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Section One
Introduction

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1.1 Context: Louisiana and Hazard Risk

Recent Catastrophic Events

The risks of natural or human-caused disasters that could create catastrophic incidents in Louisiana were well known prior to 2005. However, the impact of the 2005 hurricane season on the Gulf Coast region of the United States (US) brought about a new level of planning and engagement related to disaster response, recovery, and hazard mitigation. The 2005 hurricane season confirmed Louisiana's extreme exposure to natural disasters and the compounding effects of engineered flood-protection solutions. Hurricanes Katrina and Rita hit three weeks apart and together caused damage estimated to be between $90 to $140 billion, making the two events the first and third costliest natural disasters in US history, respectively.[1] Additionally, nearly 1600 individuals in and around New Orleans perished when area levees and floodwalls failed. On the second anniversary of Katrina, New Orleans's population remained one-third lower than before the storm and more than 200,000 people remained displaced.[2] Like Katrina, Rita was also a truly catastrophic event, and the two storms highlighted a hurricane season which was unparalleled in US history.

Katrina and Rita had profound impacts on emergency management and hazard mitigation in Louisiana. As detailed later in this document, significant funding is now being made available to the State of Louisiana for the purpose of hazard mitigation planning. The storms also raised awareness of the importance of hazard mitigation among decision-makers and the general population. However, staff with the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) which would typically be focused on hazard mitigation are still largely dedicated to addressing issues associated with the 2005 hurricane season recovery rather than working on implementing previous hazard mitigation plans. The exception to this phenomenon would be the significant amount of work that has been conducted on the Community Education and Outreach project.

In addition to catastrophic events such as Katrina and Rita, Louisiana regularly experiences incidents of severe weather. Hurricane Ike (2008) had a major impact on Louisiana despite the fact that it actually made landfall in Texas. In 2004, a number of hurricanes struck the Gulf Coast region in quick succession and caused a massive amount of damage. Hurricane Ivan (2004) actually made landfall in Alabama and Florida, yet caused millions of

[1] *The Federal Response to Hurricane Katrina Lessons Learned*, February 2006 and FEMA News Release 1603-414, March 23, 2006.

[2] Louisiana Family Recovery Corps fact sheet, August 28, 2007, citing Federal Emergency Management Agency (FEMA) and Louisiana Recovery Authority (LRA) data.

dollars of damage in Louisiana. Likewise, Tropical Storm Allison (2001) struck Louisiana as a minor tropical system, yet caused hundreds of millions of dollars of damage throughout the state.

Human-caused disasters are also likely to affect Louisiana, both in terms of physical and economic damage. The April 2010 Deepwater Horizon explosion and subsequent oil spill have caused extensive damage to Louisiana's coast and economy, and at the time of this writing the oil spill has still not been contained. The full extent of the damage caused by the oil spill cannot yet be evaluated and will likely require an extensive recovery effort.

Between 1997 and 2009, Louisiana experienced 19 presidentially declared disasters[3]. Table 1-1 summarizes their impacts on the state:

Table 1-1: Presidential Disaster Declarations in Louisiana 1997 - 2009

Disaster Event	Date	DR Number[4]	Parishes Affected	Total Federal Assistance [5] ($ Million)
Ice Storm	January 12, 1997	1169	3	$6.1
Hurricane Georges	September 9, 1998	1246	21	$370.0
Ice Storm	December 23, 1998	1264	16	$5.9
Tornadoes	April 3, 1999	1269	5	$11.7
Ice Storm	January 27, 2000	1314	8	$0.5
Ice Storm	December 11, 2000	1357	8	$6.0
Tropical Storm Allison	June 5, 2001	1380	27	$206.4
Tropical Storm Isidore	September 21, 2002	1435	16	$30.7
Hurricane Lili	October 3, 2002	1437	44	$274.7
Flood	May 12, 2004	1521	9	$6.1
Hurricane Ivan	September 13, 2004	1548	26	$20.5
Hurricane Cindy	August 23, 2005	1601	5	$3.6
Hurricane Katrina	August 29, 2005	1603	64	$22,826.0
Hurricane Rita	September 24, 2005	1607	64	$2,358.4
Severe Storms and Flooding	November 11, 2006	1668	19	$44.0
Severe Storms and Flooding	February 23, 2007	1685	3	$2.4
Hurricane Gustav	September 2, 2008	1786	64	$1,225.2
Hurricane Ike	September 13, 2008	1792	64	$255.5
Severe Storms, Tornados, and Flooding	December 10, 2009	1863	Data Not Available	Data Not Available
Total Federal Assistance 1997-2009				$27,683.7

Sources: 1997 – 2009 Disaster Declarations: State of Louisiana Governor's Office of Homeland Security and Emergency Preparedness; 2005-2009 Disaster Declarations: Federal Emergency Management Agency / Louisiana Transitional Recovery Office.

Louisiana's Location and Hazard Risk

Louisiana is located on the coast of the hurricane-prone Gulf of Mexico and at the mouth of the Mississippi River watershed, which drains over 40% of the continental US. There is no remedy for the natural forces that cause coastal storms and flooding. Such threats are compounded by the state's historic reliance on engineered flood-protection measures such as levees and floodwalls, as well as systems of canals, pipes and pumps (also known as forced drainage systems). These measures provide single lines of defense against flood hazards and when they fail the

[3] Definitions for terms like "Presidential Disaster Declarations" are included in Volume II, Appendix A.2.

[4] "DR Number" refers to disaster declaration numbers assigned by the Federal Emergency Management Agency.

[5] "Total Federal Assistance" includes: Individual Assistance, Public Assistance, and Hazard Mitigation Grant Programs administered by the Federal Emergency Management Agency and Small Business Administration loans.

results can be catastrophic. The combination of failed engineered flood-protection measures and the constant presence of manmade and natural hazards have made flood events more common and more severe in Louisiana:

- South Louisiana is subsiding at rates fast enough to be observed within decades or even years
- Coastal wetlands are eroding due to the combined effects of subsidence, severe weather, a lack of new alluvial sediments, and saltwater intrusion via navigation and oil and gas industry channels
- Climate change is causing warmer oceans and rising sea levels, which may produce more frequent extreme weather events

These factors are narrowing the natural buffers between the Gulf of Mexico and Louisiana's population centers, reducing protection from high wind and storm surges.

In addition to the natural hazards inherent on Louisiana's coast, the state's large oil and gas and petrochemical industries both present significant hazardous materials (HAZMAT) risks. Many of these industries' facilities are clustered around population centers, and they pose risks from both industrial accidents and acts of terrorism, including incidents involving highway or rail transportation. The Deepwater Horizon drilling rig explosion (April 2010) and subsequent fire on the rig's semi-submersible Mobile Offshore Drilling Unit (MODU) occurred approximately 40 miles southeast of the Louisiana coast in the Macondo Prospect oil field. The explosion killed 11 workers and injured 17 others, and caused the Deepwater Horizon to burn and sink. The incident triggered a massive ongoing offshore oil spill in the Gulf of Mexico, and is now considered to be the largest oil spill in US history. All of these relatively uncommon natural and manmade risk factors contribute to and intensify the more typical risk factors that Louisiana shares with many other states (including tornadoes, drought, wildfire, dam failures, pandemic infectious diseases, civil unrest, peacetime nuclear incidents, etc.).

In summary, Louisiana is not only particularly prone to natural and human-caused hazards, but is also subject to further vulnerability due to the fact that measures taken to protect against certain hazards (i.e., engineered flood-protection measures) have compounded the threats posed by nature. Similarly, other human actions such as those taken by oil and gas or petrochemical industries in Louisiana have also contributed to the state's susceptibility to hazards.

In light of the challenges Louisiana faces with respect to hazards, the state has been working to apply its past experiences and knowledge of hazards to reduce the impacts of future hazard events. In 2004, the state embarked on a comprehensive program to markedly improve its hazard mitigation efforts, resulting in the *State of Louisiana Hazard Mitigation Strategy* document (completed in 2005) (see Section 1.3). Following the 2005 hurricane season, Louisiana began updating its *State Hazard Mitigation Plan* (completed in 2008) (see definition, Section 1.3 below). The most recent update to the plan is being conducted in 2010 and should be approved by 2011.

1.2 Hazard Mitigation and Emergency Management

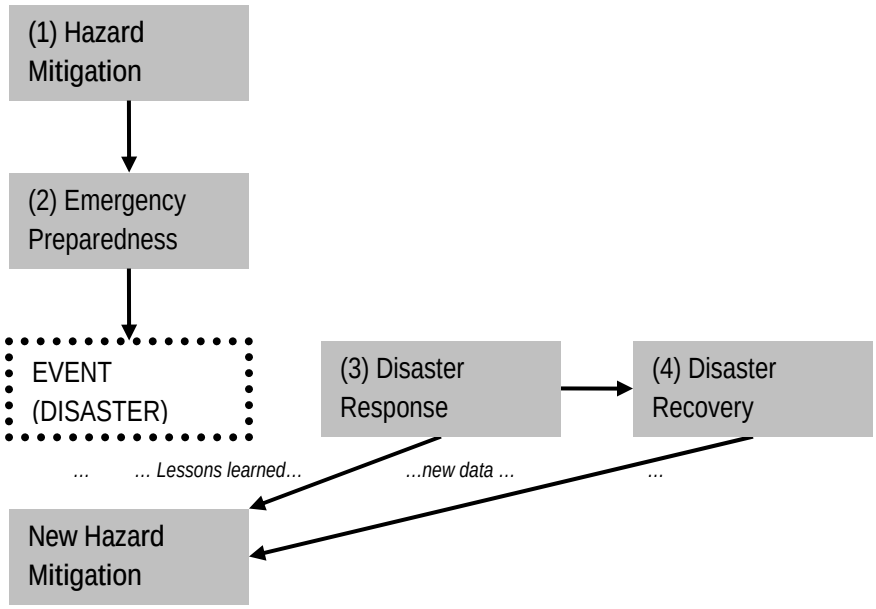
To fully understand Louisiana's hazard mitigation efforts, it is first critical to understand how hazard mitigation relates to the broader concept of emergency management. In the early 1980s, the newly-created Federal Emergency Management Agency (FEMA) was charged with developing a structure for how the Federal, state, and local governments would respond to disasters. FEMA developed the *four phases of emergency management*, an approach which can be applied to all disasters.

- Hazard mitigation is described by FEMA and the Disaster Mitigation Act of 2000 (DMA 2000) as "any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event." The goal of mitigation is to save lives and reduce property damage. This, in turn, can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical community facilities and minimize community disruption. Examples include a range of activities and actions including: land use planning, adoption and enforcement of building codes, construction projects (e.g., floodproofing homes through elevation, or acquisition or relocation away from floodplains).

- Emergency preparedness includes plans and preparations made to save lives and property and to facilitate response operations in advance of a disaster event.
- Disaster response includes actions taken to provide emergency assistance, save lives, minimize property damage, and speed recovery immediately following a disaster.
- Disaster recovery includes actions taken to return to a normal or improved operating condition following a disaster.

On the following page, Figure 1-1 illustrates the basic relationship between these phases of emergency management. It is important to note that while hazard mitigation may occur both before or after a disaster event, that it is significantly more effective when implemented before an event actually occurs. This is one of the key elements of the *Plan* and the overall *Strategy:* working to reduce risk before a disaster strikes in order to lessen the need for post-disaster response and recovery.

Figure 1-1: The Four Phases of Emergency Management



Source: FEMA

1.3 State of Louisiana Hazard Mitigation Strategy

GOHSEP[6], with the assistance and cooperation of the State Hazard Mitigation Planning Committee (SHMPC)[7], developed the comprehensive 2005 *State of Louisiana Hazard Mitigation Strategy.* One of the first steps was to develop the following mission statement:

> *Louisiana's Hazard Mitigation Strategy is the demonstration of the State's commitment to reduce risks from hazards, and serves as a guide for State decision-makers as they commit resources to reducing the effects of hazards.*

[6] Until its relocation from the Military Department to the Governor's Office in 2006, this office was known as the Louisiana Office of Homeland Security and Emergency Preparedness (variously, LOHSEP or OHSEP). A complete listing of acronyms used in this Plan is included in Volume II, Appendix A.1.

[7] See Section Three for an explanation of roles and responsibilities for GOHSEP and the SHMPC.

The 2005 *Strategy* was documented in four volumes:

I. *State of Louisiana Hazard Mitigation Plan*
II. *State of Louisiana Hazard Mitigation Plan Appendix*
III. *State of Louisiana Hazard Mitigation Program*
IV. *State of Louisiana Administrative Guidelines and Procedures*

To better understand the *Strategy*, it is important to define and review a few terms:

- *Hazard mitigation* is defined as measures taken in order to reduce the effects of hazards on a place and its population. Hazards addressed in this plan include a range of naturally occurring events such as floods, high winds and ice storms, as well as human-caused hazards resulting from accidents.
- *A Hazard Mitigation Plan* (hereafter "plan") is the result of a process states initiate in order to identify:
  - Risks they face from natural and human-caused hazards
  - The best ways to reduce or eliminate the potential for loss of life, property damage, and disruption of economic activities

  Hazard mitigation actions that can be identified through this type of planning process include a wide range of activities that include everything from home owner education to the construction of public works projects
- A *Hazard Mitigation Program* (hereafter "program") is the coordinated effort by a state or local government entity to implement actions from the plan. It also covers an important function of state governments: administering hazard mitigation grant funding to state and local agencies.
- *Administrative Guidelines and Procedures* provide the standard operating procedures and supporting materials used to solicit, award and monitor compliance with federal and state grants.

During the 2005 plan update process, Katrina and Rita made landfall in Louisiana, requiring that all staff and resources be committed to response efforts. Many of the recommendations in the 2005 plan update were not implemented due to the intensity of the response efforts.

As part of updating this 2011 plan and as described in the 2008 *Strategy*, the SHMPC began a long-term effort to better integrate key components of all plans with hazard mitigation implications in Louisiana in order to ensure that the programs, policies, recommendations and implementation strategies are internally consistent. As each of these documents have been adopted by various agencies within the state, the SHMPC has been working to incorporate this information into the decision process. As a result, the *Strategy* was broadened to include the following documents by reference:

- *State of Louisiana Emergency Operations Plan* (July 2009)
- *State of Louisiana Governor's Office of Homeland Security and Emergency Preparedness Continuity of Operations Plan (2009)*
- Regional and community-based long-term recovery plans (various dates from 2005 through 2009)

As existing planning efforts continue to evolve and new planning efforts are initiated, the SHMPC is committed to seeking consistency in the recommendations between all documents and programs

1.4 Disaster Mitigation Act of 2000 and the Interim Final Rule

The impetus for developing and maintaining a state plan comes partly from the long-term commitment of the State of Louisiana to reduce the impact of natural and human-caused hazards and partly in response to federal law. In October 2000, the President of the US signed the Disaster Mitigation Act of 2000 (DMA 2000) into law (see Volume II, Appendix I). Among its many features and supporting regulations, the DMA 2000 requires (44 CFR Part 201.4) all states to have a hazard mitigation plan approved by FEMA in order to remain eligible for many forms of federal

disaster assistance offered under the Stafford Act[8]. Table 1-2 indicates which specific Stafford Act programs will have funding withheld for states without an approved state hazard mitigation plan. DMA 2000 also requires that hazard mitigation plans be revised and updated every three years. This update of the *State of Louisiana Hazard Mitigation Plan* and *Hazard Mitigation Strategy* complies with the DMA 2000 update requirements.

Table 1-2: Federal Assistance tied to DMA 2000 Compliance

Status without State Plan Approval[9]	Major Federal Assistance Programs[10]
Funding Withheld	✓ Public Assistance (PA) – Road Systems (Category C) ✓ PA – Water Control Facilities (Category D) ✓ PA – Buildings and Equipment (Category E) ✓ PA – Utilities (Category (F) ✓ PA – Parks, Recreational, and Other (Category G) ✓ Hazard Mitigation Grant Program Project and Planning Grants (HMGP) ✓ Pre-Disaster Mitigation Grant Program Project Grants (PDM-C) ✓ Fire Management Assistance Grant Program (non-emergency provisions only) ✓ National Flood Insurance Program (NFIP) Flood Mitigation Assistance (FMA) ✓ NFIP Repetitive Flood Claims (RFC) ✓ NFIP Severe Repetitive Loss (SRL)
Funding Not Affected	✓ Public Assistance - Debris Removal (Category A) ✓ Public Assistance - Emergency Protective Measures (Category B) ✓ Pre-Disaster Mitigation Grant Program Planning Grants (PDM-C)

Source: FEMA Region VI, Denton, Texas, January 2005; "Mitigation Grant Programs Fact Sheet," www.fema.com.

Having an approved state hazard mitigation plan also allows states to be eligible for funding through the FEMA HMGP following a Presidential Disaster Declaration. Currently, HMGP funding can be set as high as 15% of the total disaster grant funds for a particular disaster. In the past, the HMGP has provided substantial funding to support hazard mitigation in Louisiana. For example, the total amount of HMGP funds for the 19 disaster declarations between 1997 and 2007 in Table 1-1 was approximately $4.3 billion, an average of more than $390 million per year. HMGP funding for Katrina alone totaled in excess of $1.7 billion.

To guide implementation of DMA 2000, FEMA published an Interim Final Rule (IFR) on February 26, 2002 that was subsequently amended in October 2002 and September 2004 (see Volume II, Appendix J). The IFR set forth the guidance and regulations under which DMA 2000-compliant state hazard mitigation plans are to be developed. The IFR provides detailed descriptions of the planning process that states and localities are required to observe, as well as descriptions of the contents of the resulting plan.

FEMA has also provided additional guidance for states and local communities to meet the requirements of the FEMA Mitigation Planning Regulations, including:

- Mitigation Planning Guidance "Blue Book"
- Mitigation Planning "How-To" Guides
- Mitigation Planning Frequently Asked Questions (FAQs)

[8] As defined in more detail in Volume II, Appendix A.2, the Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs

[9] Assuming parish and/or municipal hazard mitigation plans have been approved by FEMA.

[10] See Section Seven – Capability Assessment for a discussion of Federal assistance programs as they relate to hazard mitigation in Louisiana.

The IFR includes requirements and provisions for two different facets of hazard mitigation at the state level that are mirrored in the State of Louisiana's overall strategy: a *Standard State Hazard Mitigation Plan* and an *Enhanced State Hazard Mitigation Plan*. The main distinctions between these two sets of requirements and their relation to the components of the strategy are described in the following paragraphs.

Standard State Hazard Mitigation Plan

The Standard State Hazard Mitigation Plan, or "Standard Plan", is the Federally mandated DMA 2000 planning effort that is required to be approved by FEMA and updated on a three-year cycle to preserve current levels of federal disaster aid eligibility. In a broad sense, the Standard Plan is intended to identify and support implementation of discrete actions that will reduce the risk of loss of life and property damage and preserve eligibility for existing levels of federal pre- and post-disaster funding.

More specifically, the section of the IFR regarding the Standard Plan requires:

- *Risk Assessments* identifying the types and impacts of all natural hazards[11]
- *Goals and Objectives* that reflect the hazards that threaten the state and outline actions that can be taken to minimize or eliminate the damaging impacts of these hazards
- *A Mitigation Action Plan* outlining specific activities and actions with a concrete implementation strategy to reduce risk from the identified hazards
- *A Plan Maintenance Process* specifying how the Mitigation Action Plan will be kept current and focused on addressing hazards in the most effective manner possible

The *State of Louisiana Hazard Mitigation Plan Update*, as documented in this first volume of the overall *Strategy*, has been developed in accordance with these specific requirements.

Enhanced State Hazard Mitigation Plan

The DMA 2000 requires the production of a Standard Plan for states to maintain current levels of funding eligibility. However, the DMA 2000 also includes a significant incentive for states to undertake improvements to the way they administer programs related to hazard mitigation. Specifically, the DMA 2000 provides for "enhanced" status for states that meet certain performance criteria in their efforts to support hazard mitigation at the state and local level.

If a state is designated as having an *Enhanced State Hazard Mitigation Plan*, the most immediate benefit to the state is that the amount of money made available for HMGP funding may increase from 15% to 20% of the total disaster grants for a particular disaster in that state.

For a state with a history of natural disasters like Louisiana, having an enhanced plan could result in the state receiving a significant amount of additional HMGP funding following a federally declared disaster. Therefore, the *State of Louisiana Hazard Mitigation Program,* as documented in Volume III of the *Strategy*, identifies how Louisiana will conduct its hazard mitigation administrative program to meet the DMA 2000 requirements for Enhanced Program status.

1.5 Emergency Management Accreditation Program

The Emergency Management Accreditation Program (EMAP) is a standard-based voluntary assessment and accreditation process for state and local government programs responsible for coordinating prevention, mitigation, preparedness, response, and recovery activities for natural and human-caused disasters. Accreditation is based on compliance with collaboratively developed national standards, the *Emergency Management Standards.*

[11] The State of Louisiana Hazard Mitigation Plan Update includes consideration of several manmade hazards although this is not a requirement of the DMA 2000.

The program is administered by the EMAP Commission, a ten member governing and decision-making body. Its members are appointed by the International Association of Emergency Managers (5 members) and the National Emergency Management Association (5 members), key organizations in the creation of EMAP.

This plan update has been developed to comply with the September 2007 edition of the EMAP Standards.

1.6 Comprehensive Hazard Mitigation in Louisiana

In response to the varied risk factors faced by Louisiana, a wide array of programs, plans, and organizations have been created at the federal, state and local levels that contribute to comprehensive hazard mitigation in Louisiana. This document is one plan that has been developed to address the mitigation of natural and certain human-caused hazards in Louisiana.

This plan focuses on mitigating the impacts of hazards by using the programs and funding streams available to DMA 2000-compliant states and jurisdictions (see Table 1-2).

The core purpose of this plan is to provide a basic understanding of risks from natural and certain human-caused hazards and a consistent framework for assigning resources to projects, programs and policies intended to address those risks. The resources include funding available to DMA 2000-compliant states and jurisdictions (see Table 1-2) for hazard mitigation such as the FEMA HMGP, Pre-Disaster Mitigation (PDM) grant program, Public Assistance (PA) grant program, Flood Mitigation Assistance (FMA) program, or other federal and non-federal sources.

This plan also addresses coordination of state and local hazard mitigation planning, and hazard mitigation capability at local, regional and state levels. In instances where no other program or entity appears compatible with mitigating a particular hazard, the plan will propose future actions including new legislation, changes to administrative rules or definitions, and/or the creation of new decision-making frameworks by which Louisiana may manage that particular risk.

The overall *Strategy* acknowledges and defers to other programs or agencies that are already effectively positioned to mitigate a given hazard, especially where effective mitigation is beyond the scale and scope of the available federal hazard mitigation programs and funds. This *Strategy* supports and leverages other mitigation related efforts, but to the extent possible, it does not duplicate them. These comprehensive hazard mitigation-related efforts fall into three broad categories that are documented in detail in Section 8.3:

- Decreasing the magnitude of hazards through measures including large scale coastal protection and restoration projects, and regional wildfire mitigation and suppression programs
- Decreasing exposure to hazards through large-scale state and federally-funded construction projects such as systems of levees and floodwalls, and continued support for enforcement of floodplain management and building code ordinances
- Improving disaster response through emergency preparedness and response planning and ongoing efforts to address biological hazards such as infectious diseases

1.7 State of Louisiana Hazard Mitigation Plan Update

As noted, GOHSEP developed the original *State Hazard Mitigation Plan* in response to the DMA 2000 Standard Plan requirements with the assistance and cooperation of the SHMPC. That document (hereafter the "April 2005 Plan"), formally adopted for the state in 2005 (see Section Two), was the result of their efforts during 2004 and 2005. That document was preceded by the *State of Louisiana Hazard Mitigation Plan* which was produced in the 1990s and included an inventory of hazards but primarily focused on administrative procedures for hazard mitigation grant programs. The original plan was updated, and this update was approved in 2008.

The new updated document ("Plan Update") was approved in 2011 and meets the DMA 2000's mandate of state plan updates every three years.

The 2011 Plan Update maintains the organization of the 2005 and 2008 Plans, which parallel the structure provided in the IFR and has the following sections:

- Section One Introduction
- Section Two Plan Adoption
- Section Three Planning Process
- Section Four Hazard Identification and Profiles
- Section Five Statewide Risk Assessment
- Section Six Risk Assessment for State-Owned Assets
- Section Seven Capability Assessment
- Section Eight Mitigation Action Plan
- Section Nine Coordination with Local Mitigation Planning
- Section Ten Plan Maintenance Process

Most of these sections are written in summary form. Appendices related to each section provide full detailed discussions of all aspects of the Plan Update (e.g., methodologies, complete results, etc.).

The Plan Update identifies appropriate hazard mitigation actions focused on two parallel tracks:

- to address the risk from hazard events on a Statewide basis to help local communities and parishes set priorities for specific mitigation actions which result in the greatest benefit
- to ensure that state-owned assets are adequately protected to reduce losses and preserve the state's capability of providing essential services in the wake of a disaster

The Plan Update includes a detailed characterization of selected natural and human-caused hazards, and a risk assessment for each hazard type that leads to the determination of relative risk to physical assets, people, and operations. It also includes a set of goals, objectives, and mitigation actions formulated in direct response to the identified risks. Lastly, it includes a detailed plan for implementing and monitoring the long-term performance of the Plan Update.

1.8 Summary of Goals and Objectives

In response to the contents of the risk and capability assessments, the SHMPC created an overall mission statement for the *Strategy* and developed four overarching goals that identified the need to work with Louisiana parishes, communities, and government agencies to reduce the possibility of damage and loss through:

- Goal 1: Improving Outreach and Education
- Goal 2: Improving Data Collection, Use and Sharing
- Goal 3: Improving Hazard Mitigation Planning and Implementation Capabilities
- Goal 4: Reducing risk via implementing appropriate Mitigation Construction Projects

In an effort to provide more detailed direction to the citizens of the state and other state agencies, the SHMPC identified objectives and corresponding mitigation actions for each of these goals (see Section Eight of this Plan).

Section Two
Plan Adoption

Contents of this Section

2.1 Interim Final Rule Requirements for Plan Adoption
2.2 Plan Adoption by the Governor of Louisiana

2.1 Interim Final Rule Requirements for Plan Adoption

Disaster Mitigation Act of 2000-compliant Standard State Hazard Mitigation Plans must be formally adopted by the appropriate elected official(s). In the State of Louisiana, the Governor has the authority to act on behalf of the state in this regard.

The Interim Final Rule (IFR) contains three specific requirements relative to the adoption of the plan by the State of Louisiana:

- Requirement §201.3 (c)(3): "At a minimum, review and, if necessary, update the Standard State Mitigation Plan ... every three years from the date of the approval of the previous plan in order to continue program eligibility."
- Requirement §201.4(c)(6): "The plan must be formally adopted by the State prior to submittal to [FEMA] for final review and approval."
- Requirement §201.4(c)(7): "The plan must include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The State will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d)."

2.2 Plan Adoption by the Governor's Authorized Representative

Adoption of the *State of Louisiana Hazard Mitigation Plan* by the Governor of the state affirms the commitment of the state to pursue the activities and actions identified in the plan. Below are the approval dates of the various iterations of this plan:

- The original 2005 Plan was approved by the Governor of Louisiana on April 26, 2005.
- An interim plan update was developed by the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and then reviewed and approved by the State Hazard Mitigation Team on September 14, 2007.
- The 2008 plan was approved by the Governor's Authorized Representative in April 2008
- The current 2011 Plan Update was approved by the Governor's Authorized Representative on April 1, 2011 (see Page I-11 for a copy of the signed adoption letter).

The current 2011 update to the plan satisfies IFR requirement §201.3 (c)(3) to update and resubmit the plan every three years for FEMA approval. Following approval by FEMA, the State Hazard Mitigation Team will recommend to the Governor adoption of the plan, which incorporates and satisfies both IFR requirements (§201.4(c)(6) and §201.4(c)(7)).

BOBBY JINDAL
GOVERNOR

State of Louisiana
Governor's Office of Homeland Security and Emergency Preparedness

MARK A. COOPER
DIRECTOR

April 1, 2011

Tony Russell, Regional Director
Federal Emergency Management Agency, Region VI
Federal Regional Center, Room 206
800 N. Loop 288
Denton, TX 76201-3698

RE: State of Louisiana Standard Hazard Mitigation Plan Update

Dear Mr. Russell:

I am pleased to submit the State of Louisiana Hazard Mitigation Plan Update for your review and approval. In my capacity as Governor's Authorized Representative, I am authorized to adopt the plan on behalf of the State of Louisiana. This letter represents my formal adoption of this document and is based upon the recommendations of the State Hazard Mitigation Team, the efforts of the State Hazard Mitigation Planning Committee (SHMPC) and the support of the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP). This Plan Update builds on our previously approved Hazard Mitigation Plan and has been prepared in a manner consistent with the requirements of the Disaster Mitigation Act of 2000 (44 CFR 201.4).

The Plan Update will help continue the efforts of the State of Louisiana to reduce the impacts of natural disasters and focuses on the most significant hazards including storm surge, high winds, flooding, levee failure and subsidence. The actions described in the Plan Update address: education and outreach for communities and citizens; improving the quality and quantity of information used to make risk reduction decisions; seeking better coordination between all levels of government; and most importantly, identifying and implementing technically feasible, cost effective, and environmentally sound hazard mitigation projects.

In addition, I certify that the State will continue to comply with all applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding in compliance with 44 CFR 13.11(c). The State also certifies it will amend the plan whenever necessary to reflect changes in State or federal laws and statutes as required in 44 CFR 13.11(d).

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Page 2
RE: State of Louisiana Standard Hazard Mitigation Plan Update

I wish to express my gratitude for the efforts of your staff who have been working with GOHSEP and the SHMPC to develop this Plan Update. The successful implementation of the actions in the Plan Update will depend on a continuation of that partnership and we look forward to receiving your approval so the work can begin.

If you or your staff has any comments, please contact D. Casey Levy, State Hazard Mitigation Officer, at Casey.Levy@la.gov or at 225-267-2673. Thank you for your continued support.

Sincerely,

Mark A. Cooper

MAC:dcl

Section Three
Planning Process

Contents of this Section

3.1 Interim Final Rule Requirement for Planning Process
3.2 Documentation of the Planning Process
3.3 Coordination among Agencies, Stakeholders and Interested Parties
3.4 Program Integration

3.1 Interim Final Rule Requirements for Planning Process

The Interim Final Rule (IFR) states that "[a]n effective planning process is essential in developing and maintaining a good plan." The IFR backs up this statement with specific requirements for documenting the planning process and indicating to what extent this planning effort is integrated with other plans and programs at the Federal, state and local levels. The IFR includes three specific requirements for the process of developing Standard State Hazard Mitigation Plans:

- Documentation of the Planning Process per Requirement §201.4(c)(1): "[The State plan must include a] description of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how other agencies participated."
- Coordination among Agencies per Requirement §201.4(b): "The [State] mitigation planning process should include coordination with other State agencies, appropriate Federal agencies, interested groups…"
- Program Integration per Requirement §201.4(b): "[The State mitigation planning process should] be integrated to the extent possible with other ongoing State planning efforts as well as other FEMA mitigation programs and initiatives."

3.2 Documentation of the Planning Process

This subsection includes documentation regarding:

- Plan Update
- Meetings and Workshops
- Participants
- Stakeholders

Plan Update

As noted in Section 1.5, the Disaster Mitigation Act of 2000 (DMA 2000) provided a strong incentive for the development of a Standard State Hazard Mitigation Plan. As a result, the State of Louisiana, through the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), began the process of developing a State Hazard Mitigation Plan in 2003.

The planning process began in May 2004 and led to adoption by the Governor and approval by the Federal Emergency Management Agency (FEMA) on April 26, 2005.

Subsequently, an interim update of the plan was prepared by GOHSEP in 2007 to comply with Emergency Management Accreditation Program (EMAP) requirements. This interim update included improving integration between this plan and the state Emergency Operations Plan (EOP) and Continuity of Operations Plan (COOP). The Interim Update was presented to and approved by the State Hazard Mitigation Team (SHMT) in 2007.

The 2007 update consisted of updating all sections of the 2005 Plan using the best available data and methodologies[1], culminating with FEMA approval in April 2008.

Plan updates and FEMA re-approvals are required every three years. The process used to update this plan in accordance with said requirement was formally initiated in December 2009. The scope of work initiated by all participants consisted of updating each section of the 2008 Plan using the best available data and methodologies[2], hopefully culminating with FEMA approval by the end of April 2011.

The following summary identifies the process used to revise and update each section of the plan:

- Section One, Introduction: This section was updated with a brief overview of relevant hazard information that has changed since 2008. All Presidential Disaster Declarations, including disaster numbers, parishes affected, and total federal assistance dollar amounts were updated. A definition and subsequent discussion were included to clarify the significant differences between hazard mitigation and emergency preparedness.
- Section Two, Plan Adoption: This section was reorganized to reflect that this is an update of the 2008 Plan and was readopted by the Governor before official submission to FEMA.
- Section Three, Planning Process: This section was edited to explain the process used to update the plan. All meetings and agencies involved in the plan update are listed in this section.
- Section Four, Hazard Identification and Profiles: This section was revised to describe the hazards addressed in the plan based on relevance to hazard mitigation planning and implementation programs. When new information was available, histories for identified hazards were updated.
- Section Five, Statewide Risk Assessment: This section was updated to reflect relative risk between parishes. Information from 74 different hazard mitigation plans (including parish/local and university plans) was also reviewed for new risk data such as Advisory Base Flood Elevations; damages resulting from hurricanes Gustav and Ike; and the potential impact of levee failures.
- Section Six, Risk Assessment for State-Owned Assets: This section was updated using results from the Hazard Profiles and Statewide Risk Assessment to rank individual state-owned assets. Significant effort was put into updating the State Owned Asset database and new methodology was used to classify all of the state-owned facilities. Hazard frequency and past damage data were used to calculate annualized or monetized risk. A list of the top ten facilities was created for each hazard and a top ten list was produced to show state-owned assets at risk from all hazards. A system for conducting detailed site-specific assessments was developed for the assets deemed most at risk.
- Section Seven, Capability Assessment: This section was updated to show changes in state and local capabilities for planning and implementing hazard mitigation. Surveys were developed and administered at state, regional, and local levels to evaluate capabilities throughout the state. This included contacting various state agencies involved in hazard mitigation, nine GOHSEP Regional Coordinators, local (parish) office of homeland security and emergency preparedness directors, and local floodplain managers. The results were compiled, analyzed, noted for trends, and summarized.
- Section Eight, Mitigation Action Plan: Updating this section of the plan focused on a number of key areas:
  - documenting progress towards implementing action items in the April 2008 Plan
  - improving education and outreach efforts
  - seeking ways to improve sharing of hazard and risk data
  - building local, regional and state capabilities
  - developing region-specific priorities for mitigation projects at the parish and community levels
  - identifying pilot projects to implement for state-owned assets

[1] The term "best available data and methodologies" as used in this Plan Update is defined in Sections Four, Five and Six.
[2] The term "best available data and methodologies" as used in this Plan Update is defined in Sections Four, Five and Six.

- Section Nine, Coordination of Local Planning: This section was updated by documenting the substantial gains made regarding parish and local hazard mitigation plan adoption and documenting progress toward development and implementation of the Planning Pilot Grant Program. This section also refined the criteria for prioritizing local assistance.
- Section Ten, Plan Maintenance: The final section was revised to institutionalize monitoring, evaluating, and updating the plan. The plan, in moving forward, reflects Louisiana's commitment to improving the monitoring, evaluating, and updating process and continuing compliance with the DMA 2000 requirements.

Meetings and Workshops

The State Hazard Mitigation Planning Committee (SHMPC) met on 10 separate occasions while developing the 2011 Plan Update. Details regarding meetings for the 2011 Update can be found in Volume II, Appendix C. Below are details regarding the ten meetings that contributed to the current update of the plan:

Table 3-1: State Hazard Mitigation Planning Committee Meetings (2011 SHMP Update)

#	Date / Place	Subject	Participants
1	January 19, 2010	SHMPC Meeting #1 –Kick off meeting	GOHSEP, SHMPC & Consultants
2	February 23, 2010	SHMPC Meeting #2 Review work-in-progress	GOHSEP, SHMPC & Consultants
3	April 18, 2010	Reviewed State-Owned Facility Database and validated the assigned rankings	GOHSEP, SHMPC, Key Stakeholders & Consultants
4	April 27, 2010	SHMPC Meeting #3 - Review work-in-progress	GOHSEP, SHMPC & Consultants
5	May 5, 2010	Review Hazards and Risk Assessment methodologies	GOHSEP, SHMPC, Key Stakeholders & Consultants
6	May 25, 2010	Review Risk Assessment methodologies for State-Owned Facilities	GOHSEP, SHMPC, Key Stakeholders & Consultants
7	June 30, 2010	Plan update to new SHMT members and review of initial draft sections 1-6	GOHSEP, SHMPC & Consultants
8	July 27, 2010	SHMPC Meeting #4 - Discuss Goals, Objectives and Mitigation Actions	GOHSEP, SHMPC & Consultants
9	November 9, 2010	SHMPC Meeting #5- Discuss Final Draft	GOHSEP, SHMPC & Consultants
10	March 24, 2011	SHMPC Meeting #6- Recommend Plan Adoption	GOHSEP, SHMPC & Consultants

These workshops and meetings were facilitated by GOHSEP and its consultant. Prior to these meetings, the SHMPC and key stakeholders received packets of information that were subsequently presented and discussed at the workshops / meetings. The products were also posted on the project SharePoint site for access by those who could not attend the meetings. GOHSEP also posted information on the "Get a Game Plan" website for review and comment. After the presentations the SHMPC reviewed modified proposed elements of the Plan Update, and either approved or rejected them. This was usually accomplished through facilitated discussion and consensus. Prior to submitting the Plan Update to the Governor, the SHMPC took a formal vote to approve and recommend the Plan Update for adoption.

Participants

A number of individuals and agencies played key roles in preparing the Plan Update including:

- The Governor of Louisiana
- Governor's Office of Homeland Security and Emergency Preparedness State Hazard Mitigation Team (SHMT)
- State Hazard Mitigation Planning Committee (SHMPC)
- State Hazard Mitigation Stakeholders Group Federal Emergency Management Agency, Region VI
- Consultants

The specific responsibilities of these participants and agencies are as follows:

The Governor of Louisiana

The Governor of Louisiana was responsible for:

- Authorizing the SHMT and SHMPC to develop the State of Louisiana Hazard Mitigation Plan
- Reviewing the recommendations of GOHSEP and the SHMT to adopt the plan on behalf of the state
- Requesting revisions to the plan's contents if deemed necessary
- Formally adopting the plan

Governor's Office of Homeland Security and Emergency Preparedness

GOHSEP was the lead state agency for developing the Plan Update, with specific responsibility for project management resting with the State Hazard Mitigation Officer. Although the SHMT and SHMPC were responsible to the Governor for the actual development and production of the Plan Update, GOHSEP performed an important coordination function throughout its development. GOHSEP directly supervised the consultant's activities and facilitated the involvement of the SHMPC members. GOHSEP also provided important oversight and quality control to ensure that the plan and the associated process met federal requirements. At the end of the process, GOHSEP provided a formal recommendation for the Governor to adopt the Plan Update.

State Hazard Mitigation Team

The SHMT was responsible for developing, reviewing and approving the 2005 Plan; the 2007 Interim Plan Update; the 2008 Plan Update; and this 2011 Plan Update. At present, the SHMT is comprised of the following state agencies and key stakeholders:

- GOHSEP
- Department of Transportation and Development (DOTD)
- Department of Wildlife and Fisheries (DWF)
- Department of Environmental Quality (DEQ)
- Governor's Office of Coastal Activities (OCA)
- Department of Natural Resources (DNR)
- Department of Agriculture and Forestry (DAF)
- Division of Administration, Office of Risk Management (DOA-ORM)
- Division of Administration, Office of Community Development, Disaster Recovery Unit (DOA-OCD-DRU)
- One Office of Emergency Preparedness Director representing GOHSEP Regions 1,2,3,4 and 9
- One Office of Emergency Preparedness Director representing GOHSEP Regions 6,7 and 8
- Police Jury Association
- Louisiana Municipal Association
- Levee District Association

As directed by the governor or the governors authorized representative the duties and functions of the SHMT may include, but are not limited to:

- Identifying the State of Louisiana's vulnerability to hazards
- Reviewing existing mitigation plans and prioritizing recommendations
- Developing or updating Hazard Mitigation Plans required under 44 CFR Subpart M
- Developing a comprehensive strategy for the development and implementation of a State Mitigation Program
- Reviewing, assigning priority, and recommending mitigation actions for implementation, including measures to be funded under the Hazard Mitigation Grant Program or other Federal grant programs
- Seeking funding for implementation of mitigation measures

State Hazard Mitigation Planning Committee

To assist the SHMT in developing and updating the plan, the SHMPC was formed. The committee consists of the SHMT plus representatives of state agencies with a perceived role in hazard mitigation[3]. The SHMPC was the body that provided the primary direction for the planning process and reviewed all milestone deliverables. In addition to the members of the SHMT (listed above), the SHMPC's members include:

- The Division of Administration, Office of Facility Planning
- The Department of Corrections
- The Department of Education
- The Department of Health and Hospitals
- The Department of Public Safety, Louisiana State Uniform Construction Code Council

State Hazard Mitigation Stakeholder Group

The primary audience for the Plan Update was taken into consideration at all stages and their input was solicited at various stages of the process. The term "stakeholders" as used in the rest of this Plan Update includes the following:

- GOHSEP Regional Coordinators
- Parish Offices of Homeland Security and Emergency Preparedness
- Parish and local Floodplain Administrators
- Parish and local Coastal Zone Administrators
- Parish and local Building Officials
- State agencies with at-risk facilities

The term "local" as used in this plan includes parishes, municipalities and tribal governments[4]. Although federally recognized tribes have specific rights under DMA 2000 to be recognized as the equivalent of a state for planning purposes, all of the federally recognized tribes in Louisiana participating in hazard mitigation planning have done so as participating jurisdictions under a parish-level multi-jurisdictional hazard mitigation plan.

Federal Emergency Management Agency, Region VI

FEMA, through its Region VI office in Denton, Texas, is the responsible party for reviewing the plan for compliance with DMA 2000 and the IFR. Representatives of FEMA Region VI also helped facilitate completion of this plan through on-going review of the plan as it was developed and updated.

[3] A complete listing of the contributors to the Plan is included in the "Acknowledgements".
[4] See definition of "Local Government" in Appendix A.1

Consultants

The consultant for the Hazard Mitigation Plan Update was James Lee Witt Associates. The consultant assisted in a variety of ways, including:

- Developing an appropriate planning process
- Providing technical support in performing the risk assessments
- Developing written materials for meetings and web postings
- Making presentations at SHMPC meetings and workshops
- Facilitating SHMPC meetings and workshops, i.e., ensuring that discussions and products from meetings addressed plan elements
- Providing support for outreach to interested parties and coordination efforts among federal and state agencies
- Assembling information for inclusion in the plan

3.3 Coordination among Agencies, Stakeholders, and Interested Parties

The IFR requires that states describe how federal and state agencies were involved in the planning process. The IFR also requires that states describe how interested groups and individuals were involved in the planning process. For the purposes of this Plan Update, a distinction is made between stakeholders and interested parties. As noted in Section 3.2, "stakeholders" for this Plan Update are primarily organizations and agencies that will potentially play a direct role and/or receive a direct benefit in implementing the recommendations in the Mitigation Action Plan (Section Eight).

Interested parties include anyone else who could potentially benefit either directly or indirectly from the Plan Update recommendations. This primarily refers to residents, property owners and business owners in the State of Louisiana.

This subsection describes:

- the involvement of other Federal and state agencies and stakeholders
- the process by which GOHSEP and the SHMPC provided opportunities for interested parties to review and comment on the Plan during its development

FEMA and the state agencies that are members of the SHMPC had regular involvement in developing the Plan Update. GOHSEP and the SHMPC also sought participation from additional federal and state agencies and the Plan Update Stakeholders (see Section 3.2) while developing the Plan Update. As part of this process, the participation of universities, private citizens, businesses, and non-profit and non-governmental organizations was solicited.

Outreach to Federal and State Agencies

In addition to the involvement of state agencies on the SHMT and SHMPC and the inclusion of federal and state agencies and other organizations on the Stakeholder Group, contacts were made with federal and state agencies to inform them that we were updating our plan and to for ask for their assistance in providing the most current data. The agencies included:

Federal Agencies

- US Department of Defense, US Army Corps of Engineers
- US Environmental Protection Agency
- US Department of the Interior US Geological Survey
- US Department of Commerce National Oceanic and Atmospheric Administration
- US Department of Agriculture Natural Resources Conservation Service
- US Department of Agriculture Census
- US Department of Commerce, US Census Bureau
- US Department of Education
- US Department of Homeland Security, US Coast Guard, National Response Center

State Agencies

- Division of Administration
- Department of Culture, Recreation and Tourism
- Department of Economic Development
- Department of Insurance
- Department of Justice
- Department of Labor
- Department of Public Safety and Corrections / Office of State Police
- Department of Public Safety and Corrections / Office of Youth Development
- Department of Revenue
- Department of Social Services
- Department of State
- Department of the Treasury
- Department of Veterans Affairs
- Louisiana State University System
- Louisiana Technical College System
- University of Louisiana System
- Louisiana State University Health Sciences Center
- Southern University System

Correspondence to the agencies also indicated the desire of GOHSEP and the SHMPC to establish long-term partnerships as part of implementing the plan's recommendations. Copies of all relevant correspondence are included in Volume II, Appendix C.

Outreach to Stakeholders

In addition to contacts made with stakeholders as part of the Capability Assessment (see Section Seven), correspondence similar to that sent to the federal and state agencies was sent to all 64 parish emergency management agency directors as well as parish and community floodplain administrators. Various stakeholders were contacted to assist with the plan update. Selected groups were asked to provide subject matter expertise and they were asked to review and provide comments on relevant sections of the plan.

GOHSEP Website

GOHSEP developed the "Get a Game Plan" website and has a detailed posting on its web site that described the purpose of the plan and progress on its development. The web site and posting were linked to various state agency web sites. The posting was updated periodically during development of the plan to include copies of the Draft Plan

and all subsequent versions in printable formats. A printed copy of the information posted on the web site is provided in Volume II, Appendix C.3. The postings each provided methods of contacting GOHSEP to ask questions about the plan, and to provide input.

Briefings with Governor's Authorized Representative

A briefing was held by GOHSEP and the SHMT on January 13, 2011 with the Governor's Authorized Representative and directors of departments that comprise the SHMT. The briefing focused on recommendations included in the Plan Update as a prelude to adoption by the GAR on behalf of the State of Louisiana. Briefing materials are included in Volume II, Appendix C.

3.4 Program Integration

The IFR requires that the State describe how its mitigation planning process is integrated with other ongoing state planning efforts as well as FEMA mitigation programs and initiatives.

This subsection describes:

- State Mitigation Programs and Initiatives
- FEMA Mitigation Programs and Initiatives

State Mitigation Programs and Initiatives

A measure of integration and coordination is achieved through the participation on the SHMPC of representatives of state agencies who administer three programs: floodplain management under the National Flood Insurance Program (NFIP), coastal protection and restoration under the provisions Act 8 of the First Extraordinary Session of 2005, and the State Uniform Construction Code. There are also several initiatives listed below that have fostered further coordination and integration of the SHMPC. Each of these programs, and the interactions with the responsible agencies, are described in more detail in Section Seven – Capability Assessments and Volume II, Appendix G.

NFIP- The Department of Transportation and Development (DOTD) administers the NFIP within the State of Louisiana. The state NFIP Coordinator, who is the DOTD's representative on the SHMPC, and staff provide technical assistance visits to local municipalities to advance hazard mitigation planning concepts and advise communities how to best meet certain Community Rating System requirements. They work directly with local floodplain management officials and planners to emphasize the links among land use, comprehensive planning, and hazard mitigation planning. DOTD is also currently involved in an ongoing planning effort to develop a flood map modernization program for the state.

Coastal Protection and Restoration Authority - In response to the hurricanes of 2005, under Act 8 of the First Extraordinary Session of the 2005 State Legislature, the Louisiana Wetlands Authority was renamed the Louisiana Coastal Protection and Restoration Authority (CPRA) and its authorization was expanded to integrate hurricane protection and coastal restoration. The CPRA is comprised of the Department of Natural Resources (DNR), DOTD, GOHSEP, and the Governor's Advisory Commission on Coastal Protection, Restoration, and Conservation, plus other state agencies, representatives of levee districts in the state's coastal zone, and selected additional parish leaders. Act 8, along with a subsequent constitutional amendment, also dedicated existing and future state trust fund monies (the Coastal Protection and Restoration Fund) to hurricane protection and coastal restoration. Act 8 also mandated the development of a comprehensive master coastal protection plan along with subsequent annual plans that establish clear priorities for activities and expenditures for coastal restoration and protection. A team led by staff from DNR and DOTD developed the plan, entitled *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast*, which was approved by the Louisiana legislature in June 2007. This plan recognizes the important role of coastal restoration as an integral strategy in hurricane and flood protection and portrays the state's vision of comprehensive protection that includes structural, management, and institutional components of short- and long-term efforts. It also includes numerous large-scale projects to restore and/or stabilize shorelines, barrier islands, and navigable waterways against erosion.

The Office of Coastal Protection and Restoration (OCPR) was formed in July 2008. OCPR is an office under the Governor and reports to the Executive Director of the CPRA. OCPR staff were reassigned from two agencies: DNR, which used to direct coastal restoration activities; and DOTD, which used to coordinate coastal flood control measures. OCPR is responsible for integrating hurricane protection, storm damage reduction, flood control, coastal protection and restoration efforts, and associated infrastructure and maintenance within Louisiana.

In April 2010, OCPR developed the *CPRA Fiscal Year 2011 Annual Plan: Integrated Ecosystem Restoration and Hurricane Protection in Coastal Louisiana.* This plan links funding sources and spending levels for specific projects and identifies a three year spending plan from FY 2011 to FY 2013. The plan also provides discussion of progress in project implementation during FY 2010. The plan incorporates a variety of coastal activities including projects using Water Resources Development Act Authority funds; Coastal Wetland Planning, Protection and Restoration Act funds; Coastal Impact Assistance Program funds; and DOTD infrastructure funds. OCPR also developed a database, which lists coastal projects that Louisiana and its partners are planning, constructing, and operating. The database currently does not reflect private and local projects. However, there are plans for the inclusion of such projects in the future.

Uniform Construction Code – In 2005, Louisiana adopted the Uniform Construction Code (UCC) statewide, a recommendation made in the April 2005 Plan. Although administered and enforced at the local level, the UCC (2006 edition) is coordinated and given program support by the state Department of Public Safety. The Plan Update incorporates the UCC as a key part of the State of Louisiana Hazard Mitigation Strategy.

Levee District Consolidation – In 2006, Louisiana enacted legislation to consolidate east bank levee boards in St. Bernard Parish, Orleans, Jefferson, St. Charles and St. John the Baptist parishes, and the southern portions of St. Tammany and Tangipahoa parishes. A separate board was created to cover areas on the west bank of the Mississippi River. The two levee authorities are overseen by an 11-member board that is appointed by the Governor. Those boards are organized under the CPRA. The legislation called for the CPRA to "serve as the single state entity to act as local sponsor for construction, operation, and maintenance of hurricane, storm damage reduction, flood control, and coastal restoration." This year the Louisiana Legislature passed Act 1008 of the 2010 Regular Session which created the Chenier Plain Coastal Restoration and Protection Authority covering Calcasieu, Cameron, and Vermilion parishes.

In addition, GOHSEP has undertaken an ambitious Community Education and Outreach (CEO) program based on a recommendation of the 2005 and 2008 Plans. Funded under FEMA's Hazard Mitigation Grant Program (HMGP) derived from hurricanes Katrina and Rita, the CEO program includes provisions to create an interactive Hazard Analysis and Risk Assessment to provide useful hazard data and information regarding hazard mitigation planning and implementation to a broad audience including state, parish and local decision-makers, business and property owners.

Emergency Operations Plan (EOP) - In the July 2009 EOP care was taken to ensure that coordination was maintained with the parallel development of the EOP. The types of issues included in these coordination efforts ranged from seeking consistency in the way hazards are identified to identifying opportunities to integrate mitigation practices in response and recovery operations. Additional ongoing efforts by the SHMPC to create a comprehensive updated plan include utilizing materials from EOP Attachment 2- Hazard Identification and Risk Assessment to update and coordinate the Risk Assessments in the State of Louisiana Hazard Mitigation Plan.

Continuity of Operations Plan (COOP) – The GOHSEP COOP plan was updated in September 2009 and GOHSEP also developed a Pandemic Flu Annex to the COOP. The COOP was incorporated into the State of Louisiana Hazard Mitigation Strategy to specifically acknowledge that key provisions of that plan were part of the overall approach to reducing risk and the impacts of hazards. In particular, providing for redundancy of critical systems, equipment, flow of information, operations and materials was considered consistent with the overall goals and objectives of the plan.

Emergency Management Accreditation Program – A number of refinements and changes were made to the State Hazard Mitigation Plan in 2007 in order to achieve EMAP compliance. These interim update changes were submitted to and approved by the State Hazard Mitigation Team in late 2007. These changes have been brought forward and were integrated into subsequent plan updates.

FEMA Mitigation Programs and Initiatives

The previous discussion identified the integration of programs and initiatives of state agencies charged with administering the following FEMA programs and initiatives:

- NFIP
- CRS
- Risk MAP Program, including flood map updates

In addition, there is already a strong connection between the GOHSEP hazard mitigation planning program and the Federal DMA 2000 State and Local hazard mitigation planning initiative. However, Section Eight - Mitigation Action Plan includes recommendations that will better integrate the FEMA mitigation planning initiative with GOHSEP technical support, including GOHSEP support for:

- Completing and adopting parish and municipal hazard mitigation plans
- Improving the gathering, use and sharing of data and information between the state and local governments
- Improving local capabilities to plan and implement hazard mitigation projects

GOHSEP provides leadership for state and local mitigation planning efforts, and administers and oversees FEMA-related mitigation grant programs for the State of Louisiana that are related to hazard mitigation, emergency management and disaster relief. Based on this role, GOHSEP has the opportunity to integrate mitigation planning and project information with the FEMA grant application process for the following:

- HMGP
- Pre-Disaster Mitigation Competitive Grant Program
- Flood Mitigation Assistance (FMA) Program
- Public Assistance Grant Program
- Severe Repetitive Loss (SRL) Grant Program
- Repetitive Flood Claims Grant Program

Reduction of the state and local cost-share for federal mitigation grants is an important aspect of this Plan Update and of cost-effective floodplain management in Louisiana. The FEMA Flood Mitigation Grants and Hazard Mitigation Planning Interim Final Rule contain the following guidance regarding increasing the federal share of FMA and SRL funding from 75% to 90%:

"A State may request the reduced cost share authorized under § 79.4(c)(2) of this chapter for the FMA and SRL programs, if it has an approved State Mitigation Plan meeting the requirements of this section that also identifies specific actions the State has taken to reduce the number of repetitive loss properties (which must include severe repetitive loss properties), and specifies how the State intends to reduce the number of such repetitive loss properties. In addition, the plan must describe the strategy the State has developed to ensure that local jurisdictions with severe repetitive loss properties take actions to reduce the number of these properties, including the development of local mitigation plans."[5]

[5] *Federal Register* 72:210 (October 31, 2007), § 201.4(c)(3)(v).

The aforementioned required elements for increasing federal matching funds can be found in the Plan Update in the following locations:

- "(S)pecific actions the State has taken to reduce the number of …. severe repetitive loss properties": see Section 4.4 under "Flood" hazard profile information regarding GOHSEP's efforts to provide current repetitive and severe repetitive loss data to parishes and communities; Section 7.2, especially Table 7-4 and accompanying text regarding progress in recent years to mitigate repetitive and severe repetitive loss properties; Section 9.2 under "Technical Assistance for Parish and Municipal Mitigation Planning" regarding the emphasis placed on identifying viable mitigation alternatives for repetitive and severe repetitive loss properties as part of the Planning Pilot Grant Program; Section 9.4 regarding setting priorities for hazard mitigation projects as described under "Jurisdictions with Repetitive and Severe Repetitive Loss Properties; and Section 10.4 regarding tracking progress specifically for mitigation of repetitive and severe repetitive loss properties.
- "Specif(y) how the State intends to reduce the number of such repetitive loss properties": see Section 8.5, Table 8-2, Goal 2.1 (Action C.iii); Goal 2.2 (Action D.iii); Goal 4.1 (Action H.i); and Goal 4.2 (Action I);
- "Describe the strategy the State has to ensure that local jurisdictions with severe repetitive loss properties take actions to reduce the number of these properties, including the development of local mitigation plans": See Section 8.4, Table 8-1, Goal 3.1; Section 8.5, Table 8-2, Goal 3.1 (Action E.iv); Section 9.4 and Section 10.4.

As noted in the previous section on state programs, GOHSEP updated and upgraded administrative procedures in 2008 including improvements to the information available to GOHSEP staff, SHMPC members and potential applicants for these Federal programs (See Volume III – State of Louisiana Hazard Mitigation Program and Volume IV – State of Louisiana Administrative Guidelines and Procedures).

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Section Four
Hazard Identification and Profiles

Contents of this Section

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4.1 Interim Final Rule Requirements for Hazard Identification and Profiles

Requirement §201.4(c) (2) of the Interim Final Rule (IFR) states that "[the State plan must include a risk assessment] that provides the factual basis for activities proposed in the strategy portion of the mitigation plan." The IFR includes two specific requirements for identifying and profiling natural hazards:

- Hazard Identification per Requirement §201.4(c) (2) (i): "[The State risk assessment shall include an] overview of the type … of all natural hazards that can affect the State …."
- Hazard Profiles per Requirement §201.4(c)(2)(i): "[The State risk assessment shall include an overview of the] location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate …"

4.2 Environment

Political Divisions

The major political sub-unit in the state for the purposes of emergency management and hazard mitigation is the parish (the equivalent of a county); of which there are 64 (see Map 4-1). Section Seven of this Plan Update includes a discussion of capabilities at the parish level and how they relate to regional and state resources. The remainder of this subsection describes the physical geography and climate of the state.

Physical Geography

Louisiana is situated entirely within the southern margin of the physiographic region of the United States, referred to as the Gulf Coastal Plain. Relief is relatively slight across the state. Although the divisions are not always distinct, the state can be described as having three major physiographic regions: hills, terraces, and lowlands.

Louisiana's hill country is located north and west of a line running roughly from Leesville to Jena to Monroe (see Map 4-1). Elevations here are the highest in the state—topping 500 feet—and contain the oldest geology. Roads and settlements are located on the divides between the narrow river valleys, except along the ten- to 15-mile-wide Red River Valley.

The lower, shallower terraces sit south of Louisiana's hills, and are more recent formations resulting from glacial-age alluvial deposits. Louisiana has two major terrace zones: (1) the Florida Parishes and (2) across Southwest Louisiana, just inland from the Gulf of Mexico.

The lowlands are comprised of river floodplains and marsh lying south of the terraces. The lowlands include two major components: (1) the Chenier Plain of Southwest Louisiana and (2) the Deltaic Plain, which includes the Atchafalaya basin and almost everything south and east of metro Baton Rouge, including metro New Orleans and

Houma/Thibodaux. Except along natural or artificial river levees, relief is very slight in the lowlands; elevation is low, rarely above 20 feet, and in some cases it is below sea level. Throughout the lowlands, flooding is caused by varying combinations of riverine and coastal effects, including overflow or backwater flooding from the Mississippi and Atchafalaya Rivers, their tributaries, other waterways throughout the state, as well as high tides and storm surges from tropical storms in the Gulf of Mexico. As a result, flooding in this part of the state can inundate much of the coastal area and is difficult to attribute to one specific cause.

Due to the risk of flood from various sources, large-scale development of significant portions of South Louisiana has only been possible through the construction of a combination of levees, flood walls, and forced drainage systems. As a result of levees that cut the major rivers off from their distributaries, floods in South Louisiana are now rarely caused by high water on major river systems. Rather, local or regional rainfall events or tidal flooding are more common causes. Subsidence, coastal land loss, and poorly planned development have exacerbated the problems.

Additionally, reliance on levees, floodwalls, and forced drainage carries its own set of risks. As hurricane Katrina showed, levees and floodwalls can fail. During an extreme rain event or the failure or overtopping of a levee or floodwall, there is also the subsequent risk of forced drainage system failure. This may result from water volume exceeding pump capacity or from pump failure due to mechanical failure or power interruption.

Climate

Maritime air masses originating over the Gulf of Mexico, coupled with Louisiana's sub-tropical latitude and minimal elevations combine to produce the state's characteristic warm and humid climate. Average annual temperatures range from the mid- to upper-60°s Fahrenheit (F) across the state. Louisiana's statewide precipitation average of approximately 58 inches is one of the highest in the country. The highest precipitation totals are in the southeast part of the state.

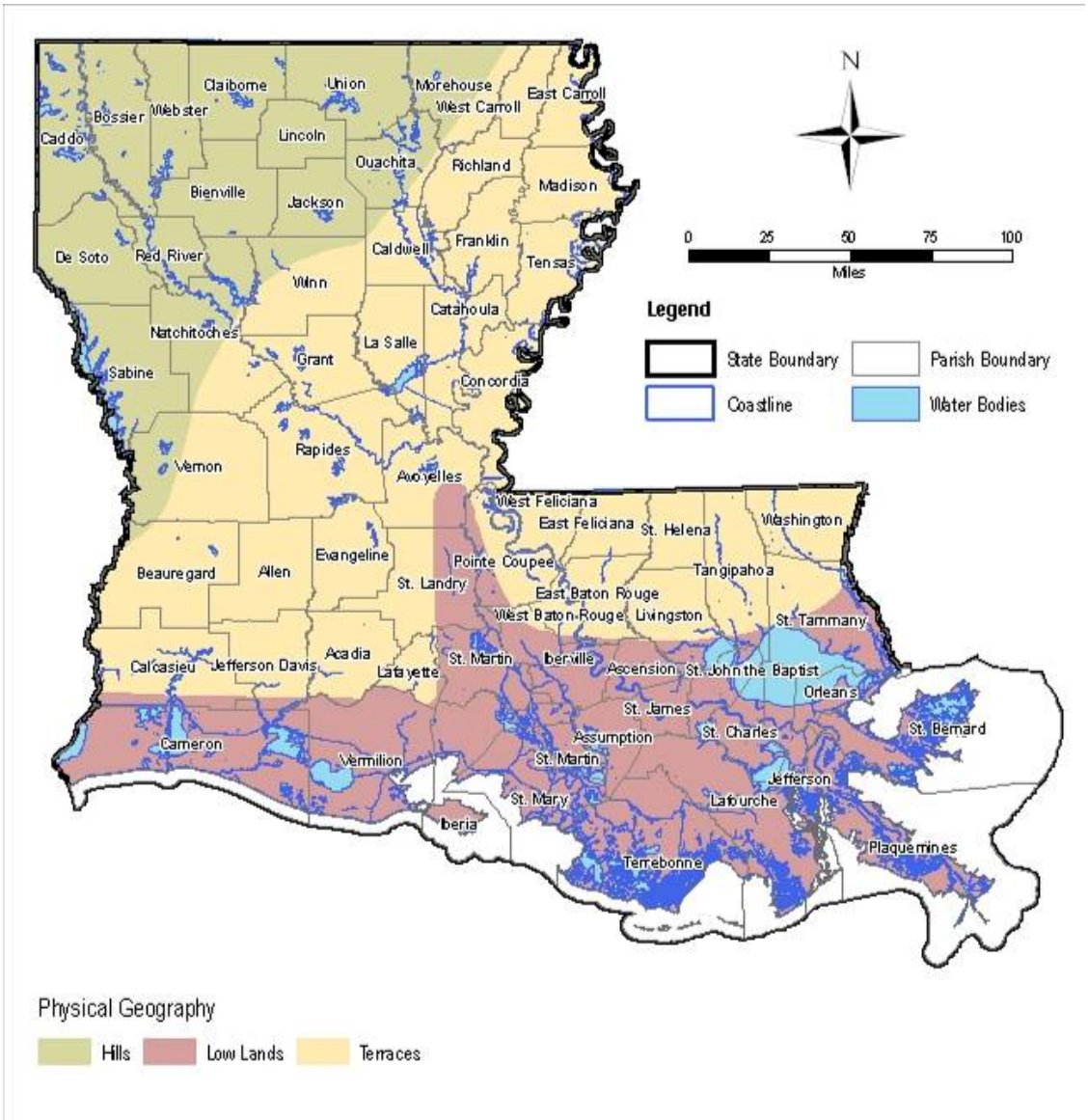
During the spring (March-May) temperatures warm faster over Louisiana than inland areas, creating surface fronts that spawn frequent rain and severe thunderstorms. High winds, large hail, lightning and tornadoes are not uncommon. Rainfall totals can exceed 10 inches over a few days. Soils tend to be near saturation at this time of year and spring is typically the period of maximum stream flow. Collectively, these characteristics increase the potential for high water throughout the state, and low-lying, poorly drained areas are particularly subject to flooding during these months.

In summer (June-August), warm and moist air from the Gulf results in a consistent climate regime. Daytime highs generally range from 85° F to 95° F. Frontal systems are infrequent, but the steady inflow of moist, unstable Gulf air masses promotes frequent development of showers and thundershowers, particularly across the southern parishes. Severe weather events tend to be somewhat less frequent and less violent than in spring. Tornadic activity is greatly diminished, particularly over the southern half of the state. Drought is also possible in the summer, as weak high pressure can inhibit the development of convective showers for weeks. Summer also marks the start of the Atlantic tropical cyclone (hurricane) season, and Louisiana is susceptible to systems fueled by the warm waters in the Gulf.

Autumn (September-November) is a period of moderating temperatures. Tropical storm activity reaches its peak at this time of year, but the duration of such events tends to only be a few days. Also, in the periods between tropical storms, daytime humidity tends to be somewhat lower than other times of the year. There is minimal contact between continental and Gulf air masses in the autumn, creating weak frontal activity that produces little or no rainfall. Autumn is the driest season of the year for Louisiana.

Louisiana winters (December-February) are characterized by a strong thermal gradient across the state, and northern Louisiana is on average 10 degrees colder than the south. Cold Canadian air can reach into the state, and at least one freeze per season is typical except on the extreme coastal margins. Such freezing events seldom last for longer than a week, even in North Louisiana. Most precipitation arrives as rain, but modest accumulations of snow do occur, particularly in the north. Freezing rain and ice storms can create significant problems across the state.

Map 4-1: Political Divisions and Physical Geography - State of Louisiana



4.3 Hazard Identification

The State of Louisiana has suffered significant loss of life, injury and property damage from natural hazards. Hurricanes, floods, and tornadoes, among other hazards, have challenged Louisiana to develop ways to reduce future damages from hazards. The state has the sixth highest number of declared disasters in the United States, with 56 Presidential Disaster Declarations since 1965 (see Table 4-1 below). However, not all major disasters receive Presidential Declarations, in particular those that can be addressed by laws designed to address certain disasters. For example, the Oil Spill Pollution Act of 1990 (OPA) provides for a response to oil spills, such as the recent Deepwater Horizon incident in the Gulf of Mexico, and authorizes the use of the Oil Spill Liability Trust Fund for disaster response costs.

Table 4-1: Disaster History 1965 - 2009

Declaration Details			Type of Assistance (# of Parishes)[1]		
DR Number[2]	Date	Type	Individual (IA)	Public (PA)	Both IA & PA
208	09.10.65	H	-	-	53
272	08.18.69	H	-	-	5
315	10.13.72	H	-	-	21
374	04.27.73	SS, F	-	-	38
418	02.23.74	F	-	-	6
448	09.23.74	H	-	-	10
450	11.01.74	SS	-	-	1
3011	04.09.75	H, R, F	-	-	7
470	05.19.75	H, R, T	-	-	12
3031	01.31.77	D, F	-	-	34
534	05.02.77	SS, F	-	-	8
556	05.09.78	SS, F	-	-	4
565	09.20.78	SS, F	-	-	2
567	12.06.78	SS, T	-	-	2
584	05.02.79	SS, F	-	-	10
604	09.25.79	SS, F	-	-	3
616	04.09.80	SS, F	-	-	12
622	05.21.80	SS, F	-	-	6
675	01.11.83	SS, F	-	-	19
679	04.20.83	SS, F	-	-	12
3090	05.15.84	SS, T	-	-	1
728	10.31.84	SS, F	-	-	4
752	11.01.85	H	-	-	14
804	11.30.87	H, R, T	10	-	-
829	06.16.89	SS, F	18	-	10
833	06.20.89	H, R, T	8	-	-
835	08.28.89	SS, F	12	-	7
849	11.19.89	H, R, F	3	-	-
902	04.15.91	S, F	11	-	3

[1] Individual Assistance (IA) and Public Assistance (PA) are disaster relief programs administered by FEMA and are defined in more detail in Volume II, Appendix A.2.

[2] "DR Number" refers to disaster declaration numbers assigned by FEMA.

Declaration Details			Type of Assistance (# of Parishes)[1]		
DR Number[2]	Date	Type	Individual (IA)	Public (PA)	Both IA & PA
904	04.29.91	F	9	-	28
956	08.25.92	H	-	-	36
978	02.02.93	SS, F	9	-	-
1012	02.28.94	W	-	-	8
1049	05.08.95	R, F	5	-	7
1169	01.12.97	W	-	-	3
1246	09.09.98	H	3	-	16
1264	12.23.98	W	-	18	-
1269	04.03.99	T	1	-	4
1314	01.27.00	W	-	6	-
1357	12.11.00	W	-	8	-
1380	06.05.01	F	-	3	21
1435	09.21.02	TS	3	-	13
1437	10.03.02	H	1	7	36
1521	05.12.04	F	9	-	-
1548	09.13.04	H	-	8	18
1601	08.23.05	TS	0	5	0
1603	08.29.05	H	-	33	31
1607	09.24.05	H	-	41	23
1668	11.02.06	SS, F	2	2	15
1685	02.23.07	SS, T	3	-	-
1786	09.02.08	H	0	15	49
1792	09.13.08	H	2	2	17
1863	12.10.09	SS, T, F	0	9	0

Source: FEMA, 2009

Explanation for Declaration Type				
	D	Drought	SS	Severe Storm
	F	Flood	T	Tornado
	H	Hurricane	TS	Tropical Storm
	R	Rain/Storm	W	Winter Storm

In addition, Table 4-2 shows all of the declarations from the US Department of Agriculture (USDA). Drought, rain, flooding, and high winds from hurricanes all effect Louisiana's agriculture industry. Agricultural-related disasters are quite common. One-half to two-thirds of the counties in the United States have been designated as disaster areas in each of the past several years. Producers may apply for low-interest emergency (EM) loans in counties named as primary or contiguous under a disaster designation. USDA Secretarial disaster designations must be requested of the Secretary of Agriculture by a governor or the governor's authorized representative, or by an Indian Tribal Council leader. The Secretarial disaster designation is very widely used to help offset the effects of natural disasters. Damages and losses prompting disaster designations must be due to a natural disaster, and a minimum 30% production loss of at least one crop in the county must have occurred.[3]

[3]Taken from http://www.fsa.usda.gov

Table 4-2: US Department of Agriculture Declarations 2005 - 2009

Date	Type	# of Parishes
11.30.09	D, R	53
11.17.09	D, R	9
10.22.09	R	6
12.08.08	R	7
10.06.08	R, H	52
9.10.08	R	16
4.24.08	R	8
0.16.07	D	9
12.28.06	R	24
9.18.06	D	10
11.2.05	D, H	46

Source: www.fsa.usda.gov

Explanation for Declaration Type:

D Drought

F Flood

H Hurricane

R Rain/Storm

In 2003, with the support of the Federal Emergency Management Agency (FEMA), the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) developed the *State of Louisiana Hazard Profiles* (Profiles). Much of the hazard profile information included in the 2005 State Hazard Mitigation Plan was adapted from that document and later updated in the 2008 Plan. Where appropriate, the information from the April 2008 Plan has been revised again in this Plan Update (see Table 4-9, Section 4.4). Additional material from the Profiles is contained in Volume II, Appendix D and specific references are included in Volume II, Appendix B. The Profiles were an important first step toward developing a comprehensive plan for damage prevention. As required by federal regulations under the Disaster Mitigation Act of 2000 (DMA 2000), the Profiles contain an overview of the natural hazards that can affect Louisiana.

The Profiles and State Hazard Mitigation Plan (and its updates) also exceed the DMA 2000 requirements by profiling a number of manmade hazards. In the Profiles and the State Hazard Mitigation Plan and updates, natural hazards include those caused by naturally occurring climatological, geological, hydrologic, or seismic events, while manmade hazards include those created or heavily influenced by human actions.

The Profiles present information on the likelihood of occurrence, possible magnitude or intensity, areas of the state that can be affected (maps are included where appropriate), and conditions that influence the manifestation of the hazard. This information provided the basis for assessing the state's vulnerability to hazards in terms of casualties and property damage, and it provided direction for setting mitigation priorities in the Plan Update. The hazards contained in the Profiles were selected in part from a comprehensive list of hazards found in the 1997 publication "Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy" by FEMA. The Profiles helped to eliminate from further consideration hazards that are not likely or significant threats to Louisiana (e.g., landslide, snow avalanche, tsunami, or volcano).

Table 4-3 lists the broad range of hazards identified and evaluated for this Plan Update and describes the results of the preliminary investigation.

Table 4-3: Disposition of Hazards Evaluated in Preliminary Investigation

Identified Hazard (occurred historically in the state)	Reasons for Exclusion from Plan Update	Hazards Profiled in Plan Update[4]
Natural Hazards		
Coastal Erosion	Large scale mitigation actions and programs to address this hazard are under the auspices of the Coastal Protection and Restoration Authority (CPRA) (see discussion under "Coordination with State Planning and Implementation Efforts regarding Coastal Erosion" on page I-12). The impacts of coastal erosion at the parish and municipal level are addressed under other hazards including storm surge and flooding. [5]	-
Dust Storm	Not considered a significant statewide threat by the State Hazard Mitigation Planning Committee (SHMPC) in comparison to other hazards and therefore is not profiled at this time.	-
Drought	-	Drought[6]
Earthquake	-	Earthquake [22]
Expansive Soil	Not considered a significant statewide threat by the SHMPC in comparison to other hazards and therefore is not profiled at this time.	-
Flood – Coastal	The effects of coastal flooding are considered under "Flood" and "Storm Surge."	-
Flood - Riverine	-	Flood
Fog	Not considered a significant statewide threat by the SHMPC in comparison to other hazards and therefore is not profiled at this time.	-
Hailstorm	-	Hailstorm
High Wind - Hurricane	-	High Wind – Hurricane
High Wind - Tornado	-	High Wind – Tornado
Hurricane / Tropical Cyclone	The effects of Hurricanes and Tropical Cyclones are considered under Flooding, High Wind-Hurricane, and Storm Surge.	-
Ice Storm	-	Ice Storm
Land Loss	Large scale mitigation actions and programs to address this hazard are under the auspices of the CPRA (see discussion under "Coordination with State Planning and Implementation Efforts regarding Coastal Erosion". [21]	-
Lightning	-	Lightning[22]

[4] Hazards considered significant enough threats that also lend themselves to attainable mitigation actions.
[5] For more on the integration of hazard mitigation and other emergency-management programs in Louisiana, see Section 8.3.
[6] Based on the results of the Profiles, this hazard is either not considered significant by the State Hazard Mitigation Planning Committee (SHMPC) in comparison to the other profiled hazards or the extent to which the hazard can be mitigated via existing hazard mitigation programs administered by GOHSEP is very small. Therefore, technical risk assessments are not included for these hazards in Sections Five and Six. However, these hazards are referenced in the Mitigation Action Plan (see Section Eight) as part of action items focused on public and state agency awareness as well as recommended practices for mitigation (see Volume II, Appendix H).

Identified Hazard (occurred historically in the state)	Reasons for Exclusion from Plan Update	Hazards Profiled in Plan Update[4]
Sea Level Rise	This hazard is currently addressed by other agencies (CPRA, US Army Corps of Engineers (USACE)).[21]	-
Severe Summer Weather / Extreme Heat	-	Severe Summer Weather / Extreme Heat [22]
Severe Winter Weather / Extreme Cold	-	Severe Winter Weather / Extreme Cold[22]
Storm Surge	-	Storm Surge
Subsidence	-	Subsidence
Tornado	The effects of Tornadoes are considered under High Wind - Tornado.	-
Wildfire	-	Wildfire
Manmade Hazards[7]		
Dam Failure	-	Dam Failure
Levee Failure	-	Levee Failure
Hazardous Material Incident	-	Hazardous Material Incident
Natural Biohazard Incident	This hazard is currently addressed by other agencies (Louisiana Departments of Environmental Quality and Health and Hospitals).[21]	-
Nuclear Facility Incident	This hazard is currently addressed by other agencies. [21]	-

As a result of GOHSEP and SHMPC's consideration of their relative impacts, 11 of the 16 hazards (listed below) profiled in the Profiles document posed a threat that was considered significant enough to warrant formal risk assessments in this Plan Update. At the request of the SHMPC, Earthquake was specifically evaluated using HAZUS, and whereas no significant losses were found, this hazard has been excluded from formal risk assessment

Natural hazards:

- Flood
- High wind – Hurricane
- High wind - Tornado
- Ice storm
- Hailstorm
- Storm surge
- Subsidence
- Wildfire

Human-caused hazards:

- Dam failure
- Levee failure
- Hazardous material incident

[7] Only accidental occurrences of manmade hazards are considered as part of the Plan Update. Although many natural hazards affecting Louisiana are either exacerbated by manmade actions or have manmade components or factors, the hazard effects that must be mitigated present themselves through essentially natural processes. Such human-impacted natural hazards include sea level rise, coastal land loss, subsidence, wildfire, storm surge, and other flood events.

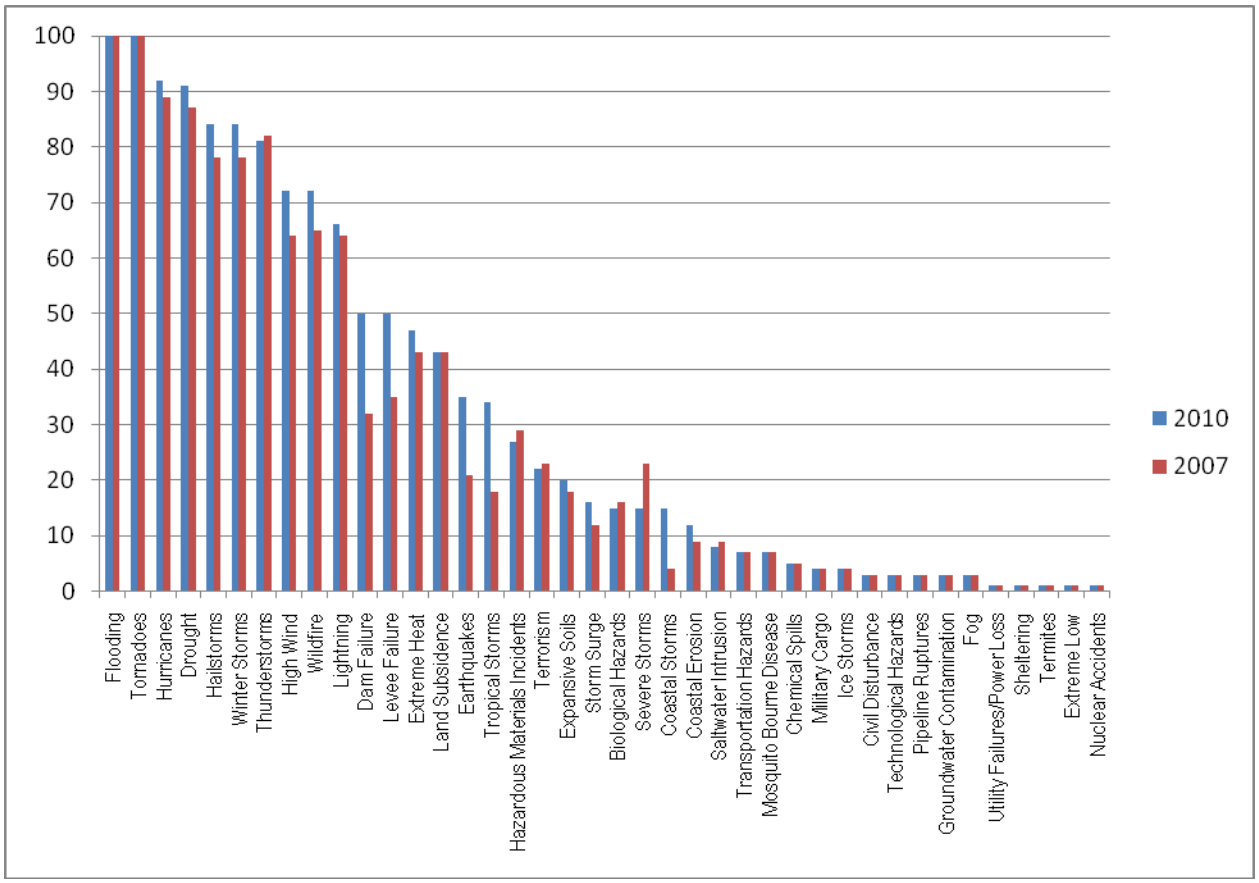
GOHSEP and SHMPC consider these hazards to be the most prevalent in Louisiana, based on recent disaster history in the state and the exposure of its residents, property owners, and state-owned and operated facilities.

Correlation with Parish and Municipal Hazard Mitigation Planning Efforts

The state is required under DMA 2000 to incorporate "local" [8] risk assessment and hazard mitigation strategies into this Plan Update. The following is a summary of hazards identified in parish and municipal Hazard Mitigation Plans (HMPs) and a comparison between the parish and municipal findings and the state finding of prevalent hazards listed above.

FEMA-approved parish and municipal HMPs address 40 identified hazards. These hazards do not necessarily match up with the hazard definitions used in the Plan Update, nor do they match up across all parish and municipal HMPs. Figure 4-1 shows the hazards identified in parish and municipal plans, and the frequency with which they appear.

Figure 4-1: Frequency of Hazards Identified in Parish and Municipal HMPs



Source: Analysis of Parish and Municipal HMPs, 2007 & 2010

Most of the prevalent hazards identified in parish and municipal HMPs are addressed directly in this Plan Update, either using the same hazard-identification terminology used in parish and municipal HMPs, or using comparable hazard-identification terminology. Table 4-4 shows which hazards identified in parish and municipal HMPs are addressed directly in the Plan Update and lists the relevant hazard identified in the Plan Update. Asterisks (*) mark hazards that appear in 30 or more parish and municipal HMPs.

[8] For the purposes of this Plan Update, the phrase "parish and municipal" are used in place of the word "local".

Table 4-4: Comparison of Hazards Identified in Parish/Municipal HMPs and Plan Update

Hazard Identified in Parish / Municipal HMPs[9]	Relevant Hazard Identified in Plan Update
Flooding*	Flood
Hurricanes*	
Coastal Storms	
Hailstorms*	Hailstorm
Hurricanes*	High wind (Hurricane)
High Wind*	
Coastal Storms	
Tornadoes*	High wind (Tornado)
High Wind*	
Winter Storms*	Ice storm
Ice Storms	
Hurricanes*	Storm surge
Storm Surge	
Coastal Storms	
Land Subsidence*	Subsidence
Wildfire*	Wildfire
Levee Failure	Levee failure
Dam Failure	Dam failure
Hazardous Materials Incidents*	Hazardous Material Incident
Transportation Hazards	
Chemical Spills	
Military Cargo	
Pipeline Ruptures	
Nuclear Accidents	

Source: Analysis of Parish and Municipal HMPs, 2007 & 2010

Some hazards identified in parish and municipal HMPs are not directly addressed in the Plan Update. Generally, these hazards appear in a small number of parish and municipal plans. There are three basic reasons why the Plan Update does not directly address mitigation for these hazards.

- These hazards may have profiles that lead to similar mitigation measures as hazards that are addressed directly by the Plan Update
- These hazards may be sufficiently addressed by another state or federal agency or entity, or
- These hazards may have been deemed by the SHMPC to not be among the most serious threats to the state.

Table 4-5 explains which parish and municipally identified hazards are not given a full treatment in the Plan Update. Asterisks (*) mark parish and municipally identified hazards that appear in 30 or more local HMPs.

[9] Some hazards appear multiple times in the above table. This is because some hazards identified in parish and municipal HMPs (for example, "hurricane") result in several identified hazards treated in the Plan Update ("flood," "high wind," "storm surge").

Table 4-5: Parish and Municipally Identified Hazards not Addressed in Plan Update

Parish and Municipally Identified Hazard	Explanation for Lack of Treatment in Plan Update
Thunderstorms*	Hazards have profiles that are similar to hazards addressed in the Plan Update.
Severe Storms	
Tropical Storms	
Terrorism	Hazards are primarily addressed by other state or federal entities (including Louisiana CPRA, USACE, Louisiana Department of Natural Resources, Louisiana Department of Transportation and Development, GOHSEP, Louisiana National Guard, Louisiana Department of Health and Hospitals, Louisiana Department of Social Services, etc.). In the case of coastal erosion, large scale actions and programs to mitigate this hazard are currently under the auspices of the CPRA (see discussion under "Coordination with State Planning and Implementation Efforts regarding Coastal Erosion" on page I-12). However, the Plan Update does include recommendations for small-scale coastal erosion problems that may be identified in parish or municipal HMPs in Appendix H.1.
Civil Disturbance	
Sheltering	
Technological Hazards	
Coastal Erosion (large scale impacts and projects)	
Saltwater Intrusion	
Biological Hazards	
Mosquito Borne Disease	
Drought*	Hazards are profiled in Plan Update Hazard Identification (Section 4) but are not deemed among the 11 most serious threats for consideration in the Statewide Risk Assessment (Section 5) or the State-Owned Facilities Risk Assessment (Section 6).
Lightning*	
Extreme Heat*	
Earthquakes	
Expansive Soils	
Groundwater Contamination	
Fog	
Termites	
Extreme Low Temperatures	
Utility Failure / Power Loss	

Source: Analysis of Parish and Municipal HMPs, 2007 & 2010

Coordination with State Planning and Implementation Efforts Regarding Coastal Erosion

Coastal Erosion and Land Loss in Louisiana

Louisiana's Gulf coast is unlike most coastlines in the United States. Most of Louisiana's coastline lies in the Deltaic Plain east of Vermilion Bay and is comprised of wetland that lacks a distinct coastline. Instead, it gradually and unevenly transitions from freshwater wetland systems to brackish water wetland, then to saltwater wetland, and eventually to open water. This region is rimmed by a fragile and intermittent necklace of barrier islands. In 2006, over 2 million residents (more than 47% of the state's population according to 2007 US Census estimates) lived in Louisiana's coastal parishes. The coastal zone covers approximately 14,913 square miles, of which 6,737 square miles is water and 8,176 square miles is land (LOSCO 2005). However most of these communities are well inland, away from Gulf's edge. Very few communities in Louisiana can even see the Gulf. Grand Isle, with a population of 1,541, is Louisiana's only inhabited barrier island. Port Fourchon is Louisiana's southernmost port and one of the few ports in Louisiana actually located adjacent to the Gulf.

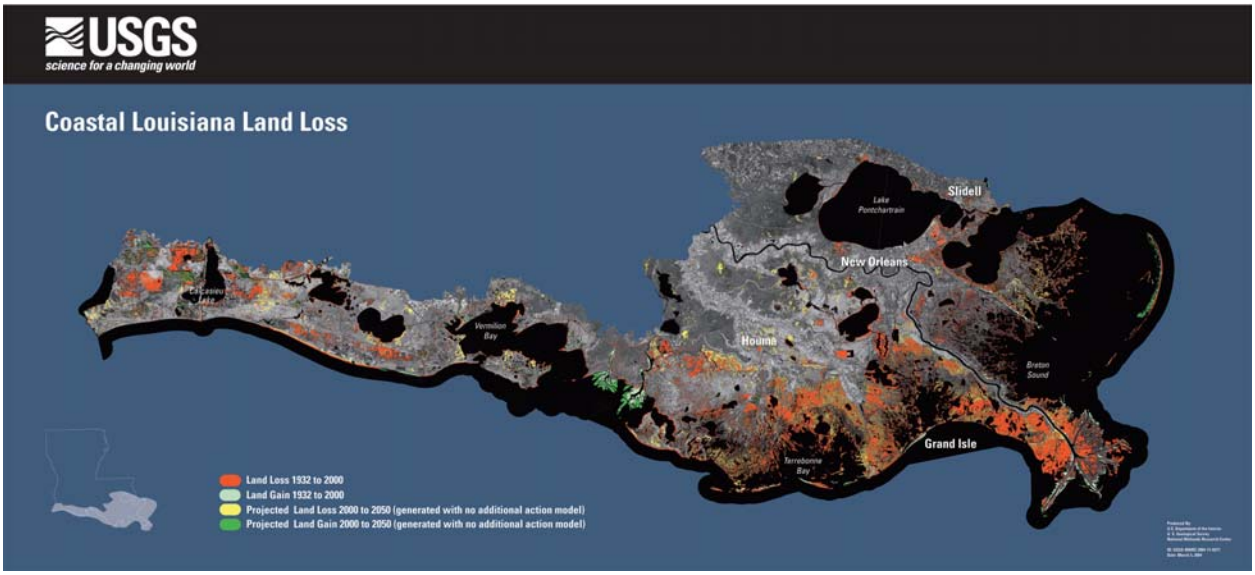
West of Vermilion Bay lays the Chenier Plain and coastal prairie. This mostly flat area is characterized on the southern edge by low ridges paralleling the shoreline and supporting stands of live oaks. These ridges (or cheniers, from the French for "oak") are separated by marsh. Much of the immediate shoreline in this area is sandy. Louisiana's chenier area is the largest in North America and the third largest in the world. While similar geography

does occur elsewhere in a smaller scale in the United States, unlike many areas with sandy shorelines, this area is very sparsely inhabited. The habitation is generally concentrated on the chenier ridges. The towns of Cameron and Holly Beach are among the few year-round communities.

In these areas, as well as along the rest of the coast, coastal erosion *per se* does represent a risk, but a relatively low population makes the direct impacts of coastal erosion appear deceptively small. In reality, land loss is a huge and complex problem throughout the coastal region of Louisiana.

As shown in Figure 4-2, from 1932 to 2000, Louisiana lost approximately 1,900 square miles of coastal land – the equivalent of the state of Delaware. In a no-action scenario, projections indicate that by 2050, the state would lose 700 additional square miles – the equivalent of the entire greater Washington, D.C.-Baltimore metro area.

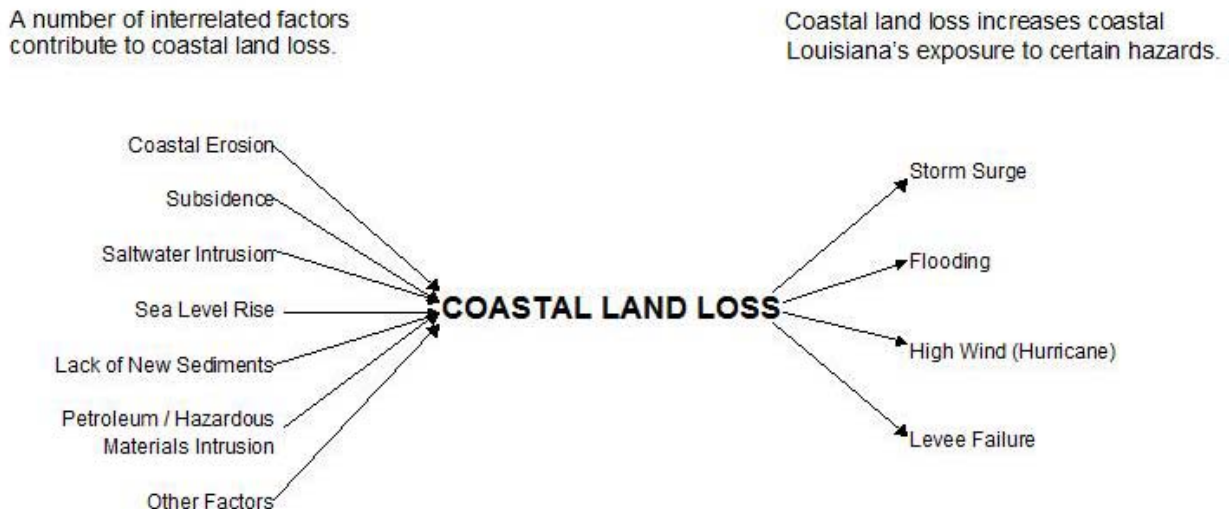
Figure 4-2: Coastal Louisiana Land Loss and Gain, 1932-2000 and 2000-2050 (Projected)



Source: J. Barras et al, "Historical and Projected Coastal Louisiana Land Changes: 1978-2050." USGS Open-File Report 03-334.

Land loss at this scale decreases the distance between open water and major population centers in South Louisiana, including metro New Orleans and the Houma-Thibodaux areas. The removal of land and wetland between the Gulf and these communities increases their exposure to hazards including hurricane-generated winds and storm surge, and also increases the risks of hazards such as flooding and levee failure (see Figure 4-3).

Figure 4-3: Coastal Erosion as an Element of Coastal Land Loss



Source: James Lee Witt Associates

Coastal Erosion and the Louisiana State Hazard Mitigation Plan

Consistent with the 2008 update to the State Hazard Mitigation Plan, this 2011 Plan Update does not address coastal erosion *per se* as a stand-alone hazard. Rather, this Plan Update continues to defer to and specifically support the integrated, coordinated, ongoing and incrementally funded effort at the state and federal levels to address coastal land loss in South Louisiana through comprehensive coastal protection. This decision reflects the magnitude and complexity of coastal erosion and related coastal land loss issues, and is consistent with parish HMPs.

Statewide, efforts to stem and reverse land loss continue to be guided by the Coastal Protection and Restoration Authority's (CPRA) *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast* ("CPRA Master Plan") which was approved by the Legislature in 2007 as the official roadmap for coastal protection and restoration in Louisiana and incorporated into the *State of Louisiana Hazard Mitigation Strategy* in 2007.

In addition, in April 2010, the Office of Coastal Protection and Restoration (OCPR) developed the *CPRA Fiscal Year 2011 Annual Plan: Integrated Ecosystem Restoration and Hurricane Protection in Coastal Louisiana.* This plan is updated annually and enhances the CPRA Master Plan by linking funding sources and spending levels for specific projects and identifying a three-year spending plan, in this case covering FY 2011 to FY 2013. The plan also provides a discussion of progress in project implementation during FY 2010. The plan incorporates a variety of coastal activities including projects using Water Resources Development Act Authority funds, Coastal Wetland Planning, Protection and Restoration Act funds, Coastal Impact Assistance Program funds, and Department of Transportation and Development infrastructure funds.

As a result, the CPRA Master Plan and subsequent CPRA Annual Plans are considered part of the Plan Update to address all issues concerning coastal erosion.

CPRA Master Plan and CPRA Fiscal Year Annual Plans

The CPRA Master Plan and subsequent CPRA Annual Plans rely on decades of sound scientific analysis and modeling to derive its hazard identification, risk assessment, mitigation program, action plan, and project lists.

The Master Plan "*offers … a snapshot of current thinking about coastal protection and restoration. The planning team based its recommendations on ideas that have been widely circulated and discussed as part of Louisiana Coastal Area activities, previous hurricane protection initiatives, and other efforts. The planning team did not start from scratch, but rather attempted to take well-established ideas about flood control and coastal restoration to a new*

level."[10] An extensive source list for the CPRA Master Plan is available on pages 115-116 of the main report as well as in the appendices of the document.

The CPRA Master Plan is based on an assumption that all the contributing factors to *coastal land loss,* rather than *coastal erosion,* must be mitigated. Yet the indirect threat from coastal erosion and other contributing factors to land loss is immense. Erosion itself is exacerbated by hurricane storm surge and other severe weather, making coastal erosion part of a negative feedback loop that must be engaged in a systematic, integrated manner.

Land loss must be approached in an integrated manner that addresses its various causes simultaneously. This must be done at a scale that is typically beyond the programmatic and funding capacity of the sources primarily addressed in this Plan Update.

For all of the reasons stated above, this Plan Update continues to defer to and support the CPRA Master Plan as well as the CPRA Fiscal Year (FY) 2011 Annual Plan as the Plan Update "annex" for coastal erosion. The CPRA Master Plan operates at a large scale, with an integrated program, high levels of interagency and intergovernmental coordination, and high levels of expected funding.

Projects identified in the CPRA Master Plan that specifically address coastal erosion are described in Table 4-6.

Table 4-6: Coastal Erosion Mitigation Projects Identified in the CPRA Master Plan

Shoreline Restoration	Shoreline Stabilization	Navigable Waterway Stabilization
▪ Chandeleur Islands ▪ Barataria Basin ▪ Terrebonne Basin ▪ Point au Fer Island ▪ Freshwater Bayou to South Point/ Marsh Island ▪ Sabine River to Calcasieu River ▪ Calcasieu River to Freshwater Bayou	▪ East Orleans land bridge ▪ Lake Pontchartrain south shore ▪ Biloxi land bridge and barrier reefs ▪ MRGO-Lake Borgne land bridge ▪ Lake Maurepas land bridge ▪ Grand Isle and vicinity ▪ Southwest Pass ▪ Vermilion Bay ▪ East and West Cote Blanche bays ▪ Grand Lake shoreline ▪ White Lake shoreline ▪ Calcasieu Lake shoreline ▪ Sabine Lake Shoreline	▪ Gulf-Intracoastal Waterway ▪ Houma Navigation Canal ▪ Freshwater Bayou

Source: CPRA Master Plan (2007)

OCPR is now proceeding with a number of coastal protection projects within the framework of the CPRA Master Plan and FY2011 Annual Plan. These projects are consistent with the CPRA Master Plan and thus with the hazard mitigation priorities described in this Plan Update. See Volume II, Appendix D.1 for a detailed list of OCPR projects.

It is a basic assumption in this Plan Update that small-scale mitigation of coastal erosion can only be effective if it is integrated with larger efforts that are focused on mitigating storm surge, flooding, hurricane wind, and levee overtopping and failure. These hazards are assessed and mitigation actions for them are described in the remaining sections of this Plan Update. However, this Plan Update does provide recommended practices for the implementation of targeted, small-scale erosion-mitigation projects in Volume II, Appendix H.2.

Figure 4-4 is a copy of Executive Order #BJ 2008-7 signed by Governor Bobby Jindal that demonstrates Louisiana's continuing efforts and commitment to coastal restoration. It further recognizes the importance of planning consistency for rebuilding, especially following disasters.

[10] CPRA Master Plan

Figure 4-4: Executive Order #BJ 2008-7

State of Louisiana

EXECUTIVE DEPARTMENT

EXECUTIVE ORDER NO. BJ 2008 -7

ACTIVITY AND PERMIT CONSISTENCY WITH LOUISIANA'S COMPREHENSIVE MASTER PLAN FOR A SUSTAINABLE COAST

WHEREAS, Hurricanes Katrina and Rita exposed vulnerabilities in Louisiana's coastal and hurricane protection systems that resulted in loss of life, damage to property, destruction of coastal land and wetlands loss and major impacts to our state's economy;

WHEREAS, Louisiana continues to experience one of the fastest rates of coastal erosion in the world and portions of our state remain unprotected from future hurricane impacts;

WHEREAS, our state's coast is a "working coast" that provides employment opportunities for Louisianans and citizens from across the United States;

WHEREAS, coastal Louisiana is a national treasure that provides energy to power the nation's economy, puts seafood on America's dinner tables, is home to the country's top ports, serves as critical habitat to numerous endangered and threatened species and is one of the most productive ecosystems in the world;

WHEREAS, Louisiana's coastal master plan, entitled "Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast", (hereinafter "Master Plan"), is the state's conceptual plan for the integration of coastal protection and restoration based upon the best available science and engineering;

WHEREAS, the Master Plan was approved by the Coastal Protection and Restoration Authority at its April 12, 2007 meeting and thereafter unanimously approved by the Louisiana Legislature by passing Senate Concurrent Resolution No. 11 during the 2007 Regular Session;

WHEREAS, the Master Plan states a goal of integration of flood control projects and coastal restoration initiatives to help both human and natural communities survive and thrive over the long-term;

WHEREAS, the Master Plan recommends, among other things, improvements to land use planning, zoning and permitting to more effectively achieve its stated goals;

WHEREAS, beginning this year, billions of dollars in efforts to repair and improve Louisiana's hurricane and coastal protection systems will be carried out;

WHEREAS, state agencies must function in a manner that recognizes the vital importance of expediting hurricane and coastal protection and ensuring sustainable practices in our coastal zone;

WHEREAS, it is critical for all state agencies to work in a cooperative manner with acute awareness of the recommendations of the Master Plan in order to ensure the aggressive and orderly implementation of its stated goals.

WHEREAS, Louisiana Revised Statute 49:213 directs the Governor, through his executive assistant for coastal activities, to "coordinate and focus the functions of all state agencies as they relate to coastal protection, including hurricane protection and wetlands conservation and restoration"; and

WHEREAS, Louisiana Revised Statute 49:213 authorizes the Governor, through his executive assistant for coastal activities, to "review and modify proposed coastal use permits prior to issuance to the extent that such permits would authorize activities which significantly affect hurricane protection or wetlands conservation and restoration projects or which significantly diminish the benefits of projects intended to protect, conserve or enhance coastal areas and to require the issuance of permits for public or private wetlands enhancement projects or plans.";

NOW THEREFORE, I, Bobby Jindal, Governor of the state of Louisiana, by virtue of the authority vested by the Constitution and the laws of the state of Louisiana, do hereby order and direct as follows:

SECTION 1: All state agencies shall administer their regulatory practices, programs, contracts, grants, and all other functions vested in them in a manner consistent with the Master Plan and public interest to the maximum extent possible.

SECTION 2: This Order is effective upon signature and shall remain in effect until amended, modified, terminated, or rescinded by the governor, or terminated by operation of law.

IN WITNESS WHEREOF, I have set my hand officially and caused to be affixed the Great Seal of Louisiana, at the Capitol, in the city of Baton Rouge, on this 23rd day of January, 2008.

/S/ Bobby Jindal
GOVERNOR OF LOUISIANA

ATTEST BY
THE GOVERNOR

/S/ Jay Dardenne
SECRETARY OF STATE

Coastal Erosion in Parish Hazard Mitigation Plans

This Plan Update's treatment of coastal erosion is consistent with parish HMPs in Louisiana. Coastal erosion does not consistently appear as a hazard in the HMPs of coastal parishes, and when it does, the quality and specificity of that treatment varies widely. Moreover, only one parish identifies what may be described as local mitigation actions in its HMP; due to the scale of the hazard, most parishes' mitigation plans for coastal erosion rely almost entirely on state or federal action.

As Table 4-7 shows, only seven parishes included coastal erosion in their parish HMPs, although nine parishes lie along the Gulf of Mexico, and eight have shorelines along flood- and surge-prone Lakes Borgne, Pontchartrain, and/or Maurepas.

Table 4-7: Inclusion of Coastal Erosion as a Hazard in Coastal Parishes' Hazard Mitigation Plans

Parish	Parish located on the Gulf of Mexico	Parish Located on Lakes Borgne, Pontchartrain, and/or Maurepas	Coastal Erosion Addressed in Parish Plan
Cameron	X		X
Iberia	X		X
Jefferson	X	X	
Lafourche	X		X
Livingston		X	
Orleans		X	
Plaquemines	X		X
St. Bernard	X	X	
St. Charles		X	X
St. John the Baptist		X	
St. Mary	X		X
St. Tammany		X	
Tangipahoa		X	

Parish	Parish located on the Gulf of Mexico	Parish Located on Lakes Borgne, Pontchartrain, and/or Maurepas	Coastal Erosion Addressed in Parish Plan
Terrebonne	X		
Vermilion	X		X

Source: Analysis of Parish Hazard Mitigation Plans, 2007 & 2010

A qualitative analysis of the specific treatments of coastal erosion in parish HMPs demonstrates that the definition of coastal erosion as a hazard is not consistent, and that the vast majority of parishes deem coastal erosion to be beyond their ability to mitigate (see Table 4-8). Several parishes defined coastal erosion as being coterminous with subsidence and sea level rise. In many cases proposed mitigation actions aimed at coastal erosion were not specific to erosion per se, but instead were generally designed to mitigate the effects of flooding or wetland loss. (For more detail on the treatment of coastal erosion in parish HMPs, see Volume II, Appendix D.1).

Table 4-8: Specific Treatment of Coastal Erosion in Coastal Parishes' Hazard Mitigation Plans

Parish	Direct Local Mitigation Actions Proposed	Indirect Local Mitigation Actions Proposed (planning, SRL, wetland restoration, etc.)	Support for and/or Coordination with State/Federal Actions Proposed
Cameron			X
Iberia	X		
Lafourche		X	X
Plaquemines	X	X	X
St. Charles		X	X
St. Mary	X	X	X
Vermilion		X	X

Source: Analysis of Parish Hazard Mitigation Plans

In cases in which mitigation actions specifically aimed at erosion were cited, parishes generally proposed supporting and/or coordinating with efforts at the state and/or federal levels, or working with neighboring parishes to provide unified project lists to state and federal agencies. Since the 2008 Plan Update, a few parishes have updated their HMPs to specifically cite local projects. The projects cited in the Iberia Parish and St. Mary Parish plans are specifically described in the CPRA Master Plan and the FY 2011 Annual Plan. This Plan Update's deference to and support for the CPRA Master Plan is therefore completely consistent with local hazard mitigation planning priorities.

In cases where erosion-mitigation projects are not described in the CPRA Master Plan but are deemed appropriate at the local level, recommended practices are addressed in Volume II, Appendix H.2.

Additional Treatment of Coastal Erosion in this Plan Update

Further explanation of this Plan Update's treatment of coastal erosion and further detail regarding Louisiana's efforts to preserve and restore its coastal region, including efforts to stem coastal erosion, may be found as follows:

- Section 3.3 describes the coordination of this Plan Update with the CPRA Master Plan and establishes a framework for placing coastal erosion and other related contributing factors to coastal land loss within the integrated efforts described in the CPRA Master Plan.
- Section 4.3 provides an overview of the identification of hazards, including coastal erosion, in this Plan Update.
- Section 4.4 (and corresponding material in Appendix D) includes a hazard profile of subsidence, which like coastal erosion is a contributing factor in coastal land loss and the resulting increased risk of storm surge,

hurricane winds, flooding, and levee overtopping and failure. This profile helps distinguish between subsidence and coastal erosion.

- Section 5.9 (and corresponding material in Appendix E) provides a statewide risk assessment for subsidence, as distinct from coastal erosion.
- Section 6.8 (and corresponding material in Appendix F) provides a risk assessment for state-owned assets from subsidence, as distinct from coastal erosion.
- Section 7.1 describes in detail state and federal funding resources available for and/or dedicated to the CPRA Master Plan for coastal restoration, including coastal erosion.
- Section 8.3 describes in detail efforts under the OCPR and other state and federal partners to implement the CPRA Master Plan for coastal restoration, including coastal erosion.
- Section 8.5 provides specific mitigation actions focused on supporting the implementation of the CPRA Master Plan.
- Appendix H.2 provides guidance for communities that wish to undertake small-scale coastal erosion mitigation projects using federal resources with a local match or using solely local resources.

Coordination with Other State Emergency Management Planning Efforts

As noted in Section Three, coordination with the GOHSEP Planning Division regarding ongoing revisions to the State of Louisiana Emergency Operations Plan (EOP) was included as part of the planning process for the April 2005 Plan Update and continued with the development of subsequent Plan Updates. This coordination has made sure that recommendations in the two plans are internally consistent in areas where potential overlaps exist. In addition, it is important to account for hazards listed as areas of concern in the EOP that are different or more extensive from the ones listed in this Plan Update. The hazards listed in the EOP Attachment 2 Potential Hazards include the following:

Natural Hazards:

- Coastal Erosion[11]
- Drought
- Earthquake
- Flood
- Fog
- Hailstorm
- Hurricane (Tropical Cyclone)
- Ice Storm
- Severe Storms (including lightning and high winds)
- Severe Summer Weather / Extreme Heat
- Storm Surge
- Subsidence
- Tornado
- Wildfire

[11] The EOP category "Coastal Erosion" as treated in the EOP would be more accurately described as "Coastal Land Loss." Erosion is only one factor in coastal land loss; see page I-35 et seq. for more on this Plan Update's treatment of coastal erosion.

Technological Hazards:

- Airplane Crash
- Dam Failure
- Levee Failure
- Hazardous Materials Fixed Facility Incident
- Hazardous Materials Transportation Incident
- Nuclear Fixed Facility Incident
- Nuclear Transportation Incident
- Offshore Oil Spill
- Utilities Failure (Energy)
- Utilities Failure (Telecommunications)
- Utilities Failure (Sewer and Water Systems)

Human-caused Hazards (Intentional Acts):

- Civil Disorder
- Terrorist/Enemy Attack
- Cyber Terrorism

Biological Hazards:

- Animal Disease
- Pandemic Infectious Disease

All 16 of the hazards profiled in this Plan Update are also included in the EOP (with the exception of Severe Winter Weather). The EOP considers a number of additional hazards. The longer list of hazards addressed in the EOP is due to differences in the basic purpose of the two plans. The EOP is intended to prepare the state to respond under emergency conditions to all manner of hazards, while the emphasis in this Plan Update is on identifying pre-disaster mitigation activities and projects. This means that hazards that do not lend themselves to pre-event mitigation are generally excluded from analysis in this Plan Update. For example, hazards from the EOP list that present a clear need for developing coherent response and recovery strategies but do not lend themselves readily to pre-disaster mitigation include airplane crashes and civil disorder.

4.4 Hazard Profiles

The following pages include a brief description of important issues related to the hazards addressed in this Plan Update. These profiles also include the summary mapping for the 16 profiled hazards. Table 4-9 indicates the specific changes and enhancements that have been made to the profile information for these hazards as part of the 2011 Plan Update.

Table 4-9: Updates to Hazard Profiles for the 2011 Update

Hazard	Changes and Enhancements
Natural Hazards	
Drought	A new data source regarding Drought ("ThreadEx ") has been identified since the April 2008 Plan. Mapping has been updated and additional information from ThreadEx has been added to the text in this Section and Appendix D.
Earthquake	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect a more comprehensive data set from US Geological Survey (USGS).
Flood	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect DFIRMS that are now available for 45 parishes and HAZUS-MH-generated flood boundaries for the remaining 19 parishes.
Hailstorm	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect more recent data from the National Climatic Data Center (NCDC).
High Wind - Hurricane	The Design Wind Speed map produced by the American Society of Civil Engineers (ASCE) has been updated to reflect more recent data since the April 2008 Plan.
High Wind - Tornado	The Design Wind Speed map produced by ASCE has been updated to reflect more recent data since the April 2008 Plan.
Ice Storm	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect more recent Ice Storm data.
Lightning	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect more recent Lightning data.
Severe Summer Weather / Extreme Heat	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect more recent Extreme Heat data.
Severe Winter Weather / Extreme Cold	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect more recent Extreme Cold data.
Storm Surge	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect Surge from Hurricane Ike.
Subsidence	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect more recent Subsidence data.
Wildfire	Tables in Appendix D have been updated since the April 2008 Plan to reflect additional data. Mapping included in this Section and Appendix D has been updated to reflect new historical data. Additional data related to the Wildland Urban Index have been added.
Manmade Hazards	
Dam Failure	Mapping and dam hazard rankings have been updated and only reflect dams currently regulated by the State of Louisiana.

Hazard	Changes and Enhancements
Levee Failure	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect more complete coverage of levees in the state.
Hazardous Material Incident	Mapping and associated information in this Section and Appendix D have been updated since the April 2008 Plan to reflect more recent Hazardous Material Incident data.

Volume II, Appendix D contains full descriptions of each hazard, including the nature of the hazard, disaster history, probability of occurrence, and magnitude.

It is important to note that the data and information used in these profiles, and the subsequent risk assessment methodologies in Sections Five and Six, have significant limitations. Appendix D includes detailed discussions of the limitations of the data used in this Plan Update. In many cases, better data or methodologies may be available for a portion of the state or a segment of the data. However, to make comparisons of risk on a statewide basis, it was necessary to seek data and methodologies that had consistent accuracy across all the parishes.

Drought

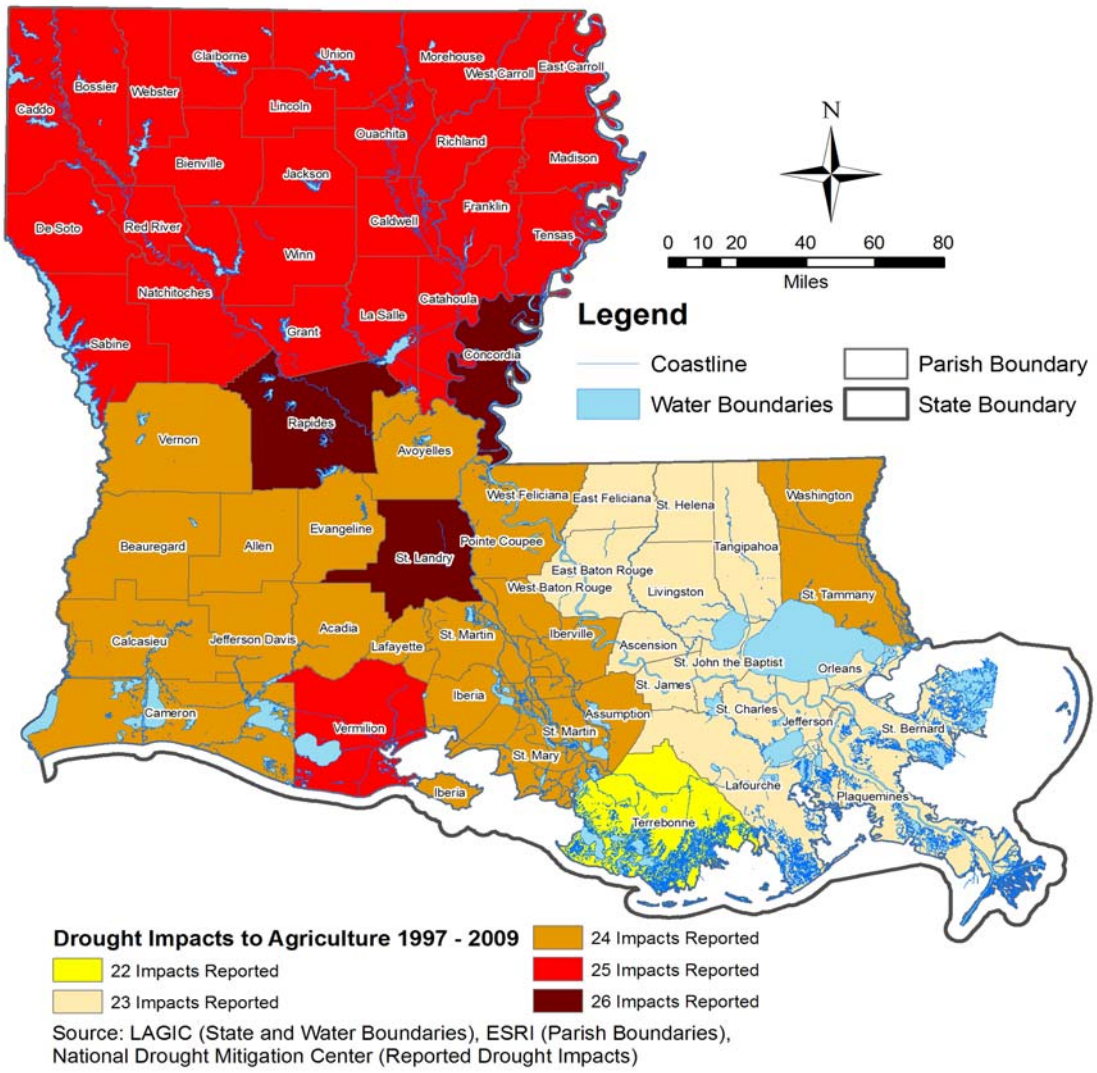
Drought is a normal part of virtually all climatic regimes, including areas with high and low average rainfall. Drought results when the amount of precipitation that is received over an extended period of time (usually a season or more in length) is significantly less than normal amounts for that area.

Although Louisiana features several large water bodies, thousands of miles of rivers, streams, and bayous, and is home to thousands of acres of wetlands, the state has experienced occasional drought conditions. Northern parishes have been especially prone to agricultural droughts, which lead to severe decreases in soil moisture and have serious consequences for crop production.

Since the 2008 Plan was adopted, there has been one significant drought in Louisiana. June 2009 was a very dry month over much of the southern region of the United States. By the month's end, four-fifths of Louisiana showed soil moisture shortages. As a result, moderate drought conditions were introduced to southeastern Louisiana. Map 4-2 shows the number of recorded impacts on agriculture as reported to the National Drought Mitigation Center. Statistics are also available regarding the drought's effects on water/energy, environmental resources, fire incidents, and social circumstances.

While Louisiana has suffered agricultural droughts throughout the state, droughts of such a magnitude as to necessitate urban and suburban water restrictions are rare. Therefore, based on the results of the hazard profiling for this study, drought is not considered significant by the SHMPC in comparison to the other profiled hazards, and the extent to which drought can be mitigated via existing hazard mitigation programs administered by GOHSEP is very small. Therefore, technical risk assessments are not included for drought in Sections Five and Six.

Map 4-2: Hazard Profile-Drought



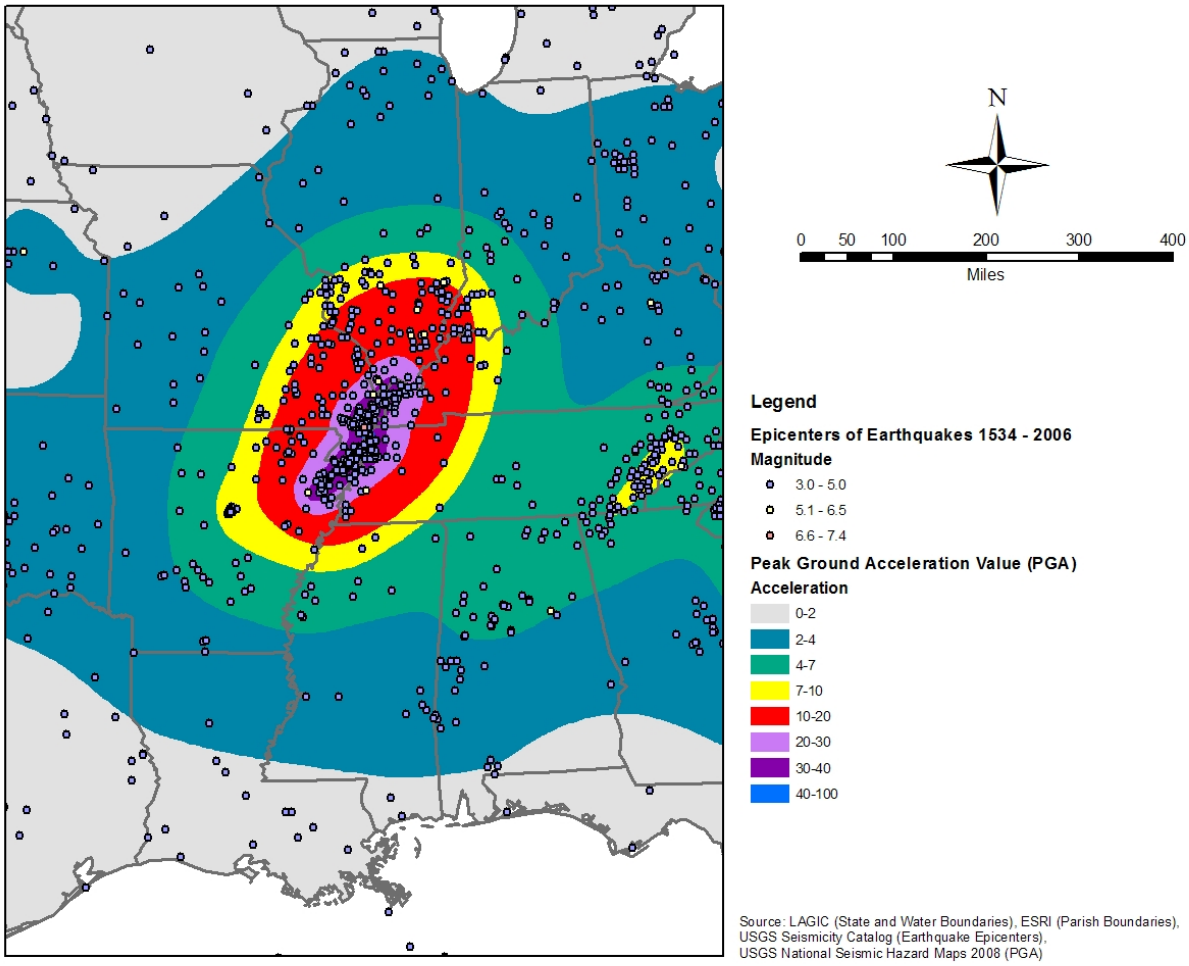
Earthquake

An earthquake is a sudden motion or trembling of the earth caused by an abrupt release of stored energy in the rocks beneath the earth's surface. The energy released results in vibrations which are known as seismic waves. Ground motion from seismic waves is expressed as peak ground acceleration (PGA), the fastest measured change in speed for a particle at ground level that is moving because of an earthquake. PGA is commonly measured as a percentage of acceleration due to Earth's gravity (%g). This measurement is relied on to determine seismic load engineering design and construction requirements.

Although Louisiana is an area of low seismic risk, a number of earthquakes have occurred in the state over the last 200 years. These earthquakes have had two distinct sources: a system of subsidence faults (also known as "growth faults") in southern Louisiana and the New Madrid seismic zone north of Louisiana. Most of these earthquakes were of low magnitude (or had low-magnitude impacts within Louisiana), and they occurred infrequently.

Map 4-3 shows the PGA and the 10% probability of exceeding normal ground motion due to seismic waves in 50 years for the south-central region of the United States. This regional perspective is necessary to understand the close proximity of North Louisiana to the New Madrid fault.

Map 4-3: Hazard Profile – Earthquake – Regional Perspective

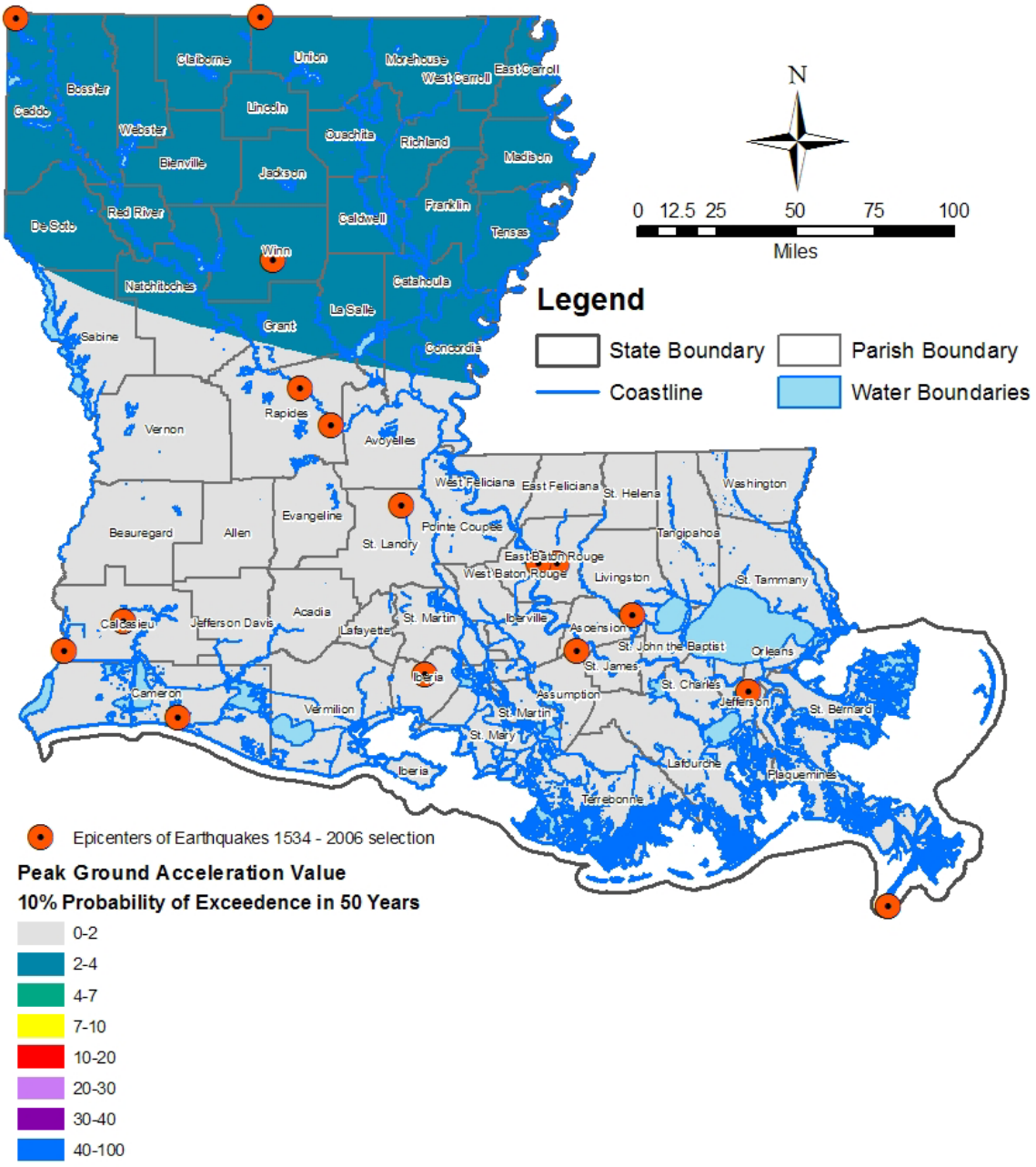


Map 4-4 shows the PGA and the 10% probability of exceeding normal ground motion due to seismic waves in 50 years for Louisiana. The southern half of the state has a PGA equal to one percent of the Earth's gravity (1%g), and the northern part of the state has a PGA of 3%g. This can be compared to the New Madrid Seismic Zone, which has a PGA as high as 40%g. It is important to note that Map 4-4 expresses a 10% probability and therefore constitutes a 90% chance that normal ground motions will not be exceeded. This map also shows the locations of epicenters of historical earthquakes.

Map 4-5 shows the gulf-margin normal (subsidence) faults, which have low seismic activity. The stress field and seismogenic potential of the crust is unknown. Consequently, its ability to cause damaging ground motion is unknown.

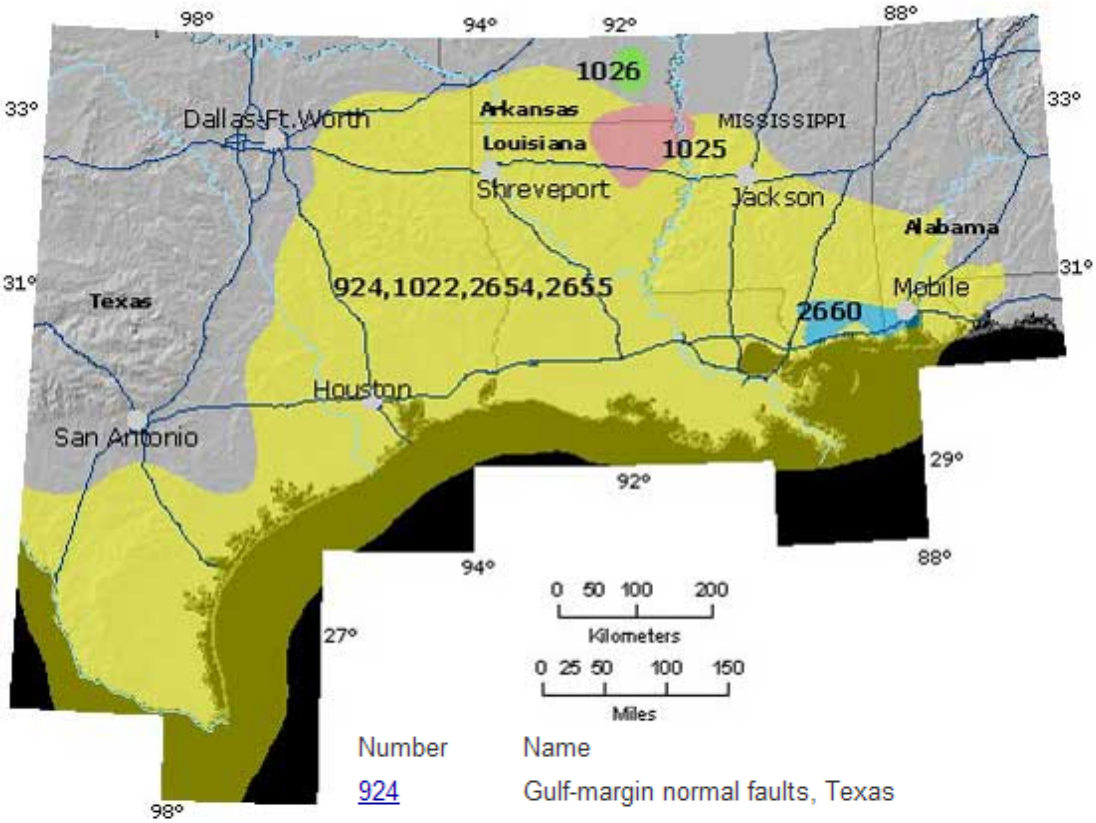
Based on the results of the hazard profiling for this study, earthquakes are not considered as significant by the SHMPC in comparison to the other profiled hazards. Therefore, technical risk assessments are not included for earthquake in Sections Five and Six.

Map 4-4: Hazard Profile-Earthquake



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
USGS Seismicity Catalog (Earthquake Epicenters),
USGS National Seismic Hazard Maps 2008 (PGA)

Map 4-5: Faults of the Gulf of Mexico Coastal Region



Number	Name
924	Gulf-margin normal faults, Texas
1022	Gulf-margin normal faults, Louisiana and Arkansas
1025	Monroe uplift
1026	Saline River fault zone
2654	Gulf-margin normal faults, Alabama and Florida
2655	Gulf-margin normal faults, Mississippi
2660	Wiggins uplift

Flood

There are multiple causes and types of flooding in Louisiana. “Flood” in this Plan Update refers to riverine flooding: naturally occurring events involving rivers and their tributaries, floodplains, or localized low areas. In a typical flood event in Louisiana, excess water from rainfall accumulates and either overflows onto banks (also referred to as “overbank” flooding) or backs up into adjacent floodplains (also referred to as “backwater” flooding). Flooding in South Louisiana can also result from storm tide and storm surge. In Louisiana, flood events include incidents that may be exacerbated by manmade flood control interventions including levees, floodwalls, and forced drainage systems. The failure of such systems can directly cause flooding, as Hurricane Katrina demonstrated, and levees and other barriers can impound water on their protected side, leading to extended inundation, as happened after both Hurricanes Katrina and Rita. Ponding is also a major factor, as water does not drain very fast from Louisiana’s flat terrain without mechanical assistance or stormwater management. Tidal or backwater flooding can compound these ponding effects.

FEMA’s National Flood Insurance Program (NFIP) maps many floodplain boundaries, and the Flood Map Modernization program is currently transforming the nation's flood maps into a readily available digital format. Each new Digital Flood Insurance Rate Map (DFIRM) is linked to a database that provides information about the flood zone, Base Flood Elevation (BFE), and the floodway status for a particular location. A list of the DFIRM status (as of July 13, 2010) for Louisiana’s communities is included in Appendix D. DFIRMs were not available for several parishes at the time the flood hazard analysis for this Update was conducted.

It is important to note that floods often go beyond the mapped high-risk flood zones, which are determined based on the statistical probabilities of flooding occurring at a given location each year, or change course due to natural processes (e.g., accretion, erosion, sedimentation, etc.) or human interventions (e.g., filling in or otherwise obstructing floodplain or floodway areas or increased imperviousness within the watershed from new development). Figures 4-5 and 4-6 illustrate the impact of flooding on residential and industrial sites as a result of Hurricane Katrina in August 2005 and Hurricane Lili in October 2002.

Figure 4-5: Flood Damages from Hurricane Katrina, August 2005

(Source: FEMA, 2005)

Most injuries and deaths related to flooding events occur when people are swept away by flood currents, and most property damage results from inundation by sediment and debris-filled water. According to the statistics compiled by the Office of Climate, Water, and Weather Services of the National Weather Service (NWS) and the NCDC, Louisiana averaged 91 flood related deaths per year from 1980 to 2009, although the 10-year average shows a decreasing trend such that the state has averaged only 64 deaths from 2000-2009[12]. The deaths from Hurricane Katrina are not included in these numbers.

Flooding is a significant potential threat throughout Louisiana, representing the state's most prevalent and pervasive natural hazard threat. Louisiana is located along the southernmost part of the Mississippi River Basin, which has the largest drainage of any basin in North America. The state's sub-tropical climate has the potential for producing heavy rainfalls at any time of the year.

Over the past century, there has been an increase in large rainstorms and resultant flooding, particularly in the late winter and spring.[13] Rainfalls of up to ten inches in a two-day period are not uncommon and are capable of producing considerable flooding (refer to Section 4.2 – Climate for additional information). Mean annual precipitation decreases to the west and north, with the northwest corner of the state receiving an average of 48 inches annually, in contrast to the delta area in southeastern Louisiana, which receives an average of about 64 inches annually.

[12] http://www.weather.gov/os/hazstats.shtml
[13] GOHSEP, 2001

Figure 4-6: Flood Impacts from Hurricane Lili, October 2002

(Source: GOHSEP)

Flooding along the Mississippi and Atchafalaya Rivers more often results from upstream runoff (from states as far away as Kentucky and Wisconsin) rather than local rainfall[14]. Flooding along the lower Mississippi can have significant economic and emergency response impacts. Major flooding on waterways can seriously affect river and barge traffic, especially along the Mississippi River where cargo is handled at the Port of New Orleans, Port of Baton Rouge, Plaquemines Port, and the Port of South Louisiana. It is the combination of these ports that make the lower Mississippi River in Louisiana such a powerful port complex. All four of these ports are in the top 15 American ports for all United States cargo processed in 2008[15]. Furthermore, the increase in riverboat casinos along the river may have repercussions for emergency response operations. Flood-stage levels that trigger emergency response may have to be adjusted to allow additional time for responders to deal with additional traffic, potential property damage, and the at-risk tourist population. Frequent flooding—whether overbank, backwater, tidal, or from any other source—is of particular concern in areas of active real estate growth and development (for more on this risks' association with recent and future development, see Section 5.15).

However, the primary focus in Louisiana in terms of mitigating flooding impacts is on repetitive loss properties (RLs). A RL is defined as any property that is currently insured under the NFIP and that has had two or more claims greater than $1,000 paid by the NFIP within any 10-year period since 1978.

Severe repetitive flood loss properties (SRLs) are a subset of repetitive loss properties that have experienced even greater damage. They must have had at least four claims payments of over $5,000 paid by the NFIP with at least two of those occurring within a ten year period and with the cumulative amount exceeding $20,000 or at least two

[14] GOHSEP, 2001
[15] Source: http://www.aapa-ports.org/Industry/content.cfm?ItemNumber=900&navItemNumber=551

separate claims that when combined exceed the value of the home.[16] A summary of SRLs is available in Appendix D, Table D-8a.

The State of Louisiana has a defined process for maintaining up-to-date repetitive flood loss data. GOHSEP receives an up to date listing of RLs, SRLs, and alternative methodology properties from FEMA Region VI on a monthly basis. These data are stored following very specific protocols to ensure that the most recent data are consistently available and that Privacy Act regulations are followed.

It is important to note that GOHSEP's focus on progress to mitigate RLs, and especially SRLs, contributes to meeting Louisiana's requirements for increased federal match on SRL and Flood Mitigation Assistance (FMA) grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning IFR, § 201.4(c)(3)(v).

A few facts about RLs in Louisiana provide an important perspective:

- Nationwide, FEMA has identified that as of 2007, about 9,000 SRLs have experienced frequent significant flooding impacts[17]
- Per GOHSEP, of these high priority properties, 4,000, or over 45%, are located in Louisiana, more than twice the number in any other state. Texas, New Jersey, and Florida follow with 1,500, 1,000, and 1,000, respectively.
- Louisiana ranks the highest among all states for number of RLs and SRLs claims and total value of each claim. The nation had over $10 billion in claims, and Louisiana accounted for $2.5 billion alone[18].

The mapping with this subsection includes the following:

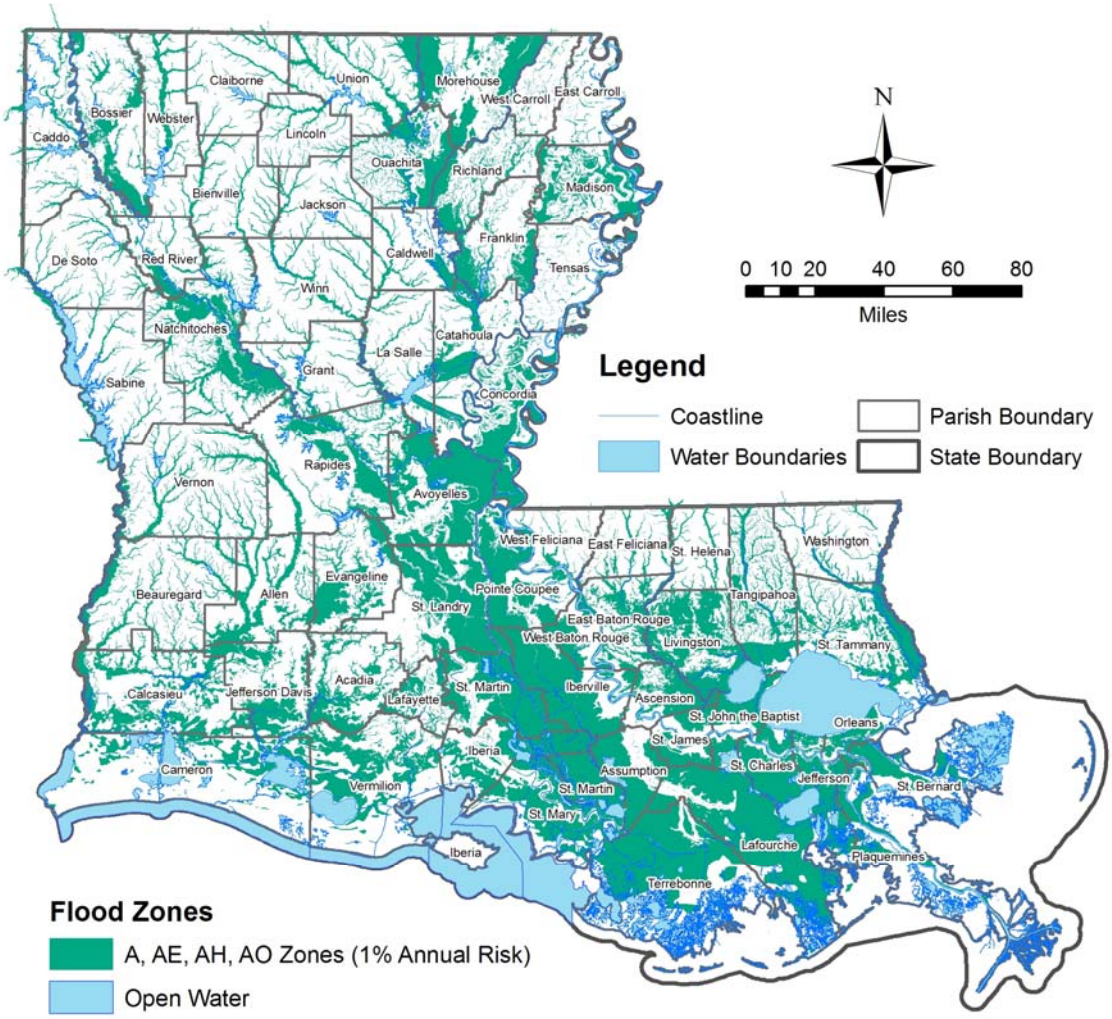
- Map 4-6 shows the extent of 100-year floodplains (areas with a 1% chance on average of being inundated in any given year) in Louisiana using the best available data. Specifically, DFIRMs were used for 45 parishes, and a floodplain boundary was determined using HAZUS-MH for the remaining 19 parishes.
- Map 4-7 indicates which data source was used for each parish to develop Map 4-6
- Map 4-8 shows designated "V" zones (velocity zones) in coastal parishes, per current DFIRM mapping
- Map 4-9 illustrates the relative distribution of RLs across the state
- Map 4-10 shows the dollar value of repetitive losses per parish
- Map 4-11 shows the number of SRLs in each parish as a percentage of the total SRLs in the state
- Map 4-12 shows the number of dollars paid by parish for SRLs

Note that Maps 4-9, 4-10 4-11 and 4-12 are intended to depict different ways of sorting repetitive loss data, depending on what the data are intended to illustrate. These maps are not intended to directly indicate prioritization for funding purposes.

Due to the extensive history of flooding and the high incidence of repetitive loss properties in the state, flood is one of the hazards included in the risk assessments and addressed in the Mitigation Action Plan.

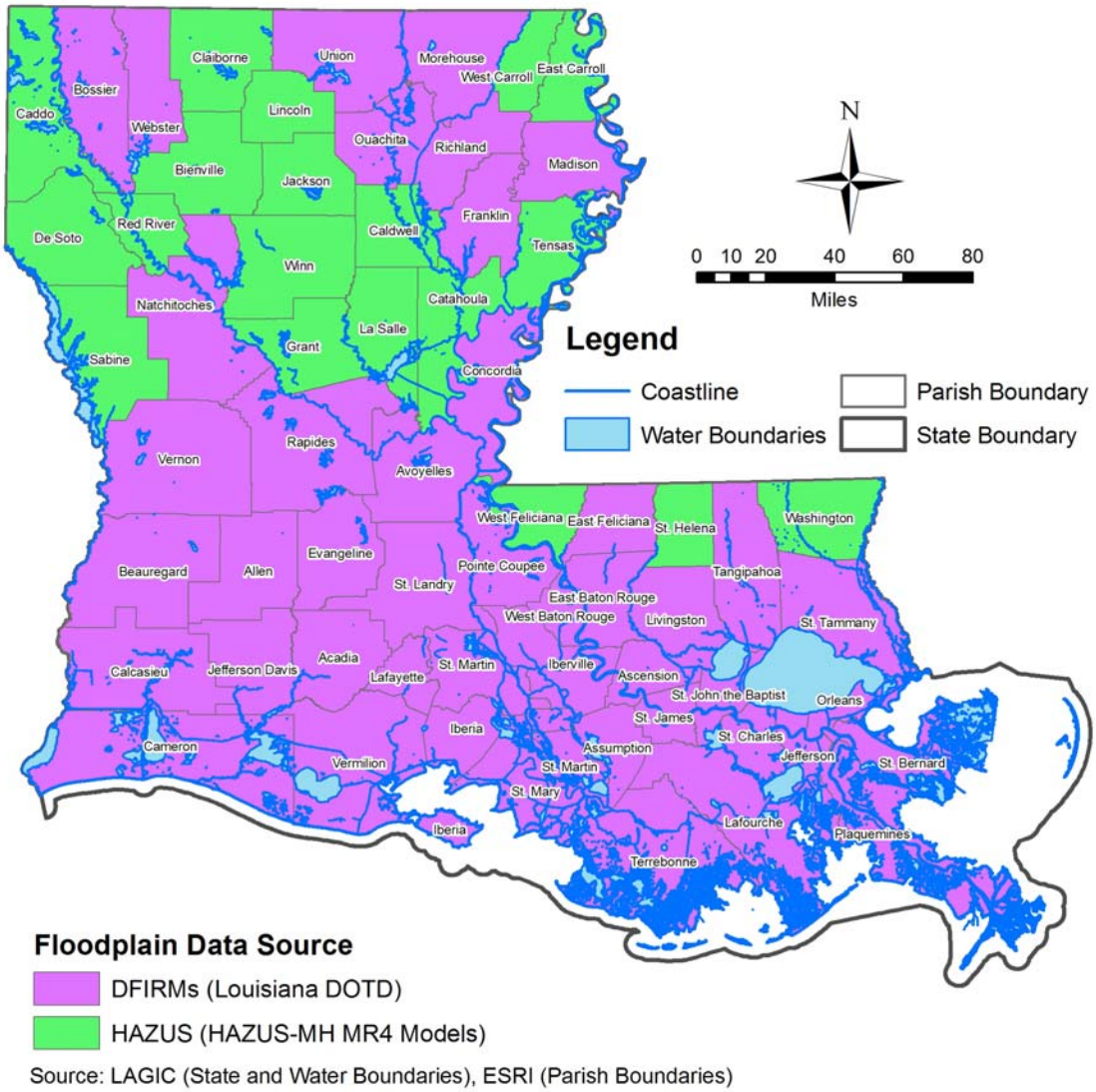
[16] GOHSEP, Technical Publication 008: Repetitive Flood Loss Data Management, July 24, 2007
[17] www.fema.gov, January 31, 2007.
[18] www.fema.gov, 2009

Map 4-6: Hazard Profile-Flood

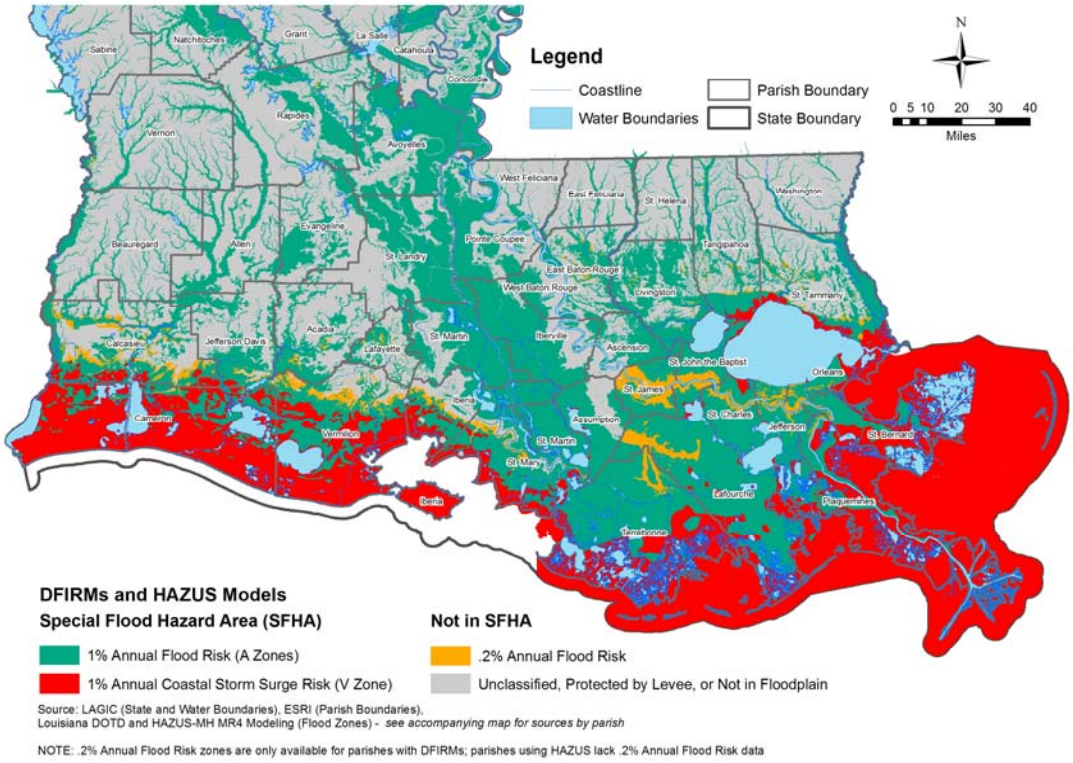


Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Louisiana DOTD (DFIRM Floodplains), HAZUS-MH MR4 (HAZUS Modeling Floodplains)

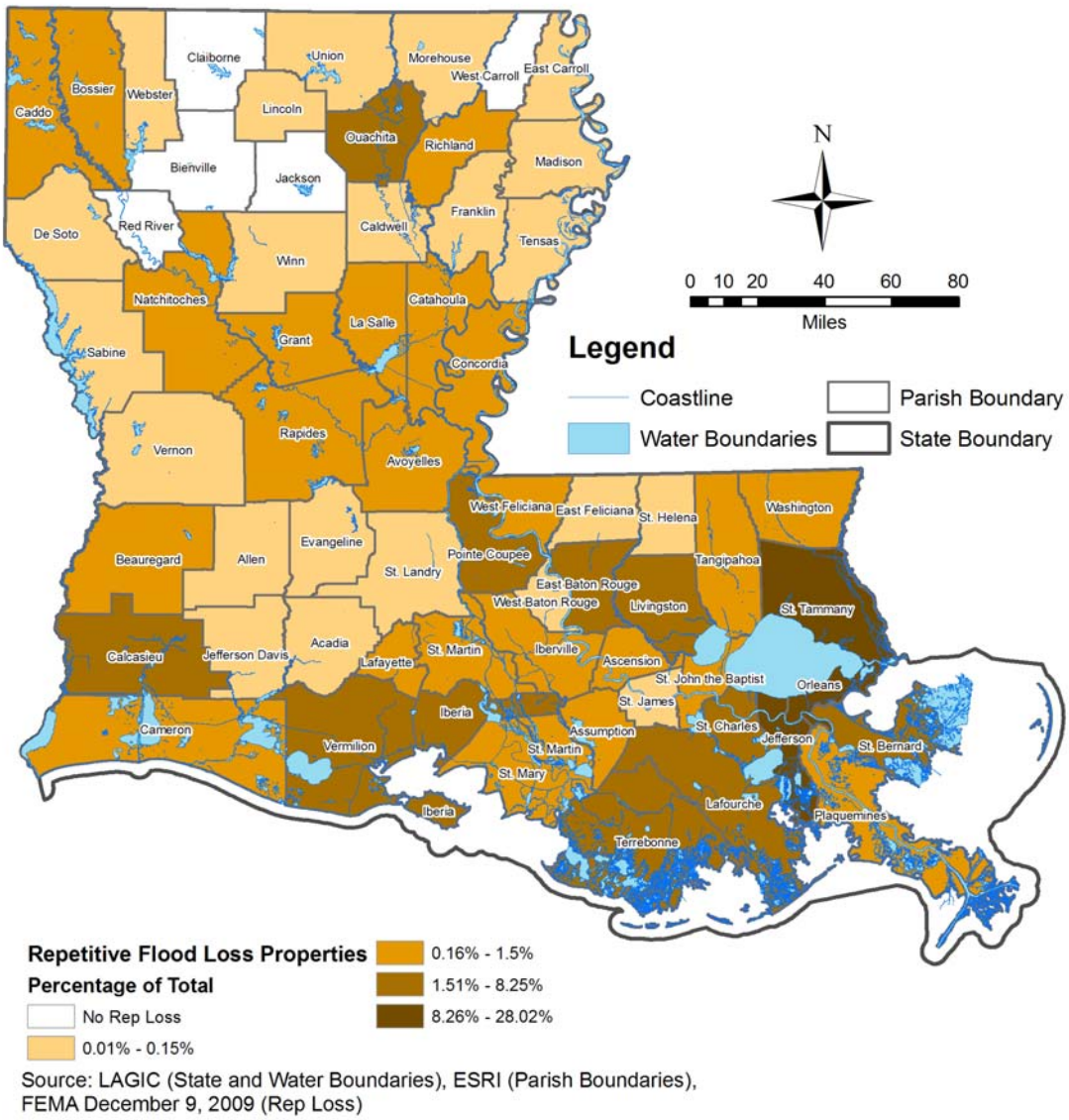
Map 4-7: Flood Hazard Data Sources



Map 4-8: DFIRM Flood Zones Showing V Zones



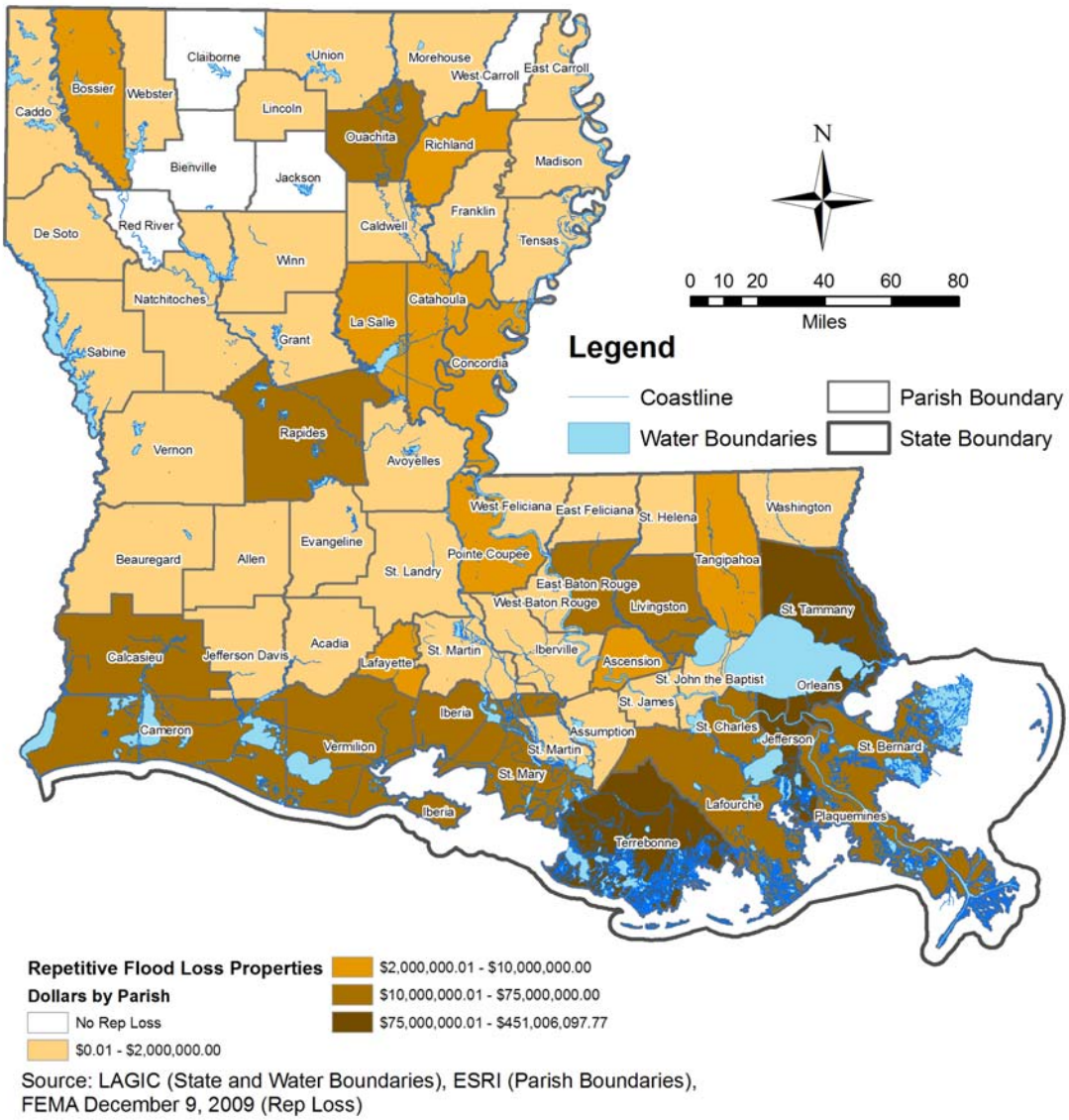
Map 4-9: Relative Distribution of Repetitive Loss Properties[19]



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Rep Loss)

[19] This map is not intended to directly indicate prioritization for funding purposes.

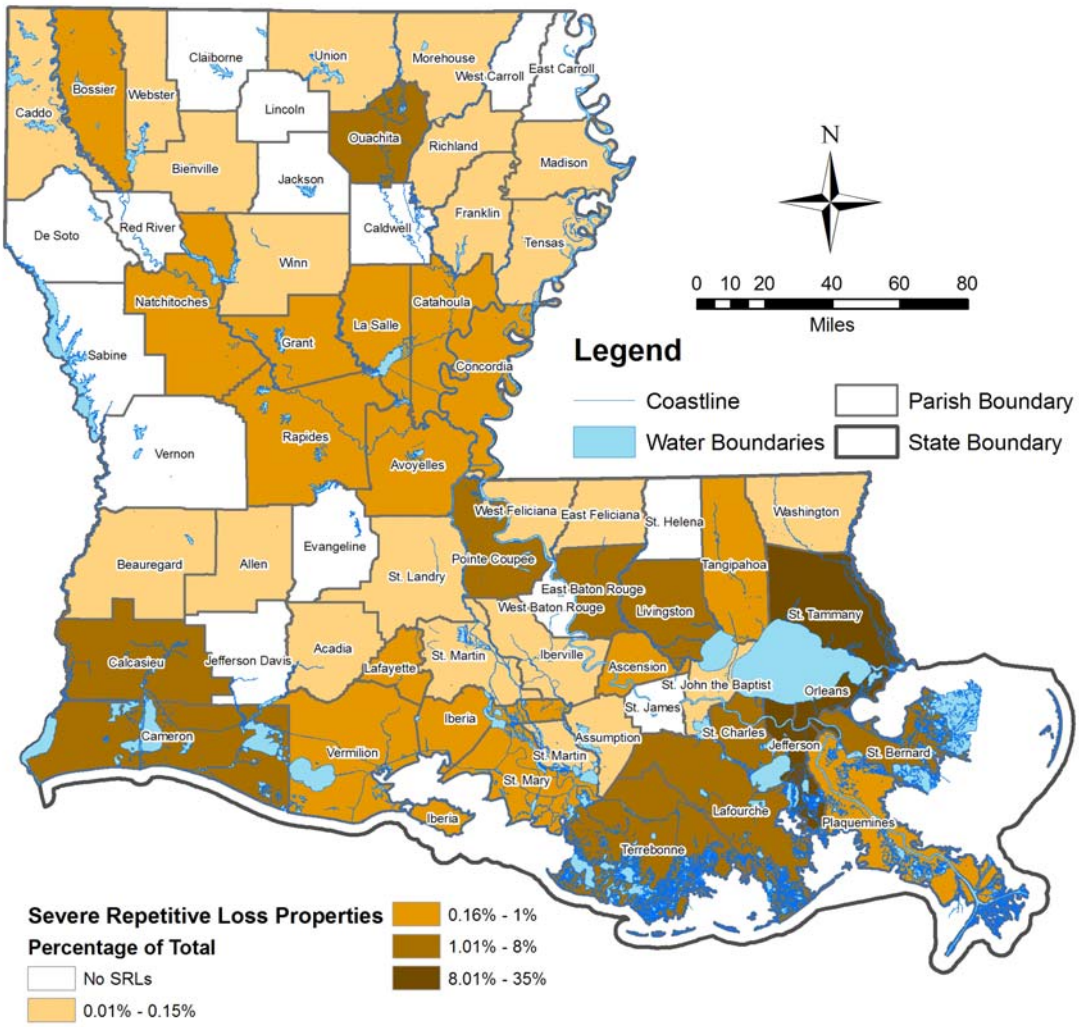
Map 4-10: Dollars Paid by Parish for Repetitive Loss Properties[20]



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Rep Loss)

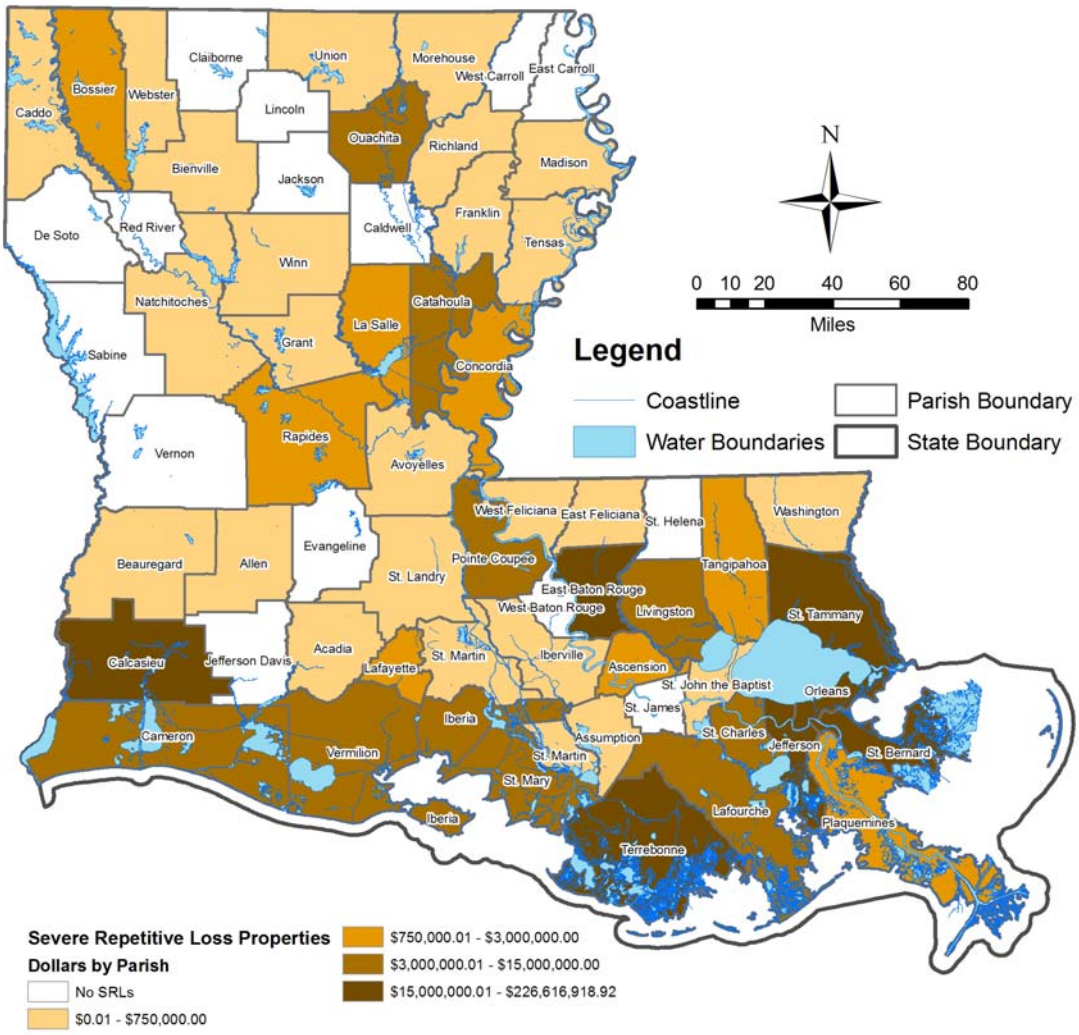
[20] This map is not intended to directly indicate prioritization for funding purposes.

Map 4-11: SRLs by Parish as a Percentage of Total SRLs in the State[21]



[21] This map is not intended to directly indicate prioritization for funding purposes.

Map 4-12: Dollars Paid by Parish for Severe Repetitive Loss Properties (SRLs) [22]



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Rep Loss)

[22] This map is not intended to directly indicate prioritization for funding purposes.

Hailstorm

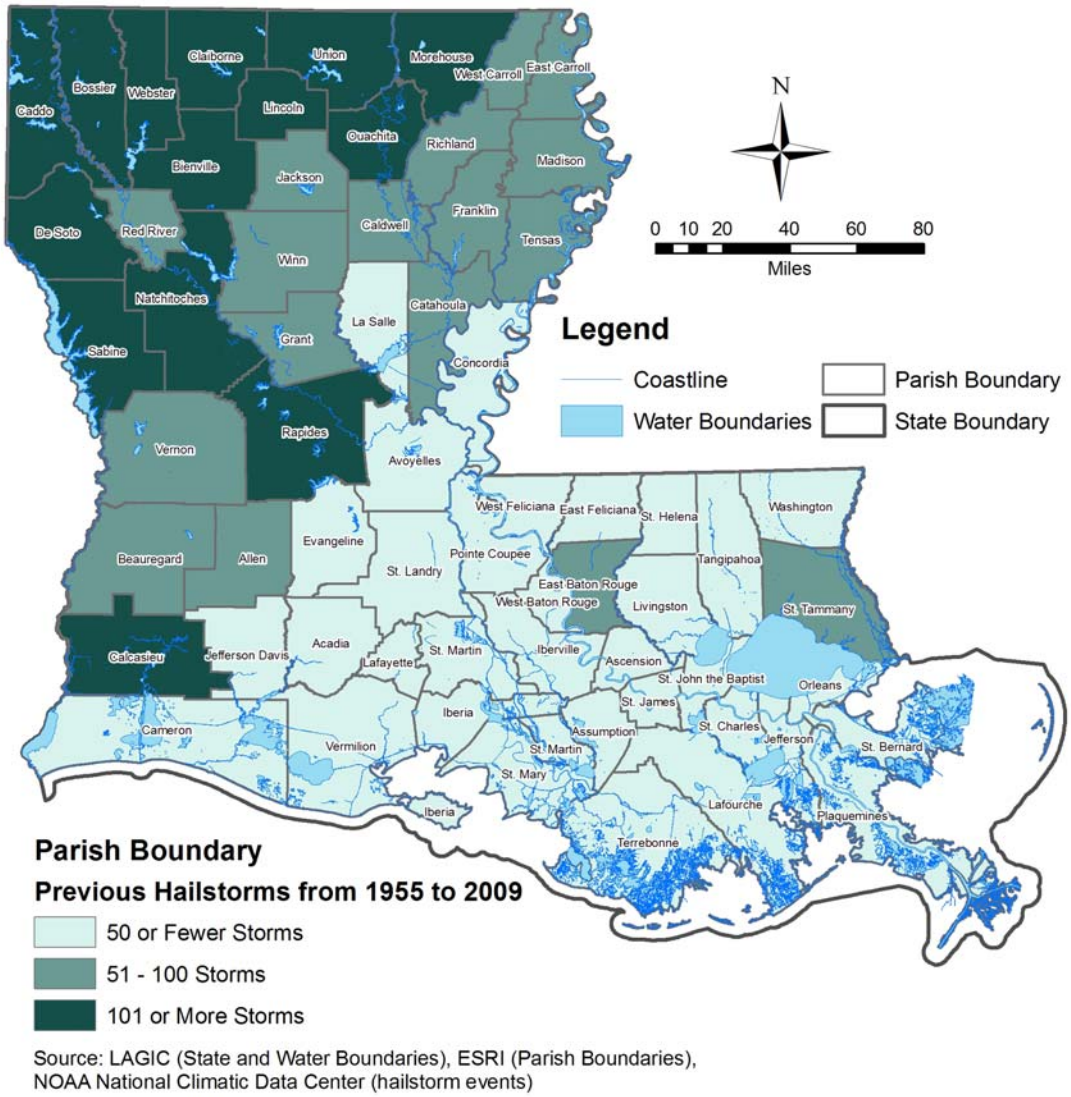
Hailstorms are severe thunderstorms in which balls or chunks of ice fall along with rain. Hail develops in the upper atmosphere initially as ice crystals that are bounced about by high velocity updraft winds. The ice crystals accumulate frozen droplets and fall after developing enough weight. The size of hailstones varies depending on the severity and size of the thunderstorm. The higher the temperatures at the Earth's surface, the greater the strength of the updrafts, the greater mass of hailstone that can be supported by updrafts, the greater the amount of time hailstones are suspended, and thus the greater the size of the hailstone. Hailstorms generally occur more frequently during the late spring and early summer, a period of extreme variation between ground surface temperatures and jet stream temperatures, which can produce the strong updraft winds needed for hail development.

Hailstorms can cause widespread damage to homes and other structures, automobiles, and crops. While the damage to individual structures or vehicles is often minor, the cumulative costs to communities, especially across large metropolitan areas, can be quite significant. The severity of hailstorms depends on the size of the hailstones, the length of time the storm lasts, and whether it occurs in developed areas.

Between 1955 and 2009, Louisiana experienced a total of 4,469 recorded hailstorm events, with a maximum hail size of 4.5 inches. Map 4-13 and associated information in this Section and Appendix D have been updated since the 2008 Plan to reflect more recent data from the NCDC.

Due to the high potential for significant personal injury and property damage for the state, this hazard was included in the Risk Assessments and is addressed in the Mitigation Action Plan.

Map 4-13: Hazard Profile-Hailstorm



High Wind (Hurricane)

Tropical storms and hurricanes are large-scale systems of severe thunderstorms that develop over tropical or subtropical waters and have a defined, organized circulation. Tropical storms are defined to have wind speeds of 39 mph to 74 mph, and hurricanes have a maximum sustained (meaning one-minute average) surface wind speed of at least 74 mph. Hurricanes and tropical cyclones get their energy from warm waters and lose strength as they move over land.

Hurricanes and tropical storms have proven to be Louisiana's costliest and deadliest natural phenomenon. At least three storms have produced 200 or more deaths, including the storm of 1893, in which roughly 2,000 lives were lost. Figures 4-7 and 4-8 show examples of damage resulting from high winds during Hurricanes Katrina and Gustav.

Figure 4-7: High Wind Damages from Hurricane Katrina in Slidell, August 2005

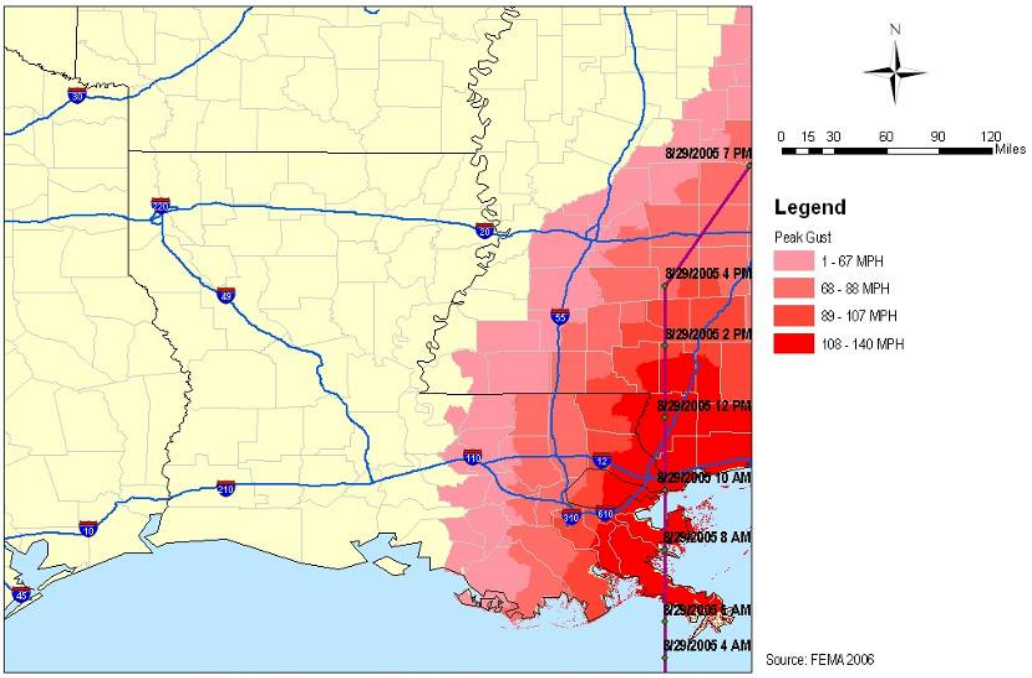
(Source: The Times Picayune, 2005)

Figure 4-8: High Wind Damages from Hurricane Gustav, September 2008

(Source: Kathy Anderson / The Times-Picayune)

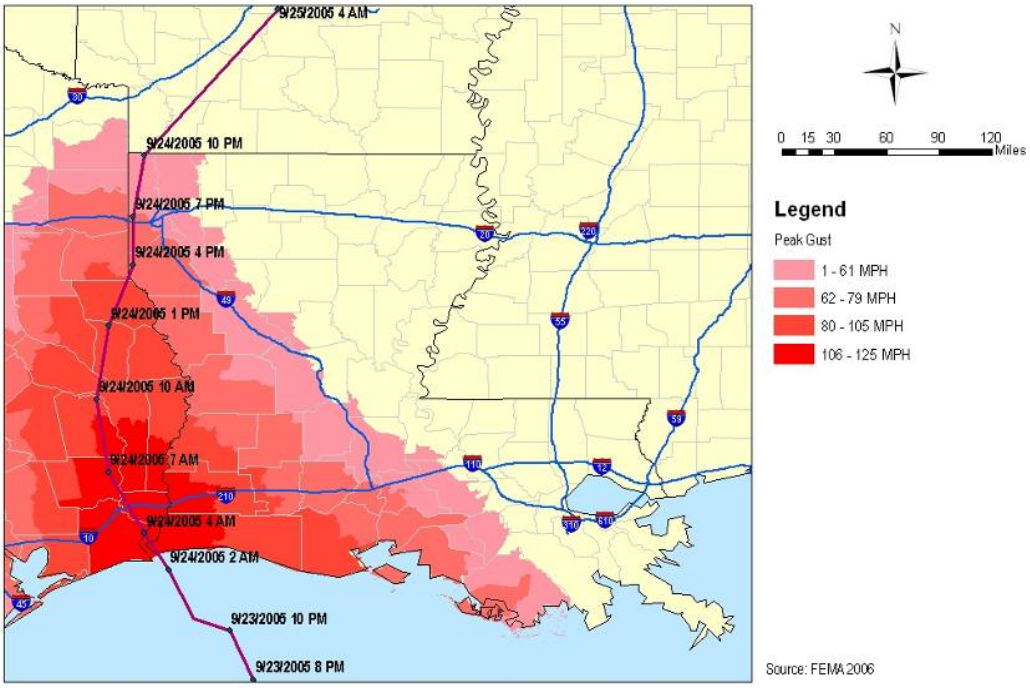
The central Gulf of Mexico coastline is among the most hurricane-prone locations in the United States. Peak hurricane activity in Louisiana occurs in September. Hurricanes and tropical storms can bring severe winds, storm surge flooding along coastal regions, high waves, coastal erosion, extreme amounts of rainfall, thunderstorms, lightning, inland flooding, and tornadoes. One of the most serious hurricane-related hazards for Louisiana is high wind. Coastal and inland areas are also vulnerable to hurricane-spawned tornadoes (refer to Volume II, Appendix D.6). Maps 4-14a and b below show the wind fields resulting from Hurricanes Katrina and Rita, respectively, at landfall. Map 4-15 shows the wind fields resulting from Hurricane Gustav at landfall. The wind-related impacts from these events were felt well inland. Many of the central parishes sustained significant wind damage and widespread, prolonged power outages as a result of Hurricane Gustav. Map 4-16 shows that all of Louisiana, including its northern reaches, can experience strong tropical storm- to hurricane-force winds. Due to the recent history and high potential for damage from hurricanes, this hazard was included in Risk Assessments and the Mitigation Action Plan.

Map 4-14a: Hurricane Katrina Extent of Wind Fields



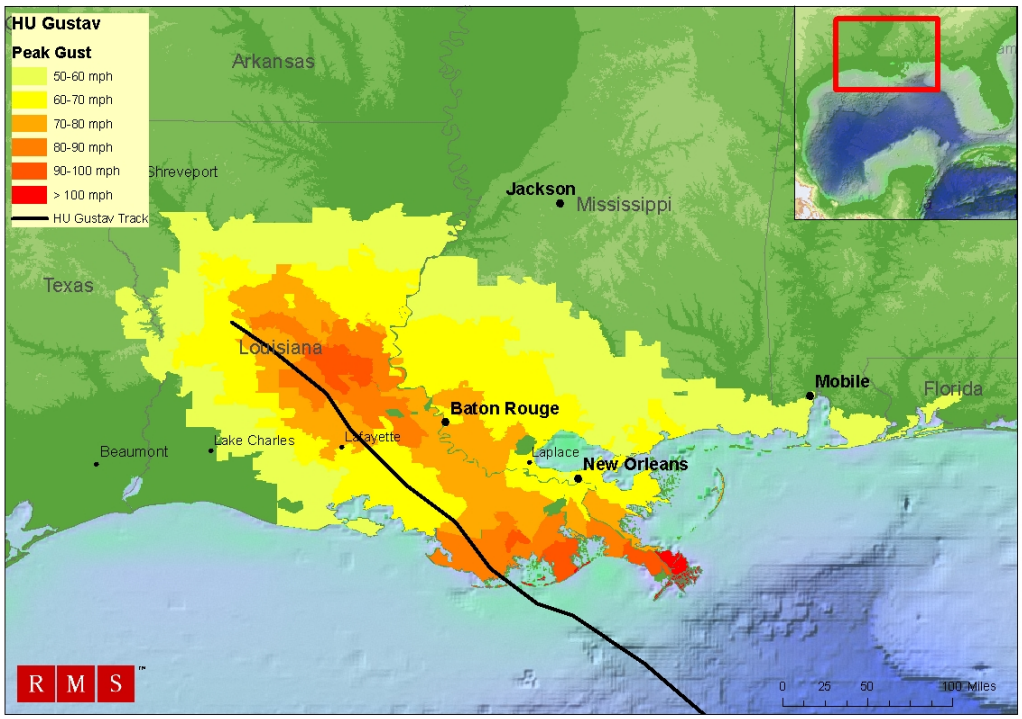
(Source: FEMA, 2006)

Map 4-14b: Hurricane Rita Extent of Wind Fields



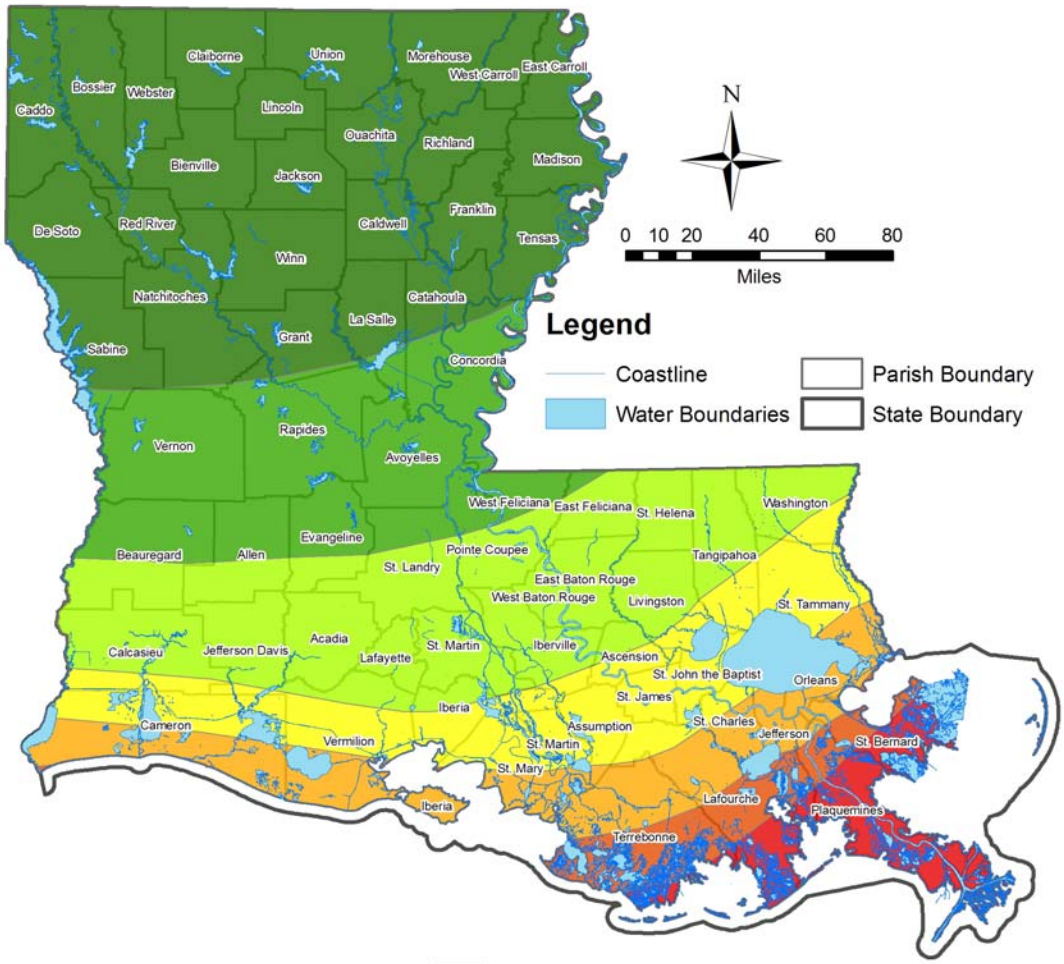
(Source: FEMA, 2006)

Map 4-15: Hurricane Gustav Extent of Wind Fields



(Source: RMS, Inc., 2008)

Map 4-16: Hazard Profile-High Wind (Hurricane), Showing Maximum Sustained Winds



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ASCE 7-05 (Wind Speeds)

High Wind (Tornado)

Tornadoes are rapidly rotating funnels of wind extending between storm clouds and the ground. They are created during severe weather events, such as thunderstorms and hurricanes, when cold air overrides a layer of warm air, causing the warm air to rise rapidly.

Tornadoes caused 126 deaths in the United States in 2008. This number is up 43 from the 2007 total of 81, and is significantly higher than the ten-year average of 62. Tornado deaths in 2008 also topped the 30-year average of 54 per year. As in most years, the most dangerous place to be during a tornado was in a mobile home, which accounted for 55 (44% of total) deaths.

Louisiana has had seven federal Disaster Declarations for tornado events since 1965. According to NOAA, one of the deadliest tornado outbreaks in United States history occurred in Louisiana and neighboring states during April 24-26, 1908. A number of violent tornadoes moved through parts of Louisiana, Mississippi, and Alabama, killing 324 people and injuring 1,652 others. The worst damage took place in Amite, Louisiana, where 29 people died.

In Louisiana, the 2008 and 2009 tornado seasons in Louisiana proved to be as deadly and costly as in previous years (see Figure 4-9). The 2008 and 2009 tornado seasons combined produced 164 recorded tornadoes that resulted in six deaths, 32 injuries, and $41.68 million in damages in the state. On December 10, 2009, President Obama issued a Presidential Disaster Declaration in the State of Louisiana and ordered federal aid to supplement state and local recovery efforts in the area struck by severe storms, tornadoes, and flooding during the period of October 29 to November 3, 2009.

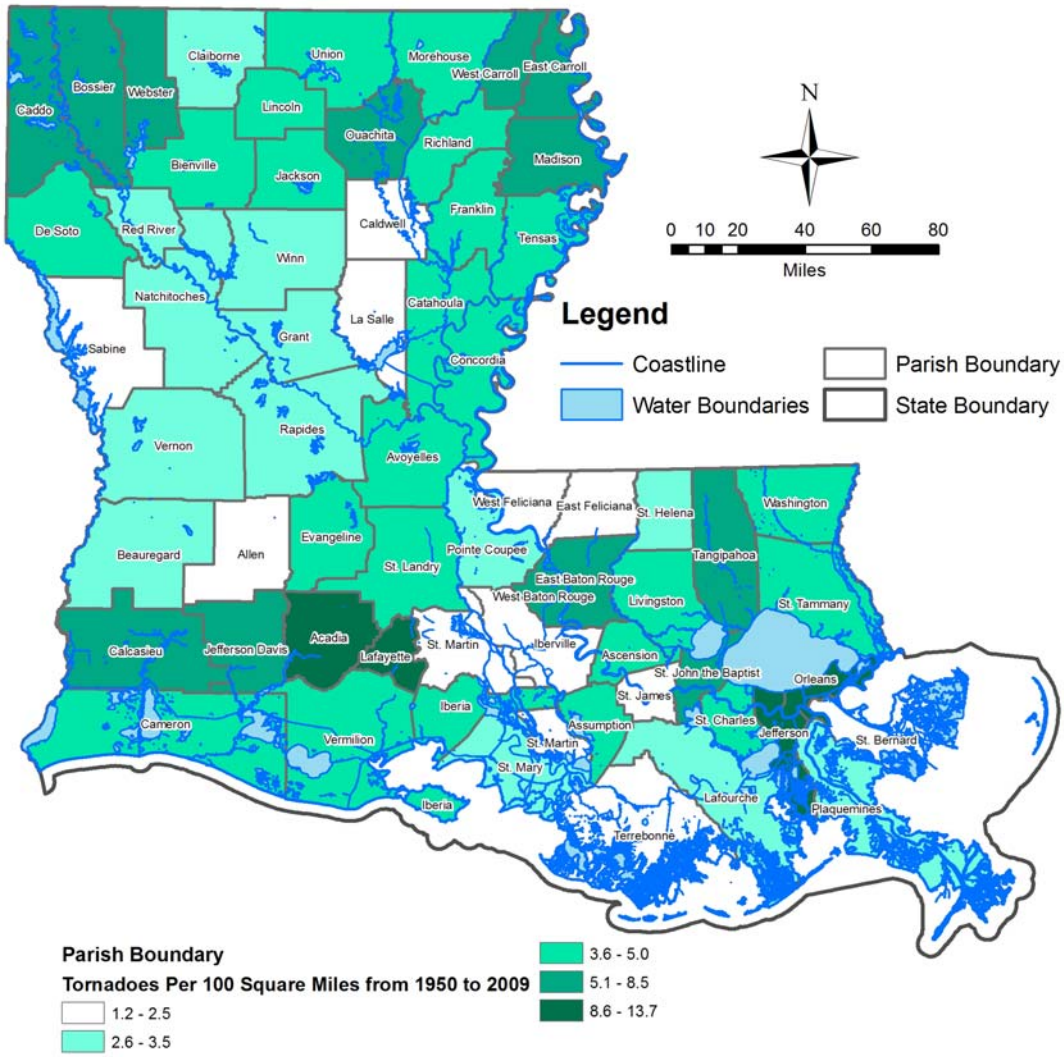
Figure 4-9: Crowley, LA survey tornado damage on Christmas Eve 2009

(Courtesy of The Daily Advertiser)

Map 4-17 is based on a 59-year NOAA data record that includes the historical tracks of 1,174 tornadoes in Louisiana, including tornadoes of all intensities. The data are used in this Plan Update to represent the relative frequency of tornadoes that can be anticipated on an annual basis in each parish, expressed in the number of tornadoes per 100 square miles per year.

Due to the recent history and high potential for damage from tornadoes in the state, this hazard was included in the Risk Assessments and addressed in the Mitigation Action Plan.

Map 4-17: Hazard Profile-High Wind (Tornado)



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (tornado events)

Severe Winter Weather - Ice Storm

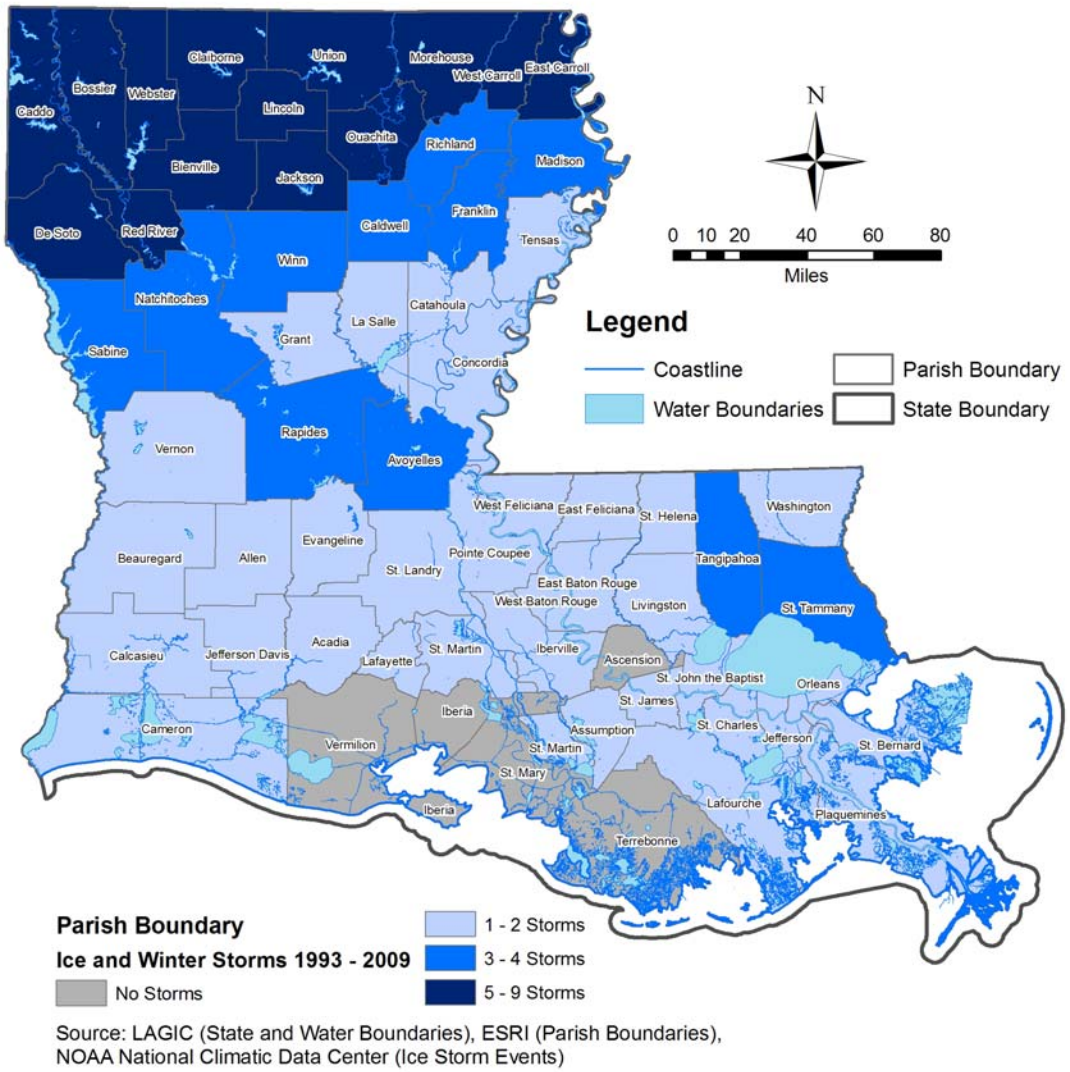
This subsection focuses on the most damaging of the other types of severe winter weather in Louisiana: ice storms. Severe winter weather in Louisiana consists of freezing temperatures and heavy precipitation, usually in the form of rain, freezing rain, or sleet, but sometimes in the form of snow and ice. While Louisiana is far less likely to have heavy snow and ice accumulation than most other states, this type of severe winter weather can be expected to occur at least once each winter. Data from the NCDC shows that the entire State of Louisiana is in the lowest category of probable snow depth: 0 to 25 centimeters of snow depth with a 5% chance of being equaled or exceeded in any given year. Temperature extremes are discussed later in this section.

Louisiana has recently experienced several occurrences of ice storms. In February 1994, a severe ice storm spread freezing rain across the northern third of the state. Ice accumulations of two to three inches combined with gusty winds snapped power lines, power poles, and trees. More than 100,000 people were without electric power for several days, and over 256,000 acres of forest were damaged. The state suffered an estimated $13.5 million in damages. Several ice storms within a two-week period in December 2000 resulted in similar damage, causing over 250,000 people to be without power, primarily in northern Louisiana. About 30 transmission lines atop “H”-shaped steel towers snapped due to the weight of the ice, and numerous traffic accidents occurred across the state. With millions of dollars in damages and one death attributed to the storms, Louisiana received a Presidential Disaster Declaration.

Louisiana ice storms that have had severe consequences for the state have generally delivered one to three inches of ice accumulation. Map 4-18 indicates the number of ice storms per parish over the 17-year period between 1993 and 2009.

Due to continued history of damaging ice storms in the state, ice storm is one of the hazards included in the Risk Assessments and addressed in the Mitigation Action Plan.

Map 4-18: Hazard Profile-Ice Storm



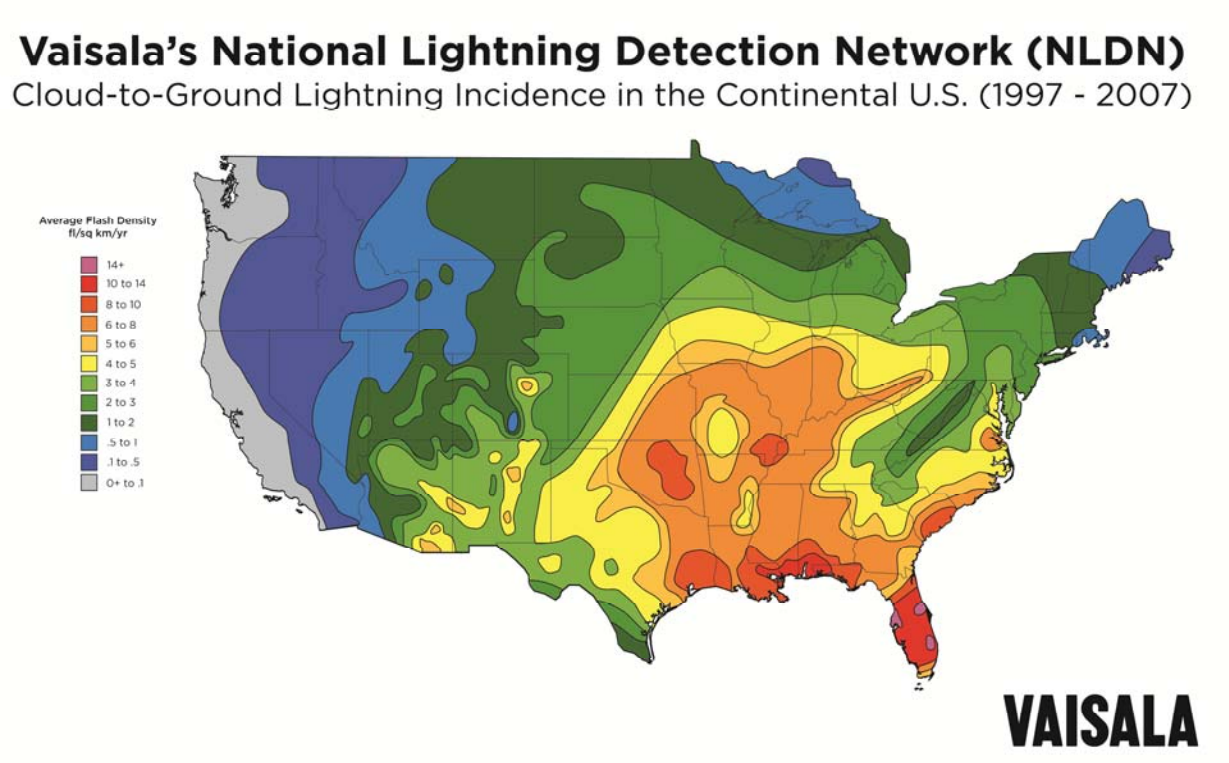
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Ice Storm Events)

Lightning

Lightning is a hazard phenomenon associated with thunderstorms. The action of rising and descending air in a thunderstorm separates positive and negative charges, with lightning resulting from the discharge of current between positive and negative charge areas. Water and ice particles may also affect the distribution of the electrical charge. In only a few millionths of a second, the air near a lightning strike is heated to 50,000°F, a temperature hotter than the surface of the sun. Thunder is the result of the very rapid expansion and collapse of air near the lightning, which causes a shock wave.

On a national scale, the State of Louisiana is second only to Florida in terms of "flash density," the number of lightning flashes per square kilometer per year (see Map 4-19), and is 12th in the nation in terms of lightning fatalities when population is factored in[23]. Map 4-20 also shows the average number of lightning flashes that have been experienced per square mile in Louisiana parishes (based on the period from 1999 to 2007).

Map 4-19: 10 Year Lightning Flash Density Map – United States (1997 – 2007)

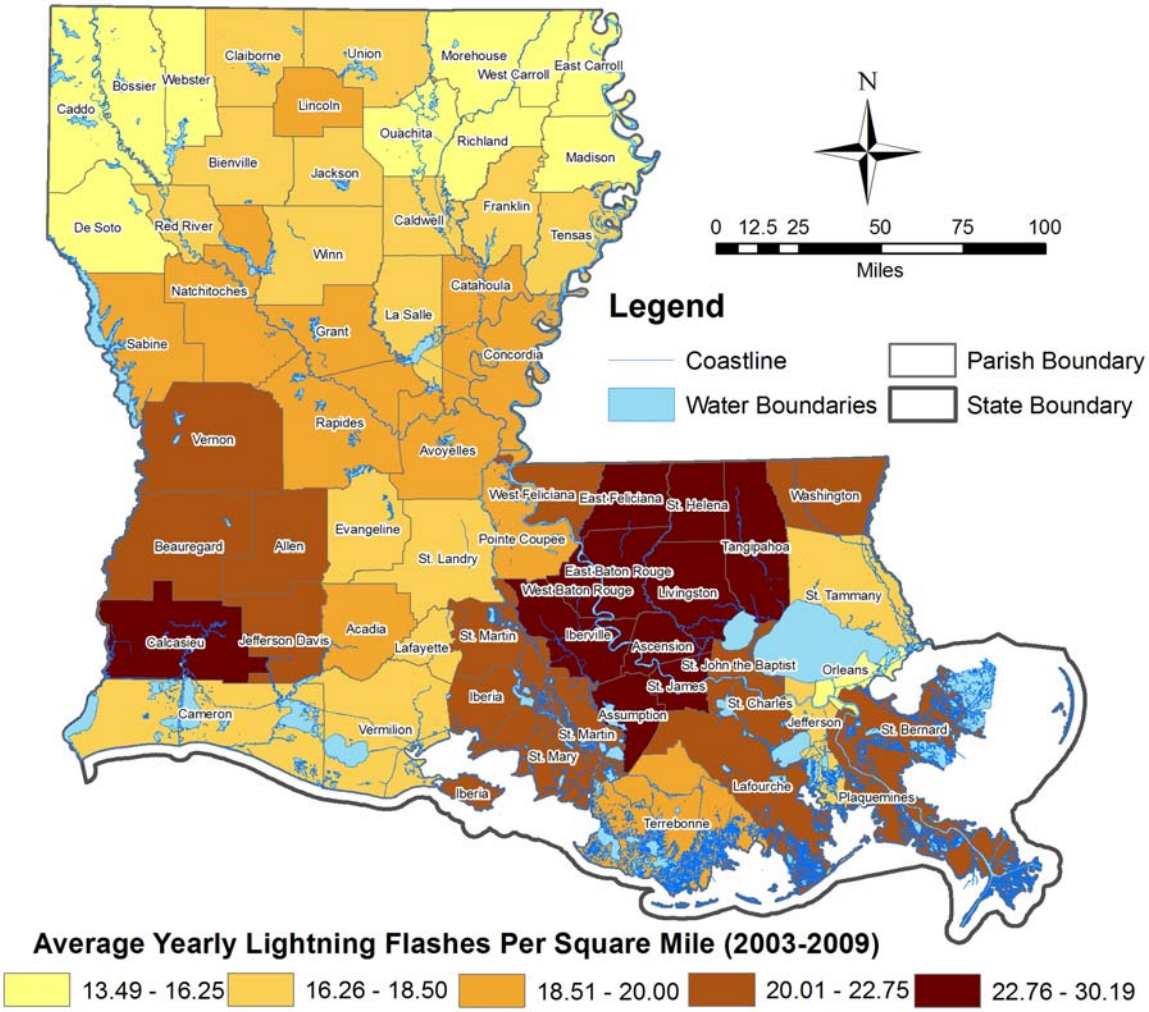


Source: Vaisala's US National Lightning Detection Network®

Due to the frequency and geographic scope of lightning strikes in Louisiana, the probability of future events is 100%. However, since the extent to which lightning strikes can be predicted at any particular location and the extent to which this hazard can be mitigated via existing hazard mitigation programs administered by GOHSEP is very small, technical risk assessments are not included for lighting in Sections Five and Six.

[23] Per the National Lightning Safety Institute for the period 1999-2008.

Map 4-20: Hazard Profile-Lightning



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Vaisala (Lightning Flash Density)

Severe Summer and Winter Weather / Extreme Heat and Cold

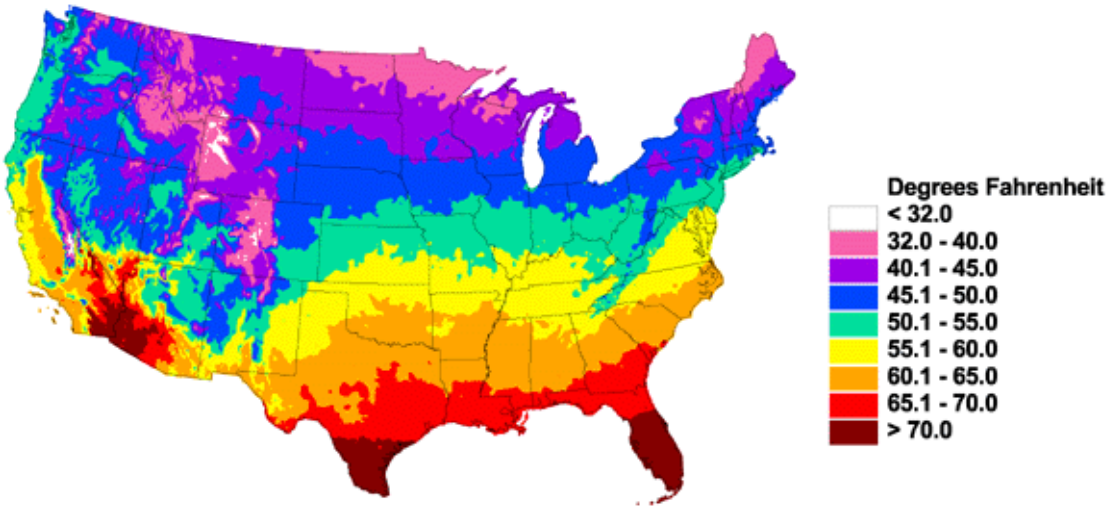
Extreme heat is defined as a long period of temperatures significantly above seasonal averages, which may be accompanied by high humidity. Extreme Heat can cause hardship to agricultural communities and widespread power outages, and the severe effects of this hazard may include the death of vulnerable populations. The most well known heat-related illness is hyperthermia, also known as heat stroke, which occurs during periods of sustained high heat and humidity. Heat stroke affects the body's ability to regulate body temperature. Elderly, young children, and the sick or overweight are the most at-risk populations for heat stroke. Additionally, those without effective cooling systems are at high risk.

In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died. On average, approximately 1,500 deaths occur nationwide related to summer heat. According to NOAA, extreme heat is the number one weather-related killer in the United States[24]

Heat-related deaths in Louisiana are uncommon due in part to the consistency and predictability of high seasonal temperatures, but do sometimes occur. Between 3 and 20 deaths occurred in the northwestern part of the state during each of several heat waves occurring in 1995, 1998, and 2000, according to NCDC. Additional information can be found in Appendix D.

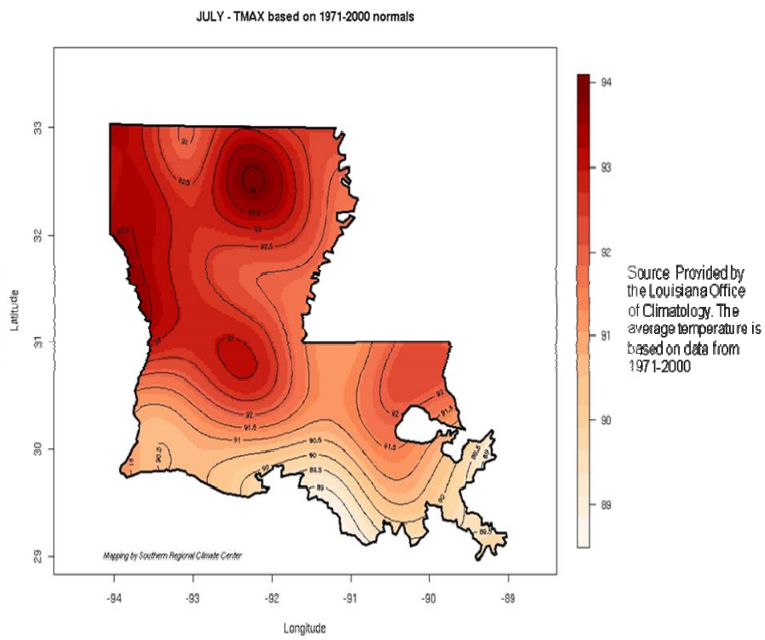
Average temperatures in Louisiana are among the hottest in the United States, as shown in Map 4-21. The average number of days each year with temperatures above 90°F ranges from 57 days in the southeastern part of the state to more than 102 days in the Northwest. The average number of days each year with temperatures below freezing ranges from four to 24. Additional information on high and low temperatures can be found in Appendix D.

Map 4-21: Annual Mean Daily Average Temperatures in the United States



[24] NOAA, 2007. NWS, 2008, based on 1986-2008 records.

Map 4-22: Average July Temperatures in Louisiana

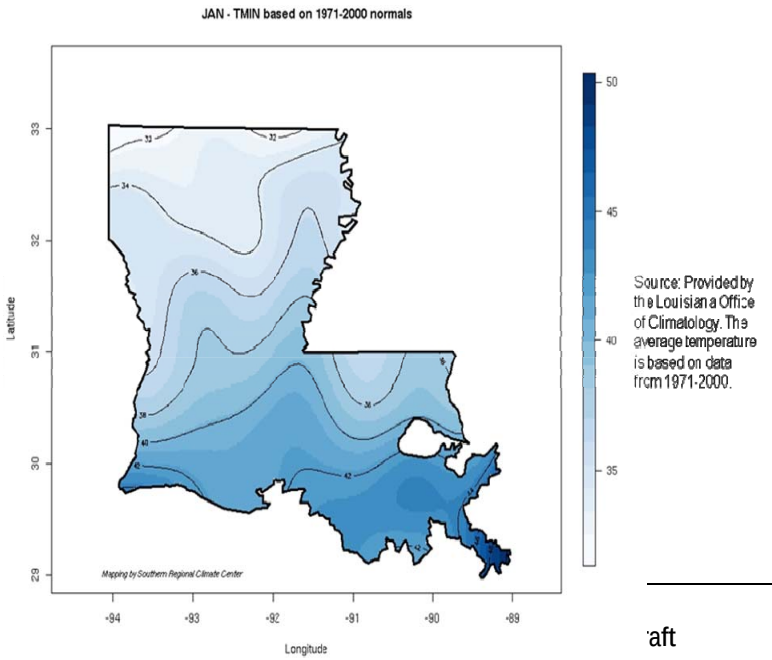


Most of Louisiana has a hot, humid, subtropical climate with very little variation in temperature during the summertime, which lasts from May through September. Average temperatures are more extreme in the western part of the state, and relatively milder in the areas around Baton Rouge and the north shore of Lake Pontchartrain, as shown in Map 4-22. The record high, set in 1936, was 114°F in Plain Dealing.

In contrast, Louisiana has short, mild winters that last from December through March. The southeastern area remains the warmest in winter, and temperatures decline steadily to the north, as shown in Map 4-23. The record low, in 1899, was -16°F in Minden.

Extreme cold is defined as a long period of temperatures significantly below seasonal averages. Extreme cold temperatures may also accompany high winds, which contribute to the wind chill factor and exacerbate cold conditions. Like extreme heat, extreme cold can cause hardship to agricultural communities and widespread power outages, and the severe effects of this hazard may include the death of vulnerable populations. Additionally, icing of roads and other public infrastructure caused by extreme cold may pose secondary risks to the exposed population. Extreme cold also significantly increases the risks of household fires due to the use of fireplaces and space heaters. However, the greatest risk of winter weather damage comes not from extreme cold but from ice storms, which are addressed separately in this Plan Update.

Map 4-23: Average January Temperatures in Louisiana



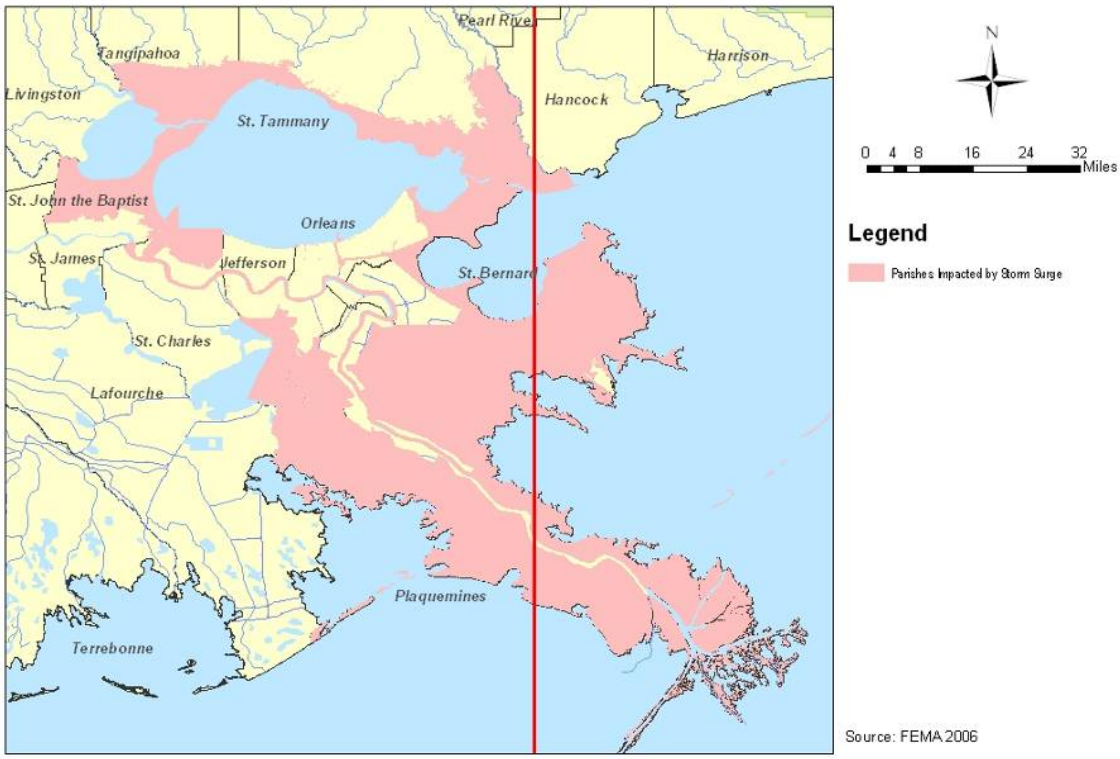
Frosts and hard-freezes are common in the northern part of the state and also occur with some regularity in the south, causing some property (and particularly crop) damage. For example, during a late winter cold snap in 1996, approximately $20 million in crop damage and $8 million in property damage was recorded by NCDC.

Storm Surge

In Louisiana, storm surge is defined as the rise of seawater from the Gulf of Mexico, often with battering waves on top, resulting from the force of the high winds of a tropical storm or hurricane. Generally the larger and more intense the storm is, the greater the height of the storm surge. The higher the storm surge is, the greater the damage to the coastline. Storm surges inundate coastal floodplains, wash out dunes, cause backwater flooding through coastal river mouths, generate large waves that run up and flood coastal beaches, and flood streets and buildings in coastal communities. Surges typically carry velocity that can have significant destructive impacts.

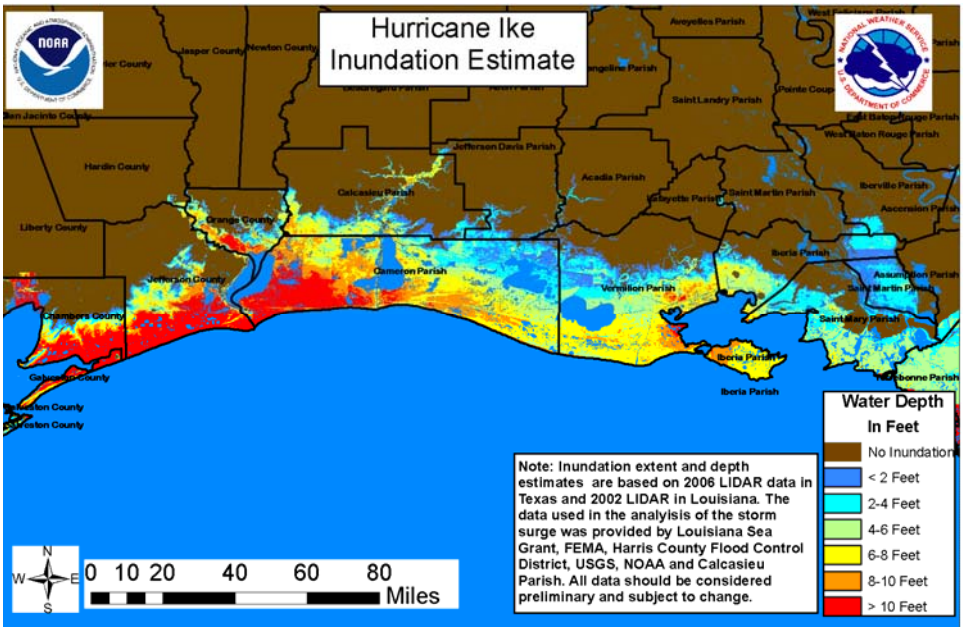
Significant hurricanes can produce extremely large storm surges. The official FEMA estimate of Hurricane Katrina's maximum surge height was 30 feet, and Hurricane Rita's was 15 feet. Even more extreme storms could produce surges of up to 36 feet along the Louisiana coast. Figure 4-10 shows areas of the Gulf Coast that were inundated from storm surge as a result of Hurricane Katrina. Figure 4-11 shows the areas of the Gulf Coast that were inundated from storm surge as a result of Hurricane Ike.

Figure 4-10: Hurricane Katrina Storm Surge Inundation



(Source: FEMA, 2006)

Figure 4-11: Hurricane Ike Storm Surge Inundation

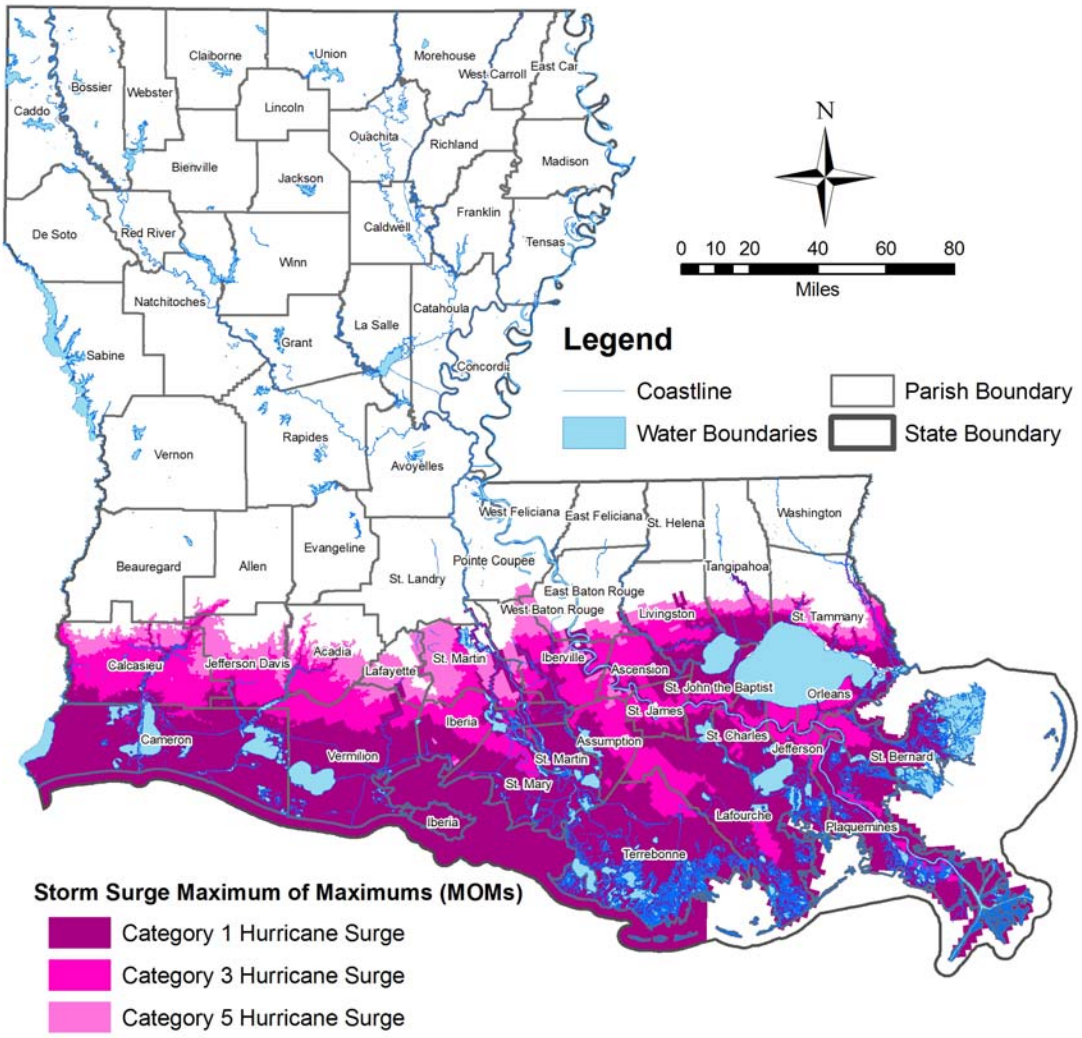


(Source: NOAA, 2008)

Storm surge areas can be mapped by the probability of storm surge occurrences using Sea, Lake and Overland Surges from Hurricanes (SLOSH) modeling. Map 4-24 depicts the most up-to-date SLOSH models available that cover all of southern Louisiana in a consistent manner. This mapping indicates the areas that can be affected by storm surge inundation due to hurricanes. SLOSH models represent the storm surge of hundreds of simulated hurricanes, taking into account storm wind intensities, forward speeds, directions of motion, and radius of maximum winds.

The mapping shown below represents the cumulative storm surges for hundreds of modeled hypothetical hurricane tracks; no single hurricane event could produce the inundation pattern depicted on the map. Due to the high potential for damage from storm surge in the state, this hazard was included in the Risk Assessments and addressed in the Mitigation Action Plan.

Map 4-24: Hazard Profile – Storm Surge Maximum Impacts



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge)

Subsidence

In Louisiana, two significant processes that are increasing hazard risk are sea level rise and land subsidence. Subsidence and sea level rise impact Louisiana in a similar manner, making it difficult to separate impacts. Together, rising sea level and subsidence, known as relative sea level rise, can accelerate coastal erosion and wetland loss, increase flooding, and increase the extent and frequency of storm impacts.

According to NOAA, global sea level rise refers to the trend currently observed in the average global sea level trend. Local sea level rise is the level that the sea is raising relative to a specific location (benchmark) at the coastline. The most prominent causes of sea level rise are the melting of the Earth's glacial ice caps, thermal expansion, and tectonic actions such as sea floor spreading. Observed local sea level trends may vary widely from the average rate of global sea level rise, depending on local conditions such as subsidence or glacial rebound. The current US Environmental Protection Agency (EPA) estimate of global sea level rise is 10-12 inches per century. According to the US Geological Survey (USGS), the Mississippi Delta plain is subject to the highest rate of relative sea level rise of any region in the nation largely due to rapid geologic subsidence. This hazard has been identified as one that is of such a scale and extent that it is best addressed primarily through the actions of other state agencies such as Department of Transportation and Development, Department of Natural Resources and CPRA in the coastal zone, and it is therefore not addressed in this Plan Update.

Subsidence is the sinking of land, over time, as a result of natural and/or human-caused actions. Subsidence results from a number of factors including:

- Compaction/consolidation of shallow strata caused by the weight of delta deposits from the Mississippi River, soil oxidation, and aquifer draw-down (shallow component)
- Consolidation of deeper strata (intermediate components)
- Tectonic effects (deep component)

This last element was only recently quantified, and research indicates that it accounts for 50% or more of subsidence.[25]

Subsidence has not been identified as a significant contributor to direct disaster damages in Louisiana. One of the very few hazard events to be documented as a direct result of subsidence is the appearance of sinkholes over a mining operation in Weeks Island. The repeated removal of underground materials (originally salt and later oil) resulted in the formation of a sinkhole in 1992. The Weeks Island facility was decommissioned as a result of this discovery.

For the most part, subsidence (along with sea level rise and land loss) is a slow-acting process with effects that are not as evident as hazards associated with a discrete "event." Although the effects in the New Orleans metropolitan area and in the coastal zone can be seen over the course of decades or even years, subsidence is a "creeping" hazard event, with chronic impacts.

The highest rate of subsidence is occurring at the Mississippi River Delta (estimated at greater than 3.5 feet/century). Subsidence rates generally decrease away from the delta in a northeast, northwest, and western direction. Map 4-25b shows the relative rates of subsidence for the most affected areas per USGS estimates. The predictive value of these estimates has been called into question as newer techniques of measurement have gained prominence. However, data from newer measurement techniques were not available for this Update. There are no particular accepted estimates for subsidence rates across Louisiana. Subsidence is not at a constant level or rate across the coast, so estimates will vary from locale to locale. Future Community Education and Outreach efforts will strive to generate more accurate subsidence rate estimates.

[25] R. K. Dokka. "Modern-Day Tectonic Subsidence in Coastal Louisiana." (Geology: 34), 2006.

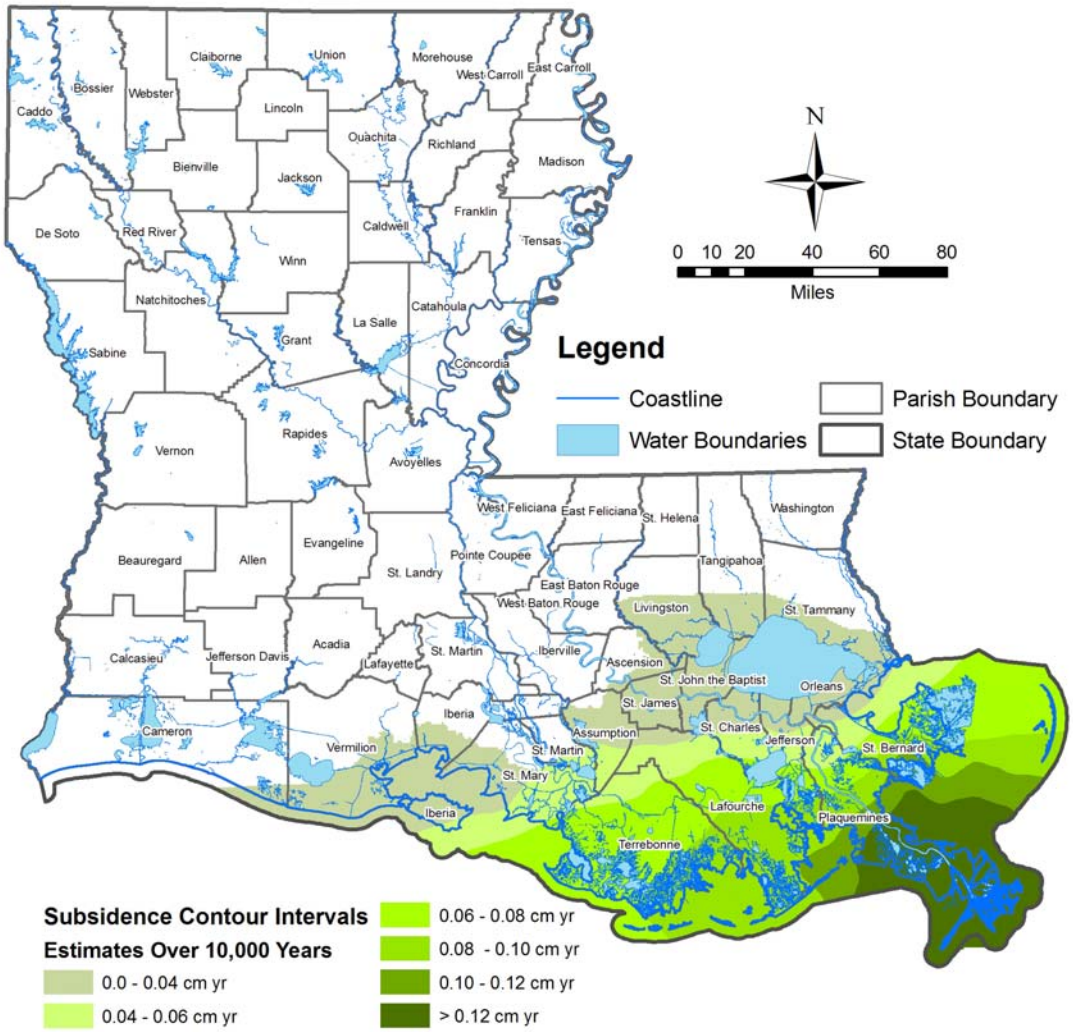
Subsidence creates three distinct problems in Louisiana:

- By lowering elevations in coastal Louisiana, subsidence accelerates the effects of saltwater intrusion and other factors that contribute to land loss
- By lowering elevations elsewhere in Louisiana, subsidence may make structures more vulnerable to flooding
- By destabilizing elevations in general, subsidence undermines the accuracy of surveying benchmarks (including those affecting levee heights, coastal restoration programs, surge modeling, BFEs, and other engineering inputs), which can contribute to additional flooding problems if construction occurs at lower elevations than anticipated or planned

In the April 2005 Plan and the updated 2008 Plan, subsidence was treated as part of the larger issue of "land loss." This 2011 Plan Update recognizes these hazards as two distinct, though interrelated, issues. Land loss is the process by which coastal lands, particularly wetlands, erode or sink into open water as a result of violent storms, coastal erosion, sediment deprivation, saltwater intrusion, and rising sea levels. Land loss can be mitigated through major coastal restoration and protection measures that are beyond the scope of most funding programs associated with DMA 2000 hazard mitigation planning, but which are being planned and implemented by other entities within the state and federal governments (see Section 4.3 and 8.3 for more information). For this reason, this Plan Update does not directly engage coastal erosion or coastal land loss as hazards separate from subsidence, which is considered in the risk assessments Sections of the Plan Update.

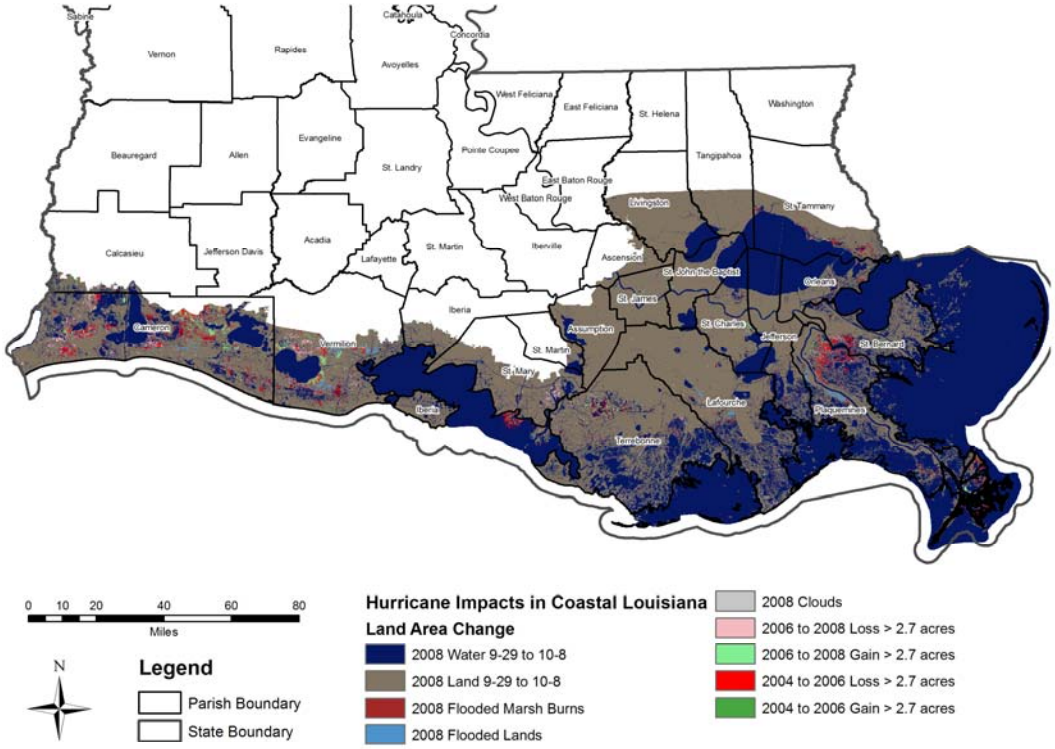
As noted above, subsidence is the process of land decreasing in elevation; in some areas, ground elevations have fallen two to four feet since 1950. Maps 4-25 A and B show the subsidence contour intervals and land loss from 2004 to 2008. These issues are related, but not identical. Map 4-26 shows the land loss classifications for Louisiana's southeastern / delta plain region between 1932 and 2000 and projects land loss for 2000-2050.

Map 4-25 a: Subsidence Contour Intervals



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Map 4-25 b: Land Loss



Source: LAGIC (State Boundaries), ESRI (Parish Boundaries), Barras, J.A., 2009, *Land area change and overview of major hurricane impacts in coastal Louisiana, 2004-08*: U.S. Geological Survey Scientific Investigations Map 3080, scale 1:250,000, 6 p. pamphlet (Land Loss Study)

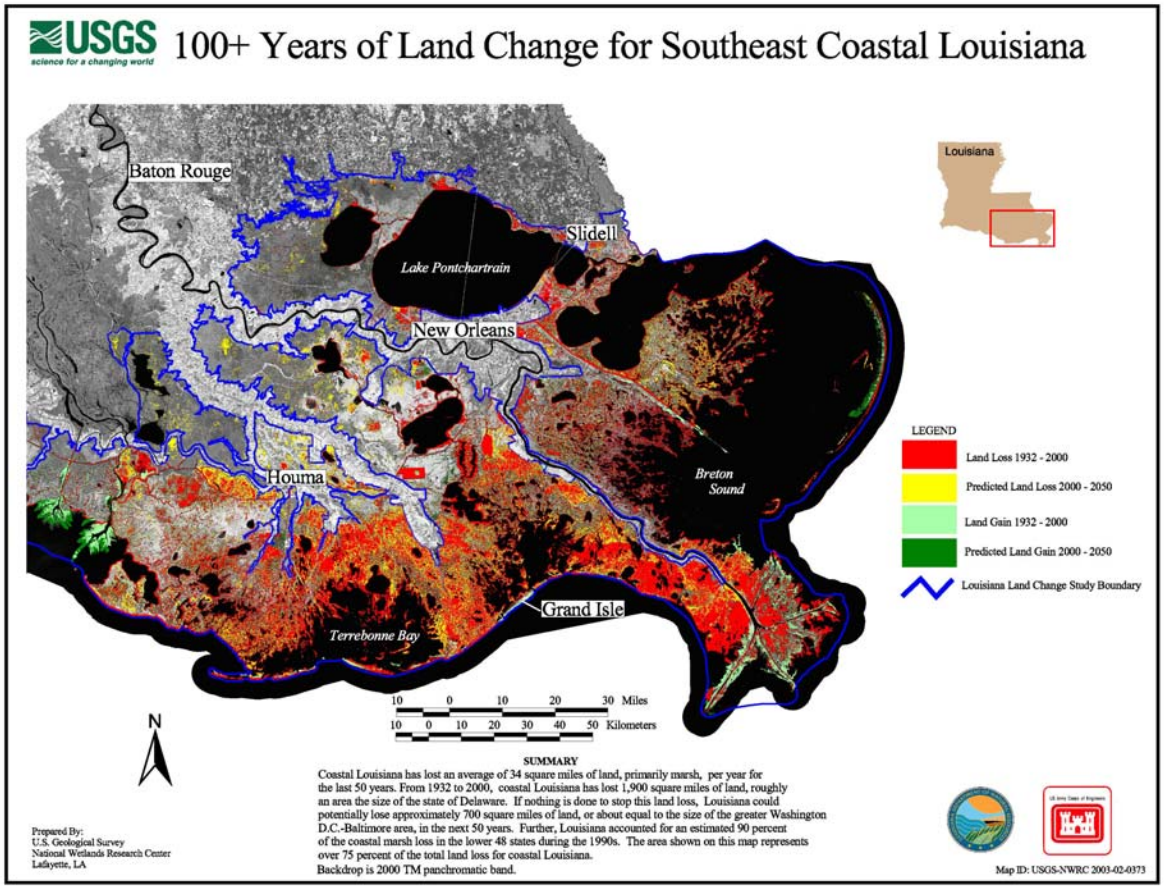
Several efforts are underway to improve the understanding of subsidence. USGS, United States Army Corps of Engineers (USACE), and the University of New Orleans have teamed to develop an objective and reliable scientific database on subsidence and sea level rise. Also, the Louisiana State University (LSU) Center for Geoinformatics is working with FEMA and NOAA to develop a plan for an accurate and sustainable system of elevations in South Louisiana.

These efforts should result in accurate data on elevation and on rates of subsidence. There are differences in the results of these analyses, in terms of the magnitude of the problem and the extent to which the problem is occurring on a micro level, in some cases differing by an order of magnitude or more. It is also important to acknowledge the complexity of the problem, including the fact that subsidence rates are not constant and can vary with time due to transient factors such as the movement of deep faults. However, all studies to date agree that areas can be identified across the southern tier of parishes that are subsiding rapidly enough for the effects to be felt during the useful life of a building. Information of this kind can lead to rational decisions about future mitigation efforts for these areas such as the provision of additional freeboard above Base Flood Elevations to account for sinking ground elevations.

It is important to note that there are reports (over the last 20 years) that claim the main culprit behind subsidence, particularly in coastal areas, is the construction of flood barriers. Flood barriers such as levees and earthen dams have strong documentation against them to suggest a significant increase in subsidence during the past 60 years. The prevention of flooding property is also preventing sediment deposit and stimulation of wetland biologic processes. Research to support this theory will continue, but even if researchers have found the main cause to subsidence, they recognize that attempting to fix the problem could result billions of dollars in time and loss properties.

Due to the long-term implications of subsidence for the state, this hazard was included in the Risk Assessments and addressed in the Mitigation Action Plan.

Map 4-26: Southeastern Louisiana Land Change



Source: USGS: National Wetland Research Center

Wildfire

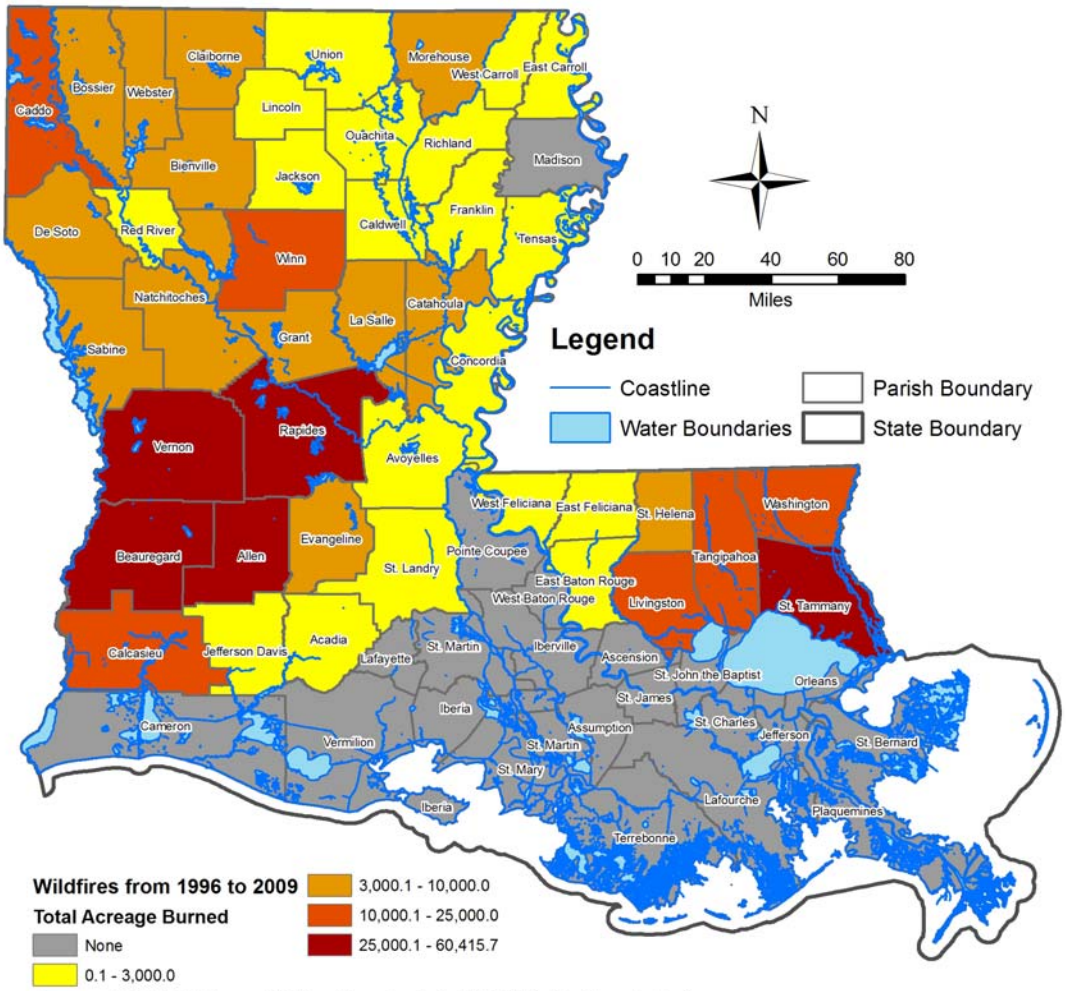
A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed, spread quickly, and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. Wildfires can be caused by human acts, such as arson or careless accidents, or by the natural occurrence of lightning.

From 1998 to 2009, the average number of forest fires in Louisiana was 2,361 per year, and the average number of acres burned was 26,956. According to the State Forestry Division, Louisiana's forestlands cover 48% or 13.8 million acres of the state's area. The wildland urban interface (WUI) is the area in which development meets wildland vegetation. Both vegetation and the built environment provide fuel for fires. As development near wildland settings continues, more people and property are being exposed to wildfire danger. Appendix D contains a map depicting the WUI for Louisiana.

Wildfire danger can vary greatly from season to season and is exacerbated by dry weather conditions. In dry and drought conditions, wildfires can become intense, burning dead forest debris on forest floors, dried grasses, and brush. Because most fires in Louisiana forests are caused by criminal or careless acts committed by people, the location and severity of fires is largely unpredictable. However, the Louisiana Department of Agriculture and Forestry provides general assessments of the risk of wildfire based on geographic location in the state (see Map 4-27). The tables in Appendix D have been updated since the 2008 Plan Update to reflect additional data, and the mapping included in this Section and Appendix D have also been updated to reflect those changes.

Due to the relative risk for certain areas of the state and an emphasis on wildfire prevention at the state and federal levels, this hazard was included in the risk assessments and addressed in the Mitigation Action Plan.

Map 4-27: Hazard Profile-Wildfire



Dam Failure

Dams are water storage, control, or diversion barriers that impound water upstream in reservoirs. Dams are a vital part of our nation's infrastructure - providing drinking water, flood protection, renewable hydroelectric power, navigation, irrigation, and recreation. These critical daily benefits are also inextricably linked to the potential harmful consequences of a dam failure.

Dam failure is a collapse or breach in the structure. A dam failure can result in severe loss of life, economic disaster, and extensive environmental damage. While most dams have storage volumes small enough that failures have little or no repercussions, dams with large storage volumes can cause significant flooding downstream. Dam failures often have a rapid rate of onset, leaving little time for evacuation. The first signs of the failure may go unnoticed upon visual inspection of the dam structure. However, continual maintenance and inspection of dams often provides the opportunity to identify possible deficiencies in their early stages and can prevent a possible catastrophic failure event.[26].

The duration of the flooding event caused by the failure depends largely on the amount of water and downstream topography. Given smaller volumes of water and a topography suited for transporting the water rapidly downstream, the event may only last hours. Because of the lack of seasonality and other predictive factors, a predictive frequency or likelihood of dam failures cannot be determined. However, the National Dam Safety Program (NDSP) produces hazard rankings (high, significant, and low) and definitions of dam structures, based on potential impact.

According to the latest LA DOTD, Dam Safety Inventory, the states provide the data to the USACE National Inventory of Dams (NID), in Louisiana there are 557 dams included in the USACE National Inventory of Dams[27]. Of these, there are 33 high hazard potential dams, 71 significant hazard potential dams, and 453 low hazard potential dams. Map 4-28 shows the high, significant, and low hazard dam locations per the USACE's inventory

In addition, it is worth noting that Congress established the Watershed Protection and Flood Prevention Program through the Flood Control Act of 1944 and the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566). Under these authorizations, Natural Resources Conservation Service (NRCS) assisted watershed project sponsors in the construction of approximately 11,000 flood control dams in 47 states since 1948. Louisiana has 142 NRCS-assisted project dams built under the Small Watershed Protection Program and Flood Prevention Act authority. Most of the dams were built with a 50-year life span that has since been exceeded. Please note that not all NRCS dams are constructed for flood control purposes.

These dams were built with federal funds at the request of local sponsors, primarily Louisiana's soil and water conservation districts, to protect areas in the watershed from flooding during periods of heavy or prolonged rainfall. The primary purpose for the vast majority of the watershed projects has been flood prevention and watershed protection; there may also be many other benefits such as: recreation, water conservation, water management, fish and wildlife habitat improvement, municipal and industrial water supply, and water quality improvement.

Populations have grown; residential and commercial development has occurred upstream and downstream from the dams; land uses have changed; sediment may have been collected in the reservoirs; and concrete and metal components may have deteriorated. Many structures may not meet current state dam safety design standards that have either been enacted or revised with more stringent requirements than when the dams were first built.

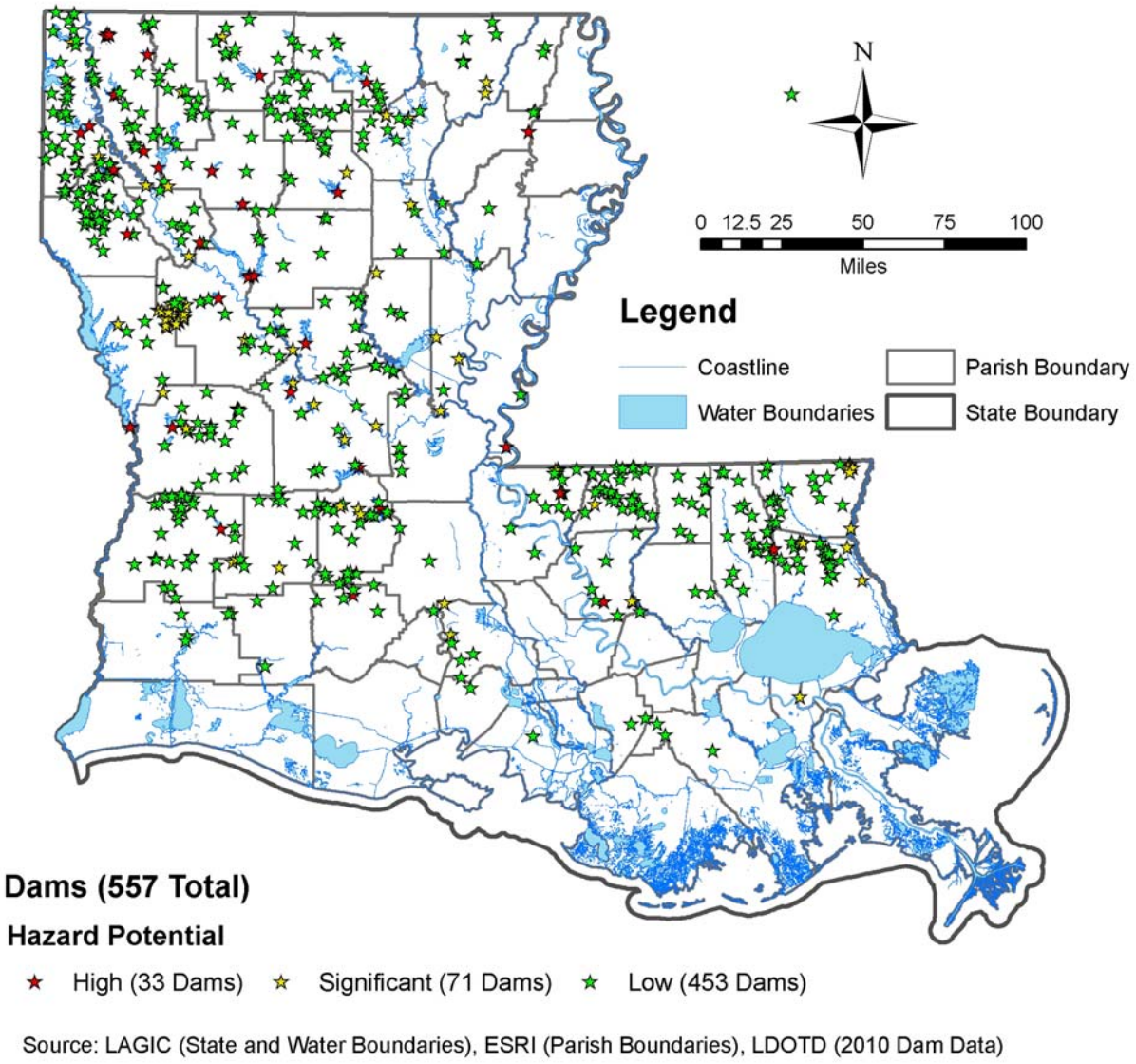
While there are no reports of significant historical dam failures in Louisiana, the potential for significant personal injury and property damage exist in the state. Furthermore, the American Society of Civil Engineers (ASCE) found in a recent study that 20 of Louisiana's 540 dams are in need of rehabilitation to meet applicable state dam safety

[26] Nationwide, it is estimated by the Dam Safety Coalition that $10.1 billion is needed to address the nation's most critical dams. Needed repairs to publicly owned dams are estimated at $5.9 billion.

[27] Zahir "Bo" Bolourchi, P. E., Director, P. W. & Water Resources Programs LADOTD

standards and that 28% of high hazard dams in Louisiana have no emergency action plan.[28] Therefore, this hazard was included in the Risk Assessments and addressed in the Mitigation Action Plan.

Map 4-28: Hazard Profile-Dam Failure



[28] ASCE Report Card for America's Infrastructure, retrieved from http://www.infrastructurereportcard.org/state-page/louisiana

Levee Failure

Levees and floodwalls are flood control barriers constructed of earth, concrete, or other materials. For the purposes of this Plan Update, levees are distinguished from smaller flood barriers (such as berms) by their size and extent. Berms are barriers that only protect a small number of structures, or at times only a single structure. Levees and floodwalls are barriers that protect significant areas of residential, commercial, or industrial development; at a minimum they protect a neighborhood or small community. Further distinctions regarding levees and floodwalls are provided in Appendix H, but for the purposes of this Plan Update, they function in essentially the same manner, differing only in terms of basic construction materials. Both are included in the following references to "levees".

Levee failure involves the overtopping, breach, or collapse of the levee or floodwall. Levee failure is especially destructive to nearby development during flood and hurricane events. The northern half of Louisiana is protected by levees on the Mississippi, Tensas, Black, Red, and Ouachita Rivers under the authority of the Vicksburg District of the USACE. Coastal and southern Louisiana is protected by an extensive levee system under the authority of the New Orleans District of the USACE. Levee certification information was not available from USACE at the time of this Update. Map 4-29 shows the location of these major levee systems in Louisiana. Other levees in Louisiana are under the authority of other USACE districts or other, non-federal jurisdictions.

Levees and floodwalls have been overtopped or breached during flood events as well as during non-flood events. In 1985, a section of levee along the Mississippi River near Marrero failed due to scour in a non-flood-related event, and several sections along Lake Pontchartrain and along both navigation and drainage canals failed in New Orleans during Hurricane Katrina. The extent and depth of these levee failures resulting from Hurricane Katrina caused extreme flooding in New Orleans that can be clearly noted in Figure 4-12. The causes of the levee and floodwall failures were varied. In some cases, there were problems with the construction and maintenance of levees and floodwalls that led to failure. However, it was clearly determined in a study by the National Institute of Standards and Technology (NIST) that overtopping played a role in at least some of the failures associated with these storms.[29]

Failure due to overtopping of levees is relatively "predictable" based on design and performance expectations for individual structures. If properly constructed and maintained, a levee designed to provide protection against a "100 year event" of a definable magnitude would have a 1% chance of being overtopped in any particular year.

The concept would appear to be simple enough: if it can be predicted how high the water will rise for different recurrence intervals, the levee can be built to the desired level of protection or elevation. Typically, some freeboard is added to the height of the levees to allow for errors or imprecision in the calculations.

Some levees in Louisiana have been designed to this frequency of occurrence criteria. This is more typical in the northern part of the state along rivers or streams where hydrologic conditions can be more reliably determined. The limits of these predictions include changes over time in the way design events are determined, i.e., what constitutes a 100-year event is revised from time to time as data improve.

In the southern part of the state, however, where levees are intended to provide protection against hurricane wind-induced storm surge, prediction of how often levees and floodwall systems may be expected to fail is far more complicated. The design process for these levees is based on a hypothetical hurricane that is referred to as the "Standard Project Hurricane" (SPH). On a case-by-case basis, the engineering of levees in these areas takes into account a number of factors intended to represent the "most severe combination of meteorological conditions considered reasonably characteristic" for a specific geographic area. This has been the prevailing practice since the 1950s.

Technology for modeling SPH has improved dramatically since the 1950s, but there is still much uncertainty in the process due to the highly variable nature of hurricanes. As a result, there is typically no recurrence interval associated with levee protection in the actual design process. However, it is possible to look at the frequency of

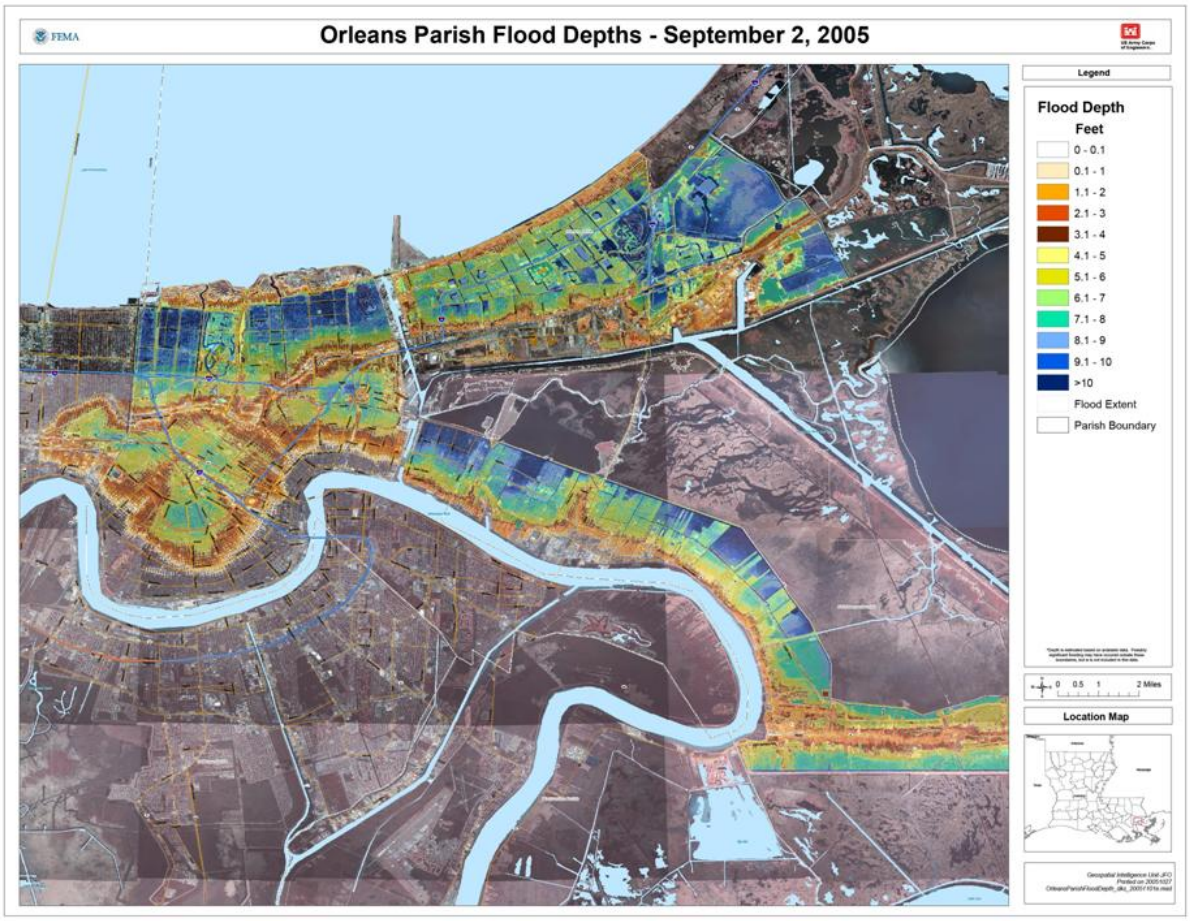
[29] NIST Technical Note 1476: "Performance of Physical Structures in Hurricane Katrina and Hurricane Rita: A Reconnaissance Report," *National Institute of Standards and Technology, Gaithersburg, MD 20899,* June 2006

occurrence for the types of events that have caused levee failures in recent history. For example, according to studies of historic data, "a hurricane of Katrina's intensity or stronger can be expected to occur, on average, once every 21 years somewhere along the Gulf coast from Texas through Alabama".[30]

Failure due to breach or collapse of levees is not easily predicted on a broad scale even with extensive investigations. Factors such as sub-grade soil conditions, construction practices, and maintenance programs must be evaluated. Even with extensive data, the predictive value is limited to areas that are directly examined in detail as specific site conditions can vary widely in just a short distance.

Due to the high potential for significant personal injury and property damage for the state, this hazard was included in the Risk Assessments and addressed in the Mitigation Action Plan.

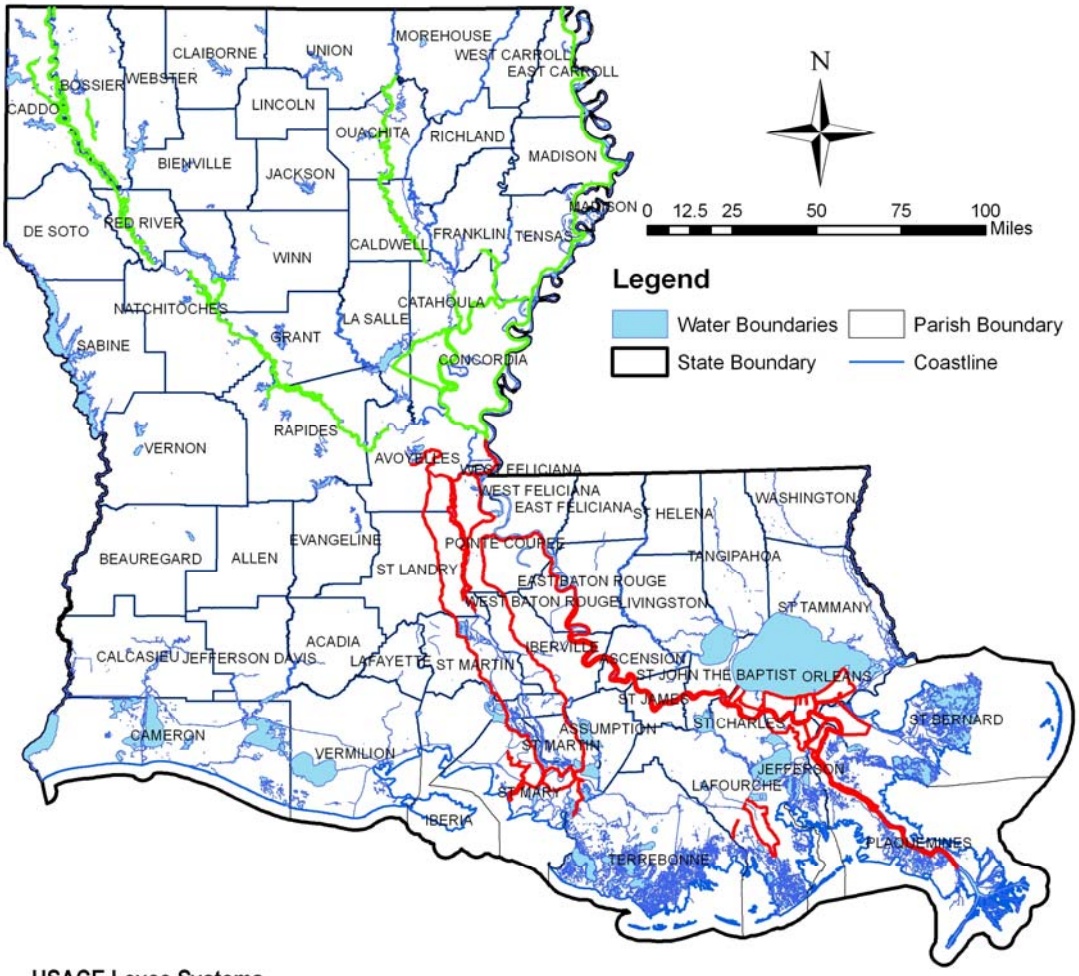
Figure 4-12: Hurricane Katrina Levee Failure Inundation



(Source: NOAA, 2006)

[30] Estimated return periods for Hurricane Katrina, J. B. Elsner,1 T. H. Jagger,1 and A. A. Tsonis, Geophysical Research Letters, Vol. 33

Map 4-29: Hazard Profile-Levee Failure



Source: LA DOTD and LOSCO 2006

Hazardous Material Incident

Hazardous materials incidents are technological (meaning non-natural hazards created or influenced by humans) events that involve accidental or intentional releases of chemical, biological, radiological, or nuclear materials. Hazardous material incidents generally involve incidents either at fixed-site facilities, which manufacture, store, process, or otherwise handle hazardous materials, or along transportation routes such as major highways, railways, navigable waterways, and pipelines. Southern Louisiana between New Orleans and Baton Rouge is commonly known as the "chemical corridor" because of its heavy concentration of petrochemical manufacturing facilities sited along highways, railways, and navigable waterways. Map 4-30 demonstrates the regions with in Louisiana with the highest concentration of hazardous materials industries. Map 4-31, which illustrates the number of hazardous material spills, reflects that the highest number of releases in the state corresponds to this corridor. As of 2008, the State of Louisiana had 388 fixed-site facilities that filed Toxic Release Inventory (TRI) reports with the EPA, the agency that monitors the manufacture, disposal, transportation, and releases of hazardous materials. Louisiana is also replete with hazardous waste facilities as defined by the Resource Conservation and Recovery Act (RCRA). This 1976 Act gives the EPA the authority to control hazardous waste throughout its life cycle, including its transportation, treatment, storage, and disposal. Map 4-32 identifies the RCRA hazardous waste facilities in the state, which again are most concentrated in the chemical corridor between Baton Rouge and New Orleans.

On average, the State of Louisiana receives about 5,000 reports of accidental hazardous materials releases annually. Louisiana also ranked 11th in the nation for the number of pounds of on- and off-site releases from these incidents (approximately 133 million pounds). Most accidental releases occur while chemicals are being transported along major highways. While the state has thousands of accidental releases each year, most damaging effects are limited by the insignificant size of the release and the timeliness of appropriate emergency response. However, some accidental releases have been of a size sufficient enough to present a danger to nearby populations and/or the environment.

The 1990 Amendment to the Clean Air Act requires that companies that use certain listed regulated flammable and toxic substances must develop a Risk Management Program (RMP), to be revised and resubmitted every five years. The RMPs must consist of risk management plans that include hazard assessments that detail the potential effects of accidental releases including the numbers of affected households, accident histories of the last five years, and evaluations of worst-case and alternative accidental releases. The information helps local fire, police, and emergency hazardous materials response personnel respond effectively to emergencies. Within Louisiana, there are 336 facilities that have submitted RMP plans. Map 4-33 identifies all facilities in Louisiana that operate under RMPs.

The severity of a hazardous materials release depends upon the type of material released, the amount of the release, and the proximity to populations or environmentally sensitive areas such as wetlands or waterways. The release of materials can lead to injuries or evacuation of nearby residents.

On April 20, 2010, an explosion on the Deepwater Horizon MC252 drilling platform in the Gulf of Mexico killed 11 people, caused the rig to sink and oil to begin leaking into the Gulf. While the source of this significant spill is not located within Louisiana's boundaries, the oil still poses a serious threat to habitat and wildlife, and to the economy, health, culture and traditions of the state's coastal communities. Although it will be months before the full extent of the damage will be known, the spill is impacting the Gulf coastline as this Plan Update is being completed[31]. Serious impacts to several industries are currently being observed, including commercial and recreational fishing and tourism, and related industries such as the restaurant industry, seafood processing, and recreational boat building.

In addition to human-caused or accidental hazardous material releases, many of the other hazards included in the state's profile, such as hurricane, tropical storm, storm surge, flooding, high wind, tornado, and lightning can cause secondary effects resulting in hazardous material releases in their impact area. As described in *Natural Hazards Review* in 2001, "These hazards can lead to [hazardous materials] releases caused by damage to equipment,

[31] http://www.deepwaterhorizonresponse.com/posted/2931/Deepwater_Oil_Spill_6_4_10.591583.pdf

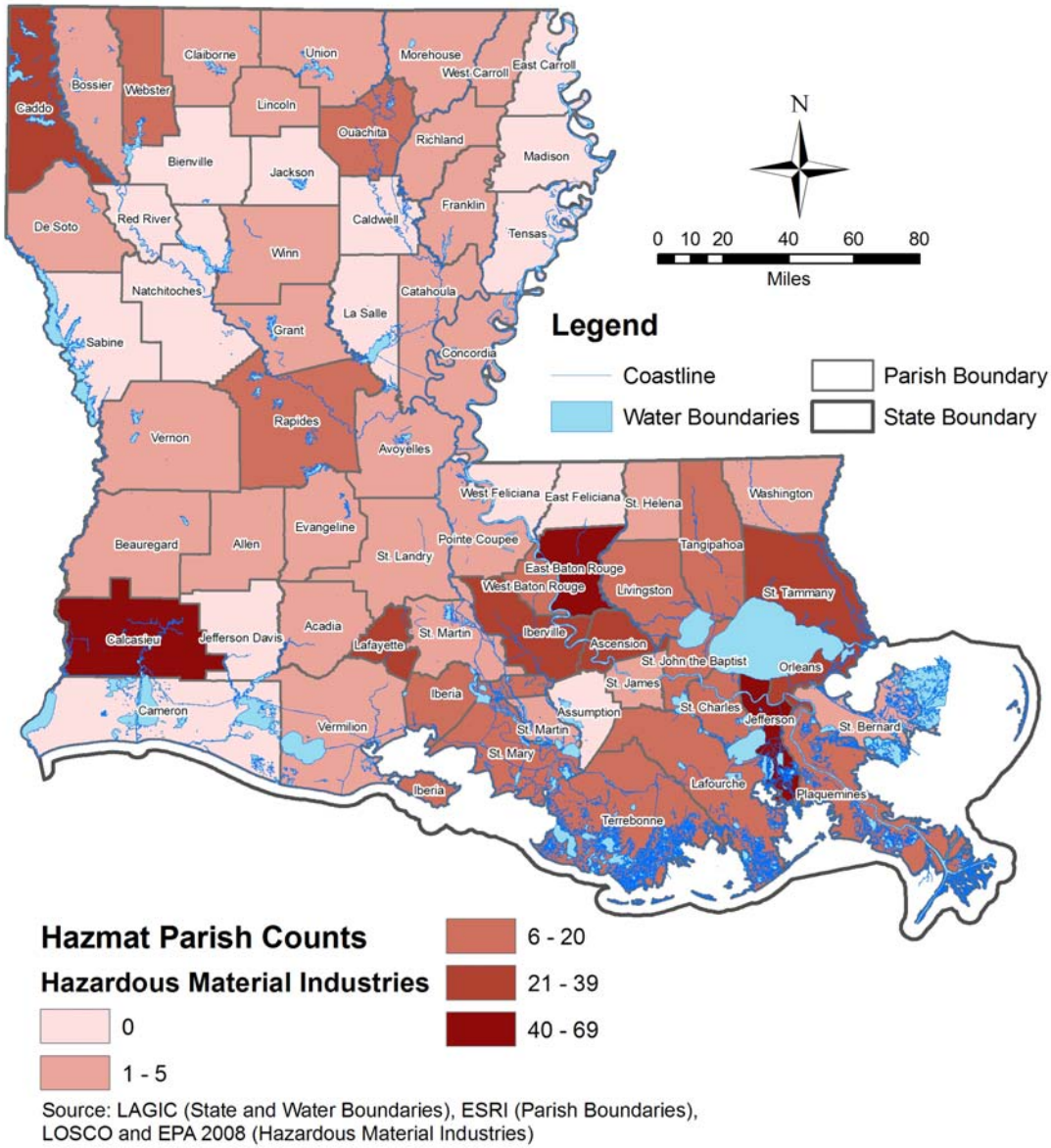
damage to pipes and connections, short circuits and/or power failures, punctured tanks and vessels, and structural damage to buildings and facilities. Hazardous material can also be released in fires and/or explosions, toxic gas emissions, and spills."[32]

A professor for the Institute for Environmental Studies at LSU theorizes that airborne debris could breach pipes or tanks, floods could break tanks away from facilities, and floating debris could rupture pipelines. Such releases could lead to widespread contamination of Louisiana's coastline and inland areas, explosions and fire, and death or injury to humans, plants, and animals. The Murphy Oil spill in St. Bernard Parish during Hurricane Katrina provides an example of this kind of event actually occurring. The exposure to such "secondary risks" is further explored in Section 5.14.

Due to the high potential for significant personal injury due to hazardous material incidents in the state, this hazard was included in the Risk Assessments and addressed in the Mitigation Action Plan.

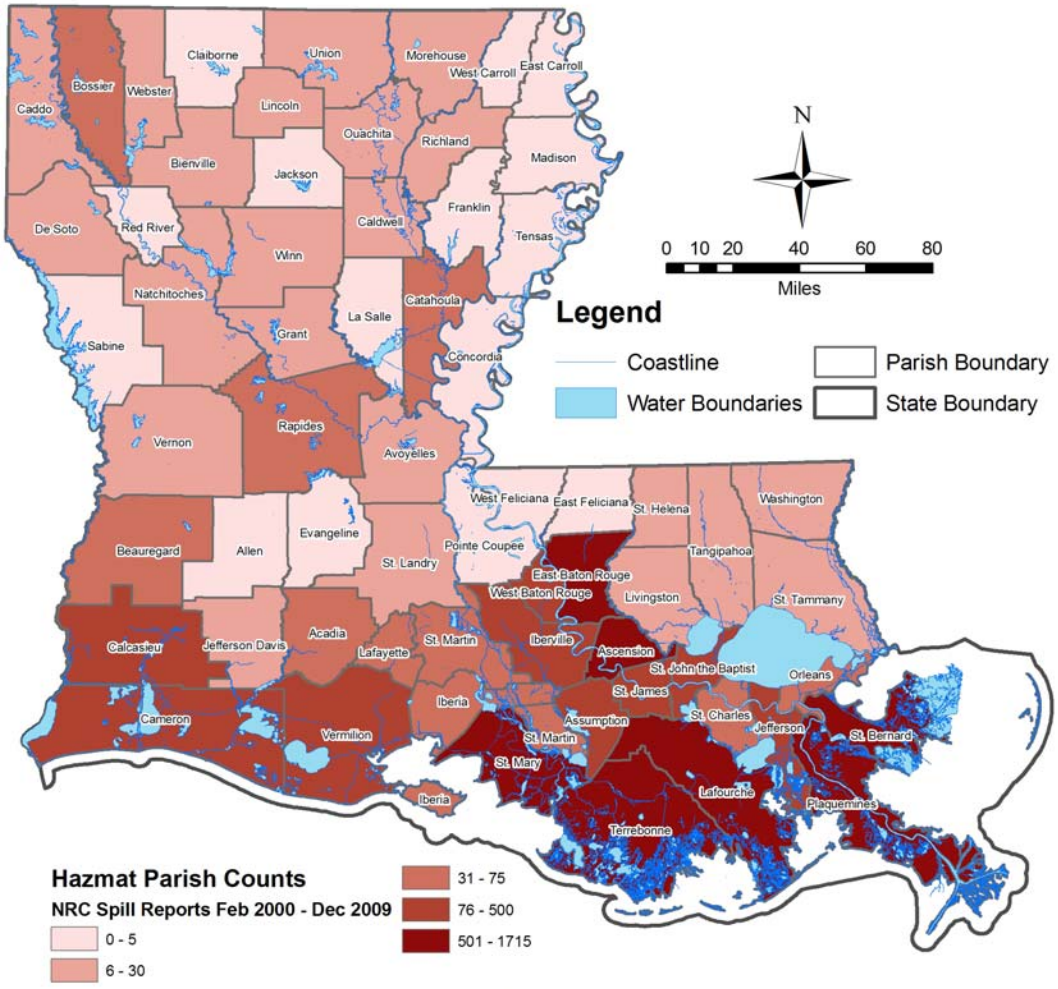
[32] Cruz, A., Steinberg, L., and Luna, R. (2001). Identifying Hurricane Induced Hazardous Material Release Scenarios in a Petroleum Refinery. *Natural Hazards Review*, 2(4), 203-210.

Map 4-30: Chemical Industries



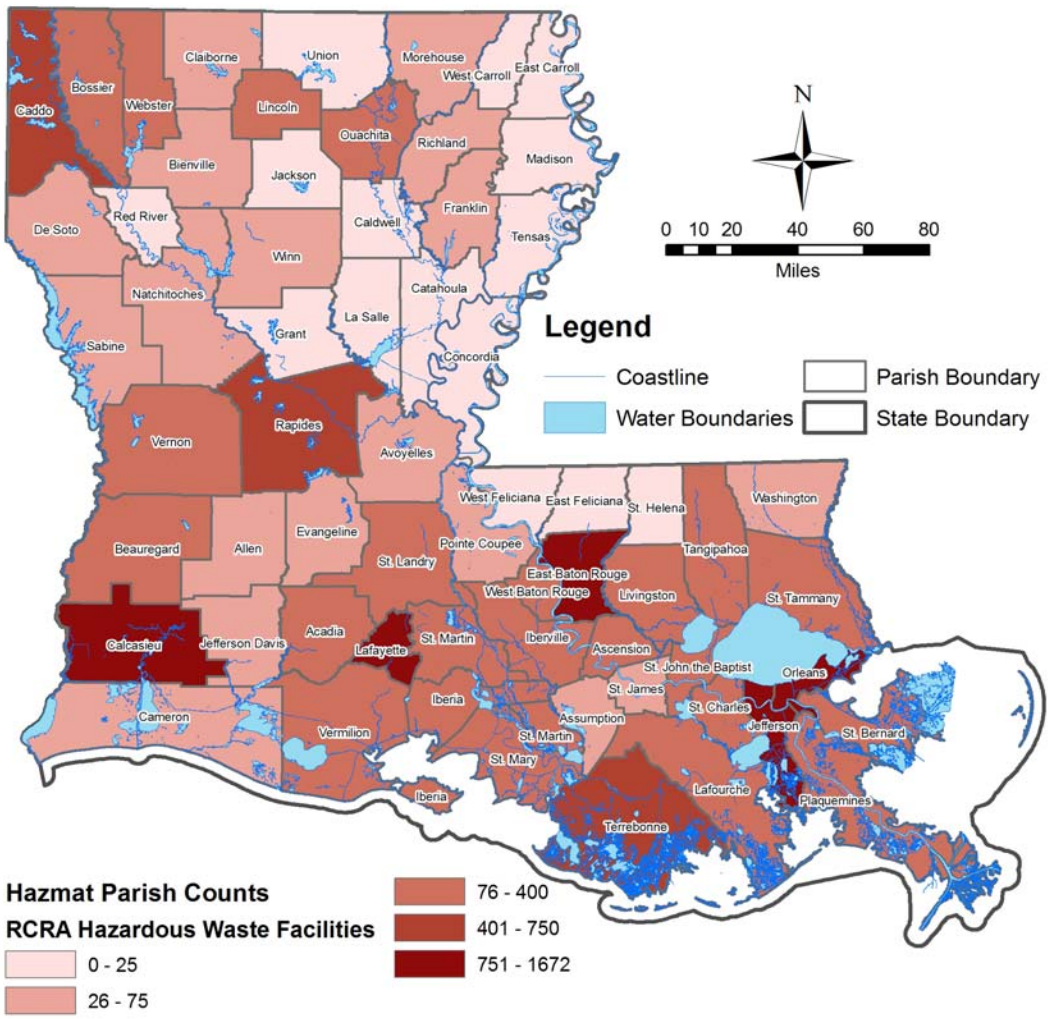
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LOSCO and EPA 2008 (Hazardous Material Industries)

Map 4-31: Hazard Profile-Hazardous Material Spills



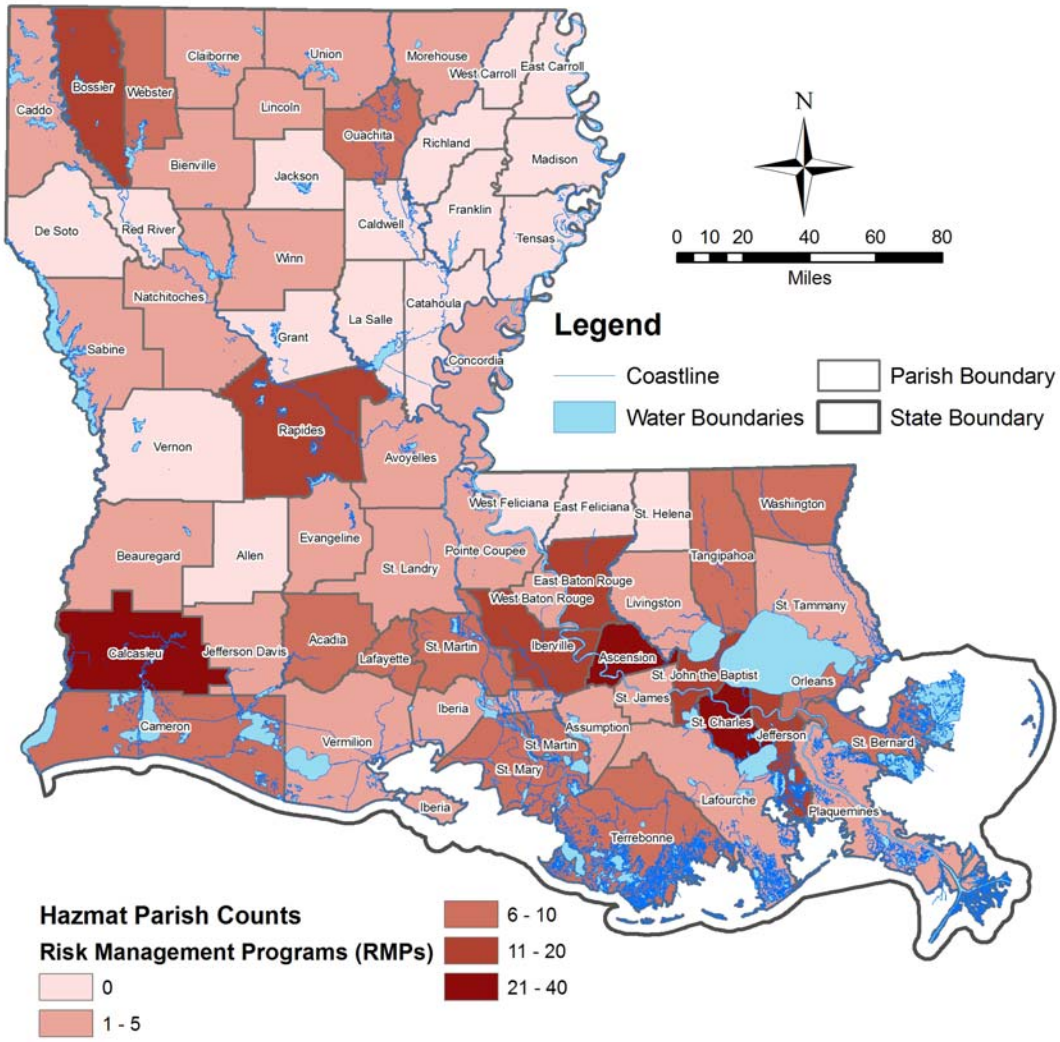
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), National Response Center (Hazardous Material Spill Reports)

Map 4-32: Resource Conservation and Recovery Act Hazardous Waste Facilities



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LOSCO and EPA 2008 (RCRA Hazardous Waste Facilities)

Map 4-33: Facilities operating under the EPA's Risk Management Program



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LOSCO and EPA 2008 (Risk Management Programs)

4.5 Hazard Priorities

Table 4-10 indicates the relative priority assigned to the 11 prevalent hazards as determined by the SHMPC. These priorities were developed by averaging hazard ranks per each SHMPC member at the July 27, 2010 meeting. These results are not meant to be an indication of how all resources should be prioritized but will be used to develop a combined risk assessment in Section Five for illustrative purposes.

Table 4-10: Hazard Priorities

Ranking	Hazard
1	Storm Surge
2	High Wind – Hurricane / Tropical Storm
3	Flood
4	High Wind – Tornado
5	Levee Failure
6	Subsidence
7	Hazardous Material Incident
8	Ice Storm
9	Hailstorm
10	Wildfire
11	Dam Failure

Only three hazards that were identified in parish and municipal HMPs neither appear on this list nor are otherwise dealt with by this Plan Update. These are: drought, lightning, and extreme heat. Refer to Section 4.3, "Correlation with Parish and Municipal Hazard Mitigation Planning Efforts," for more discussion of how the ten top identified hazards in the Plan Update correlate to the prevalence of hazards identified in parish and municipal HMPs.

Section Five
Statewide Risk Assessment

Contents of this Section

5.1 Interim Final Rule Requirements for Statewide Risk Assessment
5.2 Methodology
5.3 Flood
5.4 Hailstorm
5.5 High Wind - Hurricane
5.6 High Wind - Tornado
5.7 Ice Storm
5.8 Storm Surge
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5.10 Wildfire
5.11 Dam Failure
5.12 Levee Failure
5.13 Hazardous Materials Incident
5.14 Composite Risk Assessment
5.15 Recent and Future Development
5.16 Social Vulnerability
5.17 Notes on Data Limitations
5.18 Summary

5.1 Interim Final Rule Requirements for Statewide Risk Assessment

The Interim Final Rule (IFR) includes two specific requirements regarding statewide risk assessments:

- Vulnerability Assessment per Requirement §201.4(c)(2)(ii): "[The State risk assessment shall include an] overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the State risk assessment. The State shall describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events."
- Estimated Losses per Requirement §201.4(c)(2)(iii): "[The State risk assessment shall include an] overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment."

5.2 Methodology

A statewide risk assessment was prepared for the hazards identified in Section Four:

- Flood
- Hailstorm
- High Wind – Hurricane
- High Wind – Tornado
- Ice Storm
- Storm Surge
- Subsidence
- Wildfire
- Dam Failure
- Levee Failure
- Hazardous Materials Incident

A general overview of the risk assessment methodologies and summary results for these hazards are presented in the subsections that follow. Related maps and tables are presented in Volume II, Appendix E.

This section concludes with a summary that includes a discussion of the limitations regarding use of these results.

5.2.1 Overview

The statewide risk assessment was focused on determining the relative risk of the 64 parishes in the State to the 11 hazards identified in Section Four. Specifically, the risk assessment examines risk to citizens, communities, businesses, and industries, with the intent of prioritizing mitigation activities to address that risk. The State Hazard Mitigation Planning Committee (SHMPC) reaffirmed a decision from previous Plans that parishes were the appropriate political unit for this part of the study for the following reasons:

- The majority of local hazard mitigation plans in the State of Louisiana have been developed at the parish level. These plans, as multi-jurisdictional plans under the Disaster Mitigation Act of 2000 (DMA 2000) requirements, account for the planning needs of all participating jurisdictions within each parish. As a result, municipalities, tribes, and parishes can all be effectively "covered" by this approach.
- Similarly, the SHMPC assumed that future interactions between the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), the State Hazard Mitigation Team (SHMT) and local communities would continue to use established communications channels through the parish emergency management agencies.
- Finally, in many cases, as documented below and in Volume II, Appendix E, there were limited data available for analysis and therefore detailed analyses below the parish level would not yield any increased accuracy in the results.

The relative risk for each parish was determined using the best available data. The end result was a high / medium / low hazard ranking for each hazard for each parish. However, since the quality and availability of data vary considerably, the specific methodologies for determining the hazard rankings differ between hazards.

5.2.2 Local Risk Assessments

Section §201.4(c)(2)(ii) of the IFR makes specific reference to using the results of local risk assessments as a component of the statewide risk assessment. Since 2008, every parish in Louisiana has been covered by a Federal Emergency Management Agency (FEMA) approved Hazard Mitigation Plan, as were a number of municipalities and some other government subdivisions. Section Four of this Plan incorporates information from the approved parish plans in the identification and profiling of hazards. However, as was the case in 2008, the parish and municipal plans

vary widely in key characteristics, including hazard identification definitions, risk assessment data and methodologies, cost estimation, and more. Due to continued concentration of effort by GOHSEP on recovery activities due to hurricanes Katrina, Rita, Gustav and Ike, little progress was made in addressing these discrepancies since the 2008 Plan. This continues to make cumulative analysis of parish and municipal plans difficult.

It remains the intent of GOHSEP and the SHMT to meaningfully incorporate the results of parish and municipal Hazard Mitigation Plans into the state Plan and this is addressed by capability assessment research described in Section Seven and a number of action items from the 2008 Plan that are again included in Sections Eight and Nine of this Plan Update. Assuming these action items are put into practice, state-parish coordination on hazard mitigation should improve markedly during future updates of parish and state hazard mitigation plans.

Although the parish, municipal and state planning efforts are still not fully synchronized during this round of state planning, the results of the statewide risk assessment will be useful to:

- Provide a basis for improving consistency, data-sharing, communication, and other coordination issues between parish EMAs and state-level hazard mitigation planning.
- Provide a basis to review results of parish and municipal hazard mitigation plans.
- Provide a frame of reference for parishes and municipalities for future updates of their risk assessments and plans.
- Form the basis for comparing the relative risk of parishes as part of evaluating future hazard mitigation grant applications. Under current administrative plans and policies, GOHSEP and the SHMT will be able to refer to these results as they:
  - Develop specific Implementation Strategies for FEMA's Hazard Mitigation Grant Program (HMGP) funding on a disaster by disaster basis; and
  - Decide how to award pre- and post-disaster mitigation grant funds to competing grant applications.

5.2.3 Definitions

To better understand the methodology for this study, it is necessary to define the following key terms: risk, vulnerability, value, and probability.

Risk represents the impacts that disasters could inflict on a community. A "community" can include everything from a small village to a state or even a whole country. As noted above, the community level that is being studied in this section of the Plan is the parish.

Risk can be described qualitatively, using terms like high, medium or low. When there are sufficient data, risk can also be described quantitatively by estimating the losses that may be expected from a specific hazard event (e.g., a "100-year" flood) or more broadly from a type of hazard (e.g., flooding). Loss estimates are often expressed in dollars of future expected losses. When possible, it is calculated this way so that potential losses from different kinds of hazards can be compared. In addition, it is possible to take the results of a quantitative risk assessment and produce a qualitative ranking. For example, the communities with the highest estimated losses would be assigned the highest relative hazard ranking.

Risk is a product of several factors including vulnerability, value and probability.

Vulnerability is the extent to which something can be damaged by a hazard. Vulnerability is based on the severity of the identified hazard, what type of assets are exposed to the hazard including physical (such as buildings and infrastructure, both public and private property) and functional (such as government or business operations), and the characteristics of those assets.

- Severity is the measure of "how bad" a particular hazard event is. The severity of different hazards is measured in different ways. For example, as discussed in Section Four (and Volume II, Appendix D), floods can be measured in terms of depth, velocity, duration, contamination potential, debris flow, etc., and tornadoes are measured primarily in terms of wind speed. Related terms include magnitude and intensity.
- Magnitude represents severity in terms of a physical measurement such as wind speed.
- Intensity focuses on the related effects of the hazard, like the expected damage levels due to tornadoes of different magnitudes.
- Exposure refers to the number of people or structures at risk for loss of life, property damage and economic impact due to a particular hazard.
- Asset characteristics that are important in a vulnerability assessment differ depending on the type of hazard. For example, a public or private building that is located in an area subject to high winds will be more or less vulnerable to high wind depending on how substantially the walls and roof are constructed and connected to each other. In this example, the weaker the structure, the higher the vulnerability to the effects of a high wind.

Note: Since the 2008 Plan, GOHSEP has made progress regarding consideration of "social vulnerability", which applies a number of demographic and socioeconomic variables to assess a jurisdiction's ability to respond and recover effectively from a significant disaster (see Section 5.16).

Value is how much something is worth. When performing risk assessments, a monetary value is assigned to community assets (both physical and functional, including public and private property), and in some cases, citizen injuries and casualties. For instance, if a structure is substantially or partially damaged, the building's replacement value serves as the basis for quantifying the loss. Vulnerability assessments for a specific hazard event result in a percent of estimated damage to an asset. This percent can then be multiplied by the value of the asset. The result is an estimate of the losses that would be anticipated under those specific hazard conditions for that particular asset.

For example, researchers have determined that different types of buildings respond in reasonably predictable ways to winds of different speeds This research has resulted in "damage curves" that indicate the percentage of the total value of a building that will be damaged for a range of wind speeds. To predict the damage (or lost value) that would result to a particular building from high wind of a certain magnitude or speed, the damage curves are used to determine the expected losses for that specific event. For the Plan, which covers broad geographic areas, average property values were derived from sources like the United States 2000 Census (2000 Census).

Probability is the likelihood that an event of a particular severity will occur. The most commonly known example is the "100-year flood". As defined in Section Four, the "100-year flood" is the flood event that has a 1 percent change of occurring in any given year.

Probability is a key element of risk assessment because it determines how often an event is likely to happen. The ability to accurately determine probability depends on the type of hazard. For instance, flood studies can provide reasonably accurate estimates of how often water will reach particular places and elevations. On the other hand, the occurrence of tornadoes and earthquakes are difficult to predict. Tornadoes do not have an easily definable specific location like floods, and earthquakes can occur in a broad range of locations and severities.

5.2.4 Hazard Rankings

The preceding definitions indicate that data are needed at several points in the process to produce a true risk assessment. As noted in previous version of this Plan, most states and communities do not have all the required data, and Louisiana is no exception. Although much is known about the history of hazards and disasters in the State, a number of specific data points do not yet exist. For example, National Climatic Data Center (NCDC) data upon which there is heavy reliance in this Plan is archived and categorized by the event and not political boundaries. Therefore, it does not account for differences between jurisdictions when an event crosses multiple parish boundaries. Much more detail about historical occurrence of hazards in the State is needed to determine the probabilities of most of the possible hazard events. Therefore, the hazard rankings developed in this risk assessment are based on different kinds of analyses and vary from hazard to hazard in terms of level of detail and reliability.

Table 5-1 provides an overview of basic data inputs in the 2008 Plan and this Plan update.

Table 5-1: Risk Assessment Inputs and Methodologies

Hazard	2008 Data Inputs	2011 Data Inputs
Flood	▪ National Flood Insurance Program (1978-2007)	▪ National Flood Insurance Program (1978-2009)
Hailstorm	▪ Not profiled	▪ National Climatic Data Center (1950-2009)
High Wind (Hurricane)	▪ HAZUS-MH (2004) ▪ National Weather Service (2005)	▪ HAZUS-MH MR4 (2009) ▪ Homeland Security Infrastructure Program (2009) ▪ National Climatic Data Center (1950-2009)
High Wind (Tornado)	▪ National Climatic Data Center (1950-2005)	▪ National Climatic Data Center (1950-2009): ▪ US Census American Community Survey (2006-2008) ▪ US Census 2000 Summary File 3
Ice Storm	▪ National Climatic Data Center (2007)	▪ National Climatic Data Center (1990-2009):
Storm Surge	▪ HAZUS-MH (2004) ▪ National Weather Service (2005)	▪ HAZUS-MH MR4 (2009) ▪ Homeland Security Infrastructure Program (2009) ▪ USACE National Levee Database (2008) ▪ Louisiana Office of Emergency Preparedness ▪ National Bridge Inventory (2007) ▪ SLOSH Modeling
Subsidence	▪ National Land Cover Data (2000) ▪ U.S. Census (2000) ▪ U.S. Geologic Survey (USGS)	▪ HAZUS-MH MR4 (2009) ▪ Homeland Security Infrastructure Program (2009) ▪ Kulp, M.A., University of Kentucky, 2000

Hazard	2008 Data Inputs	2011 Data Inputs
Wildfire	▪ U.S. Census (2000) ▪ USGS National Land Cover Data (2000)	▪ HAZUS-MH MR4 (2009) ▪ Homeland Security Infrastructure Program (2009) ▪ Louisiana Department of Agriculture and Forestry ▪ University of Wisconsin-Madison Departments of Forestry and Ecology
Dam Failure	▪ Dam Classifications (2005) ▪ HAZUS-MH (2004)	▪ National Dam Inventory (2009) ▪ HAZUS-MH MR4 (2009) ▪ LADOTD Office of Public Works (2010) ▪ Homeland Security Infrastructure Program (2009)
Levee Failure	▪ U.S. Census (2000)	▪ HAZUS-MH MR4 (2009) ▪ Homeland Security Infrastructure Program (2009) ▪ USACE National Levee Database (2008)
Hazardous Material Incident	▪ ALOHA (2004) ▪ US Census (2000)	▪ HAZUS-MH MR4 (2009) ▪ Homeland Security Infrastructure Program (2009) ▪ Louisiana Department of Environmental Quality ▪ Louisiana Oil Spills Coordinators Office ▪ National Response Center Hazardous Materials Spill Reports (2000-2009) ▪ Resource Conservation Recovery Act (2009) ▪ Risk Management Programs (2009) ▪ US Environmental Protection Agency

The 2011 Plan Update utilized a "composite" methodology to develop risk assessment results. This is considered an improvement over simpler methodologies used in the original 2005 Plan and the 2008 Plan Update. The basic process is as follows.

- GOHSEP and planning consultants gathered all available data regarding hazards identified in Section Four and presented this compilation to the SHMPC.
- The SHMPC reviewed and approved recommendations from GOHSEP and the consultants regarding the list of criteria to be used for each individual hazard.
- For each criterion for each hazard, parameters were developed that enabled distinctions of relative risk, i.e., high, medium and low rankings. These parameters varied by criteria and are summarized in the following subsections (Sections 5.3 through 5.13). Full tabular and mapped results for each and every criterion are included in the corresponding sections of Appendix E (Appendices E.4 through E.14).
- For each hazard, relative rankings for each parish were combined and a composite ranking score developed using a simple point system where high = three, medium = two, low = one (Sections 5.3 through 5.13).
- For each hazard, the parishes were ranked in order based on the composite ranking score. Where the scores were equal, the parishes are listed in alphabetical order (Sections 5.3 through 5.13).

- For each hazard, a high, medium and low ranking was identified using apparent breaks in the hazard by hazard scores but with an effort to equally distribute parishes in the three categories where possible (Section 5.14).
- All the resulting composite relative rankings for each hazard were combined in a final composite ranking by summing the numerical value for the high, medium and low rankings (Section 5.14).
- The parishes were ranked in order based on the final composite ranking score. Where the scores were equal, the parishes are listed in alphabetical order (Section 5.14).

The remaining components of Section Five include hazard specific subsections showing the results of applying this composite methodology. In addition, discussion is included regarding implications of recent and future development, issues regarding social vulnerability and data limitations.

5.3 Flood

The flood hazard ranking was based on historic losses per FEMA's National Flood Insurance Program (NFIP) records, and at-risk population, building stock, critical facilities, utilities and transportation infrastructure within the Special Flood Hazard Areas (SHFAs).

The high / medium / low flood hazard rankings for each parish were developed as a composite ranking incorporating individual rankings per the following criteria:

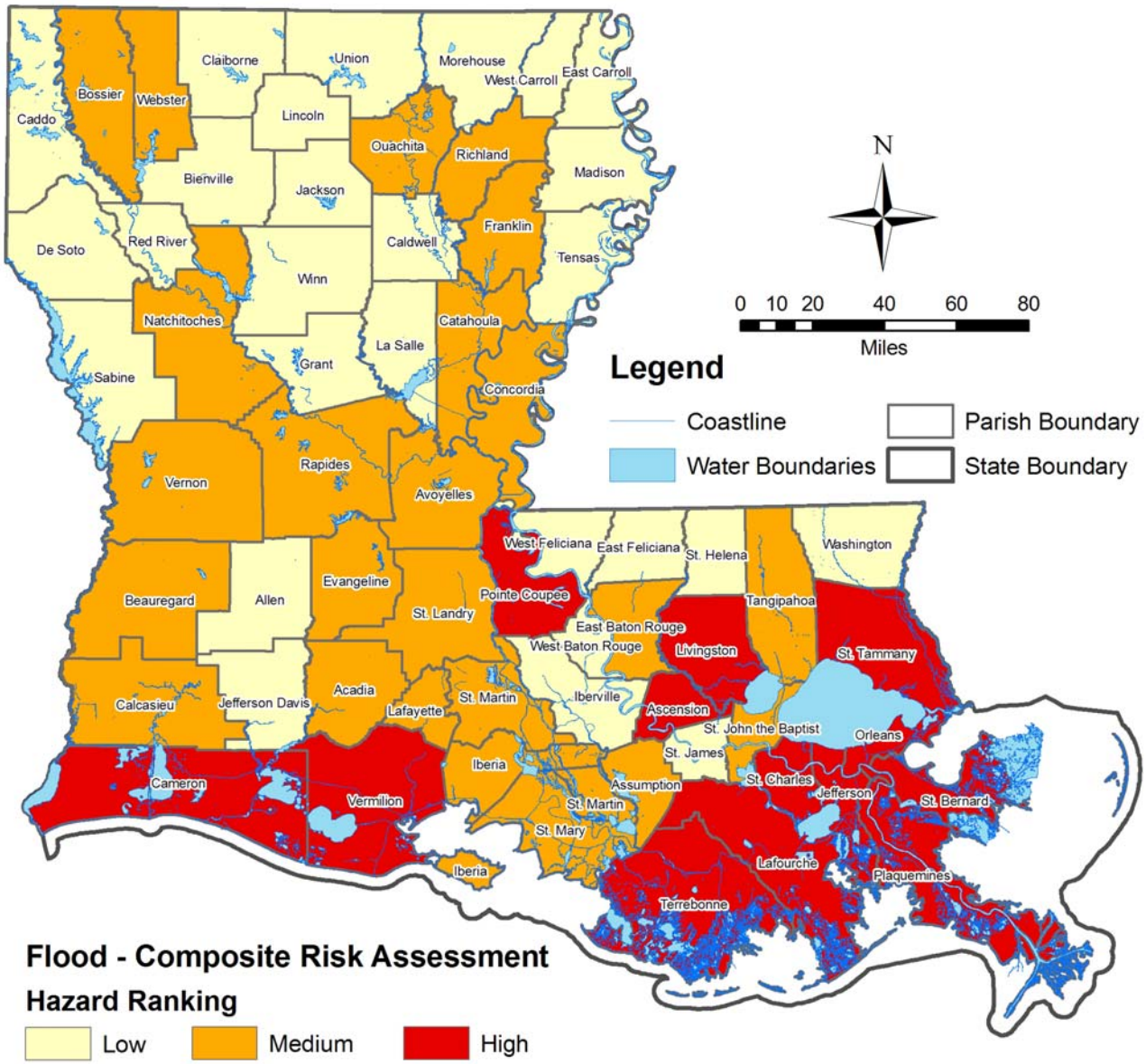
- Impacted population within the SFHAs
- Building quantity within the SFHAs
- Building value within the SFHA
- Repetitive Loss (RL) properties per parish
- Severe Repetitive Loss (SRL) properties per parish
- Average NFIP claims
- Critical facilities within the SFHAs
- Utility providers or power lines within the SFHAs
- Transportation infrastructure (bridges, roadways or railways) within the SFHAs

The specific thresholds for these high to low designations are included in Appendix E.4. The top ten parishes with "high" composite flood hazard rankings are shown in Table 5-2. Map 5-1 presents the ranking of all the parishes with high, medium and low risk to flood.

Table 5-2: Top Ten Parishes by Composite Flood Hazard Ranking

Parish	Impacted Population	Building Quantity	Building Value	Rep Loss	Severe Rep Loss	Average NFIP Claim	Critical Facilities	Utilities	Transportation	Composite Hazard Ranking
Jefferson	High	High	High	High	High	High	High	High	High	27
St. Bernard	High	High	High	High	High	High	High	High	High	27
St. Charles	High	High	High	High	High	High	High	High	High	27
Terrebonne	High	High	High	High	High	High	High	High	High	27
Cameron	High	High	Medium	High	High	High	High	High	High	26
Lafourche	High	Medium	High	High	High	High	High	High	High	26
Livingston	High	High	High	High	High	High	Medium	High	High	26
Orleans	High	High	High	High	High	High	High	High	Medium	26
Plaquemines	High	High	High	High	Medium	High	High	High	High	26
Vermilion	Medium	Medium	High	High	High	High	High	High	High	25

Map 5-1: Composite Flood Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population), HSIP (Critical Facilities, Utilities), HAZUS-MH MR4 (Highways, Railways, Buildings), DFIRM/HAZUS (Special Flood Hazard Area), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges), FEMA December 9, 2009 (Rep Loss, SRL), National Flood Insurance Program (Average Losses)

5.4 Hailstorm

The hailstorm hazard ranking was based on the total number of historical incidents, property damage, and crop damages reported to NCDC (for the years 1955 through 2009). In establishing the hazards ranking, all incidents were assumed to have equal impacts, since the level of severity could not be determined from the existing data.

The high / medium / low rankings for each parish were developed by:

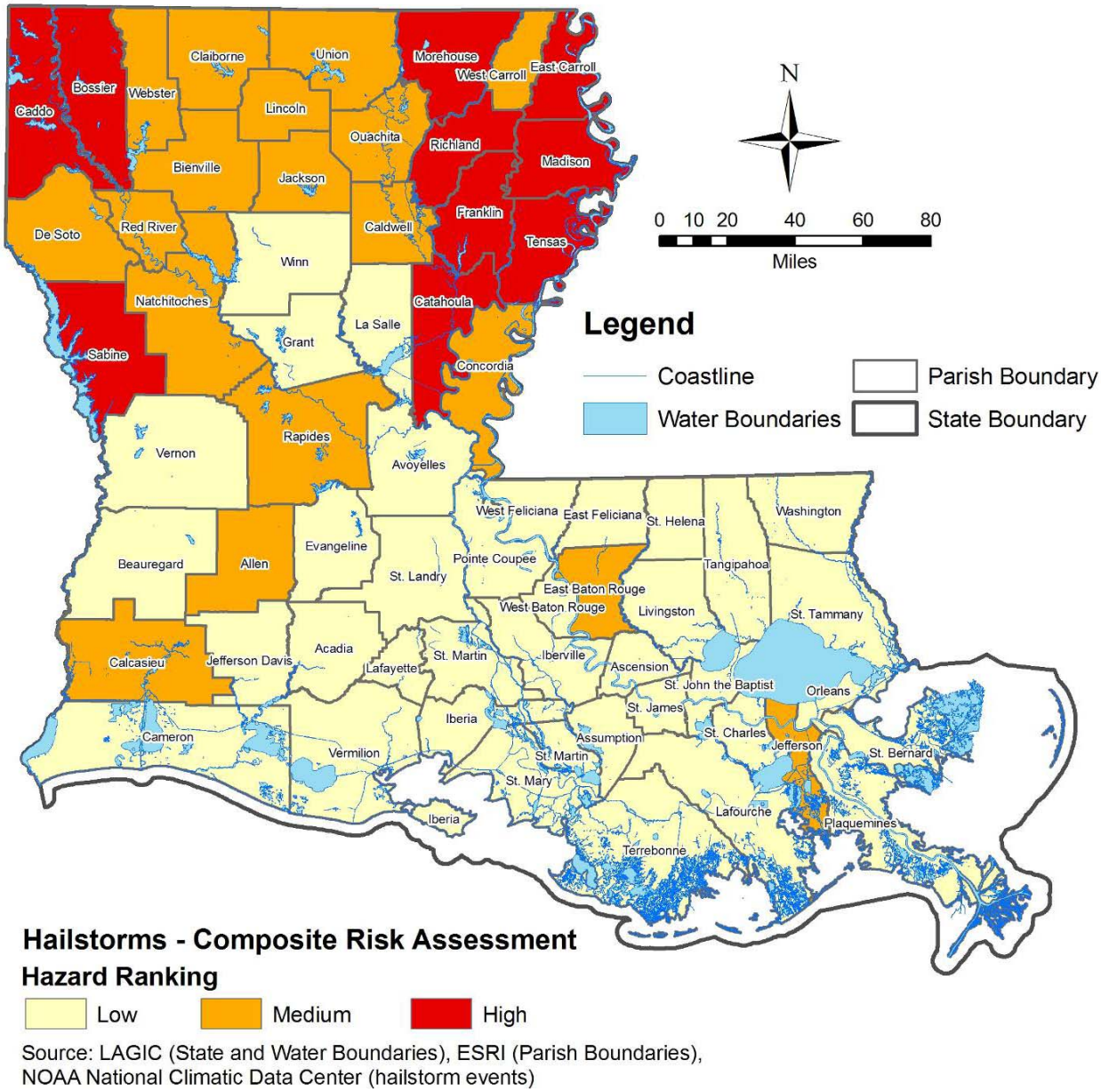
- Number of storm occurrences
- Property damage
- Crop damage

The specific thresholds for these high to low designations are included in Appendix E.5. The top ten parishes with "high" composite hailstorm hazard rankings are shown in Table 5-3. Map 5-2 presents the ranking of all the parishes with high, medium and low risk to hailstorms.

Table 5-3: Top Ten Parishes by Composite Hailstorm Hazard Ranking

Parish	Occurrences	Property Damage	Crop Damage	Composite Hazard Ranking
Tensas	Medium	High	High	8
Madison	Medium	High	High	8
Franklin	Medium	High	High	8
Catahoula	Medium	High	High	8
Sabine	High	Medium	Medium	7
Richland	Medium	High	Medium	7
Morehouse	High	High	Low	7
East Carroll	Medium	Medium	High	7
Caddo	High	High	Low	7
Bossier	High	High	Low	7

Map 5-2: Composite Hailstorm Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (hailstorm events)

5.5 High Wind (Hurricane)

Hurricane wind hazard vulnerability and loss estimates were assessed for the population, general building stock, critical facilities, utilities, and the Annual Estimated Losses (AEL) for property and crop damages as determined from NCDC historical hurricane events data and HAZUS-MH general building stock data. The total of the Annual Estimated Losses for all the parishes is $7,137,612,500.

The high / medium / low rankings for each parish were developed by examining the following criteria relative to a Category 2 hurricane event:

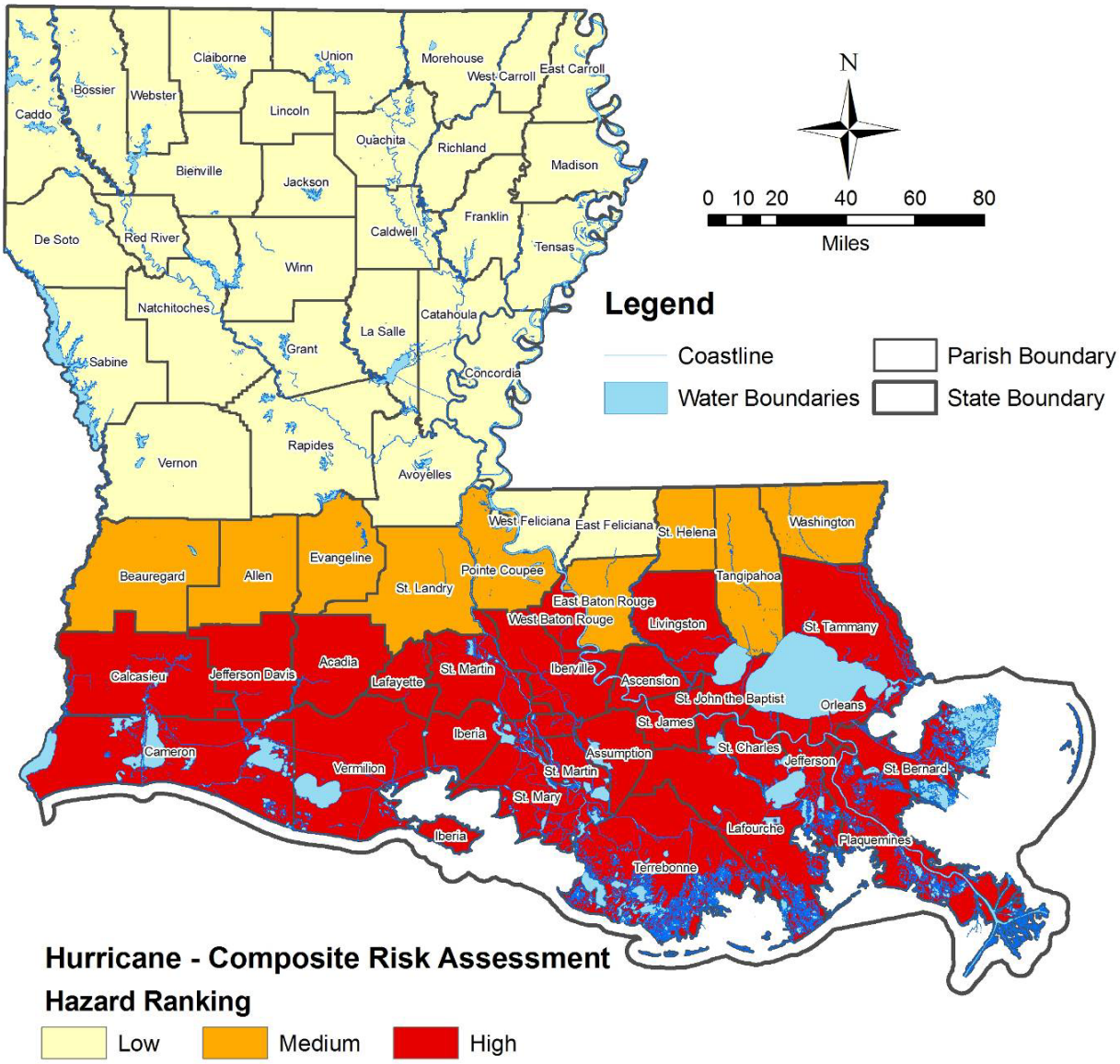
- Population
- Quantity of buildings
- Building value
- Critical facilities
- Utility providers and power lines
- Average annual property and crop damages from hurricane winds

The specific thresholds for these high to low designations are included in Appendix E.6. The top ten parishes with "high" composite hurricane wind hazard rankings are shown in Table 5-4. Map 5-3 presents the ranking of all the parishes with high, medium and low risk to hurricane winds.

Table 5-4: Top Ten Parishes by Composite Hurricane Wind Hazard Ranking

Parish	Impacted Population	Building Quantity	Building Value	Critical Facilities	Utility	Property Damage	Composite Hazard Ranking
Acadia	High	High	High	High	High	High	18
Ascension	High	High	High	High	High	High	18
Calcasieu	High	High	High	High	High	High	18
Iberia	High	High	High	High	High	High	18
Jefferson	High	High	High	High	High	High	18
Lafourche	High	High	High	High	High	High	18
Livingston	High	High	High	High	High	High	18
Orleans	High	High	High	High	High	High	18
Plaquemines	High	High	High	High	High	High	18
St. Bernard	High	High	High	High	High	High	18

Map 5-3: Composite Hurricane Wind Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Group Population), HSIP (Critical Facilities, Utilities), NOAA National Climatic Data Center (Hurricane/Tropical Storm Events), HAZUS-MH MR4 (Hurricane Wind Speed Modeling, Buildings)

5.6 High Wind (Tornado)

The Tornado hazard ranking was based on the total number of historical incidents, the number of injuries and fatalities, property and crop damages reported in the NCDC data by parish (for the years 1950 through 2009) and the number of manufactured homes in the parish.

The high / medium / low rankings for each parish were developed by:

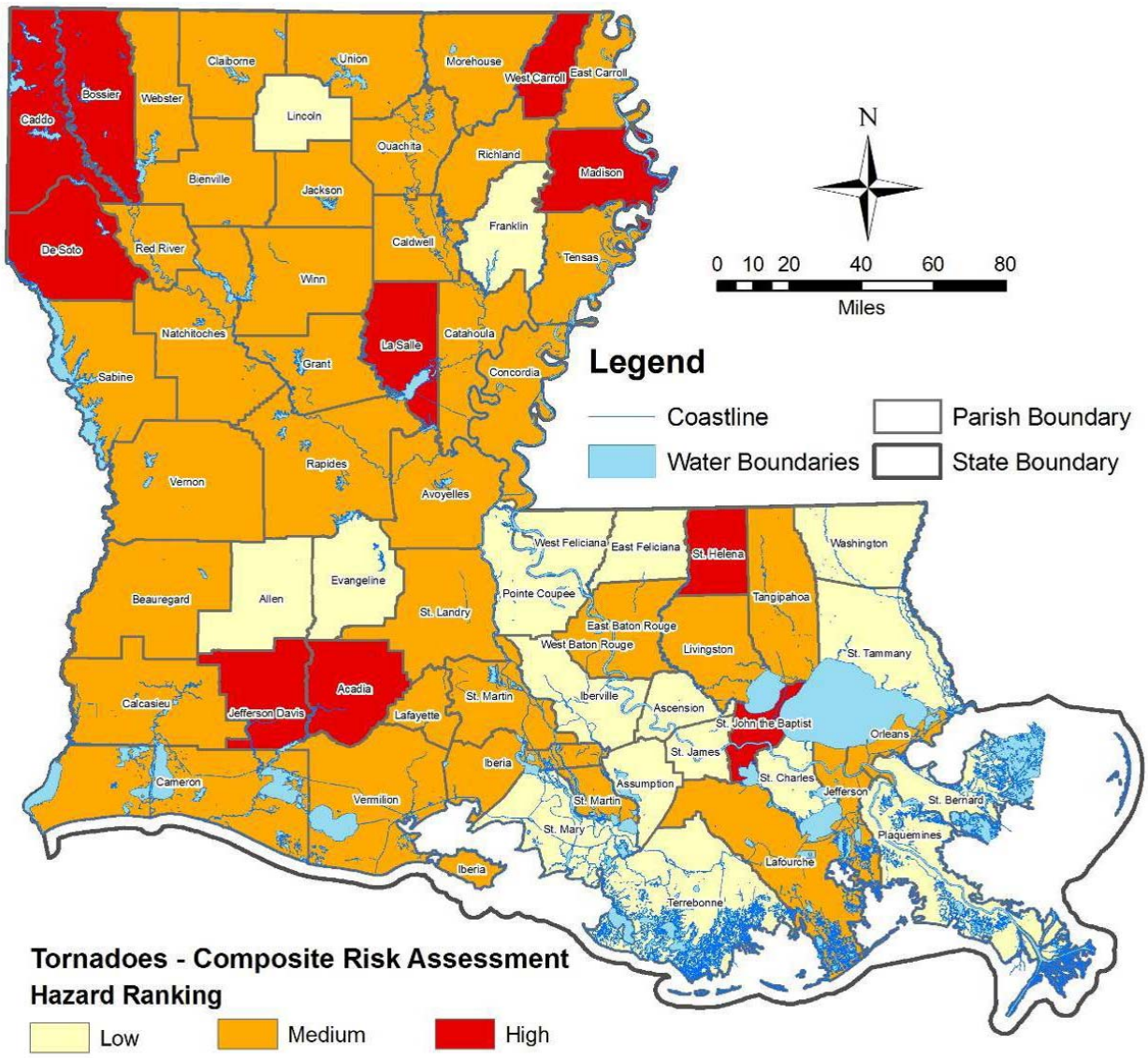
- Number of storms
- Number of injuries and fatalities
- Property losses
- Crop losses
- Number of manufactured homes

The specific thresholds for these high to low designations are included in Appendix E.7. The top ten parishes with "high" composite tornado wind hazard rankings are shown in Table 5-5. Map 5-4 presents the ranking of all the parishes with high, medium and low risk to tornado winds.

Table 5-5: Top Ten Parishes by Composite Tornado Wind Hazard Ranking

Parish	Occurrence	Intensity	Injury & Fatality	Property and Crop Loss	Manufactured Homes	Composite Hazard Ranking
Bossier	High	High	High	High	Medium	14
Acadia	High	Medium	High	High	Medium	13
Caddo	High	High	High	High	Low	13
St. John the Baptist	High	High	High	High	Low	13
De Soto	Medium	High	Medium	High	High	13
Jefferson Davis	High	Medium	Medium	High	Medium	12
Madison	High	High	High	Medium	Low	12
La Salle	Low	High	Medium	High	High	12
St. Helena	Low	High	Medium	High	High	12
West Carroll	High	High	Medium	Low	High	12

Map 5-4: Composite Tornado Wind Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center, US Census Bureau (Tornado Events)

5.7 Ice Storm

The ice storm hazard ranking was based on the total number of historical incidents reported in NCDC data by parish (for the years 1993 through 2009), the number of injuries and fatalities; property damage. In establishing the hazards ranking, all incidents were assumed to have equal impacts, since the level of severity could not be determined from the existing data.

The high / medium / low rankings for each parish were developed by:

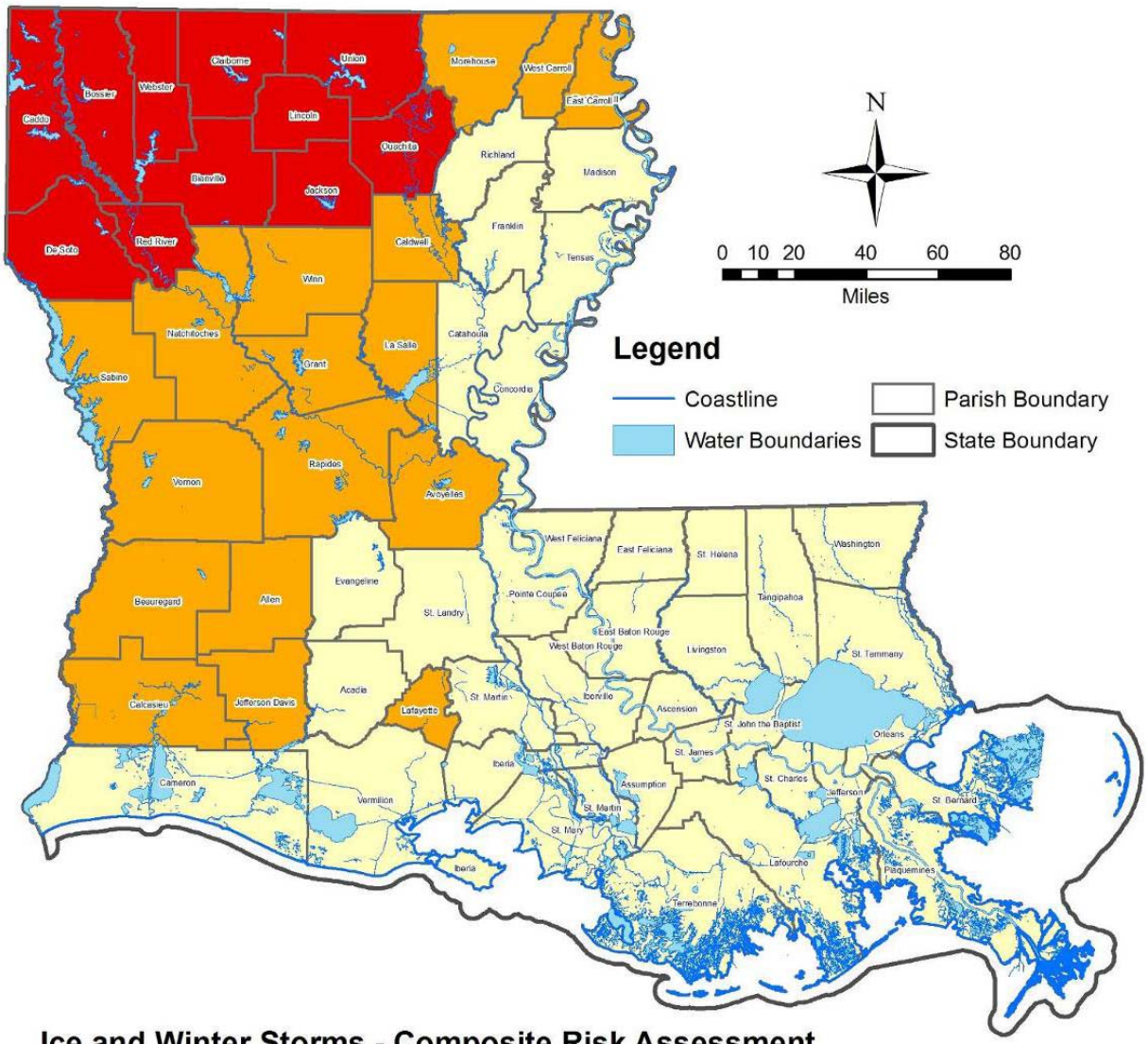
- Number of storms
- Number of injuries and fatalities
- Average annual property losses

The specific thresholds for these high to low designations are included in Appendix E.8. The top ten parishes with "high" composite ice storm hazard rankings are shown in Table 5-6. Map 5-5 presents the ranking of all the parishes with high, medium and low risk to ice storms.

Table 5-6: Top Ten Parishes by Composite Ice Storm Hazard Ranking

Parish	Occurrences	Injuries & Fatalities	Annual Property Loss	Composite Hazard Ranking
Caddo	High	High	High	9
Bienville	High	Medium	High	8
Bossier	High	Medium	High	8
Claiborne	High	Medium	High	8
De Soto	High	Medium	High	8
Jackson	High	Medium	High	8
Lincoln	High	Medium	High	8
Ouachita	High	Medium	High	8
Red River	High	Medium	High	8
Union	High	Medium	High	8

Map 5-5: Composite Ice Storm Hazard Ranking



Ice and Winter Storms - Composite Risk Assessment

Hazard Ranking

Low Medium High

Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Ice Storm Events)

5.8 Storm Surge

The storm surge hazard ranking was based on a combination of historical occurrences and the Maximum of Maximums (MOMs) as determined from Sea, Lake and Overland Surges from Hurricanes (SLOSH). SLOSH, is a computerized model developed by the Federal Emergency Management Agency (FEMA), United States Army Corps of Engineers (USACE), and the National Weather Service (NWS) to estimate storm surge depths resulting from historical, hypothetical, or predicted hurricanes by taking into account a storm's pressure, size, forward speed, forecast track, wind speeds, and topographical data. MEOW is defined through SLOSH modeling as the Maximum Envelope of Water. A MOM is a series of hundreds of theoretical MEOWs showing a worst case scenario storm surge for a given storm category at any given point in a given basin.

The high / medium / low rankings for each parish were then developed by combining the number of historical occurrences for Category 1 storm surges with the following criteria with the MOMs results for a Category 3 hurricane storm surge:

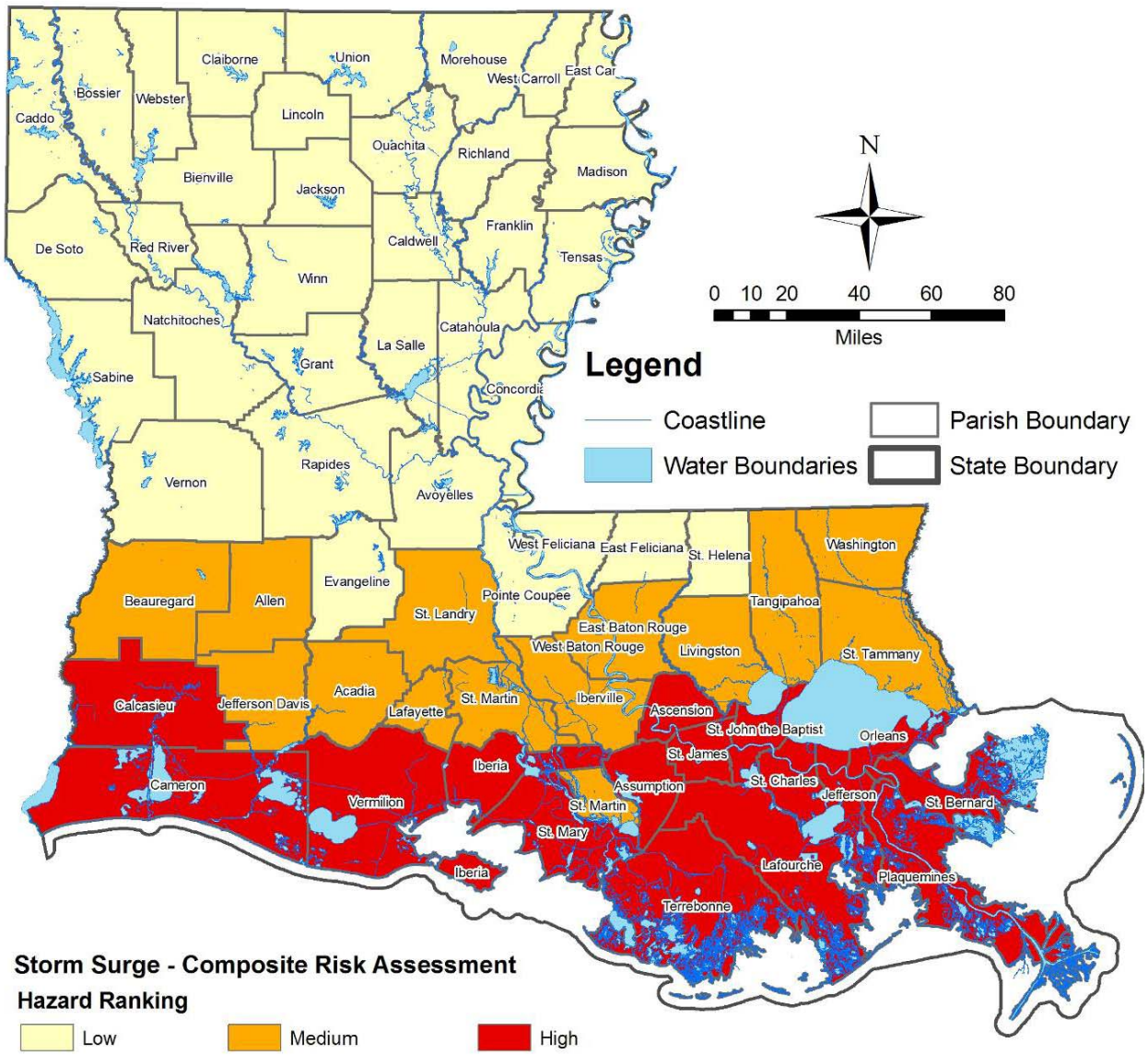
- Population
- Number of buildings
- Value of buildings
- Number of Critical Facilities
- Number of Utility providers or power lines
- Transportation infrastructure (bridges, highways and railways)

The specific thresholds for these high to low designations are included in Appendix E.9. The top ten parishes with "high" composite storm surge hazard rankings are shown in Table 5-7. Map 5-6 presents the ranking of all the parishes with high, medium and low risk to hurricane winds.

Table 5-7: Top Ten Parishes by Composite Storm Surge Hazard Ranking

Parish	Cat 1 Storm Surge Occurrences	Impacted Population	Building Quantity	Building Value	Critical Facilities	Utilities	Transportation	Composite Hazard Ranking
Ascension	High	High	High	High	High	High	High	21
Assumption	High	High	High	High	High	High	High	21
Calcasieu	High	High	High	High	High	High	High	21
Iberia	High	High	High	High	High	High	High	21
Jefferson	High	High	High	High	High	High	High	21
Lafourche	High	High	High	High	High	High	High	21
Orleans	High	High	High	High	High	High	High	21
Plaquemines	High	High	High	High	High	High	High	21
St. Bernard	High	High	High	High	High	High	High	21
St. Charles	High	High	High	High	High	High	High	21

Map 5-6: Composite Storm Surge Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population), SLOSH Modeling (Storm Surge), HAZUS-MH MR4 (Buildings, Highways, Railroads), HSIP (Critical Facilities, Utilities), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

5.9 Subsidence

The subsidence hazard ranking was developed based upon average subsidence rates. Subsidence varies in space and time and these rates represent averages over 10,000 years. As such they do not serve as accurate predictors of future subsidence rates, but can be used to conceptualize the relative difference in subsidence among the various coastal parishes[1].

The high / medium / low rankings for each parish were developed by comparing the following criteria to areas with high historical subsidence rates:

- Percentage of parish by area
- Number of buildings
- Value of buildings
- Number of Critical Facilities
- Number of Utility providers or power lines
- Transportation infrastructure (bridges, highways and railways)

The specific thresholds for these high to low designations are included in Appendix E.10. The top ten parishes with "high" composite subsidence hazard rankings are shown in Table 5-8. Map 5-7 presents the ranking of all the parishes with high, medium and low risk to subsidence.

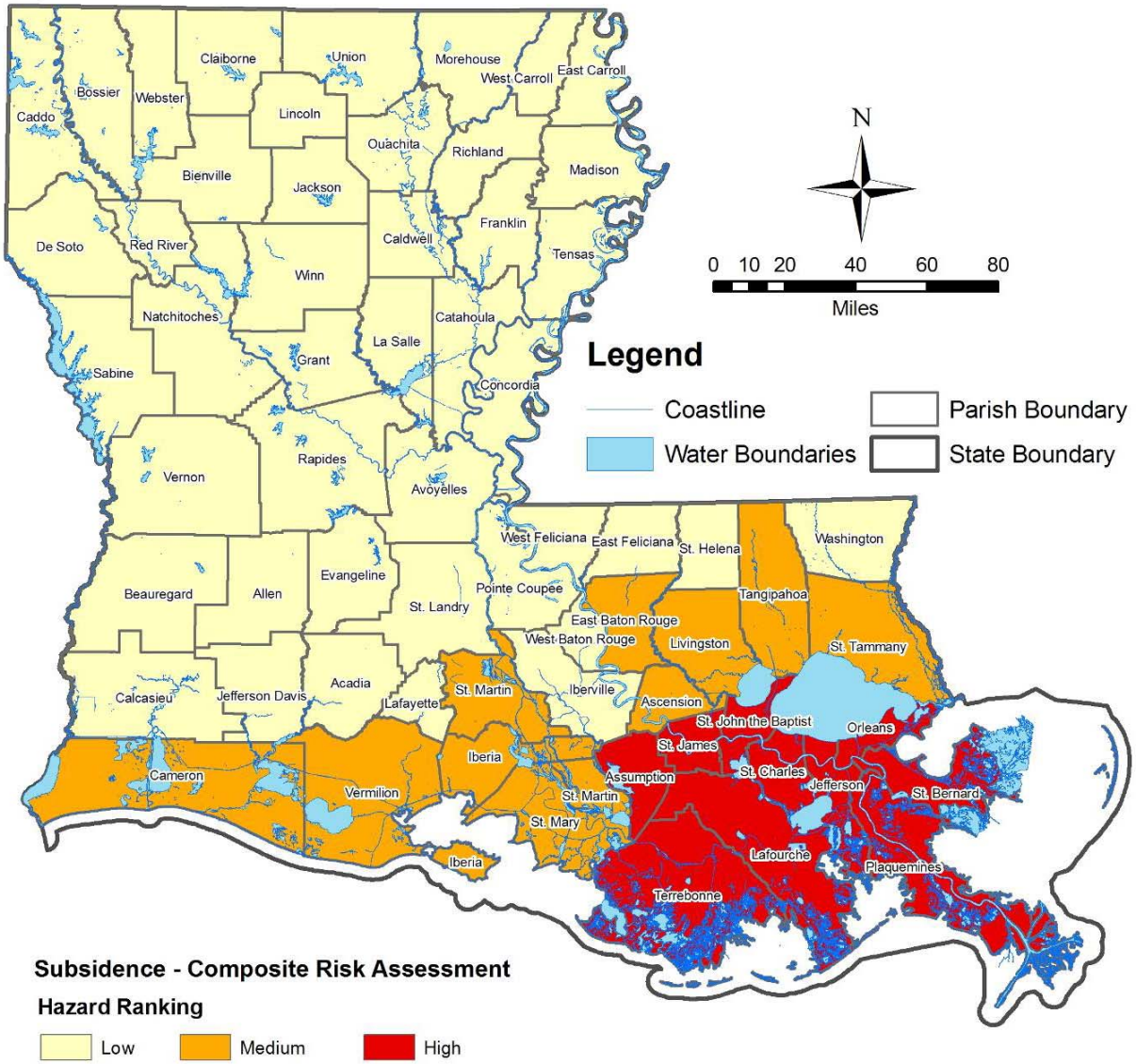
Table 5-8: Top Ten Parishes by Composite Subsidence Hazard Ranking

Parish	Area affected	Building Quantity	Building Value	Critical Facilities	Transportation	Composite Hazard Ranking
Jefferson	High	High	High	High	High	15
Lafourche	High	High	High	High	High	15
Orleans	High	High	High	High	High	15
Plaquemines	High	High	High	High	High	15
St. Bernard	High	High	High	High	High	15
St. Charles	High	High	High	High	High	15
St. John the Baptist	High	High	High	High	High	15
Terrebonne	High	High	High	High	High	15
St. James	High	High	Medium	High	High	14
Assumption	High	High	Medium	High	Medium	13

As discussed in Section Four, this Plan Update treats coastal erosion and land loss as issues that are distinct from subsidence, though recognizing they are interrelated.

[1] As noted in the 2008 Plan Update, there is still no accepted yearly subsidence rate estimate. One of the continuing challenges for the CEO program (see Section Eight) will be to determine the best information and methodology for parishes, municipalities and property owners.

Map 5-7: Composite Subsidence Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings, Highways a Railways), HSIP (Critical Facilities), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges), Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

5.10 Wildfire

The wildfire hazard vulnerability assessment was based on a compilation of historic fire data from the Forest Protection Division of the Louisiana Department of Agriculture and Forestry (LDAF). Information on the acres burned for the time period 1996-2009 was analyzed to determine the total number of acres burned and average acreage per parish burned over the past ten years. The assumption was made that this time period is representative of wildfire risk.

Wildfire vulnerability was also assessed for the population, critical facilities and general building stock (i.e., residential, commercial, industrial, governmental, educational, agricultural and religious) for parishes within Wildland Urban Interface (WUI) hazard areas.

The high / medium / low rankings for each parish were developed by combining the number of acres burned, the average size of wildfires and comparing the following criteria with the WUI:

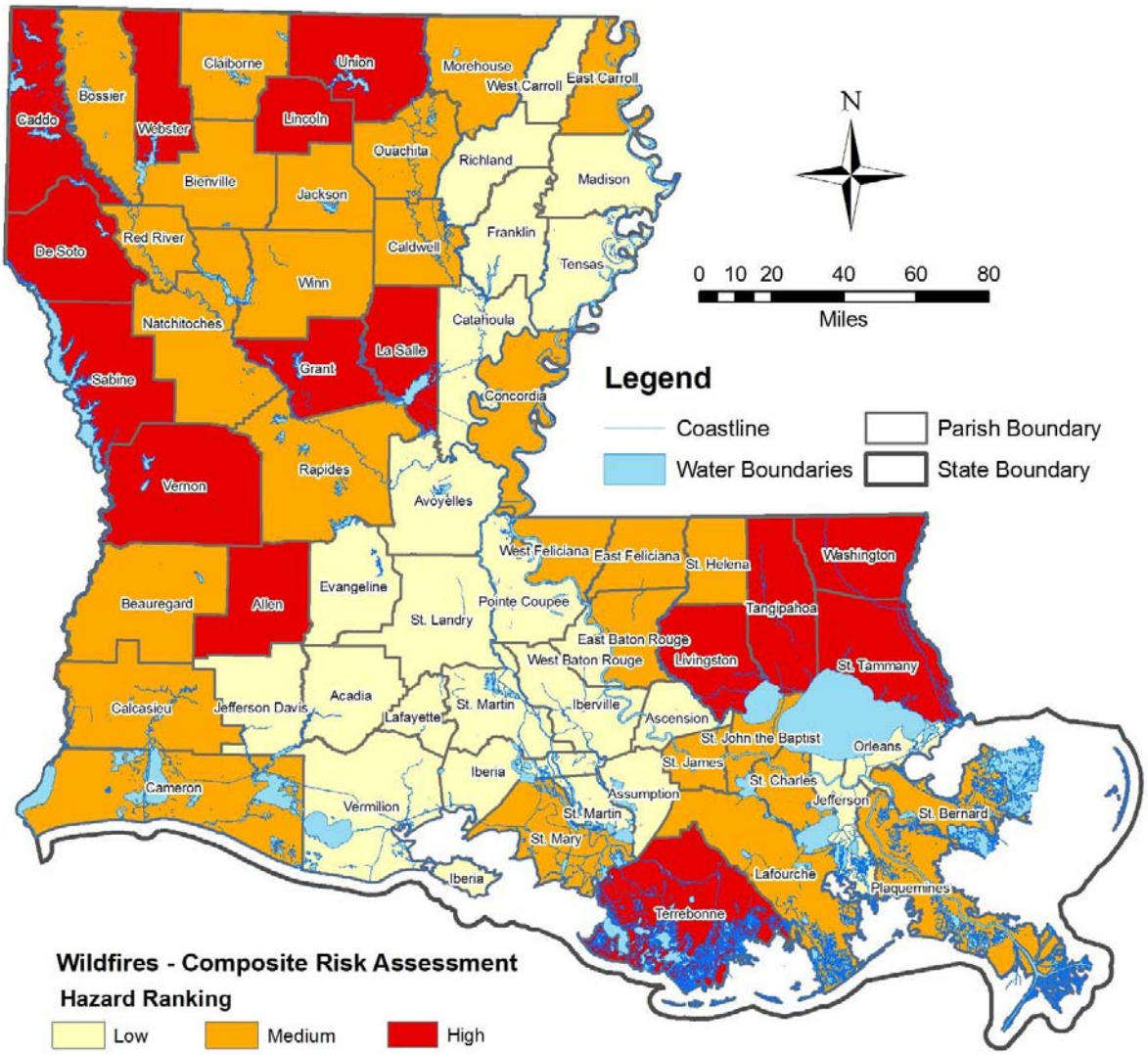
- Percentage of housing units
- Percentage of building stock
- Value of all buildings
- Percentage of population
- Percentage of critical facilities

The specific thresholds for these high to low designations are included in Appendix E.11. The top ten parishes with "high" composite wildfire hazard rankings are shown in Table 5-9. Map 5-8 presents the ranking of all the parishes with high, medium and low risk to wildfire.

Table 5-9: Top Ten Parishes by Composite Wildfire Hazard Ranking

Parish	Occurrence	Intensity	Housing Percentage	Building Percentage	Building Value	Impacted Population	Critical Facilities	Composite Hazard Ranking
St. Tammany	High	High	High	High	High	High	High	21
Livingston	High	Medium	High	High	High	High	High	20
Tangipahoa	High	Medium	High	High	High	High	High	20
Sabine	High	Medium	High	High	Medium	High	High	19
Washington	High	Medium	High	High	Medium	High	High	19
Allen	High	High	High	High	Medium	Medium	Medium	18
De Soto	Medium	Medium	High	High	Medium	High	High	18
Lincoln	Medium	Medium	High	High	Medium	High	High	18
Vernon	High	Medium	High	High	Medium	High	Medium	18
Webster	Medium	Medium	High	High	Medium	High	High	18

Map 5-8: Composite Wildfire Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Group Population), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface), HAZUS-MH MR4 (Building Data), Louisiana Department of Agriculture and Forestry (Wildfire Counts and Acreage), HSIP (Critical Facilities)

5.11 Dam Failure

The USACE National Inventory of Dams (NID), data as presented by the states, ranks dams according to the potential for loss of life as well as the potential impacts on economic, environmental and important community lifelines. Louisiana has 557 dams. Of these, 33 are ranked High Hazard, 71 are ranked Significant, and 453 are ranked low. The hazard profile and risk assessment is confined to the inundation areas for 19 of the 33 high hazard dams in Louisiana. LDOTD identified 14 additional high hazard dams during the final plan review period; however, due to time and budget constraints, these dams are not able to be analyzed until the next plan update.

The analysis below uses quantities of population, buildings, critical facilities, utilities and transportation infrastructure within the inundation areas for 19 of the 33 high hazard dams in Louisiana. Data from the 2000 Census, HAZUS-MH, HSIP the National Bridge Inventory and the Louisiana Office of Emergency Preparedness were used.

The high / medium / low rankings for each parish were developed by comparing the following criteria with the inundation areas for 19 of the 33 high-hazard dams:

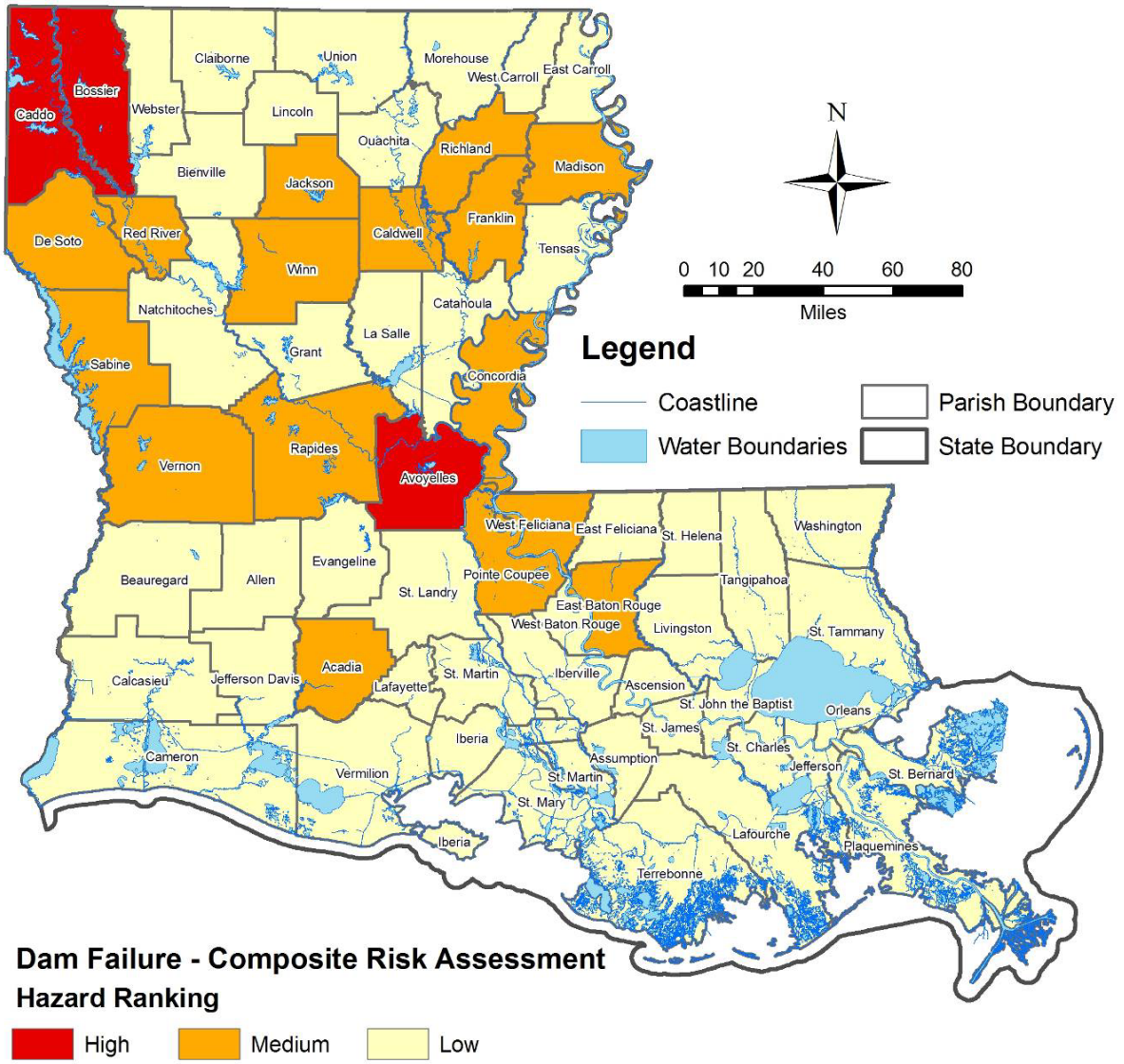
- Square miles in the inundation areas;
- Population in the inundation areas;
- Building quantity in the inundation areas;
- Building value in the inundation areas;
- Number of critical facilities in the inundation areas;
- Number of utility providers or power lines in the inundation areas;
- Number of transportation infrastructure in the inundation areas;

The specific thresholds for these high to low designations are included in Appendix E.12. The top ten parishes with "high" composite dam failure hazard rankings are shown in Table 5-10. Map 5-9 presents the ranking of all the parishes with high, medium and low risk to dam failure.

Table 5-10: Top Ten Parishes by Composite Dam Failure Hazard Ranking

Parish	Occurrence	Impacted Population	Building Quantity	Building Value	Critical Facilities	Utilities	Transportation	Composite Hazard Ranking
Bossier	High	High	High	High	High	High	High	21
Caddo	High	High	High	High	High	High	High	21
Avoyelles	High	Medium	High	High	Medium	High	High	19
Rapides	Medium	Medium	Medium	High	Medium	High	High	17
Vernon	Medium	Medium	Medium	High	Medium	High	High	17
Madison	High	Medium	Medium	Medium	Low	High	High	16
Pointe Coupee	High	Medium	Medium	Medium	Medium	Medium	High	16
De Soto	Medium	Medium	Medium	Medium	Medium	High	Medium	15
East Baton Rouge	Medium	Medium	Medium	High	Medium	Medium	Medium	15
Red River	Medium	Medium	Medium	Medium	Low	Medium	High	14

Map 5-9: Composite Dam Failure Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population), HAZUS-MH MR4 (Highways, Railways, Buildings) USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations), HSIP (Critical Facilities, Utilities) National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

5.12 Levee Failure

The levee hazard ranking was based on the US Army Corps of Engineers (USACE) Levee Protection Zone (LPZ) Boundaries. The analysis involved estimating the population, critical facilities, building stock, utilities and transportation within the LPZs in all parishes based on US Census 2000 population figures.

The high / medium / low rankings for each parish were developed by comparing the LPZs with the following criteria:

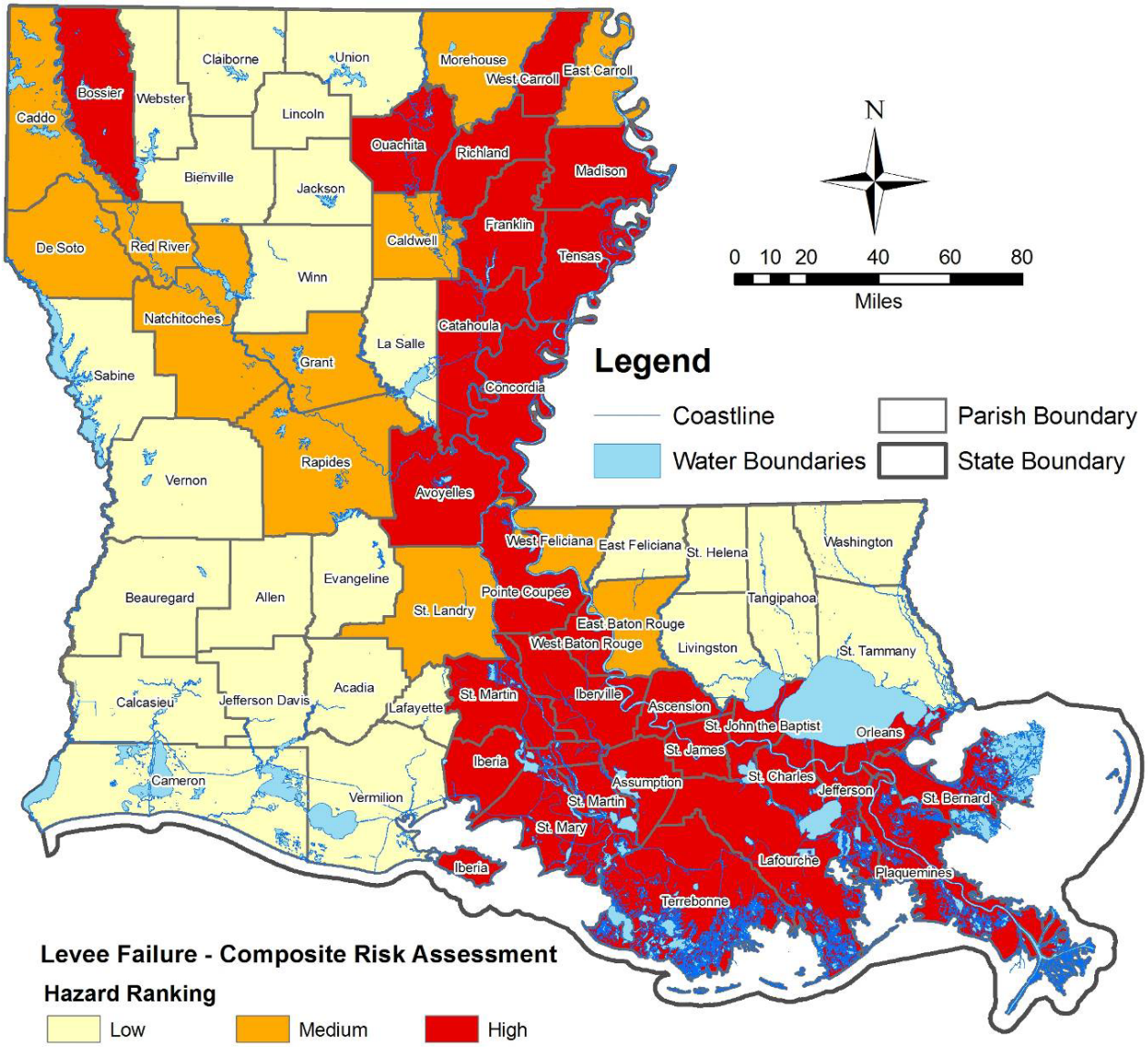
- Percentage of population
- Percentage of buildings
- Value of buildings
- Percentage of critical facilities
- Percentage of either utility providers or power lines
- Percentage of transportation facilities

The specific thresholds for these high to low designations are included in Appendix E.13. The top ten parishes with "high" composite levee failure hazard rankings are shown in Table 5-11. Map 5-10 presents the ranking of all the parishes with high, medium and low risk to levee failure.

Table 5-11: Top Ten Parishes by Composite Levee Hazard Ranking

Parish	Impacted Population	Building Quantity	Building Value	Critical Facilities	Utilities	Transportation	Composite Hazard Ranking
Ascension	High	High	High	High	High	High	18
Jefferson	High	High	High	High	High	High	18
Lafourche	High	High	High	High	High	High	18
Orleans	High	High	High	High	High	High	18
St. Charles	High	High	High	High	High	High	18
Terrebonne	High	High	High	High	High	High	18
Assumption	High	High	Medium	High	High	High	17
Avoyelles	High	High	Medium	High	High	High	17
Iberville	High	High	Medium	High	High	High	17
Ouachita	High	High	High	High	High	Medium	17

Map 5-10: Composite Levee Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population), US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems), HSIP (Critical Facilities, Utilities) HAZUS-MH MR4 (Highways, Railways, Buildings), National Bridge Inventory (Highway Bridges) Louisiana Office of Emergency Preparedness (Railway Bridges)

5.13 Hazardous Materials Incident

Hazardous materials' incident hazard vulnerability were assessed for the population and land exposure based on the fixed site locations of hazardous materials facilities (refineries and pipelines) and transportation routes (highways, railways and waterways. A buffer zone around these locations was established (½ radius for pipelines, roadways and waterways and 1 mile for railways) and the land area and populations contained therein were identified.

The high / medium / low rankings for each parish were developed by comparing the buffer zones with the following criteria:

- Density of hazmat incidents per square mile
- Land area affected by hazmat transport areas
- Population affected by hazmat transport

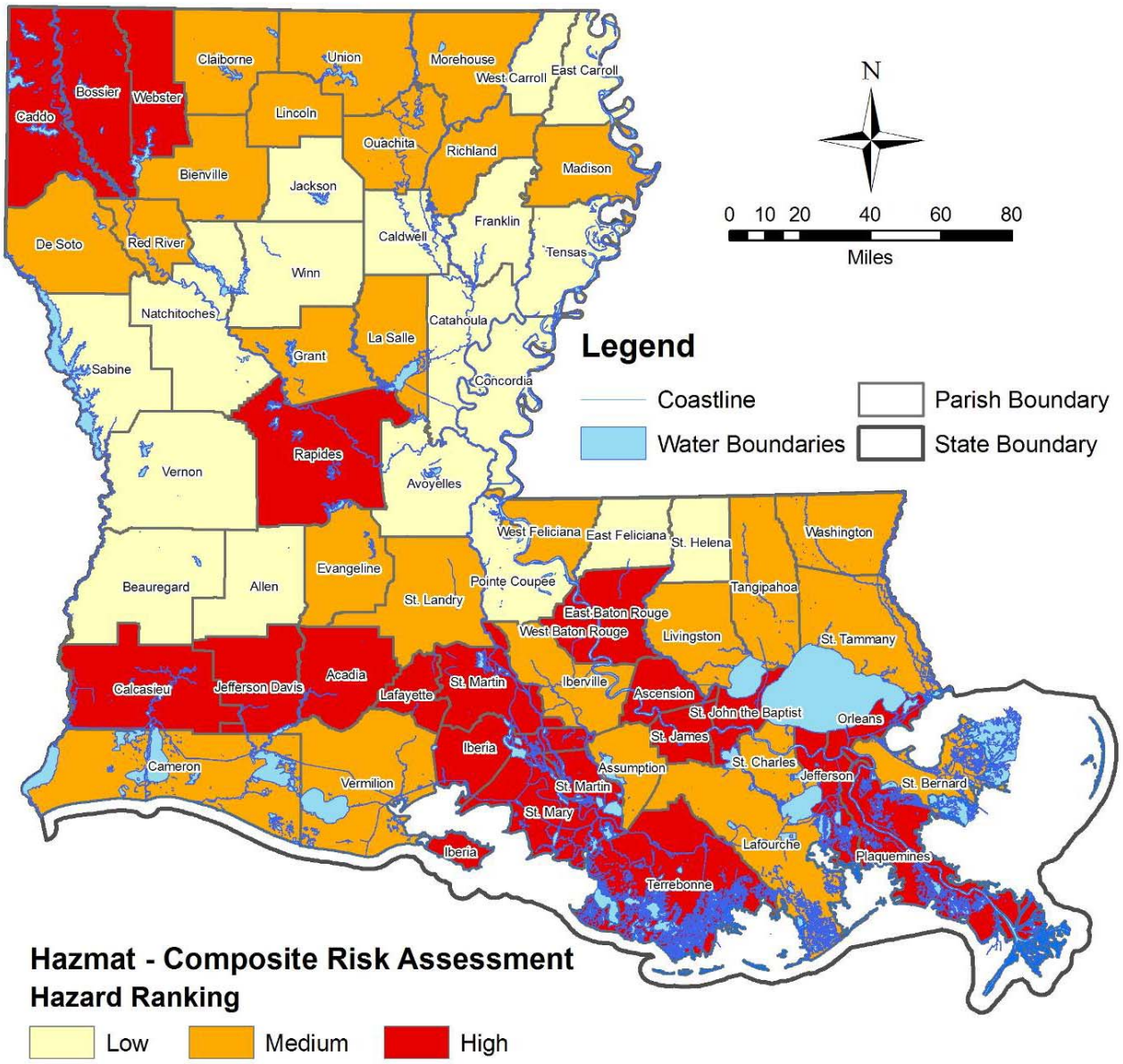
The analysis below uses data from the 2000 Census, the most recent data available that presents population data at the Census-tract or Census-block level. Although newer population data and estimates exist, including post-hurricanes Katrina and Rita surveys, these are only available at the parish level of resolution. Current RCRA and RMP facility counts and NRC incident quantities were divided by the square miles of land per parish to determine density of incidents.

The specific thresholds for these high to low designations are included in Appendix E.14. The top ten parishes with "high" composite hazardous materials incidents hazard rankings are shown in Table 5-12. Map 5-11 presents the ranking of all the parishes with high, medium and low risk to hazardous materials incidents.

Table 5-12: Top Ten Parishes by Composite Hazardous Materials Incident Hazard Ranking

Parish	Occurrence	Land Coverage	Population	Composite Hazard Ranking
Jefferson	High	High	High	9
Lafayette	High	High	High	9
West Baton Rouge	High	High	High	9
East Baton Rouge	High	Medium	High	8
Orleans	High	High	Medium	8
Plaquemines	High	High	Medium	8
St. James	High	High	Medium	8
Acadia	Medium	High	Medium	7
Ascension	High	Medium	Medium	7
Bossier	Medium	Medium	High	7

Map 5-11: Composite Hazardous Material Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Populations), HSIP (Pipelines), HAZUS-MH MR4 (Railways, Highways), Techni Graphic Systems, Inc (Waterways), National Response Center (Hazardous Material Spill Reports), LOSCO/EPA (Hazmat Industries, RCRA, RMPs)

5.14 Composite Risk Assessments

As noted in Section 5.2.4, the final step in the Statewide Risk Assessment process was the development of overall composite risk assessment relative rankings. The process involved the following steps:

- Determine high, medium and low ranges for each hazard based on hazard-level composite rankings
- Assign scores based on high = three points, medium = two points, and low = one
- Sum scores for each parish to develop an overall composite score for each parish
- Assign High Composite Hazard Ranking to parishes with scores between 21 and 33 (maximum score possible)
- Assign Medium Composite Hazard Ranking to parishes with scores between 18 and 20
- Assign Low Composite Hazard Ranking to parishes with scores between 11 (lowest score possible) and 17

The resulting scores and rankings are shown in Table 5-13 and Map 5-12.

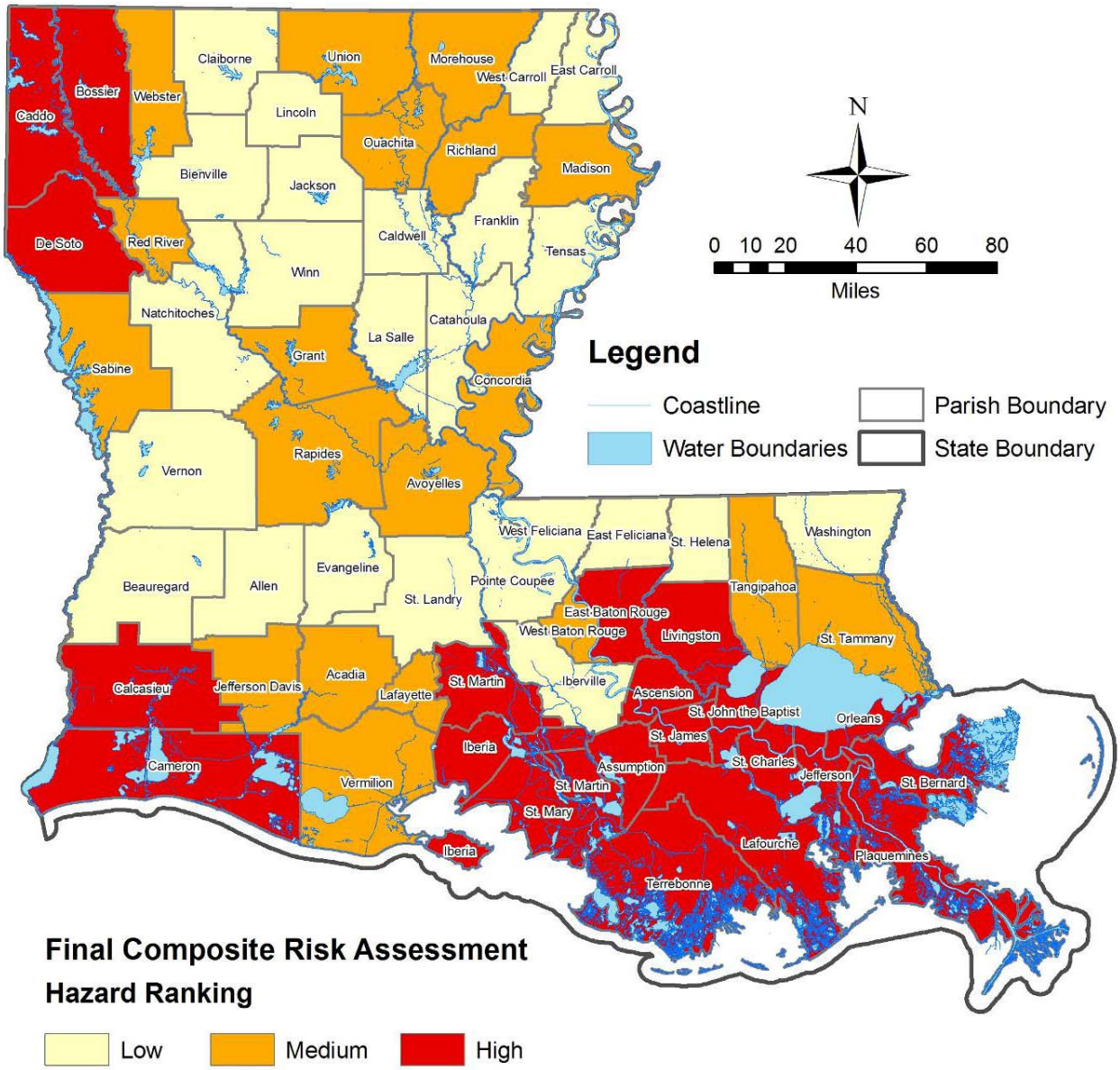
Table 5.13: Composite Hazard Ranking

Parish	Flood	Hailstorm	Hurricane	Tornado	Ice Storm	Storm Surge	Subsidence	Wildfire	Dam Failure	Levee Failure	Hazmat	Numeric Rating	Composite Ranking
Bossier	M	H	L	H	H	L	L	M	H	H	H	25	H
Jefferson	H	M	H	M	L	H	H	L	L	H	H	25	H
St. John the Baptist	M	L	H	H	L	H	H	M	L	H	H	25	H
Terrebonne	H	L	H	L	L	H	H	H	L	H	H	25	H
Caddo	L	H	L	H	H	L	L	H	H	M	H	24	H
Lafourche	H	L	H	M	L	H	H	M	L	H	M	24	H
Orleans	H	L	H	M	L	H	H	L	L	H	H	24	H
Plaquemines	H	L	H	L	L	H	H	M	L	H	H	24	H
East Baton Rouge	H	M	M	M	L	M	M	M	M	M	H	23	H
St. Bernard	H	L	H	L	L	H	H	M	L	H	M	23	H
St. Charles	H	L	H	L	L	H	H	M	L	H	M	23	H
Ascension	H	L	H	L	L	H	M	L	L	H	H	22	H
Calcasieu	M	M	H	M	M	H	L	M	L	L	H	22	H
Iberia	M	L	H	M	L	H	M	L	L	H	H	22	H
St. James	L	L	H	L	L	H	H	M	L	H	H	22	H
St. Mary	M	L	H	L	L	H	M	M	L	H	H	22	H
Assumption	M	L	H	L	L	H	H	L	L	H	M	21	H
Cameron	H	L	H	M	L	H	M	M	L	L	M	21	H
De Soto	L	M	L	H	H	L	L	H	M	M	M	21	H
Livingston	H	L	H	M	L	M	M	H	L	L	M	21	H
St. Martin	M	L	H	M	L	M	M	L	L	H	H	21	H
Acadia	M	L	H	H	L	M	L	L	M	L	H	20	M
Ouachita	M	M	L	M	H	L	L	M	L	H	M	20	M

Parish	Flood	Hailstorm	Hurricane	Tornado	Ice Storm	Storm Surge	Subsidence	Wildfire	Dam Failure	Levee Failure	Hazmat	Numeric Rating	Composite Ranking
Rapides	M	M	L	M	M	L	L	M	M	M	H	20	M
St. Tammany	H	L	H	L	L	M	M	H	L	L	M	20	M
Vermilion	H	L	H	M	L	H	M	L	L	L	M	20	M
Jefferson Davis	L	L	H	H	M	M	L	L	L	L	H	19	M
Lafayette	M	L	H	M	M	M	L	L	L	L	H	19	M
Madison	L	H	L	H	L	L	L	L	M	H	M	19	M
Red River	L	M	L	M	H	L	L	M	M	M	M	19	M
Richland	M	H	L	M	L	L	L	L	M	H	M	19	M
Tangipahoa	M	L	M	M	L	M	M	H	L	L	M	19	M
Avoyelles	M	L	L	M	M	L	L	L	H	H	L	18	M
Webster	L	M	L	M	H	L	L	H	L	L	H	19	M
West Baton Rouge	L	L	H	M	L	M	L	L	L	H	H	19	M
Concordia	M	M	L	M	L	L	L	M	M	H	L	18	M
Grant	M	L	L	M	M	L	L	H	L	M	M	18	M
Morehouse	L	H	L	M	M	L	L	M	L	M	M	18	M
Sabine	L	H	L	M	M	L	L	H	M	L	L	18	M
Union	L	M	L	M	H	L	L	H	L	L	M	18	M
Allen	L	M	M	L	M	M	L	H	L	L	L	17	L
Beauregard	M	L	M	M	M	M	L	M	L	L	L	17	L
Bienville	L	M	L	M	H	L	L	M	L	L	M	17	L
Caldwell	L	M	L	M	M	L	L	M	M	M	L	17	L
Catahoula	M	H	L	M	L	L	L	L	L	H	L	17	L
Claiborne	L	M	L	M	H	L	L	M	L	L	M	17	L
East Carroll	L	H	L	M	M	L	L	M	L	M	L	17	L
Iberville	L	L	H	L	L	M	L	L	L	H	M	17	L
Jackson	L	M	L	M	H	L	L	M	M	L	L	17	L
La Salle	L	L	L	H	M	L	L	H	L	L	M	17	L
Lincoln	L	M	L	L	H	L	L	H	L	L	M	17	L
Natchitoches	M	M	L	M	M	L	L	M	L	M	L	17	L
Pointe Coupee	H	L	M	L	L	L	L	L	M	H	L	17	L
St. Landry	M	L	M	M	L	M	L	L	L	M	M	17	L
Vernon	M	L	L	M	M	L	L	H	M	L	L	17	L
West Carroll	L	M	L	H	M	L	L	L	L	H	L	17	L
Franklin	L	H	L	L	L	L	L	L	M	H	L	16	L
Tensas	L	H	L	M	L	L	L	L	L	H	L	16	L
Washington	L	L	M	L	L	M	L	H	L	L	M	16	L

Parish	Flood	Hailstorm	Hurricane	Tornado	Ice Storm	Storm Surge	Subsidence	Wildfire	Dam Failure	Levee Failure	Hazmat	Numeric Rating	Composite Ranking
St. Helena	L	L	M	H	L	L	L	M	L	L	L	15	L
West Feliciana	L	L	L	L	L	L	L	M	M	M	M	15	L
Winn	L	L	L	M	M	L	L	M	M	L	L	15	L
Evangeline	M	L	M	L	L	L	L	L	L	L	M	14	L
East Feliciana	L	L	L	L	L	L	L	M	L	L	L	12	L

Map 5.12: Composite Hazard Ranking by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries)

5.15 Recent and Future Development

One of the requirements of the IFR is to reflect the impacts of changes in development patterns in hazard-prone areas. This can be accomplished by analyzing development since the 2008 Plan, and then by examining likely future development trends.

However, it is important to first note that parts of Louisiana have been in a state of demographic flux and unpredictability since the hurricanes of 2005. In New Orleans and surrounding areas decreases in population are apparent while many communities in Louisiana have experienced unusually rapid growth, particularly the suburban parishes of the Baton Rouge area and portions of the north shore of Lake Pontchartrain, such as Tangipahoa Parish and Covington in St. Tammany Parish[2]. How much of this growth will be permanent remains to be seen. Because reliable demographic data are an essential part of risk analysis, demographic instability presents a challenge to effective decision-making regarding the deployment of resources for hazard mitigation.

This analysis is presented in two parts:

- An assessment of recent development activity on a parish-by-parish level, considering all hazards
- An assessment of recent and future development trends at a Census Block Group level, considering only hazards that vary significantly by geography

5.15.1 Parish-Level Analysis of Recent Development

A parish-by-parish examination of residential building permitting data comparing the periods from 2005 to 2007 (i.e., through the 2008 Plan Update) and from 2008 to 2010 (see Table 5-15) reveals that the parishes with the most active residential construction parishes at the time of the 2008 Plan Update continued to see the most growth from 2008 to 2010, although eighteen of these twenty parishes experienced declines in residential permitting as the housing market contracted. These twenty parishes also tend to be relatively high hazard areas, according to the parish composite risk ranking established in Section 5.14. This is not surprising, considering that for the large majority of hazards, risk increases as a direct function of population increase.

This data represents the most robust data that is available statewide, on an annual basis, and that uses consistent data reporting across jurisdictions.

Table 5-14: New Residential Development and Composite Hazard in the 20 Fastest-Building Parishes

Parish	Total Permits Issued, 2008-2010	Total permits issued, 2005-2007	Percent Change 2005-2007 v. 2008-2010	Parish Composite Risk Rank
Orleans*	4,903	2,310	+212%	High
East Baton Rouge	3,444	5,755	-41%	High
Bossier	2,786	2,917	-4%	High
Livingston**	2,780	4,331	-36%	High
Ascension**	2,330	4,461	-47%	High
Tangipahoa	2,311	4,155	-44%	Medium
Calcasieu**	2,174	1,488	+146%	High
St. Tammany*	2,144	6,878	-69%	Medium
Lafayette	2,102	4,523	-54%	Medium
Jefferson*	1,441	2,442	-41%	High
Lafourche	1,131	1,224	-8%	High

[2] LRA/DHH (2006), "Louisiana Health and Population Survey."

Parish	Total Permits Issued, 2008-2010	Total permits issued, 2005-2007	Percent Change 2005-2007 v. 2008-2010	Parish Composite Risk Rank
Rapides	961	1,915	-50%	Medium
Caddo*	859	2,046	-58%	High
Ouachita	728	1,556	-53%	Medium
Terrebonne*	701	1,491	-53%	High
Vermilion	609	726	-16%	Medium
St. Landry	480	981	-51%	Low
St. Charles **	355	1,018	-65%	High
Washington*	270	1,000	-73%	Low
St. James	130	716	-82%	High

Source: Annual and monthly US Census reporting; residential permits only; all permitting figures in Table 5-14 are derived from US Census estimates with imputation. For more information on Parish Composite Risk Rank (Column 5 above), see Table 5-13.

Methodological and Other Notes:

Total permits issued 2008-10 (Column 3, above) is derived from the US Census Bureau annual totals for all (20) parishes (2008, 2009) and it also includes 2010 projections based on data from the US Census for January, February and March, 2010 for 6 parishes (see parishes above, marked (*); this represents the best available data). The average monthly figure for each of the six (*) parishes (over the 3-month period) was used to project an estimated annual total for each parish over the remainder of 2010. Then, in order to estimate 2010 permit estimates for the remaining parishes, for which no Census data exists for 2010, the average percent change (2009-10) among the six parishes (-29%) was weight-averaged with the percent change for all (16) parishes that showed a decrease in permitting from 2008 to 2009 (-22%). This produced an average percent change among all parishes of (-25%). This percentage was applied to 2009 permitting totals for parishes with no available data in 2010 to produce 2010 projected annual totals. 2010 estimated annual totals were added to 2008 and 2009 Census totals to produce the estimated total permits issued (2008-10).

According to US Census data, 4 parishes (see parishes above, marked (**)) experienced an increase in permitting from 2008-09, with an average percent increase of (+22%). The percentage was applied to 2009 permitting totals to produce the 2010 estimated annual totals for each of the four parishes. This figure was added to 2008 and 2009 totals to produce the estimated Total Permits Issued (2008-2010). No 2010 Census data was available for these 4 parishes.

As indicated, Table 5-14 lists 20 parishes, capturing building permit trends and total numbers from 2005-10. Although the 2005-10 period shows a significant downturn in permitting overall, owing to the nation's housing crisis and related decrease in new construction, three parishes not appearing on the above table (i.e., not identified as high growth areas in the 2008 Plan), have shown significant permitting levels during 2008 and 2009. These are West Baton Rouge (418), Iberia (331), and St. Martin (318). All three would move into the "top 20" if we consider the total number of permits issued during just the recent two-year period (2008-09). Given the general downturn in permitting statewide from 2005-10, permitting activity in these three parishes – and thus potential changes in their vulnerabilities to hazards – may merit additional focus during future Plan updates.

The 2008-10 data reveal a mixed statewide trajectory of risk reduction. Although the rate of permitting has declined overall by an average of 22% in the 20 fastest-permitting parishes, the fastest-permitting parishes tend to be north of I-10, including on the Northshore of Lake Pontchartrain (Tangipahoa, and St. Tammany parishes), in metro Baton Rouge (including East Baton Rouge, Ascension, and Livingston parishes), metro Lafayette (Lafayette Parish), and metro Shreveport (Bossier Parish). The exceptions to this trend are Orleans and Calcasieu parishes, which both saw significant permitting as part of their recoveries from Katrina and Rita. In terms of risk exposure, there is little pattern to be seen in where recent development has been faster or slower as compared to 2005-07. Both fast and slow rates of decline can be found in all parts of the state. The only increases in permitting rates, meanwhile, are to be found in those parishes directly affected by Katrina and Rita: Orleans leapt 212% over the previous period, and Calcasieu permitting increased by 146%. The long-term trajectory of Orleans Parish's risk reduction efforts remains unknown due to the complex interaction between its long-term recovery from Hurricane Katrina and its ongoing exposure to risk.

Table 5-15 (below) demonstrates this trend towards overall stability or reduction in statewide risk resulting from new development. The top 20 parishes in terms of building permits 2005-10 are analyzed according to their relative risk from the hazards examined in this Plan (1=low risk, 2=moderate risk, 3=high risk, 0=no risk) using both an average risk for each hazard and weighted composite scores for each parish and for the whole state. Weighted scores are generated using hazard weighting values per Table 5.13. In this analysis, a Composite Risk score of >2.0 indicates increasing exposure to hazard; a score of <2.0 indicates reduced exposure to hazard. Overall, in the state's 20 fastest-permitting parishes, the weighted average is 1.8, indicating neutral-to-decreasing new exposure to risk. In 2008, the overall weighted average was 2.0 in these parishes.

Table 5-15: Louisiana Parishes' Risk Profiles in Parishes with Significant New Development (2008-10)

Parish	Flood	Hailstorm	Hurricane	Tornado	Ice Storm	Storm Surge	Subsidence	Wildfire	Dam Failure	Levee Failure	HAZMAT	Weighted Composite Risk*
Orleans	3	1	3	2	1	3	3	1	1	3	3	2.2
East Baton Rouge	3	2	2	2	1	2	2	2	2	2	3	2.1
Bossier	2	3	1	3	3	1	1	2	3	3	3	2.3
Livingston	3	1	3	2	1	2	2	3	1	1	2	1.9
Ascension	3	1	3	1	1	3	2	1	1	3	3	2.0
Tangipahoa	2	1	2	2	1	2	2	3	1	1	2	1.7
Calcasieu	2	2	3	2	2	3	1	2	1	1	3	2.0
St. Tammany	3	1	3	1	1	2	2	3	1	1	2	1.8
Lafayette	2	1	3	2	2	2	1	1	1	1	3	1.7
Jefferson	3	2	3	2	1	3	3	1	1	3	3	2.3
Lafourche	3	1	3	2	1	3	3	2	1	3	2	2.2
Rapides	2	2	1	2	2	1	1	2	2	2	3	1.8
Caddo	1	3	1	3	3	1	1	3	3	2	3	2.2
Ouachita	2	2	1	2	3	1	1	2	1	3	2	1.8
Terrebonne	3	1	3	1	1	3	3	3	1	3	3	2.3
Vermilion	3	1	3	2	1	3	2	1	1	1	2	1.8
St. Landry	2	1	2	2	1	2	1	1	1	2	2	1.5

Parish	Flood	Hailstorm	Hurricane	Tornado	Ice Storm	Storm Surge	Subsidence	Wildfire	Dam Failure	Levee Failure	HAZMAT	Weighted Composite Risk*
St. Charles	3	1	3	1	1	3	3	2	1	3	2	2.1
Washington	1	1	2	1	1	2	1	3	1	1	2	1.5
St. James	1	1	3	1	1	3	3	2	1	3	3	2.0
Average	2.4	1.5	2.4	1.8	1.5	2.3	1.9	2.0	1.3	2.1	2.6	1.8

Moreover, this "neutral-to-decreasing" 1.8 score does not take into account enhanced building codes and floodplain management. New development in Louisiana more effectively mitigates hazards due to more stringent regulations. For example, the enforcement of the Uniform Construction Code (UCC) in Louisiana means that every structure that is covered by the UCC and built after the UCC's effective date of January 2007 has a beneficial net effect on Louisiana's exposure to certain hazards, including those related to high wind.

Similarly, every new structure constructed in Louisiana within a community that participates in the NFIP does so under a floodplain management regulatory system that should further reduce Louisiana's overall exposure to certain hazards, particularly flood and storm surge. This reduction should be even more pronounced in communities that are CRS-rated (see Table 7-11 and preceding).

When these regulatory improvements are figured into overall risk calculations, the net effect of new development will be expected to *decrease* risk from potential hazard events. Decreased risk translates into decreased estimated losses. Therefore, based on a parish-by-parish analysis, Louisiana expects no increase in estimated losses as a result of new development, and when accounting for regulatory enhancements, the state can expect an overall reduction in estimated losses.

5.15.2 Spatial Analyses of Recent and Future Development

Separate from the broad parish-by-parish overview presented above, recent and future development analysis was also performed at the more fine-grained Census block group level. Changes in development patterns may lead to alterations in the risk profile of a place, particularly with regard to hazards that are variable by geography.

Overview and Methodology

In order to identify, assess, and analyze trends in recent and future development in Louisiana, two analyses were performed related to estimates and projections of household (HH) change over time. HHs have been mapped at the Census block group level. The estimates and projections have been derived from a proprietary marketing dataset known as PopStats, which was provided by Synergos Technologies, Inc. (STI). The two analyses performed were:

- Recent development, showing absolute from 2007 to 2009 (i.e., since the previous State Hazard Mitigation Plan analysis was performed)[3]
- 5-year future development projection, showing change from 2009 to 2014[4]

The goal of this analysis is to identify areas where development trends indicate the potential for increased future risk. Exposure in both analyses was based upon estimates and projections of households (HHs), which have been mapped at the Census block group level, as described above. The exposure data was then compared to risk maps generated in the risk assessments found earlier in this section of the Plan Update. The analyses performed represent the best available data obtained from the US Census Bureau and other sources, including the US Post Office, as described below. The data sets were incorporated by STI into the most advanced analytical tools and growth projection models available.

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[3] For this analysis, estimated HHs in the fourth quarter of 2007 (when the analysis for the 2008 Plan Update was performed) was subtracted from estimated HHs in the third quarter of 2009 (the most recent data available). The differential indicates estimated change in development during this time period. For this analysis, the HH estimates used were provided from STI PopStats data. STI's proprietary PopStats combines four Census block group level data sets (ZIP+4, Postal, Spread and Census). STI models and derives a growth factor for each ZIP+4 in Louisiana as an element of its larger analysis of HH growth rates among all ZIP+4 areas nationwide (modeled in groups of 4 to 12 houses, and updated monthly), dating back to April 2000. PopStats then weights the growth factor by incorporating USPS Carrier Routes and actual Postal Delivery statistics (updated monthly), the primary determinant of the existing population. Next, STI adds in Spread (macro level) data on rural postal counts in order to check and balance ZIP+4 data and Postal delivery statistics. Finally, STI's Census data and model acts as a Master model, and utilizes basic artificial intelligence and decision heuristics to integrate all other data sets to arrive at the final HH population estimate and growth rate. The following terms summarize the process:

- Apr 2000 Census = f(ZIP+4[Apr 2000], Postal [Apr 2000], other sources[Apr 2000])
- Current Estimate = f(ZIP+4[current], postal[current], other sources[current])
- Where 'f' is the internal calibration built into the Census Model

[4] For this analysis, estimates HHs in the third quarter of 2009 (the most recent data available) were subtracted from projected HHs in 2014. The differential indicates projected change in development during this time 5-year period. As above, for this analysis, the HH estimates used were provided from STI PopStats data. Median data were used. STI utilizes data on each Census block group's historical growth trends combined with two separate growth projection methodologies to produce its 5-year HH projection. First, STI separately analyzes each Census block group's historical growth trajectory from 1990-2000, 2000-09, and over the last eight quarters. Next, function is applied to these three growth trajectories in order to produce "normalized" or realistic rates of HH change in each block group and establish upper and lower bounds for the estimates. (A Gompertz Curve – a sigmoid function for time series analysis – is applied to these estimates. The Gompertz Curve influences the growth projection by quantifying HH change as a function of the population increases that tend to precede infrastructure growth or development, the infrastructure growth rate, and the time gap between these two growth phases.) Finally, STI runs a "Monte Carlo Simulation" utilizing historical growth trajectories and Gompertz Curve data to arrive at its best possible 5-year HH projections.

After the HH change mapping (shown below) was completed for recent development (2007-09) and 5-year projection (2009-14) both of the maps was overlaid against those hazards that have been analyzed in this Plan which have a highly spatially varied risk profile. Hazards analyzed include the following:

- Flood
- Storm surge
- Dam failure
- Levee Failure
- Hazmat release

The reason for only selecting hazards of this type is that hazards exhibiting risk profiles that are distributed reasonably uniformly over the landscape will show a simple increase in exposure for every new structure. For example, every new house in any of a region's many block groups increases the community's net exposure to ice storm. There is therefore little analytical value in projecting the geographical distribution of development against the ice storm hazard or other similarly geographically distributed hazards.

In contrast, identifying which block groups show new development in relation to geographically specific hazards can yield extremely useful information. For example, it is useful to know whether significant new development is projected in a block group that is at high risk for dam failure, versus in one that is not.

Data Considerations

Several considerations related to the nature of the data employed in these analyses should be kept in mind, as described below.

Absolute vs. Relative Change

The analysis being performed is concerned with amount of potential new exposure created by development. For this reason, absolute (i.e., numerical) change in HHs by block group has been considered, rather than relative (i.e., proportional or percentage) change. Ten new houses in a block group in rural Tensas Parish may represent a greater relative increase than 10 new houses in East Baton Rouge, but the impact in terms of new exposure and new risk is the same in both cases.

The Unit of Analysis: Census Block Group

These analysis all employ the Census block group as the unit of analysis. No population or HH projections are available at a finer resolution between decennial US Censuses, which means that until the 2010 Census is analyzed, block group will be the best available unit of analysis.

A block group is a cluster of Census blocks containing between 600 and 3,000 people, with an optimum size of 1,500 people. Because block groups are keyed to population, they vary widely in land area; i.e., urban block groups are much smaller than rural block groups. Block groups never cross the boundaries of Census tracts, states, counties (parishes), or statistically equivalent entities,[5] but they may cross the boundary of any other geographic entity.

Census block groups are extremely useful in aggregating data and estimating population and HH trends, but it should be noted that this unit of analysis has crucial limitations in representing HH exposure to geospatially specific natural hazard risk data. Because block group data represents a total characteristic – in this case, HHs – within a defined boundary, the nature of the data necessitates that HH density be treated as though it were uniform across the block group. This unit of analysis therefore does not permit analysis of the actual estimated or projected distribution of HHs within a block group. I.e., the HH projections by block group cannot convey whether HHs will be evenly dispersed versus concentrated or patterned in some way within the block group.

[5] Except for a block group delineated by American Indian tribal authorities, and then only when tabulated within the American Indian hierarchy.

As a result, hazard risks are only able to be evaluated in terms of a block group's average HH density in relation to the hazard risk – even in cases where hazard risk may vary across the block group. Therefore, this analysis would be unable to capture, for example, effects of HH clustering away from low-lying high flood-hazard areas, or – conversely – of HH siting with preference for beachfront locations that are extremely exposed to storm surge. Both of these geographically specific effects will be "averaged out" by the block group data.

STI PopStats Data and Implications for this Analysis

The overall quality of the STI PopStats recent development and 5-year projection data used in this Plan Update is assumed to be sufficiently robust so as to be usable for the analysis below; questions related to the quality of the 10-year population projections resulted in such data not being used in this analysis.

STI has several layers of checks to ensure the quality of its data. To limit bias in the data due to extraneous figures, such as errors in the raw data, STI PopStats methodology includes automated processes for overcoming any and all anomalies, including inaccuracies, data smoothing issues related to macro-level (nationwide) data, conversions (lofts), and overrides. In addition, STI cross-verifies its results through analyses of data from FEMA and the USGS including remote sensing (satellite) images. Finally, the methodology was verified through on-site, on-the-ground verification of HH populations in New Orleans.

However, the datasets employed in these analyses data are limited to residential uses. No recent or projected future data are presented relative to other uses, including commercial (retail/office), religious, institutional, agricultural, industrial, etc. In future Plan updates, such data could be estimated using standard marketing and land-use development estimators, although the added value of such an enhanced analysis would be limited, because whereas the goal of this analysis is to identify areas where development trends indicate increased future risk, additional classes of data that are proportional to HH data will by definition provide no additional insights.

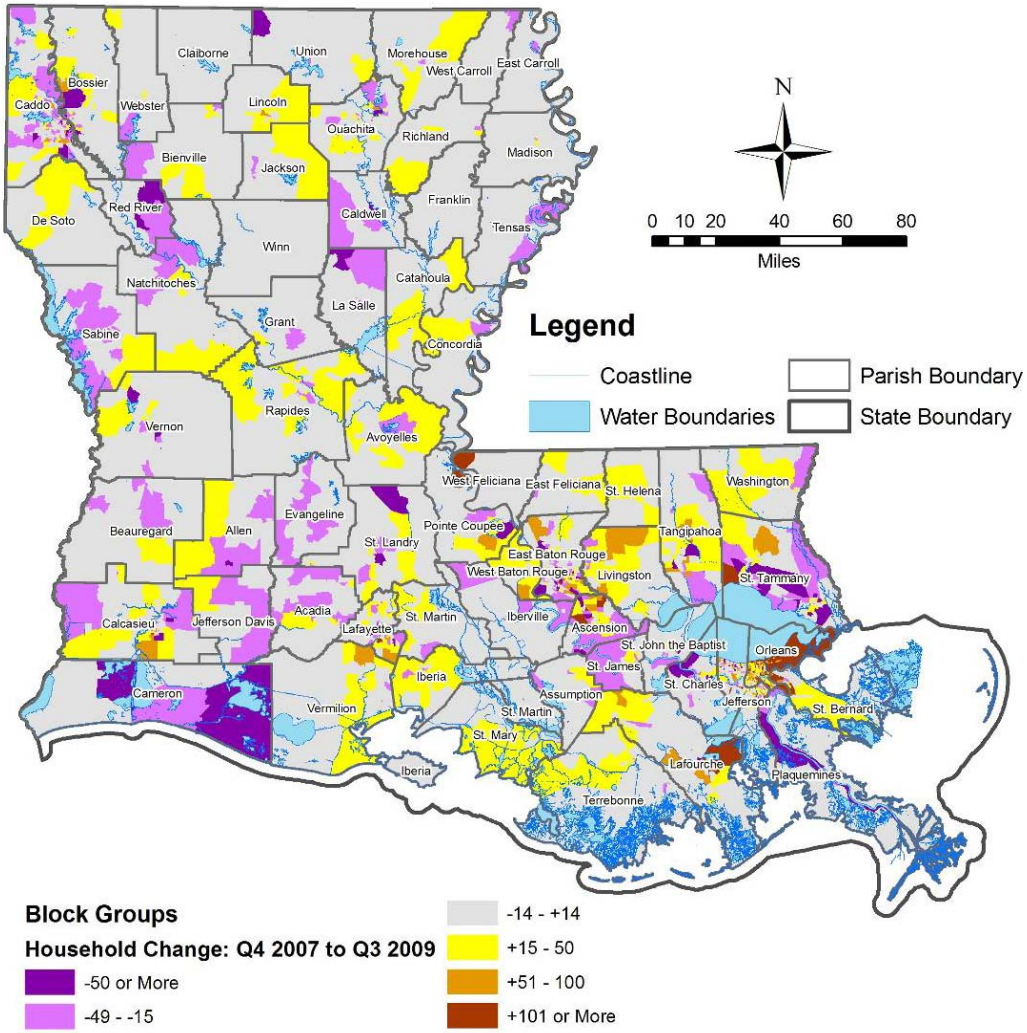
Additionally, the STI PopStats recent and future HH projection data do not contain fields reflecting HH income or housing value. As a result, loss estimating (and thus, full risk assessment) is not possible. In future Plan updates, proxy values could be derived and assigned using US Census data reflecting median housing (or other property) values, or – preferably – similar data describing median values for new housing.

Finally, STI's methodology is based on data and trends, and although STI goes to lengths to verify and validate its results, these may be expected to be most unstable in places where data and trends are most in flux. Whereas this remains the case though out much of the New Orleans metro area, results based upon data and trends in this area must be somewhat suspect, regardless of all efforts to ground-truth the data.

Recent Estimated Development and Risk

As described in the methodology above, recent HH change has been mapped by block group, allowing a visual identification of areas with the highest absolute increased in new residential construction. Map 5-13 shows these results. The block groups with the most significant increases in HHs over recent years have been clustered in metro Baton Rouge (and the I-12 corridor), Lafayette, and Houma-Thibodaux, or in the recovery areas of metro Lake Charles and New Orleans.

Map 5-13: Recent Development (Q4 2007 – Q3 2009)



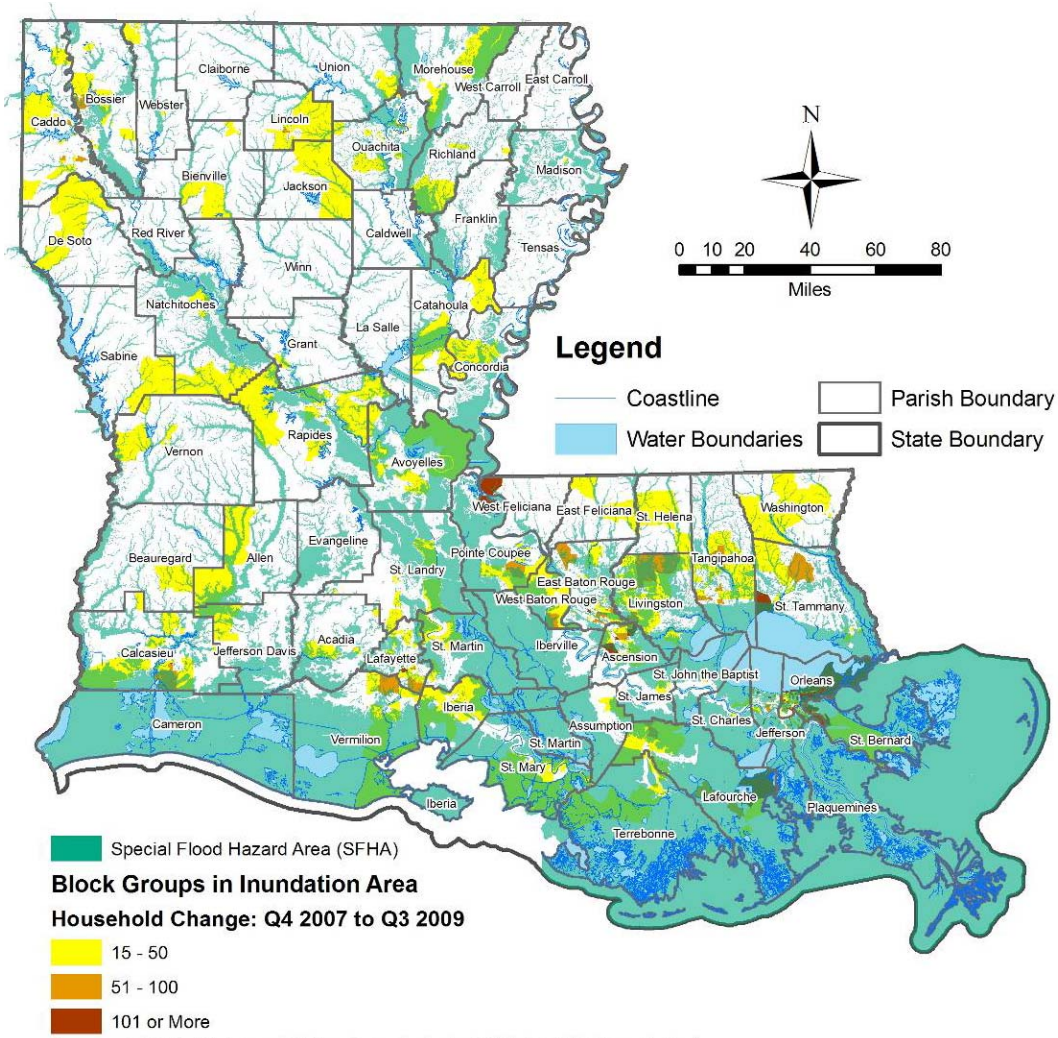
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LEO, LLC/STI PopStats (Households in Block Groups)

Recent Growth and Flood

The estimate of recent HH growth shows overlap with the SFHA (Map 5-14) in virtually every high-growth block group. Whereas most land in Louisiana is in close proximity to the SFHA, this result is not unexpected. As noted above, the this result does not indicate that all new development is projected to be within the SFHA, only that virtually all high-growth block groups have some overlap with the SFHA. There are certainly many cases in which new development has been sited so as to avoid the SFHA.

However, land in Louisiana is generally flood-prone, and many high-growth block groups – especially in the extreme southern part of the state, including in Vermillion, St. Mary, Terrebonne, Lafourche, Orleans, St. Bernard, and other parishes – lie almost entirely within the SFHA. This result reinforces the need for continued vigilance regarding flood mitigation strategies across the state, and particularly in South Louisiana.

Map 5-14: Recent High-Growth Areas and Flood Risk

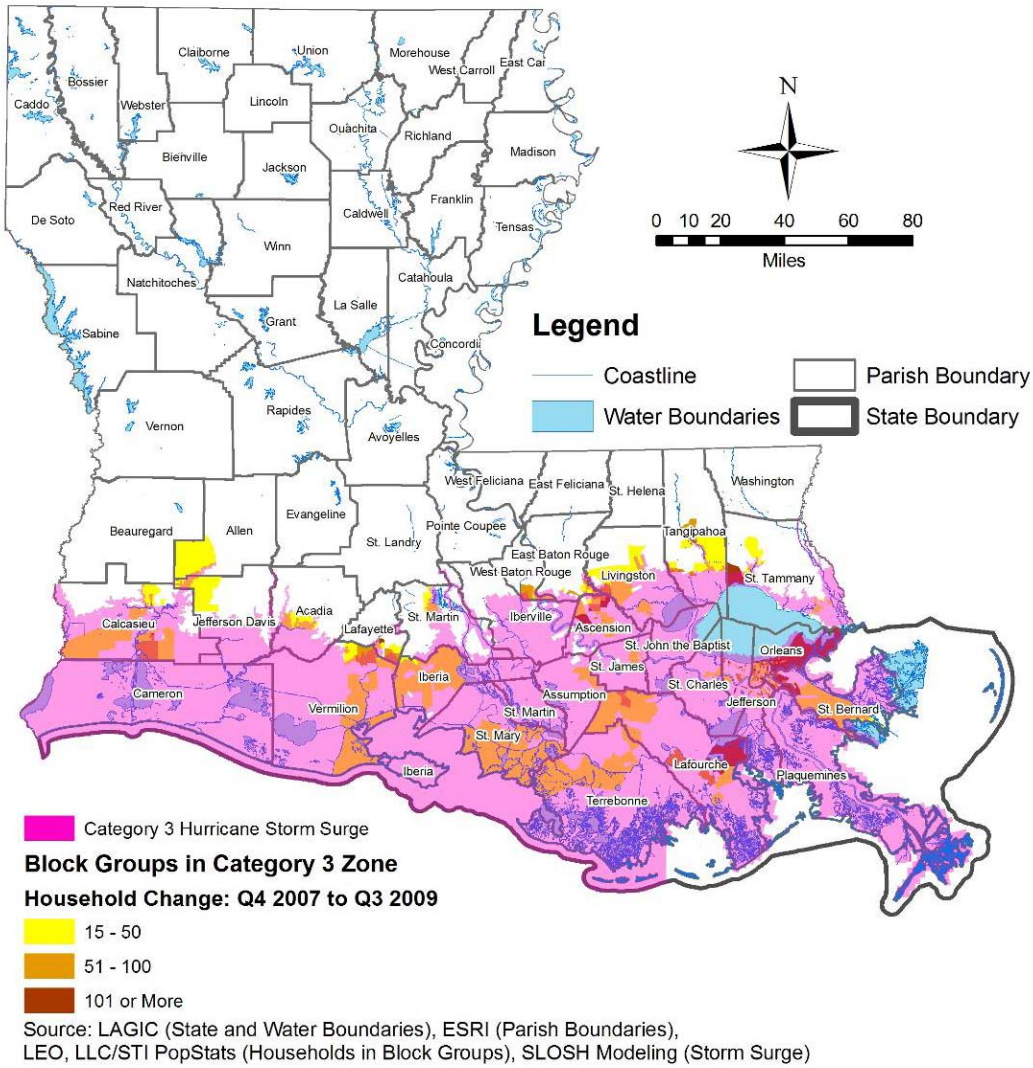


Recent Growth and Storm Surge

The estimate of recent HH growth shows overlap with Category 3 surge-risk zone (Map 5-15) in virtually every high-growth block group south of I-10 west of Baton Rouge, and south of I-12 to the east of it. As noted above, this result does not indicate that all new development in this part of the state is projected to be within the surge-risk zone, and along the boundary of the surge-risk zone some block groups showing significant recent development only partially overlap the Category 3 surge-risk zone.

Regardless of these caveats, many high-growth block groups are entirely within the Category 3 surge-risk zone, including many of the state's significant population and economic centers. It should be noted that many rapidly growing areas typically considered as "high ground" fall within the surge-risk zone, including much of the Northshore and parts of suburban Lafayette and Baton Rouge. The vast expanse of storm surge risk across the southern part of the state reinforces the need for continued vigilance regarding surge mitigation strategies in South Louisiana.

Map 5-15: Recent High-Growth Areas and Storm Surge Risk

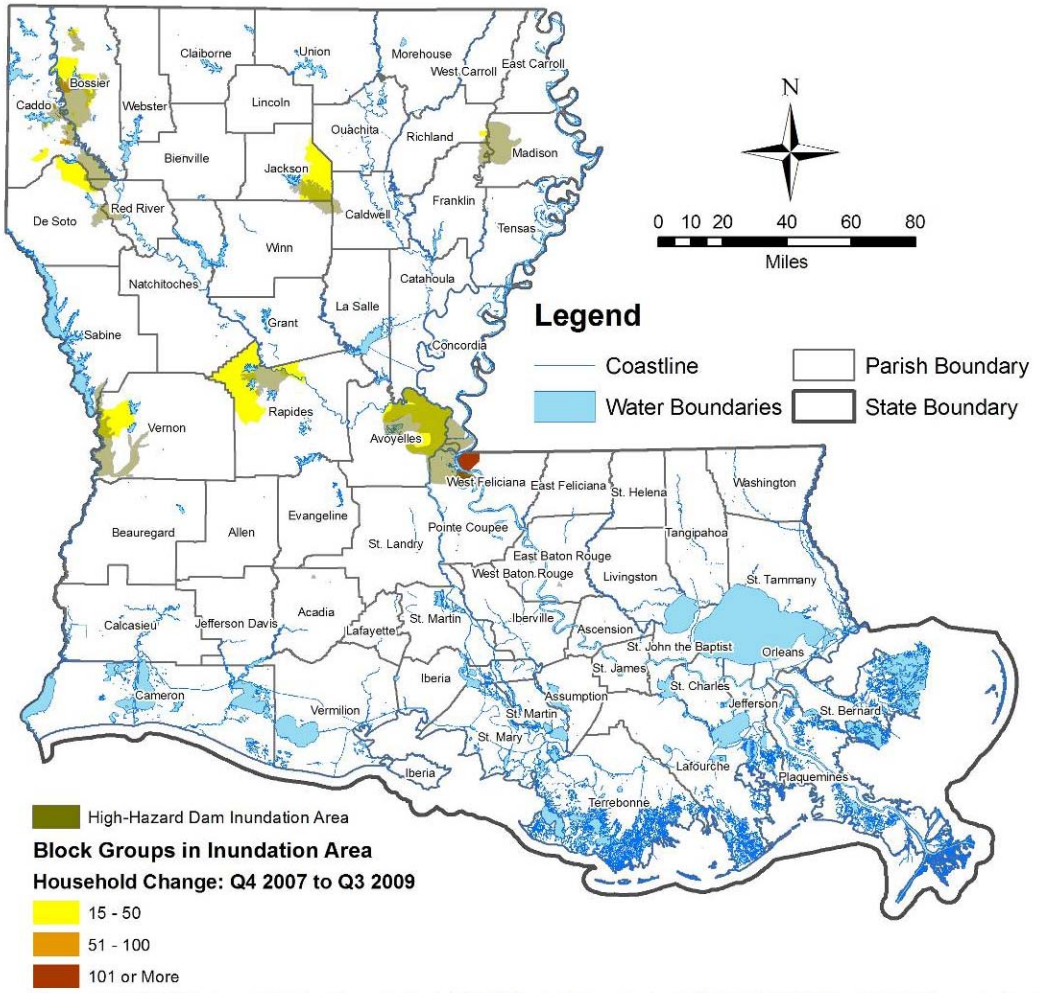


Recent Growth and Dam Failure

The estimates of recent HH growth shows limited overlap with inundation areas below high-hazard dams (Map 5-16). As noted above, results of this analysis do not indicate that all recent development in these parts of the state is projected to be within the inundation areas, only that these block groups have some overlap with the inundation areas. There appear to be many cases in which new development has avoided the inundation areas.

The greatest exposure of recent high-growth areas is concentrated in the north, central, and western parts of the state. In these areas, continued vigilance regarding flood mitigation and evacuation preparedness related to potential dam failure is appropriate.

Map 5-16: Recent High-Growth Areas and Dam Failure Risk



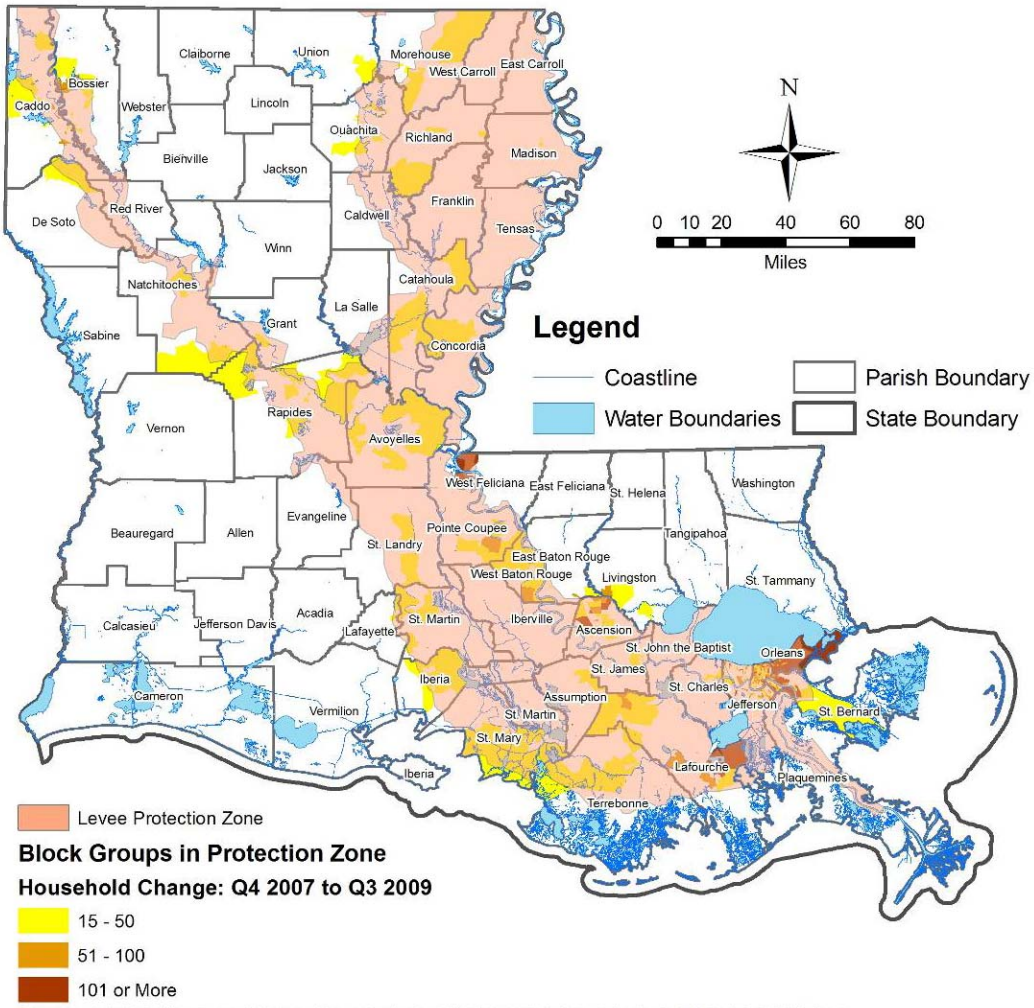
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LEO, LLC/STI PopStats (Households in Block Groups), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

Recent Growth and Levee Failure

The estimate of recent HH growth shows overlap with the levee protection zone (Map 5-17) in a wide swath of high-growth block group along the Red, Mississippi, Atchafalaya, and Ouachita rivers, as well as south of Lake Pontchartrain. As noted above, the this result does not indicate that all new development in these areas is projected to be within the levee protection zone, and along the boundary of the levee protection zone some block groups showing significant recent development only partially overlap risk areas. There are likely many cases in which new development has been sited outside levee protection zone.

However, unlike the SFHA, the levee protection zone is not formally mapped, so development should not be expected to deliberately avoid it. Every major metropolitan area in Louisiana – save for Lake Charles – shows significant recent HH growth in areas within the levee protection zone. This result reinforces the need for continued vigilance regarding flood mitigation strategies and specialized levee strategies along major rivers across the state.

Map 5-17: Recent High-Growth Areas and Levee Failure Risk



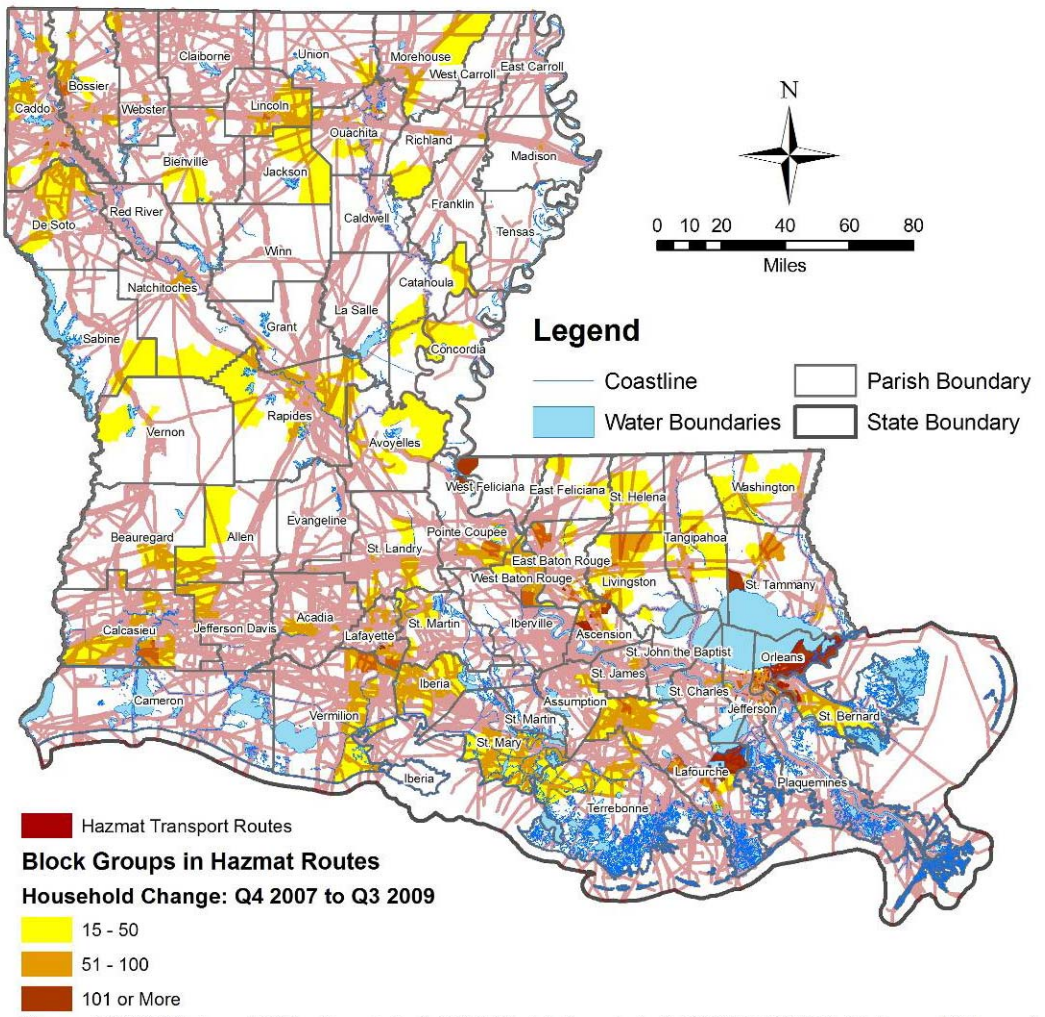
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LEO, LLC/STI Pop Stats (Households in Block Groups), US Army Corps of Engineers National Levee Database (Protection Zone)

Recent Growth and Hazardous Materials Incident

The estimate of recent HH growth shows overlap with hazmat risk (Map 5-18) in virtually every high-growth block group. Whereas most land in Louisiana is in close proximity to a highway, rail, or water transport route, this result is not unexpected. As noted above, the this result does not indicate that all new development is projected to be within hazmat risk areas, only that virtually all high-growth block groups have some overlap with them. There may be cases in which recent development has been sited so as to avoid such areas.

However, land in Louisiana is generally exposed to risks associated with the transport of hazardous materials, and most projected recent high-growth block groups in Louisiana are in and around urban areas, which have the greatest concentration of transportation infrastructure and thus create the highest exposure. This result reinforces the need for continued vigilance regarding hazmat mitigation and evacuation strategies across the state, and particularly in urban and suburban areas.

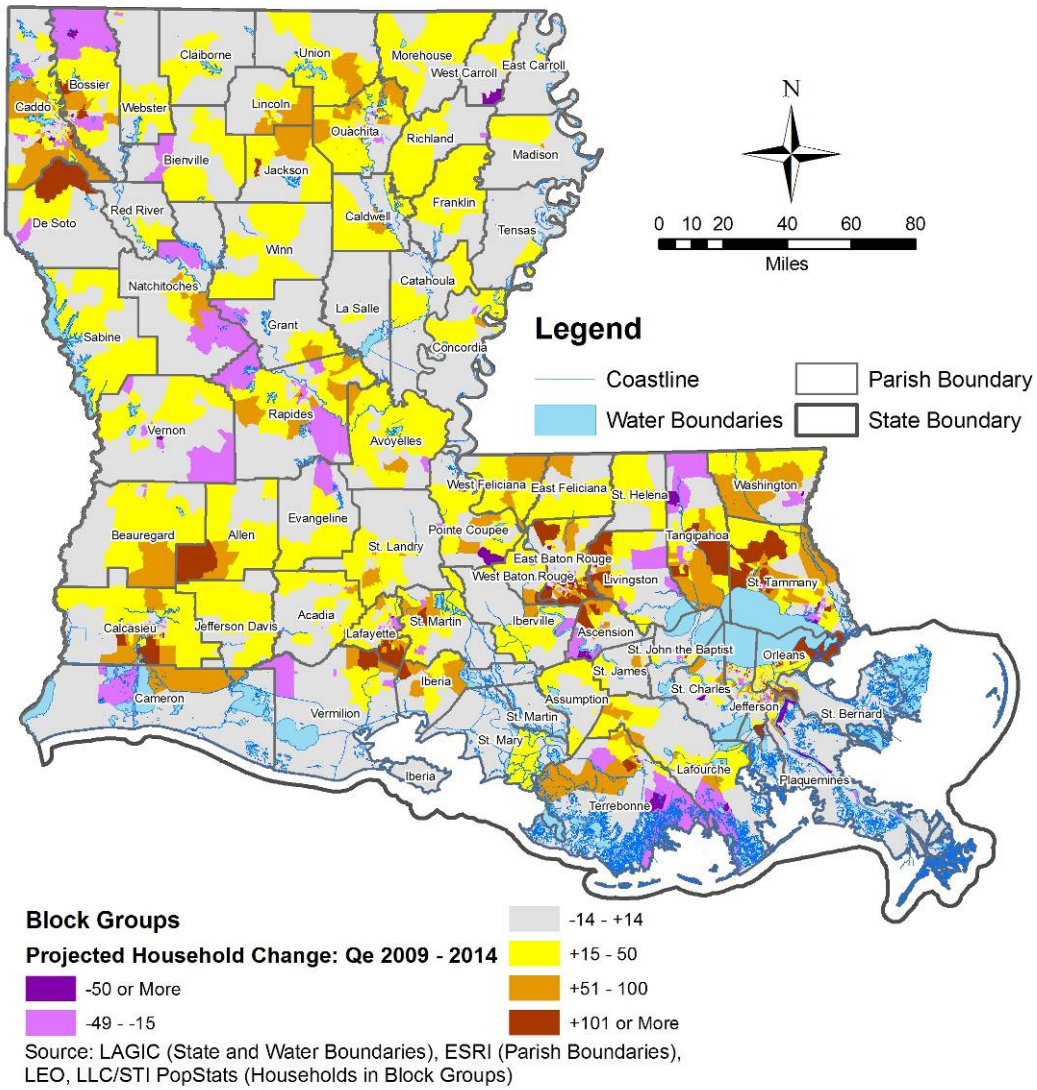
Map 5-18: Recent High-Growth Areas and Hazmat Risk



Five-Year Projected Development and Risk

As described in the methodology above, 5-year projected HH change has been mapped by block group, allowing a visual identification of areas projected to have the highest absolute increased in new residential construction. Map 5-19 shows these results. As with the period of 2007-09, growth is forecast to continue to be clustered in metro Baton Rouge, Lafayette, Houma-Thibodaux, Lake Charles, New Orleans, as well as around Shreveport and Monroe. In particular, the I-12 corridor from Baton Rouge through the Northshore is shown as an area of concentrated new development. In all cases, suburban areas are projected to see faster growth than urban areas.

Map 5-19: 5-Year Projected Future Development (Q3 2009 – 2014)



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LEO, LLC/STI PopStats (Households in Block Groups)

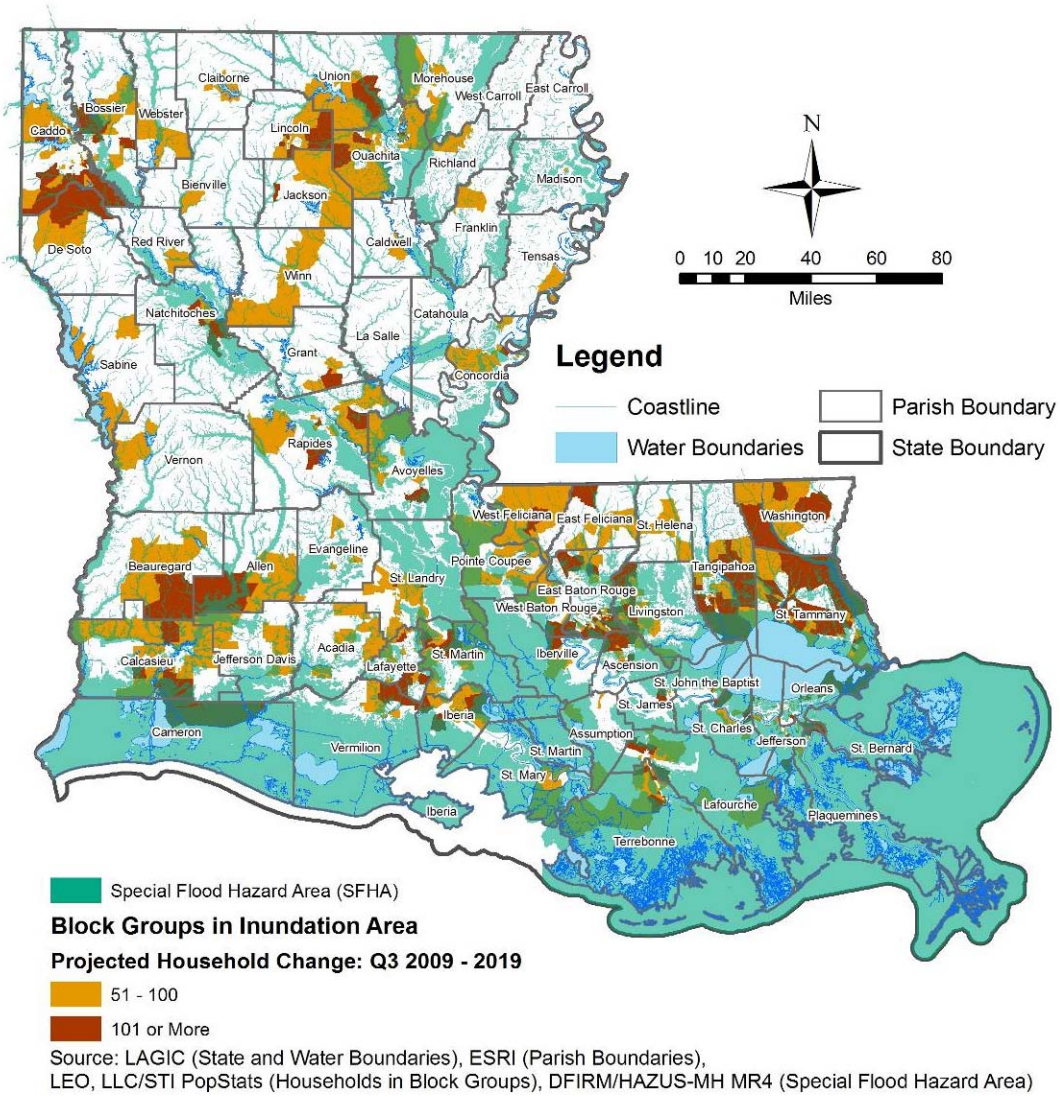
For hazard analysis of 5-year growth below, only block groups showing projected growth of more than 50 HHs were isolated. This is unlike the recent growth analysis above, which shows smaller increases because the time-span being analyzed is shorter.

Projected Growth and Flood

The 5-year projection of HH growth shows overlap with the SFHA (Map 5-20) in virtually every high-growth block group. Whereas most land in Louisiana is in close proximity to the SFHA, this result is not unexpected. As noted above, the this result does not indicate that all new development is projected to be within the SFHA, only that virtually all high-growth block groups have some overlap with the SFHA. There may be cases in which new development would be projected to avoid the SFHA.

However, land in Louisiana is generally flood-prone, and many high-growth block groups – especially in the extreme southern part of the state, including in Cameron, St. Mary, Terrebonne, Lafourche, Orleans, St. Bernard, and other parishes – lie almost entirely within the SFHA. This result reinforces the need for continued vigilance regarding flood mitigation strategies across the state, and particularly in South Louisiana.

Map 5-20: 5-Year Projected High-Growth Areas and Flood Risk



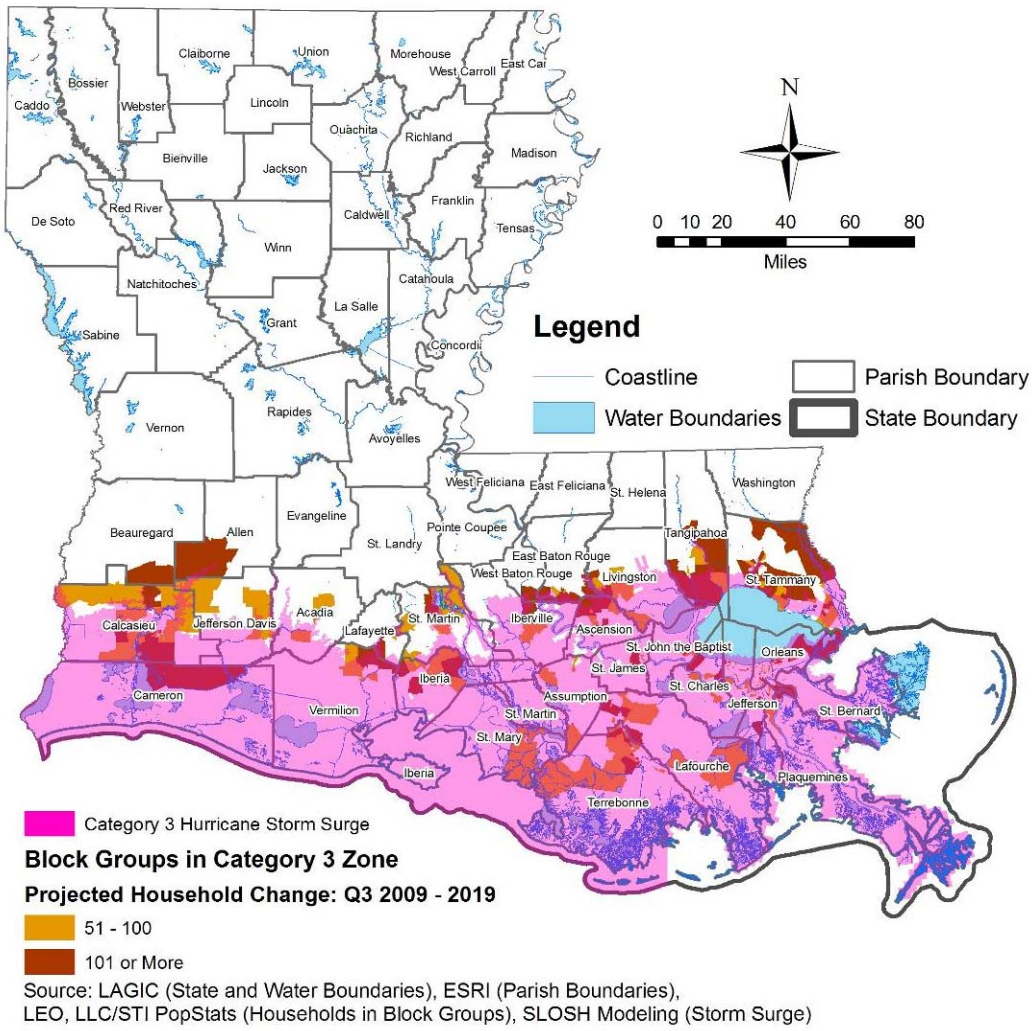
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LEO, LLC/STI PopStats (Households in Block Groups), DFIRM/HAZUS-MH MR4 (Special Flood Hazard Area)

Projected Growth and Storm Surge

The 5-year projection of HH growth shows overlap with Category 3 surge-risk zone (Map 5-21) in virtually every high-growth block group south of I-10 west of Baton Rouge, and south of I-12 to the east of it. As noted above, the this result does not indicate that all new development in this part of the state is projected to be within the surge-risk zone, and along the boundary of the surge-risk zone some block groups showing significant projected development only partially overlap the Category 3 surge-risk zone.

Regardless of these caveats, many high-growth block groups are entirely within the Category 3 surge-risk zone, including many of the state's significant population and economic centers. It should be noted that many rapidly growing areas typically considered as "high ground" fall within the surge-risk zone, including much of the Northshore and parts of suburban Lafayette and Baton Rouge. The vast expanse of storm surge risk across the southern part of the state reinforces the need for continued vigilance regarding surge mitigation strategies in South Louisiana.

Map 5-21: 5-Year Projected High-Growth Areas and Storm Surge Risk



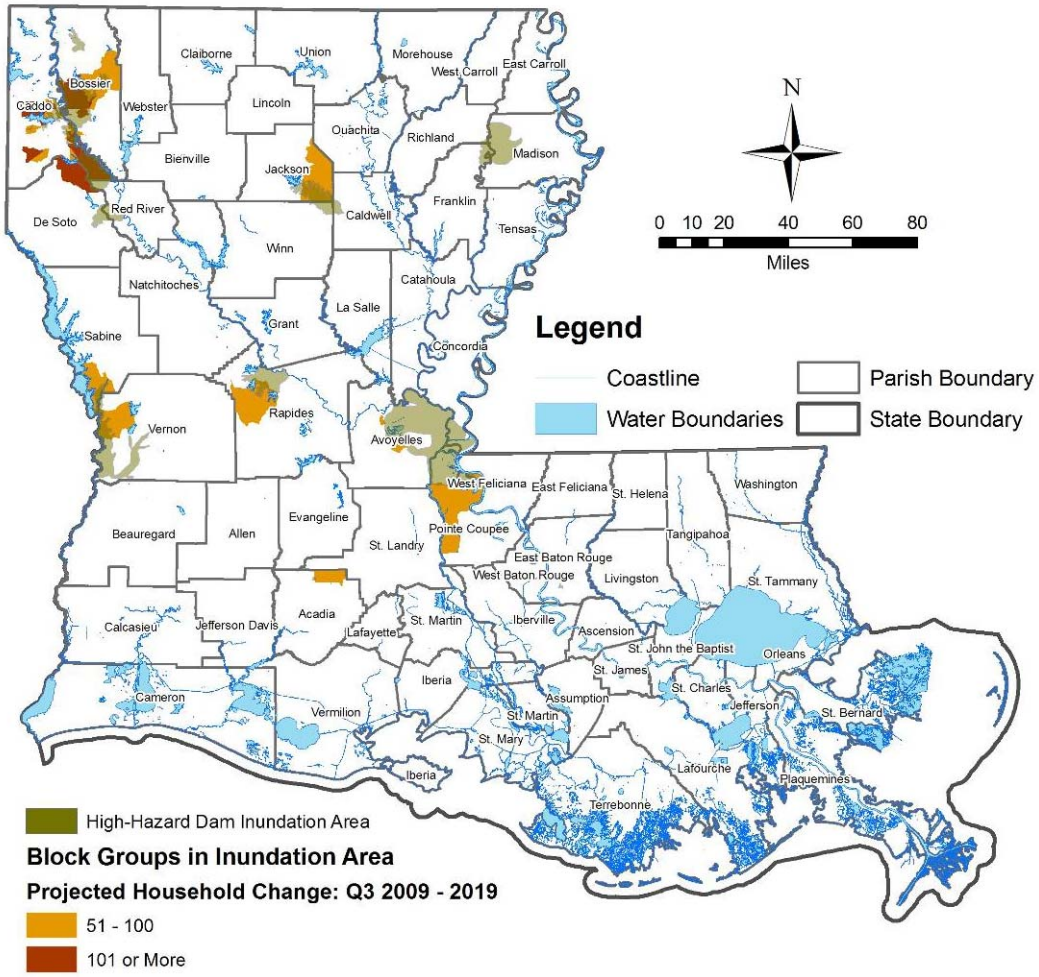
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LEO, LLC/STI PopStats (Households in Block Groups), SLOSH Modeling (Storm Surge)

Projected Growth and Dam Failure

The 5-year projection of HH growth shows limited overlap with inundation areas below high-hazard dams (Map 5-22). As noted above, results of this analysis do not indicate that all new development in these parts of the state is projected to be within the inundation areas, only that these block groups have some overlap with the inundation areas. There appear to be many cases in which new development would be projected to avoid the inundation areas.

Exposure of projected high-growth areas to dam risk is concentrated almost exclusively in the Bossier-Shreveport area. In this area, continued vigilance regarding flood mitigation and evacuation preparedness related to potential dam failure is appropriate.

Map 5-22: 5-Year Projected High-Growth Areas and Dam Failure Risk



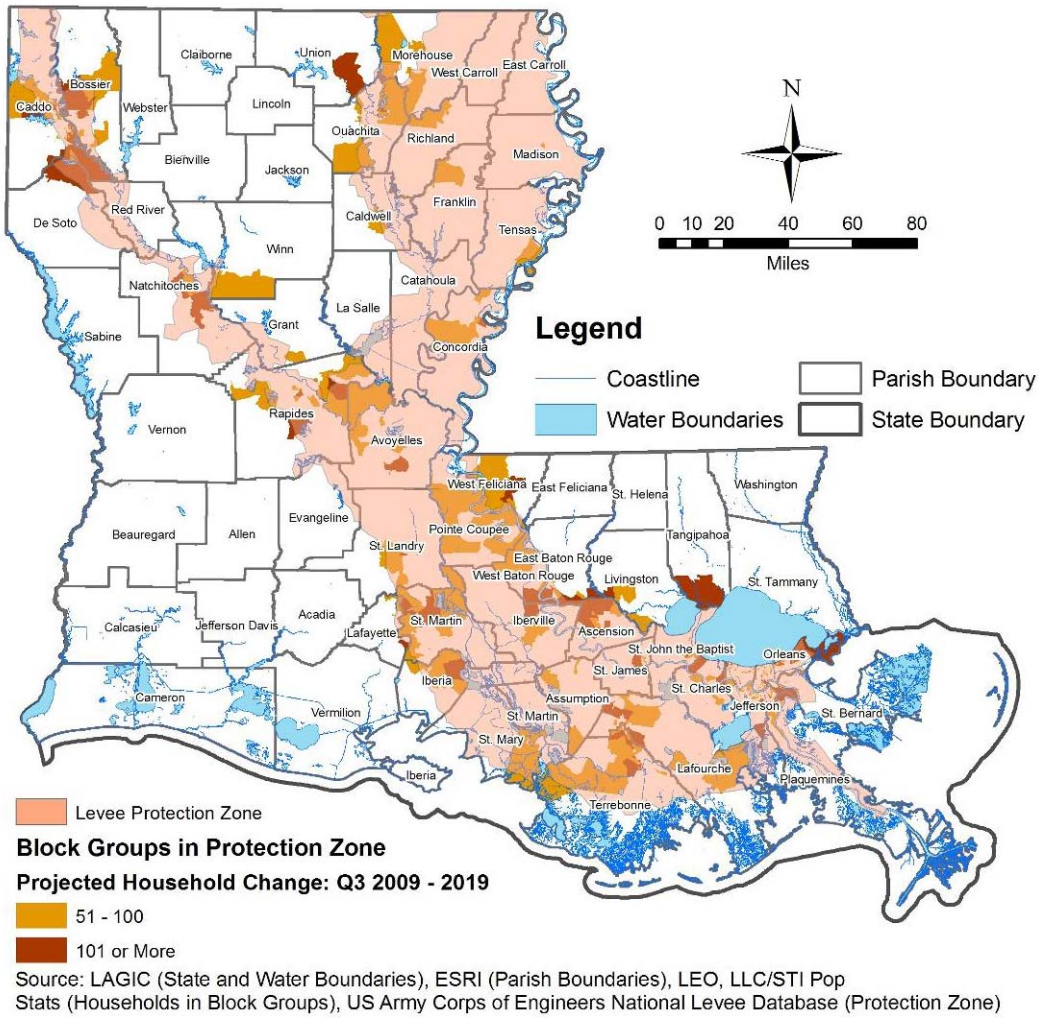
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LEO, LLC/STI PopStats (Households in Block Groups), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

Projected Growth and Levee Failure

The 5-year projection of HH growth shows overlap with the levee protection zone (Map 5-23) in a wide swath of high-growth block group along the Red, Mississippi, Atchafalaya, and Ouachita rivers, as well as south of Lake Pontchartrain. As noted above, the this result does not indicate that all new development in these areas is projected to be within the levee protection zone, and along the boundary of the levee protection zone some block groups showing significant recent development only partially overlap risk areas. There are likely many cases in which new development has been sited outside levee protection zone.

However, unlike the SFHA, the levee protection zone is not formally mapped, so future development should not be expected to deliberately avoid it. Every major metropolitan area in Louisiana – save for Lake Charles – is projected to see significant future HH growth in areas within the levee protection zone. This result reinforces the need for continued vigilance regarding flood mitigation strategies and specialized levee strategies along major rivers across the state.

Map 5-23: 5-Year Projected High-Growth Areas and Levee Failure Risk



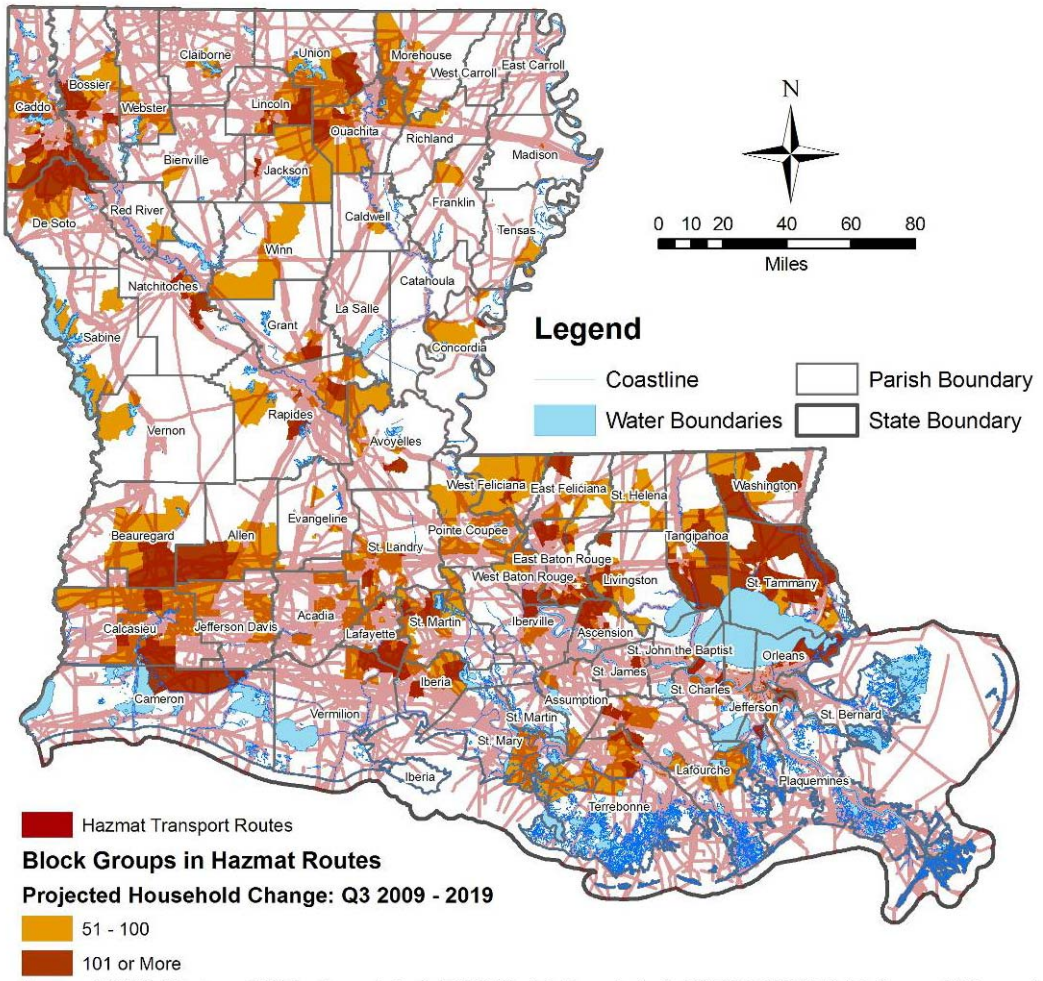
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LEO, LLC/STI Pop Stats (Households in Block Groups), US Army Corps of Engineers National Levee Database (Protection Zone)

Projected Growth and Hazardous Materials Incident

The 5-year projection of HH growth shows overlap with hazmat risk (Map 5-24) in virtually every high-growth block group. Whereas most land in Louisiana is in close proximity to a highway, rail, or water transport route, this result is not unexpected. As noted above, the this result does not indicate that all new development is projected to be within hazmat risk areas, only that virtually all high-growth block groups have some overlap with them. There may be cases in which new development would be projected to avoid such areas.

However, land in Louisiana is generally exposed to risks associated with the transport of hazardous materials, and most projected high-growth block groups in Louisiana are in and around urban areas, which have the greatest concentration of transportation infrastructure and thus create the highest exposure. This result reinforces the need for continued vigilance regarding hazmat mitigation and evacuation strategies across the state, and particularly in urban and suburban areas.

Map 5-24: 5-Year Projected High-Growth Areas and Hazmat Risk



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Railways, Highways), LEO, LLC/STI PopStats (Households in Block Groups), HSIP (Pipelines), Techni-Graphic Systems, Inc (Waterways

5.15.3 Conclusions

Analysis of recent and future development in Louisiana demonstrates that the state faces many significant hazards that are widespread and which carry significant risk. Some exposure can be avoided or reduced through careful siting, zoning, or other geographical/topographical considerations, but in many cases, hazards are sufficiently widespread that new growth cannot help but create new exposure.

Mitigation strategies, as described in Section Eight, must therefore be an integral part of all new development in Louisiana. Exposure to new hazards need not result in increased risk, if mitigation strategies are deployed so as to manage vulnerability.

5.16 Social Vulnerability

The hazard-specific and composite risk assessments in Sections 5.4 through 5.14 quantify and categorize the State of Louisiana's 64 parishes in terms of each jurisdiction's risk relative to the eleven identified hazards. However, much of the criteria used in this evaluation favors parishes that are heavily urbanized, densely populated, and possess a greater concentration of tangible assets. As vulnerable as these parishes may be, they frequently also benefit from the human, physical, and political/legal infrastructure necessary to build more powerful lines of defense against major disaster occurrences. Conversely, parishes that lack such support are frequently rural, remote, sparsely populated, and lacking in aggregate wealth. These composite risk assessments do take certain steps to remove this inherent bias, such as taking crop losses as a variable in order to register damages to rural areas. Without diminishing the importance of Louisiana's urban areas, techniques like the Social Vulnerability Index (SoVI)[6] may help correlate potential resources and capabilities with exposure to hazards.

The concept of social vulnerability evolved in the 1970s as a response to the increasing visibility of concentrated loss of life following natural disasters in developing countries. More recent research has been focused on examining geographic and biophysical hazards with consideration of social vulnerabilities to provide a better understanding of the risks posed to certain locations.

Among the most critical topics that SoVI addresses are the following:

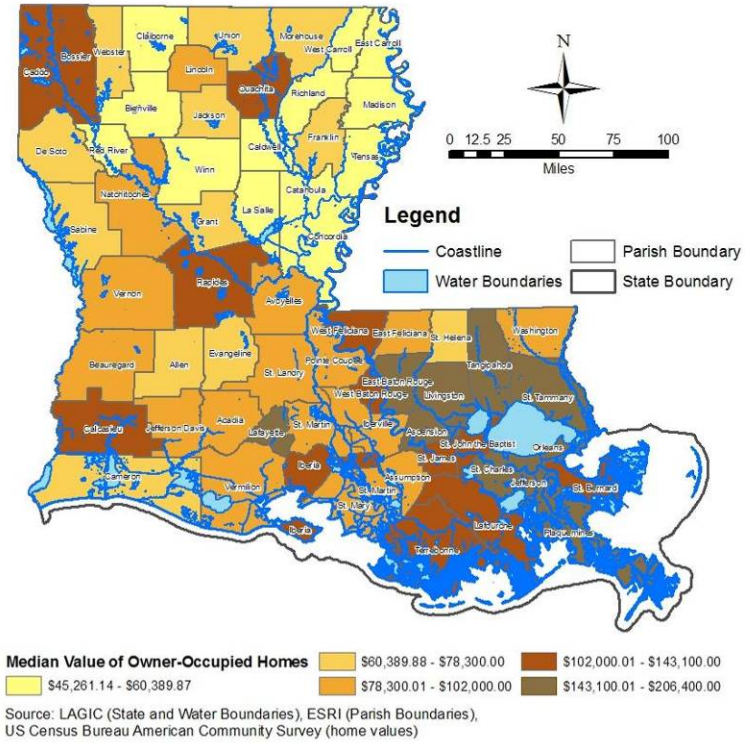
- Rural/Urban Population
- Racial/Ethnic Composition
- Poverty and Median Income Levels
- Concentration of Certain Industries (Manufacturing, Trade, Agriculture, Services)
- Presence of Young Children and Senior Citizens
- Labor Force Participation and Unemployment
- Cost of Housing (Both Rental and Owner-Occupied)
- Education Levels of Population

For Louisiana, data is available via the US Census that can be used to illustrate the geographic distribution of these demographic elements. Maps 5-26 and 27 are two examples, including Median Home Values and Poverty Levels for Louisiana Parishes respectively.

Available census data can also be used to identify parishes that are either significantly above statewide averages as a whole (high outliers) or significantly below (low outliers) (see Table 5.15). Through this composite scan of high and low outliers, one can construe that certain parishes rank strongly on variables that would suggest a low level of social vulnerability, whereas other parishes rank strongly on variables that indicate a high level of social vulnerability.

[6] The initial SOVI™ methodology and results for 1990 were originally published in: S. L. Cutter, B. J. Boruff, and W. L. Shirley 2003. "Social Vulnerability to Environmental Hazards," Social Science Quarterly 84 (2): 242-261.

Map 5-25: Median Home Values for Louisiana Parishes



Map 5-26: Poverty Levels for Louisiana Parishes

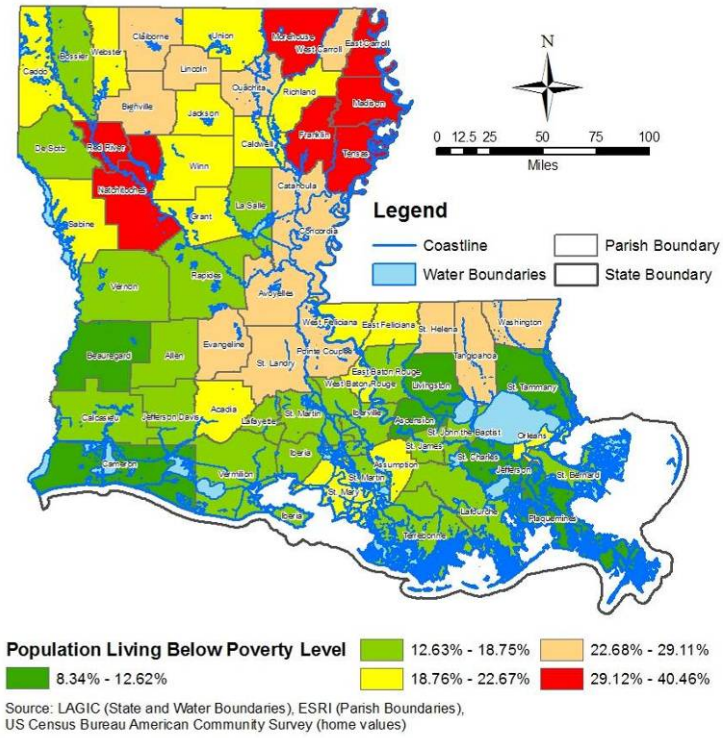


Table 5.16: High and Low Outliers among Representative SoVI Variables

SoVI Variable	Extreme High Outliers	Extreme Low Outliers
Percent Urban Population	East Baton Rouge, Jefferson, Orleans, St. Bernard	Caldwell, Cameron, Catahoula, Grant, St. Helena, Tensas, West Carroll, West Feliciana (0% urban)
Percent Rural Farm Population	Franklin, St. Helena, West Feliciana	East Baton Rouge, Jefferson, Orleans, St. Bernard
Land in Farms as a Percent of Total Land	East Carroll, Franklin, Richland, West Carroll	Orleans, St. Charles (0% in farms)
Percent Female	Orleans, Richland	Allen, East Feliciana, St. Bernard, West Feliciana
Percent of Population Under 5 Years Old	Ascension, Madison, Vernon	St. Bernard, West Feliciana
Percent of Population Over 65 Years	Bienville, Claiborne, Franklin, Jackson, Union, Webster	Ascension, Livingston, St. Charles, St. John the Baptist, West Feliciana
Median Age	Jefferson, Sabine, Webster	Lincoln, Madison, Natchitoches, St. Bernard, Vernon
Percent of Housing Units that are Mobile Homes	Catahoula, De Soto, East Feliciana, Sabine, St. Helena	Caddo, East Baton Rouge, Jefferson, Orleans, St. Tammany
Percent Renter-Occupied Housing Units	Caddo, Lincoln, Orleans, Vernon	Cameron, Catahoula, La Salle, St. Helena, St. James
Median Dollar Value of Owner-Occupied Housing	Jefferson, Orleans, Plaquemines, St. Tammany	Catahoula, East Carroll, Winn
Median Rent (in Dollars) for Renter-Occupied Housing Units (Median Gross Rent)	Jefferson, Orleans, Plaquemines, St. Tammany	Catahoula, Claiborne, Concordia, De Soto, East Carroll, Tensas
Percent of the Population Participating in the Labor Force	Ascension, East Baton Rouge, Lafayette	East Carroll, West Feliciana, Winn
Percent of Civilian Labor Force that is Unemployed	East Feliciana, Franklin, Lincoln, Orleans, Richland	Cameron, Lafourche, Livingston, St. Landry, Terrebonne, Vermilion
Percent of Households Earning More than $100,000	Ascension, East Baton Rouge, Lafourche, Plaquemines, St. Charles, St. Tammany	Bienville, Concordia, East Carroll, Madison, Red River
Percentage Social Security Recipients out of All Households	Claiborne, Sabine, St. Landry	Ascension, Lafayette, Livingston, Vernon, West Feliciana
Percent Living in Poverty	East Carroll, Franklin, Madison, Natchitoches, Tensas	Ascension, Livingston, Plaquemines, St. Charles, St. Tammany
Percent Female Headed Households, No Spouse Present	Caddo, East Carroll, Madison, Orleans	Ascension, Beauregard, Cameron, Vernon
Percent of Population 25 Years or Older with no High School Diploma	Catahoula, East Carroll, West Carroll, West Feliciana	Ascension, Bossier, East Baton Rouge, St. Tammany

Currently, the risk assessment in Section Five of this Plan Update does not incorporate social vulnerability. The main reason is the demographic dynamics that Louisiana has experienced in the 2000's. For example, variation in population in some parishes during this period can be as extreme as decreases of more than 40 percent and increases greater than 30 percent. Similar extreme variations can be found in all categories that would comprise the social vulnerability aspects of the state.

As a result, the decision was made to not incorporate interim census results at this time (e.g., US Census Bureau's one-year 2008 American Community Survey (ACS), or the three-year 2006-08 ACS) and wait until results of the full 2010 US Census are available to incorporate as part of future plan updates. On-going work with the Community Education and Outreach Project includes further development of this aspect of long-term planning in the State as well. A more detailed description of the employment of SoVI, as well as a complete list of the variables used in data assessment, can be found in Appendix E-17.

5.17 Notes on Data Limitations

As has been noted in several instances in this section and in Section Four, hazard identification and risk assessments performed at this time cannot be as robust as hoped, due to data limitations (see detailed descriptions at the end of Appendices E-4 through E-15).

In many cases, newer and much improved data will be available soon. In other cases, this Plan Update's action plan (see Section Eight) will describe methods for improving data collection, maintenance, and distribution, as well as creating consistent hazard mitigation goals, hazard definitions, risk assessment methodologies, and loss estimation methodologies.

Using the best data and tools available, all future efforts will concentrate on producing risk assessment results that can be expressed in terms of *monetized, annualized risk*, which is an *absolute* metric. Currently, the Plan Update uses a variety of *relative* metrics to express risk. This means comparisons cannot easily made between hazards.

An absolute metric also has the advantage of providing a meaningful framework for integrating local and state HMPs, because if the state and parishes run their risk assessments using consistent data and methodologies, the outcomes should be consistent. If local and state calculations were to produce different results, both sides' data and methodologies could be examined for errors and/or different interpretations, and the variance corrected. This would be a major improvement over the current system, in which, for example, a parish's "high" risk assessment and the state's "low" risk assessment for the same hazard may both be defensible.

Producing agreed-upon definitions, data, methodologies and metrics cannot be rushed. Whereas the data and methodologies employed in this process will directly affect mitigation funding, the more defensible the process is and the more buy-in it has, the greater efficacy it will have upon implementation.

Building good data and methodology will require technical review from experts in various risk-related fields, as well as consensus-building with GOHSEP, state agencies, and local jurisdictions. The SHMPC has therefore designated certain members of the SHMP Advisory Board as technical reviewers. These are mainly academics and scientists, both in the public and private sectors. In an ongoing capacity, they will be examining the data and methodologies the SHMP has thus far used for risk assessment, and proposing improvements.

5.18 Summary

Risk and vulnerability assessments are best conducted on an asset-specific basis, something that is not possible given the scope of the Plan Update. Due to this, the results of the risk assessments should be considered general in nature and accurate primarily by parish, relative to assessments of risk within the same hazard category, and secondarily between different hazards, according to the frequency with which hazards are treated in parish and municipal HMPs.

The various hazard analyses that comprise this risk assessment used different bases and focused on available information to try to draw useful conclusions. The major hazards in the State, in the opinion and experience of GOHSEP and the SHMPC are flooding and high winds (usually due to hurricanes and tropical storms). While the results of these analyses provide useful insights into the potential for damages due to the other hazards, nothing in the results changes the standing priority of the State to address the numbers of repetitive loss properties and to limit the damaging effects of tropical storm events.

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Section Six
Risk Assessment for State-Owned Assets

Contents of this Section

6.1 Interim Final Rule Requirement for Risk Assessment for State-Owned Assets
6.2 Introduction
6.3 Methodology
6.4 Flood
6.5 Hailstorm
6.6 High Wind (Hurricane)
6.7 High Wind (Tornado)
6.8 Ice Storm
6.9 Storm Surge
6.10 Subsidence
6.11 Wildfire
6.12 Dam Failure
6.13 Levee Failure
6.14 Hazardous Materials Incident
6.15 Summary
6.16 Critical Infrastructure Risk Assessment

6.1 Interim Final Rule Requirement for Risk Assessment for State-Owned Assets

The Interim Final Rule (IFR) includes two specific requirements regarding risk assessments for State-owned assets:

- Vulnerability Assessment per Requirement §201.4(c)(2)(ii): "[The State risk assessment shall include an] overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), …State-owned critical or operated facilities located in the identified hazard areas shall … be addressed."
- Estimated Losses per Requirement §201.4(c)(2)(iii): "[The State risk assessment shall] estimate the potential dollar losses to State-owned or operated buildings, infrastructure and critical facilities located in the identified hazard areas."

Note: Portions of these same provisions were also cited in Section Five as the IFR Requirements for the Statewide Risk Assessment.

6.2 Introduction

This section focuses primarily on state-owned buildings and infrastructure. Sections 6.4 through 6.15 contain hazard vulnerability assessments and loss estimates for State-owned buildings, a subset of which can be considered critical facilities. Section 6.16 contains the risk assessments and loss estimates for critical infrastructure. The risk assessments for all identified State-owned assets in Louisiana were prepared for the hazards listed below:

- Flood
- Hailstorm
- High Wind (Hurricane)
- High Wind (Tornado)
- Ice Storm
- Storm Surge
- Subsidence
- Wildfire
- Dam Failure
- Levee Failure
- Hazardous Materials Incident

Introductory maps (Maps 4-1, 6-1 and 6-2) are provided as a reference for the analysis of these hazards. Map 4-1 (see page I-27) shows the State of Louisiana and the political boundaries for the individual parishes. The locations of State-owned buildings in the State of Louisiana are presented on Map 6-1. Tables 6.1 and 6.2 reflect the ranking of State-owned buildings in the State of Louisiana.

Section 6.3 contains information regarding the assignation of criticality to the various state-owned buildings. A general overview of the hazard vulnerability assessment and loss estimation methodologies, combined loss estimate results for all eleven hazards, and hazard vulnerability assessments and loss estimate results for each hazard, are presented in the sections that follow. Detailed hazard vulnerability assessments and loss estimates for each of the eleven hazards, along with related maps and tables, are presented in Volume II, Appendix F. Note that hailstorm has been added to this section as part of the 2011 Update. Table 6.4 in Section 6.3 includes additional information regarding the changes made to the methodologies, including data sources, as part of the 2011 Update.

Section 6.15 includes a summary of combined loss estimates for State-owned buildings and limitations regarding the use of these results.

Section 6.16 contains the results of the hazard vulnerability assessments and loss estimates for state-owned bridges. The data currently available does not allow for a more detailed analysis of infrastructure vulnerability. However, the risk assessments contained within Section 5, which consider relative risk between the various parishes to the eleven hazards, take infrastructure vulnerability into consideration wherever possible.

6.3 Methodology

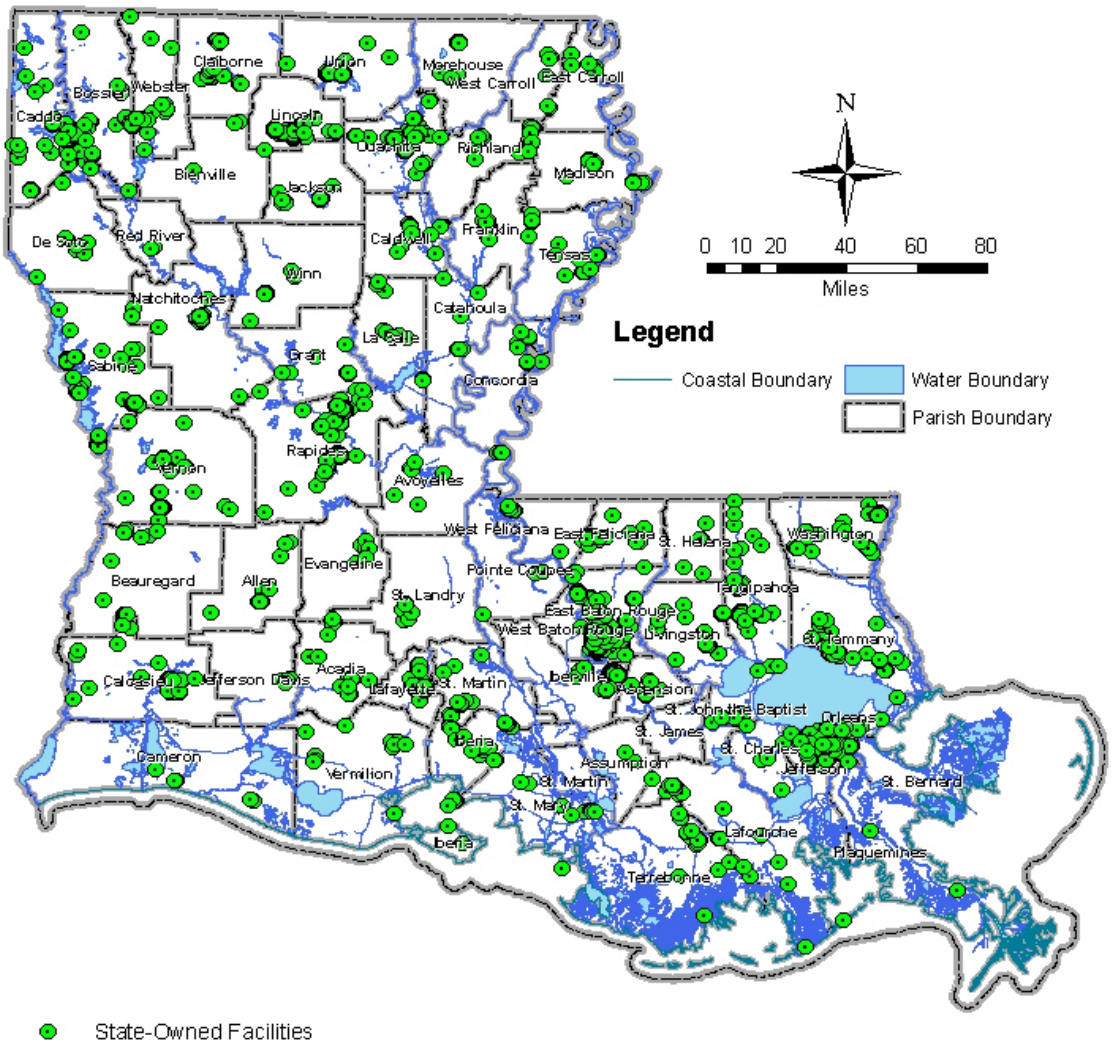
The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and the State Hazard Mitigation Planning Committee (SHMPC) undertook the risk assessment for State-owned buildings in three stages:

- Assignation of Criticality
- Vulnerability Assessment
- Loss Estimation

Identification of Critical Facilities

The State of Louisiana maintains a database of State-owned buildings ranging from structures as large as the Superdome in New Orleans to individual shelters in state parks. The attributes in the database include the move-in date, responsible state agency, size, value, location and some use information for the buildings. The total number of buildings included in the database is 8,612. The general locations of these buildings are shown in Map 6-1.

Map 6-1: State Owned Buildings



Source: ESRI (Parish and Water Boundaries), ORM (State-Owned Facilities 2010)

GOHSEP and the SHMPC determined that it was impractical to perform a risk assessment for the entire list for two reasons:

1. The list includes a large number of buildings that do not play a critical role in the operation of the State. It was assumed that damage or loss of use for these buildings would not endanger the citizens of Louisiana or adversely affect the economic stability of the State.
2. There is only so much that can be done in any set amount of time. For State Hazard Mitigation Plans, the relevant planning horizon is three years; the time interval between updates required by the Disaster Mitigation Act of 2000 (DMA 2000). In any three-year period, GOHSEP and other state agencies will only reasonably be able to address hazard mitigation issues for a fraction of the total number of buildings.

Therefore, GOHSEP and the SHMPC decided to use the *building use* information in the database to identify the State-owned buildings that are "critical facilities". The process by which GOHSEP and the SHMPC identified these critical facilities involved development and application of definitions of "criticality", through a series of workshops and meetings with several state agencies. This work provided definitions that became the basis for a ranking system for State-owned buildings that placed the highest priority on facilities such as emergency services, hospitals, and shelters. The different levels that were developed by GOHSEP under this study are shown in Table 6-1, and in Map 6-2. Representatives from various state agencies were invited to review the initial results of a draft criticality ranking and provide their input. Additional information on these workshops and meetings can be found in Appendix F, as well as Section Three and Appendix C

Table 6-1: State-Owned Buildings Criticality Level Descriptions

Criticality Level	Description
Level 1 – High Importance	Public safety buildings and facilities (Police, Fire, EMS, EMA/EOC), shelters, hospitals, urgent care centers, and other facilities that MUST remain operational during a disaster event to provide life safety measures and support.
Level 2 – Medium-High Importance	Buildings and facilities that provide essential government services and must be operational within 12 to 24 hours of a disaster. These facilities include pharmacies, pump houses, public works facilities, and facilities used for response/recovery operations (schools, airports, etc).
Level 3 – Medium Importance	Buildings and facilities that must be functional during recovery operations such as government administrative/management facilities and courthouses.
Level 4 – Medium-Low Importance	State buildings and facilities that must be operational for the restoration of normal living conditions. These facilities include college buildings, dorms, and cafeterias.
Level 5 – Low Importance	State buildings and facilities that support normal living, commerce, and tourism such as museums, vacation cabins, and service stations.

Applying the ranking system to the Facilities Management database resulted in the identification of 8,329 State-owned buildings that met one of these five descriptions. While not all of these facilities might be considered critical facilities, this methodology does allow the highest priority to be placed on those state-owned buildings with the highest assigned criticality.

Table 6-2 shows the numbers of State-owned buildings per criticality ranking. Map 6-2 illustrates the locations of these buildings.

Table 6-2: Number of State-Owned Buildings by Criticality Ranking

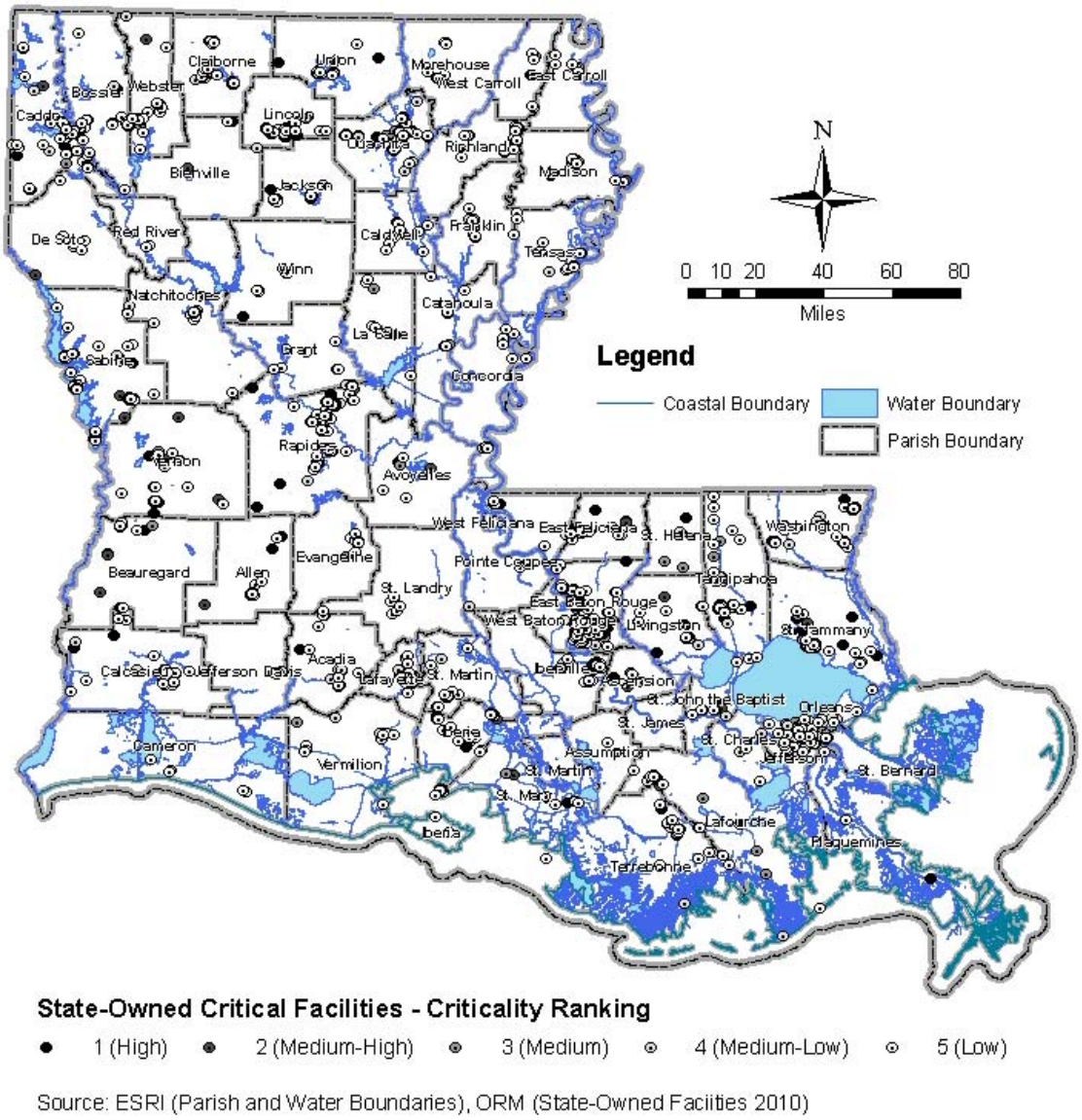
Criticality Level	Number of Buildings
1 – High	1,391
2 – Medium High	526
3 – Medium	664
4 – Medium Low	2316
5 - Low	3432
Total	8,329

Vulnerability Assessment Methodology for State-owned Buildings

Hazard vulnerability assessments provide a means of indicating whether a given building in Louisiana is at a low, medium or high vulnerability to damage from a given hazard. Although there are a variety of potential hazards, the hazard vulnerability assessments for State-owned buildings, as well as the one for bridges, adopted the same general approach for the majority of the hazards. This general approach is outlined by the three-step methodology listed below:

- Step 1 – Review Hazard Profile Maps: The first step in the hazard vulnerability assessments was to review the hazard profile map for the hazard under consideration. The hazard profile maps helped identify and establish which parishes or areas in the State of Louisiana have historically been the most prone to a given hazard, and provided a useful means of establishing hazard vulnerability levels (Step 2). The hazard profile maps for each hazard may be found in Section Four of this plan.
- Step 2 – Establish Hazard Vulnerability Levels by Location: Using information from Step 1, two or more hazard vulnerability levels were established for State-owned buildings based on location. In general, structures located outside established hazard zones were designated as having a low hazard vulnerability level, while structures located within the established hazard zones were designated with a medium or high hazard vulnerability level. Certain hazards, such as levee and dam failure, designate only a low and high hazard vulnerability level due to data limitations. The basis for the medium and high distinctions is described for each hazard in the materials starting with Subsection 6.4. Some of hazards utilized information from the risk assessments in Section 5 for these analyses.
- Step 3 – Establish Hazard Vulnerability Levels using Additional Parameters if Needed: In some cases, the location of a building is not sufficient to specify a low, medium or high vulnerability level. For example, most of the State can experience hail from time to time. For these hazards, physical location is not as important in determining vulnerability as is the condition of the structure. In these situations, the next step was to establish additional parameters to make a more specific determination. Examples of parameters used to establish hazard vulnerability levels for certain hazards include the age of the structure relative to the adoption of an established building code or floodplain ordinance. The assumption is that in general terms, buildings constructed after the establishment of a building code or an ordinance is adopted have a lower hazard vulnerability level than those that were constructed before it was established, since the code or ordinance would require construction that is more resistant to these hazards.

Map 6-2: State Owned Buildings, Ranked



Loss Estimation Methodology for State-owned Buildings

Loss estimations are intended to provide a means of quantifying the potential dollar losses from a given hazard in terms of combined physical (building) damage, contents damage, and loss of function (LOF) costs. As described for the vulnerability assessment methodology above, although there are a variety of potential hazards, the loss estimations for State-owned buildings in Louisiana adopted the same general approach for all hazards. This general approach is outlined by the three-step methodology listed below.

- Step 1 – Estimate Damage Levels by Hazard Vulnerability Level: The first step in preparing loss estimates for individual structures was to establish a magnitude or level of damage from a given hazard. The two to three hazard vulnerability levels established by the hazard vulnerability assessment for each building

provided a useful indication of the potential levels of damage that may occur from a given hazard. In general, structures with a low hazard vulnerability level are expected to experience a low level of damage or no damage, structures with a medium hazard vulnerability level are subject to a moderate level of damage, and structures with a high hazard vulnerability level will likely experience a high level of damage. In addition, for some hazards, data provided in the hazard profiles (Section Four) and parish risk assessments (Section Five) was used to estimate potential design wind speeds or flood depths associated with a given hazard vulnerability level to estimate damage levels with greater accuracy.

- Step 2 – Assume an Average Building Type: Once the three damage levels were established, the next step was to assume an average building type to use as a basis for uniformly applying damage functions (Step 3) to individual State-owned buildings. An average building type was typically assumed based on Louisiana's Office of Risk Management data and experience with basic State-owned building types in various parts of Louisiana. Examples of average building types assumed for various loss estimates include using a single story structure without a basement for water-related hazards and using concrete and steel construction for wind-related hazards.
- Step 3 – Establish Damage Functions: The final step in preparing loss estimates was to establish a series of damage functions to estimate physical damage, contents damage, and LOF costs associated with a given hazard. For some hazards, additional parameters were considered as a proxy for physical damage. For example, the wildfire hazard considers suppression costs instead of building damages. The damage functions allowed damages to be estimated for the three potential damage levels established in Step 1 using the average building type assumed in Step 2. The damage functions were applied to individual structures based on the Building Replacement Value (BRV) and the square footage of the building. The BRV and square footage values were taken directly from the information in the Facilities Management database.

  In general, physical and contents damage functions are expressed as a percentage of the BRV, while LOF costs were determined as a function of the number of days a building would be out of use. Therefore, physical and contents damages were estimated by multiplying the BRV by the corresponding physical and contents damage functions, while LOF costs were estimated as a proportion of the annual operating budget for each structure.

  The annual operating budgets for each building were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, is distributed to individual State-owned buildings based on the factored square footage of each structure. Additional information regarding this methodology can be found in Appendix F.1.

  The factored square footage for each structure was determined by multiplying the actual square footage by a Criticality Factor (CF) based on the criticality level assigned to each structure; the relationship of the criticality level to the CF is shown in Table 6-3.

Table 6-3: Relationship of Criticality Level to Criticality Factor

Criticality Level	Criticality Factor (CF)
1 – High	10
2 – Medium High	8
3 – Medium	6
4 – Medium Low	4
5 - Low	2

Note that applying the CF to the square footage of each structure allows higher criticality facilities (such as fire stations) to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance.

Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding damage function for LOF (measured in days).

For each structure, the physical damage, contents damage and LOF costs were added together to produce a combined loss estimate per structure for each hazard.

The subsections that follow provide a summary of information about the risk assessment for State-owned buildings for each hazard type. Each subsection has been changed to reflect more recent State Building data. Some subsections also include updated hazard data, while others continue to use the previous hazard data. Table 6-4 lists changes made as part of the Plan Update to hazard data. More detailed discussions of the methodologies and the results for each hazard are contained in Volume II, Appendix F.

Table 6-4: Updates to Subsections

Hazard	Comments
Natural Hazards	
Flood (6.4)	This section has been updated to reflect more recent Digital Flood Insurance Rate Maps (DFIRMs), as well as HAZUS generated floodplain boundaries. Additionally, new depth damage functions have been utilized.
Hailstorm (6.5)	This subsection has been added as part of the 2011 update.
High Wind – Hurricane (6.6)	Projected wind speeds were based on design wind speed zones from American Society of Civil Engineers 7-02. Additionally, new wind damage functions have been utilized.
High Wind –Tornado (6.7)	This section has been updated to reflect more recent data from statistical analyses (1950-2009). Additionally, the methodology has been altered to reflect a focus on safe room needs.
Ice Storm (6.8)	No new data regarding ice storms has been identified beyond what is available through the National Climatic Data Center (2009). The damage function has been revised to reflect a focus on LOF due to utility interruption.
Storm Surge (6.9)	More recent SLOSH data was available for this update. Additionally, new depth damage functions have been utilized.
Subsidence (6.10)	No new data is available from the 2008 Plan.
Wildfire (6.11)	Information regarding the Wildland Urban Interface has been used to allow for a more detailed analysis than the previous parish level vulnerability.
Manmade Hazards	
Dam Failure (6.12)	Downstream inundation areas have been calculated for all high hazard dams. Additionally, new depth damage functions have been utilized.
Levee Failure (6.13)	New information regarding the areas protected by the levees was available for this update. Additionally, new depth damage functions have been utilized.
Hazardous Material Incident (6.14)	New information regarding fixed site facilities was available for this update. The methodology was revised to buffer the area around state-owned facilities, instead of the area around fixed site facilities.

6.4 Flood

The flood hazard vulnerability assessment of State-owned buildings was based on: 1) location of the building within the 1% floodplain; and 2) the move-in date[1] of the building relative to the issuance of Flood Insurance Rate Maps (FIRMs) in Louisiana. The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned buildings are shown in Table 6-5.

Table 6-5: Flood Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Buildings
High	Structure within floodplain / pre-FIRM construction date	637
Medium	Structure within floodplain / post-FIRM construction date	397
Low	Structure not within floodplain	7144
None	Insufficient data	143

The flood loss estimate of State-owned buildings in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.2).

- Flood Hazard Vulnerability Ranking
  - Average Flood Depth
  - Average Building Type
  - Depth-Damage Functions

Table 6-6: Flood Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Buildings
High	$20,001 - $150,000,000	819
Medium	$251 - $20,000	354
Low	$0 -$250 (including facilities with insufficient data)	7156

Table 6-7: Top Ten Buildings at Risk from Flood Hazard Computed From Loss Estimates

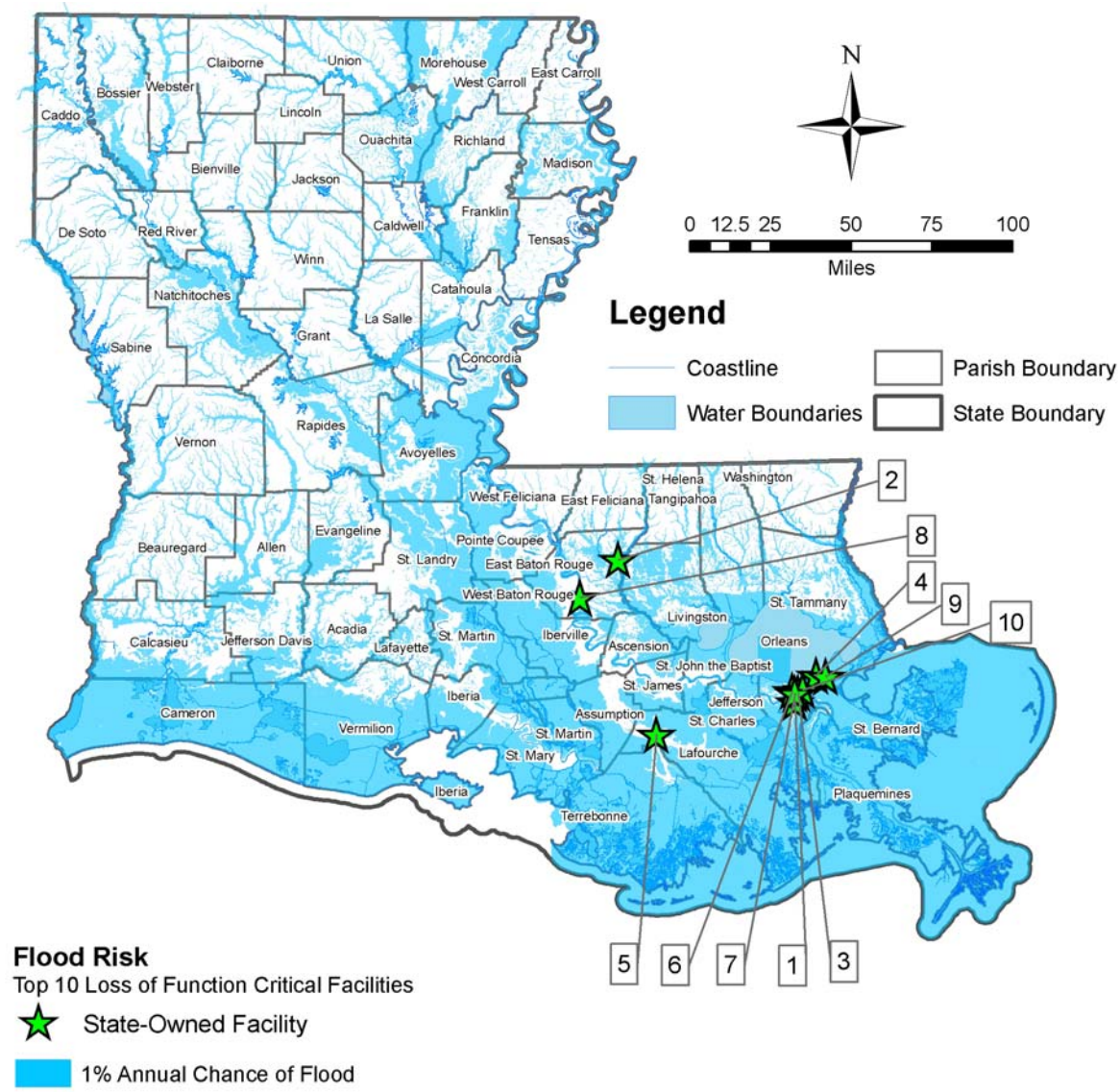
Flood Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
1	Charity – Main Hospital	Orleans	$42,214,274.46	$76,959,570.60	$18,322,846.67	$137,695,631.73
2	Eastern LA Mental Health Main Hospital (North & South)	E. Baton Rouge	$3,827,414.26	$6,944,904.90	$91,200,550.69	$101,972,869.85
3	Walter L Cohen Senior High	Orleans	$4,155,593.13	$7,540,396.20	$64,941,056.86	$76,637,049.19
4	Edward Livingston Middle School	Orleans	$4,058,706.99	$7,364,589.30	$59,924,556.50	$71,347,852.79
5	Augustine Middle School	Orleans	$2,997,144.73	$5,438,367.45	$52,537,234.66	$60,972,746.84
6	LSU General Operations	E. Baton Rouge	$19,111,027.06	$34,677,266.85	$6,273,505.05	$60,061,798.96
7	Bayou Region Support & Services Center, Main Hospital	Lafourche	$1,147,742.26	$2,082,596.85	$54,779,938.62	$58,010,277.73

[1] Actual construction dates of facilities were not available but the "move-in" date was provided and used.

Flood Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
8	George W Carver Senior High	Orleans	$2,763,829.55	$5,015,013.30	$47,961,445.85	$55,740,288.71
9	Pete Maravich Assembly Center	E. Baton Rouge	$13,398,727.74	$24,312,207.60	$2,164,389.86	$39,875,325.21
10	Valena C Jones Elementary	Orleans	$2,116,379.42	$3,840,204.60	$32,805,290.68	$38,761,874.70

Map 6-3: Loss Estimate – Flood – Total: shows the area of the 1% annual chance floodplain in the State of Louisiana based on Digital Flood Insurance Rate Maps (DFIRMs) and HAZUS, as well as the locations of the ten highest ranked buildings per Table 6-7.

Map 6-3: Loss Estimate – Flood – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), LDOTD (DFIRM Boundaries), HAZUS (Flood Boundaries)

6.5 Hailstorm

The hailstorm hazard vulnerability assessment of State-owned buildings was based on the number of recorded hailstorms within each parish as shown by data provided by the National Climatic Data Center (NCDC). The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned buildings are shown in Table 6-8.

Table 6-8: Hailstorm Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Buildings
High	Structures located in parishes with 101+ hailstorms	856
Medium	Structures located in parishes with 51 – 100 hailstorms	4351
Low	Structures located in parishes with 50 or fewer hailstorms	3122

The hailstorm loss estimate of State-owned buildings in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.3).

- Hailstorm Hazard Vulnerability
  - Average Building Type
  - Hailstorm Damage Functions

Table 6-9: Hailstorm Loss Estimate Ranges and Ranking Results

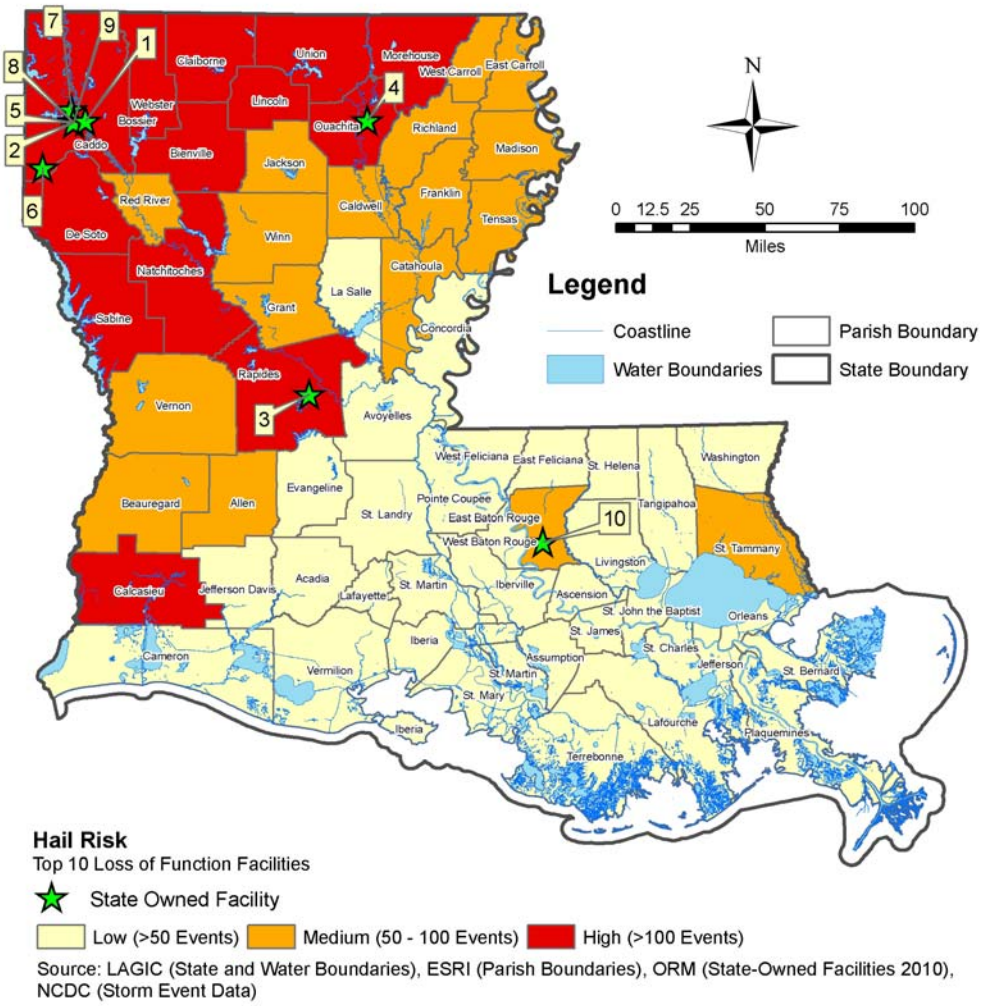
Ranking	Total Loss Estimate Ranges	Number of Buildings
High	$5,001 to $50,000	785
Medium	$501 to $5,000	5207
Low	$0 to $500	3123

Table 6-10: Top Ten Buildings at Risk from Hailstorm Hazard Computed From Loss Estimates

Ice Storm Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
1	Veteran's Home & Administration	Bossier	$36,912.22	N/A	N/A	$36,912.22
2	Ambulatory Care Center	Caddo	$28,787.40	N/A	N/A	$28,787.40
3	State Emergency Shelter	Rapides	$27,695.67	N/A	N/A	$27,695.67
4	Accent Corporate Center	Ouachita	$27,682.62	N/A	N/A	$27,682.62
5	Shreveport LSUMC Hospital	Caddo	$22,594.13	N/A	N/A	$22,594.13
6	Skilled Nursing Unit, Wade Correctional Center	Caddo	$21,961.48	N/A	N/A	$21,961.48
7	LA Tech College, Building E	Caddo	$21,606.67	N/A	N/A	$21,606.67
8	Women's and Children's Center	Caddo	$19,840.97	N/A	N/A	$19,840.97
9	Lee Dry Goods Warehouse, LSU	Caddo	$19,160.46	N/A	N/A	$19,160.46
10	Warehouse/Office Building - DPS	E. Baton Rouge	$18,793.45	N/A	N/A	$18,793.45

Map 6-4: Loss Estimate – Hailstorm – Total: shows the parish rankings according to high/medium/low ranges of estimated losses (per Table 6-8), as well as the locations of the ten highest ranked buildings from Table 6-10.

Map 6-4: Loss Estimate – Hailstorms – Top Ten



6.6 High Wind (Hurricane)

The hurricane wind hazard vulnerability assessment of State-owned buildings was based on: 1) the design wind speed zone; and 2) the move-in date of the building relative to the assumed enactment of building codes in Louisiana. The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned buildings are shown in Table 6-11.

Table 6-11: High Wind Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Buildings
High	Design wind = ≥ 110 mph & pre-adoption of building (wind) code	785
Medium	Design wind = ≥ 110 mph & post-adoption of building (wind) or Design wind = 91 – 110 mph; pre- code	4901
Low	Design wind = 91 – 110 mph; post- code or Design wind = < 90 mph	1756
None	Insufficient Data	887

The high wind loss estimate of State-owned buildings in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.4).

- Hurricane Wind Hazard Vulnerability
  - Average Building Type
  - Hurricane Wind Damage Functions

Table 6-12: High Wind Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Buildings
High	$500,001 to $150,000,000	1382
Medium	$10,001 to $500,000	4025
Low	$0 to $10,000	2034

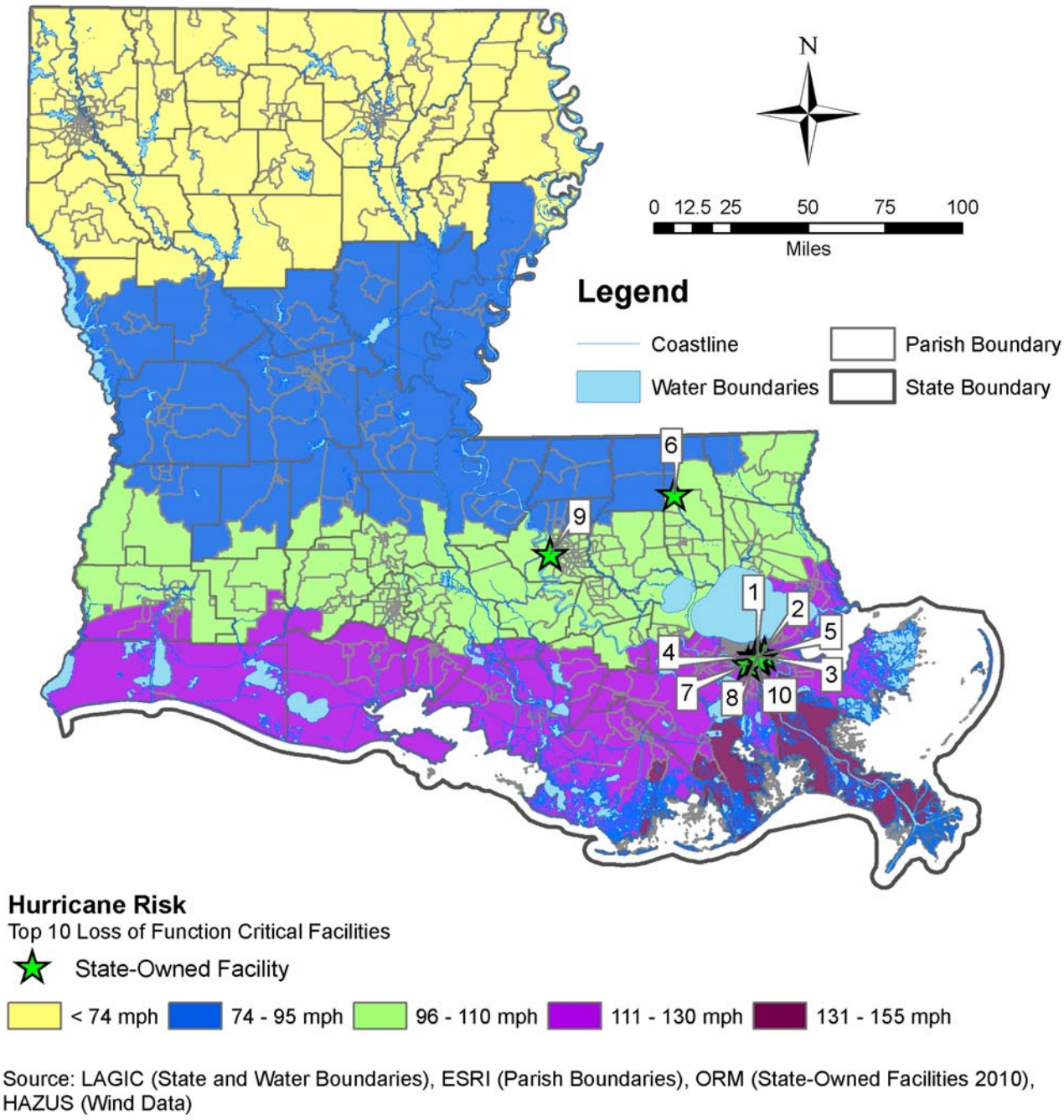
Table 6-13: Top Ten Buildings at Risk from Hurricane Wind Hazard Computed From Loss Estimates

High Wind Loss Ranking	Buildings Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
1	Louisiana Superdome	Orleans	$86,223,177.00	$28,741,059.00	$1,350,676,136.26	$1,465,640,372.26
2	New Orleans Sports Arena	Orleans	$16,127,563.05	$5,375,854.35	$152,826,476.71	$174,329,894.11
3	State Supreme Court Building	Orleans	$15,063,415.80	$5,021,138.60	$133,195,448.25	$153,280,002.65
4	Lions-LSU Clinics Bldg-Eye Center	Orleans	$10,033,054.20	$3,344,351.40	$111,259,102.07	$124,636,507.67
5	Douglass High School	Orleans	$5,055,648.60	$1,685,216.20	$100,765,394.01	$107,506,258.81
6	Human Services Office	Tangipahoa	$130,931.25	$32,732.81	$97,464,099.26	$97,627,763.33
7	Rehabilitation Hospital	Orleans	$2,616,762.60	$872,254.20	$89,204,863.05	$92,693,879.85
8	Charity – Main Hospital	Orleans	$51,306,380.40	$17,102,126.80	$20,358,718.52	$88,767,225.72
9	State Capitol	E Baton Rouge	$11,729,917.80	$2,932,479.45	$72,919,654.61	$87,582,051.86

10	State Office Bldg.	Orleans	$3,361,601.10	$1,120,533.70	$75,807,448.00	$80,289,582.80

Map 6-5: Loss Estimate – High Wind – Total: shows the average wind speed locations for a 100-year event as modeled by HAZUS for Louisiana, as well as the locations of the ten highest ranked buildings from Table 6-13.

Map 6-5: Loss Estimate – High Winds – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), HAZUS (Wind Data)

6.7 High Wind (Tornado)

The tornado wind hazard vulnerability assessment of State-owned buildings was based on: 1) the parish relative risk rankings from Section 5; and, 2) the criticality of the particular building. The criteria used to determine specific vulnerability rankings for each parish are shown in Table 6-14.

Table 6-14: High Wind Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Parishes
High	Section 5 Composite Ranking of 13 – 14	10
Medium	Section 5 Composite Ranking of 9 – 12	18
Low	Section 5 Composite Ranking of 3 – 8	36

The high wind loss estimate of State-owned buildings in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.5).

- Tornado Wind Hazard Vulnerability
  - Building Criticality

Losses were not calculated for this hazard. Instead the analysis focused on prioritizing State-owned buildings for the purpose of safe room construction.

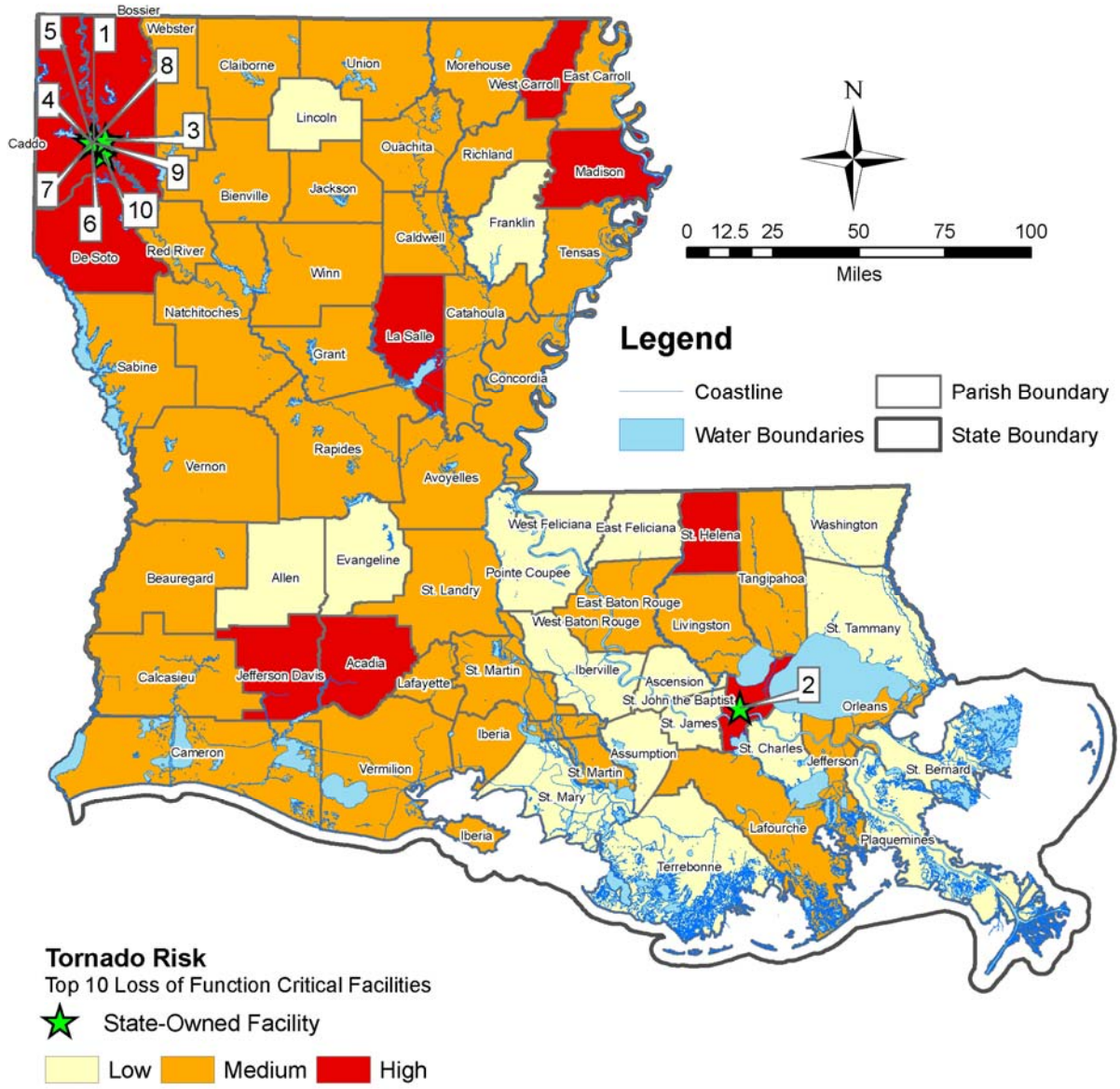
Table 6-15: Top Ten Buildings for the Purpose of Safe Room Construction.

Tornado Risk Ranking	Building Name	Parish	Total Square Feet	Adjusted Square Feet
1	Shreveport LSUMC Hospital	Caddo	414,777	4,147,770
2	Shreveport LSUMC K Wing	Caddo	240,897	2,408,970
3	B Building Medical School	Caddo	369,411	2,216,466
4	Ambulatory Care Center	Caddo	155,384	1,553,840
5	Mary Allen Office Building	Caddo	188,832	1,132,992
6	War Veteran's Home	St John the Baptist	86,420	864,200
7	Veteran's Home & Administration	Bossier	85,157	851,570
8	Feist-Weller Cancer Treatment Center	Caddo	75,028	750,280
9	Women's and Children's Center	Caddo	49,208	492,080
10	Noel Library	Caddo	122,925	491,700

*The adjusted size of the building is a representation of total square feet multiplied by an assigned criticality factor to give more critical facilities a higher priority in the risk analysis.

Map 6-6: Loss Estimate – High Wind – Tornado: shows the rankings of all parishes, as well as the locations of the ten highest ranked buildings from Table 6-16.

Map 6-6: Loss Estimate – High Wind – Tornado – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), NCDC (Storm Event Data)

6.8 Ice Storm

The ice storm hazard vulnerability assessment of State-owned buildings was based on the number of recorded ice storms within each parish based on data provided by the National Climatic Data Center (NCDC) and the estimated loss of use for State-owned buildings due to power outages during ice storms. The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned buildings are shown in Table 6-16.

Table 6-16: Ice Storm Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Buildings
High	Structures in parishes with > 4 recorded ice storms	810
Medium	Structures in parishes with from 1 to 4 recorded ice storms	4669
Low	Structures in parishes with no recorded ice storm	2850

The ice storm loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.6).

- Ice Storm Hazard Vulnerability
  - Average Building Type
  - Ice Storm Damage Functions

Table 6-17: Ice Storm Loss Estimate Ranges and Ranking Results

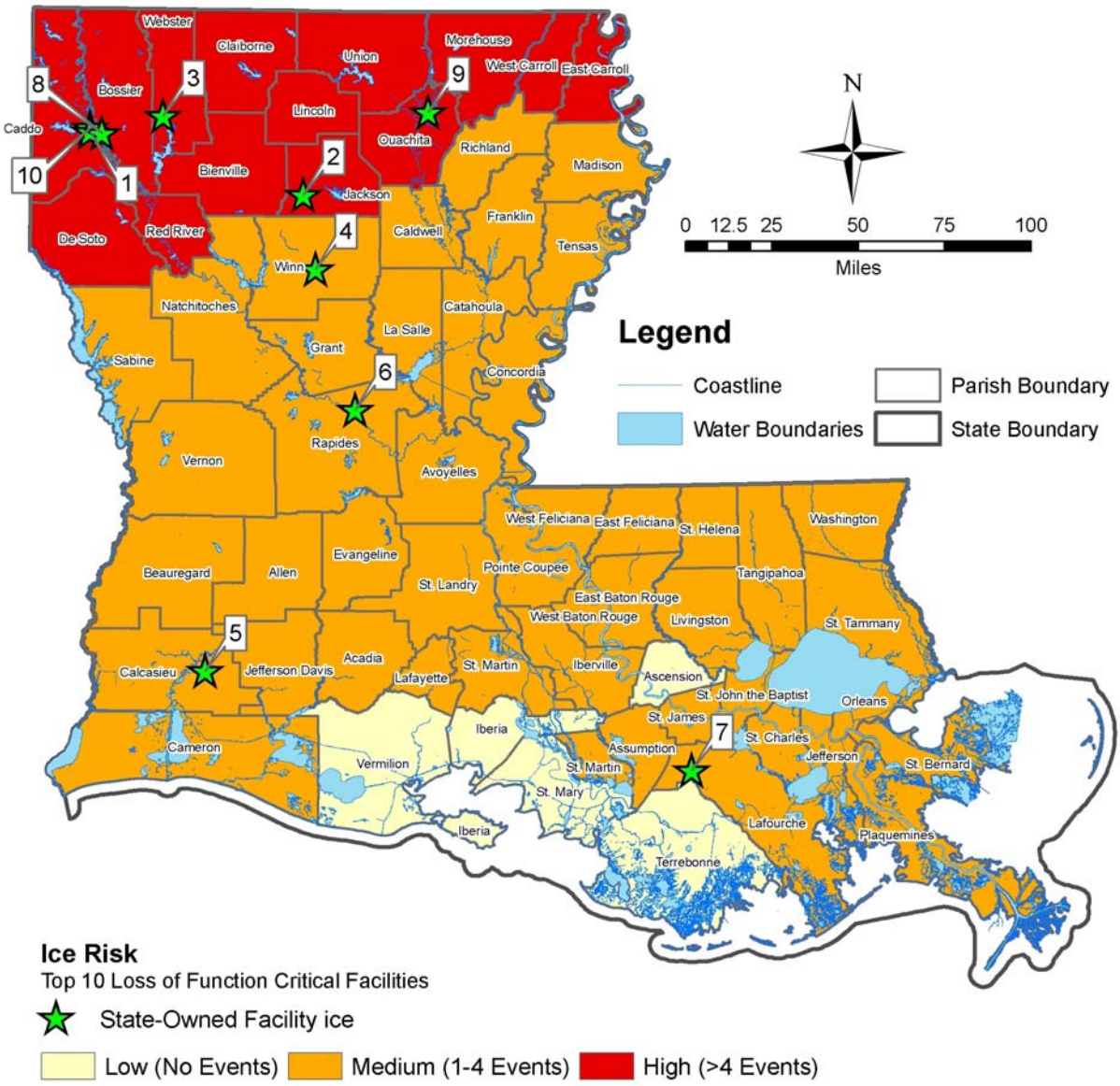
Ranking	Total Loss Estimate Ranges	Number of Buildings
High	$1,501 to $9,500,000	2153
Medium	$1 to $1,500	875
Low	$0	5301

Table 6-18: Top Ten Facilities at Risk from Ice Storm Hazard Computed From Loss Estimates

Ice Storm Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
1	Mary Allen Office Building	Caddo	N/A	N/A	$9,229,208.80	$9,229,208.80
2	Office of Family Services	Jackson	N/A	N/A	$7,944,723.24	$7,944,723.24
3	Metal Parts Manufacturing 2600	Webster	N/A	N/A	$4,641,404.07	$4,641,404.07
4	Main Office Building	Winn	N/A	N/A	$4,413,735.14	$4,413,735.14
5	Courthouse	Calcasieu	N/A	N/A	$3,761,549.75	$3,761,549.75
6	Unit-6 Patient Care	Rapides	N/A	N/A	$3,122,432.63	$3,122,432.63
7	Main Hospital	Lafourche	N/A	N/A	$3,043,329.92	$3,043,329.92
8	Veteran's Home & Administration	Bossier	N/A	N/A	$3,026,568.44	$3,026,568.44
9	Northeast LA War Veterans Home	Ouachita	N/A	N/A	$2,962,452.40	$2,962,452.40
10	Second Circuit Court of Appeals	Caddo	N/A	N/A	$2,739,058.87	$2,739,058.87

Map 6-7: Loss Estimate – Ice Storm: shows the parish rankings according to high/medium/low ranges of ice storm incidence (per Table 6-16), as well as the locations of the ten highest ranked buildings from Table 6-18.

Map 6-7: Loss Estimate – Ice Storms – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), NCDC (Storm Event Data)

6.9 Storm Surge

The storm surge hazard vulnerability assessment of State-owned critical facilities was based on sea, lake, and overland surges from hurricanes (SLOSH) models for category 1-5 hurricanes in Louisiana. The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-19.

Table 6-19: Storm Surge Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Buildings
High	Structures within SLOSH Category 1 Maximum of MEOWS* (MOM) hazard zone	350
Medium	Structures within the SLOSH Category 3 or 5 MOM hazard zone	1414
Low	Structures outside the SLOSH hazard zone	4664
None	Insufficient data available to rank the building	1900

*MEOW is defined through SLOSH modeling as the Maximum Envelope of Water. A MOM is a series of hundreds of theoretical MEOWs showing a worst case scenario storm surge for a given storm category at any given point in a given basin.

The storm surge loss estimate of State-owned buildings in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.7).

- Storm Surge Hazard Vulnerability
  - Average Surge Depth
  - Average Building Type
  - Storm Surge Damage Functions

Table 6-20: Storm Surge Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Buildings
High	$500,001 to $1,600,000,000	832
Medium	$1 to $500,000	932
Low	$0	4665
None	Insufficient data available to rank the building	1900

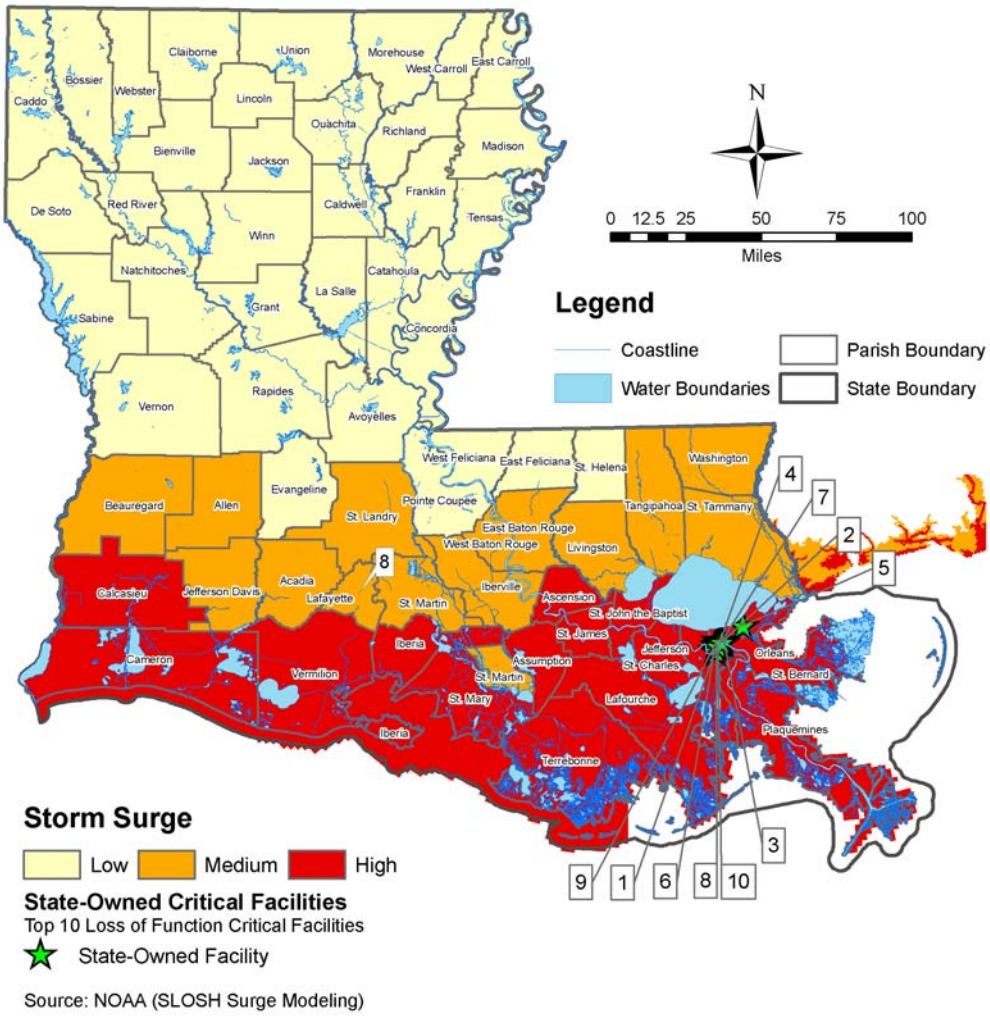
Table 6-21: Top Ten Buildings at Risk from Storm Surge Hazard Computed from Loss Estimates

Storm Surge Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	Louisiana Superdome	Orleans	$88,809,872.31	$143,705,295.00	$1,350,676,136.26	$1,583,191,303.57
2	New Orleans Sports Arena	Orleans	$46,877,449.93	$53,758,543.50	$305,652,953.42	$406,288,946.86
3	State Supreme Court Building	Orleans	$21,892,164.30	$25,105,693.00	$133,195,448.25	$180,193,305.55
4	Charity – Main Hospital	Orleans	$52,845,571.81	$85,510,634.00	$20,358,718.52	$158,714,924.33
5	Lions – LSU Clinics Bldg-Eye Center	Orleans	$10,334,045.83	$16,721,757.00	$111,259,102.07	$138,314,904.90
6	Douglas High School	Orleans	$7,347,542.63	$8,426,081.00	$100,765,394.01	$116,539,017.65

Storm Surge Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
7	Rehabilitation Hospital	Orleans	$2,695,265.48	$4,361,271.00	$89,204,863.05	$96,261,399.53
8	New Tyler Mental Health Hospital	Lafayette	$2,737,440.27	$4,429,515.00	$85,985,770.16	$93,152,725.43
9	Sarah T. Reed High School	Orleans	$5,315,311.70	$8,600,828.00	$73,351,694.03	$87,267,833.74
10	John F. Kennedy Senior High	Orleans	$5,327,528.33	$8,620,596.00	$73,295,835.07	$87,243,959.40

Map 6-8: Loss Estimate –Storm Surge: shows the storm surge hazard zones throughout the state, as well as the locations of the ten highest ranked buildings from Table 6-21.

Map 6-8: Loss Estimate – Storm Surge – Top Ten



6.10 Subsidence

The subsidence hazard vulnerability assessment of State-owned buildings was based on subsidence rate studies from the Louisiana Speaks report prepared by the Louisiana Recovery Authority in the wake of Hurricanes Katrina and Rita. The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned critical buildings are shown in Table 6-22.

Table 6-22: Subsidence Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Buildings
High	Structures located in the identified basins with highest projected rates	34
Medium	Structures located in the identified basins with lowest projected rates	234
Low	Structures outside the identified basins	729
None	Insufficient data available to rank the building	7332

The subsidence loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.8).

- Subsidence Hazard Vulnerability
  - Average Subsidence
  - Average Building Type
  - Subsidence Damage Functions

Table 6-23: Subsidence Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Buildings
High	$50,001 to $22,000,000,000	27
Medium	$1 to $50,000	241
Low	$0	730

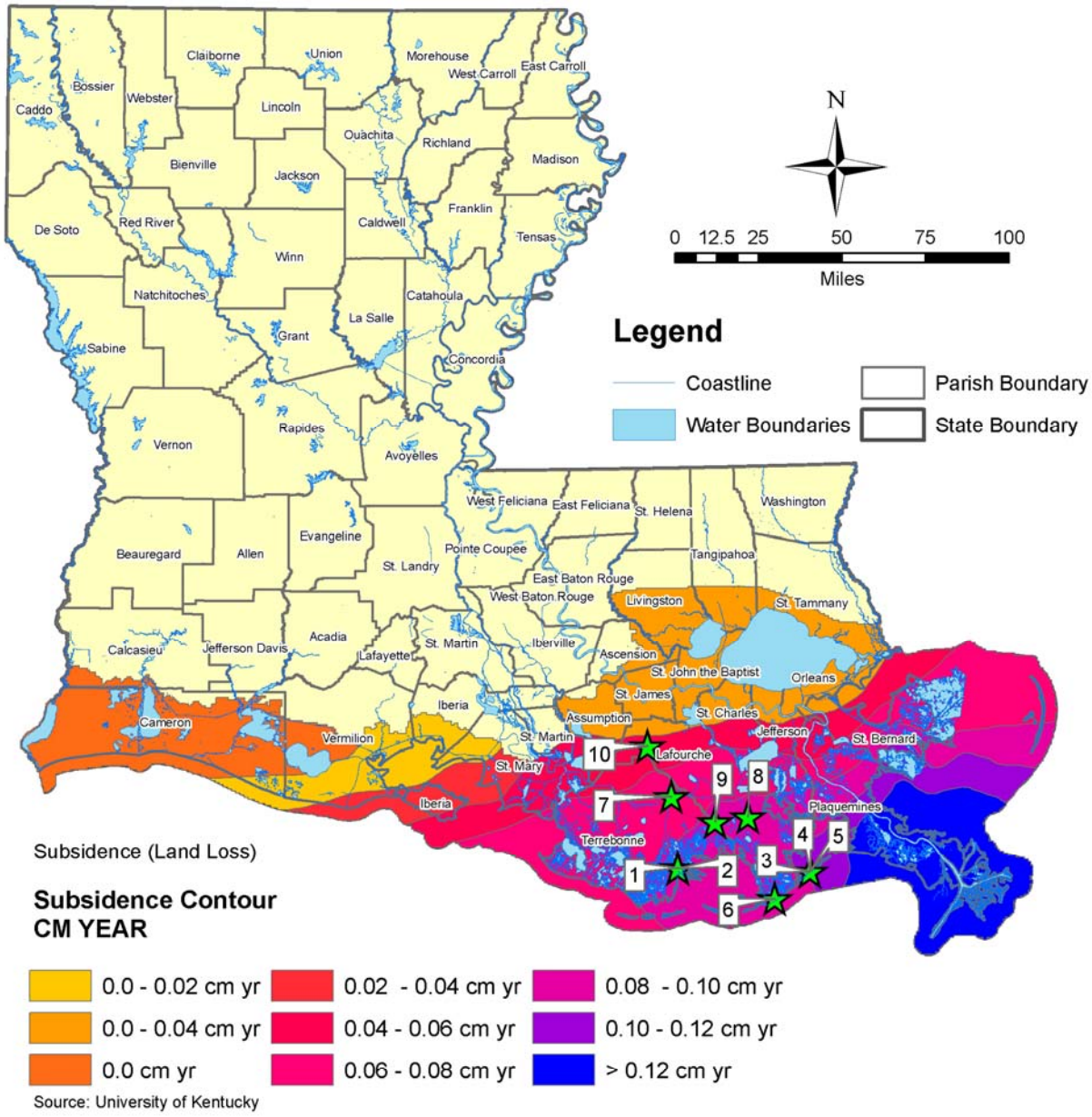
Table 6-24: Top Ten Facilities at Risk from Subsidence Hazard Computed From Loss Estimates

Subsidence Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
1	LA University Marine Consortium, Main Lab	Cocodrie	$342,381.36	N/A	$21,415,381.45	21,757,762.81
2	LA University Marine Consortium, Maint. Bldg	Cocodrie	$12,743.58	N/A	$1,234,159.94	1,246,903.52
3	Marine Fisheries Marina Bldg	Jefferson	$97,872.40	N/A	$967,185.37	1,065,057.77
4	Marine Fisheries Main Bldg	Jefferson	$47,520.18	N/A	$761,022.17	808,542.35
5	Marine Fisheries Cooperator Bldg	Jefferson	$77,329.12	N/A	$548,495.91	625,825.03
6	LSU Marine Laboratory	Lafourche	$10,176.08	N/A	$603,547.52	613,723.60
7	Leonard J Chabert Medical Center	Terrebonne	$470,560.61	N/A	$0.00	470,560.61
8	LA Tech College – Main Bldg	Lafourche	$35,709.40	N/A	$339,692.16	375,401.56
9	Coastal & Non-game Resources Headquarters	Terrebonne	$6,744.74	N/A	$287,610.39	294,355.13

Subsidence Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
10	Ellender Library	Lafourche	$206,380.69	N/A	$0.00	206,380.69

Map 6-9: Loss Estimate –Subsidence: shows the subsidence hazard zones, as well as the locations of the ten highest ranked buildings from Table 6-24.

Map 6-9: Loss Estimate – Subsidence – Top Ten



6.11 Wildfire

The wildfire hazard vulnerability assessment of State-owned critical facilities was based on the number of recorded wildfires and the number of acres burned by wildfires within each parish based on data provided by the State of Louisiana. The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-25.

Table 6-25: Wildfire Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Buildings
High	Structures located within the Wildland Urban Interface	811
Medium	Structures located within the Wildland Urban Intermix	817
Low	Structures located outside of the WUI zones	4797
None	Insufficient data available	1904

The wildfire loss estimate of State-owned critical buildings in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.9).

- Wildfire Hazard Vulnerability
  - Average Building Type
  - Wildfire Suppression Cost Functions

Table 6-26: Wildfire Loss Estimate Ranges and Ranking Results

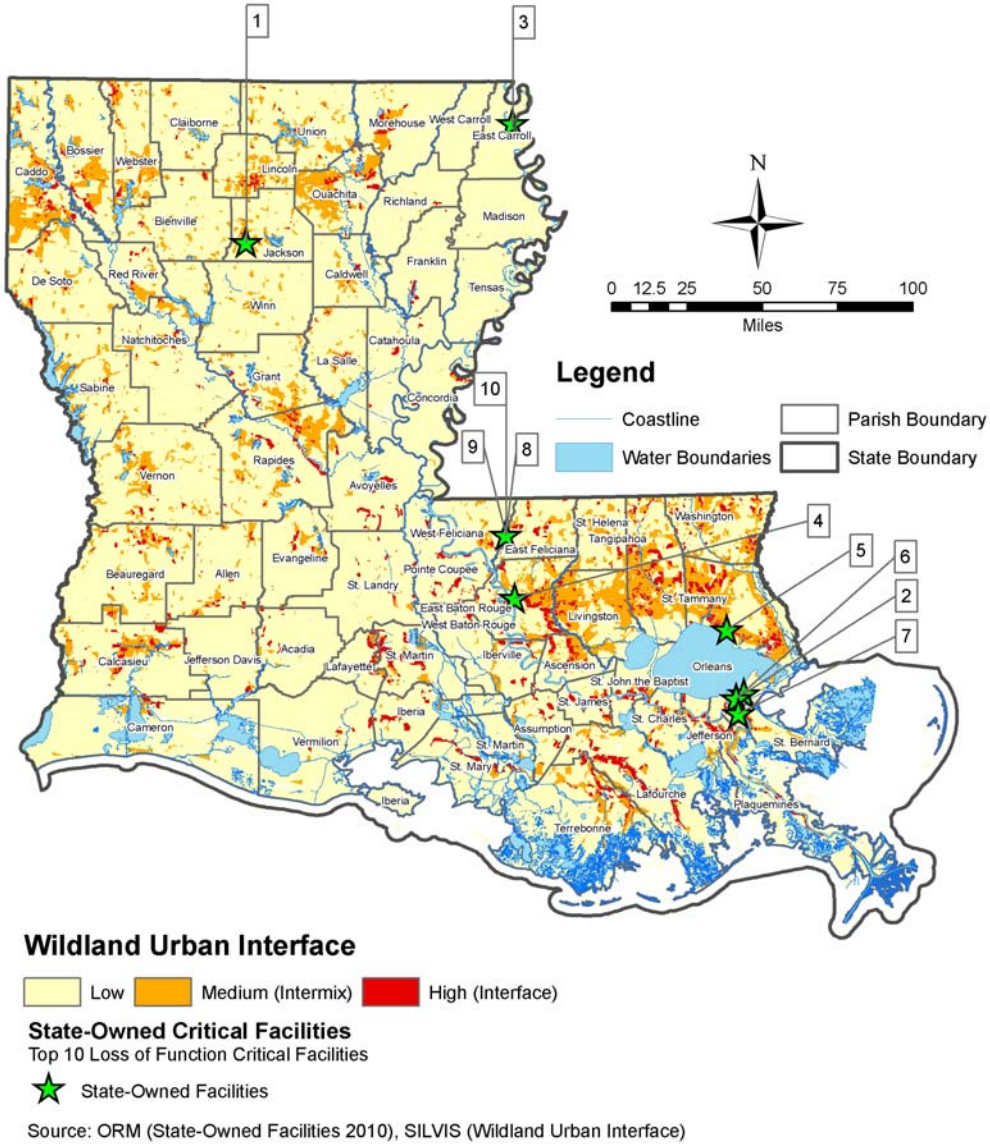
Ranking	Total Loss Estimate Ranges	Number of Critical Buildings
High	$50,001 to $12,200,000	331
Medium	$1 to $50,000	1258
Low	$0	18

Table 6-27: Top Ten Facilities at Risk from Wildfire Hazard Computed From Loss Estimates

Wildfire Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
1	Lake Providence State Office	East Carroll	N/A	N/A	$12,171,316.01	$12,175,383.64
2	OFS Region 7 Main Office	Winn	N/A	N/A	$8,827,470.27	$8,830,934.37
3	Sarah T. Reed High School	Orleans	N/A	N/A	$7,335,169.40	$7,345,771.59
4	George W. Carver Senior High	Orleans	N/A	N/A	$5,329,049.54	$5,338,086.35
5	Office of Family Services	Jackson	N/A	N/A	$5,296,482.16	$5,298,805.95
6	Northlake Support and Services Center 605/607/633/638 Cypress	Tangipahoa	N/A	N/A	$4,256,550.55	$4,268,223.08
7	Northlake Support and Services Center – 305 Cedar	Tangipahoa	N/A	N/A	$4,219,311.04	$4,230,932.40
8	William Frantz Elementary	Orleans	N/A	N/A	$3,413,661.34	$3,419,566.82
9	Schaumburg Main Building	Orleans	N/A	N/A	$3,400,662.38	$3,410,871.48
10	Engineer Readiness Center	Rapides	N/A	N/A	$3,220,018.32	$3,233,479.38

Map 6-10: Loss Estimate –Wildfire: shows the wildland urban interface for parishes in the State of Louisiana based on SILVIS data, as well as the locations of the ten highest ranked buildings from Table 6-27.

Map 6-10: Loss Estimate – Wildfire – Top Ten



6.12 Dam Failure

The dam failure hazard vulnerability assessment of State-owned facilities was based on the potential inundation from dam failure based on indentified statewide dam failure hazard zones. The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-28.

Table 6-28: Dam Failure Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Buildings
High	Structures within the dam failure hazard zone	153
Low	Structures outside dam failure hazard radius	6276
None	Insufficient data available	1900

The dam failure loss estimate of State-owned buildings in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.10).

- Dam Failure Hazard Vulnerability
  - Average Inundation Depth
  - Average Building Type
  - Inundation Depth-Damage Functions

Table 6-29: Dam Failure Loss Estimate Ranges and Ranking Results

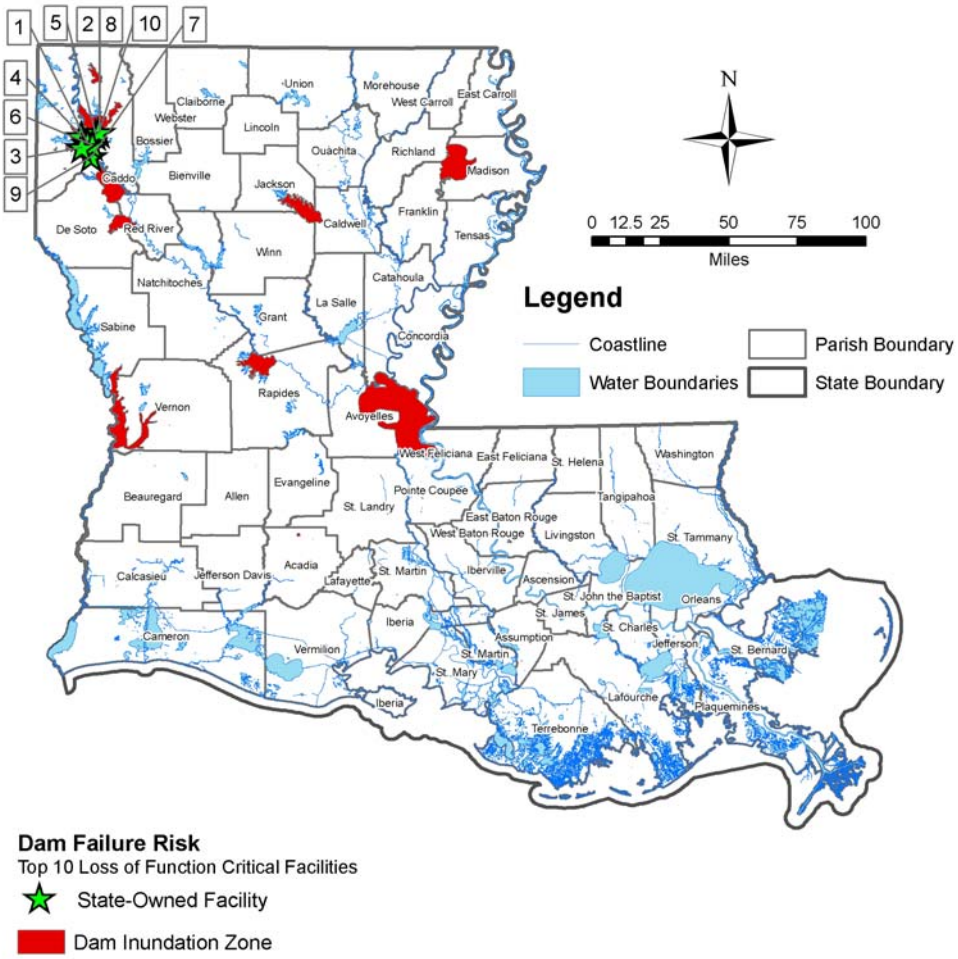
Ranking	Total Loss Estimate Ranges	Number of Buildings
High	$1,000,001 to $70,000,000	57
Medium	$1 to $1,000,000	96
Low	$0	6275

Table 6-30: Top Ten Buildings at Risk from Dam Failure Hazard Computed From Loss Estimates

Dam Failure Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
1	Veteran's Home and Administration	Bossier	$4,552,999.51	$8,261,491.05	$54,478,231.86	$67,292,722.42
2	Armory Building	Caddo	$862,087.43	$1,564,271.55	$23,306,961.76	$25,733,320.75
3	Medical Center Bldg 131-133	Bossier	$871,383.71	$1,581,139.80	$22,478,590.78	$24,931,114.29
4	Shreveport Mental Health Center	Caddo	$781,306.39	$1,417,693.05	$13,118,303.41	$15,317,302.85
5	Armory Building	Bossier	$340,481.68	$617,809.50	$14,054,420.37	$15,012,711.55
6	Noel Library	Caddo	$4,155,485.27	$7,540,195.05	$2,390,003.90	$14,085,684.22
7	Bronson Hall-Liberal Arts	Caddo	$3,889,537.02	$7,057,627.65	$2,170,825.43	$13,117,990.09
8	Northwest Supports & Services Center – Administration Bldg	Bossier	$476,304.34	$864,261.90	$10,139,017.94	$11,479,584.17
9	Allied Health Building	Caddo	$2,842,868.89	$5,158,431.45	$1,496,374.78	$9,497,675.12
10	Pinehurst Home Bldg 145-146	Bossier	$447,172.52	$811,401.75	$7,975,352.63	$9,233,926.90

Map 6-11: Loss Estimate –Dam Failure: shows the locations of various dam failure hazard zones, as well as the locations of the ten highest ranked buildings from Table 6-30.

Map 6-11: Loss Estimate – Dam Failure – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), NID (Dam Data)

6.13 Levee Failure

The levee failure hazard vulnerability assessment of State-owned buildings was limited to the potential inundation areas from levees under the jurisdiction of the New Orleans District of the U.S. Army Corps of Engineers (USACE). The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned buildings are shown in Table 6-31.

Table 6-31: Levee Failure Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Buildings
High	Structures within levee protection zones	2,903
Low	Structures outside of the levee protection zones	3,526
None	Insufficient data available	1,900

The levee failure loss estimate of State-owned buildings in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.11).

- Levee Failure Hazard Vulnerability
  - Average Inundation Depth
  - Average Building Type
  - Inundation Depth-Damage Functions

Table 6-32: Levee Failure Loss Estimate Ranges and Ranking Results

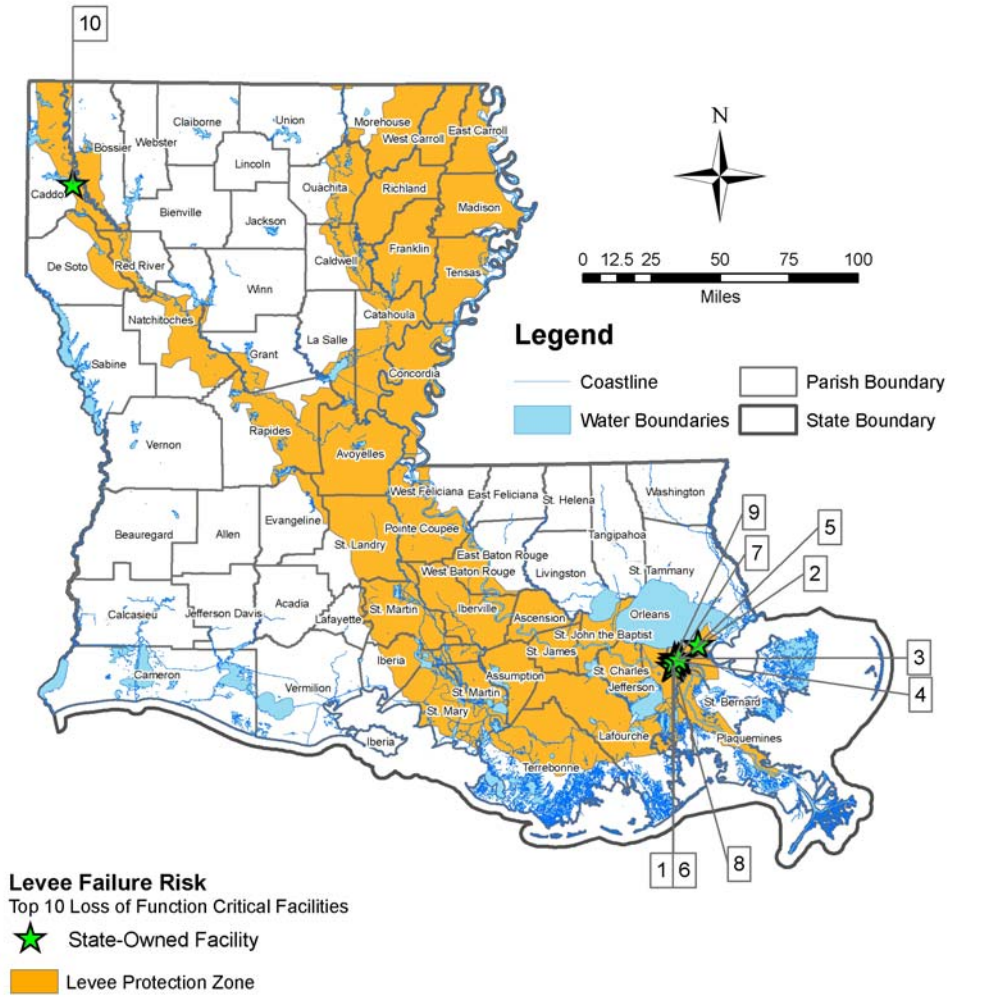
Ranking	Total Loss Estimate Ranges	Number of Critical Buildings
High	$100,001 to $215,000,000	2195
Medium	$1 to $100,000	710
Low	$0	3525

Table 6-33: Top Ten Buildings at Risk from Levee Failure Hazard

Levee Failure Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF Damage	Combined Loss
1	Louisiana Superdome	Orleans	$119,850,216.030	$143,705,295.00	$1,350,676,136.26	$1,614,231,647.289
2	New Orleans Sports Arena	Orleans	$44,834,625.279	$53,758,543.50	$305,652,953.42	$404,246,122.203
3	State Supreme Court Bldg	Orleans	$20,938,147.962	$25,105,693.00	$133,195,448.25	$179,239,289.215
4	Charity Main Hosp	Orleans	$71,315,868.756	$85,510,634.00	$20,358,718.52	$177,185,221.277
5	Lions LSU Clinics Bldg-Eye Center	Orleans	$13,945,945.338	$16,721,757.00	$111,259,102.07	$141,926,804.409
6	Shreveport LSUMC Hospital	Caddo	$49,850,059.002	$59,772,253.00	$22,401,162.58	$132,023,474.581
7	Douglass High School	Orleans	$7,027,351.554	$8,426,081.00	$100,765,394.01	$116,218,826.567
8	Mary Allen Office Building	Caddo	$10,378,620.009	$12,444,388.50	$92,292,088.02	$115,115,096.532
9	William B Hatcher Hall LSU	E. B. R.	$50,516,723.157	$60,571,610.50	$2,579,387.39	$113,667,721.048
10	Rehabilitation Hospital	Orleans	$3,637,300.014	$4,361,271.00	$89,204,863.05	$97,203,434.067

Map 6-12: Loss Estimate – Levee Failure: shows the identified levee protection areas in the State of Louisiana, as well as the locations of the ten highest ranked buildings from Table 6-33.

Map 6-12: Loss Estimate – Levee Failure – Top Ten



Source: LAGIC (State, Levee, and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010)

6.14 Hazardous Material Incident

The hazardous material incident hazard vulnerability assessment of State-owned buildings was based on potential impact areas from a hazardous materials (HAZMAT) release from a fixed site. The criteria used to determine specific vulnerability rankings for each building and the results of applying this ranking to the State-owned buildings are shown in Table 6-34.

Table 6-34: Hazardous Material Incident Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Buildings
High	4 or more HAZMAT sites within 1 mile of a state-owned building	205
Medium	1-3 HAZMAT sites within 1 mile of a state-owned building	2158
Low	0 HAZMAT sites within 1 mile of a state-owned building or have insufficient data.	5966

The hazardous material incident loss estimate of State-owned critical buildings in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Hazardous Material Incident Hazard Vulnerability
  - Average Building Type
  - Hazardous Material Incident Damage Functions

Table 6-35: Hazardous Material Incident Loss Estimate Ranges and Ranking Results

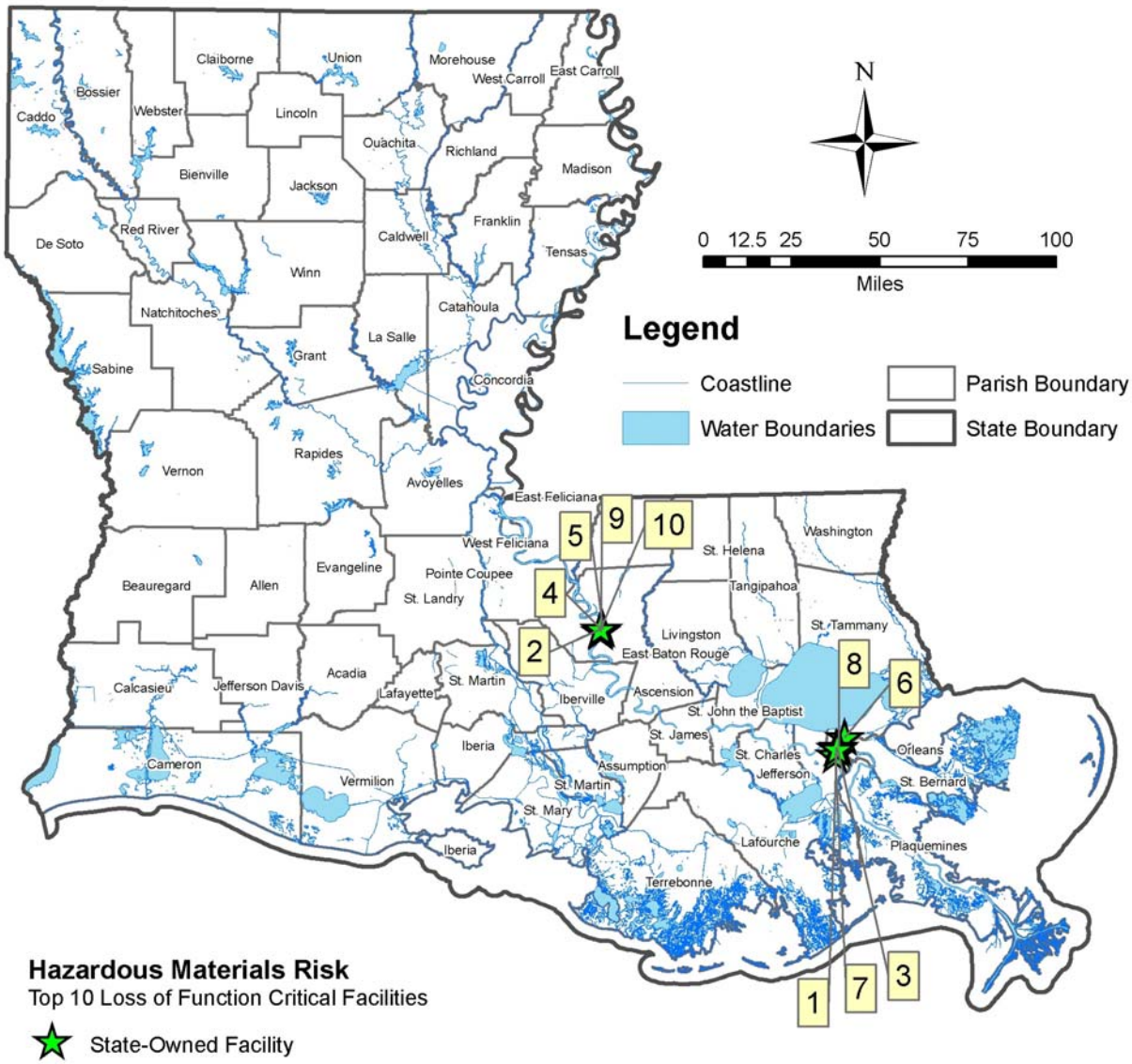
Ranking	Total Loss Estimate Ranges	Number of Buildings
High	$100,001 to $45,000,000	317
Medium	$1 to $100,000	1624
Low	$0	6388

Table 6-36: Top Ten Buildings at Risk from Hazardous Materials Incident Computed from Loss Estimates

HAZMAT Incident Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	Louisiana Superdome	Orleans	N/A	N/A	$45,022,537.88	N/A
2	State Capitol	East Baton Rouge	N/A	N/A	$14,583,930.92	N/A
3	New Orleans Sports Arena	Orleans	N/A	N/A	$10,188,431.78	N/A
4	State Capitol Annex	East Baton Rouge	N/A	N/A	$9,102,654.52	N/A
5	DOTD Headquarters Bldg.	East Baton Rouge	N/A	N/A	$5,515,283.74	N/A
6	George W. Carver High School Elevated Classroom	Orleans	N/A	N/A	$5,329,049.54	N/A
7	Live Oak RSD - Main Building	Orleans	N/A	N/A	$5,193,526.30	N/A
8	State Supreme Court Building	Orleans	N/A	N/A	$4,439,848.28	N/A
9	State Office Bldg – Baton Rouge	East Baton Rouge	N/A	N/A	$4,305,908.40	N/A
10	First Circuit Court of Appeals	East Baton Rouge	N/A	N/A	$3,586,660.41	N/A

Map 6-13: Loss Estimate – Hazardous Material Incidents: shows the locations of the ten highest ranked buildings from Table 6-36.

Map 6-13: Loss Estimate – Hazardous Materials Incidents – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010)

6.15 Summary

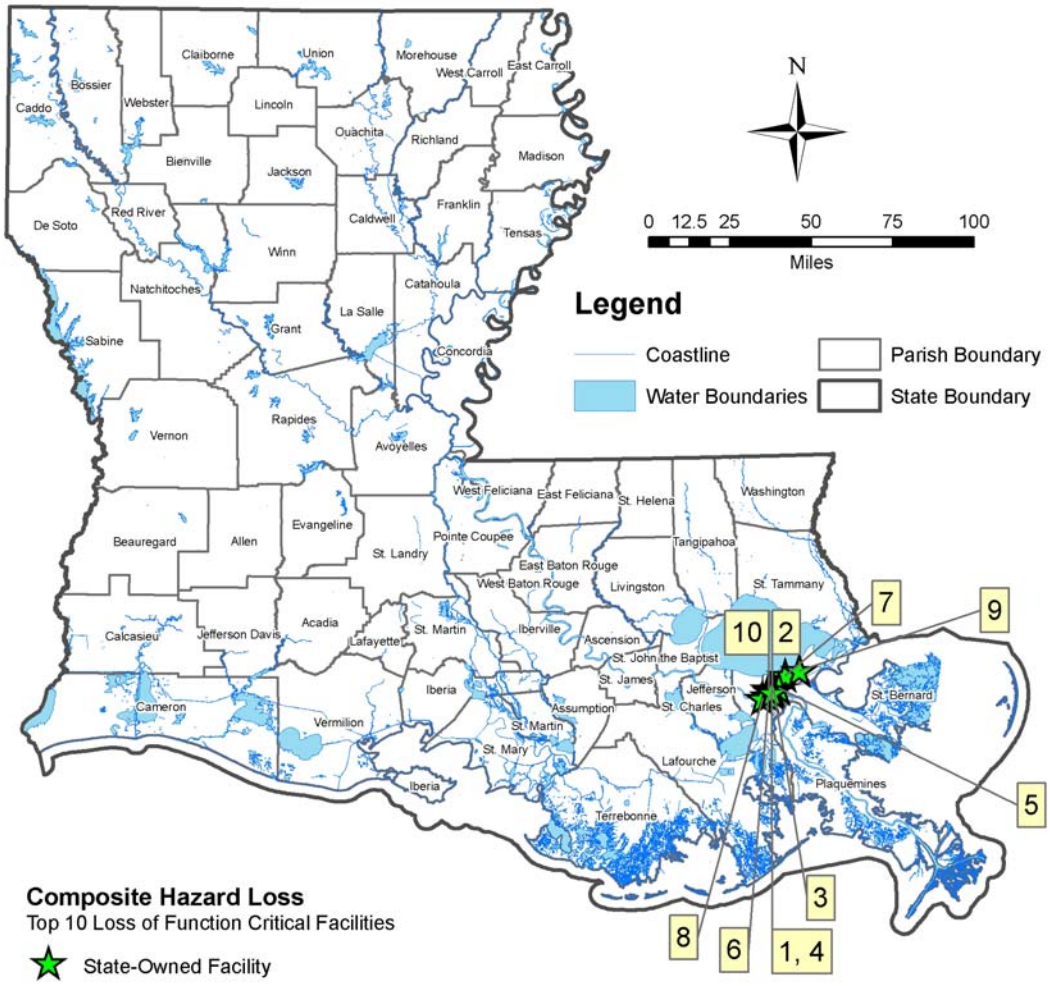
The ten critical facilities in Louisiana with the highest total combined loss estimates for all hazards: flood, hail, high wind (hurricane), ice storm, storm surge, subsidence, wildfire, dam failure, levee failure, and hazardous materials incident, are shown in Table 6-37 and displayed on the following page on Map 6-14. Note that high wind (tornado) is not included in this assessment.

It is important to note that this is a "one of a kind" analysis that does not fully account for probability, discounting of value over time or the real potential for any particular structure to get damaged. The real intent is to narrow the focus to buildings that may have a higher likelihood of experiencing damage per the methodology so that mitigation efforts can be focused on these properties.

Table 6-37: Combined Hazard Loss Estimate ($millions)

Total Loss Ranking	Building Name	Parish	Flood	High Wind (Hurricane)	Hailstorm	Ice Storm	Storm Surge	Subsidence	Wildfire	Dam Failure	Levee Failure	Hazardous Materials	Totals
1	Louisiana Superdome	Orleans	0	1,465	6.1	0	1,583	0	0	0	1,614	45	4,708
2	New Orleans Sports Arena	Orleans	0	174,329	6.8	0	406	0	0	0	404,246	10,188	995,060
3	State Supreme Court Building	Orleans	0	153,280	2.3	0	180,193	0	0	0	179,239	4,440	517,154
4	Lions-LSU Clinics Bldg-Eye Cent	Orleans	33,578	124,636	6	0	138,315	0	0	0	141,926	0	438,462
5	Frederick Douglas HS	Orleans	0	107,506	2	0	116,539	0	0	0	116,218	0	340,266
6	Walter L Cohen HS	Orleans	76,637	78,859	1.5	0	85,712	0	0	0	87,522	2,405	331,138
7	Edward Livingston MS	Orleans	71,347	73,129	2.9	0	79,822	0	0	0	81,590	2,219	308,112
8	OASS - John Hainkel Home & Rehab CTR	Orleans	0	92,693	2.4	0	96,261	0	0	0	97,203	0	286,161
9	Sarah T. Reed HS	Orleans	22,108	80,232	2.1	0	87,267	0	7,345	0	89,125	0	286,082
10	Augustine MS	Orleans	60,972	63,208	1.5	0	68,151	0	0	0	69,456	1,945	263,737

Map 6-14: Loss Estimate – All Hazards – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010)

For each hazard, a "top ten" list was developed that indicated the ten State-owned facilities with the highest estimated losses. Table 6-38 indicates which agencies have buildings that are considered among the top ten on a hazard-by-hazard basis.

Table 6-38: Top Ten Facilities per Hazard per State Agency

Agency	Flood	Hailstorm	High Wind (H)	High Wind (T)	Ice Storm	Storm Surge	Subsidence	Wildfire	Dam Failure	Levee Failure	Hazardous Materials	Totals
Department of Agriculture and Forestry	0	0	0	0	0	0	0	0	0	0	0	0
Department of Culture, Recreation and Tourism	0	0	0	1	1	0	0	0	0	0	0	2
Department of Elementary/Secondary Education	7	0	7	0	0	7	3	2	0	7	4	37
Governor's Executive Department	0	1	1	0	3	2	0	0	3	1	1	12
Department of Health and Hospitals	2	0	0	4	2	0	1	4	4	0	0	17
Department of Higher Education	1	6	0	1	0	0	1	2	3	1	2	17
Judiciary	0	0	0	0	2	0	0	0	0	0	0	2
Department of Labor	0	1	0	0	0	0	0	0	0	0	0	1
Department of Natural Resources	0	0	0	0	0	0	0	0	0	0	0	0
Department Of Public Safety and Corrections	0	2	0	0	0	0	0	0	0	0	0	2
Secretary of State	0	0	0	1	0	0	0	0	0	0	0	1
Department of Social Services	0	0	1	1	1	0	0	2	0	0	0	5
Department of Transportation	0	0	0	0	0	0	1	0	0	0	1	2
Department of Veterans Affairs	0	0	0	2	0	0	0	0	0	0	0	2
Department of Wildlife and Fisheries	0	0	0	0	0	0	4	0	0	0	0	4
Other	0	0	1	0	1	1	0	0	0	1	2	6
Total	10	10	10	10	10	10	10	10	10	10	10	110

More detailed tabulations for State-owned critical facilities for each agency in Louisiana with the highest combined loss estimates for the eleven combined hazards are presented in Volume II, Appendix F.13.

6.16 Critical Infrastructure Risk Assessment

Hazard vulnerability assessments and loss estimates for State-owned bridges in Louisiana were prepared for the hazards listed below.

- Flood
- High Wind (Hurricane)
- High Wind (Tornado)
- Ice Storm
- Storm Surge
- Subsidence
- Wildfire
- Dam Failure
- Levee Failure

Introductory maps (Maps 4-1 and 6-1 thru 6-3) are provided as a reference for the analysis of these hazards. Map 4-1 (see page I-27) shows the State of Louisiana and the political boundaries for the individual parishes. The locations of State-owned bridges in the State of Louisiana are overlaid on that base map information in Map 6-15.

A general overview of the hazard vulnerability assessment and loss estimation methodologies, combined loss estimate results for the indicated hazards, and hazard vulnerability assessment and loss estimate results for each hazard, are presented in the sections that follow. Detailed hazard vulnerability assessments and loss estimates for each of the nine hazards, along with related maps and tables, are presented in Volume II, Appendix F.12.

Introduction

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and the State Hazard Mitigation Planning Committee (SHMPC) undertook the risk assessment for State-owned bridges in three stages:

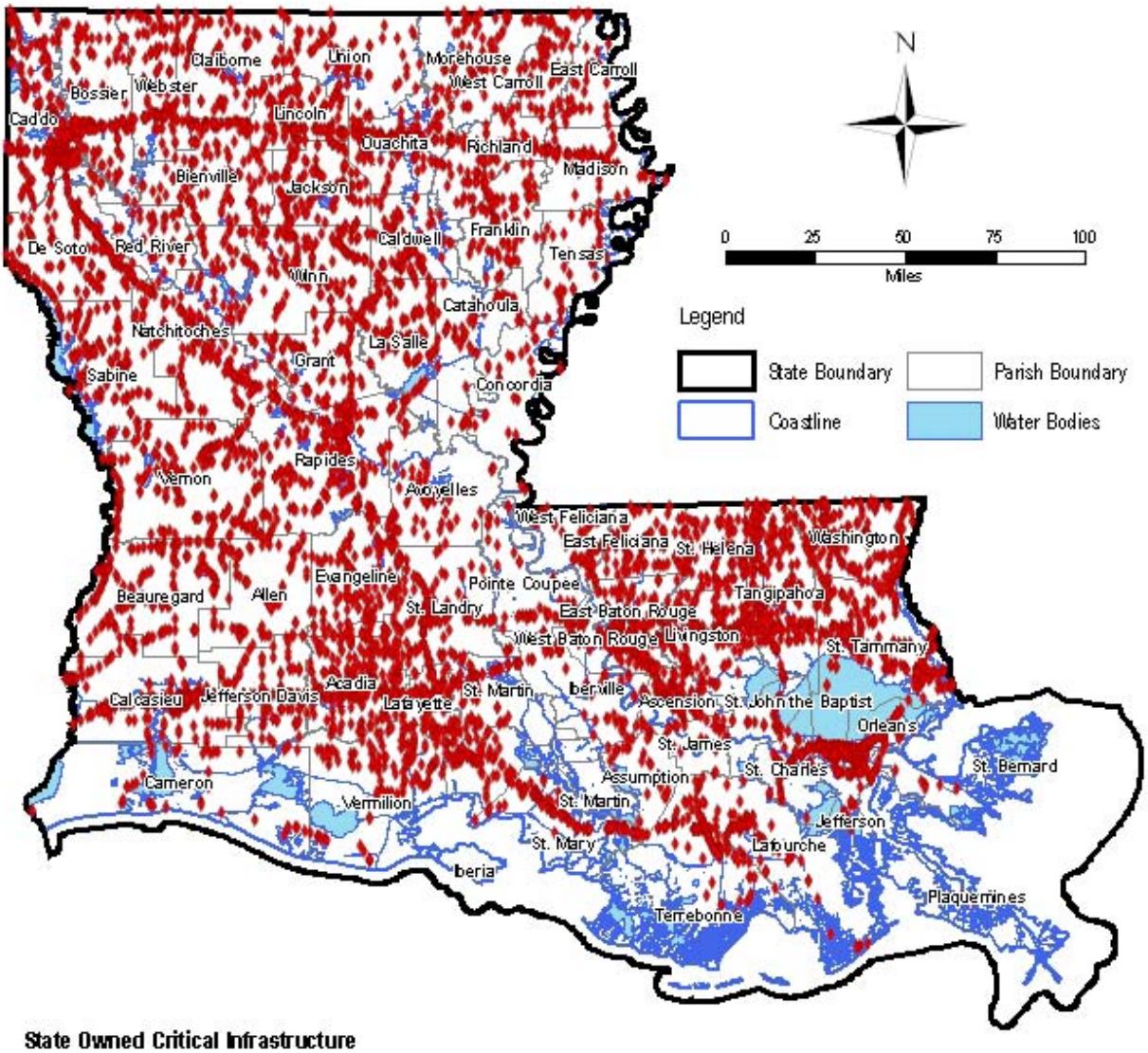
- Identification of State-owned bridges
- Vulnerability Assessment
- Loss Estimation

Identification of Critical Infrastructure

The Infrastructure Protection Branch of GOHSEP develops and maintains a classified listing of critical infrastructure and key resources in the State of Louisiana. However, GOHSEP is still in the process of gathering information from several parishes and the listing is currently only reflective of 16 parishes. As a result, for the Plan Update, default database listings of State-owned highway bridges included in HAZUS was used as the best available source of information regarding State-owned critical infrastructure.

Attributes in the database for these bridges include the location, age, and traffic counts of the bridges. The total number of assets included in the database is 7,584. The general locations of these assets are shown in Map 6-15.

Map 6-15: Critical Infrastructure - Bridges



State Owned Critical Infrastructure

- State Owned Bridges

Source: HAZUS, 2003

GOHSEP and the SHMPC decided to assign "criticality" levels based upon traffic count. The different levels that were developed by GOHSEP are shown in Table 6-39.

Table 6-39: State-Owned Bridges Criticality Level Descriptions

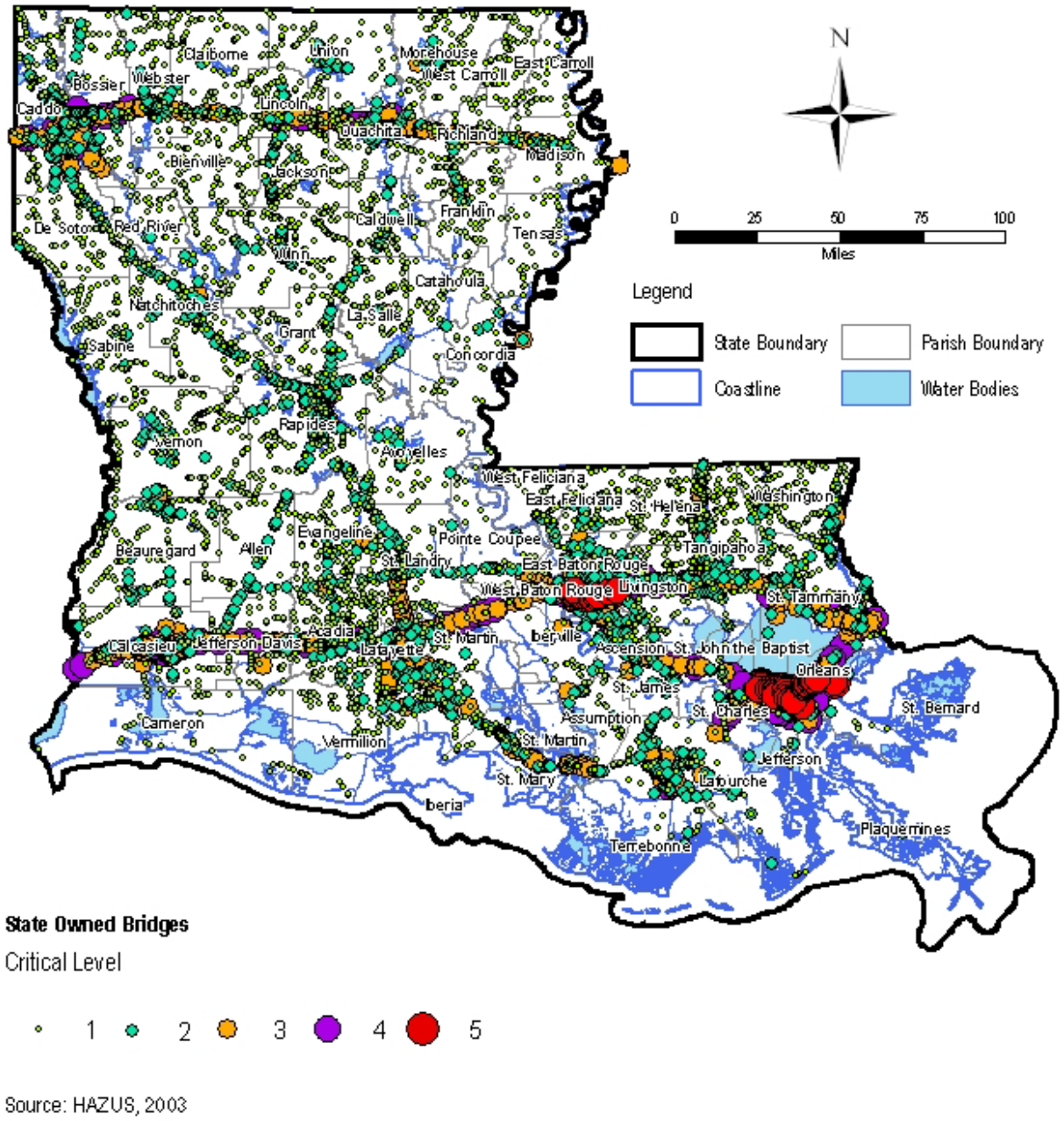
Criticality Level	Description
Level 1 - High importance/Most critical	Traffic Count > 55,750
Level 2 - Medium-high importance	Traffic Count >29,000 and < 55,750
Level 3 - Medium importance	Traffic Count >14,000 and <29,000
Level 4 - Medium-low importance	Traffic Count > 4,500 and < 14,000
Level 5 - Low importance	Traffic Count < 4,500

Table 6-40 shows the numbers of State-owned bridges per criticality ranking; this information is also illustrated in Map 6-16.

Table 6-40: Number of State-Owned Assets (Bridges) by Criticality Ranking

Criticality Level	Number of Assets (Critical Facilities)
1 – High	79
2 – Medium High	300
3 – Medium	886
4 – Medium Low	1,838
5 – Low	4,481
Total	7,584

Map 6-16: Critical Infrastructure – Bridges- Criticality



Source: HAZUS, 2003

Vulnerability Assessment Methodology for State-owned Bridges

Hazard vulnerability assessments provide a means of indicating whether a given bridge in Louisiana is at a low, medium, or high vulnerability to damage from a given hazard. Although there are a variety of potential hazards, the hazard vulnerability assessments for State-owned bridges in Louisiana adopted the same general approach for all hazards. This general approach is outlined by the three-step methodology listed below:

- Step 1 – Review Hazard Profile Maps: The first step in the hazard vulnerability assessments was to review the hazard profile map for the hazard under consideration. The hazard profile maps helped identify and establish which parishes or areas in the State of Louisiana have historically been the most prone to a given hazard, and provided a useful means of establishing hazard vulnerability levels (Step 2). The hazard profile maps for each hazard may be found in Section Four of this Plan Update.
- Step 2 – Establish Hazard Vulnerability Levels by Location: Using information from Step 1, hazard vulnerability levels were established for State-owned bridges based on location. In general, bridges located outside established hazard zones were designated as having a low hazard vulnerability level, while bridges located within the established hazard zones were designated with a medium or high hazard vulnerability level. The basis for the medium and high distinctions is described for each hazard in the materials starting on page I-180.
- Step 3 – Establish Hazard Vulnerability Levels using Additional Parameters if Needed: In some cases, the location of a bridge is not sufficient to specify a low, medium or high vulnerability level. In these situations, the next step was to establish additional parameters to make a more specific determination. Examples of parameters used to establish hazard vulnerability levels include the age of the bridge relative to the adoption of a floodplain ordinance. The assumption is that in general terms, bridges constructed after the establishment of an ordinance are designated to have a lower hazard vulnerability level than those that were constructed before it was established, since the ordinance would theoretically require construction that is more resistant to these hazards.

Loss Estimation Methodology for State-owned Critical Facilities

Loss estimations are intended to provide a means of quantifying the potential dollar losses from a given hazard in terms of combined physical (building) damage, contents damage, and loss of function (LOF) costs. Due to limitations inherent in the data, loss estimations for bridges consider only loss of function. As described for the vulnerability assessment methodology above, although there are a variety of potential hazards, the loss estimations for State-owned bridges in Louisiana adopted the same general approach for all hazards. This general approach is outlined by the two-step methodology listed below.

- Step 1 – Estimate Damage Levels by Hazard Vulnerability Level: The first step in preparing loss estimates for individual bridges was to establish a loss of function designation from a given hazard. The three hazard vulnerability levels established by the hazard vulnerability assessment for each facility provided a useful indication of the potential levels of damage that may occur from a given hazard. In general, structures with a low hazard vulnerability level are expected to experience a shorter loss of function, structures with a medium hazard vulnerability level are subject to a moderate loss of function, and structures with a high hazard vulnerability level will likely experience a longer term loss of function.
- Step 2 – Establish Damage Functions: The final step in preparing loss estimates was to establish a series of damage functions to estimate LOF costs associated with a given hazard. The damage functions allowed damages to be estimated for the three potential damage levels established in Step 1. The damage functions were applied to individual bridges based on the factored traffic count. The traffic count values were taken directly from the information in the HAZUS database.

  The factored traffic count for each bridge was determined by multiplying the actual traffic count by a Criticality Factor (CF) based on the criticality level assigned to each structure. The relationship of the criticality level to the CF is shown in Table 6-41:

Table 6-41: Relationship of Criticality Level to Criticality Factor

Criticality Level	Criticality Factor (CF)
1 – High	5
2 – Medium High	4
3 – Medium	3
4 – Medium Low	2
5 - Low	1

Once the factored traffic count was obtained for each bridge, the LOF costs were computed by using a formula derived from the FEMA Benefit Cost Toolkit 3.0. The formula is:

Traffic count (per hour) x Detour Time (in hours) x LOF (in hours) x $25

A detour time of one hour was assumed for all bridges.

The value of $25 dollars per person-hour is derived from FEMA's "What is a Benefit?" Guidance and the Benefit Cost Toolkit. In these references, a value of $21 is provided but the guidance dates from 2002 so the value was adjusted upward to represent present value.

The subsections that follow provide a summary of information about the risk assessment for State-owned bridges for each hazard type. Some subsections also include updated hazard data, while others continue to use the previous hazard data. More detailed discussions of the methodologies and the results for each hazard are contained in Volume II, Appendix F.12.

Flood

The flood hazard vulnerability assessment of State-owned bridges was based on: 1) location of the facility within the 100-year floodplain; and 2) the construction date of the bridge relative to the issuance of Flood Insurance Rate Maps (FIRMs) in Louisiana. The criteria used to determine specific vulnerability rankings for each bridge and the results of applying this ranking to the State-owned bridges are shown in Table 6-42.

Table 6-42: Flood Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Bridges
High	Bridges within floodplain / pre-FIRM construction date	3,603
Medium	Bridges within floodplain / post-FIRM construction date	875
Low	Bridges not within floodplain	3,112

The flood loss estimate of State-owned bridges facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Flood Hazard Vulnerability Ranking
  - Factored Traffic Count

Table 6-43: Flood Loss Estimate Ranges and Ranking Results

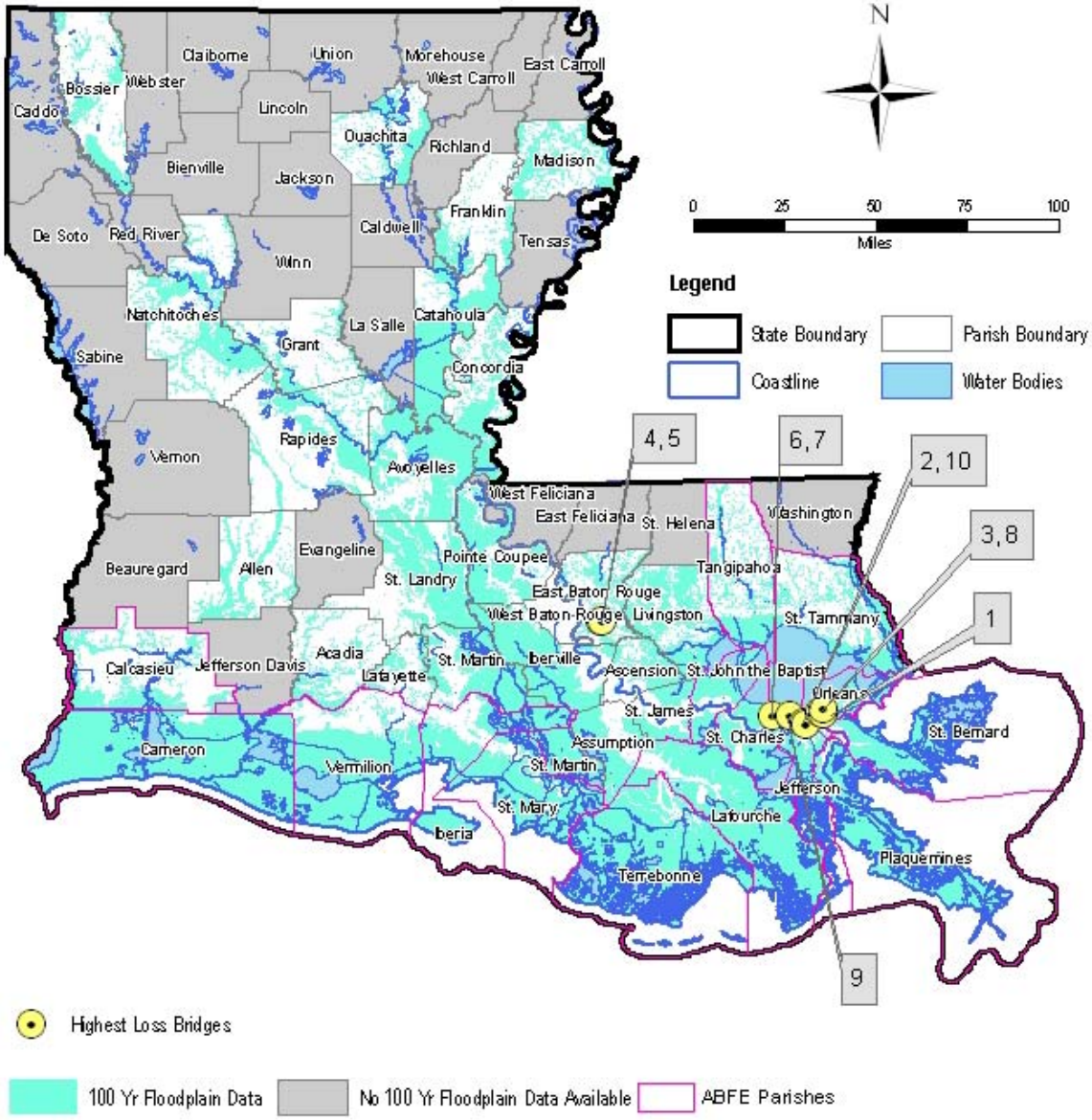
Ranking	Total Loss Estimate Ranges	Number of Bridges
High	$10,000,001 - $450,000,000	1,535
Medium	$10,001 - $10,000,000	2,812
Low	$0 -$10,000	3,237

Table 6-44: Top Ten Bridges at Risk from Flood Hazard Computed From Loss Estimates

Flood Loss Ranking	Bridge Location	Parish	Loss Estimate
1	I-10 at New Orleans East	Orleans	$442,371,375
2	I-10 at Airline Highway	Orleans	$377,500,500
3	LA 3021 at I-10	Orleans	$351,327,375
4	I-12 at LA 3064	East Baton Rouge	$294,357,375
5	I-12 at LA 61	East Baton Rouge	$294,357,375
6	I-10 at Canal Boulevard and Lakeport (1)	Orleans	$286,810,875
7	I-10 at Canal Boulevard and Lakeport (2)	Orleans	$286,810,875
8	I-10 at Chef Menteur Highway	Orleans	$281,691,000
9	I-10 at Canal Street and Bainbridge	Orleans	$274,353,750
10	I-10 at South Broad Street	Orleans	$268,447,500

Map 6-17: Critical Infrastructure Loss Estimate – Flood – Total: shows the area of the 100-year floodplain in the State of Louisiana based on Digital Quality Level 3 Flood Data (Q3) (same as Map 4-5), as well as the locations of the ten highest ranked bridges per Table 6-44.

Map 6-17: Critical Infrastructure Loss Estimate – Flood



Source: FEMA ABFE Data, 2006; FEMA Q3 Data, 1999; HAZUS, 2003

High Wind (Hurricane)

The hurricane wind hazard vulnerability assessment of State-owned bridges was based on the design wind speed zone. The criteria used to determine specific vulnerability rankings for each bridge and the results of applying this ranking to the State-owned bridges are shown in Table 6-45.

Table 6-45: High Wind Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Bridges
High	Design wind = ≥ 110 mph	1,004
Medium	Design wind = 91 – 110 mph; pre- code	3,290
Low	Design wind = < 90 mph	2,858

The high wind loss estimate of State-owned bridges in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Hurricane Wind Hazard Vulnerability
  - Factored Traffic Count

Table 6-46: High Wind Loss Estimate Ranges and Ranking Results

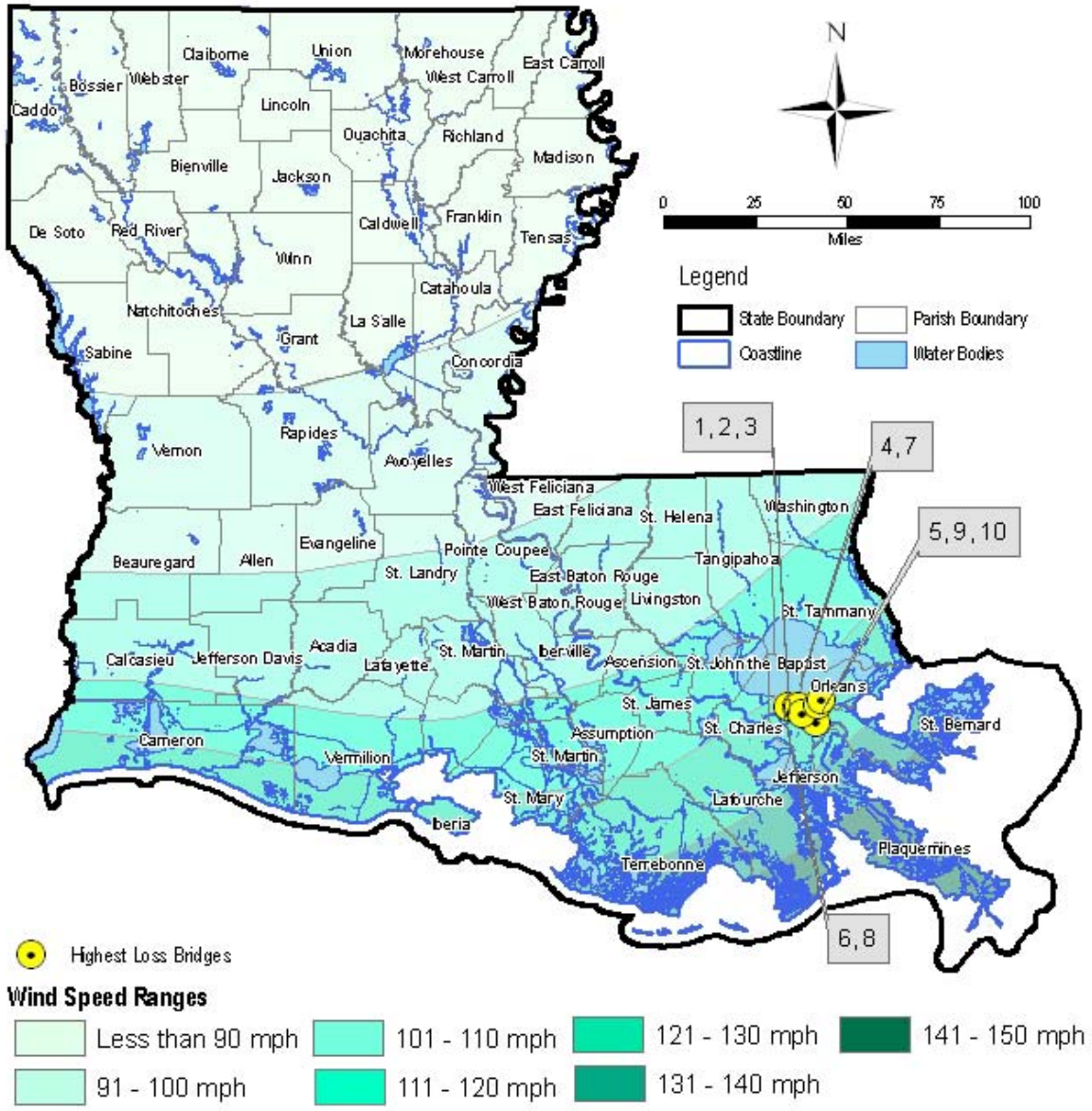
Ranking	Total Loss Estimate Ranges	Number of Bridges
High	$10,000,001 to $350,000,000	886
Medium	$250,001 to $10,000,000	3,779
Low	$0 to $250,000	3,919

Table 6-47: Top Ten Bridges at Risk from Hurricane Wind Hazard Computed From Loss Estimates

High Wind Loss Ranking	Bridge Location	Parish	Loss Estimate
1	I-10 at Pontchartrain Boulevard	Orleans	$301,312,500
2	I-610 at I-10	Orleans	$270,000,000
3	I-10 over Canal	Orleans	$245,761,875
4	I-10 at Airline Highway	Orleans	$209,722,500
5	LA 3021 at I-10	Orleans	$195,181,875
6	I-10 at Canal Street (1)	Orleans	$180,787,500
7	I-10 at Canal Street (2)	Orleans	$180,787,500
8	US 90 at General DeGaulle	Orleans	$160,485,000
9	I-10 at Clearview Road (1)	Orleans	$159,339,375
10	I-10 at Clearview Road (2)	Orleans	$159,339,375

Map 6-18: Critical Infrastructure Loss Estimate – High Wind – Total: shows the design wind speed zones from American Society of Civil Engineers 7-02 (same as Map 4-13) for Louisiana, as well as the locations of the ten highest ranked bridges from Table 6-47.

Map 6-18: Critical Infrastructure Loss Estimate – Hurricane



Source: ASCE Standard 7-02; HAZUS, 2003

High Wind (Tornado)

The tornado wind hazard vulnerability assessment of State-owned bridges was based on the average number of tornadoes per 100 square miles within each parish. The criteria used to determine specific vulnerability rankings for each bridge and the results of applying this ranking to the State-owned bridges are shown in Table 6-48.

Table 6-48: High Wind Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Parishes
5	> 3.5 tornadoes per 100 square miles	6
4	2.5 - 3.5 tornadoes per 100 square miles	8
3	1.5 – 2.5 tornadoes per 100 square miles	8
2	.5 – 1.5 tornadoes per 100 square miles	25
1	< .5 tornadoes per 100 square miles	17

The high wind loss estimate of State-owned bridges in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Tornado Wind Hazard Vulnerability
  - Percentage of Parish Land Impacted by Tornadoes
  - Factored Traffic Count per Parish

Table 6-49: High Wind Loss Estimate Ranges and Ranking Results

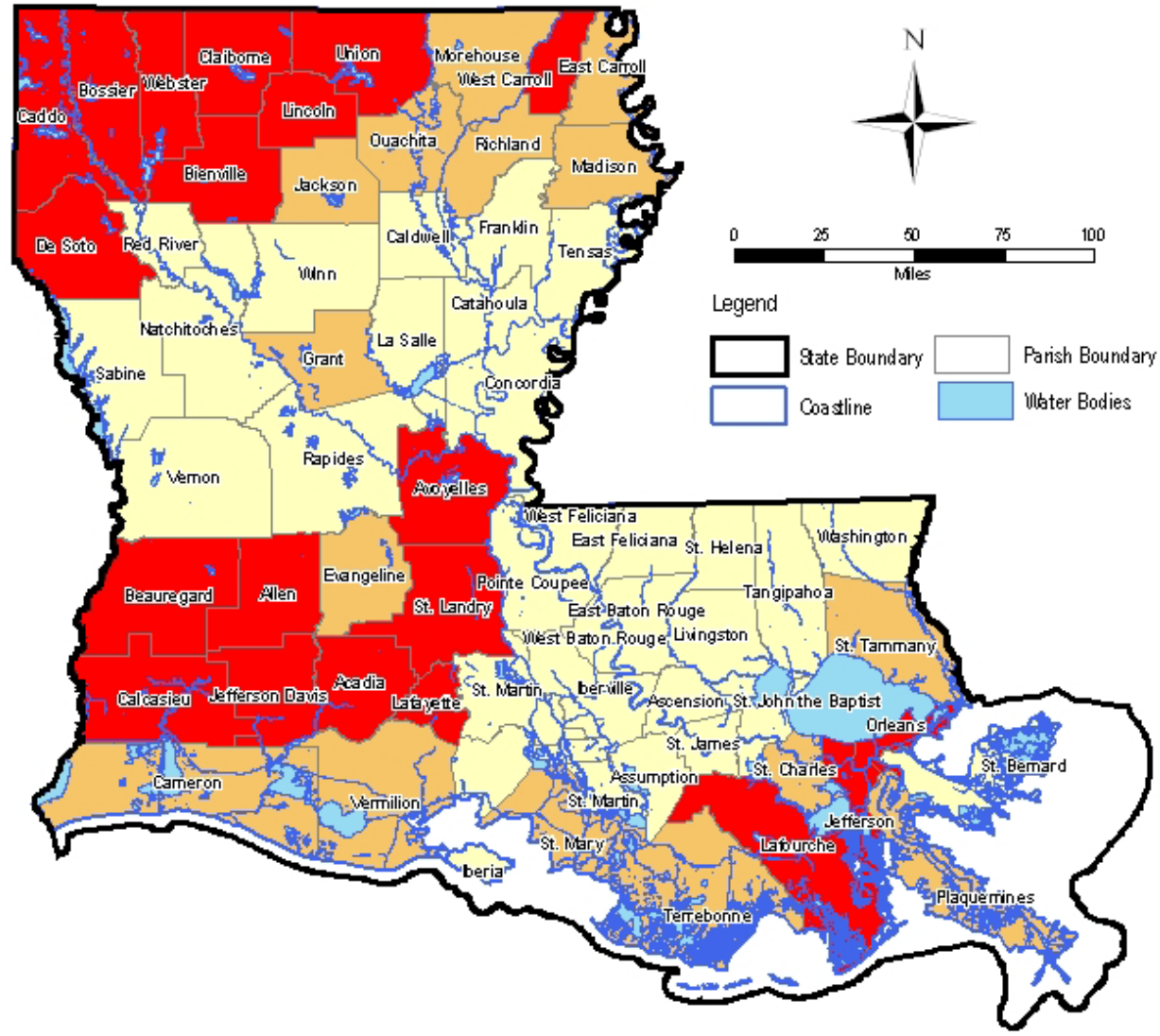
Ranking	Total Loss Estimate Ranges	Number of Parishes
High	$100,000,001 to $900,000,000	20
Medium	$10,000,01 to $100,000,000	15
Low	$0 to $10,000,000	29

Table 6-50: Top Ten Parishes at Risk from Tornado Wind Hazard Computed From Loss Estimates

High Wind Loss Ranking	Parish	Loss Estimate
1	Jefferson Davis	$896,693,000
2	Acadia	$674,258,250
3	Bossier	$657,575,800
4	Caddo	$614,979,750
5	St. Landry	$436,881,800
6	Claiborne	$373,615,500
7	Lafayette	$319,081,700
8	Orleans	$297,504,900
9	Jefferson	$291,020,675
10	West Carrol1	$267,824,875

Map 6-19: Critical Infrastructure Loss Estimate – High Wind – Total; shows the loss estimate ranking of all Parishes.

Map 6-19: Critical Infrastructure Loss Estimate – Tornado



Critical Infrastructure Estimated Losses

< $10,000,000 | $10,000,000 to $100,000,000 | >$100,000,000

Source: HAZUS, 2003

Ice Storm

The ice storm hazard vulnerability assessment of State-owned bridges was based on the number of recorded ice storms within each parish based on data provided by the National Climatic Data Center (NCDC). The criteria used to determine specific vulnerability rankings for each bridge and the results of applying this ranking to the State-owned bridges are shown in Table 6-51.

Table 6-51: Ice Storm Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Bridges
High	Bridges in parishes with > 4 recorded ice storms	1,575
Medium	Bridges in parishes with from 1 to 4 recorded ice storms	2,657
Low	Bridges in parishes with no recorded ice storm	3,350

The ice storm loss estimate of State-owned bridges in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Ice Storm Hazard Vulnerability
  - Factored Traffic Count

Table 6-52: Ice Storm Loss Estimate Ranges and Ranking Results

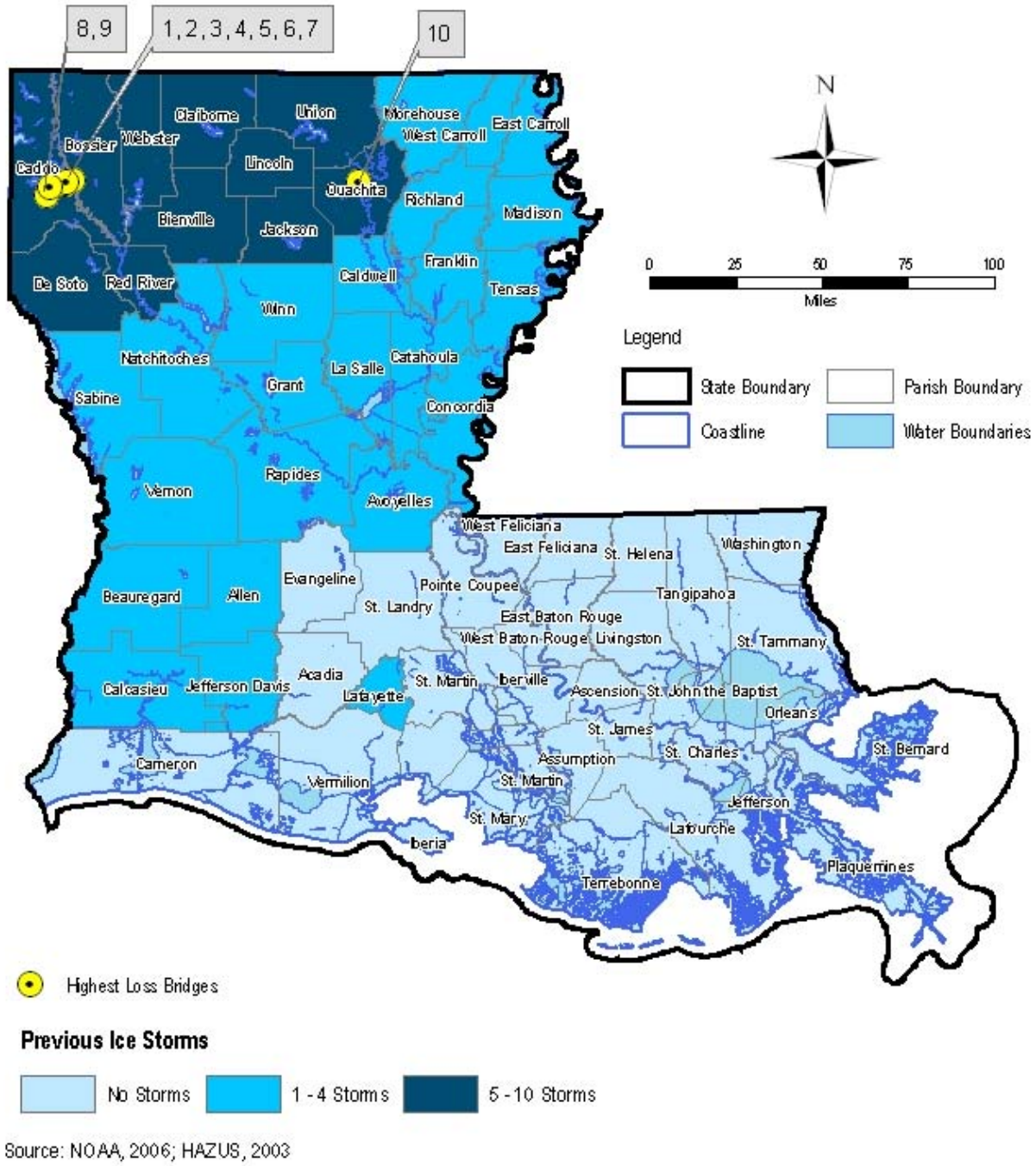
Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$1,000,000 to $17,000,000	731
Medium	$50,000 to $1,000,000	1,887
Low	$0 to $50,000	4,966

Table 6-53: Top Ten Bridges at Risk from Ice Storm Hazard Computed From Loss Estimates

Ice Storm Loss Ranking	Bridge Location	Parish	Loss Estimate
1	LA 617 at I-20	Ouachita	$16,746,000
2	I-20 Inner Loop Expressway	Caddo	$16,216,800
3	I-20 at Caddo Lake	Caddo	$16,049,100
4	I-20 at Red River	Bossier	$16,049,100
5	I-20 at Traffic Street	Bossier	$16,049,100
6	I-20 at Commerce Street	Caddo	$16,049,100
7	I-20 at Industrial Drive	Bossier	$15,380,100
8	I-20 at Louisiana Avenue (1)	Caddo	$14,580,300
9	I-20 at Louisiana Avenue (2)	Caddo	$14,580,300
10	I-20 at LA 71	Caddo	$14,580,300

Map 6-20: Critical Infrastructure Loss Estimate – Ice Storm – Total: shows the number of recorded ice storms for each parish in the State of Louisiana based on NCDC data (same as Map 4-15), as well as the locations of the ten highest ranked bridges from Table 6-53.

Map 6-20: Critical Infrastructure Loss Estimate – Ice Storm



Source: NOAA, 2006; HAZUS, 2003

Storm Surge

The storm surge hazard vulnerability assessment of State-owned bridges was based on sea, lake, and overland surges from hurricanes (SLOSH) models for category 1-5 hurricanes in Louisiana. The criteria used to determine specific vulnerability rankings for each bridge and the results of applying this ranking to the State-owned bridges are shown in Table 6-54.

Table 6-54: Storm Surge Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Bridges
High	Bridges within hazard zone with inundation depths > 12 feet	757
Medium	Bridges within hazard zone with inundation depths < 12 feet	785
Low (or None)	Bridges outside the hazard zone	6,042

The storm surge loss estimate of State-owned bridges in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Storm Surge Hazard Vulnerability
  - Factored Traffic Count

Table 6-55: Storm Surge Loss Estimate Ranges and Ranking Results

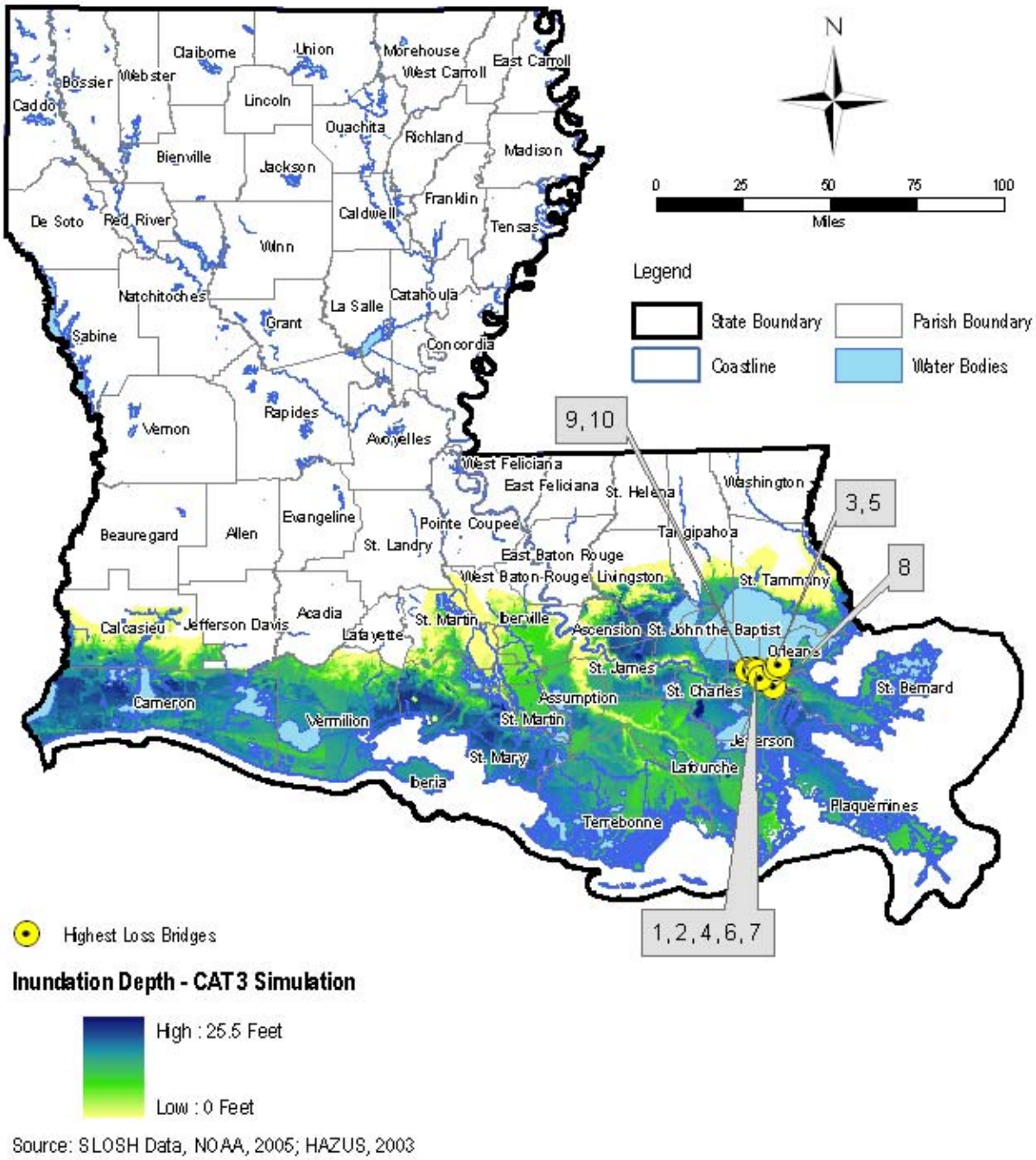
Ranking	Total Loss Estimate Ranges	Number of Bridges
High	$50,000,001 to $650,000,000	255
Medium	$1,000,001 to $50,000,000	1,090
Low	$0 to $1,000,000	6,239

Table 6-56: Top Ten Bridges at Risk from Storm Surge Hazard Computed from Loss Estimates

Storm Surge Loss Ranking	Bridge Location	Parish	Loss Estimates
1	I-10 at Pontchartrain Expressway	Orleans	$602,625,000
2	I-610 at Pontchartrain Expressway	Orleans	$540,000,000
3	I-10 in New Orleans East	Orleans	$491,523,750
4	I-10 at Airline Highway	Orleans	$419,445,000
5	LA 3021 at I-10	Orleans	$390,363,750
6	I-10 at Canal Street (1)	Orleans	$361,575,000
7	I-10 at Canal Street (2)	Orleans	$361,575,000
8	US 90 at General DeGaulle	Orleans	$320,970,000
9	I-10 at Lakeport (1)	Orleans	$318,678,750
10	I-10 at Lakeport (2)	Orleans	$318,678,750

Map 6-21: Critical Infrastructure Loss Estimate –Storm Surge – Total: shows the storm surge hazard zones and potential surge inundation depths throughout the state (same as Map 4-21), as well as the locations of the ten highest ranked facilities from Table 6-56.

Map 6-21: Critical Infrastructure Loss Estimate – Storm Surge



Source: SLOSH Data, NOAA, 2005; HAZUS, 2003

Subsidence

The subsidence hazard vulnerability assessment of State-owned bridges was based on subsidence rate studies from the Louisiana Speaks report prepared by the Louisiana Recovery Authority in the wake of Hurricanes Katrina and Rita. The criteria used to determine specific vulnerability rankings for each bridge and the results of applying this ranking to the State-owned bridges are shown in Table 6-57.

Table 6-57: Subsidence Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Bridges
High	Bridges located in the identified basins with rates > .08	150
Medium	Bridges located in the identified basins with rates between .02 and .08	993
Low (or None)	Bridges located in the identified basins with rates < .02	6,441

The subsidence loss estimate of State-owned bridges in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Subsidence Hazard Vulnerability
  - Factored Traffic Count

Table 6-58: Subsidence Loss Estimate Ranges and Ranking Results

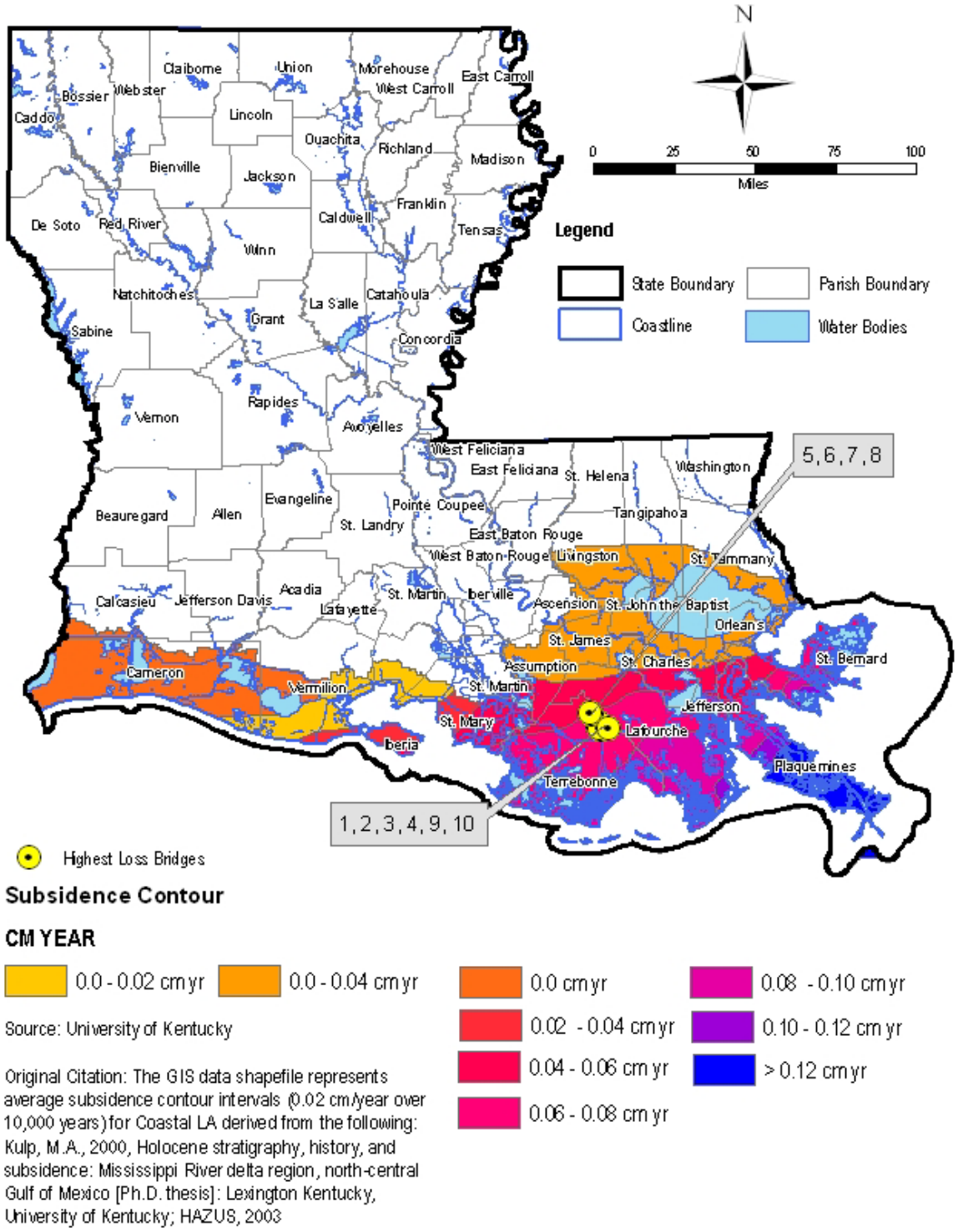
Ranking	Total Loss Estimate Ranges	Number of Bridges
High	$2,000,001 to $110,000,000	88
Medium	$1 to $2,000,000	62
Low	$0	7,434

Table 6-59: Top Ten Bridges at Risk from Subsidence Hazard Computed From Loss Estimates

Subsidence Loss Ranking	Bridge Location	Parish	Loss Estimate
1	LA 3040 at Borrow and LA 182	Terrebonne	$102,687,000
2	LA 3040 over Intercoastal Waterway	Terrebonne	$102,687,000
3	LA 659 at Darlene Street	Terrebonne	$55,532,250
4	LA 659 at Sugarland Street	Terrebonne	$53,228,250
5	LA 24 at Hackberry Avenue	Terrebonne	$53,228,250
6	LA 659 at Evergreen Drive	Terrebonne	$52,616,250
7	LA 659 at Charlette Street	Terrebonne	$52,616,250
8	LA 3087 at Main Street	Terrebonne	$45,191,250
9	LA 3087 at Intercoastal Waterway	Terrebonne	$45,191,250
10	LA 182 at Hollywood Road	Terrebonne	$38,391,750

Map 6-22: Critical Infrastructure Loss Estimate –Subsidence– Total: shows the subsidence hazard zones and the extent of potential subsidence throughout the state (same as Map 4-22b), as well as the locations of the ten highest ranked bridges from Table 6-59.

Map 6-22: Critical Infrastructure Loss Estimate – Subsidence



Wildfire

The wildfire hazard vulnerability assessment of State-owned bridges was based on the number of recorded wildfires and the number of acres burned by wildfires within each parish based on data provided by the State of Louisiana. The criteria used to determine specific vulnerability rankings for each bridge and the results of applying this ranking to the State-owned bridges are shown in Table 6-60.

Table 6-60: Wildfire Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Bridges
High	Bridges in parishes with > average burned area	3,019
Medium	Bridges in parishes with < average burned area	2,786
Low (or None)	Bridges in parishes with no recorded wildfires	1,779

The wildfire loss estimate of State-owned bridges in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Wildfire Hazard Vulnerability
  - Factored Traffic Count

Table 6-61: Wildfire Loss Estimate Ranges and Ranking Results

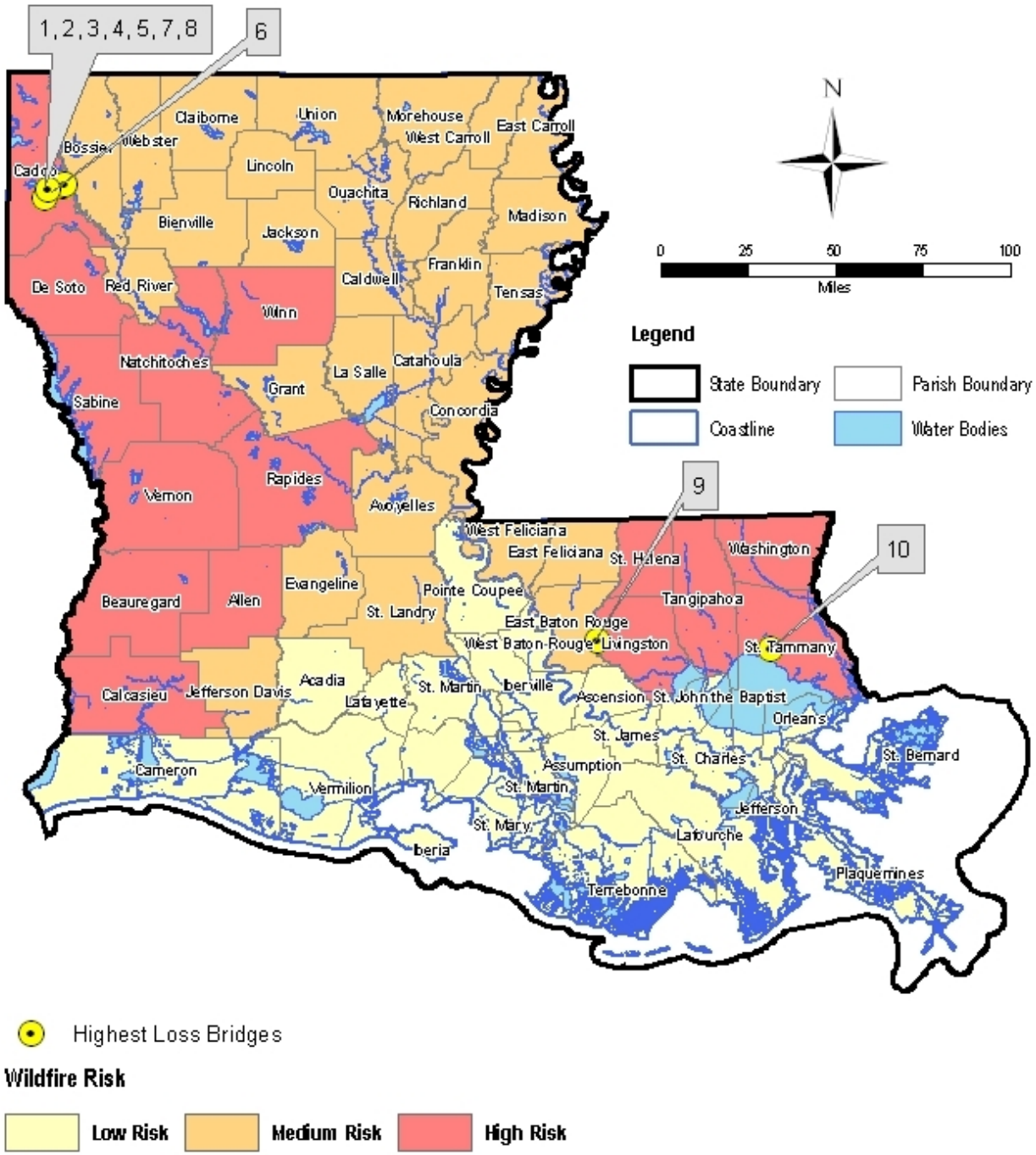
Ranking	Total Loss Estimate Ranges	Number of Bridges
High	$1,000,001 to $25,000,000	1,174
Medium	$50,001 to $1,000,000	2,887
Low	$0 to $50,000	2,523

Table 6-62: Top Ten Bridges at Risk from Wildfire Hazard Computed From Loss Estimates

Wildfire Loss Ranking	Bridge Location	Parish	Loss Estimate
1	I-12 at South Range Avenue	Livingston	$24,140,625
2	I-20 at LA 3132	Caddo	$16,216,800
3	I-20 at Commerce	Caddo	$16,049,100
4	I-20 at Red River	Caddo	$16,049,100
5	I-20 over Caddo Lake	Caddo	$16,049,100
6	US 190 at Fairway Drive	St. Tammany	$15,970,800
7	I-20 at Louisiana Avenue (1)	Caddo	$15,580,300
8	I-20 at Louisiana Avenue (2)	Natchitoches	$15,580,300
9	I-20 at LA 71 (1)	Rapides	$15,580,300
10	I-20 at LA 71 (2)	Rapides	$15,580,300

Map 6-23: Critical Infrastructure Loss Estimate –Wildfire – Total: shows the average number of acres burned by wildfires for each parish in the State of Louisiana based on state data (same as Map 4-23), as well as the locations of the ten highest ranked bridges from Table 6-62.

Map 6-23: Critical Infrastructure Loss Estimate – Wildfire



Source: Louisiana Department of Agriculture and Forestry, 2003; HAZUS, 2003

Dam Failure

The dam failure hazard vulnerability assessment of State-owned bridges was based on the potential inundation areas in proximity to low, significant and high hazard dams statewide. The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-63.

Table 6-63: Dam Failure Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Bridges
High	Bridges within 50% of dam failure hazard radius	465
Medium	Bridges in area 50% to 100% of dam failure hazard radius	968
Low (or None)	Bridges outside dam failure hazard radius	6,151

The dam failure loss estimate of State-owned bridges in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Dam Failure Hazard Vulnerability
  - Factored Traffic Count

Table 6-64: Dam Failure Loss Estimate Ranges and Ranking Results

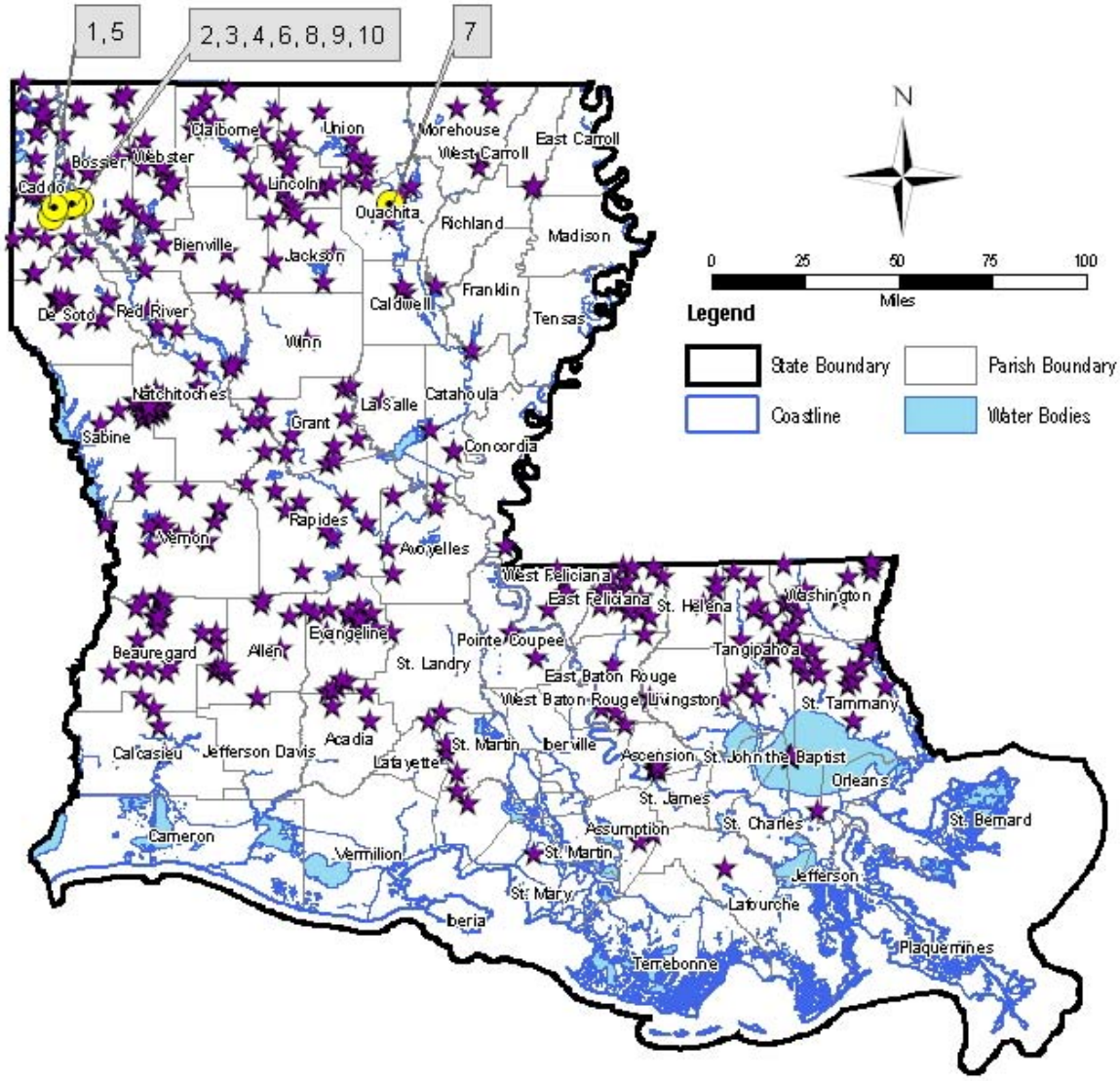
Ranking	Total Loss Estimate Ranges	Number of Bridges
High	$1,000,001 to $165,000,000	953
Medium	$1 to $1,000,000	478
Low	$0	6,153

Table 6-65: Top Ten Bridges at Risk from Dam Failure Hazard Computed From Loss Estimates

Dam Failure Loss Ranking	Bridge Location	Parish	Loss Estimate
1	I-220 at LA 3132	Caddo	$162,168,000
2	I-20 over Red River	Caddo	$160,491,00
3	I-20 at Traffic Street	Bossier	$160,491,00
4	I-20 at Commerce Street	Caddo	$160,491,00
5	I-220 over Caddo Lake	Caddo	$160,491,00
6	I-20 at Old Minden Highway	Bossier	$153,801,000
7	LA 617 at I-20	Ouachita	$150,714,000
8	I-20 at Louisiana Avenue (1)	Caddo	$145,803,000
9	I-20 at Louisiana Avenue (2)	Caddo	$145,803,000
10	I-20 at US 71	Caddo	$145,803,000

Map 6-24: Critical Infrastructure Loss Estimate –Dam Failure – Total: shows the locations of various dams in parishes throughout the State of Louisiana (same as Map 4-24), as well as the locations of the ten highest ranked bridges from Table 6-65.

Map 6-24: Critical Infrastructure Loss Estimate – Dam Failure



Source: U.S. Army Corp of Engineers National Inventory of Dams; HAZUS, 2003

Levee Failure

As noted previously, the levee failure hazard vulnerability assessment of State-owned bridges was limited to the potential inundation areas from levees under the jurisdiction of the New Orleans District of the U.S. Army Corps of Engineers (USACE). The criteria used to determine specific vulnerability rankings for each bridge and the results of applying this ranking to the State-owned bridges are shown in Table 6-66.

Table 6-66: Levee Failure Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Bridges
High	Bridges within ½ mile of levee	161
Medium	Bridges from ½ to 2 miles from levee	571
Low (or None)	Bridges > 2 miles from levee	6,952

The levee failure loss estimate of State-owned bridges in Louisiana involved an analysis of the following parameters (that are described in more detail in Volume II, Appendix F.12).

- Levee Failure Hazard Vulnerability
  - Factored Traffic Count

Table 6-67: Levee Failure Loss Estimate Ranges and Ranking Results

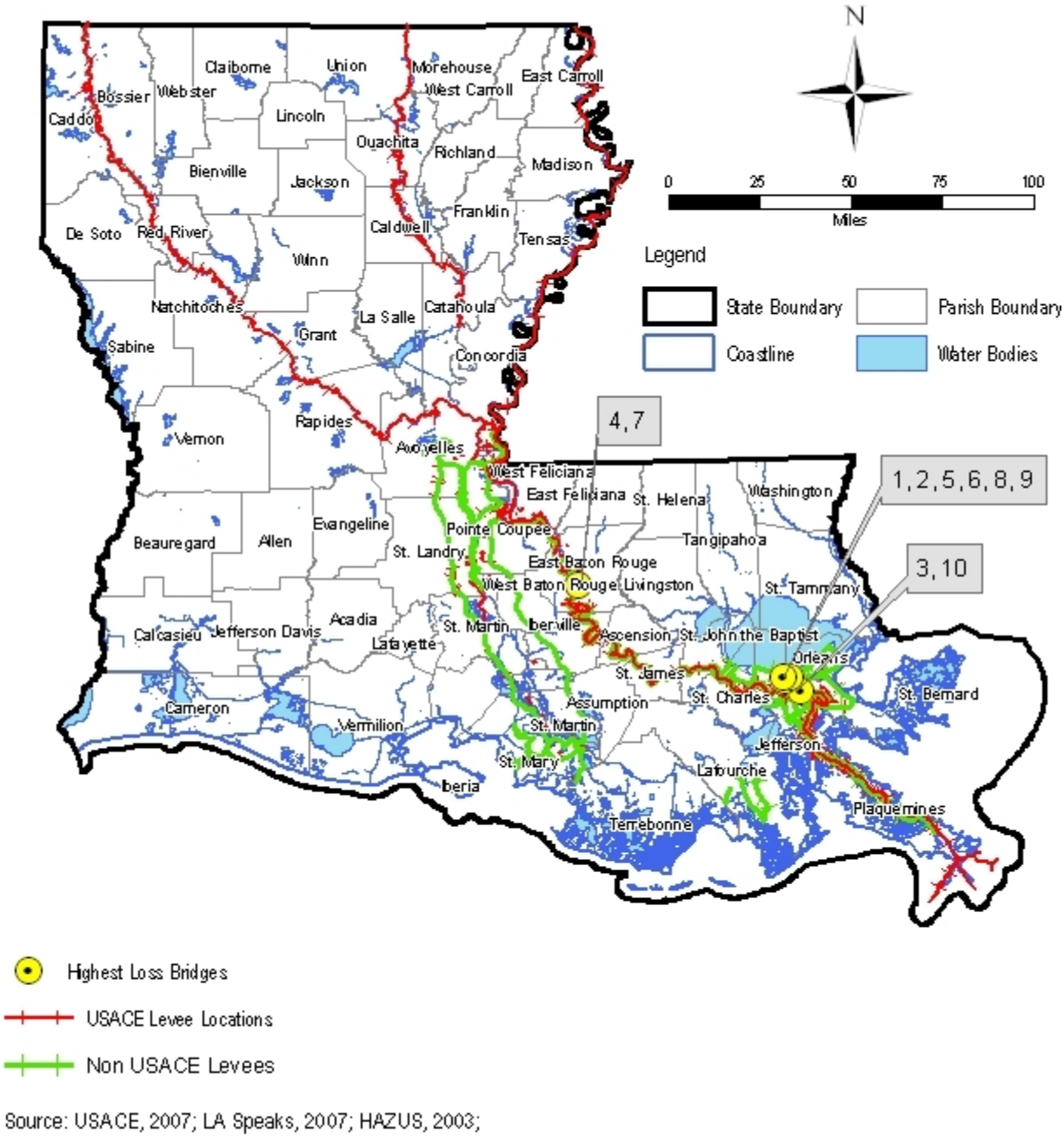
Ranking	Total Loss Estimate Ranges	Number of Bridges
High	$10,000,001 to $550,000,000	391
Medium	$1 to $10,000,000	337
Low	$0	6,856

Table 6-68: Top Ten Bridges at Risk from Levee Failure Hazard

Levee Failure Loss Ranking	Bridge Location	Parish	Loss Estimate
1	I-10 at West Pontchartrain	Orleans	$542,362,500
2	I-610 at Pontchartrain Expressway	Orleans	$388,800,000
3	US 90 at General DeGaulle	Orleans	$231,098,400
4	I-10 over Mississippi River	East Baton Rouge	$230,361,000
5	I-610 at City Park	Orleans	$225,321,000
6	I-610 City Park Drainage	Orleans	$225,321,000
7	I-10 at Nicolson Drive	East Baton Rouge	$218,352,000
8	I-610 at City Park East	Orleans	$202,788,900
9	I-610 at St. Bernard Avenue	Orleans	$202,788,900
10	US 90 over Mississippi River	Orleans	$197,796,000

Map 6-25: Critical Infrastructure Loss Estimate – Levee Failure – Total: shows the location of State-owned bridges in the State in relation to the levee locations (same as Map 4-25), as well as the locations of the ten highest ranked bridges from Table 6-68.

Map 6-25: Critical Infrastructure Loss Estimate – Levee Failure



Source: USACE, 2007; LA Speaks, 2007; HAZUS, 2003;

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Section Seven
Capability Assessment

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7.1 Interim Final Rule Requirements for Capability Assessments

This capability assessment contains an analysis of state funding opportunities to directly support hazard mitigation, along with the missions, programs, and policies of state agencies that directly or indirectly support hazard mitigation. Also included in this assessment are analyses of agency capacities to initiate, support, and/or implement mitigation programs and activities. This section also contains analysis of capability at the regional and local levels, as well as consideration of the status of contractor capability for hazard mitigation in Louisiana.

Finally, this capability assessment considers the existing versus desired location and availability of staffing, technological, and data resources for mitigation. This section then integrates the aforementioned findings and offers an analysis and recommendations intended to streamline coordination of state and local hazard mitigation goal- and priority- setting, strategic and activity planning, and project implementation.

The Interim Final Rule (IFR) includes two specific requirements for conducting capability assessments as part of the Standard State Hazard Mitigation Plans:

- State Capability Assessment per Requirement §201.4(c)(3)(ii): "[The State mitigation strategy shall include a] discussion of the State's pre-and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: an evaluation of State laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas [and] a discussion of State funding capabilities for hazard mitigation projects …."
- Local Capability Assessment per Requirement §201.4(c)(3)(ii): "[The State mitigation strategy shall include] a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities".

7.2 Mitigation Funding Sources

7.2.1 Federal Funding Sources

For the purposes of the Plan Update, the following description of Federal funding sources was limited to programs with direct relationships to hazard mitigation. Through the Federal Emergency Management Agency (FEMA), the Federal government has several programs to support hazard mitigation. These programs are federally-funded but typically administered by the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP).

7.2.1.1 FEMA Pre-Disaster Mitigation Program: The Pre-Disaster Mitigation (PDM) program is designed to implement cost-effective hazard mitigation activities that complement a comprehensive mitigation program. These include planning, acquisition, retrofitting, flood control projects, generators, and other projects. All applicants must participate in the National Flood Insurance Program (NFIP) if they have been

identified through the NFIP as having a Special Flood Hazard Area (SFHA). Only governments are eligible. PDM covers up to 75% of costs.

7.2.1.2 FEMA Hazard Mitigation Grant Program: Authorized under Section 404 of the Stafford Act, the Hazard Mitigation Grant Program (HMGP) is administered by FEMA and provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Eligible projects include drainage systems, structure elevation, landscape alteration, floodwalls, road elevation, property acquisition, development of mitigation plans, development of land-use regulations, and more. Governments and selected non-profits are eligible. HMGP covers up to 75% of costs. Public Assistance (PA) (see below) also has a mitigation program; Table 7-1 compares PA (Section 406) hazard mitigation to HMGP (Section 404).

7.2.1.3 FEMA Public Assistance: The PA Program provides supplemental Federal disaster grant assistance under Section 406 of the Stafford Act for the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain private, non-profit organizations. Eligible projects include: debris removal, emergency protective measures, repair to transportation infrastructure, repair to utility infrastructure, and more. PA covers up to 75% of costs.[1] The majority of Hurricane Katrina- and Rita-related funds came through PA and HMGP. The PA program contains a mitigation component wherein eligible damaged infrastructure can be mitigated if mitigation measures are deemed cost-effective and environmentally-sound. Disaster Assistance Policy 9526.1 provides further information on the use of Section 406 Mitigation. Table 7-1 compares PA (Section 406) hazard mitigation to HMGP (Section 404).

7.2.1.4 FEMA Flood Mitigation Assistance Program: The Flood Mitigation Assistance (FMA) program's goal is to reduce or eliminate claims under the NFIP. FMA provides funding to assist States and NFIP-participating communities in implementing plans, projects, and programs to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. This includes acquisition, elevation, flood mitigation, and more. FMA covers up to 75% of costs.

7.2.1.5 FEMA Repetitive Flood Claims Program: This program provides funding to reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP that have had one or more claim payment(s) for flood damages. Repetitive Flood Claims (RFC) funds may only be used for structures in NFIP-participating communities that cannot meet the requirements of the FMA program due to lack of cost share funds or capacity to manage the activities. RFC grants provide up to 100% of state/local match for FMA property acquisitions, as well as other flood-related mitigation measures.

7.2.1.6 FEMA Severe Repetitive Loss Program: Severe Repetitive Loss (SRL) grants target acquisition funds to NFIP-insured properties that have either had four or more claims of $5,000; two or more claims with a cumulative value of $20,000; or two or more claims whose net value exceeds the property's value. SRL typically requires a 25% state/local match; the state/local match can be decreased to as low as 10% in cases in which a FEMA-approved Standard or Enhanced Hazard Mitigation Plan exists, and includes a strategy for mitigating existing and future SRL properties.

7.2.1.7 FEMA Map Modernization Risk MAP: FEMA's flood hazard maps are one of the essential tools for flood hazard mitigation in the United States. FEMA's Flood Map Modernization is now part of the Risk MAP program, a federal program to increase the reliability of flood maps and address gaps in flood hazard data to form a solid foundation for flood risk assessments and floodplain management. This program requires the cooperation and input of State and local agencies and jurisdictions to collect and update flood data.

7.2.1.8 FEMA Unmet Needs: FEMA's Unmet Needs program is authorized by Congress for specific major disaster- related events where the needs of the citizens are not met through existing services. The Unmet

[1] The cost share for PA can be adjusted on a disaster-by-disaster basis by an Act of Congress. For example, in the wake of hurricanes Katrina and Rita, the federal share of PA was increased to 90%, and then to 100%, waiving the state/local share entirely.

Needs program is implemented only when deemed appropriate by Congress. Project eligibility is also determined by Congress, but will usually conform to the existing criteria under the HMGP unless specifically waived.

7.2.1.9 Long-term Community Recovery (LTCR): FEMA's LTCR is Emergency Support Function (ESF) #14, as identified by the National Response Framework. ESF 14 was activated following Hurricanes Katrina and Rita and was instrumental in helping parishes in southern Louisiana identify actions deemed instrumental in helping the area recover. Although not specifically identified as a mitigation program, ESF 14 is listed here as many of the outcomes are mitigation oriented. The State allocated $700 million of its Community Development Block Grant (CDBG) funding to implement ESF 14 activities. ESF 14 is not a funding program, but is instead meant to prioritize and direct recovery funds.

Table 7-1: Comparison of Section 404 (HMGP) to Section 406 (PA) Hazard Mitigation Grants

	Section 404 (HMGP)	Section 406 (PA)
Administration	State	FEMA
Funding source	Hazard Mitigation Grant Program (HMGP)	Public Assistance (PA) grant program
Application process	Application must go through HMGP review process	Application is part of PA review process
Funding uses	Usable on any facility	Limited to damaged facilities
	Usable for structural and non-structural measures	Limited to structural measures
	Usable for any mitigation purpose	Usable only for mitigation of a damaged facility or element
	Usable anywhere in the State (some disaster declarations may limit the area where HMGP can occur)	Limited to declared disaster areas
Benefit Cost Analysis (BCA) criteria	Entire project must be cost-effective per FEMA BCA module	If <15% of the total project cost are mitigation measures under PA, a project may be given administrative approval by the FEMA project officer (certain projects may be funded at higher amounts as specified in Disaster Assistance Policy 9526.1)
Linkage to hazard mitigation benefits	Cost-effectiveness can be linked to any hazard mitigation benefit	Cost effectiveness (if mitigation is >15% of project cost) must be linked to mitigating the damages actually being repaired
Total award	Total award limited by a formula based on total eligible disaster-related Public Assistance (PA) and Individual Assistance (IA) grant programs	No limit to total award

Source: FEMA, James Lee Witt Associates

7.2.2 Non-Federal Match

For many of these federal grants, the "non-federal" share can be borne by the State as "grantee"; the recipient community as "subgrantee"; or in some cases, the property owner who benefits from the project. In Louisiana, the non-federal share is typically borne by the community or the property owner and not the State.

In acquisitions to remove properties that experience repetitive flood losses, the non-federal share is typically covered by the property owner accepting the 75% federal share. The property owner documents the lost equity as the non-federal share. This can serve as a disincentive to property owners in many cases.

7.2.3 Additional Federal Funding Sources

Additionally, other Federal agencies provide mitigation assistance through various programs that conduct studies, develop and fund projects for ecosystem restoration, flood control, and hurricane protection, and may also indirectly provide mitigation assistance through disaster recovery.

7.2.3.1 USACE Beneficial Use of Dredged Material Program governed by Sections 204 and 1135 of the Water Resources Development Acts (of 1986, 1992, and 1996): These projects originate from operation and maintenance of existing USACE dredging projects for navigable waterways. Through cooperation between the state and federal governments, some of the material dredged during regularly scheduled maintenance is utilized for the creation of wetlands, improvement of wetland habitat, or the protection of eroding shorelines. The Office of Coastal Protection and Restoration (OCPR) is a local cost share partner for many of these projects.

7.2.3.2 USACE Continuing Authorities: USACE administers its Continuing Authorities program under a blanket congressional authority that allows USACE to respond more quickly to water resource development needs. USACE may take direct action under this program provided that the specific project is under a specific cost limit.

7.2.3.3 USACE Floodplain Management Services: USACE also administers a floodplain management program to encourage and guide state and local governments towards prudent use of the nation's floodplain for the benefit of the national economy and welfare. USACE has the capability to provide a full range of technical services and planning guidance on floods and floodplains.

7.2.3.4 USACE Flood Control Act funds: The Flood Control Act, renewed periodically, is a federal appropriation in support of flood control infrastructure projects.

7.2.3.5 USACE General Investigations: USACE, operating under congressional authority, periodically investigates the feasibility of providing flood damage reduction measures under General Investigations. This funding supported the *Lower Atchafalaya* and *Morganza to the Gulf* studies.

7.2.3.6 USACE Non-Structural Alternatives to Structural Rehabilitation of Damaged Flood Control Works: Direct planning and construction grants are made available through this program for non-structural alternatives to the structural rehabilitation of flood control works damaged by storms. Houses can be elevated or acquired through this program.

7.2.3.7 USACE Planning Assistance to States: Through this program, USACE provides technical and planning assistance for the preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources.

7.2.3.8 USACE Project Modification for Improvement of the Environment: This program provides for ecosystem restoration by modifying structures and/or operations or water resources projects constructed by the USACE, or restoring areas where a USACE project contributed to the degradation of an area.

7.2.3.9 USACE Water Resources Development Act: Water Resources Development Act (WRDA), renewed periodically, is federal *authorization* (not funding) in support of water resources planning and projects, including flood control and coastal restoration projects. Funds for implementation are provided through separate appropriations and typically require a local or state cost-share. Louisiana Office of Coastal Protection and Restoration (OCPR) usually partners 50:50 with the USACE in developing feasibility studies for coastal restoration projects to be authorized under WRDA and is the implementation cost-share partner (typically 35%). The 2007 WRDA (HR 1495) authorized the Louisiana Coastal Area (LCA) Ecosystem Restoration Study and the Morganza to the Gulf of Mexico Hurricane Protection Project.

7.2.3.10 U.S. Department of Agriculture, Farm Ownership Loans: This program makes loans, guaranteed/insured loans and technical assistance to farmers for developing, constructing, improving farm homes and service buildings.

7.2.3.11 USDA, Farm Service Agency, Transfer of Inventory Farm Properties to Federal and State Agencies for Conservation Purposes: This program transfers title of certain inventory farm properties owned by the Farm Service Agency (FSA) to Federal and State agencies for conservation purposes, including restoration of wetlands and floodplains to reduce future flood potential.

7.2.3.12 USDA, Natural Resources Conservation Service (NRCS), Emergency Watershed Protection Program. This program provides technical and financial assistance for relief from imminent hazards in small watersheds and is also used to mitigate life and property in small watershed areas damaged by severe natural hazard events.

7.2.3.13 USDA NRCS, Emergency Watershed Program – Floodplain Easement: NRCS purchases floodplain easements on lands that qualify for Emergency Watershed Program assistance, including those that have repeat flood hazards. Floodplain easements restore, protect, maintain, and enhance the functions of the floodplain, plus other benefits.

7.2.3.14 USDA, NRCS, Land Protection: Technical assistance is provided for run-off retardation and soil erosion prevention to reduce hazards to life and property.

7.2.3.15 USDA, NRCS, Watershed Protection and Flood Prevention Program: NRCS installs improvement projects to protect, develop and utilize land or water resources in small watersheds under 250,000 acres.

7.2.3.16 USDA, NRCS, Watershed Surveys and Planning: NRCS uses this program for appraising water and related sources, and formulating alternative plans for conservation use and development. The program provides grants and advisory/counseling services to assist with planning and implementation improvement.

7.2.3.17 USDA, NRCS, Wetlands Reserve Program: This program provides financial and technical assistance to protect and restore wetlands through easements and restoration programs.

7.2.3.18 USDA, Rural Development, Rural Development Assistance-Housing: Grants, loans, and technical assistance are made available through this program to address rehabilitation, health, and safety needs in primarily low-income rural areas, following Presidential Disaster Declarations.

7.2.3.19 USDA, Rural Development, Rural Development Assistance-Utilities: Direct and guaranteed rural economic loans and business enterprise grants are made through this program to address utility issues and development needs.

7.2.3.20 USDA, Rural Development, Section 502 Loan and Guaranteed Loan Program: This program provides loans, loan guarantees, and technical assistance to very low- and low-income applicants to purchase, build, or rehabilitate homes in rural areas.

7.2.3.21 USDA, Rural Development, Section 504 Loans for Housing: Repair loans, grants, and technical assistance are provided to very low-income senior homeowners living in rural areas to repair homes and remove health and safety hazards.

7.2.3.22 U.S. Department of Commerce, Economic Development Administration, Disaster Mitigation Planning and Technical Assistance: Through this program, EDA provides technical and planning assistance grants for capacity building and mitigation project activities focusing on creating disaster resistant jobs and workplaces.

7.2.3.23 U.S. DOC, EDA Post-Disaster Economic Recovery Grants and Assistance: Grants are made available for long-term economic recovery of communities, industries, and firms adversely impacted by disasters.

7.2.3.24 U.S. DOC National Oceanic and Atmospheric Administration, Coastal Zone Management Program: Grants are provided for planning and implementation of non-structural coastal flood and hurricane hazard mitigation projects and coastal wetlands restoration.

7.2.3.25 U. S. Department of Interior, Bureau of Indian Affairs, Indian Housing Assistance: Project grants and technical assistance are provided to substantially eliminate sub-standard Indian housing.

7.2.3.26 U.S. Department of Interior, Fish and Wildlife Service, Partners for Fish and Wildlife: Financial and technical assistance are made available to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats.

7.2.3.27 U.S. DOI, USGS, Stream Gauging and Flood Monitoring Network: USGS operates a network of over 7,000 stream gauging stations that provide data on the flood characteristics of rivers.

7.2.3.28 U.S. Department of Housing and Urban Development (HUD): CDBG Program: Subject to availability of supplemental appropriations, HUD provides flexible CDBGs to help cities, counties, and states with infrastructure development, especially in low-income areas. CDBG funds provided a significant portion of supplemental recovery funding following Hurricanes Katrina, Rita, Gustav and Ike. Following Hurricanes Katrina and Rita, the State of Louisiana received $13.41 billion from three separate appropriations from the U.S. Congress. The majority of these funds were used to assist with housing through the State's Road Home Program. Following Hurricanes Gustav and Ike, the State received $438 million to implement a wide range of long-term recovery efforts.

7.2.3.29 U.S. HUD CDBG-State Administered Program: Through this program, HUD promotes development and economic opportunities for low- and moderate-income persons who live in non-entitlement communities. Mitigation actions are often funded using this fund.

7.2.3.30 U.S. HUD CDBG Entitlement Communities Program: Larger cities and urban parishes receive CDBG funds to promote development and economic opportunities for low-and moderate-income persons. Mitigation actions are often funded using this fund.

7.2.3.31 U.S. HUD Disaster Recovery Initiative: This program provides grants to fund gaps in available recovery assistance after disasters, including mitigation initiatives and is determined by HUD based upon a Presidential Disaster Declaration of an area as a major disaster.

7.2.3.32 U.S. HUD HOME Investments Partnership Program: This program makes grants and loans to States and local governments and consortia for permanent and transitional housing (including support for property acquisition and rehabilitation) for low-income persons.

7.2.3.33 U.S. HUD Public Housing Modernization Reserve for Disasters and Emergencies: Funding is provided to housing agencies for modernization needs resulting from natural disasters (including elevation, flood proofing, and retrofits).

7.2.3.34 U.S. HUD Section 108 Loan Guarantee Program: Loan guarantees are made to public entities for community and economic development, including mitigation measures.

7.2.3.35 U. S. Environmental Protection Agency (EPA), Clean Water State Revolving Funds: This program provides loans at actual or below-market interest rates to help build, repair, relocate, or replace wastewater treatment plants.

7.2.3.36 U.S. EPA, Clean Water Act Section 319 Grants: Grants are provided to states to implement non-point source pollution programs, including support for non-structural watershed resource restoration activities.

7.2.3.37 U.S. EPA, Wetlands Protection-Development Grants: Through this program, EPA provides grants to support the development and enhancement of state and tribal wetlands protection programs.

7.2.3.38 U.S. Small Business Administration (SBA) Disaster Assistance Program: The SBA offers a variety of loan programs to assist businesses and others impacted by a disaster, including loans to homeowners and renters for personal or real property, and loans to qualified small businesses. All SBA disaster loans can be increased by up to 20 percent, but not to exceed program funding limits, for specific mitigation measures. The SBA also offers a Pre-Disaster Mitigation Loan Program.

7.2.3.39 CWPPRA funds: Also known as the "Breaux Act," CWPPRA has provided the only annually recurring federal funding for Louisiana's coastal restoration projects. Enacted in 1990, and renewed through 2019, CWPPRA provides about $60 million per year through the Louisiana Coastal Wetlands Conservation and Restoration Task Force, with representatives from the Environmental Protection Agency (EPA), NRCS, U.S. Fish and Wildlife Service (USFWS), USACE, National Marine Fisheries Service of NOAA, and the Louisiana Governor's Office of Coastal Activities. OCPR administers the program for the state and contributes 15 percent of total project costs.

7.2.3.40 Coastal Zone Management Act (CZMA) funds: The CZMA of 1972, which also led to the creation of the National Estuarine Research Reserve System, established a national policy of protecting, restoring, and enhancing coastal areas. CZMA funds are available through Coastal Zone Enhancement Grants. DNR's Coastal Management Division (CMD) is charged with implementing the Louisiana Coastal Resources Program (LCRP) under authority of the State and Local Coastal Resources Management Act. In a 50:50 cost share with National Oceanic and Atmospheric Administration (NOAA), this law seeks to protect, develop, and, restore or enhance the resources of the State's coastal zone where feasible. The CMD also oversees the Coastal Zone Management (CZM) Grants program in a 75:25 cost share with NOAA. The State cost share is provided through self-generated funds from Coastal Use Permits and the Coastal Protection and Restoration Fund.

7.2.3.41 Coastal Impact Assistance Program (CIAP): The CIAP is a revenue-sharing program authorized by Section 384 of the Energy Policy Act of 2005 to assist coastal states and their subdivisions (parishes) in mitigating the impacts from Outer Continental Shelf (OCS) oil and gas production. Louisiana is one of the 7 states that will receive funds for four years (FY 2007-10), disbursed through the Department of the Interior's Bureau of Ocean Energy Management, Regulation, and Enforcement. Thirty-five percent of the funds go to 19 coastal parishes. OCPR administers the state's portion of the funds.

7.2.3.42 OCS revenues: In 2007, federal legislation dedicated a portion of OCS lease revenues to coastal states. Louisiana is expected to receive $200 million per year through year 10. After year 10, this funding source is expected to increase to $400 million. Eighty percent of these revenues go to the state for support of the Coastal Protection and Restoration Fund, and the remainder goes to parishes.

Additionally, the proposed U.S. Safe Building Codes Act of 2007 would make states that have and enforce mandatory statewide building codes eligible for an additional 4% of post-disaster relief funds. FEMA would make determinations of which states are in compliance.

*See Volume II, Appendix G.1 for complete descriptions of these funding programs.

7.2.4 State Funding Sources

In addition to federal funds that are administered by state agencies (noted above), the State of Louisiana also has several programs or entities that have funded mitigation activities:

7.2.4.1 GOHSEP Community Education and Outreach (CEO) program: The CEO program is a $25 million public education and outreach program funded from HMGP funds and intended to educate and coordinate activities around hazard mitigation.

7.2.4.2 Department of Transportation and Development (DOTD) Floodplain Management Program/ NFIP: DOTD is the state coordinating agency for the NFIP. This program promotes local government compliance with NFIP regulations to ensure the availability of low-cost flood insurance to minimize loss of life and property due to catastrophic flooding. This is accomplished through on-site assessments, distribution of a quarterly newsletter, conducting workshops, providing technical assistance on local government ordinance development, and participation in post-disaster flood hazard mitigation activities. The program is jointly funded by FEMA and DOTD on a 75:25 cost share.

7.2.4.3 DOTD Statewide Flood Control Program: The Statewide Flood Control Program provides an average of $10 million annually to parish and municipal governments, levee boards, and drainage districts to support projects that reduce existing flood damages, do not encourage additional development in flood-

prone areas, do not increase upstream or downstream flooding, and have a total construction cost of $100,000 or more. Eligible projects include: channel enlargement, levees, pump stations, relocation of dwellings and business structures, reservoirs, and other flood damage reduction measures.

7.2.4.4 Division of Administration Louisiana Community Development Block Grants: The mission of this program is to provide assistance to local governmental entities for developing viable communities. The Louisiana Community Development Block Grants program is principally designed to assist persons of low- to moderate-income by providing decent housing, a suitable living environment, and expanded economic opportunities.

7.2.4.5 Division of Administration Capital Outlay: Capital outlays are state budget General Fund expenditures for acquiring lands, buildings, equipment or other properties, or for their preservation or development or permanent improvement. Capital outlay planning and budgeting are directed toward the acquisition or renovation of fixed assets.

7.2.4.6 Division of Administration Governor's Office of Rural Development (GORD): GORD's mission is to reach all of Louisiana's rural communities with resources to help them grow and benefit the lives of their citizens. The organization serves as the single point of contact for rural government service providers, State and Federal agencies, and individuals interested in rural policies and programs of the State.

7.2.4.7 Louisiana Department of Environmental Quality (DEQ) Municipal Facilities Revolving Loan Fund Program: The Municipal Facilities Revolving Loan Fund Program provides below market rate loans to communities for construction or upgrade of wastewater treatment works and other water quality improvement projects.

7.2.4.8 DEQ Drinking Water Revolving Loan Fund Program: The Drinking Water Revolving Loan Fund Program provides assistance to public water systems to construct or upgrade drinking water systems to meet Federal and State standards. DEQ and the Louisiana Office of Public Health, Department of Health and Hospitals (DHH) are cooperating to implement this program in Louisiana.

7.2.4.9 DEQ Hardship Grants Program: The Hardship Grants Program provides assistance to small, rural communities to construct wastewater treatment projects. A limited amount of Federal grant funds to the GORD is available to assist eligible communities that could not otherwise afford the project costs. DEQ and GORD are cooperating to implement this program.

7.2.4.10 Coastal Protection and Restoration Authority Coastal Protection and Restoration Fund: This fund (originally called the Louisiana Wetlands Conservation and Restoration Fund) was established in 1989 by the Louisiana Legislature to provide a dedicated source of funding for coastal restoration. Income for the fund is a dedication of a percentage of the State's mineral income and severance taxes from oil and gas production on State lands. In 2003, constitutional amendments dedicated a portion of mineral settlements or judgments to the fund as well as allowing the deposit of non-recurring revenues. In 2005, legislation and constitutional amendments added hurricane protection as an allowable expenditure from the fund and dedicated future OCS mineral revenues to the fund. The fund will include monies from the OCS revenues under the U.S. Gulf of Mexico Energy Security Act of 2006. In 2006, another amendment provided the fund with a portion of any tobacco settlement funds, with the precise amount being determined by the CPRA. The CPRA is also charged with developing an annual plan for expenditures from the fund. OCPR manages and administers the fund and is responsible for implementation of coastal restoration and management activities as well as hurricane protection.

7.2.4.11 OCPR Barrier Island Preservation and Stabilization Fund: This fund supports shoreline stabilization and other preservation projects for barrier islands. An annual list of priority projects is developed and submitted to the House and Senate Committees on Natural Resources.

7.2.4.12 DNR Parish Coastal Wetlands Restoration Program: This program utilizes recycled Christmas trees placed in enclosures for shoreline protection. The program partners with the local governments of the coastal zone parishes.

7.2.4.13 OCPR/NRCS/Soil and Water Conservation Committee Vegetation Planting Program: Through this program native marsh vegetation is planted and monitored throughout the coastal zone of Louisiana. OCPR enters into annual cooperative agreements with the Louisiana Department of Agriculture and Forestry (DAF). It is through the DAF and the Soil and Water Conservation Committee, Soil and Water Conservation Districts (SWCD) that the planting tasks are selected, planned, evaluated, planted, and monitored. Each NRCS District Conservationist provides technical assistance to their respective SWCD throughout the planting task process.

7.2.4.14 DNR Dedicated Dredging Program: This program is a marsh creation and nourishment program to assist private landowners and other entities in restoring critical wetlands. Projects are typically less than 40 acres. Funds are requested from the Coastal Protection and Restoration Trust Fund as projects are developed.

7.2.4.15 DNR Coastal Wetland Reserve Program: The purpose of the State's Coastal Wetland Reserve Program (CWRP) is to restore coastal wetlands on lands that have been converted to agriculture. Louisiana has pledged to make available over $200,000 each year to accomplish more of this vital coastal restoration work. The State is working with the Conservation Plan federal oversight agencies to obtain formal approval for shifting the funds for this program to focus on conservation of coastal forest through conservation easements purchased from willing landowners.

*More detailed descriptions of the state programs that fund mitigation projects are included in Volume II, Appendix G.1.

7.2.5 PDM, FMA, and HMGP Projects, 1998-2010

To fully assess the State of Louisiana's capacity to support hazard mitigation, GOHSEP completed a history of the last ten years of mitigation activities. This data was organized in such a way as to outline and document all mitigation activities since the inception of the 1998 Plan. All mitigation activities funded by the HMGP, FMA, and PDM programs were reviewed. Additionally, a separate assessment of mitigation of severe repetitive loss properties from 2005 through 2008 is presented, consistent with the requirements for reduced state/local match for FEMA's SRL grant program. This data was unable to be updated through 2010 due to the difficulties in acquiring and comparing data from the Repetitive Loss List/Severe Repetitive Loss list and the HMGP project lists from Katrina/Rita/Gustav/Ike. However, processing the data from these lists is currently underway and will be included in the next update.

The process for identifying the history of mitigation projects in Louisiana over the last ten years involved a review of GOHSEP databases for each funding type from 1998-2010. Databases were gathered, then analyzed geographically and by funding type, type of mitigation action, structures affected (if applicable), and total project cost. A master database was compiled for all FMA, HMGP, and PDM projects from 1998-2010; the information from this summary is compiled in Table 7-2. , and severe repetitive loss properties mitigated since 2008 appear in Tables 7-3 and 7-4.

Additional results of the mitigation history assessment are listed in Volume II, Appendix G.1, including data regarding:

- Mitigation Projects by Grant Type, 1998-2010
- Federal and Non-Federal Share of HMGP-Funded Projects, 1998-2010
- Number of HMGP-Funded Projects by Year, 1998-2010
- Severe Repetitive Loss Property Mitigation Measures since 2008
- Mitigated Severe Repetitive Loss Properties since 2008, by Parish

Table 7-2: Investment by Federal Mitigation Programs *, 1998-2010

Grant Type	1998-2004	2005-2010	TOTAL**
HMGP	$40,151,355	$526,855,242	$567,006,597
FMA	$3,676,143	$6,263,734	$9,939,877
PDM	$555,363	$6,275,565	$6,830,928
TOTAL**	$44,382,861	$539,394,541	$583,777,402

Source: GOHSEP, 2010
* Figures reflect approved projects
*Amounts reported are subject to underreporting/undercounting, and Unmet Needs grants are not included

Table 7-2 indicates that since 2004, almost $584 million in federal mitigation grants have been approved for Louisiana mitigation projects. This amount has been matched on the state's side – to date – by $49 million in "global match" funds.

Global match refers to local and state match for HMGP funds that do not go directly to the project being funded. Instead, global match is provided by applying the value of other projects or investments made on HMGP-eligible activities (subsequent to the disaster declaration) using non-federal sources.

In Louisiana, the eventual total global match amount is estimated to be just under $500 million. Global match is being provided by "overmatch" by homeowners who are elevating or reconstructing their homes in the Road Home (i.e., homeowners who are spending more than their grant on eligible expenses), plus $200 million in State funding being used for coastal restoration projects. Recently, President Obama signed the Supplemental Appropriations Act of 2010 (H.R. 4899). Section 603 states that "The Administrator of the Federal Emergency Management Agency shall consider satisfied for Hurricane Katrina the non-Federal match requirement for assistance provided by the Federal Emergency Management Agency pursuant to section 404(a) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5170c(a)".

7.2.6 Severe Repetitive Loss Mitigation Efforts

Louisiana has also been enhancing its efforts to mitigate severe repetitive loss properties, both adding properties to the targeted SRL list, and by stepping up efforts to mitigate them. Table 7-3 shows additions of properties to the severe repetitive loss list; Table 7-4 shows severe repetitive loss properties that have been or are currently being mitigated; and Table 7-5 shows the mitigation measures applied to completed mitigation projects. Additional results of this severe repetitive loss mitigation analysis are listed in Volume II, Appendix G.1.

These documented efforts to identify and mitigate severe repetitive loss properties contributes to meeting Louisiana's requirements for increased federal match on SRL and FMA grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).

Table 7-3: Additions to Severe Repetitive Loss List, by Year

Year added	Number of Properties
Unknown	317
2003-04	1,542
2005	753
2006	1,274
2007	264
TOTAL: SRL Properties Listed	4,020

Source: GOHSEP, 2010

Table 7-4: Mitigated Severe Repetitive Loss Properties, Completed and Ongoing

Date Mitigated	Number of Properties
Completion Date not Specified	241
Completed 2005	19
Completed 2006	160
Completed 2007	167
SUBTOTAL: SRL Properties, Mitigation Complete	587
Mitigation Ongoing*	325
TOTAL: SRL Properties Mitigation Complete or Ongoing*	912

Source: GOHSEP, 2010

* Ongoing projects include only those funded under HMGP for disaster declarations 1603 and 1607

Table 7-5: Severe Repetitive Loss Property Mitigation Measures since 2008*

Mitigation Measure	Number of Properties
Elevation	127
Demolition	293
No Longer Insured	113
Condemned	22
Other/ Not Specified	32
TOTAL: Completed SRL Projects	587

Source: GOHSEP, 2010

* Completed mitigation projects only

7.2.7 Other Uses of Federal Funds for Mitigation Actions Since 2005

In addition to the efforts described above and in the wake of Hurricanes Katrina and Rita, the State of Louisiana took the unprecedented step of establishing the Louisiana Recovery Authority (LRA) to coordinate recovery and rebuilding efforts. While being empowered to assume the function of the State Hazard Mitigation Team for those two disasters, the LRA was also given authority to establish action plans for the use of $13.41 billion in CDBG allocations for the recovery. These sources have gone towards programs to rebuild housing, infrastructure, and small businesses. Award applicants were required to take the necessary steps to mitigate their properties as a condition of approval.

Also since 2005, the State successfully applied for and secured $25 million, including the grant amount plus a 25% match, to support the CEO program via GOHSEP. This application was a response to the goals outlined in the April 2005 Plan. This Plan Update helps frame the CEO's scope.

Finally, since 2005 the State secured PDM grant funds and established the Planning Pilot Grant Program (PPGP) program to assist parishes in updating and enhancing their Hazard Mitigation Plans. This Plan Update employs data and inputs from PPGP plans, and offers specific recommendations for further enhancements to and integration of local planning. This effort is also a direct product of the goals described in the April 2005 Plan.

Following Hurricanes Gustav and Ike, LRA authorities were extended to include establishing action plans for the use of $438 million is specially appropriated CDBG funds. The LRA is expected to discontinue functioning in June 2010, at which time recovery functions will return to the appropriate state agencies. GOHSEP will resume control of the State Hazard Mitigation Team.

Summary

Below are some key conclusions regarding funding for hazard mitigation programs and activities in Louisiana:

- Mitigation projects in Louisiana administered by GOHSEP have historically been funded through federal programs. HMGP has been the most successful funding program in Louisiana. From 1998-2007, a total of over $208 million in federal funds was invested in HMGP projects in Louisiana.
- Louisiana has been successful at acquiring FMA and Unmet Needs funds. These programs have historically provided funds in Louisiana for mitigation purposes
- GOHSEP also administers a variety of flood-related programs that apply to Louisiana, including RFC and SRL grants
- Since 2002, Louisiana has received $2.8 million in PDM grants for planning purposes, which have leveraged local matches amounting to $850,000. State-level funding programs that directly support hazard mitigation include a wide array of programs and funding sources located in the Department of Transportation and Development, the Department of Natural Resources, the Department of Administration, the Department of Environmental Quality, and in other departments.
- Key mitigation programs are often under-funded, as reported by both state agencies and local officials. This is particularly true of acquisition for repetitive loss properties. Meanwhile, state, parish and municipal resources are rarely applied to repetitive loss buy-outs, thus placing the non-federal share burden on the homeowner, which creates a disincentive to accept the mitigation measure.

*Other funding projects as described in Volume II, Appendix G.1 indirectly provide mitigation funds.

7.3 State Capability Assessment

Introduction

This capability assessment contains an analysis of state funding opportunities to directly support hazard mitigation, along with the policies, programs, and activities of agencies participating on the State Hazard Mitigation Planning Committee (SHMPC) and other agencies that potentially contribute to hazard mitigation in the State of Louisiana. Also included in this assessment are analyses of these agencies' capacities to initiate, support, and/or implement mitigation programs and activities.

The principal state agencies analyzed for this assessment have representatives on the SHMPC. As identified in Section Three, the SHMPC is comprised of representatives of the following state agencies that also serve on the State Hazard Mitigation Team (SHMT):

- GOHSEP
- DOTD
- The Department of Wildlife and Fisheries
- DEQ
- DNR, Office of Coastal Management
- OCPR, Office of Coastal Protection and Restoration
- The Department of Agriculture and Forestry

The role of the SHMT is to provide technical assistance to GOHSEP. One specific SHMT task is to review, prioritize, and recommend funding levels for selected HMGP project applications. The SHMT also participates in mitigation planning, program development, and implementation. As a group, the SHMT has the most direct influence on how hazard mitigation is pursued in the State of Louisiana, outside of GOHSEP.

In addition, the SHMPC includes representatives from the following state agencies and organizations that have historically played a role in hazard mitigation in Louisiana:

- The Division of Administration, Office of Facilities Planning
- The Department of Corrections
- The Department of Education
- The Department of Health and Hospitals
- The Department of Public Safety, Louisiana State Uniform Construction Code Council

Finally, other agencies that potentially contribute to hazard mitigation in the State of Louisiana that are covered in this assessment include:

- The Division of Administration, Office of Community Development
- The Division of Administration, Office of Risk Management
- The Department of Culture, Recreation, and Tourism
- The Department of Insurance
- Louisiana Economic Development
- The Department of Public Safety (DPS)
- The Department of Social Services
- The LRA
- The Louisiana Floodplain Management Association
- The Louisiana National Guard
- The LSU Hurricane Center
- The LSU AgCenter
- Many others

Each of these entities, and many others, were invited to participate in the development of this Plan Update via the State Hazard Mitigation Plan Advisory Board. For more on the Advisory Board, see Section 3.2.

Section 7.3 also includes a description of the methods used to complete the analysis of state capabilities to support hazard mitigation; a summary of SHMPC and other state agency policies, programs, and activities; an analysis of the effectiveness of the policies, programs, and activities; and a brief description of Federal and state mitigation funding programs.

Volume II, Appendices G.2-3 provide greater detail for the State Capabilities Assessment. The Louisiana State Mitigation Capabilities Survey instrument is presented in Volume II, Appendix G.2. Volume II, Appendix G.3 is a report of state capabilities by agency, focusing mainly on SHMPC agencies but also providing information for state agencies that support hazard mitigation. The 2011 SHMPU Capability Assessment compared state agency mitigation capabilities reported in the 2007 and 2010 Survey instruments, and developed Tables which depict comparative data for 2007 and 2010 Survey responses, along with qualitative findings on what the response data suggest. Please refer to Appendix G, Table 3-2, page 27.

Federal and state hazard mitigation funding programs are presented in detail in Volume II, Appendix G.1. Furthermore, Appendix G.1 describes HMGP, FMA, and Unmet Needs Projects completed in Louisiana from 1998-2010.

7.3.1 Methodology

The process for identifying and assessing state capabilities to support hazard mitigation included a multi-phase process involving interviews and surveys, SHMPC meetings, a thorough review of public information for each agency, and a review of the current State Hazard Mitigation Plan, which was adopted and approved in 2008. Specific steps included:

- An updated Louisiana State Mitigation Capabilities Survey was generated, designed to use baseline data from the previous surveys, which were administered as part of the 2005 and 2008 Plans

- The updated survey was presented to the SHMPC in early 2010. Following their review and subsequent comments, the formal survey was improved and delivered to the SHMPC members via hard copy and email. The survey is included in Volume II, Appendix G.2.
- The survey results were compiled and summarized, and updates were made to the existing state agency capability assessment. Included in this effort for the 2011 SHMPU was an analysis of gaps, changes, and trends in 2007 and 2010. Survey response data was gathered (with general findings identified), and follow-up telephone interviews were held with each state agency's survey respondent in order to ascertain the factors leading to said data gaps, etc. (See Appendix G for conclusions)
- Concurrently, a thorough review of public information was conducted for each agency not involved in the SHMPC, including websites, annual reports, and strategic plans
- Finally, an assessment of past federal and state mitigation funding programs was conducted, using review of relevant documentation, including the current State Hazard Mitigation Plan.

7.3.2 State Agency Hazard Mitigation Policies, Programs, and Activities

This subsection summarizes the results of SHMPC and other state agency efforts to develop policies, programs, and activities that directly or indirectly support hazard mitigation. The complete results for each agency, including a review of the agencies' missions, personnel, activities, programs, limitations, and resources are listed in Volume II, Appendix G.3. A summary of identified pre-disaster, post-disaster, and development regulating programs, activities, and policies for each SHMPC agency and other state agencies are provided in Table 7-6. Some information regarding emergency preparedness, response, and recovery was included for various agencies if the program or activity also had a direct tie to mitigation. However, activities specifically from other realms of emergency management were not included or analyzed in this capability assessment. Information and analyses of individual agencies were provided by representatives of these agencies. For further discussion of complementary hazard mitigation and emergency management programs, see Section 8.3.The following definitions are used:

- Policies: Statements included in the State of Louisiana's adopted plans or legislation that expresses the intent of the state
- Programs: Formally- related, coordinated activities by one or more agency that have a distinct mitigation focus
- Activities: Informal actions, or actions taken on the part of an agency, to indirectly support mitigation
- Pre-Disaster: Plans, programs, or activities that have been completed in advance of a disaster or hazard event
- Post-Disaster: Plans, programs, or activities that have been completed following a disaster or hazard event
- Development Regulations: Laws, codes, or ordinances that control development, particularly in hazard-prone areas

7.3.3 Policies

Louisiana has a number of plans and legislation which that lay out specific goals, objectives and policy statements that already support or could support pre- and post-disaster hazard mitigation. Examples of existing documents include:

- Louisiana State Hazard Mitigation Plan
- Louisiana State Emergency Operations Plan
- Louisiana State Continuity of Operations Plan *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast* (CPRA)
- *Louisiana Speaks Regional Plan* (LRA)
- Louisiana State Public Assistance Administrative Plan
- Louisiana Administrative Code: Title 33 – Environmental Regulatory Code;

- Louisiana Administrative Code: Title 43 – Coastal Management
- Louisiana Administrative Code: Title 70 – Transportation

In addition, the Louisiana Emergency Assistance and Disaster Act (LEADA) of 1993, revised in 2000, is the main legislation affecting mitigation programs in the state. Among various preparedness, response, and recovery operations, the LEADA purposes related to mitigation are as follows:

- To reduce vulnerability of people and communities of this state to damage, injury, and loss of life and property resulting from natural or man-made catastrophes, riots, or hostile military or paramilitary action
- To authorize and provide for cooperation in emergency or disaster prevention, mitigation, preparedness, response, and recovery
- To authorize and provide for management systems embodied by coordination of activities relating to emergency or disaster prevention, mitigation, preparedness, response, and recovery by agencies and officers of this state, and similar state-local, interstate, and foreign activities in which the state and its political subdivisions may participate

Furthermore, Executive Orders KBB 2004-34 and KBB 2004-35 are directly related to mitigation activities in Louisiana. KBB 2004-34 establishes the Louisiana Emergency Response Commission. In 2008, Executive Order BJ 2008-72 referenced the following nine original agencies and associations represented and ten at-large members: This 20-member commission is comprised of representatives from the following agencies or entities:

- DPS
- DEQ
- The Department of Agriculture and Forestry
- GOHSEP
- The Right-To-Know Unit, DPS, Office of State Police
- The Louisiana Chemical Association
- The Louisiana Emergency Preparedness Association
- The LSU Firearm Training Program

Additionally, ten at-large commissioners serve as representatives of environmental interests and the chemical industry.

Executive Order KBB 2004-35 reestablishes the SHMT, and clarifies its duties and functions. The members and duties are described in Section Three and also in the Introduction of Section 7.3.

Executive Order BJ 2008-4 states that the LRA shall serve as the SHMT for the recovery associated with Hurricanes Katrina and Rita for purposes of the HMGP.

Finally, Executive Order KBB 2007-14 establishes the Homeland Security and Emergency Preparedness Advisory Council to support homeland security and emergency preparedness initiatives by linking state and local government efforts and leveraging education, industry, and private sector initiatives, among other goals. The council's work is related to and potentially supports hazard mitigation activities in Louisiana. The council's ten members include representatives of:

- GOHSEP
- The Louisiana National Guard
- The Senate Select Committee on Homeland Security
- The House Special Committee on Louisiana Homeland Security
- DHH
- The Louisiana State Police
- The Department of Social Services

- DOTD
- The Department of Wildlife and Fisheries
- The Department of Justice

Many of these plans and policies hold significant promise for hazard mitigation, particularly as they are ongoing in nature and take an integrated, strategic look at the whole hazard-mitigation landscape in Louisiana and propose ways to continually improve hazard mitigation.

7.3.4 Programs and Activities

Table 7-6 summarizes relevant hazard mitigation and hazard mitigation-related state policies, programs, and activities at the pre- and post-disaster phase, as well as those policies that relate directly to development regulation. Data listed below is derived either from the current plan or from updated state agency capability survey. Most SHMPC agencies completed the new survey, as did other agencies (see Volume II, Appendix G.3 for the full content of completed surveys). For more on integration of hazard mitigation functions and other emergency response and coordination functions, see Section 8.3.

Table 7-6: State Agency Hazard Mitigation Programs and Activities

Agency	Pre-Disaster	Post-Disaster	Regulation of Development
Coastal Protection and Restoration Authority	▪ Planning and prioritization of protection infrastructure and coastal restoration projects ▪ Public outreach and education	▪ None	▪ None
Governor's Office of Homeland Security and Emergency Preparedness	▪ State Administration of Federal Grant Programs o PDM o Fire Management Assistance o Flood Mitigation Assistance o Severe Repetitive Loss (SRL) program o Repetitive Flood Claims (RFC) Program ▪ Coordination of State and local mitigation planning ▪ Community Education and Outreach program (CEO) ▪ Representation on SHMPC and SHMT ▪ Training Programs	▪ State Administration of Federal Grant Programs o HMGP o Individual Assistance (IA) o Public Assistance (PA) o (PA) / 406 HMGP o Unmet Needs	▪ None
Department of Agriculture and Forestry	▪ Fire weather forecasting ▪ Representation on SHMPC ▪ Soil and Water Conservation ▪ Animal Health Services (food security) ▪ Formosan Termite Initiative ▪ Louisiana Project Learning Tree (K-12 environmental education)	▪ Production of reforestation seedlings	▪ Enforcement of Timber Laws
Department of Corrections	▪ Representation on SHMPC ▪ Mass care and evacuation support for municipal and parish correctional facilities. ▪ Loss Prevention Unit (employee injury, property and records loss) ▪ State and local emergency management planning (ESF-6, housing, feeding, medical and mental healthcare)	▪ General Support ▪ EOC Task Force ▪ DOC HQ Incident Management Center ▪ Continued mass care and evacuation support for municipal and parish correctional facilities ▪ Backup power generation ▪ Information/Business Continuity – (DOA) Living Disaster Recovery Program (LDRP)	▪ None

Agency	Pre-Disaster	Post-Disaster	Regulation of Development
Louisiana Economic Development	▪ Pre-Disaster Economic Impact Analysis ▪ Development of community infrastructure through Louisiana Economic Development Corporation (LEDC)	▪ Distribution of satellite imagery following a disaster ▪ Post-Disaster Economic Impact Analysis ▪ Small Business Administration (SBA) Small Business Assistance	▪ LED jointly funded a project to write model zoning ordinances.
Department of Education	▪ Participation on SHMPC	▪ Facility mitigation in the replacement and renovation of schools	▪ None
Department of Environmental Quality	▪ Representation on the SHMPC and SHMT ▪ Nuclear Power Plant Off-site Emergency Preparedness Program ▪ Radiological Emergency Planning and Response ▪ Remediation program ▪ OzoneAction! ▪ Drinking Water Well Protection Program ▪ Motor Vehicle Inspection and Enforcement Program	▪ Remediation Services Division ▪ Underground Storage Tank (UST) Remediation Program	▪ Permitting Programs (Air, Water, Waste)
Department of Health and Hospitals	▪ Fight the Bite Program (West Nile Virus) ▪ Bioterrorism Unit (training) ▪ Representation on the SHMPC ▪ Pandemic program	▪ Regional Response Team ▪ Mobile Field Units ▪ Immunization Teams ▪ Evacuation Planning Requirement for Licensing Nursing Homes and Home Health Agencies ▪ Special needs shelters	▪ None
Department of Insurance	▪ Consumer 101 public education including oversight "watchdog" functions for protecting policy holders with private insurance companies and providing information on the NFIP	▪ Office of Consumer Advocacy receives inquiries and complaints from consumers, prepares and disseminates information to inform and assist consumers, and may provide direct assistance and advocacy one	▪ None
Office of Coastal Protection and Restoration	▪ Plans, develops, constructs and monitors coastal restoration projects. ▪ State-funded coastal restoration projects (e.g., vegetative plantings, Christmas Tree recycling) ▪ Obtains Federal cost-share	▪	▪

Agency	Pre-Disaster	Post-Disaster	Regulation of Development
	funding for and implements coastal restoration programs, feasibility studies, projects. ▪ Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) ▪ Water Resources Development Act (WRDA) - Louisiana Coastal Area (LCA) ▪ Performs routine operation, maintenance and rehabilitation on constructed coastal restoration projects. ▪ Coastwide Reference Monitoring Systems (CRMS) ▪ Coastal Impact Assistance Program (CIAP) ▪ Barrier Island Restoration and Stabilization program ▪ Dedicated Dredging program ▪ Annual Levee inspection for State-owned levees		
Department of Natural Resources Department of Natural Resources (continued)	▪ Representation on SHMPC and SHMT ▪ Digital Mapping (Geographic Information System (GIS)) ▪ Distributes information on causes of coastal and wetland erosion and methodologies to restore coastal and wetland areas. ▪ Coastal Zone Management program and grants ▪ Coastal Wetlands Reserve Program ▪ Parish Coastal Wetlands Restoration program	▪ Surveys coastal restoration projects for damages and seeks FEMA funding as appropriate for needed repairs. ▪ Digital Mapping (GIS)	▪ Performs regulatory permit functions and mitigation activities related to the State's coastal zone; issues Coastal Use permits.
Department of Public Safety	▪ Coordinates the Louisiana State Uniform Construction Code Council (LSUCCC) ▪ Coordinates and supports local education and training of the UCC ▪ Representation on the SHMPC	▪ None ▪ Louisiana Traffic Safety Incident Management System (ICS)	▪ None
Department of Social Services	▪ None	▪ Individual and Family Grant Program - provides funds to	▪ None

Agency	Pre-Disaster	Post-Disaster	Regulation of Development
Department of Social Services (continued)		disaster victims to assist them in meeting disaster-related expenses ▪ Disaster Supplemental Nutrition Program (DSNAP) – assists persons / families affected by a storm with nutritional assistance purchasing (formerly known as the Disaster Food Stamp Program DFSP).	
Department of Transportation and Development	▪ State management of NFIP ▪ Statewide Flood Control Program ▪ Ports Construction and Development Program ▪ Dam Safety Program ▪ Floodplain Management Program ▪ Representation on SHMPC and SHMT ▪ Educates and assists communities with CRS participation ▪ Educates and encourages working relationships between community NFIP staff and local HMGP POCs ▪ Plans and conducts educational workshops for local officials ▪ Produces and distributes a quarterly NFIP newsletter ▪ LA. Emergency Evacuation Plan, including highway contra-flow and evacuation of persons without access to transportation	▪ Floodplain Management Staff contact each community within the declared disaster area to discuss the rules and regulations of the NFIP with a special emphasis on the community's post-disaster responsibilities ▪ Ports Construction and Development Program ▪ Post-disaster damage assessments	▪ Permitting for all state roads and highways including road access and easements ▪ Permitting for all new construction and modifications to dams in Louisiana
Department of Wildlife and Fisheries	▪ Public information library and the Woodworth Education Center ▪ Representation on SHMPC	▪ Operates staging facilities for Search and Rescue (Enforcement Division) ▪ Utilizes building elevation and hardening in reconstruction effort ▪	▪ Land Acquisition for Wildlife Management Program ▪ Scenic Rivers Program
Division of Administration	▪ Construction of state-owned structures via Facility Planning and Control (FPC)	▪ Disaster Recovery projects for state facilities (FPC) ▪ Designated applicant for public	▪ FPC is the Building Code authority for all State owned buildings.

Agency	Pre-Disaster	Post-Disaster	Regulation of Development
Division of Administration (continued)	▪ Integrating mitigation design features when feasible ▪ Enforcement of State and Federal regulations for design and construction of State buildings ▪ Maintenance of Facilities Management database ▪ Representation on the SHMPC (Office of Facilities Planning)	assistance to FEMA for all permanent repairs for Katrina and Rita (FPC) ▪ Administers Road Home housing assistance through the Office of Community Development ▪ Administers Road Home (HMGP) Elevation, Pilot Reconstruction, and Individual Mitigation Measures (OCD) ▪ Administers CDBG infrastructure grants through the Office of Community Development	▪ With limited exceptions (see Appendix G.3) FPC administers development activities of all non-DOTD State owned property through administration of the capital outlay bill. ▪ FPC is the central leasing authority for all State agencies.
LSU AgCenter	▪ Hazard mitigation information for homeowners and professionals ▪ Website resources for specific flood and wind mitigation activities, mitigation legislation and development regulations ▪ Stewardship Programs for Louisiana's Coastal Landowners ▪ Louisiana House Project ▪ Master Farmer Program ▪ Family Resource Management	▪ Provides general information and website support regarding post-disaster recovery and related mitigation activities	▪ None

7.3.5 Analysis and Evaluation of the Effectiveness of Mitigation Programs and Activities

Many of the policies, programs, and activities undertaken by Louisiana State agencies in the mitigation arena occur within GOHSEP, whose programs (as well as the federal programs it administers) serve to actively reduce disaster-related losses in Louisiana.

Additionally, DOTD; DNR; DEQ; the CPRA; the Division of Administration; the LRA; and the Louisiana Floodplain Management Association all have policies, programs, and activities specific to mitigation or that actively support hazard mitigation.

The Department of Wildlife and Fisheries; Department of Corrections; DHH; Department of Social Services; Department of Agriculture and Forestry (DAF); Department of Insurance; DPS; Louisiana National Guard; LSU AgCenter; and the LSU Hurricane Center all have programs that provide support to hazard mitigation activities in the state.

Louisiana has a number of successful or promising hazard mitigation programs and activities. These include programs directly targeted to mitigating flood risk from riverine, backwater, and surge sources, as well as programs aimed to mitigate risks posed by high winds and other identified hazards. In addition, Louisiana implements programs that support natural hazard mitigation through ecosystem and coastal restoration, coastal zone monitoring and permitting, and other land-use regulation programs.

In many cases, these programs' full potential for effective mitigation is unrealized. The most often cited cause of this is a shortage of funding, staff, and/ or technical support. It may also be due to a failure to adequately inform or educate the public, stakeholders, or other program participants. Organizational challenges are also often cited, including duplication of efforts, lack of clear lines of authority, excessive concern with "audit-proofing" grants, less than optimal coordination or integration of efforts, or a lack of commitment to a given program or policy. Programs or policies may also have loopholes, structural disincentives, or funding shortfalls. Some programs and policies that use complementary tools to achieve a common end fail to coordinate with or support each other.

In support of the research on the effectiveness of state agencies' mitigation efforts, Table 7-7 (below) identifies which mitigation programs and activities were reported (2010 Survey) to be Most Effective and Least Effective, as well as Recommendations for Improved Effectiveness. The data is limited to those State agencies responding to one or more of Survey Queries #13 – 15 (See Survey Instrument, Appendix G-2, page 18). It should be noted that the Table reflects the subjective opinion of State agency survey respondents only, and is not a complete measure of mitigation program performance or effectiveness.

Table 7-7: Mitigation Program Effectiveness

	Most Effective Mitigation Programs or Activities	Least Effective Mitigation Programs or Activities	Recommendation for Improving Mitigation Program Effectiveness
GOHSEP	HMGP and Local Mitigation Planning	No Response	Increase funding for RL Acquisition programs and relieve Non-Fed share homeowner burden
DAF	Pet evacuation and sheltering; Livestock feeding and watering programs	Communication with response partners	Reducing mitigation contracting delays; increasing ESF-11 coordination with agency partners
DEQ	Difficult to determine without effectiveness measures	Difficult to determine without effectiveness measures	Develop tools to measure program effectiveness
DHH	Flu vaccination and West Nile programs	No Response	No Response
DNR	Coastal Zone permitting (zero net land loss)	None	None
DOC	Coordination with parish and local corrections facilities	No Response	Update stakeholder meetings, training, exercises per new risks, lessons learned
DOE	School construction in Recovery School District to IBC 2006 and BFE standard including utilities	None	Continue current level of services, programs, initiatives
DOTD	NFIP/Floodplain Management	Annual Legislative funding limits	Increase staff and program funding
DSS	Multi-jurisdictional planning and coordination meetings	No Response	Additional multi-jurisdictional training, communication and coordination
DWF*	No Response	No Response	Increase preparedness training at the Woodworth facility
FPC (DOA)	Location of structures outside flood zones; elevations above BFE; IBC 2006 wind resistant standards	Flood Hardening, Floodproofing Projects	Greater Enforcement of Zoning and Building Code Regulations
OCD** (DOA)	DRU-HMGP and Individual Mitigation Measures (IMM) programs; Road Home Elevation Incentive Award (RHEI)	No Response	Defining SOW, SOPs, eligibility criteria prior to mass public outreach

* DWF 2010 Survey response obtained from Division of Wildlife only.

** OCD is an office within DOA, and is not itself a State line agency

7.3.6 Evaluation of State Policies and Programs that Affect Land Use in Hazard Areas

Below is an evaluation of the effectiveness of state policies and programs in Louisiana that affect or regulate land use and/or land development in hazard areas.

This analysis examines state programs and policies individually. As noted in more detail below, the recommendations of this Plan Update call for a systematic and comprehensive examination of hazard mitigation activities at both the state and local levels, looking especially for opportunities to remove duplication of efforts and overlap of authority; address staffing, funding, and/or technical gaps; remove policy/ program loopholes; remove structural disincentives; and promote cross-program coordination.

The authorities described below are general and may include consideration of hazard areas. However, these authorities are not specifically intended to regulate development in hazard areas.

7.3.7 Education Regarding Best Management Practices and Enforcement of Timber Laws, Department of Agriculture and Forestry (DOA), Office of Forestry

The DOA, Office of Forestry (OF) effectively contributes to mitigation of hazard via programs intended to improve land management practices on private timber lands. The office provides technical assistance for private forestland owners to encourage sound forestry practices. The OF works to place as many of the small timber tracks and farm woodlots in the state under improved forest practices and increase the use of best management practices (BMPs) on private timber land.

The OF also oversees the network of statewide programs that enforce timber laws, including the investigation of timber theft. The office is also responsible for suppressing forest fires, and for protecting, conserving, and replenishing forest resources, including those on private land.

7.3.8 Regulation of State-Owned Property, DOA

The FPC within DOA is an effective mechanism for influencing the siting of state-owned facilities within hazard areas. The DOA regulation of state-owned property via capital outlay is effective because the funds are appropriated to FPC, and the design of the buildings is under that office's direction. For example, the FPC's location of new construction outside flood hazard areas and, as needed, in conjunction with new construction elevation above flood levels, represent an effective enhancement to the state's overall effort to mitigate risk through land development. As the building code authority for state-owned property, FPC also enforces the International Building Code for all state buildings, whether or not they are funded through capital outlay. As the central leasing authority for all state-owned property, FPC further enforces standards in the procurement of leases and has the authority to set the geographic limits for the bidding of leases (FPC does not make the lease payments).

FPC has less control over siting decisions related to construction of state-owned facilities, because most such construction takes place on existing state-owned sites, and siting decisions for such facilities is largely driven by adjacency to existing facilities, and similar functional concerns.

7.3.9 National Flood Insurance Program (NFIP)/ Community Rating System (CRS), DOTD

FEMA's NFIP is an extremely effective tool in encouraging local communities to regulate development in hazard areas. Every parish in Louisiana participates in NFIP. Additionally, 37 Louisiana communities, accounting for approximately 80% of NFIP policies in the State of Louisiana, participate in the CRS. The CRS is an NFIP program that allows communities to lower the premiums charged to their citizens by going above minimum NFIP requirements

via public education, additional freeboard requirements, and so on. According to the state program administrator, this translates into approximately $20 million in savings in policyholder premiums.

NFIP participation also qualifies communities for grant funding through FEMA sources including FMA, SRL, and RFC (these funds are administered by GOHSEP; see Section 7.2 for more detail on these programs). These sources have been used effectively to mitigate risk of flood by affecting land use and development within hazard areas.

7.3.10 Statewide Flood Control Program, DOTD

Funded by Capital Outlay, the Statewide Flood Control Program works in cooperation with local governments, DOTD engineering and technical assistance to provide surveys, cost estimates, hydraulic designs, plans, right-of-way maps, specifications, advertising for bids, construction of levees, canals, dams locks, spillways, reservoirs, water wells and test holes, drainage systems, irrigation systems, navigation projects, flood control, and other types of public works projects. This DOTD program significantly enhances the state's ability to implement land use and/or land development activities in hazard areas through its integration of hazard (risk) mitigation data, techniques, and technologies into the design and construction of public works infrastructure. Such effective infrastructure design and development enables the state to consider and/or pursue other land-use or land development projects in hazard areas, and thereby greatly enhances the state's regulatory capability.

7.2.11 Permitting and Remediation Programs, Including Those for Air, Water, and Waste, DEQ

Most point sources, including temporary sources which emit or have the potential to emit any air contaminant (defined as particulate matter, dust, fumes, gas, mist, smoke, or vapor, or any combination thereof produced by process other than natural) require an air permit from DEQ's Air Permits Division.

Louisiana's water quality regulations require permits for the discharge of pollutants from any point source into waters of the State of Louisiana. DEQ's Water Permits Division administers these permits under the Louisiana Pollutant Discharge Elimination System (LPDES) program.

The Waste Permits Division of DEQ regulates the permitting and operations related to the disposal of solid waste, hazardous waste.

Targeting pollutant discharge into state land and waters, the Underground Storage Tank (UST) Remediation Program implemented through the UST Division has been an effective tool for improving the state's regulation of land-use and land development in hazard areas.

These regulation and permitting activities improve land use regulation in hazard areas by mitigating certain hazards, especially those associated with secondary risk related to hazardous materials release.

7.3.12 The Uniform Construction Code, DPS

Although the Louisiana Uniform Construction Code (UCC) is neither enforced nor administered at the state level, local education regarding the UCC is coordinated and supported by DPS through the Louisiana State Uniform Construction Code Council (LSUCCC). Since it went into effect in 2007, the UCC has had a significant impact on lowering risk by reducing exposure to wind- and flood-related hazards in hazard areas through the direct regulation of land use and development. Additionally, all parishes are now required to adopt the UCC.

7.3.13 Land Acquisition Program, DWF

The permanent protection of wildlife habitat through cash sale acquisitions, donations, or conservation easements is a way to help accomplish the DWF's mission and to advance hazard mitigation goals. Since its inception, DWF's land acquisition program has acquired almost 610,000 acres of wildlife habitat through fee title acquisitions, donations, or land transfers. An additional 516,167 acres are under variable-length, lease agreements between DWF and private corporations, governmental agencies, and non-governmental organizations. The leased properties represent

unprotected fish and wildlife habitat. The owned and leased properties collectively make up the 61 Wildlife Management Areas and Refuges managed by DWF. The WMAs and refuges provide a wide variety of habitats that help fulfill DWF's mission.

The success of the land acquisition programs depends upon several factors. Funding is the primary limiting factor and therefore, it is extremely important to have a sufficient and sustained funding source. Land prices continue to escalate, particularly within the past few years as competing interests from land development, alternative fuels, and environmental projects such as carbon sequestration have emerged. Unfortunately, DWF's funding source has been static, thereby severely limiting its ability to acquire habitat from willing sellers.

7.3.14 Scenic Rivers Program, DWF

The Scenic Rivers Program at DWF is responsible for preserving, protecting, developing, reclaiming, and enhancing the wilderness qualities, scenic beauties, and ecological regimes of certain free-flowing Louisiana streams as detailed in Louisiana RS 56:1840-1856 and Title 76, Part IX, Chapter 1. DWF identifies projects requiring Scenic River Permits by conducting routine surveillance of these streams; responding to information provided by the public and local governing authorities; and reviewing notices published by those seeking other state and federal permits for potential impacts to these streams. Channelization, clearing and snagging, channel realignment, reservoir construction, and commercial clear cutting of trees within 100 feet of the ordinary low water mark are prohibited on designated Scenic Rivers in Louisiana. By imposing restrictive permit conditions, modifying proposed activities in ways that minimize or eliminate impacts, and enforcing the provisions of the Scenic Rivers Act to insure compliance, DWF has been very effective in preserving vegetated stream buffers, protecting water quality, and preventing the encroachment of development and protecting the natural character and flood-mitigation capacity of these streams. There are currently approximately 80 streams, rivers and bayous in Louisiana's Natural and Scenic Rivers System, which includes approximately 3000 linear stream miles.

7.3.15 Louisiana Coastal Resources Program and Coastal Use Permitting, DNR

The Louisiana Coastal Resources Program (LCRP) was established in 1980, and the LCRP has a permitting requirement for activities which have direct and significant impacts on coastal waters. Coastal Use Permit (CUP) applications are processed with respect to the consistency of the proposed use with the LCRP. Impacts to wetlands and coastal protective features, as well as hazard potentials, are elements which are evaluated during the CUP review process.

DNR developed a strategic plan pursuant to state law and the strategic plan requires the creation of performance measures. The LCRP's major performance measure is wetland mitigation. The goal is for the LCRP to obtain 100% mitigation for permitted wetland impacts. The performance measure is reported to the Legislature on a quarterly basis, is subject to auditing (was the subject of a performance audit in 2004), and is available to the public. The LCRP mitigation performance measure has never been less than 100% and is usually greater than 100%.

Further, the Louisiana Coastal Wetland Conservation Plan also provides documentation of the state's mitigation requirements through the CUP process. The documentation takes the form of a biannual report to Congress composed by the U.S. Fish and Wildlife Service, EPA, and USACE.

7.3.16 Repetitive Loss and Severe Repetitive Loss Mitigation, GOHSEP

State and local governments currently have the capability to implement mitigation of severe repetitive loss properties within the larger framework of state and local mitigation efforts. GOHSEP is able to provide up-to-date information regarding severe repetitive loss properties for use in local mitigation efforts, and the mechanism to apply for SRL funds is already extant within the administration of the NFIP program and within GOHSEP's own staff. Additionally, GOHSEP is currently developing the capability to track and administer this program.

As noted in Section 7.2, existing efforts have resulted in expanding the list of severe repetitive loss properties to 4020. More than half of these properties have been added since 2005. Additionally, the State of Louisiana and local partners have to date completed mitigation on 587 of these properties (almost 60% of these have been mitigated since 2005) using FMA, HMGP, and other funding sources. Another 325 severe repetitive loss mitigation projects are currently underway using HMGP funds from disaster declarations related to Hurricanes Katrina and Rita.

Consistent with the 44 Code of Federal Regulations (44 CFR), GOHSEP plan review for local hazard mitigation plans will continue to ensure that parishes/municipalities have identified and addressed repetitive loss properties in their plans and/or plan updates. Furthermore, the number of repetitive loss properties in each parish/municipality will be taken into consideration when GOHSEP is evaluating local risk for the purpose of prioritizing grant funding.

7.3.17 Additional Programs Under Consideration

SCR 95 of the 2007 Legislative Session requests that DNR study the establishment of a state coastal land trust to acquire, accept, and manage coastal lands consistent with the CPRA Master Plan. Such a fund would have a positive impact on reducing development in hazard areas.

7.3.18 Recommendations for Further Analysis

The recommendations of this Plan Update include efforts to more thoroughly and comprehensively assess and coordinate hazard mitigation activities at both the state and local levels. At this time, such thorough and systematic policy/program evaluation(s) and organizational review(s) of hazard mitigation efforts both within the state and including Federal partners would also be appropriate. Such evaluations should target issues including:

- Identification and removal of duplication of efforts and overlap of authority
- Identification and remedy of failure of authority or of program ownership/ stewardship
- Analysis and description of staff and technical gaps
- Identification and removal of policy/program loopholes
- Analysis and quantification of program funding gaps
- Identification and removal of internal or external structural disincentives or failures of incentive inherent to programs and policies
- Identification and promotion of opportunities for policies and programs to support and/or leverage each other
- Identification of opportunities for improving state agency mitigation staff knowledge of coordinated mitigation programs and mitigation's role in building state-wide physical, social and economic resiliency

These efforts are beyond the scope of this Plan Update. However, some of them could be launched or supported under GOHSEP's CEO program.

7.3.19 Mitigation Staffing (2008 – 2010)

According to 2007 and 2010 State Agency Survey data, from 2007-2010 mitigation staffing changed to some degree. During that time period, GOHSEP, DEQ, and DOTD have had the most staff with responsibilities that are either specific to or actively support hazard mitigation. In 2008, GOHSEP reported 273 positions in the Disaster Recovery Division, of which 89 were in Hazard Mitigation. In 2010, the numbers increased to 350 in the Disaster Recovery Division with 100 staff working in Hazard Mitigation. (For more detail on GOHSEP staffing levels, see Volume II, Appendix G.3)

In 2007, DNR had among the highest numbers of mitigation staff with145 whose responsibilities directly related to, or actively supported hazard mitigation, all in the Office of Coastal Restoration and Management, However, in 2010 that number dropped precipitously to just 7 mitigation staff.

In 2007, DOTD had approximately 30 staff persons with mitigation-related duties, but not all had full-time mitigation-related job functions. That number dropped to 25 in 2010.

In 2007, DEQ reported 234 employees available to carry out mitigation activities, and 53 with job duties directly related to hazard mitigation. Although the number of "available" employees dropped to 173 in 2010, all 173 were reported to have job duties directly related to hazard mitigation, which represents more than a three-fold increase. DEQ's primary mitigation programs (the Accident Prevention Program; the Remediation Services Division; Emergency Response Section; and Radiation Emergency Preparedness and Response) have staff devoted to mitigation on a full-time basis. Much of the implementation capacity for programs coordinated at the state level lies at the local level. This is particularly true of floodplain management, Uniform Construction Code (UCC) enforcement, and Coastal Zone Management.

GOHSEP's mitigation staffing capability extends to being tasked with coordinating state hazard mitigation planning and policy, in large part through the creation, maintenance, and implementation of this Plan Update. GOHSEP currently has 100 Hazard Mitigation positions (permanent and temporary) authorized, of which 62 are filled. (For more detail on GOHSEP staffing levels, see Volume II, Appendix G.3) However, although GOHSEP is now a larger agency than it was in 2008, much of this capability-building – at least in terms of actually filling approved positions – has been in homeland security, emergency preparedness, and disaster recovery.

GOHSEP is continuing to develop the capability to consistently maintain the level of accounting and documentation required to support labor-intensive HMGP administrative and management processes. However, maintenance of the current level of service and any potential expansion of support from GOHSEP to other state agencies and local communities continues to be hampered by a lack of staff continuity and depth of hazard-mitigation training and expertise. This issue is accentuated by the fact that a significant number of GOHSEP personnel also serve in the Louisiana National Guard, and fulfilling those responsibilities creates discontinuities in GOHSEP staffing and institutional knowledge. Specific skill-set shortfalls are apparent regarding issues of technical capability (e.g., evaluating benefit-cost analysis for hazard mitigation projects) and Geographical Information Systems (GIS)/data management for hazard mitigation (for more on this, see the following section).

Most GOHSEP staff assigned to hazard mitigation are relatively new in their posts, and have had little training in mitigation prior to working in their current positions. Therefore, most staff members assigned to hazard mitigation lack strong knowledge of issues related to property protection or acquisition, floodplain management, GIS, or integrated land-use planning. New GOHSEP hazard mitigation staff must spend a significant amount of time learning about basic hazard mitigation concepts.

Additionally, salary levels at GOHSEP are not competitive with salaries in the private sector or at FEMA. As a result, once GOHSEP's hazard mitigation staff has been trained sufficiently regarding the issues and technical capacity involved in hazard mitigation planning, support, and implementation, they are incentivized to leave the agency for higher salaries. Since August 2005, approximately 30 out of 43 GOHSEP Disaster Recovery employees who were on staff before Hurricanes Katrina and Rita have departed, although only four of left for the purpose of retirement. GOHSEP reports that the annual turnover rate is approximately 50% in the Disaster Recovery Division. Most of these employees have received positions in related fields for greater pay. Partly as a result of all of these factors, much of GOHSEP's current hazard mitigation capability is contracted through private firms. As of February 2008, approximately 53% of GOHSEP's staff (157 out of 295) was comprised of temporary hires. These firms are providing formal and on-the-job training opportunities for GOHSEP personnel, but unless structural issues are addressed within the agency, it is likely that many of the personnel being trained may leave the agency for other positions with more competitive pay.

Finally, to summarize the trends in mitigation staffing, Table 7-8 provides data from 2008 and 2010 Surveys, and provides a snap-shot of state agency responses to the following four survey queries:

1. How many people are employed by your agency?
2. How many employees at your agency would be able and available to **directly carry out** mitigation actions?

3. Of these employees, how many currently have any of their job duties dedicated to mitigation actions and/or strategies?

4. How many employees at your agency would be able and available to provide technical assistance in carrying out mitigation actions?

Table 7-8: Blank cells indicate that a survey was not received from a given agency; NR (No Response) indicates that a survey was received, but no answer was provided for the related query

2007 ---------- 2010	Total Agency Employment	Number Available for Mitigation	Number Employed in Mitigation	Number Available for Mitigation Technical Assistance	Comments
GOHSEP	295	89	62	NA - TA through Disaster Recovery Division	
	350	100	100	90 - TA through Disaster Recovery Division	
DAF	NR	NR	NR	NR	
	650	450	0	9	
DCRT					
DEQ	1050	234	52	220	
	889	173	173	7	2010 survey provides departmental breakdown for mitigation personnel
DHH	12,500	2	1	NR	
	12,000	3	0	0	
DNR	550	200	145	NR	
	399	7	7	7	
DOC	10,100	10,100	100	1,500	
	5,900	NR	NR	NR	
DOE	620	0	NR	NR	
	640	20	10	10	2010 survey provides departmental breakdown for mitigation personnel
DOI	NR	NR	NR	NR	NR
DOR					
	856	60	0	60	2010 survey indicates all TA capability is in Information Technology
DOTD	4,800	30	30	NR	
	4,500	25	25	25	
DOTR					
DPS	NR	NR	NR	NR	NR
DSS	NR	NR	NR	NR	

	4,923	4	4	NR	2010 survey indicates ESF 6 (EP) capability only.
DWF*	850	NR	0	0	
	NR	NR	1	NR	
FPC (DOA)	63	30	3	NR	
	70	31	0	31	2010 survey indicates only 2 or 3 available for mitigation at a given time.
LED					
	NR	NR	NR	NR	
OCD/DRU (DOA)**	NR	NR	NR	NR	
	48	38	38	42	2010 survey provides departmental breakdown for mitigation personnel

* DWF 2010 Survey response obtained from Coastal and Non-Game Resources only.
** OCD is an office of DOA, not a State line agency

7.3.20 Technical Capability and GIS/Data Management for Hazard Mitigation

Currently, there is no integrated system for GIS data-collection and/or management related to hazard (or other topics) in Louisiana. Several agencies and regional entities, as well as a number of localities and universities, maintain excellent GIS and other data bases on a number of topics. At the state level, DOTD, DOA, DNR, DEQ, and others maintain valuable GIS data. LAGIC is also involved in coordination of data. But these databases, at the state and other levels, are neither interoperable, nor specifically tailored to hazard mitigation needs.

Even departments with very high GIS capabilities report that their base geospatial data (and paper maps) are often extremely outdated, particularly following the hurricanes of 2005. This makes accurate assessment of planning for risk very difficult. Additionally, limited opportunities for GIS training through the state, and "turf" battles over the creation and maintenance of GIS data repositories are cited as concerns.

The management of GIS data regarding risk and hazard mitigation will be an important aspect of this Plan Update. This includes establishing the infrastructure and methods for ongoing GIS data transfers between state and local governments. This GIS information sharing would create a system in which readily available and up-to-date hazard data can be gathered or developed using compatible methodologies and consistent formats to provide the basis for effective state and local risk assessments, hazard mitigation planning, and project implementation.

Part of the process of updating the plan is developing and evaluating options for the future structure and role of GOHSEP regarding all aspects of hazard mitigation planning and project implementation.

Potential future options lie along a spectrum, as detailed below:

- GOHSEP as the "sole source" of GIS and hazard mitigation data: GOHSEP would need to establish and maintain capabilities to manage all GIS and hazard data needs related to plan updates and project development for state agencies and parishes. In this scenario, state agencies, regional entities, municipalities/parishes, universities, and non-profits would be sources of information and would not have any distinct responsibilities for managing data on behalf of GOHSEP or parishes. Local communities would have a client relationship to GOHSEP regarding data.

** Given the current lack of technical and staff capacity devoted to GIS at GOHSEP, this scenario is not considered viable at present.*

- GOHSEP regional offices as the leads in coordinating GIS and hazard mitigation data: GOHSEP would establish consistency and interoperability guidelines and frameworks for all GIS and hazard data needs related to plan updates and project development for state agencies and parishes. GOHSEP's role would be as administrator of hazard mitigation grants. Local communities would have a client relationship to the GOHSEP regional offices regarding data.

  **Given the current lack of technical and staff capacity at the regional level, this scenario is not considered viable at present.*
- Parishes as the leads in coordinating GIS and hazard mitigation data: GOHSEP would establish (or facilitate the creation of) consistency and interoperability guidelines and frameworks for parish offices for all data needs related to plan updates and project development for state agencies and local communities. GOHSEP's role would be as administrator of hazard mitigation grants, and it would have a client relationship to the parishes regarding data.

  ** Given the diffusion of authority and difficult coordination that this scenario would imply, coupled with the lack of technical and staff capacity in many parishes, this scenario is not considered viable at present.*
- Third party lead (or leads) on coordination of GIS and hazard mitigation data: One or more organizations and agencies would have varying responsibilities for data management and planning. GOHSEP would likely retain responsibility for hazard mitigation plan reviews for consistency with the requirements of the Disaster Mitigation Act of 2000, but technical support and data management would be provided by others including, but not limited to: Louisiana universities, regional planning commissions, or other state agencies. GOHSEP's role would be as administrator of hazard mitigation grants. Local communities and GOHSEP would have a client relationship to the third-party provider regarding data.

  **This scenario is plausible, although it would distance all end-users of hazard mitigation data, including local communities and GOHSEP, from the management of that data, and therefore may not be a preferred option.*
- Some combination of the above options: Data collection might take place at the state, regional, and local levels, and data coordination, management, and distribution might take place at a state level. For example: A partnership between a consortium of Louisiana universities, GOHSEP, and other relevant state agencies. This scenario would involve developing the mechanisms for ongoing collection, storage, and local access to risk assessment data from municipalities, parishes, and other sources. It would also be necessary to determine the capabilities and interest of local Universities to fully draft such an alternative.

  **This is the most viable option; the challenge at this point is to determine the right combination of organizations and roles to gain the most efficient long-term delivery of the information and technical support.*

Assuming that this final option is the preferred alternative, it would then become necessary to determine the aforementioned roles and relationships. This is something that can potentially be coordinated with GOHSEP's CEO program. In these discussions, it will be important to consider the following factors:

- GOHSEP is in the process of enhancing its regional-based capabilities for coordination of emergency management related issues, and the regional coordinators have expressed interest in a greater hazard mitigation role. Therefore, the GOHSEP regional coordinators could play a role in this process.
- The Louisiana GIS Council (LGISC) has been tasked by the Legislature with coordinating GIS data for the State through the LaGIC (Louisiana Geographic Information Center). Any efforts to coordinate hazard mitigation data should leverage ongoing efforts at LaGIC.

Summary

A number of mitigation-specific Acts, plans, Executive Orders and policies exist in the state. Among them are several targeted planning and policy documents, and several multi-agency attempts at integrating the various hazard mitigation activities in the state. Many of these plans and policies hold significant promise for hazard mitigation, particularly because they are ongoing and take an integrated, strategic look at the whole hazard-mitigation landscape in Louisiana and propose ways to continually improve hazard mitigation.

The largest number of the mitigation policies, programs, and activities undertaken by Louisiana state agencies occur within GOHSEP. However, DOTD, DNR, DEQ, CPRA, the Division of Administration (and its constituent offices), and the Louisiana Floodplain Management Association all have policies, programs, and activities specific to mitigation or that actively support hazard mitigation. Additional agencies and entities have programs that further support hazard mitigation activities in the state.

In many cases, these programs' full potential for effective mitigation is unrealized. Thorough and systematic policy/ program evaluation(s) and organizational review(s) of hazard mitigation efforts both within the state and including Federal partners are therefore now indicated.

GOHSEP, DNR, and DOTD all have significant numbers of staff devoted specifically to hazard mitigation or whose activities actively support hazard mitigation. GOHSEP is the programmatic lead on hazard mitigation activities, but currently lacks sufficient personnel and subject-area expertise and experience to effectively support the hazard mitigation activities in the state at the level at which they should be supported, particularly given the relatively low understanding and application of mitigation throughout the Louisiana parishes.

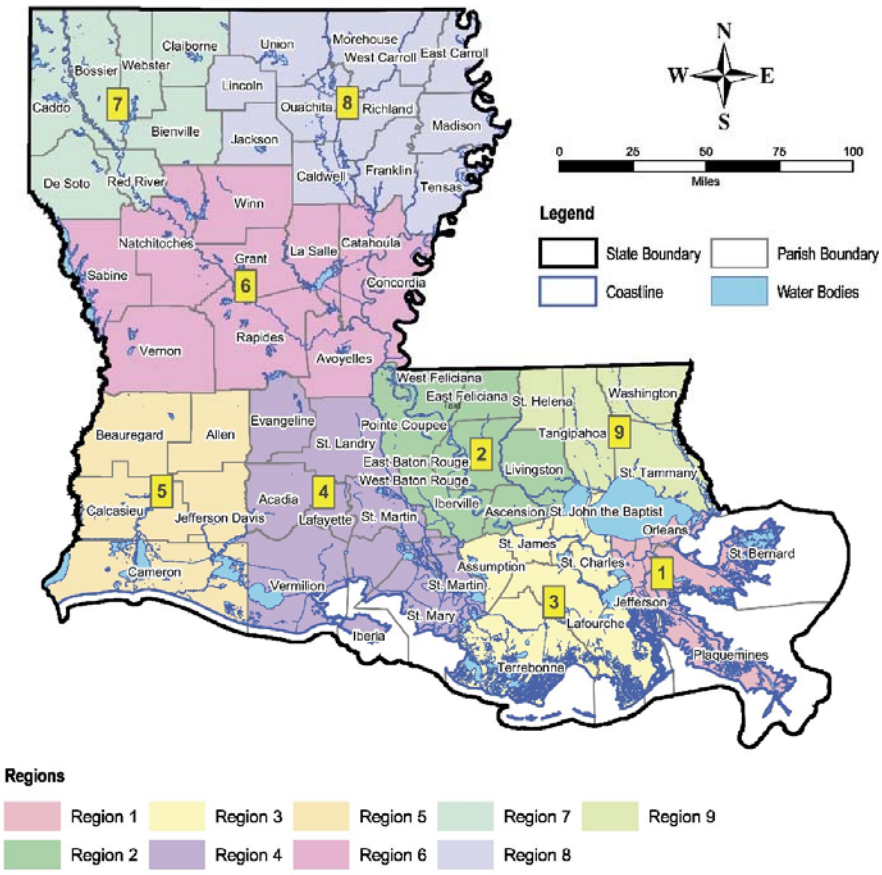
Finally, to provide a sound basis for ongoing and future hazard mitigation planning, and to integrate local and state planning, a better system of GIS and other data creation, consistency, management, and distribution is needed. The most viable option is likely one that involves partnerships between GOHSEP, Louisiana universities, and other state agencies, as well as local and regional entities.

7.4 Regional Capability Assessment

Introduction

In an effort to support and coordinate local emergency preparedness and response efforts, GOHSEP has established the Regional Coordinator (RC) position. Louisiana has nine RCs, each working directly with both GOHSEP and the four-to-twelve parishes that make up each of the Louisiana Emergency Management Regions (see Map 7-1).

Map 7-1: Louisiana Emergency Management Regions



Source: GOHSEP, 2005

As a matter of statewide policy, the GOHSEP RC position has not been used for hazard mitigation purposes. But, as GOHSEP and the SHMT consider ways to improve hazard mitigation planning and implementation in Louisiana, especially as they continue to look for ways to improve coordination between the state and parishes and municipalities and between the Plan Update and local Hazard Mitigation Plans (HMPs), a clear understanding of the regional layer of GOHSEP organization is essential.

7.4.1 Methodology and Survey Response Characteristics

The RC capability assessment survey builds upon the baseline established by the regional survey administered in 2007 for the 2008 Plan. The survey instrument was presented to the SHMPC for comment and review. The 2010 Regional Capabilities survey follows the basic outline of existing surveys. This year's survey had more positive responses than previous surveys as well as good input on how to provide better service to parishes and how the

coordinators can increase their knowledge in the HMGP. The 2010 update included additional questions which would assist in understanding any challenges or assistance that may be needed.

Some questions in the regional coordinator capability assessment survey intend to document the capabilities of the RC office itself. Others asked the regional coordinators to assess the capabilities of the local Office of Homeland Security/Emergency Preparedness (OHS/EP) offices with whom they work. Responses to the former are described in this section of the Plan Update, and responses to the latter are included in Section 7.5, the Local Capability Assessment discussion. Questions included, but were not limited to, the following topics:

- Tenure and relevant education and experience
- Job responsibilities
- Staff capability
- Hazard mitigation capability
- GIS capability
- Interest in a greater hazard mitigation role
- Liaison role between local OHS/EPs and GOHSEP and other intergovernmental coordination issues
- Assessment of local hazard mitigation capability, including planning and administration of Hazard Mitigation Plans, floodplain management, the UCC, and land-use planning and regulation
- Familiarity with hazard mitigation funding sources

During the first quarter of 2010 the regional capability assessment survey was administered via email to participating GOHSEP RCs. The responses were consolidated into a spreadsheet for analysis. (See Volume II, Appendix G.4 for the survey instrument and Appendix G.5 for a spreadsheet of the results.)

Of the nine GOHSEP RCs, eight participated in this survey. The one region not represented has a vacancy. The response rate to the 2010 survey was therefore 90%, indicating a potentially high level of interest in hazard mitigation among RCs, and at the very least a generally high level of responsiveness in that group.

7.4.2 The Role of RCs

GOHSEP RCs concentrate mainly on building relationships with local OHS/EP offices to improve emergency response and preparedness by enhancing coordination, communication, and grant-management. Specifically, respondents reported their core missions to include:

- Assisting local OHS/EP offices in emergency preparedness and grant-writing/-administration
- Serving as liaison between the state GOHSEP and local OHS/EP offices
- Coordinating local efforts, including meetings, training, planning and emergency operations reviews

7.4.2.1 Liaison and Coordination Evaluation

Regarding their working relationships with parish OHS/EP directors, most RCs reported an overall healthy situation. RCs are in agreement that the issue in not the relationship between directors and coordinators, but a lack of knowledge of the HMGP and a lack of interest in furthering that knowledge. According to one coordinator, “Most directors see hazard mitigation as a function of engineers, not emergency management.”

The RCs reported good communication with other regional partners. They all reported excellent coordination among themselves. All responding RCs also reported that they regularly coordinate and communicate with DHH/Office of Public Health regional offices. Several also reported working with DEQ and the State Police, as well as with regional planning commissions and local planning and development districts. At the state level, the Louisiana Department of Social Services was also mentioned several times, although more than one coordinator cited problems in working with that agency. DOTD, DWF, the Louisiana National Guard, the Red Cross, and others were also cited. No partnerships specifically targeted to hazard mitigation were noted. RCs most often cited the Office of Public Health or their local partners as their most valuable relationships.

The regional subdivisions created in Louisiana by various state agencies and local partnerships do not always match up well geographically, especially in Southeast Louisiana. This makes a high level of inter-entity coordination at the regional level difficult.

In the future, RCs expressed an interest in more closely coordinating mitigation efforts with the U.S. Coast Guard, FEMA, and GOHSEP. Several also cited opportunities for improved regional coordination via regional hazard mitigation planning, risk assessment, and/or data management, particularly concerning flood-hazard issues. The high level of inter-agency coordination reported by RCs could make them valuable assets in future efforts to reorganize or streamline hazard mitigation resources. According to one coordinator, "It's important to keep in mind that Regional Coordinators work every aspect of emergency management and numerous aspects of homeland security. As such beyond a working knowledge, it would be difficult if not almost impossible to increase an RC's responsibilities in just one area. RCs are already tasked by every section of GOHSEP from preparedness to response to recovery and mitigation".

7.4.3 RCs and Hazard Mitigation

Generally, hazard mitigation is not currently part of an RC's role. However, based on the response from the survey, the majority of coordinators have a high interest in receiving more training in hazard mitigation, while some mentioned that it is just as important that local OHS/EP directors be given mandatory training each year. More than half of responding RCs reported familiarity with floodplain management and local hazard mitigation planning, but few reported any familiarity with the UCC or with land-use planning as a mitigation strategy.

Almost all respondents reported basic familiarity with FEMA PA and HMGP grant programs, while most reported no familiarity with the FEMA PDM grant program.

Most respondents were interested in expanding their purview over hazard mitigation. In fact, of all the respondents interviewed only one RC stated that they would *not* want a greater role in hazard mitigation planning and implementation.

Several RCs cited concerns with taking on a greater hazard mitigation role in the absence of sufficient training. The RC who said they would not be interested in HMGP training but that they would instead be interested in application and procurement training.

7.4.4 Personnel and Technical Capability

RCs reported having no staff support. Meanwhile, they have been tasked with building relationships with local OHS/EP offices. Although this has presented a challenge to some coordinators, the responses from the survey indicate a willingness and desire to assist in education and development of the parishes in regards to hazard mitigation training.

In the past, the RC positions have been characterized by short tenures and a high turnover rate. Consequently, even those RCs who excelled at their jobs still failed to establish an institutional foundation that could outlast their own tenure. However, as of 2010 most coordinators have been in their position long enough to have established solid relationships and have been able to build a foundation of trust and respect. As mentioned by the Region 8 coordinator, "The relationship has been built over several years and continues to grow". The position of RC continues to be one of high value and importance, and acts as direct line of communication from GOHSEP to the parishes.

The RCs generally have backgrounds in emergency management, law enforcement/criminal justice, and/or the military. Experience levels range from a few years to more than 20. Several reported numerous Local Emergency Manager (LEM), Incident Command System (ICS) and National Incident Management System (NIMS) certifications. Some were outside hires, others were career GOHSEP employees. While no one reported having a hazard mitigation background, the nature of such training is ongoing and is a part of each RCs daily routine. RCs assist local

OHS/EP directors in all aspects of their jobs, and therefore the importance of continued training in each area of emergency management is critical.

RC's offices do not have a great deal of technical capability. Less than half of the responding coordinators reported using GIS. They reported using it mainly for emergency-response purposes, especially for real-time events. The regional offices used GIS accessed it through state-maintained resources. Many RCs reported a low estimation of the effectiveness of local floodplain management and UCC enforcement as mitigation measures. This indicates a need for education on mitigation issues among this group. Most coordinators agreed that knowledge of floodplain management would assist them in their duties related to hazard mitigation.

Summary

Below is a summary of the key findings of the Regional Capability Survey:

- RCs reported that their core roles include: Assisting local OHS/EP offices in emergency preparedness and grant-writing/administration; serving as liaison between the state GOHSEP and local OHS/EP offices; and coordinating local efforts, including meetings, training, planning and emergency operations reviews. In their liaison function, the RCs reported a high level of interaction with parish officials, GOHSEP, and numerous regional and state-agency partners.
- Generally, hazard mitigation is not currently part of the RC's role, though many reported some knowledge of basic concepts and funding programs. Similarly, RCs tend to have high levels of emergency management experience, but little depth in hazard mitigation. Finally, regional coordinators' offices do not have a great deal of technical capability, and they typically do not use the technology they have for hazard mitigation purposes.
- Most RCs reported an interest in a greater hazard mitigation role on the condition that adequate staff, technical, and budget support accompanied that increased role. However, the SHMPC noted that RC's low estimation of the value of floodplain management and UCC enforcement indicates the need for outreach and education prior to these offices being given a greater mitigation role.

7.5 Local Capability Assessment

Introduction

This capability assessment contains an analysis of local capability to plan for and implement hazard mitigation strategies, programs, projects and activities. Engaging local stakeholders in this assessment is essential because local officials know their own landscape best. Additionally, many of the most critical and effective hazard mitigation strategies and programs, such as enforcement of floodplain management, building codes, and land-use planning, are implemented at the local level.

Local capability is crucial to help the state determine where staff and technical capability exists and can be leveraged and as well as where it is in need of augmentation by other local, regional, state or other sources.

In addition, this assessment will be useful in gauging whether the current local organizational structures and inter-jurisdictional coordination mechanisms for hazard mitigation could be improved, and how.

7.5.1 Methodology and Survey Response Characteristics

Section 7.5, the Local Capability Assessment, is derived from three sources:

- Local Capability Assessment Surveys collected in 2007 and 2010, the methodology of which is discussed in detail below
- 2005 State Hazard Mitigation Plan

The local capability assessment survey had an antecedent in the previous FEMA-approved April 2005 and 2008 Plan Updates, and wherever applicable, the updated survey replicated the previous survey's questions in order to enable a longitudinal analysis of the data.

The 2010 local capability assessment survey instrument was presented to the SHMPC for comment and review. All questions in the survey intended to document local hazard mitigation capabilities. Questions included, but were not limited to, the following topics.

- Respondents' tenure in current post and experience or qualifications
- Number of staff overseen, and who work in and/or have expertise in hazard mitigation
- Access to and location of GIS data
- Coordination with other parish and local offices/agencies, neighboring jurisdictions, regional entities, or state agencies
- Preferences regarding standard hazard definitions and risk assessment methodologies
- Local enforcement of the Uniform Construction Code
- Local administration of floodplain management
- Local comprehensive planning, zoning, subdivision regulation, and other development regulations
- Interagency and Intergovernmental Coordination
- Most effective mitigation activities
- Least effective mitigation activities
- Lessons learned from mitigation activities
- Promising future mitigation activities

The 2010 survey target group was the parish department of record responsible for the local hazard mitigation plan. This responsibility resides, with few exceptions, with the local OHS/EP or its equivalent. In most cases, the survey was completed by the OHS/EP director or designee. The survey was made available and accessed through a web-based survey tool. Participation in the 2010 survey more than doubles the rate of participation in previous survey efforts. Fifty-nine percent (38 of 64) of the parish OHS/EP offices participated in the survey.

7.5.2 Personnel Capability

On average, respondents had a significant amount of experience in their current posts. Respondents reported having been in their current positions anywhere from a few months to more than 30 years, and the average tenure for local OHS/EP directors responding to the survey was approximately six years.

Most OHS/EP respondents had significant experience relevant to emergency response and management. They often reported experience in law enforcement, fire service, homeland security, or military service. Certifications typically included NIMS, Emergency Management Institute (EMI), and other emergency management courses. In several cases, respondents had college degrees in business or communications.

Some offices charged with hazard mitigation are thinly staffed (see Table 7-9).

Table 7-9: Average Total Staffing of Local Offices (Respondent not Included)

	Full-time	Part-time	Contractors or Third-Party Providers	Volunteer
	4.1	1.04	.43	3.6

Source: Local Capability Assessment Survey, 2010

Moreover, respondents reported that the average proportion of staff in their offices who worked directly in a hazard mitigation-related capacity was one-third or less, and in several cases this role was filled by contractor capacity (see Table 7-10). In addition, as reported by GOHSEP staff and consultants, for specific tasks such as development of hazard mitigation plans and plan updates and documenting hazard mitigation projects for funding applications, some parishes have dedicated staff that can adequately handle these tasks, but many parishes and municipalities rely heavily on consultant support. GOHSEP also observed that in some cases, consultants are not well-versed in relevant programmatic and technical aspects due to the specialized nature of the work and the sporadic instances when this expertise is required, i.e., it is difficult for communities and consultants alike to obtain and maintain expertise in an area that is not consistently and regularly required.

Table 7-10: Average Hazard Mitigation Staffing in Local Offices (Respondent not Included)

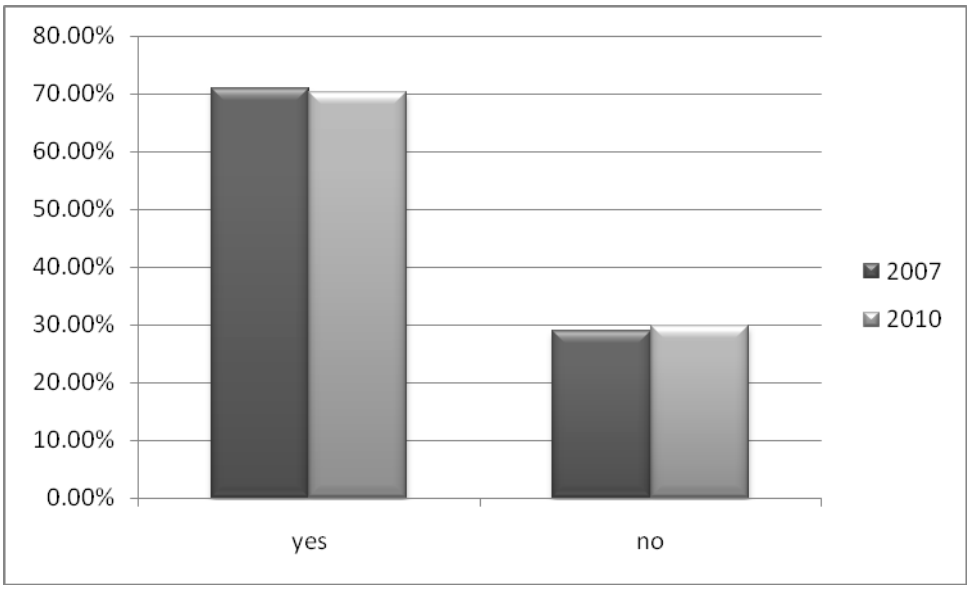
	Full-time	Part-time	Contractors or Third Party Providers	Volunteer
	.58	.44	.33	.44

Source: Local Capability Assessment Survey, 2010

7.5.3 Technical and Technological Capability

GIS data was reported to be widely accessible by local survey respondents, but capability to analyze, process, create, and maintain such data was low. Nearly three-quarters of respondents stated that neither they nor their offices had access to GIS (see Figure 7-1). In 2005, a similar survey found that 30% of OHS/EP offices had GIS capabilities. In the 2010 survey, 30 of 47 (70%) of respondents reported having staff who maintain GIS in their offices. While GIS capability more than doubled between 2005 and 2008, there has been virtually no change since the last update.

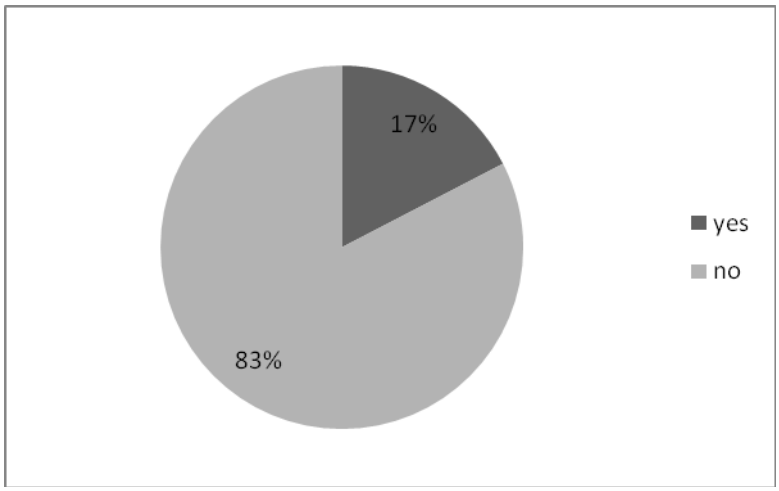
Figure 7-1: GIS Accessibility by Parish/Municipal Offices



Source: Local Capability Assessment Survey, 2007 & 2010

Although the majority of respondents to the Local Capability Survey stated that they use or have access to GIS, less than one fifth in the 2007 survey reported that their offices maintained their own GIS data (see Figure 7-2). Those respondents who maintained their own GIS data stated that they devoted an average of 2.2 employees on an annual basis, supported by an average GIS-budget of $156,000. In the 2010 survey, few respondents included GIS budget information, but budget data provided ranged from $4,000 to more than $200,000.

Figure 7-2: In-House GIS Maintenance by Parish/Municipal Offices



Source: Survey of Parish and Municipal HMP and PPGP participants, 2010

Those departments that reported coordinating with or accessing off-site GIS indicated a variety of locations where this data was housed. In some cases (for example, Jefferson Parish), the parish maintains GIS data. In others (for example, South Central Planning Development Commission or Northwest Louisiana Council of Governments), a regional entity coordinates and houses data. Other parishes utilize local universities as the repository of important GIS data.

7.5.4 Planning and Regulatory Capability

Parishes and communities in Louisiana vary widely in their capacity for planning and regulation relevant to hazard mitigation. Some communities have a full range of implementation tools, while others have none. Tools considered in this analysis include:

- Local hazard mitigation plans (HMPs)
- Floodplain management
- The Uniform Construction Code
- Land-use planning and regulations

7.5.4.1 Local HMPs

All parishes in Louisiana are covered by FEMA-approved HMPs which must be updated every five years. Currently, 20 parishes are updating their HMPs under the FEMA PPGP program. Additionally, 11 municipalities, two universities, and several Louisiana Nursing Homes have FEMA-approved HMPs.

In 2007, several RCs indicated that the part-time status of some OHS/EP directors was a potential challenge for effective hazard planning. This, coupled with the lack of hazard mitigation staff capability and expertise in OHS/EP offices, raised some RC's concerns about whether these offices should be in the lead or sole oversight role in the development and implementation of parish HMPs. In the future, the state may want to encourage parishes to broaden their hazard mitigation planning and implementation teams to include a broader cross-section of parish and municipal agencies.

7.5.4.2 Floodplain Management

Another key tool in local mitigation of hazards is floodplain management. Floods, whether riverine, backwater, surge-related, or caused by levee failure, present the most costly and pervasive hazard in Louisiana. Floodplain management is the most comprehensive, relevant, and practical mitigation tool, with many funding options available through typical hazard mitigation sources.

One measure of the effectiveness of floodplain management is participation in FEMA's NFIP. Statewide, all parishes participate in NFIP, and all affected jurisdictions adopted post-Katrina/Rita Advisory Base Flood Elevations (ABFEs), except St. John the Baptist Parish and the incorporated municipalities of Gueydan and Erath (however, Vermilion Parish, within which both of these municipalities are located, adopted ABFEs).

Additionally, 39 Louisiana communities, accounting for approximately 80% of NFIP policies in the State of Louisiana, participate in the Community Rating System (CRS). The CRS is an NFIP program that allows communities to lower premiums charged to their citizens by going above minimum NFIP requirements via public education, additional freeboard requirements, and other criteria. According to the state program administrator, this translates into approximately $20 million in savings in policyholder premiums. Table 7-11 shows the communities in Louisiana that participate in CRS.

Table 7-11: CRS Participation in Louisiana

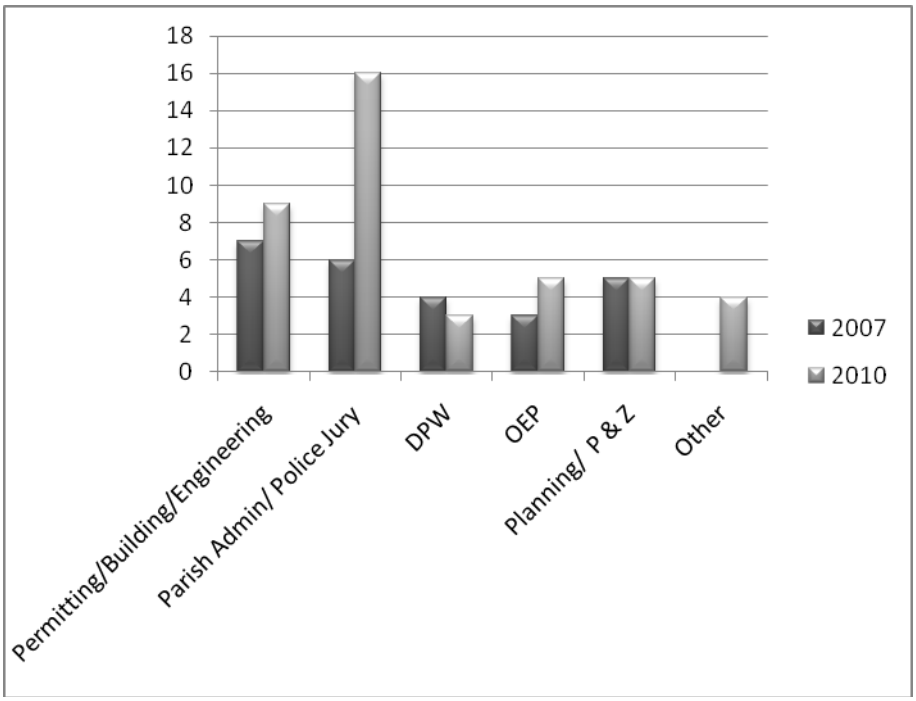
Parish	CRS-Participating Jurisdiction
Acadia	Rayne
Ascension	Ascension Parish

Parish	CRS-Participating Jurisdiction
	French Settlement
	Gonzales
	Sorrento
Beauregard	DeRidder
Bossier	Bossier City
Caddo	Caddo Parish
	Shreveport
Calcasieu	Calcasieu Parish
	Lake Charles
East Baton Rouge	Baker
	East Baton Rouge City/ Parish
	Zachary
Jefferson	Gretna
	Harahan
	Jefferson Parish
	Kenner
	Westwego
Lafayette	Carencro
Lincoln	Ruston
Livingston	Denham Springs
	Livingston Parish
	Walker
Orleans	New Orleans/Orleans Parish
Ouachita	Monroe
	Ouachita Parish
St. Charles	St. Charles Parish
St. James	Lutcher
	St. James Parish
St. John the Baptist	St. John Parish
St. Mary	Morgan City
St. Tammany	Mandeville
	Slidell
	St. Tammany Parish
Tangipahoa	Tangipahoa Parish
Terrebonne	Houma
	Terrebonne Parish
West Baton Rouge	West Baton Rouge Parish

Source: Cindy O'Neal, National Flood Insurance Program State Coordinator, DOTD, 2007

The local capability assessment survey revealed that floodplain management is carried out by a variety of parish and municipal agencies and offices (see Figure 7-3). Most often, especially in small parishes, this function is in a building department or resides within the parish adminstration itself. The 2010 survey included a significant increase in respondent jurisdictions in which the floodplain management function is carried out under Parish Administration or Police Jury.

Figure 7-3: Bureaucratic Home of Parish/Municipal Administration of Floodplain Management



Source: Local Capability Assessment Survey, 2007, 2010

This local capabilty analysis has insufficient data to draw conclusions about the effectiveness of floodplain management relative to its bureacratic home, but anecdotal feedback indicates that floodplain management is most effective when administered via a permitting agency, office, or commission, especially entities that issue building permits or zoning approvals. In these cases, floodplain issues are linked directly to construction or site-plan approval and less likely to be overridden or otherwise undermined by other entities' priorities.

7.5.4.3 The Uniform Construction Code (UCC)

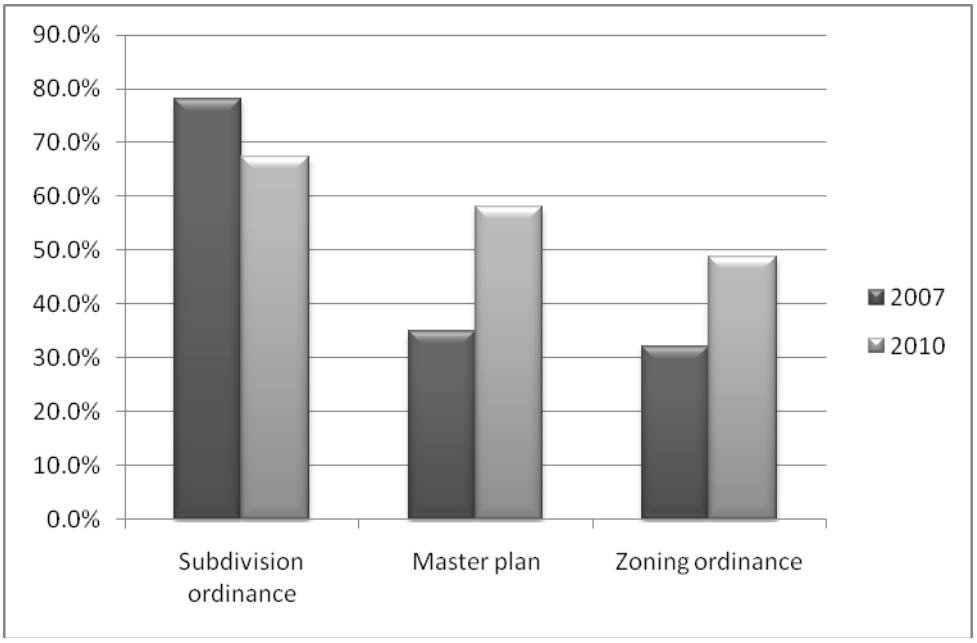
The UCC requires buildings to be constructed to better withstand high wind and flood, consistent with UCC specifications. Although all parishes are now required to enforce the UCC, the 2007 survey indicated that a small percentage of respondents were not yet doing so. However, the 2010 survey indicated that 89% of the respondents replied yes to enforcing the UCC (the remaining 11% did not know). The SHMPC noted that if some local officials are not aware of UCC-enforcement, better education of local officials is needed.

7.5.4.4 Land-Use Planning and Regulation

There is a final set of tools that can be effective for mitigating hazards, but they remain underutilized in Louisiana. These land-use tools include comprehensive planning (known as "master planning" under Louisiana Revised Statutes), zoning, and subdivision regulation.

Most parishes in Louisiana conduct subdivision review. A 2007 study showed only about one third administer a zoning ordinance or have (or are developing) comprehensive plans. The 2010 survey indicates an increase in the use of zoning ordinances and comprehensive planning from what was found in the 2007 study (see Figure 7-4).

Figure 7-4: Parish/Municipal Land Use Planning and Regulatory Capability—Presence of Selected Tools



Source: Lynn Maloney-Mújica, 2007. "Factors Associated with the Adoption of Land-Use Planning in Louisiana Parishes." MA Thesis, LSU. Local Capability Assessment Survey, 2010

In 2007, of the 21 parishes (35% of all parishes) that had or were developing comprehensive plans, only 10 had plans that were both completed and up-to-date (less than 10 years old). In 2010, 25 of 43 respondents stated that their parishes had a comprehensive plan. Comprehensive planning is most common in metropolitan areas, although some smaller parishes also have plans. In 2007, only about one third of parishes had planning staff, including part-time staff and contractors. Just 12 parishes had all three basic components of land-use planning: A comprehensive plan to guide the jurisdiction, a zoning ordinance to implement the plan, and a planning staff to administer both.

Louisiana lacks any effective requirement for comprehensive plans, something approximately half of all U.S. states now have.[2] Comprehensive plans ("Master Plans") are theoretically required under Louisiana Revised Statutes (RS 33:109) for any jurisdiction that regulates land use through zoning or other land-use controls, but there is no recourse if this requirement is not met (other than civil litigation), and Louisiana courts have been extremely forgiving to violators. Moreover, the statute regarding Master Plans is a standard enabling legislation dating back to the 1920s that does not provide guidelines or criteria for plan development or content.

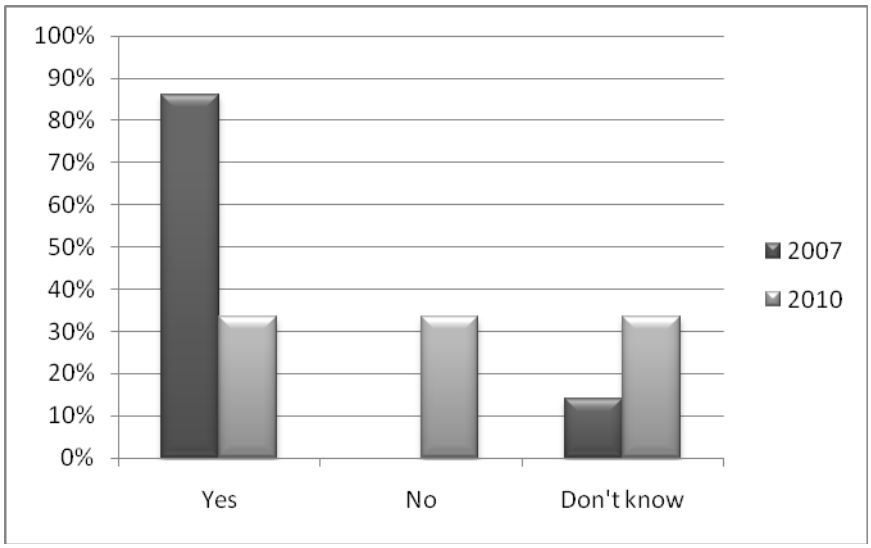
In the 2007 survey, only 9 parishes (14% of all parishes) reported having "progressive" planning tools including techniques such as clustered development, planned urban development/planned unit development, or traditional neighborhood development. Progressive planning tools make it easier for developers to increase concentrate density on a site and thus decrease the developed footprint of a project, leaving more land undisturbed. These tools are particularly useful in mitigating hazard in developments in or near wetlands and floodplains.

[2] Twenty-five states have either conditional or fully mandatory requirements for local comprehensive plans. Institute for Business and Home Safety, 2005. *Survey of State Land-Use and Natural Hazards Planning Laws*.

Among respondents to the 2007 local capability assessment survey whose parishes had comprehensive plans, only half stated that their parish plans addressed hazard mitigation. Almost 70% in the 2010 survey reported that the parish comprehensive plan addresses hazard mitigation.

Regarding zoning, almost half of the jurisdictions participating in the 2010 survey reported having a zoning ordinance. Among respondents to the 2007 local capability assessment survey whose parishes had zoning ordinances, a large majority stated that their parish zoning addressed hazard mitigation. The 2010 survey reflected a lack of clarity among respondents as to whether zoning ordinances address mitigation (see Figure 7-5).

Figure 7-5: Local Assessment of Whether Parish/Municipal Zoning Directly Addresses Hazard Mitigation (of those that have zoning ordinance)

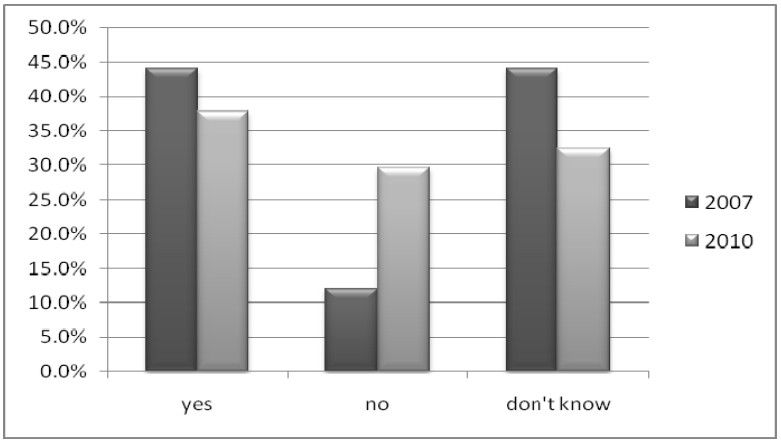


Source: Local Capability Assessment Survey, 2007 & 2010

Of those zoning ordinances that addressed hazards, floodplain management regulations and Base Flood Elevation (BFE) and/or freeboard requirements were included.

Finally, among respondents to the local capability assessment survey whose parishes had subdivision ordinances, nearly half in 2007 and slightly less in 2010 stated that their parish subdivision ordinance addressed hazard mitigation (see Figure 7-6).

Figure 7-6: Local Assessment of Whether the Parish/Municipal Subdivision Ordinance Directly Addresses Hazard Mitigation (of those that have subdivision ordinance)



Source: Local Capability Assessment Survey, 2007 & 2010

Subdivision ordinances that were reported to engage hazard mitigation typically did so by directly linking permitting to floodplain management regulations, drainage study requirements, and BFE and/or freeboard rules.

The survey results for the degree to which comprehensive plans and zoning and subdivision ordinances address mitigation indicate opportunities for training and education of parish OHS/EP and other personnel on integration of these tools into hazard mitigation efforts.

Finally, within the designated Coastal Zone, parishes or the Louisiana DNR impose an additional layer of permitting for certain projects through the Coastal Zone Management (CZM) program. CZM permitting was not part of this capability survey. Future updates to the Plan Update should include an analysis of the effectiveness of the CZM program. Forthcoming research by the LSU Sea Grant program will also provide data and analysis of the effectiveness of planning and land-use controls in coastal areas.

7.5.5 Intra- and Inter-Governmental Coordination

The most significant hazards faced in Louisiana have regional impacts, and lend themselves to regionally coordinated responses. All responding RCs recognized that the parishes in their regions faced hazards that crossed parish lines. Yet the respondents to the local capability assessment survey reported that inter-jurisdictional coordination, and even inter-agency coordination within jurisdictions, was often not strongly emphasized.

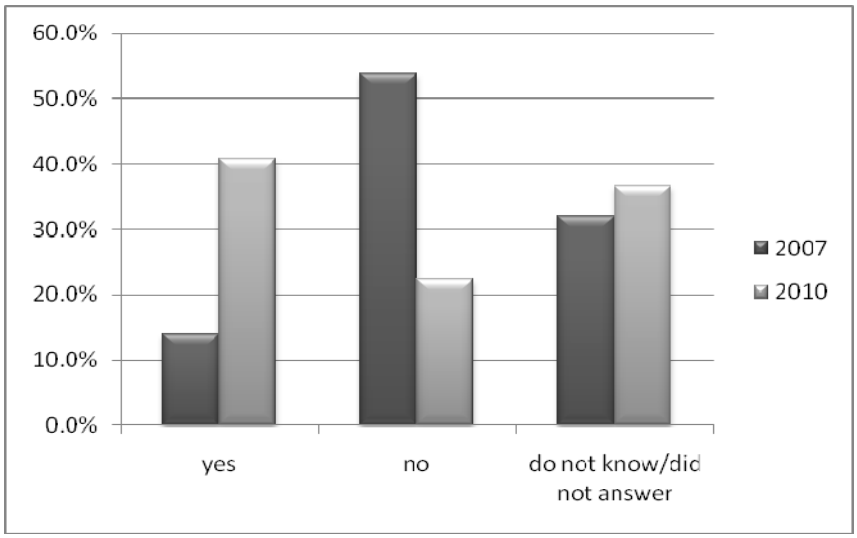
7.5.5.1 Intra-Jurisdictional Coordination

In 2010, 59% of local respondents that reported having hazard mitigation responsibilities centered in more than one office stated that processes exist for coordination or communication between those offices. In the 2007 survey, RCs noted internal “friction” between sheriffs and OHS/EPs as a result of local and state electoral politics.

7.5.5.2 Inter-Jurisdictional Coordination

The 2007 survey indicated that less than 25% of the respondents reported engaging in inter-jurisdictional coordination. The data obtained from the 2010 survey shows that slightly more than 40% of the respondents engage in inter-jurisdictional coordination activities.

Figure 7-7: Coordination with Neighboring Jurisdictions

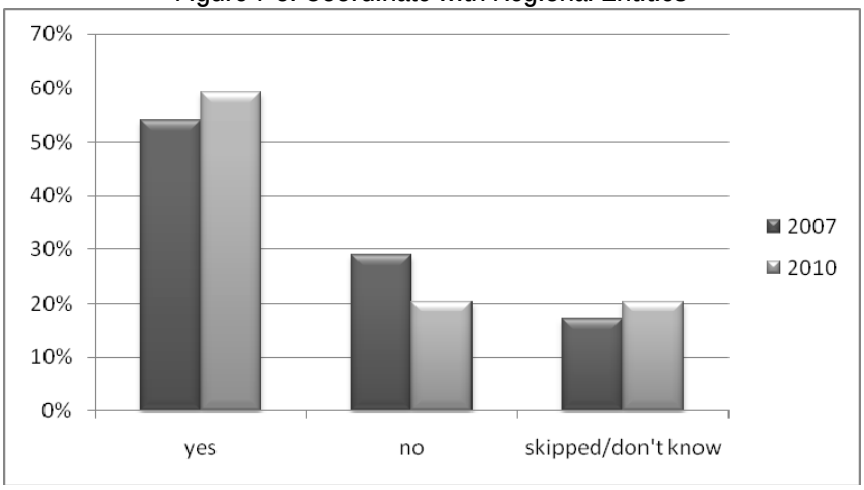


Source: Local Capability Assessment Survey, 2007 & 2010

7.5.5.3 Regional Coordination

As reflected below, in 2007 more than half of local respondents reported participating in regional coordination. In 2010, a larger majority of the respondents reported engaging in regional coordination activities (see Figure 7-8).

Figure 7-8: Coordinate with Regional Entities



Source: Local Capability Assessment Survey, 2007 & 2010

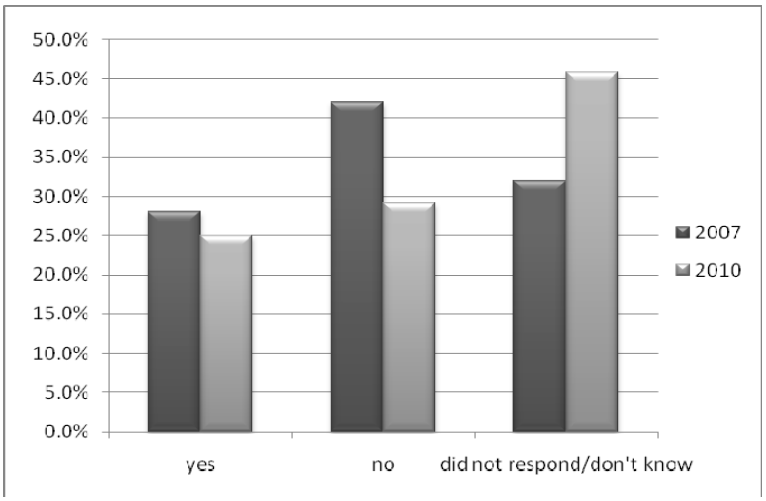
Most local OHS/EP offices reported working with GOHSEP RCs, and several local respondents also reported interactions with regional planning commissions/planning and development districts, in particular the South Central Planning Development Commission (metro Houma-Thibodaux), Baton Rouge UASI, and the Delta regional planning office.

7.5.5.4 Coordination with State Agencies

Second to GOSHEP, the state agency that parishes most commonly coordinate with was DOTD, which administers floodplain management. Other responses included DAF, DEQ, DNR, DHH's Office of Public

Health, the State Police, and the Department of Culture, Recreation and Tourism's State Historic Preservation Office. These responses came from all three types of local offices: OHS/EP, floodplain management, and code offices.

Figure 7-9: Coordination with State Entities other than GOHSEP



Source: Local Capability Assessment Survey, 2007 & 2010

7.5.5.5 Key Partnerships

When asked which partnership was the most important for hazard mitigation, some parish respondents cited offices within their own jurisdictions, while others cited state agencies or offices, particularly GOHSEP and DOTD. In 2007, none indicated a neighboring jurisdiction or a regional entity. As a change from 2007 to 2010, several respondents cited regional partnerships as valuable.

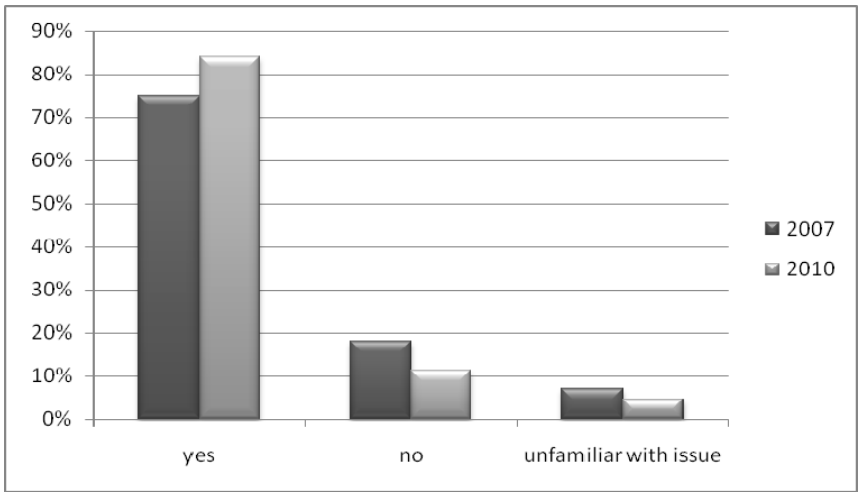
When asked to identify an entity that they do not currently work with that could be of benefit for hazard mitigation, many parishes gave no response. Responses included private industry, LSU and other universities, neighboring parishes, levee boards, internal parish/municipal departments, schools and non-profit organizations.

The sample size in the local capability assessment survey was not large enough to draw out trends connecting population size or region and key existing or desired partnerships.

7.5.6 Local/ State Consistency Issues in Hazard Mitigation Planning

Among the challenges in integrating local HMPs and the Plan Update is the lack of common terminologies, data sets, and methodologies. Part of the local capability assessment survey examined local willingness to have these things standardized. As in 2007, local officials in 2010 favored allowing the state to standardize hazard definitions and profiles (see Figure 7-10).

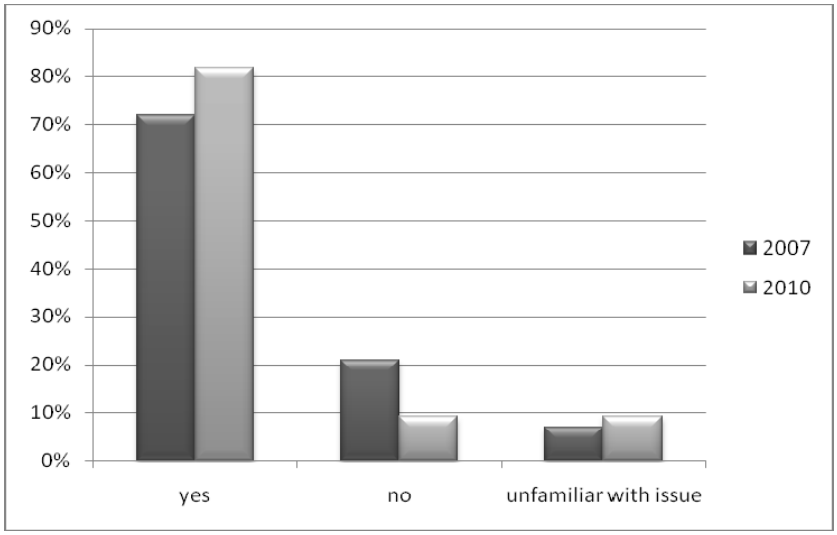
Figure 7-10: Preference for Standardized Hazard Profiles and Definitions



Source: Local Capability Assessment Survey, 2007 & 2010

Additionally, respondents were broadly in favor of State-standardized methodologies for risk assessment and loss estimation (see Figure 7-11).

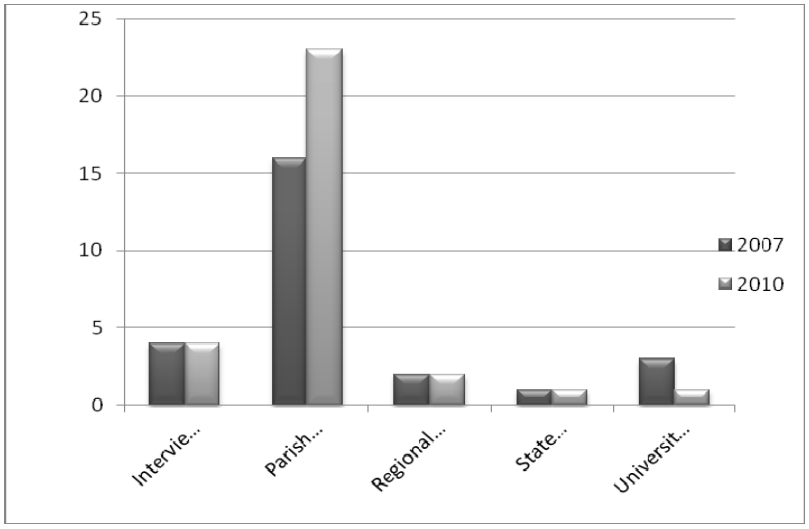
Figure 7-11: Preference for Standardized Risk Assessment Methodologies



Source: Local Capability Assessment Survey, 2007 & 2010

When asked where GIS data should ideally be created, housed and maintained, a majority (86%) favored a parish office or clearinghouse (see Figure 7-12). The ramifications of this preference are open to some interpretation, especially in light of the low GIS-efficacy demonstrated by many of the respondents. The preference for a local source may reflect a suspicion of regional- or state-level partners, or may be a symptom off past turf battles with them. The option of "state office" in particular received a very low response.

Figure 7-12: Preference for Where GIS Data Should be Housed



Source: Local Capability Assessment Survey, 2007 & 2010

The preference for a local source, however, appears to underestimate the regional- or state-level nature of many of the mitigation-relevant data sets, the difficulty of maintaining such data, and the challenges implied by creating numerous local GIS data sets that probably would not be compatible and would not be easy to aggregate for state hazard mitigation planning.

The low preference for the option of "interviewee's office" may indicate that respondents recognize the cost and effort necessary to house and maintain GIS, but the preference for a "parish office" does not seem to consider that such an office might not be eager or able to take on those costs and efforts.

This local preference for locally housed data resources must be taken into account if and when an attempt is made to update, streamline, and/or consolidate GIS data for hazard mitigation or any other purpose.

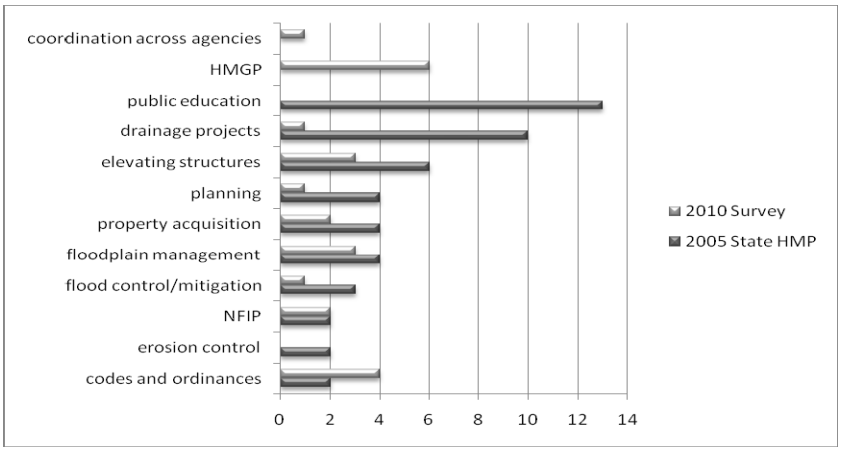
7.5.7 Evaluation of Existing Hazard Mitigation Planning and Programs, and Lessons Learned

Respondents to the local capability assessment survey invariably indicated that the most effective local programs were flood-related, citing some combination of:

- Floodplain management
- Drainage projects
- Participation in the CRS
- Repetitive loss property mitigation

GOHSEP RCs voiced similar assessments of relative local program effectiveness. These findings are largely consistent with those of the 2005 local capability assessment survey of the 63 OHS/EP directors (see Figure 7-13), with one major exception: public education, which had been considered by respondents to be the most effective tool, was not cited at all in the related open-ended question (choices not provided for selection) in the 2010 local capability assessment survey.

Figure 7-13: Most Effective Mitigation Activities, Programs, and Projects identified in 2005 State Hazard Mitigation Plan Compared to Perceptions from Local Capability Assessment Survey Respondents, 2010



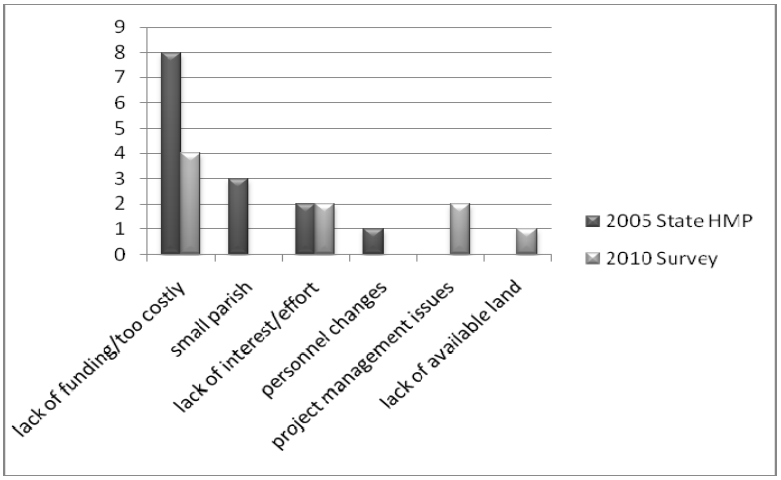
Source: State Hazard Mitigation Plan, 2005, & Local Capability Assessment 2010

Few local respondents to the new survey noted any less-than-effective mitigation programs, but those that did pointed to the UCC, maintenance dredging, and community education. They cited cost and lack of community feedback as the reasons for these programs' ineffectiveness.

In 2005, respondents to the comparable questions cited property acquisition as the least effective mitigation measure, but the response rate to the question was extremely low. Lack of funding was the most frequently cited reason for lack of success with mitigation programs in 2005 (see Figure 7-14), although in 2005 there was, and has recently been, a large amount of Federal funding available to the state and the local communities. This can be seen in 2010 responses identifying the HMGP as important. Respondents in 2010 also identified codes and ordinances and coordination as effective tools.

The reasons cited that mitigation activities are less than effective may provide indications also of local challenges in mitigation, in that in 2010, respondents noted project management issues, lack of interest and participation, and lack of available land among reasons for ineffective mitigation programs. Assistance in the first two of these could be an area for increased focus and support by the state.

Figure 7-14: Causes Cited for Ineffective Mitigation Programs 2005 State Hazard Mitigation Plan and 2010 Local Capability Assessment Survey Respondents



Source: State Hazard Mitigation Plan, 2005, & Local Capability Assessment Survey, 2010

Respondents to the new survey stated that the following programs and policies would also be useful to implement or expand: FEMA Severe Repetitive Loss Program, public education and awareness, increased elevation or freeboard requirements, zoning, and hardening critical infrastructure. Only the first two were cited more than once.

Finally, respondents to the 2007 survey reported several lessons from hazard mitigation planning experiences. One lesson was to keep a close working relationship with GOHSEP. Another was that if a contractor is selected, being sure the firm is familiar with the local terrain and involves sufficient local stakeholder input. Finally, several respondents advised that it was important that hazard mitigation staff have sufficient training.

Following are the main findings of the Local Capability Assessment:

- The parish personnel responding to the 2010 survey on average had been in their current jobs for more than six years. However, some of these offices were thinly staffed, and many responsibilities, especially in code enforcement, are being filled by contractors or third-party providers. Respondents in the 2010 survey were primarily from parish OHS/EPs or parish administration.
- A high level of GIS-access was reported, but relatively few offices maintain their own data or demonstrated a clear understanding of the potential of GIS. Most offices interviewed used GIS for emergency management. Full understanding of GIS and use of it for hazard mitigation was most common in floodplain management offices.
- All Louisiana parishes have HMPs, participate in NFIP, and are required to enforce the UCC. Most Louisiana parishes have subdivision ordinances, but only about one third of these address hazard mitigation. Meanwhile, less than one third of all parishes practice effective land-use planning and zoning, but those with zoning report that it almost always directly addresses hazard mitigation. Offices reported some level of coordination within their own governments, as well as with neighboring jurisdictions, regional entities, and state agencies. However, formal coordination between municipal/parish agencies and between neighboring jurisdictions was often reported to be weak.
- Local respondents recognized that coordinating local HMPs and the State Hazard Mitigation Plan requires standardized hazard identification categories and standardized risk assessment and loss estimation methodologies. Large majorities supported State-led standardization of these. Local respondents were wary of State management of GIS data, preferring it housed at the parish level. It is not clear from the survey whether respondents had a full appreciation for the reliability or resource issues implied by having numerous local data clearinghouses.

Section Eight
Mitigation Action Plan

Contents of this Section

8.1 Interim Final Rule Requirement for Mitigation Action Plan
8.2 Summary of Risk and Capability Assessments
8.3 Program Integration
8.4 Goals and Objectives
8.5 Identification of Mitigation Actions
8.6 Evaluation and Prioritization of Mitigation Actions
8.7 Implementation
8.8 Funding Sources

8.1 Interim Final Rule Requirements for Mitigation Action Plan

Section §201.4(c)(3) of the Interim Final Rule (IFR) states that "[to be effective, the plan must include] the State's blueprint for reducing the losses identified in the risk assessment."

Note: The IFR refers to this "blueprint" as a "Mitigation Strategy". However, as described in Section One, the State of Louisiana uses that phrase to encompass a comprehensive array of hazard mitigation, emergency management and long term recovery planning activities and programs. The State refers to this part of the documentation as the "Mitigation Action Plan".

The IFR includes three specific requirements that relate to the development of a Mitigation Action Plan for the State of Louisiana:

- Hazard Mitigation Goals per Requirement §201.4(c)(3)(i): "[The State shall include a] description of State goals to guide the selection of activities to mitigate and reduce potential losses."
- Mitigation Actions per Requirement §201.4(c)(3)(iii): "[State plans shall include an] identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy."
- Funding Sources per Requirement §201.4(c)(3)(iv): "[The State mitigation strategy shall include an] identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities."

The Mitigation Action Plan goes beyond the minimum IFR requirements by developing a tentative timeframe for implementing these actions and determining the responsible parties for the individual actions listed below. While the Mitigation Action Plan identifies actions to be taken primarily by the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and the State Hazard Mitigation Planning Committee (SHMPC) over time, interactions and participation by other state agencies is also considered an important part of the program.

8.2 Summary of Risk and Capability Assessments

Sections Four, Five, Six and Seven of the Plan Update indicate current conditions regarding risk and capabilities in the State of Louisiana per the best available information. The following summary is intended to help turn the results of these analyses into actions.

Summary of Risk Assessments

On a statewide basis, per the results in Section Four and Five, risk factors for some hazards are essentially equal throughout the State. For example, the risk due to lightning strikes or severe summer weather (i.e., high heat) is basically the same throughout the State. However, for many of the more significant hazards, potential effects vary in different parts of the State. This discussion divides the State into four simplified regions for purposes of summarizing key sources of risk from natural hazards (see Map 8-1):

- Coastal Parishes
- Inland Southern Parishes
- Central Parishes
- Northwest Parishes

Coastal Parishes

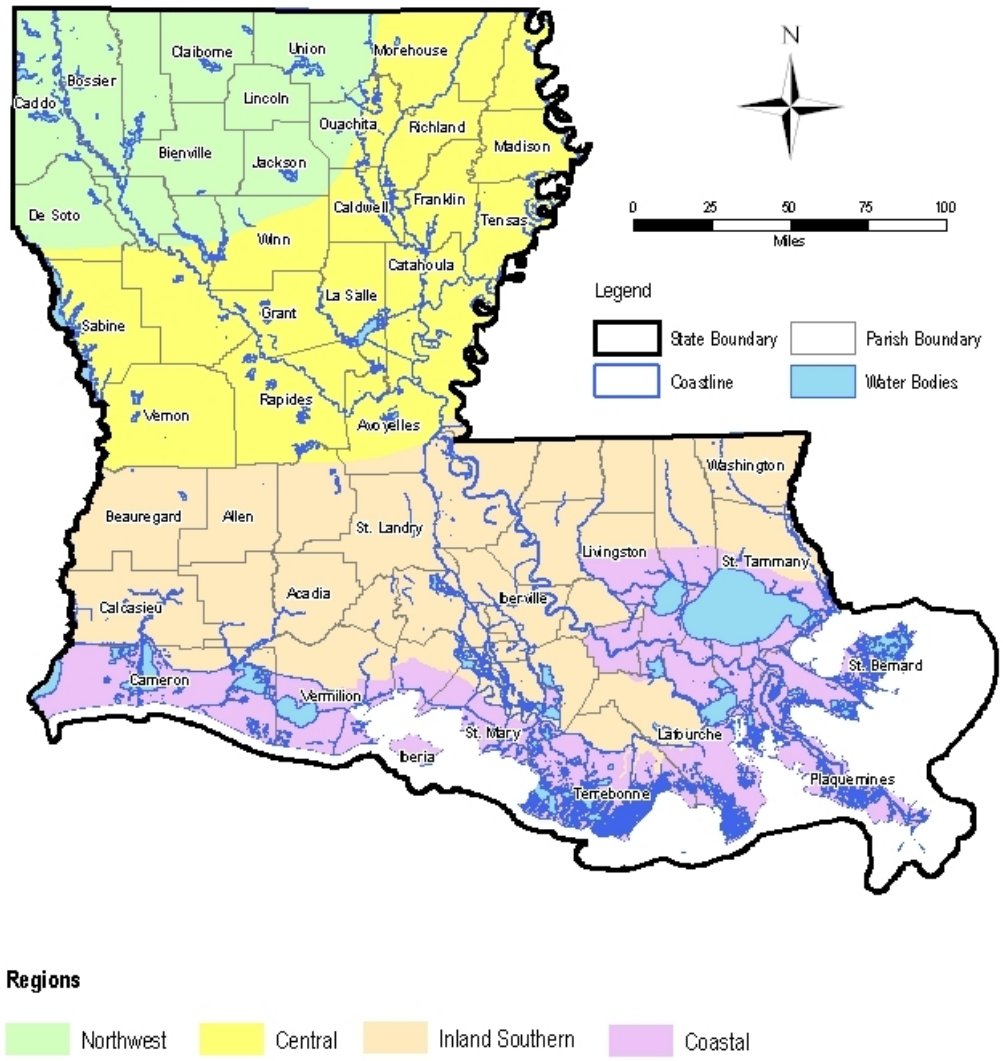
- High risk of loss of life, injury and property damage due to inundation and wave action from storm surge caused by tropical storms and hurricanes. The largest concentrations of repetitive and severe repetitive loss properties in the State occur in the heavily populated areas in this region. Due to a variety of factors, including salt water intrusions, diversion of natural seasonal flooding, coastal erosion, subsidence and sea level rise, the extent and effectiveness of land and wetland buffers are decreasing. As a result, risk due to storm surge in existing urban areas is expected to increase.
- High risk of damage due to inundation directly from riverine and backwater flooding. The failure of levees, floodwalls and forced drainage systems along the major rivers and drainage systems all pose a high risk in the southeast coastal parishes. Subsidence in much of this area, particularly again in the southeast, is a significant contributing factor to an anticipated increase in exposure and risk to existing and future structures.
- High risk of direct wind damage and damage from wind borne debris in existing pre-Uniform Construction Code (UCC) structures caused by tropical storms, hurricanes and tornadoes spawned by these major storm events.
- High risk of hazardous materials spills, particularly in the heavily industrialized central and eastern parishes.
- Low risk of drought, hailstorms, ice storms, earthquakes, and wildfires.

Inland Southern Parishes

- High risk of damage due to inundation directly from riverine and backwater flooding and failure of levees, floodwalls and forced drainage systems along the major rivers and drainage systems. In the eastern parishes, subsidence is a contributing factor to an anticipated increase in exposure to existing and future structures. Future development is likely to occur in this region associated with existing urban areas and corridors between existing urban centers.
- Moderate to high risk of direct wind damage and low to moderate risk of damage from wind-borne debris in existing pre-UCC structures caused by tropical storms, hurricanes and tornadoes. Risk caused by hurricane wind exposure or storm surge increases in direct relation to proximity to the coast.
- Low to moderate risk of wildfires, though the parishes north of Lake Pontchartrain suffer some of the highest risk.
- Low risk of hailstorms and ice storms.

- Moderate to high risk of hazardous materials spills, particularly in the urbanized parishes that contain the Interstate 10 corridor.

Map 8-1: Regional Risk Assessment Summary



Central Parishes

- Moderate risk of damage due to inundation directly from riverine and backwater flooding. The failure of levees, floodwalls and forced drainage systems along the major rivers and drainage systems poses a particularly severe risk in parishes that about one of the two major river systems in the state: the Mississippi and the Red Rivers. Urban centers have concentrations of repetitive and severe repetitive loss properties. Rural parishes in this area have relatively low concentrations of repetitive and severe repetitive loss properties. Subsidence is not considered a significant contributing factor to increased future exposure.
- Low risk of direct wind damage from tropical storms or hurricanes and in existing pre-UCC structures. Risk of damage from wind borne debris due to tropical storms and hurricanes is not considered as significant in these areas, compared to coastal and inland southern parishes. Moderate risk of tornado damage, with the exception of the far northeast parishes, where the risk is high.

- Moderate risk due to wildfires relative to other areas of state, with higher concentrations of risk in the western parishes, along the Texas border.
- Moderate to high risk of hailstorms, particularly in the northeast parishes.
- Low to moderate risk of ice storms and hazardous materials spills.

Northwest Parishes

- Highest relative risk of hailstorms, ice storms, and wildfire.
- Low to moderate risk of damage due to inundation directly from riverine and backwater flooding and failure of levees, floodwalls and forced drainage systems along the major rivers and drainage systems. Similar to the Central Parishes, urban centers have concentrations of repetitive and severe repetitive loss properties. However, rural parishes in this region have lowest concentrations of repetitive and severe repetitive loss properties in the State. Based on 19 of the high hazard dam inundation areas, the parishes at highest risk due to dam failure are in the far northwest corner of the state.
- Low risk of subsidence, storm surge, or direct wind damage from tropical storms. Moderate risk of direct wind damage from tornadoes in existing pre-UCC structures.

In addition, part of the risk assessment process per the Disaster Mitigation Act of 2000 (DMA 2000) is the incorporation of information from parish and municipal hazard mitigation plans. Section Five includes summaries of relevant information from these plans, but it also identified a number of problems inherent in the plans that prevented full integration of hazard and risk information including a lack of consistency in:

- hazard terminology and definitions;
- data and methodologies for vulnerability assessment including identification and definitions for critical facilities;
- data and methodologies for loss estimation and risk assessment;
- goals and objectives; and
- detailed development of hazard mitigation projects.

Summary of Capability Assessments

A number of mitigation-specific Acts, plans, Executive Orders and policies exist in the State. Among them are several targeted planning and policy documents, and several multi-agency attempts at integrating the various hazard mitigation activities in the State. Many of these plans and policies hold significant promise for hazard mitigation, particularly because they are ongoing and take an integrated, strategic look at the whole hazard-mitigation landscape in Louisiana and propose ways to continually improve hazard mitigation. In many cases, these programs' full potential for effective mitigation remains unrealized. Thorough and systematic policy/ program evaluation(s) and organizational review(s) of hazard mitigation efforts both within the State and including Federal partners are therefore now indicated.

GOHSEP, OCPR, DNR, and DOTD all have significant numbers of staff devoted specifically to hazard mitigation, or whose activities actively support hazard mitigation. GOHSEP is the programmatic lead on hazard mitigation activities, but currently lacks sufficient personnel and subject-area expertise and experience to effectively support the hazard mitigation activities in the State at the level at which they should be supported, particularly given the relatively low understanding and application of mitigation throughout the Louisiana parishes. Most GOHSEP regional coordinators reported an interest in a greater hazard mitigation role, as long as adequate staff, technical, and budget support accompanied that increased role. However, there is a need for outreach and education prior to these offices being given a greater mitigation role.

All Louisiana parishes have HMPs, participate in NFIP, and are required to enforce the UCC. Most Louisiana parishes have subdivision ordinances, but only about one third of these address hazard mitigation. Meanwhile, less than one third of all parishes practice effective land-use planning and zoning, but those with zoning report that it almost always directly addresses hazard mitigation. Offices reported some level of coordination within their own

governments, as well as with neighboring jurisdictions, regional entities, and state agencies. However, formal coordination between municipal/parish agencies and between neighboring jurisdictions was often reported to be weak.

Finally, to provide a sound basis for ongoing and future hazard mitigation planning, and to integrate local and state planning, a better system of GIS and other data creation, consistency, management, and distribution is needed. The most viable option is likely one that involves partnerships between GOHSEP, Louisiana universities, and other state agencies, as well as local and regional entities.

8.3 Program Integration

As noted in Section 1.3, the response to these varied risk factors has been development of a wide array of programs, plans, and organizations at the federal, state and local levels. Mitigation of natural and certain technological/manmade hazards as addressed in this Plan Update is one such response. As also noted in Section 1.3, the core function of this Plan Update is to provide a basic understanding of risks from natural and certain manmade or technological hazards and a consistent framework for assigning resources; through the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) grant program, Public Assistance (PA) grant program, Flood Mitigation Assistance (FMA) program, or other federal and non-federal sources, to projects, programs and policies intended to address those risks. This Plan Update concentrates on mitigating *impacts or effects* of hazards. That is to say, it mitigates the direct effects of flooding and high wind, rather than of "hurricanes."

In instances where other programs or agencies are already effectively positioned to mitigate a given hazard, especially where effective mitigation is beyond the scope of the programs and funding streams available for hazard mitigation to DMA 2000-compliant states and jurisdictions, *this Plan Update acknowledges and defers to those efforts*. However, in some cases, especially mitigation of coastal land loss, the scale of mitigation projects is a key consideration; small-scale measures may still be covered within this Plan Update, even if large-scale projects fall outside its scope. These related efforts fall into three broad categories:

- Decreasing the magnitude of hazards;
- Decreasing exposure to hazards; and
- Improving disaster response.

Decreasing the Magnitude or Severity of Hazards

These programs and strategies reduce the likelihood of a hazard event occurring, or reduce the severity of a hazard event such that it poses a less significant risk to public safety and property.

Coastal Protection and Restoration

The risks posed by coastal flooding, and particularly storm surge hazards, increase as a function of exposure. In Louisiana, exposure of population centers to these hazards is typically mitigated through planning and implementation of large-scale, physical coastal protection and restoration strategies and projects, including a combination of structural protection measures (for example, levees, floodwalls, and floodgates), and coastal restoration measures (for example, barrier island restoration, coastal stabilization, wetland protection, and wetland restoration). This Plan Update addresses mitigation of flooding from riverine or surge sources, but it does not directly address coastal protection and restoration per se. This is because (a) projects of the scale required are typically beyond the funding capacity of the hazard mitigation resources accessible as a result of DMA 2000 planning, and (b) other state and federal entities have already been tasked with the integrated planning and implementation effort required to engage these challenges.

The Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) and the Coastal Impact Assistance Program (CIAP) fund many of the projects in Louisiana. In 1990, Congress passed the Coastal Wetlands Planning Protection, and Restoration Act (CWPPRA). CWPPRA annually designates approximately $60 million for wetland

enhancement projects. The Coastal Impact Assistance Program (CIAP) was established by Section 384 of the Energy Policy Act of 2005 to help producing states and their coastal political subdivisions mitigate impacts from Outer Continental Shelf (OCS) oil and gas production. Authorized uses of CIAP funds are: projects and activities to conserve, protect or restore coastal areas, including wetland; mitigation of damage to fish, wildlife or natural resources; planning assistance and the administrative costs of CIAP compliance; implementation of a federally approved marine, coastal or comprehensive conservation management plan; and mitigation of the impact of OCS activities by funding onshore infrastructure projects and public service needs.

In 1989, the State Legislature established the Wetlands Conservation and Restoration Authority under Act 6. The Authority included top officials from the Division of Administration, DNR, and four other state agencies. Then, in response to the hurricanes of 2005, Act 8 of the First Extraordinary Session of the 2005 State Legislature expanded the Wetland Conservation and Restoration Authority into the Coastal Protection and Restoration Authority (CPRA) and authorized it to integrate hurricane protection and coastal restoration. The CPRA is comprised of the Department of Natural Resources (DNR), the Department of Transportation and Development (DOTD), GOHSEP, the Governor's Office of Coastal Activities, the Division of Administration, and five other state agencies, in addition to representatives of levee districts and selected parish leaders.

The Office of Coastal Protection and Restoration (OCPR) was formed in July 2008, which helped merge coastal restoration and flood protection. OCPR is currently an office under the Governor and reports to the Executive Director of the CPRA. OCPR staff were reassigned from two agencies: the Department of Natural Resources, which used to direct coastal restoration activities; and the Department of Transportation, which used to coordinate coastal flood control measures. OCPR is responsible for integrating hurricane protection, storm damage reduction, flood control, coastal protection and restoration efforts, and associated infrastructure and maintenance within Louisiana.

Act 8 also mandated the development of a comprehensive master coastal protection plan along with subsequent annual plans that establish clear priorities for activities and expenditures for coastal restoration and protection. CPRA developed *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast* (the "Master Plan"), which was approved by the Louisiana legislature in June 2007. Based on the best available science and engineering, the Master Plan identifies hurricane protection and coastal restoration measures as well as a strategy for implementing the measures to develop a conceptual vision for a sustainable coast. The Master Plan is coordinated with the development of the U.S. Army Corps of Engineers (USACE)'s Louisiana Coastal Protection and Restoration plan. CPRA's Master Plan will be partially funded through three funding streams: the federal Coastal Impact Assistance Program and Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), as well as future revenues from Outer Continental Shelf leases and other congressional appropriations.

In April 2010, OCPR developed the *CPRA Fiscal Year 2011 Annual Plan: Integrated Ecosystem Restoration and Hurricane Protection in Coastal Louisiana.* This plan links funding sources and spending levels for specific projects and identifies a three year spending plan from FY 2011 to FY 2013. The plan also provides discussion of progress in project implementation during FY 2010. The plan incorporates a variety of coastal activities including projects using Water Resources Development Act Authority funds, Coastal Wetland Planning, Protection and Restoration Act funds, Coastal Impact Assistance Program funds, and Department of Transportation and Development infrastructure funds. OCPR also developed a database, which lists coastal projects that Louisiana and its partners are planning, constructing, and operating. The database currently does not reflect private and local projects; however, there are plans for inclusion in the future.

Wildfire Mitigation and Suppression

The Plan Update includes actions to address mitigation of wildfire risk with the understanding that mitigation of wildfire hazard is an area over which an existing state agency's programs are already in place. The Plan Update intends to coordinate with these existing efforts. The Department of Agriculture and Forestry (DAF) Forest Protection Division oversees the detection and fighting of forest fires, helping to prevent property damage and loss of life, and the destruction of timber. The Forest Protection Branch administers the Federal Excess Property Program which

provides trucks and other machinery at no cost to rural Louisiana fire departments. The Volunteer Fire Assistance Program provides federal cost-share funding to aid in the training and equipping of rural volunteer departments.

On the mitigation side, the Forest Protection Division also maintains the Certified Prescribed Burn Manager Program, which is designed to promote the safe and effective use of prescribed fire in the management of natural resources. Additionally, DAF regularly maintains records of fire lines plowed throughout the state. After hurricanes Katrina and Rita, with additional fuel on the ground in many areas, additional mitigation lines were installed in some areas using the resources assigned to the fire incidents. DAF's prevention personnel also work to inform landowners about maintaining defensible space around structures and are working with communities to complete Community Wildfire Protection Plans (CWPPs). Grant monies will be available for CWPP communities to contract for fuel reduction. Educating the public about mitigating dangers from wildfire is also accomplished through the Firewise program and other prevention activities.

In 2010, the Office of Forestry has also developed a *statewide forestry resources assessment and strategy* as a first of what may become a perennial re-assessment of the conditions and goals for forestry in Louisiana. This has been placed in motion in response to innovations in the U.S. Farm Bill which focused on dispersing what limited funds are available to the states and forestry initiatives most in need or demonstrating the greatest potential. In accordance with this mandate and in opportune harmony with what has been and will continue to be three of the underlying duties of the Office of Forestry, this assessment and strategy will incorporate three national priorities, as designated by the Farm Bill. Those being:

- Conserving working forest landscapes
- Protecting forests from threats
- Enhancing public benefits from trees and forests

The assessment has designated regions that demonstrate the greatest concern or opportunity and portray how the DAF has analyzed the threats at hand and allocated resources to best serve the citizens and landowners of Louisiana. Through this process, Office of Forestry will aim to depict the state's history, how the state have grown through the decades, and the fresh, yet traditional approaches the state is utilizing to confront the demands on Office of Forestry, the state, and the forest-related industries into the future.

An account of these primary issues is to follow:

Issue 1: Wildfire & Protection

Wildfire is a prevalent risk to Louisiana's forests. The assessment has looked into the history of wildfire protection by Office of Forestry, how the Office of Forestry has evolved to confront the risks for battling wildfire, and what regions of the state annually display the highest risk of fire.

Issue 2: Longleaf Regeneration

With a conducive climate and suitable soils, longleaf pine, native to Louisiana, is making a comeback in some parts of the state. The assessment has looked at longleaf pine, the challenges in promoting this pine variety, and where and why longleaf develops best.

Issue 3: Cogongrass

A vigorous invasive, cogongrass has aggressively begun to overrun the South. The assessment discussed the vectors that have promoted its spread, the threats that it presents, and the steps that Louisiana Forestry is taking to discourage its march across the state.

Issue 4: Urban Sprawl and WUI (Wildland Urban Interface)

The population of Louisiana has been in flux through recent years. Following four major hurricanes in the last five years, the exodus and return of the state's population has led to increased movement out of urban areas into the rural frontier. Without question, the portion of the state most impacted lies north, across Lake Pontchartrain, from New Orleans. The assessment discussed this impact and shows the regions of the state that are being impacted by interface and intermix.

Issue 5: Insects, Disease, and Forest Health

Blessed with an ecosystem that is productive in forestry, the same elements in Louisiana promote threats to the forests. The assessment discussed insects and disease that have historically plagued forest health and the steps to which the Office of Forestry has gone to detect and prevent these risks.

Issue 6: Cypress-Tupelo Management

The long-term and productive management of cypress and tupelo stands by landowners in south Louisiana has been a contentious issue in recent years. While it is consistently the mission of the Office of Forestry to support the independent landowner in keeping forested lands productive and healthy, there has been a growing movement among private interests to prevent landowners from harvesting timber. The assessment discussed this issue, outlines the areas of the state involved, and presents the positions of those for and opposed to traditional silviculture in theses bottomland hardwood areas.

Issue 7: Gulf Storms and Climate

Positioned in the center of the Gulf of Mexico, Louisiana has suffered some of the most devastating storms in US history. The assessment discussed the aftermath of these storms, including the devastation caused by hurricanes such as Katrina, Rita, Ike and Gustav, in recent years on Louisiana's forests and the value of the trees left standing.

Issue 8: Hardwood Regeneration

The regeneration of hardwood stands, especially in areas of the state that lend themselves to other forms of agriculture, has been an ongoing effort for the Office of Forestry. This assessment discussed where the efforts are taking place and what steps are being incorporated to promote this effort.

In addition, DAR has integrated the tracking and monitoring of wildfires into a GIS risk assessment system. The system uses:

I. Methodology for measuring wildfire vulnerability
   a. CAR Ratings; Housing Density in Urban Areas and Census Blocks; Fire Ignition Locations; Fire Occurrence Area (FOA); Level of Concern (LOC); Surface Fuels; Wildland Fire Susceptibility Index (WFSI); Wildland-Urban Interface (WUI) (see attachments)
   b. Nearly all relevant wildfire vulnerability concerns rest in the Florida Parishes (St. Tammany, Tangipahoa, Washington, Livingston, St. Helena, East/West Feliciana, East Baton Rouge). These comprise the bulk of parishes in Louisiana that have both high instances of fire and many new building permits.

II. Challenges to wildfire vulnerability assessment
   a. The use of “section blocks” at 40 acres in size limits the ability to assess Fire Occurrence Areas (FOAs) precisely
   b. Determining natural and human-induced wildfires: 64% of fires in Louisiana are arson, which by definition means they are deliberate
   c. System attempts to account for distinctions between public and volunteer fire departments, road networks and allowable speeds, regional Agriculture/Forestry offices

III. Budgetary challenges to improving the wildfire vulnerability assessment system
   a. 25% budget cut to the Department this past year has been particularly painful

i. July 2010 was the start of a new fiscal year: must defend the use of state funds before exploring the option of federal monies
ii. While recognizing the state's budgetary concerns, it will be impossible for Louisiana's wildfire monitoring program to compare to a state like Florida with a continually shrinking budget, nor will it be possible to expand sophistication or capacity even while greater demands are being placed upon it.

b. DAF could easily double administrative/technological staff, particularly in monitoring wildfires
c. ICS certified officers is a strong point of the Department

Public, Transportation, and Environmental Safety

A range of hazards exist in the form of ambient threats to public safety, transportation, and environmental or health safety; the Plan Update does not directly address these.

- Public safety: local jurisdictions and fire districts provide day-to-day basic public-safety services, in coordination, as appropriate, with state and federal agencies, including state and federal law enforcement and the Louisiana National Guard.
- Transportation safety: the Highway Safety Commission of the Department of Public Safety (DPS) maintains transportation-safety data, works to mitigate construction, rail-crossing and other physical roadway and pedestrian hazards, and engages in public education and policy aimed at reducing drunk driving, encouraging seatbelt use, and similar risk-reduction programs. The Louisiana State Police in DPS enforce traffic laws and engage in public-safety campaigns aimed at mitigating roadway hazards.
- Environmental and food safety: Various divisions within the Department of Environmental Quality (DEQ) mitigate environmental and/or public health hazards by assessment, permitting, and remediation for factors that impact air quality, water quality, waste disposal, brownfields, and more. Additionally, various programs within DAF mitigate environmental and/or food safety hazards by inspection, prevention and/or regulation of livestock disease, food safety, pesticides, nuisance animals, and more.

Decreasing Exposure and Vulnerability to Hazards

These programs and strategies do not directly engage the magnitude of the hazard itself, but instead intend to reduce risk by decreasing the impact a hazard or disaster event has on public safety and property.

Critical Facilities and Infrastructure

The Infrastructure Protection Branch of GOHSEP develops and maintains a classified listing of critical infrastructure and key resources in the State of Louisiana consistent with seventeen (17) sectors defined by the US Department of Homeland Security:

- Agriculture and Food
- Defense Industrial Base
- Energy
- Public Health and Healthcare
- National Monuments and Icons
- Banking and Finance
- Water
- Chemical
- Commercial Facilities
- Dams
- Critical Manufacturing
- Emergency Services

- Nuclear Reactors, Materials and Waste
- Information Technology
- Communications
- Postal and Shipping
- Transportation Systems
- Government Facilities

The Infrastructure Protection Branch provides technical assistance for preparedness, response and recovery regarding these key resources. As part of this Plan Update, it is recommended that the Branch incorporate technical support for hazard mitigation to reduce the risk of damage or loss of function to these resources in the event of a natural disaster.

Dams/Reservoirs and Levees

Dam/Reservoir Safety[1]

DOTD is responsible for dam safety in Louisiana. DOTD's Public Works and Water Resources Division maintains Louisiana's Dam Safety Program, under which DOTD defines the minimum standards for the design, construction, operation, and maintenance of dams in the state of Louisiana. DOTD has statutory responsibility and the authority to enforce the standards of the program.

Under the program, "dam" is defined to include any embankments, impoundment structures, spillways, outlet works, and other attendant parts which impound or divert water. DOTD has authority over dams as low as six feet high, depending on the volume of water impounded.

A permit from the DOTD is required prior to construction or structural modifications of any dam. All dams permitted by DOTD must be designed by a professional civil engineer registered in the state, and the designs must conform to nationally recognized engineering standards. Once in service, the integrity of the dam must be sustained by regular maintenance, in accordance with the approved operations and maintenance document provided by the designer, which must include forms and schedules for records and documentation of inspections, maintenance procedures, and repairs. DOTD periodically performs limited inspections of the dams in the jurisdiction of the program to ascertain whether the structure is being properly maintained. The dam's owner is responsible for performing and documenting periodic inspections, also. The dam owner is responsible for the remediation of deficiencies found during inspections. The dam's owner must also maintain an approved Emergency Action Plan (EAP), and is responsible for executing it in an emergency.

Levee and flood wall certification[2]

The planning, construction, and maintenance of structural flood-protection measures such as levees, floodwalls, and floodgates is the purview of the USACE, in cooperation with state agencies and entities including CPRA and DOTD, as well as levee districts. USACE has responsibility for certification of levees and floodwalls, though both USACE and other entities may construct such infrastructure. In order for FEMA's National Flood Insurance Program (NFIP) to recognize the protection offered by a levee and/or floodwall, the structure must be certified by USACE.

[1] DOTD, "Dam Safety Rules and Regulations."

[2] USACE Corps Points (July 25, 2007), "Certification of Levee Systems for the National Flood Insurance Program (NFIP)"; USACE Corps Points (April 12, 2006), "Flood Data and Cost Estimates Announced for New Orleans Area Protection System"; USACE "National Levee Safety Program Fact Sheet" (2007).

The draft USACE Engineer Technical Letter (ETL) 1110-2-570 provides a consolidated document of USACE procedures for levee/floodwall system certifications determinations, which are effectively contemporaneous with FEMA "accredidations" in support of the NFIP. The ETL updates methods and references to current USACE practices and criteria. FEMA fully participated in the development and review of this document. Controversy over identified timelines for certification and repercussions to communities failing certification has stalled the full implementation of this program and finalization of ETL 1110-2-570.

USACE and FEMA agree that the local sponsor seeking recognition of the levee system for NFIP purposes is responsible for providing certification documentation. USACE will continue to certify levees it operates and maintains. For all other levees within the USACE program, funding for operations and maintenance must be provided by the local sponsor.

Among the requirements for USACE certification:

- Levees and flood walls must meet USACE engineering specifications.
- Levees and flood walls must offer protection at the 100-year flood level.
- No certification of individual components of the system is allowed. A levee system includes all components that are interconnected and necessary to insure flood and storm damage reduction for the associated floodplain, including levee/floodwall sections, closure structures, pumping stations, culverts, interior drainage works, and system operation and maintenance.
- Emergency operations and flood warning plans are required for systems under evaluation.
- The maximum period of validity for USACE certification will be 10 years and consistent with the cycle of inspection and assessment provisions.

In the wake of the levee and flood wall failures during Hurricane Katrina, USACE began reassessing its own federal program levee systems, under the National Levee Safety Program. Since 2006, USACE has developed a national inventory database to capture information about each levee, including the location and last recorded inspection rating. Now, USACE will be assessing all of the levees in the inventory. The levees included in this initial survey will include levees that are:

- federally owned and maintained;
- federally built and locally maintained; and
- locally built and maintained and meet specified USACE standards.

The assessment is expected to take five years to complete and will begin in 2008, if funds are appropriated.

In 2006, a state Constitutional amendment phased out the old parish levee board system in Southeast Louisiana in favor of two regional boards: the Southeast Louisiana Flood Protection Authority-East, and Southeast Louisiana Flood Protection Authority-West. The regional authorities are responsible for levee construction and maintenance, levee drainage, flood protection and hurricane flood protection. The new boards must have both geographical representation and, for the first time, members with technical specialties, including hydrology, civil engineering, and geology. They also require training for members.

Floodplain Management

The Plan Update addresses floodplain management, particularly in terms of local capability assessment, but it does so by supporting and enhancing the pre-existing framework of flood-hazard mitigation, which is built around the financial incentive of the NFIP. Local jurisdictions that participate in the NFIP must administer and enforce floodplain management, including primarily the requirement that new structures be elevated above the 100-year floodplain, or Base Flood Elevation (BFE).

Additionally, parishes wishing to be eligible to receive HMGP funds related to hurricanes Katrina and Rita were required to adopt new, post-Katrina/Rita Advisory Base Flood Elevations (ABFE) by the Louisiana Recovery Authority

(LRA)[3]. The ABFEs reflected new, and typically higher, elevations for 100-year flood risk. NFIP is coordinated at the state level by the Floodplain Management Program of the DOTD Public Works and Water Resources Division, with funding from FEMA and DOTD. Statewide, all parishes participate in NFIP, and all affected jurisdictions adopted ABFEs with the exception of St. John the Baptist Parish and the incorporated municipalities of Gueydan and Erath within Vermilion Parish (Vermillion Parish adopted ABFEs).

Additionally, 37 Louisiana communities, accounting for approximately 80% of NFIP policies in the State of Louisiana, participate in the Community Rating System (CRS); an NFIP program that allows communities to lower the premiums charged to their citizens by going above minimum NFIP requirements via efforts such as public education and additional freeboard requirements. According to the program administrator, this translates into approximately $20 million in savings in policyholder premiums.[4]

Administration of BFE regulations varies by locality in quality, consistency, and enforcement mechanism/structure. Meanwhile, enforcement, capacity, and public education remain challenges for the program, and accordingly these are addressed in this Plan Update.

Finally, consistent with the 44 Code of Federal Regulations (44 CFR), GOHSEP plan review for local hazard mitigation plans will continue to ensure that parishes/municipalities have identified and addressed repetitive loss properties in their plans and/or plan updates. Furthermore, the number of repetitive loss properties in each parish/municipality will be taken into consideration when GOHSEP is evaluating local risk for the purpose of prioritizing grant funding.

Building Codes

Construction codes are addressed in this Plan Update, particularly in terms of local capability assessment. The existing framework policy and regulations will be supported and enhanced. Local jurisdictions are currently charged with administration and enforcement of the State UCC, a building code adopted state-wide by the Legislature in 2005 that is consistent with the International Building Code (IBC) and International Residential Code (IRC), both developed by the International Code Council (ICC). The UCC results in structures that can withstand high winds and floods with exceptions made for certain industrial structures as well as farm and private recreational structures. UCC requirements went into effect on January 1, 2007, although the 2007 Legislature relaxed code requirements regarding work on existing one- and two-family dwellings.

This program is coordinated at the state level by the Louisiana State Uniform Construction Code Council (LSUCCC) within DPS. LSUCCC has promulgation authority for the UCC with the exception of the Plumbing Code that is enforced by Department of Health and Hospitals (DHH). Review and enforcement powers for all aspects of the UCC for private property reside at the local level. (The Office of the State Fire Marshal has no enforcement authority relative to the UCC, although it is allowed to provide plan review services at the request of local jurisdictions; the Fire Marshal does have review and construction enforcement powers related to the Life Safety Code, Americans with Disability Act accessibility guidelines, and Energy Conservation for commercial structures only, among others; it has no authority over one- or two-family dwellings or townhouses that are regulated by the UCC.) LSUCCC can initiate civil litigation for non-compliance.

LSUCCC has provided intensive 30-day regional training seminars for 40 code officers across the state. This training may potentially be recorded and converted into an interactive, on-line certification program. Certification and continuing education criteria under the state code officer program will be consistent with ICC guidelines.

[3] The Louisiana Recovery Authority (LRA) was created following hurricanes Katrina and Rita to manage and coordinate state mitigation, recovery, and long-term planning functions for Disaster Declarations 1603 and 1607, hurricanes Katrina and Rita, respectively and were subsequently responsible for Disaster Declarations 1786 and 1792, hurricanes Gustav and Ike. As of 2010 it formally "sunset" and its functions were folded into DOA-OCD. For more information on the LRA, see Section 3—Planning Process and Section 7—Capability Assessment.

[4] Cindy O'Neal, Louisiana NFIP State Coordinator, Louisiana DOTD. This figure is accurate as of December 18, 2007.

DPS is also administering a $14 million HMGP-funded program to provide training, education and grants to communities for purchasing hardware and software in support of code implementation (potentially including e-permitting), and DPS is providing direct salary support to regional code officers who work across a number of parishes that would not otherwise be able to support a salaried building inspector position.[5]

It is important to note that construction of State or Federal owned facilities is not subject to local permitting requirements. State facilities adhere to the Louisiana Building Code which is administered by the Department of Facility Planning and Control within the Division of Administration. However, State owned facilities are required to comply with local floodplain management ordinances including adhering to BFE and freeboard requirements set by parishes and municipalities.

Insurance

Mitigation of financial losses to individuals, firms, and institutions is the role of the Louisiana Department of Insurance, which engages in public education and works directly with insurers to ensure that commercial insurance is available and affordable.

The State, though the Department of Insurance, also oversees the Louisiana Citizens Property Insurance Corporation. Louisiana Citizens Property Insurance Corporation is a non-profit, legislatively created public corporation charged to provide a residual market for residential and commercial property applicants who are in good faith entitled, but unable, to procure insurance through the voluntary insurance marketplace. Its board consists of elected officials or their designees and appointments made by the governor. It operates pursuant to a plan of operation approved by the Senate and House Committees on Insurance, and it is subject to oversight by the Commissioner of Insurance.

All parishes and many communities in Louisiana also participate in the FEMA NFIP.

Post-Katrina and Rita, limited homeowner's insurance availability and affordability have threatened to become a crisis for many individuals and firms in Louisiana, particularly in South Louisiana. This threatens to undermine South Louisiana's recovery and the whole State's economic health.

This Plan Update does not directly engage personal and business financial loss as a mitigation issue per se, but it does assess the fiscal impacts of certain mitigation measures. Moreover, while no particular portion of this Plan Update targets insurance, taken as a whole this Plan Update itself represents a mitigation measure that will directly affect insurance risk. Because actuarial insurance premiums are essentially a monetized expression of risk, the overall reduction of hazard and hazard exposure advanced in this Plan Update, through better construction techniques, sound floodplain management, participation in the NFIP CRS, mitigation of repetitive loss structures, land use reform, public education, better data management, inter-agency and intergovernmental coordination, and more, will serve to reduce risk, and hopefully increase the availability and affordability of insurance.

Long-Term Recovery Planning

Following hurricanes Katrina and Rita, the State of Louisiana, in partnership with municipalities, parishes, FEMA and a number of non-profit and philanthropic partners, launched several long-term recovery planning initiatives which typically included projects and programs with hazard-mitigation components. Recovery planning efforts included FEMA Emergency Support Function – 14 (ESF-14) long-term parish recovery planning, the Unified New Orleans Plan and City of New Orleans Recovery Plan, the LRA Louisiana Speaks Regional Plan and demonstration charrettes, and other local recovery planning initiatives. In all, long-term community recovery plans were implemented in 27 parishes. The outcomes of these efforts are integrated into this Plan Update, especially insofar as recovery projects, programs, and strategies directly engage hazard mitigation.

The LRA has allocated $700 million in CDBG funds to pay for long-term community recovery projects in 23 parishes. Some of these projects have a mitigation emphasis. For example in St. Bernard Parish, flood-prone properties are

[5] Curt McCarty, LSUCCC Administrator, 2008

being acquired. In Jefferson and Vermilion Parishes CDBG funds will be used to help fund drainage projects. In Lafourche and Plaquemines Parishes, funds are targeted for developing drainage master plans. Parish long-term community recovery plans can be viewed at lousisianspeaks-parishplans.org/. Following allocation of recovery funds for hurricanes Katrina, Rita, Gustav and Ike, the LRA was "sunset" in June 2010. The work of LRA will continue through the Office of Community Development's Disaster Recovery Unit.

GOHSEP is also managing a program called the Planning Pilot Grant Program (PPGP) that is also seeking to incorporate relevant parts of the ESF-14 recommendations. The PPGP is explained in detail in Section Nine but basically is intended to help parishes identify and document viable mitigation projects for future funding. One of the requirements of the PPGP is that parishes consider any recommendations from the ESF-14 plans that may have a mitigation component as part of the project lists.

Land Use/ Development Planning and Hazard Mitigation

This Plan Update addresses specific issues of risk assessment and hazard mitigation, and provides a framework for the application of funds to effective projects and programs. This Strategy's focused approach would benefit greatly from being integrated into a broadly coordinated framework for hazard mitigation and land-use/comprehensive planning. Such a system has been proposed as part of the LRA's Louisiana Speaks Regional Plan and the CPRA Master Plan.

Key relevant recommendations of this plan include:

- Creating an Office of State Planning that would coordinate closely with GOHSEP, CPRA, and other agencies and offices to provide technical, personnel and direct assistance to local efforts concerning zoning, comprehensive planning and hazard mitigation. (HCR 229 of the 2007 Legislative Session established a study group to recommend future action on creation of an Office of State Planning. The study group's February 2008 report recommended establishing such an office within LRA in the near term and then establishing it as an independent office in the future);[6]
- Creating Model Development Ordinances, including model regulations related to hazard mitigation, that local jurisdictions could voluntarily adopt "cafeteria"-style or as a complete Unified Development Code;
- Creating a State Conservation and Mitigation Trust Fund that would purchase development rights to environmentally sensitive and/or high-risk lands;
- Continue working with existing Geographic Information System (GIS) and mapping resources to create a coordinated, Internet-accessible "Louisiana Location Index" that would categorize land according to development suitability, accounting for, among other factors, hazard levels. State agencies would be able to link public investments, incentives and other programs to this Index, and local jurisdictions would be able to use it as a framework for comprehensive planning and hazard mitigation planning; and
- Requiring the development of Comprehensive Plans for parishes and municipalities above a benchmark population and/or growth rate (to be determined), including a mandatory hazard-mitigation element.

Similar to the note under "Long-Term Recovery Planning" above, the PPGP also requires that participants in the grant program seek out and include local planners in the project development process. This is intended to help integrate and coordinate planning efforts that may not have common roots but should have common goals.

Enhancing the Response to Hazards

These programs and strategies neither reduce hazard magnitudes nor reduce exposure of public safety and property to hazards, but instead aim to reduce incident severity and duration by effectively managing the disaster response.

[6] The Division of Administration currently has an Office of Planning and Budget (OPB), but it does not serve the purpose of the proposed Office of State Planning. The OPB has responsibility for performance-based budgeting for Louisiana's executive branch, as well as and policy development, planning, accountability, and other management services. The State Economist and State Demographer are housed in this office.

Emergency Preparedness and Response

Emergency response is a separate phase of emergency preparedness and is distinctly different from hazard mitigation in many respects, and as such is treated as complementary to the *State Hazard Mitigation Strategy.* GOHSEP oversees emergency response plans and execution. GOHSEP's Emergency Operations Plan (EOP) and Continuity of Operations Plan (COOP) for Louisiana were revised in 2009. These plans govern all aspects of emergency preparedness and response, as well as continuity of operations and other emergency-related issues. They were developed in coordination with the Strategy, which GOHSEP also developed, ensuring internal consistency between the two plans. The EOP is consistent with the National Incident Management System (NIMS) and Incident Command System (ICS). The EOP also coordinates the activities of all state agencies and executive offices during emergency response. This also includes coordination for several highly specialized offices including, for example, the Radiological Emergency Preparedness and Response program in DEQ and the Oil Spill Coordinator's Office in the Office of the Governor.

GOHSEP also separately maintains additional topic-specific emergency-response and recovery plans, often in coordination with other agencies:

- Louisiana Shelter Operations Plan
- Peacetime Radiological Response Plan
- Disaster Recovery Manual
- State of Louisiana Terrorist Incident Plan
- Emergency Support Functions Support Plans

Additionally, GOHSEP coordinates state evacuation planning in coordination with the Office of the Governor and the Louisiana State Police in DPS. Finally, GOHSEP administers a series of preparedness grant programs through the DHS Office of Domestic Preparedness and disaster-recovery grants through the FEMA PA program, and it provides state-level oversight for DHS preparedness initiatives such as the Critical Infrastructure and Key Resources program.

Infectious Disease and Bio-Hazard Planning

Hazards of this nature were directly addressed in the April 2005 Plan. But whereas they are effectively managed and mitigated elsewhere within the state's emergency preparedness and response framework, they will not be addressed in this Plan Update.

The DHH Office of Public Health administers a wide array of emergency management planning to address infectious diseases and other health risks. This includes public education, preparedness, response and mitigation for pandemic influenza, avian influenza (bird flu), West Nile Virus, meningitis, and other communicable diseases. The Office also addresses risks posed by food and water, including food-borne illnesses, mercury, and water quality; and it works toward the reduction of non-infectious public health threats related to behavioral or environmental factors, such as lung disease, asthma, heart disease, stroke, and diabetes. DHH also coordinates with DAF on mosquito and other disease-vector control programs, and it coordinates health-care resources in coordination with GOHSEP during emergency response.

DHH has been educating, training, and drilling employees in preparation for a potential pandemic influenza event. DHH and GOHSEP have incorporated pandemic influenza annexes into their Continuity of Operations Plans to address the assumptions that 20% to 40% of the workforce may be ill and not available to report for duty. A number of employees have been trained to assist with receiving, storing, and distributing medication and medical supplies which Louisiana will receive from the federal government. DHH has drilled with hospitals to test its plans to save as many lives as possible during the increased demand for medical services. In addition to these departmental activities, DHH continues to help plan with other state agencies and communities in its role as the state's lead agency for emergency preparedness activities regarding pandemic flu.

Catastrophic Events and Hazard Mitigation

In the aftermath of hurricanes Katrina, Rita, Gustav and Ike, a special note is warranted about the catastrophic nature of some hazards faced by Louisiana. In Louisiana, some threats have the potential to cause casualties and property destruction on a truly epic scale. Although it is tempting to rush to mitigate all effects of such catastrophes, the state's responses must be measured and rational. Removing all risk posed by these hazards would be prohibitively expensive and could consume resources that might be more effectively used to mitigate other hazards, including those that are more common but less monumental.

Some of Louisiana's catastrophic hazards can simply be treated as "normal" risks. These include storm surges that overtop (but do not breach) levees or affect areas without levee protection, such as was the case in Plaquemines, St. Bernard, Orleans, Jefferson and other parishes during Hurricane Katrina (except those places affected by levee breaches), and in Cameron, Vermilion, and other parishes during Hurricane Rita. They also include the "slow-motion" catastrophe in coastal Louisiana posed by the increased exposure of South Louisiana's population centers to hazard as the result of the combined effects of subsidence, coastal land loss, and rising global sea levels. In these cases, there is a hazard that can be identified, there is a statistical likelihood of that hazard occurring, and there is a measurable vulnerability posed by exposure of population and property to the hazard. All of this can be quantified, allowing the State to create policies and prioritize mitigation measures in the same way it acts to mitigate the effects of ice storms, riverine flooding, tornadoes, or any other normal hazard.

On the other hand, there are catastrophes in which the impact of a natural hazard is compounded by a man-made failure, making their likelihood impossible to quantify. Such events include the breaches of the levee system in and around Orleans and St. Bernard parishes during Katrina, and it would also include potential catastrophic levee or dam failures throughout the state, particularly along the Mississippi, Red, Atchafalaya, or Ouachita rivers. In these cases, a meaningful statistical likelihood of occurrence is not possible, because every event is unique, and historical occurrences have been extremely infrequent.

Reducing the risks posed by such events can be partially accomplished by use of some of the same mitigation measures as other hazards, such as buy-outs, elevation, or policies to limit development in areas deemed to be at risk. *However, decisions regarding how to allocate resources to such measures cannot be made using the standard set of rational tools, including risk assessment and benefit-cost analysis.* Meanwhile, other measures to reduce these risks require outside implementation mechanisms that are beyond the scope of the FEMA Hazard Mitigation Grant Program and similar FEMA hazard mitigation funding mechanisms which are being addressed by other hazard mitigation efforts. These include large-scale coastal protection and restoration efforts, regional watershed management efforts, and levee and dam maintenance programs. Small-scale coastal protection and restoration efforts are within the scope of HMGP funding and thus are addressed in this Plan Update.

As explained in Section One, the State has been working for more than four years to implement a Hazard Mitigation Strategy of which this Plan Update is a key part. The integrated programs and activities in Section 8.3 already have and will continue to contribute to reducing risk for the State of Louisiana. However, there is much that these programs do not address. The remaining parts of Section Eight of this Plan Update are intended to meet these needs.

8.4 Goals and Objectives

The *State of Louisiana's Hazard Mitigation Strategy* has a common guiding principle as expressed through the mission statement:

> *Louisiana's Hazard Mitigation Strategy is the demonstration of the State's commitment to reduce risks from hazards, and serves as a guide for State decision makers as they commit resources to reducing the effects of hazards.*

To help implement this Strategy and adhere to this mission statement, preceding sections of the Plan Update have been focused on identifying and quantifying the risks faced by the residents and property owners in the State of Louisiana from natural and manmade hazards. By articulating goals and objectives based on, and intended to address the risk assessment results, the Plan Update sets the stage for identifying, evaluating and prioritizing feasible, cost effective and environmentally sound actions to be promoted at the parish and municipal level and to be undertaken by the State for its own property and assets. By doing so, progress toward reducing the identified risks will be realized. For the purposes of this Plan Update, goals, objectives and action items are defined as follows:

- Goals are general guidelines that explain what the State wants to achieve. Goals are expressed as broad policy statements representing desired long-term results.
- Objectives describe strategies to attain the identified goals. Objectives are more specific statements than goals; the strategies are usually measurable and can have a defined completion date.
- Action Items are the specific steps (projects, policies, and programs) that advance a given Objective. They are highly focused, specific and measurable.

The goals and objectives were based on the findings of the Statewide Risk Assessment (Section Five), the Risk Assessment for State-Owned Assets (Section Six) and the Capability Assessment (Section Seven). The risk and capability assessments were considered together to develop a plan for risk reduction that accurately reflects available resources and abilities. The goals and objectives were also based on consideration of the relative costs and benefits to the State of Louisiana of implementing this action plan.

These goals and objectives are largely unchanged from the April 2008 Plan. In 2004 and 2005, the SHMPC identified these four goals and related objectives based on a risk assessment that has not changed dramatically in the ensuing three years. Therefore, it was not considered necessary to develop wholly new or different statements. The main difference in the current Plan Update is in Goal #3 where the emphasis has shifted to more directly address issues related to the Capability Assessment results in Section Seven. Table 8-1 (beginning on the following page) lists the goals and objectives developed by the SHMPC.

The relationship between each set of goals and objectives and the risk and capability assessments results is explained as part of Table 8-1 including a brief discussion of how these actions will contribute to overall risk reduction. Also, the cost and benefit considerations are articulated for each goal and objective.

In addition, the goals and objectives developed by the SHMPC all represent long-term commitments by the State of Louisiana. However, the implementation strategies for the various resulting mitigation actions discussed later in this section of the plan include short, intermediate and long term timeframes (see Tables 8.3 and 8.4) for implementation. Significant progress has been made towards many of the goals and objectives identified in the 2008 Plan Update. These efforts will continue in order to maintain the forward momentum of the State Hazard Mitigation Program. Many of the achievements are documented in Section 10 and Appendix L of this Plan Update.

Table 8-1: State of Louisiana Hazard Mitigation Plan - Goals and Objectives

Goal 1:	The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.
1.1	Objectives for Statewide education and outreach efforts: Increase awareness of risks and understanding of the advantages of mitigation by the general public and local government officials. Provide information to municipalities and parishes regarding best practices for hazard mitigation project identification and implementation. Increase local government official awareness about funding opportunities for mitigation.
1.2	Objectives for education and outreach efforts for State agencies: ▪ Increase awareness of risks and understanding of the advantages of mitigation by State agency heads.

Linkage to the Statewide Risk Assessment, Risk Assessment for State-Owned Assets and Capability Assessment – Goal 1

The Risk Assessments in Sections Five and Six demonstrate that all areas of the State are vulnerable to a wide range of hazards potentially affecting all sectors of the population and economy and a long list of State-owned assets. The most potentially devastating hazards include flooding and high winds due to severe natural hazard events such as tropical storms, hurricanes and tornadoes for which there are several options available for feasible, cost effective and environmentally sound mitigation measures (see Appendix H in Volume II).

It is assumed that most parishes and State agencies comprehend the level of risk faced by the State in general terms but the Capability Assessment results in Section Seven indicate that many do not have sufficient background or experience in hazard mitigation to effectively translate that information to their own communities and identify potentially cost-effective projects. In particular, the Capability Assessment indicated that improvements could be realized in integrating hazard mitigation and land use planning, especially in areas of floodplain management and flood mitigation. The first step in this process is helping municipal officials understand this connection.

Goal 1 is intended to increase community and State agency awareness regarding the most effective mitigation measures (such as elevation, acquisition and development regulations in floodplains) that are relevant for the prevalent hazards in Louisiana. Goal 1 is also intended to bring together different groups within the community that have common interests that may not be immediately apparent.

Cost, Benefit and Risk Reduction Considerations – Goal 1

The SHMPC agreed with results in the Capability Assessment in Section Seven that indicates public education is one of the most effective actions that can be taken for all hazards prevalent in Louisiana. As detailed in Table 8-3, the costs include development, production and distribution of information and educational materials and the dedication of staff resources within relevant State departments to conduct outreach and education efforts. In many cases, such as the Plans Coordinator within GOHSEP, State Floodplain Coordinator within DOTD and the Louisiana State University (LSU) Ag Center, staff with these responsibilities already exist. There are existing State staff that have public education and outreach as part of their work tasking, so the cost has already been assumed in part by the State.

The SHMPC determined that the benefits of a comprehensive outreach and education effort will far outstrip the costs. By helping communities to better understand their risks and what they can do about them, future state and federal hazard mitigation funds can be targeted to projects that are the most cost effective and result in the highest degree of risk reduction. This determination was indirectly endorsed by FEMA in 2007 with the approval of an HMGP grant for GOHSEP for the Community, Education and Outreach Program (CEO) in the amount of $25 million. The CEO was proposed in direct response to the April 2005 Plan and much of the action items related to Goal #1 have been funded by this initiative and will continue until all funds are expended.

Table 8-1: State of Louisiana Hazard Mitigation Plan - Goals and Objectives (continued)

Goal 2:	The State of Louisiana will improve data collection, use and sharing to reduce the impacts of hazards.
2.1	Objectives for statewide data-related efforts: Improve data available to parishes and communities for use in future planning efforts. Provide parish and municipal officials and local practitioners with educational opportunities and information regarding available tools to effectively use risk and related data. Improve integration of parish and municipal mitigation plans into the *State of Louisiana Hazard Mitigation Plan* as part of periodic monitoring, evaluating and updating of the Plan.
2.2	Objectives for data related efforts for State agencies: ▪ Improve data available to State agencies for use in future planning efforts. ▪ Improve communication of updated data and information from State agencies to GOHSEP and the SHMPC.

Linkage to the Statewide Risk Assessment, Risk Assessment for State-Owned Assets and Capability Assessment – Goal 2

- The Risk Assessments in Sections Six and Seven of the April 2005 Plan and this Plan Update incorporated the best available data. However, both then and now, the SHMPC recognized that there were a number of limitations due to the quantity and/or quality of that data. For example, in Volume II, Appendix E-4: Floods, the following "data limitation" is cited regarding the Statewide Risk Assessment results for Floods:

  "The calculation is based on a database of insurance claims, not flood losses to the community. In many communities, uninsured homes, businesses, and infrastructure are damaged in floods and the damage is not reflected in the NFIP data because no claims are made. Therefore, actual flood losses for some parishes may be higher than indicated by the NFIP claim data."

These limitations were considered an important aspect to acknowledge and address, especially for the types of hazards prevalent in Louisiana. Per the flood risk assessment example cited above, not fully accounting for potentially hazard prone properties does not yield complete results for future decision making. In addition, at the time the April 2005 State Plan was developed, virtually no parish or municipal hazard mitigation plans were completed and no State agencies had undertaken formal hazard mitigation plans on either a department or facility specific level. As a result, there was not an opportunity for the State to gather any useful detailed information from municipal, parish or agency level plans to augment the risk assessment results or to make sure that the results of the State Risk Assessments were consistent with the experiences and information to be found at the local government level and within the various affected State agencies.

As noted in Section Five, there are now approved parish level hazard mitigation plans in-place across the whole state, but differences in terminology, data and methodologies used by the parishes has made it difficult to incorporate this information for this Plan Update as well. As a result, there was and still is a desire to make sure that parish and municipal officials with responsibility for developing hazard mitigation plans have access to the most effective methods for determining potential losses and risk and can do so in a way that both the State and parish officials can agree on the accuracy and utility of the results. Goal 2 is intended to address these data limitations in the risk assessment for all of the identified hazards in the State.

Cost, Benefit and Risk Reduction Considerations – Goal 2

DMA 2000 incorporates specific hazard mitigation planning requirements for municipalities and State governments. This recognizes that careful, systematic planning is a cost effective way to identify mitigation actions and projects to reduce risk; a position endorsed by the SHMPC through the development of this goal and related objectives. Similar to Goal 1, the cost of action items related to this goal and objectives over the next three years can be accomplished under the CEO program. The SHMPC concluded that the benefits from future planning efforts to update hazard mitigation plans at the State, parish and municipal levels were worth the cost and will include availability of better risk information, which will result in more effective risk reduction; FEMA's approval of the CEO application is again considered to be implied endorsement of this conclusion.

Table 8-1: State of Louisiana Hazard Mitigation Plan - Goals and Objectives (continued)

Goal 3:	The State of Louisiana will improve capabilities and coordination at the municipal, parish, regional and state level to plan and implement hazard mitigation projects.
3.1	Objectives for supporting local hazard mitigation planning and implementation of projects: Support hazard mitigation planning and project implementation at the municipal and parish level. Support increased NFIP / CRS participation. Support full and effective UCC enforcement. Support increased integration of municipal/parish floodplain management and Coastal Zone Management with effective municipal/parish zoning regulation, subdivision regulation, and comprehensive planning.
3.2	Objective for supporting state agency hazard mitigation planning: Provide information regarding techniques for state agencies to undertake detailed vulnerability and risk assessments for their own planning efforts and prioritize funding for project implementation.
3.3	Objective for integrating policies and plans: Evaluate all plans included in the *State of Louisiana Hazard Mitigation Strategy* to ensure consistency between risk assessments, policies and recommendations. Continue involvement by members of the SHMPC and the State Hazard Mitigation Planning Advisory Board.

Linkage to the Statewide Risk Assessment, Risk Assessment for State-Owned Assets and Capability Assessment – Goal 3

The substantial risk faced by the State and documented in the Risk Assessments requires a comprehensive response by all relevant and affected government agencies in planning and implementing emergency management measures and hazard mitigation projects. The results of the Capability Assessment indicated that there are limits to the capabilities of state, regional and local staff due to shortfalls in both available resources and the backgrounds and training of existing staff members. In addition, as was identified in the April 2005 and 2008 Plan, multiple agencies have existing programs with hazard mitigation related components but little if any coordination occurs outside the State Hazard Mitigation Team (SHMT) and SHMPC.

The following are specific relationships between Goal 3 objectives and these assessments:

- Objective 3.1 is related to the identified flood risk and the large numbers of repetitive loss and severe repetitive loss properties in the State of Louisiana. (This strategy to mitigate repetitive loss properties and especially severe repetitive loss properties contributes to meeting Louisiana's requirements for increased federal match on Severe Repetitive Loss (SRL) and FMA grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).) This objective also responds to the need to improve coordination between emergency managers, floodplain coordinators, building code officials and other stakeholders to provide more efficient identification and implementation of projects. It also recognizes the need to effectively enforce and close loopholes as necessary, in programs such as floodplain management and the UCC. Finally, this objective recognizes that zoning and subdivision ordinances can be effective hazard mitigation tools, if they are meaningfully integrated with existing mitigation programs and expertise.
- Objective 3.2 is related to the extensive potential losses identified in Section Six and the need for mitigation planning efforts at those agencies.
- Objective 3.3 supports the on-going process of fully integrating the plans and documents added to the State of Louisiana Hazard Mitigation Strategy. This includes the EOP, COOP, long-term recovery plans and the CPRA (see Section 1.4) to ensure that all aspects of the hazard mitigation program benefit from broad participation by interested and affected parties.

Table 8-1: State of Louisiana Hazard Mitigation Plan - Goals and Objectives (continued)

Cost, Benefit and Risk Reduction Considerations – Goal 3

A common theme in Goals 1 through 3 is improving the ability of State and local government agencies to identify and implement feasible, cost effective and environmentally sound projects in the face of the substantial risk identified in Sections Five and Six. This requires a broad spectrum of technical support and assistance. The investment by the State or "cost" is considered relatively minimal and in most cases, consists of existing dedicated staff resources. The SHMPC believed that the benefit is the same as the DMA 2000 emphasis on planning as a cost effective method to enable risk reduction and cost effective project implementation.

Goal 4:	The State of Louisiana will continue to pursue opportunities to reduce impacts to the State's manmade and natural environment through mitigation of repetitive and severe repetitive loss properties and other appropriate construction projects and related activities.
4.1	Objective for identifying cost-effective, environmentally sound and technically feasible projects: ▪ Facilitate development and administration of project applications that will meet state and Federal guidelines for funding for repetitive and severe repetitive loss properties and other appropriate construction projects. ▪ Establish mitigation project priorities on a regional, hazard-specific basis.
4.2	Objectives for State-owned assets: Harden and retrofit infrastructure and critical facilities with highest vulnerability rankings.
4.3	Objectives for enhancing regulatory requirements and establishing and pursuing a legislative and regulatory reform agenda: Maintain and enhance local regulatory standards. Elicit and support efforts by federal and state legislatures to address shortcomings in existing laws, programs and administrative rules related to hazard mitigation.

Linkage to the Statewide Risk Assessment, Risk Assessment for State-Owned Assets and Capability Assessment – Goal 4

The emphasis for hazard mitigation planning is to identify hazard mitigation projects to implement. The risk assessments in Sections Five and Six identify significant risks for all parishes in the State for the range of identified hazards. In addition, Appendix H in Volume II identifies what the SHMPC recommends as the best practices for mitigating these specific identified hazards. For projects to be implemented at the municipal and parish level, the State of Louisiana's role, beyond the technical support related to Goals 1 through 3, is largely administrative. Helping communities identify projects and develop applications that can be approved for funding are key parts of those duties. The State can provide leadership and guidance by identifying priority projects based on the types of exposure and risk that exist in different parts of the State and by using these priorities in allocating resources when they become available. GOHSEP is currently administering the Planning Pilot Grant Program that is a direct result of following through on this goal and objectives. The program is focused on identifying projects that address the prevalent hazards from the Statewide Risk Assessment and the risk assessment results of the local planning efforts. In addition, as part of the overall State of Louisiana Hazard Mitigation Strategy, GOHSEP developed *Volume IV - Administrative Guidelines and Procedures.* In Section Eight: Project Eligibility of Volume IV, GOHSEP has identified the criteria it will use in evaluating projects including Subsection 8.1 – Federal Criteria wherein the selection criteria for projects is grounded in federal regulations including the requirement to meet benefit-cost criteria.

Also, Objective 4.2 was developed in response to the need to address mitigation of critical facilities and infrastructure at risk in the State – per Section Six and Volume II, Appendix F.

Table 8-1: State of Louisiana Hazard Mitigation Plan - Goals and Objectives (continued)

Finally, Objective 4.3 reflects refinements in the Plan where it was identified that more effective mitigation would only be possible with changes to current rules, regulations and laws at the State and federal levels.

Cost, Benefit and Risk Reduction Considerations – Goal 4

The SHMPC considered that the marginal cost of GOHSEP staff providing technical and administrative support for the identification and implementation of projects will be a cost-effective approach.

8.5 Identification of Mitigation Actions

As identified in Section 8.1, the Mitigation Action Plan focuses on actions to be taken by GOHSEP and the SHMT. While other agencies and organizations are referenced in the discussion that follows, specific commitments by agencies other than GOHSEP must be secured as part of the process of implementing the Plan Update. It is also important to note that many of the mitigation actions identified below are activities (education, training, facilitating, etc.) as opposed to "bricks and mortar" projects, most of which are the purview of local subgrantees. As such, demonstrating cost effectiveness of identified state actions can be difficult. The costs can be quantified, but the specific benefits are more ephemeral. In addition, while Goal #4 is clearly focused on supporting the development and implementation of cost effective projects, the Plan does not identify projects to implement in specific locations or situations. However, all of the activities in this Mitigation Action Plan will be focused on helping municipalities, parishes and State agencies in developing and funding projects that are not only cost effective but also meet the other DMA 2000 criteria of environmental compatibility and technical feasibility.

Goals and objectives from Section 8.4 are repeated below and a Plan of Action is described for each objective. It is also important to note that the actions listed below are considered by GOHSEP and the SHMT as the appropriate steps to meet their goals and objectives. However, it would clearly take more than three years, the planning horizon identified in DMA 2000, to implement many of the listed actions listed below, even under the best of conditions. Therefore, the SHMPC undertook a process to prioritize and schedule these actions by defining a rational sequence and identifying realistic expectations of what will be possible in the next three years. As a result, the entire list is established and recorded for future reference as the Plan is updated and refined over time.

It is important to note that many references are made in Section 8.5 to "parishes", "municipalities" and "state agencies". As noted earlier in this document, these are terms of convenience in writing this type of document and are not meant to exclude any eligible parties.

For example:

- Federally recognized tribes have clear rights to receive direct assistance for planning and implementation of projects. However, since tribes in Louisiana have typically participated in parish hazard mitigation planning efforts in a manner similar to municipalities, they are not explicitly mentioned each time; and
- Public universities and other higher educational institutions in the State of Louisiana are considered as state agencies for the purposes of this plan and will be eligible and encouraged to participate in all relevant facets of the implementation of the Plan Update.

Table 8-2: Identification of Mitigation Actions

Goal 1:	The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.
1.1	Objectives for Statewide education and outreach efforts: Increase awareness of risks and understanding of the advantages of mitigation by the general public and local government officials. Provide information to municipalities and parishes regarding best practices for hazard mitigation project identification and implementation. Increase local government official awareness about funding opportunities for mitigation.

Plan of Action to address Objective 1.1:

A. Support start-up and implementation of the CEO program and institutionalize practices for after the completion of CEO. The CEO is a $25 million three-year project funded through a FEMA grant. It is intended to empower better decision-making by providing hazard mitigation information and education to a broad audience that includes Louisiana residents; local and state governmental officials; civic, business and nonprofit community leaders; potential property buyers; visitors; and other local and regional community planners, influencers and mitigation stakeholders; and the media, so that communities are stronger and better able to withstand future disasters through mitigation techniques that protect lives and property.

B. The CEO initiative is managed by an eight-member CEO Project Team which includes the CEO Project Manager, State Hazard Mitigation Officer (SHMO),GOHSEP Disaster Recovery Division; Group Leader, GOHSEP Hazard Mitigation; GOHSEP Hazard Mitigation Outreach Coordinator; GOHSEP Problem Resolution Officer, Hazard Mitigation; and Disaster Recovery Specialists. The CEO is currently supported by communications, outreach and graphics specialists through its Communication Contractor.

C. The CEO initiative has five goals (as articulated in the *CEO Communications Contract Scope of Services*):

   i. Create a culture of mitigation.
   ii. Promote personal responsibility.
   iii. Promote community-based mitigation.
   iv. Promote regional partnerships.
   v. Build mitigation capacity at the local community level.

D. CEO outcomes are envisioned as better decision making on the part of Louisiana leadership and citizens when building and rebuilding, and increased use of federal grants by Louisiana parishes to facilitate the implementation of hazard mitigation strategies within their communities, so that stronger, safer communities are realized and are better able to withstand future disasters.

E. CEO seeks to accomplish its mission through community education and outreach that increases awareness and educates its target audiences on pre- and post-disaster hazard mitigation opportunities.

F. The CEO Team has identified three major outreach and education objectives to address the above listed goals and help it achieve its desired outcomes:

   i. Improve education and outreach efforts to Louisiana citizens and State and local community leaders regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impacts.
   ii. Increase awareness among the general public and local government officials about the advantages of mitigation.

iii. Increase awareness of mitigation funding opportunities.

G. The CEO Team has identified the following Strategies as cornerstones of the education and outreach effort:

- STRATEGY #1: Outreach to the public through mass media.
- STRATEGY #2: Partner with other organizations and entities to outreach to the public through events that have high public visibility and public participation.
- STRATEGY #3: Provide access to important mitigation education information through a one-stop web portal.
- STRATEGY #4: Conduct regional workshops targeted to local elected officials, State agency leadership and key professional staff to raise awareness of mitigation opportunities and funding sources to aid in the implementation of mitigation strategies.
- STRATEGY #5: Conduct mitigation demonstration projects targeted to general audiences.
- STRATEGY #6: Conduct industry-specific workshops targeted to design and construction professionals, insurance agents, real estate brokers and lenders to promote mitigation education and awareness.
- STRATEGY #7: Develop curricula at the college and university level.
- STRATEGY #8: Create and distribute mitigation educational materials targeted to key CEO target audiences.
- STRATEGY #9: Provide sub grants to governmental partners and nongovernmental organizations (NGOs) to support and promote mitigation education and expand the outreach of the CEO initiative.

H. Specific action items include:

i. Continue efforts started under Capability Assessments for the Plan Update to define the audience and its needs regarding increased awareness and the definition of preferred methodologies for risk assessment and mitigation planning.

ii. Development a CEO implementation plan that identifies a methodology for administering the program statewide and the setting and monitoring of measurable goals and objectives with timelines.

iii. Develop and implement a staffing plan for GOHSEP that would support continuing statewide education and outreach efforts. Per the summary analysis in Section Seven, current staffing levels at GOHSEP would not be able to meet time commitments for an increased public education and outreach effort without additional staff positions. In addition, GOHSEP will determine and periodically refine funding needs to address statewide education and outreach efforts.

iv. Identify existing public information resources and programs conducted by other state agencies related to hazard mitigation. By doing this, GOHSEP and the CEO would be able to ensure that all relevant aspects of hazard mitigation are covered in a statewide public information program, capitalize on efforts that have already been initiated, and avoid duplication of efforts. Examples of on-going efforts for specific hazards include:

- For Flood – the *Louisiana Floodplain Management Desk Reference* developed by DOTD in cooperation with FEMA, and the LouisianaFloods.org website hosted by the LSU AgCenter; and
- For Coastal Issues – DNR and allied efforts to develop public awareness regarding this issue via the America's Wetlands campaign, outreach efforts through CWPPRA, the Louisiana Sea Grant Program, and DNR's Coastal Management Division, and USACE Louisiana Coastal Area *Ecosystem Restoration Study*.

iv. Explore options and create tools to use in education and outreach efforts including:

- Existing state websites, toll-free "hot-line" information services, Public Service Announcements, speaker series, demonstration events, insurance and real estate disclosures, and training;
- Presentations at regularly scheduled events that attract target audiences (e.g., the annual conference of local EMA directors, the Louisiana Association of Floodplain Managers, etc.);
- Creation and implementation of regional and local meetings and workshops:
    - Up to nine (9) regional meetings targeted to local elected officials and their professional staffs to make them more aware of hazard mitigation benefits and opportunities for funding local mitigation projects with federal grant dollars.
    - Up to five (5) meetings targeted to construction and design professionals, State and local agencies and coastal construction, code-plus and *Blueprint for Safety* practitioners in southern Louisiana.
    - Up to nine (9) targeted to lenders, agents, insurers, community officials, academia and others to increase awareness of hazard mitigation issues.
- Periodic video teleconferences to provide updates and general training for broad audiences;
- Identifying mitigation options for flood insurance policyholders as part of notification requirements under the Flood Insurance Reform Act of 2004; and
- Facilitating the connection between OHS/EPs both between and within parishes and other Stakeholders to foster the sharing of information. For example, there are typically different agencies within each parish that have responsibilities for floodplain management, building code enforcement, local land use planning, etc.
- The production and placement through a partnership with the Louisiana Association of Broadcasters (LAB) and the Louisiana Press Association (LPA) of radio, television and print hazard mitigation messaging to statewide general audiences.
    - The development of a statewide public outreach effort that includes mitigation demonstration opportunities and that is supported by paid and earned TV, radio, newsprint, outdoor, direct mail, direct contact and social media strategies. Named *Louisiana Mitigation Makeover*, the centerpiece of the program is envisioned as a 15-part Louisiana Public Broadcasting (LPB) series focusing on Louisiana mitigation success stories.
- The creation of a travelling demonstration booth for use at tradeshows and conferences that ties into the *Louisiana Mitigation Makeover* theme.
- The creation of public-private partnerships for mitigation messaging that ties into the *Louisiana Mitigation Makeover* theme.
- Development and promotion of a web-portal for easy access to mitigation information that is cross-platformed for general public use as well as for use by local and statewide officials and other mitigation practitioners.
    - Working with UNO-CHART to develop mitigation curricula and NIMSAT (discussed elsewhere) to develop a data collection, storage and retrieval web-based portal accessible by the general public and a secure side accessible by the emergency management community through local OEP Directors. The portal is named the *Louisiana Hazard Information* portal and will contain NCDC data as well as field data provided by Louisiana mitigation professionals.

v. Identify and solicit support and participation by other state agencies and parties that may have an interest in public education and outreach efforts for selected hazards and/or an established method for communicating this type of information to address other gaps in the program. Examples of non-state agencies with access to parishes and communities throughout the state include the Louisiana Association of Planning and Development Districts, the Police Jury Association, the Louisiana Municipal Association.

vi. Work with Public Information Officer(s) within GOHSEP and other state and local agencies to develop and distribute a common message to accompany public education and outreach efforts related to hazard mitigation. The basic theme of this message would be to develop public awareness of a full range of hazards, to identify common resources and methods to address these hazards, and to provide state agency and interested party contacts for further information. The intent is to take advantage of as many avenues as possible to impart useful information to the public and to make sure the efforts of state agencies are as coordinated as possible; the intent is *not* to develop a "one size fits all" information program that all state agencies would have to use and apply in all situations. One "kick-off" possibility would be to sponsor a contest among school age groups and/or interested parties to develop a "catch phrase" to use in hazard mitigation outreach efforts. The contest could include development of a poster or web posting that would show how the phrase could be used as a backdrop for different mitigation-related messages.

vii. Develop and distribute materials to partner agencies and interested parties to support delivery of the message including website postings, presentations, brochures, posters, etc.

- The creation and dissemination of print materials to support hazard mitigation CEO target audiences and initiatives. Those are envisioned to include brochures, FAQs, carry cards and other messaging materials for K-12 grade populations, homeowners, government officials and those needed to support specific workshops, meetings and conferences.

viii. Periodically seek feedback from partner agencies and interested parties to determine needs for additional information, and alternative methods to reach additional audiences (e.g., school programs, university degree programs in planning, etc.). Note: This will be most effective if a baseline level of understanding of basic mitigation concepts and available resources is determined at the outset of the education and outreach efforts

I. The CEO Planning Team is currently looking at opportunities for greater outreach. Specifically, it is reviewing opportunities with regard to the small business community, greater focus on State agency heads, additional training opportunities for local officials on web portal access, more advanced application training, project identification and prioritization, outreach effort that includes historical preservation issues in mitigation, additional public-private partnerships and more. Some of these efforts may be included in one of the planned workshops noted above or may evolve into stand alone, separate initiatives or may not be feasible once further explored.

1.2 Objectives for education and outreach efforts for state agencies:

- Increase the awareness of risks and understanding of the advantages by mitigation of state agency heads.

Plan of Action to address 1.2 Objectives for education and outreach efforts for state agencies:

B. Develop and implement an "internal" state agency mitigation education and outreach program (parallel to the public education and outreach program under Plan of Action A.). The first step will likely need to include outreach to state agency heads as identified in Objective 1.2, as well as the development of a financial incentive for the participation of State agencies and facility managers in taking on what may be perceived as an additional burden in terms of planning and reporting (see related objectives and action items under Goals #3 and #4). This coordination effort may also eventually include identifying means to address information related to hazard mitigation within existing state agency programs. Currently, there is no consistent statewide effort focused on hazard mitigation, but it will be possible to augment existing internal departmental communications to include this information. Potential examples of this include:

i. Develop and implement a staffing plan for education and outreach efforts with state agencies.[7] Part of the staffing plan for GOHSEP (as identified under Plan of Action A) should include ongoing training to increase capabilities of individual staff and to stay abreast of current programs and policies. These training sessions should also be available to members of the SHMPC.

ii. Conduct follow-up interviews of State Agencies that were contacted as part of the Section Seven Capability Assessment to determine interest and specific needs for continuing education and outreach efforts.

iii. Solicit and secure participation by state agencies that are not already member agencies on the SHMT or represented on the SHMPC (especially those identified in the Plan as having critical facilities at risk), including establishing points-of-contact and preferred methods for future exchanges of information.[8]

iv. Establish a mechanism to provide the results of the Risk Assessment for State-Owned Assets (per Section Six and Volume II, Appendix F) in a "real-time" format to reflect continuing data updates.

v. Develop and conduct training with state facility managers regarding recommended procedures for "ground-truthing" information (see related information under the Plan of Action D under Goal 2) to participating state agencies. Procedures should be supported by "job-aids" that could include reference materials, assessment criteria, and checklists for buildings and State-owned assets.

vi. Work with State agencies to identify existing plans and planning efforts that could be enhanced through integration with the State Hazard Mitigation Planning updates.

vii. Develop and implement an internal training program within GOHSEP for the Infrastructure Protection Branch to facilitate integration of hazard mitigation into existing technical assistance offered by that Branch to owners and operations of identified critical infrastructure and key resources.

[7] As part of the same effort identified under Action Item A.ii., et al.
[8] This process has already been initiated as described in Section 3.3 - Coordination among Agencies and Interested Parties.

Goal 2: The State of Louisiana will improve data collection, use and sharing to reduce the impacts of hazards.

2.1 Objectives for statewide data-related efforts:

Improve data available to parishes and communities for use in future planning efforts.
Provide parish and municipal officials and local practitioners with educational opportunities and information regarding available tools to effectively use risk and related data.
Improve integration of parish and local mitigation plans into the *State of Louisiana Hazard Mitigation Plan* as part of periodic monitoring, evaluating and updating of the Plan.

Plan of Action to address 2.1 Objectives for statewide data enhancement efforts:

C. Define and implement appropriate institutional arrangements for collection, use and sharing data for parishes and municipalities. One of the basic concepts behind DMA 2000 requirements is the sharing of data between states and local governments to enrich planning at both levels. Although much has been accomplished, there are still a number of data deficiencies indicated in the Plan that limit the utility of parish and state planning efforts. To address these limitations in the most cost effective way, this plan of action builds on previous efforts as much as possible and looks for opportunities for gathering data that will prove useful to a wide range of users.

Section 7.3 identifies different institutional arrangements under the heading "Technical Capability and GIS/Data Management for Hazard Mitigation" and provides an initial evaluation of these alternatives. As noted in Section Seven, the challenge at this point is to determine the right combination of organizations and roles to gain the most efficient long-term delivery of the information and technical support. It is crucial that this combination ensure consistency in results among the various parishes and municipalities.

However, it is unlikely that we will be able to determine with absolute certainty the best way to proceed without discussions with potential partners including the intended audience (responding to sensitivities identified among the parishes about third party "control of data"). For the purposes of the Plan Update, it will be sufficient to identify these options (assuming that these outcomes are all acceptable to GOHSEP and the SHMPC) and lay out the course by which GOHSEP and participants in the CEO will help define what might make sense for the next three years (while the CEO is funded) and after.

Specific action items include:

i. Develop and implement a staffing plan for statewide data improvement efforts.[9] In addition, as part of subsequent steps in this plan of action, determine and periodically refine funding needs to address specific data deficiencies.

ii. Provide common definitions and preferred methodologies for use by State, regional, parish and municipal officials regarding hazards, assets (e.g., critical facilities), risk assessments, loss estimations, goals and objectives and projects types. This is seen as an important first step as it is difficult to communicate effectively about complex data issues without a common vocabulary and will be used in subsequent action items iv, v., and vi.

It should be noted that some of the assumptions that underpin some risk assessment methodologies employed in this Plan Update may need to be revisited. In previous sections, differences in opinion regarding specific interpretations of data have been identified. For example, there is not clear agreement yet on rates to use for actual design purposes related to subsidence. In addition, members of the State Hazard Mitigation Planning Advisory Board (SHMPAB) and SHMPC noted that, for example, the relative risk assessments for some parishes for surge or levee failure hazards may not fairly capture the risk faced by those places. Because the risk assessment in this Plan relied on estimated losses, parishes with relatively lower total property values by definition rank lower.

[9] As part of the same effort identified under Action Item A.ii. et al.

This means that a parish such as Plaquemines, which has relatively little total property value compared with other parishes and thus less *exposure*, ranks lower for risk from storm surge, despite the fact that the absolute risk of surge to Plaquemines Parish is extreme. Similar issues were identified by participants in the capability assessments in Section Seven for some parishes along the Mississippi River levees that have low total property values, but could be at extreme risk from a levee failure. As risk assessment methodologies are further refined and developed in consultation with other stakeholders, these issues must be explored and resolved.

iii. Work with parish and municipal officials to make sure that all parties understand what data already exists or will be available for their use within reasonable timeframes. One example of flood-related data that will be available soon is work by the University of New Orleans that was on-going as this Plan Update was developed. This work, funded by FEMA, is intended to create a comprehensive GIS and database of repetitive loss properties in the State of Louisiana.

As part of this effort, it will be important to explain what can and cannot be done with specific data. For example, parish officials already have access to some lists of repetitive loss properties within their jurisdictions. This includes information about property owners that is considered confidential under the Privacy Act. If municipal officials do not place the proper restrictions on access to certain parts of this information, they can seriously diminish the effectiveness of future efforts to acquire or pursue mitigation for these properties.

(This action to mitigate repetitive loss properties and especially severe repetitive loss properties contributes to meeting Louisiana's requirements for increased federal match on SRL and FMA grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).)

iv. Encourage parish and municipal officials to continue the process of validating or "ground-truthing" components of the Plan Update, including its data, methodologies, and results. For example, efforts were made to correlate lists of critical facilities between the April 2005 Plan and parish plans currently being updated as part of the Planning Pilot Grant Program. However, difference in definitions and terminology made that process difficult (see item C.ii. above). The process could be conducted by the appropriate public entity, private sector, or academia, or a combination of all three.

The planning process to date has used existing information effectively. However, to provide the best results for reducing the impact of natural and manmade hazards over time, it is important to enlist the help of municipal officials to:

- Validate and improve wherever possible on the study methodology;
- Disseminate and collect information from municipal governments and other State agencies; and
- Support the process of identifying appropriate eligible mitigation projects at the parish level and within other State agencies.

For example, per Section Five (and Volume II, Appendix E), the Hazards U.S. – Multi Hazard (HAZUS-MH) local critical facilities inventory was currently the best data available to the State to conduct a statewide risk assessment of the potential impacts on these facilities. However, this data was assembled "second hand" from available data listings that can quickly become outdated. To attain more useful results for future assessments, it is recommended that the data be reviewed and verified by local governments as they undertake plan updates in the future to ensure that the information used in this and subsequent Plan Updates reflects:

- whether critical facilities that are in the HAZUS-MH database still exist;
- the existence of facilities that have been recently constructed (that may not show up in records used to compile the HAZUS-MH database);
- accurate georeferenced locations (i.e., latitude and longitude) of critical facilities if available; and
- other relevant attributes (e.g., first floor elevations of structures that are prone to flooding).

At the same time, it would be possible to encourage local governments to collect additional information in a uniform and consistent manner, because collection of data via local planning processes should be a key source for statewide databases. The "ground-truthing" efforts could entail site visits, or if the local governments already had an up-to-date list of facilities with the address and cost (hopefully as part of their parish or municipal level mitigation planning efforts), their mapping software could be used to determine a geographic location without the need of re-collecting the data. Similar to Action Item B.iii, GOHSEP could support the process by providing templates of data-collection forms that include guidance for issues to look for based on the types of hazards.

Potential means of coordinating statewide "ground-truthing" efforts could include the following:

- Web site portal – Encourage Louisiana state agencies with responsibility for data management to develop a data portal for entering and exchanging data about critical facilities. This would result in the dynamic population of data that could be used in risk assessment models without the need for significant manipulation and/or reformatting of the data.

  GOHSEP could send correspondence to the local governments to explain the purpose and intended outcomes, the process for downloading existing data for their parish, preferred means to ground-truth the data, and the process to upload/enter the data into the portal. The web site would include helpful information about the overall process and existing data (e.g., year collected/updated, projection, etc.). This could also be part of a system whereby the municipalities access data from the state. The highest degree of success might be achieved by introducing the web site and its operation by conducting a workshop with local governments to explain the process. To hold down costs and use resources most efficiently, this could be done at a routinely scheduled state workshop or a series of area coordinator meetings.
- Written correspondence – Send a letter and CD-ROM with existing critical facilities data to each parish with an explanation of the process. Request that each parish ground-truth their data and e-mail it to a central point of contact at the State who would have responsibility for compiling all of the data into a State-owned or maintained database.

v. Provide and support data management training for parish and municipal officials in concert with general education and outreach efforts under Plan of Action A. For example, FEMA has recently developed a Risk Assessment Workshop that is targeted to municipalities that desire useful risk assessment results but that do not have high capabilities or extensive data sets. GOHSEP should work with FEMA Region VI to have the workshop delivered for targeted municipalities and to seek training for GOHSEP staff and other interested parties (such as local planning and engineering firms) to conduct subsequent trainings.

vi. Integrate data from local risk assessments into future updates of the Plan. Sections 9.3 and 10.2 of the Plan include specific steps that the GOHSEP and SHMT will undertake in working with parishes and municipalities to evaluate and integrate information from municipal plans into the Plan Update to be in compliance with DMA 2000 requirements.

viii. Continue efforts to obtain improved data for use in future updates of the State Hazard Mitigation Plan.

   A. Consistent with this Action Plan, GOHSEP's CEO project is currently finalizing a scope of work for data management and interface with the National Incident Management Systems and Advanced Technologies (NIMSAT) at the University of Louisiana at Lafayette (ULL). The ULL project would use surveys and interviews with stakeholders to develop:
      - A validated database of historical disasters, indexed by address, zip code, and/or census tract.
      - A statewide "Risk Index" based upon the above data and valid, uniform risk assessment methodologies
      - A web portal offering general public and business access,
      - A secure-access web portal for governmental stakeholders (development version), and
      - Ongoing support including communications, data management, tutorials, and web-hosting.

B. While the ULL scope is focused on providing a public stakeholder interface, an online web portal is being developed that will allow the application and management of Hazard Mitigation Grants in Louisiana from FEMA to State and local governments and Indian tribes. Information can then be captured for inclusion in future plan updates.
   - Developed and hosted by MB3 Inc, protected information on the site will be accessible only to registered users.
   - The portal will allow management of mitigation projects from application through closeout.
   - Applicants can submit quarterly reports and report on milestones.
   - State staff will be able to track progress and issue reimbursement.
   - A resources page will be publicly available to provide information, documentation, and guidance to viewers and users.

2.2 Objectives for data related efforts for state agencies:

- Improve data available to state agencies for use in future planning efforts.
- Improve communication of updated data and information from state agencies to GOHSEP and the SHMPC.

Plan of Action to address 2.2 Objectives for data related efforts for State agencies:

D. Support implementation of a coordinated approach to data collection, use and sharing for State agencies to validate and disseminate results of the Risk Assessment for State-owned Buildings, Critical Facilities and Infrastructure. This effort would parallel efforts to validate and disseminate the Statewide Risk Assessment results, described in Plan of Action C. For example, the critical facilities in Louisiana with the ten highest combined loss estimates for each hazard as summarized in Section Six (and detailed in Volume II, Appendix F) should be ground-truthed to determine if the loss-estimate methodologies are reasonable and to gather more detailed information to help facility managers and the State of Louisiana determine what the best course of action will be in terms of mitigation (and to support development and delivery of training under Plan of Action item B.v, above).

i. Develop and implement a staffing and funding plan for data improvement efforts with State agencies.[10]

ii. Encourage State agency heads and facility managers to "ground-truth" data and results from the Plan. The processes and methodology for identifying and profiling hazards and determining the loss of function for State-owned facilities has been detailed in Section Six and Volume II, Appendix F. The methodology provided the State with a ranking for all facilities that had previously been identified as critical in the State's Facility Management database. Using the criticality for each structure, along with vulnerability to a particular hazard, loss of function, physical damage, and content damage, the SHMPC determined the facilities with the highest loss estimates for each hazard and the combined loss estimates for all hazards. Once determined, a list was generated that will allow the State to not only identify individual facilities at risk, but assign priorities for future mitigation actions. This list will give the State a defined agenda on which structures should be investigated to see if the overall process and methodologies are sound.

Better data will improve the process. "Data" can include many things in this case, such as:

- An updated Facility Management database with accurate information that has been verified by the State, including confirmation of actual ownership and/or responsibility for each facility;
- Improved information about a given hazard, such as accurate flood data for the State that will help determine the base flood elevation for a given structure;
- Base map data, such as contours and soils;
- Hazard histories for individual facilities;
- First floor elevations (for flood-prone properties);
- Physical location (i.e., to position the structure or asset relative to known hazard boundaries, latitude and longitude data are preferable to street addresses);
- Date of construction (and/or applicable building code);
- Number of stories;
- Roofing material;
- Exterior façade material;
- Construction type;
- Building use and function; and
- Digital photos of structure and surroundings.

Once this information is collected for each facility, and stored in a database such as the Facilities Management database, the SHMT and/or the facility staff can use this information to validate the

[10] As part of the same effort identified under Action Item A.ii. et al.

original risk assessment results and identify and prioritize possible mitigation actions for facilities clearly at risk.

Note: It may not be practical due to resource limits to secure all the desired data in one step. It may prove more effective to add a few data fields each year for each facility, starting with the more important aspects like physical location and gradually build up an improved data record. As mentioned in preceding plans of action, GOHSEP can provide effective technical support via "job-aids" to help capture the right information and enable consistent data entry.

iii. Support a centralized data repository accessible to state and local agencies as well as interested parties. The Louisiana Geographic Information System Council (LGISC) has been working toward a similar end for all data related issues in the State. GOHSEP, as a voting member of LGISC, can request that LGISC establish regular procedures for receiving more detailed information from State agencies that can be used in required regular updates to the Plan (see Section Ten).

However, much like the proposed work with municipalities and parishes, the desired long-term result is to help position individual state agencies and facility managers to maintain their own information and plans regarding their own facilities. Since GOHSEP and the SHMT have some responsibility for oversight and coordination of these data collection efforts (per the requirements of DMA 2000) to maintain eligibility as a "Standard" program and to attain and maintain "Enhanced" status, they can help to identify desired types of information to LGISC so that provisions can be made in terms of database development and maintenance by the appropriate State agency.

This effort should also include ensuring that the definitions used for various data are as consistent as possible. For example, in determining the physical locations of State-owned structures, it may be most effective to use the same procedures for determining longitude and latitude as the work at the University of New Orleans to develop its repetitive loss property database.

Key types of information that have already been identified include:

- Records of disaster damages;
- Spatial locations for specific facilities;
- Status and details regarding mitigation projects (this is related to on-going efforts by GOHSEP to establish a database to track progress and status of Federally funded mitigation grants – see Administrative Guidelines and Procedures in Volume IV).

(This action to mitigate repetitive loss properties and especially severe repetitive loss properties contributes to meeting Louisiana's requirements for increased federal match on SRL and FMA grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).)

Goal 3: The State of Louisiana will improve capabilities and coordination at the municipal, parish, regional and state level to plan and implement hazard mitigation projects.

3.1 Objectives for supporting local hazard mitigation planning and implementation of projects:

Support hazard mitigation planning and project implementation at the municipal, parish, and multi-parish level.

Support increased NFIP / CRS participation.

Support full and effective UCC enforcement.

Support increased integration of local/parish floodplain management and Coastal Zone Management with effective municipal/parish zoning regulation, subdivision regulation, and comprehensive planning.

Plan of Action to address 3.1 Objectives for supporting parish and municipal mitigation planning:

E. Provide technical support to municipalities, parishes, or groups of parishes for on-going and continuing municipal hazard mitigation planning efforts. All Louisiana parishes have completed the first round of DMA 2000 compliant multi-jurisdictional and municipal hazard mitigation plans, and a significant number are engaged in the PPGP developing updated plans and enhanced mitigation strategies.

As noted, the current plans have a number of areas in which improvements can be made. GOHSEP and the SHMT will need to keep the municipalities and parishes focused on improving any deficiencies in their plans and on implementing the appropriate recommendations in a manner consistent with related aspects under Action Items A and C, as well as the implementation of the CEO.

Note: Technical support should identify issues that cross local planning responsibilities and ensure that all training and technical support is done in ways that do not create conflicts, but rather that cover and integrate as many exigencies as possible. For example, municipal and parish efforts during "normal" hazard mitigation planning to account for assets that are at-risk would be of benefit in the wake of disaster; these assets could then be adequately repaired or replaced (with adequate mitigation) in the event of damage from a disaster. Long-term recovery planning is another area with potential overlaps with both hazard mitigation planning and land use planning, and it should therefore be included in future plan updates.

Specific action items include:

i. Develop a staffing plan that maintains adequate levels of GOHSEP support for planning-related technical support and training activities.

ii. Work with municipalities and parishes that have received FEMA approval for their plans to diligently monitor, evaluate and update their mitigation plans over the next five-year cycle[11].

GOHSEP should pursue municipal plan updates on a rotating basis (e.g., 10-to-15 parish or multi-parish plans would come up for review and formal update each year). This will allow the State to spread funding and resource demands out over time, but it would also require that some parishes undertake an update and review of their plan before the five year "expiration date" of their approval from FEMA.

Technical assistance should be provided to any jurisdiction that could be an eligible Subgrantee for federal grant programs.

Protections will need to be instituted in the planning process to protect interests of both the parishes and individual municipalities, including requiring that funding applications be accompanied by a letter from the Parish Hazard Mitigation Planning Committee and guidance regarding the acceptable membership on such a committee.

That is to say, hazard mitigation planning should not be done by and for the parish as a *political unit*, but rather by and for the parish as a *geographical unit comprised of a number of political entities*.

[11] Although DMA 2000 requires the State Plan to be updated and reapproved every three years, municipal and/or parish plans are only required to be updated and reapproved every five years.

iii. Identify and encourage parishes and municipalities that would benefit most from increased participation in the NFIP to do so. For example, the results of the Statewide Risk Assessment in Section Five and Volume II, Appendix E can be used to identify parishes at relatively high risk to floods that are either non-participants in CRS or have low CRS rankings.

iv. Continue to encourage parishes to prioritize mitigation of repetitive loss properties and especially severe repetitive loss properties, making use of existing and new data sources described elsewhere in this document (see Plan of Action D, above). (This action to mitigate repetitive loss properties and especially severe repetitive loss properties contributes to meeting Louisiana's requirements for increased federal match on SRL and FMA grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).)

v. Encourage parishes to expand their hazard mitigation planning and implementation efforts to include all relevant local parties, including OHS/EP offices, floodplain managers, building offices, Coastal Zone Management offices, land-use/community planning offices, and others; as well as partnering with neighboring jurisdictions.

vi. Encourage and support parishes to increase preparations to effectuate compliance with NFIP requirements concerning substantial damage during disaster recovery situations including making grants available to fund parish and municipal efforts in this regard.

Eligible activities could include: research of construction costs and market values, initial set-up of estimating software, site inspections of damages, notifications to property owners about permitting requirements, processing substantial damage determinations and notifying property owners, processing appeals of such determinations, issuing permits to rebuild and/or demolish, site inspections for compliance, record keeping; or hiring a contractor to do the same activities.

As part of the support activities, GOHSEP will prepare template applications for HMGP funding and work with the NFIP State Coordinator to make sure parish and local floodplain administrators are adequately prepared for future disaster recovery.

3.2 Objective for supporting State agency hazard mitigation planning:

Provide information regarding techniques for State agencies to undertake detailed vulnerability and risk assessments for their own planning efforts and prioritization of funding for project implementation.

Plan of Action to address 3.2 Objective for supporting State agency hazard mitigation planning:

F. Provide technical support to state agencies for on-going and continuing mitigation planning. State agencies can be subgrantees under hazard mitigation grant programs such as HMGP and Pre-Disaster Mitigation Competitive Grant Program (PDM-C), and they can develop their own agency-specific DMA 2000 compliant plans that can be treated as annexes to this Plan Update. To require this of all State agencies would place an unjustifiable demand on time for both the agencies and GOHSEP. However, for the larger institutions and/or agencies with multiple facilities at risk, this may be an efficient way to address their specific needs.

i. In addition to improving the flow of data as described in Plan of Action D., additional follow-up training and technical support should be provided to interested State agencies to help them develop, maintain and implement hazard mitigation plans for their facilities. This support can take the form of:

- helping State agencies prepare HMGP and PDM planning grant applications (see Volume IV of the State of Louisiana Hazard Mitigation Strategy, the Administrative Guidelines and Procedures);
- sharing existing data and methodologies; and
- providing plan reviews at key milestones in the process.

ii. Pursue the designation of 5% Initiative funds as part of Implementation Strategies for post-disaster HMGP funding (see Administrative Guidelines and Procedures in Volume IV). 5% Initiative funds would be used for an established list of funding needs (e.g., efforts identified in Plan of Action E.vi. to effectuate compliance with NFIP requirements concerning substantial damage during disaster recovery

situations or for presentation materials for public outreach efforts per Plan of Action A) that could be met by relatively small set-asides in the total hazard mitigation funding.

3.3 Objective for integrating policies and plans:

Evaluate all plans included in the *State of Louisiana Hazard Mitigation Strategy* to ensure consistency between risk assessments, policies and recommendations.
Continue involvement by members of the SHMPC and the SHMPAB.

Plan of Action to address 3.3 Objective for integrating policies and plans:

G. Conduct follow-up activities to engage members of the SHMPC in a review of planning and implementation activities under their jurisdictions and responsibility. These activities would include interviews, focus group meetings and/or video teleconferences to review identified overlapping areas of concern and to review all documents to confirm consistency in hazard identification, profiling, risk assessment methodologies and results, policies and key recommendations.

Goal 4: The State of Louisiana will continue to pursue opportunities to reduce impacts to the State's manmade and natural environment through mitigation of repetitive and severe repetitive loss properties and other appropriate construction projects and related activities.

4.1 Objective for identifying cost effective, environmentally sound and technically feasible projects:

- Facilitate development and administration of project applications that will meet State and federal guidelines for funding for repetitive and severe repetitive loss properties and other appropriate construction projects.
- Establish mitigation project priorities on a regional, hazard specific basis.

Plan of Action to address 4.1 Objective for identifying cost effective projects and prioritizing (or ranking) them according to cost-effectiveness:

H. Work with municipalities, parishes and State agencies to identify, fund and implement cost effective projects to mitigation repetitive and severe repetitive loss properties and other appropriate risks, and to prioritize (or rank) them according to cost-effectiveness. One of the main purposes of the DMA 2000 was to improve the quality of hazard mitigation projects funded by the federal government. In this context, "quality" is virtually synonymous with "cost effectiveness."

i. In addition to mitigation of repetitive and severe repetitive loss properties, indicate preferred regional (based on discussion in Section 8.2) and specific project types that address hazards identified in the Plan.

Volume II, Appendix H (Recommended Practices for Mitigation in the State of Louisiana) provides detailed descriptions of recommended mitigation actions that parishes and municipalities should undertake to work with the State in achieving the goals and objectives in general terms. Further distinctions between regions are needed and will be developed as part of this task.

Current top priorities include, but are not limited to:

- Repetitive and severe repetitive loss properties from both Coastal and Riverine Flood studies including prioritizing parishes with highest bulk numbers or highest ratios per preferred criteria (e.g., repetitive losses per capita in a parish). It is important to note that establishing the mitigation of repetitive and severe loss properties as a top priority is consistent with the goals of FEMA's SRL, FMA, and Repetitive Flood Claim programs and continues progress made to date in mitigating these issues. (This action to mitigate repetitive loss properties and especially severe repetitive loss properties contributes to meeting Louisiana's requirements for increased federal match on SRL and FMA grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).)

- Limiting forced drainage solutions to areas where levees or floodwalls are already in place and supporting planning and non-structural solutions in areas where engineered systems have been relied on heavily in the past.
- Hardening critical facilities (as determined by municipal and parish governments but using common definitions to be developed in cooperation with GOHSEP and possibly via the CEO) to withstand rated wind speeds per the UCC.
- Parishes and municipalities may also be encouraged to develop programs and projects that may *not* qualify for HMPG or satisfy federal Benefit Cost Analysis (BCA) criteria, but that serve a compelling community interest; funding for such programs and projects must also be sought out.

In this compendium of successful techniques, there are alternatives for mitigation actions that must be evaluated by each community for each situation to determine the best choice. However, the listing and background information indicate to the communities what the State perceives as choices that are most likely to be successful.

ii. Provide education at the local level regarding project application "best practices" (which correlates with action items already described for Goals 1 and 2). Education and training should reflect on-going improvements by GOHSEP to the mitigation grant project application review and approval processes (which are documented in Volume IV) including project review criteria that respond to the results of the Plan Update for pre-disaster funding and as developed at the time for post-disaster funding as part of disaster specific implementation strategies. Consistent with the desire for increased quality, the education efforts at the local level should be centered on:

- how to prepare HMGP and PDM-C grant applications (including development of standard definitions and more consistency in the information required for applications per comments made by parish and municipal officials during the Capability Assessments); and
- how to determine a benefit-cost ratio consistent with FEMA guidance. Over time, this will provide communities with a better pre-application assessment of how likely projects are to be funded, and it will result in improved success rates for Louisiana communities when competing nationally for pre-disaster mitigation funding.
- establishing education and outreach on improved cost-estimation data and methodologies;
- on-line training, including (but not limited to): hazard mitigation grant programs' funding availability, project eligibility and application procedures; building code enforcement information regarding UCC provisions and specifications.
- direct technical support and outreach to improve coordination of emergency management and regulatory officials (including floodplain coordinators, building officials, and planning-and-zoning staffs and commissions).

4.2 Objectives for State-owned assets:

Harden and retrofit infrastructure and critical facilities with highest vulnerability rankings.

Plan of Action to address 4.2 Objective for identifying cost effective projects for State-owned assets and prioritizing (or ranking) them according to cost-effectiveness:

I. Support efforts by State agencies to identify and pursue hazard mitigation projects for at-risk State-owned assets and critical infrastructure, and prioritize (or rank) them according to cost-effectiveness (see related item under State Legislative Agenda items below). Plan of Action D includes encouraging State agencies to ground-truth the list of ranked critical facilities identified in Section Six of the Plan Update. Part of the purpose is to lead to good candidate sites for hazard mitigation projects. GOHSEP will also work with these agencies to encourage them to set priorities for hazard mitigation actions, beyond simply identifying the sites with the highest potential losses per the Plan Update methodology. These priorities would include:

- Using the University of New Orleans' results combined with the State building data per the Facilities Management database to determine where State buildings occur within clusters of repetitive loss properties. (This action to mitigate repetitive loss properties and especially severe repetitive loss properties contributes to meeting Louisiana's requirements for increased federal match on SRL and FMA grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).)
- Pursue wind-load hardening and retrofitting of critical facilities south of Interstate I-10 as the highest priority.

Other related work efforts by GOHSEP that should be considered as part of this Plan of Action include:

- Continue work to coordinate this Plan Update's recommendations with future Emergency Management Accreditation Program updates;
- Pursue cross-training arrangements and Memoranda of Understanding with other agencies and/or states to provide assistance in the wake of disasters.
- Use of the best possible cost-estimation data and methodologies;
- Help State agencies prepare HMGP and PDM planning grant applications.

As part of the process of working with State agencies, the following methodology is proposed to identify hazard mitigation projects for State-owned at risk facilities (in addition to ground-truthing per Plan of Action D):

Facility managers of top ten facilities as identified in Section Six will be asked to complete the following:

1. A worksheet requesting facility specific data which can either be completed online via a web portal, or printed out with the data later entered into the portal. This worksheet should require no more than two (2) hours to complete.
2. A hazard specific worksheet requesting additional information (e.g., past damages for hazard events) which can either be completed online via a web portal, or printed out with the data later entered into the portal. Facilities which appear on multiple lists may be required to complete more than one worksheet. However, there may be significant overlap regarding the data needs and the overall time requirement should not be excessive. These worksheets should require no more than four hours to complete assuming that accurate records have been kept.
3. Photographs of certain building components and equipment. A list will be provided and photographs can be uploaded onto the web portal. These photographs should require no more than three hours.
4. Photographs of previous damages, if available, may also be uploaded onto the web portal.
5. Additional information may be provided by facilities managers at their discretion, also via the online portal.

Facility managers may be requested to provide additional information. The worksheets will be designed to gather relevant information necessary to support applications to seek federal hazard mitigation funding for identified mitigation measures and decide which measures are appropriate.

In addition, GOHSEP will develop and conduct training for facility managers which will assist them in the identification of potential hazard mitigation activities and projects. This will be offered across the state, and will not focus solely on facilities identified within the top ten lists. Measures highlighted will range from those which carry a low cost and can be easily completed, to those which may require state or federal funding. Training materials will include a power point presentation, worksheets, and additional reference materials. The course will be offered in Baton Rouge, but will also be available in an online format via the web portal.

4.3 Objectives for enhancing regulatory requirements and establishing and pursuing a legislative agenda:

Maintain and enhance local regulatory standards.

Elicit and support efforts by federal and State legislatures to address shortcomings in existing laws and programs related to hazard mitigation.

Plan of Action to address 4.3 Objective for enhancing regulatory requirements and establishing a legislative agenda:

J. Support and pursue legislative agendas at all levels of government:

i. Support adoption, implementation and enforcement of higher regulatory standards at the municipal and parish level by developing and delivering technical assistance focused on improving the way municipalities and parishes approach hazard mitigation. Municipalities have multiple potential points of contact with hazard mitigation in their communities. Other objectives under this goal address how communities pursue hazard mitigation directly through their own construction projects. This objective and plan of action address the ways communities can improve the manner in which future development occurs including:

- Promote adoption and enforcement of comprehensive planning, zoning (i.e., land development regulations at the municipal/parish level), sensitive area protection ordinances (e.g., for wetlands) and floodplain ordinances, including integration of municipal/parish Hazard Mitigation Plans as required elements.
- Establish local requirements for development permitting-review processes for wetlands (similar to requirements for Coastal Zone, but for all wetlands).
- Establish local freeboard requirements for construction in areas with significant (to be defined) subsidence rates, such that during the useful life of a building (e.g., as defined by FEMA BCA standards) no increased risk should be encountered.

ii. State legislative agenda items including:

- Provide funding for non-federal share of projects; educate the State Legislature to establish a State Hazard Mitigation Fund that would provide a state source of pre-disaster hazard mitigation funding to supplement Federal and local sources. Louisiana statutes prohibit State funding for certain types of projects on private property, unless there is an overriding public interest[12]. However, there are myriad needs for funding public entities' hazard mitigation needs that such a fund would help satisfy.
- Establish incentives for participation by State facility managers in risk assessment and hazard mitigation planning and project implementation in the form of rebates on insurance premiums from the Office of Risk Management.
- Address the need for refinements or corrections in the UCC legislation (Act 12) including:
  - Regulation of additions and improvements to existing structures;
  - Regulation of appurtenances not in the original footprint associated with mobile homes;
  - Refining the definition of "recreational structures" to exclude habitable year-round dwellings;
  - Refining the definition of "work area" such that extensive alterations, renovations, and repairs are covered, even if less than 50% of the total area is involved in the projects (See Appendix J of the IRC); and
  - Resolving confusion in wording that implies that commercial properties under the NFIP are not covered by the UCC.

[12] Article VII, Section 14 of the Louisiana Constitution of 1974.

- Establish a state freeboard requirement for construction in areas with significant (to be defined) subsidence rates, such that during the useful life of a building (e.g., as defined by FEMA BCA standards) no increased risk should be encountered.
- Establish a state requirement for a development permitting-review process for wetlands (similar to requirements for Coastal Zone, but for all wetlands).
    - Establish incentives for parishes and municipalities to use accurate benchmark data and/or surveying procedures for elevation certificates, especially in areas that are subject to subsidence.
    - Pursue legal analysis and outreach regarding state and local liabilities for actions (permitting or lack of) or inaction.

iii. Support the following federal legislative agenda items:

- Enforce flood insurance rate increases for property owners that refuse mitigation funding.
- Develop and enforce actuarial-based flood insurance rates for non-primary residential structures.

8.6 Evaluation and Prioritization of Mitigation Actions

DMA 2000 requires an evaluation of cost effectiveness, environmental soundness and technical feasibility and designation of priorities for implementation. This is not entirely practical for a "strategic plan" like this one, but these aspects of these actions were nevertheless considered for this Plan Update. As explained in Section 8.2 and Table 8.1, the SHMPC developed all of the goals, objectives and resulting plans of action in direct response to results of the risk and capability assessments. Generally, the approach that resulted from the identified goals and objectives is applicable to any particular hazard and the recommended practices identified in Appendix H of Volume II are all hazard-specific. However, for the purposes of DMA 2000, the Consultant Team evaluated the environmental soundness and technical feasibility of the Plans of Action. The results are show in Table 8-3.

Table 8-3: State of Louisiana Hazard Mitigation Plans of Action Evaluation Results – Environmental Soundness and Technical Feasibility

Plan of Action Item	Description	Goal / Objective	Environmental Soundness	Technical Feasibility
A.	Statewide Education and Outreach.	1 / 1.1	N/A	N/A
B.	Education and Outreach for State Agencies.	1 / 1.2	N/A	N/A
C.	Statewide Data-Related Efforts.	2 / 2.1	N/A	Y (2)
D.	Data-related Efforts for State Agencies.	2 / 2.2	N/A	Y (2)
E.	Technical Support for Parish and Municipal Hazard Mitigation Planning.	3 / 3.1	N/A	Y (2)
F.	Technical Support for State Agencies Hazard Mitigation Planning.	3 / 3.2	N/A	Y (2)
G.	Plan Integration.	3 / 3.3	N/A	N/A
H.	Identifying Cost Effective Projects with Parishes and Municipalities.	4 / 4.1	Y (1)	Y (3)
I.	Identifying Cost Effective Projects with State Agencies.	4 / 4.2	Y (1)	Y (3)
J.	Legislative and Regulatory Enhancements.	4 / 4.3	N/A	N/A

The opportunity for loss reduction considerations in Table 8-3 include three designations:

- "Y" which indicates the Consultant Team considered the Plan of Action to be environmentally sound or technically feasible. Note: these designations were made with additional notations as follows:
  1. The Plan of Action involves supporting development of project applications by Parishes and Municipalities or State Agencies. That activity is considered "not applicable" but technical assistance will stress the need for identifying projects that are environmentally sound.
  2. The technical capability exists within the state agencies involved to carry out this activity.
  3. The Plan of Action involves supporting development of project applications by Parishes and Municipalities or State Agencies. That activity is considered "not applicable" but the technical assistance provided will stress the need for identifying projects that are technically feasible.
- "N" which indicates the Consultant Team considered the Plan of Action to be unsound from an environmental perspective or technically infeasible. Note: The Mitigation Action Plan did not include a Plan of Action that was considered by the Consultant Team to be either unsound from an environmental perspective or technically infeasible.
- "N/A" which indicates that the Consultant Team considered the criteria did not apply due to the nature of these activities.

In addition, the opportunity for loss reduction as an expression of cost-effectiveness on a relative basis was assessed by the SHMPC (see Table 8-4 below) .The SHMPC also identified priorities for implementation based on an examination of the available resources or "costs" to the State and the agency versus the urgency and potential contribution of each plan of action to risk reduction or "benefits" to the residents, property owners and business community in the State.

Table 8-4: State of Louisiana Hazard Mitigation Plans of Action Evaluation Results – Cost Effectiveness and Prioritization.

Plan of Action Item	Description	Goal / Objective	Opportunity for Loss Reduction	Priority
A.	Statewide Education and Outreach.	1 / 1.1	H	1
B.	Education and Outreach for State Agencies.	1 / 1.2	M	2
C.	Statewide Data-Related Efforts.	2 / 2.1	H	5
D.	Data-related Efforts for State Agencies.	2 / 2.2	M	7
E.	Technical Support for Parish and Municipal Hazard Mitigation Planning.	3 / 3.1	H	10
F.	Technical Support for State Agencies Hazard Mitigation Planning.	3 / 3.2	M	8
G.	Plan Integration.	3 / 3.3	M	6
H.	Identifying Cost Effective Projects with Parishes and Municipalities.	4 / 4.1	H	4
I.	Identifying Cost Effective Projects with State Agencies.	4 / 4.2	H	3
J.	Legislative and Regulatory Enhancements.	4 / 4.3	H	9

The opportunity for loss reduction considerations in Table 8-4 include three designations:

- "H" which represents the highest relative potential for loss reduction;
- "M" which represents moderate relative potential for loss reduction; and
- "L" representing the lowest relative potential for loss reduction.

The Mitigation Action Plan did not include a Plan of Action that was considered by the SHMPC to have a low potential for risk reduction.

The ranking of the Plans of Action according to priority were as follows:

Table 8-5: State of Louisiana Hazard Mitigation Plans of Action – Ranked by Priority

Plan of Action Item	Description	Priority
A.	Statewide Education and Outreach.	1
B.	Education and Outreach for State Agencies.	2
I.	Identifying Cost Effective Projects with State Agencies.	3
H.	Identifying Cost Effective Projects with Parishes and Municipalities.	4
C.	Statewide Data-Related Efforts.	5
G.	Plan Integration.	6
D.	Data-related Efforts for State agencies.	7
F.	Technical Support for State Agencies Hazard Mitigation Planning.	8
J.	Legislative and Regulatory Enhancements.	9
E.	Technical Support for Parish and Municipal Hazard Mitigation Planning.	10

8.7 Implementation

This Section includes:

- Implementation of Mitigation Plans of Action. Table 8-6 includes entries for:
  - ✓ Goal / Objective Addressed
  - ✓ Summary Description
  - ✓ Hazard(s) Addressed (in response to the hazards identified in Sections Five and Six)
  - ✓ Responsible Organization / Staff
  - ✓ Supporting Organizations
  - ✓ Staffing Requirements
  - ✓ Estimated Costs
  - ✓ Funding Source
  - ✓ Timeframe / Loss Reduction Potential
  - ✓ Priority Ranking
- Table 8-7: Summary of Mitigation Plans of Action
- Tentative Timetable. This timetable makes a distinction between Plans of Action work efforts that are "Initial / Concentrated Efforts" such as developing and implementing staffing plans and "Sustained / Intermittent Efforts" that will be carried out over a long time frame as needed and appropriate. In very general terms, the priorities for the Plan Update are based on first addressing mitigation actions related to the non-construction (or programmatic) aspects of the Plan Update and then focus attention increasingly on construction activities which have the highest potential for risk reduction.

Table 8-6: Implementation of Mitigation Plans of Action

Plan of Action A: Statewide Education and Outreach

Goal / Objective addressed	Goal 1. / Objective 1.1
Summary Description	Support start-up and implementation of CEO Program
Hazard(s) addressed	All
Responsible Organization / Staff	GOHSEP / State Hazard Mitigation Officer (SHMO) / Sides / NIMSAT / UNO-CHART / Press Association / Broadcasters Association
Supporting Organization(s)[13]	SHMT, SHMPC, Governor's Office, partner agencies and organizations already in place and to be identified as part of initial phases of CEO program
Staffing Requirements per year (average over the life of the Plan)[14]	Contractor labor + 10 FTE involved and another 10-15 FTE involved in outreach, but no FTE 100% of time
	Are staff available at present: ❑ Yes ☑ No[15]
Estimated Cost (if applicable)	No capital costs are anticipated (that are not already funded as part of CEO; only identified staff requirements are needed
Funding Source[16]	CEO initiative has been funded by HMGP.
	Is funding in place: ☑ Yes ❑ No
Timeframe / Loss Reduction Potential	Long term (Note: CEO was funded for a three (3) year duration) / High
Priority Ranking	1

Plan of Action B: Education and Outreach for State Agencies

Goal / Objective addressed	Goal 1. / Objective 1.2
Summary Description	Develop and implement State agency education and outreach program
Hazard(s) addressed	All
Responsible Organization / Staff	GOHSEP / SHMO
Supporting Organization(s)	SHMT, SHMPC, Governor's Office
Staffing Requirements per year (average over the life of the Plan)	0.50 FTE
	Are staff available at present: ☑ Yes ❑ No
Estimated Cost (if applicable)	Graphic production services $ 5,000.
Funding Source	Expenses for graphic production of education and outreach materials will be funded by a / general operating funds / and HMGP 5% Initiative.
	Is funding in place: ☑ Yes ❑No Presently funded under CEO
Timeframe / Loss Reduction Potential	Long term / Moderate
Priority Ranking	2

[13] Designations of supporting organizations other than SHMT and the SHMPC for all Plans of Action should be considered tentative pending confirmation of available staff and level of interest among indicated agencies.

[14] See "Summary Evaluation of Mitigation Action Plans" at the end of Table 8-5 for a summary of staffing requirements for Plan Update implementation.

[15] See "Summary Evaluation of Mitigation Action Plans" at the end of Table 8-5 for a discussion of current and proposed GOHSEP planning staff levels.

[16] "Funding Source" refers to "Estimated Cost" only. "Staffing Requirements" are funded by combination of State Management Costs from federal mitigation grants (75% federal) and general operating funds for GOHSEP (25% non-federal).

Table 8-6: Implementation of Mitigation Plans of Action (continued)

Plan of Action C: Statewide Data-Related Efforts

Goal / Objective addressed	Goal 2. / Objective 2.1
Summary Description	Develop and implement hazard data management program for parishes and municipalities (this will be done with integration with Virtual Louisiana)
Hazard(s) addressed	All
Responsible Organization / Staff	GOHSEP / SHMO / NIMSAT
Supporting Organization(s)	SHMT, SHMPC, Parish and municipal OHSEPs and Stakeholders, other potential end users
Staffing Requirements per year (average over the life of the Plan)	3 Contractors
	Are staff available at present: ❑ Yes ☑ No
Estimated Cost (if applicable)	No capital costs are anticipated; only identified staff requirements are needed
Funding Source	CEO / HMGP
	Is funding in place: ☑ Yes ❑ No ❑N/A
Timeframe / Loss Reduction Potential	Intermediate / High
Priority Ranking	5

Plan of Action D: Data-Related Efforts for State Agencies

Goal / Objective addressed	Goal 2. / Objective 2.2
Summary Description	Develop and implement hazard data management program for State agencies – this may be addressed by CEO through a grant to maintain a portal for ORM and agencies to upload building inventory data
Hazard(s) addressed	All
Responsible Organization / Staff	GOHSEP / SHMO
Supporting Organization(s)	SHMT, SHMPC, Department of Administration, LAGISC, DOTD, State Agencies, other potential end users
Staffing Requirements per year (average over the life of the Plan)	0.50 FTE
	Are staff available at present: ❑ Yes ☑ No
Estimated Cost (if applicable)	No capital costs are anticipated; only identified staff requirements are needed
Funding Source	Not applicable
	Is funding in place: ❑ Yes ❑ No ☑ N/A
Timeframe / Loss Reduction Potential	Intermediate / Moderate
Priority Ranking	7

Table 8-6: Implementation of Mitigation Plans of Action (continued)

Plan of Action E: Technical Support for Parish and Municipal Hazard Mitigation Planning

Goal / Objective addressed	Goal 3. / Objective 3.1
Summary Description	Increase hazard mitigation planning and implementation capability for parishes and municipalities – will include BCA training for local Emergency Managers
Hazard(s) addressed	All
Responsible Organization / Staff	GOHSEP / SHMO
Supporting Organization(s)	SHMT, SHMPC, Parish and municipal OHSEPs, Stakeholders
Staffing Requirements per year (average over the life of the Plan)	4 – 5 (Parishes may need to hire consultants)
	Are staff available at present: ❑ Yes ☑ No
Estimated Cost (if applicable)	No capital costs are anticipated; only identified staff requirements are needed
Funding Source	Not applicable
	Is funding in place: ❑ Yes ❑ No ☑ N/A
Timeframe / Loss Reduction Potential	Long term / High
Priority Ranking	10

Plan of Action F: Technical Support for State Agencies Hazard Mitigation Planning

Goal / Objective addressed	Goal 3. / Objective 3.2
Summary Description	Increase hazard mitigation planning and implementation capability for State agencies to include Board of Regents, H & HS, and technical assistance to DRUs
Hazard(s) addressed	All
Responsible Organization / Staff	GOHSEP / SHMO
Supporting Organization(s)	SHMT, SHMPC, State Agencies, GOHSEP employees
Staffing Requirements per year (average over the life of the Plan)	4
	Are staff available at present: ☑ Yes ❑No
Estimated Cost (if applicable)	No capital costs are anticipated; only identified staff requirements are needed
Funding Source	Not applicable
	Is funding in place: ❑ Yes ❑ No ☑ N/A
Timeframe / Loss Reduction Potential	Long term / Moderate
Priority Ranking	8

Table 8-6: Implementation of Mitigation Plans of Action (continued)

Plan of Action G: Plan Integration

Goal / Objective addressed	Goal 3. / Objective 3.3
Summary Description	Improve integration of hazard mitigation related aspects of State policies and plans to include EOPs, COOPs, Master Plans, and CIPs
Hazard(s) addressed	All
Responsible Organization / Staff	GOHSEP / SHMO / Supporting Organizations / State Agencies
Supporting Organization(s)	SHMT, SHMPC, DNR, DOTD, CPRA, LRA, and other agencies identified during implementation
Staffing Requirements per year (average over the life of the Plan)	0.50 FTE
	Are staff available at present: ❑ Yes ☑ No
Estimated Cost (if applicable)	No capital costs are anticipated; only identified staff requirements are needed
Funding Source	Not applicable
	Is funding in place: ❑ Yes ❑ No ☑ N/A
Timeframe / Loss Reduction Potential	Long Term / Moderate
Priority Ranking	6

Plan of Action H: Identifying Cost Effective Projects with Parishes and Municipalities

Goal / Objective addressed	Goal 4. / Objective 4.1
Summary Description	Identify, fund and implement repetitive and severe repetitive loss property and other appropriate hazard mitigation projects with parishes and municipalities. Will provide lists to parishes noting number of properties and what has been mitigated. GOHSEP will alert parishes when funding becomes available.
Hazard(s) addressed	All, with priority for Flood (Repetitive and Severe Repetitive Loss Properties) and High Wind (Critical Facilities and Infrastructure)
Responsible Organization / Staff	GOHSEP / SHMO
Supporting Organization(s)	SHMT, SHMPC, Parish and municipal OHSEPs, Stakeholders
Staffing Requirements per year (average over the life of the Plan)	1.00 FTE
	Are staff available at present: ❑ Yes ☑ No
Estimated Cost (if applicable)	No capital costs are anticipated; only identified staff requirements are needed
Funding Source	Not applicable
	Is funding in place: ❑ Yes ❑ No ☑ N/A
Timeframe / Loss Reduction Potential	Long term / High
Priority Ranking	4

Table 8-6: Implementation of Mitigation Plans of Action (continued)

Plan of Action I: Identifying Cost Effective Projects with State Agencies

Goal / Objective addressed	Goal 4. / Objective 4.2
Summary Description	Identify, fund and implement hazard mitigation projects with State agencies
Hazard(s) addressed	All, with priority for Flood (Repetitive and Severe Repetitive Loss Properties) and High Wind (Critical Facilities and Infrastructure)
Responsible Organization / Staff	GOHSEP / SHMO
Supporting Organization(s)	SHMT, SHMPC, State Agencies
Staffing Requirements per year (average over the life of the Plan)	0.25 FTE
	Are staff available at present: ❑ Yes ☑ No
Estimated Cost (if applicable)	No capital costs are anticipated; only identified staff requirements are needed
Funding Source	Not applicable
	Is funding in place: ❑ Yes ❑ No ☑ N/A
Timeframe / Loss Reduction Potential	Long Term / High
Priority Ranking	3

Plan of Action J: Legislative and Regulatory Enhancements

Goal / Objective addressed	Goal 4. / Objective 4.3
Summary Description	Support and pursue legislative agendas at municipal, parish, State and federal levels
Hazard(s) addressed	All
Responsible Organization / Staff	GOHSEP / SHMO
Supporting Organization(s)	SHMT, SHMPC
Staffing Requirements per year (average over the life of the Plan)	0.25 FTE
	Are staff available at present: ❑ Yes ☑ No
Estimated Cost (if applicable)	No capital costs are anticipated; only identified staff requirements are needed
Funding Source	Not applicable
	Is funding in place: ❑ Yes ❑ No ☑ N/A
Timeframe / Loss Reduction Potential	Long term / High
Priority Ranking	9

Table 8-6 includes designations of "Staffing Requirements per year", averaged over the life of the implementation of the Plan Update. These designations are all referring to GOHSEP staff. The total commitment represented in Table 8-6 is 7.00 FTE or the equivalent of seven (7) full time positions per year. This is based on the following staffing plan:

- (1) Plans Coordinator / Manager
- (1) Senior Planner
- (4) Planner
- (1) CEO Coordinator.

Job descriptions for all seven positions are provided as part of the State of Louisiana Administrative Plan (Volume IV of the State of Louisiana Hazard Mitigation Strategy). These staffing projections do not include contracted services that are currently being provided by James Lee Witt Associates as those services are specifically related to the development and implementation of the PPGP.

As of the date of the Plan Update, two (2) of these positions are filled; the Plans Coordinator / Manager and the CEO Coordinator. GOHSEP is anticipating that the other five positions will be filled within six months.

Table 8-7: Summary Evaluation of Mitigation Plans of Action

Action Items	Staffing in place?	Funding in place?
A. Statewide Education and Outreach	No	Yes
B. Education and Outreach for State Agencies	No	No
C. Statewide Data-Related Efforts	No	N/A
D. Data-related Efforts for State Agencies	No	N/A
E. Technical Support for Parish and Municipal Hazard Mitigation Planning	No	N/A
F. Technical Support for State Agencies Hazard Mitigation Planning	No	N/A
G. Plan Integration	No	N/A
H. Identifying Cost Effective Projects with Parishes and Municipalities	No	N/A
I. Identifying Cost Effective Projects with State Agencies	No	N/A
J. Legislative and Regulatory Enhancements	No	N/A

Tentative Timetable

The specific order and sequencing of action items to be implemented as a result of this Plan Update over the next three years are identified in the following tentative timetable.

	Plan Year One				Plan Year Two				Plan Year Three			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
A. Statewide Education and Outreach												
A.i. Define audience												
A.ii. Staffing plan												
A.iii. Identify existing resources/programs												
A.iv. Create tools												
A.v. Identify / solicit support												
A.vi. Work with PIO's												
A.vii. Develop / distribute materials												
A.viii. Feedback												
B. Education and Outreach for State Agencies												
B.i. Staffing plan												
B.ii. Follow-up interviews												
B.iii. Identify / solicit support												
B.iv. Data management mechanism												
B.v. Develop / conduct training												
B.vi. Plan integration efforts												
B.vii. Infrastructure Protection Branch												
C. Statewide Data-related Efforts												
C.i. Staffing plan												
C.ii. Definitions and methodologies												
C.iii. Identify available data												
C.iv. Validate Plan Update results												
C.v. Develop / conduct training												
C.vi. Integrate data w/ 2011 Plan Update												
C.vii. Continue data gathering												
D. Data-related Efforts for State Agencies												
D.i. Staffing plan												
D.ii. Contact agency heads / managers												
D.iii. Centralized data repository												

	Plan Year One				Plan Year Two				Plan Year Three			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
E. Technical Support for Parish and Municipal HMPs												
E.i. Staffing plan												
E.ii. Support parish plan maintenance												
E.iii. Support NFIP participation												
E.iv. Support repetitive loss mitigation												
E.v. Support plan integration												
E.vi. Support NFIP substantial damage permitting preparations												
F. Technical Support for State Agencies' HMPs												
F.i. Training and technical support												
F.ii. Reserve Fund												
G. Plan Integration												
G. Plan Integration												
H. Identifying Cost Effective Projects with Parishes and Municipalities												
H.i. Preferred regional project types												
H.ii. Project application training												
I. Identifying Cost Effective Projects with State Agencies												
I. Technical support												
J. Legislative and Regulatory Enhancements												
J.i. Municipal												
J.ii. State												
J.iii. Federal												

Legend

Initial / Concentrated Efforts

Sustained / Intermittent Efforts

8.8 Funding Sources

As noted above, the Mitigation Action Plan is focused on the efforts to be undertaken by the Disaster Recovery Division of GOHSEP. Most of the funding commitment needed is for staffing positions and the full complement of the GOHSEP staffing plan has been authorized. Funding for the staff commitments will come from the general operating funds of GOHSEP.

Currently, GOHSEP has an overall annual operating budget of $1.116 billion. Of this total, $1.097 billion comes from federal grant programs (as technical assistance, management and administrative costs) and $0.019 billion comes from State funding (source http://www.doa.la.gov/opb/pub/FY10/FY09-10_StateBudget.pdf).

All capital costs or outside consulting services to support the implementation of the Plan Update will be derived from federal funding. This includes set-asides of HMGP funding as it becomes available as part of the "Reserve Fund" (see Action Item F.iii. on page I-156). Volumes III and IV of the State of Louisiana Hazard Mitigation Strategy, i.e., the Program and Administrative Guidelines and Procedures respectively, describe the process the SHMT will use to develop an implementation strategy for each notification of available funds under HMGP. As part of these implementation strategies, the SHMT can elect to set aside, or reserve, a portion of the available funds to support the specific recommendations in the Plan (within the project eligibility guidelines for HMGP and subject to the approval by FEMA Region VI on a case-by-case basis). These reserved funds would not be available for project applications and therefore, it is envisioned that the Reserve Fund set-asides will be limited to larger disaster declarations and notifications of available HMGP funding.

Section Nine

Coordination of Parish and Municipal Mitigation Planning

Contents of this Section

9.1 Interim Final Rule Requirement for Coordination of Parish and Municipal Mitigation Planning
9.2 Funding and Technical Assistance for Parishes and Municipalities
9.3 Parish and Municipal Plan Integration
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9.1 Interim Final Rule Requirements for Coordination of Parish and Municipal Mitigation Planning

A key element of the Disaster Mitigation Act of 2000 (DMA 2000) is the emphasis placed on strengthening the interactions between the state, parishes and municipalities regarding hazard mitigation planning and implementation. Most significant mitigation occurs at the local level, so it is beneficial to all concerned to make sure that parish and municipal plans are as effective as possible in identifying hazards and developing action plans.

The Interim Final Rule (IFR) includes three specific requirements for the manner in which the State needs to coordinate with parishes and municipalities for planning efforts:

- Local Funding and Technical Assistance per Requirement §201.4(c)(4)(i): "[The section on the Coordination of Local Mitigation Planning must include a] description of the State process to support, through funding and technical assistance, the development of local mitigation plans..."
- Local Plan Integration per Requirement §201.4(c)(4)(ii): "[The section on the Coordination of Local Mitigation Planning must include a] description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan."
- Prioritizing Local Assistance per Requirement §201.4(c)(4)(iii): "[The section on the Coordination of Local Mitigation Planning must include] criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures. Further, that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs."

9.2 Funding and Technical Assistance for Parishes and Municipalities

As described in Section Eight, the Plan Update emphasizes the need for the state to provide continuing funding and technical assistance to support mitigation planning at the parish and municipal level. To gain perspective on what needs to be done in the future, it is important to also understand what has been accomplished to date.

The State of Louisiana, through the Governor's Office of Homeland Security and Emergency Preparedness (GOSHEP), has made a concerted effort to assist with the parish and municipal plan development process by providing:

- Support to obtain federal funding for parish and municipal level plan development and updates
- Technical assistance to plan preparers at the parish and municipal level
- Plan reviews at draft and final stages of completion
- Coordination with Federal Emergency Management Agency (FEMA) Region VI on parish and municipal plan development and review issues

Current Status of Parish and Municipal Mitigation Planning in Louisiana

As of January 17, 2008, 64 parish level, 11 local community and 3 private non-profit organization plans have been approved in the State of Louisiana. Of these plans, 58 participated in the Planning Pilot Grant Program (PPGP) with 25 parishes undertaking Plan Updates and project scoping, and another 33 parishes doing plan amendments and project scoping. Since the last Plan Update, an additional 9 new plans are being developed of these 2 are local communities, 2 universities, 1 Indian Tribe and 4 Special Districts. Appendix K contains documentation regarding how the PPGP is administered in the State of Louisiana.

Current Funding

Since the last plan update, GOHSEP has provided an additional $4,480,928 in Hazard Mitigation Grant Program (HMGP) "7 percent" planning funds to local governments and private non-profit, to assist in developing, amending and updating local mitigation plans. In response to the DMA 2000, the state has committed in excess of $21,000,000 in funding toward the development and updating of local mitigation plans. Table 9-1 includes a summary of the funding sources for these plans:

Table 9-1: Funding for Parish and Municipal Hazard Mitigation Planning

Funding Sources	Federal Share	Non-Federal Share	Project Totals
Hazard Mitigation Grant Program (HMGP)	$13,963,515	$3,160,863	$17,124,378
Pre-Disaster Mitigation Grant Program (PDM)	$2,367,673	$851,095	3,050,826
Flood Mitigation Assistance Grant Program(FMA)	$685,401	$228,467	$913,868
Totals	$17,016,589	$4,240,425	$21,089,072

Source: GOSHEP, 2007-10

Technical Assistance for Parish and Municipal Mitigation Planning

GOSHEP, with funding provided by FEMA through the Hazard Mitigation Technical Assistance Program (HMTAP), conducted a series of local hazard mitigation planning workshops in 2002 to familiarize parish officials with the requirements of DMA 2000 and to offer training regarding hazard mitigation planning techniques per FEMA guidance. Five separate workshops were held and 56 of the 64 parishes participated in at least one workshop- an attendance rate of 87%. Since the last Plan Update, GOHSEP continues to provide technical assistance for the completion and update of all parish hazard mitigation plans, as well as the development of 1 municipal, 2 universities, 1 Indian Tribe, 4 Special Districts, and 3 private, non-profit plans. In addition, the State has used HMGP funding related to hurricanes Katrina and Rita to implement the PPGP and has provided extensive technical support and training to all participants.

To date, technical assistance has included guidance and training regarding:

- Application and Scope of Work Development
- Consultant Procurement Procedures
- Project Identification

- Project Scoping including benefit-cost analysis
- Plan Updates including risk assessment procedures for using Advisory Base Flood Elevations (ABFE) and for levee failures

One requirement of the PPGP is focused specifically on repetitive loss (RL) and severe repetitive loss (SRL) properties. As part of project scoping activities, parishes and municipalities are required to analyze RL and SRL properties within their jurisdiction to determine what, if any, mitigation actions are feasible, environmentally sound and cost effective. The intent is to prompt parishes and municipalities to identify the options that exist for mitigation of these properties once funding becomes available through Hazard Mitigation Assistance Grant Program (HMA), which includes the HMGP, PDM, FMA, Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SLR) grant programs. This will lead to improvements in the rate at which these properties are mitigated in the State of Louisiana.

The PPGP has been truly a success story in Louisiana. Many of the projects scoped under the pilot were later submitted by the parishes for funding consideration under GOHSEP reallocation of Hurricanes Katrina and Rita HMGP funds. Additionally, GOHSEP has strongly encouraged all potential applicants for HMGP funds under Hurricanes Gustav and Ike to submit projects that have been scoped under the PPGP for funding consideration.

This focus on projects to mitigate RL properties and especially SRL properties contributes to meeting Louisiana's requirements for increased federal match on SRL and FMA grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).

Continuing Technical Assistance

Per Section Eight, GOSHEP intends to provide continued technical assistance to parishes and municipalities in the State to develop and maintain comprehensive parish and municipal mitigation plans and to pursue cost effective mitigation projects. For example, Plan of Action 'E' in Section Eight identifies specific steps GOSHEP will take to support parish and municipal hazard mitigation planning. Other action items include providing training and guidance for improving risk assessments and plan implementation that are important aspects of the overall process.

Plan Reviews

The overview of GOHSEP's mitigation planning capability should be presented in the context of the significant accomplishments attained since Hurricane Katrina (August 29, 2005). The disaster provided GOHSEP with the impetus for expanding the role of pre-disaster planning to improve GOHSEP's internal capabilities, as well as its ability to build mitigation capacity and relationships at parish and municipal levels. As evidence, prior to Hurricane Katrina only 3 jurisdictions had FEMA-approved hazard mitigation plans. However, as of December 18, 2007, 78 parish, municipal and private / non-profit organization hazard mitigation plans have been approved by FEMA. In fact, all parishes in the state now have approved hazard mitigation plans and several are involved in updating their plans. Finally, beyond the plan development and review process, GOSHEP Mitigation Planning continues to improve its delivery of services as liaison between FEMA Region VI and the parishes and municipalities.

The GOSHEP Planning Team was trained by James Lee Witt Associates in concert with FEMA Mitigation Planning staff to build State-parish/municipal relationships, and assess parish/municipal hazard risks, structural vulnerabilities, and mitigation capabilities, to develop a multi-hazard hazard mitigation plan for addressing each of these factors. In turn, GOHSEP staff coordinated with FEMA Mitigation Planning staff to build internal plan review capabilities in accordance with established FEMA (44 CFR) guidelines and processes for conducting plan reviews, working with parish/municipal officials to revise draft versions of mitigation plans, and working with FEMA staff to establish a corpus of FEMA-approved multi-hazard mitigation plans. The step-by-step plan review process GOSHEP employs is as follows:

Step 1: The initial draft of a parish or municipal plan is sent to GOSHEP for review. GOHSEP staff develops and provides parish or municipal officials with comprehensive guidance for improving the format and content of the plan.

Step 2: Parish or municipal officials revise the plan in accordance with GOHSEP guidance, and re-submit the plan for GOHSEP review. With satisfactory revisions, the plan is forwarded with GOSHEP comments to FEMA Region VI.

Step 3: FEMA Region VI reviews the plan and forwards their comments to GOSHEP who then relays new comments back to the parish or municipality. GOHSEP continues to interface with parish or municipal officials to discuss and clarify all review comments on a point-by-point basis.

Step 4: The parish or municipality addresses both GOSHEP and FEMA Region VI comments and revises the plan.

Step 5: A revised draft is submitted to GOSHEP for review. GOHSEP staff evaluates revisions and forward to FEMA Region VI.

Step 6: FEMA Region VI reviews the revised plan, and if all comments were satisfactorily addressed, a letter stating that the plan is "approvable pending adoption" is mailed to GOSHEP and the parish or municipality. In cases where comments have not been addressed satisfactorily, the parish or municipality again addresses the comments and repeats the process.

Step 6: The plan is then formally adopted by all participating jurisdictions through a Resolution.

Step 7: The plan is officially approved by the Regional Director of FEMA Region VI.

The timeframe for this review process is approximately six months, not including the time spent by parishes or municipalities to revise their plans in response to GOHSEP and FEMA comments and is based on the following assumptions:

- Step 1 requires approximately 45 days for State review
- Step 2 requires an additional 45 days for FEMA
- After resubmitting the plan for final review, the state and FEMA are each given a 45-day review period

9.3 Parish and Municipal Plan Integration

As described in Subsection 9.1, the IFR requirements pertaining to this Section, 201.4(c)(4)(ii) state that "[The section on the Coordination of Local Mitigation Planning must include a] description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan." In developing the Plan Update, GOSHEP was aware of the importance of ongoing parish and municipal planning efforts and did so to the extent possible as indicated in Section Five. Ideally, the process for developing the Plan Update would have used parish and municipal risk assessments, goals, strategies and actions to a greater extent to help characterize the range of hazards, mitigation strategies and actions identified across the state.

However, as noted in previous sections, problems with inconsistencies (terminology, data, methodology, goals, project types, etc.) made direct incorporation into the Plan Update analyses impractical. Several aspects of the Mitigation Action Plan are intended to address these problems and an overarching goal of GOHSEP's Community Education and Outreach (CEO) project is to improve the "data connection" between the state, parishes and municipalities. It is anticipated that by the time of the next plan update, there will be more consistent and relevant data that can be directly integrated and used in risk assessments.

Therefore, most of the parish and municipal plan integration into this Plan Update must still be performed by GOSHEP and the State Hazard Mitigation Planning Committee (SHMPC) as described below.

As part of the integrating parish and municipal plans with the state plan and in response to the problems and issues associated with inconsistencies between state and local government hazard risk data collection and processing identified in last Plan update, GOHSEP through the CEO program, continues to work in partnership with University of Louisiana at Lafayette's NIMSAT Institute developed a web-based pass-word protected risk data collection portal. The portal is designed to provide a mechanism for state planners to collect and exchange hazard risk based data. Through this process, NIMSAT will collect and ground truth hazard risk based data from parishes and municipals, this data will be filtered and returned to local community for concurrence as well as make it available for updating risk assessment in both the state and local mitigation plans.

In addition, GOSHEP will consider non-technical aspects for incorporation into the Plan Update including standardized goals and objectives and a requirement for capability assessments for parishes and municipalities.

It is clear that parish and municipal conditions and priorities will change over time. To account for this, in addition to progress anticipated under the CEO as well as assembling and reviewing the approved parish and municipal plans, GOSHEP will correspond with parish and municipal Emergency Management Agency (EMA) directors and other Stakeholders on an annual basis, requesting them to advise GOSHEP of any significant changes in parish and municipal vulnerability and risk, mitigation activities that have been completed or initiated, and changes in a community's mitigation goals, strategies or priorities. GOSHEP will review the responses, prepare a report and recommendations, and present these to the SHMPC for its consideration. The Mitigation Action Plan's goal is to provide updated and current data and hazard information on a continuing basis for municipal, parish and State agencies alike. The exchange of information between State, parish and municipal plans will thus gradually improve the level of integration.

9.4 Prioritizing Parish and Municipal Assistance

IFR subsection 201.4(c)(4)(iii) states that the State Hazard Mitigation Plan must include "[c]riteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with:

- Highest risk
- Repetitive loss properties
- Most intense development pressures

Further, that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.

The sub-sections below discuss these four criteria. Following these subsections is additional discussion of how the state intends to prioritize applications for funding future planning efforts.

In all cases applicants must demonstrate that their risk is sufficient to merit grant funds, particularly when compared to the project cost, but there is often considerable uncertainty in risk determinations. For this and other reasons, the state considers a variety of factors in addition to risk and benefit-cost analysis in determining its priorities for mitigation grants.

In addition, as identified above, GOHSEP has established a policy of prioritizing funding for hazard mitigation planning efforts at the parish level in the future. This policy includes making sure that the interests of municipalities are protected and acknowledged as part of the process.

Jurisdictions with Highest Risk

One of the primary purposes of this Plan Update is to identify the areas in Louisiana with the highest risk from natural and manmade hazards. As described in Section Five, the parishes in Louisiana have different levels of exposure and risk. Although the state does not have a formal system established to evaluate and prioritize potential mitigation projects on the basis of risk, this Plan Update is partly intended to introduce such criteria to the process. In general, the state will direct mitigation grant funds to the areas with the highest risk. However, in many cases, more localized

risk assessments (possibly produced in the parish and municipal mitigation planning process), as well as risk assessments and benefit-cost analyses done in support of applications, may indicate areas with high risk outside the highest-risk parishes identified in this Plan Update.

The most worthwhile mitigation projects are a product of both the risk in a particular place and the effectiveness of a project. Although risk is clearly a good initial indicator of mitigation potential, the state will also carefully consider the effectiveness and cost of mitigation projects in determining funding priorities.

Jurisdictions with Repetitive Loss Properties

There is currently no formal requirement that grants made through either the HMGP or Pre-Disaster Mitigation Competitive Grant Program (PDM-C) emphasize repetitive loss properties. However, in response to the Federal emphasis on reducing the burden that repetitive losses place on the National Flood Insurance Program (NFIP), the State presently considers the repetitive loss status of properties in determining the grants it will support (i.e., forward to FEMA for consideration and funding), and will continue to do so as additional grant funds are available.

The FMA program mandates that grant funds are directed to NFIP repetitive loss properties, and the state will continue to comply with this requirement as it has since its inception. The Flood Insurance Reform Act of 2004, which was signed into law by the President on June 30, 2004, requires the NFIP to provide a disincentive to property owners to live in repetitively flooded areas. Rather than continue to rebuild, the program would provide repeatedly flooded homeowners assistance in either elevating or moving their homes away from floodwaters. Those who refuse mitigation assistance would pay premiums that will progressively approach the full actuarial costs for choosing to live in a risky area.

(This strategy to mitigate repetitive loss properties and especially severe repetitive loss properties contributes to meeting Louisiana's requirements for increased federal match on SRL and FMA grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).)

Jurisdictions with Most Intense Development Pressure

At the time this Plan Update was developed Louisiana had no formal process for evaluating potential mitigation grants relative to future development. As it develops a more rigorous review and recommendation process, the state will include development pressure as a potential review criterion. It is assumed that parish and municipal plans will provide some indication of the implications of future development per DMA 2000 requirements for local plans. The degree to which this information is included in the parish and municipal plans will determine the ability of GOSHEP and the SHMPC to make decisions based on these criteria.

Although development pressure is clearly a potential factor in any risk determination, development that is undertaken in accordance with adequate building codes, land planning and floodplain management principles should in many cases be less risky than development that pre-dates these codes and principles. However, the state is aware that increased development does cause related increases in population, infrastructure, etc., and may in some cases have adverse impacts on existing areas. These factors will be carefully considered in additional reviews. Section 5 provides an analysis of future development.

Maximizing Benefits According to Benefit-Cost Review of Local Projects

Regulations for FEMA's HMA grant program state that proposed mitigation projects must be cost effective. Under some pre-established conditions, certain projects may be exempt from this regulation, but in most cases a benefit-cost analysis is undertaken for projects either prior to being submitted to GOSHEP and FEMA for funding consideration, or during the grant evaluation process.

The PDM-C program, which was instituted in 2003/04, further emphasizes the role of cost-effectiveness by making the benefit-cost ratio the single most important criterion in project rating and evaluation. For the HMGP and FMA programs, the regulations require only that proposed mitigation projects are cost-effective, *not* that they are the *most* cost-effective projects that the state or FEMA is considering. However, the state generally believes that projects with high benefit cost ratios should get preference, all other aspects being equal.

In most cases, grant applications are either accompanied by a benefit-cost analysis, or GOSHEP or FEMA performs one in accordance with FEMA and the Louisiana Office of Management and Budgets regulations. Projects that do not achieve the required 1.0 benefit-cost ratio, and are not exempted from benefit-cost analysis, are rejected from funding consideration. This is the case for all FEMA HMA grants.

Prioritization of Parishes to Receive Planning Grants

In determining priorities for which parishes will receive mitigation planning grants, GOSHEP will consider several criteria:

- Quality and completeness of the parish's existing mitigation plan.
- The degree of risk in the parish, as determined by the potential effects of natural hazards on population, infrastructure and operations per the results of this Plan Update.
- Existing capability, i.e., if the parish already has the resources to create or update its plan and do they have the administrative infrastructure in place to implement actions.
- Potential for the plan to support or enhance parish mitigation efforts.

These criteria are intended to blend objective and subjective considerations to determine the best way to spend limited funds to help parishes improve their mitigation plans.

Although the preceding subsections discuss specific criteria required by the IFR, the State considers other factors in determining how to prioritize mitigation grant proposals. Among these other factors are:

- The extent to which the project identified by the community has been identified or developed through the local hazard mitigation process;
- Local needs, (i.e., which grants would help communities most);
- The particular hazard or hazards that the project is mitigating;
- The criticality of the facility/ies that the project is protecting;
- The status of a community with respect to the NFIP / Community Rating System; and
- The community's adoption and enforcement of building codes.

This is not intended as a comprehensive list of factors, only as a general indication of the areas that the State will contemplate in reviewing project proposals.

Prioritization of Parishes to Receive HMGP Funding

The State Hazard Mitigation Officer shall submit recommendations to the Governor or his/her Designee for the use of available HMGP funds. These recommendations will include:

- Priority for use of funds, if any
- Allocation of funds to parishes based on their prorated share of damages as determined by the final damage assessment figures
- Allocations of available funds to State and Regional Agencies
- Use of all available initiative funds
- Other priority related issues as a result of the disaster

Funds will only be made available to those eligible applicants that have or is covered by a FEMA approved state or local mitigation plan. The parishes will submit eligible project applications to GOHSEP in prioritized order up to the amount of their allocation. Parishes are encouraged to submit more projects than their allocation in case several projects are deemed not eligible.

Non-Federal Cost Share Requirements

In general, under the Hazard Mitigation Assistance (HMA) program grants, the total cost to implement an approved mitigation activity is generally based on a combination of both federal and non-federal sources. The federal share will generally cover 75 percent of the total eligible project cost and the remaining 25 percent is provided from a non-federal source. The accompanying non-federal source must be an eligible cost used to in direct support of the overall mitigation activity. The non-federal source cannot be met with funding from other federal agencies, unless authoring statutes explicitly allow. However, acceptable methods of meeting the non-federal source including, contributions of cash, in-kind services and/or materials, and the use of global match (see definition below).

If an in-kind service or material would have been an eligible cost under the grant, it is generally eligible to be used towards satisfying the non-federal cost share requirement. Examples of in-kind services or materials include the following:

- Staff time and benefits (when not included in project management or administration)
- Use of force account labor towards the project's approved scope of work
- Use of equipment owned by the applicant towards the project's approved scope of work
- Donations of cash, goods, or services from a third party

All in-kind, material or third party donations used to satisfy the non-federal cost share requirement must be properly documented and substantiated, and must be eligible costs under the grant. Additionally, under the FMA, not more than one half of the non-federal contribution may be provided from n-kind contributions

The state may also formally seek pre-approval from FEMA to use "Global Match" to assist in meeting the 25 percent non-federal match share. The term global match generally refers to the non-federal contribution derived from several non-federally funded projects that are pooled together to meet the grant award match. Global match can also be apply when a single non-federally funded project is used to fulfill the match requirement for one or more federally funded projects. Generally, global match is used to fulfill the 25 percent or greater non-federal match requirements under the HMGP. Additionally, the global match project(s) must meet all HMGP eligibility criteria and must have been implemented after the date of the declaration of the disaster for which the match is intended. Global match may not be applicable under the other HMA grant programs.

Table 9.2 below provides a discussion of the general non-federal cost share requirements for each HMA program.

Table 9-2: Cost Share Requirements under the HMA

Funding Sources	Mitigation Activity Grant Cost Share
HMGP	75/25
PDM	75/25
PDM-Small and Impoverished community	90/10
FMA	75/25
FMA-severe repetitive loss property with Repetitive Loss Strategy	90/10
RFC	100/0
SRL	75/25
SRL- with Repetitive Loss Strategy	90/10

There are two exceptions under the HMA grant program were the federal and non-federal cost share may be adjusted from 75/25 to 90/10. A discussion of these exceptions is provided below:

Small Impoverished Communities

Under PDM, in some cases, communities that meet the definition of "small impoverished" may be eligible for up to a 90% federal cost share, and the non-federal cost share is reduced to 10%. Small impoverished communities are those that:

- Have 3,000 or fewer individuals within a state-identified rural community that is not a remote area within the corporate boundaries of a larger city;
- Be economically disadvantaged, with residents having a per capita income that does not exceed 80% of the national per capita income, based on the best available data;
- Have a local unemployment rate that exceeds by 1% or more the most recently reported, average yearly national unemployment rate; and
- Meet other criteria established by the state in which the community is located.

Applicants seeking designation as "small impoverished" must certify and provide documentation of the community's status with their sub-application to justify the increased federal cost share. If proper documentation is not submitted, no more than the standard federal cost share will be provided.

Repetitive Loss Strategy

Under FMA and SRL, Applicants with a mitigation plan that addresses a Repetitive Loss Strategy for properties identified as severe repetitive loss properties may receive up to 90% of the project's cost as the federal share. The remaining 10% must be satisfied through non-federal sources. Up to one half of the non-federal cost share may be satisfied with in-kind or material contributions. The remaining percentage must be satisfied with cash contributions.

Section Ten
Plan Maintenance Process

Contents of this Section

10.1 Interim Final Rule Requirements for Plan Maintenance Process
10.2 Monitoring, Evaluating and Updating the Plan
10.3 Monitoring Implementation of Mitigation Actions
10.4 Reviewing Progress on Achieving Goals
10.5 Reviewing Progress on Activities and Projects
10.6 Plan Maintenance Progress

10.1 Interim Final Rule Requirements for Plan Maintenance Process

The Interim Final Rule (IFR) requires State Standard Hazard Mitigation Plans to include a section describing the plan maintenance process the State will use to ensure the plan remains current (§201.4(c)(5)(i-iii)). The IFR requirements cover three areas regarding the process of maintaining the plan once it is approved:

- Monitoring, Evaluating and Updating the Plan per Requirement §201.4(c)(5)(i): "[The Standard State Plan Maintenance Process must include an] established method and schedule for monitoring, evaluating, and updating the plan";
- Monitoring Implementation of Mitigation Measures and Project Closeouts per Requirement §201.4(c)(5)(ii): "[The Standard State Plan Maintenance Process must include a] system for monitoring implementation of mitigation measures and project closeouts"; and
- Reviewing Progress on Goals, Activities and Projects per Requirement §201.4(c)(5)(iii): "[The Standard State Plan Maintenance Process must include a] system for reviewing progress on achieving goals as well as activities and projects in the Mitigation Strategy."

It is important to note the differences between the first requirement and the other two. §201.4(c)(5)(i) focuses on the maintenance of the plan itself while §201.4(c)(5)(ii) and §201.4(c)(5)(iii) are both concerned with progress made in implementing the plan's recommendations.

10.2 Monitoring, Evaluating and Updating the Plan

By law, the Plan must be updated every three years prior to re-submittal to the Federal Emergency Management Agency (FEMA) for re-approval[1]. However, it is anticipated that over the next three years, there will be a need and a desire to update all or part of the plan on a more frequent basis. Therefore, the first part of this subsection describes the whole update process, including:

- Responsible parties
- Methods to be used
- Evaluation criteria to be applied
- Scheduling for monitoring and evaluating the plan

These descriptions are followed by an explanation of how and when the plan will be periodically updated.

[1] As noted previously, the State Plan must be updated and reapproved every three years but parish and municipal plans only need to be updated and reapproved by FEMA every five years.

Responsible Parties

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) is the state agency directly responsible for maintaining the plan. Within that agency, the State Hazard Mitigation Officer (SHMO) is the individual responsible for assuring that plan monitoring and evaluating are done in accordance with the procedures outlined in this section. The State Hazard Mitigation Team (SHMT) and the State Hazard Mitigation Planning Committee (SHMPC) are responsible for developing periodic updates to the plan.

Methods for Monitoring and Evaluating the Plan

On a quarterly basis (and as warranted by circumstances such as a major disaster declaration), GOHSEP will monitor the plan in order to assess the degree to which assumptions and underlying information contained in the plan may have changed. For example, GOHSEP will look for:

- Changes in the information available to perform vulnerability assessments and loss estimates. For example: as discussed in Section Nine, as parish and municipal risk assessments and plans are integrated into this Plan Update, GOHSEP will be soliciting feedback from parish and municipal emergency management directors about any changes in their real or perceived risks. Likewise, as the results of the 2010 census are released, GOHSEP might want to consider updating the risk assessment.
- Changes in laws, policies and regulations. For example: FEMA has discussed developing a Final Rule to refine the requirements for implementing the Disaster Mitigation Act of 2000 (DMA 2000).
- Changes in state agencies and/or their procedures, including GOHSEP and the administration of grant programs

The results of these monitoring efforts will be made available to the SHMT and SHMPC as they are produced.

Using the compiled results of ongoing monitoring efforts, the plan will be evaluated annually, generally starting in the month of January (unless circumstances indicate otherwise). GOHSEP will initiate the evaluations by contacting state agencies identified as responsible parties in the Mitigation Action Plan (see Section Eight), as well as other agencies and organizations that have been involved in developing the plan.

GOHSEP and the SHMT/SHMPC have the authority to determine if other organizations should also be involved in the process. The SHMT/SHMPC will be encouraged to include other agencies/organizations which have specific technical knowledge and/or data pertaining to risks.

The initial contacts will be made no later than December of each year for the first two years and in September in the third year (in anticipation of the required Plan Update for FEMA re-approval). The initial contact will advise the appropriate agencies/organizations that the plan will be re-evaluated in the coming months, and request their participation in the process.

GOHSEP also has the authority to evaluate and update the plan at times other than those identified in this section under the following general conditions: (1) After a major disaster declaration; (2) At the request of the Governor; or (3) When significant new information regarding risks or vulnerabilities is identified (per processes identified in Section Eight).

Plan Evaluation Criteria

The evaluations will consider several basic factors which are similar to those addressed in the monitoring process, and any additional review indicated by GOHSEP or the SHMPC. The factors that will be taken into consideration during these periodic evaluations of the plan include:

1. Changes in vulnerability assessments and loss estimations. The evaluation will include an examination of the analyses conducted for hazards identified in the plan and determine if there have been changes in the level of risk to the state and its citizens to the extent that the plan (in particular the strategies and prioritized actions the state is considering) should be modified.

2. Changes in laws, policies, or regulations. The evaluation will include an assessment of the impact of changes in relevant laws, policies, and regulations pertaining to elements of the plan.
3. Changes in state agencies or their procedures (in particular GOHSEP, which is responsible for maintaining the plan) that will affect how mitigation programs or funds are administered
4. Significant changes in funding sources or capabilities
5. Progress on mitigation actions (including project closeouts) or new mitigation actions that the state is considering

Updating the Plan

Updates will follow the original planning process outlined in Section Three of the Plan Update. The update process will entail a detailed and structured re-examination of all aspects of the original plan, followed by recommended updates. The update process will be undertaken by GOHSEP and assisted and monitored by the SHMT and SHMPC. The recommendations will be presented to the SHMT for consideration and approval. It is expected that the Governor will issue a letter of adoption for each update of the plan.

At a minimum, the plan will be updated and re-submitted to FEMA for re-approval every three years, as required by DMA 2000. The three-year update for FEMA re-approval will require that all the original steps outlined in Section Three be revisited to make sure the plan assumptions and results remain valid as a basis for further decision-making and priority-setting.

The plan will also be subject to interim updates as significant changes or new information is identified in the periodic evaluations described above. The degree to which the entire process is repeated will depend on the circumstances that precipitate the update. For example: the introduction of new data regarding vulnerability to one of the identified hazards might create the need for an update to the portion of the plan that relates to that specific hazard and nothing more.

GOHSEP will initiate, coordinate and lead all plan updates in conjunction with the SHMT/SHMPC. The next two paragraphs describe the procedures for interim and three-year updates, respectively.

Updates Resulting from Interim Evaluations

The nature of Plan Updates will be determined by the evaluation process described above. In general, GOHSEP will notify the SHMT that the agency is initiating an interim Plan Update, and describe the circumstances that created the need for the update (per the list in the Plan Evaluation Criteria section above). GOHSEP and the SHMT will determine if the SHMPC should be consulted regarding potential changes. If it is determined that the SHMPC should be involved, the nature of the involvement will be at the discretion of GOHSEP.

When interim updates are completed absent the involvement of the SHMPC, GOHSEP will advise all SHMPC members via email that the plan has been updated, and describe the nature of the update. In addition, GOHSEP will provide FEMA Region VI with a copy (although there is no requirement to have the plan re-approved by FEMA for interim updates).

Updates Related to the Required Three-year Plan Review

As required by the DMA 2000, the plan will be updated every three years and re-submitted to FEMA for re-approval. In those years, the evaluation process will be more rigorous, and will examine all aspects of the plan in detail. It is anticipated that several meetings of the SHMT and SHMPC will be required and that the Governor will formally re-approve the plan prior to its submission to FEMA.

Based on the three-year renewal requirements for Plan Updates, GOHSEP anticipates that the submission date for the required update will be approximately April 2014. Prior to that time, GOHSEP will contact SHMT and SHMPC members and other appropriate agencies/organizations to confirm a schedule for the Plan Update.

Scheduling Issues

The following basic schedule will be undertaken for monitoring, evaluating and updating the plan:

- At a minimum, monitoring activities by the GOHSEP should be done on a quarterly basis
- Notices regarding annual evaluations should be sent by GOHSEP to the SHMPC in December of the first two years of the plan and in September of the third year
- The timetable for evaluations and updates for the first two years is expected to last up to four months (January – April), and up to six months for the update in the third year for re-submittal to FEMA (November – April).

Note: The "Plan year" runs from May 1 to April 30 based on the original approval date of the Plan. This could be shifted in the next round of approvals to a more convenient or intuitive date (i.e., December 31), but that would require initiating the third year process four months earlier to allow adequate time for the full Plan update.

10.3 Monitoring Implementation of Mitigation Actions

Each mitigation project or activity has an established period of performance that GOHSEP and FEMA monitor throughout the development and execution of the activity. As described in the *State of Louisiana Administrative Guidelines and Procedures* (see Volume IV of the State of Louisiana Hazard Mitigation Strategy), GOHSEP uses the following system for monitoring mitigation projects and project closeouts.

Monitoring Mitigation Projects

Mitigation projects are generally monitored as follows:

- GOHSEP regularly meets with representatives from FEMA Region VI to coordinate project monitoring activities
- Every calendar quarter, GOHSEP sends letters to all subgrantees with open projects (i.e., ones that have been funded but are not completed), requesting a project progress update
- Each of the subgrantees responds to the GOHSEP request by preparing a standard report that details progress on individual mitigation projects and indicates a percent complete estimate
- GOHSEP compiles the subgrantee progress reports and produces a consolidated quarterly report that is sent to FEMA Region VI for review. The consolidated quarterly report identifies changes from previous reports, areas of concern, and strategies to address problems.

Monitoring Project Closeouts

Mitigation project closeouts generally occur in the following sequence. These procedures are established in the *State of Louisiana Administrative Guidelines and Procedures* - Volume IV of the State of Louisiana Hazard Mitigation Strategy in accordance with FEMA requirements for State Administrative Plans and Hazard Mitigation Grant Program (HMGP) guidelines as set out in the HMGP Desk Reference.

- Subgrantee indicates in a quarterly project progress report that a mitigation project is 100 percent complete
- GOHSEP reconciles the FEMA SmartLink account for the project (by disaster)
- GOHSEP initiates a comprehensive internal financial audit of the project
- GOHSEP works with subgrantees to resolve any issues discovered in the audit
- GOHSEP sends FEMA Region VI a closeout letter that identifies the final eligible cost of the project, de-obligations that are required, and any monies that will be recovered from the subgrantee

10.4 Reviewing Progress on Achieving Goals

Subsection 201.4 (c)(5(ii) of the IFR states that the State Hazard Mitigation Plan must include a system for reviewing progress on goals that are included in the Mitigation Action Plan (Section Eight).

GOHSEP will ensure that both the annual and three-year Plan evaluations include a detailed examination and analysis of the goals and the various actions that are intended to achieve them. Section Eight of the Plan Update describes four major hazard mitigation goals and describes various strategies and actions that the state is undertaking, or considering undertaking, to address the identified goals. In future versions of the plan, GOHSEP will indicate the status of the various actions and a general indication of progress.

GOHSEP will focus on progress to mitigate repetitive loss properties and especially severe repetitive loss properties as a priority, contributing to meeting Louisiana's requirements for increased federal match on Severe Repetitive Loss (SRL) and Flood Mitigation Assistance (FMA) grants under FEMA's Flood Mitigation Grants and Hazard Mitigation Planning Interim Rule, § 201.4(c)(3)(v).

10.5 Reviewing Progress on Activities and Projects

Subsection 201.4 (c)(5)(iii) of the IFR states that the plan must include a system for reviewing progress on activities and projects that are included in the Mitigation Action Plan.

As part of the yearly and three-year evaluations and updates to this plan, GOHSEP will initiate a review of all activities and projects noted in the Mitigation Action Plan. The review will take place in five stages:

1. In cooperation with the SHMPC and SHMT, GOHSEP's Hazard Mitigation Planning Section will undertake a preliminary review and analysis of progress on activities and projects that are listed in Section Eight
2. GOHSEP's Hazard Mitigation Planning Section will prepare a draft report that describes progress, remaining tasks, and projected time to complete the tasks
3. The draft report will be presented to the SHMPC during the meeting(s) related to the yearly (and three-year) updates
4. After SHMPC review, comment, and approval, results of the progress review will be included as a new or updated column in the tabulation of mitigation goals and actions in Section Eight
5. If requested by FEMA, GOHSEP will prepare a summary report describing the results of the review

10.6 Plan Maintenance Progress

Few states have had to deal with multiple disasters of the complexity and scale of Hurricanes Katrina and Rita, as well as subsequent disasters such as Hurricanes Gustav and Ike, and the more recent Deepwater Horizon oil spill. The result is that the monitoring and evaluation process identified in the April 2008 Plan was not executed as described. However, the State of Louisiana has made progress in accomplishing its 2008 HMP goals and objectives as detailed below.

Goals identified in the April 2008 Plan include:

- Goal 1 – The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact
- Goal 2 – The State of Louisiana will improve data collection, use and sharing to reduce the impacts of hazards
- Goal 3 – The State of Louisiana will improve capabilities and coordination at the municipal, parish, regional and state level to plan and implement hazard mitigation projects
- Goal 4 – The State of Louisiana will continue to pursue opportunities to reduce impacts to the state's constructed and natural environment through mitigation of repetitive and severe repetitive loss properties and other appropriate construction project and related activities.

The following represents progress directly related to these Goals:

- The FEMA funded Community Education and Outreach (CEO) initiative focuses on implementing public education and outreach efforts across multiple mediums targeting residents, businesses, local government, state agencies, tribal governments and other eligible sub applicants for non disaster hazard mitigation grant

funding and the post-disaster Hazard Mitigation Grant Program. It primarily supports SHMP Goal 1. However, CEO Goals, Objectives and Strategies also have an ongoing and positive impact on SHMP Goals 2, 3 and 4 through broad-reaching hazard mitigation education and awareness building that creates a positive environment where success of all SHMP is facilitated. This $25 million effort to promote awareness of the benefits of hazard mitigation strategies in building stronger, safer and more resilient communities — better able to withstand future disasters, and funding opportunities that support the implementation of local hazard mitigation projects has made significant achievements in its first 18 months of implementation. Major milestones include:

- *Communications Contractor Selection.* The FEMA CEO grant award was made to the State of Louisiana. Communications Contractor selection (SIDES & Associates) for the initial CEO initiative was completed May 18, 2009 putting into place strategic planning and limited implementation support for CEO strategies.
- *CEO Strategic Plan and Progress Brief.* A DRAFT strategic plan and report on CEO progress was completed October 2010, and is in circulation for review and comment. Developed by the CEO Team, the plan articulates CEO accomplishments and updates CEO implementation priorities, making recommendations for funding for key CEO initiatives over the remaining grant period.
- *Awarding of Sub Grants.* Two 2) sub grants have been awarded to date. The NIMSAT sub grant supports the SHMP GOAL #2 (information collection and sharing) and the UNO-CHART sub grant support SHMP GOALS #1, #3 and #4 (targeted education and outreach).
    - On June 30, 2010 GOHSEP awarded an $825,000 grant to National Incident Management Systems and Advanced Technologies (NIMSAT) Institute for data collection and reporting. Work includes development of a statewide database to collect and house hazard-related information. Basic design of the web portal and key navigational features are in progress. Key activities in progress include:
        - Development and implementation of a parish profile tool to be completed by local Regional and OEP Directors.
        - Development of a process for local leadership (OEP Directors or their designee) to provide locally-based real time and post-disaster situational awareness to add to vulnerability, risk assessment and impact data currently included in the (National Climate Data Center [NCDC[data base).
        - Creation of a web portal with both public and non-public (restricted) access.
            - The restricted access side will be exclusively available to the emergency management community so it can provide ongoing and current local hazard-related data to a central statewide information pool, download parish-specific hazard information including maps and other tools that aid in the updating of local hazard mitigation plans and provide valuable easy to retrieve data needed when applying for hazard mitigation grants. The information will inform the disaster declaration process at the national level.
            - The public side will inform citizen decision-making by providing easy access to local vulnerability and risk assessment information.
    - In 2008 UNO-CHART received an award for $866,312. The grant provides funding support for five (5) key initiatives:
        - Identification of local and regional best practices in continuity contingency planning and mitigation for community organizations (businesses, government agencies, faith-based organizations and non profits).
        - Development of a campus-wide coastal hazards resiliency curriculum and hazard mitigation planning curriculum.

- In partnership with existing programs, development of an education program focused on disaster and literacy.
- Plan and implement a disaster resilient university statewide conference.
- Outreach and education to executive level officials and civic leaders to develop strong leadership and competence in hazards management (*Executive Symposium in Hazard Mitigation and Storm Risk Management*).

- *Branding.* To facilitate internal, public and target-audience receptivity to hazard mitigation messaging, several brands have been created and implemented:
  - *Educate to Mitigate* is the brand under which all CEO efforts are implemented. Private sector partners and sub grantees will use this brand on to identify all CEO produced and/or funded materials.
  - *Louisiana Hazard Information Portal* is the brand created to identify the NIMSAT created web-based data collection, storage and retrieval tool.
  - *Louisiana Mitigation Makeover* is the co-brand developed to support the major public outreach initiative that includes significant paid media, trade and conference show participation, television broadcast series and public outreach print materials.
  - *Unique co-brands are created for unique programs.* For example, the *Executive Symposium* hosted by UNO-CHART under its sub grant, will carry a uniquely created logo to set this program apart from all others. Similarly a unique look is being created for the *Disaster Recovery University* program also hosted by UNO-CHART.
- *Public Outreach*. Supporting especially SHMP Goal 1, CEO initiatives for public outreach had been primarily on two (2) fronts during this time period:
  - To raise mitigation awareness among general audiences, the CEO initiative has made good use of the partnerships with the Louisiana Association of Broadcasters (LAB) and the Louisiana Press Association (LPA): 21 newspaper ads produced and placed; 20 radio spots produced and aired; 20 TV SPOTS produced and aired; 20 web banners have been posted. The value of exposure through both partnerships has continued to meet the requirements of the CEO grant match of $6+ million. Messaging has been created to empower Louisiana citizens to better decision and take personal responsibility for the safety of their families and property by providing mitigation "how to" information.
  - CEO has designated getagameplan.org as the single web portal for all GOHSEP hazard mitigation messaging. The getagameplan mitigation web page has been updated and the companion GOHSEP mitigation web page to facilitate public and local government access to and use of important mitigation-related information.
- *GOHSEP-Conducted CEO Regional Meetings.* The centerpiece of mitigation education to date has been the planning and implementation of regional meetings targeted professional staff of elected officials. Regional meetings support SHMP Goals 1, 3 and 4. Regional meeting Outcomes were to:
  - Increase awareness of mitigation-related grant opportunities.
  - Remove perceived barriers within the application process.
  - Better connect communities with GOHSEP hazard mitigation staff who can help them do mitigation planning and apply for grants.

CEO Objectives were to:

- Encourage more hazard mitigation grant applications.
- Receive better quality applications.
- Strengthen relationships between GOHSEP staff and local authorities and prospective applicants.

Regional meetings were developed as a series of workshops to train participants on key steps and the principles underlying the grant and grant application process. The workshops offered overviews of:

- Risk throughout Louisiana and an identification of the 11 risks called out in the SHMP.
- The role and importance of mitigation planning.
- The four (4) non-disaster grants available annually and the Hazard Mitigation Grant Program (HMGP) available after a presidentially declared disaster.
- Other mitigation-related federal funding and technical assistance resources.
- Benefit Cost Analysis (BCA) and its role in the hazard mitigation grant application process.
- The grant application process including a hands-on workshop on completing Scope of Work (SOW) and key budget components.
- Project management, procurement and recordkeeping requirements.

To date, 344 participants have gone through the statewide regional meeting training, resulting in an increase in grant applications received by GOHSEP. As a by-product of regional meeting planning and outreach targeted to prospective attendees, GOHSEP now has the beginnings of a robust database with more than 5,112 contact names, 2,956 email addresses, 3,562 phone numbers and 1,035 fax numbers. GOHSEP has a rich contact tool that can be reused for future messaging. Registration numbers were robust, significantly outpacing similar previous efforts from similar organizations: Meeting #1: 81 registrants (Regions 2 + 9); meeting #2: 66 registrants (Regions 1 + 3); meeting #3: 67 registrants (Regions 4 + 5); meeting #4: 75 registrants (Regions 7 + 8); meeting #5: 53 registrants (Region 6).

The CEO Team is in the process of analyzing grant application trends and will shortly have a complete report that identifies grants received as result, in part or in total, of the regional meeting training. Since June 27, 2010 (the day of the first meeting), GOHSEP has received more than 10 new grant applications, that can be directly attributed to the regional meetings, five (5) new inquiries and one (1) new municipal planning effort. Once the analysis is complete we expect to report a significantly higher number.

- *GOHSEP Staff Receiving Presentations and Communications Skills-Building Training.* As an added value component, regional meeting outreach and in preparation for the workshops, more than 20 GOHSEP employees received presentation and communications training to support their participation in workshop training, building important capacity for ongoing CEO outreach after that funded by the current grant is complete.

- *Mitigation Education Tools.* In addition to newspaper, television and radio messaging and a redesigned mitigation page on the getagameplan.org web site, the CEO initiative has produced several first-of-their-kind, best-practices mitigation education tools. And more are in the works. Tools completed to date were developed to support the regional meetings and workshops and have a secondary use as training tools for GOHSEP new hires, to address gaps in program education resulting from staff turnover of key points-of-contacts at the parish level, and to offer to those new to mitigation planning and the grant application process. Those tools include:

        - FAQ on the CEO program.
        - Mitigation "carry card."
        - *Big 5: Funding Hazard Mitigation Workbook.*
        - *Funding Hazard Mitigation Resource Reference* (3-ring "how to" binder for mitigation grant applications).
        - A series of "how to" PowerPoints identifying Louisiana hazard mitigation risks and instructing professional staff on hazard mitigation planning, grant writing and project management.
    - It is important to note that institutionalizing of practices is occurring beyond that accomplished through GOHSEP staff CEO presentation training. Additional institutionalization is occurring by making training and educational materials available via print and the internet to the public, businesses, mitigation practitioners, State agencies and other prospective, current grant applicants and others. A training "how to" video is being developed to capture the information and tutorials offered in the regional meeting workshops and a webinar is currently being considered as an additional sub grant funded initiative.
    - It is also important to note that CEO outreach is facilitating coordination between GOHSEP and parish and municipal governments and other eligible sub applicants as well as State agencies by raising awareness of the assistance that GOHSEP provides in identifying and preparing mitigation project applications and developing or updating hazard mitigation plans. The recently held workshops provided opportunities for participants to coordinate with each other and learn best mitigation practices and standards such as repetitive loss-focused project prioritization, benefit cost analysis (BCA) techniques, cost-estimation methodologies, data resource identification and more.
- Progress on goals 1, 2, 3 and 4 has been made by GOHSEP Hazard Mitigation (HM) and contract staff who have participated in more than 3200 meetings, site visits, conference calls, and training sessions with state agencies, parishes, municipalities and other eligible groups from 2007-2010, in support of hazard mitigation program actives, education and outreach, and technical assistance. Between July 2007-October 2009, over 2000 HMGP technical assistance visits were made state wide and another 454 planning assistance visits.
    - GOHSEP staff are participating in CEO workshops; the L242 Unified Hazard Mitigation Grant Assistance Application Development Course; and other education and outreach efforts associated with the Hazard Mitigation Program and Technical Assistance. GOHSEP HM and contract staff also participated in a series of 4 seminar/disaster fairs held throughout the state in 2009 targeting state agencies, parish and local government, and other eligible subapplicants to educate them about the HM program and other available GOHSEP assistance.
    - GOHSEP staff participation in workshops, training, conferences, and seminars focus on education and outreach about assistance that GOHSEP can provide; mitigation measures; the application process; program progress; program success stories; and best mitigation practices
    - GOHSEP technical assistance includes site visits to provide engineering expertise to identify cost effective mitigation projects; perform site inspections; provide assistance with developing cost estimates and benefit cost analysis; provide data; and assist in applying hazard identification and risk analysis methodologies
    - GOHSEP assisted in the application process for all 64 parishes; 9 state agencies; 1 university; and 1 tribe, whose combined hazard mitigation grant awards have totaled over $1 billion
    - Over $597 million in HMGP and PDM grant funds have be awarded to state agencies with the assistance of GOHSEP in identifying mitigation projects and developing grant applications
    - GOHSEP planning staff participates in the development or update of all parish, municipal, and other eligible entities' hazard mitigation plans by attending planning and public meetings; providing guidance on the identification of stakeholders; advising them on state mitigation priorities; advising

them on FEMA mitigation plan requirements; and reviewing developed plans. GOHSEP tracks the status of all hazard mitigation plans during the development and update process. Nine new parish hazard mitigation plans have been written; 48 parish hazard mitigation plan updates have been completed or are underway; and 1 regional planning effort is underway.

  - Through the FEMA Planning Pilot Grant Program, GOHSEP assisted 58 parishes, cities, and universities in updating HMPs and scoping mitigation projects. Efforts included meeting facilitation, plan guidance and review, and technical assistance in mitigation project scoping.
  - GOHSEP pursues outreach through their website, email, and mail to encourage participation in mitigation and to solicit mitigation projects from parishes, municipalities, state agencies, and other eligible subapplicants.
- Other efforts and accomplishments addressing Goal 1 include:
  - GOHSEP works with LSU AgCenter, sharing information and coordinating efforts related to mitigation, floodplain maps, mitigation measures, and recovery
  - Development of "Let's Mitigate Louisiana" print materials and website to educate the public about mitigation practices, the benefits of mitigation, and mitigation success stories
  - State agencies are participating in SHMP update efforts, improving their capabilities in identifying and development mitigation projects
  - The Office of Community Development (OCD) has established a grant program designed to foster collaboration between land use planning and emergency management
- Other initiatives addressing Goal 2 include:
  - 5% project funding for a Statewide Alert and Warning System to provide emergency alert portals and receivers to parishes, universities, GOHSEP, and state police ($5.2 million - 30% complete)
  - 7% project funding for Statewide Spatial Data Imagery Development ($9.5 million - 5% complete)
  - Ongoing statewide data coordination efforts (Virtual LA, LOSCO, LAGIC)
- Other initiatives addressing Goal 3 include:
  - State agencies are participating in SHMP update efforts, and are improving coordination between agencies and GOHSEP
  - The OCD has established a grant program designed to foster collaboration between land use planning and emergency management
  - 5% project funding for the Public Safety Code Enforcement Project, a $14 million effort to provide technical assistance to local code enforcement of ICC code statewide, and to provide for staffing, training, and equipment
- Additional efforts addressing Goal 4 include:
  - 5% project funding for the Public Safety Code Enforcement Project, a $14 million effort to provide technical assistance to local code enforcement of ICC code statewide, and to provide for staffing, training, and equipment
  - *The Road Home* program is designed to provide compensation to Louisiana homeowners affected by Hurricanes Katrina or Rita for the purpose of rebuilding or relocating their homes, and to facilitate the restoration of affordable rental units. To date, over 120,000 applicants have been awarded $8.58 billion in benefits. The program also provides education and assistance to homeowners who are rebuilding or relocating, and provides building professionals with training and the construction and design resources needed to assist *Road Home* applicants.
  - The state has made significant progress in mitigating repetitive loss and severe repetitive loss properties. Through non-disaster mitigation programs, 526 such properties have been successfully mitigated
  - Statewide implementation of the ICC code

- Statewide participation in US Army Corps of Engineers flood damage reduction and levee improvement efforts
- State participation in the Smart Levee initiative to develop remote levee monitoring capabilities
- DNR and LDAF programs targeting ecosystem restoration projects that strive to maintain and expand the natural protection from hurricanes provided by the Louisiana coastal marshes and wetlands

Annex L contains the database developed to track progress and accomplishments associated with April 2008 Plan Goals as well as imagery and documents supporting the accomplishments identified.

Monitoring the implementation of mitigation activities, reviewing the progress toward attaining the goals of the April 2008 Plan, and reviewing progress on implementing activities and projects are similar. In the absence of any experience with the monitoring and evaluation process to determine if any aspects are not effective, no changes in these procedures have been proposed in this Plan Update.

One perceived shortcoming identified in the April 2008 Plan will be addressed in this Plan Update: to clearly define the responsible parties within GOHSEP for follow-through on these activities and the continuing role of the SHMT and SHMPC. In general terms, the SHMO is ultimately responsible for maintaining the plan, but GOHSEP will be developing specific amendments and administrative guidance for existing job descriptions of GOHSEP staff. Said administrative guidance will determine when to involve the SHMT and SHMPC and is intended to ensure clear lines of plan maintenance responsibilities. Such administrative guidance is also intended to ensure that periodic reviews and evaluations are performed in a timely manner. The recent implementation of coordinated procedures for grant administration within GOHSEP will provide tracking of the location, progress, and completion of individual subgrants and will allow GOHSEP to determine losses mitigated from future disaster events. These procedures will be further refined in a scheduled revision to the *State of Louisiana Administrative Guidelines and Procedures* (identified as Volume IV of the State of Louisiana Hazard Mitigation Strategy in Section 1.3), which support the plan maintenance process.

Appendix A:
Acronyms and Definitions

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Appendix A.1
Acronyms

A

AASHTO	American Association of State Highway and Transportation Officials
ABFE	Advisory Base Flood Elevation
ACS	American Community Survey
ADA	Americans with Disability Act
ADCIRC	ADvanced CIRCulation model
AEL	Annual Estimated Loss
AICP	American Institute of Certified Planners
APA	American Planning Association
ARC	American Red Cross
ASCE	American Society of Civil Engineers

B

BCA	Benefit-cost analysis
BOCA	Building Officials and Code Administrators
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BMP	Best Management Practices
BRV	Building Replacement Value

C

CBR	chemical/biological/radiological
CDBG	Community Development Block Grants
CDC	U.S. Centers for Disease Control and Prevention
CED	Coastal Engineering Division of Louisiana OCRM
CEM	Comprehensive Emergency Management
CEO	Community Education and Outreach
CERT	Citizens Emergency Response Team
CF	Criticality Factor
CFR	Code of Federal Regulations
CI/KR	Critical Infrastructure and Key Resources Program of DHS
CIAP	Coastal Impact Assistance Program
CMD	Coastal Management Division of Louisiana DNR
COOP	Continuity of Operations Plan
CPI	Consumer Price Index
CPGP	Calcasieu Parish Groundwater Project
CPRA	Louisiana Coastal Protection and Restoration Authority
CRD	Coastal Restoration Division of Louisiana OCRM
CRMS	Coastwide Reference Monitoring Systems
CRS	Community Rating System
CRT	Louisiana Department of Culture, Recreation, and Tourism
CUP	Coastal Use Permit
CUSEC	Central United States Earthquake Consortium
CVI	Coastal Vulnerability Index
CWPP	Community Wildfire Protection Plan

CWPPRA	Coastal Wetlands Planning, Protection and Restoration Act
CWRP	Coastal Wetland Reserve Program of Louisiana DNR
CZM	Coastal Zone Management Grants Program
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Plan

D

D&B	Dun and Bradstreet
DAF	Louisiana Department of Agriculture and Forestry
DDF	Depth-Damage Function
DED	Louisiana Department of Economic Development
DEQ	Louisiana Department of Environmental Quality
DFIRM	Digital Flood Insurance Rate Map
DHH	Louisiana Department of Health and Hospitals
DHS	U.S. Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000
DNR	Louisiana Department of Natural Resources
DOA	Louisiana Division of Administration
DOC	Louisiana Department of Corrections
DOQQ	Digital Orthophoto Quarter Quadrangle
DOS	Department of State
DOTD	Louisiana Department of Transportation and Development
DR	Disaster Recovery (Division at GOHSEP)
DSS	Louisiana Department of Social Services
DWF	Louisiana Department of Wildlife and Fisheries

E

EDA	U.S. Economic Development Agency
EMA	Emergency Management Agency
EMAP	Emergency Management Accreditation Program
EMI	Emergency Management Institute
EMS	Emergency medical Service
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
EPM	Emergency Program Manager
ESF	Emergency Support Function
ESRI	Environmental Systems Research Institute
ETL	Engineer Technical Letter

F

F	Degrees Fahrenheit
FBI	U.S. Federal Bureau of Investigation
FEMA	U.S. Federal Emergency Management Agency
FFE	First Floor Elevation
FHBM	Flood Hazard Boundary Map
FIA	Flood Insurance Administration
FIMA	Flood Insurance Management Agency

FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance grant program
FPC	Facility Planning and Control
FPI	Fire Potential Index
FPMS	FloodPlain Management Services
fps	feet per second
FY	Fiscal Year

G

GAO	Government Accounting Office
GIS	Geographic Information System
GOCA	Louisiana Governor's Office of Coastal Activities
GOHSEP	Louisiana Governor's Office of Homeland Security and Emergency Preparedness
GORD	Louisiana Governor's Office of Rural Development
GPS	Global positioning system
GSA	U.S. General Services Administration

H

HAZMAT	Hazardous material
HAZUS	Hazards U.S.
HAZUS-MH	Hazards U.S. – Multi-Hazard
HH	Household (US Census)
HIDF	Hazardous Materials Incident Damage Function
HIRA	Hazard Identification and Risk Assessment
HMP	Hazard mitigation plan
HMGP	Hazard Mitigation Grant Program
HMTAP	Hazard Mitigation Technical Assistance Program
HUD	U.S. Department of Housing and Urban Development

I

IA	Individual Assistance program
IBC	International Building Code
IBHS	Institute for Building and Home Safety
ICC	International Code Council
ICS	Incident Command System
IDDF	Inundation Depth-Damage Function
IEB	Interim Emergency Board
IEMS	Integrated Emergency Management System
IFG	Individual and Family Grants
IFLOWS	Integrated Flood Observing and Warning System
IFR	Interim Final Rule of DMA 2000
IRC	International Residential Code
ISDF	Ice Storm Damage Function

L

LaGIC	Louisiana Geographic Information Center

LAMAP	Louisiana Mosquito Abatement Program
LaNG	Louisiana National Guard
LCA	Louisiana Coastal Area
LCCC	Local Citizen Corps Committees
LCDBG	Louisiana Community Development Block Grant
LCRP	Louisiana Coastal Resources Program
LDAF	Louisiana Department of Agriculture and Forestry
LDI	Louisiana Department of Insurance
LEADA	Louisiana Emergency Assistance and Disaster Act
LEM	Local Emergency Management
LEPC	Local Emergency Planning Committee
LFMA	Louisiana Floodplain Management Association
LF	Linear Feet/ Foot
LGISC	Louisiana Geographic Information System Council
LLDF	Land Loss Damage Function
LMCA	Louisiana Mosquito Control Association
LOF	Loss of Function
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
LPDES	Louisiana Pollutant Discharge Elimination System
LPZ	Levee Protection Zone
LRA	Louisiana Recovery Authority
LRCP	Louisiana Coastal Resources Program
LSU AgCenter	Louisiana State University -Agricultural Center
LSU	Louisiana State University
LSUCCC	Louisiana State Uniform Construction Code Council
LTCR	Long-term Community Recovery

M

MEOW	Maximum Envelope of Water
MOA	Memorandum of Agreement
MOM	maximum of the maximum
MOU	Memorandum of Understanding
MMI	Modified Mercalli Index
MMP	Map Modernization Program
mph	miles per hour
mps	meters per second
MSL	Mean sea level

N

NBC	Nuclear, Biological, Chemical
NBI	National Bridge Inventory
NCDC	National Climatic Data Center
NDSP	National Dam Safety Program
NED	National Elevation Dataset
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NFIRA	National Flood Insurance Reform Act
NHC	National Hurricane Center
NIBS	National Institute of Building Sciences

NID	National Inventory of Dams
NIMS	National Incident Management System
NIST	National Institute of Standards and Technology
NITF	National Insurance Task Force
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRC	Nuclear Regulatory Commission (U.S)
NRCS	Natural Resources Conservation Service
NTSB	National Transportation Safety Board
NWS	National Weather Service

O

OCD	Office of Community Development of Louisiana DOA
OCPR	Office of Coastal Protection and Restoration
OCRM	Office of Coastal Restoration and Management of Louisiana DNR
OCS	Outer Continental Shelf
OEP	Office of Emergency Preparedness
OFPC	Office of Facility Planning and Control of Louisiana DOA
OHS/EP	Office of Homeland Security / Emergency Preparedness
OMB	Office of Management and Budgets of Louisiana DOA
OPA	Oil Spill Pollution Act of 1990
OPB	Office of Planning and Budget of Louisiana DOA
OPH	Office of Public Health of Louisiana DHH
ORM	Object-Relational Mapping

P

PA	Public Assistance grant program
PCWRP	Parish Coastal Wetlands Restoration Program
PDM	Pre-Disaster Mitigation grant program
PDM-C	Pre-Disaster Mitigation Competitive Grant Program
PGA	Peak Ground Acceleration
PL	Public Law
PNP	Private Non-Profit
PPE	Personal Protective Equipment
PPGP	Planning Pilot Grant Program
PSA	Public Service Announcement
PUD	planned urban (or unit) development
PW	Project Worksheet

Q

Q3	Digital Quality Level 3 Flood Data

R

RACES	Radio Amateur Civil Emergency Service
RCRA	Resource Conservation and Recovery Act
RFC	Repetitive Flood Claim program
RL	Repetitive flood loss properties
RMP	Risk Management Programs

S

SARS	severe acute respiratory syndrome
SBA	U.S. Small Business Administration
SBC	Standard Building Code
SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SHMPC	State Hazard Mitigation Planning Committee
SHMT	State Hazard Mitigation Team
SHPO	State Historic Preservation Officer
SLOSH	Sea, Land, and Overland Surges from Hurricanes Model
SoVI	Social Vulnerability Index
SPH	Standard Project Hurricane
Sq mi	square miles
SRL	Severe Repetitive Flood Loss property
SSDF	Storm Surge Damage Function
STI	Synergos Technologies, Inc
SWCC	Soil and Water Conservation Committee
SWCD	Soil and Water Conservation District

T

TND	traditional neighborhood development
TRI	Toxic Release Inventory

U

UCC	Louisiana State Uniform Construction Code
UGB	Urban Growth Boundary
UNO	University of New Orleans
USB	Urban Service Boundary
USACE	U.S. Army Corps of Engineers
USBC	Uniform Statewide Building Code
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forestry Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
UST	Underground Storage Tank

V

VOAD	Volunteer Organizations Active in Disaster

W

WDF	Wind Damage Function
WMD	Weapons of Mass Destruction
WRDA	Water Resources Development Act
WSCF	Wildfire Suppression Cost Functions
WUI	Wildland Urban Interface

Appendix A.2
Definitions

The following terms are used throughout the Plan, but are not necessarily defined when they occur. Many of the definitions provided below are based on FEMA's State and Local Mitigation Planning How-to Guides (FEMA 386-1, 2, and 7) and the American Planning Association publication, *Planning for Post-disaster Recovery and Reconstruction* (Schwab 1998).

Words that are shown in **Boldface** the first time they occur in the definitions are also defined in this sub-appendix.

0.2% Flood
Also known as the "**500-year flood**", this is a flood event having a 0.2 percent chance of being equaled or exceeded in any given year.

1% Flood
Also known as the "**100-year flood**" or "base flood", this is a flood event having a 1 percent chance of being equaled or exceeded in any given year. This is the most common reference point for flood events because it is used for regulatory purposes in the **National Flood Insurance Program (NFIP)**.

100-Year Flood
See **1% Flood**.

406 Mitigation
Hazard Mitigation Funding under section 406 of Stafford Act used for the repair, restoration and replacement of damaged facilities.

500-year Flood
See **0.2% Flood**

Acceleration
The rate of change of **velocity** with respect to time.

Accretion
Sediment movement that occurs when more sediment is deposited along a particular area (*e.g.*, a stream bank or shoreline) than is lost due to erosion.

Acquisition (of hazard-prone structures)
The process by which local governments may gain possession of lands and other property in high hazard areas through the use of conservation easements, purchase of development rights, or outright purchase of the property.

Asset
Any manmade or natural feature that has value, including but not limited to: people; buildings; infrastructure such as bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.

Asset Inventory

An assessment of community assets that are located in each hazard area. This assessment should include information about the asset locations, types, function, value, contents (if applicable), and the population of the jurisdiction that may be affected by each hazard event. An estimation of the effect on the jurisdiction of the loss of or damage to this asset also should be considered.

Average Daily Operating Budget

The average cost to operate a facility for one day (including wages, overhead, inventory, etc.)

Base Flood

See 1% Flood.

Base Flood Elevation (BFE)

The elevation of the Base Flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The Base Flood Elevation is used as a standard for the National Flood Insurance Program (NFIP). The Base Flood is the flood that has a 1% chance of being equaled or exceeded in any given year. The Base Flood is also referred to as the 100-Year Flood.

Base Map

A map used as a bottom "layer" for risk assessment and hazard analysis. This map should be planimetric and should be as complete, accurate, and current as possible. Other than distinguishable buildings, roads, rivers, coastlines, place names, and a north arrow, the base map should be as uncluttered as possible.

Bedrock

The solid rock that underlies loose material such as soil, sand, clay, or gravel.

Benefit-cost Analysis

A systematic, quantitative method of comparing the projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Berm

A small embankment or "mini levee" which may or may not be constructed in the context of a larger levee system. In the context of a levee system, a berm is a specific component of a levee and serves a specific design purpose.

Building

A structure falling under any of the following descriptions: having two or more outside rigid walls and a fully secured roof, that is affixed to a permanent site; a Manufactured Home; a travel trailer without wheels, built on a chassis and affixed to a permanent foundation. "Building" does not mean a gas or liquid storage tank or a recreational vehicle, park trailer, or other similar vehicle, except as described above.

Capability Assessment

An assessment that provides a description and analysis of a community's or state's current capacity to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community's or state's ability to address specific hazards or threats.

Channelization

The practice of hardening (and more often than not, straightening) the banks of a river or stream to ensure that its path remains predictable and controlled.

Coastal High Hazard Area

As defined under the NFIP, this is an area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high-velocity wave action from storms or seismic sources.

Coastal Zone

The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas having direct drainage to the ocean.

CoBRA

Coastal Barrier Resources Act enacted in 1982. The CoBRA, while not prohibiting privately financed development, prohibits most new Federal financial assistance, including flood insurance, within an area designated as part of the Coastal Barrier Resources System (CBRS).

Community

As defined for the purposes of the NFIP, a community is any State, area, or political jurisdiction or any Native American tribe, authorized tribal organization, Alaska native village, or authorized native organization that has the authority to adopt and enforce floodplain management ordinances for the area under its jurisdiction. See also Local Government.

Community Rating System (CRS)

A voluntary system under the NFIP in which communities undertake planning and regulatory activities beyond NFIP minimum requirements to obtain credits that earn premium reductions for flood insurance for their residents and property owners. These activities are delineated in the CRS guidelines but include four general categories: public information; mapping and regulatory activities; flood damage reduction; and flood preparedness. The premium reductions come in a series of 5 percent steps based on points earned under the system.

Comprehensive Emergency Management (CEM)

A framework for planning, organizing, and managing emergency protection efforts. There are four recognized phases in the all-hazards approach; mitigation, preparedness, response, and recovery.

Consequences

The damages (full or partial), injuries, and losses of life, property, environment, and business resulting from a hazard event that can be quantified by some unit of measure, often in economic terms.

Constriction

In a Floodplain, re-grading, or filling within or on the edge of a floodplain, that obstructs flood flows, backing up floodwaters onto upstream and adjacent properties. Constrictions also increase the velocity of floodwater downstream of the constriction, and reduce the floodplain's ability to store excess water, sending more water downstream and causing floods to rise to higher levels.

Content Loss

Part of the Loss Estimation process, this value represents the total dollar value loss to the contents of a structure as a result of damage from a hazard event. This value (for each affected structure) is equal to the Content Value of the structure multiplied by the percent damage experienced by those contents from the hazard event.

Content Value

As part of an asset inventory, this is an estimate of the costs associated with loss of a building's inventory. This value is usually estimated as a percentage of a facility's Replacement Value, depending on the Occupancy Class of the facility.

Contour

A line of equal ground elevation on a Topographic map.

Cost-effectiveness

One evaluation criteria for Federal grant programs. FEMA defines a cost-effective project as one whose long-term benefits exceed its costs. That is, a project should prevent more expected financial loss that it costs initially to fund the effort. Benefit-cost analysis is one way to illustrate that a project is cost-effective.

County (see "Parish")

Critical Facility

Any facility or building that is considered vital to the health, safety, and welfare of the population and the use of which is especially important following hazard events. Critical facilities include, but are not limited to: (1) essential facilities required to maintain emergency response actions, (2) lifeline services (*e.g.*, shelters, potable water supplies, health facilities), (3) public safety (*e.g.*, police and fire stations), (4) facilities that may cause devastating financial or safety conditions if shut down for more than one week, (5) locations that house irreplaceable items, records, equipment, or research, (6) locations that house a special population that requires particular social services on site not needed by the general public (*e.g.*, prisons, nursing home, and advanced care facilities), or (7) facilities that have a special historic or other character.

Critical Fire Weather

A set of weather conditions, usually a combination of wind and low relative humidity, whose effects on fire behavior make fire control difficult and threaten firefighter safety.

Debris

The scattered contents and structural material of homes, businesses, and other structures broken or destroyed in a hazard event. Debris caused by a wind or water hazard events can cause additional damage to other community assets.

Depth of Flooding

The difference between the Base Flood Elevation and the Lowest Floor Elevation.

Design Wind Speed

The wind velocity for which structures in a specific Design Wind Speed Zone must be constructed to withstand. The American Society of Civil Engineers (ASCE) determines the Design Wind Speeds and Zones.

Design Wind Speed Zone

A zone throughout which the Design Wind Speed, as determined by the ASCE, is consistent. There are four zones in the U.S.: Zone I (winds up to 130 mph); Zone II (winds up to 160 mph); Zone III (winds up to 200 mph); and Zone IV (winds up to 250 mph).

Digital Flood Insurance Rate Map (DFIRM)

A Flood Insurance Rate Map that has been updated and produced in digital format for use in GIS and internet applications.

Digital Orthophoto Quarter Quadrangle (DOQQ)

A computer-generated image of an aerial photograph in which displacements caused by camera orientation and terrain have been removed. These products combine the image characteristics of a photograph with the geometric qualities of a map and can be used in numerous GIS applications either alone or in combination with other digital data.

Disaster

A dangerous event that causes significant human and economic loss and demands a crisis response beyond the scope of any single agency or service such as the fire department or police.

Disaster Mitigation Act of 2000 (DMA 2000)

The DMA 2000 (PL 106-390), signed into law October 10, 2000, amends Section 409 of the Stafford Act, reinforces the importance of mitigation planning, and emphasizes planning for disasters before they occur. It establishes a pre-disaster mitigation program and provides new requirements for the Hazard Mitigation Grant Program (HMGP). A complete copy of this Act is provided in the appendix to this Plan.

Displacement Cost

The overall dollar amount it would cost for the function of a facility, business, or service to be relocated to another structure because of a hazard event.

Displacement Cost per Day

Part of the Loss Estimation process, this is the average cost per day for a facility to be relocated to a temporary facility as a result of a hazard event. This value can be estimated by dividing the Displacement Cost by the Displacement Time.

Displacement Time

The average time (in days) that a building's occupants typically must operate from a temporary location while repairs are made to the original building due to damages resulting from a hazard event.

Duration

The length of time a hazard event lasts.

Earthflow

A type of Landslide generally characterized as a combination of a Slump and a Mudflow.

Earthquake

A sudden motion or trembling that is caused by a release of strain accumulated within or along a fault. See also Ground Motion.

Earthquake Focus

The true center of an earthquake.

Emergency

As defined in the Stafford Act, "any occasion or instance for which, the determination of the President, federal assistance is needed to supplement State and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States."

Emergency Management

Organized analysis, planning, decision making, and assignment of available resources to mitigate, prepare for, respond to, and recover from the effects of all hazards.

Emergency Response Plan

Also known as an emergency operations plan, this is a document that contains information on the actions that may be taken by a governmental jurisdiction to protect people and property before, during, and after a disaster.

Epicenter

The point on the earth's surface directly above the earthquake focus.

Erosion

The wearing away of the land surface by detachment and movement of soil and rock fragments, during a flood or storm or over a period of years, through the action of wind, water, or other geologic processes.

Erosion Hazard Area

The area anticipated to be lost to shoreline retreat over a given period of time. The projected inland extent of the area is measured by multiplying the average annual long-term recession rate by the number of years required.

Evapotranspiration

The combination of water that is evaporated and water that is transpired by plants as a part of their metabolic processes.

Exposure

The number, types, qualities, and monetary values of various types of property, infrastructure or life that may be subject to an undesirable or injurious hazard event.

Extent

The size of an area affected by a hazard or hazard event.

Extratropical Cyclone

Cyclonic storm events like Nor'easters and severe winter low-pressure systems. Both the West and East coasts can experience these non-tropical storms that produce gale-force winds and precipitation in the form of heavy rain or snow. Typically called Nor'easters on the East Coast because of the direction of the storm winds, these storms can last for several days and be very large – 1,000 mile-wide storms are not uncommon.

Fault

A fracture in the continuity of a geological formation caused by a shifting, dislodging, or other changes to the earth's crust, in which adjacent surfaces are differentially displaced. South Louisiana has a system of subsidence faults (also known as "growth faults").

Federal Emergency Management Agency (FEMA)

Agency created in 1979 to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response, and recovery. FEMA is part of the Department of Homeland Security.

Fire Hazard Severity

The potential for the occurrence of a Wildfire due to a combination of slope, fuel availability and type, and prevalence of Critical Fire Weather in an area.

Fire Hazard Severity Table

A table that correlates Critical Fire Weather prevalence, slope, and fuel classification of an area to estimate an area's degree of fire hazard.

Fire Management Assistance

The Fire Management Assistance grant program awards FEMA grants for mobilization, response, equipment, supplies, personnel, and demobilization. It is available to any state or local government for mitigation, management, and control of any major fire burn on public or private forest land or grassland that threatens destruction that would constitute a major disaster. The grant is based on 75%/25% cost sharing basis.

Fire Potential Index (FPI)

Developed by the United States Geological Service (USGS) and United States Forest Service (USFS), this index is used to assess and map fire hazard potential over broad areas. Using the geographic information from this index, national policy makers and on-the-ground fire managers have established priorities for prevention activities in defined areas to reduce the risk of managed and wildfire ignition and spread. Prediction of fire hazard shortens the time between fire ignition and initial attack by enabling fire managers to pre-allocate and stage suppression forces to high fire risk areas.

Flash Flood

A flood event occurring with little or no warning where water levels rise at an extremely fast rate.

Flood

A general and temporary condition of partial or complete inundation of normally dry land areas from: (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.

Flood Depth

The height of the floodwater surface above the ground surface.

Flood Elevation

The elevation of the water surface above an established datum (*e.g.*, the National Geodetic Vertical Datum of 1929; the North American Vertical Datum of 1988; or Mean Sea Level).

Flood Hazard Area

An area as defined on a Flood Insurance Rate Map having the possibility to be inundated by a flood of a given magnitude.

Flood Insurance Rate Map (FIRM)

As defined under the NFIP, this is an official map of a community on which the administrator of the Flood Insurance Administration has delineated the Special Flood Hazard Areas applicable to that community.

Flood Insurance Study (FIS)

A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.

Flood Mitigation Assistance Program (FMA)

A program created as part of the National Flood Insurance Reform Act of 1994. FMA provides funding to assist communities and states implement actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NFIP insurable structures, with a focus on repetitive loss properties. The FMA program is comprised of yearly funds used in the acquisition, relocation, and demolition of repetitive loss properties throughout the State. Based on 75%/25%cost sharing, the property loss must be flood-related. All projects must be submitted through the local government to the State Hazard Mitigation Officer (SHMO) and recommended by the State Hazard Mitigation Team (SHMT) before they can be forwarded to FEMA for consideration. Grants are based on an annual allocation from FEMA.

Flood Zone

A geographical area shown on a FIRM that reflects the severity or type of flooding in the area. Flood zones may be classified as A, A1-30, AE, AO, AH, A99, AR, V, V1-30, VE, B, C, D, or X. The characteristics of these zones are described on the FIRM.

Floodplain (or flood-prone area)

As defined under the NFIP, any land area susceptible to being inundated by water from any source.

Floodplain Management

As defined under the NFIP, the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations.

Floodproofing

Actions that prevent or minimize future flood damage. Making the areas below the anticipated flood level watertight (dry flood proofing) or intentionally allowing floodwater to enter the interior to equalize flood pressures (wet flood proofing) are examples of flood proofing.

Flood wall

Structures built of manmade materials, such as concrete and masonry, having as their principal function the prevention of flooding of adjacent land. Sometimes used in conjunction with Levees.

Floodway

See Regulatory Floodway.

Frequency

The measure of how often on average a hazard event of a particular magnitude is expected to occur within a particular time frame. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average, and would have a 1 percent chance – its Probability – of happening in any given year (*e.g.*, a 1% flood).

Fuel

Combustible plant material, both living and dead, that is capable of burning in a wildland situation. Also, any other flammable material in the built environment that feeds a wildfire.

Fujita Scale of Tornado Intensity

This scale rates tornadoes with numeric values from F0 to F5 based on tornado wind speed and damage sustained. An F0 indicates wind speeds less than 72 miles per hour and minimal damage such as broken tree limbs or signs, while an F5 indicates wind speeds in excess of 260 miles per hour and severe damage sustained.

Function Loss

Part of the Loss Estimation process, this value represents the functional dollar value loss of a structure/facility as a result of damage from the hazard event. This value (for each affected structure) is equal to the Average Daily Operating Budget of the structure multiplied by the Functional Downtime plus the Displacement Cost per Day multiplied by the Displacement Time.

Function Value

An estimate during an asset inventory that represents the value of a building's use or function that would be lost if it were damaged or closed.

Functional Downtime

The average time (in days) during which a function (business or service) is unable to provide its services due to a hazard event.

Geographic Area Impacted

See Extent.

Geographic Information System (GIS)

A computer software application that relates physical features on the earth to a database of attributes (descriptions, characteristics) about those physical features to be used for mapping and analysis.

Goals

General guidelines that express desired results. They are usually broad policy-type statements, long-term in nature and represent global visions.

Ground Failure

Permanent deformation of the soil, including faulting, consolidation, liquefaction, or landslides. Ground failure can cause extensive damage to buildings and lifelines. Development in areas prone to ground failure should be avoided.

Ground Motion

Movement of the ground resulting from earthquake-generated waves in the earth. Ground motion normally includes horizontal and vertical components, although the horizontal movement is more severe and causes the greatest damage. Building codes normally address horizontal motion, as vertical motion usually does not exceed gravity design.

Ground-Truthing

Verification of data against observable conditions.

Hazard

Generally, any source of potential danger or adverse condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, and agricultural loss, damage to the environment, interruption of business, or other types of harm or loss. Hazards may be divided into two broad categories, depending on the source of the event - Natural Hazards and Manmade Hazards.

Hazard Event
A specific occurrence of a particular type of hazard.

Hazard Identification
See Hazard Profile.

Hazard Mitigation
Measures undertaken to reduce the effects of hazards on a place and its population. Hazards addressed in this Plan Update include a range of naturally occurring events, such as floods, high winds and ice storms, and manmade hazards resulting from accidents.

Hazard Mitigation Plan
The result of a process States undertake to identify risks they face from natural and manmade hazards; and recommendations for the best ways to reduce or eliminate the potential for loss of life, property damage, and disruption of economic activities. Hazard mitigation actions that can be identified through this type of planning process include a wide range of activities and projects; from educating home owners about how to strengthen their homes to resist damage from hurricane force winds, to the construction of large scale public works projects like a levee that limits the extent of flooding.

Hazard Mitigation Program
The coordinated effort by a state or community to implement actions from the Plan. It also includes an important function of state governments; administering hazard mitigation grant funding to state and local agencies. A fundamental part of the Program, therefore, is the *Administrative Guidelines and Procedures* used to solicit, award and monitor compliance with Federal and state grants.

Hazard Mitigation Grant Program (HMGP)
A grant program authorized under Section 404 of the Stafford Act, 42 USC 5170c and implemented at 44 CFR Part 206, Subpart N, that authorizes funding for certain mitigation measures identified through the evaluation of natural hazards conducted under Section 322 of the Stafford Act 42 USC 5165. HMGP is administered by implementing hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster. HMGP provides 75% of the eligible project costs and requires 25% non-Federal funds.

Hazard Profile
The process by which the hazards that affect a particular locality or region are identified, described, and defined, including the physical characteristics, magnitude and severity, probability and frequency, causative factors, and extent.

HAZUS
"Hazards U.S." A standardized, nationally applicable hazard loss estimation methodology that uses PC-based GIS software. Although originally designed for use in estimating earthquake losses, recent updates to the software now include both flood and wind event modules (known as HAZUS-MH or HAZUS-Multi-hazard). See the FEMA website at http://www.fema.gov/hazus/ for more information.

Hurricane

An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center or "eye." Hurricanes develop over the North Atlantic Ocean, northeast Pacific Ocean, or the South Pacific Ocean east of 160° East longitude. Hurricane circulation is counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Hydrology

The study of water and its properties. A flood discharge model is developed by a hydrologic study.

Individual Assistance

FEMA's disaster housing program that provides Individual and Family Grants up to $15,000 per family for disaster-related uninsured losses. Grants under the IA program can include temporary housing, food, relocation assistance, legal and tax assistance, and a Cora Brown Fund of $2,000 are also included in this category.

Infrastructure

Refers to the public services of a community that have a direct impact on the quality of life in that community. These services include communication technology such as phone lines or internet access, vital services such as public water supplies and sewer treatment facilities, and transportation systems such as airports, highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots, waterways, and canals. See also Lifeline Systems.

Inland Flooding

Flooding that occurs landward of a shoreline as a result of a coastal storm moving across the land bringing torrential rains and backwater flooding from the ocean. These in turn cause rivers and streams in these inland areas to overflow. Severe coastal storms have been known to cause floods in inland areas whose flood depths may exceed that expected from a 0.2% flood.

Integrated Emergency Management System (IEMS)

The application of the Comprehensive Emergency Management concept. This program integrates or incorporates all available resources for the full range of hazards and the full range of functions related to the four phases of emergency management (mitigation, preparedness, response, and recovery).

Interim Emergency Board (IEB)

State-awarded emergency funds are available through the Interim Emergency Board and are used whenever an event does not meet the criteria of a Federal disaster declaration. Based upon a 75%/25% cost share, applicants must be in a declared area and make s submission to the State disaster package requesting funding under the IEB program.

Intensity

A measure of the strength of a hazard event at a particular place.

Inundate / Inundation

To cover or be covered by water, especially from a flood, as a result of a severe rainstorm, hurricane, or tsunami.

Landslide

Downward movement of a slope and materials under the force of gravity. There are at least four types of landslides, depending on the content and flow characteristics: Mudslides; Rock Slides; Slumps; and Earthflows.

Landslide Hazard Map

These maps show the extent of a landslide threat, combining data about locations where landslides have occurred in the past, present and future. When compiled accurately, these maps may be used to predict the relative degree of landslide hazard in a landslide area.

Landslide Inventory

The process to identify areas that appear to have failed due to landslides, including debris flows and cut-and-fill failures.

Landslide Susceptibility Map

These maps show areas that have the potential for landslides by correlating some of the principal factors that contribute to landslides (*i.e.*, steep slopes, geologic units that lose strength when saturated, poorly drained rock or soil, slope angle, and soil drainage characteristics) with the past distribution of landslides in those areas.

Lateral Spread

A type of liquefaction, this develops on gentle slopes and entails the sidelong (downhill) movement of large masses of soil as the underlying layer liquefies.

Levee

An embankment of compacted soil whose primary purpose is to furnish flood protection from seasonal high water. Sometimes used in conjunction with Flood walls.

Level of Acceptable Risk

The amount or degree of potential exposure to loss or injury from a hazard event that a jurisdiction has agreed to concur with when planning the future development of that jurisdiction.

Lifeline Systems

Public works and utilities (such as electrical power, gas and liquid fuels), telecommunications, transportation, and water and sewer systems.

Liquefaction

The temporary loss of shear strength in a water-saturated, cohesion-less soil deposit, or temporary transformation of unconsolidated materials into a fluid mass. Liquefaction causes two types of ground failure: Lateral Spread and Loss of Bearing Strength.

Local Government

As defined by the Disaster Mitigation Act of 2000, this is any county (parish), municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Locality

See Local Government.

Loss of Bearing Strength

A type of liquefaction, this results when the soil supporting a structure liquefies, potentially causing the structure to tip and topple.

Lowest Floor Elevation

Under the NFIP, this is the elevation of the lowest floor of the lowest enclosed area of a structure (including a basement). This information is available from an elevation certificate (if the building was constructed after a floodplain management ordinance was in force) or from a recorded subdivision plat, site survey, or building permit.

Magnitude

A measure of the strength of a hazard event. The magnitude (also referred to as "severity") of a given hazard event is usually determined using technical measures specific to the hazard.

Major Disaster

As defined by the Stafford Act, "any natural catastrophe…, or, regardless of cause, any fire, flood, or explosion in any part of the United States, which in the determination of the president causes damage of sufficient severity and magnitude to warrant major disaster assistance under this act to supplement the efforts and available resources of states, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby."

Managing State

A State to which FEMA has delegated the authority to administer and manage the HMGP under the criteria established by FEMA pursuant to 42 USC 5170c(c). FEMA also may delegate authority to tribal governments to administer and manage the HMGP as a Managing State.

Manmade Hazards

Hazard events that originate from human activity. These types of events may be further defined as either technological hazards or terrorism.

Manufactured Home

A structure, also known as a Mobile Home, built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation.

Mitigate

To cause something to become less harsh, hostile, or destructive; to make less severe or painful.

Mitigation

See Hazard Mitigation.

Mitigation (404)

Mitigation (404) makes funds available following a Presidential Disaster Declaration and can be used on any eligible preventive measure. It is based on a 75%/25% cost sharing basis, requires the submission of Form 424 2016, and a FEMA Project Summary in order to apply.

Mitigation (406)

Mitigation (406) supplements the Public Assistance Program through proposed mitigation measures.

Mitigation Measures / Mitigation Strategies

Those actions proposed and/or undertaken by a jurisdiction to minimize future vulnerability to one or more hazards.

Mitigation Planning

A systematic evaluation of the nature and extent of vulnerability to the effects of hazards typically present in a jurisdiction. This process also includes a description of Mitigation Measures.

Mitigation Plan

The document that articulates results from the systematic process of identifying hazards and evaluating vulnerability, identifying goals, objectives, and actions to reduce or eliminate the effects of identified hazards, and an implementation plan for carrying out the actions.

Mobile Home (see Manufactured Home)

Modified Mercalli Scale

A subjective measure of the strength (Intensity) of the shaking experienced in a seismic event. This scale represents the local effect or damage caused by an earthquake. Also known as Modified Mercalli Intensity. See also Peak Ground Acceleration and Richter Magnitude Scale.

Mudslide / Mudflow

A type of landslide characterized by flows of a well-mixed mass of rock, earth, and water that behaves like a fluid and moves down slopes with a consistency similar to that of newly mixed concrete. Also known as debris flows.

Municipality

As defined in Title 15.2 Section 102 of the COV this term shall be construed to relate only to Cities and Towns.

National Flood Insurance Program (NFIP)

A Federal program created by Congress in 1968 that makes flood insurance available in communities that enact the minimum floodplain management regulations defined in 44 CFR §60.3.

National Weather Service (NWS)

A division of the National Oceanographic and Atmospheric Administration (NOAA), the NWS prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to Federal and State entities in preparing weather and flood warning plans.

Natural Hazards

Those events caused by one or more natural occurrences, including hurricanes, tornadoes, storms, floods, tidal waves, tsunamis, high or wind-driven waters, volcanic eruptions, earthquakes, snowstorms, wildfires, droughts, landslides, and mudslides. While the risks presented by natural hazards may be increased or decreased as a result of human activity, they are not inherently human-induced.

Objectives

Objectives define strategies or implementation steps to attain identified goals. Unlike goals, objectives are specific and measurable.

Obstruction

In a floodplain, obstructions are bridges, culverts, and other obstacles that can block flood flow and trap debris, causing increased flooding upstream and increased flood velocity downstream.

Occupancy Class

As part of an asset inventory, this is a description of a facility's general use or function. Based on a facility's Occupancy Class, one also may estimate the Content Value and Replacement Value using tables developed from regional and national averages.

Open Space Preservation

Preserving undeveloped areas from development through any number of methods, including low-density zoning, open space zoning, easements, or public or private acquisition. Open space preservation is a technique that can be used to prevent flood damage in flood-prone soils, and can enhance the natural and beneficial functions of floodplains.

Outflow

In a coastal storm event, this is the flow of floodwaters from inundated areas back to the ocean or bay. Outflow can create strong currents, ripping at structures, pounding them with debris, and eroding beaches and coastal structures.

Parish

A political subdivision of the State of Louisiana legally equivalent to a county in other U.S. states. As per Title 15.2 Section 102 of the COV, a "County" is any existing county or such unit hereafter created.

Peak Ground Acceleration (PGA)

A measure of the strength of ground movements in a seismic event. This measures the rate in change of motion relative to the established rate of acceleration due to gravity (g =9.8 meters/second/second).

Planimetric

Describes a map in which the information on the map is in true geographic relationship (*i.e.*, it is "to scale") with measurable horizontal distances.

Planning

The act or process of making or carrying out plans; specifically, the establishment of goals, policies, and procedures for a social or economic unit.

Planning Committee

The core group of Stakeholders who conduct the hazard mitigation planning process by setting the plan schedule, organizing the work teams, monitoring progress, and coordinating the review and adoption of the various sections of the plan. This committee should include representatives from the following groups: neighborhood groups and other non-profit organizations; State, regional, and local government representatives; businesses and development organizations; elected officials; Federal agency representatives; and academic institutions. See also Stakeholder. (Please refer to the FEMA How-to Guide, "Getting Started," Chapter 2 for more information on this topic.)

Post-Disaster Recovery Planning

The process of planning those steps the jurisdiction will take to implement long-term reconstruction with a primary goal of mitigating its exposure to future hazards. The post-disaster recovery planning process can also involve coordination with other types of plans and agencies, but it is distinct from planning for emergency operations.

Preparedness

A condition in which a Community is making or has made plans and preparations to strengthen the capability of that community to reduce the impact of, respond to, and recover from a disaster.

Probability

A statistical measure of the likelihood that a hazard event will occur in a given time period.

Public Assistance

FEMA's Public Assistance (PA) grant program provides reimbursement of overtime, materials, rented equipment, and contracts used for emergency and permanent work to eligible state and local government applicants in accordance with 44 CFR, Part 206.222. The applicant must be in the declared area and agree to a 75%/25% cost share..

Q3 Flood Data

Also known as "Digital Quality Level 3" flood data, these data are a digital representation of certain features on the paper Flood Insurance Rate Maps (FIRM). At present, this data is available on CD-ROM from FEMA for 1,200 counties nationwide. This data is similar to the FIRM data, but does not include: hydrographic features (streams, rivers, lakes, and shorelines); base flood elevations; cross-section lines; roads, road names, or address ranges; and locations, elevations, and descriptions of benchmarks and elevation reference marks.

Reconstruction

The long-term process following a disaster of rebuilding a community's destroyed housing stock, commercial and industrial buildings, public facilities, and other structures.

Recovery

The actions taken by an individual or community after a catastrophic event to restore order and lifelines in a community. These may be started during but extend beyond the emergency period to that point when the vast majority of such services, including electricity, water, communications, and public transportation have resumed normal operations. Short-term recovery does not include the reconstruction of the built environment (although reconstruction may commence during this period) but primarily focuses on restoring public and utility services. Long-term recovery (see Reconstruction) is the process of returning the community, to the extent possible, to the conditions that existed prior to the event, preferably while taking advantage of opportunities to mitigate against future disasters.

Recurrence Interval

The time between hazard events of a similar size in a given location. This interval is based on the probability that the given event will be equaled or exceeded in any given year. See also 1% Flood and 0.2% Flood.

Regulatory Floodway

As defined under the NFIP, this is the stream channel and that portion of the adjacent floodplain that must remain open to permit passage of the base flood without raising the water surface elevation by more than one foot.

Repetitive Flood Loss (property)

Any property that is currently insured that has had two or more claims greater than $1,000 paid by the NFIP within any 10-year period since 1978.

Replacement Value

As assessed during an asset inventory, this is the current cost of returning a physical asset to its pre-damaged condition. This usually is expressed in terms of cost per square foot and reflects the present-day cost of labor and materials to construct a building of a particular size, type, and quality. See also Content Value.

Resource Inventory

An analysis of the resources a community can call upon in the event of an emergency.

Response
Those actions taken during a hazard event to provide emergency assistance by addressing immediate life and safety needs, minimize further damage to properties, and speed Recovery immediately following a disaster.

Revetments
Rock or other hardened materials (*e.g.*, concrete blocks) placed atop riverbanks, along shorelines, and on slopes to reduce erosion, temper wave action, and improve stream flow.

Richter Magnitude Scale
A numerical scale of earthquake magnitude devised by seismologist C.F. Richter in 1935. See also Modified Mercalli Scale and Peak Ground Acceleration.

Riprap
See Revetments.

Risk
The estimated probability that damage will occur to life, property, or the environment if a hazard event occurs. Risk often is expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage as the result of a hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of a hazard event.

Risk Assessment
A process or method for evaluating risk associated with a specific hazard and defined in terms of hazard probability and frequency of occurrence, magnitude and severity (Intensity), exposure, and consequences. See also Risk, Vulnerability, Exposure, and Probability.

Riverine
Of or produced by a river.

Rock Slide
A type of Landslide characterized by the sudden and rapid slide of bedrock along planes of weakness.

Saffir/Simpson Scale
A system for evaluating the intensity and magnitude of hurricanes, based on wind speed, storm surge, and central pressure. This scale ranges from the weakest (Category 1) to the most powerful (Category 5).

Scale
On a map, this is the proportion used in determining a dimensional relationship. It is the ratio of the distance between two points on a map and the actual distance between those two points on the earth's surface. For example, a scale of 1:24,000 means that every one inch on the map is equal to 24,000 inches on the earth's surface.

Scarp
A steep slope.

Scour
The removal of soil or fill material by the flow of floodwaters. The term is frequently used to describe storm-induced, localized conical erosion around pilings and other foundation supports where the Obstruction of flow increases turbulence.

Seismicity
Describes the likelihood of an area being subject to earthquakes.

Slump
A type of Landslide characterized by the downward and outward movement of rock or unconsolidated material as a unit or as a series of units. Also called slope failure.

Special Flood Hazard Area (SFHA)
As defined under the NFIP, this is land in the floodplain within a community having 1% or greater chance of flood occurrence in any given year (100-year floodplain); represented on FIRMs by darkly shaded areas with zone designations that include the letter A or V.

Stafford Act
The Robert T. Stafford Disaster Relief and Emergency Assistance Act (P.L. 100-707), signed into law November 23, 1988, amending the Disaster Relief Act of 1974 (P.L. 93-288). The Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs.

Stakeholder
Individuals or groups that will be affected in any way by an action or policy. For the purposes of the State of Louisiana Hazard Mitigation Plan, these include GOHSEP Regional Coordinators; Parish Offices of Homeland Security and Emergency Preparedness; Parish and local Floodplain Administrators; Parish and local Coastal Zone Administrators; Parish and local Building Officials; and State agencies with at-risk facilities.

State Hazard Mitigation Officer (SHMO)
The representative of State government who is the primary point of contact with FEMA, other State and Federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation programs and activities required under the Stafford Act.

Storm Surge
The rise in the water surface above normal water level on the open coast due to the action of wind stress and atmospheric pressure on the water surface. It is usually manifested as water that is pushed toward the shore by the force of the winds swirling around a storm. These large waves of water sweep across the shorelines where a storm makes landfall. The height of the storm surge will be greater the more intense a storm is. Storm surge areas can be mapped by the probability of storm surge occurrence using Sea, Lake, and Overland Surges from Hurricanes (SLOSH) modeling.

Storm Tide
A combination of a storm surge and the normal tide. For example, a 15-foot storm surge along with the normal 2-foot tide creates a storm tide of 17 feet.

Structure
See Building.

Structure Loss
Part of the loss estimation process, this value represents the structural dollar value loss as a result of damage from the hazard event. This value (for each affected structure) is equal to the replacement value of the structure multiplied by the percent damage experienced by the structure.

Substantial Damage

Damage of any origin sustained by a structure whereby the cost of restoring the structure to its pre-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage.

Sub-tropical Depression

A weather system that has some characteristics of a tropical cyclone and some characteristics of an extra tropical cyclone.

Subdivisions and Development Regulations

Regulations and stands governing the division of land for development for sale. Subdivision regulations can control the configuration of parcels, set standards for developer-built infrastructure, and set standards for minimizing runoff, impervious surfaces, and sedimentation during development. They can be used to minimize exposure of buildings and infrastructure to hazards.

Surface Faulting

The differential movement of two sides of a fracture, the location where the ground breaks apart. This is characterized by the length, width, and displacement along the fault zone.

Sustainability

The concept and practice in which decisions and actions made by the present generation do not reduce the options of future generations. These decisions and actions allow the present generation to pass on to the following generations a natural, economic, and social environment that will provide a continuing high quality of life.

Sustainable

Able to be continued or maintained at a particular level or intensity without depleting the supporting resource.

Sustainable Community

In addition to embracing the ideals of sustainability, a sustainable community also considers the following issues when planning for and with its citizens: environmental quality and quality of life; disaster resistance; economic vitality and a fair legacy for future generations; an understanding of and accounting for the impact of its actions and policies on adjacent jurisdictions as well as the greater surrounding region and beyond; and an emphasis on combining policies, programs, and design solutions that bring about multiple objectives and seek to address and integrate social and environmental concerns.

Technological Hazard

Technological hazards refer to incidents that may arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials. For the purposes of this sub-definition, it is assumed that technological emergencies are accidental and that their consequences are unintended. See also: Manmade Hazards.

Tectonic Plate

Torsionally rigid, thin segments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that cause seismic activity. See also Earthquake.

Terrorism

Terrorism refers to intentional, criminal, malicious acts, specifically those related to: the use of weapons of mass destruction (WMD) (including biological, chemical, nuclear, and radiological weapons); arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and "cyber-terrorism". See also: Manmade Hazards.

Topographic
A map that shows natural features and indicates the physical shape of the land using contour lines. These maps also may include manmade features.

Tornado
A violently rotating column of air extending from a thunderstorm to the ground.

Town
As defined by Title 15.2 Section 102 of the COV this is any existing town or an incorporated community within one or more counties that became a town before noon, July 1, 1971, as provided by law or that has within defined boundaries a population of 1,000 or more and that has become a town as provided by law.

Tropical Cyclone
A generic term for a cyclonic, low-pressure system over tropical or sub-tropical waters.

Tropical Depression
A tropical cyclone with maximum sustained winds of less than 39 mph.

Tropical Storm
A tropical cyclone with maximum sustained winds greater than 39 miles per hour and less than 74 miles per hour.

Tsunami
A great sea wave produced by submarine earth movement or volcanic eruption.

Unmet Needs program
Congress may specifically authorize Unmet Needs funding for a major disaster-related event wherein additional funds may be provided to projects not normally funded. Such funding requires a letter of "intent to apply" once Congress has provided authorization and is only available in conjunction with specific authorization by the President.

Urban Growth Boundary (UGB)
A politically defined boundary of the limits of an urban growth area in an attempt to concentrate growth within a designated area, typically an area where urbanization already is prevalent.

Urban Service Boundary (USB)
A politically defined boundary beyond which public utilities will not be extended. This boundary is determined and enacted by a locality in an attempt to temper and manage urban growth in sensitive and vulnerable areas by limiting the extension of city utilities into undeveloped areas.

Urban Wildfire
A fire moving from a wildland environment, consuming vegetation as fuel, to an urban environment where the fuel consists primarily of buildings and other structures.

Urban/Wildland Interface
A developed area occupying the boundary between an urban or settled area and a wildland characterized by vegetation that can serve as fuel for a forest fire.

Velocity
The speed of a moving object, usually measured in miles per hour, kilometers per hour, feet per second, or meters per second.

Vulnerability
The level or degree of exposure of human life and property to damage from natural or manmade hazards.

Vulnerability Assessment
The analysis and determination of the overall vulnerability of the population and property in a specified area to possible injury and damage that may result from a hazard event of a given intensity. This assessment analyzes the impact of hazard events on both the existing and future population and built environment.

Vulnerable Populations
Any segment of the population that is more vulnerable to the effects of hazards because of things such as lack of mobility, sensitivity to environmental factors, or physical abilities. These populations can include, but are not limited to, senior citizens and school children.

Wave Height
The height of a wave above the mean water surface level of a lake or ocean.

Wave Runup
The distance or height up to which a wave extends on a steep shoreline, as measured relative to a reference level such as the normal height of the sea.

Wildfire
An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

Wildland Fire
A Wildfire in an area in which development is essentially nonexistent, except for roads, power lines, railroads, and other similar features.

Zoning Ordinances
Designation of allowable land use and intensities for local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

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Appendix B: References

References for sources used in this Plan Update are provided for Sections Four through Seven and Appendix H. All other information was provided by the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and/or was a product of the analyses conducted for this plan.

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Appendix H: Recommendations for Mitigation in the State of Louisiana

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Appendix C
Planning Process

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Appendix C.1:
Executive Order No. KBB 2004-35

State of Louisiana

EXECUTIVE DEPARTMENT

EXECUTIVE ORDER NO. KBB 2004 - 35

STATE HAZARD MITIGATION TEAM

WHEREAS, the Louisiana Homeland Security and Emergency Assistance and Disaster Act, set forth in R.S. 29:721 *et seq.*, recognizes "the existing possibility of the occurrence of emergencies and disasters of unprecedented size and destructiveness resulting from terrorist events, enemy attack, sabotage, or other hostile action, or from fire, flood, earthquake, or other natural or man-made causes," and designates the Military Department, state of Louisiana, the State Homeland Security and Emergency Preparedness Agency;

WHEREAS, disaster preparedness assistance is provided by federal grants and through federal programs to states designating an agency to plan and administer disaster preparedness programs and to improve and update disaster assistance plans, Public Law 93-288, Title II §201; 42 U.S.C.A. §5131, *et seq.*; and

WHEREAS, the Hazard Mitigation Team was originally established by executive order to ensure that homeland security and emergency preparations for the state of Louisiana are adequate to deal with such emergencies or disasters, to preserve the lives and property of the people of the state of Louisiana, and to respond to emergencies in the event a state of emergency or disaster is declared by either the Governor or the President;

NOW THEREFORE I, KATHLEEN BABINEAUX BLANCO, Governor of the state of Louisiana, by virtue of the authority vested by the Constitution and laws of the state of Louisiana, do hereby order and direct as follows:

SECTION 1: The State Hazard Mitigation Team (hereafter "Team") is reestablished and continued within the Military Department, Office of Homeland Security and Emergency Preparedness, Office of the Governor;

SECTION 2: The duties and functions of the Team shall include, but are not limited to, the following:

A. Identifying the state of Louisiana's vulnerability to hazards;

B. Reviewing existing mitigation plans and prioritizing recommendations;

C. Developing or updating Hazard Mitigation Plans required under 44 CFR Subpart M;

D. Developing a comprehensive strategy for the development and implementation of a State Mitigation Program;

E. Reviewing, assigning priority, and recommending mitigation actions for implementation, including measures to be funded under the Hazard Mitigation Grant Program or other federal grant programs; and

F. Seeking funding for implementation of mitigation measures.

SECTION 3: The Team shall be composed of representatives appointed from the following state agencies:

A. The Military Department, Office of Homeland Security and Emergency Preparedness, Office of the Governor;

B. The Department of Transportation and Development;

C. The Department of Wildlife and Fisheries:

D. The Department of Environmental Quality;

E. The Department of Natural Resources, Office of Coastal Restoration and Management; and

F. The Department of Agriculture and Forestry.

SECTION 4: The chair of the Team shall be the adjutant general of the Military Department, Office of Homeland Security and Emergency Preparedness.

SECTION 5: The Team shall meet quarterly and at the call of the chair.

SECTION 6:

A. Team members shall not receive additional compensation or a per diem from the Office of the Governor for serving on the Team.

B. Team members who are employees or elected public officials of the state of Louisiana or a political subdivision thereof may seek reimbursement of travel expenses, in accordance with PPM 49, from their employing and/or elected department, agency and/or office.

C. Team members who are also members of the Louisiana Legislature may seek a per diem from the Louisiana State Senate or House of Representatives, as appropriate, for their attendance .

SECTION 7: Support staff, facilities, and resources for the Team shall be provided by the Military Department, Office of Homeland Security and Emergency Preparedness.

SECTION 8: All departments, commissions, boards, offices, entities, agencies, and officers of the state of Louisiana, or any political subdivision thereof, are authorized and directed to cooperate with the Team in implementing the provisions of this Order.

SECTION 9: This Order is effective upon signature and shall continue in effect until amended, modified, terminated, or rescinded by the governor, or terminated by operation of law.

IN WITNESS WHEREOF, I have set my hand officially and caused to be affixed the Great Seal of Louisiana, at the Capitol, in the city of Baton Rouge, on this 20th day of August, 2004.

Kathleen Babineaux Blanco
GOVERNOR OF LOUISIANA

ATTEST BY
THE GOVERNOR

_____
SECRETARY OF STATE

Executive Order No. BJ 2008-4

State of Louisiana

EXECUTIVE DEPARTMENT

EXECUTIVE ORDER NO. BJ 2008 -4

LOUISIANA RECOVERY AUTHORITY

WHEREAS, the Louisiana Recovery Authority was created to coordinate programs and funding from federal, state, local, and private sources to achieve the most effective and efficient use of monetary, human, and organizational resources toward services related to recovery by the state of Louisiana from Hurricanes Katrina and Rita in 2005;

WHEREAS, the Louisiana Recovery Authority has acted as the coordinating body for disaster recovery programs over the past two years including overseeing the implementation of disaster recovery programs funded with more than $13 Billion of Community Development Block Grant funds from the United States Department of Housing and Urban Development for housing, economic development, and infrastructure programs;

WHEREAS, in addition to the Community Development Block Grant funds, Louisiana also received disaster recovery assistance from the Federal Emergency Management Agency for the Public Assistance Program and the Hazard Mitigation Grant Program;

WHEREAS, the Public Assistance Program provides much needed financial resources to individual homeowners and state and local governmental units to help them recover from a natural disaster;

WHEREAS, the Hazard Mitigation Grant Program provides grants to state and local governments to implement long-term hazard mitigation measures to reduce the loss of life and property due to natural disasters;

WHEREAS, the Governor's Office of Homeland Security and Emergency Preparedness has been tasked with the responsibility of administering the Public Assistance Program and the Hazard Mitigation Grant Program; and

WHEREAS, these programs and federal funds related to the devastation caused by Hurricanes Katrina and Rita administered by the Governor's Office of Homeland Security and Emergency Preparedness are within the jurisdiction of the Louisiana Recovery Authority and the integration of the recovery programs should be managed through one organization.

NOW THEREFORE, I, Bobby Jindal, Governor of the state of Louisiana, by virtue of the authority vested by the Constitution and the laws of the state of Louisiana, do hereby order and direct as follows:

SECTION 1: The Louisiana Recovery Authority shall set priorities and offer broad direction to the Governor's Office of Homeland Security and Emergency Preparedness relating to the use of funds made available to the state for recovery and redevelopment efforts through the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, and special congressional appropriations for the Public Assistance Program and the Hazard Mitigation Grant Program associated with Hurricanes Katrina and Rita.

SECTION 2: The Executive Director of the Louisiana Recovery Authority shall serve as the Governor's Authorized Representative for Louisiana's Public Assistance Program associated with Hurricanes Katrina and Rita. The Executive Director shall be afforded all duties and responsibilities conferred upon the Governor's Authorized Representative in the state's Public Assistance Administrative Plan.

SECTION 3: The Louisiana Recovery Authority shall serve as the State Hazard Mitigation Team for the recovery associated with Hurricanes Katrina and Rita for purposes of the Hazard Mitigation Grant Program.

SECTION 4: The Governor's Office of Homeland Security and Emergency Preparedness is authorized and directed to cooperate in the implementation of the provisions of this Order.

SECTION 5. This Order is effective upon signature and shall continue in effect until amended, modified, terminated, or rescinded by the governor, or terminated by operation of law.

IN WITNESS WHEREOF, I have set my hand officially and caused to be affixed the Great Seal of Louisiana, at the Capitol, in the city of Baton Rouge, on this 15th day of January, 2008.

/S/ Bobby Jindal
GOVERNOR OF LOUISIANA

ATTEST BY
THE GOVERNOR

/S/ Jay Dardenne
SECRETARY OF STATE

Appendix C.2:

SHMT and SHMPC Meeting Agendas, Presentation Materials, and Minutes

The following contain agendas, presentations materials and minutes for the meetings of the State Hazard Mitigation Teams (SHMT) and the State Hazard Mitigation Planning Committee (SHMPC) held during the development of the Plan Update:

#	Date / Place	Subject	Participants
1	January 19, 2010	SHMPC Meeting #1 –Kick off meeting	GOHSEP, SHMPC & Consultants
2	February 23, 2010	SHMPC Meeting #2 Review work-in-progress	GOHSEP, SHMPC & Consultants
3	April 18, 2010	Reviewed State Owned Facility Database and validated the assigned rankings	GOHSEP, SHMPC, Key Stakeholders & Consultants
4	April 27, 2010	SHMPC Meeting #3 - Review work-in-progress	GOHSEP, SHMPC & Consultants
5	May 5, 2010	Review Hazards and Risk Assessment methodologies	GOHSEP, SHMPC, Key Stakeholders & Consultants
6	May 25, 2010	Review Risk Assessment methodologies for State Owned Facilities	GOHSEP, SHMPC, Key Stakeholders & Consultants
7	June 30, 2010	Plan update to new SHMT members and review of initial draft sections 1-6	GOHSEP, SHMPC & Consultants
8	July 27, 2010	SHMPC Meeting #4 - Discuss Goals, Objectives and Mitigation Actions	GOHSEP, SHMPC & Consultants
9	November 9, 2010	SHMPC Meeting #5 – Review of draft edits and updates, initial discussion regarding adoption and maintenance	GOHSEP, SHMPC & Consultants
10	March 24, 2011	SHMPC Meeting #6 – Review of final edits, closing discussion regarding adoption and maintenance	GOHSEP, SHMPC & Consultants

Governor's Office of Homeland Security and Emergency Preparedness

Hazard Mitigation Meeting Agenda

Louisiana Hazard Mitigation Plan Update
State Hazard Mitigation Team and State Hazard Mitigation Planning Committee Meeting #1

January 19, 2010 at 10:00am

1. Introductions – Steve Garcia
2. 2011 State of Louisiana Hazard Mitigation Plan Update Overview – Alessandra Jerolleman
    a. Role of SHMT and SHMPC
    b. Draft Schedule
    c. Purpose of Meeting #1
3. Overview of the Planning Process – Alessandra Jerolleman
4. Outreach – Alessandra Jerolleman
    a. Outreach to the Public
    b. Outreach to Stakeholders
5. Selection of Hazards to be Profiled – Alessandra Jerolleman
    a. 2008 Plan Hazards
    b. Other hazards in local mitigation plans
6. Next Steps – Alessandra Jerolleman
7. Conclusion of Meeting – Steve Garcia

GOHSEP Region 9 OEP Director's Meeting

Date and Time: 10:00 am, January 12, 2010, St. Tammany Courthouse, Covington, LA

Attendees: OEP Directors from Washington, St. Tammany, and Tangipahoa Parishes, Red Cross, GOHSEP SAL, et al,

Notes:

1. GOHSEP (Travis Johnson) provided a briefing on some upcoming 2-day training opportunities regarding interoperability.
2. NIMSAT (Shannon Strother) provided an overview of NIMSAT activities. One of NIMSAT's purposes is to foster public-private partnerships to enhance national resiliency to disasters. NIMSAT is focusing on systematic information flow, private to public information, and public to private information. NIMSAT also seeks to develop a reliable mechanism to store critical information during a crisis, through the use of its super computer. NIMSAT has developed a website called the Louisiana Emergency Operations Center, through which NIMSAT will compile a list of vendors that have been vetted. Local governments will be provided access to the website in the near future.

   NIMSAT is conducting a CEO Project Survey to all 64 parishes and to GOHSEP's 9 regions. In return for participating, NIMSAT will provide specific historic data, gathered through SHELDUS and NCDC. The data being compiled will also include information gathered on 32 social indicators used to better understand social vulnerability. The results of the survey will also be use in the upcoming release of the Louisiana State Hazard Mitigation Plan. Information from the survey will be a tool in helping target the future use of Hazard Mitigation Grant Program funds.
3. I provided a short description of GOHSEP's effort to update the State Hazard Mitigation Plan. I provided the web address, and urged OEP Directors to go online, view the plan and provide feedback.

Meeting Notes from the January 19, 2009 State Hazard Mitigation Team Meeting

Held at the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) Office on Independence

Attendees:

Steve Garcia, Brenda Cooper and Margaret Sanz, GOHSEP

Denise Jobe,

Cindy O'Neal, LA DOTD

Eric Sivula, Corrections

Richard Hollowell, DHHS

Bill Morrison, DOA/OFP

Keith Horn, DEQ

Alessandra Jerolleman, Greg Fenton, Steve Pratt, James Lee Witt Associates

Welcome: Steve Garcia called the meeting to order. He provided the agenda for the meeting, which included: including

- Introductions
- Plan Update
- Overview of the Planning Process
- Outreach Activities
- Hazards Identification
- Next Steps

Steve had all attendees introduce themselves and give their name, organization, and previous experience working on the State Hazard Mitigation Plan. Steve introduced Alessandra, who then gave a presentation.

Regulatory Requirement: The State updates the plan every three years. The plan is a pre-requisite—as identified in 44 CFR 201.4 (a) (1)—for the state to obtain mitigation funding for:

- Hazard Mitigation Grant Program
- Pre-Disaster Mitigation Grant Program
- Flood Mitigation Assistance Program
- Severe Repetitive Loss Program
- Repetitive Flood Claims Program

What is Hazard Mitigation: Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazardous conditions. Mitigation is a long-term action.

Purpose of Meeting #1: Today's purpose is to briefly discuss the Disaster Mitigation Act of 2000; discuss the opportunity to reconvene the State Hazard Mitigation Team (SHMT) and the State Hazard Mitigation Planning Committee (SHMPC). For recent large disasters, the Louisiana Recovery Authority (LRA) has acted as the SHMT.

Cindy O'Neal Q: Who will serve as the SHMT for the new disaster in Northern Louisiana? No order has been provided by the Governor's Office specifying that the LRA will be responsible.

Keith Horn Q: Is the SHMT even viable, given that it no longer has any legal standing? According to Keith, the Executive Order expired within 30 days of the swearing in of a new Governor.

Alessandra agreed to look into any difficulty associated with the Executive Order and its legal standing.

Alessandra continued with explaining the purpose of the meeting. Information will be provided on soliciting public comment. Alessandra explained that work on the SHMP update began prior to the holidays.

Role of the SHMT and SHMPC: SHMT and SHMPC direct the development of the plan. Attendance by SHMT members is important and vital to facilitating an effective planning process. Comments and edits will be accomplished by the SHMT through SharePoint. The SHMT and SHMPC will also be asked to provide input on hazard profiles.

SharePoint Instructions: Alessandra provided information on how to log onto SharePoint at sharepoint.jlwitt.com/SHMPU. The user name is SHMPUusers; the password is jlwashmp345. Once in, click on Shared Documents; click on the Steering Committee folder; Right click on documents in order to save them to your computer.

Folders will be put on SharePoint with access meeting minutes and documents. A folder will be set up for draft documents.

Draft Schedule: Alessandra asked the participants to look at the project schedule and make comments

Cindy O'Neal Q: What do the dates running across the top represent? Answer: They are arbitrary dates, placed there by the software. The actual dates of when activities will occur are found in the body of the schedule.

Alessandra mentioned that she would send out an electronic version of the schedule, which will be a little easier to read.

Planning Process: Alessandra gave a brief description of the steps in the planning process, including:

- Organize resources
- Assess risk
- Develop mitigation plan
- Implement the plan and monitor progress

State-Wide Risk Assessment: Alessandra mentioned that the State-wide Risk Assessment will identify hazards and compare risks and provide information on what is in harm's way. Hazards will be profiled and an inventory taken on State assets. The assessment helps identify priorities for future funding allocations by the SHMT. The University of Louisiana at Lafayette has a separate contract, under which they are assessing 32 social indicators. This will provide a better picture of the social vulnerability to hazards. Through the State-wide assessment, we will have a better picture of which State facilities are at the highest risk. Methodologies will be provided in the plan to address each hazard. A training program for facility managers will be developed in phase 2 of the State-wide risk assessment process.

Capability Assessment: Alessandra mentioned that under Capability Assessment, strengths and weaknesses will be identified. She also stated that team members will be provided a survey, so they can gather information from their agency. The survey will also be available at the Survey Monkey website. Alessandra asked if each agency could return the survey by the end of the month. Alessandra stated that we need to make sure that the State and parish plans are in sync with each other. We wouldn't want to see a local plan state that a hazard is a high risk and then have a state plan that shows little to no risk.

Cindy O'Neal Q: Can I obtain a list of the parishes that did not spend their $1 million Katrina allocation? Steve Pratt and Alessandra will send her the list. Cindy stated that perhaps GOHSEP was not reaching the right audience, when they provided information on the Katrina allocations.

Keith Horn Comment: The State survey and accompanying web link should be sent to the Administrators and Secretaries of agencies in order to obtain their input.

Keith Horn Comment: Fix the calendar. One future meeting is scheduled for July 25, which is a Sunday.

Alessandra mentioned that some parishes took advantage of the Pilot Planning Grant Program (PPGP) and funded projects that were highlighted in the PPGP. The PPGP allows parishes to be better positioned to submit projects when short turnaround times for project submissions are given.

Cindy O'Neal Comment: There is a disconnect between the Planning Point-of-Contact at the parish level and the OEP Director, which can result in failing to mitigate repetitive loss structures.

Keith Horn Comment: In the future, mitigation program funding opportunities should be sent to the OEP Directors and the Planning Points-of-Contacts.

Mitigation Action Plan: Alessandra mentioned that the plan will contain goals, objectives and plans of action.

Plan Maintenance Process: The maintenance process will incorporate new hazard and risk information, will determine effectiveness of existing plans and implementation. The plan maintenance process will also prepare periodic SHMP updates.

Coordination with Parish/Local HMP's: The plan contains a section for coordinating with parish and other local plans. The plan also continues to improve identification and implementation of feasible, cost-effective, environmentally-sound hazard mitigation projects at the local level.

Outreach: Alessandra urged SHMT members to help expand the list of stakeholders. She provided the link to the plan at getagameplan.org.

Keith Horn Q: Can we get the results of State agency surveys from the last time the plan was updated?

Margaret Sanz suggested that it may be helpful to reach out to floodplain managers.

Denise Jobe recommended adding the Building Officials Association as stakeholders. Denise will send contact information.

Keith Horn recommended adding the Brownfields Association to the list of stakeholders.

Bill Morrison recommended adding the American Institute of Architects and the Consulting Engineers Council to the list of stakeholders.

Cindy O'Neal recommended adding the Vicksburg USACE District to the list of stakeholders.

Alessandra mentioned that, after adding a plan link to Getagameplan.org, 50 hits on the link were made in less than a month. She also stated that it is important that the plan include opportunities to involve the public.

Hazards: Alessandra provided a list of hazards found in the FEMA crosswalk, along with the list of hazards identified in the plan, and a list of hazards identified by local HM plans that are not listed in the State Plan, including: coastal erosion, coastal storm, expansive soils, and saltwater intrusion. The question was posed: should the State Plan profile additional hazards.

The last plan gave a summary of the coastal erosion problem and listed plans that address the issue. Activities for this issue are big and expensive and require federal assistance and are not addressed in the State Plan.

Keith Horn recommended that saltwater intrusion be treated the same way as coastal erosion was treated in the last update.

Cindy O'Neal mentioned that the plan should make mention of recent budget cuts.

Keith Horn Q: How many parishes identified expansive soils as a hazard? How big of a problem is it? If it is only a concern in one or two parishes, should it be profiled? Alessandra answered that only a few parishes listed it. Keith recommended that saltwater intrusion and expansive soils not be profiled.

Keith Horn Q: What is coastal storm? Alessandra answered that the issue associated with coastal storms are addressed by other coastal events profiled. Keith recommended that any additional information found under local HM plans on coastal storms be incorporated into other areas addressed.

Next Steps: Alessandra noted follow-up needed on the following:

- Obtain responses from State agencies on the information they provided on the past update
- Send schedule of events by email
- Provide information on who did not spend their $1 million Katrina allocations
- Reach out to floodplain managers
- Send State survey to department heads along with who else was cc'd.
- Add saltwater intrusion summary language to the plan
- Add the new stakeholders identified
- Review status of Executive Order

Keith Horn: When do you want the State surveys returned? Answer: end of the month. Can the timeframe be expanded? Alessandra agreed to mid-February.

Cindy O'Neal Q: Who prioritizes new disasters? State team does.

Cindy O'Neal Q: Can additional set-aside money be made available for incorporation of state building code? Answer: No, but additional set-aside money is available following high wind events.

Keith Horn Comment: We have had a problem having a quorum at meetings. Today, we are missing three agencies. Alessandra recommended adding a remote vote to solve the issue. Alessandra agreed to check out the current plan and see what it states about quorums.

Tentative Dates:

- Meeting #2 – February 23, 2010
- Meeting #3 – April 27, 2010
- Preliminary Draft – June 30, 2010
- Meeting #4 – July 27, 2010
- Second Draft – August 31, 2010
- Final Draft – November 30, 2010
- Meeting #5 – TBA

Meeting Adjourned.

January 19, 2010 Kick-Off Meeting Sign-In Roster

STATE HAZARD MITIGATION PLAN UPDATE
KICK-OFF MEETING
SIGN -IN ROSTER
January 19, 2010

AGENCY	NAME	EMAIL	Address	City	PHONE	SIGNATURE
DEQ	Keith Horn	Keith.horn@la.gov	PO Box 4314	BR, LA 70821-4314	225-219-3209	Attended
DOTD	Cindy O'Neal	cindy.oneal@la.gov	8900 Jimmy Wedell Dr	BR, LA 70807	225-274-4354	Attended
GOHSEP	Steve Garcia	sgarcia@la.gov	415 N 15th Street, 4th Floor	BR, LA 70802	225-267-2644	Attended
DOA/OFP	Bill Morrison	Bill.morrison@la.gov	PO Box 94095	BR, LA 70804	225-342-0855	Attended
DOC	Eric Sivula	esivula/corrections@corrections.state.la.us	504 Mayflower	BR, LA 70802	225-342-1178	Attended
DHH	Richard Hollowell	Rhollowe@dhh.la.gov	628 N 4th Street	BR, LA 70802	225-342-3501	Attended
DPS/LSUCCC	Denise Jobe	denise.jobe@dps.la.gov	18 Columns Court	LaPlace, LA 70068	225-333-2100	Attended
GOHSEP	Margaret Sanz	margaret.sanz@la.gov	415 N. 15th Street, 4th Floor	BR, LA 70802	225-267-2678	Attended
GOHSEP	Brenda Cooper	bcooper@la.gov	415 N. 15th Street, 4th Floor	BR, LA 70802	225-267-2525	Attended
JLWA	Stephen Pratt	spratt@wittassociates.com	415 N. 15th Street, 4th Floor	BR, LA 70802	225-303-6550	Attended
JLWA	Greg Fenton	gfenton@wittassociates.com	415 N. 15th Street, 4th Floor	BR, LA 70802	404-942-7750	Attended
JLWA	Alessandra Jerolleman	ajerolleman@wittassociates.com	616 Solomon Drive	Covington, LA	504-914-6648	Attended

January 19, 2010 Kick-Off Meeting PowerPoint Presentation

LA State Hazard Mitigation Plan Update
January 19, 2010 – Meeting # 1

Presented by GOHSEP

LA SHMP Update

AGENDA

- Introductions
- Plan Update
- Overview of the Planning Process
- Outreach Activities
- Hazards Identification
- Next Steps

2

LA SHMP Update

Introductions

3

Introduction

- Name, Position, Organization
- Previous Participation and/or Experience with the Hazard Mitigation Plan Update
- Contact Information

Please make sure to sign the sign-in sheet.

4

LA SHMP Update

Plan Update Overview

5

Regulatory Requirement

Per 44 CFR 201.4 (a) (1) - For all disasters declared on or after November 1, 2004, all states, local governments, and tribes must have a FEMA approved plan in order to become eligible for all types of FEMA funding.

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Purpose of Plan Update

A State is required to update its FEMA approved State Hazard Mitigation Plan every three (3) years for continued eligibility of the following:

- Hazard Mitigation Grant Program
- Pre-Disaster Mitigation Grant Program
- Flood Mitigation Assistance Program
- Severe Repetitive Loss Program
- Repetitive Flood Claims Programs
- Public Assistance (beyond Parts A & B)

7

What is Hazard Mitigation?

Hazard Mitigation refers to any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazardous conditions.

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Purpose of Meeting #1

- Disaster Mitigation Act of 2000
- Reconvene the SHMT and SHMPC.
- Identify hazards.
- How to solicit public comment for a more inclusive State Hazard Mitigation Plan?
  - Pitfalls to avoid during this update.

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Role of the SHMT and SHMPC

- Directs the development of the plan.
- Voice for the State.
- Attendance is valued and necessary to facilitate an effective planning process.
- Comment on drafts through SharePoint.

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Accessing SharePoint

- Log on to the web address at: http://sharepoint.jlwitt.com/SHMPU
- The assigned user name is: **SHMPUusers**
- The assigned password is: **jlwashmp345**
- Instructions for use:
  - Click on Shared Documents
  - Click on the Steering Committee folder
  - Right click on documents in order to save them to your computer
- Open document(s) on your own computer and either insert comments using the track changes option or email them to Alessandra Jerolleman at ajerolleman@wittassociates.com

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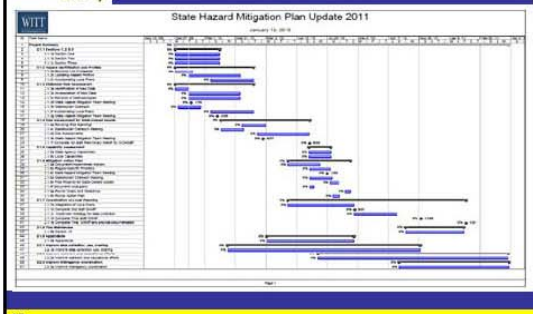
Draft Schedule



12

LA SHMP Update

Overview of Planning Process

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Planning Process

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards. There are four basic phases of the hazard mitigation process.

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Overview of Planning Process

- Document Planning Process
- State-Wide Risk Assessment
- Risk Assessment for State-Owned Assets
- Capability Assessment
- Mitigation Goals, Objectives, and Action Plan
- Plan Maintenance
- Coordination with Parish and Local HMP's

15

Document Planning Process

- Describe process used to develop plan.
- Include how it was prepared.
- Include who was involved in the process.
- Describe participation of other agencies.

16

State-Wide Risk Assessment

- Identify Hazards
  - i.e. Hurricanes, Flooding, Tornadoes
- Profile Hazard Events
  - i.e. Hurricanes Gustav, Ike, April 2008 Floods
- Inventory Assets
  - Recognize vulnerable structures and infrastructure, i.e., highways, State Police Buildings

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State-Wide Risk Assessment

- Purpose
  - Provide information and support for parish and local level planning and project implementation.
  - Help identify priorities for future funding allocations by the SHMT.

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Risk Assessment for State-Wide Assets

- Purpose
  - Help identify priorities for further detailed, site/facility level assessments.
  - Provide information and support for state facility managers re: planning and project implementation efforts.
  - Help identify priorities for future funding allocations by the SHMT.

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Capability Assessment

- Identify strengths and weaknesses.
- Identify resources in place to support new or expanded mitigation initiatives.
  - Technological
  - Informational
  - Financial
  - Physical
- Shape areas of focus in mitigation action plan

20

Mitigation Action Plan

- Goals, Objectives and Plans of Action
  - Respond to the results of the risk and capability assessments and focus on improving:
    - Interest
    - Information
    - Interaction
    - Implementation

21

Plan Maintenance Process

- Incorporate new hazard and risk information.
- Determine effectiveness of existing plans and implementation.
- Prepare future periodic SHMP updates.

22

Coordination with Parish/Local HMP's

- Continue to improve identification and implementation of feasible, cost effective, environmentally sound hazard mitigation projects at the parish/local level.
  - Build the State Plan from the ground up by importing data from the local plans.

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LA SHMP Update

Outreach

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Outreach to the Public

- Provide an environment to facilitate an open line of communication to make the update process more inclusive.
  - How to get the word out?
  - Provide avenues for effective communication and public comment.

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Outreach to Stakeholders

- Part of the public outreach effort.
- Draft list of participants is being confirmed.
- Terms of participation:
  - Will not be required to attend meetings.
  - Communication will be solicited via phone calls and/or emails.

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Get a Game Plan

Website:

http://www.getagameplan.org/mitigateplanupdate.htm

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Get a Game Plan

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LA SHMP Update

Hazards

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Hazards - Comparison

FEMA's List Hazard Type Hazards Identified (Found in Crosswalk)	Hazards in State Plan	Hazards Consistent with Local Plans	Hazards in Local Plans but not in State Plan
Avalanche			
Coastal Erosion		✓	✓
Coastal Storm		✓	✓
Dam Failure	✓	✓	
Drought	✓	✓	
Earthquake	✓		
Expansive Soils		✓	✓
Extreme Heat	✓	✓	
Flood	✓	✓	
Hailstorm	✓	✓	
Hurricane	✓	✓	
Land Subsidence	✓	✓	

FEMA's List Hazard Type Hazards Identified (Found in Crosswalk)	Hazards in State Plan	Hazards Consistent with Local Plans	Hazards in Local Plans but not in State Plan
Landslide			
Severe Winter Storm/Extreme Cold/Ice Storms	✓	✓	
Tornado	✓	✓	
Tsunami			
Volcano			
Wildfire	✓	✓	
Windstorm			
Levee Failure	✓	✓	
* Lightning	✓	✓	
* Storm Surge	✓	✓	
* Salt Water Intrusion		✓	✓
Hazardous Materials Incident	✓	✓	

30 * Denotes those hazards specific to Louisiana and not included in FEMA's generic list.

LA SHMP Update

Next Steps

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Next Steps

- Meeting dates.
- Tentative dates for submittal of draft plan

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Tentative Dates

- Meeting #2 - February 23, 2010
- Meeting # 3 - April 27, 2010
- Preliminary Draft – June 30, 2010
- Meeting # 4 – July 26, 2010
- Second Draft – August 31, 2010
- Final Draft – November 30, 2010
- Meeting #5 – TBA
- State Capability Assessment Survey

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LA SHMP Update

Questions?

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State Plan Update 2011

Meeting #1

January 19, 2010

Hazard Identification

FEMA's List Hazard Type Hazards Identified (Found in Crosswalk)	Hazards in State Plan	Hazards Consistent with Local Plans	Hazards in Local Plans but not in State Plan
Avalanche			
Coastal Erosion		▯	▯
Coastal Storm		▯	▯
Dam Failure	▯	▯	
Drought	▯	▯	
Earthquake	▯		
Expansive Soils		▯	▯
Extreme Heat	▯	▯	
Flood	▯	▯	
Hailstorm	▯	▯	
Hurricane	▯	▯	
Land Subsidence	▯	▯	
Landslide			
Severe Winter Storm/Extreme Cold/Ice Storms	▯	▯	
Tornado	▯	▯	
Tsunami			
Volcano			
Wildfire	▯	▯	
Windstorm			
Levee Failure	▯	▯	
* Lightning	▯	▯	
* Storm Surge	▯	▯	
* Salt Water Intrusion		▯	▯
Hazardous Materials Incident	▯	▯	

**** Denotes those hazards specific to Louisiana and not included in FEMA's generic list.***

January 19, 2010 Kick-Off Meeting Handout

MITIGATION DIRECTORATE

State and Local Mitigation Planning

Building Stronger and Safer—Disaster Resilient

Hazard mitigation is sustained action taken to reduce or eliminate long-term risk to people and their property from hazards. Hazard mitigation planning is the process State, Tribal, and local governments use to identify risks and vulnerabilities associated with natural disasters, and to develop long-term strategies for protecting people and property from future hazard events.

Under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288), as amended, State, Tribal, and local governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance, including funding for mitigation projects.

RAISES AWARENESS AND SUPPORT

The planning process promoted by FEMA is as important as the resulting plan because it creates a framework for governments to reduce the negative impacts from future disasters on lives, property, and the economy.

The mitigation plan defines a long-term strategy for reducing disaster losses by breaking the cycle of disaster damage, reconstruction, and repeated damage. Mitigation planning includes the following elements:

Public involvement – Planning creates a way to solicit and consider input from diverse interests. Involving stakeholders is essential to building communitywide support for the plan. In addition to emergency managers, the planning process involves other government agencies (e.g., planning, zoning, floodplain management, public works, conservation, community and economic development), businesses, civic and neighborhood groups, environmental groups, and schools.

Risk assessment – Mitigation plans identify natural hazards and risks based on history, potential frequency and magnitude, and identifies potential losses of life and property. The assessment considers the built environment including the type and numbers of existing and future buildings, infrastructure, and critical facilities relative to identified hazard areas.

Mitigation strategy – Based on the risk assessment, communities develop mitigation goals and objectives, as part of a strategy for mitigating disaster losses. The strategy is a community's approach for implementing mitigation activities that are cost-effective, technically feasible, and environmentally sound as well as allowing strategic investment of limited resources.

BENEFITS OF MITIGATION PLANNING

Increases public awareness and understanding of vulnerabilities as well as support for specific actions to reduce losses from future natural disasters.

Builds partnerships with diverse stakeholders increasing opportunities to leverage data and resources in reducing workloads as well as achieving shared community objectives. For example, managing floodplain development may decrease flood losses but also protect water quality by restoring natural functions.

Expands understanding of potential risk reduction measures to include structural and regulatory tools, where available, such as ordinances and building codes. Through implementation of local floodplain ordinances, it is estimated that $1.1 billion in flood damages are prevented annually.

Informs development, prioritization, and implementation of mitigation projects. Benefits accrue over the life of the project as losses are avoided from each subsequent hazard event.

FEMA 2009 PAGE 1

PLANNING GUIDANCE, TOOLS & TRAINING

Multi-Hazard Mitigation Planning Guidance, or "Blue Books," are designed to increase understanding of the requirements for States, local and Tribal governments when developing new or updated mitigation plans, and help Federal and State reviewers fairly and consistently evaluate mitigation plans from different jurisdictions.

Training available through FEMA's Emergency Management Institute (EMI) or your State Hazard Mitigation Officer (SHMO) include:

- G318 Mitigation Planning Workshop for Local Governments
- E296 HAZUS Multi-Hazard/DMA 2000 Risk Assessment
- E344 Mitigation for Tribal Officials

Series of "How-To" guides are designed to provide information beyond FEMA's basic requirements. The guides focus on initiating and maintaining a planning process that will result in safer communities, and are applicable to jurisdictions of all sizes, resource and capability levels.

CURRENT LIST OF HOW-TO SERIES

- Getting Started: Building Support For Mitigation Planning (FEMA 386-1)
- Understanding Your Risks: Identifying Hazards And Estimating Losses (FEMA 386-2)
- Developing The Mitigation Plan: Identifying Mitigation Actions And Implementing Strategies (FEMA 386-3
- Bringing the Plan to Life: Implementing the Hazard Mitigation Plan (FEMA 386-4)
- Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5)
- Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning (FEMA 386-6)
- Integrating Manmade Hazards Into Mitigation Planning (FEMA 386-7)
- Multi-Jurisdictional Mitigation Planning (FEMA 386-8)
- Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects (FEMA 386-9)
- Using HAZUS-MH for Risk Assessment (FEMA 433)

HAZARD MITIGATION PLANNING RESULTS

History shows that the physical, financial, and emotional losses caused by disasters can be reduced significantly through hazard mitigation planning. A broad range of activities designed to reduce risk can result from the mitigation planning process, such as:

- Adopting and enforcing regulatory tools, including ordinances, regulations, and building codes to guide and inform land use, development, and construction decisions in areas affected by hazards. Where authorized, consider adopting more stringent criteria to provide greater protection for citizens, as conditions may change over time. For example, consider:
  - Exceeding the National Flood Insurance Program (NFIP) floodplain management regulations by elevating structures above the Base Flood Elevation (BFE) in high-risk areas.
  - Creating a buffer area by protecting natural resources, such as floodplains, wetlands or sensitive habitats. Additional benefits to the community may include improved water quality and recreational opportunities.
- Developing mitigation projects to acquire and demolish flood damaged structures, such as homes or businesses, or to retrofit public buildings, schools, and critical facilities to withstand extreme wind events or ground shaking from earthquakes.

The examples above illustrate a range of possible long-term mitigation actions and are not intended as examples of eligible activities under the FEMA Hazard Mitigation Assistance (HMA) programs.

HAZARD MITIGATION ASSISTANCE (HMA)

FEMA's HMA programs fund eligible mitigation activities that reduce future disaster losses and protect life and property. Funding is available for mitigation plan development and updates as well as mitigation projects. Please note that specific requirements relative to FEMA-approved mitigation plan(s) as a condition of receiving mitigation project grants vary by HMA program.

FOR MORE INFORMATION

Please visit the Mitigation Planning website:
www.fema.gov/plan/mitplanning/index

FEMA

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January 19, 2010 Kick-Off Meeting Stakeholders Handout

Organization	Last	First	Title
GOHSEP / Region 1	Delatte	Darryl	Regional Coordinator
GOHSEP / Region 2	Jones	Blaine	Regional Coordinator
GOHSEP / Region 3	Roussel	Pam	Regional Coordinator
GOHSEP / Region 4	Guidry	Darren	Regional Coordinator
GOHSEP / Region 5	Zettlemoyer	Doug	Regional Coordinator
GOHSEP / Region 6	Batts	Sadye	Regional Coordinator
GOHSEP / Region 7	Carmack	Lisa	Regional Coordinator
GOHSEP / Region 8	Stewart	Joe	Regional Coordinator
GOHSEP / Region 9	Teresa	Basco	Regional Coordinator
Natural Hazard Mitigation Association	Jane	Rovins	Board President
Louisiana FloodPlain Managers Association	Pam	Mattingly	
FEMA / TRO	Harvey	Kincaid	Planning Lead
Red Cross	Jane	Morgan	
Red Cross	Bobbie	Zaunbrecher	
Red Cross	Barbara	Reiser	
LPBF- Lake Pontchartrain Basin Foundation	Rheans	Anne	Executive Director
LAGC- Louisiana Assocation of General Contractors	Naquin	Ken	CEO
LHBA- Louisiana Homebuilders Association	Dodd	Jeannie	Executive Director
LMA- Louisiana Municipal Association	McHugh	Tom	Executive Director
LA Realtors Association	Young	Malcome	CEO
LPJA- Police Jury Association of Louisiana	Dartez	Roland	Executive Director
LSU Ag	Skinner	Patricia	Disaster Programs Coord.
Stephenson Disaster Management Institute	Anderson	Thomas	Interim Exec. Director
USDA/NRCS (Natural Resource Conservation Service)	Sticker	Brad	Acting State Conservation Eng
USGS (US Geological Survey)	Casadevall	Thomas	Director
ULL/CSFM (Center for Structural & Functional Materials	Misra	Devesh	Director
ULL/LITE (LA Immersive Technologies Enterprise)	Crus-Neira	Carolina	Director
UNO/CHART (Center Hazard Assessment Response and Technology	Laska	Shirley	Director
UNO/PLANNING	Brooks	Jane	Chair
APA, LA Chapter (American Planning Association)	Villavaso	Stephen D.	President
ASLA (American Society of Landscape Architects	Brown	Dana	President
ASLA (American Society of Landscape Architects	Brown	Shannon	President - Elect
Association of Levee Boards	Wilson Thomas	Steve Amber	President Staff Support
Center for Planning Excellence	Thomas	Elizabeth "Boo"	President and CEO
CRCL (Coalition to Restore Coastal Louisiana)	Peyronnin	Steven	Executive Director
CPRA (Coastal Protection and Restoration Authority of Louisiana)	Graves	Garrett	Governor's Executive Assistant for Coastal
LDI (Louisiana Department of Insurance)	Benoist	Virginia	Assistant Attorney General
DSS (Department of Social Services)	Nichols	Kristy	Secretary
DOA/OCD (Division of Administration/ Office of Community Development)	Keegan	Robin	Director
DOA/ORM (Division of Administration/ Office of Risk Management)	Thompson	Bud	Director
DOA/ORM (Division of Administration/ Office of Risk Management)	Rayborn	Henry	Loss Prevention Supervisor

LED (Louisiana Economic Department)	Smart	Skip	Director of Community Development
Louisiana Housing Finance Authority (LHFA)	Minor	Charlotte	Program Administrator
La Geographic Information Center (LAGIC)	Pennington	Chris	Technical Service & Support
Center for GeoInformatics	Kent	Joshua	GIS Manager
CLEAR/CERA LSU Hurricane Center	Suhayda	Joseph	Interm Director
LSU Sea Grant	Wilkins	Jim	Director
SLFPA-East	Boudreaux	Glenda	Administrator
SLFPA-West	Spohrer	Gerald	Chief of Operations
Southern University	Wells	Mary	Facilities Planner
Tulane Law/IWR	Davis	Mark	Director
USACE Non Structural	Buss	Larry	Chairman
ASCE			
DNR/CMD			
Coastal Affairs			
LA/Nat Guard			
CRT			
LRA			
LANO			
LAPDD			
LMHA			
LMA			
LPJA			
LA Realtors			
LSU Hurricane Center			
NIMSAT			
USACE NOD			
USACE NOD			
EPA			
NOAA			

February 23, 2010 Meeting #2 Minutes

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

Meeting Notes from the February 23, 2010 State Hazard Mitigation Planning Committee Meeting

Held at the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) Office on Independence

Attendees:
Steve Garcia, Jerry Monier, Brenda Cooper, Shantelle Dunn, Peggy Poche and Margaret Sanz, GOHSEP
Michele Deshotels, OCPR
Cindy O'Neal, LA DOTD
Linda Pace, DNR/OCRM
Dodi Langlois, ORM
Richard Hollowell, DHHS
Jim Hanifen and Robert Love, LDWF
John Walters and Diane Stacy, LDAF
Bill Morrison, DOA/OFP
Keith Horn, DEQ
Raju Gottumukkala and Shannon Strother, NIMSAT
Alessandra Jerolleman, Greg Fenton, Nicolle Dailey, James Lee Witt Associates

Welcome: Steve Garcia called the meeting to order. He provided the agenda for the meeting, which included:

- Introductions
- SHMT Update
- NIMSAT CEO Presentation – Risk Assessment
- Hazard Profiles
- State-owned Facilities Risk Assessment
- Capability Assessment
- Next Steps

Steve had all attendees introduce themselves and give their name, organization, and previous experience working on the State Hazard Mitigation Plan. Steve then gave an update on the SHMT.

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TELEPHONE (225) 925-7500 FAX (225) 925-7501

1

SHMT Update. There is no Federal mandate for the formation of a SHMT. The SHMP maintenance section states that the update process will be undertaken by the State Hazard Mitigation Planning Committee (SHMPC) and supported by GOHSEP. The group present today makes up the planning committee. The SHMT has not been formally identified, though it has been suggested that the LRA has been authorized by the governor to act as the SHMT for the big 4 disasters. GOHSEP is working with Governor Jindal's office to identify language and guidance pending the identification of the SHMT. Any developments will be communicated to the SHMPC.

Cindy O'Neal – Question concerning SHMT meeting requirements identified in SHMP.

Keith Horn – Comment that the lack of SHMT meetings to monitor progress of the SHMP goals were not held and needs to be addressed in the update.

Alessandra – The SHMT meetings will be addressed in the update, the planning committee will meet the CFR guidance. We will capture what has been accomplished and how, even if it wasn't as laid out in the existing SHMP, as well as items that were not accomplished.

Richard Hallowell – Comment that the LRA will be going away this year.

Steve Garcia - The plan update must continue to move forward regardless of SHMT identification.

NIMSAT CEO Presentation: Raju Gottumukkala gave a presentation about the CEO Risk Assessment Methodology. Portal will be available to the public with varying levels of access. Local government will be able to access data and information to aid in HMP efforts and project justification. Public users will be able to identify their risks and link to mitigation measures they can pursue. Products are currently being refined.

NIMSAT will be meeting with local OEM officials to review and refine the portal and products. They are counting on OEM officials to coordinate with appropriate offices/departments to provide feedback and necessary information.

Cindy O'Neal – Comment that they need to bring in key players to get data such as DEQ.

Jerry Monier – Questioned how it will link to Virtual Louisiana.

Alessandra – The scope of work for the effort was specific to the CEO program, future efforts can pursue linking the system to Virtual Louisiana. Discussed parallel efforts that have been going on and the need to improve integration in the future.

Michele Deshotels – Raised concerns with the interpretation of one of the datasets utilized. It is an initial effort and possibly too simplistic to capture reality. Additional studies will be available in the near future that should further improve methodology and better capture reality which should be incorporated into the system. Will discuss concerns in more detail with NIMSAT.

Cindy O'Neal – Comment that OEP has not reached out to CFMs adequately to participate in the development of the program.

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2

Hazard Profiles: Alessandra presented the 10 prevalent hazards determined by the SHMPC in the current plan and updated information for each. The Section 4 updates are fairly complete.

Keith Horn – Commented that the HAZMAT data is old, he will get updated information for incorporation into the update.

The 10 prevalent hazards identified in the current plan and ranked by the SHMPC at the time include:

- Storm Surge
  - Updated to incorporate Hurricanes Ike and Gustav
- Hurricanes/Tropical Storms
  - Hurricanes Ike and Gustav damages and information were incorporated.
  - Jerry Monier requested that the evacuation statistics be clarified to state that the numbers are national and not specific to Louisiana. *Numbers are for the entire Gulf Coast.*
- Flooding
  - Recent declarations in northern parishes will be incorporated.
  - Cleaning up RL/SRL data sets.
  - Working to identify most recent digital floodplain mapping for each Parish. Will coordinate with Cindy O'Neal to obtain that information.
- Tornadoes
  - Updated to incorporated 2008/2009 Tornado seasons.
- Levee Failure
  - Incorporated information from IPET report.
  - Levee systems undergoing decertification.
  - Keith Horn – Commented that LDOTD now has a levee group that may have additional information.
  - Michele Deshotels – Commented that she may be able to access additional data that may include smaller levees.
  - Peggy Poche – Questioned if the levee districts had been coordinated with. (Response that OCPR was working closely with them)
- Land Subsidence
  - USGS states that the Mississippi Delta plain is subject to the highest rate of relative sea level rise of any city in the US.
  - Current efforts are in place to monitor subsidence much more accurately.
  - This is not an immediate threat but will be significant over time.
- Hazardous Materials Incidents
  - Added HSEES data as well as reports and surveillance records supporting "natural hazard" events.
  - Added hurricane related findings in industrial settings.
- Ice Storms
  - 2 minor events added.
- Wildfire
  - Increase in arson caused wildfires per a verbal interview with LDAF staff.
  - LDAF budget for wildfire control greatly reduced.
  - Second and tertiary effects of wildfires as identified in California, increased runoff and erosion, discussed.

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- Keith Horn – Questioned the increase in arson caused wildfires in LA. Alessandra responded that the data came from LDAF interview though there are no numbers to support that information, it is a national trend.
- Michele Deshotel – Comment on the issues affecting Louisiana can be similar to those found in CA. Areas in LA where wildfires occur can have more runoff and erosion which can increase sediment in streams causing more flooding.
- Robert Love – Comment that prescribed burning is the best measure to reduce fuel for wildfires.

- Dam Failure
  - Incorporated information concerning dam failure hazards such as population growth, development upstream and downstream, land use changes, reduced capacities due to sedimentation and general deterioration.
  - Many structures do not meet current State dam safety regulations and are reaching or have exceeded their expected life span.
  - Alessandra commented that FEMA may incorporate a dam failure zone to future floodplain maps.

Other hazards profiled but without a risk assessment include:

- Extreme Heat
- Extreme Cold
- Hailstorm
- Lightning
- Earthquake
- Drought

Keith Horn – Commented that there is a fault line in French Settlement.

Alessandra – Comment that updated lightning and drought information has been incorporated.

Distributed handout of the 10 primary hazards for the SHMPC to provide input on their ranking.

State-owned Facilities Risk Assessment. Alessandra presented on the 2008 methodology used to prioritize critical facilities and the new proposed methodology. The new methodology will account for the criticality of the buildings based on their use during response/recovery operations. The new methodology should make it easier for the state to differentiate between buildings and prioritize related mitigation actions. State agencies to not fit into a local mitigation plan and they have not been well captured in the 2008 SHMP. The data set is incomplete, efforts are ongoing to better identify the building function, i.e. ESF support, resource storage, critical public service. The new methodology is based on Continuity of Operations standards and classifies use from Level 5 to Level 1 (most critical).

Jerry Monier will provide comments on descriptions of each level to better link to emergency operations. JLWA will provide Jerry the dataset for review and structure prioritization

Capability Assessments. Status of capability assessment worksheets was discussed.
State Agencies – 6 received, 3 in progress.
Regional assessments – 2 received, 6 in progress.
Parish assessments – 32 received, 32 in progress.

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Tentative Dates:

- Meeting #3 – April 27, 2010
- Preliminary Draft – June 30, 2010
- Meeting #4 – July 26, 2010
- Second Draft – August 31, 2010
- Final Draft – November 30, 2010
- Meeting #5 – TBA
- State Capability Assessment Survey

Distributed Section 4 and Appendix D for review; comments are due **March 12, 2010**.

Meeting Adjourned.

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February 23, 2010 Meeting #2 PowerPoint Presentation

State Hazard Mitigation Plan

2011 Update

Presented by GOHSEP

Agenda

- Introductions
- SHMT Updates
- Risk Assessment
- Hazard Profiles
- State-owned Facilities Risk Assessment
- Capability Assessment
- Next Steps

2

LA SHMP Update

Introductions

3

Introduction

- Name, Position, Organization
- Previous Participation and/or Experience with the Hazard Mitigation Plan Update
- Contact Information

Please make sure to sign the sign-in sheet.

4

LA SHMP Update

- **The 44 CFR under section 201.4 (b) Planning process it states "…The mitigation planning process should include coordination with other State agencies, appropriate Federal agencies, interested groups…"**
- **201.4 (5) (i) A Plan Maintenance Process.**
- **There is currently no Federal statutory / regulatory provision that mandates the formation of a State Hazard Mitigation Team**

5

LA SHMP Update

- In the plan maintenance section of our current plan it states that for the purpose of the Plan update process we will entail a detailed and structured re-examination of all aspects of the original Plan, followed by recommended updates. The update process will be undertaken by the State Hazard Mitigation Planning Committee (SHMPC) and supported by GOHSEP. The recommendations will be presented to the State Hazard Mitigation Team (SHMT) for consideration and approval. It is expected that the Governor will issue a letter of adoption for each update of the Plan.
- It has been suggested that the LRA has been authorized by the governor to act as the SHMT for all open disasters. Any future development regarding the LRA and the State Hazard Mitigation Team will be communicated to the SHMPC.

6

LA SHMP Update

RISK ASSESSMENT

National Incident Management Systems and Advanced Technologies (NIMSAT) Institute

University of Louisiana at Lafayette

7

LA SHMP Update

Table indicates the relative priority assigned to the 10 prevalent hazards as determined by the SHMPC.

Ranking	Hazard
1	Storm Surge
2	High Wind – Hurricane / Tropical Storm
3	Flood
4	High Wind – Tornado
5	Levee Failure
6	Subsidence
7	Hazardous Material Incident
8	Ice Storm
9	Wildfire
10	Dam Failure

These priorities were developed by averaging hazard ranks per each SHMPC member at the November 29, 2007 meeting.

8

LA SHMP Update

Storm Surge

9

LA SHMP Update

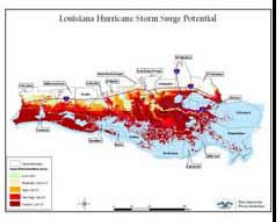
- Storm surge from:
  - FEMA-1792-DR-LA Hurricane Ike (9-13-08)
    - ✓ Inundates coast – storm surge went 30 miles inland
    - ✓ Flooding 10,000's of homes
    - ✓ Many roads impassable
    - ✓ Levee failure
    - ✓ 600 rescued from floodwaters

Delcambre, LA
September 13, 2008

10

LA SHMP Update

- Storm surge from:
  - FEMA-1786-DR-LA Hurricane Gustav (9-1-08)
    - ✓ Inundates coast
    - ✓ Storm surge result in tides of 12 feet in Black Bay, Plaquemines Parish
    - ✓ Surge flowed up rivers that drain into lakes



11

LA SHMP Update

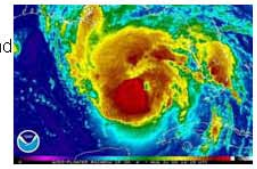
Hurricanes/Tropical Storm

High Wind

12

LA SHMP Update

- **Hurricane Gustav – September 1, 2008**
  - Second most destructive of 2008 season
  - Largest evacuation in US History – 3 million
  - Tenth largest declared event in FEMA history
  - Threaten oil production
  - Spawned tornadoes
  - Power outage widespread
  - 1.5 month to restore



13

LA SHMP Update

Billions	Name	Year
$81.2	Hurricane Katrina	2005
$40.7	Hurricane Andrew	1992
$35.0	Hurricane Ike	2008
$29.1	Hurricane Wilma	2005
$18.6	Hurricane Charley	2004
$18.1	Hurricane Ivan	2004
$15.23	Hurricane Agnes	1972
$14.1	Hurricane Hugo	1989
$10.5	Hurricane Rita	2005
$10.4	Hurricane Frances	2004
$10.2	Hurricane Gilbert	1988
$9.35	Hurricane Betsy	1965
$8.5	Hurricane Gustav	2008

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LA SHMP Update

- Hurricane Ike – September 12, 2008
  - Third largest declared event in FEMA history
  - Largest in Atlantic basic history
  - Major flooding, hundreds were rescued
  - Areas had not recovered yet from Gustav

Rank	Hurricane	Season	Cost (2008 USD)
1	Katrina	2005	$89.6 billion
2	Andrew	1992	$40.7 billion
3	**Ike**	2008	$27.0 billion
4	Wilma	2005	$22.7 billion
5	Charley	2004	$18.6 billion

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LA SHMP Update

Flooding

16

LA SHMP Update

- Recent declaration for flooding, plus severe storms & tornadoes, on 12-10-09 for 9 northern parishes.
- Updated RL/SRL data.
- Identifying most recent digital floodplain mapping for each Parish.

17

LA SHMP Update

Tornadoes

High Wind

18

LA SHMP Update

- 2008 and 2009 Tornado season proved to be as deadly and as costly as in previous years.
- 2008/2009 tornado season produced 164 recorded tornadoes that resulted in approximately 6 Deaths, 32 Injuries, and $41.684m in Damages in Louisiana.
- On December 10, 2009 President Obama declared a major disaster in the area struck by severe storms, **tornadoes**, and flooding during the period of October 29 to November 3, 2009 (FEMA-1863-DR-LA severe storm and tornadoes for 9 parishes)

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LA SHMP Update

Levee Failure

20

LA SHMP Update

- Results of the IPET report.
- Levee systems undergoing decertification.
- No significant events since the previous plan.

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LA SHMP Update

Land Subsidence

22

LA SHMP Update

- According to the USGS, the Mississippi Delta plain is subject to the highest rate of relative sea level rise of any region in the US.
- Rate for New Orleans is approximately 1.48 feet in 50 years…about .28 to.34 inches per year.
- Technology now includes a continuously operating reference stations (CORS), which will move accurate monitor subsidence progress (a sample per second).

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LA SHMP Update

Hazard Material Incidents

24

Hazardous Material Incidents

- Added data from reports based on information from the Hazardous Substance Emergency Events Surveillance (HSEES) system
- Reports and surveillance supporting "natural hazard" events i.e.., hurricane, tornado, flood, lightning, causing hazardous material releases
- Added findings regarding hurricane related releases in industrial settings

25

LA SHMP Update

Ice Storms

26

LA SHMP Update

- 2 minor events since the prior plan Update.

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LA SHMP Update

Wildfire

28

LA SHMP Update

- Percentage of wildfire caused by arson has sharply increased in recent years.
- LDAF's budget for wildfire control has been greatly reduced.
- Study from California wildfires in 2003 indicated that denuded hills have at least 4 times higher runoff for same precipitation event, plus debris flow. Runoff expected to much higher for denuded forest land, such as Louisiana.

29

LA SHMP Update

Dam Failure

30

LA SHMP Update

- Populations have grown; residential and commercial development has occurred upstream and downstream from the dams; land uses have changed; sediment pools have filled; and concrete and metal components have deteriorated.
- Many structures do not meet current State dam safety regulations that have either been enacted or revised with more stringent requirements than when the dams were first built.
- Most of the dams were built with only a 50-year life span.

31

LA SHMP Update

- Other hazards profiled, but without a risk assessment:
  - Extreme Heat
  - Extreme Cold
  - Hailstorm
  - Lightning
  - Earthquake
  - Drought

32

LA SHMP Update

Please indicate if Steering Committee wants to make new ranking!

Ranking	Hazard
	Storm Surge
	High Wind – Hurricane / Tropical Storm
	Flood
	High Wind – Tornado
	Levee Failure
	Subsidence
	Hazardous Material Incident
	Ice Storm
	Wildfire
	Dam Failure

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LA SHMP Update

Old 2008 Methodology

Critical Level	Description
Level 1 - High importance/Most Critical	Emergency medical services, fire, police & EOC's
Level 2 – Medium-high importance	Shelters
Level 3 – Medium importance	Essential government services (i.e. public works Departments, schools)
Level 4 - Medium-low importance	Non-essential government service buildings (i.e. museums, parks & recreation)

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LA SHMP Update

- The proposed methodology accounts for the criticality of buildings based on their use during response/recovery operations.
- It considers Continuity of Operations standards and makes assignments that are reflective of those criteria.
- The new methodology should make it easier for the state to differentiate between buildings and prioritize related mitigation actions.

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LA SHMP Update

New 2010 Methodology

Critical Level	Description
Level 1	Public safety bldgs/facilities (police,fire,ems,ema/eoc), shelters, hospitals, urgent care center plus other bldgs that must stay operations during disaster event to provide life safety measures/support.
Level 2	Bldgs/facilites that provide essential govt services & must be operational w/in 12-24 hr of disaster (e.g. pharmacies, pump stations, public works facilities, response/recovery operations bldgs (schools, airports, etc.
Level 3	Bldgs/facilities that be functional during recovery operational (e.g. govt admin/mgmt bldg, courthouses)
Level 4	State bldgs/facilites that must be operational for restoration of normal living condition (e.g. college bldgs, dorms, cafeteria)
Level 5	State bldgs/facilies that support normal living, commerce, tourism (e.g. museums, vacation cabins, service stations)

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LA SHMP Update

Capability Assessments

37

LA SHMP Update

Next Steps

38

Tentative Dates

- Meeting # 3 - April 27, 2010
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- Second Draft – August 31, 2010
- Final Draft – November 30, 2010
- Meeting #5 – TBA
- State Capability Assessment Survey

39

Comments

- Please provide comments on Section 4 and Appendix D
- Deadline is March 12, 2010
- Your time and effort are greatly appreciated!

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Accessing SharePoint

- Log on to the web address at: http://sharepoint.jlwitt.com/SHMPU
- The assigned user name is: **SHMPUusers**
- The assigned password is: **jlwashmp345**
- Instructions for use:
  - Click on Shared Documents
  - Click on the Steering Committee folder
  - Right click on documents in order to save them to your computer
- Open document(s) on your own computer and either insert comments using the track changes option or email them to Alessandra Jerolleman at ajerolleman@wittassociates.com

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LA SHMP Update

Questions?

42

February 23, 2010 Meeting #2 NIMSAT PowerPoint Presentation

NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES

Community Education And Outreach: Risk Assessment Methodology for Louisiana's Hazard Information Portal

N. Raju Gottumukkala, Ph.D.

Shannon Strother, M.P.H

NIMSAT Institute, University of Louisiana at Lafayette

State Hazard Mitigation Planning Committee Meeting, 02/23/2010
Baton Rouge, LA

CONNECTING FOR A RESILIENT AMERICA

NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES

Introduction

- CEO Effort at NIMSAT Institute, UL Lafayette
  - Provide tools for effectively communicating hazards to Louisiana businesses and citizens
  - Provide an improved system of hazards data collection and management
- Goals
  - Provide a Web based Risk Communication Portal
  - Provide a Risk assessment methodology
  - Provide a validated Disaster Database
  - Provide a Data Management Architecture for Hazard Data Collection and Management

9/9/2010 2

CONNECTING FOR A RESILIENT AMERICA

NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES

Datasets

- Sheldus (1996-2008)
- NCDC (1950-2009)
- SOVI (2000)
- Others
  - USGS (Earthquakes, landslides)
  - Flood Plain Data (16 parishes)
  - Wild Fires

9/9/2010 3

CONNECTING FOR A RESILIENT AMERICA

NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES

Risk Assessment

- Hazard
  - Likelihood of an event happening to a particular geographical area
  - Occurrence based on
    - Historical Hazards
    - Physical Environmental conditions
- Vulnerability
  - Potential degree of loss
  - Types
    - Biophysical
    - Social
- Consequence
  - Magnitude of damage
  - Deaths, Injuries, Property/Crop Damages

9/9/2010 4

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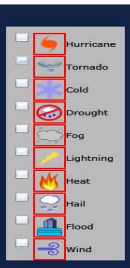
NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES

Data Used for Risk

- Attributes for Threat
  - What occurred (type) (Sheldus)
  - Where it occurred (Parish) (Sheldus)
- Attributes for Consequence
  - Property Damages (Sheldus)
  - Crop Damages (Sheldus)
  - Fatalities (Sheldus)
  - Injuries (Sheldus)
- Attributes for Vulnerability
  - SOVI



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NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES

Comprehensive Risk

- Multiple Hazards
- Arrive at a simple number
  - 0 to 1

$$Risk(k) = \left(\sum_{i=1}^{k} H_i * \left(\frac{\sum_{j=1}^{n} V_i * C_i}{n}\right)\right)$$

H_i is the probability of a particular hazard occurring to a particular geographical area.
V_i is the degree of vulnerability for a particular factor j for a particular hazard i.
C_i is the consequence factor j for a particular hazard i

9/9/2010 6

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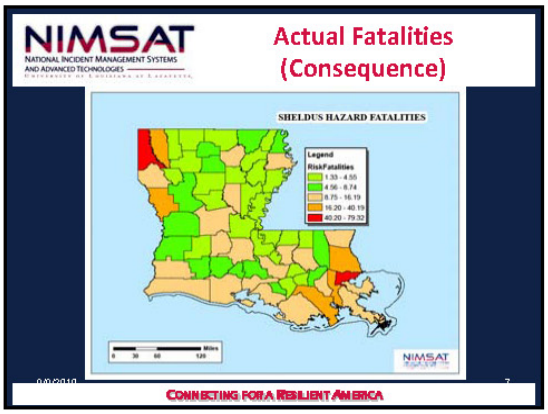
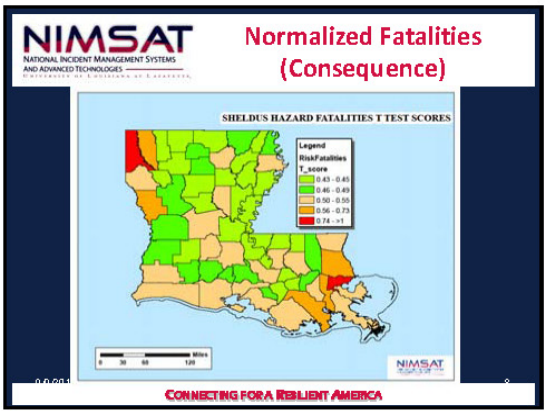
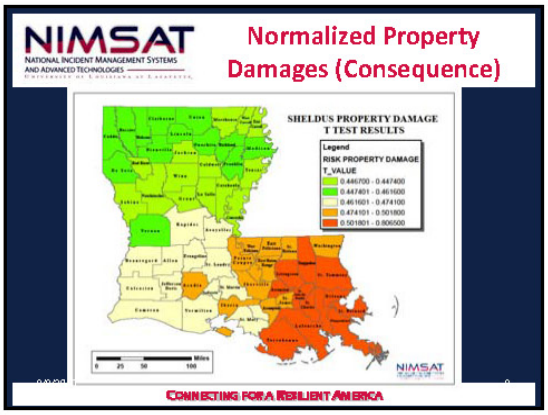

NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Actual Fatalities (Consequence)
SHELDUS HAZARD FATALITIES
Legend
RiskFatalities
1.33 - 4.55
4.56 - 8.74
8.75 - 16.19
16.20 - 40.19
40.20 - 79.32
CONNECTING FOR A RESILIENT AMERICA


NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Normalized Fatalities (Consequence)
SHELDUS HAZARD FATALITIES T TEST SCORES
Legend
RiskFatalities
T_score
0.43 - 0.45
0.46 - 0.49
0.50 - 0.55
0.56 - 0.73
0.74 - >1
CONNECTING FOR A RESILIENT AMERICA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NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Normalized Property Damages (Consequence)
SHELDUS PROPERTY DAMAGE T TEST RESULTS
Legend
RISK PROPERTY DAMAGE
T_VALUE
0.446700 - 0.447400
0.447401 - 0.461600
0.461601 - 0.474100
0.474101 - 0.501800
0.501801 - 0.806500
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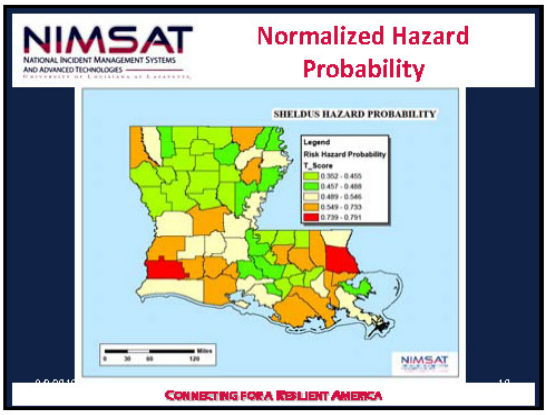
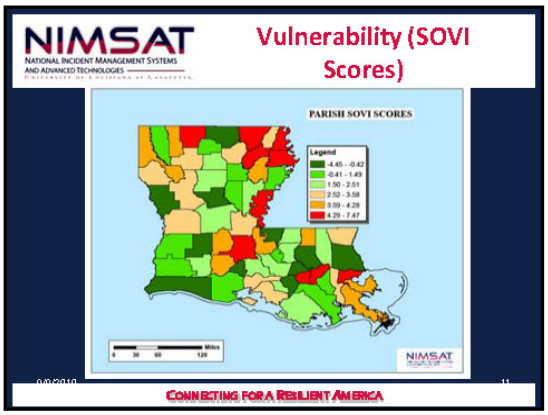
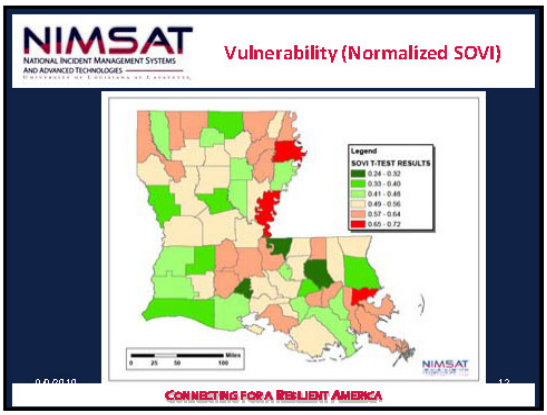
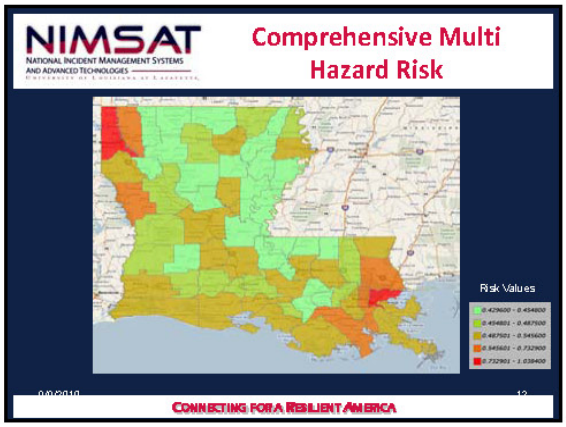

NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Normalized Hazard Probability
SHELDUS HAZARD PROBABILITY
Legend
Risk Hazard Probability
T_Score
0.352 - 0.455
0.457 - 0.488
0.489 - 0.546
0.549 - 0.733
0.739 - 0.791
CONNECTING FOR A RESILIENT AMERICA


NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Vulnerability (SOVI Scores)
PARISH SOVI SCORES
Legend
-4.45 - -0.42
-0.41 - 1.49
1.50 - 2.51
2.52 - 3.58
3.59 - 4.28
4.29 - 7.47
CONNECTING FOR A RESILIENT AMERICA


NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Vulnerability (Normalized SOVI)
Legend
SOVI T-TEST RESULTS
0.24 - 0.32
0.33 - 0.40
0.41 - 0.48
0.49 - 0.56
0.57 - 0.64
0.65 - 0.72
CONNECTING FOR A RESILIENT AMERICA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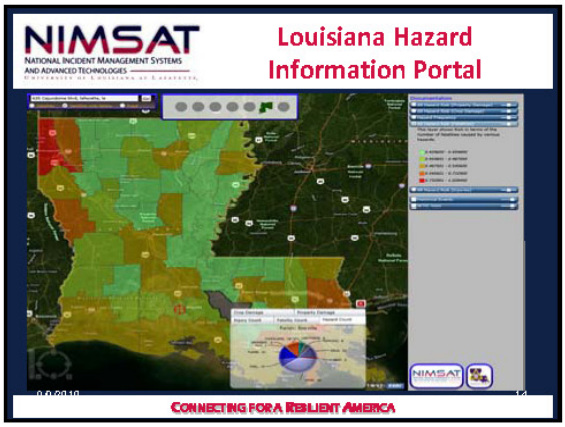
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Comprehensive Multi Hazard Risk
Risk Values
CONNECTING FOR A RESILIENT AMERICA


NIMSAT
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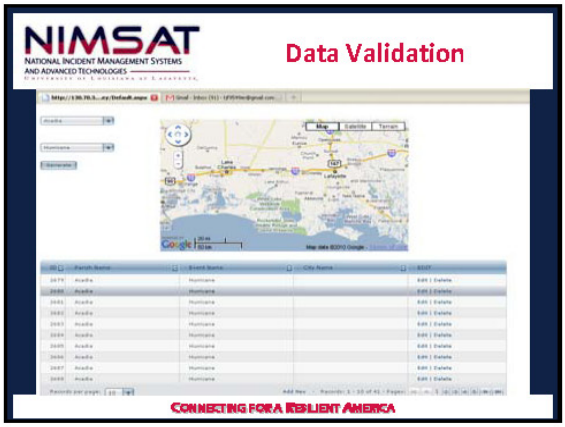
Louisiana Hazard Information Portal
CONNECTING FOR A RESILIENT AMERICA

NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Next Steps
CONNECTING FOR A RESILIENT AMERICA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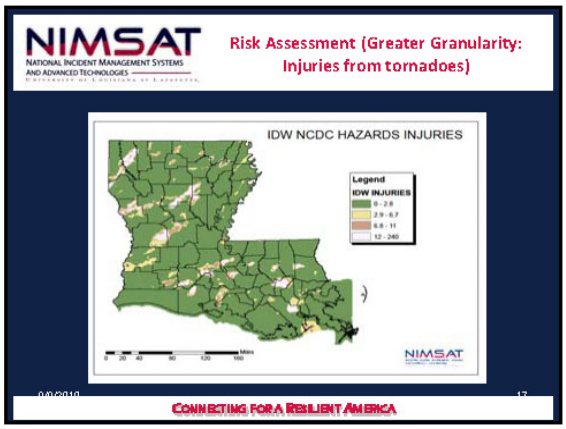
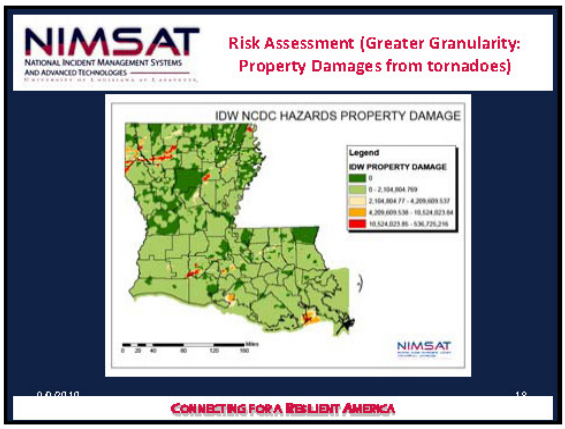
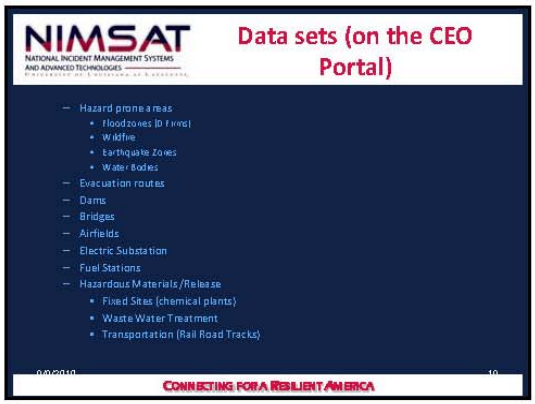
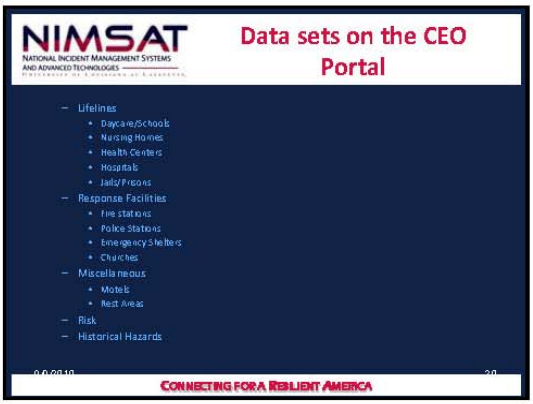
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Data Validation
CONNECTING FOR A RESILIENT AMERICA


NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Risk Assessment (Greater Granularity: Injuries from tornadoes)
IDW NCDC HAZARDS INJURIES
Legend
IDW INJURIES
NIMSAT
CONNECTING FOR A RESILIENT AMERICA


NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Risk Assessment (Greater Granularity: Property Damages from tornadoes)
IDW NCDC HAZARDS PROPERTY DAMAGE
Legend
IDW PROPERTY DAMAGE
NIMSAT
CONNECTING FOR A RESILIENT AMERICA


NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Data sets (on the CEO Portal)
– Hazard prone areas
• Floodzones (D Firms)
• Wildfire
• Earthquake Zones
• Water Bodies
– Evacuation routes
– Dams
– Bridges
– Airfields
– Electric Substation
– Fuel Stations
– Hazardous Materials/Release
• Fixed Sites (chemical plants)
• Waste Water Treatment
• Transportation (Rail Road Tracks)
CONNECTING FOR A RESILIENT AMERICA


NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Data sets on the CEO Portal
– Lifelines
• Daycare/Schools
• Nursing Homes
• Health Centers
• Hospitals
• Jails/Prisons
– Response Facilities
• Fire stations
• Police Stations
• Emergency Shelters
• Churches
– Miscellaneous
• Motels
• Rest Areas
– Risk
– Historical Hazards
CONNECTING FOR A RESILIENT AMERICA

NIMSAT
NATIONAL INCIDENT MANAGEMENT SYSTEMS AND ADVANCED TECHNOLOGIES
Thank you
CONNECTING FOR A RESILIENT AMERICA

Louisiana Hazard Mitigation Plan Update

Appendix D Hazard Identification and Hazard Profiles

Comment Form

Name:	
Title:	
Agency:	
Date:	

1. General Comments.

(Please provide any general comments you have regarding this section of the plan).

Page	Line	Comment

2. D.1 Coastal Erosion

(Please provide any comments you have regarding the Coastal Erosion Hazard Profile).

Page	Line	Comment

3. D.2 Drought

(Please provide any comments you have regarding the Drought Hazard Profile).

Page	Line	Comment

4. D.3 Earthquake

(Please provide any comments you have regarding the Earthquake Hazard Profile).

Page	Line	Comment

5. D.4 Flood

(Please provide any comments you have regarding the Flood Hazard Profile).

Page	Line	Comment

6. D.5 Hailstorm

(Please provide any comments you have regarding the Hailstorm Hazard Profile).

Page	Line	Comment

7. D.6 High Wind-Hurricane

(Please provide any comments you have regarding the High Wind (Hurricane) Hazard Profile).

Page	Line	Comment

8. D.6 High Wind-Tornado

(Please provide any comments you have regarding the High Wind-Tornado Hazard Profile).

Page	Line	Comment

9. D.7 Ice Storm

(Please provide any comments you have regarding the Ice Storm Hazard Profile).

Page	Line	Comment

10. D.8 Lightning

(Please provide any comments you have regarding the Lightning Hazard Profile).

Page	Line	Comment

11. D.9 Severe Summer/Winter Weather

(Please provide any comments you have regarding the Summer/Winter Weather Hazard Profile).

Page	Line	Comment

12. D.10 Storm Surge

(Please provide any comments you have regarding the Storm Surge Hazard Profile).

Page	Line	Comment

13. D.11 Subsidence

(Please provide any comments you have regarding the Subsidence Hazard Profile).

Page	Line	Comment

14. D.12 Wildfire

(Please provide any comments you have regarding the Wildfire Hazard Profile).

Page	Line	Comment

15. D.13 Dam Failure

(Please provide any comments you have regarding the Dam Failure Hazard Profile).

Page	Line	Comment

16. D.14 Levee Failure

(Please provide any comments you have regarding the Levee Failure Hazard Profile).

Page	Line	Comment

17. D.15 Hazardous Materials Incident

(Please provide any comments you have regarding the Hazardous Materials Incident Hazard Profile).

Page	Line	Comment

18. D.16 EOP HIRA

(Please provide any comments you have regarding the EOP HIRA section of the plan).

Page	Line	Comment

Louisiana Hazard Mitigation Plan Update

Section 4 Hazard Profiles

Comments Form

Name:	
Title:	
Agency:	
Date:	

19. General Comments.

(Please provide any general comments you have regarding this section of the plan).

Page	Line	Comment

20. 4.2 Environment

(Please provide any comments you have regarding the Environment portion of the plan).

Page	Line	Comment

21. 4.3 Hazard Identification

(Please provide any comments you have regarding the overall Hazard Identification).

Page	Line	Comment

22. 4.4 Hazard Profiles

(Please provide any comments you have regarding the overall Hazard Profile).

Page	Line	Comment

23. 4.4 Drought

(Please provide any comments you have regarding the Drought Hazard Profile).

Page	Line	Comment

24. 4.4 Earthquake

(Please provide any comments you have regarding the Earthquake Hazard Profile).

Page	Line	Comment

25. 4.4 Flood

(Please provide any comments you have regarding the Earthquake Hazard Profile).

Page	Line	Comment

26. 4.4 Hailstorm

(Please provide any comments you have regarding the Hailstorm Hazard Profile).

Page	Line	Comment

27. 4.4 High Wind (Hurricane)

(Please provide any comments you have regarding the High Wind Hazard Profile).

Page	Line	Comment

28. 4.4 High Wind (Tornado)

(Please provide any comments you have regarding the High Wind Hazard Profile).

Page	Line	Comment

29. 4.4 Ice Storm

(Please provide any comments you have regarding the Ice Storm Hazard Profile).

Page	Line	Comment

30. 4.4 Lightning

(Please provide any comments you have regarding the Lightning Hazard Profile).

Page	Line	Comment

31. 4.4 Extreme Heat and Cold

(Please provide any comments you have regarding the Extreme Heat and Cold Hazard Profile).

Page	Line	Comment

32. 4.4 Storm Surge

(Please provide any comments you have regarding the Storm Surge Hazard Profile).

Page	Line	Comment

33. 4.4 Subsidence

(Please provide any comments you have regarding the Subsidence Hazard Profile).

Page	Line	Comment

34. 4.4 Wildfire

(Please provide any comments you have regarding the Wildfire Hazard Profile).

Page	Line	Comment

35. 4.4 Dam Failure

(Please provide any comments you have regarding the Dam Failure Hazard Profile).

Page	Line	Comment

36. 4.4 Levee Failure

(Please provide any comments you have regarding the Levee Failure Hazard Profile).

Page	Line	Comment

37. 4.4 Hazardous Materials Incident

(Please provide any comments you have regarding the Hazardous Material incident Hazard Profile).

Page	Line	Comment

38. 4.4 Hazard Priorities

(Please provide any comments you have regarding the Hazard Priorities portion of the section).

Page	Line	Comment

State Hazard Mitigation Plan Update

Planning Committee Meeting #2

February 23, 2010

Please rank the Hazards listed below, with 1 being highest priority and 10 being lowest priority. We will revisit this again following the risk assessment.

Ranking	Hazard
	Storm Surge
	High Wind – Hurricane / Tropical Storm
	Flood
	High Wind – Tornado
	Levee Failure
	Subsidence
	Hazardous Material Incident
	Ice Storm
	Wildfire
	Dam Failure

We appreciate your time and effort in this survey.

SHMPU Workshop
4/19/2010

G. Fenton PPT

-explanation of process, sec 6
(**Copy agenda in)

Where are the Recovery School District Facilities?

M. Stanley

-described use of spreadsheet (not public)
-criticality vs. hazard exposure
-needs to differentiate between buildings on larger campuses
-hazmat storage example
-described set up/format of the spreadsheet
-removed list – examples and process
-agency TBD list
-described origins of 2010 methodology
-habitats as an example of need for more info
**Need to get removals "approved"

AG/Forestry canopies and public safety canopies love fuel.

Line 44 on removed – Put back on list – Priority 1, public safety

Line 42 on removed – Put back on list – Priority 1, public safety

Agency TBD

Administrative Services Program - Division of Administration
LA School for Math, Science – Board of Regents
LA Educational Television Authority – Department of Education
Louisiana Housing Finance Agency – quasi-gov; insured but not under an agency necessarily
LA Office Facilities – Department of Administration
Louisiana Property Assistance – Department of Administration
Office of Aircraft Services – Department of Administration
**DOE person looking into NOCA

179-182 is either Social Services or Health and Hospitals

Sabine River Authority – DOTD

Plaquemine Locks - CRT

LA School Employee System (TSRL) – Same as Lasers

Schools in the leased tab are RSD

-leased, but yet they are totally managed by Recovery School District
-We need to add language about this and create a new tab.
-need criticality

Ran through unprioritized list.

Brenda will ask Jeff/Casey re: military

Switchgear buildings (line 9 and 22) go to Priority 1

Pentagon Barracks are apts for legislators/senators (lines 18-21) Priority 3

Line 13, Priority 4

Line 15, May have a generator and be a shelter, Priority 1

Line 16, Priority 5

Change Department of Administration to Division of Administration

Line 30, Level 5

Department of Ag & Forestry

M. Stanley gave an overview of rankings

62 needs to be Level 1

57, 59, 61 all Level 1

70 needs to be Level 1

76 needs to be Level 1

77 needs to be Level 1

94 needs to be Level 1

95 needs to be Level 1

98 needs to be Level 2

103 is Level 1

107 is Level 1

117 is Level 2

132 is Level 1

184 is Level 1

Level 2 on all standby cabins (185-204) 226-228

**Send his tab to military guy – Carl Hebert

He'll look through on his own

**We'll email your facilities after meeting

Department of Public Safety

-Did a pre-look at the list

Line 3 – not under public safety – will email who they belong to

Lind 19-26 – getting turned back – not state owned; all Level 5

Line 16 = Level 5

Line 13 = Level 5

Line 17 – will be demolished – come off list entirely (remove)

Line 70 = Level 1

Line 72 = Level 1

Line 73-78 = Level 5

Line 79 = Level 5

Line 101-102 = Level 5

Line 82 = Level 1

Line 84 = Level 1

Line 85 – not DPS, separate entity, Board of Commissioners

**Will get back to us re: 3 DMVs in NOLA – 2 fall off (91, 92, 88)

Line 93 = Level 1

Line 96 = Level 1

Line 97 = Level 1

Line 99-102 = Level 5

Line 110 = Level 1

Line 115 = Level 5

Line 121 = Level 1

Line 136 – 138 = Level 1

Line 143 = Level 1

Line 148 = Level 1

**Ensure consistency with training designation

**Add all attendees to stakeholder list

**Email facilities to all participants

Department of Administration

**email

Line 9 = Level 1

All show Center are Level 5 (24, 28)

Line 48 = Level 2

Department of Education

**email list

Move school for deaf and school for visually impaired from Board of Regents to Department of Education

Rich Griswald at Board of Regents is person to talk to; ORM guy will send contact info

Jim Howell for LSU system

**Superdome was not reconstructed to be a shelter again.

LSED

Lines 2 and 3 = Level 5

GOHSEP

All 5 items are Level 1

DWLF – Jerry will send us a list of staging areas for US&R

Mike Wilson at DOC will push down to the warden

*contact info will be sent

State leased (recovery district)

Line 146 = come off entirely

Line 173 = come off entirely

Line 187-191 = come off the list

Line 206, 207, 209 = demolished

Line 216 = demolished

**Others say to be demolished – need removing (see Column K)

Line 300-302 = off the list

**Get Jeff to write up the RSD issue in a paragraph

(whole group ran through the entire list)

331 = Level 3

**One building from ULM has been transferred to LDAF

Diane will send us the building number

2245 and 2234 move to Level 1

Look for FG Wark Activity Center = Line 623 = Level 1

2604 to 2609 = move to Level 1

Department of Social Services

Line 109 = belongs to Social Services but through DOA – Level 1 = HQ

**Close meeting but kept Josh Gill (DSS)

**Send whole list to DSS (Josh)

**Cross-check with Red Cross shelter list

<u>SHELTERS</u>

Jewella, Heymann (DSS)

Agency TTSD = Line 109, Cat 1

Get with ORM to find out if all DSS owned/leased facilities list is available. Per Josh Gill, DSS buildings are not on this facility list.

Josh to send his list to us.

SHMPU Workshop
4/19/2010

Attendees 10

Removed

Canopy

Line 44, Line 42 – Add to the list as Priority 1

OSP

Approved by the group

All agencies

Line 9 = 1

Line 22 = 1

Line 18-21 = 3

Line 13 = 4

Line 15 = 1 - verify

Line 23 = 5

Line 30 = 5

DAF

Line 57 = 1

Line 59 = 1

Line 61 = 1

Line 62 = 1

Line 70 = 1

Line 76 = 1

Line 77 = 1

Line 89 = 1

Line 94 = 1

Line 95 = 1

Line 98 = 2

Line 103 = 1

Line 107 = 1

Line 117 =2

Line 124 = 1

Line 132 = 1

Line 147 = 1

Line 184 = 1

Line 226 = 2

Line 228 = 2

All standby cabins = 185-204 = 2

DPS

Line 3 = will move

Line 19-26 = 5

Line 17 = move to removed

Line 72 = 1

Line 73-79 = 5

Line 70 = 1

Line 99 -102 = 5

Line 82 = 1

Line 84 = 1

Training must equal

Line 85 = Not DPS, they are their own entity

Line 93 = 1

Line 88, 90, 92 = might be removed

Line 96 = 1

Line 97 = 1

Line 110 = 1

Line 115 = 5

Line 121 = 1

Line 136-138 = 1

Line 143 = 1

Line 148 = 1

DOA

Line 9 = 1

Line 28 = 5

Line 24 = 5

Line 48 = 2

Board of Regents – Rich Griswald

LA School for the Deaf and Visually Impaired = DOE

LSU System = Jim Howell

GOSHEP

All = 1

DWLF

Department of Correction

FG Clark

Leased – RSD

Make 2

Line 187-191 = Move to removed

Line 206, 207, 209 = Demo

Line 300 -302 = Demo

Master List

327-328 = Verify

Line 331 = 3

Line 2234 = 1

Line 2245 = 1

Line 2604 -2609 = Move to 1

Line 6231 = 1

DLWF Meeting Notes

4/30/10

-Get building stock, critical facilities and transportation exposure from Tom

-Compare total property and crop damage for hailstorm RA, also ice storm.

-Check for intensity of tornadoes to see how it could be mapped.

-Look at static file from Tom on subsidence, fool around with Barras data.

-WIV Hurricane Disabled – 100 year event – make breaks for each hurricane category and tropical winds.

Row 3072 – currently being repaired, could benefit

Row 3074 – seldom used, move to Priority 5

Row 3214 – move to Priority 2

Row 3215 – move to Priority 2

Row 3077 – move to Priority 1

Row 3202 – move to Priority 1

Row 3203 – move to Priority 1

Row 3096 – move to Priority 2

Row 3220 – move to Priority 3

Row 3093 – move to Priorty 2

Row 3094 – move to Priority 2

Row 3098 – move to Priority 2

Row 3099 – Remove, no longer exists

Row 3182 – move to Priority 2

Row 3184 to 3187 – eliminate

Row 3189 – eliminate

Row 3207 – Remove, shut down

Row 3226 to 3228 – move to Priority 4

Row 3322 – move to Priority 2

Row 3104 – move to Priority 2

Row 3106 – move to Priority 3

Row 3107 – move to Priority 2

Row 3109 – move to Priority 5

Row 3111 – move to Priority 3

Row 3112 – move to Priority 3

Row 3114 to 3117 – move to Priority 2

Row 3119 – move to Priority 3

Row 3122 – move to Priority 1

Row 3185 to 3187 – eliminate

Row 3188 – move to Priority 1

Row 3189 – eliminate

Row 3232 to 3234 –move to Priority 3

Row 3243 – move to Priority 3

Row 3246 – move to Priority 5

Row 3247 – eliminate

Row 3249 – move to Priority 3

Row 3251 – move to Priority 3

Row 3258 – move to Priority 5

Row 3260 – remove

Row 3261 – move to Priority 5

Row 3323 – move to Priority 3

Row 3328 – remove

Row 3129 - move to Priority 4

Row 3147 – move to Priority 4

Row 3151 – move to Priority 4

Row 3153 – move to Priority 3

Row 3154 – move to Priority 3

Row 3165 – move to Priority 3

Row 3168 – move to Priority 4

Row 3169 – eliminate

Row 3171 – move to Priority 4

Row 3175 – move to Priority 2

Row 3178 – move to Priority 4

Row 3192 – eliminate

Row 3195 – eliminate

Row 3196 – eliminate

Row 3199 – eliminate

Row 3209 – move to Priority 3

Row 3269 – move to Priority 4

Row 3295 – eliminate

Row 3310 – eliminate

Row 3314 – Gone

Row 3320 – eliminate

Row 3332 – eliminate

Row 3336 – move to Priority 3

Row 3337 – move to Priority 3

Row 3338 – move to Priority 3

Row 3340 – remove

Row 3341 – move to Priority 3

April 19, 2010 Meeting PowerPoint Presentation

State Owned Facilities Criticality Workshop

State Hazard Mitigation Plan

2011 Update

Presented by GOHSEP

Agenda

- Introductions
- Ground Rules
- New Methodology
- Draft Rankings
- Review, Modify and Approve Rankings
- Next Steps

2

Ground Rules

- Building/facility ranking is for mitigation purposes only (put on your GOHSEP hat)
- Time is critical. If we get stuck on a topic and time runs out, we'll table further discussion and move on with the agenda
- No more than 5 minutes will be given to any building/facility
- We don't need "top secret" information, but you may need to express a need for reprioritization
- If a building/facility has an emergency use that is NOT its primary use, let us know
- Take notes for reference throughout the day
- Orderly discussion will expedite the workshop process
- One conversation at a time (no sidebars)
- No phone calls, texting, or emailing during session

3

Introductions

- Name
- Agency
- Position
- Describe a natural disaster (outside of the big four) that you remember

4

LA SHMP Update

Old 2008 Methodology

Critical Level	Description
Level 1 - High importance/Most Critical	Emergency medical services, fire, police & EOC's
Level 2 – Medium-high importance	Shelters
Level 3 – Medium importance	Essential government services (i.e. public works Departments, schools)
Level 4 - Medium-low importance	Non-essential government service buildings (i.e. museums, parks & recreation)

5

LA SHMP Update

- The proposed methodology accounts for the criticality of buildings based on their use during response/recovery operations.
- It considers Continuity of Operations standards and makes assignments that are reflective of those criteria.
- The new methodology should make it easier for the state to differentiate between buildings and prioritize related mitigation actions.

6

LA SHMP Update

New 2010 Methodology

Critical Level	Description
Level 1	Public safety bldgs/facilities (police,fire,ems,ema/eoc), shelters, hospitals, urgent care center plus other bldgs that must stay operational during disaster events to provide life safety measures/support.
Level 2	Bldgs/facilites that provide essential govt services & must be operational w/in 12-24 hr of disaster (e.g. pharmacies, pump stations, public works facilities, response/recovery operations bldgs (schools, airports, etc.)
Level 3	Bldgs/facilities that be functional during recovery (e.g. govt admin/mgmt bldgs, courthouses)
Level 4	State bldgs/facilites that must be operational for restoration of normal living conditions (e.g. college bldgs, dorms, cafeterias)
Level 5	State bldgs/facilies that support normal living, commerce, tourism (e.g. museums, vacation cabins, service stations)

7

State Owned Facilities

Agency	Number of Buildings	Square Footage	RCV
Board of Regents	2,805	48,859,801	$ 3,922,933,805.00
Department of Corrections	1,025	9,758,125	$ 925,397,437.00
Department of Health & Hospitals	303	4,810,230	$ 430,273,557.00
Department of Culture, Recreation & Tourism	772	1,345,705	$ 183,554,372.00
Military Department	760	4,881,388	$ 319,282,817.00
DOTD	223	2,204,450	$ 131,025,279.00
Department of Wildlife & Fisheries	280	675,240	$ 49,125,246.00
Department of Agriculture & Forestry	259	955,380	$ 59,139,098.00
Department of Public Safety	145	1,187,400	$ 157,899,794.00
Civil System	105	3,572,205	$ 314,028,127.00
Office of Juvenile Justice	34	447,198	$ 32,040,740.00
Department of Administration	45	2,207,314	$ 249,144,122.00
Secretary of State	37	523,451	$ 38,711,000.00
Veterans Affairs	20	492,925	$ 31,599,300.00
Department of Labor	14	253,892	$ 26,259,938.00
LSU	12	2,984,372	$ 439,939,178.00
Department of Revenue	7	108,202	$ 9,005,999.00
SOWELA	3	39,482	$ 7,403,419.00
Revenue & Taxation	4	140,487	$ 23,330,098.00
Judicial	5	129,598	$ 17,477,445.00
Board of Trust	1	120,421	$ 9,569,957.00

8

April 19, 2010 Meeting Methodology Handout

The methodology used in the facility prioritization focuses on critical need before, during or immediately after an incident occurs. The completed risk assessment will consider both the criticality of the facility, as determined by this process, as well as the exposure to the various hazards profiled within the State Plan.

Throughout the process, the primary use of each building (based on the limited data provided by ORM) was used to place each in one of the five priority categories. Certain facilities have multiple buildings, and each with a unique purpose. For that reason, buildings were considered independent of the facility but still had facility management as a factor. As an example: Correctional centers are prioritized as Level 1 facilities, but not all buildings within a prison system are vital for secure operations. Fencing, dormitories, and administrative buildings are essential to security and operations of such facilities. Kitchens, gymnasiums, and storage facilities (while important) are not and received a lower category ranking. Military installations, college campuses, and other large facilities were treated in a similar manner.

College facilities were broken down by general building use. Buildings that provide public safety services (except training) received Level 1 priority, and college infrastructure/utilities were placed in Level 2. Buildings used as office space and administration received a Level 3 priority, while buildings used for housing and general classroom space received a Level 4 priority. Storage sheds and recreational buildings were generally placed in Level 5.

Dormitories and housing facilities were generally classified as Level 4, but in certain cases, they were given higher priority if the residents aren't likely to be capable of self-preservation (e.g. hospitals, correctional facilities, and homes for the sick, disabled, or infirmed) or if they provide quarters for emergency responders.

Animal housing/boarding buildings were placed in Level 2 if they supported emergency operations or provided shelter for animals that pose a threat to the community (alligator houses). Other pet shelters, kennels, and livestock barns were generally placed in Level 4

Ice houses, mechanical buildings, hangars, and certain dual-purpose warehouses were placed in the Level 2 category if they support Level 1 buildings.

Level 3 buildings, such as offices and financial institutions, provide administrative support to facilities. Note that those administrative offices that are critical to emergency response or public safety services are generally placed in the Level 1 category.

Level 5 buildings are primarily reserved for recreation related buildings, general storage and warehouses, and buildings that provide convenience services.

Certain buildings or facilities may be categorized higher or lower (based on data provided) if special consideration was needed. The Superdome, for example, is an arena used typically for recreation but also serves as a congregate care shelter.

Minutes of the

State Hazard Mitigation Plan Update

Steering Committee Meeting #3

April 27, 2010

Steve Garcia indicated that there are new faces to this steering committee meeting; he ask everyone to introduce themselves and how much experience in this SHMPU process.

Michele Deshotels:	Office of Coastal Protection and Restoration. This is her first time
Linda Pace:	Office of Coastal Management, LDNR. Second meeting
Bill Morrison:	DOA, FP&C. Been through this one completely and involved with previous one.
Brenda Cooper:	GOHSEP Hazard Mitigation Planning Team Lead, and has been with previous one as well.
Margaret Sanz:	GOHSEP Hazard Mitigation Planning. This is my second go around.
Cindy O'Neal	DOTD. I help developed the inter-regional plans.
Keith Horn:	Formerly with DEQ. Second longest serving next to Cindy
Richard Hollowell:	DHH. Been involved with original plan.
Cathy Ashworth:	With CEO of GOHSEP. Here to hear updates.
Mike Wilson:	Corrective Services, here for Col Sibling.
Kris Van Orsoel:	LRA. Here for Robin today.
Alessandra Jerolleman:	JLWA
Dennis Quan:	JLWA
Steve Garcia:	GOHSEP. This year is my first experience with update. I turn this over to Alessandra.

Alessandra: Starts PowerPoint. Tells audience they have copy of agenda and the PowerPoint presentation. We shall discuss risk assessment, not just an update of previous meeting. Thank everyone who submitted comments on section 4 and appendix D. …hazard profile and corresponding appendix. Those comments have been incorporated into the plan and available in the next draft. Those comments will help form the methodology in section 5, risk assessment, in particular, the relative risk assessment which compares the parishes to each other in terms of these hazards.

What you see here is the list of hazard addressed, which were conducted in the previous plan and have been conducted for the update. Most of these are now complete. You will see the results as we go through. There will be additional tweaking. And subsidence and levee failure, you will notice that these are in progress, waiting for data. I talk a little more about them as we get there.

'Potential additions would be hail, if the group would like to discuss this. For earthquake, we did some HAZUS runs, about 6 or 7….I will let you know.

I want to remind you of the work that NIMSAT (the National Incident Management Systems and Advanced Technologies Institute) through the CEO project, which is going to be a part of this risk assessment. It is essentially a parallel risk assessment, which incorporated the Social Vulnerability (So-Vi) indicators, which are various economic characteristics, which are from census data that are routed into an equation to come up with a different ranking for the parishes. At our last meeting, we have Raju (Gottumukkala) give you a presentation about their work. In text of the update, you

will see risk assessment that we conducted that either revocate or slightly improve upon the methodology of the previous plan. Then for certain hazard you see results from this analysis. The reason that there are two is primarily, because these are two parallel processes. They started at different times. NIMSAT work is not complete…and also it is using primarily year 2000 census data. So it cannot stand alone. There are certain challenges in academia to the issue of using social vulnerability in this way. This needs to be address as we move forward, were this is a standalone assessment. It is very interesting, as we go through this, to see how the ranking differ from the two methodologies. This is some of the indicator that is considered by the analysis. Poverty and Median Income Levels, children, unemployment…to housing, education….these kind of indicators.

Cindy: How does this affect the Risk Analysis?

Alessandra: The risk assessment that NIMSAT is doing, is based off of three elements: hazard impact, consequences, vulnerability. It looks, for example, at property damages…it looks at other hazard and consequences…it looks at social vulnerability indicators…essential comes up with a factor analysis, that produces an index. That's a very, brief, brief answer to your question. They were given funding separately, through the Community Education Outreach of GOHSEP to do all this work for all the parishes, for certain hazard, with the hope that this will feed back into the plan.

We talked about this, a little bit, at the previous meeting….if your remember, Raju (Gottumukkala) and Shannon (Strother) came and gave a presentation.

Cindy: I was coming to that…I don't see how this fits into the risk analysis.

Alessandra: It's a different methodology for assessment and because…

Richard: Alleged the vulnerability of certain community, to its hazard, one of three components, if I understand.

Alessandra: Much like our assessment, it is being used to show the poor potential impact to the various parishes relative to each other. The assessment that we conducted are going to be heavily weighted toward simply historical damages.

Cindy: There are education levels, whether they are important or not, that ties into how risk assessment we have?

Alessandra: I can share with you some academic literature built on social vulnerability, which you can say is the flip side of the coin, which is resiliency. This is not analysis that we want. I can tell you with this brand of literature, is based on certain indicators of, what's termed, vulnerability. So that, someone, for example, who is very poor, may suffer disapportionately from a hazard event, as compared to somebody of above medium income. So the idea being, if you want to look at the impact on people, property, infrastructure, etc, of a particular hazard event on a parish…the analysis of this style, would in theory, at least, would allow you to consider…that this parish has a lot more folks who are impoverish and this parish has more money….well, maybe, you might have slightly wind in parish A, but they have more money, overall, then perhaps, they still are not going to suffer much as parish B.

Richard: …this has nothing to do with risk involved, has to nothing to do with after the fact, what recovery involves…the impact afterwards. This has nothing to do with the hurricane coming or earthquake, or whatever, if it does come, it has to do that this parish is going suffer than this parish, because of all these factors.

Alessandra: Probability does factor in. So it is still a component….it's just not the only component. It is still based on a normalized probability based off of 50 years data, primarily SHELDUS

(county-level hazard data set for the U.S. for 18 different natural hazard events types such thunderstorms, hurricanes, floods, wildfires, and tornados) data. What it is actually showing, for the 50 years that we have data on, or able to use, what is percent chance of an event occurring in that time, 100% based on historic. Not necessarily a very accurate probability, but it should give you an idea…that there's various factor, including the fact the NCDC data, which is the source of the SHELDUS data, is very imperfect and based on people reporting. Based on historic record of damages. Hurricane are not best example, but if you look at something, like hail…quarter size hail lands on a field and nobody reports it. It can make a less populated area appear to have less hail. Tornado is another one. Tornados occurring in certain areas do not necessarily get reported. So that's a fault in the data. So that's another reason why the probability is not 100% or perfect. It is something to work on….often it is just something that you have.

If you guys wish, we can invite NIMSAT again, maybe next time….this time to give a more in depth presentation and answers to your questions. I'm hesitant to speak for them. While I do know the methodologies they run, I did not run it.

Cindy: After I see it in the plan, and how you propose to use it, then it will determine how you are going to ask them.

Alessandra: Sure. As you can see, the draft one of the things that is new is the integration of the data. I think that it is very important that your opinion of how well they are done. It is providing a clear comparison and a clear picture and what we can do to make it clearer. We did not want to end up doubling the size of this section by having two complete assessments for hazard, but this needs to be brought in, because it is new data…and it is interesting how they compare. You will see as we go through.

One more comment on this is that there are actually three analyses. One is based on property damages. One is based on crop losses. One is based on fatalities. What you see, as we are displaying here. Low to high ranking on property damages. That comes closes to what we have done in our assessment. As much as possible, we wanted to compare apples to apples….though, at the end of the day, it is apple to oranges.

Next slide.

I am going hazard by hazard. This is only data used in the risk assessment…used to compare the parishes. This is the same methodology used last time for flood, comparing the parishes off of NFIP claims, number and value of claims. We also have data on floodplain boundaries, we have data on repetitive flood loss, and date of presidential declarations, NCDC events, USDA declarations, lot of it is in section 4 and appendix D. But for the purpose of this comparison of the parishes, we are focusing primarily on the NFIP insurance claims. Section 6, which is state own facilities risk assessment, that is more concern with point level….that assessment will look in and out of the flood plain.

Next slide

Here are the

It was consider low, if it is less than $100,000 annual losses, moderate from $100,000 to $1 million, and high, greater than or equal to $1 million. All of this data is to the end of 2009. For some hazard, we have a few months of data, but FEMA Region 6 requires that the stop date used in the plan be consistent. So December 2009 is the date we used.

Next slide.

Hope this is not too difficult to see…high is red, medium or moderate is yellow, and low is the tan color. And you can see the area that experiences the greatest number of claims.

Cindy: What is the time frame?

Alessandra: This is from 1978 to 2009. That said seven, but it is actually nine.

These are all draft maps. You will notice a few little things that need to be tweaked by cartography. You see that the legend needs to move to the right more. This is still a work in progress. Today, we focused on getting these runs completed, getting the data there, and within the next month, the images clean up, making everything incorporated.

Going into next slide.

This is the result of the So-Vi analysis. It is very different. This is one example where you can see a pretty big difference on our analysis based just on claims and this analysis that incorporate Social Vulnerability indicated shows.

Next slide

For high winds, hurricanes, the data that was used is HAZUS…

Richard: Could you go back one slide

Alessandra: Sure

Richard: Want to make sure that is SW Louisiana that changed dramatically.

Alessandra: One thing that alters the results for So-Vi is that the building damages, in theory, also reflect potential exposure. So for that area, if you have several elevations or building removed, that would impact the analysis, somewhat.

Go back to high winds, and population control also, the will be highest concentration …overall in that SE area where you have the high population.

HAZUS high wind is a probabilistic high wind run. It is a wind range per parish. And it is for certain storms, ten, fifty years, etc. All that data is available in the appendix.

Next slide

This is the previous methodology, but a new HAZUS run. Results are based off estimated annual losses. And you can see $400,000 for low, $400,000 to $5 million for moderate, and $5 million or greater for high. Next map is going to change, slightly. We will probably redisplay this based simply on wind probability, and not dollar value. The data for value in HAZUS is typically not great. Latest MR4 release has some data 2006, some, 2008. We probable change to potential wind range. 17:34 instead damages estimated by HAZUS. So this will give you an idea. This is probable of what you expect for high, medium and low.

Next slide

So-VI, when used for population…you see high in SE, and a lot of the SW parishes drop down to medium or moderate. So you can see some of the difference, which points to the possible challenges of using SoVi as a standalone.

Next slide

Richard: Understanding the reasoning there …Cameron Parish is highly exposed, but is highly unpopulated.

Alessandra: But it does present a potential challenge when you are doing with the parishes.

Cindy: Is SoVI going to replace the existing methodology, or is it meant to wire on top of it as an additional consideration?

Alessandra: That's something that the state really will have to decide on for the next update. You can take something, along the line of the SoVi methodology, and tweak it, bring in the 2010 census and see what shows are. For some, it may be wise to still have a parallel assessment to account for some of the major changes that SoVi indicates. Also Social Vulnerability Based Analysis only incorporate vulnerability, which is seem as a negative, and which does not incorporate elements of resiliency, which would be the flip side, the positive component. There are certain elements in certain communities that might them better able to recovery or, in spite having more single mothers, or being poorer, more unemployment. To some extent, it may be over simplified, when it is actually very complicated. This should be considered and incorporated the next time. 19:44 I think that once it is complete, it will be grounds for discussion.

Cindy: Will this plan going to determine where our funds are going to be spent for our projects, for disasters?

Alessandra: Well, that's something that the state will have to decide. How moving forward, funds will be allocated. 20.03 for disasters. What we talked about in the past. Currently, what's in writing is for the big four. There is a requirement that funding priority, to some extent comes out of the plan. But there will be somebody to make that decision.

Next slide

For tornado, this is historical event data. Again, based on NCDC report 1950 to 2009

Next slide

This is total loss for that period. The previous analysis actually had annualized losses. We did not annualize them this time because of the consideration of whether we convert everything to 2009 dollars. We'll do that and see how it turns things.

Basically, low was less than $4 million, moderate $4 million to $10 million, and high greater than $10 million. These are really high numbers, but it was a very long span of time….it is over 50 years.

Next slide

Cindy: You don't alter these! I mean, don't you have to alter all of them, if you alter these?

Alessandra: It has the same challenges, but by not annualizing it, it's just total losses to date. While it is not 2009 dollars, they are still relatively comparable to each other, because the range is the same. You might have an event that occurred…a significant event that occurred in very earlier years, because it have not been converted to 2009 dollars, it is carrying slightly more weight. But to average out to a year amount, increases that.

Richard: Well, it is a relative measures between the various parishes annually. Another thing about tornado risk, I think, is that tornado could be a terrible and expensive event, but it is a fair random event, and if you start annualizing it, if one parish had a tornado last year, it would look like it is the highest parish.

Alessandra: And the historic NFIP data was not converted to 2009 dollar, either. It began in the same range. Tornado are very challenging, because we don't know necessarily enough of how they work to really assign probability. We see trend, especially when you look at 50 years of data. We do see that particular parishes are impacted. But the scientific community really does not understand why that might be.

You can see here, certain area of concentration, certain concentration, further south, reflect the fact that tornadoes come with hurricanes. Further north, typically, a area we see getting hit with tornado fairly evenly.

Richard: Northwest corner?

Alessandra: Northwest corner.

Richard: Outstretch tornado alley.

Alessandra: Exactly. If you look at Madison and East Carroll, they are red because of one very significant event, which essentially replicated by the Yazoo Tornado. This time, the losses were more concentrated in Mississippi. Several more death and great deal more damages in Louisiana with that previous event.

You see, as you were saying before, one, out layer, big event will skew the data. 24:03 to make the area appear to experience more.

Richard: Something you mention earlier, Sabine Parish…a tornado sat down in lot of Sabine Parish and do not do much damage. It should, realistically looking at the map, higher risk because of the location …limitation of the data.

Alessandra: Exactly, very much so the limitation of the data.

Next Slide

This is the SoVI results. And again, very different. Also, one thing that we will do is work with the folks at NIMSAT to capture specifically, what about these particular dataset that led to differences.

Richard: Shreveport.

Alessandra: I believe so

Richard: Because it is the population, perhaps. Only highly populated area in that part of the state.

Alessandra: You can, sort, see a trend, at least medium, in the area where you might get hurricane induced tornadoes. In the northwest, it is not as pronounced….actually showing up as low.

Next slide

Ice Storm. Based off of NOAA data. It is simply the number of recorded incidents, per parishes.

Next Slide

It would consider low if there were no historic incidents recorded. Moderate if there between 1 and 4. High if there more than 4. We know that this is a hazard that is strongly underreported in NCDC. I know of severe events within recent years that are not showing up in this dataset. That's another limitation of the data. One of the things NIMSAT is doing is allowing the parishes input and modify the NCDC dataset, through a portal. That would help with some of these challenges of the NCDC data.

Next slide

Here is what you see is pretty much what you expect. Low, medium and High. Again, this is off of historic events, number of events.

Richard: Doesn't NIMSAT have access to all the National Weather Service data?

Alessandra: Actually, that's the NCDC data and that's publically available.

Richard: That's what I expect. I expect them to do probability, like when the weather is cold. OK. I do not know what NCDC meant.

Alessandra: It is the National Climatic Data Center, as part of the National Weather Service, and SHELDUS is the same thing, but cleanup a bit. When it is clean up, you end up with .3 fatalities. Sometimes data does not put up with this.

Cindy: Does everyone here know what NIMSAT is?

Richard: probably not

Alessandra: Research out of UL Lafayette… actually I do not know what the acronism stands for …National Incident Management …something.

Cindy: Actually it is National Incident Management Systems and Advanced Technologies Institute (NIMSAT).

Alessandra: Maybe I will remember that next time (laugh from group)….maybe I won't.

Someone: Y'all been out there?

Alessandra: Yes.. ULL campus. The probability they are using are based on 50 year historic data, which is essentially what we went ahead and used it and normalized it.

Next Slide

There is no SoVI analysis for Ice Storm. There is one for cold, but it incorporates more than just ice storm events. We did not include here for actual comparison.

Next Slide

Storm Surge. This is a brand new methodology. This is first of five that's completely new. Whole lot more data this time around. We had from NOAA relatively recent MOM's…MOM is the maximum of maximum. It is essentially an average of tons and tons of SLOSH runs, in the three basins, being Vermilion and New Orleans. We look at category one, three and five. It is a worst case scenario…how it is often described.

Next Slide

What we look at then is we looked at which of these MOM's, which of these models, impacted which parishes. For parish where only category five event caused surge to enter the parish, that would be considered low. For some parish, we consider them no risk. That's not entirely accurate. Moderate would parishes that are affected by the five and the three. High, parish even affected by the one.

Next Slide

One thing that you will see is that the parishes will ended up as a high, surge will travel in some of the water bodies. You will see red relatively in the far north. May need to reconsider that distinction between low, moderate and high. But this shows you a rough idea. And the data includes height. But height is not the same as depth because of topography, so we did not incorporate it…really the data is not there to do that in depth analysis.

Cindy: That causes a lot of confusion. Some people interpret it as so much feet over the ground height. So they are changing it.

Alessandra: Better data to work with…it would not give a better understanding. For the state own facilities assessment where it is at the point level where you can actually try to capture potential surge height relative to the building, not just relative to sea level.

Next Slide

Again, there is no SoVi for surge.

Subsidence. We are still working to determine the methodology.

Someone: SoVI for surge.

Alessandra: There's no SoVI for surge and there's no NCDC data for surge. There no historical surge data. You probably can generate something based on historical data off SLOSH run.

Someone: they did something…I have seen anything for surge. We have historic model as far back as Betsy. So it would not be impossible to generate.

Someone: They run stuff for Gustav and Ike simulation …all the impacts. And they did an historical for Katrina for land use data.

Denny: Since they were not in time for Katrina, but the USGS put out 50 transducers, so that they were able to capture surge heights from Rita onward. Just 50 of them. So this is the beginning of capturing electronic data on surge. They need to expand a little more, and have them more automated than just typing to a stop sign.

Someone: NOAA is in the process of putting buoys all over the state. Real time buoys are going out there, so in the future you can tie into it.

Alessandra: We are still struggling to understand what the clear relationship is between hurricane category and surge. It is the language we use right now. In Katrina showed that it was flawed. They are still trying to work on something better than the Saffir–Simpson scale was edited to no longer to connect as clearly with the surge height.

Cindy: I think there is a time schedule for changing.

Alessandra: Something new came up earlier this year, but it did not get to there. I don't know what is the dead line.

Subsidence is one we will talk about next time. As we continue to discuss what is the best data is, to use.

Next Slide.

Wild Fire is based on historic acres burnt from data from Agriculture and Forestry…1996 to 2009. This replicates the methodology from the last plan, but adds a lot more years. Actually, last plan only mandates up to the year 2000.

Next slide

Low, no acres burnt, moderate less than 15, and high, 15 or more. That's averaged per year.

Next Slide

Here you can see the low, medium and high….and how the parishes break out. This is another one where there's no SoVi. Again, this is based on the data that Agriculture and Forestry keep.

One of the challenges of Wild Fire is that historic incidents don't necessary correlate to probability, because there is so many items that can impact….arson is one of them. Droughts have a big impact. Several other elements.

Next Slide

Dam Failure. National Dam Inventory for what are high significant and low hazard dams. Methodology remains the same as last time. We actually have areas of concern. This is potential inundation area. We have that data now …we can use that for state own facilities assessment but don't have it on enough dams for this assessment for comparing the parishes to each other.

Next Slide

Methodology…again, this is the same. They were considered low, if they were low hazard dams…moderate, there were also significant hazard dams, and high if they were high hazard dams. Again, just keep in mind, that the high hazard dam classification does not necessarily indicate a high risk of failure….better indicator of high potential damages….people, population, buildings, exposed in the area protected by the dam.

There are others elements that come into that, which usually does not include the age of the dam. But being a high hazard dam does not necessarily meant that there's a greater risk of it failing than a low hazard dam

Next Slide

Here you can see how the parishes fall out. There are some parishes where there is none. They had no dams noted in the data. Again, you can see areas of high hazard.

Again, this is one where there is no equivalent SoVi.

Next Slide

Levee failure…we are still working on the methodology. The previous plan looks at population in proximity to the levee. We're hoping to get a little more data from the Corps this time around, for the different segment of the levees, so we can do a more in depth analysis of the population within the area…specifically the area protected by the levee. That may not be in time…we maybe out of time this week…may have to use the old methodology. It has been requested from the Corps, and it has been taking….a rather long time.

Someone: Say it again. If you don't get the data from the Corps, you will go with the old data run?

Alessandra: We are going with the old methodology…it is going be similar to the old data as the levee has not really changed.

Someone: Does it include New Orleans levees or all of the levees?

Alessandra. All we have mapped are the Corps levees….the one for New Orleans and the Vicksburg district. Of course, with the new federal legislation, there is a need to map additional levees, and I think DOTD is searching for funds to do that. Actually, we had some meetings with some folks …a new definition of levees that is more inclusive. But that won't be readily for this time around.

A lot of those small levees do not protect populations…they are agricultural levees.

Next Slide

Haz Mat incidents. We looked at a lot more data this time around than first time, but the data that lend itself best to a comparison across parishes, was RC Spills data, and look at the year 2000 to 2010. We have other data, such as location of chemical industry as an example, but can't make a clear correlation between the number of industry and risk…there are too many factors involved.

Next Slide

The way this is broken out was based on the numbers of spills. Low was less than one report per square mile, moderate, one to 3.5 per square miles, and high, more than 3.5. Again, this is over a ten year period.

Next Slide

You can see where the high, moderate and low falls on this one. 39.45

Cindy: Did this take in site and facilities in the mall?

Alessandra: I actually have to check the dataset for that.

Cannot hear comments from audience.

Next Slide.

This is one that you, the Steering Committee, can add. There was no risk assessment completed for hail in the previous plan. It was profiled but there was no risk assessment. This methodology replicates what was done for ice storms….based on number of events as a means to compare the parishes.

Certainly hail is a big concern for lots of parishes in the state. Many parishes do profile hail in their own plans.

Next Slide

The way this is number out to get number of historic incidents…low is 50 or few, moderate is between 51 and 100, and high is over 100.

Next Slide

The Map. You see pretty much what you expect for the area of high concentration and more historic events. Keep in mind the reporting bias of NCDC data…pretty strong for hail.

Richard: Again, if we add hail … is adding a risk assessment, but there really not much you can do about it, really.

Alessandra: There are some modifications for structures…roof type, or gutter type. But you are right, there not a whole lot you can do.

Richard: Profiling will show risk assessment

Someone: Would it be advantageous to add it?

Alessandra: Because it is already profiled in the plan local plans are considering it…it can be covered already. My personal recommendation, because so many parishes profile it, the SHMP ought to profile it as well and do a risk assessment…it is an easy risk assessment…it does not add a lot to time to it. Because there is not much we can say about it, other the number of events.

Cindy: Have they taken into consideration the frequency?

Alessandra: Not really. Certainly, the data is available. Another way to look at this is the average hail stone size per parish….another potential methodology. Again, the size is reported…a trained spotter seeing it on the ground and writing that it looks like a softball or golf ball or quarter….that has some limitation. That's why we do not do it. This is just a little more accurate than was it there or not.

Some kidding around…

Someone: Does someone measure the hail as soon as it hits the ground? Or does it melt for a period?

Alessandra: …did you go outside…did you guess through your window…

Someone: do they actually measure it?

Alessandra: All of these data are full of challenges.

Right, now, is there a feeling in the room to go ahead and do a risk assessment for Hail? Have not heard any strong objections.

Richard: Might make the parishes happy if it is profiled.

Next Slide

Alessandra: Earthquakes. We ran several scenarios based on New Madrid event. High as 7.7 and close as can come to historical event to the state of Louisiana. None showed any significant ground motion in the state. None showed damages to buildings based on the structure types that HAZUS has in its database for the state. We then played around with the soil category, where we actually changing the soil category and characteristic for Louisiana, did yield damages. But to do that in the plan, we would need a geologist to validate that case. So at this point, it is our recommendation to not do a risk assessment for earthquake. Given the data available, there appears not to be significant damages. Now one recommendation might be to do a soil analysis and that data can be put into HAZUS, and may well show impact. I expect some impact in the northern part of the state, but data today does not support that.

Are there any kinds of objection to expecting a soil data done by the USGS and table this one for next time, when characteristic of the soil can be incorporated into the HAZUS model. The question is, would there be enough events in the New Madrid to

Historically, there has been event that caused the Mississippi to flow in reverse. Might see damages to control structures, and flooding, potentially. But it does not seem to be ground shaking based on these models.

Next Slide

That takes us back to SoVi. And the reason we came back to SoVi…I want to show you some small changes in the data that SoVi analysis is based on, from year 2000, which is used in the maps we show you…to more recently. Now, there's a lot of indicators that goes into that analysis that come from many places. We pull the most recent and provided them to NIMSAT, so that they could incorporate them at a later date.

In some cases, it is 2006, from American Community Services, in some cases it is 2008…in some cases, it is still the year 2000. Not every community has American Community Survey data collected. Of course, the 2010 census data will be available in 2011.

Next Slide

This shows population changes from 1990 to 2008. You can see some significant population losses in some parishes…that's the red. There are some significant gains in some parishes…that's the dark blue or purple. These changes will impact the SoVi analysis. That's based on year 2000 data that does not take into account shift from the big four. So that's something to think about as you look at the results. Some have been mapped into the plan to show the results.

One of the reasons is that SoVi is not standing alone this time.

Next Slide

This is person below the poverty line. Changes from 2000 to 2008. Again, an increase in poverty in certain parishes….that's the red. A significant decrease in others…very dark green. So again, this will impact what the SoVi Analysis will show.

Next Slide

That takes us to section 6, for a minute. Section 6 is the state own facilities risk assessment. We shall look at the master list of state own facilities, and considering two elements for them. One is criticality, and we shared that methodology with you in the past, but I shall revisit it. And the other is impacts from the different hazards. This is able to zero in at the point level, say, in or out of the flood plain, for example. For others, it is based on the ranking of the parishes relative to the other parishes, based on data available.

Where we are with it, is that we done a lot of work towards cleaning up the list, including actually having a workshop last Monday, where we invited representative from various state departments, to go through their list with us, facilities that were managed or owned by their departments.

Started out with 8,500 buildings total. That did not include lease. What you can do to mitigate a leased structure is pretty limited.

This was already a monstrous spreadsheet. After initial review remove 300, things like benches, not significant for the purpose of analysis.

Richard: Road side rest areas

Alessandra: Exactly. But something, like park shelters, we'll keep, because they might serve as other function. There also things like carport. There is some subjectivity in there. The remaining 8,200 plus, we went through them and assign a priority, 1,2,3,4,5. This methodology is slightly different than the last plan, but same idea. From FEMA continuity plan, from FEMA planning guide. The question is, how soon do you need this facility operating and afford to have damaged. So level one, priority one is full services: EOC's, hospital, shelter …you really want to protect these facilities. Then you go on down to building that supports tourism, normal living, museum, things along these lines.

Next Slide

What we did after we had assigned those preliminary rankings, we called folks to this workshop and went through the process with them, validated the levels 1 thru 5. You might remember at the previous meeting, we held with you guys, we shared the methodology with you. You gave a preliminary thumb up and we also asked the folks who were involved with the facilities in the state departments to also give a thumbs ups as well. 51;53

And to help prioritized the few facilities that we could not prioritize, and to re-prioritized other facilities. One example is a facility that is designated as a office, looking at the spreadsheet, we might give a low priority, but in truth, it might function as a EOC, might serve as a coordination point for search and rescue…only the people who own and manage that facility will know that….and were able to go ahead and tell us that. And certain buildings we don't know who it belongs to, we were also able to go ahead and assign. Not every department was able to attend….great turn out…great workshop….here almost all day. I have a few contacts for the departments that remain and hope that by end of this week, we would come up with a final state own facility list, then we can look each of the hazard. Again, the combination of the two factors, priority and the exposures to the various hazard…rough prioritization.

Next slide

Where we are today. There will be a draft of the plan, at least through section six, ready by June 30. Section six is again, the state own facilities risk assessment. That's what our Scope of Works indicate. By that date, that's how far…

We are almost into capability section, which is section seven. 90% chance, it will be in there as well, for you guys to look at…and also the corresponding appendices… a lot of pages E, for example, is the methodology table. Section six is about that thick right now. You may not need to read line by line, you may want to focus on the section to do more particular with your area of expertise or knowledge. Please do pencil into your schedule, some time in that first week of July, to spend a day really going through it and providing your feedback. There's only so much to do in this kind of context. Sometimes it is better for you to dig in and really read through it, and provide your suggestions, so we can make changes.

Next actual meeting is July 26th. By then, we should have incorporated most of your recommendations, by then you should have gotten through the rest of the plan, at least for this first draft.

FEMA requires six month review period. Really, all of this must be done by August or November. There will be a few times to incorporate your comments. Possibly a public comment period, etc, before it goes to FEMA for review.

That's it!

Next Slide

Remember about the SharePoint, draft for review will be posted in the SharePoint site, in HMPC (state hazard mitigation plan committee) folder. Also in there, you will find folder for these meetings, so meeting notes, PowerPoint's, the agenda, etc, my contact information as well. My cards are by the door.

If you have any question, meet on any portion of the plan, please let me know. I will be more than happy to do that.

I will send out notice when there are things specifically posted for your review. But you are welcome to go in there anytime. You find the previous meeting notices, minutes, there as well.

If there's any reason you can't get in, there's only one guess account …it will lock if someone tries to get in a few times and have a typo or something…for whatever reason you can't get in, just email me a line, and I can get it unlock in a few seconds. It does happen rarely.

That's it

Next Slide

Any questions?

Thank you for coming.

Cindy: I think in one of the previous meetings, I asked you to present me a list of the parishes the State Hazard Mitigation team voted to give each parish a million dollars. I think y'all will provide me a list of parishes that return monies to you, that did not want to use it. I am still waiting for that list.

Kris: We did an allocation, with Witt help, just after Katrina. I don't know if there was a floor on everyone getting x amount of dollars. Ran thru GOHSEP, Witt and it was passed. And we did the same thing for Gustav and Ike. We can find the answers. Drew did it.

Alessandra: There were parishes that had problems because their Benefit Cost Analysis was not cost effective.

Steve Pratt will pull data on that. Dollars went elsewhere. Parish can apply for certain amount of dollar. We can follow up on that. I make a note on that and follow up.

Richard: Was it successful

Alessandra: It was successful. Parishes complete 2/3 of the survey. Nearly everyone turns in something. Thank you for everyone for coming out.

State Hazard Mitigation Plan Update

Steering Committee Meeting #3

April 27, 2010, 10:00 a.m.

Governor's Office of Homeland Security and Emergency Preparedness

7667 Independence Boulevard, Classroom 1

Name	Agency	Phone Number	e-mail
Margaret Sanz	GOHSEP	225/267-2678	margaret.sanz@la.gov
Alessandra Jerolleman	JLWA	504/914-6648	ajerolleman@wittassociates.com
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Bill Morrison	FP&C	225/342-0855	bill.morrison@la.gov
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Kathy Ashworth	GOHSEP	337/371-1777	kathy.ashworth@prodigy.net
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Linda Pace	LDMR	225/342-7936	linda.pace@la.gov
Cindy O'Neal	LA DOTD	225/274-4354	cindy.oneal@la.gov
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Dodi Langlois	ORM	225/342-8598	dodi.langlois@la.gov
Melissa Harris	ORM	225/342-8414	melissa.harris@la.gov
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Peggy Poche'	GOHSEP	225/276-7837	peggy.poche@la.gov

May 5, 2010 SHMPSC Meeting Minutes

Minutes from the May 5, 2010 State Hazard Mitigation Plan Steering Committee Meeting

Held at the Joint Field Office, Baton Rouge

Attendees:

Steve Garcia and Brenda Cooper, GOHSEP

Cindy O'Neal, LA DOTD

Richard Hollowell, DHHS

Bill Morrison, DOA/OFP

Keith Horn, DEQ

Linda Pace, DNR/OCRM

Alessandra Jerolleman, Tom Malmay, Eric McAfee and Dave Freeborn, James Lee Witt Associates

Welcome: Alessandra Jerolleman called the meeting to order and began with:

- Description of hand-outs
- Explanation of HAZUS-MH
- Showing maps of HAZUS data
    - Schools
    - Health
    - etc

Alessandra guided the discussion of the risk assessment elements for each of the identified hazards. This discussion compared the data used in 2008 with current recommendations

Flood: Some parishes have no Digital data so HAZUS is being used.

> Cindy O'Neal – E. Baton Rouge and Ascension Parishes may have some digital flood maps or data and that the planners should contact her office.

The risk Assessment Data in Chapter 5 and Appendix E if the 2006 plan profiled Average Annual Loss, Total Annual Losses and 100 yr exposure (Critical Facilities, Buildings, Population, Transportation & Utilities)

It was recommended that the Committee consider for the risk assessment: Percent of land in floodplains.

Following a discussion of each element, the Committee decided to use: Average Annual Losses (NFIP), total Annual Losses (NFIP, Number of RL, Number of SRL, 100 yr exposure (Critical Facilities, Building stock, Population, Transportation and utilities), and Percentage of land area in floodplain.

Hail: New section for 2010. We have data for total number of events. Discussion of possible considerations:

Total losses property and crops, Size of hail, Total Losses separate crop and property. Discussion of pros and cons followed and the Committee decided to focus on: Total number of storms, Property losses and Crop losses.

Hurricane –Wind: the existing plan discusses Average Estimated Loss (HAZUS) based upon average storm, Loss of function, Probabilistic (10, 20, 50, 100, 500 etc) and Average wind speed. It was recommended that the committee consider, Exposure (Population, Building, Critical Facility, Utility), 100 yr probability. The merits of each were discussed and the committee decided to use Annual Estimated losses (potential average losses for a Cat. 3), 100 yr probabilistic, and to Rename AELs that don't use HAZUS

Tornado: The current plan profiles Average Annual Loss (actually totals, just property) and Tornado frequency overlaid on population density (map). The committee was asked to also consider Totals storms, number per 100 sq miles, Deaths and injuries, Crop vs. property losses. The pros and cons of the various topics were presented along with some potential mitigation action items (Building codes, Shelters and Weather radios required in mobile homes). **The SoVI map showing percent of housing that is mobile homes can be used in the new plan.** The committee decided to have the plan present the number of deaths, Deaths, Total of crop and property losses, each parish's Percentage of severe storms and Annual average losses.

Ice Storms: the 2008 plan considers only the Number of storms. The committee may want to also consider Total losses, Average Losses, Intersection of utilities and transportation with Land cover (pine trees). It was pointed out that the Entergy Ice Storm Plan has considerations of accumulations of ice, Power outages data might be located from local electric co-ops. Potential right of way and power line rerouting/burial actions were identified. In the end the committee agreed to focus on Number of events, Total Property losses, Total crop losses, Number of deaths and Average losses.

Storm Surge: the current plan uses HAZUS, AEL, SLOSH, Population/Buildings/Critical Facilities and Utilities exposed to Cat 3 storm surge. New topics for consideration are: MOMs (maximum of maximums) for the various basins: Sabine, Vermillion, NOLA (Cat 1, 3, 5) {MOMs Measure extent of reach}. The committee agreed that this was the best approach

Subsidence: The existing plan has limited data and focuses on Subsidence contour intervals and buildings, Critical Facilities and Infrastructure. Subsidence is difficult because the data is not static and there are many variables. Additionally, there is potential overlap with other hazards (sea level rise, land loss, etc), The Existing USGS map is confusing and needs clarification. The committee reached the decision that although flawed the update would carry over the Subsidence contour intervals, Buildings,

Critical Facilities and Infrastructure components.

Wildfire: The 2008 plan profiles Wildfire risk using Total Acres Burned, Average Acres Burnt per fire, Percentage Fires out of total for state as well as building stock exposure. The planning team recommended utilizing population, critical facilities and buildings that are confined to the delineated Wildland Urban Interface. The Committee agreed that this is the preferred methodology if the WUI data can be acquired. If not the plan will use total acres burnt, average acres burnt and percent of total fires updated from the 2008 plan.

Dam Failure: In 2008 the plan profiled this hazard using the number of dams by classification (High, Significant, Low), Affected Areas, the quadrant method, and exposure (population, buildings, critical facilities and utilities/transportation exposure). The planners explained a potential method to extract from the Emergency action plans the "Area of Coverage" thereby redefining the area of risk. For the update the Committee decided to evaluate the dams by the Number of Dams by Class, then exposure (population, Buildings, Critical Facilities and Utilities/Transportation). For Non-EAP high hazard dams, the planners would modify the quadrant method based upon topography.

Levee Failure: at present the plan shows Population exposure to Levee failure – ½ mile buffer. The planners have had difficulty acquiring additional statistics about levees. It was suggested that the new may have levee protected areas delineated, that we can acquire. Ultimately, the committee decided to utilize the Levee protected areas in DFIRMS, then determine exposure (Population, Critical Facilities, Buildings, Utilities and Transportation). Two other areas to work towards are tax data from levee districts and Sub-watersheds around sub-basins.

Haz Mat (accidents): The 2008 plan shows Toxic Release Inventory Facilities and Transportation buffers/facilities buffers. The reports in this data base are limited to reportable quantities. Because of this limitation the update could consider additional topics. The committee request the update focus on NRC reported spills, the number of Chemical facilities, Risk Management Plans, Pipelines, Resource Conservation Recovery Act (RCRA) reports, Major Highway and water transportation (1/2 mile in either direction), railway Rail (1 mile in either direction).

The attendees had a discussion of the Social Vulnerability Index and how this data could be brought in to the plan. It was proposed to do risk assessment then SoVI and discuss any special issues or concerns. Example maps were shown and discussed. SoVI data can be used to define Education, Funding and resource allocation and Parishes with combinations of hazards how they affect special populations

Discussion of the value of today's meeting and proposed doing the same thing for section 6: State owned facilities.

May 5, 2010 SHMPSC Meeting PowerPoint Presentation

State Hazard Mitigation Plan

2011 Update

Presented by GOHSEP

Agenda

- Introductions
- SHMT Updates
- Hazards Assessed
- Social Vulnerability Index
- Next Steps

2

LA SHMP Update

Introductions

3

Introduction

- Name, Position, Organization
- Previous Participation and/or Experience with the Hazard Mitigation Plan Update
- Contact Information

Please make sure to sign the sign-in sheet.

4

Hazards Assessed

- Flood
- High Wind (Hurricane)
- High Wind (Tornado)
- Ice Storm
- Storm Surge
- Subsidence
- Wildfire
- Dam Failure
- Levee Failure
- HAZMAT Incident

5

Information Gathered by Hazard

- Data Used
- Methodology
- Risk Assessment Result

6

Flood: Data Used

- NFIP Insurance Claims Data
- Digital Quality Level 4 Flood Data (Q3)
- HAZUS-MH (Multi-hazard)
- Repetitive Loss Data from the NFIP
- Severe Repetitive Loss Data from the NFIP
- USDA Declaration

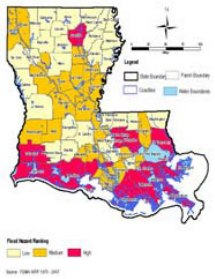
7

Flood: Methodology

Level	Annual Dollar Losses
Low	Less than $100,000 annual losses
Moderate	Less than $1million, but greater than or equal to $100,000 in annual losses
High	Greater than or equal to $1million in annual losses

8

Flood: Risk Assessment Results



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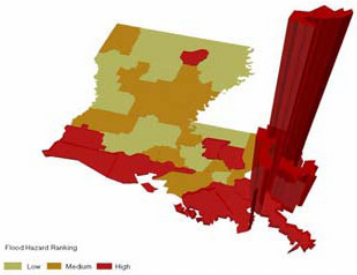
Flood: Risk Assessment Results



10

Hailstorm: Data Used

- NOAA Data by Parish (1955-2009)

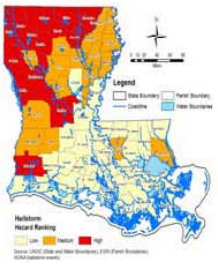
11

Hailstorm: Methodology

Level	Historic Incidents
Low	Fifty or fewer historic incidents
Moderate	Between 51 and 100 historic incidents
High	More than 100 historic incidents

12

Hailstorm: Risk Assessment Results



13

High Wind (Hurricane): Data Used

- NOAA Historical Hurricane Events Data: AEL (1900 through 2003)
- HAZUS-MH (general building stock data)

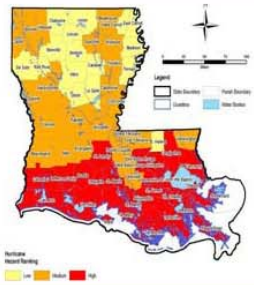
14

High Wind (Hurricane): Methodology

Level	Annual Dollar Losses
Low	Annual losses less than $400,000
Moderate	Annual losses less than $5 million but greater than or equal to $400,000
High	Annual losses greater than or equal to $5 million

15

High Wind (Hurricane): Risk Assessment Results



16

High Wind (Tornado): Data Used

- NOAA Historical Hurricane Events Data: AEL (1950 through 2005)

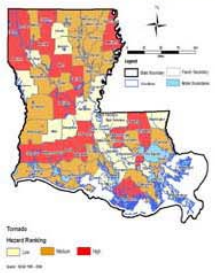
17

High Wind (Tornado): Methodology

Level	Annual Dollar Losses
Low	Annual losses less than $75,000
Moderate	Annual losses less than $200,000 but greater than or equal to $75,000
High	Annual losses greater than or equal to $200,000

18

High Wind (Tornado): Risk Assessment Results



19

Ice Storm: Data Used

- NOAA data by Parish (1950-2009)

20

Ice Storm: Methodology

Level	Historic Incidents
Low	No historic incidents
Moderate	Equal to or less than 4 historic incidents, or greater than or equal to 1 incident
High	More than 4 historic incidents

21

Ice Storm: Risk Assessment Results

22

Storm Surge: Data Used

- AEL determined from HAZUS-MH (general building stock data)
- Data taken from LSU Coastal Louisiana Ecosystem Assessment and Restoration
- Data taken from LSU Coastal Emergency Assessment Team

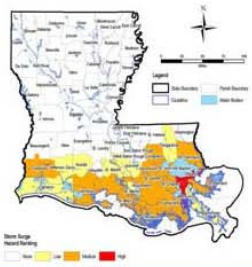
23

Storm Surge: Methodology

Level	Annual Dollar Losses
Low	Annual dollar losses less than $250 million
Moderate	Annual dollar losses less than $15 billion but greater than or equal to $250 million
High	Annual dollar losses more than or equal to $15 billion

24

Storm Surge: Risk Assessment Results



25

Subsidence: Data Used

- Average subsidence rates in Parishes*
- University of Kentucky average subsidence contour intervals
- Holocene stratigraphy history and subsidence

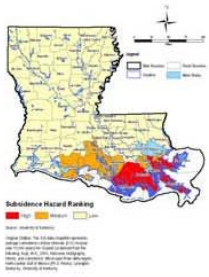
* Subsidence rates represent averages over 10,000 years, and are not accurate predictors of future subsidence rates, but can be used to conceptualize the relative difference in subsidence in coastal parishes

26

Subsidence: Methodology

27

Subsidence: Risk Assessment Results



28

Wildfire: Data Used

- USGS National Land Cover Data (1991-2000)
- Information on acres burned (1991-2000)

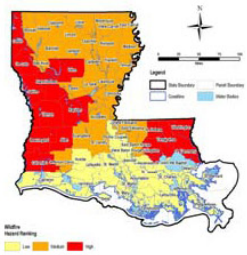
29

Wildfire: Methodology

Level	Acres Burned
Low	No acres burned
Moderate	Acres burned are less than 1,000 but greater than zero
High	Acres burned greater than or equal to 1,000 acres burned

30

Wildfire: Risk Assessment Results



31

Dam Failure: Data Used

- National Inventory of Dams

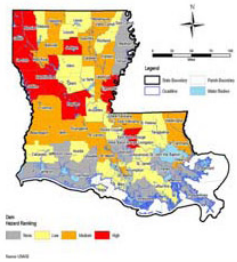
32

Dam Failure: Methodology

Level	Dams by Classification
Low	One or more low hazard dams
Moderate	One or more significant hazard dams
High	One or more high hazard dams

33

Dam Failure: Risk Assessment Results



34

Levee Failure: Data Used

35

Levee Failure: Methodology

Level	Levees by Classification
Low	
Moderate	
High	

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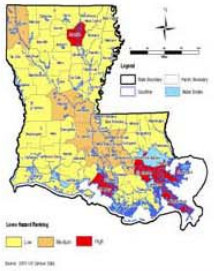
Levee Failure: Risk Assessment Results



37

HAZMAT Incident: Data Used

- EPA Toxic Release Inventory Report
- US Census Data

38

HAZMAT Incident: Methodology

Level	Population Within 1 Mile Radius of HAZMAT Facility
Low	Population less than 90
Moderate	Population is less than 1,000 but greater than or equal to 90
High	Populations is greater than or equal to 1,000

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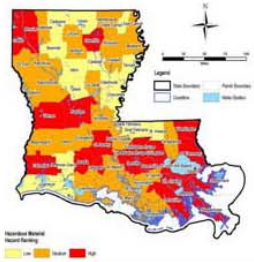
HAZMAT Incident: Risk Assessment Results



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Social Vulnerability Index (SoVi)

- The SoVi integrates a more fair method of determining vulnerability by adding the following:
  - Rural vs. Urban Population
  - Racial/Ethnic Composition
  - Poverty and Median Income Levels
  - Concentration of certain industries
  - Presence of Young Children and Senior Citizens
  - Labor Force Participation and Unemployment
  - Cost of Housing (rental and owner-occupied)
  - Education Levels

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SoVi Uses

- Researchers can perform statistical analyses to determine which parishes and regions are particularly threatened during disasters due to a lack of human capital necessary to fully recover
  - Extreme High Outliers Determined
  - Extreme Low Outliers Determined
- East Carroll, Madison, Tensas, among others indicate a high level of social vulnerability

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Accessing SharePoint

- Log on to the web address at: http://sharepoint.jlwitt.com/SHMPU
- The assigned user name is: **SHMPUusers**
- The assigned password is: **jlwashmp345**
- Instructions for use:
  - Click on Shared Documents
  - Click on the Steering Committee folder
  - Right click on documents in order to save them to your computer
- Open document(s) on your own computer and either insert comments using the track changes option or email them to Alessandra Jerolleman at ajerolleman@wittassociates.com

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LA SHMP Update

Questions?

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State Hazard Mitigation Plan Steering Committee Meeting

9:00 May 5, 2010

JFO, Baton Rouge

Meeting Notes:

Introduction: Description of hand-outs

Explanation of HAZUA-MH

Showing maps of HAZUS data

Schools, Health, etc

Flood

Some parishes have no Digital data so HAZUS is being used

E. Baton Rouge and Ascension can have additional data for flood maps

Contact Cindy O'Neal's office

Risk Assessment Data

In Ch 5: Average Annual Losses

In App. E: Total Annual Losses

100 yr exposure
- Critical Facilities
- Buildings
- Population
- Transportation & Utilities

Map Shows 1%, 0.02%, V zones

Won't be used in plan, it is too detailed

Instead we will use the 1% map

Question on table E-11 – Insured Losses:

What is measured by Percent of increase or decrease?

Are these changes reflective in number of NFIP policies?

Consider:

Percent of land in floodplains

Some parishes are very marshy, this may skew the data

But if you have low population it will offset and balance to some extent

Discussion of Rep Loss map and options

Decision to use: Percent of land area as a component in the composite for flood

Discussion about merging SRL and RL to have a total number

Use total losses or average losses

Total may include old properties that may have been mitigated already

Decision to use: Average Annual Losses (NFIP)

Total Annual Losses (NFIP

Number of RL

Number of SRL

100 yr exposure:

Critical Facilities

Building stock

Population
Transportation and utilities
Percentage of land area in floodplain
Will give each consideration even weight in the ranking

Hail

New section for 2010
We have data for total number of events
Consider:
Total losses property and crops
Size of hail (can be inconsistent)
Difficult to delineate exposure
Metal roofs discussion
Size is dependant upon observer and by number of population reporting
Size can counter balance number of storms
Losses can compensate as well
Size will not be considered
Total Losses separate crop and property

Decision to use: Total number of storms

Property losses
Crop losses

Hurricane –Wind

Ch. 5: AEL (Hazus) based upon average storm; could do a historic storm
E: Loss of function
Probalistic (10, 20, 50, 100, 500 etc)
Average wind speed
Consider:
Population exposure
Recommendation to use 100 yr probability with population (may not be useful), buildings, utilities

Decision to use: Annual Estimated losses (potential average losses for a Cat. 3)

100 yr probabilistic
Maximum wind speed
Population exposed to maximum wind speeds of Category 2 wind speeds or greater.
Building/Critical Facility/Utility exposure – need a total number for each parish; what is the best way to get this? Would this be a subcomponent of AEL?
Rename AELs that don't use HAZUS
HAZUS AEL vs. AEL - need to define and indicate which are which throughout the plan

Tornado

Ch 5: Average Annual Loss (actually totals, just property)
E: Tornado frequency overlaid on population density (map)
Consider:
Totals

Land Area in tornado tracks or number per 100 sq miles
Deaths and injuries
Crop vs. property losses
Number of events
Total
Average

Deaths are somewhat problematic, people move
Does average intensity or density make more sense than total number?
Are losses enough or should we include intensity or number
The usefulness of crop damages was discussed
Potential mobile home mitigation actions:
Building codes
Shelters
Weather radios required in mobile homes
The SoVI map showing percent of housing that is mobile homes can be used

Decision:

Deaths
Total of crop and property losses
Percentage of severe storms
Annual average losses

Ice Storms

Ch 5: Number of storms
Consider:
Total losses: property and crop
Average Losses
Intersection of utilities and transportation with Land cover (pine trees)

Deaths are usually related to motor vehicle accidents
Entergy Plan – considerations of accumulations of ice
Power outages might be located
Discussion of local electric co-ops and declarations: shut-ins, and medical concerns
Potential right of way and power line rerouting actions
Pros and cons of power line burial

Decision:

Number of events
Total Property losses
Total crop losses
Number of deaths
Average losses

Storm Surge

Ch 5: Hazus AEL
E: SLOSH

Population exposed to Cat 3
Buildings exposed to Cat 3
Critical Facilities exposed to Cat 3
Utilities exposed to Cat 3

Consider:

MOMs (maximum of maximums) for the various basins:

Sabine (Cat 1, 3, 5)
Vermillion (Cat 1, 3, 5)
NOLA (Cat 1, 3, 5)

Measures extent of reach
What can be incorporated?

Buildings
Population (limited usefulness)

Decision: use the MOMs for the three basins:

Sabine, Vermillion and NOLA (Cat 1, 3, 5)

Subsidence

Ch 5: Subsidence contour intervals
E: buildings
Critical Facilities
Infrastructure
Subsidence is difficult because the data is not static and there are too many variables
Additionally there is a lot of overlap with other hazards (sea level rise, land loss, etc)
Existing USGS map is confusing and needs clarification
Discussion of benchmarks and mapping/elevations
Data that exists is limited and has many variables
Recommendation for future study

Decision:

Use existing although flawed:

Subsidence contour intervals
Buildings
Critical Facilities
Infrastructure

Wildfire

Ch 5: Total Acres Burned

Average Acres Burnt per fire
Percentage Fires out of total for state

E: Some Tabulations of HAZUS info – total building stock
Consider: Wildland Urban Interface (WUI, if data can be acquired)

People
Critical Facilities
Buildings

Data on WUI and losses is limited

Decision:

If WUI is not available, we will use Total Acres

Average acres

Percent of total fires

Dam Failure

Ch 5: Number of dams by classification (High, Significant, Low)

E: Affected Areas

Drawing (quadrant method)

Population Exposure

Building Exposure

Critical Facilities Exposure

Utilities/Transportation exposure

Consider:

"Area of Coverage" from EAPs – limited number of them

Redefine area of risk

Decision:

Number of Dams by Class

Then population exposure, Building exposure, Critical Facilities exposure, Utilities/Transportation exposure.

For Non-EAP high hazard dams, modify the quadrant method based upon topography

Levee Failure

Ch 5: Population exposure to Levee failure – ½ mile buffer

Requests for additional data from USACE not forthcoming

NEW DFIRMS may have levee protected areas delineated, that we can acquire –Call Susan Billon 274-4317

Decision:

Levee protected areas in DFIRMS

Then determine: Population, Critical Facilities, Buildings, Utilities and Transportation

Possibly acquire tax data from levee districts

Sub-watersheds around sub-basins

Haz Mat (accidents)

National Response center data provides a snapshot of 10 years, but only reportable quantities

Ch 5: Tri Facilities

E: Transportation buffers/facilities buffers

Consider:

NRC reported skills

Chemical facilities

Risk Management Plans

Pipelines

Resource Conservation Recovery Act (RCRA)

Major Highway, railway, water transportation

Discussion of RCRA law and what is covered; waste from point facilities and treatment/storage

Some facilities that were not covered by these may be addressed by SARA Tier II/Right to Know, Data is in a different format than what we need – can this be extracted?

Decision:

Use: NRC reported skills

Chemical facilities

Risk Management Plans

Pipelines

Resource Conservation Recovery Act (RCRA)

Major Highway, railway, water transportation

NEED TO ADJUST the buffers for highway to (1/2 mile in either direction) and Rail (1 mile in either direction) and Pipeline (prob ½ mile) and Waterway

SOVI

Discussion about how we bring this data in?

Proposal: do risk assessment then SoVI and discuss any special issues or concerns

Example maps shown and discussed

The map showing percent of housing that is mobile homes can be used for Tornado

Discussion of how SoVI can apply to mitigation

Education

Funding and resource allocation

Parishes with combinations of hazards and present how it affects special populations

Discussion of the value of today's meeting and proposed doing the same thing for section 6: State owned facilities.

Sign In Sheet: Meeting to Review Hazards and Risk Assessment Methodologies

May 5, 2010

Name	Agency	Phone	E-Mail
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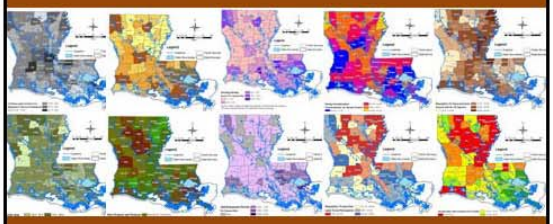
May 5, 2010 SHMPSC Meeting SoVI PowerPoint Presentation

Sample Maps for SoVI



Eric McAfee
5 March 2010

Social Vulnerability Index (SoVI)

- Originally used to understand the pronounced loss of life in developing countries after national disasters, it now broadly examines conditions across any nation-state that may make the locality more susceptible to mass casualties or social collapse from a disaster event.
- SoVI Variables: a variety of demographic, economic, and workforce indicators used to gauge social vulnerability
- Source of SoVI Variables: Cutter, Emrich, and Boruff. "Erosion Hazard Vulnerability of US Coastal Counties", from *Journal for Coastal Research*, September 2005, pp. 932-942.

SoVI in Louisiana

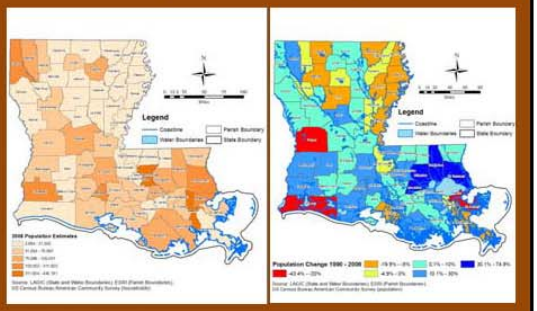
- Data on Variables available for all 64 Parishes and the state as a whole
- 2008 data whenever possible
- Primary Sources:
  - American Community Survey (2008 or 2006-08)
  - US Decennial Census 2000
  - USDA Census of Agriculture
  - Census Annual Economic Survey
  - Census Business and Industry
  - State Department of Health

Sample Louisiana SoVI Maps

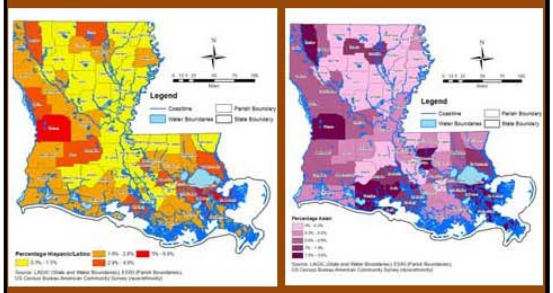
Grouped by Various Categories:

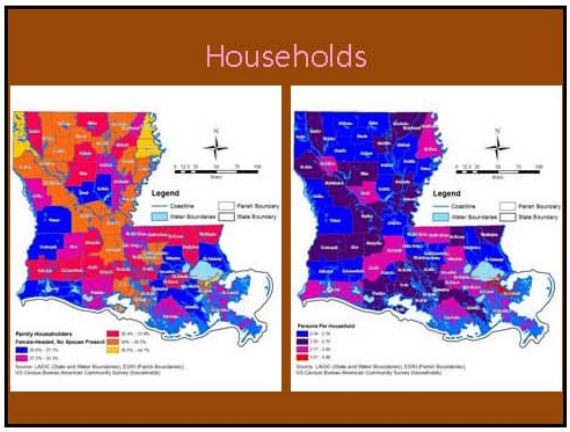
- Population Change
- Race/Ethnicity
- Households
- Labor Force
- Income and Poverty
- Housing
- Urban/Rural and Farms
- Education

Population Change



Race/Ethnicity




Households
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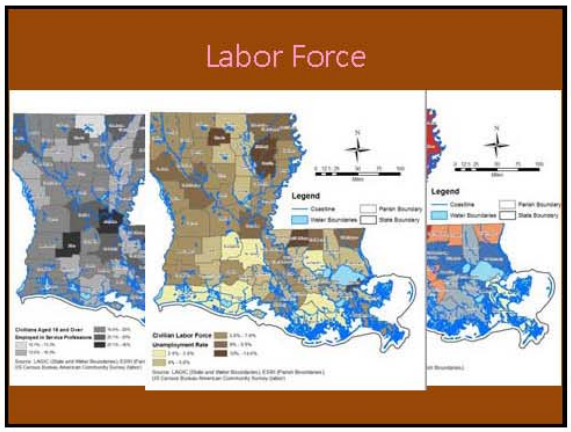
Labor Force
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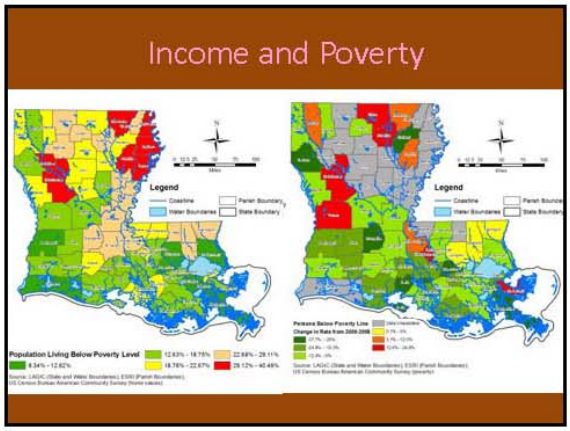
Income and Poverty
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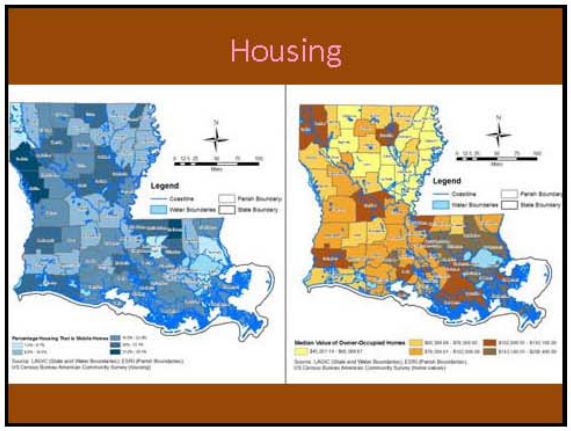
Housing
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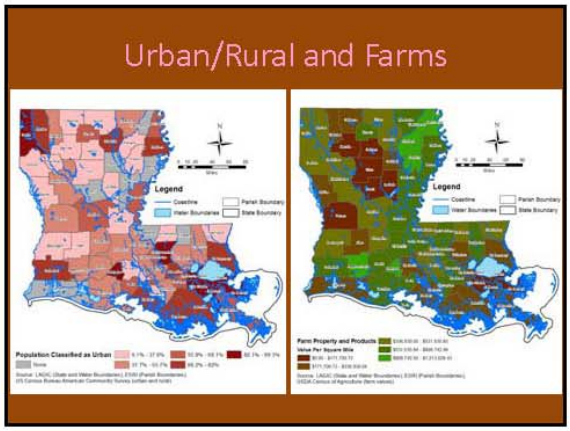
Urban/Rural and Farms
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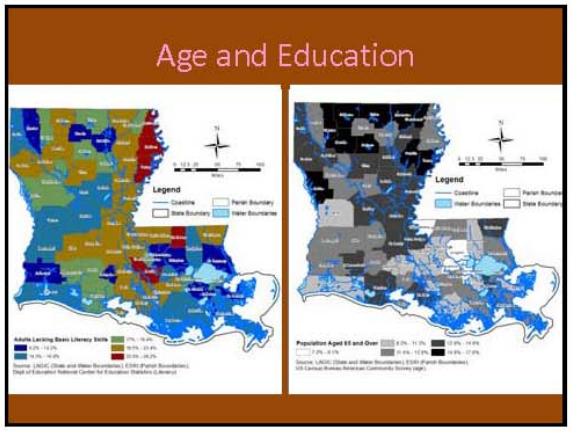
Age and Education
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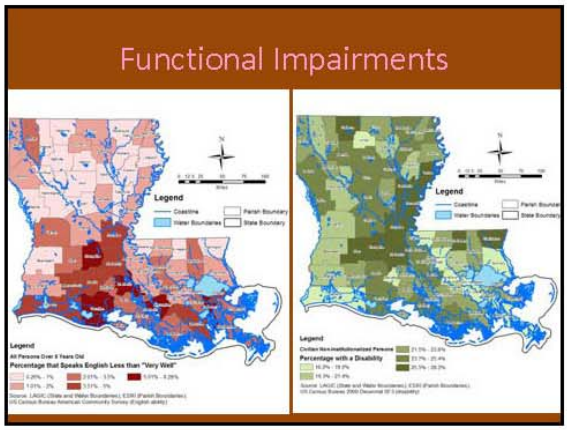

Other Mapable Topics

- Median rent
- Birth rate
- Net international migration
- Percentage seniors (65+ years)
- Density of commercial/manufacturing
- Social security recipients
- Rural farm population
- Farmland value and output

Steering Committee Workshop on Section 6
May 25, 2010
Agenda

Welcome and Introductions

Description of Handouts

Overview of Prioritization Process

- Methodology (how priorities were determined)
- Value calculations (based on budgets)
- Calculating the criticality

Overview of Generic Facility (What we used and why for the workshop)

Explanation of Methodologies

- Flood
- Hail
- Hurricane – Wind
- Tornado
- Ice Storms
- Storm Surge
- Subsidence
- Wildfire
- Dam Failure
- Levee Failure
- Hazardous Materials

Open Discussion

Minutes from the State Hazard Mitigation Plan Steering Committee Meeting

Joint Field Office, Baton Rouge

May 25, 2010

Attendees:

Matt Stanley, JLWA

Bill Morrison, DOA-FP&C

Keith Horn, DEQ-RSO

Reuben Meador, JLWA

Richard Hollowell, DHH

John Walter, LDAF

Margaret Sanz, GOHSEP

Brenda Cooper, GOHSEP

Michele Deshotels, OCPR

Mary Sharp, JLWA

Matt Stanley, JLWA

Knecole Blake, LWA

Welcome: Matt Stanley called the meeting to order and began with:

- Introductions
- Overview of meeting, pre-discussion of PowerPoint information
- Agenda
- Questions from previous meeting

Brief review of different hazard and risk levels to include the 8,308 buildings that are on the prioritization list which are still being evaluated. Criticality levels have been established on many.

John Walther: Speaking on criticality levels. Prioritization of building type needs to be established first – Shelters, Critical Facilities, Emergency Fuel Stations, etc.

Discussed new breakdown of methodologies based on criticality levels 1-5 in a chart format with one being the most critical for buildings.

Question: Why are schools listed with a high criticality level and need to up and running within 24 hours?

Answer: Schools are used as distribution points, shelters, etc.

Discussed and agreed on criticality levels of several buildings.

Vulnerability Assessment Methodology

The Methodology is based on the same methodology used in the 2008 plan – No changes were recommended

Consideration of:

1. Review of hazard profile maps

2. Establish hazard vulnerability levels by location
3. Establish hazard vulnerability levels using additional parameters if needed

Discussion of buildings owned by the State verses buildings leased by the State

Buildings not leased or State owned yet are identified as an "L" property on the list. The responsibility for any mitigation actions for these buildings would fall on the Parish.

Loss Estimation Methodology – State owned facilities

Statement of methodology and building types

- Estimate damage levels by hazard vulnerability
- Assumes average building type
- Established damage functions

Discussion of specific buildings level of vulnerability among participants and changing building types (concrete to steel) under step 2 "assume an average building type".

Group accepted chart showing criticality level ratings as well criticality factors.

Michele Deshotels: Mentioned of possible basements in the State owned larger buildings where official records are kept.

Keith Horn: Advised that many of the "basements" are above grade.

Agreement on establishing damage functions for buildings with basements/partial basements.

Comment: Several museums are State-owned – the content value of museums, in many cases, are higher than the building value, as some buildings house irreplaceable archival records, some are on the historic register, and some house many historic items, some which are priceless.

Hazards

- Flood
- Hail
- High Wind Tornado
- High Wind Hurricane
- Ice Storm
- Storm Surge
- Subsidence
- Wildfire
- Dam Failure
- Levee Failure
- Hazardous Materials

Flood

Discussion on which buildings are in the 100 year flood plain and how to obtain such data.

Hail

This hazard is new to the plan. Proposed methodology involved an analysis of number of recorded hail storms within each Parish.

Hazard vulnerability assigned for each State owned building. Committee asked for review of methodology using "4" for high hazards. Suggestion was to increase the levels from 1-5 instead of 1-4. Also when analyzing hail – size of hail, duration, Frequency, and Magnitude should be taken into consideration (Data may be sketchy at best as certain trends have not been tracked for a long time)

High Wind – Hurricane

Committee Question – what is design wind speed rating used for each building?

Answer – ASCE 7-02, maximum 3-second peak wind speed recorded over a 100 year occurrence.

Discussion and questions on building code design, when buildings codes were established, and ranking.

Statement: Some buildings had their own code and did no follow the 1991 IBC code. (Research needs to be done to see if there was an adoption to the code. Group is ok with the methodology for this vulnerability assessment.

High Wind – Tornado

Light discussion. Vulnerability based on a 56 year NOAA data record; average number of tornadoes per 100 square miles.

Committee mentioned that hurricanes sometimes cause tornados, yet these tornadoes are not usually tracked.

Statement: (Missing number 2 vulnerability ranking on category graph.)

Ice Storms:

Questions:

What metric can we add to the Frequency?

Can we obtain "duration" for each event?

Why use (NCDC) 1993 data to present date?

Statement: Ice storms may be considered to be a winter event and these storms could result from a rain event.

Storm Surge Discussion

Discussion of levels of vulnerability and accuracy of slosh models prepared by NOAA for Cat 1-5 hurricanes.

Recommendation: Explain why and how we used SLOSH models. Cat 1 zone theory of inundation used for Cat 2-5 vulnerabilities.

Committee ok with Methodology.

Final statement: Run model as discussed and review the analysis.

Subsidence

Discussed vulnerability levels and how data was derived.

Subsidence levels vary widely depending on the underlying soils and direct cause of the subsidence. Current evaluations cannot be compared to elevations previously because bench marks were unknowingly sinking.

May 26, 2010 SHMPSC Meeting Sign-In Sheet

Governor's Office Of Homeland Security and Emergency Preparedness

BRIEFING / MEETIING: Louisiana State Hazard Mitigation Plan Section (6) Workshop DATE: May 25, 2010

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Knecole Blake	JLWA	407-334-7504		Knecole_Blake@hotmail.com

May 25, 2010 SHMPSC Meeting PowerPoint Presentation

Risk Assessment for State-Owned Assets

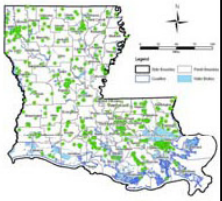
Louisiana State Hazard Mitigation Plan
Section 6 Workshop
May 25, 2010

Agenda

- Welcome and Introductions
- Overview of Facility Prioritization Process
- Explanation and Discussion of Methodologies
- Open Discussion and Review
- Moving Forward

Facility Prioritization Process

- Methodology
  - 8308 prioritized facilities distributed across the state
  - Different hazard levels
  - Different risk areas



Facility Prioritization Process

- Methodology
  - Criticality levels
  - Based on their use during response/recovery operations
  - Considers Continuity of Operations standards
- Vetting Process
  - Steering Committee and department meetings

Facility Prioritization Process

Criticality Level	Description
Level 1	Public safety buildings and facilities (Police, Fire, EMS, EMA/EOC), shelters, hospitals, urgent care centers, and other buildings that MUST remain operational during a disaster event to provide life safety measures and support.
Level 2	Buildings and facilities that provide essential government services and must be operational within 12 to 24 hours of a disaster. These facilities include pharmacies, pump houses, public works facilities, and buildings used for response/recovery operations (schools, airports, etc).
Level 3	Buildings and facilities that must be functional during recovery operations such as government administrative/management buildings and courthouses.
Level 4	State buildings and facilities that must be operational for the restoration of normal living conditions. These buildings include college buildings, dorms, and cafeterias.
Level 5	State buildings and facilities that support normal living, commerce, and tourism such as museums, vacation cabins, and service stations.

Vulnerability Assessment

- Step 1 – Review Hazard Profile Maps: review the hazard profile map for the hazard under consideration.
- Step 2 – Establish Hazard Vulnerability Levels by Location: In general, structures located outside established hazard zones were designated as having a low hazard vulnerability level; structures located within hazard zones were designated with a medium or high hazard vulnerability level.
- Step 3 – Establish Hazard Vulnerability Levels using Additional Parameters if Needed: In some cases, the location of a building or facility is not sufficient to specify a low, medium or high vulnerability level.

Loss Estimation Methodology

- Step 1 – Estimate Damage Levels by Hazard Vulnerability Level: Establish a magnitude or level of damage from a given hazard.
- Step 2 – Assume an Average Building Type: Assume an average building type to use as a basis for uniformly applying damage functions
- Step 3 – Establish Damage Functions: Establish a series of damage functions to estimate physical damage, contents damage, and LOF costs associated with a given hazard.

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Hazards

- Flood
- Hail
- High Wind – Hurricane
- High Wind – Tornado
- Ice Storm
- Storm Surge
- Subsidence
- Wildfire
- Dam Failure
- Levee Failure
- Hazardous Materials

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Flood

- Is the building in the 100 year floodplain?
  - Determined by data derived from FIRM
- Is it Pre-FIRM or Post-FIRM construction?
  - Move in date after 1982
- Based on above, 3 hazard vulnerability levels
  - Low Hazard Vulnerability: Structures located outside the 100-year floodplain
  - Medium Hazard Vulnerability: Post-FIRM structures located within the 100-year floodplain
  - High Hazard Vulnerability: Pre-FIRM structures located within the 100-year floodplain

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Hail

- The Hail hazard vulnerability assessment is new to the Hazard Mitigation Plan.
- Proposed methodology involved an analysis of the number of recorded hail storms within each parish.
- A hazard vulnerability assessment level will be assigned for each of the State-owned buildings and critical facilities:
  - Low Hazard Vulnerability: Structures located in parishes with no recorded hail storms
  - Medium Hazard Vulnerability: Structures located in parishes with one to four recorded hail storms
  - High Hazard Vulnerability: Structures located in parishes with more than four recorded hail storms

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High Wind - Hurricane

- What is the design wind speed?
  - The minimum design wind speeds in ASCE 7-02 are based on the maximum 3-second peak wind gust speeds recorded over a 100-year recurrence interval in coastal areas and a 50-year recurrence interval in inland areas.
- Is the building pre- or post-wind code construction
  - Move-in date in relation to 1991 SBC

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High Wind - Hurricane

- Hazard Vulnerability Assessment

Hazard Vulnerability Level	Design Wind Speed (mph)	Pre-Wind Code vs. Post-Wind Code
Low	≤ 90	Post-Wind Code
Low	≤ 90	Pre-Wind Code
Low	91-110	Post-Wind Code
Medium	91-110	Pre-Wind Code
Medium	> 110	Post-Wind Code
High	> 110	Pre-Wind Code

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High Wind - Tornado

- Tornado Wind Hazard Vulnerability: The vulnerability analysis is based on a 56 year NOAA data record that includes the historical tracks of 661 tornadoes in Louisiana that include tornadoes of all intensities The size of each track, in square miles, was used to identify the total area of each Parish previously impacted by tornadoes.
- Average Number of Tornadoes per 100 Square Miles: The total area of each Parish previously impacted by tornadoes (in square miles), was divided by the average tornado track (in square miles) to generate an average number of tornadoes per Parish.

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High Wind - Tornado

- Hazard Vulnerability Categories:

Hazard Vulnerability Ranking	Criteria	Number of Parishes
5	<.5 tornadoes per 100 square miles	6
4	.5 to 1.5 tornadoes per 100 square miles	8
3	1.5 to 2.5 tornadoes per 100 square miles	8
1	2.5 to 3.5 tornadoes per 100 square miles	25

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Ice Storm

- The ice storm hazard vulnerability assessment involved an analysis of the number of recorded ice storms within each parish based on data provided by the National Climactic Data Center (NCDC) between 1993 and the present.
- A hazard vulnerability assessment level was assigned for each of the State-owned buildings and critical facilities:
  - Low Hazard Vulnerability: Structures located in parishes with no recorded ice storms
  - Medium Hazard Vulnerability: Structures located in parishes with one to four recorded ice storms
  - High Hazard Vulnerability: Structures located in parishes with more than four recorded ice storms

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Storm Surge

- The storm surge hazard vulnerability assessment involved an analysis of SLOSH models prepared by NOAA for Category 1-5 hurricanes in Louisiana.
- The three hazard vulnerability levels:
  - Low Hazard Vulnerability: Structures located outside the storm surge hazard zone
  - Medium Hazard Vulnerability: Structures located within the storm surge hazard zone with surge inundation depths less than 12 feet
  - High Hazard Vulnerability: Structures located within the storm surge hazard zone with surge inundation depths greater than 12 feet

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Subsidence

- The subsidence hazard vulnerability assessment involved an analysis of subsidence studies. The results were then used to prepare subsidence zones based on three ranges of subsidence rates.
- The three hazard vulnerability levels:
  - Low Hazard Vulnerability: Structures located within an area with projected subsidence rates less than .02 cm/yr.
  - Medium Hazard Vulnerability: Structures located within an area with the projected subsidence rates between .02 and .08 cm/yr.
  - High Hazard Vulnerability: Structures located within an area with the highest projected subsidence rates.

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Wildfire

- The wildfire hazard vulnerability assessment involved an analysis of the number of recorded wildfires and acres burned by wildfires within each parish between 1991 and 2000, based on data provided by the State of Louisiana. (Update data being researched)
- The three hazard vulnerability levels:
  - Low Hazard Vulnerability: Structures located in parishes with no recorded wildfires
  - Medium Hazard Vulnerability: Structures located in parishes where the average number of acres burned by wildfires was less than the State-wide average for all parishes
  - High Hazard Vulnerability: Structures located in parishes where the average number of acres burned by wildfires was greater than the State-wide average for all parishes

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Dam Failure

- The dam failure hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of potential inundation areas from all possible dam failures statewide
- The potential inundation areas were estimated based on an algorithm which distributed dam capacities provided by the State over a failure hazard radius of a selected depth around each dam
- The results were then used to prepare dam failure hazard zones based on proximity to the failure hazard radii computed by the algorithms

Dam Failure

- The three hazard vulnerability levels:
  - Low Hazard Vulnerability: Structures located outside the dam failure hazard radius
  - Medium Hazard Vulnerability: Structures located within the area greater than 50% but less than 100% of the dam failure hazard radius
  - High Hazard Vulnerability: Structures located within the area less than or equal to 50% of the dam failure hazard radius

Levee Failure

- The levee failure hazard vulnerability assessment involved an analysis of potential inundation areas from levee failure.
- The potential inundation areas were identified based on levee locations across the State as provided by the New Orleans District of the US Army Corps of Engineers (USACE), as well as non-USACE levees.
- The results were then used to prepare levee failure hazard zones based on the perpendicular distance from the levee wall.

Levee Failure

- The three hazard vulnerability levels:
  - Low Hazard Vulnerability: Structures located more that two miles away from the levee wall
  - Medium Hazard Vulnerability: Structures located between one-half mile and two miles away from the levee wall
  - High Hazard Vulnerability: Structures located within one-half mile of the levee wall

Hazardous Materials

- The hazardous material incident hazard vulnerability assessment involved an analysis of potential impact areas from a hazardous materials (HAZMAT)release from a fixed site.
- The results were then used to prepare hazardous material incident hazard zones based on the distance from the HAZMAT site
- Updates to methodology and vulnerabilities are being researched
  - Transportation lines
  - Transmission lines

Hazardous Materials

- The three hazard vulnerability levels:
  - Low Hazard Vulnerability: Structures located outside a two mile radius from a HAZMAT site
  - Medium Hazard Vulnerability: Structures located between a one and two mile radius from a HAZMAT site
  - High Hazard Vulnerability: Structures located within a one mile radius of a HAZMAT site

Open Discussion/Review

- Facility Prioritizations
- Vulnerability Assessments
- Loss Estimation Methodology
- Hazard Methodologies

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Moving Forward

- Review Comments with Planning Team
- Complete Research on Data Updates
- Incorporate Latest Changes in Prioritizations
- Map facilities for each hazard
- Finalize draft of Section 6

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May 25, 2010 SHMPSC Meeting Handout

Loss Estimation Methodology for State-owned Critical Facilities

Loss estimations are intended to provide a means of quantifying the potential dollar losses from a given hazard in terms of combined physical (building) damage, contents damage, and loss of function (LOF) costs. As described for the vulnerability assessment methodology above, although there are a variety of potential hazards, the loss estimations for State-owned critical facilities in Louisiana adopted the same general approach for all hazards. This general approach is outlined by the three-step methodology listed below:

- Step 1 – Estimate Damage Levels by Hazard Vulnerability Level: The first step in preparing loss estimates for individual structures was to establish a magnitude or level of damage from a given hazard. The three hazard vulnerability levels established by the hazard vulnerability assessment for each facility provided a useful indication of the potential levels of damage that may occur from a given hazard. In general, structures with a low hazard vulnerability level are expected to experience a low level of damage or no damage, structures with a medium hazard vulnerability level are subject to a moderate level of damage, and structures with a high hazard vulnerability level will likely experience a high level of damage. In addition, for some hazards, data provided in the hazard profiles (Section Four) was used to estimate potential design wind speeds or flood depths associated with a given hazard vulnerability level to estimate damage levels with greater accuracy.
- Step 2 – Assume an Average Building Type: Once the three damage levels were established, the next step was to assume an average building type to use as a basis for uniformly applying damage functions (Step 3) to individual State-owned critical facilities. An average building type was typically assumed based on engineering judgment and experience with basic building types in various parts of Louisiana. Examples of average building types assumed for various loss estimates include using a single story structure without a basement for water-related hazards and using a lightly engineered building type for wind-related hazards.
- Step 3 – Establish Damage Functions: The final step in preparing loss estimates was to establish a series of damage functions to estimate physical damage, contents damage, and LOF costs associated with a given hazard. The damage functions allowed damages to be estimated for the three potential damage levels established in Step 1 using the average building type assumed in Step 2. The damage functions were applied to individual structures based on the Building Replacement Value (BRV) and the square footage of the building. The BRV and square footage values were taken directly from the information in the Facilities Management database.

In general, physical and contents damage functions are expressed as a percentage of the BRV, while LOF costs were determined as a function of the number of days a facility would be out of use. Therefore, physical and contents damages were estimated by multiplying the BRV by the corresponding physical and contents damage functions, while LOF costs were estimated as a proportion of the annual operating budget for each structure.

The factored square footage for each structure was determined by multiplying the actual square footage by a Criticality Factor (CF) based on the criticality level assigned to each structure.

Criticality Level	Criticality Factor (CF)
1 – High	10
2 – Medium High	8
3 – Medium	6
4 – Medium Low	4
5 - Low	2
All Others	1

Note that applying the CF to the square footage of each structure allows higher criticality facilities such as fire stations to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance.

Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding damage function for LOF (measured in days).

For each structure, the physical damage, contents damage and LOF costs were added together to produce a combined loss estimate per structure for each hazard.

Louisiana State Hazard Mitigation Team and Steering Committee Meeting

State Police Building, Classroom A

June 30, 2010

1:00 PM

At 1PM, Steve Garcia advised that we would hold the meeting for another 10 minutes because of weather.

1:10 PM, Steve Garcia opened the meeting with a welcome, overview of agenda, and introductions.

Steve reviewed:

- 44 CFR guidance 201.4 ((a), (c)(1), (b), (5)(i))
- Composition of the SHMT (agencies and names)
- Composition of State Hazard Mitigation Planning Committee (agencies and names)
- Duties and functions of the SHMT (see PowerPoint for specific functions)
- Duties and functions of the SHMPC

Meeting handed over to Alessandra at 1:20PM to discuss the planning process update.

Alessandra reviewed:

- SHMPC meetings and workshops dates and basic content of them
- How to access SharePoint and what is on the site
  - Specific workshop materials will not be found on SharePoint
- State-owned facility database workshop and subsequent meetings, and how criticality was assigned then vetted
- Hazard and Risk Assessment methodologies workshop
- Risk Assessment methodologies for State owned facilities

Alessandra reminded the team that the plan had not been through a technical edit and some formatting issues will be encountered during the review. She also noted that Sections 1-3 are “moving targets” in the fact that these sections will change and be amended throughout the planning period.

Section 5 Highlight:

- See PowerPoint

Section 6 Highlight:

- See PowerPoint

Initial Draft:

- Printed copies of volume 1 are provided today
- We’ll provide CD copies by mail within the next 24 hours.
- Get a game plan website will post pdf files for public review
- Review of SharePoint site
  - Directions were provided on how to access and download files
- How to comment on the draft: track changes or in a memo

Please return comments in the next 2 – 3 weeks via SharePoint, email, or written comment which we can pick up

Next Steps:

Draft available June 30

July 27, Meeting 5 – Discuss goals, objectives and Mitigation Actions – Section 8

Oct 13, Meeting 6 – Discuss final draft

Jan 12, 2011 SHMPC Meeting 7 – Recommend plan options

Q/A:

What time is the next meeting? That time hasn't been set yet.

Will there be any more committee meetings? No one has been removed from the process and everyone will be invited to the meetings.

June 30, 2010 Memo to SHMT

Act with confidence.

JAMES LEE WITT ASSOCIATES
Part of GlobalOptions Group

To: State Hazard Mitigation Team
Re: June 30, 2010, Draft

The June 30, 2010 Draft of the State of Louisiana Hazard Mitigation Plan Update includes sections 1 – 6 with corresponding appendices. Please note that this draft has not undergone a technical edit at this time. We are requesting your comments on the content of the documents, and not the formatting. Below are some additional notes regarding the sections being released for review at this time.

Section 1 / Appendix A

Additional edits will be made to this section throughout the planning process.

Section 2 / Appendix B

Some data in this section cannot be filled in at this time.

Section 3 / Appendix C

Additional edits will be made to this section throughout the planning process.

Section 4 / Appendix D

This section and appendix are complete, although some language regarding Deepwater Horizon may be added at a later date.

Section 5 / Appendix E

Appendix E is not yet available for review. It will be made available shortly.

Section 6 / Appendix F

Some revisions may yet be made to the methodologies for state-owned bridges.

Please feel free to contact Alessandra Jerolleman, at 504-914-6640 or ajerolleman@wittassociates.com, with any questions you might have.

235 Peachtree Street, N.E., Suite 2215 Atlanta, Georgia 30303 tel.404.963.8214 fax.404.880.1769 www.wittassociates.com

June 30, 2010 SHMT Meeting PowerPoint Presentation

State Hazard Mitigation Plan

2011 Update

Presented by GOHSEP

Agenda

- Introductions
- CFR Requirements
- Composition of the SHMT
- Duties and Responsibilities of the SHMT
- Duties and Responsibilities of the SHMPC
- Summary of Planning Process to Date
  - SHMPC Meetings
  - Workshops
- Significant Changes in the 2011 Update
  - Section 5
  - Section 6
- June 30, 2010 Draft
- Next Steps

2

LA SHMP Update

Introductions

3

Introduction

- Name, Position, Organization
- Contact Information

Please make sure to sign the sign-in sheet.

4

44 CFR Guidance

- Plan Requirement §201.4 (a)
- Documentation of the Planning Process per Requirement §201.4(c)(1):
- Coordination among Agencies §201.4 (b)
- Program Integration per Requirement §201.4(b):
- Plan Maintenance Process 201.4 (5) (i) .

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Composition of the SHMT

- Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)
- Department of Transportation and Development (DOTD)
- Department of Wildlife and Fisheries (DWF)
- Department of Environmental Quality (DEQ)
- Governor's Office of Coastal Activities (OCA)
- Department of Natural Resources (DNR)
- Department of Agriculture and Forestry (DAF)
- Office of Risk Management (ORM)
- Division of Administration, Office of Community Development, Disaster Recovery Unit (DOA-OCD-DRU)
- One OEP Director representing GOHSEP Regions 1,2,3,4,5 and 9
- One OEP Director representing GOHSEP Regions 6,7 and 8
- Police Jury Association
- Louisiana Municipal Association
- Levee District Association

6

SHMT

Duties and functions of the Team shall include, but are not limited to, the following:

- Identifying the State of Louisiana's vulnerability to hazards;
- Reviewing existing mitigation plans and prioritizing recommendations;
- Developing or updating Hazard Mitigation Plans required under 44 CFR Subpart M;
- Developing a comprehensive strategy for the development and implementation of a State Mitigation Program;
- Reviewing, assigning priority, and recommending mitigation actions for implementation, including measures to be funded under the Hazard Mitigation Grant Program or other Federal grant programs;
- Seeking funding for implementation of mitigation measures

7

SHMPC

Duties and functions of the Planning Committee shall include, but are not limited to, the following:

- Assisting the SHMT with the development of Hazard Mitigation Plans
- Otherwise assist the SHMT when called upon to do so.

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Planning Process Update

- SHMPC Meetings
  - 1/19/10 SHMPC Meeting #1 Kick off meeting
  - 2/23/10 SHMPC Meeting #2 Review work-in-progress
  - 4/27/10 SHMPC Meeting #3 Review work-in-progress
  - 6/30/10 SHMPC Meeting #4 Plan update to new SHMT members and review of initial draft sections 1-6
- Workshops
  - 4/18/10 Reviewed State Owned Facility Database and validated the assigned rankings
  - 5/5/10 Review Hazards and Risk Assessment methodologies
  - 5/25/10 Review Risk Assessment methodologies for State Owned Facilities

9

Significant Changes in the 2011 Update

- Section 5
  - Previous version (2008) only used one dataset per hazard: usually just event history
  - Multiple datasets for each hazard risk assessment
    - Variables include event history, property damage, injuries/fatalities, impacted infrastructure, vulnerable area coverage
    - Variables assessed individually, then consolidated into one composite risk assessment for each hazard
  - Broader array of data sources (HAZUS, ESRI, National Databases, scholarly research on hazards)

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Significant Changes in the 2011 Update

- Section 6
  - Revision of criticality methodology
  - Vetting of criticality designations with agencies
  - Revised methodologies
  - Broader array of data sources (HAZUS, ESRI, National Databases, scholarly research on hazards)
  - Bridge analysis

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Initial Draft

- Where is the draft located?
  - Printed copy
  - Digital copy via CD
  - Get a Game Plan – Click on Mitigation link
  - Sharepoint site
- How and where do I send comments
  - Within the document in Track Changes
  - In a memo

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Next Steps

- Draft available June 30, 2010
- July 27, 2010 SHMPC Meeting #5 - Discuss Goals, Objectives and Mitigation Actions – Section 8
- October 13, 2010 SHMPC Meeting #6- Discuss Final Draft
- January 12, 2011 SHMPC Meeting #7- Recommend Plan Adoption

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Accessing SharePoint

- Log on to the web address at: http://sharepoint.jlwitt.com/SHMPU
- The assigned user name is: **shmpuuser**
- The assigned password is: **shmpuuser**
- Instructions for use:
  - Click on Shared Documents
  - Click on the Steering Committee folder
  - Right click on documents in order to save them to your computer
- Open document(s) on your own computer and either insert comments using the track changes option or email them to Alessandra Jerolleman at ajerolleman@wittassociates.com

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LA SHMP Update

Questions?

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July 28, 2010 SHMPSC Meeting Attendees

State Hazard Mitigation Plan Update
Steering Committee Meeting

July 28, 2010, 1:00 p.m.

Governor's Office of Homeland Security and Emergency Preparedness

7667 Independence Boulevard, Classroom 1

Name	Agency	Phone Number	e-mail
Dean A. Smith	Pontchartrain Levee Police District	225-445-3433	policedeptpld@bellsouth.net
Norris J. Melancon	Pontchartrain Levee Police District	225-206-0789	nmelanconpld@bellsouth.net
Rebecca M. Broussard	Vermilion OHSEP, Region 4 Director	337-898-4308	vpoep@cox-internet.com
Carrie Robinette	GOHSEP	225-267-2558	Carrie.robineette@la.gov
Steve Pratt	GOHSEP	225-303-6550	spratt@wittassociates.com
John Gallagher	LMA	225-344-5001	jgallgher@lma.org
Tom Ed McHugh	LMA	225-344-5001	tmchugh@lma.org
Lt. Col. Mike Wilson	Department of Corrections	225-342-4399	Mwilson2@corrections.state.la.us
Keith Horn	LA Department of Environmental Quality	225-219-3503	Keith.horn@la.gov
Bill Morrison	Facility Planning and Control	225-342-0855	Bill.morrison@la.gov
Melissa Harris	ORM	225-342-8414	Melissa.harris@la.gov
Susan West	ORM	225-342-6031	Susan.west@la.gov
Brenda Cooper	GOHSEP	225-267-2523	Brenda.cooper@la.gov
Michele Deshotels	OCPR	225-342-3150	Michele.deshotels@la.gov
Jeffrey Giering	GOHSEP	225-267-2516	Jeffrey.giering@la.gov
Diane Stacy	LA Department of Agriculture and Forestry	225-935-2173	dstacy@ldaf.state.la.us
Linda Pace	LDNR/OCM	225-342-7936	Linda.pace@la.gov
Alessandra Jerolleman	JLWA	504-914-6648	ajerolleman@wittassociates.com
Matt Stanley	JLWA	912-655-4809	mstanley@staff.jlwitt.com

July 28, 2010 SHMPSC Meeting Agenda

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY
AND
EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

State Hazard Mitigation Plan Update Meeting Agenda

July 28, 2010, 10:00 a.m.

- Introductions – Brenda Cooper
- Goals and Objectives – Alessandra Jerolleman
- Next Steps – Alessandra Jerolleman

November 9, 2010 SHMT Meeting PowerPoint Presentation

State Hazard Mitigation Planning

2011 Update

Presented by GOHSEP

Agenda

- Introductions
- Edits made to August 31, 2010 draft
- Changes from the original LA State Plan
- Plan Maintenance
- Adoption Process
- Next Steps

2

LA SHMP Update

Introductions

3

Introduction

- Name, Position, Organization
- Previous Participation and/or Experience with the Hazard Mitigation Plan Update
- Contact Information

Please make sure to sign the sign-in sheet.

4

Edits to August 31, 2010 Draft

- Comments were received from:
  - LDEQ
    - Edits to LDEQ responsibilities
  - OCPR
    - Updates to Coastal Restoration section
  - DOTD
    - Updates to Dam Failure section
  - GOHSEP
    - Additional information on CEO project
- Minor grammatical and typographical revisions
- Revised future development methodology

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Changes from Original SHMP

Section 4 – Hazard Identification:

- All hazard profiles were updated to reflect additional data available
  - Statewide floodplain
  - SLOSH data available
  - US ACE levee protected areas

6

Changes from Original SHMP

Section 5 - Statewide Risk Assessment:

- New Methodology of Composite Risk
- Statewide HAZUS runs for certain hazards
- Workshop held to review methodologies

7

Changes from Original SHMP

Section 6 – Risk Assessment for State-Owned Assets:

- Revision to criticality methodology
- Workshop held to review methodologies
- All data provided to ORM

8

Changes from Original SHMP

Section 7 – Capability Assessment:

- Local, Regionall and State surveys were all updated.

9

Changes from Original SHMP

Section 8 – Mitigation Action Plan:

- All action Items have been updated to reflect current status and progress made

10

Changes from Original SHMP

Section 9 – Coordination of Local Planning:

- Incorporation of Pilot Planning Grant Program

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Plan Maintenance

- Review and analysis of progress on activities and projects
- Quarterly monitoring of mitigation projects
- Quarterly meetings of the SHMT and SHMPC to review progress
- Updates every three years
- Additional updates as needed
- Identification of additional data sources

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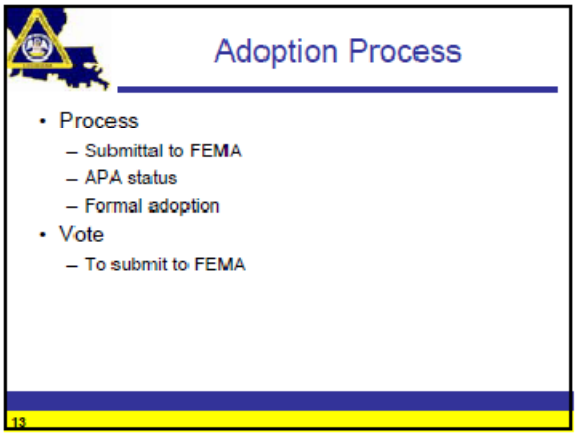
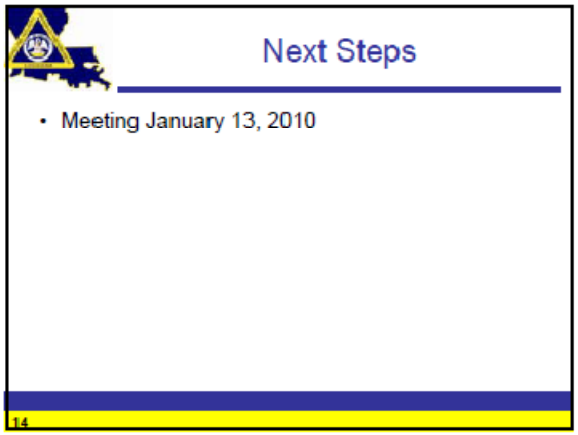

Adoption Process
• Process
– Submittal to FEMA
– APA status
– Formal adoption
• Vote
– To submit to FEMA
13


Next Steps
• Meeting January 13, 2010
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November 9, 2010 SHMT Meeting Attendees

Name	Agency	Phone Number	e-mail
Rebecca M. Broussard	Vermilion OHSEP, Region 4 Director	337-898-4308	vpoep@cox-internet.com
Keith Horn	LA Department of Environmental Quality	225-219-3503	Keith.horn@la.gov
Brenda Cooper	GOHSEP	225-267-2523	Brenda.cooper@la.gov
Jeffrey Giering	GOHSEP	225-267-2516	Jeffrey.giering@la.gov
Linda Pace	LDNR/OCM	225-342-7936	Linda.pace@la.gov
Steve Garcia	GOHSEP	225-439-5343	Steven.garcia@la.gov
Mike Wilson	Corrections Services HQ	225/342-4399	mwilson@corrections.state.la.us
Dean A. Smith	Pontchartrain Levee Police District	225-445-3433	policedeptpld@bellsouth.net
Peggy Poche'	GOHSEP	225/276-7837	peggy.poche@la.gov
Melissa Harris	ORM	225/342-8414	melissa.harris@la.gov
Kathy Ashworth	GOHSEP	337/371-1777	kathy.ashworth@prodigy.net
Richard Hollowell	DHH	225/342-3501	richard.hollowell@la.gov
Larry Sides	GOHSEP	337-255-6473	larry@sides.com
Bill Haygood	OCD	225-235-6647	William.haygood@la.gov
Tracy Hilburn	Ouachita OEP	318-322-2641	thilburn@ohsep.net
Stephen Tassin	DoTD	225-274-4185	Stephen.tassin@la.gov
Bo Bolourchi	DoTD	225-274-4170	Bo.bolourchi@la.gov
Jerry Graves	Witt Associates	504-400-3210	jgraves@wittassociates.com
Alessandra Jerolleman	Witt Associates	504-914-6648	ajerolleman@wittassociates.com

November 9, 2010 SHMT Meeting Minutes

Louisiana State Hazard Mitigation Plan Update

Louisiana State Police Building (Baton Rouge, LA)

November 9, 2010

1PM-2:15PM

Meeting #5 Minutes

Introduction (Alessandra Jerolleman, Witt)

- Agenda overview (Jerolleman)
- The purpose of today's meeting is to review changes that have been made to the August 31, 2010 draft of the Plan Update. We are aiming to submit the Plan Update to FEMA by November 15th so that they can complete their review by April 2011. (Jerolleman)
- Please review the latest draft of the Plan Update on the disc you have been provided, and submit any further comments as soon as possible. (Jerolleman)

Slideshow

- Edits to the August draft (slides)
- New information has driven this last round of edits. (Jerolleman)
- The Dam Failure section of the Plan Update should actually be titled "Dam Safety." (Bo Bolourchi, DOTD)
- We will address changes to the Dam section of the plan, including the title of the section However, "Dam Failure" is the terminology used by FEMA. (Jerolleman)
- The term "safety" does not need to be included when listing hazards in the Plan Update. (Keith Horn, DEQ)
- A dam has never failed in Louisiana. (Bolourchi)
- Failure is the hazard itself in the case of dams, and dam safety is not actually a hazard. (Jerolleman)

- The group should discuss this further. However, changing the name of the section may be difficult. Perhaps we can change the name of the section to "Dams." How will we address the Levee Failure section? (Jerolleman)
- We should keep the section titles consistent with FEMA terminology. (Various Attendees)
- FEMA should not use the "failure" terminology in certain instances. I personally object to using the terminology in this instance. (Bolourchi)
- By show of hands: Who wants to change the name of the section? (Jerolleman)
- (Attendees agree to changing the title of the Dam Failure section of the Plan Update to "Dams")
- The potential inundation areas for dams in Louisiana has been received, but we do not have enough time to utilize the methodology required to process the new data, as it previously took about fifteen (15) hours per dam to process the initial data. (Jerolleman)
- The breach analyses are now also available through my office. (Bolourchi)
- It should be noted in the Data Limitations section that GOHSEP and DOTD will update this data as soon as possible. DOTD is now in the process of digitizing its data. (Bolourchi)
- The group must continue to meet regarding the Plan Update even after adoption in order to keep the Plan current. Some of the "moving targets" in the Data Limitations section must be continually addressed. (Jerolleman)
- We obtained better levee data this time around, and we were able to produce a stronger analysis. However, there is still language in the Data Limitations section regarding the lack of information on private levees, etc. (Jerolleman)
- The editing of this latest draft has been well done, and we have only found a few mistakes. (Horn)
- The Potential Future Development section methodology was slightly revised, as the previous data was collected by a third party. However, we found some errors in their projections, so we contacted them regarding their methods. We then addressed the errors by simply narrowing how they used Census Block data to project future development. (Jerolleman)
- Did we receive information from the Corps regarding the decertification of levees? (Horn)

- There are currently a lot of levees under review, but it is unclear what will happen next with any of them. Federally, it is a challenge to determine what their policies are going to be. The levees in California actually seem to be a higher priority right now. (Jerolleman)
- Levees which serve multiple purposes are always even more difficult to address. (Jerolleman)
- PDF and Word versions of the latest draft of the Plan Update are available on Sharepoint. You will all also get hard copies of the final version once the Plan Update is officially adopted. (Jerolleman)
- Section 4: Hazard Identification (slides)
- Changes to Section 4 primarily included updates due to additional information that we obtained. We were able to use HAZUS to generate a boundary layer for the floodplain statewide. However, it is not completely accurate and should be updated as new DFIRM data becomes available. (Jerolleman)
- MOMs were previously used in the SLOSH models for the three major basins in Louisiana. The Corps has updated all basin models with the exception of the Sabine, and this deficiency is noted in the Data Limitations section. (Jerolleman)
- Section 5: Statewide Risk Assessment (slides)
- Instead of using a methodology for looking at one piece of data, we used a new methodology which addresses composite risk. Hail is an example of a hazard which required further sub-categorizing because of its disproportionate effect on rural areas. (Jerolleman)
- Section 6: Risk Assessment for State-Owned Assets (slides)
- Section 7: Capability Assessment (slides)
- Section 8: Mitigation Action Plan (slides)
- It is critical that everyone review Section 8 at a minimum. The State should be working off of this section going forward, sp please take a close look at it and review the content. (Jerolleman)
- In the past, we were given a pass for not implementing previous versions of Section 8 because of the hurricanes we experienced. If there are no major hurricanes in the future, FEMA is going to want to ensure that we took the actions outlined in this section of the Plan Update. (Horn)

- Section 9: Coordination of Local Planning (slides)
- PPGP overview (Jerolleman)
- Virtually every parish is in the process of updating their plans. (Jerolleman)
- Forty-seven (47) parishes are due for updates in 2011, and eleven (11) more are due for updates in 2012. (Brenda Cooper, GOHSEP)
- Section 10: Plan Maintenance (slides)
- If something major occurs, you are encouraged to amend the plan. Amendments can actually be made without a long, formal process, and can wait for official adoption and the Governor's signature until the time of the next Plan Update. (Jerolleman)
- Was PPGP used anywhere other than Louisiana? (Peggy Poche, GOHSEP)
- Mississippi and Alabama were given the opportunity to try PPGP, but it did not work out for either state. (Jerolleman)
- While working on a disaster, also working on BCAs for new mitigation projects can be a bit much. The advantage of PPGP is that it funds project identification and scoping. (Jerolleman)
- Adoption Process (slides)
- How much time is there? Can I have until next week to submit comments? (Linda Pace, DNR)
- Perhaps everyone can vote on a deadline for the middle of next week? We can send an email out for that. (Jerolleman)
- Next meeting date (slides)
- **Adjourn**

November 9, 2010 SHMT Meeting Agenda

State of Louisiana

GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

BOBBY JINDAL
GOVERNOR

MARK A. COOPER
DIRECTOR

State Hazard Mitigation Plan Update Meeting Agenda

November 9, 2010, 1:00pm

- Introductions – Steve Garcia
- Edits made to July 30, 2010 draft - Alessandra Jerolleman
- Changes from the original State of Louisiana Hazard Mitigation Plan – Alessandra Jerolleman
- Plan Maintenance - Alessandra Jerolleman
- Recommend 2011 SHMPU for adoption – Steve Garcia
- Next Steps – Alessandra Jerolleman

March 24, 2011 SHMT Meeting PowerPoint Presentation

State Hazard Mitigation Planning

2011 Update

Presented by GOHSEP

Agenda

- Introductions
- LA SHMP Update
- Changes Requested by FEMA
- Adoption Process
- Plan Maintenance
- Next Steps

2

LA SHMP Update

Introductions

3

Introduction

- Name, Position, Organization
- Previous Participation and/or Experience with the Hazard Mitigation Plan Update
- Contact Information

Please make sure to sign the sign-in sheet.

4

LA SHMP Update

- The Plan was originally developed to comply with the Disaster Mitigation Act of 2000 (DMA 2000), which is administered by the Federal Emergency Management Agency (FEMA)
- Per the DMA 2000, states must have a FEMA-approved hazard mitigation plan in order to maintain eligibility for federal pre- and post-disaster funding opportunities

Purpose of the Plan Update

- A State is required to update its FEMA approved State Hazard Mitigation Plan every three (3) years for continued eligibility of the following:
  - Hazard Mitigation Grant Program
  - Pre-Disaster Mitigation Grant Program
  - Flood Mitigation Assistance Program
  - Severe Repetitive Loss Program
  - Repetitive Flood Claims Programs
  - Public Assistance (beyond Parts A & B)

LA SHMP Update

- A key part of Louisiana's mitigation program is the State of Louisiana Hazard Mitigation Plan
- The Plan identifies the risks faced by Louisiana from natural hazards
- The Plan outlines a broad range of actions to reduce the risk of loss of life, injury, and property damage or disruption

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LA SHMP Update

- Per the Interim Final Rule, the Plan must be updated every three (3) years
- Louisiana's current Plan was approved by FEMA in April 2008
- The 2011 Plan Update must be completed, adopted by the State, and approved by FEMA by the end of April 2011 in order to avoid interruption of funding eligibility

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LA SHMP Update

- The 2011 Plan Update was funded by FEMA under the HMGP, and work began on the project in December 2009
- When the State Hazard Mitigation Team (SHMT) approves the final draft of the 2011 Plan Update, it will be submitted to Mark Cooper for signature and formal adoption

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LA SHMP Update

- The 2011 Plan Update has been developed through the efforts of the following members:
  - Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)
  - State Hazard Mitigation Team (SHMT)
  - State Hazard Mitigation Planning Committee (SHMPC)
  - State Hazard Mitigation Stakeholders Group
  - Federal Emergency Management Agency, Region VI
  - Consultants

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Changes Requested By FEMA

- The probability of future occurrence for a number of the hazards addressed in the Plan was further detailed
- The definition and description of the extreme cold hazard were expanded
- Language was added in order to address how Louisiana was going to address repetitive loss structures in accordance with the 44 CFR
- The following sections/appendices were slightly revised as a result of the above changes:
  - Sections 4, 7, and 8
  - Appendix D

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Adoption Process

- Process
  - Submittal to FEMA - Completed
  - APA status - Completed
  - Vote
  - Formal adoption
  - To submit to FEMA

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Approved Pending Adoption(APA)

- The comments and required revisions provided by FEMA were addressed
- LA SHMP is Approved Pending Adoption (APA)

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SHMT Approval Process

- Vote
  - All SHMT members in favor of approving the plan
  - Any SHMT member not in favor of approving the plan

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Adoption Process

- Adoption Letter

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Plan Maintenance

- Review and analysis of progress on activities and projects based on plan goals and objectives
- Quarterly monitoring of mitigation projects
- Quarterly meetings of the SHMT and SHMPC to review progress
- Updates every three years
- Additional updates as needed
- Identification of additional data sources

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2011LA SHMP Goals

1. The State of Louisiana will improve **education and outreach** efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact
2. The State of Louisiana will improve **data collection, use, and sharing** to reduce the impacts of Hazards

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2011LA SHMP Goals

3. The State of Louisiana will **improve capabilities and coordination** at the municipal, parish, regional and state level to plan and implement hazard mitigation projects
4. The State of Louisiana will continue **to pursue opportunities to reduce impacts** to the State's manmade and natural environment through mitigation of repetitive and severe repetitive loss properties and other appropriate construction projects and related activities

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Plan Maintenance

- Review and analysis of progress on activities and projects based on plan goals and objectives
- Quarterly monitoring of mitigation projects
- Quarterly meetings of the SHMT and SHMPC to review progress
- Updates every three years
- Additional updates as needed
- Identification of additional data sources

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Next Steps

- Next SHMT Meeting will be 2nd Qtr 2011. Date ???

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LA SHMP Update

Questions?

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March 24, 2011 SHMT Meeting Attendees

Name	Agency	Phone Number	e-mail
Rebecca M. Broussard	Vermilion OHSEP, Region 4 Director	337-898-4308	vpoep@cox-internet.com
Keith Horn	LA Department of Environmental Quality	225-219-3503	Keith.horn@la.gov
Brenda Cooper	GOHSEP	225-267-2523	Brenda.cooper@la.gov
Michele Deshotels	OCPR	225-342-3150	Michele.deshotels@la.gov
Jeffrey Giering	GOHSEP	225-267-2516	Jeffrey.giering@la.gov
Linda Pace	LDNR/OCM	225-342-7936	Linda.pace@la.gov
Mark Riley	GOHSEP	225-925-7345	Mark.riley@la.gov
Steve Garcia	GOHSEP	225-439-5343	Steven.garcia@la.gov
Jerry Graves	Witt Associates	504-400-3210	jgraves@wittassociates.com
Greg Fenton	Witt Associates	404-942-7750	mstanley@staff.jlwitt.com

March 24, 2011 SHMT Meeting Minutes

Louisiana State Hazard Mitigation Plan Update - Final Meeting Minutes
Louisiana State Police Building (Baton Rouge, LA)
March 24, 2011
1:30 PM-2:30 PM

Steve Garcia, GOHSEP provided the opening remarks and started the introductions.
Greg Fenton, Witt described that the purpose of today's final SHMT meeting was for the SHMT to approve the final plan and recommend that Mark Cooper, the Governor's Authorized Representative, officially adopt the 2011 LA SHMP.

Meeting Agenda (See Slides)
Project update (See Slides)
Meeting purpose (See Slides)
FEMA comments and final revisions to the plan (See Slides)
Greg Fenton, Witt provided an explanation of all of the final revisions that were made to the plan. Only minor revisions were needed and an overview that explained the changes and referenced the section and page numbers of the modifications were e-mailed to SHMT and SMPC members to help facilitate their review.

Michele Deshotels, OCPR commented that there remained a few outstanding issues with data collection which could not be addressed during this plan update due to several different circumstances. She stated that these data collection issues need to be addressed in the next update.

Greg Fenton, Witt added that these data collection issues are a normal part of the plan maintenance process.

Keith Horn, DEQ stated that if we start the process of data collection sooner next time, we could probably be more successful incorporating State data into the plan.

Michele Deshotels, OCPR commented on the data and methods used to assess the probability of future occurrence for the hazards profiled in the plan. She liked language we used to describe where the data came from and how we determined the probability on some of the hazards. She would like our format to be more consistent in the next update. She added that this is important because the plan will be well-cited and used as a reference source in future planning efforts, including those outside of government (such as NGOs and non-profits).

Mark Riley, GOHSEP added we should start a working draft of the plan immediately, and by the time we get to the next plan update we will have resolved many of the issues regarding data collection.

Adoption process (See Slides)

All SHMT members that were present voted in FAVOR of approving the 2011 and recommending that Mark Cooper officially adopt the 2011 LA SHMP.

Keith Horn, DEQ wondered how we will vote for adoption when we do not have a quorum of SHMT members present.

Mark Riley, GOHSEP stated that the SHMT is not bound by Robert's Rules of Order. However, we will give each team member the opportunity to vote on adoption. Since many of the team members are not present, we will email them a request for their vote.

Plan maintenance (See slides)

Steve Garcia, GOHSEP discussed ongoing Community Education and Outreach (CEO) program efforts.

Greg Fenton, Witt added that the CEO efforts were a good example of something that was a goal and objective in the 2008 plan and was still being worked on and is a part of the 2011 plan.

2011 Plan Update goals (See slides)

Greg Fenton, Witt discussed the importance of plan maintenance and conducting future SHMT meetings.

Next steps (See slides)

The SHMT members in attendance recommended that the next SHMT/SHMPC meeting to discuss plan maintenance items will be in Mid May. GOHSEP will be responsible for sending out the meeting invite and developing the agenda.

Mark Riley, GOHSEP recommended that the SHMT make an effort to make a connection between the funding that has been received in Louisiana and the accomplishments that have been made in terms of mitigation. We have received an estimated $1.8 billion in funding and have made a great deal of progress with those funds, but we have not clearly demonstrated our accomplishments.

Michele Deshotels, OCPR added that Mark's recommendation has been proposed in the past, but it is a major undertaking. There are serious challenges in terms of collecting and synthesizing the data needed to show the progress we have made. Unfortunately, people are under the impression that we have not done much to protect ourselves from future events. But the truth is that we have done quite a lot.

Greg Fenton, Witt stated that the planning team spent an enormous amount of time trying to sort through data just for the purposes of this plan update. In many cases, much of the data was in an unusable format and had to be "cleaned up" a great deal. He recommended that data collection (Goal 2) be a discussion item during the plan maintenance period. He also recommended that the State should consider taking the Mitigation Actions (Section 8) and creating a separate, brochure-style document that is smaller and more manageable. This document could be used by the SHMT as a guide at future meetings.

Final Remarks

Greg Fenton, Witt congratulated and thanked to the group for participating in the planning process and helping produce a complete plan.

Steve Garcia stated that an e-mail would be sent to the rest of the SHMT requesting that they approve (or not approve) the plan. Once the SHMT has voted to approve the plan, then he would provide Mark Cooper with the adoption letter to sign. Once signed, the adoption letter would be sent to FEMA.

Michele Deshotels, OCPR recommended that we put an announcement on the website that the plan is complete, but that it was only a three-year update and will be updated again soon.

Steve Garcia, GOHSEP thanked everyone for their participation in the planning process and adjourned the meeting.

Appendix C.3
GOHSEP Website Postings

This appendix contains printouts posted at www.ohsep.louisiana.gov regarding the State of Louisiana Hazard Mitigation Plan Update.

Appendix C.4
Correspondence

This appendix contains copies of letters used to solicit participation in the Plan Update process including correspondence to:

Potential members of the State Hazard Mitigation Planning Committee

Potential members of the State Hazard Mitigation Planning Advisory Board

GOHSEP Letter Inviting Participation

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY
AND
EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

December 17, 2009

GOHSEP-AFO-BR

SUBJECT: State of Louisiana Hazard Mitigation Plan Update
Parish Participation

Dear

The State of Louisiana is updating its current version of the hazard mitigation plan and your participation in this effort is an integral component to the success of this project. Information from your parish, particularly as it relates to the assessment of hazards that adversely affect your area, will be considered during the State Plan Update.

Someone from my office will be contacting you regarding your participation as well as information that will be needed. Additionally, we ask that you take a look at the April 2008 version of the State of Louisiana Hazard Mitigation Plan to possibly provide comments or to note any concerns you may have regarding the information provided in the plan. A copy of the plan will be available on SharePoint at http://sharepoint.jlwitt.com/SHMPU, which may be accessed by using the following information: username - **SHMPUusers** password - **jlwashmp345**.

We look forward to working with you on this project; and, thank you for your continued commitment and cooperation to the mitigation planning process. If you should have any questions or comments regarding the contents of this letter, please contact Alessandra Jerolleman at 504.914.6648 or at AJerolleman@globaloptions.com.

Sincerely,

D. Casey Levy
State Hazard Mitigation Officer

DCL: smh

7667 INDEPENDENCE BOULEVARD BATON ROUGE, LA 70806
TELEPHONE (225) 925-7500 FAX (225) 925-7501

GOHSEP Letter Requesting Participant Identification

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY
AND
EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

January 13, 2010

GOHSEP-AFO-BR

SUBJECT: State of Louisiana Hazard Mitigation Plan Update - Stakeholder Participation

Dear

The State of Louisiana has been approved to update its current version of the hazard mitigation plan. As a stakeholder, your participation in this effort is an integral component of the update process. Please let us know if you or your assigned representative are willing to participate by contacting Alessandra Jerolleman at 504.914.6648 or at AJerolleman@globaloptions.com.

Many positive policy changes, partnerships, and success stories have occurred after the most recent hurricanes and we want to ensure that we capture these events. We ask that you take a look at the April 2008 version of the State of Louisiana Hazard Mitigation Plan to provide comments or to note any concerns. You may access it at the following link: www.getagamplan.org/planmitigate.htm

The State of Louisiana Hazard Mitigation Plan is vitally important to the continued success of the State's Hazard Mitigation and Public Assistance programs. Again, your input and participation in this process is extremely important.

We look forward to working with you on this project; and, thank you for your commitment to the State of Louisiana. If you should have any questions or comments regarding the contents of this letter, please contact Alessandra Jerolleman at 504.914.6648 or at AJerolleman@globaloptions.com.

Sincerely,

D. Casey Levy
State Hazard Mitigation Officer

DCL: smh

7667 INDEPENDENCE BOULEVARD BATON ROUGE, LA 70806
TELEPHONE (225) 925-7500 FAX (225) 925-7501

Participant Identification Correspondence Response Tracker

Organization	Last Name	First Name	Date Correspondence Sent	Organization Response	Comments
Louisiana Housing Finance Authority (LHFA)	Minor	Charlotte	1/15/2010	Yes- 1/15/10	
La Geographic Information Center (LAGIC)	Pennington	Chris	1/15/2010		
Center for GeoInformatics	Kent	Joshua	1/15/2010	Maybe- 1/23/10 May participate based on time- 1/27/10	
CLEAR/CERA LSU Hurricane Center (Coastal Louisiana Ecosystem Assessment and Restoration/)	Suhayda	Joseph	1/15/2010		
LSU Sea Grant	Wilkins	Jim	1/15/2010		
SLFPA-East (Southeast Louisiana Flood Protection Authority)	Boudreaux	Glenda	1/15/2010		
SLFPA-West (Southeast Louisiana Flood Protection Authority)	Spohrer	Gerald	1/15/2010		
Southern University	Wells	Mary	1/15/2010		
Tulane Law/IWR (Institute for Water Resources)	Davis	Mark	1/15/2010	Yes- 1/15/10	
USACE Non Structural (US Army Corps of Engineers)	Buss	Larry	1/15/2010		
NIMSAT- National Incident Management Systems & Advanced Technology	Kolluru	Ramesh	1/15/2010	Yes- 1/18/2010	Three other participants were added.
LAGIC	Johnson	Craig		Yes	
CRT- Department of Culture, Recreation, and Tourism	Kaspar	Eric	1/22/2010		
LAPDD- Louisiana Association of Planning and Development Districts	Smoak-Urena	Heather	1/22/2010	Yes- 1/25/10	
Amite River Basin Drainage & Water Conservation	Guitrau	Toni	4/7/2010		
Atchafalaya Basin Levee District		Christy	4/7/2010		
Bossier Levee District	Long	Mark	4/7/2010	Responded- 4/7/10	Yes, will participate
Caddo Levee District	Bell	Gaylyn	4/7/2010		
City of Baton Rouge, Parish of EBR, Department of Public Works	Ferguson	Jim	4/7/2010	Responded 4/6/10- Maybe	Will get back with us.
Fifth Louisiana Levee District	Trichell	Jason	4/7/2010		
Governor's Office of Coastal Activities	Kinchen	Enger	4/7/2010		

Organization	Last Name	First Name	Date Correspondence Sent	Organization Response	Comments
Grand Isle Independent Levee District	Bellanger	Pat	4/7/2010		
Lafitte Area Independent Levee District	Christen	Krystal	4/7/2010		
Lafitte Area Independent Levee District	Crain	Yvette	4/7/2010		
Lafourche Basin Levee District	Trosclair	Randy	4/7/2010		
Louisiana Department of Transportation and Development	Thomas	Amber	4/7/2010		
Natchitoches Levee and Drainage District	Corkern	Ronald	4/7/2010		
Nineteenth Louisiana Levee District	Hyde	Emma	4/7/2010		
North Lafourche Conservation, Levee, and Drainage District	Bourgeois	Dwayne	4/7/2010		
Plaquemines Parish Government	Hahn	PJ	4/7/2010		
Pontchartrain Levee District	Salins	Monica	4/7/2010		
Red River, Atchafalaya, and Bayou Boeuf Levee District	Lafleur	Debbie	4/7/2010		
Red River Levee and Drainage District	Forrest	Milton	4/7/2010		
Southeast Louisiana Flood Protection Authority- East	Johnson	Pat	4/7/2010		
Southeast Louisiana Flood Protection Authority- East	Heaton	Wilma	4/7/2010		
Southeast Louisiana Flood Protection Authority- West	Spohrer	Gerald	4/7/2010		
South Lafourche Levee District	Punch	Mary	4/7/2010		
St. Mary Levee District	Siracusa	Catherine	4/7/2010		
Teche-Vermilion Fresh Water District	Sagrera	Donald	4/7/2010		
Tensas Basin Levee District	Stringer	John	4/7/2010		
Terrebonne Levee and Conservation District	Rains	Angela	4/7/2010		
AARP	Sibille	Bob	4/7/2010	Responded- 4/13/10	Yes, will participate
Regional Planning Commission	Laborde	Chris	4/7/2010		

GOHSEP Sample Invitation Letter #1 for SHMPC Meeting #1

Date

GOHSEP-AFO-BR

Insert name
Title (if applicable)
Insert address]
Insert city, state xxxxx

SUBJECT: State of Louisiana Hazard Mitigation Plan Update
Steering Committee Invitation

Dear insert name:

It is that time again! We are happy to inform you that the State of Louisiana has been approved to update its current version of the hazard mitigation plan. As a member of the Steering Committee your participation in this effort is an integral component of the update process. A Kick-Off Meeting will be held at time on January 19, 2009 at location.

As with the previous State Plan Update, this meeting will serve to kick-off the first steps in the update process by discussing the planning process, hazards to be considered, and steps that should be taken to move forward. Many positive policy changes, partnerships, and success stories have occurred after the most recent hurricanes and we want to ensure that we capture these events. We ask that you take a look at the April 2008 version of the State of Louisiana Hazard Mitigation Plan to possibly provide comments or to note any concerns you may have regarding the information in the plan. The plan may be accessed on SharePoint. Please review the attachment for further instructions.

We look forward to working with you on this project; and, thank you for your continued commitment to the State of Louisiana. If you should have any questions or comments regarding the contents of this letter, please contact Alessandra Jerolleman at 504.914.6648 or at AJerolleman@globaloptions.com.

Sincerely,

D. Casey Levy
State Hazard Mitigation Officer

DCL: smh

Enclosure: SharePoint Memo

GOHSEP Letter Announcing Capability Assessment Survey

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

January 28, 2010

GOHSEP-AFO-BR

SUBJECT: State of Louisiana Hazard Mitigation Plan Update
Capability Assessment

Dear

The State of Louisiana has been approved to update its current version of the hazard mitigation plan. Your participation in this effort is an integral component of the update process and we are in need of your help.

The State of Louisiana Hazard Mitigation Plan is vitally important to the continued success of the State's Hazard Mitigation and Public Assistance programs. The information you provide enhances the State's ability to plan for and implement potential hazard mitigation projects.
Again, your input and participation in this process is extremely important.

Many positive policy changes, partnerships, and success stories have occurred after the most recent hurricanes and we want to ensure that we capture these events. A key component to capturing this information is to assess the State of Louisiana's capabilities for implementation of hazard mitigation. As a result we would like your help with assessing your department's current plans, policies, and programs.

We ask that you take a look at a short survey which may be accessed at the Survey Monkey website by using the following link:

http://www.surveymonkey.com/s/YB6ZH9B

If you are unable to access the link, the following modes of filling out the survey are also available:

- If you should prefer to fill out the survey by hand, a copy is attached which can be completed and mailed to:

Page 2
January 28, 2010

Alessandra Jerolleman
c/o Steve Garcia
415 N. 15th Street
4th Floor Mitigation
Baton Rouge, LA 70802

- If you should prefer to fill out the survey on your computer, you can simply download the attached copy, fill it out and return it via email to ajerolleman@globaloptions.com
- If conducting the survey over the phone, please send an email or call the number below to set a time.

Please provide your response on or before ***February 22, 2010***.

We look forward to receiving your information, and thank you for your commitment to the State of Louisiana. If you should have any questions or comments regarding the contents of this letter, please contact Alessandra Jerolleman at 504.914.6648 or at AJerolleman@globaloptions.com.

Sincerely,

Steve Garcia
Group Lead

DCL: smh

7667 INDEPENDENCE BOULEVARD BATON ROUGE, LA 70806
TELEPHONE (225) 925-7500 FAX (225) 925-7501

2

Capability Assessment Survey Correspondence Response Tracker

Organization	Name	Title	Date Correspondence Sent	Organization Response	Comments
Department of Agriculture & Forestry	Mike Strain	Commissioner	1/28/2010	Yes- 1/28/10	John Walther will be completing the survey
Department of Civil Service	Shannon Templet	Director	1/28/2010	Completed 2/8/10	
Department of Corrections	James M. LeBlanc	Secretary	1/28/2010		
Department of Economic Development	Stephen Moret	Secretary	1/28/2010	Completed 2/8/10	
Department of Education	Paul G. Pastorek	Superintendent	1/28/2010		
Department of Environmental Quality	Peggy Hatch	Secretary	1/28/2010	Completed 3/4/2010	Sent from Keith Horn- DEQ
Department of Health and Hospitals	Alan Levine	Secretary	1/28/2010	Completed 2/22/10	Richard Hollowell responded and stated the survey was just completed and we should be getting it shortly.
Department of Labor	John Warner Smith Tim Barfield	Secretary	Letter Not Sent- can't find contact information		
Department of Natural Resources	Scott Angelle	Secretary	1/28/2010	Yes- 1/22/10	Should be completed by 2/26/10. Marjorie A. McClinton is the contact: 225-342-1649 marjorie.mcclinton@la.gov
Department of Public Safety	Jill Boudreaux	Undersecretary	1/28/2010	Yes- 1/28/10	Danielle LeBouef called Alessandra to find out who filled out the information before. Alessandra sent her the DPS data from the 2008 version of the HM Plan.
Department of Revenue	Cynthia Bridges	Secretary	1/28/2010		
Department of Social Services	Kristy Nichols	Secretary	1/28/2010	Yes- 2/22/10	Should be completed by 3/5/10
Department of Transportation & Development	William Ankner	Secretary	1/28/2010		
Department of Wildlife & Fisheries	Robert Barham	Secretary	1/28/2010		
Department of Insurance	James Donelon	Commissioner	2/17/2010		
Department of Culture, Recreation, & Tourism	Pam Breaux	Secretary	2/17/2010		
Division of Administration	Angele Davis (DOA)	Commissioner	2/17/2010	Responded 2/22/10	Staff are working on the survey in attempt to get the information by 2/22/10; however, it may be tomorrow before it is completed 2/23/10.

GOHSEP Sample Invitation Letter #1 for SHMPC Meeting #2

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY
AND
EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

Date

GOHSEP-AFO-BR

Insert name
Title (if applicable)
Insert address]
Insert city, state xxxxx

SUBJECT: State of Louisiana Hazard Mitigation Plan Update
Steering Committee Confirmation

Dear insert name:

Thank you for your recent participation in the State Plan Kick-off meeting held on January 19, 2010. As mentioned in the previous correspondence, as a member of the Steering Committee your participation is extremely important to the update process.

Per the recent kick-off meeting, the first action item was decided. There should be a vote on the membership of the State Hazard Mitigation Planning Committee. In order to accomplish this, you may cast your vote via email. The responsible party for this effort is Alessandra Jerolleman and her email address is provided below. As this is the first action item, we would like to have the State Hazard Mitigation Planning Committee confirmed as soon as possible. Please cast your vote prior to the next meeting, which will be held on February 23, 2010.

Again thank you for your participation and your continued commitment to the State of Louisiana. If you should have any questions, concerns, or comments regarding the contents of this letter, please contact Alessandra Jerolleman at 504.914.6648 or at AJerolleman@globaloptions.com.

Sincerely,

D. Casey Levy
State Hazard Mitigation Officer

DCL: smh

7667 INDEPENDENCE BOULEVARD BATON ROUGE, LA 70806
TELEPHONE (225) 925-7500 FAX (225) 925-7501

GOHSEP Sample Invitation Letter #2 for SHMPC Meeting #2

State of Louisiana
GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

BOBBY JINDAL
GOVERNOR

MARK A. COOPER
DIRECTOR

February 18, 2010

GOHSEP-AFO-BR

SUBJECT: State of Louisiana Hazard Mitigation Plan Update
State Hazard Mitigation Planning Committee Meeting #2 Invitation

Dear

As a member of the State Hazard Mitigation Planning Committee (SHMPC) your continued participation in this effort is an integral component of the update process. A second meeting will be held at 10 am on February 23, 2010 in Classroom 1 at the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) Main Office located at 7667 Independence Boulevard in Baton Rouge.

This meeting will focus on a review of the updated Hazard Profiles, as well as a presentation by the ***National Incident Management Systems and Advanced Technologies (NIMSAT) Institute, University of Louisiana at Lafayette*** regarding a portion of the Risk Assessment.

We will be providing a draft copy of Section 4 and Appendix D for your review prior to the meeting. We also ask that you continue to access SharePoint for current updates. Please review the attachment for further instructions.

We look forward to continue working with you on this project; and, thank you for your continued commitment to the State of Louisiana. If you should have any questions or comments regarding the contents of this letter, please contact Alessandra Jerolleman at 504-914-6648 or at AJerolleman@wittassociates.com.

Sincerely,

D. Casey Levy
State Hazard Mitigation Officer
Disaster Recovery Division

DCL: daq

enclosure: SharePoint Memo

SHMPC Meeting #2 Invitation Correspondence Response Tracker

Organization	Last Name	First Name	Correspondence Sent	Date Correspondence Sent	Organization Response	Comments
Department of Agriculture and Forestry (DAF)	Walters	John	Invitation for Second Meeting	1/8/2006		Attended
Department of Environmental Quality (DEQ)	Horn	Keith	Invitation for Second Meeting	1/8/2006	Plans to attend- 2/10/10	Attended
Department of Natural Resources (DNR/OCRM)	Pace	Linda	Invitation for Second Meeting	1/8/2006		Attended
Department of Transportation & Development	O'Neal	Cindy	Invitation for Second Meeting	1/8/2006		Attended
Department of Wildlife and Fisheries	Carter	James	Invitation for Second Meeting	1/8/2006		
GOHSEP	Garcia	Steve	Invitation for Second Meeting	1/8/2006		Attended
DOA/OFP	Davis	John	Invitation for Second Meeting	1/8/2006		
DOA/OFP	Morrison	Bill	Invitation for Second Meeting	1/8/2006		Attended
DOC	Sivula	Eric	Invitation for Second Meeting	1/8/2006		
Department of Transportation & Development	Feazel	Bill	Invitation for Second Meeting	1/8/2006		
DHH	Hollowell	Richard	Invitation for Second Meeting	1/8/2006		Attended
DPS/LSUCCC	Noel	Randy	Invitation for Second Meeting	1/8/2006		
DPS/LSUCCC	Jobe	Denise	Invitation for Second Meeting	1/8/2006		
LRA	Keegan	Robin	Invitation for Second Meeting	1/8/2006	Responded 2/23/10	Will not be able to attend- phone call
OCPR	Buras	Honora	Invitation for Second Meeting	1/8/2006		Replaced by Michelle Deshotels
OCPR	Deshotels	Michelle	Invitation for Second Meeting	1/17/2006	Yes- will attend- 2/18/10	Attended
GOHSEP	Poche	Peggy	Invitation for Second Meeting	1/8/2006	Yes will attend- 2/9/10	Attended
GOHSEP	Monier	Jerry	Invitation for Second Meeting	1/8/2006		Attended
ORM	West	Susan	Invitation for Second Meeting	2/21/2006		Dodi Langlois Attended for ORM
ORM	Harris	Melissa	Invitation for Second Meeting	2/21/2006		Dodi Langlois Attended for ORM

GOHSEP Sample Letter Requesting Levee Data and Information

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

March 12, 2010

GOHSEP-AFO-BR

SUBJECT: Obtaining Newest Levee Data and Inspection/Certification Status

Dear

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) is updating the State Hazard Mitigation Plan (SHMP). In the process, GOHSEP is gathering information across the state regarding various hazards and associated vulnerabilities. The SHMP is a valuable tool that the State Hazard Mitigation Team uses to aid in establishing goals and priorities for mitigation actions, before and after disasters.

Levee failure is one of the hazards identified in the SHMP. As such, GOHSEP is seeking available details from the Army Corps of Engineers regarding the locations and the various inundation analyses of the levee systems within Louisiana through the National Levee Database. Specifically, we are looking for this information in regards to the levees around Louisiana that the Army Corps has certified, decertified, or are currently evaluating. GOHSEP's interest in obtaining this data is for the purpose of understanding which State-owned critical facilities may be vulnerable to levee failure.

Although the SHMP will be a public document, GOHSEP will block public access to information regarding the locations and impact zones of these decertified levees. However, State and local government leaders, who are tasked with administering hazard mitigation programs and initiatives, will have access to the requested data. As such, GOHSEP is willing to provide your office with a copy of the SHMP Update, both the public access and the confidential versions, for your review and commentary.

Page 2
March 12, 2010

Alessandra Jerolleman, the State Contracted Project Manager hired to update the State Hazard Mitigation Plan, will be contacting you in the near future in an attempt to obtain this information. Should you have a question regarding this request, please do not hesitate to contact me at (225) 267-2644.

Sincerely,

D. Casey Levy,
State Hazard Mitigation Officer
Disaster Recovery Division

GOHSEP Sample Letter Requesting Spillway Data and Information

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

March 22, 2010

GOHSEP-AFO-BR

SUBJECT: Obtaining Inundation Area Data for Major Spillways in Louisiana

Dear

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) is updating the State Hazard Mitigation Plan (SHMP). In the process, GOHSEP is gathering information across the state regarding the various hazards and associated vulnerabilities. The SHMP is a valuable tool that the State Hazard Mitigation Team uses to aid in establishing goals and priorities for mitigation actions, before and after disasters.

I understand that your office has information regarding inundation areas for major spillways. At times of high water, when spillways are used frequently, flooding can occur downstream and critical state facilities could be impacted.

GOHSEP seeks from your office, available details on the inundation areas of the major spillways in Louisiana. Alessandra Jerolleman, the contracted Project Manager assigned to the plan update, will be calling you to obtain this information. Please provide this data so we can include it in the SHMP Update. Should you have a question regarding this request, please contact Alessandra at (504) 914-6648. Thank you for your assistance on this important matter.

Sincerely,

D. Casey Levy,
State Hazard Mitigation Officer
Disaster Recovery Division

Witt Stakeholder Letter Announcing Appendix D Availability for Review

Act with confidence.

JAMES LEE WITT ASSOCIATES
Part of GlobalOptions Group

To: State of Louisiana Hazard Mitigation Plan Update Stakeholders
Re: Drafts of section 4 and Appendix D now available online for comments
Date: March 24, 2010

The draft of Section 4 and Appendix D of the State of Louisiana Hazard Mitigation Plan Update are now available for your review on the website http://www.getagameplan.org/mitigateplanupdate.htm. As a community stakeholder, your knowledge of the parish and municipality is critical to this process, and we hope that you will submit your thoughts on these drafts.

Please note that this is a work in progress. You will see editing marks within the document that is downloaded. Also, please keep in mind that the use of documents with tracked changes may cause some distortion of the intended document format. Notes have been made throughout the document to mark items that have been updated, or are in the process of being updated. It will be useful to the planning team if you are able to note the page numbers and/or line numbers of text which you are providing comments or questions about.

A form is available on the website for your comments. Please ensure that you include your name and contact information in the form. You are requested to please review the posted drafts and submit any comments or questions no later than April 1, 2010.

235 Peachtree Street, N.E., Suite 2215 Atlanta, Georgia 30303 tel.404.963.8214 fax.404.880.1769 www.wittassociates.com

Plan Review Correspondence Tracker

Organization	Name	Correspondence Sent	Date Correspondence Sent	Organization Response	Comments
GOHSEP Region 1 Coordinator	Darryl Delatte	Request to review drafts appendix D and Section 4	3/24/2010		
GOHSEP Region 4 Coordinator	Darren Guidry	Request to review drafts appendix D and Section 5	3/24/2010		
GOHSEP Region 7 Coordinator	Lisa Carmack	Request to review drafts appendix D and Section 6	3/24/2010		
Natural Hazard Mitigation Association	Jane Rovins	Request to review drafts appendix D and Section 7	3/24/2010		
Louisiana Floodplain Managers Association	Pam Mattingly	Request to review drafts appendix D and Section 8	3/24/2010		
American Red Cross	Rose Hill	Request to review drafts appendix D and Section 9	3/24/2010	3/31/2006	Responded and had no comments
LSU Agricultural Center	Patricia Skinner	Request to review drafts appendix D and Section 10	3/24/2010		
Stephenson Disaster Management Institute	Thomas Anderson	Request to review drafts appendix D and Section 11	3/24/2010		
Stephenson Disaster Management Institute	Jennifer Butler	Request to review drafts appendix D and Section 12	3/24/2010		
USDA/NRCS (United States Department of Agriculture/Natural Resource Conservation Service)	Paul Britt	Request to review drafts appendix D and Section 13	3/24/2010		
UNO/CHART (University of New Orleans/Center Hazard Assessment Response and Technology	Monica Farris	Request to review drafts appendix D and Section 14	3/24/2010		
APA, LA Chapter (American Planning Association)	Lynn Maloney-Mujica	Request to review drafts appendix D and Section 15	3/24/2010		
ASLA (American Society of Landscape Architects	Dana Brown	Request to review drafts appendix D and Section 16	3/24/2010	Responded-4/1/2010	Comments for changes / edits
Center for Planning Excellence	Elizabeth "Boo" Thomas	Request to review drafts appendix D and Section 17	3/24/2010		
Louisiana Housing Finance Authority (LHFA)	Charlotte Minor	Request to review drafts appendix D and Section 18	3/24/2010		
Center for GeoInformatics	Joshua Kent	Request to review drafts appendix D and Section 19	3/24/2010		
Tulane Law/IWR (Institute for Water Resources)	Mark Davis	Request to review drafts appendix D and Section 20	3/24/2010		

Organization	Name	Correspondence Sent	Date Correspondence Sent	Organization Response	Comments
NIMSAT- National Incident Management Systems & Advanced Technology	Ramesh Kolluru	Request to review drafts appendix D and Section 21	3/24/2010		
NIMSAT- National Incident Management Systems & Advanced Technology	Faju Gottumukkala	Request to review drafts appendix D and Section 22	3/24/2010		
NIMSAT- National Incident Management Systems & Advanced Technology	Mickie Valente	Request to review drafts appendix D and Section 23	3/24/2010		
NIMSAT- National Incident Management Systems & Advanced Technology	Shannon Strother	Request to review drafts appendix D and Section 24	3/24/2010		
LAPDD- Louisiana Association of Planning and Development Districts	Heather Smoak-Urena	Request to review drafts appendix D and Section 25	3/24/2010		
CFM	Margaret Broussard	Request to review drafts appendix D and Section 26	3/24/2010		
CFM	Carol Blanchard	Request to review drafts appendix D and Section 27	3/24/2010		
CFM	Donna O'Dell	Request to review drafts appendix D and Section 28	3/24/2010		
CFM	Cindy Mallett	Request to review drafts appendix D and Section 29	3/24/2010		
CFM	Carl Kraemer	Request to review drafts appendix D and Section 30	3/24/2010		
CFM	Jody Chenier	Request to review drafts appendix D and Section 31	3/24/2010		
CFM	Kathi Cowen	Request to review drafts appendix D and Section 32	3/24/2010		
CFM	Bobbie Bourgeois	Request to review drafts appendix D and Section 33	3/24/2010		
CFM	Tommy Clark	Request to review drafts appendix D and Section 34	3/24/2010		
CFM	Tina Horn	Request to review drafts appendix D and Section 35	3/24/2010		
AARP	Bob Sibille	Request to review drafts appendix D and Section 36	4/14/2010		

GOHSEP Sample Invitation Letter for SHMPC Meeting #3

State of Louisiana
GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

BOBBY JINDAL
GOVERNOR

MARK A. COOPER
DIRECTOR

April 15, 2010

GOHSEP-AFO-BR

SUBJECT: State of Louisiana Hazard Mitigation Plan Update
State Hazard Mitigation Planning Committee Meeting #3 Invitation

Dear

As a member of the State Hazard Mitigation Planning Committee (SHMPC) your continued participation in this effort is an integral component of the update process. A third meeting will be held at 10 am on April 27, 2010 in Classroom 1 at the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) Main Office located at 7667 Independence Boulevard in Baton Rouge.

This meeting will focus on the Sections 5 and 6 of the State Hazard Mitigation Plan. Both sections focus on risk assessment; Section 5 pertains to a Statewide Risk Assessment; Section 6 pertains to State-Owned Facilities Risk Assessment.

We look forward to continue working with you on this project; and, thank you for your continued commitment to the State of Louisiana. If you should have any questions or comments regarding the contents of this letter, please contact Alessandra Jerolleman at 504-914-6648 or at AJerolleman@wittassociates.com.

Sincerely,

D. Casey Levy
State Hazard Mitigation Officer
Disaster Recovery Division

DCL: daq

enclosure: SharePoint Memo

SHMPC Meeting #3 Invitation Correspondence Response Tracker

Organization	Last Name	First Name	Correspondence Sent	Date Correspondence Sent	Organization Response	Comments
DAF	Walters	John	Meeting #3 Invite	4/15/2010		
DEQ	Horn	Keith	Meeting #3 Invite	4/15/2010	Responded 4/15/10	Yes, will attend
DNR/OCRM	Pace	Linda	Meeting #3 Invite	4/15/2010		
DOTD	O'Neal	Cindy	Meeting #3 Invite	4/15/2010		
DWF	Carter	James	Meeting #3 Invite	4/15/2010		
GOHSEP	Garcia	Steve	Meeting #3 Invite	4/15/2010		
DOA/OFP	Davis	John	Meeting #3 Invite	4/15/2010		
DOA/OFP	Morrison	Bill	Meeting #3 Invite	4/15/2010		
DOC	Sivula	Eric	Meeting #3 Invite	4/15/2010		
DOTD	Feazel	Bill	Meeting #3 Invite	4/15/2010		
DOTD	Bolourchi	Bo	Meeting #3 Invite	4/15/2010		
DHH	Hollowell	Richard	Meeting #3 Invite	4/15/2010		
DPS/LSUCCC	Noel	Randy	Meeting #3 Invite	4/15/2010		
DPS/LSUCCC	Jobe	Denise	Meeting #3 Invite	4/15/2010		
LRA	Keegan	Robin	Meeting #3 Invite	4/15/2010		
OCPR	Deshotels	Michele	Meeting #3 Invite	4/15/2010		
ORM	West	Susan	Meeting #3 Invite	4/15/2010		
ORM	Harris	Melissa	Meeting #3 Invite	4/15/2010		
GOHSEP	Monier	Jerry	Meeting #3 Invite	4/15/2010	Responded 4/15/10	Will not be able to attend due to GOHSEP Terrorism meeting
GOHSEP	Poche	Peggy	Meeting #3 Invite	4/15/2010	Responded 4/15/10	Yes, will attend

GOHSEP Invitation to LDOTD Participate

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY
AND
EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

May 17, 2010

Re: State of Louisiana Hazard Mitigation Plan Update
State Hazard Mitigation Planning Team Representative

Dear

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) would like to invite the Department of Transportation and Development to participate as a member of the State Hazard Mitigation Team (SHMT) during the 2010 State of Louisiana Hazard Mitigation Plan Update. Part of the mission of the SHMT is to oversee plan development and provide guidance necessary to ensure the State of Louisiana's Mitigation Measures are adequate to preserve lives and property during emergencies and disasters.

Federal regulations require that the State Hazard Mitigation Plan be updated and resubmitted to FEMA for approval every three years. GOHSEP has begun the plan update process and it is important that the Department of Transportation and Development is represented on the SHMT. We are requesting that your agency appoint a representative to attend Hazard Mitigation Plan update meetings and future SHMT meetings. This decision further enhances our efforts in creating an all inclusive participatory process that will lead to an approved State Hazard Mitigation Plan.

We look forward to working with the Department of Transportation and Development and your representative on this project. Please provide your appointment information to Steve Garcia at (225) 267-2644 or steven.garcia@la.gov. Thank you for your continued commitment to the State of Louisiana.

Sincerely,

Mark Cooper
GOHSEP Director

GOHSEP Invitation to Vermilion Parish to Participate

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY
AND
EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

May 28, 2010

Re: State of Louisiana Hazard Mitigation Plan Update
State Hazard Mitigation Planning Team Representative

Dear

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) would like to invite you to participate as a member of the State Hazard Mitigation Team (SHMT) during the 2010 State of Louisiana Hazard Mitigation Plan Update. Part of the mission of the SHMT is to oversee plan development and provide guidance necessary to ensure the State of Louisiana's Mitigation Measures are adequate to preserve lives and property during emergencies and disasters.

Federal regulations require that the State Hazard Mitigation Plan be updated and resubmitted to FEMA for approval every three years. GOHSEP has begun the plan update process and we felt it important to include Parish representation on the SHMT. We are requesting that your office appoint a representative to attend Hazard Mitigation Plan update meetings and future SHMT meetings. Your participation will enhance our efforts to create an all inclusive participatory process that will lead to an improved State Hazard Mitigation Plan.

We look forward to working with you on this project. Our point of contact for the SHMT is Steve Garcia and he can be reached at (225) 267-2644 or steven.garcia@la.gov. Thank you for your continued commitment to the State of Louisiana.

Sincerely,

Mark Cooper
GOHSEP Director

GOHSEP Invitation to Ouachita Parish to Participate

State of Louisiana

BOBBY JINDAL
GOVERNOR

GOVERNOR'S OFFICE OF HOMELAND SECURITY
AND
EMERGENCY PREPAREDNESS

MARK A. COOPER
DIRECTOR

May 28, 2010

Re: State of Louisiana Hazard Mitigation Plan Update
State Hazard Mitigation Planning Team Representative

Dear

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) would like to invite you to participate as a member of the State Hazard Mitigation Team (SHMT) during the 2010 State of Louisiana Hazard Mitigation Plan Update. Part of the mission of the SHMT is to oversee plan development and provide guidance necessary to ensure the State of Louisiana's Mitigation Measures are adequate to preserve lives and property during emergencies and disasters.

Federal regulations require that the State Hazard Mitigation Plan be updated and resubmitted to FEMA for approval every three years. GOHSEP has begun the plan update process and we felt it important to include Parish representation on the SHMT. We are requesting that your office appoint a representative to attend Hazard Mitigation Plan update meetings and future SHMT meetings. This decision further enhances our efforts to create an all inclusive participatory process that will lead to an improved State Hazard Mitigation Plan.

We look forward to working with you on this project. Our point of contact for the SHMT is Steve Garcia and he can be reached at (225) 267-2644 or steven.garcia@la.gov. Thank you for your continued commitment to the State of Louisiana.

Sincerely,

Mark Cooper
GOHSEP Director

GOHSEP Invitation to SHMT Meeting to Review Plan Draft

State of Louisiana

GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

BOBBY JINDAL
GOVERNOR

MARK A. COOPER
DIRECTOR

July 13, 2010

GOHSEP-AFO-BR

SUBJECT: State of Louisiana Hazard Mitigation Plan Update
Discussion of State of Louisiana Hazard Mitigation Plan Update goals and objective.

Dear

As a member of the State Hazard Mitigation Team (SHMT), your continuing participation in this effort is an integral component of the update process. A short meeting will be held from 1:00 p.m. to 3:00 p.m. on Monday July 26, 2010 in Classroom "A", Louisiana State Police (LSP) Headquarters, 7919 Independence Blvd in Baton Rouge.

This meeting will focus on goals and objective of completed draft 2011 State of Louisiana Hazard Mitigation Plan Update released on June 30, 2010.

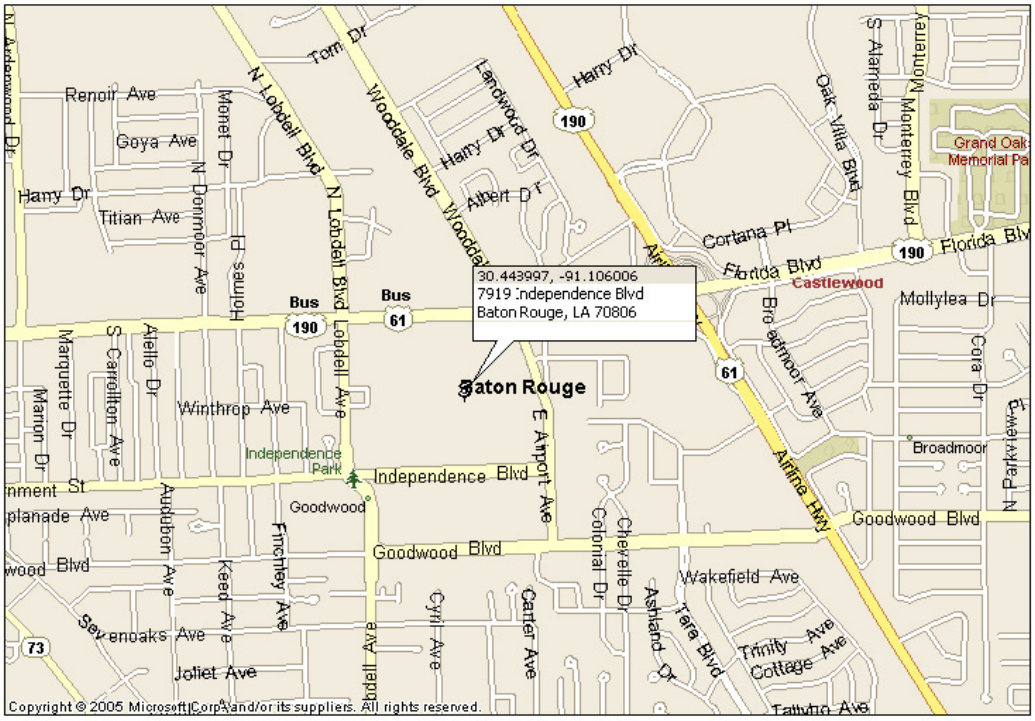
We look forward to continue working with you on this project; and, thank you for your continued commitment to the State of Louisiana. If you should have any questions or comments regarding the contents of this letter, please contact Alessandra Jerolleman at 504-914-6648 or at AJerolleman@wittassociates.com.

Sincerely,

D. Casey Levy
State Hazard Mitigation Officer
Disaster Recovery Division

DCL: daq

enclosure: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7919 Independence Blvd
Baton Rouge, LA 70806
Baton Rouge
Independence Blvd
Goodwood Blvd
Florida Blvd
Airline Hwy
Wakefield Ave
Cortana Pl
Castlewood
Grand Oak Memorial Pa
Mollylea Dr
Broadmoor
Independence Park
Renoir Ave
Goya Ave
Hany Dr
Titian Ave
Monet Dr
N Denmoor Ave
Holmes Dr
N Lobdell Blvd
Lobdell Ave
Wooddale Blvd
Tom Dr
Albert Dr
Landwood Dr
Harry Dr
Oak Villa Blvd
S Alameda Dr
Monterrey Blvd
Bro ehmoor Ave
Cora Dr
N Parkview Pl
Marquette Dr
Marron Dr
S Carrollton Ave
Atello Dr
Winthrop Ave
Audubon Ave
Keed Ave
Finchley Ave
Sevenoaks Ave
Joliet Ave
Cyril Ave
Carter Ave
E Airport Ave
Colonial Dr
Chevelle Dr
Ashland Dr
Tara Blvd
Trinity Ave
Cottage Ave
Tallyho Ave
Bus
190
61
73
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GOHSEP Sample Invitation to SHMT Meeting to Discuss Adoption and Approval

State of Louisiana
GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

BOBBY JINDAL
GOVERNOR

MARK A. COOPER
DIRECTOR

March 16, 2011

Steve Garcia
415 N 15th Street, 4th Floor
Baton Rouge, LA 70802

RE: Review and Approval of the 2011 State Hazard Mitigation Plan Update

Dear Steve Garcia:

As a member of the State Hazard Mitigation Team, you are invited to attend a meeting from 1:30 pm to 3:30 pm on March 24, 2011 in Classroom D at the Department of Public Safety and Corrections Office of Louisiana State Police located at 7919 Independence Boulevard in Baton Rouge.

This meeting will focus on the plan's final revisions that were requested by FEMA and approval of the State Hazard Mitigation Plan Update. I ask that you review the final plan prior to attending the meeting, which can be accessed on the Share Point site.

To access the Share Point site and relevant shared documents:

- Log on to the web address at: http://sharepoint.wittassociates.com/SHMPU
- The assigned user name is: **shmpuuser**
- The assigned password is: **shmpuuser**
- Instructions for use:
  - Click on Shared Documents
  - Click on the LA SHMPU Final APA Draft folder
  - Right click on documents in order to save them to your computer

Thank you for your continued commitment to the State of Louisiana. If you have any questions or comments regarding the contents of this letter, please contact Greg Fenton at 404-942-7750 or at GFenton@wittassociates.com.

Sincerely,

D. Casey Levy
State Hazard Mitigation Officer
Disaster Recovery Division

GOHSEP E-mail Soliciting Votes for Plan Adoption

On Mar 25, 2011, at 12:02 PM, "Brenda Cooper" <Brenda.Cooper@LA.GOV> wrote:

State Hazard Mitigation Team Members:

A meeting of the State Hazard Mitigation Team was held on Thursday, March 24th 2011. At this meeting, we reviewed the changes requested by FEMA and ways to keep the plan current thru the plan maintenance process. See attached power point presentation. Our first plan maintenance meeting is scheduled for mid-May of this year with time and date to follow.

All the team members present were asked to vote in favor, not in favor, or abstain from voting on the plan update approval. All members present were in favor of approving the plan update.

Although, you were unable to attend this meeting, we would still like to hear from you. Please respond that you are in favor, not in favor, or would like to abstain from voting on approving the plan update.

Once the plan is approved by the State Hazard Mitigation Team, an adoption letter will be sent by Mark Cooper, the Governor's Authorized Representative, to the FEMA Regional Director Tony Russell requesting final approval of the 2011 plan update.

Please respond by close of business Monday, March 28th, 2011. Should you have any questions or concerns, please contact Brenda Cooper at Brenda.cooper@la.gov<mailto:Brenda.cooper@la.gov> or (225) 267-2523.

Thank you,

Steve Garcia
Group Leader- Hazard Mitigation
Governor's Office of Homeland Security
and Emergency Preparedness
(225)267-2644 (o)
(225)439-5343 (c)

Responses to GOHSEP E-mail Soliciting Votes for Plan Adoption

From: Casey Levy
Sent: Friday, March 25, 2011 12:03 PM
To: Brenda Cooper
Subject: Re: Approval of the State Hazard Mitigation Plan

Approve

Casey

From: Susan West
Sent: Friday, March 25, 2011 12:58 PM
To: Brenda Cooper
Cc: Melissa Harris
Subject: RE: Approval of the State Hazard Mitigation Plan

Brenda,

I approve the State Hazard Mitigation Plan. Thank you again for your assistance and hard work on this much needed plan.

Susan T. West, MBA, CRM

State Risk Administrator

Loss Prevention, Underwriting & Statistics

Office of Risk Management

From: Melissa Harris
Sent: Friday, March 25, 2011 1:08 PM
To: Brenda Cooper
Subject: RE: Approval of the State Hazard Mitigation Plan

Yes, I approve the plan update. Hope to see you in May.

From: Cindy ONeal
Sent: Friday, March 25, 2011 2:50 PM
To: Brenda Cooper
Subject: Re: Approval of the State Hazard Mitigation Plan

I would like to abstain.

From: ksteibpld@bellsouth.net [mailto:ksteibpld@bellsouth.net]
Sent: Tuesday, March 29, 2011 10:18 AM
To: Steven Garcia
Subject: Re: Approval of the State Hazard Mitigation Plan

In favor, thanks for invite to participate.

From: Susan Menard [mailto:smenard438@centurytel.net]
Sent: Thursday, March 31, 2011 08:12 AM
To: Steven Garcia
Subject: Re: Approval of the State Hazard Mitigation Plan

FOR

From: Fay Ayers On Behalf Of Lara Robertson
Sent: Thursday, March 31, 2011 11:08 AM
To: Steven Garcia; Brenda Cooper
Cc: Fay Ayers
Subject: RE: Approval of the State Hazard Mitigation Plan

Steve:

I have reviewed the changes requested by FEMA to the State Hazard Mitigation Plan, including the ways to keep the plan current through the entire maintenance process. I am in favor of and approve the 2011 plan update.

Please let me know when the first plan maintenance meeting is scheduled, and please copy my secretary, Fay Ayers, at fay.ayers@la.gov with the meeting information.

Thanks!

Lara Robertson

DRU Deputy Director

Office of Community Development

Disaster Recovery Unit

(225) 219-9600

SHMT Votes for Plan Adoption

Agency	Last	First	Email	Adoption Process
Dept. of Agriculture & Forestry	Walters	John	john_w@ldaf@state.la.us	NR
Dept. of Environmental Quality	Horn	Kieth	Keith.horn@la.gov	AM
Dept. of Natural Resources	Pace	Linda	linda.pace@la.gov	AM
Dept. of Transportation & Developemtn	O'Neal	Cindy	cindy.oneal@la.gov	Abstained
Dept of Wildlife & Fisheries	Lacaze	Keith	jcarter@wlf.louisiana.gov	NR
Governor's Office of Homeland Security & Emergency Preparedness	Garcia	Steve	steven.garcia@la.gov	AM
Governor's Office of Homeland Security & Emergency Preparedness	Levy	Casey	casey.levy@la.gov	AE
Office of Risk Management	West	Susan	susan.west@la.gov	AE
Office of Risk Management	Harris	Melissa	melissa.harris@la.gov	AE
Parish OEP Director - North	Hilburn	Tracey	thilburn@ohsep.net	NR
Parish OEP Director - South	Broussard	Rebecca	vpoep@cox-internet.com	AM
LA. Police Jury Association	Dardez	Roland	attyrol@aol.com	NR
LA Municipal Association	Menard	Susan	smenard438@centurytel.net	AE
Levee District Association	Steib	Kenneth	ksteibpld@bellsouth.net	AE
Office of Coastal Protection & Restoration	Deshotels	Michele	michele.deshotels@la.gov	AM
Office of Community Development	Robertson	Lara	lara.robertson@la.gov	AE

AE - Approval Email
Am- Approval at Meeting
NR- No Response

Appendix C.5
State Agency Involvement

This Section contains the composition of the State Hazard Mitigation Team, the State Hazard Mitigation Planning Committee, and the list of State Hazard Mitigation Stakeholders.

The State Hazard Mitigation Team shall be comprised of leadership from the following:

- Governor's Office of Homeland Security and Emergency Preparedness
- Department of Transportation and Development
- Department of Wildlife and Fisheries
- Department of Environmental Quality
- Governor's Office of Coastal Activities
- Department of Natural Resources
- Department of Agriculture and Forestry
- Office of Risk Management
- Division of Administration, Office of Community Development, Disaster Recovery Unit
- One OEP Director per each region, selected by the GOHSEP Director
- Police Jury Association
- Louisiana Municipal Association
- Levee District Association

State Hazard Mitigation Planning Committee

Organization	Last Name	First Name	Address	City	Phone	Email
DOA/OFP	Davis	John	1201 N. 3rd Street Suite 7-160	BR, LA 70802	225-342-0841	John.davis@la.gov
DOA/OFP	Morrison	Bill	PO Box 94095	BR, LA 70804	225-342-0885	Bill.morrison@la.gov
DOC	Sivula	Eric	504 Mayflower	BR, LA 70802	225-342-1178	Esivula/corrections@corrections.State.la.us
DOTD	Feazel	Bill	8900 Jimmy Wedell Drive	BR, LA 70807	225-274-4365	wfeazel@dotd.la.gov
DOTD	Bolourchi	Bo	8900 Jimmy Wedell Drive	BR, LA 70807	225-274-4170	Bo.bolourchi@la.gov
DHH	Hollowell	Richard	628 N. 4th Street	BR, LA 70802	225-342-3501	rhollowell@hdd.la.gov
DPS/LSUCCC	Noel	Randy	18 Columns Court	LaPlace, LA 70068	504-915-2815	revedev@aol.com
DPS/LSUCCC	Jobe	Denise	18 Columns Court	LaPlace, LA 70068	225-333-2100	Denise.jobe@dps.la.gov
LRA	Keegan	Robin	150 3rd Street, Suite 200	BR, LA 70801		Robin.keegan@la.gov
OCPR	Deshotels	Michele	450 Laurel Street, Suite 1201	BR, LA 70801	225-342-5175	Michele.deshotels@la.gov
ORM	West	Susan	PO Box 91106	BR, LA 70821	225-342-6031	Susan.west@la.gov
ORM	Harris	Melissa	PO Box 91106	BR, LA 70821	225-342-8414	Melissa.harris@la.gov
GOHSEP	Monier	Jerry	7667 Independence Blvd.	BR, LA 70806	225-358-5656	Jerry.monier@la.gov
GOHSEP	Poche	Peggy	7667 Independence Blvd.	BR, LA 70806	225-276-7837	Peggy.poche@la.gov

State Hazard Mitigation Stakeholders									
Organization	Last	First	Title	Address	City	State	Zip	Phone	e-mail
GOHSEP / Region 1	Delatte	Darryl	Regional Coordinator					225-485-7452	darryl.delatte@la.gov
GOHSEP / Region 2	Jones	Blaine	Regional Coordinator					225-329-4261	blaine.jones@la.gov
GOHSEP / Region 3	Roussel	Pam	Regional Coordinator					985-851-2900	pam.roussel@la.gov
GOHSEP / Region 4	Guidry	Darren	Regional Coordinator					337-482-0624	Darren.Guidry@la.gov
GOHSEP / Region 5	Zettlemoyer	Doug	Regional Coordinator					225-405-9174	doug.zettlemoyer@la.gov
GOHSEP / Region 6	Batts	Sadye	Regional Coordinator	PO Box 2251	Jena	LA	71342	225-572-1644	sadye.batts@la.gov
GOHSEP / Region 7	Carmack	Lisa	Regional Coordinator					318-425-5351	lisa.carmack@la.gov
GOHSEP / Region 8	Stewart	Joe	Regional Coordinator					318-323-6374	joe.stewart@la.gov
GOHSEP / Region 9	Basco	Teresa	Regional Coordinator					225-715-3207	teresa.basco@la.gov
Natural Hazard Mitigation Association	Rovins	Jane	Board President						jane.rovins@gmail.com
Louisiana FloodPlain Managers Association	Mattingly	Pam							pmattingly@cppj.net
FEMA / TRO	Kincaid	Harvey	Planning Lead	1 Seine Court	New Orleans	LA	70114		harvey.kincaid@dhs.gov
Red Cross	Morgan	Jane							morganj@usa.redcross.org
Red Cross	Zaunbrecher	Bobbie							bzaun@batonrouge.redcross.org
Red Cross	Reiser	Barbara							breister@batonrouge.redcross.org
LPBF- Lake Pontchartrain Basin Foundation	Rheans	Anne	Executive Director	PO Box 6965	Metairie	LA	70009	504-836-2215	anne@saveourlake.org

State Hazard Mitigation Stakeholders									
Organization	Last	First	Title	Address	City	State	Zip	Phone	e-mail
LAGC- Louisiana Association of General Contractors	Naquin	Ken	CEO	666 North Street	Baton Rouge	LA	70802	225-344-0432	kenn@lagc.org
LHBA- Louisiana Homebuilders Association	Dodd	Jeannie	Executive Director	660 Laurel Street Ste. A	Baton Rouge	LA	70802	225-387-2714	jeannie@lhba.org
LMA- Louisiana Municipal Association	McHugh	Tom	Executive Director	700 North 10th Street	Baton Rouge	LA		225-344-5001	tmchugh@lam.org
LA Realtors Association	Young	Malcome	CEO	PO Box 14780	Baton Rouge	LA	70898-4780	225-923-2210	malcolm@larealtors.org
LPJA- Police Jury Association of Louisiana	Dartez	Roland	Executive Director	707 North 7th Street	Baton Rouge	La	70802	225-343-2835	roland@lpgov.org
LSU Ag	Skinner	Patricia	Disaster Programs Coord.	E.B. Doran, LSU Room 104	Baton Rouge	La	70803	225.578.2910	pskinner@agcenter.lsu.edu
Stephenson Disaster Management Institute	Anderson	Thomas	Interim Exec. Director	1103 F Patrick F. Taylor Hall	Baton Rouge	Louisiana	70803	225-578-7034	tanderson@lsu.edu
USDA/NRCS (Natural Resource Conservation Service)	Sticker	Brad	Acting State Conservation Engineer	3737 Government Street	Alexandria	LA	71302	318-473-7791	brad.sticker@la.usda.gov
USGS (US Geological Survey)	Casadevall	Thomas	Director	PO Box 25046 - DFC-Mail Stop 964	Denver	CO		303-236-5648	tcasadevall@usgs.gov
ULL/CSFM (Center for Structural & Functional Materials	Misra	Devesh	Director	PO BOX 44130	Lafayette	LA	70504	337-482-6430	dmisra@louisiana.edu
ULL/LITE (LA Immersive Technologies Enterprise)	Crus-Neira	Carolina	Director	587 Cajundome Blvd	Lafayette	LA	70506	337-735-5483	Carolina@louisiana.edu

State Hazard Mitigation Stakeholders									
Organization	Last	First	Title	Address	City	State	Zip	Phone	e-mail
UNO/CHART (Center Hazard Assessment Response and Technology	Laska	Shirley	Director	2000 Lakeshore Drive/ MH 118	New Orleans	LA	70148	504-280-1254	slaska@uno.edu
UNO/PLANNING	Brooks	Jane	Chair	2000 Lakeshore Drive/ MH 370	New Orleans	LA	70148	504-280-6514	jsbrooks@uno.edu
APA, LA Chapter (American Planning Association)	Villavaso	Stephen D.	President			LA			svillavaso1@cox.net
ASLA (American Society of Landscape Architects	Brown	Dana	President			LA			dbrown@browndanos.com
ASLA (American Society of Landscape Architects	Brown	Shannon	President - Elect			LA			sblakeman@jeffreycarbo.com
Association of Levee Boards	Wilson Thomas	Steve Amber	President Staff Support	P. O. Box 2961	Baton Rouge	LA	70821	225-405-0884	louisianalevee@live.com
Center for Planning Excellence	Thomas	Elizabeth "Boo"	President and CEO	402 N. Fourth Street	Baton Rouge	LA	70802	225-267-6300	
CRCL (Coalition to Restore Coastal Louisiana)	Peyronnin	Steven	Executive Director	6160 Perkins Road Suite #225	Baton Rouge	LA	70808	225-767-4181	stevenp@crcl.org
CPRA (Coastal Protection and Restoration Authority of Louisiana)	Graves	Garrett	Governor's Executive Assistant for Coastal Activities			LA			www.lacpra.org (Website)
LDI (Louisiana Department of Insurance)	Benoist	Virginia	Assistant Attorney General	P. O. Box 94214	Baton Rouge	LA	70804-9214	225-342-5750	vbenoist@ldi.la.us benoistv@ag.state.la.us

State Hazard Mitigation Stakeholders									
Organization	Last	First	Title	Address	City	State	Zip	Phone	e-mail
DSS (Department of Social Services)	Nichols	Kristy	Secretary	P.O. Box 3776	Baton Rouge	LA	70821	225-342-0286	
DOA/OCD (Division of Administration/ Office of Community Development)	Keegan	Robin	Director	P.O. Box 94095	Baton Rouge	LA	70804-9095	225-342-7000 800-354-9548	Robin.Keegan@la.gov
DOA/ORM (Division of Administration/ Office of Risk Management)	Thompson	Bud	Director			LA		225-342-8500	Bud.Thompson@la.gov
DOA/ORM (Division of Administration/ Office of Risk Management)	Rayborn	Henry	Loss Prevention Supervisor	P.O. Box 91106	Baton Rouge	LA	70821-9106	225-342-8480	Henry.Rayborn@la.gov
LED (Louisiana Economic Department)	Smart	Skip	Director of Community Development	P.O. Box 94185	Baton Rouge	LA	70804-9185	225-324-4321	smart@la.gov
Louisiana Housing Finance Authority (LHFA)	Minor	Charlotte	Program Administrator	2415 Quail Drive	Baton Rouge	LA	70809	225-763-8700	cminor@lhfa.state.la.us
La Geographic Information Center (LAGIC)	Pennington	Chris	Technical Service & Support	E313 Howe-Russell Geoscience Complex; LSU	Baton Rouge	LA	70803	225-578-2901	cpennington@lagic.lsu.edu
Center for GeoInformatics	Kent	Joshua	GIS Manager	Center for GeoInformatics; LSU	Baton Rouge	LA	70803	225-578-4605	jkent4@lsu.edu
CLEAR/CERA LSU Hurricane Center	Suhayda	Joseph	Interim Director	3195 ECE Bldg; LSU	Baton Rouge	LA	70803	225-252-1438 225-578-6422	Josephsuhayda@yahoo.com
LSU Sea Grant	Wilkins	Jim	Director	227-B Sea Grant Bldg; LSU	Baton Rouge	LA	70803	225-578-5963	jwilkens@lsu.edu
SLFPA-East	Boudreaux	Glenda	Administrator	6508 Spanish Fort Blvd	New Orleans	LA	70124	504-355-4100	gboudreaux@slfpae.com

State Hazard Mitigation Stakeholders									
Organization	Last	First	Title	Address	City	State	Zip	Phone	e-mail
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Tulane Law/IWR	Davis	Mark	Director	6329 Freret Street Suite 359 C	New Orleans	LA	70118	504-865-5982`	msdavis@tulane.edu
USACE Non Structural	Buss	Larry	Chairman	106 S. 15th Street	Omaha	NE	68102-1618	402-995-2300	larry.s.buss@usace.army.org
ASCE									
DNR/CMD									
Coastal Affairs									
LA/Nat Guard									
CRT									
LRA									
LANO									
LAPDD									
LMHA									
LMA									
LPJA									
LA Realtors									
LSU Hurricane Center									
NIMSAT									
USACE NOD									

Appendix D:
Hazard Identification and Profiles

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This appendix provides detailed documentation in support of Section Four – Hazard Identification and Profiles.

NOTE: The annual probability of future occurrence for each hazard is explained in the *Probability of Occurrence and Magnitude* subsection for each hazard. Probability may be expressed as an exact figure when it has already been established (such as the 1%-annual chance flood), or it may be expressed as a calculated approximate figure. When the use of an approximate figure is not feasible and/or not appropriate, probability may be expressed in ranges such as *high* (70-100% annual probability), *moderate* (30-69% annual probability), or *low* (0-29% annual probability). The term "extreme" may be used to describe the range of probability when the probability of hazard occurrence is determined to be near the upper-limits of the high range or near the lower-limits of the low range.

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Appendix D.1
Coastal Erosion

As noted in Section 4.3, coastal erosion is not addressed as a stand-alone hazard in this Plan Update. Rather, it is understood to be part of an interrelated system of hazards that are linked to coastal land loss. As such, this hazard is subsumed into the state CPRA Master Plan for coastal protection and restoration.

This treatment is consistent with local hazard mitigation plans, as shown in detail in Table D-1.

Table D-1: Treatment of Coastal Erosion Hazard in Parish Hazard Mitigation Plans

Cameron Parish
▪ Risk Assessment: Treats coastal erosion and land subsidence together in a general manner. ▪ Mitigation Actions: No direct mitigation actions proposed except to provide assistance and support to the state and/or federal agencies who are addressing the problem.
Jefferson Parish
▪ Risk Assessment: Provides overview of coastal erosion including definitions, statistics, and specific locations with the parish. ▪ Mitigation Actions: There are no mitigation actions within the plan. Mitigation accomplishments include Fifi Island rock dike and Fifi Island restoration efforts.
Iberia Parish
▪ Risk Assessment: Provides very general information; states the parish has a "high" to "very high" Coastal Vulnerability Index (CVI) zone. ▪ Mitigation Actions: Proposes three local initiatives: the Vermilion Bay Shoreline Restoration, the Marsh Island Marsh Creation, and the Weeks Bay and Marsh Creation and Shore Protection/Commercial Canal.
Lafourche Parish
▪ Risk Assessment: Provides overview of coastal erosion in the parish, statistics, and a list of projects in the parish. ▪ Mitigation Actions: Calls for support and coordination with state and federal efforts, specifically the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). Also calls for increased sediment diversion as well as creating additional marshland.
Orleans Parish
▪ Risk Assessment: Treats coastal erosion and land subsidence together in a general manner. ▪ Mitigation Actions: Calls for natural resource protection, including wetland protection as well as erosion and sedimentation control.
Plaquemines Parish
▪ Risk Assessment: Provides overview of coastal erosion in the parish, statistics, specific locations, and a list of projects in the parish. ▪ Mitigation Actions: Calls for support for and coordination with state and federal efforts, including CWPPRA. Also calls for creating man-made and natural barriers as well as restoring marshland.
St. Bernard Parish
▪ Risk Assessment: Treats coastal erosion and land subsidence together in a general manner. ▪ Mitigation Actions: No specific identified mitigation actions.

St. Charles Parish

- Risk Assessment: Provides overview of coastal erosion including definitions, statistics, and specific locations within the parish.
- Mitigation Actions: Coordinate with elected officials and relevant staff of neighboring parish governments to identify high priority regional coastal restoration projects that are the most critical to the economic and environmental well-being of the entire southeast Louisiana region. Submit final list of regional coastal restoration priorities to all relevant state and federal parties, such as the US Army Corps of Engineers.

St. Mary Parish

- Risk Assessment: Provides overview of coastal erosion in the parish, statistics, specific locations, and a list of projects in the parish.
- Mitigation Actions: Calls for support for and coordination with state and federal efforts, specifically CWPPRA. Also calls for increased sediment transport from Atchafalaya River down Wax Lake Outlet for marsh enhancement and restoration as well as stabilizing the shoreline along Vermilion Bay and West Cote Blanche Bay.

Terrebonne Parish

- Risk Assessment: Coastal erosion was identified; however, it was not profiled in the plan.
- Mitigation Actions: There are no mitigation actions within the plan.

Vermilion Parish

- Risk Assessment: Provides overview of coastal erosion in the parish, statistics, specific locations, and a list of projects in the parish.
- Mitigation Actions: Calls for support and coordination with state and federal efforts, specifically CWPPRA. Also calls for creating additional marshland and increasing sediment diversion.

Source: Analysis of Parish Hazard Mitigation Plans

Figure D-1 is a copy of Executive Order #BJ 2008-7 signed by Governor Bobby Jindal that demonstrates Louisiana's continuing efforts and commitment to coastal restoration. It further recognizes the importance of planning consistency for rebuilding, especially following disasters.

Figure D-1: Executive Order #BJ 2008-7

State of Louisiana

EXECUTIVE DEPARTMENT

EXECUTIVE ORDER NO. BJ 2008 -7

ACTIVITY AND PERMIT CONSISTENCY WITH LOUISIANA'S COMPREHENSIVE MASTER PLAN FOR A SUSTAINABLE COAST

WHEREAS, Hurricanes Katrina and Rita exposed vulnerabilities in Louisiana's coastal and hurricane protection systems that resulted in loss of life, damage to property, destruction of coastal land and wetlands loss and major impacts to our state's economy;

WHEREAS, Louisiana continues to experience one of the fastest rates of coastal erosion in the world and portions of our state remain unprotected from future hurricane impacts;

WHEREAS, our state's coast is a "working coast" that provides employment opportunities for Louisianans and citizens from across the United States;

WHEREAS, coastal Louisiana is a national treasure that provides energy to power the nation's economy, puts seafood on America's dinner tables, is home to the country's top ports, serves as critical habitat to numerous endangered and threatened species and is one of the most productive ecosystems in the world;

WHEREAS, Louisiana's coastal master plan, entitled "Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast", (hereinafter "Master Plan"), is the state's conceptual plan for the integration of coastal protection and restoration based upon the best available science and engineering;

WHEREAS, the Master Plan was approved by the Coastal Protection and Restoration Authority at its April 12, 2007 meeting and thereafter unanimously approved by the Louisiana Legislature by passing Senate Concurrent Resolution No. 11 during the 2007 Regular Session;

WHEREAS, the Master Plan states a goal of integration of flood control projects and coastal restoration initiatives to help both human and natural communities survive and thrive over the long-term;

WHEREAS, the Master Plan recommends, among other things, improvements to land use planning, zoning and permitting to more effectively achieve its stated goals;

WHEREAS, beginning this year, billions of dollars in efforts to repair and improve Louisiana's hurricane and coastal protection systems will be carried out;

WHEREAS, state agencies must function in a manner that recognizes the vital importance of expediting hurricane and coastal protection and ensuring sustainable practices in our coastal zone;

WHEREAS, it is critical for all state agencies to work in a cooperative manner with acute awareness of the recommendations of the Master Plan in order to ensure the aggressive and orderly implementation of its stated goals.

WHEREAS, Louisiana Revised Statute 49:213 directs the Governor, through his executive assistant for coastal activities, to "coordinate and focus the functions of all state agencies as they relate to coastal protection, including hurricane protection and wetlands conservation and restoration"; and

WHEREAS, Louisiana Revised Statute 49:213 authorizes the Governor, through his executive assistant for coastal activities, to "review and modify proposed coastal use permits prior to issuance to the extent that such permits would authorize activities which significantly affect hurricane protection or wetlands conservation and restoration projects or which significantly diminish the benefits of projects intended to protect, conserve or enhance coastal areas and to require the issuance of permits for public or private wetlands enhancement projects or plans.";

NOW THEREFORE, I, Bobby Jindal, Governor of the state of Louisiana, by virtue of the authority vested by the Constitution and the laws of the state of Louisiana, do hereby order and direct as follows:

SECTION 1: All state agencies shall administer their regulatory practices, programs, contracts, grants, and all other functions vested in them in a manner consistent with the Master Plan and public interest to the maximum extent possible.

SECTION 2: This Order is effective upon signature and shall remain in effect until amended, modified, terminated, or rescinded by the governor, or terminated by operation of law.

IN WITNESS WHEREOF, I have set my hand officially and caused to be affixed the Great Seal of Louisiana, at the Capitol, in the city of Baton Rouge, on this 23rd day of January, 2008.

/S/ Bobby Jindal
GOVERNOR OF LOUISIANA

ATTEST BY
THE GOVERNOR

/S/ Jay Dardenne
SECRETARY OF STATE

Table D-2 demonstrates the broad consistency of the CPRA Master Plan's designated coastal erosion projects with the hazard mitigation goals and actions outlined in this Plan Update.

Table D-2: Coastal Restoration Projects Supporting State Hazard Mitigation Plan Goals

Project Name	Federal Sponsor	Funding Program	Project Description
Acadiana to the Gulf of Mexico Access Channel (AGMAC)	N/A		For the AGMAC project, it is anticipated that material removed from deepening of the Gulf Intracoastal Waterway and the Freshwater Bayou Channel will be placed along those waterways at elevations that would help to reduce storm surge and associated damages to adjacent lands and communities. The surplus funds will be utilized to help meet the state's cost-share obligations.
Acadiana Regional Airport Street Improvements-Admiral Doyle Drive	US Minerals Management Service (MMS)		This project will patch and overlay 5,310 feet (about 1 mile) of Admiral Doyle Road around the Acadiana Regional Airport in Iberia Parish from its intersection with LA 3212 to the end of the four lane section. This project will provide improved access to both the airport and the Port of Iberia, both of which support OCS facilities and commerce.
Alexandria to the Gulf	N/A		Alexandria to the Gulf is currently in Feasibility Study phase. The study's purpose is to evaluate options or alternates for providing urban drainage and flood reduction to the City of Alexandria and irrigation and flood reduction benefits to agricultural areas south and southeast of the city.

Project Name	Federal Sponsor	Funding Program	Project Description
Alligator Bend Marsh Restoration and Shoreline Protection	United States Army Corps of Engineers (USACE)	Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)	The goal of this project is to restore critical wetlands destroyed by Hurricane Katrina and to prevent breaching of degraded marshes between the GIWW and Lake Borgne. This will be accomplished through dedicated dredging for marsh creation and vegetation planting for shoreline protection. The project would benefit approximately 494 acres of fresh marsh and open water over the 20-year project life.
Amite River Diversion Canal Modification	USACE		Construct gaps in spoil banks of Amite River Diversion Canal to introduce nutrients and sediment into western Maurepas Swamp. Facilitate organic deposition, improve biological productivity, and prevent further swamp deterioration. *Fully funded Phase 2 cost includes preliminary engineering and design.
Avoca Island Diversion and Land Building	USACE	CWPPRA	The project objective is to divert freshwater, sediment, and nutrients into the open water areas in central Avoca Island to create and protect 143 acres of emergent wetlands by the end of the 20-year project life. The project design team is considering the addition of a marsh creation component utilizing dredged material to increase project wetland benefits.
Barataria Barrier Island Complex Project: Pelican Island and Pass La Mer to Chaland Pass Restoration	National Marine Fisheries Service (NMFS)	CWPPRA	The objectives of this project are to create barrier island habitat, enhance storm-related surge and wave protection, prevent overtopping during storms, and increase the volume of sand within the active barrier system. Conceptual project plans envision dedicated dredging of local, near shore sand sources to directly create beach, dune, and wetland habitats.
Barataria Basin Barrier Shoreline	USACE		The purpose of this project is to provide beach/dune restoration and marsh creation on Caminada Headlands and Shell Island. *Fully funded 2 Phase 2 cost taken from WRDA 2007 legislation.
Barataria Basin Landbridge Shoreline Protection, Phase 3	Natural Resources Conservation Service (NRCS)	CWPPRA	Phase 3 of this project encompasses approximately 41,000 feet of shoreline protection. Approximately 26,000 feet of protection will be along the west bank of Bayou Perot and the north shore of Little Lake in Lafourche Parish. In Jefferson Parish, about 9,600 feet of the shoreline protection will be along the east bank of Bayou Rigolettes and approximately 2,700 feet along each bank of Harvey Cutoff. *Construction Units 1-3 have been completed.

Project Name	Federal Sponsor	Funding Program	Project Description
Barataria Basin Landbridge Shoreline Protection, Phase 4	NRCS	CWPPRA	Phase 4 of this project begins at the intersection of Bayou Rigolettes and Barataria Bay Waterway, and extends about 31,500 feet southward along the east bank of Bayou Rigolettes and ties into the northern limit of Phases 1 and 2.
Barataria Basin Landbridge Shoreline Protection, Phases 1 and 2	NRCS	CWPPRA	This project is designed to protect a deteriorated intermediate to brackish marsh located between Lake Salvador and Little Lake by reducing shoreline erosion. Phase 1 and 2 of this project will provide 35,000 linear feet of shoreline protection along Bayous Perot and Rigolettes within the Barataria Basin.
Barrier Island Comprehensive Monitoring (BICM)	USACE		The Barrier Island Comprehensive Monitoring (BICM) data collection program is designed to monitor the mainland shoreline of the south Louisiana coast, with special emphasis on the sandy beaches and barrier islands.
Bay Welsh Disposal Site (Houma Navigation Canal)	N/A		The purpose of this project is to pre-clear the Bay Welsh disposal site adjacent to and east of the Houma Navigation Canal.
Bayou Dupont Ridge Creation and Marsh Restoration	NMFS	CWPPRA	The goals of this project are to: 1) create and nourish marsh using sediment dredged from the Mississippi River and transported via pipeline to the project area; and 2) create a ridge along the southwestern shoreline of Bayou Dupont. The project will create approximately 184 acres brackish marsh, nourish approximately 118 acres of brackish marsh, and construct about 15 acres of maritime ridge habitat.
Bayou Lafourche Siphon (Phase 1)	Environmental Protection Agency (EPA)		The goal of the project is to reduce marsh loss adjacent to Bayou Lafourche by introducing nutrient and sediment laden river water through large siphon pipes. This project was reauthorized on the 11th PPL as BA-25b.
Bayou Lamoque Freshwater Diversion (transferred)	EPA USACE		This project is intended to create approximately 620 acres of new marsh, increase the percent cover of aquatic vegetation in interior marsh ponds and channels, increase the area of shallow open water habitat in the project area, and decrease mean salinity in the project area.
Bayou Sale Shoreline Protection	NRCS	CWPPRA	The project goal is to reduce and/or reverse shoreline erosion and create marsh between the breakwater and the existing shoreline. A foreshore rock dike will be constructed parallel to the existing eastern shoreline of East Cote Blanche Bay.

Project Name	Federal Sponsor	Funding Program	Project Description
Beneficial Use-Calcasieu Ship Channel (Black Lake)	N/A		The purpose of this project is to create approximately 200 acres marsh through beneficial use of dredged material from the Calcasieu Ship Channel.
Benneys Bay Diversion	USACE		The objective of the project is to create vegetated wetlands in shallow open water areas in Benneys Bay. The project would divert sediment in an effort to create, nourish, and maintain approximately 5,828 acres of fresh to intermediate marsh over the 20-year project life.
Bertrandville Siphon	EPA		The goals of the project are to eliminate future wetland loss, convert approximately 50% of the existing intermediate marsh to fresh marsh, and increase SAV in the project area by 20% by constructing a siphon from the Mississippi River, with 2,000 cfs maximum capacity.
Biloxi Marsh	N/A		The Biloxi Marsh Creation project was funded with the 2007 surplus; however, it has since been changed to a shoreline protection project
Bio-Engineered Oyster Reef Demonstration	NMFS	CWPPRA	The purpose of this project is to determine the effectiveness of an Oysterbreak in reducing beach erosion along the Gulf of Mexico shoreline in areas of poor load-bearing capacity. The Oysterbreak is a light-weight, modular shore protection device that uses accumulating biomass (oyster reef) to dissipate wave energy.
Bohemia Mississippi River Reintroduction	EPA	CWPPRA	This project will reintroduce Mississippi River water into adjacent wetlands, restoring natural deltaic growth and habitats. An uncontrolled diversion with a capacity of approximately 10,000 cfs will be constructed. The project is anticipated to create/protect 635 acres of marsh over the 20-year project life.
Brown Lake Hydrologic Restoration	NRCS		The project is intended to restore, to the extent possible, the natural hydrology of the area. A reduction in marsh loss and improved water conditions are expected to occur following project implementation.
Caernarvon Outfall Management/Lake Lery Shoreline Restoration	United States Fish and Wildlife Service (USFWS)	CWPPRA	The goals of this project are to: 1) restore 32,000 feet of the southern shoreline of Lake Lery, which was heavily damaged during Hurricane Katrina; and 2) divert approximately 10% (up to 800 cfs) of the Caernarvon outfall into marshes north of Lake Lery, which currently are suffering from a lack of freshwater from the outfall.

Project Name	Federal Sponsor	Funding Program	Project Description
Cameron-Creole Freshwater Introduction	NRCS		The purpose of this project is to restore the function value and sustainability to approximately 22,247 acres of marsh and open water. The vegetative planting feature has been approved for Phase 2 and will be completed in 2010. The remaining features are undergoing engineering and design.
Cameron Creole Levee	N/A		The intent of this project is to provide for repair and maintenance of critical perimeter control structures around Calcasieu Lake and repairs to the Cameron-Creole Levee. These structures were severely damaged by Hurricane Rita.
Cameron Parish Shoreline	N/A		The purpose of this project is to nourish 5 to 6 miles of the Gulf shoreline due west of the Calcasieu Ship Channel utilizing sand mined from an offshore borrow site.
Castille Pass Channel Sediment Delivery	NMFS		The Castille Pass project was intended to re-establish the sedimentation processes that lead to subdelta development in this area of the Atchafalaya Delta. This project consists of dredging and extending Castille Pass to promote subdelta development.
Central Terrebonne Freshwater Enhancement	NRCS		The project will reestablish historic hydrologic and salinity conditions by reducing the artificial intrusion of Gulf marine waters via the Grand Pass into the Central Terrebonne marshes while enhancing the influence of the Atchafalaya River waters into the area.
Central Wetlands Assimilation (Phase 1)	MMS		The Sewerage and Water Board of New Orleans in partnership with St. Bernard Parish jointly propose that the first phase of a regional wetland restoration project be funded to restore critically important wetlands using wetland assimilation of treated wastewater effluent. The project is projected to establish 2,300 acres of cypress swamp and low-salinity marsh where open water currently exists.
Cheniere Ronquille Barrier Island Restoration	NMFS		The project goal is to maintain shoreline integrity and create and restore saline marsh on Chenier Ronquille. The project involves dedicated dredging from nearshore Gulf deposits to create saline marsh in open water areas and nourish existing marshes in project area. About 11,000 ft of shoreline will be nourished through the creation of beach and dune. Intensive dune plantings in the project area are also proposed.

Project Name	Federal Sponsor	Funding Program	Project Description
Coastal Forest Conservation Initiative	MMS		Implementation primarily focuses on purchasing land rights on an estimated 30,000 acres of coastal forest from several different hydrologic classes that serve significant ecological and storm-surge reduction functions. Additional action will include small scale restoration projects, such as reforestation of coastal cheniers and natural levee forests and small scale projects to reduce excessive ponding.
Coastwide Nutria Control Program	NMFS		The goal of the project is to eliminate or significantly reduce damage to coastal wetlands resulting from nutria herbivory.
Coastwide Reference Monitoring System - Wetlands	United States Geological Survey (USGS)		The Coastwide Reference Monitoring System (CRMS) project involves the creation of hundreds of environmental monitoring sites throughout the Louisiana coastal environment, but intentionally places these sites both inside and outside the boundaries of restoration project areas.
Convey Atchafalaya River Water to Northern Terrebonne Marshes	USACE		The goals of this project are to utilize GIWW to convey increased Atchafalaya River water to central and eastern Terrebonne marshes (Lake Boudreaux and Grand Bayou areas); repair banks along the GIWW, enlarge constrictions in the GIWW, and enlarge channels to distribute increased freshwater; reduce saltwater intrusion during the late summer and fall; and manage operation of HNC Lock to make more efficient use of Atchafalaya River waters and sediment flow. The Multipurpose Operation of HNC Lock project has been rolled into this project; therefore, the cost estimates include the HNC Lock project.
Dedicated Dredging on the Barataria Basin Landbridge	USFWS		This project, in conjunction with the Barataria Basin Landbridge Shoreline Protection project (BA-27, BA-27c), will protect the functional integrity of this critical area of the Barataria Basin. This project will create emergent marsh through the deposition of dredged material into open water areas.
Delcambre-Avery Canal (E&D)	N/A		This project will design and engineer a flood control structure for the Delcambre-Avery Canal just south of the Intracoastal Waterway. When constructed this project will provide flood protection improvements by allowing the closure of the Delcambre-Avery Canal to reduce the impact of storm surge from Vermilion Bay.
Delta Building Diversion at Myrtle Grove (transferred)	USACE		The objective of this project is to divert Mississippi River water and sediment for the creation of new emergent wetlands.

Project Name	Federal Sponsor	Funding Program	Project Description
Delta Building South of Empire	USACE		The objective of this project is to create marsh in open water areas south of Empire through the diversion and capture of fluvial sediment from the Mississippi River. Ultimately, the project will relay sediment 2 to the barrier shoreline enhancing the ability of these features to regenerate and stabilize.
Delta Building Diversion North of Fort St. Philip	USACE		This project is intended to reduce the loss of existing marsh in the 2,252-acre project area and enhance the integrity of the delta system. Project strategies included dredging a series of channel armor gaps that will be strategically located along the east descending bank of the Mississippi River in the vicinity of Fort St. Philip to divert sediment and nutrients to adjacent wetlands.
DTOG (Donaldsonville to the Gulf)	USACE		The purpose of the project is to reduce the risk of flooding from coastal storm surge and rainfall to prevent further economic losses and environmental damage in the Barataria Basin. The project is currently in its feasibility study phase, during which various alternatives to reducing storm surge are being examined, the adequacy of the existing drainage system is being assessed, and cultural, environmental, and recreational issues are being identified. The scope is to study various alternatives that will provide flood protection from tidal, hurricane surges, and heavy rainfall events, determine the adequacy of the existing interior drainage systems and evaluate whether additional pumping capacity is required, and analyze recreational, cultural, and environmental needs.
East Marsh Island Marsh Creation	NRCS	CWPPRA	The goal of the project is to re-create brackish marsh habitat in the open water areas of the interior marsh primarily caused by hurricane damage. The project will also create marsh behind the two easternmost existing rock dikes.
East Sabine Lake Hydrologic Restoration	USFWS	CWPPRA	This project utilizes water control structures, shoreline protection, terraces, and vegetation plantings to restore the historical hydrologic regime to approximately 36,623 acres of the Sabine National Wildlife Refuge. Specific goals include reducing elevated salinities within fresh and intermediate marshes, reducing tidal scour, reducing erosion on the eastern shore of Sabine Lake, reducing the turbidity of open water areas, and restoring and protecting marsh.

Project Name	Federal Sponsor	Funding Program	Project Description
East/West Grand Terre Islands Restoration (transferred)	NMFS	CIAP	The goal of this project is to stabilize and benefit 1,575 acres of barrier island habitat and extend the island's life expectancy. Dredged material will be used to create dune and marsh habitat on East Grand Terre Island.
EB - Bayou Lamoque Floodgate Removal		CIAP	The goal of this project is to remove the existing floodgates from two separate water control structures to allow for the unimpeded flow of Mississippi River water into Bayou Lamoque and surrounding marsh.
EB - Blind River Freshwater Diversion			The goal of this project is to construct and operate a 1,500 cfs maximum capacity siphon to divert freshwater from the Mississippi River into the Blind River. The objective of this project is to provide supplemental freshwater and associated nutrients to benefit approximately 2,000 acres of swamp and increase the flow of the Blind River.
EB - Caminada Headlands	MMS	CIAP	The Caminada Headlands project will focus on restoring dune and beach features within the western portion of the Caminada Headlands, which extends from Belle Pass to Caminada Pass.
EB - Dedicated Dredging on Barataria Landbridge	MMS	CIAP	This project will protect the functional integrity of this critical area of the Barataria Basin by creating emergent marsh in open water areas using dredged material. The CIAP will fund construction of 60% of this project, while CWPPRA will fund the remaining 40%.
EB - East Grand Terre	MMS		The goals of this project are to repair breaches and tidal inlets in the shoreline, reinforce the existing shoreline with sand, and plug/repair the growing tidal inlets through the shoreline. Dredged material will also be used to create dune and marsh habitat.
EB - Freshwater Bayou Bank Stabilization	MMS	CIAP	The goal of this project is to stop erosion along the bank of Freshwater Bayou Canal and to protect interior wetlands from saltwater intrusion, increased tidal exchange and wake-induced erosion. This will be achieved by constructing a rock dike along critical areas of the western and eastern banks of the canal.
EB - GIWW Bank Restoration of Critical Areas of Terrebonne	MMS	CIAP	The project objective is to restore critical lengths of deteriorated channel banks and stabilize/armor selected critical lengths of deteriorated channel banks with hard shoreline stabilization materials.

Project Name	Federal Sponsor	Funding Program	Project Description
EB - Grand Lake Shoreline Protection	MMS	CIAP	The goal of this project is to reduce erosion rates along the southern shoreline of Grand Lake. This will be achieved by constructing 37,800 linear-feet of foreshore rock dike between Superior Canal and the mouth of Catfish Lake. The project also includes beneficial use of all excavated material to create about 120 acres of marsh behind the dike. An additional 5,700 linear feet of dike around Tebo Point will be constructed using CWPPRA funds.
EB - Lake Salvador Shoreline Protection Phase III	MMS		This project is a continuation of an existing shoreline protection project along the northwestern portion of Lake Salvador in St. Charles Parish. The project will consist of installing approximately 7,300 linear feet of foreshore rock dike to reduce shoreline erosion rates in the area.
EB - Long Distance Mississippi River Sediment Pipeline	MMS	CIAP	The goal of this project is to establish an appropriate long-distance pipeline capability for conveying Mississippi River sediment for land building (marsh and ridge) in strategic areas of the central Barataria Basin.
EB - Marsh Creation via Beneficial Use (Phase 1)	MMS	CIAP	This proposed project will involve the beneficial use of dredged material to restore coastal wetlands. The project will pay the incremental cost above the federal standard (if necessary) to beneficially place sediment dredged by the USACE to maintain navigation channels in coastal Louisiana. It is estimated that marsh will be restored at four sites, each approximately 200 acres, through this program in areas near federal navigation channels.
EB - Orleans Landbridge Shoreline Protection and Marsh Creation	MMS	CIAP	The goal of this project is to protect approximately 1,400 acres of marsh on the East Orleans Landbridge, and thereby protect vulnerable Orleans and St. Bernard Parish communities and infrastructure, by reducing the rate of shoreline erosion. The project may also include the beneficial use of all excavated material to create about 220 acres of marsh in shallow open water within the project area.
EB - Rockefeller Refuge Gulf Shoreline Stabilization	MMS	CIAP	This project will address shoreline retreat along Rockefeller Refuge's Gulf shoreline, which averages approximately 39 feet per year with subsequent direct loss of saline marsh. The project would entail construction of a nearshore breakwater along the Gulf of Mexico shoreline, extending approximately from Beach Prong to Joseph Harbor.

Project Name	Federal Sponsor	Funding Program	Project Description
EB - Violet Diversion	MMS		The project entails removing the existing Violet Canal siphon, constructing a gated structure at the same location, and modifying the outfall canal to divert approximately 4,000 cfs of freshwater into the Central Wetlands complex of St. Bernard Parish. The project also includes beneficial use of all excavated earthen material to create about 49 acres of marsh in shallow open water within the project area.
Enhancement of Barrier Island Vegetation Demonstration	EPA		The goal of this project is to test several technologies or products to enhance the establishment and growth of key barrier island and salt marsh vegetation.
Floating Marsh Creation Demonstration Project	NRCS		The goal of this project is to develop and test unique and previously untested technologies for creating floating marsh for potential use in fresh and intermediate zones.
Four Mile Canal Storm Surge Reduction	N/A		This project will provide flood protection improvements for Southern Vermilion Parish. This project consists of design, engineering, and construction of a swing barge flood control structure on Four-Mile Canal, just south of the Intracoastal Waterway.
Franklin Canal	N/A		A lock structure will be constructed on Franklin Canal to provide salinity control.
Freshwater Bayou Bank Stabilization	MMS		The goal of this project is to stop erosion along the bank of Freshwater Bayou Canal and to protect the interior wetlands from saltwater intrusion, increased tidal exchange and wake-induced erosion. This will be achieved by constructing a rock dike along critical areas of the eastern and western banks of the canal.
Freshwater Bayou Bank Stabilization - Belle Isle Canal to Lock	USACE	CWPPRA	The goal of this project is to stop erosion along the bank of Freshwater Bayou Canal, and to protect the interior wetlands from increased tidal exchange and wake-induced erosion. This objective will be achieved by constructing a rock dike along the eastern bank of Freshwater Bayou Canal, between Belle Isle Canal and Freshwater Bayou Lock.
Freshwater Bayou Marsh Creation	NRCS		The proposed project would create approximately 290 acres or more of interior marsh and nourish approximately 117 acres. That marsh would restore and maintain a wetland buffer between the open water of the Mermentau Basin and Freshwater Bayou.

Project Name	Federal Sponsor	Funding Program	Project Description
Fringe Marsh Repair	MMS		Restoration of approximately 300 acres of wetland area seaward of the back levee toe in Plaquemines Parish. There are several fringe marsh locations in need of restoration due to the breakup and fragmentation of those fringe marshes adjacent to the back levees' bases.
Forty Arpent Levee, St. Bernard Parish	N/A		This project is in the Lake Borgne Levee District and calls for raising low reaches of the Forty Arpent Levee.
GIWW Bank Restoration of Critical Areas in Terrebonne	NRCS	CWPPRA	The project objective is to restore critical lengths of deteriorated channel banks and stabilize/armor selected critical lengths of deteriorated channel banks with hard shoreline stabilization materials.
Goose Point/Point Platte Marsh Creation	USFWS		The objective of this project is to create marsh habitat through the deposition of dredged material in open water areas in the vicinity of Goose Point and Point Platte as well as to maintain the lake rim function along this section of the north shore of Lake Pontchartrain.
Grand Bayou Hydrologic Restoration	USFWS		The objective of the project is to maintain emergent wetlands in this area by providing supplemental freshwater, nutrients, and sediment from the Atchafalaya River via the Gulf Intracoastal Waterway (GIWW).
Grand Lake Shoreline Protection	USACE	CWPPRA	The objective of this project is to reduce erosion along the southern shoreline of Grand Lake which is caused by high wave energy associated with storm winds and frontal passages. Project features will include construction of a rock breakwater from Superior Canal to Tebo Point.
Grand Liard Marsh and Ridge Restoration	NMFS		The goals of this project are to create/nourish marsh and associated edge habitat for aquatic species through pipeline sediment delivery and to restore the Grand Liard Ridge to reduce wave and tidal setup and provide fallout habitat for neotropical migrant birds.
Houma Navigation Lock	N/A		The HNC Complex would involve use of state funds to accelerate efforts to reduce saltwater intrusion and storm surge that makes its way into the Terrebonne Basin via the Houma Navigation Canal.
Jean Lafitte Tidal Protection	N/A		This project involves tidal protection of the Pen Levee and flood protection along Main Street (Rosethorn Basin) and Fischer School Basin. Additional armoring and scour protection is the last part of the Lafitte Tidal Protection.

Project Name	Federal Sponsor	Funding Program	Project Description
Jonathan Davis Wetland Protection	USACE		The goal of this project is to restore the natural hydrologic conditions of the area and reduce shoreline erosion. This was accomplished through constructing a series of water control structures and a rock dike. Construction Unit 4 is currently under construction.
LA 1 Improvements-Fourchon to Leeville Bridge	MMS		This project is located 60 miles south of New Orleans in lower Lafourche Parish between Leeville and Port Fourchon. It will construct a 5 mile long, two lane elevated highway (two, 12 ft lanes and two, 8 ft shoulders). The Phase IA project connects to the Phase IB and Phase IC projects (in Leeville) by relocating LA 1 on a new alignment.
LaBranche East Marsh Creation	NRCS		The proposed project consists of the creation of emergent wetlands, shrub scrub wetlands, and subtidal water bottoms using dedicated dredging from Lake Pontchartrain. Vegetative plantings would be utilized in the areas designated to be emergent marsh. The proposed project would also provide storm buffer protection to I-10.
Larose to Golden Meadow	USACE		This funding would be used to support raising of the Larose to Golden Meadow, LA hurricane protection levees so that they provide protection against the project-design storm under today's conditions as 2, 3a well as elevating highways serving as evacuation routes. This project will be partially funded by state Surplus 2008 funds.
Lake Borgne and MRGO Shoreline Protection	USACE	CWPPRA	The objective of this project is to preserve the marsh between Lake Borgne and the Mississippi River Gulf Outlet (MRGO) by preventing shoreline erosion. A rock dike will be constructed along the Lake Borgne shoreline and along the north bank of the MRGO.
Lake Hermitage Marsh Creation	USFWS	CWPPRA	The goals of this project are to create approximately 593 acres of wetlands, reduce tidal exchange in marshes surrounding Lake Hermitage, and reduce fetch and turbidity to enhance open water habitats. This project utilizes hydraulic dredging, terraces, a rock dike, and an earthen plug to benefit approximately 1,581 acres of brackish marsh and open water habitats.
Little Pecan Bayou Hydrologic Restoration	NRCS	CWPPRA	The project objectives include providing a means to remove excess water from the Lakes subbasin by installing a water control structure within Little Pecan Bayou, constructing a freshwater conveyance channel with two water control structures through Grand Chenier Ridge to assist in excess water removal, and excavation of a collector channel within the marsh.

Project Name	Federal Sponsor	Funding Program	Project Description
Lafitte Levee Protection	N/A		This project involves tidal protection of the Pen Levee and flood protection along Main Street (Rosethorn Basin) and Fischer School Basin. Additional armoring and scour protection is the last part of the Lafitte Tidal Protection.
Lafitte Tidal Protection	N/A		This project will provide flood protection improvements consisting of new earthen levees, sheet pile floodwalls, concrete floodwalls and flood gates to 8.0 NAVD.
Lake Pontchartrain and Vicinity	USACE		The information provided represents all hurricane and storm damage risk reduction projects for Lake Pontchartrain and Vicinity included in IERs 1 through 11. The total cost figures presented were provided by the USACE for the entire Lake Pontchartrain and Vicinity project. Fully Funded Phase I cost includes real estate and engineering and design, and Fully Funded Phase 2 cost represents construction cost.
Lost Lake Marsh Creation and Hydrologic Restoration	USFWS		The goal of the project is to prevent the coalescence of Bayou DeCade and Lake Pagie and extend the landbridge function of the North Lake Mechant Landbridge Project. The project will also create new marsh and protect existing marsh in the project area through terracing, increasing freshwater flow, and replacing existing weirs with bays/gates that will increase freshwater and sediment delivery.
Madison Bay Marsh Creation and Terracing	NMFS	CWPPRA	The goals of this project are to create and nourish marsh and associated edge habitat and to promote conditions conducive to the growth of submerged aquatic vegetation. The proposed terraces will reduce the wave erosion of existing marshes along the fringes of Madison Bay. The project would benefit approximately 1,019 acres of fresh marsh and open water over the 20-year project life.
Madisonville Bulkhead	N/A		The project is located at the mouth of the Tchefuncte River and is critical to provide protection to a road and parking lot that are being jeopardized by erosion.
Maintain Land Bridge Between Caillou Lake and Gulf of Mexico	USACE		The goals of this project are to prevent connection between the gulf and Caillou Lake by constructing shoreline protection on gulf and Grand Bayou du Large, marsh creation, and closure of newly opened channels and to minimize saltwater intrusion, prevent gulf shore erosion and increase freshwater influence on marshes in project area. *Fully funded Phase 2 cost includes preliminary engineering and design.

Project Name	Federal Sponsor	Funding Program	Project Description
Medium Diversion at White's Ditch	USACE		Medium diversion (5001 – 15,000 cfs) to provide freshwater, nutrients, and fine sediment to wetlands between Mississippi River and River aux Chenes ridges. Facilitate organic sediment deposition, improve biological productivity, and prevent further marsh deterioration. *Fully funded Phase 2 cost includes preliminary engineering and design.
Medium Diversion with Dedicated Dredging at Myrtle Grove	USACE		Authorized by WRDA 2007 as a sediment diversion between 2,500 and 15,000 cfs. Ongoing modeling effort to examine potential for modification of the WRDA authority for a larger sediment diversion to promote infilling of shallow open water areas through deposition and marsh expansion. *Fully funded Phase 2 cost taken from WRDA 2007 legislation.
Marsh Creation Near Freshwater Bayou			The purpose of this project is to create 96 acres of marsh southeast of intersection of Acadiana Canal and Freshwater Bayou.
Mississippi River Delta Management Strategic Planning	MMS		OCPR will coordinate the development of a strategic framework for feasibility evaluation of improved management of fresh water, nutrients, and sediment resources of the Lower Mississippi River, from the Old River Control Structure to Head of Passes, to better sustain its Deltaic Plain.
Mississippi River Reintroduction Into Bayou Lafourche			The goal of the project is to restore and protect the health of marshes in the Barataria and Terrebonne basins through reintroduction of sediment and nutrient laden Mississippi River water via Bayou Lafourche. This project was originally authorized on the 5th PPL as BA-25. This project was officially deauthorized by the Breaux Act Task Force in October 2007; however, engineering and design will be continued by the Department of Natural Resources using state funds.
Mississippi River Reintroduction Into Northwest Barataria Basin	EPA	CWPPRA	The goal of this project is to restore the natural hydrologic regime and add nutrients to adjacent swamp areas. The project will utilize a freshwater diversion/siphon from the Mississippi River to northwest Barataria Basin wetlands, with gapping of spoil banks and placement of culverts under LA Highway 20.
Mississippi River Sediment Delivery System - Bayou Dupont	EPA		The goal of this project is to create/restore 474 acres of brackish marsh by delivering via pipeline, dredged material from the Mississippi River to an adjacent area within the Barataria Basin, and planting marsh vegetation.

Project Name	Federal Sponsor	Funding Program	Project Description
Mississippi River Sediment Trap	USACE		This project was reauthorized on the 12th PPL to create emergent wetlands through the beneficial use of material dredged from a sediment trap located between miles 5 and 1 above Head of Passes in the Mississippi River. The proposed sediment trap would consist of an area dredged out of the riverbed that would force sediment deposition.
Modification of Caernarvon Diversion	USACE		Investigate modifying project's existing authorization (for salinity management) to enhance wetland creation and restoration. Identify and assess changes to project's operation to facilitate organic and sediment deposition, improve biological productivity, and prevent further deterioration of marshes. *Fully funded Phase 2 cost includes preliminary engineering and design.
Modification of Davis Pond Diversion	USACE		The purpose of this project is to investigate modifying project's existing authorization (for salinity management) to enhance wetland creation and restoration. Identify and assess changes to project's operation to facilitate organic and sediment deposition, improve biological productivity, and prevent further deterioration of marshes. *Fully funded Phase 2 cost includes preliminary engineering and design.
Morgan City Industrial Road	N/A		Located in Morgan City, St. Mary Parish, the project is a road alignment that begins at the First Street floodgate. The alignment will proceed along the unprotected side of the floodwall a distance of 1857 feet. And end at the Port of Morgan City's north gate. The project goal is to reduce the truck traffic through the residential neighborhoods by rerouting the traffic through the proposed realigned road. The preliminary project benefit is to provide more road access to the industrial facilities and the museum through the proposed new road, and decrease the traffic in the residential area.
Morgan City / St. Mary Flood Protection	N/A		The purpose of this project is to pre-clear the Bay Welsh disposal site adjacent to and east of the Houma Navigation Canal.

Project Name	Federal Sponsor	Funding Program	Project Description
Morganza to the Gulf of Mexico Hurricane Protection	N/A		This project aims to protect people and property as well as the remaining fragile marsh from hurricane storm surge in the vicinity of Houma, Louisiana. The area has been affected by an extreme deterioration of coastal marshes as a result of saltwater intrusion, land subsidence, and the lack of sediment deposits from the Mississippi River and its tributaries. This deterioration has led to increased hurricane and storm surge inundation. The area is also significantly affected by tides emanating from the Gulf of Mexico. The project was authorized by the Water Resources Development Act of 2007. The state has contributed funds from Surplus 2007, 2008, and 2009.
Move Existing Atchafalaya Water to Central Terrebonne	USFWS		This project is intended to reduce marsh loss through the improved distribution of excess freshwater seasonally available in the Gulf Intracoastal Waterway (GIWW). The project will benefit deteriorating marshes in central and/or eastern portions of the Terrebonne Basin.
Non-Rock Alternatives to Shoreline Protection Demo	NRCS		The intent of this demonstration project is to provide a funding mechanism to research, install, and monitor various shoreline protection alternatives in an area(s) of the state where physical, logistical and environmental limitations preclude the use of current adopted methods.
North Shore Hurricane / Flood Protection Plan	N/A		The objective of this project is to develop a hurricane protection plan for the North Shore.
North Lake Boudreaux Basin Freshwater Introduction and Hydrologic Management	USFWS	CWPPRA	The project objective is to seasonally introduce freshwater from the Houma Navigation Canal in order to reduce saltwater intrusion and promote vegetation diversity within the project area. Project plans include enlargement of a portion of Bayou Pelton, dredging of an outfall channel, installation of a major water control structure, building a bridge for Louisiana Highway 57 over the outfall canal, construction of water management structures, and a flood protection provision.
North Lake Mechant Landbridge Restoration	USFWS	CWPPRA	The project will help to maintain and restore the landbridge (Lake Mechant north shoreline and the Small Bayou LaPointe Ridge) which provides a hydrologic barrier between brackish and low-salinity habitats. Project features include marsh creation, the planting of smooth cordgrass on the shoreline, the construction various plugs, and repairing of a fixed-crest weir along Bayou Raccourci.

Project Name	Federal Sponsor	Funding Program	Project Description
Pass Chaland to Grand Bayou Pass Barrier Shoreline Restoration	NMFS	CWPPRA	This project will prevent the barrier island from breaching through the deposition of dredged material, the creation of tidal creeks and ponds, and vegetation plantings. This will provide a continued barrier to reduce wave and tidal energy, thereby protecting the mainland shoreline from continued erosion.
Penchant Basin Natural Resources Plan, Increment 1	NRCS	CWPPRA	The objective of the project is to combine the long-term realignment of the Penchant Basin hydrology with restoration and protection measures aimed at maintaining the physical integrity of the area during the transition toward greater riverine influence. The major problems in the project area include hydrologic alterations, interior marsh erosion, subsidence, saltwater intrusion, herbivory, and hurricane damages.
Periodic Introduction of Sediment and Nutrients at Selected Diversion Sites Demonstration	USACE		The demonstration project is intended to show the effectiveness of using a hydraulic pipeline dredge to provide increased sediment through a diversion structure or siphon. Monitoring of the project will determine not only the characteristics of the sediment input concentrations, but also the subsequent effects in the outfall area.
Port of Iberia Bridge Replacement- Port Road over Rodere Lateral	MMS		The project is located in Iberia Parish, and will aid the Port of Iberia in its day-to-day operations. This project will replace the bridge on Port Road over Rodere Lateral. The existing bridge is approximately 28 feet wide and 60 feet long. The Port of Iberia handles a substantial amount of OCS produced products and the large equipment used in transporting these products take a major toll on the port's bridges and roadways.
Port of Iberia Bridge Replacement- Port Road over Commercial Canal	MMS		The project is located in Iberia Parish, and will aid the Port of Iberia in its day to day operations. This project will replace the bridge on Port Road over Commercial Canal. The existing bridge is approximately 24 feet wide and 76 feet long. The Port of Iberia handles a substantial amount of OCS produced products and the large equipment used in transporting these products take a major toll on the ports bridges and roadways.

Project Name	Federal Sponsor	Funding Program	Project Description
Port of Iberia Bridge Replacement-David Dubois Road over Commercial Canal	MMS		The project is located in Iberia Parish, and will aid the Port of Iberia in its day to day operations. This project will replace the bridge on David Dubois Road over Commercial Canal. The existing bridge is approximately 24 feet wide by 70 feet long. The Port of Iberia handles a substantial amount of OCS produced products and the large equipment used in transporting these products takes a major toll on the port's bridges and roadways.
Port of Iberia Street Improvements – Unifab Road	MMS		The project is located in Iberia Parish, and will aid the Port of Iberia in its day-to-day operations. This project will patch and overlay 850 feet of Unifab Road. The Port of Iberia handles a substantial amount of OCS produced products and the large equipment used in transporting these products takes a major toll on the port's bridges and roadways.
Raccoon Island Shoreline Protection/Marsh Creation (Phase B)	NRCS	CWPPRA	The goal of this project is to protect the Raccoon Island rookery and seabird colonies from an encroaching shoreline by reducing the rate of erosion along the western end of the island and creating more land along the northern shoreline. This goal will be accomplished through the construction of eight additional segmented breakwaters and a terminal groin along the gulf side of the island, adjacent to the Raccoon Island Breakwaters Demonstration (TE-29) project. In addition, dredged material will be used to create marsh on the bay side of the island.
Raising of LA 23 at La Reussite	N/A		This project will raise LA Hwy. 23 to the elevation of the adjoining La Reussite Siphon guide levees, where the highway crosses those guide levees. LDOTD will perform the engineering in house and let contracts to complete the project.
River Reintroduction into Maurepas Swamp	EPA	CWPPRA	This project is intended to restore a natural hydrologic regime and increase nutrient inputs in cypress-tupelo swamp tracts south of Lake Maurepas. This will be accomplished through the diversion of Mississippi River water into an area of degraded swamp.
Riverine Sand Mining/Scofield Island Restoration	NMFS	CWPPRA	The goals of this project are to repair breaches and tidal inlets in the shoreline, reinforce the existing shoreline with sand, and increase the island width with back barrier marsh to increase island longevity. The project will create and nourish existing island habitat through the introduction of riverine sand and offshore fine sediment.

Project Name	Federal Sponsor	Funding Program	Project Description
Rockefeller Refuge Gulf Shoreline Stabilization	NMFS	CWPPRA	The project will address Rockefeller Refuge Gulf shoreline retreat, which averages approximately 31 feet per year with subsequent direct loss of saline marsh. The project would entail construction of a nearshore breakwater along the Gulf of Mexico shoreline, extending approximately from Beach Prong to Joseph Harbor.
Sabine Cycle 2	N/A		The purpose of this project is to cover the cost of marsh fill for the Sabine Refuge Marsh Creation, Cycle 2 Breaux Act project.
Sabine Refuge Marsh Creation, Cycles 4 & 5	USACE USFWS		The objective of this project is to strategically create marsh in large, open water areas to block the wind-induced introduction of saltwater. Additionally, it will increase nourishment in adjacent marshes while reducing open water fetch and erosion of marsh fringe. Cycle 4 if approved by the Task Force is expected to coincide with the FY 2011 maintenance dredging of the Calcasieu River Ship Channel.
Sediment Containment System for Marsh Creation Demonstration	NRCS	CWPPRA	The purpose of this project is to demonstrate the effectiveness of a sediment containment system to strategically define areas of accumulation and improve sediment retention in small and medium freshwater diversions as well as contain fluid material delivered via hydraulic dredging to create marsh.
Small Bayou Lafourche Reintroduction	N/A		Small diversion (less than 5000 cfs) to reintroduce flow from the Mississippi River into Bayou Lafourche. Provide freshwater, sediment and nutrients needed to reduce salinity, stimulate plant productivity, and reduce wetland loss between Bayous Lafourche and Terrebonne. Funds from the budget surplus of 2008 will be used for the state's cost- share requirement. *Construction cost taken from WRDA 2007 legislation.
Small Diversion at Convent / Blind River	USACE		Diversion of water from the Mississippi River into the Blind River to freshen Maurepas swamp and prevent further deterioration. The state is using surplus funds as part of the required cost-share for this project. *Fully funded Phase 2 cost includes preliminary engineering and design.
Small Diversion at Hope Canal	USACE		Small freshwater diversion (less than 5000 cfs) to introduce sediment and nutrients into Maurepas Swamp in order to facilitate organic deposition, improve biological productivity, and prevent further deterioration of the swamp. The state is using surplus funds as part of the required cost-share for this project. *Fully funded Phase 2 cost provided is the projected cost estimate.

Project Name	Federal Sponsor	Funding Program	Project Description
Ship Shoal: Whiskey West Flank Restoration	EPA	CWPPRA	This project is intended to rebuild dunes and a marsh platform on the west flank of Whiskey Island through the deposition of dredged material transported from Ship Shoal. This project will provide a barrier to reduce wave and tidal energy, thereby protecting mainland shoreline from continued erosion.
South Central Coastal Plan	N/A		This project will develop a feasibility study to determine coastal protection and restoration needs for Iberia, St. Mary, and St. Martin parishes.
South Grand Chenier Hydrologic Restoration Project	USFWS	CWPPRA	This project is intended to restore the Hog Bayou watershed hydrology through the use of dredged material to create two 200-acre cells that will stop saltwater intrusion into the project area. Freshwater, sediment, and nutrients from the Mermentau River will also be introduced into the project area at two separate locations.
South Lake DeCade Freshwater Introduction	NRCS	CWPPRA	This project will include the construction of a water control structure in the southern bank of Lake DeCade. This will increase the amount of Atchafalaya River water and sediment introduced into the marshes south of the lake. In addition, shoreline protection will be implemented adjacent to the proposed structure and a weir in Lapeyrouse Bayou will be removed.
South Pecan Island Freshwater Introduction	NMFS	CWPPRA	The goal of this project is to provide freshwater flow to 7,000 acres for at least 3 months per year and to create 98 acres of marsh. The project would be constructed to allow excess freshwater to drain, while preventing saltwater intrusion into the Lakes Sub-basin. The project would benefit approximately 7,005 acres of brackish marsh, submerged aquatic vegetation, and open water.
South Shore of The Pen Shoreline Protection and Marsh Creation	NRCS	CWPPRA	The goals of this project are to stop shoreline erosion and to create and nourish marsh located between The Pen and Barataria Bay.
Southwest Coastal Louisiana Feasibility Study	USACE		Phase 1 looked at coastal restoration and hurricane protection features developed for Planning Unit 4 from the Louisiana Coastal Protection and Restoration (LACPR) Draft Technical Report and evaluated them so that the most optimal features could be advanced to Phase 2 for further study. Phase 2 will move ahead with the most promising features for evaluation and comparison and conduct a Feasibility Study to recommend a tentative selected plan. The study area for the Southwest Coastal study includes Calcasieu, Cameron and Vermilion Parishes.

Project Name	Federal Sponsor	Funding Program	Project Description
South White Lake Shoreline Protection	USACE		The objective of this project is to reduce erosion along the southern White Lake shoreline through the construction of a foreshore rock dike. Marsh accretion and submerged aquatic vegetation habitat creation is expected to occur behind the structure due to occasional wave overwash and the reduction of turbidity in the interior open water areas.
St. Charles Parish West Bank Hurricane Protection Levee Phase 1 – Magnolia Ridge	N/A		This funding will be used to install two water control structures (Paradis Canal North and Paradis Canal South) in the Magnolia Ridge segment of the above project now under construction. The earthen works component of that levee segment is being constructed.
Rosethorne Tidal Protection	N/A		This project will provide flood protection improvements consisting of new earthen levees, approximately 8,010 linear feet of reinforced concrete floodwall and flood gates to 8.0 NAVD.
Southwest Louisiana Gulf Shoreline Nourishment and Protection	USACE	CWPPRA	The goal of this project is to nourish and protect approximately 685 acres and create 203 acres of marsh along the gulf shoreline by the end of the 20-year project life. Approximately 4.9 million cubic yards of sediment will be deposited parallel to 47,900 linear feet of gulf shoreline between Dewitt Canal and Constance Lake. The project would benefit approximately 1,244 acres of saline and brackish marsh and open gulf water.
Spanish Pass Diversion	USACE		The goal of this project is to create emergent marsh, to the maximum extent practicable, by diverting Mississippi River water and sediment from Grand Pass into open water receiving areas.
Terrebonne Basin Barrier Shoreline Restoration	USACE		The goals of this project are to restore Timbalier and Isles Dernieres barrier island chains and to reduce the current number of breaches and enlarge width and dune crest. *Fully funded Phase 2 cost includes preliminary engineering and design.
Terrebonne Bay Shore Protection Demonstration	USFWS		This demonstration project is intended to test several applications of concrete mats, A-Jacks®, and techniques for establishing shoreline oyster reefs for their ability to prevent shoreline erosion while encouraging oyster reef formation. The project design includes three 230 to 300 foot-long replicates of each treatment.

Project Name	Federal Sponsor	Funding Program	Project Description
Venice Ponds Marsh Creation and Crevasses	EPA	CWPPRA	The goals of the project are to create, maintain, nourish, and replenish existing deteriorating wetlands through dedicated dredging, hydrologic restoration, crevasse construction, and crevasse enhancement. The project would benefit approximately 1,944 acres of fresh marsh and open water. Approximately 511 acres of marsh would be created/protected over the 20-year project life.
Weeks Bay Marsh Creation and Shore Protection/Commercial Canal Freshwater Redirection	USACE	CWPPRA	The objective of this project is to stop shoreline and bank erosion. This objective will be achieved by the construction of a retention levee and channel plugs, dedicated placement of dredged material, re-vegetating critical areas, and armoring shore/bank areas with sheetpile revetment. In addition, a low-sill weir will be placed across Commercial Canal to reduce tidal energy and redirect Atchafalaya River water.
West Bank and Vicinity	USACE		The project will reduce the risk of storm surges from Lake Cataouatche, Lake Salvador, and other waterways leading to the Gulf of Mexico. The original project included 22 miles of earthen levee and 2 miles of floodwalls extending from the Harvey Canal to the V-levee near the Jean Lafitte National Historical Park and back up to the town of Westwego. The Lake Cataouatche area eliminated the west-side closure in Westwego, and added about 10 miles of levee and 2 miles of floodwalls to the project. The East of Harvey Canal area includes a sector floodgate in the Harvey Canal just below Lapalco Boulevard and about 25 miles of levee and 5 miles of floodwalls, including enlargement of the federal levees along the Algiers Canal. This project will be partially funded by state Surplus 2008 funds.
West Belle Pass Barrier Headland Restoration	NMFS	CWPPRA	The goals of this project are to reestablish the eroded West Belle Pass headland via dune and marsh creation and to prevent increased erosion along the adjacent bay shoreline. The project will create a continuous, substantial headland and marsh platform over approximately a 9,300-foot linear distance, construct 120 acres of beach/dune habitat, and construct 150 acres of marsh habitat. The project would benefit about 389 acres of dune, beach, and saline marsh over the 20-year project life.
West Cameron Port	N/A		The purpose of this project is to beneficially use 2 million cubic yards of dredged material from the West Cameron Port in the Oyster Bayou area west of the Calcasieu Ship Channel.

Project Name	Federal Sponsor	Funding Program	Project Description
West Lake Boudreaux Shoreline Protection and Marsh Creation	USFWS		This project is intended to protect the shoreline from erosion due to direct exposure to lake wave energy and to restore interior marsh lost from subsidence and saltwater intrusion. This objective will be accomplished through the construction of a rock dike to stop erosion along the western shoreline of Lake Boudreaux and the creation of marsh habitat through the deposition of dredged material.
West Pointe a la Hache Marsh Creation	NRCS	CWPPRA	The goal of this project is to create/nourish approximately 352 acres of marsh using sediment hydraulically dredged from the Mississippi River and pumped via pipeline to the project area.
West Pointe a la Hache Outfall Management	NRCS	CWPPRA	This project provides for management of the West Pointe a la Hache siphon outfall area to maximize the retention of freshwater, nutrients, and sediment within interior brackish marshes to counteract saltwater intrusion and wetland loss. This project utilizes water control structures to divert water from the main distributary channels to secondary channels and allow more efficient flow over the marsh.
Whiskey Island Back Barrier Marsh Creation	EPA	CWPPRA	The goal of this project is to enhance the structural function of Whiskey Island as a protective barrier for back bay and inland areas. Dredged material will be deposited on the island's back barrier area to widen the marsh platform on the central and eastern portions of Whiskey Island.
White Ditch Resurrection and Outfall Management	NRCS	CWPPRA	The goal of this project is to reduce the rate of marsh loss through the introduction of freshwater, nutrients, and sediment into interior marshes. This will be accomplished through the rehabilitation of the existing siphon at White Ditch and the installation of a second siphon of similar capacity. The project's proposed features also include installing a gated plug in the outfall channel approximately two miles below the siphon to allow water flow into the interior marshes.
Yankee Pond Polder Demonstration	N/A		The Yankee Pond Polder Project is a cooperative endeavor with the National Park Service and others to aid coastal restoration. The objective of the project is to return open water into marshland by creating conditions for natural vegetation development. The proposed location is Yankee Pond, a pond of approximately 100 acres in Jean Lafitte National Park.

Project Name	Federal Sponsor	Funding Program	Project Description
Bald Cypress / Tupelo Coastal Forest Protection	MMS		The project location is within Livingston Parish, in the Maurepas Swamp of southeast Louisiana. The project area includes 1,762 contiguous acres of coastal wetland forest, specifically bald cypress-tupelo swamp, with roughly 200 acres fronting the western edge of Lake Maurepas.
Blind River Freshwater Diversion Property Purchase	MMS		The St. James Parish Council intends to purchase a tract of land extending from the Mississippi River to the Parish Canal in order to secure the required property for a future freshwater diversion. This project will purchase approximately 68 acres of existing agriculture and wetland areas in order to accommodate a proposed freshwater siphon project.
East Bank Wastewater Assimilation Plant	MMS		This project will construct a wetland assimilation treatment plant which will collect wastewater from secondary treatment modules in Grand Point, Louisiana. It will pump the wastewater to the pond area that will discharge into seven acres of forested wetland areas that will directly affect 2,400 acres of wetlands.
East LaBranche Shoreline Protection	MMS		This project involves the continuation of rock shoreline protection project on the south shore of Lake Pontchartrain in St. Charles Parish. The project will consist of installing approximately 15,300 linear feet of rock dike.
French Property Preservation Project	MMS		This project includes the acquisition of a 40 acre parcel composed of pine trees and mixed hardwoods with inclusion savannas, which lies between the I-12 Service Road and Bayou Liberty in Slidell, Louisiana. This project is to educate the public about the value of wetlands. Invasive plant species will be removed and nest boxes will be installed.
Green Property Preservation Project	MMS		This project includes the acquisition of a 27.2 acre parcel to preserve a sensitive wetland composed of pristine cypress swamp and bottomland hardwoods from future commercial or residential development. It is located between Bayou Lacombe and the Tammany Trace linear park south of US 190 in Lacombe, Louisiana within the Bayou Lacombe watershed.

Project Name	Federal Sponsor	Funding Program	Project Description
Hydrologic Restoration in the West Lake Maurepas Swamps	MMS		The Amite River is located southwest of Lake Maurepas and east of I-10. The objective of this project is to allow floodwaters to introduce additional fresh water, nutrients, and sediment into the western Maurepas Swamp. The exchange of flow would occur during flood events on the river and from runoff of localized rainfall events, and would in turn provide nutrients and sediment to facilitate organic sediment deposition in the swamp, some fluctuation of water levels, improve biological productivity, and prevent further swamp deterioration.
Lake Lery Rim Re-Establishment and Marsh Creation	MMS		The project proposes to dredge a waterway through Lake Lery historically used for navigation. The waterway is located approximately along the St. Bernard and Plaquemines Parish line. The project will utilize the dredged material and borrow areas in Lake Lery to create marsh in the open water areas north and east of the lake. It will also re-establish the lake rim by armoring the northern and eastern shoreline of Lake Lery using a rock dike.
Lake Pontchartrain Shoreline Protection	MMS		The project is located in Tangipahoa Parish between Pass Manchac and the mouth of the Tangipahoa River. The goal of the proposed project is to construct approximately 12,000 linear feet of foreshore protection.
Manchac Shoreline Protection Project	MMS		The proposed project will consist of capping 21,500 linear feet of USACE existing breakwaters and filling in the gaps to create a continuous structure. The project is located in St. John the Baptist Parish near the town of Manchac, near the Manchac Wildlife Management area and Manchac Pass.
Mandeville Aquatic Ecosystem Restoration Project	MMS		This project will include an upgrade of the existing wastewater treatment plant and construction of a discharge structure and piping system for wetland assimilation. It will construct 2.5 miles of force main for disbursement of treated effluent into 1.7 square miles of uninhabited wetland adjacent to the western border of the City of Mandeville.
Northshore Beach Marsh Creation / Restoration	MMS		This project is located in the Pontchartrain Basin in St. Tammany Parish. Project features include approximately 600 acres of marsh creation via hydraulic dredging and placement of 2 million cubic yards of material. The likely borrow location is Lake Pontchartrain, the Highway 11 Canal, and Bayou Bonfouca and associated canals. The objectives of this project are to create approximately 600 acres of intermediate marsh, reduce erosion of adjacent interior marshes, and maintain and support the integrity of the Lake Pontchartrain shoreline.

Project Name	Federal Sponsor	Funding Program	Project Description
Reserve Relief Canal Shoreline Protection Project	MMS		The proposed project will consist of approximately 1,400 linear feet of shoreline protection extending in an easterly and westerly direction in St. John the Baptist Parish, where the Reserve Relieve Canal enters Lake Maurepas and entrance protection lining. The proposed feature consists of a foreshore rock dike with gaps for fish and public access to the lake shoreline.
Update of St. Bernard Parish Coastal Zone Management Plan	MMS		Funds will be used so that the St. Bernard Parish Coastal Zone Management Plan may be updated.
Waterline Booster Pump Station, East Bank	MMS		The project would construct a waterline booster pump along LA Highway 44 in Convent, Louisiana in St. James Parish. The construction includes housing a 40 hp motor with a 1,100 gallon/minute high-service pump and connecting to the existing 10 inch PVC waterline at two locations in order to establish a loop and by-pass system. The station will have a metal building with a concrete floor to enclose the pump and electrical equipment.
West LaBranche Shoreline Protection	MMS		This project involves the continuation of the rock shoreline protection project on the south shore of Lake Pontchartrain in St. Charles Parish. The project will consist of installing approximately 2,150 linear feet of rock dike on the existing shoreline and the construction of a 130-foot-long timber pile bridge at the mouth of Bayou LaBranche.
Bayside Segmented Breakwaters at Grand Isle	MMS		The project is located in Jefferson Parish, Louisiana, along the bay side of Grand Isle, Louisiana. The purpose of this project is to reduce erosion on the bay side of Grand Isle. Twenty-four 300 foot breakwaters (approximately 1.5 miles) will be constructed on the back-bay side of Grand Isle.
Baytree Freshwater Diversion Property Purchase	MMS		The St. James Parish Council intends to purchase a tract of land extending from the Mississippi River to the Parish Canal in order to secure the required property for a future freshwater diversion. This project is proposed to purchase approximately 63 acres of existing agriculture and wetland areas in order to accommodate a proposed freshwater siphon project.

Project Name	Federal Sponsor	Funding Program	Project Description
Fifi Island Restoration Extension	MMS		The project is located at the eastern tip of Fifi Island, adjacent to Bayou Rigaud, on the northern side of Grand Isle. The project would provide approximately 2,200 linear feet of rock dike protection and create approximately 6 acres of marsh. Additionally, the project will provide protection to the bay side of Grand Isle.
Goose Bayou Ridge Creation and Shoreline Protection	MMS		This project located in Lafitte, Jefferson Parish Louisiana, will improve shoreline protection by creating over 8,000 linear feet of additional shoreline through the use sediment from the Mississippi River, and vegetative planting, along the west side of Goose Bayou. This project will help establish a wetland ridge which will function as habitat for native species of plants and animals.
Jump Basin Dredging and Marsh Creation	MMS		The proposed project is located in the Venice area of Plaquemines Parish, and more specifically in the Jump Basin Marina and along the west side of Tidewater Road. The proposed project would use material dredged from the marina to create marsh on the west side of Tidewater Road. Based on preliminary surveys, it is predicted that approximately 65,000 cubic yards of material could be dredged from the marina. Based on water depths in the target area, an initial estimate of 4 to 7 acres of marsh could be created.
Lower Lafitte Shoreline Stabilization at Bayou Rigolettes	MMS		This project located within Lafitte, Louisiana will help protect the integrity of wetlands within the Barataria Basin and reduce saltwater intrusion and deterioration of interior marsh. Over 10,600 linear feet of foreshore rock revetment will be constructed, along with a water control structure in order to protect the interior marshes.
Maritime Forest Ridge Restoration	MMS		Distributary ridges and chenier ridges along the coast of Louisiana are disappearing at an alarming rate. Projects such as these help establish ridge habitats and associated wetlands which are extremely important for millions of migrating Neo-tropical songbirds that cross the Gulf of Mexico, in addition to providing wetland habitat for coastal plant and animal species.
Northwest Little Lake Marsh Creation and Enhancement	MMS		This project, located in Lafourche Parish, will use dedicated dredge material to create 30-40 acres of wetlands in interior open water bodies (enhancing 70-100 acres of marsh) and plant 2 rows of smooth cordgrass along approx. 7,500 linear feet of the lake shoreline.

Project Name	Federal Sponsor	Funding Program	Project Description
Small Dredge Program	MMS		This program involves the use of a small dredge to hydraulically dredge borrow canals and other open water areas to restore approximately 175 acres of marsh apron along levees, cheniers and roadways in Lafourche Parish.
Tidewater Road Flood Protection	MMS		Tidewater Road is subject to heavy inundation from directional winds that elevate tides over the roadway. Wetland loss in the area is severe, and along much of Tidewater Road's length there is open water in canals and ponds that abut the road shoulder. Tidewater Road is an important access point for the oil and gas industry. This project also proposes to create flood protection along the entire length of Tidewater Road.
Update of the Plaquemines Parish Coastal Management Plan	MMS		Funds will be allocated to the parish so that they may update their coastal management plan.
Waterline Booster Pump Station, West Bank	MMS		This project would construct a waterline booster pump station in Welcome, Louisiana. The proposed site is located near Section 43, T-11-S, R-3-E, along LA Highway 18. The proposed construction includes the installation of a 40 hp electric motor with a 1,100 gpm high-service pump. The booster pump will be built along the existing waterline and be tied in at two places in order to establish a loop and by-pass system with 10-inch in-line valves. The station will a have metal building with a concrete floor to fully enclose and protect the pump and electrical equipment.
West Bank Wastewater Assimilation Plant	MMS		The St. James Parish Council plans to construct a wetland assimilation treatment plant on property owned by the Parish Council in Vacherie, Louisiana. The plant will collect wastewater from secondary treatment modules and pump the wastewater to a sediment pond area. The nine acre pond will discharge into 2,400 acres of forested wetland areas that will directly affect the swamp's composition and structure.
Attakapas Canal Hydrologic Restoration	MMS		This project will remove excessive accumulated sediment from Attakapas Canal at its intersection with Lake Verret in Assumption Parish for a distance of approximately 2,000 feet improving water quality, fisheries habitat, and sport fishing access. The removed sediment will be beneficially used to restore approximately 12 acres of bald cypress habitat along the shoreline of Lake Verret. As part of the project, cypress trees will be planted at the rate of 302 trees per restored acre.

Project Name	Federal Sponsor	Funding Program	Project Description
Falgout Canal Freshwater Enhancement (Phase 1)	MMS		The proposed project area is located in the Terrebonne Basin in the marshes adjacent to Falgout Canal, between Bayou Dularge and the Houma Navigation Canal (HNC). This project would include construction/modification of an inlet structure at a site located on the HNC north of Falgout Canal, modeling of the basin, along with channel improvements, as necessary, to improve efficiency of freshwater flow within the basin area.
Houma Navigation Lock	MMS		The Houma Navigational Canal Lock Complex is a key component in the fight to protect and restore the Terrebonne Basin by reducing saltwater intrusion and maximize the use of very limited freshwater from the Atchafalaya River. As an added benefit, this Morganza project feature will provide flood protection and accommodate navigation in a synergistic approach of protecting the ecosystem and supporting regional infrastructure.
Lake Verret Swamp and Lake Rim Restoration	MMS		Located in west-central Assumption Parish, Lake Verret accumulates sediment in its shallow areas. The proposed project will use a hydraulic dredge to remove material that will be used beneficially. The project objective is to remove accumulated sediment from Lake Verret and improve the condition of 40 acres of deteriorating lake rim and adjacent swamp habitat.
Bayou Amy Boat Launch and Education Pavilion	MMS		This project located in St. Martin Parish will construct an open-air pavilion and a 1,235 foot long nature trail adjacent to an existing wilderness canoe trail. This project will serve as a gateway to the Atchafalaya Basin providing public access, information and educational opportunities. It will ultimately tie into Lake Fausse Point State Park.
Beau Bayou Water Quality and Sediment Reducation	MMS		This project consists of a combination of multiple actions including dredging, gapping and creating inline-sediment traps in and adjacent to Beau Bayou in St. Martin Parish. This will correct existing sediment overload and lack of oxygen (hypoxia) improving fisheries habitat as well as the overall health of the system.
Burns Point Recreation Park Improvements	MMS		This project in St. Mary Parish at the Burns Point Recreation Park adjacent to East Cote Blanche Bay will provide a 600 foot sheet bulkhead and walkway along the park's shoreline. This will stop the rapid erosion that is occurring at the park's shoreline and provide access for inspection.

Project Name	Federal Sponsor	Funding Program	Project Description
CIAP Vegetative	MMS		This project will conduct annual vegetative plantings along approximately 102,000 linear feet of the shorelines of Vermilion Bay, and other areas, that have proven to be sites where plantings might help establish and solidify the shoreline.
Chenier au Tigre Cement Bag Extension	MMS		This project will install 1,000 feet of cement bags as a breakwater at Chenier au Tigre in Vermilion Parish to slow erosion.
Deer Island Pass Realignment	MMS		Located in St. Mary Parish, this project near the mouth of Deer Island Bayou will dredge a 5,280 foot long, 280 foot wide channel to improve water and sediment flow into northeast Atchafalaya Bay. The dredged material will be beneficially used to reduce shoreline erosion and to create about 30 acres of marsh.
Four Mile Canal Hydrologic Restoration	MMS		This project will design a rock plug with a barge bay that will reduce the cross section of the Four Mile Canal to the needed navigation width and depth and help move fresh water through Onion Bayou, the Vermilion River, Schooner Bayou, and Bayou Chene. This project will begin to restore the historic hydrologic flows that existed prior to the boat wake induced erosion that has occurred along Four Mile Canal.
Henry Hub Access Improvements-Charlie Field Road Bridge Replacement	MMS		This project will replace an existing three span timber bridge with a four span concrete deck bridge for the Charlie Field Road Bridge across a tributary of Bayou Tigre. The bridge is located approximately 2,300 feet south of LA Hwy. 14, in eastern Vermilion Parish.
Henry Hub Access Improvements-Charlie Field Road Improvements	MMS		This project provides for the widening and reconstruction of Charlie Field Road, a vital link between LA 14 and the Henry Hub, from LA Hwy. 14 to LA Hwy. 331 in eastern Vermilion Parish. The project will widen the existing 18-foot wide roadway to a 20-foot surface for approximately 4,100 feet to provide room for the truck traffic to utilize this stretch of the roadway to access the Henry Hub.
Henry Hub Access Improvements-Highway 331 Realignment	MMS		This project will realign approximately 2,000 linear feet of LA Hwy. 331, at a location approximately 3 miles south of LA Hwy.14. This segment of the roadway has a reverse curve that represents a safety hazard for traffic traveling this highway to the Henry Hub.

Project Name	Federal Sponsor	Funding Program	Project Description
Hydrologic Restoration at Little Bayou Chene	MMS		This project is located along the eastern edge of the GIWW at the location of Bayou Chene at the entrance to Little Vermilion Bay. This project will design a rock plug with a barge bay to reduce the cross section of Bayou Chene by approximately 80%, to the depth and width required for navigation interests. Appropriate navigation lighting or signage will be included in the project as required by the US Coast Guard.
Intracoastal City Street Improvements	MMS		This project provides for the reconstruction of several roadways in the Intracoastal City area to mitigate the damage caused by heavy oilfield support truck traffic over the years. The streets to be improved are as follows: Offshore Road (4,700 linear feet), M. I. Liquid Road (850 linear feet), Barge Road (1,450 linear feet), and Teal Road (1,200 linear feet).
Lake Sand Terracing	MMS		The project is located in Iberia Parish on the Marsh Island State Wildlife Refuge, and will construct approximately 55 acres of shallow bay bottom terraces planted with native vegetation. The construction of the terraces will result in the direct creation of 34 acres of marsh and it is anticipated that construction of the terraces will result in a 50% reduction in the erosion of the neighboring shoreline.
Lake Torn / Lake Michael Terracing	MMS		The project is located in Iberia Parish on the Marsh Island State Wildlife Refuge, and will construct approximately 55 acres of shallow bay bottom terraces planted with native vegetation. The construction of the terraces will result in the direct creation of 55 acres of marsh and it is anticipated that construction of the terraces will result in a 50% reduction in the erosion of the neighboring shoreline.
Oyster Reef Parallel to Cheniere au Tigre	MMS		This project will create a one mile oyster reef 1,300 feet from shore by using approved available materials. Oyster spat are plentiful in this area; therefore, creating this base will establish a living sustainable reef. This project will reduce the shoreline loss rate by half. It will slow down wave energy, attract fish and shellfish habitat, slow coastal erosion, and increase recreational fishing opportunities.
Planning Assistance and Administration (St. Mary Parish)	MMS		This project will provide necessary financial assistance to St. Mary Parish Government to manage and implement the CIAP program.

Project Name	Federal Sponsor	Funding Program	Project Description
Point Chevreuil Shoreline Protection	MMS		The project is located in Region 3, Atchafalaya River Basin, St. Mary Parish, along the southeastern shoreline of East Cote Blanche Bay, around Point Chevreuil and the northwestern shoreline of Atchafalaya Bay. The eroding shoreline was caused by the open water fetch and resulting wave energy from East Cote Blanche and Atchafalaya Bays. Project features will protect the natural ridge functions of the Bayou Sale Ridge and protect the adjacent marshes.
Prien Point Reef Extension	MMS		This project consists of creating approximately 5,000 linear feet of oyster reef by the Louisiana Wetlands Association along the Redfish Point shoreline in Vermilion Bay, using clean graded recycled materials. These reefs will afford the shoreline more protection and improve fish and shellfish habitat within the Acadiana Bays region.
Shoreline Protection and Marsh Creation at Tiger Point	MMS		This project will install 1,500 feet of cement bags at Tiger Point in Vermilion Parish to slow erosion rates by half.
Shoreline Protection on Southwest Point at Southwest Pass	MMS		This project is located in Vermilion Parish. The goal of the project is to armor the shoreline via 8,759 linear feet of onshore revetment for the south shoreline of Vermilion Bay at Southwest Point. The funds allocated in the current project would be used to initiate surveying, geotechnical investigation, engineering, design and permit development so that when additional funds become available this project will be able to proceed to construction in a more-timely manner.
Stephensville Wastewater Assimilation and Facility Restoration	MMS		This project will include an upgrade of the existing wastewater treatment plant infrastructure and construction of a discharge structure and piping system into the adjacent wetlands for wetland assimilation. Stephensville's wastewater facility is located in Stephensville along Bayou Milhomme in Lower St. Martin Parish.
Thorguson Road Improvements	MMS		The project is located in Berwick and extends to Morgan City in St. Mary Parish. This project will upgrade Thorguson Road from Hwy 90 to the River Road, as a result it, the project will increase capacity, and improve safety and efficiency during normal operations. The road improvement feature includes the widening of the existing road. The preliminary project benefit is to provide improved traffic flow and safety while increasing roadway access to the industrial and commercial facilities located in Berwick, Louisiana.

Project Name	Federal Sponsor	Funding Program	Project Description
Vermilion Bay Shoreline Restoration	MMS		The project is located along the Vermilion Bay Shoreline south of Tigre Lagoon; it will establish approx. 8,300 linear feet of shoreline using the wave dampening structure determined to be most feasible. These structures will also allow for sediment trapping and accretion.
Vermilion Parish CZM Planning and Development	MMS		Funds will be available to assist Vermilion Parish in improvements to the Coastal Zone Management plan for the parish.
Weeks Bay / Commercial Canal Marsh Creation and Shoreline Protection	MMS		Feasibility Study of methods of marsh creation to build landmass and create vegetated wetlands. Project will evaluate various methods to create a sediment deposition field and protect the existing shoreline. This will enhance natural processes to create landmass between Weeks Bay and the GIWW and protect it.
Bank Stabilization: Bugas Cut to Kelso Bayou	MMS		This project will provide the engineering and design in order to continue the construction of approximately two miles of rip-rap dike from Dugas Landing to Kelso Bayou and reclaim eroded channel bank utilizing spoil material from dredging activities when more funding becomes available to the parish.
Black Lake Ecosystem Restoration	MMS		Creation of approximately 200 acres marsh through beneficial use of dredged material from the Calcasieu Ship Channel.
CIAP- Clear Marais Bank Protection	MMS		The project is located north of the Gulf Intracoastal Waterway (GIWW) approximately 10 miles northwest of Hackberry in Calcasieu Parish, Louisiana. The goal of this project is to extend the rock armored shoreline stabilization by one mile adjacent to the GIWW to prevent continued erosion of the GIWW levee and to prevent the encroachment of the GIWW into the marshes north.
East Little Pecan Bayou Restoration	MMS		This project is located along Little Pecan Bayou in the south central portion of Cameron Parish. Project features include the installation of one bulkhead with four 48 inch water control structures at the location of an existing plug. The objective of the proposed project is to repair the water control structures so that pre-Hurricane Rita salinity and water levels can be restored to approximately 1,500 acres of marsh.

Project Name	Federal Sponsor	Funding Program	Project Description
Horseshoe Lake Marsh Restoration	MMS		The project is a 1,200 acre marsh restoration/protection project located in Calcasieu Parish, Louisiana, approximately 3.0 miles northwest of Hackberry. This project proposes four different components: 1. Two water control structures; 2. Four miles of new levee construction; 3. Repair of 1 mile of existing levee on the eastern and western boundaries; and 4. Placement of approximately four miles of rip rap rock dike along the Gulf Intracoastal Waterway (GIWW).
Mermentau Ship Channel Sediment By-Pass	MMS		The project proposes to rebuild 75 to 100 acres of gulf shoreline at Hackberry Beach by moving sediment from the east side of the Mermentau Pass to the west via a hydraulic dredge. The project area is located along the Gulf of Mexico shoreline at the mouth of the Mermentau Ship Channel, south of Grand Chenier.
North Mermentau Restoration	MMS		This project will replace 12 existing water control structures that are not currently functioning as designed and also refurbish 1.5 miles of adjacent levees. Cameron Parish will purchase the structures that will be installed by the local gravity drainage district. The objective is to restore the pre-Hurricane Rita salinity and water levels to approximately 10,000 acres of marsh.
Rabbit Island	MMS		The project is located in the Calcasieu-Sabine Basin, in the West Cove of Calcasieu Lake. The goal of the project is to restore approximately 200 acres of pelican nesting and marsh habitat to Rabbit Island by adding sediment, through the beneficial use of sediment dredged from the Calcasieu Ship Channel, and 2,500 linear feet of small limestone shoreline protection to the west corner of Rabbit Island.
Shoreline Protection at Intracoastal Park	MMS		This is a two phase project that is located on the south side of the Gulf Intracoastal Waterway at LA Highway 27 south. The goal of the project is to restore the existing rock shoreline protection and stabilization for approximately 1,000 feet by placing cellular concrete block revetment along the existing shoreline.
South GIWW Restoration	MMS		This project features include the relocation of two existing water control structures (48 inch culverts) that are currently not functioning as designed; the installation of a new water control structure (two 36 inch culverts); and the refurbishment of three miles of adjacent levees.

Project Name	Federal Sponsor	Funding Program	Project Description
South Little Pecan Bayou Restoration	MMS		This proposal refers to the Chenier Plain portion of Coast 2050, Region 4, Little Pecan mapping unit. Project features include the replacement of three existing water control structures (three 4 inch culverts) that are currently not functioning as designed, one new water control structure (that includes three 48 inch culverts), and the refurbishment of portions of three miles of existing levees (adding in some locations 2 feet of material to return the levees to +3 feet NAVD).
West Big Burn Bridge Restoration	MMS		This proposal refers to the Chenier Plain portion of the Coast 2050, Region 4, Big Burn mapping unit. Project features include the replacement of one existing water control structure (three 8-foot bays) that is currently not functioning as designed.
New Orleans to Venice	USACE		The project straddles the Mississippi River in Plaquemines Parish. On the east bank, the project extends 16 miles on the back levee from Phoenix (located 28 miles southeast of New Orleans) down to Bohemia, Louisiana. On the west bank it extends 34 miles from St. Jude (located 39 miles southeast of New Orleans) to Venice, Louisiana, on the back levee and on the mainline levee. (Mainline levees typically run parallel to the channel, and back levees, or "setback" levees, usually serve as a backup to an existing levee that has become endangered due to such actions as river migration or erosion.)
Storm-Proofing of Interior Pumping Stations- Jefferson and Orleans Parish	USACE		Addition of features to stormproof interior pump stations in Orleans and Jefferson Parish.
Southeast Louisiana Urban Flood Control Project (SELA)	USACE		The purpose of the project is to reduce damages due to rainfall flooding in Orleans, Jefferson, and St. Tammany Parishes. In Jefferson Parish, 41 contracts have been awarded to date, with 31 completed. In Orleans Parish, nine contracts have been awarded, with eight having been completed. Overall, the currently scheduled work in Orleans and Jefferson Parishes is about 60 percent complete and should be finished in 2016, if funding is made available. The St. Tammany work is still unscheduled. The Corps is working with the parish administration to complete a study of the W-14 watershed in Slidell and to develop a plan for a parish-wide study.

Project Name	Federal Sponsor	Funding Program	Project Description
Permanent Closure of Canals and Pumps	USACE		The proposed action consists of a new permanent pump station and closure (i.e. gates) at or near the mouth of each of the outfall canals operating in series with the existing Sewerage and Water Board of New Orleans (SWBNO) pump stations (PS). The pumping capacity at 17th Street would fall between the range of 10,500 and 12,500 cfs. The pumping capacity at Orleans Avenue would be 2,700 cfs. The pumping capacity at London Avenue would fall between the range of 8,000 and 9,000 cfs. Under normal conditions, the flow from the canals would discharge through open gates directly into Lake Pontchartrain without having to operate the new pumping station. During those events where the combination of storm surge from Lake Pontchartrain and flow from the existing SWBNO pump stations could create a condition where the safe water elevation in the canals is exceeded, the gates would be closed and the new pump stations operated.
West Shore Lake Pontchartrain	USACE		This project is in the Feasibility Study Phase. A public Scoping meeting was held in January of 2009 and data collection began in the summer of 2009. The project is expected to provide hurricane protection to existing development in the LaPlace-Reserve-Garyville area and allow for projected future development. Protection will be provided from the West Guide Levee of the Bonnet Carre Floodway westward to the Hope Canal in the Garyville community, and will include protection of portions of I-10, I-55 and US 51, designated hurricane evacuation routes for this area and the New Orleans Metropolitan area.

Source: OCPR Website and OCPR FY 2011 Annual Plan

Appendix D.2

Drought

Nature of the Hazard

Drought impacts can be classified as meteorological, hydrologic, agricultural, and socioeconomic. Table D-3 below presents definitions for these types of droughts.

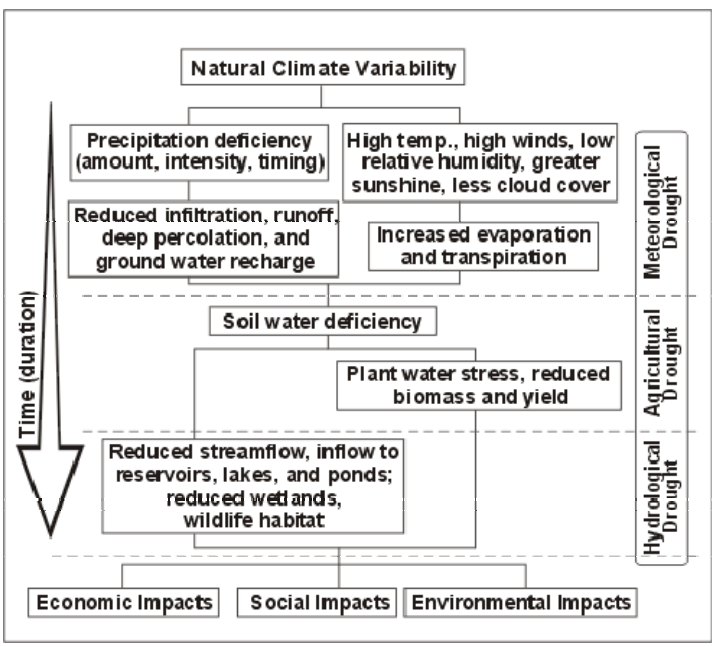
Table D-3 Drought Classification Definitions

Term	Definition
Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on streamflows and reservoir, lake, and groundwater levels.
Agricultural Drought	Soil moisture deficiencies relative to water demands of plant life, usually crops.
Socioeconomic Drought	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Source: "Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy," FEMA

According to the National Drought Mitigation Center these types of drought impacts can be viewed as a sequence, shown in Figure D-1:

Figure D-1: Types of Drought Impacts



Source: National Drought Mitigation Center, www.drought.unl.edu

Louisiana has experienced occasional drought conditions. Northern parishes, especially, have experienced agricultural droughts, leading to severe soil moisture decreases that have had serious consequences for crop production. Additionally, The Mississippi and Atchafalaya Rivers are dependent upon rain that falls

north of the state; therefore, droughts in other parts of the country can significantly reduce the flow of these rivers.

Disaster History

The 1988 drought in the upper Midwest and High Plains resulted in record low river stages in the lower Mississippi, even though rainfall in Louisiana was above normal for that year. Waterway traffic along the Mississippi and Atchafalaya Rivers was brought to a near-standstill for several weeks, and water supplies for several river-dependent parishes were threatened by low flows and salt-water intrusion.

Historical review indicates that a significant relationship exists between southern Louisiana precipitation and La Niña weather patterns. La Niña, characterized by unusually cold ocean temperatures in the Pacific, can bring abnormally warm and dry weather conditions to Louisiana. For example, during the mid-1998 to 2000 period, the state shifted to a drier weather pattern. The year 2000 was the driest winter in over 100 years. During about 80 percent of past significant La Niña occurrences, winter and spring rainfall have been below normal.

A significant drought event occurred in October 2005 across Northwest Louisiana, leading to increased wildfire risk and causing Shreveport to search for an alternate water supply source. The drought also impacted much of Texas and Arkansas and was classified as an Extreme Drought.

The drought conditions remained through much of 2006. Table D-4 shows drought impacts by sector from 1995 through 2009.

Table D-4: Reported Drought Impacts

Year	Agriculture	Fire	Water/ Energy	Environment	Social	Other
1995	0	0	0	0	0	0
1996	1	0	0	0	0	0
1997	0	0	0	0	0	0
1998	4	0	1	1	0	6
1999	0	0	1	1	0	0
2000	4	1	0	2	1	0
2001	0	0	0	1	0	0
2002	0	0	0	0	0	1
2003	0	0	0	1	0	0
2004	0	0	0	1	0	0
2005	9	3	7	3	2	2
2006	10	9	11	3	4	6
2007	1	0	1	1	1	4
2008	1	2	0	0	1	1
2009	6	3	1	1	0	6

Source: Drought Impact Reporter, National Drought Mitigation Center, www.drought.unl.edu

According to the National Oceanic and Atmospheric Administration (NOAA) National Climatic and Data Center (NCDC), almost all stations in Louisiana reported less than 50% of the monthly normal precipitation in June 2009. The drought pattern in the southern region of the United States noticeably changed from May. Unseasonably high temperatures compounded this dryness.Table D-5 depicts the most recent moisture and drought status.

NCDC reported that the Baton Rouge area was one of the driest locations in the region. According to the ThreadEx station in Baton Rouge, a total of 0.56 inches (14 mm) of precipitation was recorded for June 2009, making it the sixth driest June on record (1892-2009). ThreadEx, which stands for Threaded Extremes, takes the maximum and minimum temperature, and the daily total precipitation recorded at 268 National Weather Service Automated Surface Observing Stations (ASOS) across the United States and pieces them together to create a single, long-term set of daily weather information. Some of the climate records date as far back as 1857.

Map D-1 shows the number of recorded impacts on agriculture as reported to the National Drought Mitigation Center. Statistics are also available regarding the effects on water/energy, environmental resources, fire incidents, and social consequences.

Table D-5: Statewide Precipitation Amounts 2008-2009 and Relative Ranks for Louisiana 1892-2009

Period	Length (months)	Amount	Rank[1]
June 2009	1	1.59"	6th driest - 110th wettest
May-June 2009	2	6.45"	21st driest - 95th wettest
April-June 2009	3	10.88"	28th driest - 88th wettest
March-June 2009	4	17.74"	56th driest - 60th wettest
February-June 2009	5	20.00"	34th driest - 82nd wettest
January-June 2009	6	22.62"	19th driest - 97th wettest
December-June 2008-09	7	27.95"	24th driest - 91st wettest
November-June 2008-09	8	31.76"	25th driest - 90th wettest
October-June 2008-09	9	33.28"	12th driest - 103rd wettest
September-June 2008-09	10	42.52"	39th driest - 76th wettest
August-June 2008-09	11	49.78"	48th driest - 67th wettest
July-June 2008-09	12	52.24"	35th driest - 80th wettest

Source: National Climatic Data Center, July 9, 2009.

Probability of Occurrence and Magnitude

Map D-1 shows the number of reported drought impacts from 1997 to 2009 by parish. Historical review indicates that a significant relationship exists between southern Louisiana precipitation and La Niña weather patterns. Table D-4 (above) highlights the cyclic nature of the La Niña weather patterns on the reported drought impacts over the past 15 years.

While Louisiana has suffered agricultural droughts in its northern parishes, droughts of such magnitude that require urban and suburban water restrictions are rare. Overall, the probability of future occurrences of

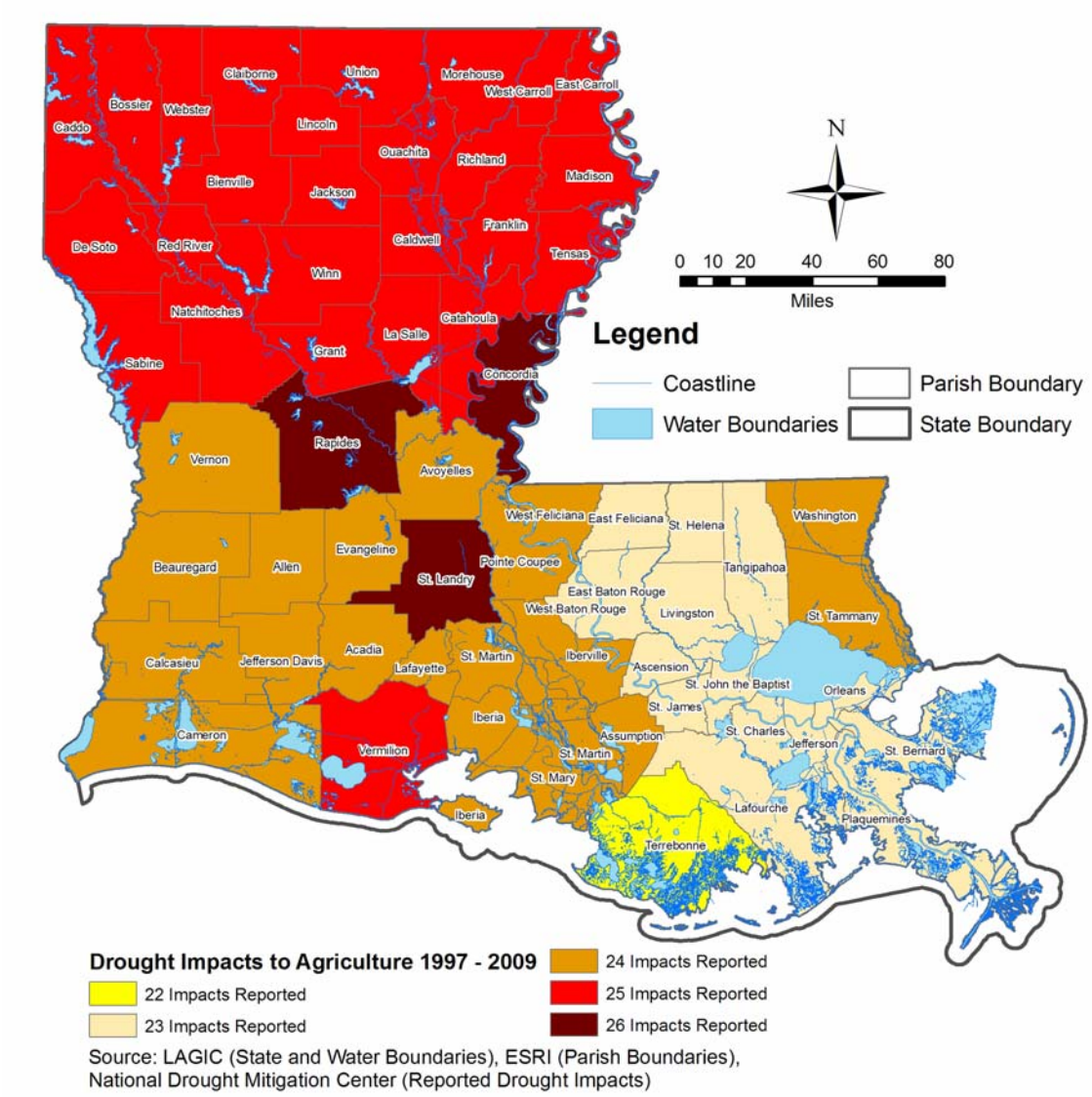
[1] as compared to recorded precipitation for the period 1892-2009

drought is high. There have been a total of 26 drought events in Louisiana reported to the NCDC between 1996 and 2010. 9 events were reported throughout Louisiana in 1998 alone, and 7 events were reported in 2010.

Data Limitations

The Drought Impact Reporter (DIR) dataset at the National Drought Mitigation Center reports several drought impacts which NCDC does not. However, the DIR relies primarily on news reports and allows individuals to submit entries. As a result of this, it must be assumed that there may be some errors within the dataset. Additionally, there are very few data available on the effects of the 2005 and 2006 droughts in Louisiana as most attention was fixed on the southern parishes' continuing recovery from Hurricanes Katrina and Rita and not on agricultural impacts in the North.

Map D-1: Hazard Profile – Drought



Appendix D.3

Earthquake

Nature of the Hazard

Ground motion from seismic waves is expressed as peak ground acceleration (PGA), the fastest measured change in speed for a particle at ground level that is moving because of an earthquake. PGA is commonly measured as a percentage of acceleration due to Earth's gravity (%g). This measurement is relied on to determine seismic load engineering design and construction requirements.

Earthquakes are typically described in terms of magnitude and intensity. Magnitude is the measure of the amplitude of the seismic wave and is expressed by the Richter scale, and intensity is a measure of how strong the shock was felt at a particular location, expressed by the Modified Mercalli Intensity (MMI) scale. The Richter scale represents a logarithmic measurement where an increase in the scale by one whole number represents a tenfold increase in measured amplitude of the earthquake.

Table D-6 shows the rough correlation between the Richter scale, PGA, and the MMI. The relationship between these is approximate and depends upon such specifics as the distance from the epicenter (the location on the earth's surface above the earthquake focus) and depth of the focus (the location of the actual rock movement) of the earthquake.

Table D-6: Earthquake Magnitude / Intensity Comparison

PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
<0.17	1.0 - 3.0	I	I. Not felt except by a very few under especially favorable conditions.
0.17 - 1.4	3.0 - 3.9	II - III	II. Felt only by a few persons at rest, especially on upper floors of buildings.
			III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
1.4 - 9.2	4.0 - 4.9	IV - V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rock noticeably.
			V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
9.2 - 34	5.0 - 5.9	VI - VII	VI. Felt by all. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
			VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
34 - 124	6.0 - 6.9	VII - IX	VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
>124	7.0 and higher	VIII or higher	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: USGS Earthquake Hazards Program

The system of subsidence faults in southern Louisiana developed due to accelerated land subsidence and rapid sediment deposition from the Mississippi River. The system stretches across the southern portion of the state from Beauregard Parish in the east to St. Tammany Parish in the west, and it includes every parish south of this line. This system is thought to be responsible for many of the recorded earthquakes from 1843 to the present (see Table D-7). All of the earthquakes that occurred over this period of time were of low magnitude, resulting mostly in limited property damage (i.e., broken windows, damaged chimneys, and cracked plaster).

While faults throughout the northwestern parishes are thought to be inactive, the New Madrid seismic zone lies just to the north of Louisiana and originates in the region of New Madrid, Missouri. The magnitude of historic earthquakes originating in the New Madrid seismic zone is far greater than that generated by the subsidence fault system in coastal Louisiana. A significant seismic event from the New Madrid seismic zone is more likely to have a greater impact on Louisiana than a seismic event from the subsidence fault system.

Disaster History

A number of earthquakes have occurred over the past 200 years in the state, 47 of which were recorded by USGS (see Map D-3 and Table D-7). Most of the earthquakes were very minor. Map D-3 shows the location of the epicenters of all historical earthquakes felt during this period. The two most significant historic earthquakes were the New Madrid earthquakes (1811-1812) and the 1930 earthquake in Donaldsonville in southern Louisiana, which measured 4.2 on the Richter scale.

The New Madrid earthquakes were among the largest earthquake events ever to occur in the United States Occurring near New Madrid, Missouri, from December 16, 1811, to February 7, 1812, a number of earthquakes originated in this region, with the three strongest earthquakes thought to have magnitudes between 8.4 and 8.7 on the Richter scale. The strongest tremors were felt from New Orleans to Quebec, and the course of the Mississippi River was permanently changed. Aftershocks were felt for more than five years after the initial series of earthquakes.

The largest recorded earthquake event originating in Louisiana occurred in Donaldsonville on October 19, 1930. The earthquake was felt over a 15,000-square-mile area of southeastern Louisiana. The towns that suffered the most damage were Donaldsonville, Gonzales, Napoleonville, and White Castle. There were reports of damaged brick chimneys, broken windows, and overturned small objects. Other towns affected

were Morgan City, Franklin, Elemans, Berwick, and Plaquemine. These towns reported doors and windows rattling, houses creaking, and hanging objects swinging.

Table D-7: Earthquakes Felt In and Around Louisiana

Event	Date	Latitude	Longitude	Depth (km) to Focus of Earthquake	Richter Magnitude	Name of Nearest Parish
1	2/14/1843	30	-90	-		Orleans
2	2/15/1843	30	-90	-		Orleans
3	4/12/1882	30	-90	-		Orleans
4	1/22/1886	30.4	-92	-		St. Landry
5	2/3/1905	30.5	-91.1	-		East Baton Rouge
6	12/15/1927	29	-89.4	-	3.9	Plaquemines
7	7/28/1929	29	-89.4	-	3.8	Plaquemines
8	10/19/1930	30	-91	-	4.2	Assumption
9	12/2/1940	33	-94	-		Caddo
10	6/28/1941	32.4	-90.9	-		Madison
11	9/20/1947	31.9	-92.7	-		Winn
12	11/6/1958	30	-90	-		Orleans
13	11/19/1958	30.3	-91.1	-		Iberville
14	10/15/1959	29.6	-93.1	-	3.8	Cameron
15	4/24/1964	31.38	-93.81	1	3.7	Sabine
16	4/24/1964	31.3	-93.8	-	2.6	Sabine
17	4/24/1964	31.42	-93.81	5	3.7	Sabine
18	4/24/1964	31.38	-93.8	5	3.2	Sabine
19	4/24/1964	31.3	-93.8	-	2.6	Sabine
20	4/24/1964	31.48	-93.79	9	3.2	Sabine
21	4/24/1964	31.3	-93.8	-	2.9	Sabine
22	4/24/1964	31.3	-93.8	-	2.8	Sabine
23	4/24/1964	31.3	-93.8	-	2.6	Sabine
24	4/25/1964	31.3	-93.8	-	2.6	Sabine
25	4/25/1964	31.3	-93.8	-	2.9	Sabine
26	4/25/1964	31.3	-93.8	-	2.9	Sabine
27	4/26/1964	31.3	-93.8	-	2.7	Sabine
28	4/26/1964	31.55	-93.78	5	3.3	Sabine
29	4/27/1964	31.3	-93.8	-	3.2	Sabine

Event	Date	Latitude	Longitude	Depth (km) to Focus of Earthquake	Richter Magnitude	Name of Nearest Parish
30	4/28/1964	31.3	-93.8	-	3.1	Sabine
31	4/28/1964	31.4	-93.82	6	3.4	Sabine
32	4/28/1964	31.3	-93.8	-	4.4	Sabine
33	4/28/1964	31.63	-93.8	14	4.4	Sabine
34	4/30/1964	31.5	-93.8	-	3.0	Sabine
35	5/2/1964	31.3	-93.8	-	3.3	Sabine
36	5/3/1964	31.3	-93.8	-	3.0	Sabine
37	5/7/1964	31.5	-93.8	-	3.2	Sabine
38	8/16/1964	31.4	-93.8	-	2.9	Sabine
39	8/19/1964	31.3	-93.8	3		Sabine
40	2/13/1981	30	-91.8	-		Iberia
41	2/18/1981	29.56	-91.46	5	3.0	St. Mary
42	10/16/1983	30.24	-93.39	5	3.8	Calcasieu
43	6/10/1994	33.01	-92.67	5	3.2	Union
44	3/3/2001	33.19	-92.66	5	3.0	Union
45	12/17/2001	33.2	-92.7	10	2.8	Union
46	12/20/2005	30.26	-90.71	5	3.0	Livingston
47	5/16/2007	33.3	-92.59	5	3.0	Union

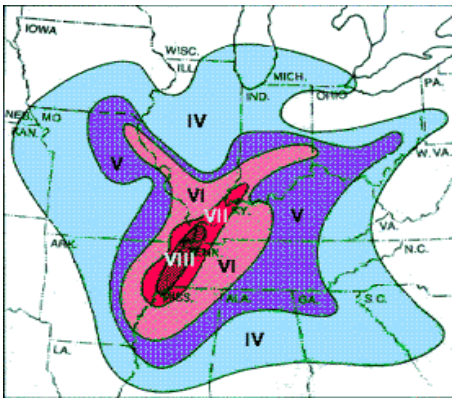
Source: USGS Earthquake Hazards Program

Probability of Occurrence and Magnitude

Developed by the Central United States Earthquake Consortium (CUSEC), Figure D-2 depicts a hypothetical earthquake in the New Madrid region with a magnitude of MMI VIII, similar to the magnitude of the 1811-1812 New Madrid earthquakes. An earthquake at this magnitude would be felt in the northern reaches of Louisiana at a magnitude of MMI VI.

Based on historic events, the most severe earthquakes in the state are likely to occur to the very north (near the Arkansas - Mississippi border), originating from the New Madrid seismic zone, and to the south (near the coast) from the subsidence fault system.

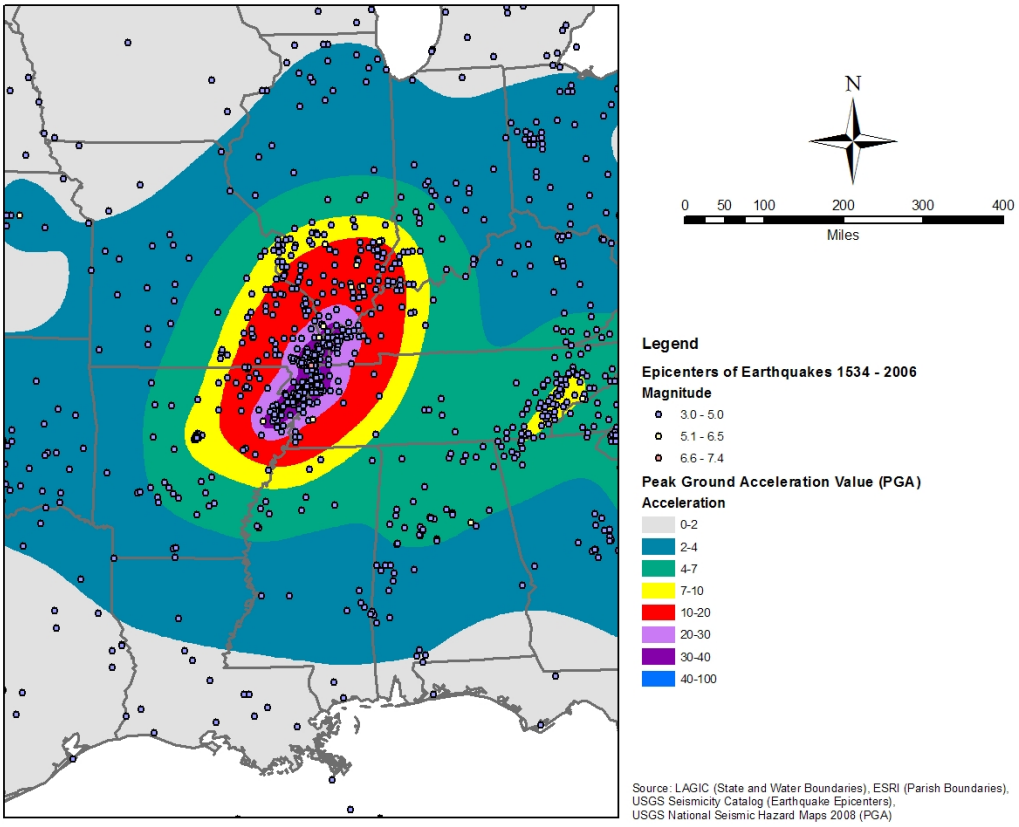
Figure D-2: New Madrid Seismic Zone



Source: CUSEC

Map D-2 shows the PGA and the 10% probability of exceeding normal ground motion in 50 years for the south-central region of the United States. This regional perspective is necessary to understand the close proximity of the New Madrid fault. Map D-3 shows the PGA and the 10% probability of exceeding normal ground motion in 50 years for the state. The southern half of the state has a PGA of 1 percent gravity (1%g) and the northeastern part of the state has a PGA of 3%g; this can be compared to the New Madrid Seismic Zone, which has a PGA as high as 40%g. It is important to note that Map D-3 expresses a 10% probability; therefore, there is a 90% percent chance that normal ground motions will not be exceeded.

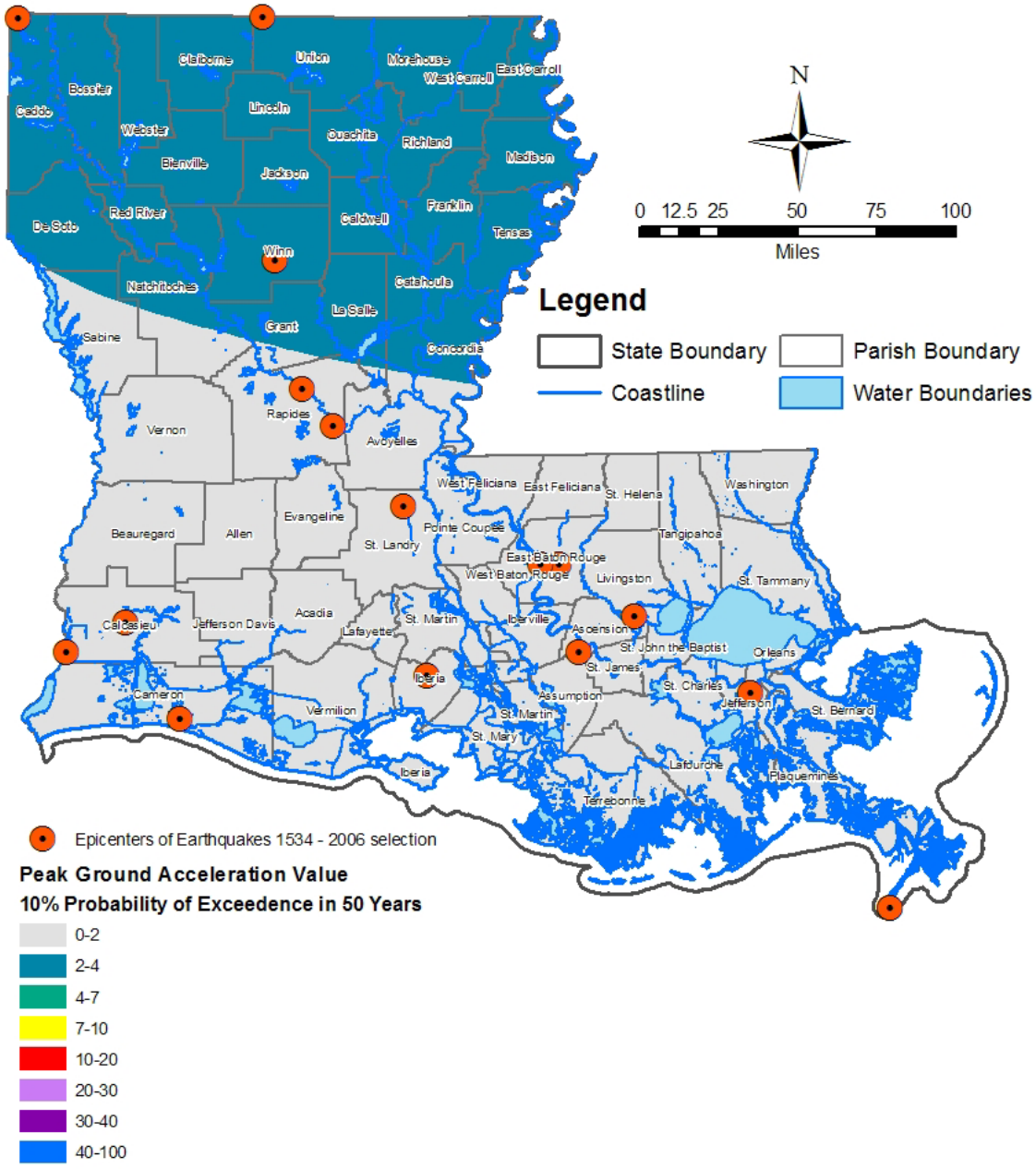
Map D-2: Earthquake – Regional Perspective



Data Limitations

The data used in this section represent the most recent data available at the time of the 2010 Plan Update, and much of it remains unchanged from previous Plans. Unfortunately, the dataset does not accurately capture all smaller seismic events. This lack of data makes it challenging to accurately predict the probability of occurrence.

Map D-3: Hazard Profile – Earthquake



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), USGS Seismicity Catalog (Earthquake Epicenters), USGS National Seismic Hazard Maps 2008 (PGA)

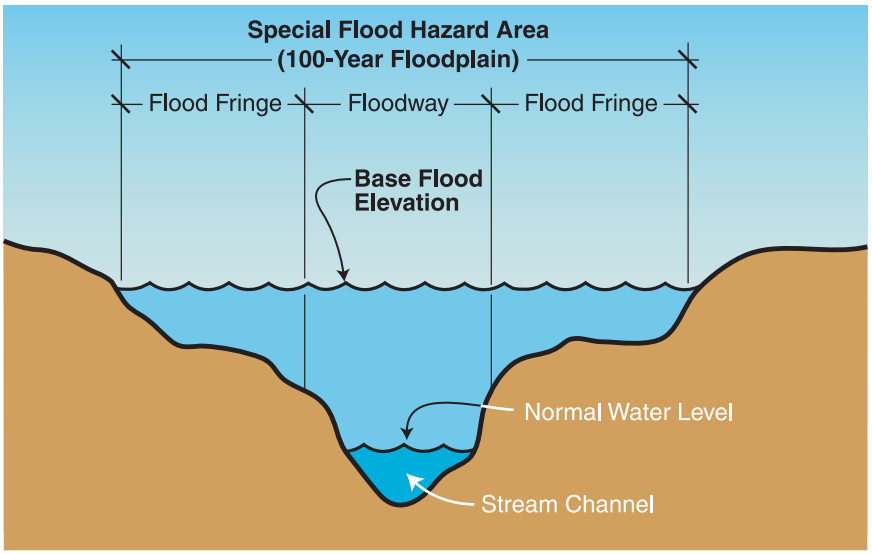
Appendix D.4

Flood

Nature of the Hazard

The 100-year floodplain designation (see Figure D-3) refers to a zone that has a 1% chance, on average, of flooding in any given year. However, a 100-year flood could occur two years in a row, or once every 10 years. The elevation of the 100-year flood is also referred to as the Base Flood Elevation (BFE).

Figure D-3: Definition Sketch for Floodplains[2]



Source: "Understanding Your Risks," FEMA Publication 386-2

Each new Digital Flood Insurance Rate Map (DFIRM) produced by FEMA's Flood Map Modernization program is linked to a database that provides information about the flood zone, the BFE, and the floodway status for a particular location. The standard DFIRM database also includes NFIP community information, map panel information, cross section and hydraulic structure information, Coastal Barrier Resource System information, when applicable, and base map information such as road, stream, and public land survey data. A list of the DFIRM status (as of July 13, 2010) for Louisiana's communities is included in Table D-8. DFIRMs were not available for several parishes at the time the flood hazard analysis for this Update was conducted.

[2] This diagram is consistent with flood hazards in North and Central Louisiana. However, in South Louisiana, land adjacent to a river or bayou may be at its highest elevation at the water's edge (the natural levee) and slope downward, away from the water; this results in very different flooding characteristics.

Table D-8. DFIRM Status for Louisiana's Communities

Parish	Community	Preliminary DFIRM Issued Date	Start of Appeal/ Comment Period	End of Appeal/ Comment Period	Letter of Final Determination (New DFIRM Effective Date)	Date of Current Effective Map
Acadia	Acadia Parish	7/31/2008	9/6/2009	12/5/2009	05/26/2010-Eff(11/26/2010)	11/20/1998
	Church Point, Town of	7/31/2008	9/6/2009	12/5/2009	Eff(11/26/2010)	11/5/1980
	Crowley, City of	7/31/2008	9/6/2009	12/5/2009	Eff(11/26/2010)	7/27/1982
	Estherwood, Village of	7/31/2008	9/6/2009	12/5/2009	Eff(11/26/2010)	2/4/1981
	Iota, Town of	7/31/2008	9/6/2009	12/5/2009	Eff(11/26/2010)	7/18/1985
	Mermentau, Village of	7/31/2008	9/6/2009	12/5/2009	Eff(11/26/2010)	3/2/1981
	Morse, Village of	7/31/2008	9/6/2009	12/5/2009	Eff(11/26/2010)	4/15/1981
	Rayne, City of	7/31/2008	9/6/2009	12/5/2009	Eff(11/26/2010)	3/29/1974
Allen	Allen Parish	9/30/2008	6/25/2009	9/23/2009		1/3/1990
	Coushatta Tribe of Louisiana[3]	9/30/2008	6/25/2009	9/23/2009		1/1/1950
	Elizabeth, Town of	9/30/2008	6/25/2009	9/23/2009		2/1/1987
	Kinder, Town of	9/30/2008	6/25/2009	9/23/2009		11/1/1985
	Oakdale, City of	9/30/2008	6/25/2009	9/23/2009		8/5/1985
	Oberlin, Town of	9/30/2008	6/25/2009	9/23/2009		10/12/1982
	Reeves, Village of	9/30/2008	6/25/2009	9/23/2009		8/15/1975
Ascension	Ascension Parish	2/3/2006	4/20/2006	7/19/2006	2/16/2007	8/16/2007
Assumption	Assumption Parish	7/28/2009	3/2/2010	5/31/2010		11/5/1997
	Napoleonville, Town of	7/28/2009	3/2/2010	5/31/2010		1/1/1950
Avoyelles	Avoyelles Parish[4]	9/30/2009				2/26/1980
	Bunkie, Town of[4]	9/30/2009				11/6/1979
	Cottonport, Town of[4]	9/30/2009				1/1/1950
	Evergreen, Village of[4,5]	9/30/2009				1/1/1950
	Hessmer, Village of[4]	9/30/2009				1/1/1950
	Mansura, Town of[4]	9/30/2009				6/25/1976

[3] Community Not Sanctioned by the NFIP
[4] Awaiting Federal Register Publication Process
[5] Community Non Participating

Parish	Community	Preliminary DFIRM Issued Date	Start of Appeal/ Comment Period	End of Appeal/ Comment Period	Letter of Final Determination (New DFIRM Effective Date)	Date of Current Effective Map
	Marksville, Town of[4]	9/30/2009				7/16/1980
	Moreauville, Village of[4]	9/30/2009				1/31/1978
	Plaucheville, Village of[4]	9/30/2009				9/11/1979
	Simmesport, Town of[4]	9/30/2009				7/16/1980
	Tunica-Biloxi Indians of Louisiana[3,4]	9/30/2009				Not Mapped
Beauregard	Beauregard Parish	5/4/2009	10/13/2009	1/13/2010	05/26/2010-Eff(11/26/2010)	5/3/1990
	Deridder, City of	5/4/2009	10/13/2009	1/13/2010	Eff(11/26/2010)	10/16/1992
	Merryville, Town of	5/4/2009	10/13/2009	1/13/2010	Eff(11/26/2010)	2/1/1987
Bienville	Bienville Parish					7/3/2006
Bossier	Bossier Parish				3/26/2008	9/26/2008
Caddo	Caddo Parish					5/17/2004
Calcasieu	Calcasieu Parish	4/30/2008	10/31/2008	1/29/2009		6/8/1998
	Dequincy, City of	4/30/2008	10/31/2008	1/29/2009		4/2/1979
	Iowa, Town of	4/30/2008	10/31/2008	1/29/2009		12/15/1990
	Lake Charles, City of	4/30/2008	10/31/2008	1/29/2009		7/3/1997
	Sulphur, City of	4/30/2008	10/31/2008	1/29/2009		9/21/1998
	Vinton, Town of	4/30/2008	10/31/2008	1/29/2009		7/16/1981
	Westlake, City of	4/30/2008	10/31/2008	1/29/2009		2/3/1982
Caldwell	Caldwell Parish					4/3/1978
	Clarks, Village of[5]					8/15/1975
	Columbia, Town of					6/1/1978
	Grayson, Village of					8/13/1976
Cameron	Cameron Parish	3/28/2008	12/18/2008	3/19/2009		5/4/1992
Catahoula	Catahoula Parish					4/19/2005
	Harrisonburg, Village of					4/5/1988
	Jonesville, Town of					4/19/2005
	Sicily Island, Village of					1/1/1950
Claiborne[6]						1/1/1992
Concordia	Concordia Parish	1/21/2010				6/2/1994

[6] Parish not being mapped as a DFIRM

Parish	Community	Preliminary DFIRM Issued Date	Start of Appeal/ Comment Period	End of Appeal/ Comment Period	Letter of Final Determination (New DFIRM Effective Date)	Date of Current Effective Map
	Clayton, Village of	1/21/2010				8/1/1978
	Ferriday, Town of	1/21/2010				12/15/1977
	Ridgecrest, Town of	1/21/2010				4/3/1978
	Vidalia, Town of	1/21/2010				1/5/1982
Desoto	Desoto Parish					12/16/2003
East Baton Rouge	East Baton Rouge Parish	8/14/2006	11/16/2006	2/14/2007	11/2/2007	5/2/2008
East Carroll						11/15/1985
East Feliciana	East Feliciana Parish	7/31/2009	3/3/2010	6/1/2010		1/1/1950
	Clinton, Town of	7/31/2009	3/3/2010	6/1/2010		12/4/1979
	Jackson, Town of	7/31/2009	3/3/2010	6/1/2010		6/4/1980
	Norwood, Village of[5]	7/31/2009	3/3/2010	6/1/2010		1/1/1950
	Slaughter, Town of	7/31/2009	3/3/2010	6/1/2010		9/19/1975
	Wilson Village of[5]	7/31/2009	3/3/2010	6/1/2010		1/1/1950
Evangeline	Evangeline Parish	8/29/2008	7/30/2009	10/28/2009	03/03/2010-Eff(09/03/2010)	10/20/1998
	Basile, Town of	8/29/2008	7/30/2009	10/28/2009	Eff(09/03/2010)	1/15/1988
	Chataignier, Village of	8/29/2008	7/30/2009	10/28/2009	Eff(09/03/2010)	1/1/1950
	Mamou, Town of	8/29/2008	7/30/2009	10/28/2009	Eff(09/03/2010)	11/1/1985
	Pine Prairie, Village of	8/29/2008	7/30/2009	10/28/2009	Eff(09/03/2010)	6/25/1976
	Turkey Creek, Village of	8/29/2008	7/30/2009	10/28/2009	Eff(09/03/2010)	9/1/2008
	Ville Platte, Town of	8/29/2008	7/30/2009	10/28/2009	Eff(09/03/2010)	10/20/1998
Franklin	Franklin Parish	11/20/2009	7/7/2010	10/5/2010		11/1/1985
	Baskin, Village of	11/20/2009	7/7/2010	10/5/2010		9/1/1986
	Gilbert, Village of	11/20/2009	7/7/2010	10/5/2010		9/3/1980
	Winnsboro, Town of	11/20/2009	7/7/2010	10/5/2010		9/1/1978
	Wisner, Town of	11/20/2009	7/7/2010	10/5/2010		7/16/1980
Grant[6]						11/16/1995
Iberia	Iberia Parish	2/19/2008	10/20/2009	1/18/2010		9/28/1990
	Delcambre, Town of	2/19/2008	7/24/2008	10/22/2008		10/16/2003
	Jeanerette, City of	2/19/2008	7/24/2008	10/22/2008		4/17/1979
	Loreauville, Village of	2/19/2008	7/24/2008	10/22/2008		9/28/1990

Parish	Community	Preliminary DFIRM Issued Date	Start of Appeal/ Comment Period	End of Appeal/ Comment Period	Letter of Final Determination (New DFIRM Effective Date)	Date of Current Effective Map
	New Iberia, City of	2/19/2008	10/20/2009	1/18/2010		7/13/1982
Iberville	Iberville Parish	9/30/2008	2/23/2009	5/4/2009		8/5/1991
	Grosse Tete, Village of	9/30/2008	2/23/2009	5/4/2009		3/1/1978
	Maringouin, Town of	9/30/2008	2/23/2009	5/4/2009		1/1/1950
	Plaquemine, City of	9/30/2008	2/23/2009	5/4/2009		1/1/1950
	Rosedale, Village of	9/30/2008	2/23/2009	5/4/2009		2/26/1980
	St. Gabriel, Town of	9/30/2008	2/23/2009	5/4/2009		1/1/1950
	White Castle, Town of	9/30/2008	2/23/2009	5/4/2009		1/1/1950
Jackson[6]						6/4/1980
Jefferson	Jefferson Parish	10/30/2008				3/23/1995
	Grand Isle, Town of	10/30/2008				3/23/1995
	Gretna, City of	10/30/2008				3/23/1995
	Harahan, City of	10/30/2008				3/23/1995
	Jean Lafitte, Town of	10/30/2008				3/23/1995
	Kenner, City of	10/30/2008				3/23/1995
	Westwego, City of	10/30/2008				3/23/1995
Jefferson Davis	Jefferson Davis Parish	7/31/2008	4/30/2009	7/29/2009	1/22/2010-Eff(07/22/2010)	6/15/1988
	Elton, Town of	7/31/2008	4/30/2009	7/29/2009	Eff(07/22/2010)	2/3/1982
	Fenton Village of	7/31/2008	4/30/2009	7/29/2009	Eff(07/22/2010)	1/1/1950
	Jennings, City of	7/31/2008	4/30/2009	7/29/2009	Eff(07/22/2010)	4/15/1981
	Lake Arthur, Town of	7/31/2008	4/30/2009	7/29/2009	Eff(07/22/2010)	4/15/1981
	Welsh, Town of	7/31/2008	4/30/2009	7/29/2009	Eff(07/22/2010)	7/16/1981
Lafayette	Lafayette Parish	9/28/2007	2/7/2008	5/6/2008		1/20/1999
	Broussard, Town of	9/28/2007	2/7/2008	5/6/2008		1/20/1999
	Carencro, City of	9/28/2007	2/7/2008	5/6/2008		1/20/1999
	Duson, Town of	9/28/2007	2/7/2008	5/6/2008		1/20/1999
	Scott, City of	9/28/2007	2/7/2008	5/6/2008		1/20/1999
	Youngsville, Town of	9/28/2007	2/7/2008	5/6/2008		1/20/1999
Lafourche	Lafourche Parish	7/30/2008	7/2/2009	9/30/2009		5/4/1992
	Golden Meadow, Town of	7/30/2008	7/2/2009	9/30/2009		7/11/1975

Parish	Community	Preliminary DFIRM Issued Date	Start of Appeal/ Comment Period	End of Appeal/ Comment Period	Letter of Final Determination (New DFIRM Effective Date)	Date of Current Effective Map
	Lockport, Town of	7/30/2008	7/2/2009	9/30/2009		8/15/1980
	Thibodaux, City of	7/30/2008	7/2/2009	9/30/2009		12/15/1989
Lasalle[6]						11/1/1985
Lincoln	Lincoln Parish	3/30/2007	7/6/2007	10/4/2007	10/2/2008	4/2/2009
Livingston	Livingston Parish	1/31/2008	5/9/2008	8/6/2008		8/23/2001
	Albany, Village of	1/31/2008	5/9/2008	8/6/2008		8/23/2001
	Denham Springs, City of	1/31/2008	5/9/2008	8/6/2008		8/23/2001
	French Settlement, Village of	1/31/2008	5/9/2008	8/6/2008		8/23/2001
	Killian, Village of	1/31/2008	5/9/2008	8/6/2008		8/23/2001
	Livingston, Town of	1/31/2008	5/9/2008	8/6/2008		8/23/2001
	Port Vincent, Village of	1/31/2008	5/9/2008	8/6/2008		8/23/2001
	Springfield, Town of	1/31/2008	5/9/2008	8/6/2008		8/23/2001
	Walker, Town of	1/31/2008	5/9/2008	8/6/2008		8/23/2001
Madison	Madison Parish	11/24/2009	7/1/2010	9/29/2010		3/4/1988
	Delta, Village of	11/24/2009	7/1/2010	9/29/2010		9/25/1979
	Mound, Village of	11/24/2009	7/1/2010	9/29/2010		7/12/1977
	Richmond, Village of	11/24/2009	7/1/2010	9/29/2010		7/16/1980
	Tallulah, City of	11/24/2009	7/1/2010	9/29/2010		8/19/1986
Morehouse	Morehouse Parish	1/25/2010				10/15/1985
	Bastrop, City of	1/25/2010				12/16/1980
	Bonita, Village of	1/25/2010				4/1/2007
	Collinston, Village of	1/25/2010				1/1/1950
	Mer Rouge, Village of	1/25/2010				6/27/1978
	Oak Ridge, Village of	1/25/2010				1/1/1950
Natchitoches	Natchitoches Parish	5/21/2009	10/13/2009	1/14/2010		12/8/1998
	Ashland, Town of[5]	5/21/2009	10/13/2009	1/14/2010		1/1/1950
	Campti, Town of	5/21/2009	10/13/2009	1/14/2010		1/2/1950
	Clarence, Village of	5/21/2009	10/13/2009	1/14/2010		9/18/1987
	Goldonna, Village of	5/21/2009	10/13/2009	1/14/2010		6/29/1982
	Natchez, Village of	5/21/2009	10/13/2009	1/14/2010		12/8/1998

Parish	Community	Preliminary DFIRM Issued Date	Start of Appeal/ Comment Period	End of Appeal/ Comment Period	Letter of Final Determination (New DFIRM Effective Date)	Date of Current Effective Map
	Natchitoches, City of	5/21/2009	10/13/2009	1/14/2010		9/18/1987
	Powhatan, Village of[5]	5/21/2009	10/13/2009	1/14/2010		1/1/1950
	Provencal, Village of	5/21/2009	10/13/2009	1/14/2010		11/1/1992
	Robeline, Village of	5/21/2009	10/13/2009	1/14/2010		10/6/1998
Orleans	Orleans Parish	11/13/2008				3/1/1984
Ouachita	Ouachita Parish	8/7/2009	7/8/2010	10/6/2010		3/15/1994
	Monroe, City of	8/7/2009	7/8/2010	10/6/2010		3/15/1994
	Richwood, Town of	8/7/2009	7/8/2010	10/6/2010		3/15/1994
	Sterlington, Town of	8/7/2009	7/8/2010	10/6/2010		3/15/1994
	West Monroe, City of	8/7/2009	7/8/2010	10/6/2010		3/15/1994
Plaquemines	Plaquemines Parish	10/30/2008				9/30/1993
Pointe Coupee	Pointe Coupee Parish	5/29/2009	1/28/2010	4/28/2010		11/16/1995
	Fordoche, Village of	5/29/2009	1/28/2010	4/28/2010		1/1/1950
	Livonia, Town of	5/29/2009	1/28/2010	4/28/2010		1/1/1950
	Morganza, Village of	5/29/2009	1/28/2010	4/28/2010		1/1/1950
	New Roads, Town of	5/29/2009	1/28/2010	4/28/2010		11/16/1995
Rapides	Rapides Parish	7/31/2007	1/17/2008	4/15/2008		6/2/1999
	Alexandria, City of	7/31/2007	1/17/2008	4/15/2008		9/3/1997
	Ball, Town of	7/31/2007	1/17/2008	4/15/2008		11/22/1999
	Boyce, Town of	7/31/2007	1/17/2008	4/15/2008		1/1/1950
	Cheneyville, Town of	7/31/2007	1/17/2008	4/15/2008		3/2/1981
	Forest Hill, Village of	7/31/2007	1/17/2008	4/15/2008		1/1/1950
	Glenmora, Town of	7/31/2007	1/17/2008	4/15/2008		2/3/1982
	Lecompte, Town of	7/31/2007	1/17/2008	4/15/2008		6/2/1999
	Mcnary, Village of	7/31/2007	1/17/2008	4/15/2008		7/13/1982
	Pineville, City of	7/31/2007	1/17/2008	4/15/2008		9/5/1984
	Woodworth, Village of	7/31/2007	1/17/2008	4/15/2008		1/7/1998
Red River[6]						5/15/1985
Richland	Richland Parish	11/23/2009	5/20/2010	8/19/2010		12/8/1998
	Delhi, Town of	11/23/2009	5/20/2010	8/19/2010		3/9/1999

Parish	Community	Preliminary DFIRM Issued Date	Start of Appeal/ Comment Period	End of Appeal/ Comment Period	Letter of Final Determination (New DFIRM Effective Date)	Date of Current Effective Map
	Mangham, Town of	11/23/2009	5/20/2010	8/19/2010		10/9/1979
	Rayville, Town of	11/23/2009	5/20/2010	8/19/2010		9/3/1980
Sabine[6]						8/5/1991
St. Bernard	St. Bernard Parish	10/30/2008				6/30/1999
St. Charles	St. Charles Parish	10/30/2008				6/16/1992
St. Helena	St. Helena Parish					9/27/1991
	Greensburg, Town of					1/7/1975
	Montpelier, Village of					9/27/1991
St. James	St. James Parish	6/10/2009	3/25/2010	6/23/2010		7/13/1982
	Gramercy, Town of	6/10/2009	3/25/2010	6/23/2010		1/24/1978
	Lutcher, Town of	6/10/2009	3/25/2010	6/23/2010		4/24/1979
St. John the Baptist	St. John the Baptist Parish	7/30/2008	4/29/2009	7/28/2009	05/04/2010-Eff(11/04/2010)	2/2/1983
St. Landry	St. Landry Parish	9/30/2008	6/24/2009	9/23/2009	02/05/2010-Eff(08/05/2010)	10/16/1991
	Cankton, Village of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	6/25/1976
	Grand Coteau, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	6/30/1976
	Krotz Springs, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	1/15/1988
	Leonville, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	11/9/1982
	Melville, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	7/3/1978
	Opelousas, City of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	8/3/1981
	Palmetto, Village of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	4/15/1986
	Port Barre, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	4/15/1981
	Sunset, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	3/30/1982
	Washington, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	5/1/1985
	Eunice, City of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	6/1/1981
	Arnaudville, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(08/05/2010)	11/1/1985
St. Martin	St. Martin Parish	9/30/2008	6/24/2009	9/23/2009	05/04/2010-Eff(11/04/2010)	12/19/1997
	Arnaudville, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(11/04/2010)	11/1/1985
	Breaux Bridge, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(11/04/2010)	3/16/1988
	Henderson, Town of	9/30/2008	6/24/2009	9/23/2009	Eff(11/04/2010)	5/3/1982
	Parks, Village of	9/30/2008	6/24/2009	9/23/2009	Eff(11/04/2010)	7/16/1980

Parish	Community	Preliminary DFIRM Issued Date	Start of Appeal/ Comment Period	End of Appeal/ Comment Period	Letter of Final Determination (New DFIRM Effective Date)	Date of Current Effective Map
	St. Martinville, City of	9/30/2008	6/24/2009	9/23/2009	Eff(11/04/2010)	12/16/1980
St. Mary	St. Mary Parish	3/31/2008	11/7/2008	2/5/2009		6/30/1999
	Baldwin, Town of	3/31/2008	11/7/2008	2/5/2009		12/15/1978
	Berwick, Town of	3/31/2008	11/7/2008	2/5/2009		4/3/1995
	Chitimacha Tribe of Louisiana1	3/31/2008	11/7/2008	2/5/2009		1/1/1950
	Franklin, City of	3/31/2008	11/7/2008	2/5/2009		4/15/1992
	Morgan City, of	3/31/2008	11/7/2008	2/5/2009		5/20/1996
	Patterson, City of	3/31/2008	11/7/2008	2/5/2009		5/2/1995
St. Tammany	St. Tammany Parish	4/30/2008	10/31/2008	1/29/2009		4/21/1999
	Abita Springs, Town of	4/30/2008	10/31/2008	1/29/2009		5/17/1988
	Covington, City of	4/30/2008	10/31/2008	1/29/2009		11/19/1980
	Folsom, Village of	4/30/2008	10/31/2008	1/29/2009		3/16/1982
	Madisonville, Town of	4/30/2008	10/31/2008	1/29/2009		3/16/1983
	Mandeville, City of	4/30/2008	10/31/2008	1/29/2009		4/4/1983
	Pearl River, Town of	4/30/2008	10/31/2008	1/29/2009		5/4/1988
	Slidell, City of	4/30/2008	10/31/2008	1/29/2009		4/21/1999
	Sun, Village of[5]	4/30/2008	10/31/2008	1/29/2009		4/16/1976
Tangipahoa	Tangipahoa Parish	1/25/2008	10/7/2009	1/5/2010	01/22/2010-Eff(7/22/2010)	8/23/2000
	Amite City, Town of	1/25/2008	4/9/2008	7/8/2008	Eff(7/22/2010)	9/19/1991
	Hammond, City of	1/25/2008	4/9/2008	7/8/2008	Eff(7/22/2010)	7/21/1999
	Independence, Town of	1/25/2008	10/7/2009	1/5/2010	Eff(7/22/2010)	7/5/1977
	Kentwood, Town of	1/25/2008	4/9/2008	7/8/2008	Eff(7/22/2010)	4/15/1980
	Ponchatoula, City of	1/25/2008	4/9/2008	7/8/2008	Eff(7/22/2010)	7/21/1999
	Roseland, Town of	1/25/2008	10/7/2009	1/5/2010	Eff(7/22/2010)	9/1/1987
	Tangipahoa, Village of	1/25/2008	4/9/2008	7/8/2008	Eff(7/22/2010)	9/28/1979
	Tickfaw, Town of	1/25/2008	4/9/2008	7/8/2008	Eff(7/22/2010)	8/23/2000
Tensas[6]						4/3/1978
Terrebonne	Terrebonne Parish	7/30/2008	6/24/2009	9/22/2009		4/2/1992
	Houma, City of	7/30/2008	6/24/2009	9/22/2009		5/19/1981
Union	Union Parish Uia	11/30/2009	4/22/2010	7/21/2010		11/22/1999

Parish	Community	Preliminary DFIRM Issued Date	Start of Appeal/ Comment Period	End of Appeal/ Comment Period	Letter of Final Determination (New DFIRM Effective Date)	Date of Current Effective Map
	Bernice, Town of[5]	11/30/2009	4/22/2010	7/21/2010		1/1/1950
	Farmerville, Town of	11/30/2009	4/22/2010	7/21/2010		11/22/1999
	Lillie, Village of[5]	11/30/2009	4/22/2010	7/21/2010		4/3/1979
	Marion, Village of[5]	11/30/2009	4/22/2010	7/21/2010		1/1/1950
	Spearsville, Village of[5]	11/30/2009	4/22/2010	7/21/2010		Not Mapped
	Junction City, Village of[5]	11/30/2009	4/22/2010	7/21/2010		7/18/1975
Vermilion	Vermilion Parish	2/29/2008	5/29/2008	8/27/2008		5/4/1992
	Abbeville	2/29/2008	5/29/2008	8/27/2008		8/3/1981
	Delcambre, Town of	2/29/2008	7/24/2008	10/22/2008		10/16/2003
	Erath, Town of	2/29/2008	7/24/2008	10/22/2008		4/4/1983
	Gueydan, Town of	2/29/2008	7/24/2008	10/22/2008		(NSFHA)
	Kaplan, City of	2/29/2008	5/29/2008	8/27/2008		3/1/1982
	Maurice, Town of	2/29/2008	5/29/2008	8/27/2008		6/30/1976
Vernon	Vernon Parish	6/4/2009	12/22/2009	3/22/2010		3/1/1987
	Anacoco, Village of	6/4/2009	12/22/2009	3/22/2010		1/1/1950
	Hornbeck, Village of	6/4/2009	12/22/2009	3/22/2010		6/1/2005
	Leesville, City of	6/4/2009	12/22/2009	3/22/2010		6/2/1995
	New Llano, Village of	6/4/2009	12/22/2009	3/22/2010		7/18/1985
	Rosepine, Village of	6/4/2009	12/22/2009	3/22/2010		10/19/1982
	Simpson, Village of[5]	6/4/2009	12/22/2009	3/22/2010		1/1/1950
Washington	Washington Parish	7/17/2008	11/12/2008	2/10/2009	6/3/2009	12/3/2009
Webster	Webster Parish	8/29/2008	2/12/2009	5/12/2009	9/2/2009	3/2/2010
West Baton Rouge	West Baton Rouge Parish	12/9/2008	5/21/2009	8/19/2009		9/7/2000
	Addis, Town of	12/9/2008	5/21/2009	8/19/2009		9/7/2000
	Brusly, Town of	12/9/2008	5/21/2009	8/19/2009		9/7/2000
	Port Allen, City of	12/9/2008	5/21/2009	8/19/2009		9/8/2000
West Carroll[6]						3/1/1987
West Feliciana[6]						2/13/1979
Winn[6]						7/24/1989

Disaster History

Louisiana has experienced several severe flooding events. In fact, of the 56 Presidential Disaster Declarations Louisiana has received since 1965, 28 have resulted from flood damages. Table D-9 shows the total number of declarations received by parishes affected by declared flood disasters. Table D-10 provides more detailed information, including the date of declaration.

Table D-9: Number of Presidential Flood Declarations by Parish

Parish	Total	Parish	Total	Parish	Total
Caldwell	10	Vermilion	8	Lincoln	5
Livingston	10	Assumption	7	Madison	5
St. Martin	10	Calcasieu	7	St. James	5
St. Tammany	10	Morehouse	7	St. John the Baptist	5
Ascension	9	St. Bernard	7	St. Mary	5
Beauregard	9	St. Charles	7	Sabine	5
Catahoula	9	St. Landry	7	West Carroll	5
Iberville	9	Terrebonne	7	West Feliciana	5
La Salle	9	Webster	7	Acadia	4
Lafayette	9	Allen	6	DeSoto	4
Natchitoches	9	Avoyelles	6	Iberia	4
Pointe Coupee	9	Bienville	6	Red River	4
Rapides	9	Bossier	6	St. Helena	4
East Baton Rouge	8	Claiborne	6	West Baton Rouge	4
Franklin	8	East Feliciana	6	Cameron	3
Grant	8	Jefferson Davis	6	East Carroll	3
Jefferson	8	Union	6	Evangeline	3
Lafourche	8	Vernon	6	Jackson	3
Orleans	8	Washington	6	Tensas	3
Ouachita	8	Winn	6	Plaquemines	2
Richland	8	Caddo	5		
Tangipahoa	8	Concordia	5		

Source: NCDC, 2009

A significant flood occurred in April 1983, when storms produced 17 inches of rain in five days in parts of southeastern Louisiana. Since soils were already saturated before the storms, stream runoff exceeded the 100-year floodplain (a floodplain with a 1% chance on average of being inundated in any given year) in many areas. Streamflow gauges monitored by the USGS showed that 181 of 491 gauges recorded peak discharges, and 50 gauges had their greatest recorded discharges with 20 of them equaling or exceeding the 100-year flood.

In May 1990, torrential rains produced flooding along Louisiana's rivers, causing more than $1 billion in damage. In May 1995, another large storm system brought rains, hail, and tornadoes that crossed much of southeast Louisiana and the New Orleans area; between ten and 25 inches of rain fell in five days, resulting in $5 to $6 billion in damages, 32 deaths, and Disaster Declarations for 12 parishes (see Table D-10).

In June 2001, remnants of Tropical Storm Allison caused severe flooding throughout the state. Thousands of homes were flooded and innumerable streets were impassable. The event brought up to 30 inches of rain in some areas. The heavy rainfall caused the Bogue Falaya River at Covington, St. Tammany Parish, to

exceed flood stage for several days, cresting twice with near-record flooding, threatening levees, and producing major flooding. In Iberville Parish, a levee broke along Bayou Manchac, flooding roadways and cutting off access to many houses in both Iberville and Ascension Parishes[7]. Major flooding occurred on the lower portions of the Amite and Comite Rivers, with the highest water levels observed since 1983. In total, the flooding caused nearly $30 million in damages, resulting in disaster declarations for 27 parishes (see Table D-10).

In August 2005, Hurricane Katrina caused severe flooding in southeastern Louisiana. This flooding was primarily the result of levee breaches and is described in greater detail within the Levee Failure profile.

In December 2009, nine Louisiana parishes received a Disaster Declaration for flooding, tornadoes, and severe storms. Most of these parishes were in North and Central Louisiana. A series of heavy rainfall events and severe storms throughout the state led to rivers and creeks overflowing their banks, causing widespread flood damages.

Table D-10: Declared Flood Disasters by Parish, 1965-2009

Parish	27-Apr-73	23-Feb-74	9-Apr-75	31-Jan-77	2-May-77	9-May-78	20-Sep-78	2-May-79	25-Sep-79	9-Apr-80	21-May-80	11-Jan-83	20-Apr-83	31-Oct-84	16-Jun-89	28-Aug-89	19-Nov-89	15-Apr-91	29-Apr-91	2-Feb-93	8-May-95	5-Jun-01	12-May-04	2-Nov-06	02-Sept-08	10-Dec_09	Total
Acadia											●				●								●		●		4
Allen									●			●			●	●								●	●		6
Ascension	●			●	●			●					●							●	●	●			●		9
Assumption	●							●		●									●		●	●			●		7
Avoyelles	●		●	●									●						●						●		6
Beauregard												●			●	●		●	●			●		●	●	●	9
Bienville				●											●	●		●	●						●		6
Bossier				●												●		●	●						●	●	6
Caddo				●											●			●	●						●		5
Calcasieu									●		●	●			●	●								●	●		7
Caldwell	●	●	●	●								●			●				●					●	●	●	10
Cameron	●											●													●		3
Catahoula	●	●	●					●				●						●	●					●	●		9
Claiborne				●											●			●	●						●	●	6
Concordia	●	●	●																●						●		5
DeSoto				●														●							●	●	4
East Baton Rouge	●				●			●					●			●				●		●			●		8
East Carroll	●																		●						●		3
East Feliciana				●	●								●		●							●			●		6
Evangeline												●												●	●		3
Franklin	●	●	●	●								●			●				●					●	●		9
Grant	●			●								●			●	●			●					●	●		8
Iberia	●													●								●			●		4
Iberville	●							●		●						●			●	●		●	●		●		9
Jackson															●				●						●		3

[7] Source: www.ascensionparish.net, 2007

Parish	27-Apr-73	23-Feb-74	9-Apr-75	31-Jan-77	2-May-77	9-May-78	20-Sep-78	2-May-79	25-Sep-79	9-Apr-80	21-May-80	11-Jan-83	20-Apr-83	31-Oct-84	16-Jun-89	28-Aug-89	19-Nov-89	15-Apr-91	29-Apr-91	2-Feb-93	8-May-95	5-Jun-01	12-May-04	2-Nov-06	02-Sept-08	10-Dec_09	Total
Jefferson	●					●				●			●				●				●	●			●		8
Jefferson Davis				●							●					●							●	●	●		6
La Salle	●	●	●	●				●				●			●				●					●	●		10
Lafayette				●	●						●			●		●				●		●	●		●		9
Lafourche	●			●						●								●	●		●	●			●		8
Lincoln				●								●			●				●						●		5
Livingston	●			●	●			●					●						●	●		●	●		●		10
Madison	●														●				●					●	●		5
Morehouse				●								●			●			●	●					●	●		7
Natchitoches				●								●			●	●		●	●					●	●	●	9
Orleans	●					●				●			●				●				●	●			●		8
Ouachita	●	●					●					●			●				●						●	●	8
Plaquemines	●																								●		2
Pointe Coupee	●			●				●			●		●			●						●	●		●		9
Rapides	●		●	●					●			●				●		●	●						●		9
Red River				●											●				●						●		4
Richland	●			●			●					●			●				●					●	●		8
Sabine				●											●	●								●	●		5
St. Bernard	●					●				●			●								●	●			●		7
St. Charles	●									●							●		●		●	●			●		7
St. Helena				●																		●		●	●		4
St. James	●																		●		●	●			●		5
St. John the Baptist	●					●															●	●			●		5
St. Landry	●				●										●	●							●	●	●		7
St. Martin	●				●			●		●				●					●	●		●	●		●		10
St. Mary	●									●									●			●			●		5
St. Tammany	●			●				●		●			●						●	●	●	●			●		10
Tangipahoa	●			●	●								●							●	●	●			●		8
Tensas	●																		●						●		3
Terrebonne	●									●								●	●		●	●			●		7
Union				●								●			●				●						●	●	6
Vermilion				●							●			●	●	●				●		●			●		8
Vernon				●								●			●	●								●	●		6
Washington	●			●						●			●									●			●		6
Webster				●											●	●		●	●						●	●	7
West Baton Rouge	●																					●	●		●		4
West Carroll				●											●			●	●						●		5
West	●			●																		●			●		4

Parish	27-Apr-73	23-Feb-74	9-Apr-75	31-Jan-77	2-May-77	9-May-78	20-Sep-78	2-May-79	25-Sep-79	9-Apr-80	21-May-80	11-Jan-83	20-Apr-83	31-Oct-84	16-Jun-89	28-Aug-89	19-Nov-89	15-Apr-91	29-Apr-91	2-Feb-93	8-May-95	5-Jun-01	12-May-04	2-Nov-06	02-Sept-08	10-Dec_09	Total
Feliciana																											
Winn												●			●	●			●					●	●		6
Total Parishes Declared	38	6	7	34	8	4	2	10	3	12	6	19	12	4	28	19	3	14	37	9	12	27	9	19	64	9	

Probability of Occurrence and Magnitude

Flood studies identify floodplain areas and associate possible flood elevations in the floodplains with probabilities of occurrence. Generally, floods with higher flood stages have lower chances of occurring. Minor flooding is virtually a yearly occurrence for a number of rivers and tributaries, and major floods occur regularly in Louisiana.

Map D-4 shows the extent of 100-year floodplains in Louisiana using the best available data. Specifically, DFIRMs were used for 45 parishes, and the floodplain boundary was determined using HAZUS-MH for the remaining 19 parishes.

Map D-5 indicates which data source was used for each parish to develop Map D-4.

Map D-6 shows designated "V" zones, or velocity zones, per current DFIRM mapping in coastal parishes.

Severe Repetitive Flood Loss Properties (SRLs)

Table D-10a lists SRLs and corresponding NFIP claims payments by parish. Map D-7a illustrates the relative distribution of RLs across the state. Map D-7b shows the dollar value of RLs per parish. Map D-8a shows the number of SRLs in each parish as a percentage of the total SRLs in the state. Map D-8b shows the number of dollars paid by parish for SRLs.

Table D-10a: SRLs by Parish and Amount Paid by NFIP

Parish	SRL Count	Total Paid	Parish	SRL Count	Total Paid
ACADIA	2	$204,247.46	MOREHOUSE	1	$36,607.86
ALLEN	6	$430,575.14	NATCHITOCHES	7	$680,883.26
ASCENSION	24	$2,387,934.40	ORLEANS	1,118	$223,937,187.15
ASSUMPTION	2	$96,669.89	OUACHITA	45	$4,837,867.70
AVOYELLES	7	$727,120.23	PLAQUEMINES	14	$2,589,506.76
BEAUREGARD	5	$559,804.24	POINTE COUPEE	61	$6,254,334.02
BIENVILLE	1	$85,247.80	RAPIDES	28	$2,585,604.44
BOSSIER	16	$1,818,789.63	RICHLAND	5	$597,243.70
CADDO	2	$317,928.81	ST. BERNARD	82	$16,162,029.72
CALCASIEU	94	$17,657,287.44	ST. CHARLES	45	$5,714,973.43
CAMERON	70	$13,235,685.69	ST. JOHN THE BAPTIST	3	$338,103.28
CATAHOULA	43	$3,552,494.51	ST. LANDRY	2	$259,194.75
CONCORDIA	30	$2,702,855.23	ST. MARTIN	1	$272,475.02
EAST BATON ROUGE	159	$22,008,984.75	ST. MARY	22	$3,762,009.35
EAST FELICIANA	1	$222,242.59	ST. TAMMANY	434	$82,504,541.62
FRANKLIN	1	$175,012.94	TANGIPAHOA	13	$1,569,395.01

Parish	SRL Count	Total Paid	Parish	SRL Count	Total Paid
GRANT	8	$516,446.16	TENSAS PARISH	4	$254,246.28
IBERIA	26	$3,500,543.94	TERREBONNE	193	$30,753,213.63
IBERVILLE	1	$91,017.00	UNION	1	$43,881.16
JEFFERSON	1,485	$200,166,791.83	VERMILION	41	$6,437,545.31
LA SALLE	16	$974,933.94	WASHINGTON	5	$414,983.89
LAFAYETTE	19	$2,133,999.76	WEBSTER	3	$367,279.34
LAFOURCHE	49	$5,702,635.16	WEST CARROLL	1	$111,177.82
LIVINGSTON	108	$13,293,405.45	WEST FELICIANA	6	$548,912.24
MADISON	1	$274,973.00	WINN	2	$264,240.90
			Total	4,313	$684,135,064.63

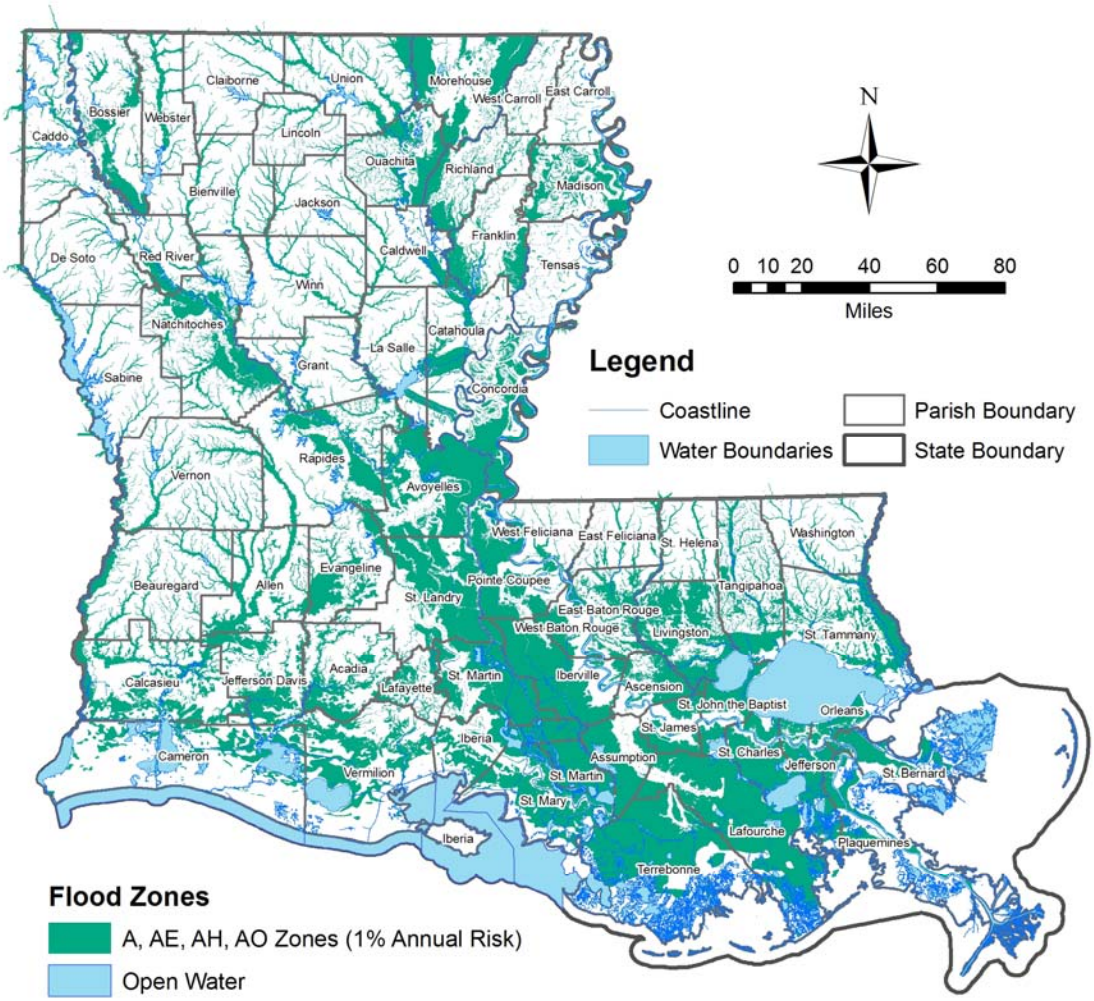
Source: FEMA Dec 2009 SRL Data

Data Limitations

The Advisory Base Flood Elevations (ABFEs) released for southeastern Louisiana do not fully account for the possibility of catastrophic flooding as a result of levee failure. Instead, they represent a compromise between projected flood levels based on stormwater drainage and the inundation levels reached following Hurricane Katrina. Other areas of the state have outdated BFEs that do not take into account significant changes in drainage patterns due to development. Additionally, Flood Insurance Rate Maps (FIRMs) are only estimates of flood levels. Floodwaters rarely stop exactly at the line drawn on the map.

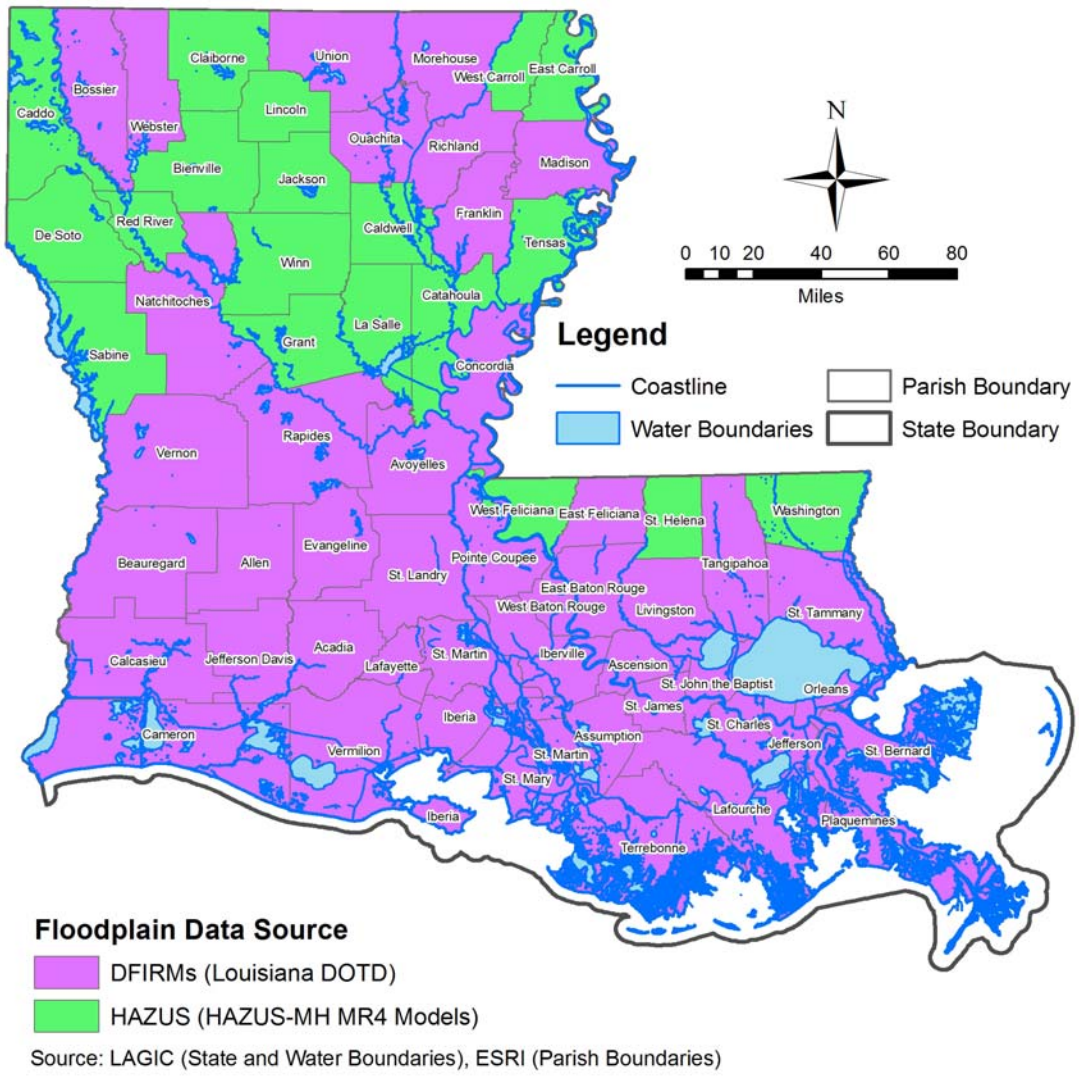
This analysis of flood risk relies in part on data from the NFIP. However, NFIP data are only representative of insured properties. Therefore, they do not indicate flooding in areas with low participation in the NFIP. This includes impoverished populations and renters.

Map D-4: Hazard Profile – Flood

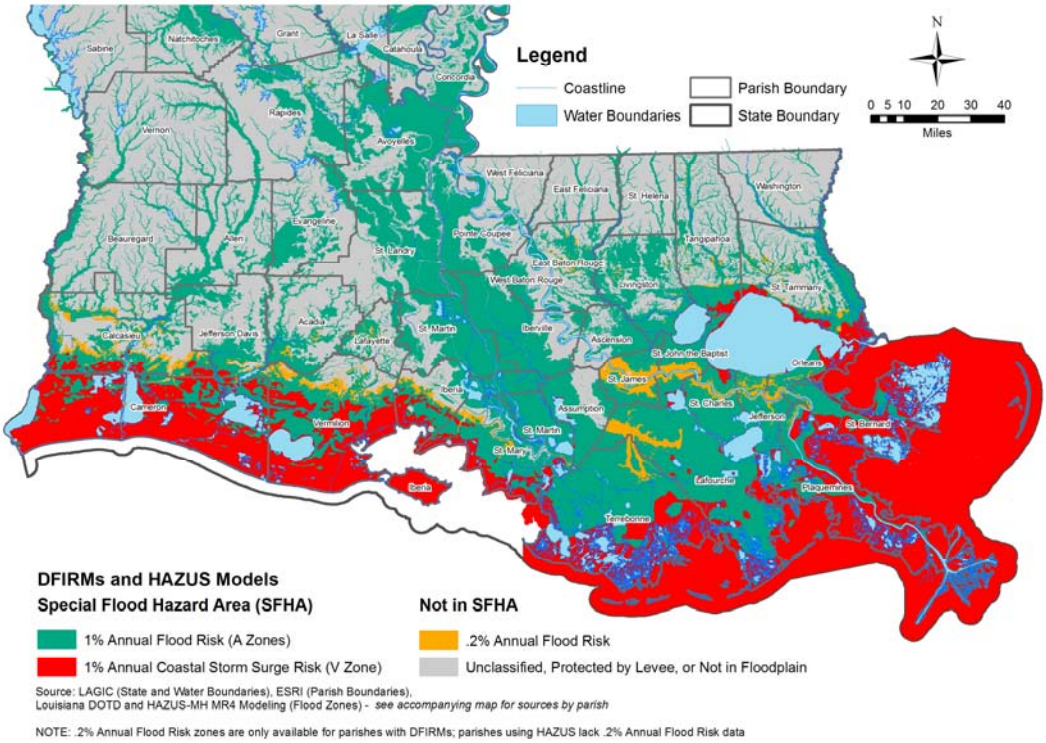


Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Louisiana DOTD (DFIRM Floodplains), HAZUS-MH MR4 (HAZUS Modeling Floodplains)

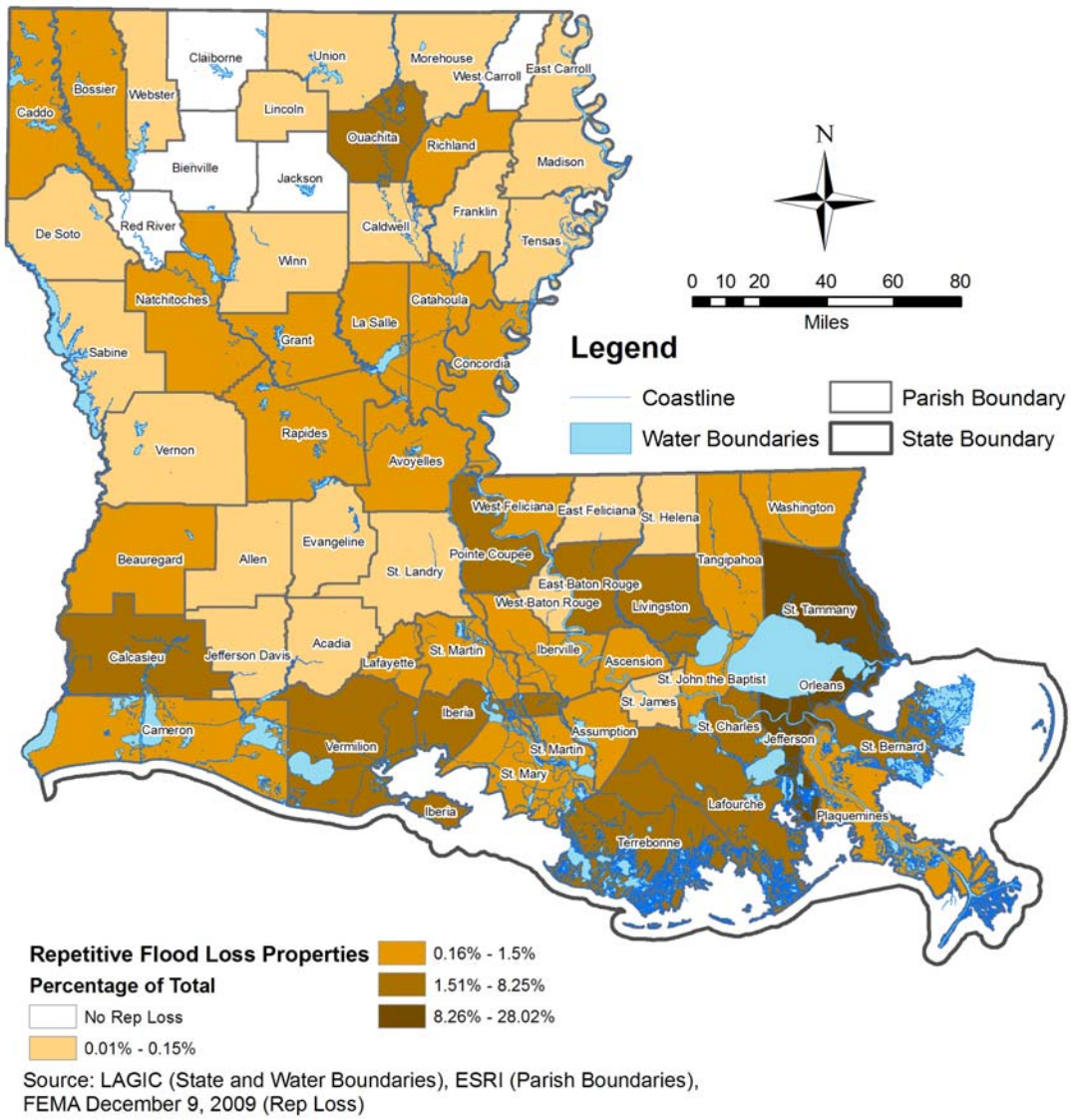
Map D-5: Flood – Flood Hazard Data Sources



Map D-6: Flood - DFIRM Flood Zones Showing V Zones

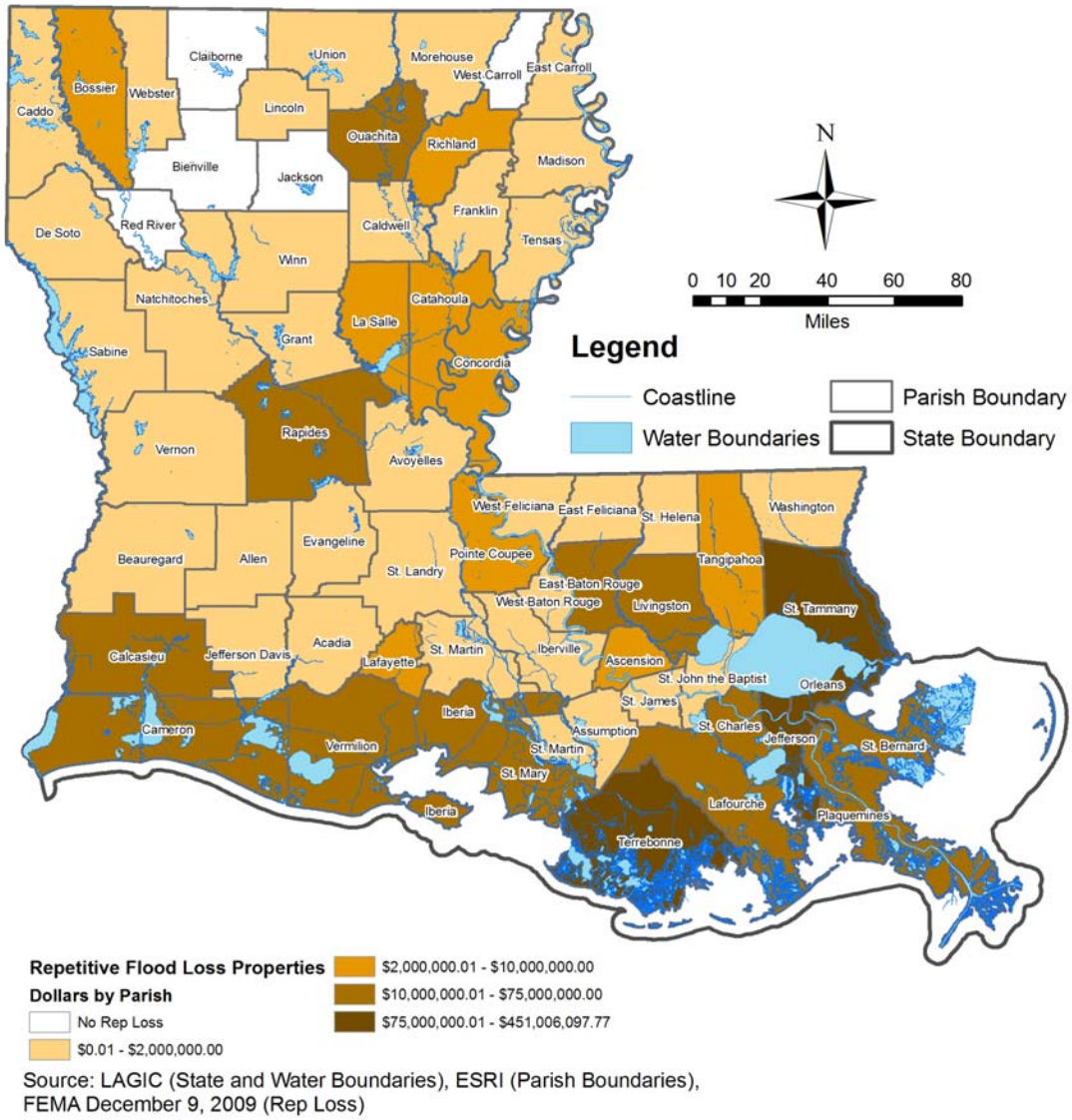


Map D-7a: Flood – Relative Distribution of Repetitive Loss Properties[8]



[8] This map is not intended to directly indicate prioritization for funding purposes.

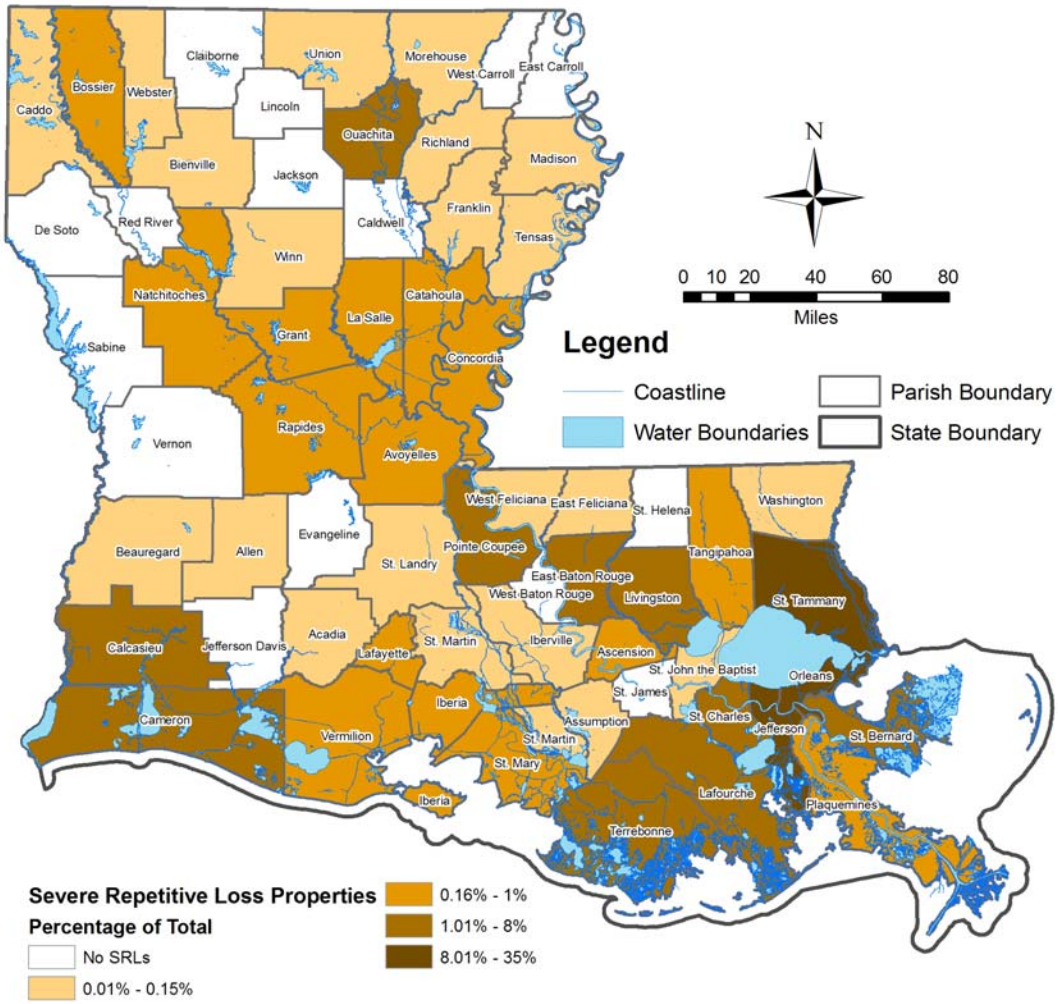
Map D-7b: Flood – Severe Repetitive Loss Properties (SRLs) Per Parish as a Percentage of Total SRLs in the State[9]



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Rep Loss)

[9] This map is not intended to directly indicate prioritization for funding purposes.

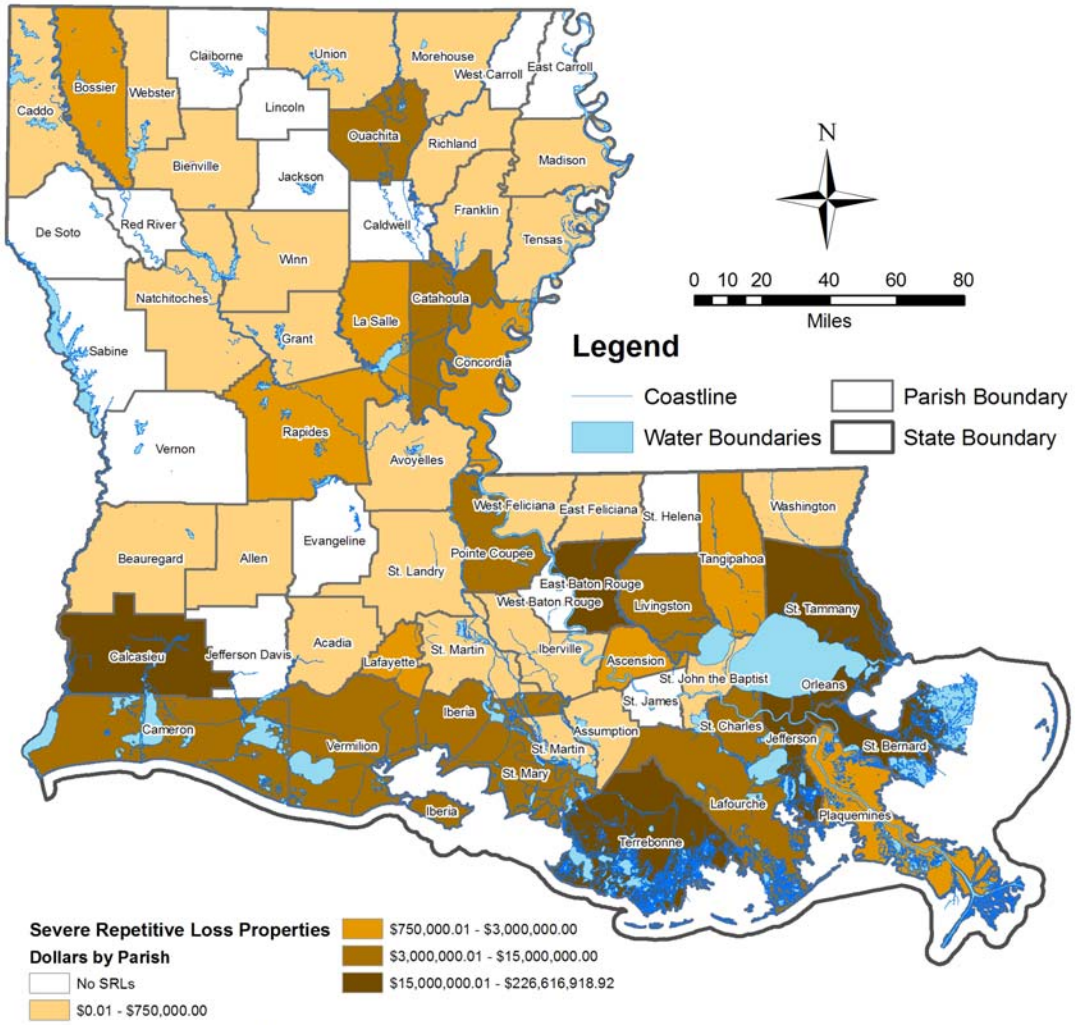
Map D-8a: Flood – Relative Distribution of Repetitive Loss Properties Per Capita[10]



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Rep Loss)

[10] This map is not intended to directly indicate prioritization for funding purposes.

Map D-8b: Flood Dollars Paid by Parish For Severe Repetitive Loss Properties[11]



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Rep Loss)

[11] This map is not intended to directly indicate prioritization for funding purposes.

Appendix D.5

Hailstorm

Nature of the Hazard

On January 5, 2010, all National Weather Service weather forecast offices operationally changed the minimum hail size criterion used to issue severe thunderstorm warning and severe weather statement products from .75 inch (e.g. a penny-sized diameter) to one inch (e.g., quarter-sized diameter).

Disaster History

On May 12, 2007, hail of four inches in diameter was reported in Sterlington. This event did not cause any significant damage or injuries. The second notable event occurred on March 27, 2009, in Reeves. Again, hail was measured at four inches in diameter and this particular storm caused $10,000 in property damages.

A storm on April 22, 1995, brought hailstones as large as 4.5 inches in diameter and caused about $50 million in property damages to the Shreveport metropolitan area, including Bossier and Caddo Parishes.

Table D-11: Top 10 National Hailstorm Events, 1994-2000

Rank	Date	Primary Location	Loss Amount
1.	5-15-98	Minn.-St. Paul, MN	$1.73 billion
2.	5-5-95	Ft. Worth, TX	$929 million
3.	4-19-96	Indianapolis, IN	$658 million
4.	5-18-00	Chicago suburbs, IL	$572 million
5.	4-25-94	Dallas-Ft. Worth, TX	$542 million
6.	4-23-99	Northern Virginia	$394 million
7.	7-7-00	Minn.-St. Paul, MN	$381 million
8.	1-23-00	New Orleans, LA	$353 million
9.	5-3-96	Louisville, KY	$339 million
10.	4-16-98	Bowling Green, KY	$290 million

Source: IBHS 2002 Annual Conference, "Hailstorm Loss Database," PowerPoint Presentation, November 12, 2002

As shown on Table D-11, on January 23, 2000, a hailstorm caused significant damage to property in the New Orleans metropolitan area, including Jefferson, Orleans, and St. Bernard Parishes. Ranging from dime- to golf ball-size, the hail damaged roofs, windows, and vehicles, resulting in nearly 42,000 homeowner and 37,500 auto insurance claims at an estimated cost of $353 million. The Institute for Building and Home Safety (IBHS) identified this storm as the eighth most damaging storm in the nation in the period from 1994 to 2000. Historic records for number of storms, maximum hailstone size by parish, and the percentage of events occurring per parish are included in Table D-12 and the number of storms is also shown on Map D-9.

Probability of Occurrence and Magnitude

Between 1955 and 2009, Louisiana experienced 4,469 hailstorm events during 792 days, an average of 17 storms annually. The average size of hailstones in Louisiana was 2.53 inches, the median size was 2.75 inches, and the maximum size was 4.5 inches. Statewide there is a 13% statistical chance on any given day of having a hailstorm with hailstones of any size (this represents a statistical probability calculated mathematically based on the occurrence of past hailstorm events, not a probability founded on a climatological or meteorological study). There is a chance of having a hailstorm with hailstones at least one inch in diameter (see Table D-13). Hailstorms occur more frequently in the northern portion of the state, with 81% of reported events occurring in that region[12].

[12] Source: "Hail," University of Louisiana at Monroe, www.ulm.edu/~geos/wx_hail.htm, 2007

Table D-12: Number of Hailstorms, Maximum and Average Hail Size by Parish, 1955 to 2009

Parish	Number of Storms	Maximum Hail Size	Percentage in Louisiana	Parish	Number of Storms	Maximum Hail Size	Percentage in Louisiana
Acadia	36	1.75	0.8%	Morehouse	115	2.75	2.6%
Allen	53	2.75	1.2%	Natchitoches	143	2.75	3.2%
Ascension	18	3.00	0.4%	Orleans	28	1.75	0.6%
Assumption	7	1.75	0.2%	Ouachita	176	4.00	4.0%
Avoyelles	49	1.75	1.1%	Plaquemines	14	2.00	0.0%
Beauregard	73	2.00	1.6%	Pointe Coupee	26	1.75	0.0%
Bienville	119	2.75	2.7%	Rapides	120	2.75	2.7%
Bossier	277	4.50	6.3%	Red River	64	2.75	1.70%
Caddo	440	4.50	9.9%	Richland	76	2.75	1.4%
Calcasieu	144	2.75	3.2%	Sabine	131	3.00	3.0%
Caldwell	57	2.75	1.3%	St. Bernard	14	1.75	0.3%
Cameron	39	2.75	0.9%	St. Charles	35	2.75	0.8%
Catahoula	51	2.75	1.2%	St. Helena	12	1.75	0.3%
Claiborne	109	2.75	2.5%	St. James	10	1.75	0.3%
Concordia	46	4.50	1.0%	St. John the Baptist	6	1.75	0.1%
DeSoto	161	4.50	3.6%	St. Landry	47	2.00	1.1%
East Baton Rouge	52	2.50	1.2%	St. Martin	19	2.75	0.4%
East Carroll	60	2.75	1.4%	St. Mary	22	1.75	0.5%
East Feliciana	16	1.75	0.4%	St. Tammany	59	3.00	1.3%
Evangeline	37	2.75	0.8%	Tangipahoa	41	1.75	0.9%
Franklin	93	2.75	2.1%	Tensas	75	2.75	1.7%
Grant	54	4.75	1.2%	Terrebonne	18	2.00	0.4%
Iberia	25	1.75	0.6%	Union	122	2.75	2.8%
Iberville	23	1.75	0.5%	Vermilion	44	4.25	1.0%
Jackson	92	2.75	2.1%	Vernon	80	2.75	1.8%
Jefferson	46	3.00	1.0%	Washington	40	2.00	0.9%
Jefferson Davis	29	1.75	0.7%	Webster	201	2.75	4.5%
La Salle	42	2.75	0.9%	West Baton Rouge	13	2.75	0.3%
Lafayette	44	2.00	1.0%	West Carroll	71	2.00	1.6%
Lafourche	22	1.75	0.5%	West Feliciana	11	1.75	0.2%
Lincoln	124	2.75	2.8%	Winn	83	2.75	1.9%
Livingston	41	1.75	0.9%	Total/Maximum/Average	4471	4.50	100%
Madison	76	4.25	1.7%				

Source: NCDC, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms

Table D-13: Probability of Hailstorms by Size of Hailstone by Parish (1955-2002)

Parish	Hailstone Size in Inches					Annual Probability for All Hailstone Sizes
	0-.74	.75-.99	1.0-1.9	2.0-2.9	3.0+	
Acadia	0.00%	0.02%	0.06%	0.00%	0.00%	0.09%
Allen	0.00%	0.07%	0.07%	0.01%	0.00%	0.15%
Ascension	0.00%	0.02%	0.02%	0.01%	0.01%	0.05%

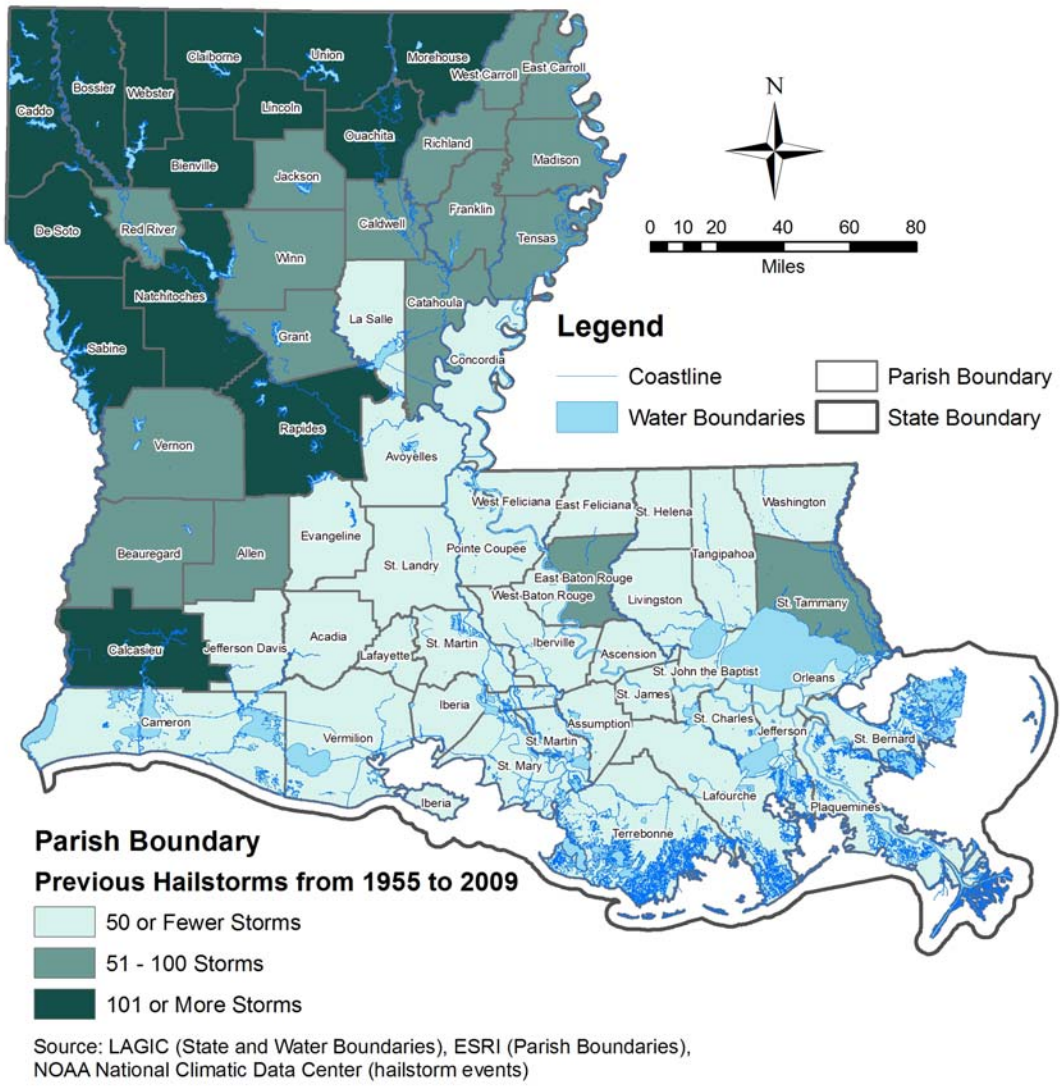
Parish	Hailstone Size in Inches					Annual Probability for All Hailstone Sizes
	0-.74	.75-.99	1.0-1.9	2.0-2.9	3.0+	
Assumption	0.00%	0.01%	0.03%	0.00%	0.00%	0.04%
Avoyelles	0.00%	0.04%	0.07%	0.00%	0.00%	0.11%
Beauregard	0.00%	0.12%	0.09%	0.01%	0.00%	0.22%
Bienville	0.01%	0.09%	0.25%	0.02%	0.00%	0.36%
Bossier	0.01%	0.21%	0.44%	0.09%	0.01%	0.75%
Caddo	0.01%	0.35%	0.62%	0.11%	0.03%	1.12%
Calcasieu	0.00%	0.21%	0.19%	0.01%	0.00%	0.40%
Caldwell	0.00%	0.07%	0.19%	0.01%	0.00%	0.27%
Cameron	0.00%	0.03%	0.05%	0.01%	0.00%	0.09%
Catahoula	0.00%	0.03%	0.03%	0.02%	0.00%	0.09%
Claiborne	0.00%	0.10%	0.22%	0.01%	0.00%	0.33%
Concordia	0.00%	0.03%	0.03%	0.01%	0.01%	0.09%
DeSoto	0.00%	0.16%	0.34%	0.02%	0.01%	0.53%
East Baton Rouge	0.00%	0.06%	0.10%	0.01%	0.00%	0.17%
East Carroll	0.00%	0.07%	0.11%	0.02%	0.00%	0.21%
East Feliciana	0.00%	0.01%	0.02%	0.00%	0.00%	0.03%
Evangeline	0.00%	0.05%	0.06%	0.01%	0.00%	0.12%
Franklin	0.00%	0.06%	0.21%	0.02%	0.00%	0.30%
Grant	0.00%	0.05%	0.09%	0.01%	0.00%	0.15%
Iberia	0.00%	0.03%	0.03%	0.00%	0.00%	0.06%
Iberville	0.00%	0.02%	0.05%	0.00%	0.00%	0.07%
Jackson	0.01%	0.09%	0.14%	0.05%	0.00%	0.29%
Jefferson	0.00%	0.03%	0.09%	0.01%	0.01%	0.14%
Jefferson Davis	0.00%	0.05%	0.05%	0.00%	0.00%	0.10%
La Salle	0.00%	0.06%	0.05%	0.01%	0.00%	0.12%
Lafayette	0.00%	0.03%	0.11%	0.01%	0.00%	0.14%
Lafourche	0.00%	0.05%	0.05%	0.00%	0.00%	0.10%
Lincoln	0.01%	0.10%	0.21%	0.02%	0.00%	0.34%
Livingston	0.00%	0.03%	0.09%	0.00%	0.00%	0.13%
Madison	0.00%	0.06%	0.17%	0.02%	0.00%	0.26%
Morehouse	0.00%	0.13%	0.22%	0.03%	0.00%	0.38%
Natchitoches	0.02%	0.15%	0.29%	0.01%	0.00%	0.46%
Orleans	0.00%	0.06%	0.07%	0.00%	0.00%	0.13%
Ouachita	0.01%	0.14%	0.26%	0.05%	0.01%	0.47%
Plaquemines	0.00%	0.01%	0.03%	0.01%	0.00%	0.06%
Pointe Coupee	0.00%	0.04%	0.05%	0.00%	0.00%	0.09%
Rapides	0.00%	0.19%	0.21%	0.02%	0.00%	0.42%
Red River	0.00%	0.06%	0.15%	0.02%	0.00%	0.23%
Richland	0.00%	0.05%	0.15%	0.01%	0.00%	0.21%
Sabine	0.00%	0.11%	0.26%	0.02%	0.01%	0.39%
St. Bernard	0.00%	0.02%	0.03%	0.00%	0.00%	0.05%
St. Charles	0.01%	0.02%	0.07%	0.01%	0.00%	0.10%
St. Helena	0.00%	0.00%	0.02%	0.00%	0.00%	0.02%
St. James	0.00%	0.01%	0.02%	0.00%	0.00%	0.03%
St. John the Baptist	0.00%	0.01%	0.02%	0.00%	0.00%	0.03%

Parish	Hailstone Size in Inches					Annual Probability for All Hailstone Sizes
	0-.74	.75-.99	1.0-1.9	2.0-2.9	3.0+	
St. Landry	0.00%	0.03%	0.05%	0.01%	0.00%	0.09%
St. Martin	0.00%	0.02%	0.02%	0.01%	0.00%	0.05%
St. Mary	0.00%	0.02%	0.02%	0.00%	0.00%	0.04%
St. Tammany	0.00%	0.05%	0.10%	0.00%	0.01%	0.16%
Tangipahoa	0.00%	0.03%	0.10%	0.00%	0.00%	0.13%
Tensas	0.00%	0.10%	0.10%	0.03%	0.00%	0.22%
Terrebonne	0.00%	0.02%	0.03%	0.00%	0.00%	0.06%
Union	0.00%	0.09%	0.22%	0.02%	0.00%	0.33%
Vermilion	0.00%	0.03%	0.05%	0.00%	0.00%	0.08%
Vernon	0.00%	0.09%	0.13%	0.02%	0.00%	0.23%
Washington	0.00%	0.02%	0.07%	0.01%	0.00%	0.10%
Webster	0.01%	0.16%	0.38%	0.03%	0.00%	0.57%
West Baton Rouge	0.00%	0.01%	0.03%	0.00%	0.00%	0.05%
West Carroll	0.00%	0.07%	0.11%	0.01%	0.00%	0.19%
West Feliciana	0.00%	0.03%	0.01%	0.00%	0.00%	0.04%
Winn	0.00%	0.08%	0.15%	0.01%	0.00%	0.25%
Statewide Probability	0.08%	4.32%	7.74%	0.82%	0.09%	13.04%

Data Limitations

The NCDC data on hail incidents and hailstone size are based on local reports. As a result, several hail events may not have been reported, particularly in unpopulated areas, or may have incorrect hailstone size measurements. This uncertainty renders any estimates of probability based upon the data suspect.

Map D-9: Hazard Profile – Hailstorm



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (hailstorm events)

Appendix D.6.A

High Wind - Hurricane

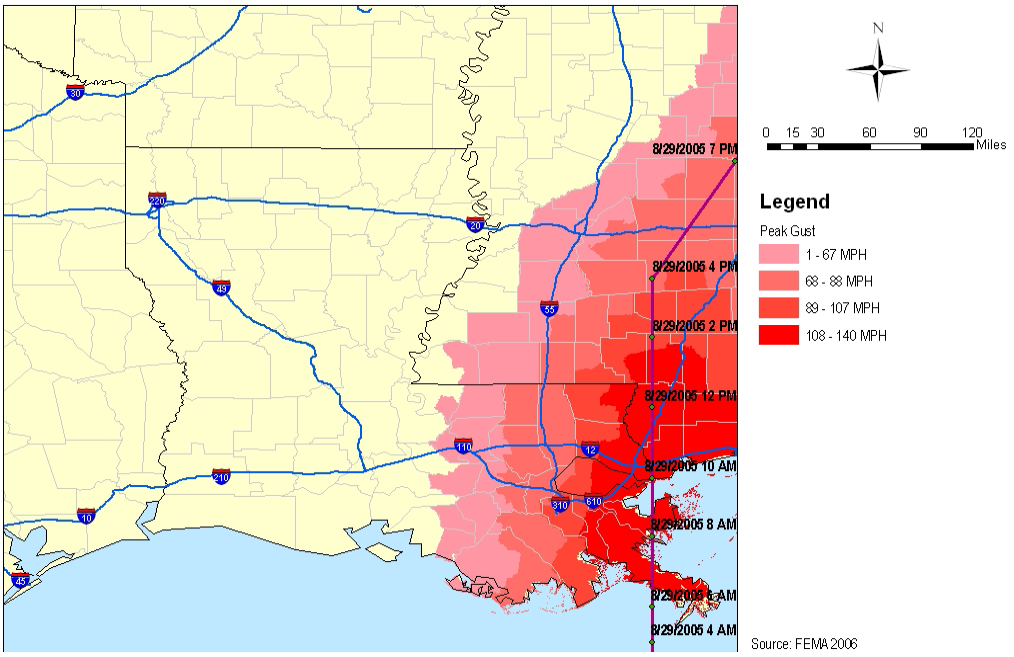
High winds can be experienced from tropical storms (or hurricanes) or tornadoes. Appendix D.6 will be divided into two subsections that are profiled separately and labeled as D.6.A High Wind-Hurricane and D.6.B High Wind-Tornado.

Nature of the Hazard

The central Gulf of Mexico coastline is among the most hurricane-prone locations in the United States While the Atlantic Basin hurricane season officially extends from June 1 to November 30; Louisiana has experienced storms as early as late May and has not experienced a storm during the month of November for more than 100 years. The peak hurricane activity in Louisiana occurs in September. Hurricanes and tropical cyclones get their energy from warm waters and lose strength as they move over land. Hurricanes and tropical storms can bring severe winds, storm surge flooding along coastal regions, high waves, coastal erosion, and extreme amounts of rainfall, thunderstorms, lightning, inland flooding, and tornadoes.

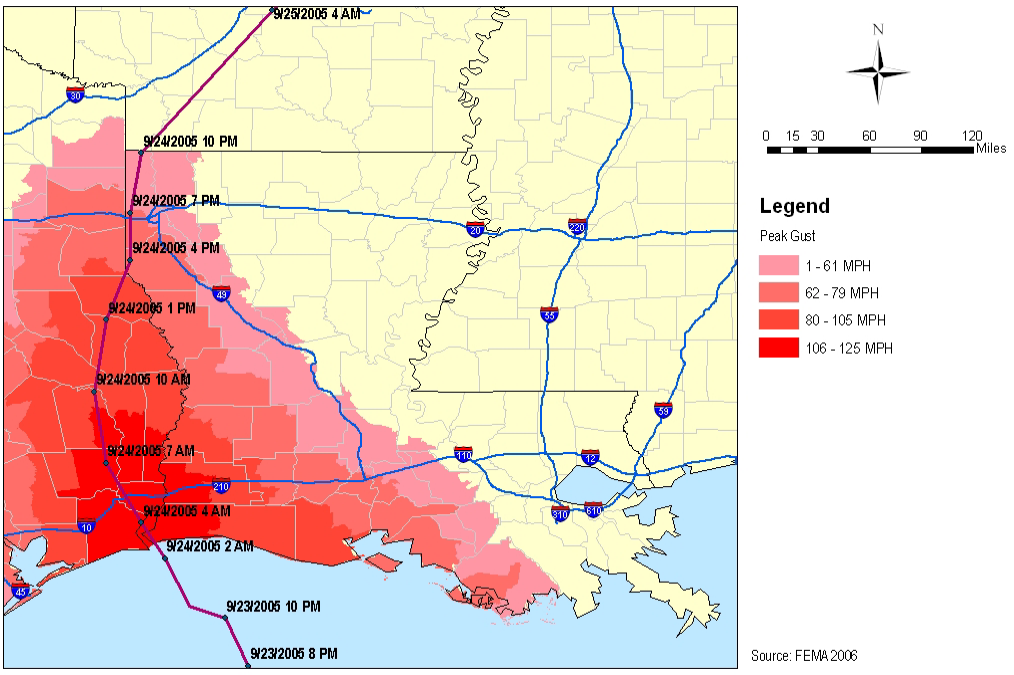
One of the most serious hurricane-related hazards for Louisiana is high wind. Coastal and inland areas are also vulnerable to hurricane-spawned tornadoes (refer to Appendix D.6b). Maps D-10 and D-11 below show the wind fields resulting from Hurricanes Katrina and Rita, respectively, at landfall. The wind-related impacts from these two events were felt well inland. Map D-12 shows the impacts from Hurricane Gustav, which carried hurricane-force winds significantly further into inland Louisiana. In the following subsection regarding High Wind (Tornado), Maps D-13a and b illustrate that all of Louisiana, including its northern reaches, can experience strong tropical storm- to hurricane-force winds.

Map D-10: Hurricane Katrina Extent of Wind Fields



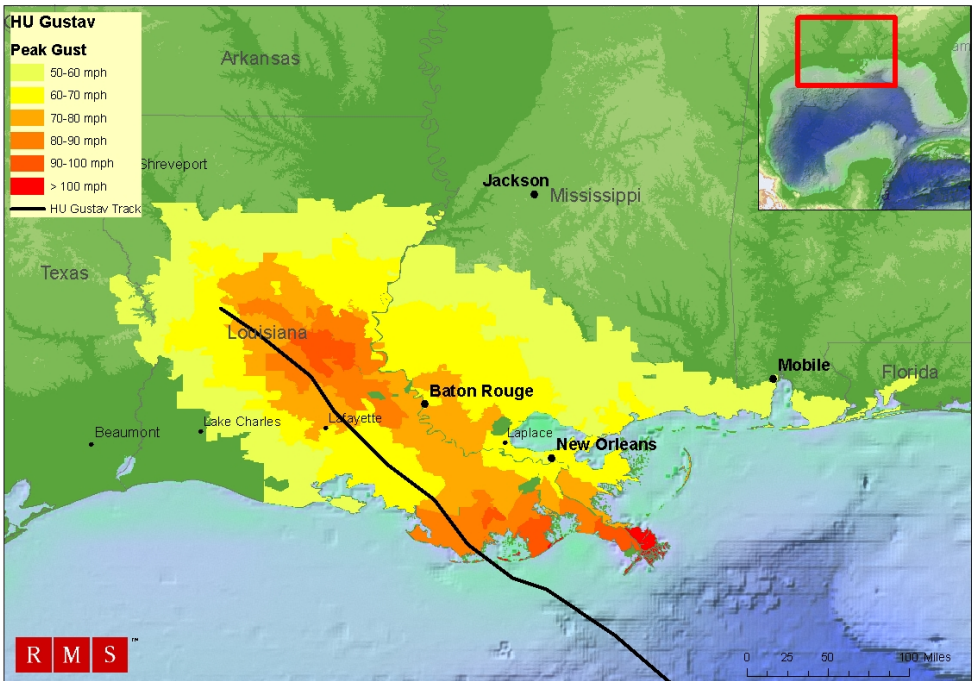
Source: FEMA, 2006

Map D-11: Hurricane Rita Extent of Wind Fields



Source: FEMA, 2006

Map D-12: Hurricane Gustav Extent of Wind Fields



Source: Risk Management Solutions, 2008

Hurricane magnitude is measured on the Saffir-Simpson hurricane scale, shown in Table D-14, which categorizes hurricane magnitude by wind speeds and storm-surge above normal sea levels. Wind speed is not an accurate predictor of storm surge levels. Storm surge can be affected by several factors such as ocean topography and the rate of forward motion of the storm, as well as the size of the area covered by the storm.

Table D-14: Saffir-Simpson Hurricane Scale

Category	Wind Speed	Storm Surge (feet above normal sea level)	Expected Damage
1	74–95 mph	4–5 ft.	Minimal: Damage primarily to shrubbery and trees; unanchored mobile homes damaged; some damaged signs; no real damage to structures.
2	96–110 mph	6–8 ft.	Moderate: Some trees toppled; some roof coverings damaged; major damage to mobile homes.
3	111–130 mph	9–12 ft.	Extensive: Large trees toppled; some structural damage to roofs; mobile homes destroyed; structural damage to small homes and utility buildings.
4	131–155 mph	13–18 ft.	Extreme: Extensive damage to roofs, windows, and doors; roof systems on small buildings completely fail; some curtain walls fail.
5	> 155 mph	> 18 ft.	Catastrophic: Considerable and widespread roof damage; severe window and door damage; extensive glass failures; entire buildings may fail.

Source: "Understanding Your Risks: Identifying Hazards and Estimating Losses." FEMA. 2001.

Disaster History

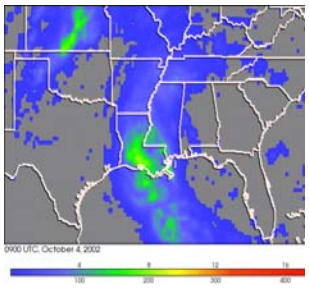
Between 1886 and 2009, Louisiana had 33 direct hurricane landfalls. The state received 18 Presidential Disaster Declarations for hurricanes from 1965 to 2009. Only five hurricanes have made landfall as major hurricanes of category 4 or 5 intensity: unnamed hurricanes in 1909 and 1915, Hurricane Audrey in 1957, Hurricane Betsy in 1965 and Hurricane Camille in 1969. Hurricanes Katrina and Rita, despite the devastation they caused, both made landfall as category 3 hurricanes. Table D-15 presents additional historical hurricane facts for the State of Louisiana. Table D-16 (located at end of this subsection) includes detailed information on average wind speeds of past hurricane and tropical storms.

Table D-15: Louisiana Hurricane Historic Facts	
First recorded storm	September 1711
Earliest Tropical Storm	April 3, 1846
Longest period between storms	18 years (September 1722 – September 1740)
Shortest period between storms	10 days (August 22, 1879 – September 1, 1879)
Most storms in a single year	3 (1860, 1985, 1998)
Highest death total	2,000 (October 1893)
Highest death total this century	556 (Audrey, June 1957)
Most monetary damage	$75 billion (Katrina, August 2005)
Most powerful storm at landfall	Camille, August 1969 (Category 5)

Sources: USGS, "Environmental Atlas of Lake Pontchartrain," http://pubs.usgs.gov/of/2002/of02-206//phy-environment/, TRAC, "Louisiana's Hurricane History", and GOHSEP, 2004.

Hurricanes and tropical storms have proven to be Louisiana's costliest and deadliest natural phenomenon. At least three storms have produced 200 or more deaths, including the storm of 1893, in which roughly 2,000 lives were lost. Hurricanes Betsy in 1969 and Andrew in 1992 both created losses of about $1 billion. More recently, Louisiana received Presidential Disaster Declarations for Tropical Storm Allison in June 2001, Tropical Storm Isidore in September 2002, Hurricane Lili in October 2002, Hurricane Ivan in 2004, Hurricane Katrina in 2005, Hurricane Rita in 2005, and Hurricane Gustav in 2008; all of these storms are described further below.

Figure D-4: Hurricane Lili Rainfall Footprint



Source: NASA

Hurricane Betsy made landfall in August 1965 at Grand Isle, Louisiana, bringing 160 mph gusts and a 15.7-foot storm surge that flooded the entire island. Winds gusted to 125 mph in New Orleans and a storm surge with a height of 9.8 feet caused major flooding. Most of southeast Louisiana had winds reaching 100 mph, and areas as far inland as Monroe had winds exceeding 60 mph. Offshore oil rigs, public utilities, and commercial boats all suffered severe damage, resulting in more than $1 billion in disaster costs. Fifty-eight people lost their lives.

Hurricane Andrew in August 1992 made landfall in Louisiana near Morgan City with 115 mph winds, causing a nine foot storm surge. The hurricane caused widespread power outages and flooding as it continued north through the state and spawned an F3 tornado in Laplace. Several crops experienced a significant loss as a result of the storm with the sugar cane crop taking a $200 million loss.

Hurricane Lili made landfall in October 2002 as a category 1 hurricane, having dropped rapidly from a category 4 just before landfall. The hurricane caused three to five feet of storm-surge tides across most of coastal southeast Louisiana and four to seven feet across south Lafourche and Terrebonne Parishes.

The storm surge overtopped or breached several locally-built levees and flooded over 1,000 homes and businesses in Terrebonne Parish. Along Lakes Pontchartrain and Maurepas, the storm flooded low-lying roadways and structures. Figure D-4 shows the rainfall footprint for Hurricane Lili; note the rain accumulation of up to ten inches (indicated by the color green).

Hurricane Katrina made landfall in August 2005 as a category 3 hurricane resulting in over $75 billion in damages. The hurricane, and resulting storm surge, breached several levees and flooded 80% of New Orleans. Flooding was widespread along coastal Louisiana. Levee breaches also led to flooding in St. Bernard and Plaquemines, with additional flooding in St. Tammany due to the storm surge. Wind damage was also extensive, as far north as Washington Parish and several Parishes were impacted by the need to house those displaced from southeastern Louisiana.

Hurricane Rita made landfall on the Louisiana/Texas border early in the morning of September 23, 2005. At landfall, the storm's sustained winds measured 121 mph, making it the second category 3 hurricane to strike Louisiana in less than a month. Just prior to landfall, hurricane force winds extended more than 85 miles from the storm's center, and tropical storm force winds extended more than 200 miles. As a result of Rita, almost every structure in Holly Beach, Cameron, Creole, and Grand Cheniere in Cameron Parish was destroyed, with many completely swept away. More than 700,000 people in 41 parishes across Louisiana were without power, some for weeks. One fatality in Louisiana was directly attributed to Rita, with many others indirectly attributed. Hundreds of people in southwest Louisiana required rescue after Rita's landfall.

Hurricane Gustav made landfall in Cocodrie in September 2008 as a category 2 hurricane, resulting in over $4 billion in estimated damages. Seven deaths in Louisiana are directly attributable to Gustav, while another 41 are indirectly attributable to the storm. The storm brought winds, surge, and tornadoes, with an F2 tornado confirmed in Evangeline Parish. Many of the central parishes sustained significant wind damage and widespread, prolonged power outages, also as a result of wind. Thousands of trees were uprooted or snapped by the wind, and few homes escaped roof damage. Statewide, more than 1.5 million residents were without power after the storm.

Hurricane Ike made landfall on September 13, 2008, at 2:10am as a category 2 hurricane with winds of 110 mph. The 2:00 am National Hurricane Center (NHC) advisory cited tropical storm and hurricane force winds extending 275 miles (443 km) and 120 miles (190 km), respectively, from the storm's center. The storm surge blew onshore of Louisiana well ahead of Ike's predicted landfall in Texas. Areas in coastal south-central and southwestern Louisiana, some of which were flooded by Gustav, were re-flooded as a result of Ike.

Table D-16: Average Wind Speed by Category of Historical Hurricanes and Tropical Storms, 1851-2009

Name	Year	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Not Named	1855	-	-	-	120	-	-
Not Named	1856	-	-	-	-	150	-
Not Named	1860	-	-	-	118	-	-
Not Named	1860	-	-	103	-	-	-
Not Named	1860	-	-	103	-	-	-
Not Named	1865	-	-	103	-	-	-
Not Named	1867	-	-	103	-	-	-

Name	Year	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Not Named	1868	69	-	-	-	-	-
Not Named	1869	-	81	-	-	-	-
Not Named	1872	57	-	-	-	-	-
Not Named	1875	46	-	-	-	-	-
Not Named	1877	-	81	-	-	-	-
Not Named	1879	49	-	-	-	-	-
Not Named	1879	-	-	-	126	-	-
Not Named	1879	57	-	-	-	-	-
Not Named	1885	57	-	-	-	-	-
Not Named	1885	57	-	-	-	-	-
Not Named	1885	69	-	-	-	-	-
Not Named	1886	57	-	-	-	-	-
Not Named	1886	-	-	98	-	-	-
Not Named	1887	-	-	98	-	-	-
Not Named	1888	-	-	103	-	-	-
Not Named	1889	-	-	98	-	-	-
Not Named	1891	53	-	-	-	-	-
Not Named	1892	54	-	-	-	-	-
Not Named	1893	-	-	98	-	-	-
Not Named	1893	-	-	98	-	-	-
Not Named	1895	56	-	-	-	-	-
Not Named	1895	40	-	-	-	-	-
Not Named	1897	-	82	-	-	-	-
Not Named	1898	49	-	-	-	-	-
Not Named	1900	51	-	-	-	-	-
Not Named	1901	-	83	-	-	-	-
Not Named	1902	69	-	-	-	-	-
Not Named	1904	40	-	-	-	-	-
Not Named	1905	43	-	-	-	-	-
Not Named	1905	41	-	-	-	-	-
Not Named	1907	42	-	-	-	-	-
Not Named	1909	-	-	102	-	-	-
Not Named	1912	50	-	-	-	-	-
Not Named	1914	40	-	-	-	-	-
Not Named	1915	-	-	98	-	-	-
Not Named	1918	-	-	98	-	-	-
Not Named	1920	-	-	103	-	-	-
Not Named	1923	-	-	98	-	-	-
Not Named	1923	52	-	-	-	-	-

Name	Year	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Not Named	1926	-	-	98	-	-	-
Not Named	1926	50	-	-	-	-	-
Not Named	1931	46	-	-	-	-	-
Not Named	1932	40	-	-	-	-	-
Not Named	1932	46	-	-	-	-	-
Not Named	1934	-	75	-	-	-	-
Not Named	1936	46	-	-	-	-	-
Not Named	1937	40	-	-	-	-	-
Not Named	1938	-	75	-	-	-	-
Not Named	1939	41	-	-	-	-	-
Not Named	1940	-	81	-	-	-	-
Not Named	1940	42	-	-	-	-	-
Not Named	1941	46	-	-	-	-	-
Not Named	1941	52	-	-	-	-	-
Not Named	1943	40	-	-	-	-	-
Not Named	1944	45	-	-	-	-	-
Not Named	1946	40	-	-	-	-	-
Not Named	1947	-	90	-	-	-	-
Not Named	1948	-	75	-	-	-	-
Not Named	1949	46	-	-	-	-	-
Not Named	1949	52	-	-	-	-	-
Barbara	1954	40	-	-	-	-	-
Brenda	1955	59	-	-	-	-	-
Not Named	1955	46	-	-	-	-	-
Not Named	1956	49	-	-	-	-	-
Flossy	1956	-	86	-	-	-	-
Audrey	1957	-	-	-	-	144	-
Bertha	1957	69	-	-	-	-	-
Esther	1957	52	-	-	-	-	-
Arlene	1959	46	-	-	-	-	-
Ethel	1960	-	92	-	-	-	-
Hilda	1964	-	-	-	115	-	-
Betsy	1965	-	-	-	-	155	-
Camille	1969	-	-	-	-	-	190
Edith	1971	-	-	98	-	-	-
Carmen	1974	-	-	-	-	150	-
Babe	1977	-	75	-	-	-	-
Debra	1978	57	-	-	-	-	-
Bob	1979	-	75	-	-	-	-

Name	Year	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Claudette	1979	52	-	-	-	-	-
Chris	1982	58	-	-	-	-	-
Danny	1985	-	85	-	-	-	-
Elena	1985	-	-	-	115	-	-
Juan	1985	-	77	-	-	-	-
Not Named	1987	-	-	-	-	-	-
Beryl	1988	49	-	-	-	-	-
Florence	1988	-	81	-	-	-	-
Andrew	1992	-	-	-	-	132	-
Danny	1997	-	78	-	-	-	-
Hermine	1998	42	-	-	-	-	-
Allison	2001	35	-	-	-	-	-
Bertha	2002	35	-	-	-	-	-
Hanna	2002	50	-	-	-	-	-
Isidore	2002	55	-	-	-	-	-
Lili	2002	-	90	-	-	-	-
Bill	2003	50	-	-	-	-	-
Matthew	2004	40	-	-	-	-	-
Cindy	2005	-	75	-	-	-	-
Katrina	2005	-	-	-	-	140	-
Rita	2005	-	-	-	121	-	-
Humberto	2007	40	-	-	-	-	-
Gustav	2008	-	-	104	-	-	-
Ike	2008	70	-	-	-	-	-
Total Number For Each Category	108	58	19	18	6	6	1

Frequency of Occurrence and Magnitude

Louisiana has had seven recorded hurricanes of categories 4 and 5 between the years of 1851 and 2009. As shown in Table D-14 (above), hurricanes of this magnitude have sustained winds reaching up to 155 mph, storm-surge heights up to 18 feet, and can cause extensive damage to structures. Louisiana experiences a category 4 hurricane with an average frequency of 70 years (Table D-17). Map D-13a depicts 3 second wind gusts at 33 feet, and Map D-13b depicts maximum high winds and 100 year probabilities.

Table D-17: Frequency of Hurricanes Passing Within 80 Miles of New Orleans, Louisiana

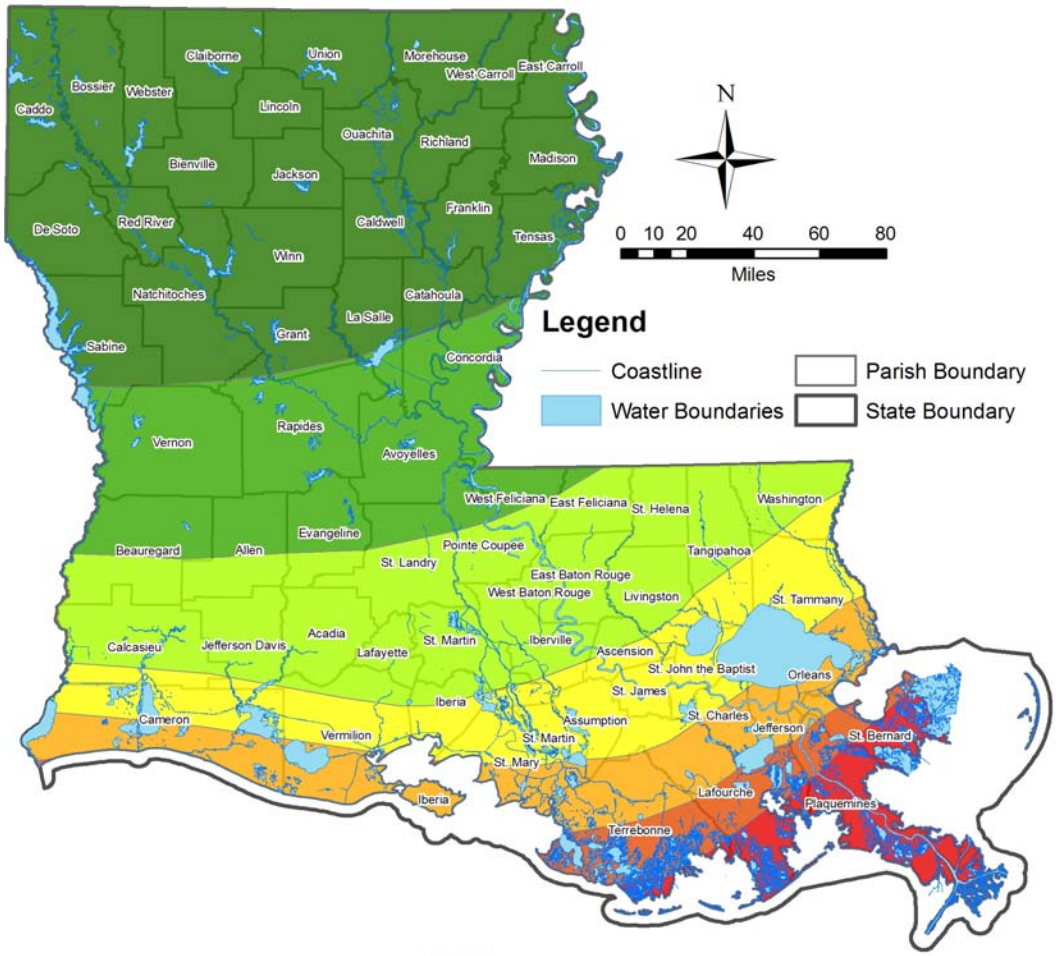
Intensity	Frequency
Category 1	8 years
Category 2	19 years
Category 3	32 years
Category 4	70 years
Category 5	180 years

Source: USGS, "Environmental Atlas of Lake Pontchartrain," http://pubs.usgs.gov/of/2002/of02-206//phy-environment/.

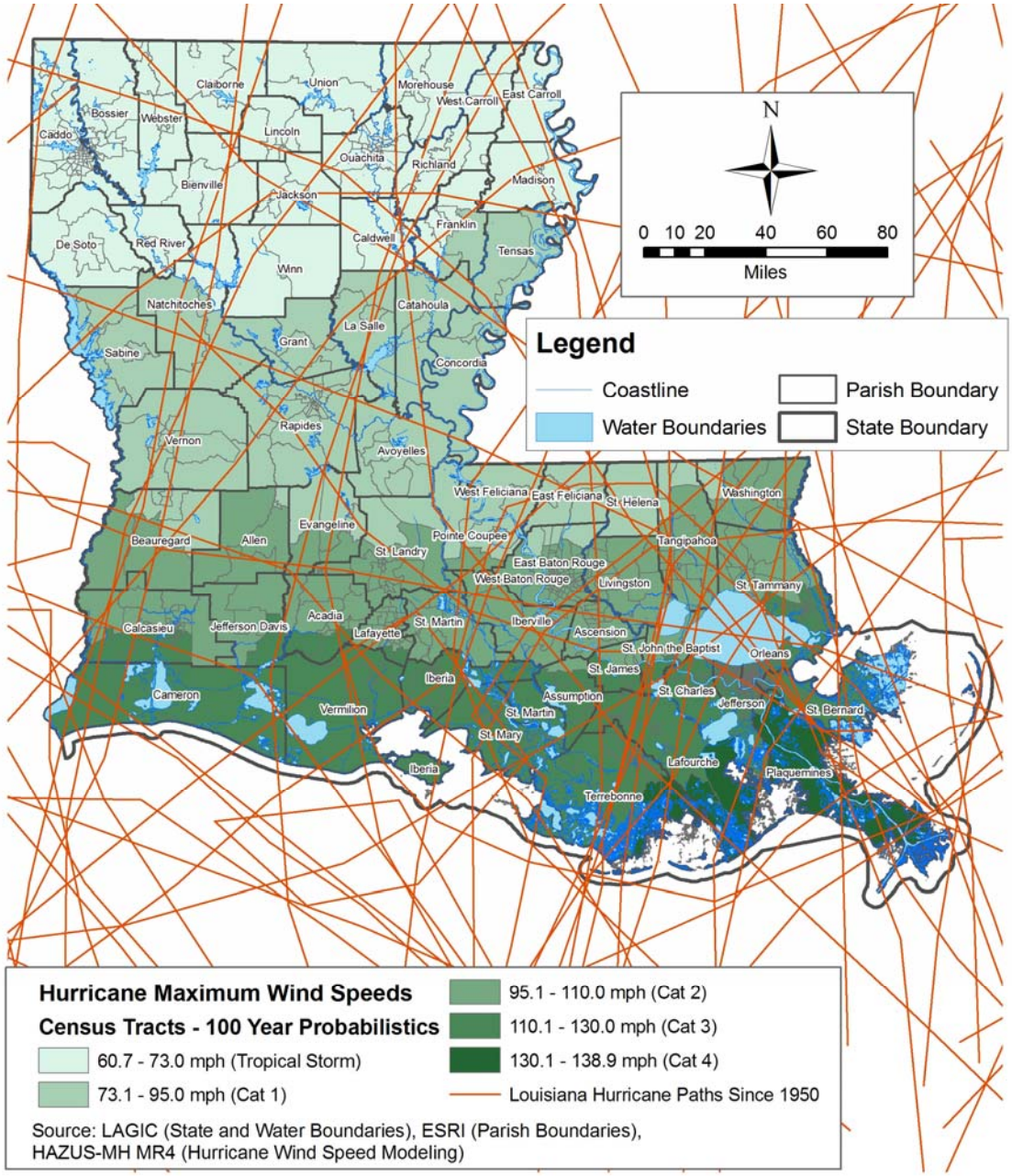
Data Limitations

The hurricane data available from the NCDC and National Weather Service (NWS) are very comprehensive and cover a significant span of time. It would be beneficial, however, for the dataset to include additional information on the impact of the storms.

Map D-13a: Hazard Profile – High Wind (Hurricane), Showing Maximum Sustained Winds



Map D-13b: Hazard Profile (Hurricane) – Maximum High Winds and 100 year Probabilities



Appendix D.6b

High Wind (Tornado)

Nature of the Hazard

The midsection of the United States, including Louisiana, experiences a higher rate of tornadoes than other parts of the country because of the recurrent collision of moist, warm air moving north from the Gulf of Mexico with colder fronts moving east from the Rocky Mountains. Tornadoes are not systematically predictable (they only have statistical likelihood), and they do not really respect geographical or climatological characteristics in the way other weather phenomena do. In Louisiana, tornadoes have a higher frequency in the spring months of March, April, and May. While a majority of tornadoes cause little or no damage, some are capable of tremendous destruction, reaching wind speeds of 250 mph or more.

Until 2007, the Fujita Tornado Measurement Scale was the standard for measuring tornado intensity. This scale, shown in Table D-18a, determines likely wind speeds based on the severity of tornado damage and assigns a scale category, F0 – F5. The table shows the tornado categories, corresponding wind speed, types of damage possible, and the number of tornadoes per category that Louisiana has experienced from 1950 to 2009.

Table D-18a: Fujita Tornado Measurement Scale and Frequencies in Louisiana

Fujita Category	Wind Speed	Examples of Possible Damage	Number in Louisiana	% of State Tornadoes
F0	Gale (40–72 mph)	Light damage: Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; damaged sign boards.	556	30.2%
F1	Moderate (73–112 mph)	Moderate damage: Surface peeled off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads.	809	44%
F2	Significant (113–157 mph)	Considerable damage: Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.	323	17.5%
F3	Severe (158–206 mph)	Severe damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.	134	7%
F4	Devastating (207–260 mph)	Devastating damage: Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	18	1%
F5	Incredible (261–318 mph)	Incredible damage: Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 yards; trees debarked; incredible phenomena occur.	2	0.1%
Total Tornadoes in Louisiana, 1950-2009			1,842	100%

Source: "Storm Event Database." National Climatic Data Center, National Oceanic and Atmospheric Administration. http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms

The original Fujita Scale was based largely on the extent of damage done to houses and mobile homes and on the effects of high winds on vehicles and trees. The weakest tornadoes, those that had caused minor damage to chimneys and tree limbs, were assigned an F0 rating, or gale tornado status. As the wind speed increased, so did the "F" value. An incredible tornado was assigned a rating of F5. Its impact would be recognized only after the event by evidence such as remnants of strong frame houses that had been carried from their foundations and torn apart.

Although the Fujita Scale offers a way to compare tornado strength, it is subjective. Its reliability and repeatability depend on several factors. First, reliability depends on the skill of the surveyor. Will all surveyors know how to distinguish tornado damage from the downburst of straight-line winds? Will surveyors be consistent in interpreting the extent of damage? In addition to human inconsistency and subjectivity, location can introduce differences as well. Structures and trees vary from place to place, making it difficult to standardize observations. Estimating wind speed in isolated regions where there are no structures to be damaged is also a challenge.

To address these problems, weather experts now use an Enhanced Fujita Scale, shown in Table D-18b. Known as the EF-Scale, this system is expanded to include 28 more diverse and better described damage indicators. This results in less observer bias and more consistency when comparing tornadoes. Familiar locations such as schools, strip malls, high-rise buildings, and warehouses are now included as specific damage indicators. If a tornado passes by one of these structures, the damage done to the building provides information to infer wind speed more accurately.[13]

Table D-18b: Enhanced Fujita Tornado Measurement Scale

Enhanced Fujita Category	Wind Speed (mph)	Potential Damage
EF0	65-85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.

[13] http://www.jason.org/digital_library/122.aspx

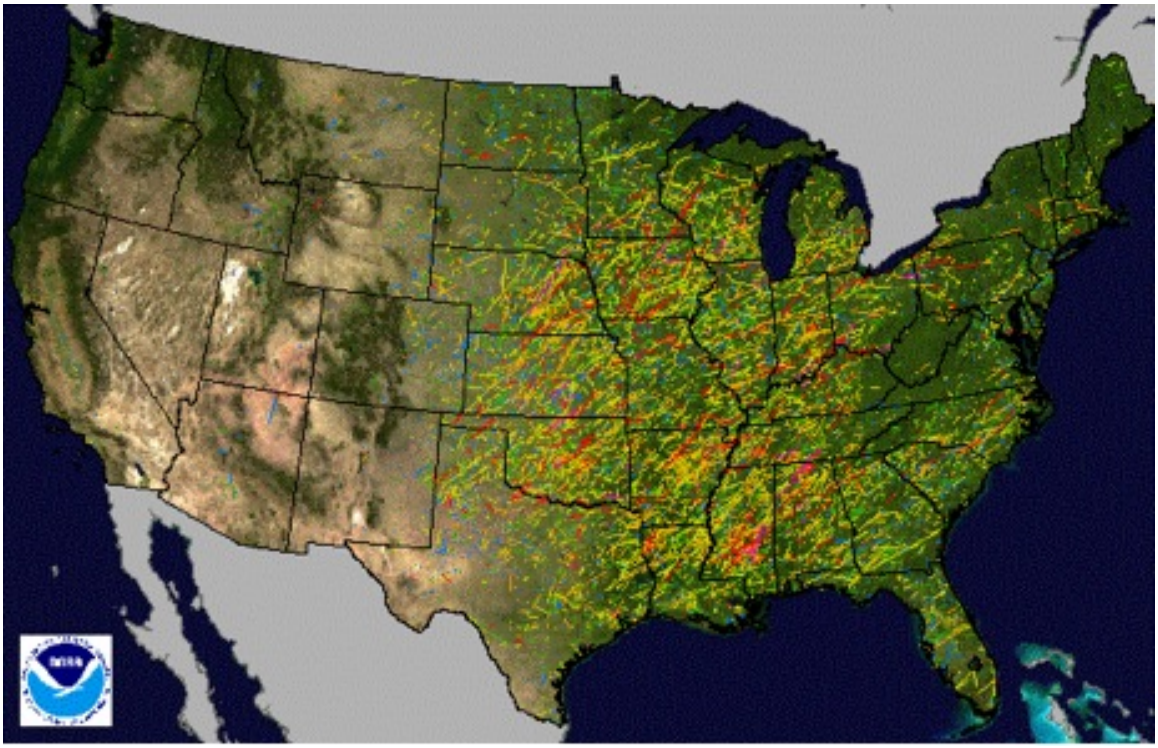
Enhanced Fujita Category	Wind Speed (mph)	Potential Damage
EF4	166-200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur.

Source: http://en.wikipedia.org/wiki/Enhanced_Fujita_Scale

Disaster History

Figure D-5 shows past tornado activity across the United States from 1950 to 2009. While the vast majority of tornado events in Louisiana have produced little damage and few injuries, the state has experienced several violent and fatal tornado outbreaks. The state has had seven federal Disaster Declarations for tornado events since 1965. According to the NOAA, one of the deadliest tornado outbreaks in United States history occurred in Louisiana and neighboring states during April 24-26, 1908. A number of violent tornadoes moved through parts of Louisiana, Mississippi, and Alabama, killing 324 people and injuring 1,652 others. The worst damage took place in Amite, Louisiana, where 29 people died.

Figure D-5: Past Tornado Events, 1950 to 2009



Source: National Oceanic and Atmospheric Administration

More recently, tornadoes struck Bossier, Caddo, Claiborne, and DeSoto Parishes on April 3, 1999. Several F3 and F4 tornadoes touched down, killing seven people, injuring 103 others, and causing more than $12 million in damages, resulting in a Presidential Disaster Declaration.

Additional tornadoes struck Orleans Parish on February 2, 2006, and February 13, 2007. Several F2 tornadoes touched down in Westwego, New Orleans, and Gentilly. The 2007 tornadoes caused over $5 million in damages, hitting areas still devastated from Hurricanes Katrina and Rita.

The 2008 and 2009 tornado season proved to be as deadly and as costly as in previous years. The 2008 and 2009 tornado seasons combined produced approximately 164 recorded tornadoes in Louisiana that resulted in 6 deaths, 32 injuries, and $41.6 million in damages in Louisiana. On December 10, 2009, President Obama declared a Presidential Disaster in the State of Louisiana and ordered federal aid to supplement state and local recovery efforts in the area struck by severe storms, tornadoes, and flooding during the period of October 29 to November 3, 2009.

Probability of Occurrence and Intensity

Table D-19 lists the top states in the nation for number of tornadoes, fatalities, and injuries caused by tornado events, and accumulated (inflation-adjusted) dollar damages. Louisiana ranks in the top 20 for all four categories, indicating that it has a relatively high likelihood for tornado occurrences and damages.

Table D-19: Top 20 States for Number of Tornadoes, Fatalities, Injuries, 1950 to 2009, and Damages, 1950 to 1994

Tornadoes			Fatalities			Injuries			CPI adjusted dollars		
Rank	State	Number	Rank	State	Number	Rank	State	Number	Rank	State	Number
1	Texas	7,103	1	Texas	550	1	Texas	8,305	1	Texas	$1,955,927,552
2	Oklahoma	2,976	2	Mississippi	376	2	Alabama	5,966	2	Indiana	$1,648,654,336
3	Kansas	2,893	3	Alabama	365	3	Mississippi	5,323	3	Kansas	$1,212,980,480
4	Florida	2,789	4	Oklahoma	344	4	Oklahoma	4,535	4	Georgia	$1,117,426,176
5	Nebraska	2,306	5	Arkansas	327	5	Arkansas	4,400	5	Oklahoma	$1,065,659,392
6	Iowa	1,908	6	Indiana	249	6	Indiana	4,389	6	Minnesota	$1,015,354,624
7	Illinois	1,772	7	Tennessee	227	7	Ohio	4,321	7	Ohio	$965,464,832
8	Colorado	1,631	8	Michigan	214	8	Illinois	4,085	8	Illinois	$823,819,264
9	Missouri	1,540	9	Ohio	200	9	Tennessee	3,257	9	Missouri	$739,382,784
10	South Dakota	1,445	10	Illinois	198	10	Georgia	3,180	10	Iowa	$709,211,904
11	Louisiana	1,417	11	Kansas	172	11	Florida	3,179	11	Nebraska	$632,463,872
12	Mississippi	1,416	12	Louisiana	170	12	Michigan	3,007	12	Massachusetts	$617,793,280
13	Arkansas	1,291	13	Georgia	155	13	Louisiana	2,843	13	Pennsylvania	$615,033,088
14	Alabama	1,288	14	Missouri	153	14	Kentucky	2,572	14	Alabama	$609,664,768
15	Minnesota	1,278	15	Florida	139	15	Kansas	2,479	15	Louisiana	$593,237,248
16	North Dakota	1,131	16	Kentucky	115	16	Missouri	2,461	16	Mississippi	$541,601,536
17	Georgia	1,127	17	Wisconsin	98	17	Iowa	1,926	17	Arkansas	$516,939,264
18	Indiana	1,087	18	Massachusetts	98	18	Minnesota	1,815	18	Florida	$498,256,384
19	Wisconsin	1,017	19	Minnesota	90	19	North Carolina	1,769	19	Wisconsin	$410,756,864
20	North Carolina	922	20	North Carolina	78	20	South Carolina	1,546	20	Connecticut	$385,388,800

Source: Storm Prediction Center, National Oceanographic and Atmospheric Administration, www.spc.noaa.gov/archive/tornadoes/st-rank.html.

Table D-19 shows the tornado categories and the number of tornadoes per category that Louisiana has experienced from 1950 to 2009. Refer to Table D-20 for tornado occurrence and intensity by parish. Louisiana averages 24 to 29 tornadoes annually, based on historic frequency from 1950 to 2009. The majority of reported tornadoes (1,174, about 70%) have been at the F0 – F1 levels.

Table D-20: Tornado Occurrences in Louisiana by Parish and by Intensity (1950-2009)

Parish	F0	F1	F2	F3	F4	F5	Total
Acadia	23	22	8	6	0	0	59
Allen	10	5	1	1	0	0	17

Parish	F0	F1	F2	F3	F4	F5	Total
Ascension	2	5	3	1	0	0	11
Assumption	6	4	6	0	0	0	16
Avoyelles	10	10	9	2	0	0	31
Beauregard	5	21	7	0	0	0	33
Bienville	8	15	3	3	0	0	29
Bossier	4	24	9	8	3	0	48
Caddo	13	31	11	8	2	0	65
Calcasieu	30	34	8	4	0	0	76
Caldwell	4	3	3	3	0	0	13
Cameron	26	15	5	2	0	0	48
Catahoula	8	10	6	2	0	0	26
Claiborne	1	14	4	5	0	0	24
Concordia	8	16	4	3	0	0	31
De Soto	4	19	8	8	1	0	40
East Baton Rouge	5	18	7	3	0	0	33
East Carroll	3	12	7	2	0	1	25
East Feliciana	3	4	3	1	0	0	11
Evangeline	5	17	5	0	0	0	27
Franklin	4	10	8	1	0	0	23
Grant	5	9	3	1	3	0	21
Iberia	12	8	4	0	0	0	24
Iberville	3	6	3	1	0	0	13
Jackson	6	16	5	1	0	0	28
Jefferson*	17	16	9	0	0	0	42
Jefferson Davis	14	13	7	2	0	0	36
Lafayette	10	18	8	1	0	0	37
Lafourche	8	19	3	0	1	0	31
La Salle	4	3	3	2	1	0	13
Lincoln	7	7	8	0	0	0	22
Livingston	6	15	2	1	0	0	24
Madison	10	15	13	5	0	1	44
Morehouse	5	21	4	1	1	0	32
Natchitoches	18	11	6	7	0	0	42
Orleans	4	5	7	0	0	0	16
Ouachita	13	15	4	1	1	0	34
Plaquemines	10	13	4	1	0	0	28
Pointe Coupee	1	12	1	2	0	0	16
Rapides	12	16	9	4	2	0	43
Red River	6	3	3	1	0	0	13

Parish	F0	F1	F2	F3	F4	F5	Total
Richland	5	10	5	3	0	0	23
Sabine	4	6	4	5	0	0	19
St. Bernard	2	5	1	0	0	0	8
St. Charles	5	6	1	1	0	0	13
St. Helena	1	5	4	1	0	0	11
St. James	3	0	0	0	0	0	3
St. John the Baptist	5	4	1	1	1	0	12
St. Landry	11	24	7	4	0	0	46
St. Martin	4	7	5	1	0	0	17
St. Mary	2	11	3	1	0	0	17
St. Tammany*	16	14	5	0	0	0	35
Tangipahoa	15	23	9	1	0	0	48
Tensas	7	6	6	5	0	0	24
Terrebonne	11	15	2	1	0	0	29
Union	7	19	6	3	0	0	35
Vermilion	24	23	3	3	0	0	53
Vernon	10	20	7	0	1	0	38
Washington	7	18	2	1	0	0	28
Webster	9	22	7	3	1	0	42
West Baton Rouge	3	3	3	1	0	0	10
West Carroll	3	6	8	2	0	0	19
West Feliciana	0	5	2	0	0	0	7
Winn	2	14	5	3	0	0	24

* In these parishes, one of the events was a combination or a tornado and waterspout.

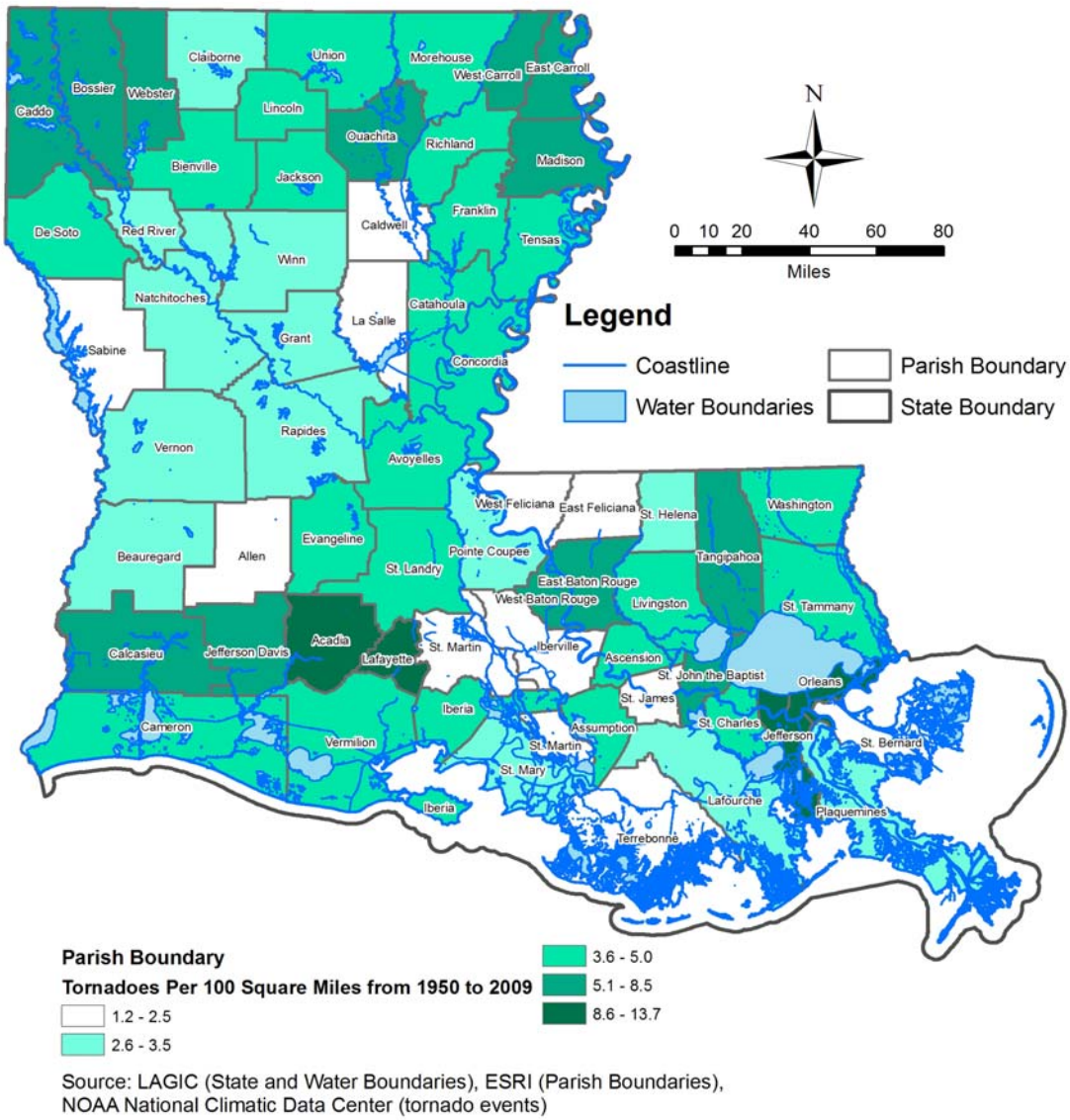
Map D-14 (also included in Section Four as Map 4-17) is based on a 56 year NOAA data record that includes the historical tracks of 661 tornadoes in Louisiana that include tornadoes of all intensities. The data is used in this Plan Update to represent the relative frequency of tornadoes that can be anticipated on an annual basis in each parish, expressed in terms of the number of tornadoes per 100 square miles per year.

Data Limitations

The Enhanced Fujita Scale, an update to the Fujita Scale by meteorologists, became effective in January of 2007. However, all historical data for Louisiana are based on the existing Fujita Scale with very few tornadic events occurring after 2007.

An additional limitation is the NWS's method of data collection. Tornado data are collected from both Doppler images and on-the-ground reports. Doppler radar does not always spot all tornados, so the NWS relies on trained weather spotters as well as untrained individuals to call in tornado reports. As a result, some tornados may never be reported, and other reports may turn out to be false. Wind speed designations are made following the event based upon damage patterns. This also allows for some error.

Map D-14: Hazard Profile – High Wind (Tornado)



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (tornado events)

Appendix D.7

Ice Storm

Nature of the Hazard

The discussion in this subsection of Appendix D focuses on the most damaging type of severe winter weather in Louisiana: ice storms. Since severe winter storm events are relatively rare in Louisiana (compared to more northern states where winter events are expected, and states therefore tend to be better equipped to handle them), occurrences tend to be very disruptive to transportation and commerce. Snow accumulations tend to be small, fleeting, and infrequent, but more often trees, cars, roads, and other surfaces may develop a coating of ice, and even very small accumulations of ice can be extremely hazardous to motorists and pedestrians. The most prevalent effects of accumulations of ice are slippery roads and walkways that lead to vehicle and pedestrian accidents; collapsed roofs from fallen trees and limbs and heavy ice and snow loads; and felled trees, telephone poles and lines, electrical wires, and communication towers. Significant losses attributed to these weather events include widespread interruption of electric-power delivery to thousands of customers as a result of downed power lines and utility poles and substantial losses to the state's timber industry as a result of damage or destruction to young trees.

Disaster History

Louisiana recently has had several occurrences of severe winter weather. In February 1994, a severe ice storm spread freezing rain across the northern third of the state. Ice accumulations of two to three inches combined with gusty winds snapped power lines, power poles, and trees. More than 100,000 people lost electric power for several days, and over 256,000 acres of forest were damaged. The state suffered an estimated $13.5 million in damages. Several ice storms within a two-week period in December 2000 resulted in similar damage, causing over 250,000 people to lose power, primarily in northern Louisiana. About 30 transmission lines atop "H"-shaped steel towers snapped due to the weight of the ice, and numerous traffic accidents occurred across the state. With millions of dollars in damages and one death attributed to the storms, Louisiana received a Presidential Disaster Declaration.

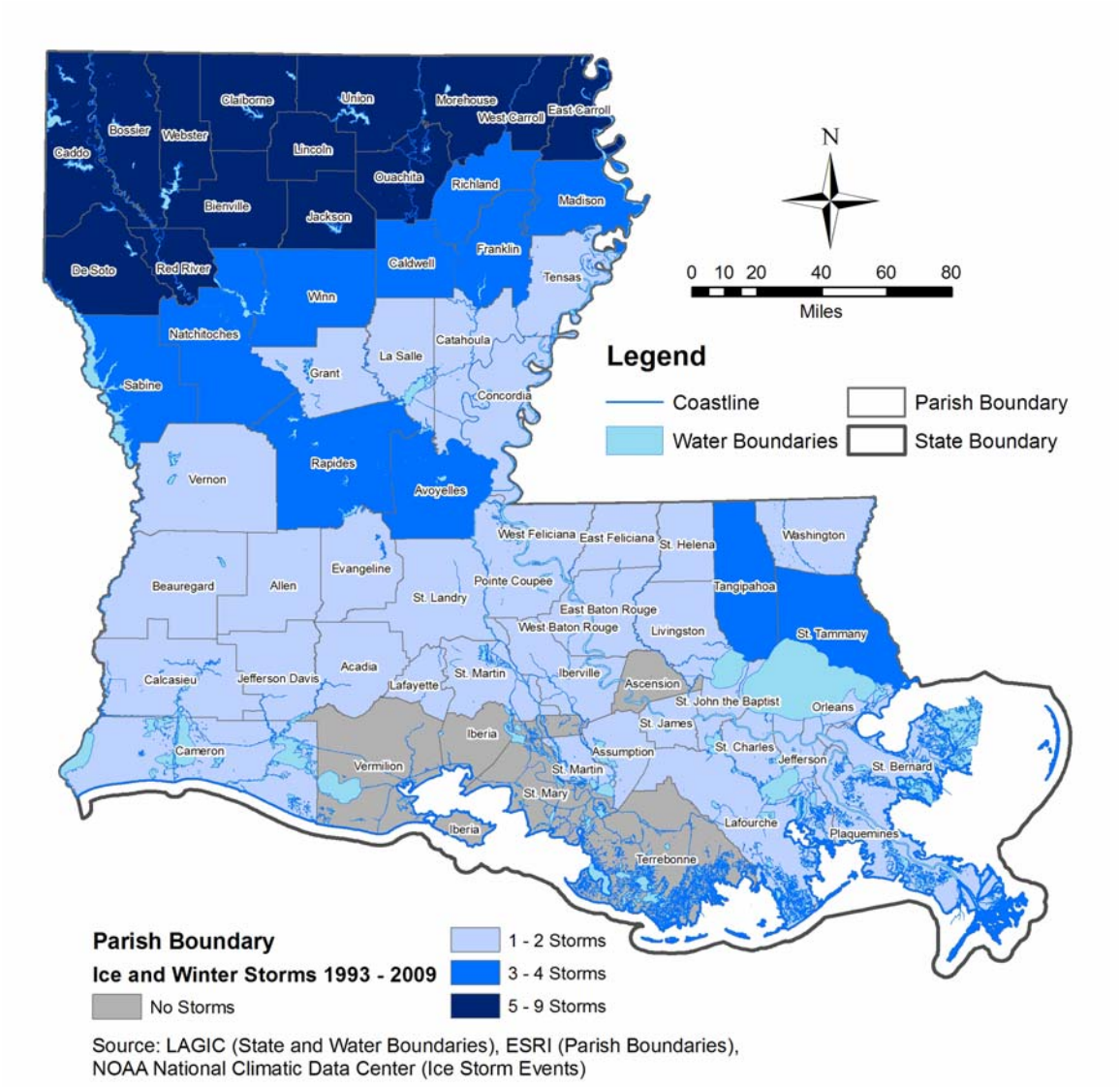
Probability of Occurrence and Severity

While Louisiana is far less likely to have heavy snow and ice accumulation than most other states, Louisiana can expect this type of severe weather to occur at least once each winter. Data from NCDC show that the entire State of Louisiana is in the lowest category of probable snow depth: 0 to 25 centimeters of snow depth with a 5% chance of being equaled or exceeded in any given year. Louisiana ice storms that have had severe consequences for the state have generally delivered one to three inches of ice accumulation. Map D-15 indicates the number of ice storms per parish over the 17-year period between 1993 and 2009.

Data Limitations

The NWS and NCDC data are based primarily on local reports, some by trained weather spotters and others by individuals. These reports are then substantiated with Doppler radar which can verify the presence of precipitation and ambient temperature. However, ice storm events can occur without being reported and may occur more often than shown above. Some misreporting is also possible.

Map D-15: Hazard Profile – Ice Storm



Appendix D.8

Lightning

Nature of the Hazard

High winds, rainfall, and a darkening cloud cover are the warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the beginning of an approaching storm, more than half of lightning deaths occur after a thunderstorm has passed. The lightning threat diminishes after the last sound of thunder, but may persist for more than 30 minutes. When thunderstorms are in the area, but not overhead, the lightning threat can exist when skies are clear. Lightning has been known to strike more than ten miles from the storm in an area with clear sky above.

According to NOAA, an average of 20 million cloud-to-ground flashes are detected every year in the continental United States. About half of all flashes have more than one ground-strike point, so at least 30 million points on the ground are struck on average each year. In addition, there are roughly five to ten times as many cloud-to-cloud flashes as there are to cloud-to-ground flashes.[14]

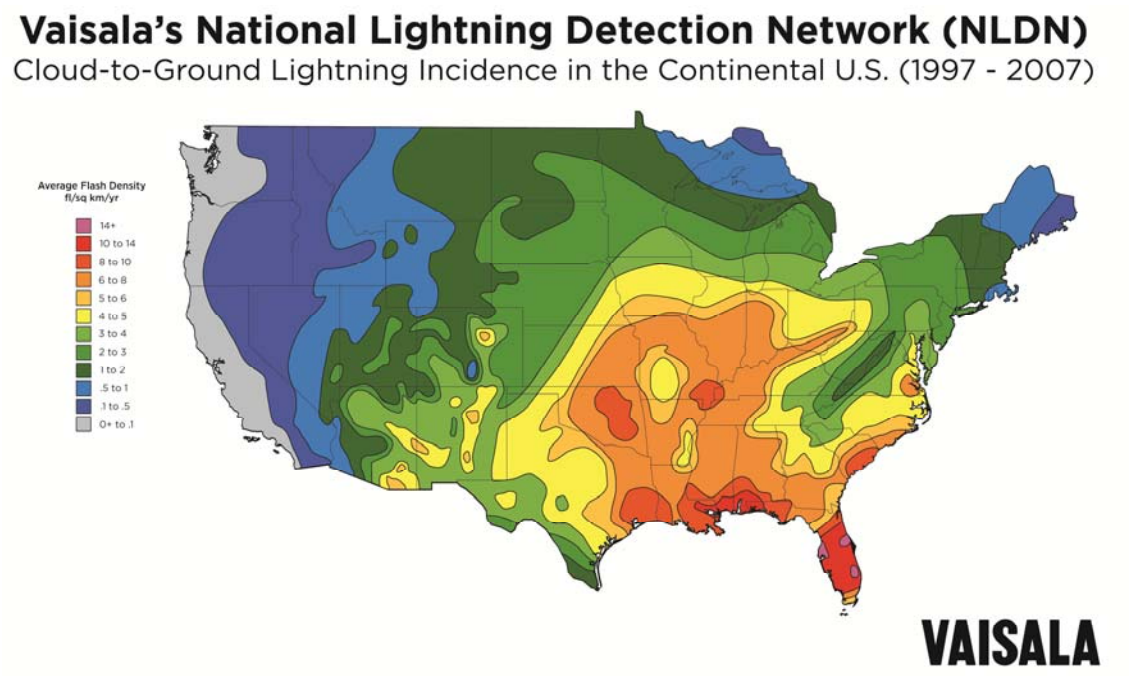
Lightning is the most dangerous and frequently encountered weather hazard that most people in the United States experience annually. Lightning is the second most frequent natural hazard killer in the United States, behind floods and flash floods, with nearly 100 deaths and 500 injuries annually. These numbers are likely to underestimate of the actual number of casualties because estimates of up to 40% of lightning deaths and injuries are unreported. Cloud-to-ground lightning can kill or injure people by either direct or indirect means. The lightning current can branch off to strike a person from a tree, fence, pole, or other tall object. It is not known if all people are killed who are directly struck by the flash itself. In addition, electrical current may be conducted through the ground to a person after lightning strikes a nearby tree, antenna, or other tall object. The current also may travel through power lines, telephone lines, or plumbing pipes to a person who is in contact with an electric appliance, telephone, or plumbing fixture. Lightning may use similar processes to damage property or cause fires.

Probability of Occurrence

On a national scale, the State of Louisiana is second only to Florida in terms of “flash density,” the number of lightning flashes per square kilometer per year (see Figure D-6). Map D-16 also shows the average number of lightning flashes that have been experienced per square mile in Louisiana parishes (based on the period from 1999 to 2009). Due to the frequency and geographic scope of lightning strikes in Louisiana, the probability of future events is 100%.

[14] http://www.nssl.noaa.gov/primer/lightning/ltg_climatology.html

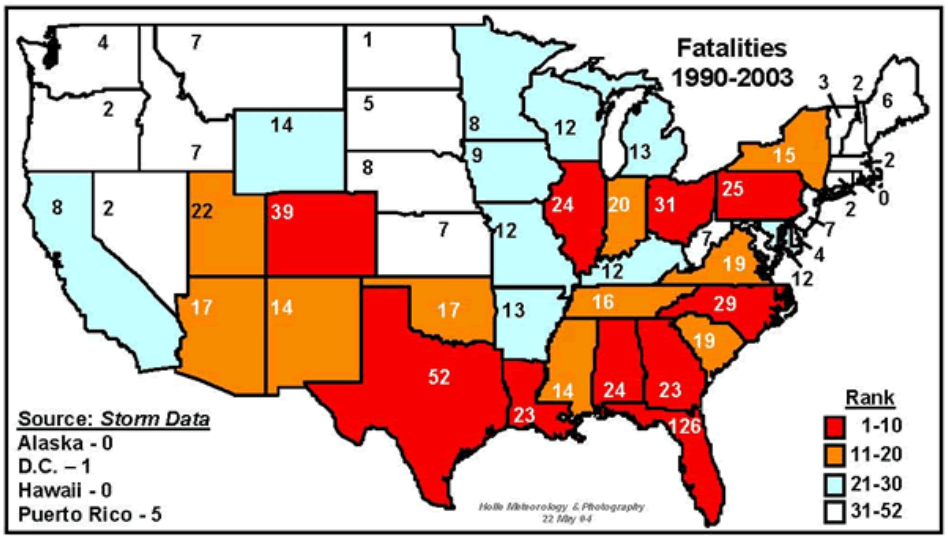
Figure D-6: 5-Year Flash Density Map – United States



Source: Vaisala's US National Lightning Detection Network®

Louisiana is 23rd in the nation in lightning fatalities, and ranks even higher in susceptibility to lightening fatalities when population density is taken into account. Lightning strikes most frequently between June and August, with 30% of all lightning fatalities occurring in July. Most deaths and injuries from lightning occur between two and six in the afternoon. Figure D-7 shows lightning fatalities across the United States from 1990-2003[15].

Figure D-7: Lightning Fatalities, 1990-2003



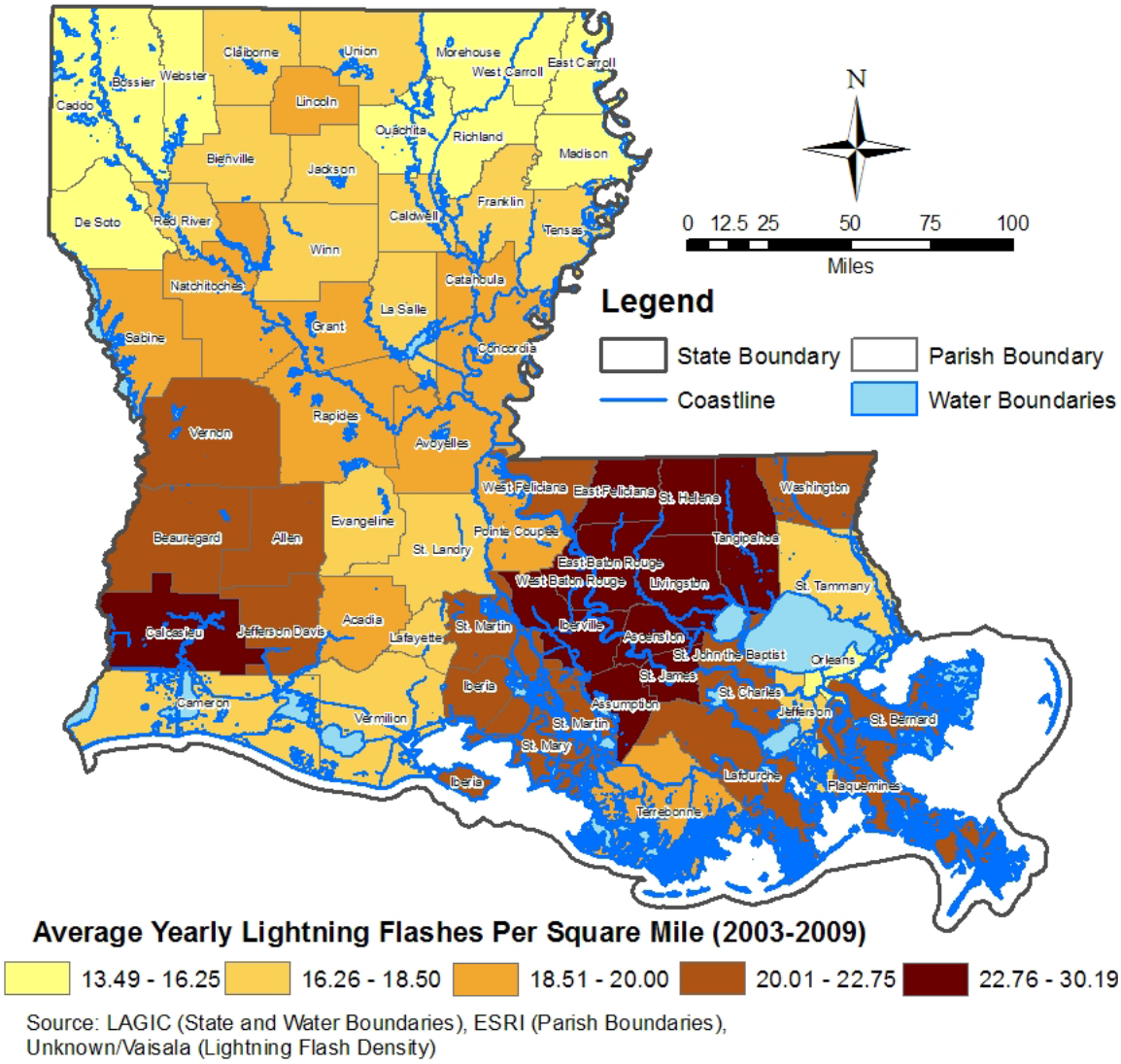
Source: The National Lightning Safety Institute, 1990-2003

[15] National Lightning Safety Institute, www.lightningsafety.com, 2007

Data Limitations

Available lightning data are affected by under reporting. Lightning related injuries and fatalities often go unreported, or are ascribed to other causes.

Map D-16: Hazard Profile – Lightning



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Unknown/Vaisala (Lightning Flash Density)

Appendix D.9

Severe Summer and Winter Weather / Extreme Heat and Cold

Nature of the Hazard

Extreme heat can cause extreme hardship to agricultural communities and widespread power outages, and the severe effects of this hazard may include the death of vulnerable populations. The most well known heat related illness is hyperthermia, also known as heat stroke, which occurs during periods of sustained high heat and humidity. Heat stroke affects the body's ability to regulate body temperature. Elderly, young children, and the sick or overweight are the most at-risk for heat stroke. Additionally, those without effective cooling systems are at high risk.

Extreme cold is defined as a long period of temperatures significantly below seasonal averages. Like extreme heat, extreme cold can cause hardship to agricultural communities and widespread power outages, and the severe effects of this hazard may include the death of vulnerable populations. Extreme cold temperatures may also accompany high winds, which contribute to the wind chill factor and exacerbate cold conditions. Additionally, icing of roads and other public infrastructure caused by extreme cold may pose secondary risks to the exposed population. Extreme cold can also lead to hypothermia, which is a very dangerous condition. Hypothermia occurs when the body loses heat faster than it can produce heat. The elderly, babies, and those without access to heat are most at risk. It can occur at temperatures as high as 40°F if a person is chilled from submersion in water. In fact, according to the NCDC, Louisiana has experienced one such case of hypothermia that resulted in death.

Disaster History

In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died. A normal year results in approximately 160 heat-related deaths nationwide. According to NOAA, extreme heat is the number one weather related killer in the United States

Heat-related deaths in Louisiana are not common, due in part to the consistency and predictability of high seasonal temperatures, but they do occur. Between 1995 and 2008, 47 deaths occurred in the state as a result of extreme heat according to NOAA. In 1998, NOAA reported one of worst extreme heat events recorded, including 27 days with temperatures over 100 degrees, which resulted in the deaths of 20 people. The following tables show incidents of extreme heat reported by the NCDC and NOAA.

Table D-21: Extreme Heat, 1993-2010

Date	Parish	Notes
July 1997	Iberia	High temps caused a house to catch fire
July 1998	Caddo, Bossier	27 days 100+, 5 days 105+
August 1999	DeSoto	1 death; 27 illnesses
August 2000	Ouachita; Southwest / Central LA	Record highs
September 2000	Southwest / Central LA	Record highs
June 2005	Caddo	Record highs
July 2006	All	Record highs

Source: NCDC, 2010

Table D-22: Heat- Related Deaths, 1995-2008

Year	Deaths	Location
1995	3	Vehicle/Home
1996	1	Permanent Home
1997	0	NA
1998	20	5-Outside/Open 15- Permanent Home
1999	2	Outside/Open
2000	12	Permanent Home
2001	1	Permanent Home
2002	2	1-Outside/Open 1- Permanent Home
2003	0	NA
2004	0	NA
2005	2	1-Outside/Open 1- Permanent Home
2006	2	1-Outside/Open 1- Permanent Home
2007	0	NA
2008	2	Permanent Home
Total	47	

Source: NOAA, 2010

Frosts and hard freezes are common in the northern part of the state and also occur with some regularity in the south, causing some property and particularly crop damage. For example, during a late winter cold-snap in 1996, the NCDC reported approximately $20 million in crop damage and $8 million in property damage. In areas of the country that tend to be warmer, such as Louisiana, extreme cold significantly increases the risks of household fires due to the use of fireplaces and space heaters[16]. Between 1995 and 2008, four deaths occurred in the state as a result of extreme cold, according to NOAA. The United States Fire Administration reports that an estimated 54,000 heating fires occur each year. These fires peak each year during January and February. Heating fires are caused by central heating units, fixed or portable local heating units, fireplaces, heating stoves, chimneys, and water heaters. These fires resulted in an average of 190 deaths, 625 injuries, and $286 million in property loss. However, the greatest risk of winter-weather damage comes not from extreme cold but from ice storms, which are addressed separately in this Plan Update. The following tables show incidents of extreme cold reported by the NCDC and NOAA.

[16] Information from CDC Weather, Extreme Cold, dated 2007 http://www.bt.cdc.gov/disasters/winter/guide.asp

Table D-23: Extreme Cold, 1993-2007

Date	Parish	Notes
March 1993	All	$89 mil in agricultural losses; 60% of strawberry crop lost; 60% of peach crop lost; 100% of blueberry crop lost; 1 death
February 1996	Rapides; Allen	water pipes burst; 30,000 gallon water tank ruptured
March 1996	Iberville, Pointe Coupee, West Baton Rouge	$7 mil damage to sugar cane crop
January 1997	Webster	1 death

Source: NCDC, 2007

Table D-24: Cold Related Deaths, 1995-2008

Year	Deaths	Location
1995	0	NA
1996	1	Outside/Open
1997	1	Outside/Open
1998	0	NA
1999	0	NA
2000	0	NA
2001	0	NA
2002	0	NA
2003	0	NA
2004	0	NA
2005	0	NA
2006	0	NA
2007	0	NA
2008	2	Outside/Open
Total	4	

Source: NOAA, 2010

Probability of Occurrence and Magnitude

Average temperatures in Louisiana are among the hottest in the United States, as shown in Figure D-8. The average number of days each year with temperatures above 90°F ranges from 57 days in the southeastern part of the state to more than 102 days in the northwest. Table D-25 shows the average high and low temperatures for major cities across Louisiana.

Between 1993 and 2010, only 9 extreme cold events in Louisiana were reported to the NCDC. However, this number does not account for the 76 snow and ice events which were reported separately during that same time period. When taken in combination, the probability of future occurrences of extreme cold in Louisiana is extremely high. Likewise, 41 extreme/excessive heat events in Louisiana were reported to the

NCDC between 1993 and 2010, making the probability of future occurances of extreme heat events extremely high. Naturally, the extent and frequency of extreme cold and heat events will vary by region.

Figure D-8: Annual Mean Daily Average Temperatures in the US

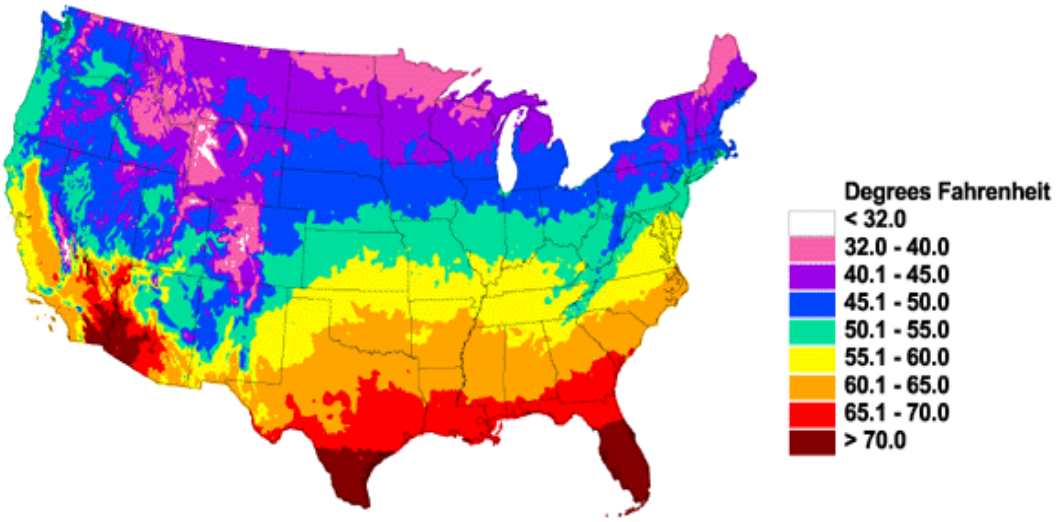


Table D-25: Average High and Low Temperatures, 1986-1998

City	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Alexandria	57	61	68	77	84	90	92	92	87	78	68	61
	36	38	48	56	64	68	72	71	66	54	46	38
Arcadia	55	60	68	77	84	90	94	92	86	77	67	58
	34	37	44	52	60	67	70	68	64	52	44	36
Baker	58	64	72	78	85	90	91	91	87	80	70	64
	38	42	50	57	64	70	74	72	68	57	48	42
Baton Rouge	58	64	72	78	85	90	91	91	87	80	70	64
	38	42	50	57	64	70	74	72	68	57	48	42
Bossier City	55	60	68	77	84	88	94	94	87	78	68	58
	34	38	45	54	62	68	72	71	66	54	45	37
Breaux Bridge	60	64	71	78	84	88	90	90	86	78	71	64
	41	44	51	58	65	71	74	74	68	57	50	44
Bunkie	57	61	68	78	84	90	92	92	87	78	68	61
	37	40	48	56	64	68	72	70	65	54	47	40
Chalmette	64	66	74	78	85	90	91	91	87	80	72	66
	42	45	52	58	65	70	72	72	68	58	52	45
Covington	61	65	72	78	85	90	91	91	87	80	71	64
	38	41	48	54	61	67	70	70	66	54	47	41
Delhi	52	58	66	76	84	90	92	91	87	78	67	56
	34	37	45	54	61	68	71	70	64	52	44	36
Denham Springs	58	64	72	78	85	90	91	91	87	80	70	64
	38	42	50	57	54	70	74	72	68	57	48	42
Gonzales	61	64	71	78	85	90	91	91	88	80	71	64

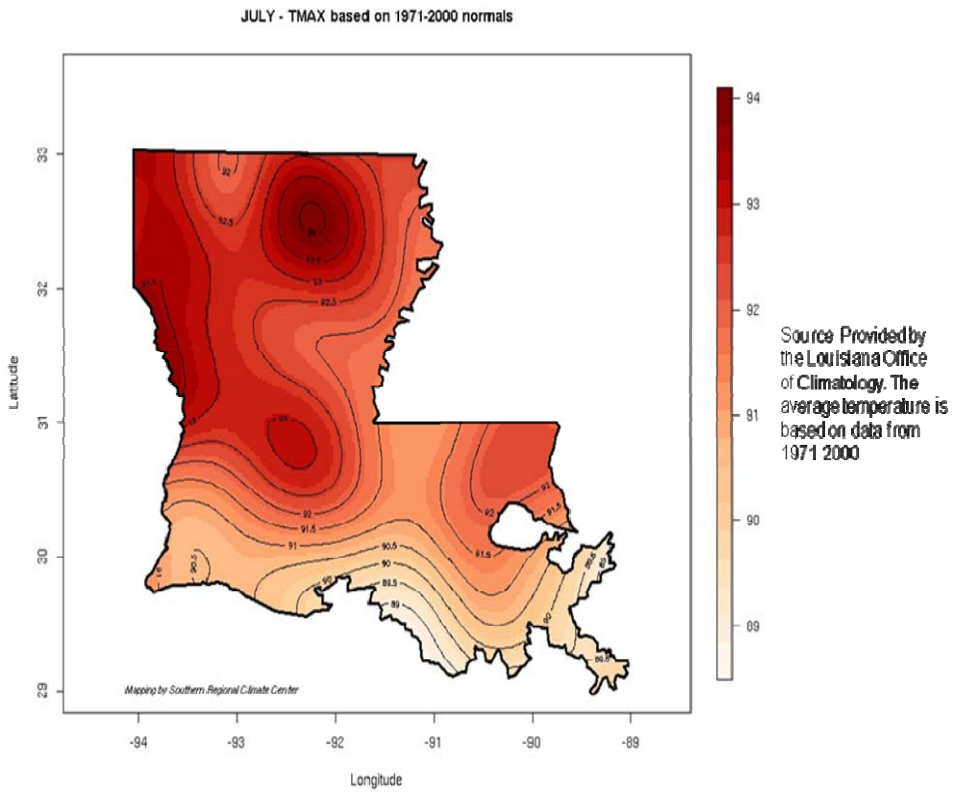
City	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
	40	42	50	58	64	71	74	72	68	58	50	44
Gretna	61	64	71	78	84	88	90	90	87	80	71	64
	44	47	54	60	67	74	74	74	71	61	54	47
Hammond	58	64	71	78	85	91	92	92	88	80	71	64
	37	40	47	55	62	68	71	70	66	54	47	40
Harvey	61	64	71	78	84	88	90	90	87	80	71	64
	44	47	54	60	67	74	74	74	71	61	54	47
Houma	62	64	71	78	84	88	90	90	87	80	72	62
	42	44	52	58	65	70	72	72	68	58	51	44
Jennings	58	62	70	78	84	88	91	91	87	80	70	62
	38	42	48	57	64	70	72	72	68	57	48	42
Kenner	60	64	71	78	84	88	90	90	86	78	71	64
	41	44	51	58	65	70	74	72	68	58	51	44
Kinder	58	64	71	78	84	88	91	92	88	80	71	62
	38	41	48	56	64	68	71	71	66	55	48	41
La Place	60	64	71	78	84	88	91	90	87	78	71	64
	40	44	50	57	64	70	72	72	68	57	50	44
Lafayette	60	64	71	78	84	88	90	90	86	78	71	64
	41	44	51	58	65	71	74	74	68	57	50	44
Lake Charles	58	64	70	77	84	88	90	90	86	80	70	64
	41	44	50	58	65	71	74	74	68	57	50	44
Leesville	57	62	70	78	84	88	92	92	87	78	68	60
	35	38	46	54	61	67	70	68	64	52	45	38
Livonia	58	62	70	78	84	90	91	91	87	78	71	62
	37	40	48	56	64	68	71	71	66	55	47	40
Luling	60	64	71	78	84	88	90	90	86	78	71	64
	41	44	51	58	65	70	74	72	68	58	51	44
Metairie	60	64	71	78	84	88	90	90	86	78	71	64
	41	44	51	58	65	70	74	72	68	58	51	44
Minden	54	58	68	76	84	88	92	94	87	78	67	57
	32	35	44	52	60	67	78	70	64	52	44	35
Monroe	54	58	67	76	84	90	92	91	86	78	67	57
	34	38	46	54	62	68	72	70	64	51	44	37
Morgan City	61	64	71	78	84	88	90	90	87	80	72	65
	41	44	52	58	65	71	74	74	68	58	51	44
Natchitoches	56	61	70	78	84	90	94	94	88	78	68	60
	34	38	46	54	62	68	72	71	65	54	45	37
New Iberia	60	64	71	78	84	88	90	90	86	78	71	64
	40	44	50	58	65	70	72	72	68	57	48	44
New Orleans	60	64	71	78	84	88	90	90	86	78	71	64

City	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
	41	44	51	58	68	70	74	72	68	58	51	44
Opelousas	60	64	71	78	85	90	91	91	88	81	71	64
	40	44	50	57	64	68	72	71	67	56	48	44
Pineville	57	61	68	77	84	90	92	92	87	78	68	61
	36	38	48	56	64	68	72	71	66	54	46	38
Port Allen	58	64	70	78	84	88	90	90	87	80	71	64
	38	40	48	56	64	68	71	70	66	54	47	41
Rayne	58	62	70	77	84	88	90	91	87	80	70	62
	38	41	48	57	64	70	72	71	67	56	48	41
Rayville	52	58	66	76	84	90	92	91	87	78	67	56
	34	37	45	54	61	68	71	70	64	52	44	36
Ruston	55	60	68	77	84	90	94	92	86	77	67	58
	34	37	44	52	60	67	70	68	64	52	44	36
Scott	60	64	71	78	84	88	90	90	86	78	71	64
	41	44	51	58	65	71	74	74	68	57	50	44
Shreveport	55	60	68	77	84	88	94	94	87	78	68	58
	34	38	45	54	62	68	72	71	66	54	45	37
Slidell	60	64	70	78	84	88	91	90	87	80	71	64
	38	42	48	57	64	70	72	71	67	56	48	42
Sulphur	58	64	70	77	84	88	90	90	86	80	70	64
	41	44	50	58	65	71	74	74	68	57	58	44
Tallulah	54	58	67	76	84	88	91	91	86	78	67	57
	34	36	45	54	61	68	71	68	64	51	44	36
Thibodaux	62	64	72	78	84	90	91	91	87	80	72	65
	38	42	48	57	64	68	71	71	67	56	48	44
Ville Platte	57	61	68	78	84	90	92	92	87	78	68	61
	37	40	48	56	64	68	72	70	65	54	47	40

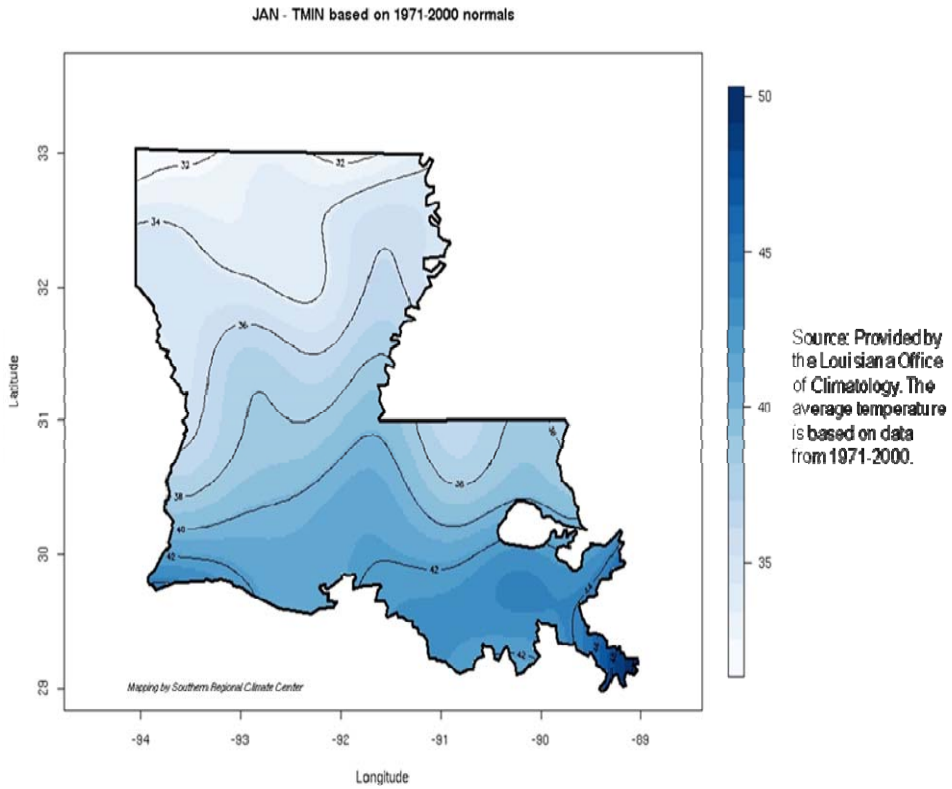
Source: Country Studies, US Department of Army, 1986-1998

Map D-17 illustrates average temperatures in Louisiana for the month of July from 1971 to 2000. Map D-18 shows average temperatures for the month of January for the same years.

Map D-17: Average July Temperatures in Louisiana



Map D-18: Average January Temperatures in Louisiana



Data Limitations

It can be difficult to define a particular temperature as "extreme" because extreme temperature is a combination of a temperature, along with the heat index or wind chill, and its effects on a population. Additionally, the NCDC did not begin collecting data on extreme temperature until the middle of the 1990s, leading to a lack of historical data. As with several other hazards, data are based on local reports that are affected by the subjective nature of the hazard. Finally, the number of deaths is most probably underreported as it depends on local coroners contacting the NWS.

Appendix D.10

Storm Surge

Nature of the Hazard

Storm surge, an increase above the normal astronomical high tide of tidally influenced bodies of water, is the most threatening hurricane-related hazard to Louisiana (for additional information regarding hurricanes and tornadoes refer to Section D.6). Intense storms with high wind speeds and low barometric pressures drive water across the coast, increasing the elevation of water. The storm surge from a major hurricane can cause extreme devastation including the complete destruction of coastal communities and the exacerbation of land loss.

Shallow coastal bathymetry, such as that of much of Louisiana, increases the magnitude of a storm surge. Southeastern Louisiana, with its low, flat topography and land surface elevations that in many places dip below sea level, can experience storm surges up to 100 miles inland. Significant hurricanes can produce extremely large storm surges. The official FEMA estimate of Hurricane Katrina's maximum surge height is 30 feet, and Hurricane Rita's is 15 feet. More extreme storms could produce surges of up to 36 feet along the Louisiana coast. Figure D-9 shows areas of the Gulf Coast that were inundated from storm surge as a result of Hurricane Katrina and depicts the inundation as though the levees held. Furthermore, lakes along the coast, namely, Lake Maurepas, Lake Borgne, and Lake Pontchartrain, exacerbate the effects of coastal flooding because of wave effects that can regenerate over large inland lakes. All of these effects were evident during Hurricanes Katrina and Rita.

The probability of storm surge occurrences can be mapped using Sea, Lake and Overland Surges from Hurricanes modeling (SLOSH). Two composite products are Maximum Envelope of Water (MEOW) and Maximum of the MEOWs (MOM) are created in order to provide a manageable dataset for hurricane evacuation planners to access and display. MEOW stands for "Maximum Envelope of Water." Envelope refers to the maximum the water reaches at any point in time at every grid cell in the SLOSH Basin, for a given hypothetical storm. The MEOW is formed from a composite of many individual SLOSH model runs. It is the set of the highest surge values at each grid location for a given storm category, forward speed, and direction of motion, regardless of which individual storm simulation produced the value.

The NHC has generated one MEOW for each storm category, storm direction, forward speed, and tide level used in the simulation study. The MEOW shows the flooding possible from a threatening hurricane of a given category, size, and general track direction. NHC forecasts have error. NHC forecasters do not have the ability to determine exactly where landfall will occur, or what characteristics the hurricane will have at landfall. Accuracy increases as the forecast projection becomes shorter. A 24-hour forecast will be significantly better, in general, than a 48-hour forecast. The MEOW plans for the worst-case scenario. A MOM is a composite of the maximum storm surge heights for all simulated hurricanes for a given category. There are typically five (one per category) MOMs per basin. Thus, a MOM depicts potential flooding for a given category, regardless of landfall approach direction or speed.[17]

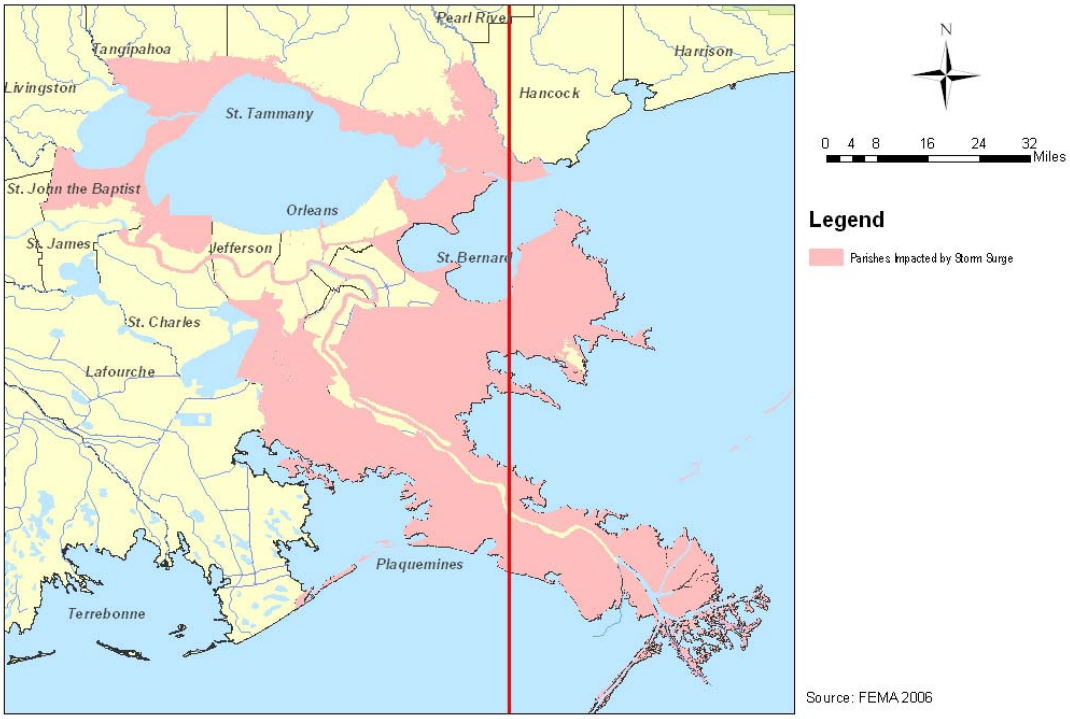
"ADCIRC is a system of computer programs for solving time dependent, free surface circulation and transport problems in two and three dimensions. These programs utilize the finite element method in space allowing the use of highly flexible, unstructured grids. Typical ADCIRC applications have included: (i) modeling tides and wind driven circulation, (ii) analysis of hurricane storm surge and flooding, (iii) dredging feasibility and material disposal studies, (iv) larval transport studies, (v) near shore marine operations."[18] It is

[17] Taken from *The Role of the SLOSH Model in National Weather Service Storm Forecasting*, Bob Gahn Et Al., August 2009

[18] http://www.unc.edu/ims/adcirc/

being developed by numerous partners including the Coastal Hydraulics Laboratory of USACE. SLOSH remains the easies and most readily available tool do model storm surge and is often used in conjunction with ADCIRC.

Figure D-9: Hurricane Katrina Storm Surge Inundation

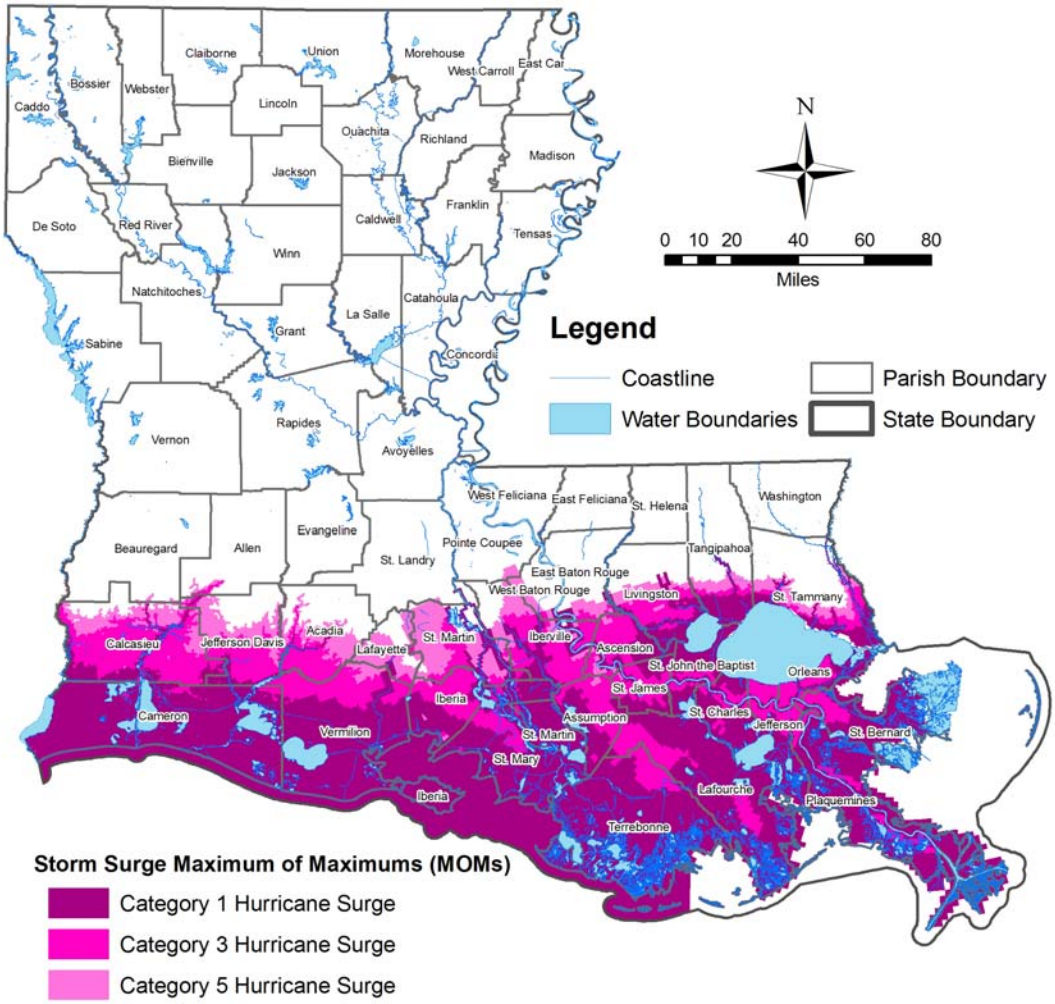


Source: FEMA, 2006

Map D-19 depicts the most up-to-date SLOSH models that cover all of southern Louisiana consistently. This mapping indicates the areas that can be affected by storm surge inundation due to category 3 hurricanes (refer to D.6 for more information on hurricane categories). SLOSH models represent the storm surge of hundreds of simulated hurricanes, taking into account storm wind intensities, forward speeds, directions of motion, and radius of maximum winds. The map represents the cumulative storm surges for hundreds of modeled hypothetical hurricane tracks; no single hurricane event would produce the inundation pattern depicted on the map. FEMA has begun using a modeling technique based on a more accurate statistical analysis and run at a higher resolution. The ABFEs for coastal Louisiana are based on this model, but the results for storm surge are not publicly available as of the publication date for the Plan Update.

Storm surge impacts can be even more severe when combined with the ongoing, long-term phenomenon of coastal subsidence (refer to D.11) and the potential release of hazardous materials (refer to D.15). Roads for evacuation routes are sinking and, in time, may be unusable in developed areas during coastal storms. Furthermore, flooding from storm surge can damage hazardous materials facilities in the “petrochemical industrial corridor” between New Orleans and Baton Rouge, as well as those located on the coast. Damaged pipelines or storage tanks can leak into storm waters and contaminate surface waters, soil, and groundwater resources.

Map D-19: Hazard Profile – Storm Surge Profiles for the Sabine, Vermilion and NOLA Basins

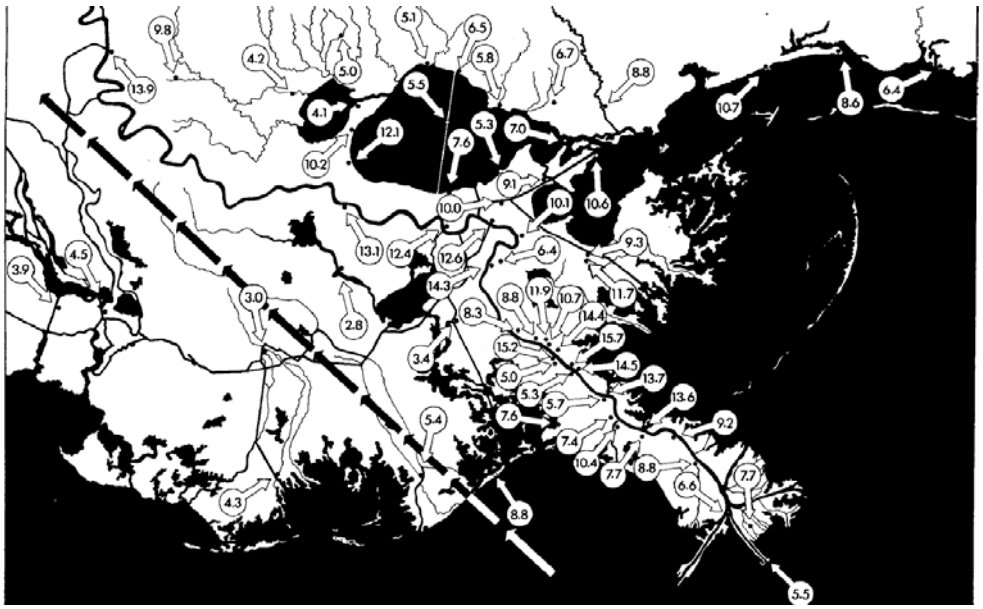


Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge)

Disaster History

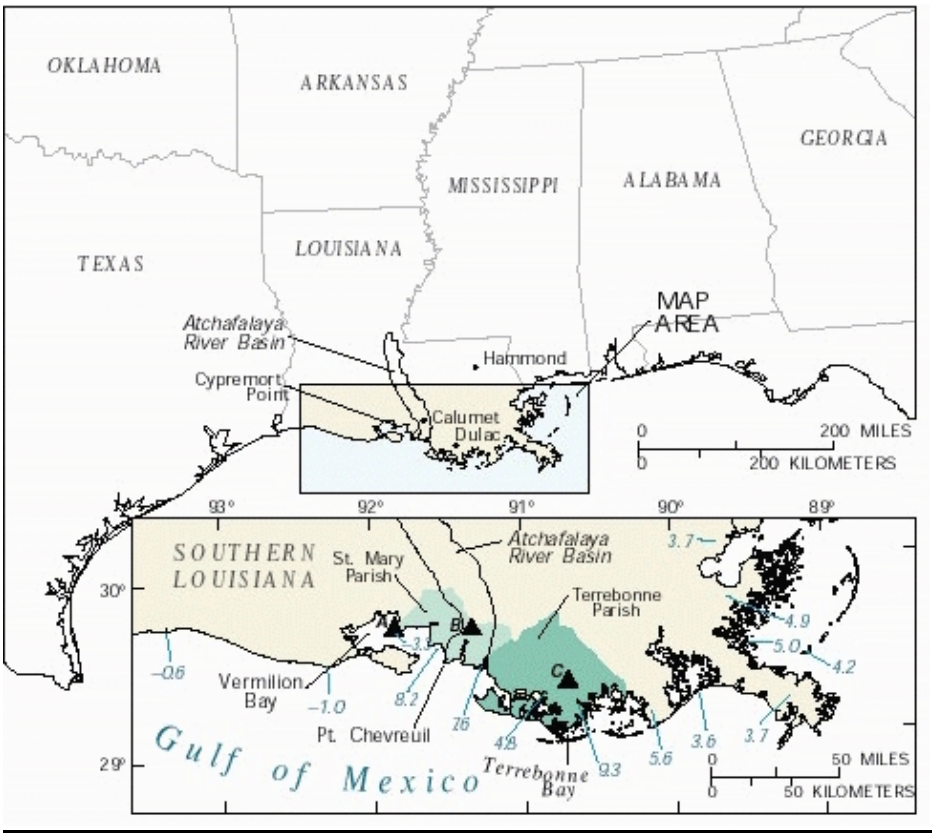
Hurricane Betsy: Hurricane Betsy struck the southeast Louisiana coast on the night of September 9 1965, and it was one of the most destructive hurricanes, at the time, to strike the United States. The flooding that inundated a large portion New Orleans and most of the parishes in the areas southeast of the city was a result of storm surge. Most of the delta of Southeast Louisiana was inundated by at least ten feet of water above the mean sea level causing flood damage to almost every structure in the area. The surge caused many fish camps and homes to float away. The surge reached its crest about 25 miles southeast of New Orleans. The low lying marshes over which the storm surge traveled and the existence of a wide deep channel assisted in carrying the water far inland. The surge elevations increased to a maximum of about 17 feet 70 miles upriver from its mouth. The loss of 57 lives in southern Louisiana, during Hurricane Betsy occurred mainly from the inland flooding rather than from actual surge on the immediate coast. The following figure shows high water marks from the storm.

Figure D-10: High Water Marks from Hurricane Betsy



Hurricane Andrew made landfall in August 1992 near Morgan City with 115 mph winds, causing a nine foot storm surge. In some areas, Hurricane Andrew scoured portions of marsh away leaving open water. In some sites, large portions of soil and vegetation were torn from the marsh and deposited into oil and pipeline canals. Some marshes lost plant covering because the salty gulf waters "burned" the top of plants. The following figure shows storm surge elevations during Hurricane Andrew at selected points along the Louisiana Coast.

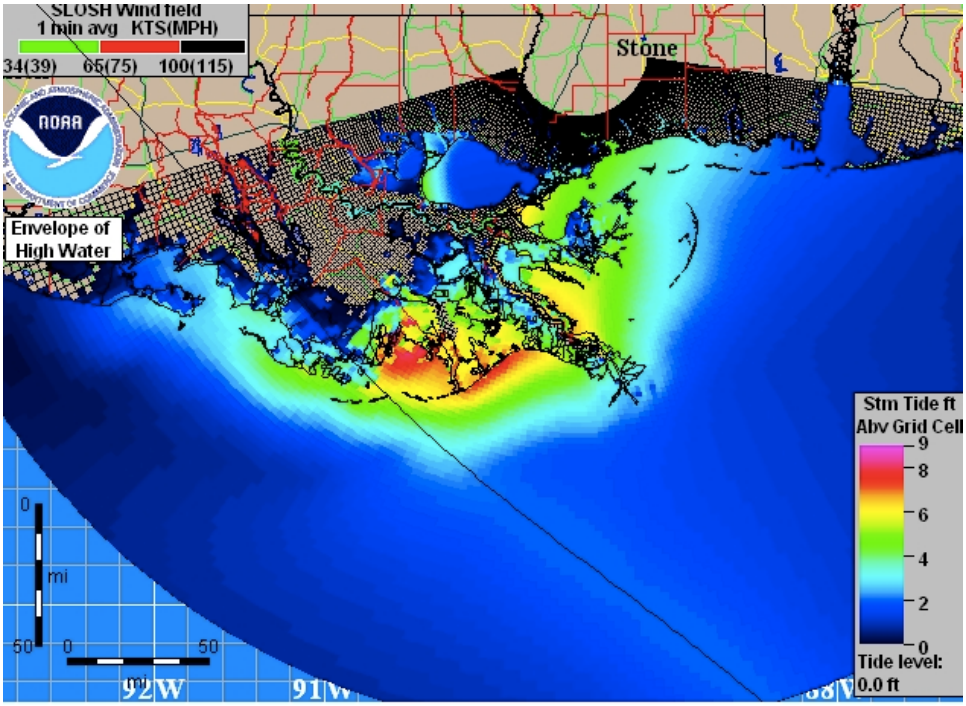
Figure D-11: Surge from Hurricane Andrew



Source: USGS

Hurricane Lili made landfall in October 2002 as a category 1 hurricane, having dropped rapidly from a category 4 just before landfall. Prior to landfall, tidal water levels were already two to four feet above normal. The USACE reported storm surges as much as three feet above normal 40 miles upstream from the Atchafalaya Bay. The water height at Burn's Point, south of Morgan City, was estimated at ten to 12 feet above normal, based on the observed water level inside a house. The following figure shows the storm tide for Hurricane Lili.

Figure D-12: Surge from Hurricane Lili



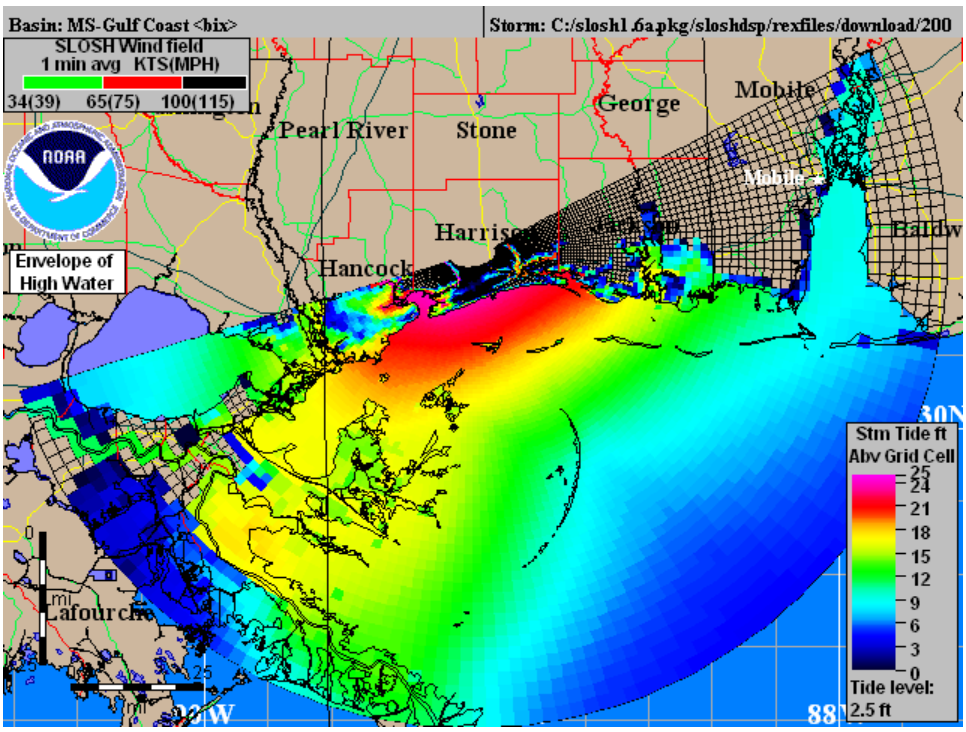
Source: NOAA

Hurricane Lili greatly affected barrier islands as well as fresh and intermediate-salinity marshes and some mainland tree and shrub damage. The storm surge was most significant in Terrebonne Parish along the bayous south of Houma. Several locally-built levees were overtopped or breached, causing flooding to homes and businesses in Terrebonne Parish. Along lakes Pontchartrain and Maurepas, the storm flooded low-lying roadways and structures.

Hurricane Katrina made landfall in August 2005 as a category 3 hurricane resulting in over $75 billion in damages. Coastal storm surge flooding of 20 to 30 feet above normal tide levels, along with large and dangerous battering waves, occurred near and to the east of where the center of the storm made landfall. Widespread damage occurred, including beach erosion and damage and destruction of homes and infrastructure. Although the storm surge was highest to the east of the path of the eye of Katrina, a very significant storm surge also occurred west of the path of the eye. As the level of Lake Pontchartrain rose, several feet of water were pushed into communities along its northeastern shore in St. Tammany Parish from Slidell to Mandeville. High water mark data indicate the storm surge was 12 to 16 feet in those areas. The data also indicate a storm surge of 15 to 19 feet occurred in eastern New Orleans, St. Bernard Parish, and Plaquemines Parish, while the surge was ten to 14 feet in western New Orleans along the southern shores of Lake Pontchartrain. Farther west, observations indicate a storm surge of five to ten feet along the shores of western Lake Pontchartrain.

The hurricane and resulting storm surge breached several levees and flooded 80% of New Orleans. Flooding was widespread along coastal Louisiana. Levee breaches also led to massive flooding in St. Bernard and Plaquemines, with additional flooding in St. Tammany due to the storm surge. The surge also caused extensive damages to critical infrastructure, including several bridges. The I-10 Twin Span Bridge, for example, had over 60 spans dropped and almost 500 shifted out of alignment. Hurricane Katrina is described in more detail in both the flooding and high wind sections. Figure D-13 shows areas of the Gulf Coast that were inundated from storm surge as a result of Hurricane Katrina.

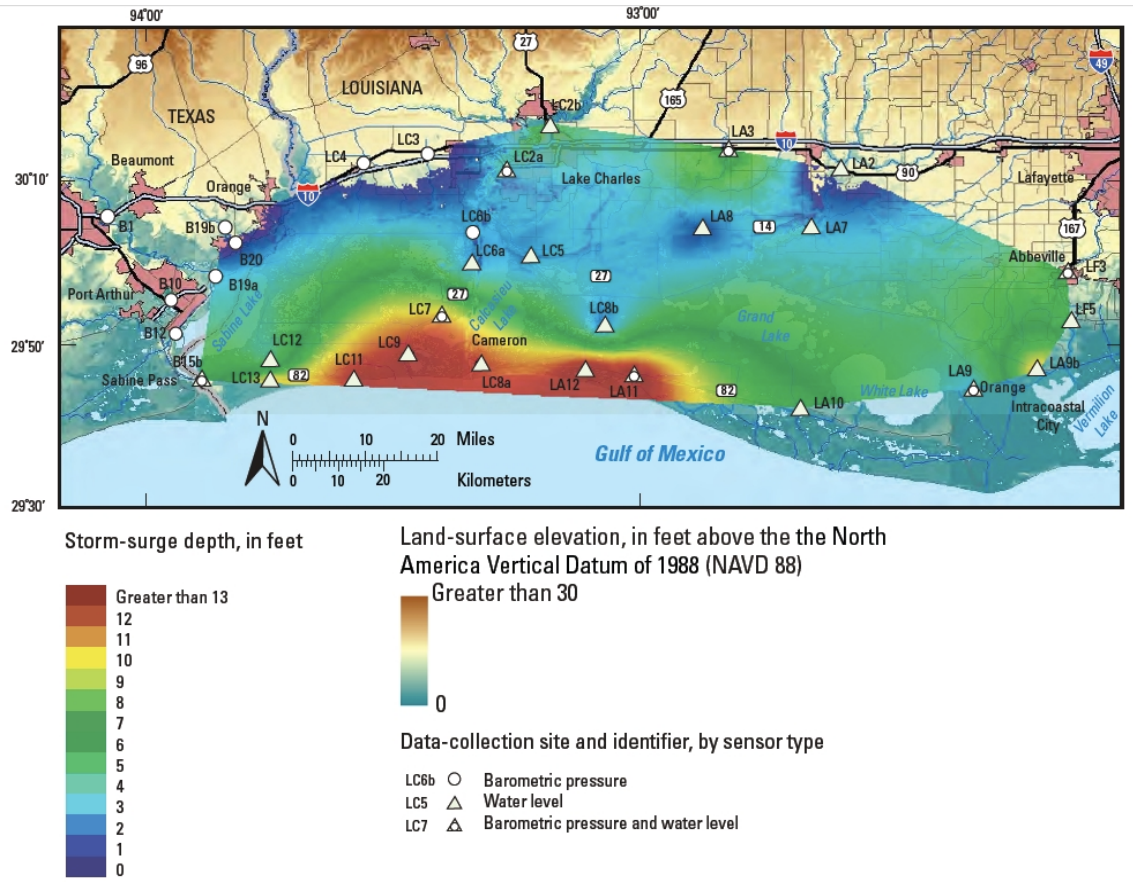
Figure D-13: Surge from Hurricane Katrina



Source: NOAA

Hurricane Rita made landfall on the Louisiana/Texas border early in the morning of September 23, 2005. Rita produced significant storm surge that devastated coastal communities in southwestern Louisiana, an area very vulnerable to surge. Since so many structures were completely destroyed, and because many gauges failed up to several hours before the center of the hurricane crossed the coast, measuring the storm surge has been a daunting task. The data, along with unofficial visual estimates, suggest that the storm surge in portions of the Cameron area was as high as about 15 feet. Water was also pushed into Calcasieu Lake, flooding portions of communities along its shoreline, such as Grand Lake, with a storm surge of at least about eight feet. The surge then propagated up the Calcasieu River and flooded portions of the Lake Charles area, where in several locations the surge reached Interstate 10 (about 25 miles from the Gulf Coast). Flood waters in downtown Lake Charles were as deep as about six feet in some places. Farther east, most or all of Vermilion, Iberia, and St. Mary Parishes south of Highway 14 and US 90 (several miles inland) were inundated by the storm surge, visually estimated at eight to 12 feet in some of these areas; a high water mark of nearly 12 feet was also observed in western St. Mary Parish. The water crossed these highways in numerous locations and was three to six feet deep in many homes. Figure D-14 provides an estimate of the storm surge depth.

Figure D-14: Surge from Hurricane Rita



The storm surge of Rita devastated entire communities in coastal areas of southwestern Louisiana, including Holly Beach, Cameron, Creole, and Grand Cheniere in Cameron Parish. Almost every structure in these areas was destroyed, and some were completely swept away. Several miles inland from the Gulf along Calcasieu Lake, numerous homes in the town of Grand Lake were damaged or destroyed. Many portions of the Lake Charles area suffered substantial flood damage, including downtown and some surrounding residential communities. In Vermilion Parish, dozens of homes and businesses were flooded

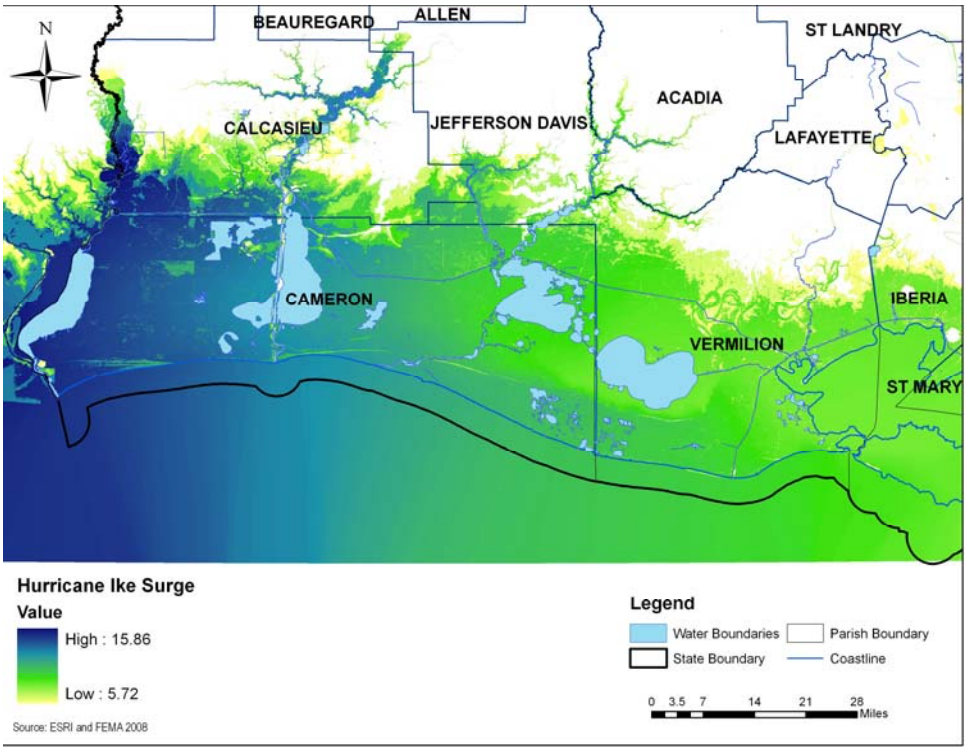
and damaged by storm surge, and most structures in the town of Pecan Island were destroyed. Storm surge damage to homes and businesses in low-lying areas extended eastward along the entire coast of Louisiana, although the impact in the New Orleans area was not nearly as widespread as during Hurricane Katrina.

Hurricane Gustav made landfall in Cocodrie in September 2007 as a category 2 hurricane resulting in over $4 billion in estimated damages. Storm surge was a significant problem in parts of Louisiana as Gustav moved onshore. Storm tides of 12 feet were measured at Black Bay in Plaquemines Parish, Louisiana, 10.5 feet at the Industrial Canal in Orleans Parish, and 9.5 feet at Bayou Dupre in St Bernard Parish. Major beach erosion was observed near Grand Isle in Jefferson Parish with 4.5 feet and Port Fourchon in Lafourche Parish with 4.5 feet of surge. Additional flooding occurred around Lakes Pontchartrain and Maurepas as southeast and east winds pushed water into the lakes thus parts of St. John the Baptist, Ascension, Livingston, Tangipahoa, and St. Tammany Parishes. Storm surge in the tidal lakes also caused water to back up into the rivers that drain into the lakes. The following images, provided by the USGS, show Grand Isle on September 30, 2005 (after Rita made landfall) and on September 4, 2008 (after Gustav made landfall). The results of storm surge can be clearly seen in the post-Gustav photograph.

Figure D-15: Photos of Surge from Hurricane Gustav

Hurricane Ike made landfall on September 13, 2008, at 2:10am as a category 2 hurricane with winds of 110 mph. The 2:00 am NHC advisory cited tropical storm and hurricane force winds extending 275 miles (443 km) and 120 miles (190 km), respectively, from its center. The storm surge blew onshore of Louisiana well ahead of Ike's predicted landfall in Texas. Areas in coastal south-central and southwestern Louisiana, some of which were flooded by Gustav, were re-flooded as a result of Ike. The storm surge of Ike again affected entire communities in coastal areas of southwestern Louisiana, including Holly Beach, Cameron, Creole, and Grand Cheniere in Cameron Parish. Figure D-16 shows the inundation levels across the Southwest Louisiana coast.

Figure D-16: Hurricane Ike Storm Surge Inundation

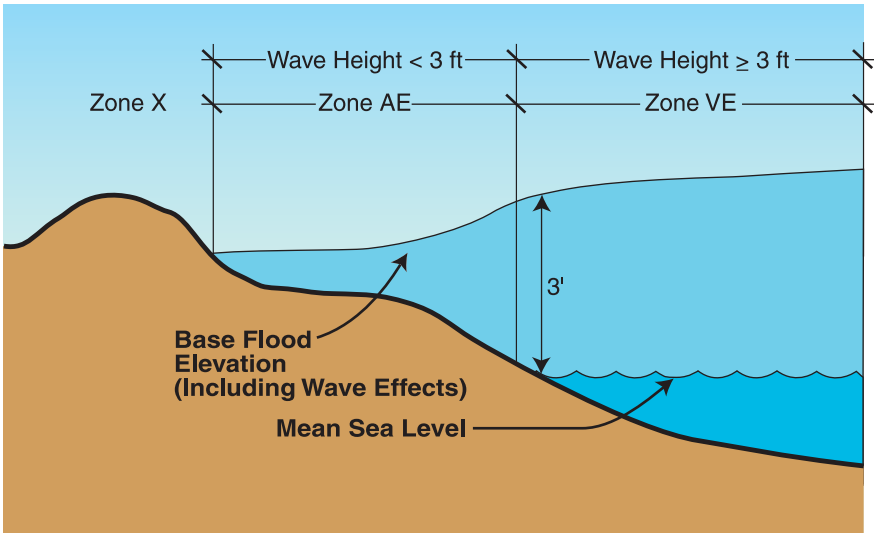


Source: ERSI and FEMA, 2008

Probability of Occurrence and Severity

Much like riverine flooding, predictive modeling has been used by FEMA to create NFIP mapping that reflects the 1% recurrence interval events for storm surge or coastal flooding. While the "100-year floodplain" for inland and coastal purposes is usually referred to as the "A" zone, there is an additional designation in coastal areas, a "V" or "VE" zone, that is the area subject to the 1% recurrence interval flood and/or the area where flood waters are anticipated to be moving with velocity and associated forces (Figure D-17). The velocity and force of the water make flooding even more destructive.

Figure D-17: Definition Sketch for Coastal Floodplains



Source: "Understanding Your Risks," FEMA Publication 386-2

Data Limitations

The data in this section are based on a previous run of the SLOSH model because there are no up-to-date runs covering the entire state. Specifically, the bathymetry for areas around Vermilion Bay are being updated by NOAA, after which new SLOSH models will become available.The SLOSH data presented in this plan do not take into account the advances in modeling that have taken place in recent years or lessons learned from Hurricane Katrina; however, 2010 SLOSH models for the New Orleans Basin will and should become available in late 2010. Additionally, the SLOSH model includes data on topography and is limited in its accuracy by the resolution at which it is run.

Appendix D.11

Subsidence

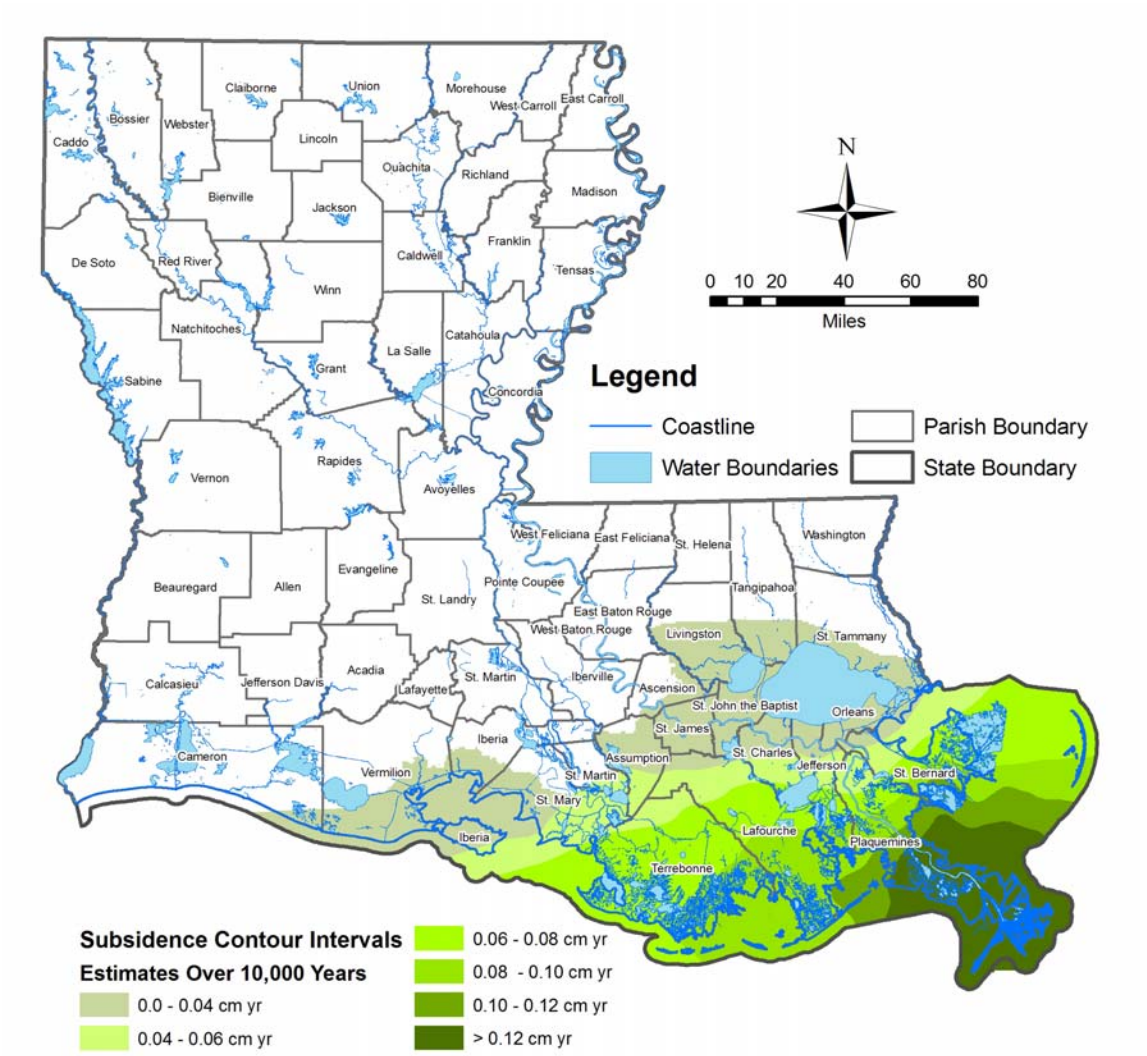
Nature of the Hazard

Sea-level rise has been identified as a hazard of such a scale and extent that it is best addressed primarily through the actions of other state agencies such as Department of Transportation and Development, Department of Natural Resources and Coastal Protection and Restoration Authority in the coastal zone and is not addressed in this Plan Update.

Subsidence has not been identified as a significant contributor to direct disaster damages in Louisiana. For the most part, subsidence (along with sea level rise and land loss) is a slow acting process with effects that are not as evident as sudden-occurrence hazards like earthquakes. Although the effects in the New Orleans metropolitan area and in the coastal zone can be seen over the course of decades or even years, subsidence is a “creeping” hazard event, with chronic impacts.

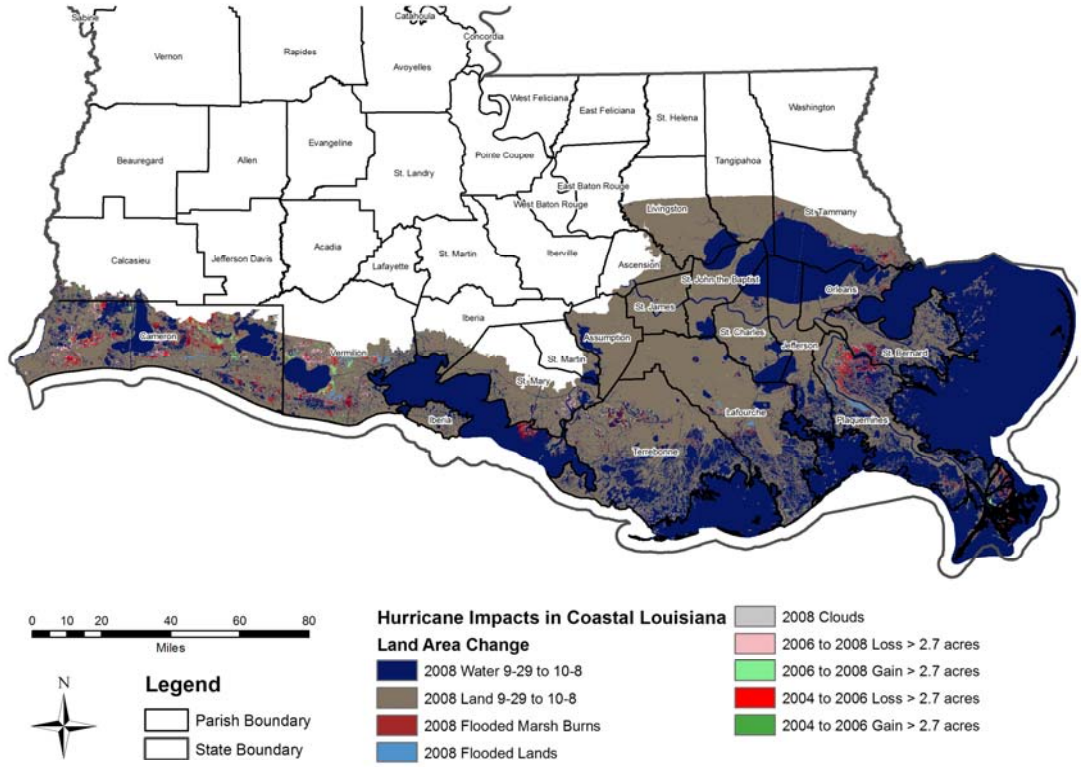
In some areas, ground elevations have fallen two to four feet due to subsidence since 1950. Maps D-20a and b show the subsidence contour intervals and land loss from 2004 to 2008. These issues are related, but not identical. Figure D-20 (below) shows the land loss classifications for Louisiana’s southeastern / delta plain region between 1932 and 2000 and projects land loss from 2000-2050.

Map D-20a: Subsidence Contour Intervals



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Map D-20b: Land Loss



Source: LAGIC (State Boundaries), ESRI (Parish Boundaries), Barras, J.A., 2009, *Land area change and overview of major hurricane impacts in coastal Louisiana, 2004-08*: U.S. Geological Survey Scientific Investigations Map 3080, scale 1:250,000, 6 p. pamphlet (Land Loss Study)

Causes of subsidence in coastal Louisiana areas include the isostatic adjustment of land due to Mississippi River sediment-loading and the localized compaction of older sediments. The term "isostatic adjustment" refers to the attempts of the Earth's crust to maintain equilibrium. In this case, large amounts of sediment are being deposited by the Mississippi River in a relatively short amount of time, causing the crust to compensate for the extra weight of the sediment. Tables D-26 and D-27 compare mean annual subsidence rates based on geologic conditions and soils in Louisiana coastal areas. As shown on the tables, geology and soil types do not have much effect on subsidence rates.

Table D-26: Mean Annual Subsidence Coded by Geology, 1985-1991

Class	Mean Annual Subsidence (mm/yr)	Standard Deviation
Natural Levee Deposits	-9.37	3.36
Alluvial Soils	-8.57	2.36
Artificial Fill	-9.66	1.07
Lake Fringe Deposits	-9.49	2.18
Total	-9.16	2.98

Source: Hart and Zilkoski, 1994

Table D-27: Mean Annual Subsidence Coded by Soils, 1985-1991

Class	Mean Annual Subsidence (mm/yr)	Standard Deviation
Sharkey-Commerce (natural levees)	-8.65	2.28
Clovelly-Lafitte-Gentilly (marsh / swamp)	-1.51	1.75
Harahan-Westwego (drained marsh)	-9.35	5.45
Allemands/Kenner (drained marsh)	-8.46	2.64
Aquents (spoil)	-9.09	3.22
Total	-8.42	3.65

Source: Hart and Zilkoski, 1994

Disaster History

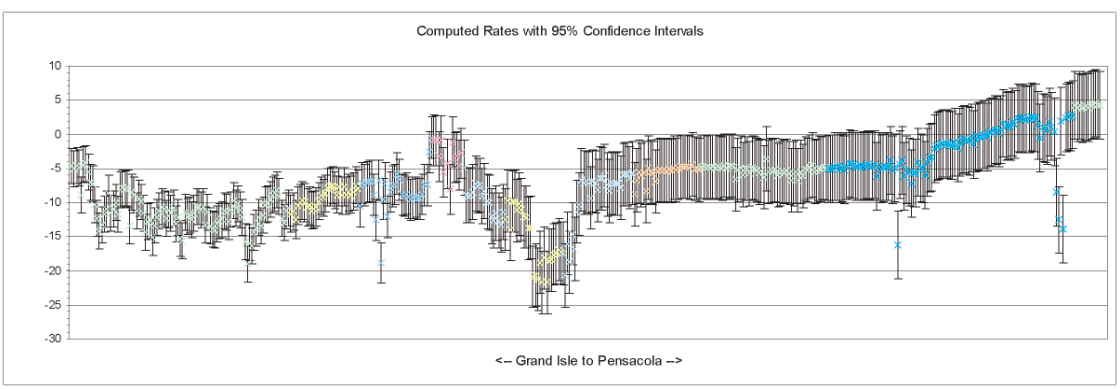
Subsidence has not been identified as a significant contributor to direct disaster damages in Louisiana. The only hazard event documented as a direct result of subsidence is the appearance of sinkholes over a mining operation in Weeks Island. The repeated removal of underground materials (originally salt and later oil) resulted in a sinkhole in 1992. The Weeks Island facility was decommissioned as a result of this discovery.

Rate of Occurrence

The highest rate of subsidence is occurring at the Mississippi River Delta (estimated at greater than 3.5 feet/century). Subsidence rates generally decrease away from the delta in a northeast, northwest, and western direction. Map D-20a (above) shows the subsidence contour intervals for the most affected areas. Figure D-18 is a Vertical Velocity Profile from Grand Isle to Pensacola showing subsidence rates in mm/yr. Figure D-19 shows subsidence rates in southern Louisiana.

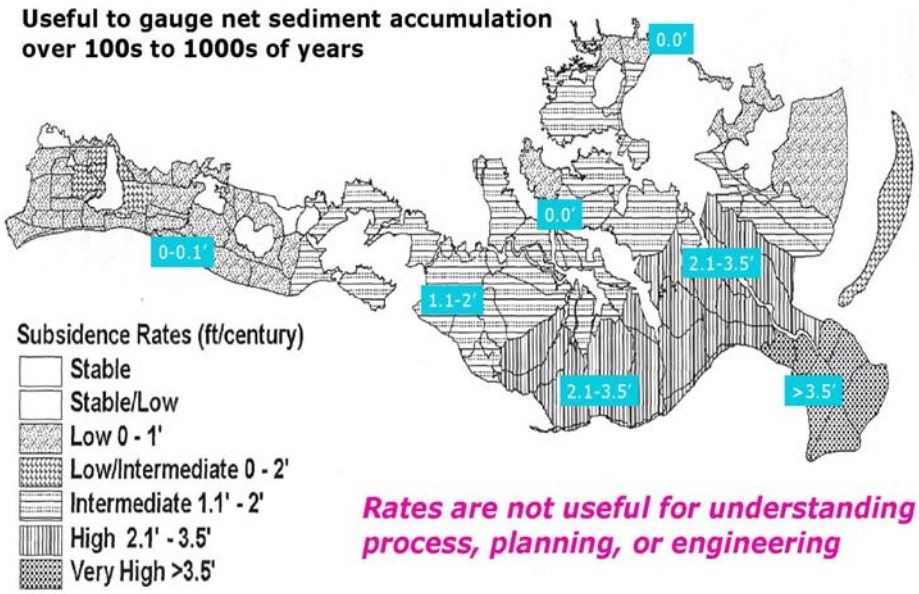
Figure D-20 shows the land loss classifications for Louisiana's southeastern / delta plain region between 1932 and 2000 and projects land loss from 2000-2050. Since subsidence rates can vary greatly over time and geographic location, and there is no clear consensus on appropriate rates to use for planning and design purposes, care needs to be taken in using historical rates as predictors of future behavior. The predictive value of these future estimates has been called into question as newer techniques of measurement have gained prominence. However, there are no particular accepted estimates for subsidence rates across Louisiana. Subsidence is not at a constant level or rate across the coast, so estimates will vary from locale to locale. Future Community Education and Outreach efforts will strive to generate more accurate subsidence rate estimates.

Figure D-18: Vertical Velocity Profile



Source: Shinkle and Dokka (2004)

Figure D-19: Subsidence Rates in Southern Louisiana

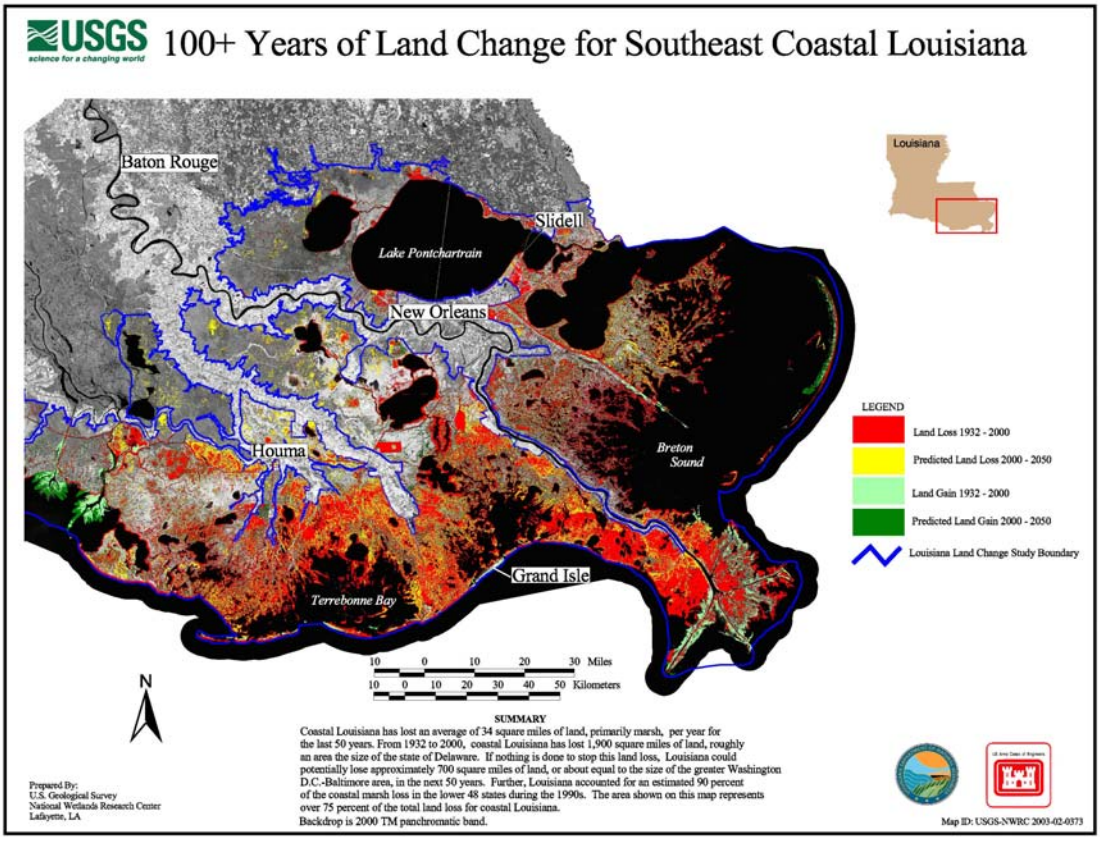


Source: Shinkle and Dokka (2004), Gagliano (1999)

Data Limitations

Subsidence rates vary over time and space. Therefore, any estimate represents an estimate over several years and therefore, consideration to these variations must be included when there is a need to predict future behavior. The predictive value of these estimates has been called into question as newer techniques of measurement have gained prominence. However, there are no particular accepted estimates for subsidence rates across Louisiana.

Figure D-20: Southeastern Louisiana Land Change



Source: USGS: National Wetland Research Center

Appendix D.12

Wildfire

Nature of the Hazard

Wildfire danger can vary greatly season to season and is exacerbated by dry weather conditions. According to the State of Louisiana Forestry Division, most forest fires in Louisiana are caused by intentional acts (arson) or carelessness and negligence committed by people.

The wildland urban interface is the area in which development meets wildland vegetation (see Map D-21). Both vegetation and the built environment provide fuel for fires. As development near wildland settings continues, more and more people and property are exposed to wildfire danger.

According to the State Forestry Division, Louisiana's forestlands cover 13.8 million acres, about 48% of the state's area. Private, non-industrial landowners own 62% of the state's forestland, forest products industries own 29%, and public entities own nine percent. Forests provide the raw material for Louisiana's second largest manufacturing employer, the forest products industry, with over 900 firms in 45 parishes employing more than 25,000 people. An additional 8,000 people work in the harvesting and transportation of these resources. Louisiana's forests provide many other benefits, including clean air and water, wildlife habitat, recreational opportunities, and scenic beauty. The loss from wildfire is potentially catastrophic.

In addition to the destruction of valuable forestland and the impact on the economy through the loss of this important resource, wildfires seriously threaten countless rural structures, human lives, and wildlife. The secondary effects of wildfires, including erosion, landslides, introduction of invasive species, and changes in water quality, are often more disastrous than the fire itself. Recent economic troubles in Louisiana state government has forced the Department of Agriculture and Forestry to streamline its operation in order to successfully operate within its budget. Part of the streamlining effort included the sale of six surveillance aircraft, leaving 12 remaining aircraft, and a reorganization of the State's Forestry Districts. In an effort to reduce the damage of wildfires, the Louisiana Department of Agriculture and Forestry utilizes 71 fire crews to fight wildfires. In 1982 the average fire crew in Louisiana protected approximately 187,000 acres, but as of 2009, the average crew is protecting approximately 266,000 acres.

Disaster History

Table D-28 shows that from 1998 to 2009, the average number of forest fires in Louisiana was 2,361 per year, and the average number of acres burned was 29,956. Because most fires in Louisiana forests are caused by arson and other careless acts committed by people, the location and severity of fires is largely unpredictable.

Table D-28: Forest Fires and Acres Burned (1998-2009)

Year	Total Fires	Total Acres Burned
1998	2,711	30,922
1999	3,672	30,512
2000	5,166	92,575
2001	1,123	7,800
2002	1,619	12,909
2003	1,698	14,474
2004	1,464	13,893

Year	Total Fires	Total Acres Burned
2005	3,275	39,544
2006	3,143	36,005
2007	1,294	11,465
2008	1,645	18,079
2009	1,525	15,288
Average	2,361	26,956
Grand Total	28,335	323,467

Source: Forestry Division, Louisiana Department of Agriculture and Forestry.

Table D-29: Total Fires By Parish (1998-2008)

Parish	Total Fires	Parish	Total Fires
Beauregard	3,020	Evangeline	417
Allen	1,994	East Feliciana	403
Rapides	1,904	Caldwell	391
St Tammany	1,853	Lincoln	279
Vernon	1,691	Jackson	251
Tangipahoa	1,537	Morehouse	237
St Helena	1,436	Red River	225
Livingston	1,273	West Carroll	223
Washington	1,123	Ouachita	200
Sabine	867	Catahoula	193
Calcasieu	840	Jefferson Davis	75
Natchitoches	804	Richland	54
Winn	729	East Baton Rouge	39
LaSalle	639	Franklin	30
Grant	607	West Feliciana	29
Caddo	525	Avoyelles	25
Claiborne	524	Tensas	6
De Soto	515	East Carroll	4
Bienville	472	St Landry	3
Webster	471	Acadia	2
Union	450	Concordia	2
Bossier	440	Madison	1

Source: Forestry Division, Louisiana Department of Agriculture and Forestry.

The Louisiana Department of Agriculture and Forestry provides general assessments of the risk of wildfire based on geographic location in the state (see Maps D-22a and b).

Probability of Occurrence and Magnitude

Table D-30 shows the number of acres burned in recent years by month. Table D-31 indicates that the number of wildfires, their magnitude in terms of acres burned, and probability of occurrence can vary greatly from year to year and start time. In dry and drought conditions, wildfires can become quite intense, burning dead forest debris on forest floors, dried grasses, and brush. Another indicator of magnitude, besides number of acres burned, is the number of structures and residences damaged by fire. Table D-32 shows the number of structures and residences damaged by wildfire in recent years. Given the average number of wildfires and acres burned each year in Louisiana, the probability of future events is 100%. Naturally, the probability will vary by region, as Table D-29 and Map D-22(a) indicate.

Table D-30: Total Acres Burned by Month and Year

Month	Year			Total	Annual Average per Month
	2000	2001	2002		
January	8,298	398	1,281	9,977	3,326
February	14,111	1,656	3,496	19,263	6,421
March	6,337	822	2,720	9,879	3,293
April	2,041	1,608	737	4,386	1,462
May	1,549	1,627	1,200	4,376	1,459
June	1,109	122	831	2,062	687
July	1,803	203	299	2,305	768
August	12,631	298	939	13,868	4,623
September	41,786	34	970	42,790	14,263
October	2,427	367	55	2,849	950
November	249	617	136	1,002	334
December	234	48	245	527	176
Total	92,575	7,800	12,909	113,284	37,761

Source: Forestry Division, Louisiana Department of Agriculture and Forestry. http://www.ldaf.state.la.us/divisions/forestry/forestprotection/wildfire/search.asp.

Table D-31: 2008 Forest Fires and Percentage by Start Time

Time	Total Fires	Percent of Total
0001- 0100	13	0.80%
0101 – 0200	9	0.56%
0201 - 0300	6	0.37%
0301 - 0400	5	0.31%
0401 - 0500	6	0.37%
0501 – 0600	4	0.25%
0601 - 0700	5	0.31%
0701 - 0800	11	0.68%

Time	Total Fires	Percent of Total
0801 - 0900	10	0.62%
0901 - 1000	17	1.05%
1001 - 1100	43	2.66%
1101 - 1200	55	3.40%
1201 - 1300	83	5.13%
1301 - 1400	171	10.58%
1401 - 1500	270	16.70%
1501 - 1600	305	18.86%
1601 - 1700	235	14.53%
1701 - 1800	117	7.24%
1801 - 1900	72	4.45%
1901 - 2000	53	3.28%
2001 - 2100	51	3.15%
2101 - 2200	36	2.23%
2201 - 2300	33	2.04%
2301 - 2400	7	0.43%
Normal Work Hours		67.72%
After Work Hours		32.78%

Source: Forestry Division, Louisiana Department of Agriculture and Forestry.

Table D-32: Structures and Residences Damaged/Protected (2006-2009)

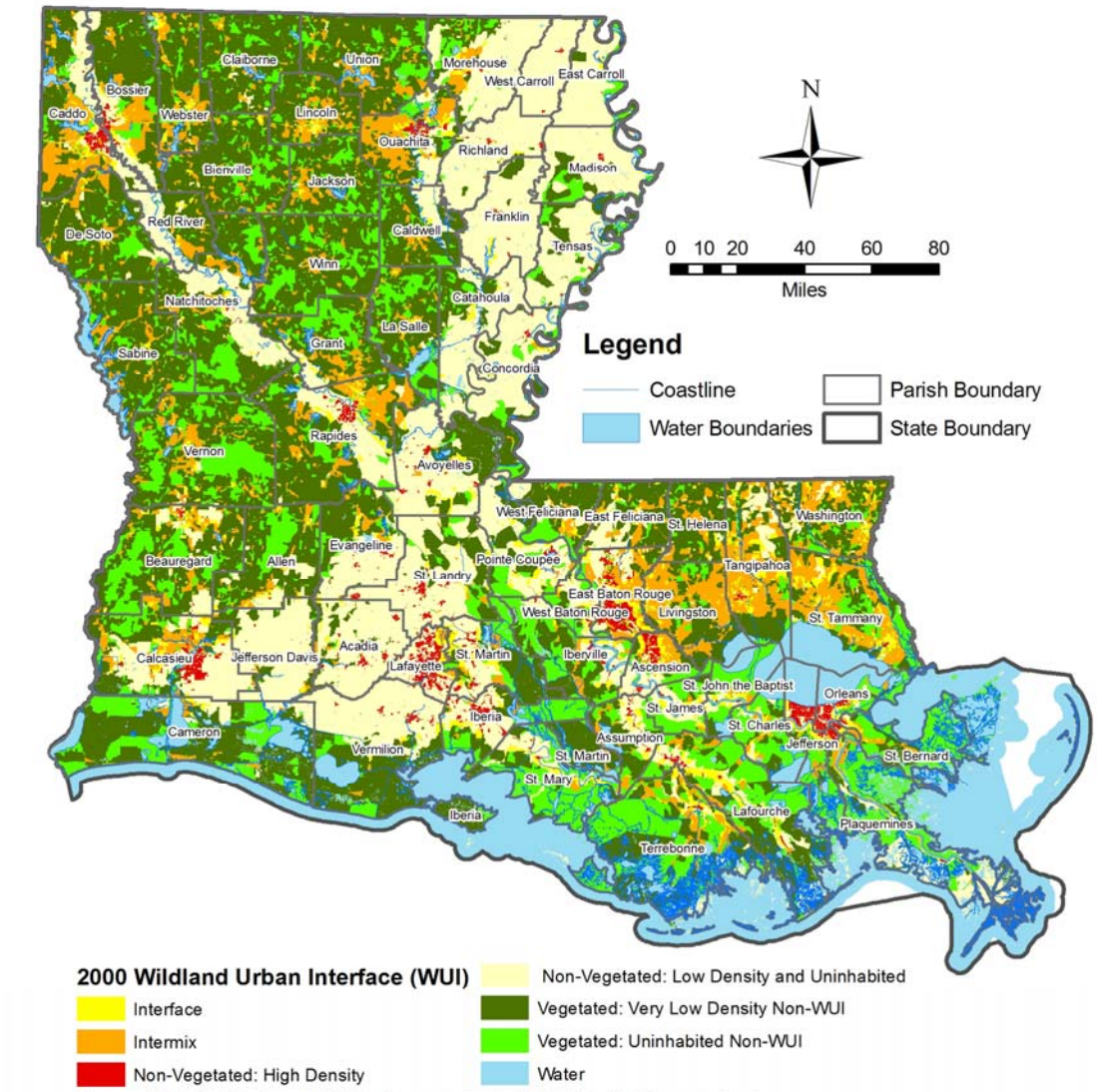
Year	Structures Damaged	Structures Protected	Residences Damaged	Residences Protected
2006	85	1092	40	254
2007	37	491	19	608
2008	51	829	25	832
2009	56	760	50	876
Average	57.25	793	33.5	642.5
Grand Total	229	3,172	134	2,570

Source: Forestry Division, Louisiana Department of Agriculture and Forestry.

Data Limitations

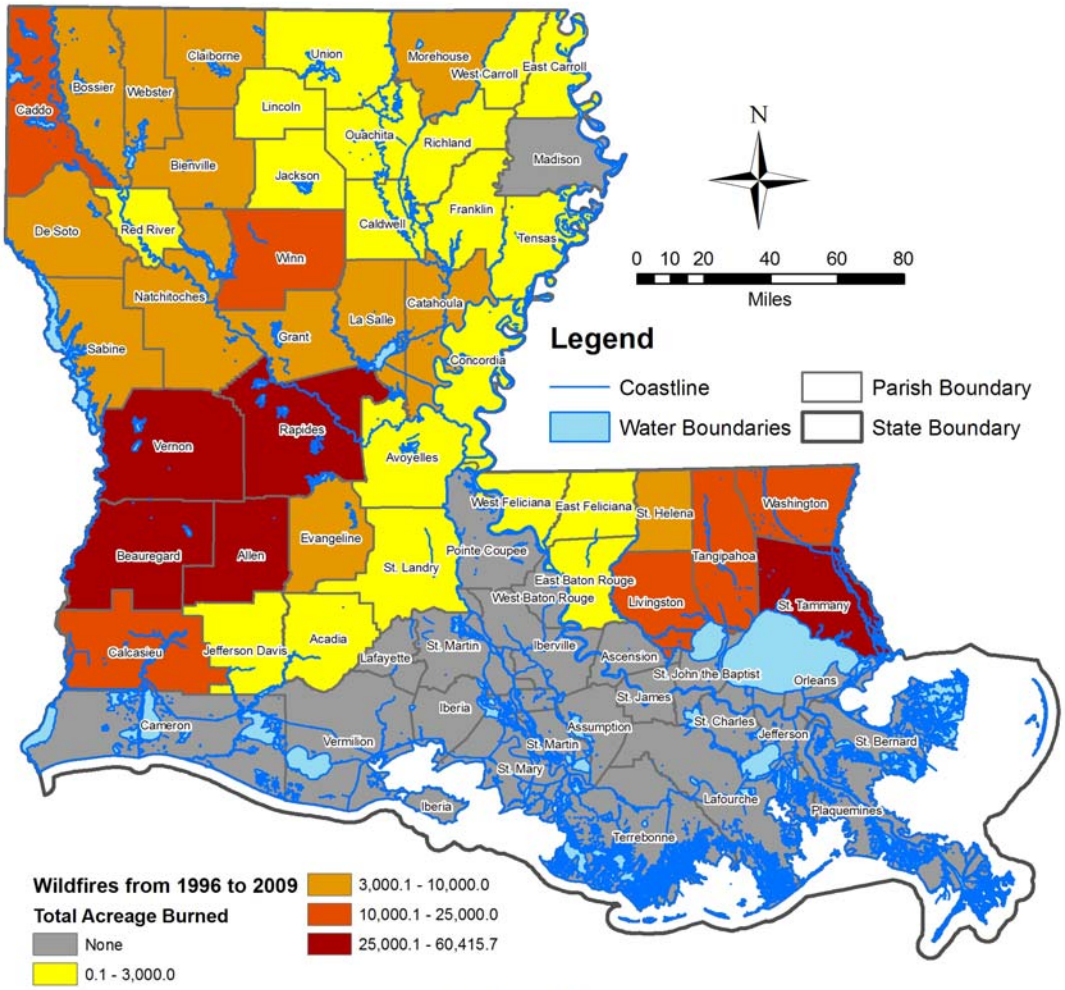
The figures for acres burned represent estimates by the Department of Forestry, based in part on reports by land owners, and as such these figures may fail to include smaller fires.

Map D-21: Wildland Urban Interface



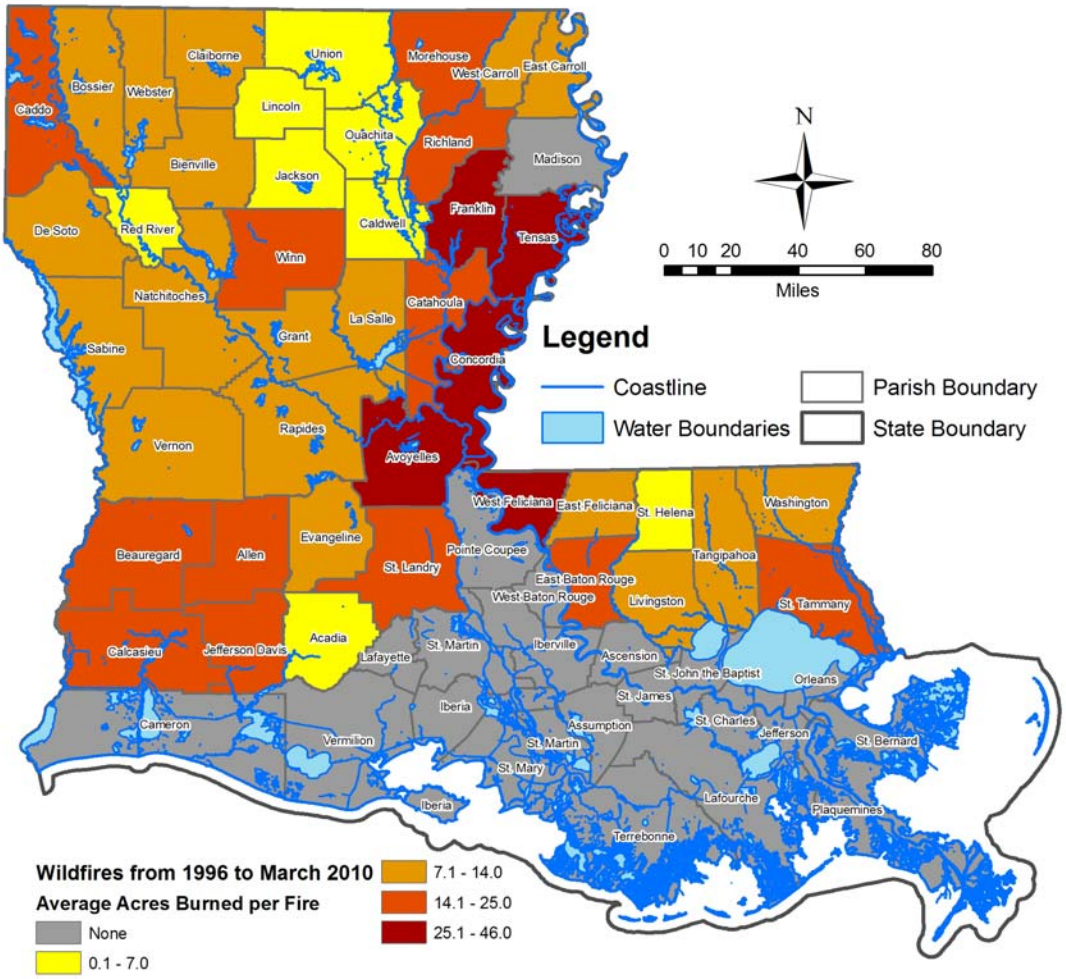
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface)

Map D-22a: Hazard Profile – Wildfire (Total Acres Burned)



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Louisiana Department of Agriculture and Forestry (Wildfires)

Map D-22b: Hazard Profile – Wildfire (Average Acres Burned)



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Louisiana Department of Agriculture and Forestry (Wildfires)

Appendix D.13

Dam Failure

Nature of the Hazard

Dam failures can result from any one of or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which cause most failures;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross-section of the dam and abutments, or maintain gates, valves, and other operational components;
- Improper design, including the use of improper construction materials and construction practices;
- Negligent operation, including the failure to remove or open gates or valves during high flow periods;
- Failure of upstream dams on the same waterway;
- Landslides into reservoirs, which cause surges that result in overtopping;
- High winds, which can cause significant wave action and result in substantial erosion; and
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments that can weaken entire structures.

Louisiana has 142 USDA Natural Resources Conservation Service (NRCS) -assisted project dams built under the Small Watershed Protection Program and Flood Prevention Act authority.

In Louisiana there are 557 dams managed by the Department of Transportation and Development as of September 2010. Map D-23 shows dam locations per the LDOTD inventory. The USACE National Inventory of Dams records dams as having a "high hazard potential," "significant hazard potential," and "low hazard potential."These categories are defined below.

- High hazard potential dams are dams where failure or improper operation will probably cause loss of human life.
- Significant hazard potential dams are those where failure or improper operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. Dams classified as having "significant hazard potential" are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
- Low hazard potential dams are those where failure or improper operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

Most dams were built with a 50-year life span. Louisiana has a number of dams that will reach their life span in the following years: 2008 (three dams), 2009 (11 dams), 2010 (three dams), 2011 (two dams), 2012 (two dams), 2013 (three dams), 2014 (two dams), 2015 (one dam). Of the NRCS-assisted project dams in Louisiana, five dams are classified as having a high hazard potential, seven as having a significant hazard

potential, and 23 as having a low hazard potential. Twenty-eight of these dams will reach the end of their lifespan by 2017.[19]

Disaster History

While there are no reports of significant dam failures in Louisiana, the National Performance of Dams Program, a database of dam incidents (events that affect the structural and functional integrity of dams, though not necessarily causing failure and not including ordinary maintenance and repair, vandalism, acts of war, recreational accidents, and sabotage) maintained by Stanford University, lists one incident from the fall of 1985. Park managers at the Cotile Lake Dam in Rapides Parish reported seepage due to sand and gravel deposits that displaced concrete slabs. There was no dam failure or controlled breach reported in this incident.

Probability of Occurrence and Magnitude

The amount of water impounded, and the density, type, and value of development downstream determine the potential severity of dam failure. In Louisiana, there are 33 high hazard potential, 71 significant hazard potential, and 453 low hazard potential dams. There are also eight existing unrated dams and one high hazard dam under construction as of September 2010. As shown in Figure D-21, 30 of the 35 High Hazard dams have existing emergency action plans at the time this Plan Update was prepared. Given that there has never been a confirmed dam failure in Louisiana, the probability of future occurance is extremely low.

[19] http://www.la.nrcs.usda.gov/programs/Watershed%20Programs/watershed_rehabilitation_louisiana.html

Figure D-21: Dams with Emergency Action Plans by Hazard Potential

DamName	NIDID	County	Owner_Name	Hazard	EAP	InspDate
BAYOU COCODRIE DAM	LA00012	RAPIDES&EVANGELINE	STATE OF LOUISIANA	H	YES	3/23/2010
BAYOU DARBONNE DAM + RESERVOIR	LA00015	UNION	STATE OF LOUISIANA	H	YES	5/17/2010
BLACK BAYOU DAM	LA00003	CADDO	STATE OF LOUISIANA	S	YES	5/18/2010
BLACK LAKE BAYOU RESERVOIR	LA00386	NATCHITOCHES	STATE OF LOUISIANA	H	YES	4/8/2010
BUNDICKS CREEK DAM	LA00006	BEAUREGARD	STATE OF LOUISIANA	H	YES	7/28/2010
CANEY CREEK DAM	LA00385	JACKSON	STATE OF LOUISIANA	H	YES	6/2/2010
CHICOT LAKE DAM	LA00010	EVANGELINE	STATE OF LOUISIANA	H	YES	9/22/2009
CHIVERY DAM	LA00004	NATCHITOCHES	STATE OF LOUISIANA	H	YES	4/8/2010
GRAND BAYOU RESERVOIR	LA00387	RED RIVER	STATE OF LOUISIANA	H	YES	4/5/2010
IATT LAKE DAM	LA00018	GRANT	GRANT PAR. POL. JURY	H	YES	4/7/2010
IVAN LAKE DAM	LA00020	BOSSIER	STATE OF LOUISIANA	H	YES	4/06/2010
KEPLER CREEK DAM	LA00021	BIENVILLE	STATE OF LOUISIANA	H	YES	5/19/2010
LAKE BISTINEAU	LA00002	BOSSIER/ BIENVILLE	STATE OF LOUISIANA	H	YES	5/19/2010
LAKE CLAIBORNE	LA00011	CLAIBORNE	STATE OF LOUISIANA	H	YES	4/06/2010
LOWER ANACOCO DAM	LA00001	VERNON	STATE OF LOUISIANA	L	YES	5/20/2010
NANTACHIE LAKE DAM 1	LA00025	GRANT	STATE OF LOUISIANA	L	YES	4/7/2010
SALINE LAKE DAM	LA00026	WINN&NATCHITOCHES	STATE OF LOUISIANA	H	YES	4/8/2010
SMITHPORT LAKE DAM	LA00028	DESOTO	STATE OF LOUISIANA	L	YES	5/19/2010
TURKEY CREEK DAM	LA00029	FRANKLIN	STATE OF LOUISIANA	L	YES	6/1/2010
VERNON LAKE DAM	LA00022	VERNON	STATE OF LOUISIANA	H	YES	5/20/2010

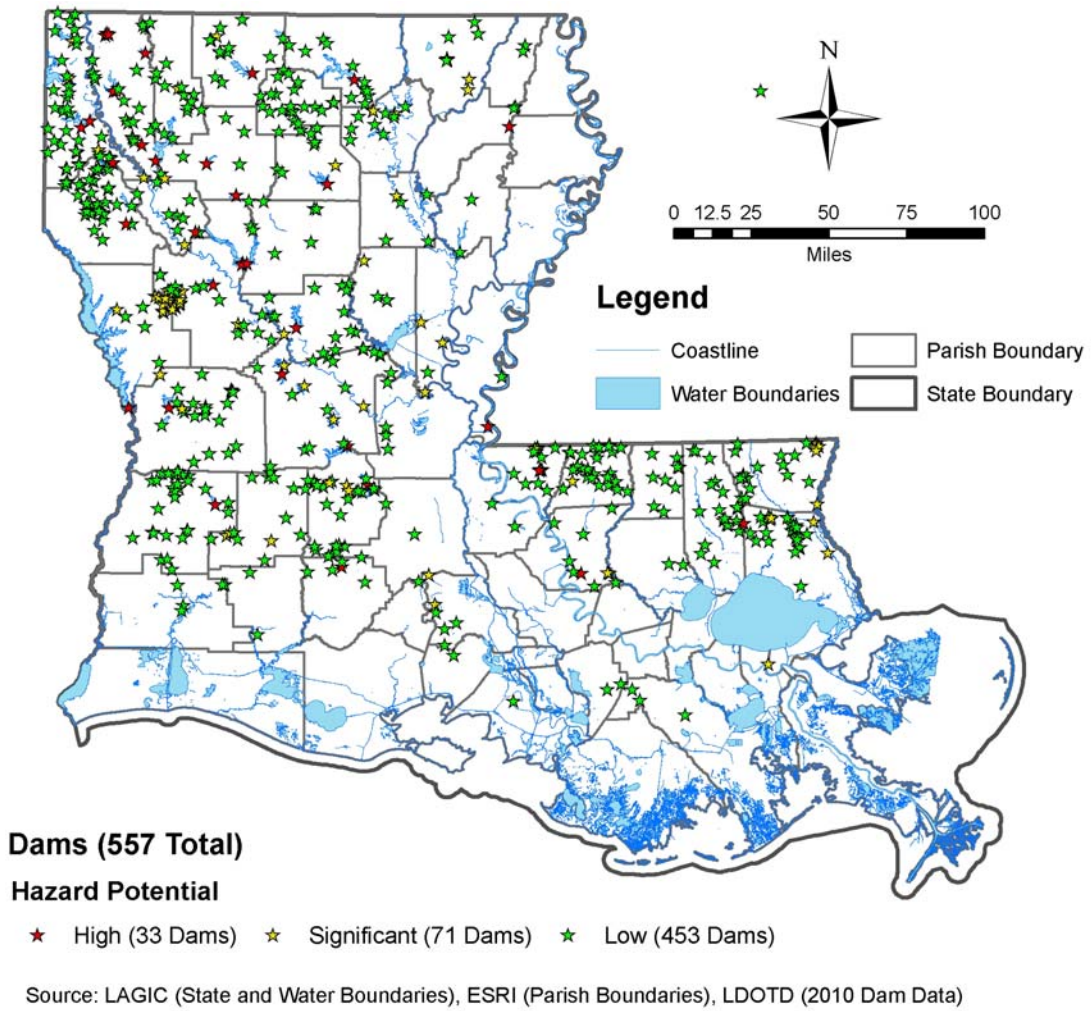
DamName	NIDID	County	Hazard	EAP	InspDate	InspFrequency	StateRegDam
ACADIA POWER PARTNERS HOLDING POND	LA00394	ACADIA	H	YES	2/22/2010	1	YES
BAYOU BODCAU DAM	LA00179	BOSSIER	H	YES	5/18/2010	1	YES
BAYOU COCODRIE DAM	LA00012	RAPIDES&EVANGELINE	H	YES	3/23/2010	1	YES
BAYOU DARBONNE DAM + RESERVOIR	LA00015	UNION	H	YES	5/17/2010	1	YES
BLACK LAKE BAYOU RESERVOIR	LA00386	NATCHITOCHES	H	YES	4/8/2010	1	YES
BRECKENRIDGE LAKE DAM	LA00391	CADDO	H	NO	6/25/2009	1	YES
BUNDICKS CREEK DAM	LA00006	BEAUREGARD	H	YES	7/28/2010	1	YES
CANEY CREEK DAM	LA00385	JACKSON	H	YES	6/2/2010	1	YES
CHICOT LAKE DAM	LA00010	EVANGELINE	H	YES	9/22/2009	1	YES
CHIVERY DAM	LA00004	NATCHITOCHES	H	YES	4/8/2010	1	YES
COTILE LAKE DAM	LA00031	RAPIDES	H	NO	4/15/2010	1	YES
CROSS LAKE DAM AND SPILLWAY	LA00346	CADDO	H	YES	4/13/2010	1	YES
CYPRESS BAYOU NO 1	LA00345	BOSSIER	H	YES	10/27/2009	1	YES
CYPRESS BAYOU NO 2	LA00041	BOSSIER	H	YES	10/7/2009	1	YES
CYPRESS BAYOU NO 3	LA00040	BOSSIER	H	YES	10/7/2009	1	YES
CYPRESS BLACK BAYOU SITE NO 2	LA00347	BOSSIER	H	YES	10/6/2009	1	YES
DOLET HILLS MAKE-UP WATER POND	LA00388	DESOTO	H	YES	4/13/2010	1	YES
GRAND BAYOU RESERVOIR	LA00387	RED RIVER	H	YES	4/5/2010	1	YES
HIDEAWAY HARBOR LAKE	LA00389	CADDO	H	NO		1	YES
IATT LAKE DAM	LA00018	GRANT	H	YES	4/7/2010	1	YES
IVAN LAKE DAM	LA00020	BOSSIER	H	YES	4/06/2010	1	YES
KEPLER CREEK DAM	LA00021	BIENVILLE	H	YES	5/19/2010	1	YES
LAKE BISTINEAU	LA00002	BOSSIER/ BIENVILLE	H	YES	5/19/2010	1	YES
LAKE CLAIBORNE	LA00011	CLAIBORNE	H	YES	4/06/2010	1	YES
LILLY BAYOU CONTROL STRUCTURE	LA00507	E BATON ROUGE	H	NO	Under Construction	1	YES
MILL CREEK DAM	LA00024	BIENVILLE	H	YES	9/23/2009	1	YES
OLD RIVER	LA00598	CONCORDIA	H	YES	5/15/2008	1	NO
PENNINGTON LAKE DAM	LA00390	E BATON ROUGE	H	NO	6/26/2009	1	YES
POVERTY POINT RESERVOIR DAM	LA00513	RICHLAND	H	YES	6/4/2010	1	YES
SALINE LAKE DAM	LA00026	WINN&NATCHITOCHES	H	YES	4/8/2010	1	YES
SIBLEY LAKE DAM	LA00027	NATCHITOCHES	H	YES	4/14/2010	1	YES
SINCLAIR LAKE	LA00083	WEST FELICIANA	H	NO	2/8/2010	1	YES
TOLEDO BEND DAM	LA00030	SABINE	H	YES	9/23/2008	1	NO
VERNON LAKE DAM	LA00022	VERNON	H	YES	5/20/2010	1	YES
WALLACE LAKE DAM	LA00180	CADDO/DESOTO	H	YES	5/18/2010	1	YES

Total = 35 5 NOs $\frac{(35-5)}{35} \times 100 = 86\%$ yes

Data Limitations

The dataset relied upon for this section is very comprehensive and up to date. However, it would benefit from the addition of flow direction data to better predict the inundation area in case of failure where EAP inundaton maps are not available.

Map D-23: Hazard Profile – Dam Failure



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LDOTD (2010 Dam Data)

Appendix D.14

Levee Failure

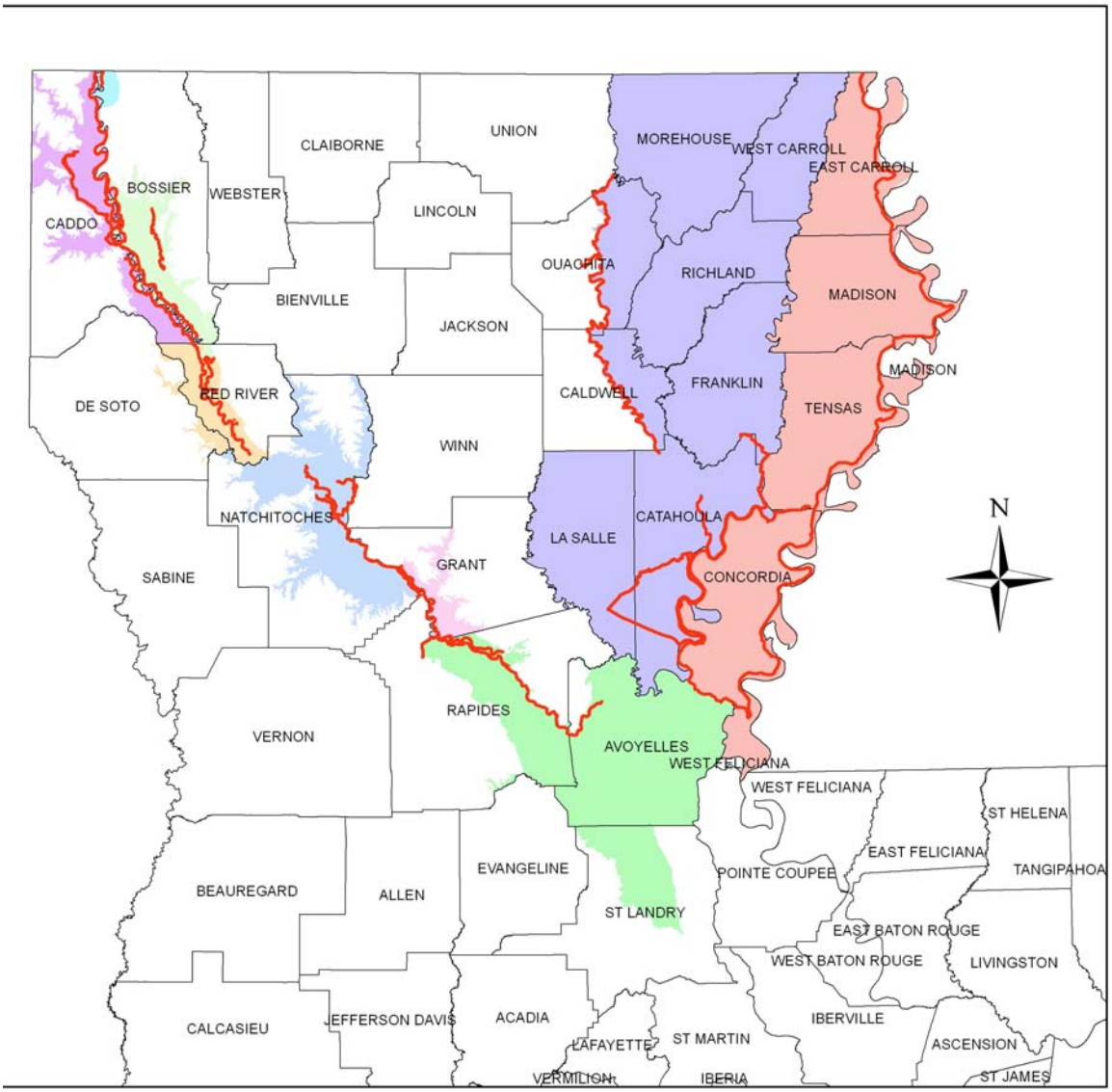
Nature of the Hazard

Levee failure involves the overtopping, breach, or collapse of the levee. Levee failure is especially destructive to nearby development during flood and hurricane events. The northern half of Louisiana is protected by levees on the Ouachita River under the authority of the Vicksburg District of the USACE. The Vicksburg District encompasses 68,000 square miles in the States of Arkansas, Mississippi and Louisiana. They manage seven drainage basins, including the Yazoo, Pearl, Big Black, Red, Ouachita, and Mississippi Rivers; 12 locks and dams on the Pearl, Red, and Ouachita rivers; 1,808 miles of levees, including 468 along the Mississippi River; and multiple lakes with 1,709 miles of shoreline.

Coastal and southern Louisiana is protected by an extensive levee system under the authority of the New Orleans District of the USACE. This system includes 30,000 square miles of Louisiana south of Alexandria, including 961 miles of river levees in the Mississippi River and Tributaries Project, 449 miles of river levees in the Atchafalaya Basin, and 340 miles of hurricane-protection levees. Other levees have been built along stretches of rivers throughout Louisiana by local levee districts and private citizens. The data regarding these non-federal levees are managed by the individual entity responsible for construction and subsequent maintenance and are not kept in consistent format for a comprehensive hazard analysis.

Map D-24 shows the location of the major levees and levee protection zones in these basins. Figures D-21a and b contain graphics of hurricane levee districts in the USACE New Orleans District and Vicksburg District.

Figure D-21a: Louisiana Levee District - North



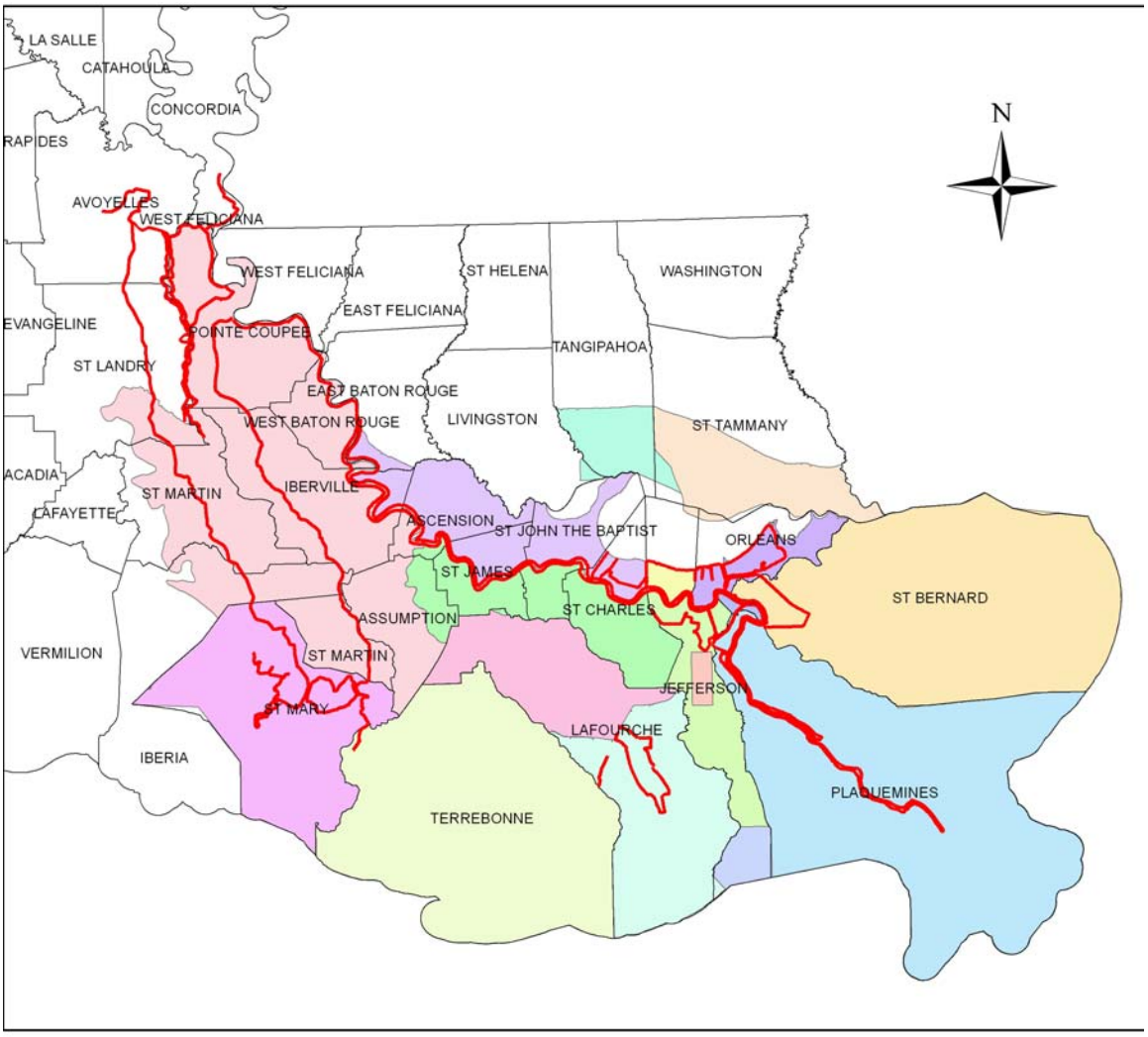
Legend

USACE Vicksburg District	CADDO	NORTH BOSSIER
Districts North	FIFTH	RED RIVER
LEVEE_DIST	NATCHITOCHES	RED RIVER, ATCHAFALAYA, & BAYOU BOEUF
BOSSIER	NINETEENTH	TENSAS

Source: USACE 2010

0 5 10 20 30 40 Miles

Figure D-21b: Louisiana Levee Districts



Legend

USACE New Orleans District

District South

LEVEE_DIST

- LAKE BORGNE BASIN
- ALGIERS
- ATCHAFALAYA
- EAST JEFFERSON
- GRAND ISLE
- LAFITTE
- LAFOURCHE BASIN
- NORTH LAFOURCHE CONSERVATION
- ORLEANS
- PLAQUEMINES
- PONTCHARTRAIN
- SOUTH LAFOURCHE
- ST MARY
- ST TAMMANY
- TANGIPAHOA
- TERREBONNE
- WEST JEFFERSON

Source: USACE 2010

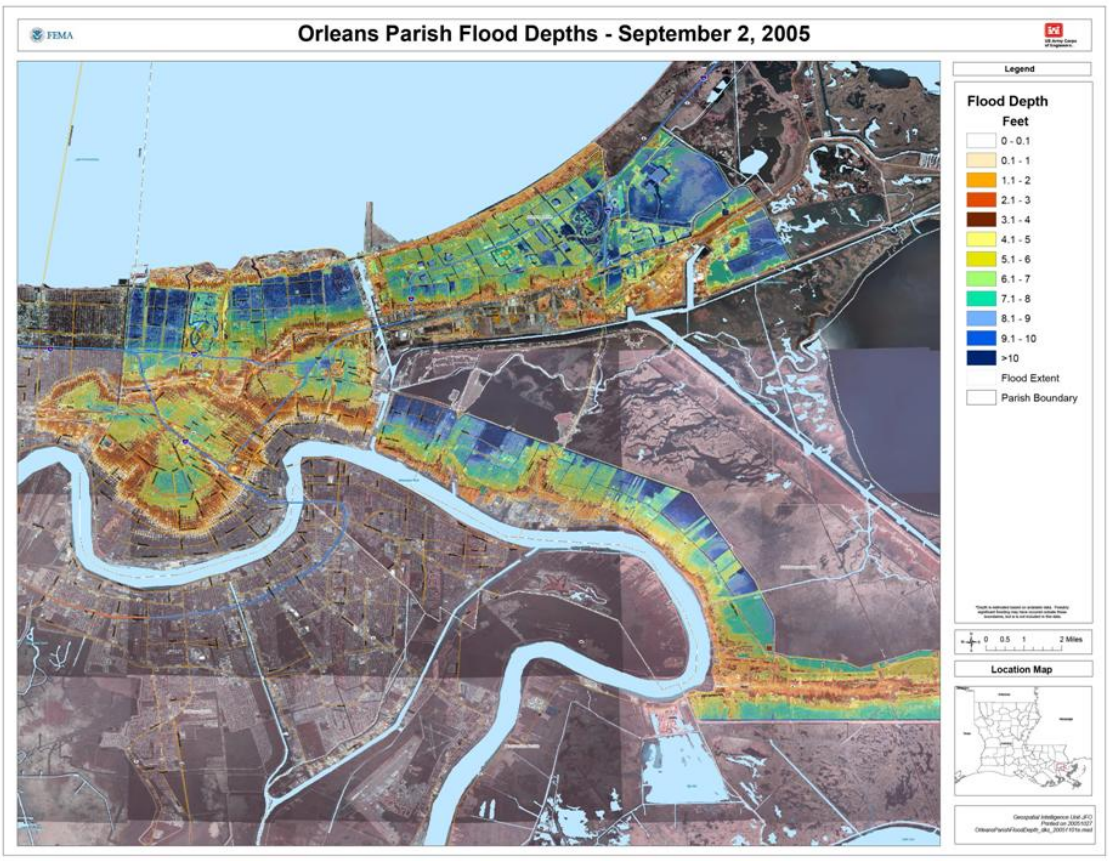
0 5 10 20 30 40 Miles

Disaster History

Levees have been overtopped or breached during flood events and non-flood events. In 1985, a section of levee along the Mississippi River near Marrero failed due to scour in a non-flood-related event. The causes of this failure included scouring and erosion of sand from the toe of the river bank, which created an over-steepened slope and resultant instability of the upper bank. Severe scour at the toe resulted as the channel bottom deepened through the sandy substratum. Flow failure in the sands then led to loss of the upper bank. Thus, the location of the failure was controlled by the nature of the geologic deposits beneath the levee combined with progressive deepening of the river channel at that location.

Several sections along Lake Pontchartrain and along both navigation and drainage canals failed in New Orleans during Hurricane Katrina. The extent and depth of these levee failures resulting from Hurricane Katrina caused extreme flooding in New Orleans that can be clearly noted in Figure D-22. The causes of these failures were varied.

Figure D-22: Hurricane Katrina Levee Failure Inundation



Source: NOAA, 2006

Probability of Occurrence and Magnitude

Similarly, the severity of impacts from levee breaches depends upon the amount of nearby development. According to the Louisiana Department of Transportation and Development, levees in the New Orleans District are regularly maintained by the USACE to prevent breaches, but the very existence of levees can present a danger to metropolitan New Orleans. Levee construction by the USACE has encouraged New Orleans and its industries to drain marshland protected by the levees. As drainage has lowered the water

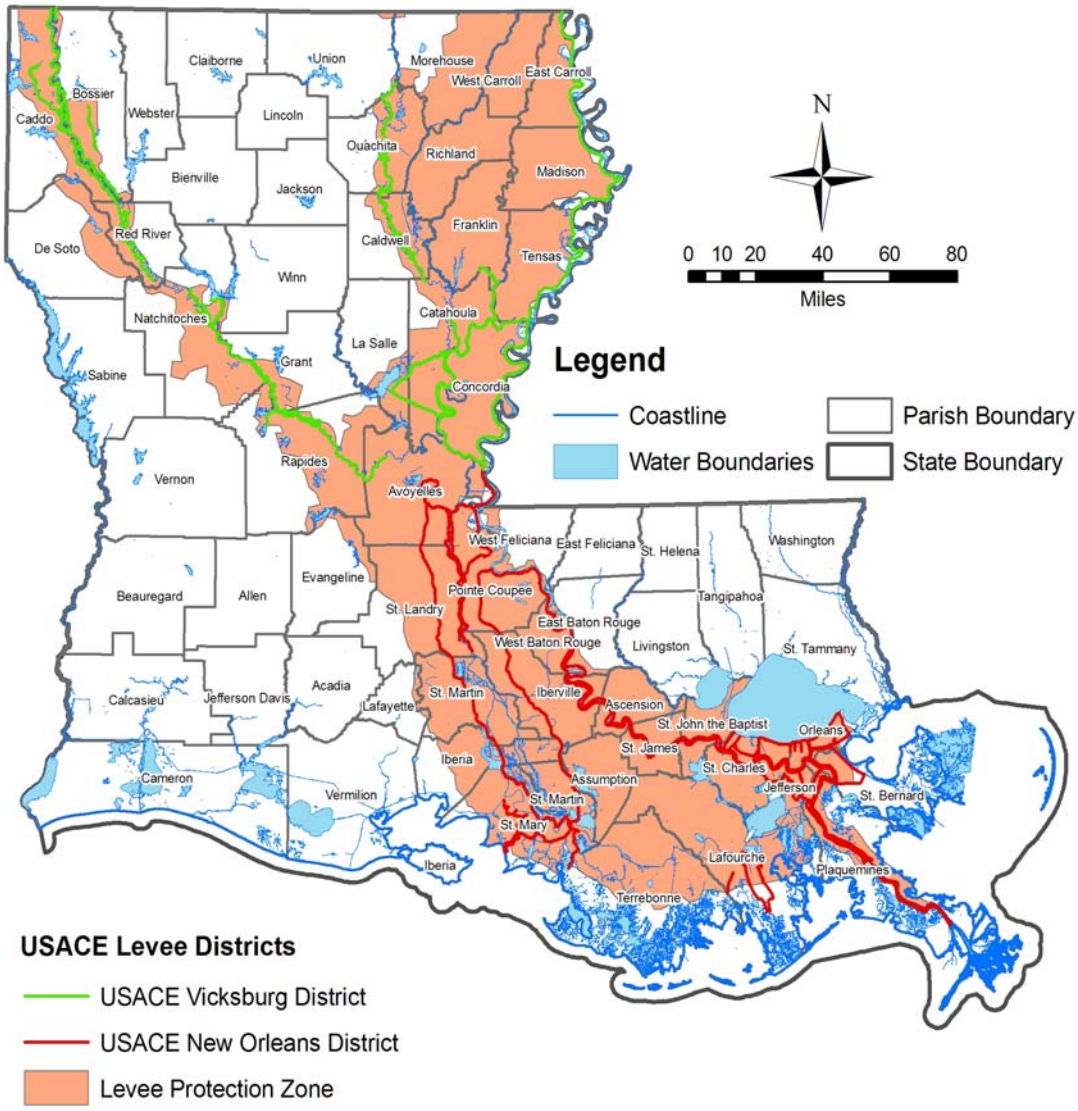
table allowing the top layers of muck (wet peat) to dry, consolidate, and subside, New Orleans has sunk further below sea level. The experience of Hurricane Katrina confirmed that a large-scale hurricane that hits just east of the city can overtop levees, trap water within their walls, and inundate the city under more than 12 feet of water.

While the probability of levee failure due to natural or human causes is low throughout the state, the probability increases in coastal areas where the threat of tropical weather and storm surge exists. As seen during Hurricane Katrina, coastal communities are especially vulnerable to levee failure because of the impact that tropical weather and storm surge may have on levee stability.

Data Limitations

The available datasets showing levees in the state do not include all levees. This is due in part to the fact that levees are managed by several different entities, and the data are kept in different formats. Additionally, the data from the USACE used for this section did not include metadata and as such cannot be fully evaluated.

Map D-24: Hazard Profile – Levee Districts and Levee Protection Zones



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems)

Appendix D.15

Hazardous Material Incident

Nature of the Hazard

Hazardous materials incidents generally involve incidents at fixed-site facilities, which manufacture, store, process, or otherwise handle hazardous materials, or along transportation routes like major highways, railways, navigable waterways, and pipelines. There are 2,738 miles of state and federal highways, 2,273 miles of navigable waterways, and 4,579 miles of railways that can potentially carry hazardous materials around the s

In addition to chemical production facilities, there are three nuclear facilities with Emergency Planning Zones, the 10-mile Plume Pathway Exposure Zone and the 50-mile Ingestion Pathway Zone, that include parts of the State of Louisiana, the Grand Gulf Nuclear facility, located in Mississippi, and the River Bend and W-3 nuclear facilities within the Louisiana state boundary. Areas within the Plume Pathway Exposure Zone are at risk from immediate exposure to accidental radiological releases, and those within the Ingestion Pathway Zone are at risk from deposited contamination.

Nuclear accidents are classified in three categories:

- Criticality accidents involving nuclear assemblies, research, production, or power reactors, and chemical operators;
- Loss-of-coolant accidents resulting from significant breaks in the reactor coolant system; and
- Loss-of-containment accidents involving the release of radioactivity through breaches in containment vessels at fixed facilities or damage to packages in transportation accidents.

Disaster History

While the state has thousands of accidental releases each year, most damaging effects are limited by the insignificant size of the accident and the timeliness of appropriate emergency response. However, some spills and other accidental releases have been big enough to present a danger to nearby populations or the environment.

Figure D-23: Early response to the Deepwater Horizon explosion (photo courtesy US Coast Guard).

On April 20, 2010, an explosion on the Deepwater Horizon MC252 drilling platform in the Gulf of Mexico caused the rig to sink, and oil began leaking into the Gulf (Figure D-23). While the source of this significant spill is not located within Louisiana's boundaries, the oil still poses a serious threat to habitat and wildlife, and to the economy, health, culture and traditions of the state's coastal communities. Although it will be months before the full extent of the damage will be known, the spill is impacting the Gulf coastline. As outlined below, the oil spill is impacting Louisiana's shoreline habitats and fisheries as well as current and completed restoration projects on the coast.

- Fisheries: During past oil spills in the Gulf of Mexico, NOAA has documented direct toxic impacts to commercially important aquatic life including blue crabs, squid, shrimp, and a variety fish species. Toxins in the oil can kill these species or have other harmful effects such as: genetic damage, liver disease, cancer, and reproductive, developmental, and immune system impairment in fish and other organisms.
- Habitat: The presence of discharged oil in the environment may cause decreased habitat use in the area, altered migration patterns, altered food availability, and disrupted life cycles. Oiled plants could die, eliminating the roots that help bind and stabilize soil, leading to erosion.
- Restoration: There are many NOAA restoration projects that could be affected by the spill, including two large-scale American Recovery and Reinvestment Act projects.[20]

In October 1995, a railroad tank car holding rocket fuel (nitrogen tetroxide) exploded at the Gaylord Chemical plant in Bogalusa, Louisiana, releasing a cloud of nitrogen tetroxide. The explosion occurred after weeks of nitrogen tetroxide vapor leaks from faulty valves on a railroad tank car. The National Transportation Safety Board (NTSB) determined that the probable cause of the accident was the lack of adequate procedures to prevent or detect the contamination of nitrogen tetroxide with water used by employees to dilute the chemical during transfer from the faulty tank car to another. The contamination

[20] Taken from http://www.deepwaterhorizonresponse.com/posted/2931/Deepwater_Oil_Spill_6_4_10.591583.pdf

formed an extremely corrosive product that lead to the failure of the tank car. The accident resulted in the evacuation of 3,000 people, injuries to 4,700 people, and hospitalization of 81 people.

Another hazardous materials incident involved a large gasoline spill in March 1997 that required concentrated local and state response efforts and generated much media attention (see Figure D-24). In Baton Rouge, a 25-barge tow being pushed by a tugboat struck the US Highway 190 bridge over the Mississippi River. The tow separated, sinking two barges and capsizing a tank barge. The capsized barge began leaking some of the 10,000 barrels of pyrolysis gasoline, leading to concerns about benzene fumes and the evacuation of 24 nearby schools, a university, and nearby homes and offices in downtown Baton Rouge. Several citizens sought medical attention after reporting to be affected by the heavy fumes. Extensive monitoring of the ambient air and water continued for 12 days, until the barge was transported nearly 50 miles downstream for final lightering.

Figure D-24: Pyrolysis gasoline spill near Baton Rouge, March 1997.

Source: Louisiana Department of Environmental Quality.

The May 2000 derailment of an eastbound Union Pacific Railroad train released hazardous materials that led to the evacuation of 3,500 people near Eunice, Louisiana and damages exceeding $35 million. Of 113 cars, 33 derailed, 15 of which contained hazardous materials. The NTSB determined that the probable cause of the derailment was the failure of a set of defective joint bars on the tracks.

Probability of Occurrence and Magnitude

On average, the State of Louisiana receives about 5,000 reports of accidental hazardous materials releases annually. Most accidental releases occur while chemicals are being transported along major highways. Table D-34 represents data pulled from the National Response Center database. This table lists Chemical Industries by parish (see Map D-25), number of facilities regulated by the Resource Conservation and Recovery Act by parish (see Map D-26), and number of NRC Spill Reports by parish (see Map D-27)

Table D-34: NRC LA Database 2000-2009

Parish Name	Chemical Industry	RCRA Waste Facilities	NRC Spill Reports
ACADIA	5	134	135
ALLEN	2	29	28
ASCENSION	38	244	1359
ASSUMPTION		32	162
AVOYELLES	2	57	50
BEAUREGARD	3	90	60
BIENVILLE		26	28
BOSSIER	4	259	112
CADDO	32	694	343
CALCASIEU	45	762	2981
CALDWELL		5	12
CAMERON		62	3075
CATAHOULA	2	9	31
CLAIBORNE	1	26	44
CONCORDIA	1	11	20
DE SOTO	2	32	66
EAST BATON ROUGE	69	1488	1874
EAST CARROLL		8	6
EAST FELICIANA		12	11
EVANGELINE	2	52	35
FRANKLIN	3	33	8
GRANT	1	14	22
IBERIA	8	240	317
IBERVILLE	26	129	1172
JACKSON		17	15
JEFFERSON	40	1672	3609
JEFFERSON DAVIS		71	79
LA SALLE		12	107
LAFAYETTE	31	948	131
LAFOURCHE	14	262	2269
LINCOLN	3	81	35
LIVINGSTON	7	112	70
MADISON		14	21
MOREHOUSE	1	49	17
NATCHITOCHES		44	24
ORLEANS	27	1053	1394
OUACHITA	18	363	805
PLAQUEMINES	6	250	3609

Parish Name	Chemical Industry	RCRA Waste Facilities	NRC Spill Reports
POINTE COUPEE	1	29	101
RAPIDES	13	401	95
RED RIVER		17	8
RICHLAND	4	32	23
SABINE		28	35
ST BERNARD	4	158	1603
ST CHARLES	19	139	2399
ST HELENA	1		9
ST JAMES	5	45	791
ST JOHN THE BAPTIST	10	119	339
ST LANDRY	5	141	206
ST MARTIN	3	115	220
ST MARY	8	240	1400
ST TAMMANY	23	368	382
TANGIPAHOA	7	174	126
TENSAS		6	11
TERREBONNE	10	475	1665
UNION	3	13	22
VERMILION	4	148	1573
VERNON	3	81	67
WASHINGTON	1	61	37
WEBSTER	8	105	60
WEST BATON ROUGE	13	124	412
WEST CARROLL	1	15	5
WEST FELICIANA		10	17
WINN	1	29	19
Totals	540	12,469	35,761

Source: NRC Database LA 2000-2009

Severity

The severity of a hazardous materials release depends upon the type of material released, the amount of the release, the proximity to populations or sensitive areas like wetlands or waterways, and environmental factors such as wind velocity and direction and sunlight. The release of materials can lead to injuries or evacuation of thousands of nearby residents. Radiological releases are among the most feared of technological hazards because they can cause widespread death or long-term illness to humans and animals and contaminate the environment for decades.

In addition to human-caused or accidental hazardous material releases, many of the other hazards included in the state's profile such as hurricane, tropical storm, storm surge, flooding, high wind, tornado, and lightning can cause hazardous material releases in their impact area. These hazards can lead to hazardous material releases caused by damage to equipment, damage to pipes and connections, short circuits and/or

power failures, punctured tanks and vessels, and structural damage to buildings and facilities. Hazardous material can also be released in fires and/or explosions, toxic gas emissions, and spills. As noted in a 2007 study:

> Data from two states (Louisiana and Texas) participating in the Hazardous Substances Emergency Events Surveillance (HSEES) system were analyzed to describe the characteristics of hazardous substances releases in industrial settings associated with Hurricanes Katrina and Rita. HSEES is an active multi-state Web-based surveillance system maintained by the Agency for Toxic Substances and Disease Registry (ATSDR). In 2005, 166 hurricane-related hazardous substances events in industrial settings in Louisiana and Texas were reported. Most (72.3%) releases were due to emergency shut downs in preparation for the hurricanes and start-ups after the hurricanes. Emphasis is given to the contributing causal factors, hazardous substances released, and event scenarios. Recommendations are made to prevent or minimize acute releases of hazardous substances during future hurricanes, including installing backup power generation, securing equipment and piping to withstand high winds, establishing procedures to shutdown process operations safely, following established and up-to-date start-up procedures and checklists, and carefully performing pre-start-up safety reviews.[21]

Also, as highlighted by the Louisiana Office of Public Health in a 2004 report:

> Since 2001, the Louisiana Department of Health and Hospitals (LDHH) has participated in the Hazardous Substances Emergency Events Surveillance (HSEES) system. In 2001, there were 815 events qualified for HSEES surveillance. Data for each event was gathered and analyzed. During these hazardous substances events, there were 1164 chemicals released resulting in injuries to 63 people, most with respiratory system irritation. Even though more people were injured in fixed-facility events, injuries were more likely to result from transportation-related events. The quantity and frequency of hazardous substance releases do not always positively correlate with the number of injuries sustained during those releases. A higher percentage of "Rail" transport events was observed in Louisiana when compared with other HSEES states. By collecting and analyzing more data and disseminating results to the public, it is expected that further adverse public health consequences from hazardous releases/spills in Louisiana can be reduced and/or minimized.[22]

Data Limitations

Updated data were only available for toxic releases by parish and did not provide release locations. Additionally, the data do not show pipeline locations or oil and gas wells. Pipelines and oil and gas wells in the State of Louisiana are regulated by the Louisiana Department of Natural Resources, Office of Conservation.

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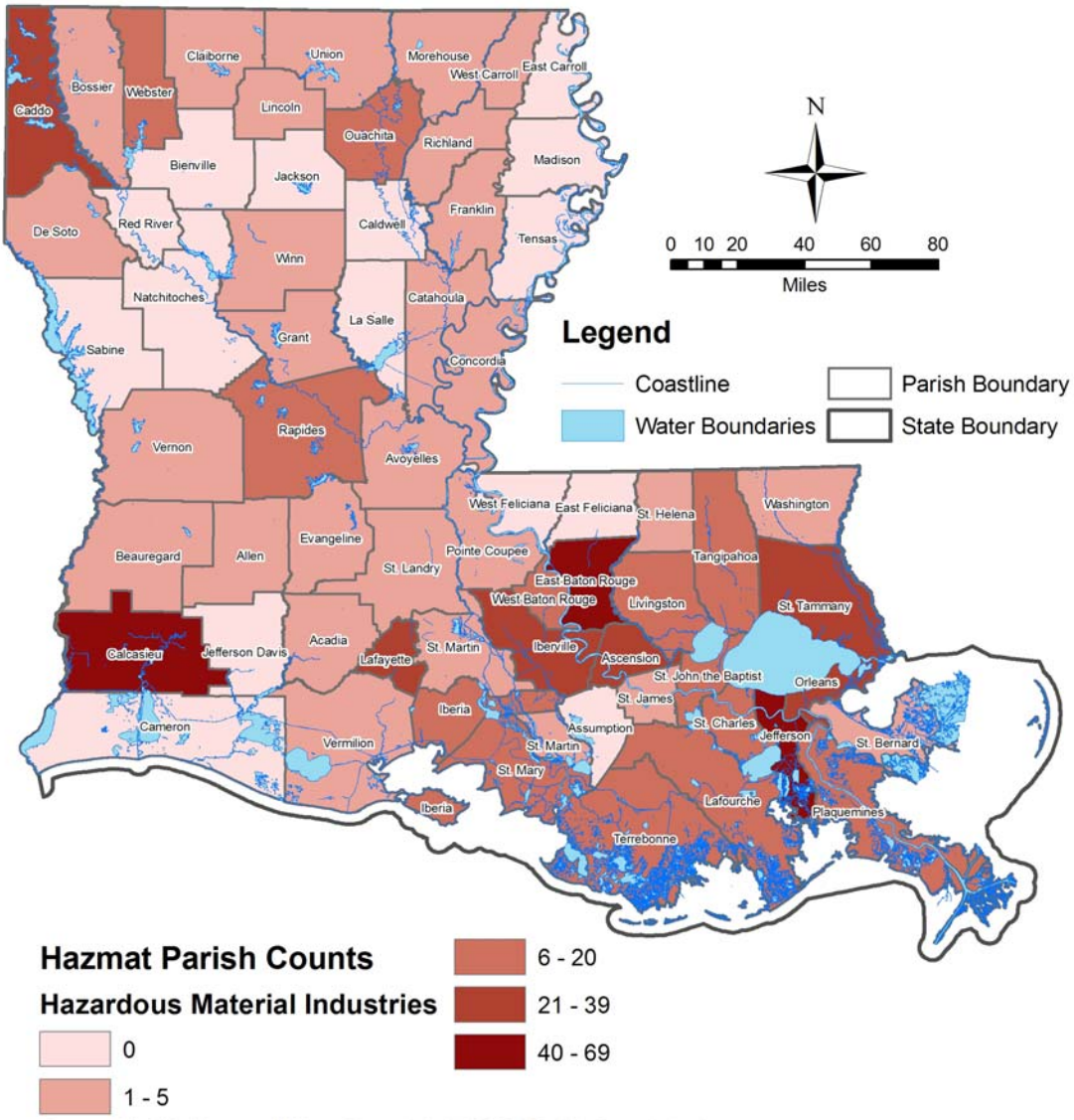
[21] Ruckert, P., Orr, M., Lanier, K., and Koehler, A. (2008). Hazardous substance releases associated with Hurricanes Katrina and Rita in industrial settings, Louisiana and Texas. *Journal of Hazardous Materials*, 159(1), 53-57. doi:10.1016/j.jhazmat.2007.07.124

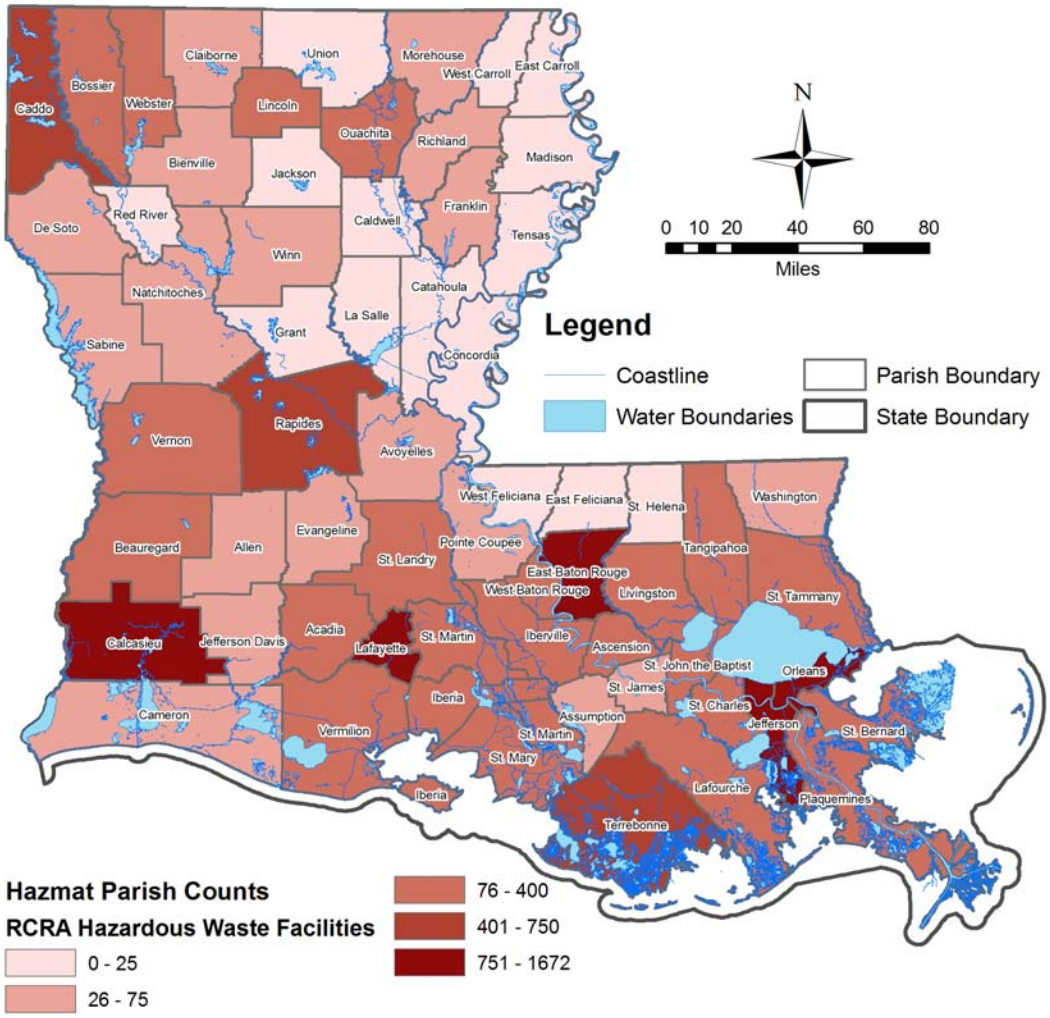
[22] Hu, C., and Raymond, D. (2004). Lessons learned from hazardous chemical incidents - Louisiana Hazardous Substances Emergency Events (HSEES) system. *Journal of Hazardous Materials, 115(1-3), 33-38. doi:10.1016/j.jhazmat.2004.05.006*

Map D-25: Hazard Profile – Chemical Industries by Parish



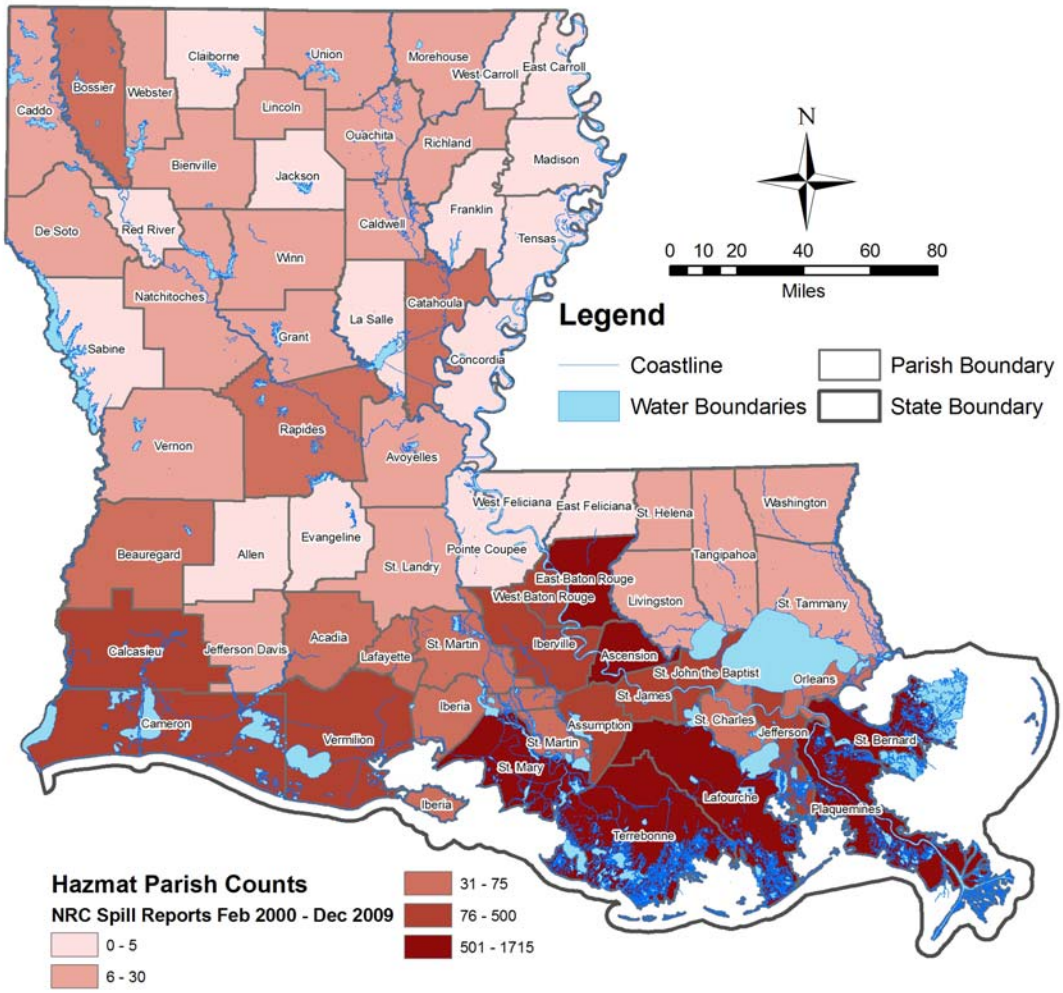
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LOSCO and EPA 2008 (Hazardous Material Industries)

Map D-26: Resource Conservation and Recovery Act Hazardous Waste Facilities by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LOSCO and EPA 2008 (RCRA Hazardous Waste Facilities)

Map D-27: Hazard Profile-Hazardous Material Spills by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), National Response Center (Hazardous Material Spill Reports)

Appendix D.16
EOP HIRA

Louisiana's geographic location and its industrial and population distribution subject the state and its people to a variety of hazards. The Emergency Operations Plan (EOP) Hazard Identification and Risk Assessment (HIRA) defines preparedness, response, and short term recovery. The Louisiana EOP ensures that all levels of government are able to mobilize as a unified emergency management organization to safeguard the well-being of the state's citizens. The methodology used to determine the EOP HIRA differs from the State Hazard Mitigation Plan HIRA, resulting in a different hazard ranking. Attachment 2 from the EOP includes, but is not limited to, the most serious likely hazards separated into natural, technological, human-caused, and biological categories:

1. Natural Hazards:
    - A. Coastal Erosion
    - B. Drought
    - C. Earthquake
    - D. Flood
    - E. Fog
    - F. Hailstorm
    - G. Hurricanes (Tropical Cyclone)
    - H. Ice Storm
    - I. Severe Storms, including lightning and high winds (Thunderstorms)
    - J. Subsidence
    - K. Severe Summer Weather/Extreme Heat
    - L. Storm Surge
    - M. Tornado
    - N. Wildfire
2. Technological Hazards:
    - A. Airplane Crash
    - B. Dam Failure
    - C. Levee Failure
    - D. Hazardous Materials Fixed Facility Incident
    - E. Hazardous Materials Transportation Incident
    - F. Nuclear Fixed Facility Incident
    - G. Nuclear Transportation Incident
    - H. Offshore Oil Spill
    - I. Utilities Failure (Energy)

J. Utilities Failure (Telecommunications)

K. Utilities Failure (Sewer and Water Systems)

3. Human-caused Hazards (Intentional Acts):

A. Civil Disorder

B. Terrorist/Enemy Attack

C. Cyber Terrorism

4. Biological Hazards:

A. Animal Disease

B. Pandemic Infectious Disease

Appendix E
Statewide Risk Assessment

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Appendix E.1:
General Building Stock

Tables E-1 through E-6 provide data that is included in the Hazards US – Multi-Hazard (HAZUS-MH) default inventory which utilizes 2000 US Census Data. This inventory was used as data for calculating the risk assessments presented in this report. Table E-1 provides the population and building count by occupancy for the 64 Louisiana parishes.

Table E-1: Building Count by Key Occupancy

Parish	Population	Residential	Commercial	Industrial	Governmental	Educational	Religious	Agricultural	Total
Acadia	58,861	25,037	1,151	305	34	40	108	151	26,826
Allen	25,440	9,898	365	80	33	16	70	35	10,497
Ascension	76,627	29,510	1,298	345	31	33	122	84	31,423
Assumption	23,388	10,039	296	74	16	14	36	38	10,513
Avoyelles	41,481	17,803	746	171	50	24	86	98	18,978
Beauregard	32,986	15,348	570	151	32	19	111	62	16,293
Bienville	15,752	9,191	277	70	18	6	73	25	9,660
Bossier	98,310	36,638	1,757	517	97	44	199	119	39,371
Caddo	252,161	96,240	5,040	1,269	154	132	672	240	103,747
Calcasieu	183,577	74,466	3,706	840	112	87	398	192	79,801
Caldwell	10,560	5,251	169	38	16	7	33	20	5,534
Cameron	9,991	5,483	193	63	15	5	24	17	5,800
Catahoula	10,920	5,631	195	32	21	10	34	37	5,960
Claiborne	16,851	8,458	260	96	20	18	65	20	8,937
Concordia	20,247	9,738	375	66	26	15	73	59	10,352
DeSoto	25,494	12,208	400	134	30	21	94	45	12,932
East Baton Rouge	412,852	136,735	8,017	1,703	501	283	903	350	148,492
East Carroll	9,421	3,610	133	12	10	7	37	22	3,831
East Feliciana	21,360	8,584	283	73	40	10	64	28	9,082
Evangeline	35,434	15,847	590	96	31	21	67	80	16,732
Franklin	21,263	9,420	404	71	24	13	85	103	10,120
Grant	18,698	9,206	236	80	21	8	58	28	9,637
Iberia	73,266	28,597	1,481	439	45	50	102	95	30,809
Iberville	33,320	13,349	610	143	40	23	96	44	14,305
Jackson	15,397	8,096	293	69	19	8	79	20	8,584
Jefferson	455,466	150,409	9,289	2,474	219	232	689	320	163,632
Jefferson Davis	31,435	13,848	640	129	25	24	85	122	14,873
La Salle	190,503	7,108	197	63	14	7	28	10	7,427
Lafayette	89,974	71,301	4,852	1,373	106	114	269	256	78,271
Lafourche	14,282	35,857	1,616	436	52	52	120	110	38,243
Lincoln	42,509	16,879	813	203	33	39	101	61	18,129
Livingston	91,814	36,985	1,349	481	42	39	153	71	39,120
Madison	13,728	5,710	252	33	18	8	34	32	6,087
Morehouse	31,021	13,302	537	97	32	19	113	91	14,191

Parish	Population	Residential	Commercial	Industrial	Governmental	Educational	Religious	Agricultural	Total
Natchitoches	39,080	17,584	754	153	48	29	147	79	18,794
Orleans	484,674	159,652	9,272	1,537	368	391	1,076	174	172,470
Ouachita	147,250	56,867	3,418	803	100	87	373	170	61,818
Plaquemines	26,757	10,384	505	178	34	14	52	42	11,209
Pointe Coupee	22,763	11,011	338	85	21	13	42	69	11,579
Rapides	126,337	53,123	2,848	581	109	94	390	185	57,330
Red River	9,622	4,035	106	21	10	3	17	10	4,202
Richland	20,981	9,379	398	77	19	16	81	90	10,060
Sabine	23,459	14,856	474	118	33	21	98	45	15,645
St. Bernard	67,229	25,319	1,058	278	18	21	67	42	26,803
St. Charles	48,072	17,061	759	221	37	27	75	34	18,214
St. Helena	10,525	5,043	132	31	11	6	31	20	5,274
St. James	21,216	7,877	301	80	24	8	40	29	8,359
St. John the Baptist	43,044	15,274	638	161	29	26	57	25	16,210
St. Landry	87,700	39,087	1,614	306	57	46	158	145	41,413
St. Martin	48,583	21,297	794	239	30	26	51	68	22,505
St. Mary	53,500	22,289	1,237	348	63	31	155	55	24,178
St. Tammany	191,268	77,238	4,327	1,290	119	119	340	268	83,701
Tangipahoa	100,588	40,914	1,897	442	58	63	263	143	43,780
Tensas	6,618	4,039	96	14	13	7	23	23	4,215
Terrebonne	104,503	39,273	2,200	669	60	66	188	104	42,560
Union	22,803	11,998	409	115	22	11	77	55	12,687
Vermilion	53,807	24,831	1,065	249	29	32	79	119	26,404
Vernon	52,531	19,658	675	157	49	27	118	45	20,729
Washington	43,926	21,090	781	157	32	33	155	80	22,328
Webster	41,831	19,953	799	246	37	27	126	39	21,227
West Baton Rouge	21,601	8,922	466	143	20	14	58	30	9,653
West Carroll	12,314	5,317	220	51	19	8	55	95	5,765
West Feliciana	15,111	4,483	143	29	8	5	24	14	4,706
Winn	16,894	7,997	287	85	18	9	70	19	8,485
TOTAL	4,468,976	1,731,633	86,401	21,090	3,472	2,728	9,767	5,401	1,860,492

Source: HAZUS-MH (2004).

Table E-2 provides the total estimated building and content valuation (replacement cost) by key occupancies by parish.

Table E-2: Building and Content Valuation by Key Occupancy

Parish	Building and Content Values - Replacement Cost ($1,000)							
	Residential	Commercial	Industrial	Government	Educational	Religious	Agricultural	Total
Acadia	1,594,186	277,104	65,850	26,360	21,394	85,914	7,916	2,078,724
Allen	5,895,301	1,199,200	573,932	41,168	54,772	177,572	20,182	7,962,127
Ascension	1,589,904	228,697	82,462	13,613	31,026	44,972	11,548	2,002,222
Assumption	2,616,673	479,642	142,222	49,722	30,854	86,900	25,450	3,431,463
Avoyelles	2,317,204	354,844	119,044	40,420	30,392	106,784	19,186	2,987,874
Beauregard	1,054,956	163,271	70,347	11,187	9,542	68,196	11,118	1,388,617
Bienville	7,806,945	1,728,211	409,167	135,864	54,632	242,130	32,418	10,409,367
Bossier	19,124,852	5,805,328	1,497,920	200,182	209,623	946,102	70,094	27,854,101
Caddo	14,074,828	3,591,841	888,398	132,007	206,004	516,332	47,304	19,456,714
Calcasieu	678,862	145,079	32,682	15,579	11,542	34,326	5,952	924,022
Caldwell	906,392	158,337	102,554	11,557	4,248	27,996	3,612	1,214,696
Cameron	653,730	129,828	17,448	16,915	14,034	40,492	12,346	884,793
Catahoula	1,063,383	165,443	93,260	22,899	27,588	70,352	10,546	1,453,471
Claiborne	1,233,612	370,963	35,976	19,818	28,167	73,538	16,880	1,778,954
Concordia	1,588,255	251,554	114,082	26,580	29,918	108,148	12,358	2,130,895
DeSoto	37,474,781	10,766,443	1,865,771	837,254	660,138	1,252,008	100,190	52,956,585
East Baton Rouge	458,877	100,592	7,845	16,199	11,816	44,514	13,314	653,157
East Carroll	1,336,226	183,715	41,492	54,712	16,834	72,350	7,814	1,713,143
East Feliciana	2,168,393	416,887	63,608	46,478	33,996	73,242	19,158	2,821,762
Evangeline	1,259,136	288,373	43,307	21,672	23,476	93,014	38,484	1,767,462
Franklin	1,235,342	96,778	55,567	22,492	13,032	60,752	6,370	1,490,333
Grant	4,873,818	1,403,834	812,353	58,241	93,144	112,552	32,568	7,386,510
Iberia	2,049,011	444,294	292,256	50,797	31,865	106,094	11,104	2,985,421
Iberville	1,212,333	178,544	25,001	17,862	13,571	79,802	4,004	1,531,117
Jackson	42,416,520	11,286,329	2,254,175	380,824	512,804	928,550	91,728	57,870,930
Jefferson	2,240,484	423,689	73,965	26,864	61,548	102,906	32,130	2,961,586
Jefferson Davis	959,139	174,900	59,346	13,706	9,044	33,342	2,330	1,251,807
La Salle	15,591,851	5,771,194	1,571,346	180,286	223,289	355,224	64,264	23,757,454
Lafayette	6,918,213	1,526,000	535,021	60,770	115,404	143,058	33,014	9,331,480
Lafourche	2,930,682	746,036	230,624	26,944	112,050	130,046	14,296	4,190,678
Lincoln	6,477,075	1,245,119	319,781	45,124	72,649	212,566	16,756	8,389,070
Livingston	786,567	208,188	34,324	11,450	15,604	31,512	17,144	1,104,789
Madison	1,939,056	354,656	80,433	32,075	25,410	126,888	29,206	2,587,724
Morehouse	1,594,186	277,104	65,850	26,360	21,394	85,914	7,916	2,078,724

Table E-2 (continued)

Parish	Building and Content Values - Replacement Cost ($1,000)							
	Residential	Commercial	Industrial	Government	Educational	Religious	Agricultural	Total
Natchitoches	2,608,173	2,608,173	2,608,173	2,608,173	2,608,173	2,608,173	25,600	15,674,638
Orleans	40,887,201	10,525,989	1,840,624	792,679	1,801,201	1,695,076	51,824	57,594,594
Ouachita	10,491,582	4,110,718	843,311	157,745	160,547	484,158	39,526	16,287,587
Plaquemines	1,910,834	515,635	255,095	39,410	25,389	81,640	13,082	2,841,085
Pointe Coupee	1,740,871	308,983	83,444	16,746	16,832	51,988	17,048	2,235,912
Rapides	9,217,568	3,363,331	543,825	148,099	147,507	503,520	83,968	14,007,818
Red River	577,832	107,001	14,493	8,836	8,966	20,394	3,014	740,536
Richland	1,206,342	262,820	79,421	25,747	19,624	91,408	30,624	1,715,986
Sabine	1,688,713	365,313	72,109	32,221	23,324	101,138	9,696	2,292,514
St. Bernard	5,734,320	887,132	220,276	21,318	64,442	101,636	11,080	7,040,204
St. Charles	4,262,756	688,648	327,883	65,615	51,302	120,912	9,140	5,526,256
St. Helena	603,534	102,806	35,661	21,817	6,208	32,646	3,896	806,568
St. James	1,485,603	266,086	159,030	29,828	10,040	54,416	11,386	2,016,389
St. John the Baptist	3,469,979	651,986	166,396	40,420	68,325	79,488	7,310	4,483,904
St. Landry	5,499,376	1,263,278	244,716	58,436	82,207	170,276	32,804	7,351,093
St. Martin	3,282,614	540,798	272,665	36,837	45,623	53,552	13,970	4,246,059
St. Mary	3,525,270	1,060,459	594,370	87,666	58,232	202,428	19,292	5,547,717
St. Tammany	16,543,924	3,940,140	732,274	160,300	168,719	380,752	75,176	22,001,285
Tangipahoa	6,308,537	1,439,477	328,872	59,878	140,570	299,968	41,120	8,618,422
Tensas	482,908	81,678	19,064	9,230	8,076	25,750	28,312	655,018
Terrebonne	7,986,152	2,618,802	1,008,785	79,859	136,154	254,216	46,266	12,130,234
Union	1,554,599	245,209	67,219	19,281	16,780	80,900	13,830	1,997,818
Vermilion	3,919,845	767,309	205,440	29,485	64,762	87,692	31,732	5,106,265
Vernon	3,538,011	581,174	70,012	43,294	47,193	116,472	10,468	4,406,624
Washington	2,657,753	458,603	126,216	35,534	42,234	165,486	28,006	3,513,832
Webster	2,821,324	530,289	199,756	28,072	43,097	131,904	7,624	3,762,066
West Baton Rouge	1,613,118	374,189	197,491	24,376	21,852	59,618	15,410	2,306,054
West Carroll	725,364	130,155	68,506	17,709	21,172	57,620	33,344	1,053,870
West Feliciana	885,614	166,667	8,470	2,451	11,604	27,102	3,576	1,105,484
Winn	1,086,209	180,826	68,827	11,253	9,690	68,096	5,362	1,430,263
TOTAL	342,842,513	89,808,587	24,073,983	7,379,936	8,739,255	14,796,599	1,564,270	489,205,143

Source: HAZUS-MH (2002 Valuations).

Table E-3 provides the total estimated residential building and content valuation by specific occupancies.

Table E-3: Residential Building and Content Valuation

Parish	Residential ($1,000)			
	Single Family Dwelling	Multi-Family Dwelling	Other	Total
Acadia	3,353,826	240,957	344,249	3,939,032
Allen	1,299,839	78,511	215,836	1,594,186
Ascension	5,218,160	192,909	484,232	5,895,301
Assumption	1,367,102	26,445	196,357	1,589,904
Avoyelles	2,125,301	162,228	329,144	2,616,673
Beauregard	1,930,181	107,304	279,719	2,317,204
Bienville	833,082	54,402	167,472	1,054,956
Bossier	6,338,393	730,810	737,742	7,806,945
Caddo	15,396,126	2,557,574	1,171,152	19,124,852
Calcasieu	11,552,941	1,206,246	1,315,641	14,074,828
Caldwell	540,822	18,297	119,743	678,862
Cameron	751,422	12,399	142,571	906,392
Catahoula	523,832	17,387	112,511	653,730
Claiborne	865,006	39,473	158,904	1,063,383
Concordia	1,023,400	44,774	165,438	1,233,612
DeSoto	1,279,746	98,898	209,611	1,588,255
East Baton Rouge	29,933,702	5,661,539	1,879,540	37,474,781
East Carroll	354,319	36,374	68,184	458,877
East Feliciana	988,597	33,439	314,190	1,336,226
Evangeline	1,856,110	110,269	202,014	2,168,393
Franklin	1,039,082	46,718	173,336	1,259,136
Grant	1,042,405	24,765	168,172	1,235,342
Iberia	3,999,309	321,941	552,568	4,873,818
Iberville	1,705,675	88,979	254,357	2,049,011
Jackson	1,032,353	57,158	122,822	1,212,333
Jefferson	34,236,660	6,937,994	1,241,866	42,416,520
Jefferson Davis	1,941,988	93,799	204,697	2,240,484
Lafayette	770,705	27,754	160,680	959,139
Lafourche	12,455,361	2,028,070	1,108,420	15,591,851
La Salle	5,936,382	398,007	583,824	6,918,213
Lincoln	1,909,873	417,681	603,128	2,930,682
Livingston	5,595,797	148,176	733,102	6,477,075
Madison	547,601	80,712	158,254	786,567
Morehouse	1,595,026	103,230	240,800	1,939,056
Natchitoches	1,941,689	237,597	428,887	2,608,173
Orleans	26,726,392	11,742,384	2,418,425	40,887,201
Ouachita	8,400,728	1,141,025	949,829	10,491,582
Plaquemines	1,498,030	127,743	285,061	1,910,834
Pointe Coupee	1,520,206	45,602	175,063	1,740,871

Table E-3 (continued)

Parish	Residential ($1,000) Single Family Dwelling	Multi-Family Dwelling	Other	Total
Rapides	7,273,162	910,344	1,034,062	9,217,568
Red River	462,006	27,066	88,760	577,832
Richland	957,290	63,424	185,628	1,206,342
Sabine	1,214,996	81,747	391,970	1,688,713
St. Bernard	4,982,685	524,450	227,185	5,734,320
St. Charles	3,863,804	230,003	168,949	4,262,756
St. Helena	471,979	12,785	118,770	603,534
St. James	1,288,847	72,630	124,126	1,485,603
St. John the Baptist	3,159,262	160,829	149,888	3,469,979
St. Landry	4,551,909	397,758	549,709	5,499,376
St. Martin	2,770,947	131,571	380,096	3,282,614
St. Mary	2,890,454	287,165	347,651	3,525,270
St. Tammany	14,937,578	800,006	806,340	16,543,924
Tangipahoa	4,868,187	550,644	889,706	6,308,537
Tensas	430,443	11,526	40,939	482,908
Terrebonne	6,871,692	536,327	578,133	7,986,152
Union	1,275,753	55,814	223,032	1,554,599
Vermilion	3,380,824	135,005	404,016	3,919,845
Vernon	2,367,505	455,945	714,561	3,538,011
Washington	2,251,058	124,213	282,482	2,657,753
Webster	2,346,152	148,662	326,510	2,821,324
West Baton Rouge	1,374,645	71,250	167,223	1,613,118
West Carroll	599,202	16,970	109,192	725,364
West Feliciana	667,757	40,560	177,297	885,614
Winn	878,044	44,186	163,979	1,086,209
TOTAL ($)	277,563,350	41,390,450	27,827,745	346,781,545

Source: HAZUS-MH (2004).

Table E-4 provides the total estimated commercial building and content valuation by specific occupancies.

Table E-4: Commercial Building and Content Valuation

Parish	Commercial ($1,000)				
	Retail Trade	Wholesale Trade	Banks	Other	Total
Acadia	188,264	122,178	28,042	494,698	833,182
Allen	65,316	15,594	16,054	180,140	277,104
Ascension	260,958	151,140	26,940	760,162	1,199,200
Assumption	46,998	23,344	7,762	150,593	228,697
Avoyelles	102,624	43,386	21,040	312,592	479,642
Beauregard	74,916	35,348	14,260	230,320	354,844
Bienville	36,262	16,576	10,558	99,875	163,271
Bossier	340,868	226,756	42,566	1,118,021	1,728,211
Caddo	776,502	701,076	112,186	4,215,564	5,805,328
Calcasieu	660,212	370,088	118,238	2,443,303	3,591,841
Caldwell	27,682	11,462	7,078	98,857	145,079
Cameron	19,114	28,560	5,014	105,649	158,337
Catahoula	49,210	8,258	8,190	64,170	129,828
Claiborne	26,736	12,430	3,304	122,973	165,443
Concordia	170,166	24,846	10,642	165,309	370,963
DeSoto	73,650	18,846	11,274	147,784	251,554
East Baton Rouge	1,612,344	1,192,392	267,056	7,694,651	10,766,443
East Carroll	24,400	25,970	1,550	48,672	100,592
East Feliciana	58,916	22,044	7,416	95,339	183,715
Evangeline	87,570	48,152	9,650	271,515	416,887
Franklin	98,698	15,654	11,112	162,909	288,373
Grant	20,726	16,008	2,958	57,086	96,778
Iberia	220,364	173,414	27,526	982,530	1,403,834
Iberville	77,568	54,780	22,280	289,666	444,294
Jackson	38,784	14,156	10,404	115,200	178,544
Jefferson	1,697,466	1,473,516	232,536	7,882,811	11,286,329
Jefferson Davis	114,870	37,178	27,872	243,769	423,689
Lafayette	19,142	14,204	8,152	133,402	174,900
Lafourche	874,870	659,224	109,012	4,128,088	5,771,194
La Salle	256,032	130,792	45,384	1,093,792	1,526,000
Lincoln	140,596	80,746	29,392	495,302	746,036
Livingston	183,538	426,692	30,174	604,715	1,245,119
Madison	29,784	15,562	5,860	156,982	208,188
Morehouse	84,634	45,776	13,040	211,206	354,656
Natchitoches	107,050	41,646	30,892	441,817	621,405
Orleans	1,077,386	769,262	360,670	8,318,671	10,525,989
Ouachita	640,424	458,878	83,524	2,927,892	4,110,718
Plaquemines	82,142	120,792	6,492	306,209	515,635
Pointe Coupee	69,668	19,560	12,220	207,535	308,983

Table E-4 (continued)

Parish	Commercial ($1,000)				
	Retail Trade	Wholesale Trade	Banks	Other	Total
Rapides	522,428	372,138	62,974	2,405,791	3,363,331
Red River	20,114	17,918	4,936	64,033	107,001
Richland	57,316	25,726	8,708	171,070	262,820
Sabine	74,544	29,918	14,006	246,845	365,313
St. Bernard	140,962	147,086	18,698	580,386	887,132
St. Charles	88,896	118,106	20,162	461,484	688,648
St. Helena	10,698	8,382	3,280	80,446	102,806
St. James	46,912	57,122	8,314	153,738	266,086
St. John the Baptist	89,056	66,880	14,844	481,206	651,986
St. Landry	264,958	115,388	38,422	844,510	1,263,278
St. Martin	118,114	72,412	13,800	336,472	540,798
St. Mary	204,122	135,550	21,536	699,251	1,060,459
St. Tammany	617,378	324,150	76,510	2,922,102	3,940,140
Tangipahoa	277,048	159,962	51,300	951,167	1,439,477
Tensas	12,028	29,130	4,550	35,970	81,678
Terrebonne	412,292	289,916	46,746	1,869,848	2,618,802
Union	43,222	18,280	10,382	173,325	245,209
Vermilion	140,118	90,732	32,578	503,881	767,309
Vernon	134,010	66,332	19,192	361,640	581,174
Washington	119,290	41,314	16,658	281,341	458,603
Webster	120,920	63,934	15,036	330,399	530,289
West Baton Rouge	66,390	63,738	13,832	230,229	374,189
West Carroll	30,856	13,034	11,450	74,815	130,155
West Feliciana	20,258	6,768	6,414	133,227	166,667
Winn	44,036	16,046	5,588	115,156	180,826
TOTAL ($)	14,212,416	10,016,248	2,338,236	62,088,101	88,655,001

Source: HAZUS-MH (2004).

Table E-5 provides the total estimated industrial building and content valuation by specific occupancies.

Table E-5: Industrial Building and Content Valuation

Parish	Industrial ($1,000)						
	Heavy	Light	Food/Drugs/ Chemicals	High Tech	Construction	Other	Total
Acadia	103,542	81,123	147,552	0	52,742	33,761	418,720
Allen	26,257	2,581	12,086	0	23,770	1,156	65,850
Ascension	121,518	38,269	303,263	0	97,594	13,288	573,932
Assumption	11,177	5,207	39,449	0	19,748	6,881	82,462
Avoyelles	63,914	8,033	36,300	0	32,100	1,875	142,222
Beauregard	38,347	9,628	39,915	0	29,792	1,362	119,044
Bienville	38,407	726	3,863	0	7,130	20,221	70,347
Bossier	136,888	56,220	29,141	2,611	115,976	68,331	409,167
Caddo	592,645	226,266	201,636	0	256,060	221,313	1,497,920
Calcasieu	169,788	101,351	319,269	0	203,578	94,412	888,398
Caldwell	21,300	954	0	0	3,874	6,554	32,682
Cameron	5,821	1,910	46,817	0	8,884	39,122	102,554
Catahoula	3,121	2,001	1,418	0	4,604	6,304	17,448
Claiborne	36,925	9,169	16,013	0	9,522	21,631	93,260
Concordia	15,721	3,896	1,370	0	8,926	6,063	35,976
DeSoto	61,181	4,488	3,109	0	20,994	24,310	114,082
East Baton Rouge	407,522	253,531	580,199	8,082	480,528	135,909	1,865,771
East Carroll	2,698	1,050	2,543	0	1,554	0	7,845
East Feliciana	9,665	12,295	4,643	0	13,994	895	41,492
Evangeline	21,629	7,568	11,460	0	14,784	8,167	63,608
Franklin	10,188	5,891	13,914	0	10,308	3,006	43,307
Grant	30,290	9,892	1,075	0	13,292	1,018	55,567
Iberia	236,035	21,814	292,204	0	100,724	161,576	812,353
Iberville	42,460	17,442	191,667	360	26,228	14,099	292,256
Jackson	8,499	1,188	1,381	0	9,716	4,217	25,001
Jefferson	602,260	388,593	374,990	29,161	693,352	165,819	2,254,175
Jefferson Davis	28,649	7,108	4,971	0	20,032	13,205	73,965
Lafayette	14,260	2,251	0	553	4,440	37,842	59,346
Lafourche	330,361	237,154	143,831	980	246,408	612,612	1,571,346
La Salle	248,963	50,488	101,055	0	71,330	63,185	535,021
Lincoln	149,279	18,354	15,942	0	37,644	9,405	230,624
Livingston	146,918	29,040	18,479	0	113,980	11,364	319,781
Madison	10,569	2,787	15,490	0	4,510	968	34,324
Morehouse	47,494	9,240	6,603	0	16,578	518	80,433
Natchitoches	37,549	11,818	12,258	0	26,754	430	88,809
Orleans	437,453	226,438	485,452	868	330,102	360,311	1,840,624
Ouachita	309,545	232,296	95,833	2,305	181,636	21,696	843,311
Plaquemines	51,002	19,052	59,911	0	41,148	83,982	255,095
Pointe Coupee	18,826	6,307	38,662	0	16,998	2,651	83,444

Table E-5 (continued)

Parish	Industrial ($1,000)						
	Heavy	Light	Food/Drugs/ Chemicals	High Tech	Construction	Other	Total
Rapides	171,057	103,936	119,222	0	135,030	14,580	543,825
Red River	2,546	2,891	3,483	0	3,688	1,885	14,493
Richland	11,670	10,382	15,021	0	16,482	25,866	79,421
Sabine	41,171	1,955	6,615	0	18,522	3,846	72,109
St. Bernard	46,509	25,055	69,514	0	53,630	25,568	220,276
St. Charles	36,490	23,413	205,970	0	54,716	7,294	327,883
St. Helena	2,066	521	15,956	0	12,072	5,046	35,661
St. James	12,441	3,597	49,655	0	12,920	80,417	159,030
St. John the Baptist	52,637	6,401	62,048	0	37,488	7,822	166,396
St. Landry	67,960	27,097	60,972	0	59,004	29,683	244,716
St. Martin	52,398	16,035	110,206	0	51,152	42,874	272,665
St. Mary	322,727	30,973	114,455	0	56,276	69,939	594,370
St. Tammany	217,685	85,561	68,158	1,106	303,418	56,346	732,274
Tangipahoa	114,586	50,741	55,080	450	84,634	23,381	328,872
Tensas	15,013	413	1,690	0	960	988	19,064
Terrebonne	193,856	40,209	66,299	0	208,382	500,039	1,008,785
Union	39,023	2,879	4,746	0	16,850	3,721	67,219
Vermilion	25,476	16,868	64,770	1,488	39,180	57,658	205,440
Vernon	20,111	17,128	1,421	0	28,358	2,994	70,012
Washington	52,398	23,110	14,027	0	26,778	9,903	126,216
Webster	68,809	38,266	16,195	0	49,368	27,118	199,756
West Baton Rouge	91,740	11,972	58,336	0	31,024	4,419	197,491
West Carroll	52,234	2,793	4,643	0	7,978	858	68,506
West Feliciana	2,098	666	0	0	5,706	0	8,470
Winn	51,815	3,357	0	0	8,156	5,499	68,827
TOTAL ($)	6,413,182	2,669,638	4,862,246	47,964	4,693,106	3,287,203	21,973,339

Source: HAZUS-MH (2004).

Table E-6 provides the building valuation by building type.

Table E-6: Valuation of Building Types in Louisiana Parishes

Parish	Building Type Valuation ($1,000)					
	Wood	Masonry	Concrete	Steel	Manufactured Housing	Total
Acadia	2,289,133	540,300	165,509	225,867	138,965	3,359,774
Allen	888,488	213,300	67,461	65,009	61,332	1,295,590
Ascension	3,418,440	730,830	189,026	289,319	271,094	4,898,709
Assumption	873,612	174,841	41,331	53,232	110,597	1,253,613
Avoyelles	1,479,256	352,473	99,675	117,408	82,622	2,131,434
Beauregard	1,286,336	280,270	61,360	91,984	144,136	1,864,086
Bienville	565,802	129,909	36,334	50,880	78,385	861,310
Bossier	4,491,679	1,052,467	266,522	382,429	261,514	6,454,611
Caddo	11,432,131	2,924,951	931,915	1,214,201	329,953	16,833,151
Calcasieu	8,155,758	1,969,627	562,841	726,803	511,997	11,927,026
Caldwell	364,409	86,306	28,246	34,171	53,229	566,361
Cameron	495,002	114,438	31,116	45,805	59,810	746,171
Catahoula	350,012	84,930	21,427	31,609	60,195	548,173
Claiborne	579,997	139,577	48,216	54,157	67,768	889,715
Concordia	701,947	178,873	49,788	73,263	81,697	1,085,568
DeSoto	874,098	200,880	47,854	80,043	113,351	1,316,226
East Baton Rouge	22,662,316	5,829,049	1,520,536	2,158,095	212,042	32,382,038
East Carroll	258,569	74,589	25,610	24,685	17,455	400,908
East Feliciana	675,082	183,328	77,421	50,906	86,805	1,073,542
Evangeline	1,247,719	279,056	77,044	88,154	63,167	1,755,140
Franklin	718,800	184,416	53,748	67,364	61,748	1,086,076
Grant	661,460	127,524	25,003	35,829	94,555	944,371
Iberia	2,801,463	722,256	273,766	385,714	221,869	4,405,068
Iberville	1,168,178	302,102	101,865	129,338	98,832	1,800,315
Jackson	691,606	148,058	28,763	41,814	53,153	963,394
Jefferson	25,810,795	6,227,619	1,318,298	2,203,604	123,820	35,684,136
Jefferson Davis	1,308,993	295,986	61,734	99,565	76,361	1,842,639
Lafayette	506,839	113,586	50,252	41,133	61,075	772,885
Lafourche	9,375,272	2,485,378	785,061	1,232,134	349,856	14,227,701
La Salle	4,000,372	879,576	265,149	351,676	233,888	5,730,661
Lincoln	1,532,703	491,519	229,482	178,381	107,526	2,539,611
Livingston	3,607,014	743,983	172,822	282,623	438,783	5,245,225
Madison	421,972	129,342	62,734	41,125	19,858	675,031
Morehouse	1,105,097	270,542	64,716	91,244	74,855	1,606,454
Natchitoches	1,422,108	399,200	141,218	127,932	134,227	2,224,685
Orleans	24,081,448	7,111,477	1,694,038	2,207,058	23,427	35,117,448
Ouachita	6,240,022	1,745,981	669,873	768,578	292,797	9,717,251
Plaquemines	1,063,998	286,783	93,279	146,759	123,884	1,714,703
Pointe Coupee	985,813	202,312	57,025	63,770	83,637	1,392,557

Table E-6 (continued)

Parish	Building Type Valuation ($1,000)					
	Wood	Masonry	Concrete	Steel	Manufactured Housing	Total
Rapides	5,371,362	1,512,886	641,188	593,756	261,549	8,380,741
Red River	307,135	70,187	25,857	19,729	39,074	461,982
Richland	673,919	178,482	61,468	68,734	63,093	1,045,696
Sabine	838,998	210,724	65,162	78,971	218,002	1,411,857
St. Bernard	3,385,335	675,344	124,851	185,226	78,501	4,449,257
St. Charles	2,547,948	528,592	115,869	170,630	71,421	3,434,460
St. Helena	311,364	71,000	19,076	25,407	69,980	496,827
St. James	851,937	184,075	58,216	81,760	59,656	1,235,644
St. John the Baptist	2,072,276	421,771	86,172	139,637	73,834	2,793,690
St. Landry	3,139,145	722,174	195,573	251,382	232,481	4,540,755
St. Martin	1,820,993	381,172	90,992	143,729	205,003	2,641,889
St. Mary	2,062,700	547,325	182,593	319,073	175,850	3,287,541
St. Tammany	9,938,483	2,086,726	528,620	739,445	318,434	13,611,708
Tangipahoa	3,488,045	887,955	248,185	319,806	367,702	5,311,693
Tensas	278,672	63,903	20,448	25,155	17,056	405,234
Terrebonne	4,822,377	1,195,295	326,394	668,583	262,925	7,275,574
Union	840,322	179,593	48,970	59,435	116,757	1,245,077
Vermilion	2,242,211	470,092	127,272	164,676	169,294	3,173,545
Vernon	1,794,876	491,247	201,049	110,698	176,548	2,774,418
Washington	1,510,755	342,805	80,283	118,134	130,407	2,182,384
Webster	1,590,039	359,815	96,091	133,475	146,323	2,325,743
West Baton Rouge	931,524	223,051	60,763	107,514	78,732	1,401,584
West Carroll	401,554	104,436	36,870	48,884	47,291	639,035
West Feliciana	453,142	114,807	59,574	22,612	42,117	692,252
Winn	592,595	136,208	42,183	51,086	64,016	886,088
TOTAL ($)	202,861,446	50,567,299	14,041,777	19,001,198	8,966,311	295,438,031

Source: HAZUS-MH (2004).

Appendix E.2:

Critical Facilities and Infrastructure

Table E-7 lists the critical facilities, infrastructure and hazardous material facilities by parish per the HAZUS-MH default inventory. This inventory was used as data for calculating the risk assessment presented in this report.

Table E-7: Critical Facilities and Infrastructure Inventory

Parish	Critical Facilities	Infrastructure			Hazardous Materials Facilities	
	Number	Highway (Mi)	Railway (Mi)	Oil Pipe (km)	Number of Facilities	Number of Chemicals
Acadia	64	426	60.6	*	3	16
Allen	28	198.6	73.9	*	2	5
Ascension	45	271.6	73.5	*	19	266
Assumption	24	180.2	10.9	*	3	18
Avoyelles	42	347.3	50.1	*	2	9
Beauregard	31	280.3	96.8	*	3	37
Bienville	19	337	59.6	*	3	10
Bossier	54	296.5	108.5	*	6	25
Caddo	139	424.8	176.7	*	23	80
Calcasieu	134	366.3	137.2	*	31	337
Caldwell	18	203.5	32.6	*	-	-
Cameron	26	178.6	-	*	3	3
Catahoula	22	186.7	-	*	-	-
Claiborne	23	288.5	34.6	*	-	-
Concordia	30	220.8	-	*	1	2
DeSoto	28	379.3	79.7	*	7	43
East Baton Rouge	206	309	76.8	*	21	314
East Carroll	11	140.5	35.6	*	1	1
East Feliciana	25	211.8	30.7	*	-	-
Evangeline	42	317.4	35.1	*	2	10
Franklin	21	267.4	-	*	1	3
Grant	24	243.6	99.2	*	1	1
Iberia	62	214.7	48	*	8	20
Iberville	29	238.9	61.2	*	18	299
Jackson	21	217.1	14.1	*	1	10
Jefferson	196	174.2	107.8	*	23	134
Jefferson Davis	32	269.4	55.2	*	-	-
La Salle	21	219.1	19.7	*	2	12
Lafayette	96	237.6	29.8	*	12	62
Lafourche	55	319.2	46.8	*	6	18
Lincoln	33	296	31.5	*	8	18
Livingston	53	362.9	25.5	*	6	22
Madison	16	172.1	50.5	*	2	11
Morehouse	39	237.9	78.3	*	1	24

Table E-7 (continued)

Parish	Critical Facilities	Infrastructure			Hazardous Materials Facilities	
	Number	Highway (Mi)	Railway (Mi)	Oil Pipe (km)	Number of Facilities	Number of Chemicals
Natchitoches	39	522.8	71.6	*	6	36
Orleans	255	149.9	126.9	*	7	19
Ouachita	88	294.5	110.2	*	12	55
Plaquemines	26	121.7	37.7	*	10	69
Pointe Coupee	28	286.9	97.4	*	3	28
Rapides	125	595.9	164.7	*	12	55
Red River	16	178	63.2	*	1	2
Richland	28	264.9	27.9	*	1	7
Sabine	30	277.4	51	*	5	17
St. Bernard	28	64.7	20.4	*	2	59
St. Charles	39	143.7	90	*	21	278
St. Helena	8	196	-	*	1	1
St. James	29	133.4	60	*	8	81
St. John the Baptist	33	107.6	74.7	*	11	98
St. Landry	79	494.7	90.8	*	4	29
St. Martin	39	260.2	10.5	*	3	12
St. Mary	63	225	69.6	*	6	37
St. Tammany	126	429.3	36.3	*	5	12
Tangipahoa	88	459.3	68.8	*	5	16
Tensas	16	273	-	*	-	-
Terrebonne	76	250.9	17.1	*	3	9
Union	25	252.8	7.4	*	2	4
Vermilion	59	328.8	21.5	*	3	13
Vernon	53	385.2	50.5	*	2	16
Washington	46	348	26.4	*	2	23
Webster	46	251.7	116.9	*	3	15
West Baton Rouge	25	159	69.6	*	14	43
West Carroll	22	181.4	-	*	-	-
West Feliciana	16	104.8	5	*	1	15
Winn	26	338.5	51	*	2	5
TOTAL	3,286	17,114.70	3,478.00	*	374	2864

*Oil pipeline data is not available in the HAZUS inventory. Local data is needed.

Source: HAZUS-MH (2004).

Appendix E.3:

Demographics

As of the 2000 Census, 4.7 million people live within the 51,838.7 square miles of the State of Louisiana. Louisiana is bordered by Arkansas to the north, the Gulf of Mexico to the south, Mississippi to the east, and Texas to the west. Table E-8 provides the population and residential units, land area, and population and residential density for each parish and the State of Louisiana per the HAZUS-MH default inventory. This inventory was used as data for calculating the risk assessment presented in this report.

The Plan Update also references the 2000 data from the US Census Bureau which estimates a total of 4.3 million residents in the State of Louisiana. Parish level population estimates after 2005 could only be utilized for some hazards. This inventory is found in Table E-9.

Table E-8: Population, Land Area and Population/Housing Density

Parish	Population	Housing	Area in Square Miles (sq mi)			Density per sqmi of Land Area	
			Total area	Water area	Land area	Population	Housing
Acadia	58,861	23,209	657.62	2.33	655.28	89.8	35.4
Allen	25,440	9,157	765.67	1.17	764.50	33.3	12.0
Ascension	76,627	29,172	302.88	11.35	291.53	262.8	100.1
Assumption	23,388	9,635	364.55	25.87	338.68	69.1	28.4
Avoyelles	41,481	16,576	865.67	33.24	832.44	49.8	19.9
Beauregard	32,986	14,501	1,165.99	5.90	1,160.09	28.4	12.5
Bienville	15,752	7,830	821.77	11.13	810.64	19.4	9.7
Bossier	98,310	40,286	866.93	27.68	839.25	117.1	48.0
Caddo	252,161	108,296	936.90	54.91	881.99	285.9	122.8
Calcasieu	183,577	75,995	1,094.34	23.22	1,071.12	171.4	70.9
Caldwell	10,560	5,035	540.72	11.30	529.42	19.9	9.5
Cameron	9,991	5,336	1,931.60	618.63	1,312.96	7.6	4.1
Catahoula	10,920	5,351	739.43	35.78	703.65	15.5	7.6
Claiborne	16,851	7,815	767.55	12.90	754.65	22.3	10.4
Concordia	20,247	9,148	748.68	52.77	695.91	29.1	13.1
DeSoto	25,494	11,204	894.49	17.29	877.20	29.1	12.8
East Baton Rouge	412,852	169,073	470.54	15.11	455.43	906.5	371.2
East Carroll	9,421	3,303	442.45	21.01	421.44	22.4	7.8
East Feliciana	21,360	7,915	455.69	2.29	453.40	47.1	17.5
Evangeline	35,434	14,258	679.61	15.34	664.27	53.3	21.5
Franklin	21,263	8,623	635.43	11.82	623.61	34.1	13.8
Grant	18,698	8,531	664.56	19.45	645.11	29.0	13.2
Iberia	73,266	27,844	1,030.86	455.73	575.13	127.4	48.4
Iberville	33,320	11,953	652.84	34.20	618.64	53.9	19.3
Jackson	15,397	7,338	580.34	10.59	569.75	27.0	12.9
Jefferson	455,466	187,907	642.41	335.89	306.52	1,485.9	613.0
Jefferson Davis	31,435	12,824	658.58	6.26	652.31	48.2	19.7
Lafayette	190503	78122	269.83	.46	269.37	707.2	290.0

Table E-8 (continued)

Parish	Population	Housing	Area in Square Miles (sqmi)			Density per sqmi of Land Area	
			Total area	Water area	Land area	Population	Housing
Lafourche	89974	35045	1084.68	387.51	697.17	129.1	50.3
Lincoln	42,509	17,000	472.27	0.89	471.38	90.2	36.1
La Salle	14282	6273	648.02	38.54	609.48	23.4	10.3
Livingston	91,814	36,212	702.84	54.82	648.02	141.7	55.9
Madison	13,728	4,979	650.53	26.45	624.09	22.0	8.0
Morehouse	31,021	12,711	805.20	10.95	794.25	39.1	16.0
Natchitoches	39,080	16,890	1,299.30	43.85	1,255.45	31.1	13.5
Orleans	484,674	215,091	350.21	169.66	180.56	2,684.3	1,191.3
Ouachita	147,250	60,154	632.70	22.17	610.53	241.2	98.5
Plaquemines	26,757	10,481	2,428.54	1,583.98	844.56	31.7	12.4
Pointe Coupee	22,763	10,297	590.68	33.34	557.34	40.8	18.5
Rapides	126,337	52,038	1,361.96	39.42	1,322.54	95.5	39.3
Red River	9,622	3,988	402.08	12.79	389.29	24.7	10.2
Richland	20,981	8,335	564.51	6.05	558.45	37.6	14.9
Sabine	23,459	13,671	1,011.51	146.25	865.27	27.1	15.8
St. Bernard	67,229	26,790	1,793.75	1,328.71	465.04	144.6	57.6
St. Charles	48,072	17,430	410.16	126.52	283.64	169.5	61.5
St. Helena	10,525	5,034	409.46	1.09	408.36	25.8	12.3
St. James	21,216	7,605	257.79	11.66	246.13	86.2	30.9
St. John the Baptist	43,044	15,532	347.84	128.94	218.90	196.6	71.0
St. Landry	87,700	36,216	938.83	10.18	928.65	94.4	39.0
St. Martin	48,583	20,245	816.46	76.60	739.85	65.7	27.4
St. Mary	53,500	21,650	1,118.83	506.04	612.79	87.3	35.3
St. Tammany	191,268	75,398	1,124.08	269.93	854.15	223.9	88.3
Tangipahoa	100,588	40,794	823.12	32.88	790.24	127.3	51.6
Tensas	6,618	3,359	641.20	38.72	602.48	11.0	5.6
Terrebonne	104,503	39,928	2,079.90	824.97	1,254.93	83.3	31.8
Union	22,803	10,873	905.28	27.68	877.60	26.0	12.4
Vermilion	53,807	22,461	1,538.31	364.53	1,173.78	45.8	19.1
Vernon	52,531	21,030	1,341.51	13.10	1,328.41	39.5	15.8
Washington	43,926	19,106	675.97	6.40	669.57	65.6	28.5
Webster	41,831	18,991	615.07	19.85	595.22	70.3	31.9
West Baton Rouge	21,601	8,370	203.62	12.42	191.20	113.0	43.8
West Carroll	12,314	4,980	360.32	0.92	359.40	34.3	13.9
West Feliciana	15,111	4,485	426.01	20.01	406.00	37.2	11.0
Winn	16,894	7,502	956.91	6.43	950.49	17.8	7.9
State of Louisiana	4,468,976	1,847,181	51,839.70	8,277.85	43,561.85	102.6	42.4

Source: US Census Bureau (2000).

Table E-9: Annual Population Estimate by Parish: July 1, 2000 to July 1, 2006

Parish	Change 2005-2006	July 1, 2006	July 1, 2005	July 1, 2004	July 1, 2003	July 1, 2002	July 1, 2001	July 1, 2000
Acadia	1,210	60,457	59,247	59,047	59,103	59,078	58,831	58,840
Allen	206	25,447	25,241	25,273	25,251	25,137	25,328	25,425
Ascension	6,888	97,335	90,447	86,926	84,296	81,693	79,521	77,370
Assumption	364	23,472	23,108	23,141	23,190	23,192	23,228	23,390
Avoyelles	874	42,663	41,789	41,830	41,803	41,482	41,466	41,491
Beauregard	588	35,130	34,542	33,988	33,507	33,185	33,116	33,067
Bienville	-15	15,168	15,183	15,294	15,288	15,392	15,487	15,723
Bossier	1,961	107,270	105,309	103,677	102,019	100,615	99,538	98,614
Caddo	2,680	253,118	250,438	250,158	249,506	250,079	251,102	251,992
Calcasieu	-184	184,524	184,708	184,187	183,733	183,009	182,993	183,541
Caldwell	-3	10,615	10,618	10,714	10,611	10,607	10,548	10,571
Cameron	-1,819	7,792	9,611	9,645	9,685	9,760	9,857	9,951
Catahoula	95	10,567	10,472	10,587	10,637	10,742	10,859	10,910
Claiborne	26	16,210	16,184	16,290	16,557	16,596	16,640	16,777
Concordia	162	19,460	19,298	19,488	19,667	19,913	20,063	20,224
De Soto	89	26,390	26,301	26,115	25,853	25,738	25,525	25,520
East Baton Rouge	19,264	429,073	409,809	410,410	409,995	409,704	410,537	412,756
East Carroll	-87	8,699	8,786	8,839	8,973	9,075	9,213	9,397
East Feliciana	219	20,922	20,703	20,834	20,978	21,083	21,235	21,381
Evangeline	449	35,911	35,462	35,189	35,079	35,321	35,337	35,404
Franklin	65	20,455	20,390	20,643	20,822	20,870	21,038	21,269
Grant	441	19,879	19,438	19,110	18,840	18,727	18,722	18,711
Iberia	1,297	75,509	74,212	73,967	73,849	73,614	73,433	73,271
Iberville	814	32,974	32,160	32,317	32,703	33,007	33,255	33,309
Jackson	118	15,202	15,084	15,211	15,258	15,247	15,375	15,388
Jefferson Davis	224	31,418	31,194	31,117	31,047	31,100	31,192	31,409
Jefferson	-19,688	431,361	451,049	452,083	451,255	451,431	452,099	454,781
La Salle	83	14,093	14,010	14,072	14,105	14,234	14,158	14,287
Lafayette	6,464	203,091	196,627	194,943	193,437	192,464	190,790	190,413
Lafourche	1,644	93,554	91,910	91,801	91,319	90,736	90,118	89,982
Lincoln	-50	41,857	41,907	42,114	42,006	41,806	42,007	42,480
Livingston	5,847	114,805	108,958	105,707	102,027	98,928	95,546	92,588
Madison	-143	12,328	12,471	12,627	12,860	13,165	13,425	13,718
Morehouse	-158	29,761	29,919	30,297	30,505	30,464	30,660	30,981
Natchitoches	399	38,719	38,320	38,287	38,541	38,876	38,739	39,086
Orleans	-228,782	223,388	452,170	459,048	465,884	471,440	477,142	483,502
Ouachita	1,538	149,259	147,721	147,879	147,323	146,890	146,314	147,225
Plaquemines	-6,391	22,512	28,903	28,933	27,906	27,320	26,998	26,749

Table E-9 (continued)

Parish	Change 2005-2006	July 1, 2006	July 1, 2005	July 1, 2004	July 1, 2003	July 1, 2002	July 1, 2001	July 1, 2000
Pointe Coupee	360	22,648	22,288	22,378	22,442	22,527	22,605	22,766
Rapides	2,314	130,201	127,887	127,494	127,012	126,565	126,311	126,437
Red River	-7	9,438	9,445	9,553	9,577	9,559	9,549	9,604
Richland	163	20,554	20,391	20,451	20,513	20,686	20,884	20,950
Sabine	219	23,934	23,715	23,533	23,472	23,383	23,411	23,500
St. Bernard	-49,633	15,514	65,147	65,536	65,774	66,326	66,544	67,029
St. Charles	2,207	52,761	50,554	49,886	49,246	49,060	48,509	48,200
St. Helena	621	10,759	10,138	10,256	10,294	10,408	10,425	10,512
St. James	690	21,721	21,031	20,988	21,073	21,223	21,239	21,193
St. John the Baptist	2,387	48,537	46,150	45,394	44,752	44,127	43,690	43,144
St. Landry	1,888	91,528	89,640	89,106	88,718	88,225	87,989	87,763
St. Martin	1,113	51,341	50,228	50,200	49,787	49,450	49,055	48,664
St. Mary	654	51,867	51,213	51,883	52,215	52,462	52,749	53,304
St. Tammany	10,791	230,605	219,814	213,349	207,252	201,740	196,080	192,282
Tangipahoa	6,985	113,137	106,152	104,779	103,269	102,257	101,541	100,826
Tensas	21	6,138	6,117	6,147	6,252	6,407	6,486	6,583
Terrebonne	2,254	109,348	107,094	106,282	105,925	105,404	104,981	104,539
Union	98	22,964	22,866	22,813	22,856	22,786	22,881	22,779
Vermilion	754	56,021	55,267	54,608	54,337	54,248	54,038	53,988
Vernon Parish	-1,763	46,748	48,511	49,320	50,450	51,178	52,258	52,495
Washington	473	44,750	44,277	43,939	43,841	43,823	43,826	43,904
Webster	157	41,301	41,144	41,161	41,199	41,457	41,478	41,733
West Baton Rouge	829	22,463	21,634	21,826	21,639	21,672	21,633	21,565
West Carroll	-83	11,732	11,815	11,903	12,139	12,156	12,113	12,293
West Feliciana	350	15,535	15,185	15,071	15,201	15,150	15,140	15,135
Winn	-94	15,835	15,929	16,062	16,272	16,544	16,571	16,848

Source: U.S. Census Bureau, March 20, 2007

Table E-10 provides data on the population in Louisiana parishes.

Table E-10: Sensitive Populations in Louisiana Parishes

Parish	Total Population	Population Density	Population 65 Years and Over (Percent)	Population Below Poverty Level (Percent)
Acadia	58,861	89.8	12.3	24.5
Allen	25,440	33.3	11.8	19.9
Ascension	76,627	262.8	7.7	12.9
Assumption	23,388	69.1	10.9	21.8
Avoyelles	41,481	49.8	13.7	25.9
Beauregard	32,986	28.4	11.9	15.6
Bienville	15,752	19.4	17.6	26.1
Bossier	98,310	117.1	10.4	13.7
Caddo	252,161	285.9	13.7	21.1
Calcasieu	183,577	171.4	11.9	15.4
Caldwell	10,560	19.9	13.9	21.2
Cameron	9,991	7.6	10.6	12.3
Catahoula	10,920	15.5	14.4	28.1
Claiborne	16,851	22.3	17.3	26.5
Concordia	20,247	29.1	14.7	29.1
DeSoto	25,494	29.1	14.1	25.1
East Baton Rouge	412,852	906.5	9.9	17.9
East Carroll	9,421	22.4	12.5	40.5
East Feliciana	21,360	47.1	10.6	23
Evangeline	35,434	53.3	12.8	32.2
Franklin	21,263	34.1	15.3	28.4
Grant	18,698	29.0	12.7	21.5
Iberia	73,266	127.4	11.4	23.6
Iberville	33,320	53.9	10.7	23.1
Jackson	15,397	27.0	16.2	19.8
Jefferson	455,466	1,485.9	11.9	13.7
Jefferson Davis	31,435	48.2	13.3	20.9
Lafayette	190,503	706.0	9.5	15.7
Lafourche	89,974	82.9	11.3	16.5
La Salle	14,282	129.1	14.8	18.7
Lincoln	42,509	90.2	11.3	26.5
Livingston	91,814	141.7	8.5	11.4
Madison	13,728	22.0	11.6	36.7
Morehouse	31,021	39.1	15.1	26.8
Natchitoches	39,080	31.1	12.1	26.5
Orleans	484,674	2,684.3	11.7	27.9
Ouachita	147,250	31.7	11.8	20.7
Plaquemines	26,757	40.8	9.8	18
Pointe Coupee	22,763	241.2	13.9	23.1
Rapides	126,337	95.5	13.1	20.5

Table E-10 (continued)

Parish	Total Population	Population Density	Population 65 Years and Over (Percent)	Population Below Poverty Level (Percent)
Red River	9,622	24.7	14.4	29.9
Richland	20,981	37.6	15	27.9
Sabine	23,459	27.1	16.5	21.5
St. Bernard	67,229	144.6	13.8	13.1
St. Charles	48,072	169.5	9	11.4
St. Helena	10,525	25.8	12.5	26.8
St. James	21,216	86.2	11.1	20.7
St. John the Baptist	43,044	196.6	7.8	16.7
St. Landry	87,700	94.4	13.4	29.3
St. Martin	48,583	65.7	10.1	21.5
St. Mary	53,500	87.3	11	23.6
St. Tammany	191,268	223.9	10	9.7
Tangipahoa	100,588	102.6	10.6	22.7
Tensas	6,618	127.3	15.5	36.3
Terrebonne	104,503	11.0	9.7	19.1
Union	22,803	83.3	14.9	18.6
Vermilion	53,807	26.0	13.5	22.1
Vernon	52,531	45.8	7.9	15.3
Washington	43,926	39.5	14.3	24.7
Webster	41,831	65.6	16.3	20.2
West Baton Rouge	21,601	70.3	9.7	17
West Carroll	12,314	113.0	15.5	23.4
West Feliciana	15,111	34.3	7.2	19.9
Winn	16,894	37.2	14	21.5
TOTAL	4,468,976	17.8	11.6	19.6

Source: US Census Bureau (2000).

Appendix E.4:

Flood

The flood hazard ranking was based on the Historic Losses as determined from FEMA's National Flood Insurance Program (NFIP) records and population, building stock, critical facilities, utilities, and transportation infrastructure within the Special Flood Hazard Areas (SHFAs).

For the purposes of this plan the definitions for Repetitive Loss (RL) and Severe Repetitive Loss (SRL) follow FEMA guidelines: An RL property is defined as a property that has sustained two or more flood losses within a period of ten years, with each loss resulting in a flood insurance claim payment exceeding $1,000.00.

An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:
(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.
For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

Utility providers include nuclear plants, sewage treatment plants, wastewater facilities, electric substations, and power plants. Critical facilities include fire stations, law enforcement facilities, hospitals, schools, State EOCs, and EMS.

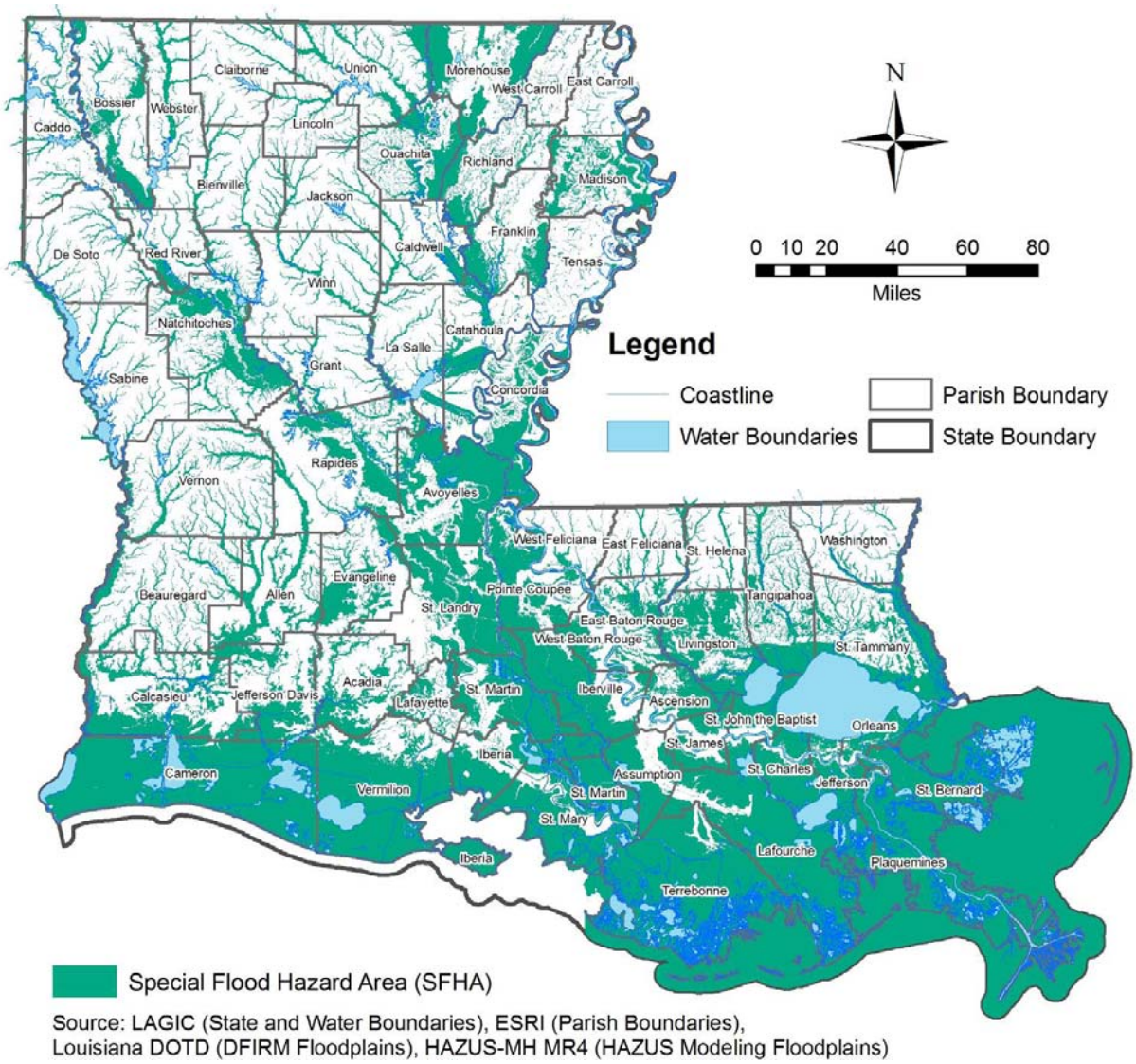
The high / medium / low rankings for each parish were developed by:

- Obtaining the SFHA and NFIP data;
- Sorting the list by parish from most to least population within the SFHAs;
    - Assigning the high rank to parishes with more than 50% of population within SFHAs;
    - Assigning the medium rank to parishes with 25% to 50% of population within SFHAs; and
    - Assigning the low rank to parishes with up to 25% of population within SFHAs.
- Sorting the list by parish from highest to lowest building quantity within the SFHAs;
    - Assigning the high rank to parishes with more than 70% of buildings within the SFHA;
    - Assigning the medium rank to parishes with 40% to 70% of buildings within the SHFA; and
    - Assigning the low rank to parishes with up to 40% of buildings within the SHFA.
- Sorting the list by parish from highest to lowest building value within the SFHA;
    - Assigning the high rank to parishes with more than $1 billion of buildings in the SHFA;
    - Assigning the medium rank to parishes with $400 million to $1 billion of buildings in the SHFA; and
    - Assigning the low rank to parishes with up to $400 million of buildings in the SHFA.
- Sorting the list by parish from highest to lowest Repetitive Loss (RL) properties per parish;
    - Assigning the high rank to parishes with more than $10 million in repetitive losses or more than 200 RL properties;
    - Assigning the medium rank to parishes with between $1 million and $10 million in RL losses or 50 to 200 RL properties; and
    - Assigning the low rank to parishes with up to $1 million in RL losses or fewer than 50 RL properties.
- Sorting the list by parish from highest to lowest Severe Repetitive Loss (SRL) properties per parish;
    - Assigning the high rank to parishes with more than $5 million in severe repetitive losses or more than 100 SRL properties;
    - Assigning the medium rank to parishes with between $500 thousand and $5 million in SRL losses or 25 to 100 SRL properties; and

    - Assigning the low rank to parishes with less than $500 thousand in RL losses or fewer than 25RL properties.
- Sorting the list by parish from highest to lowest quantity of critical facilities within the SFHAs;
    - Assigning the high rank to parishes with more than 35% of critical facilities within the SFHA;
    - Assigning the medium rank to parishes with 10% to 35% of critical facilities within the SHFA; and
    - Assigning the low rank to parishes with up to 10% of critical facilities within the SHFA.
- Sorting the list by parish from highest to lowest quantity of utility providers or power lines within the SFHAs;
    - Assigning the high rank to parishes with more than 50% of providers or power lines within the SFHA;
    - Assigning the medium rank to parishes with 25% to 50% of providers or power lines within the SHFA; and
    - Assigning the low rank to parishes with up to 25% of providers or power lines within the SHFA.
- Sorting the list by parish from highest to lowest quantity of transportation infrastructure (bridges, roadways or railways) within the SFHAs;
    - Assigning the high rank to parishes with more than 75% of either bridges, roadways or railways within the SFHA;
    - Assigning the medium rank to parishes with 50% to 75% of either bridges, roadways or railways within the SHFA; and
    - Assigning the low rank to parishes with up to 50% of either bridges, roadways or railways within the SHFA.
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 22 or more;
    - Assigning the medium composite ranking to parishes with a score of 15 to 21; and
    - Assigning the low composite ranking to parishes with a score of 14 or less.

The Special Flood Hazard Areas statewide are shown in Map E-1.

Map E-1: Special Flood Hazard Areas Statewide

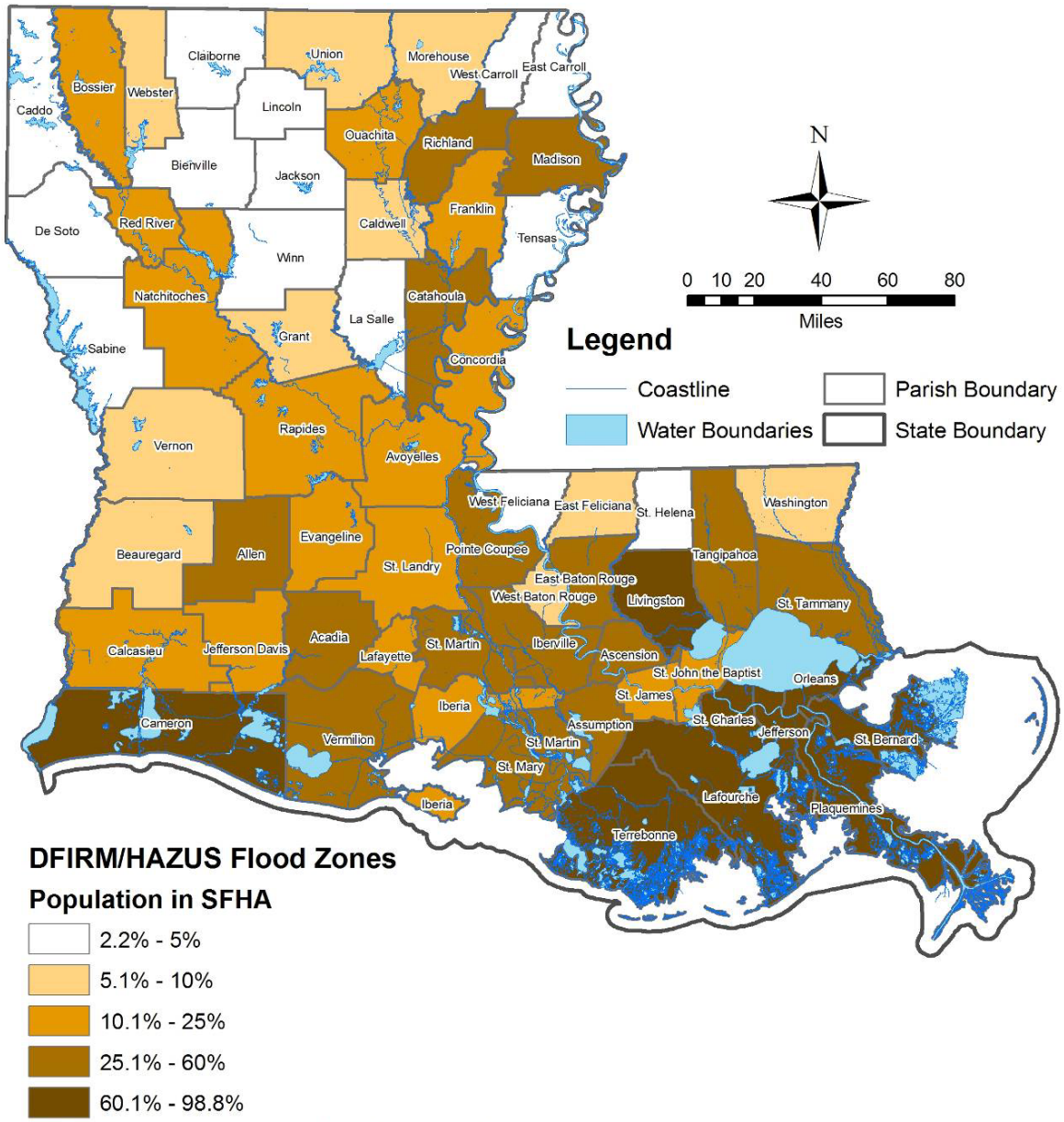


The population by parish within the SHFA is shown in Table E-11 and Map E-2. Map E-3 shows the parishes ranked by population.

Table E-11: Population per Parish within the SFHA

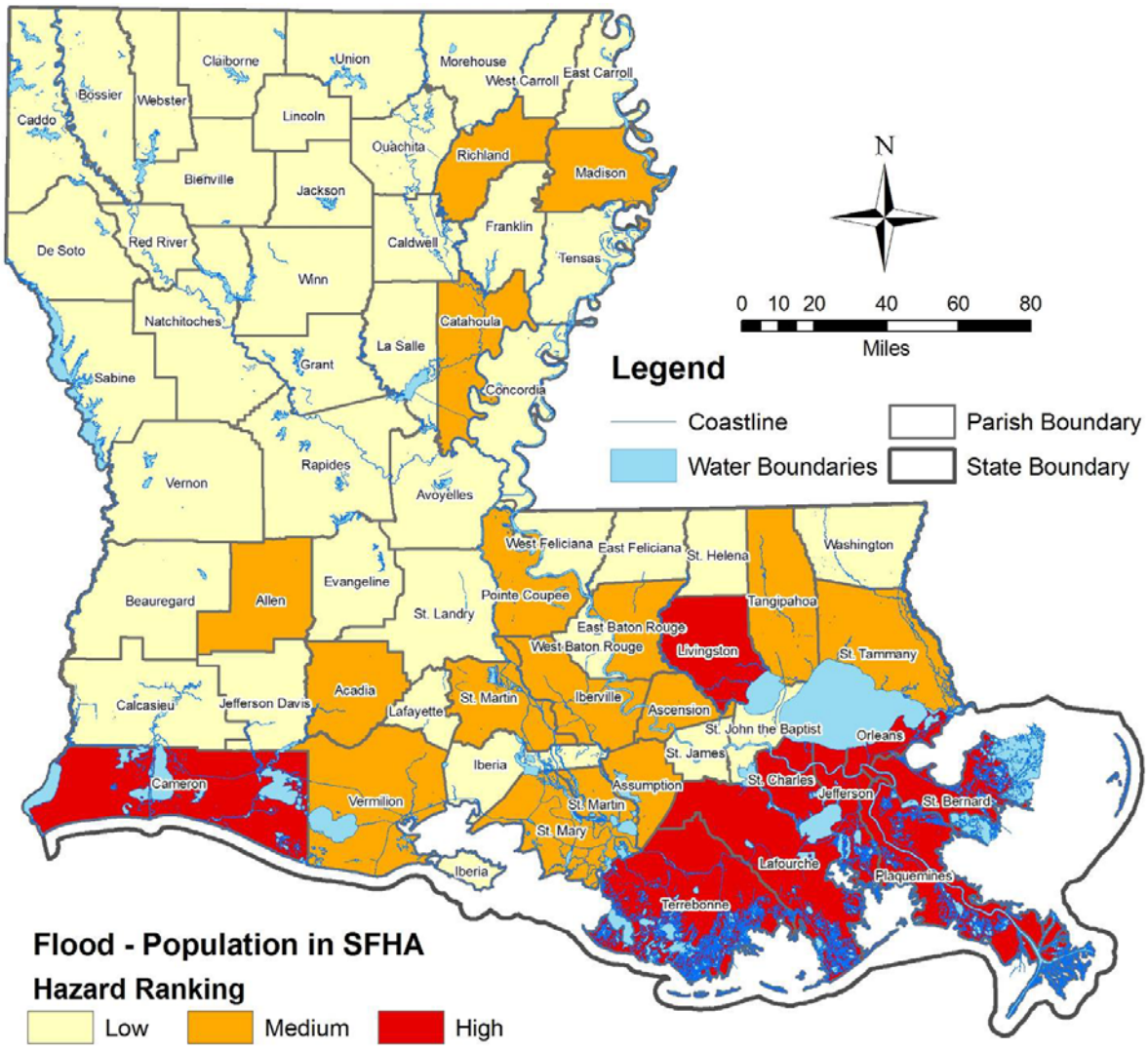
Parish	Total Pop. 2000	Population of Blocks in SFHA	% of Parish Pop. in SFHA	Hazard Ranking	Parish	Total Pop. 2000	Population of Blocks in SFHA	% of Parish Pop. in SFHA	Hazard Ranking
Acadia	58,861	22,471	38.2%	Medium	Madison	13,728	3,440	25.1%	Medium
Allen	25,440	7,461	29.3%	Medium	Morehouse	31,021	2,975	9.6%	Low
Ascension	76,627	29,759	38.8%	Medium	Natchitoches	39,080	7,118	18.2%	Low
Assumption	23,388	9,718	41.6%	Medium	Orleans	484,674	354,865	73.2%	High
Avoyelles	41,481	10,287	24.8%	Low	Ouachita	147,250	33,508	22.8%	Low
Beauregard	32,986	3,275	9.9%	Low	Plaquemines	26,757	22,470	84.0%	High
Bienville	15,752	579	3.7%	Low	Pointe Coupee	22,763	6,543	28.7%	Medium
Bossier	98,310	19,678	20.0%	Low	Rapides	126,337	30,843	24.4%	Low
Caddo	252,161	7,177	2.8%	Low	Red River	9,622	2,217	23.0%	Low
Calcasieu	183,577	40,993	22.3%	Low	Richland	20,981	5,616	26.8%	Medium
Caldwell	10,560	932	8.8%	Low	Sabine	23,459	1,116	4.8%	Low
Cameron	9,974	9,859	98.8%	High	St. Bernard	67,229	66,320	98.6%	High
Catahoula	10,920	4,399	40.3%	Medium	St. Charles	48,072	28,938	60.2%	High
Claiborne	16,851	368	2.2%	Low	St. Helena	10,525	511	4.9%	Low
Concordia	20,247	3,612	17.8%	Low	St. James	21,216	3,811	18.0%	Low
De Soto	25,494	644	2.5%	Low	St. John the Baptist	43,044	8,890	20.7%	Low
East Baton Rouge	412,852	107,449	26.0%	Medium	St. Landry	87,715	20,156	23.0%	Low
East Carroll	9,421	213	2.3%	Low	St. Martin	48,583	15,597	32.1%	Medium
East Feliciana	21,360	1,514	7.1%	Low	St. Mary	53,500	22,397	41.9%	Medium
Evangeline	35,434	7,644	21.6%	Low	St. Tammany	191,268	79,155	41.4%	Medium
Franklin	21,263	4,487	21.1%	Low	Tangipahoa	100,588	31,282	31.1%	Medium
Grant	18,698	1,179	6.3%	Low	Tensas	6,618	153	2.3%	Low
Iberia	73,266	13,659	18.6%	Low	Terrebonne	104,494	68,028	65.1%	High
Iberville	33,320	9,972	29.9%	Medium	Union	22,803	2,152	9.4%	Low
Jackson	15,400	472	3.1%	Low	Vermilion	53,807	22,945	42.6%	Medium
Jefferson	455,466	335,571	73.7%	High	Vernon	52,531	3,796	7.2%	Low
Jefferson Davis	31,435	6,463	20.6%	Low	Washington	43,926	2,376	5.4%	Low
Lafayette	190,488	40,685	21.4%	Low	Webster	41,834	2,568	6.1%	Low
Lafourche	89,983	58,064	64.5%	High	West Baton Rouge	21,601	1,891	8.8%	Low
La Salle	14,282	398	2.8%	Low	West Carroll	12,314	567	4.6%	Low
Lincoln	44,288	2,079	4.7%	Low	West Feliciana	15,111	356	2.4%	Low
Livingston	91,814	55,471	60.4%	High	Winn	16,894	621	3.7%	Low

Map E-2: Population per Parish within the SFHA



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Census Block Population), DFIRM/HAZUS (Special Flood Hazard Area)

Map E-3: Parishes Ranked by Population within the SFHA



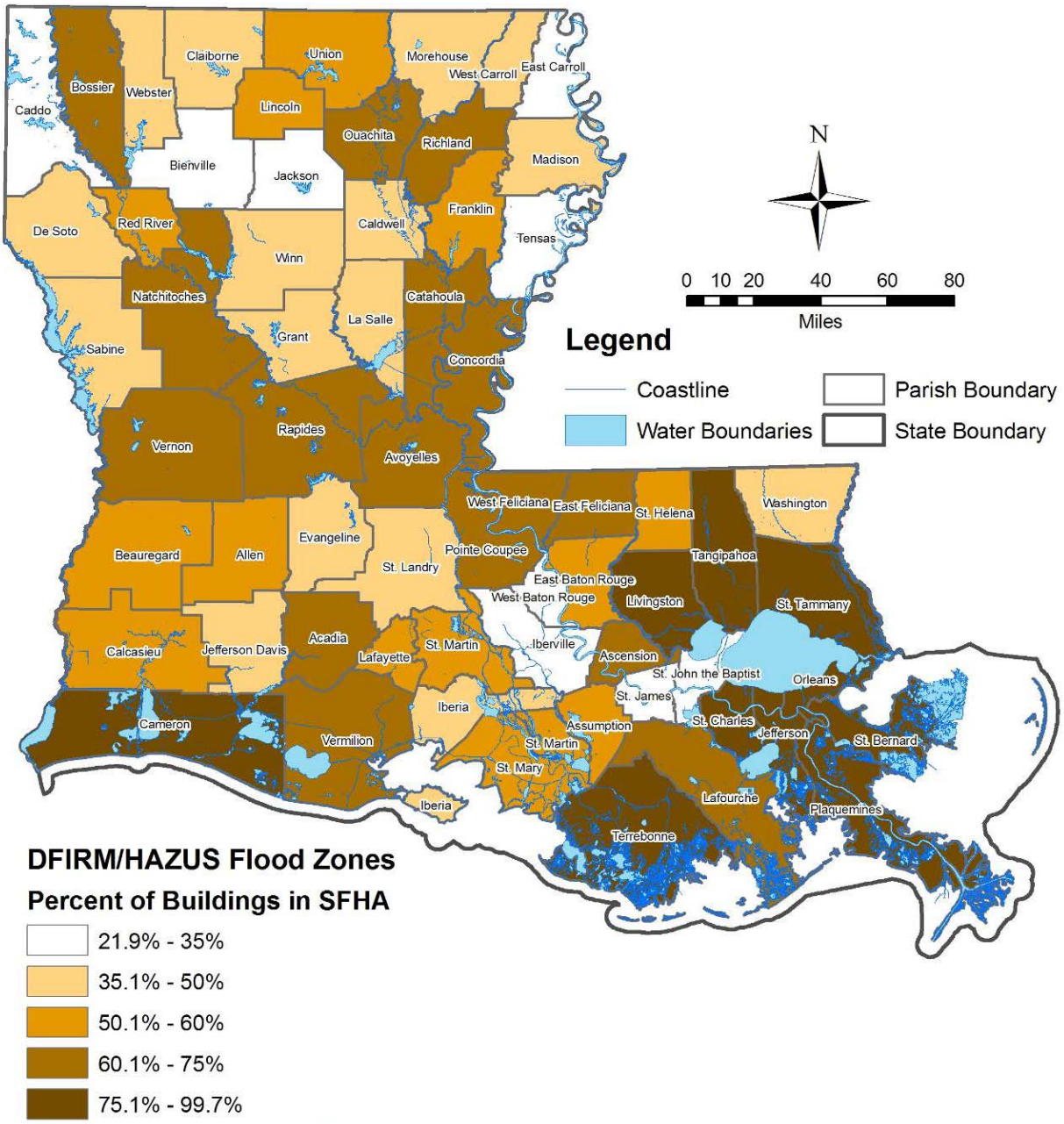
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Census Block Population), DFIRM/HAZUS (Special Flood Hazard Area)

The building quantity by parish within the SHFA is shown in Table E-12 and Map E-4. Map E-5 shows the parishes ranked by quantity.

Table E-12: Building Quantity per Parish within the SFHA

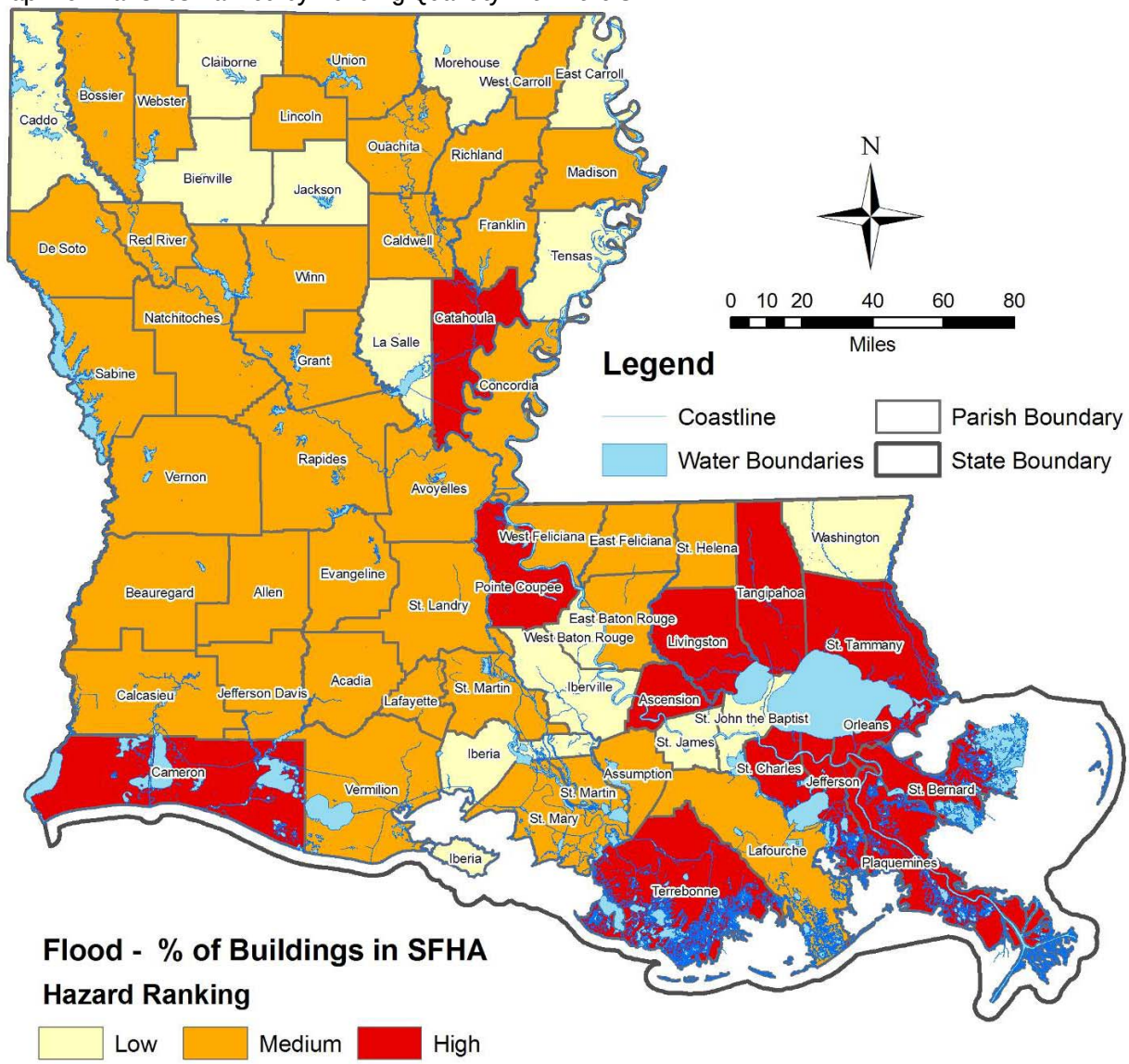
Parish	Total Buildings	Buildings in SFHA	% Buildings in SFHA	Hazard Ranking	Parish	Total Buildings	Buildings in SFHA	% Buildings in SFHA	Hazard Ranking
Acadia	27,817	18,704	67.2%	Medium	Madison	6,576	3,060	46.5%	Medium
Allen	11,600	5,843	50.4%	Medium	Morehouse	14,604	5,737	39.3%	Low
Ascension	33,123	24,400	73.7%	High	Natchitoches	19,780	12,362	62.5%	Medium
Assumption	10,844	6,029	55.6%	Medium	Orleans	173,671	132,649	76.4%	High
Avoyelles	19,795	11,917	60.2%	Medium	Ouachita	62,493	39,338	62.9%	Medium
Beauregard	17,476	9,924	56.8%	Medium	Plaquemines	12,374	9,938	80.3%	High
Bienville	10,612	3,575	33.7%	Low	Pointe Coupee	12,092	8,702	72.0%	High
Bossier	40,408	24,320	60.2%	Medium	Rapides	58,948	35,733	60.6%	Medium
Caddo	105,041	22,974	21.9%	Low	Red River	4,767	2,619	54.9%	Medium
Calcasieu	80,762	41,909	51.9%	Medium	Richland	10,847	6,845	63.1%	Medium
Caldwell	6,011	2,600	43.3%	Medium	Sabine	15,926	7,955	49.9%	Medium
Cameron	6,211	5,766	92.8%	High	St. Bernard	26,842	26,769	99.7%	High
Catahoula	6,483	4,792	73.9%	High	St. Charles	19,200	15,301	79.7%	High
Claiborne	9,517	3,545	37.2%	Low	St. Helena	6,254	3,706	59.3%	Medium
Concordia	10,636	6,732	63.3%	Medium	St. James	8,815	2,428	27.5%	Low
De Soto	13,848	5,669	40.9%	Medium	St. John the Baptist	16,521	5,104	30.9%	Low
East Baton Rouge	151,107	81,795	54.1%	Medium	St. Landry	43,957	21,718	49.4%	Medium
East Carroll	4,195	1,214	28.9%	Low	St. Martin	24,736	14,023	56.7%	Medium
East Feliciana	10,030	6,231	62.1%	Medium	St. Mary	24,408	14,079	57.7%	Medium
Evangeline	17,665	8,642	48.9%	Medium	St. Tammany	84,508	64,250	76.0%	High
Franklin	10,757	6,372	59.2%	Medium	Tangipahoa	45,367	34,893	76.9%	High
Grant	10,350	5,110	49.4%	Medium	Tensas	4,467	1,395	31.2%	Low
Iberia	32,309	12,370	38.3%	Low	Terrebonne	43,923	36,660	83.5%	High
Iberville	15,059	5,241	34.8%	Low	Union	13,760	7,757	56.4%	Medium
Jackson	9,181	2,966	32.3%	Low	Vermilion	27,475	17,869	65.0%	Medium
Jefferson	164,539	143,991	87.5%	High	Vernon	21,626	13,546	62.6%	Medium
Jefferson Davis	16,691	7,494	44.9%	Medium	Washington	23,350	8,187	35.1%	Low
Lafayette	81,011	44,096	54.4%	Medium	Webster	21,865	9,030	41.3%	Medium
Lafourche	40,570	27,380	67.5%	Medium	West Baton Rouge	10,252	2,456	24.0%	Low
La Salle	7,828	2,825	36.1%	Low	West Carroll	5,945	2,916	49.0%	Medium
Lincoln	18,894	10,054	53.2%	Medium	West Feliciana	5,056	3,306	65.4%	Medium
Livingston	42,671	36,387	85.3%	High	Winn	8,993	3,823	42.5%	Medium

Map E-4: Building Quantity per Parish within the SFHA



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), DFIRM/HAZUS (Special Flood Hazard Area, Buildings)

Map E-5: Parishes Ranked by Building Quantity within the SFHA



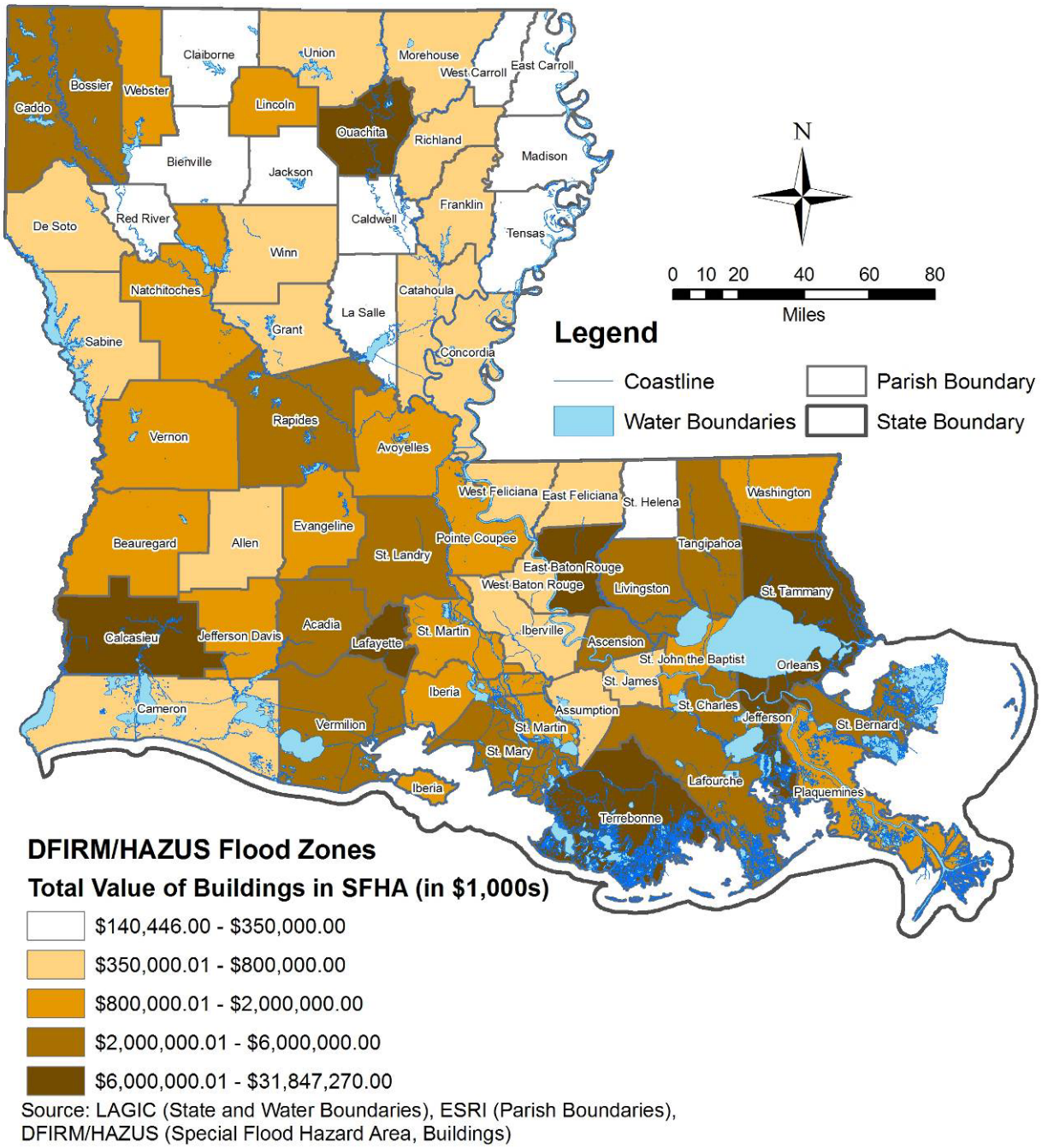
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), DFIRM/HAZUS (Special Flood Hazard Area, Buildings)

The building value by parish within the SHFA is shown in Table E-13 and Map E-6. Map E-7 shows the parishes ranked by value.

Table E-13: Building Value per Parish within the SFHA

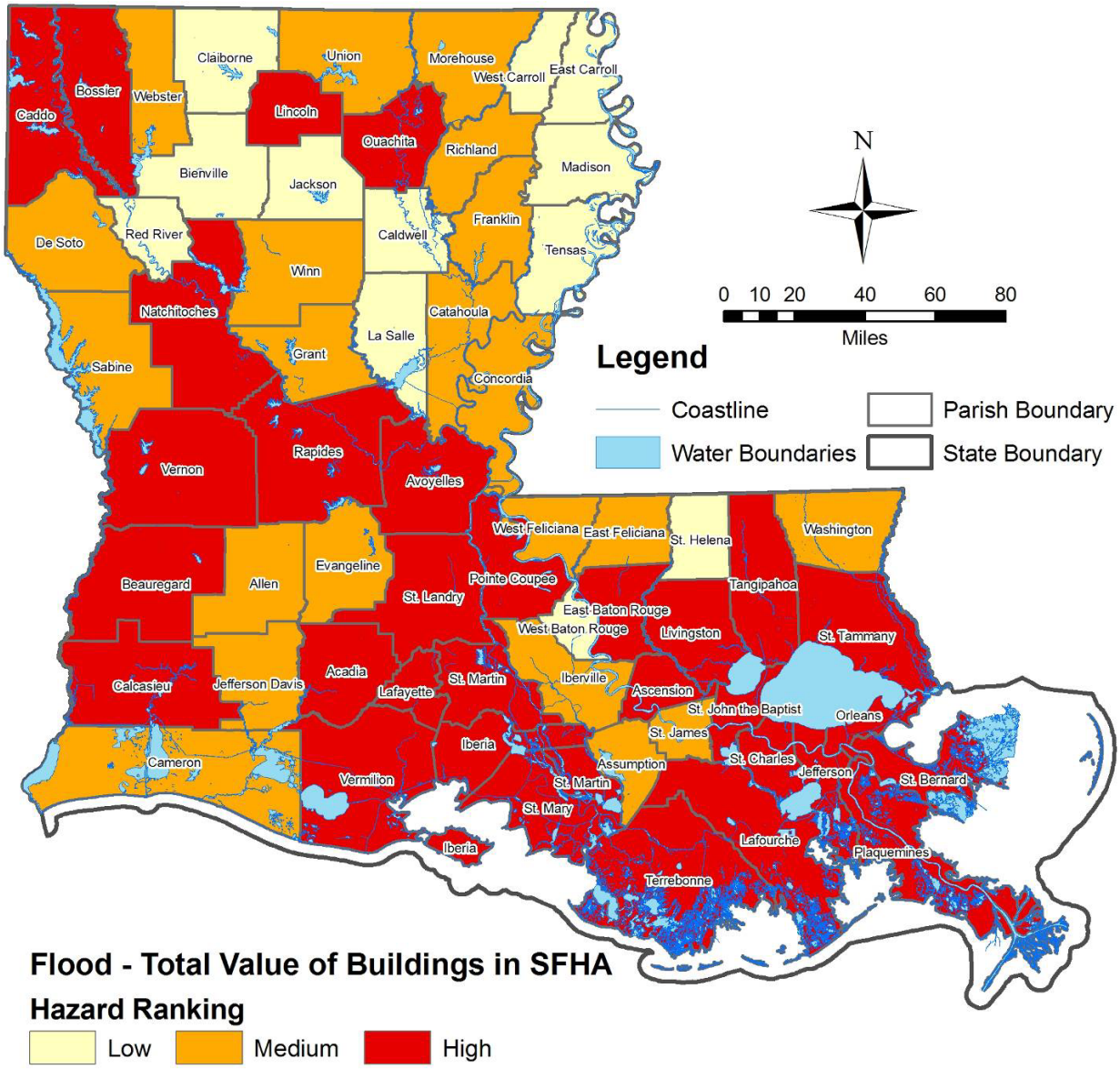
Parish	Total Value of Buildings in SFHA (in $1000s)	Hazard Ranking	Parish	Total Value of Buildings in SFHA (in $1000s)	Hazard Ranking
Acadia	$2,281,776	High	Madison	$341,392	Low
Allen	$774,433	Medium	Morehouse	$628,684	Medium
Ascension	$3,856,424	High	Natchitoches	$1,326,614	High
Assumption	$694,836	Medium	Orleans	$24,992,129	High
Avoyelles	$1,330,572	High	Ouachita	$6,137,440	High
Beauregard	$1,091,235	High	Plaquemines	$1,499,087	High
Bienville	$295,136	Low	Pointe Coupee	$1,007,263	High
Bossier	$4,335,017	High	Rapides	$5,169,945	High
Caddo	$3,592,463	High	Red River	$246,423	Low
Calcasieu	$6,214,478	High	Richland	$702,338	Medium
Caldwell	$259,141	Low	Sabine	$676,528	Medium
Cameron	$738,430	Medium	St. Bernard	$4,444,064	High
Catahoula	$441,404	Medium	St. Charles	$2,991,976	High
Claiborne	$348,286	Low	St. Helena	$348,834	Low
Concordia	$738,366	Medium	St. James	$406,853	Medium
De Soto	$570,589	Medium	St. John the Baptist	$1,038,691	High
East Baton Rouge	$19,016,983	High	St. Landry	$2,428,505	High
East Carroll	$151,071	Low	St. Martin	$1,624,959	High
East Feliciana	$734,679	Medium	St. Mary	$2,030,710	High
Evangeline	$960,623	Medium	St. Tammany	$10,281,963	High
Franklin	$682,200	Medium	Tangipahoa	$4,200,956	High
Grant	$512,760	Medium	Tensas	$140,446	Low
Iberia	$1,952,620	High	Terrebonne	$6,127,941	High
Iberville	$700,077	Medium	Union	$755,955	Medium
Jackson	$338,212	Low	Vermilion	$2,202,002	High
Jefferson	$31,847,270	High	Vernon	$1,899,417	High
Jefferson Davis	$934,844	Medium	Washington	$845,071	Medium
Lafayette	$8,057,928	High	Webster	$958,128	Medium
Lafourche	$4,001,076	High	West Baton Rouge	$390,184	Low
La Salle	$291,294	Low	West Carroll	$326,855	Low
Lincoln	$1,388,835	High	West Feliciana	$455,436	Medium
Livingston	$4,882,277	High	Winn	$403,153	Medium

Figure E-6: Building Value per Parish within the SFHA



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), DFIRM/HAZUS (Special Flood Hazard Area, Buildings)

Figure E-7: Parishes Ranked by Building Value within the SFHA



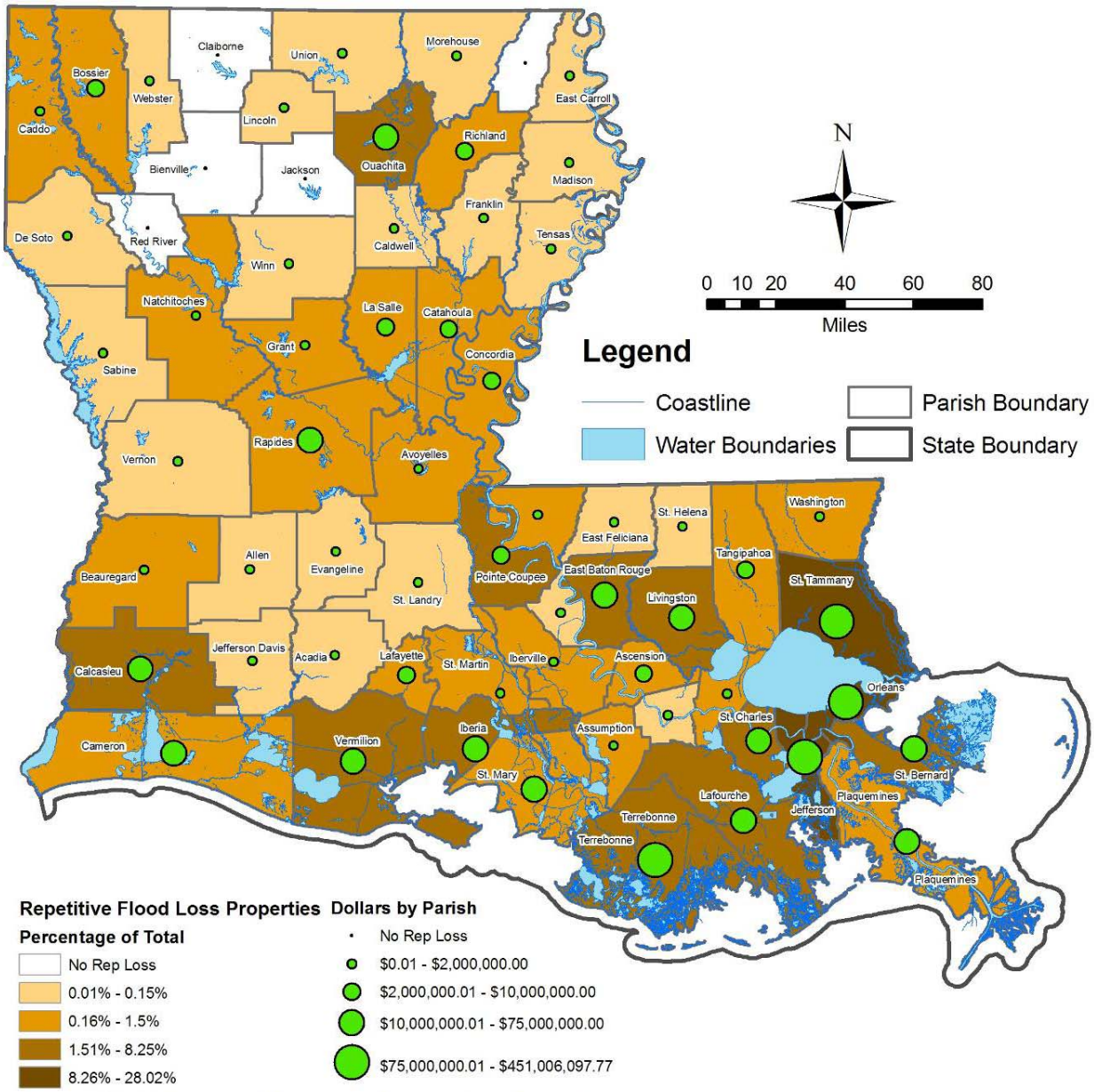
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), DFIRM/HAZUS (Special Flood Hazard Area, Buildings)

The RL quantity and costs value by parish are shown in Table E-14 and Map E-8. Map E-9 shows the parishes ranked by quantity and costs.

Table E-14: Repetitive Losses by Parish

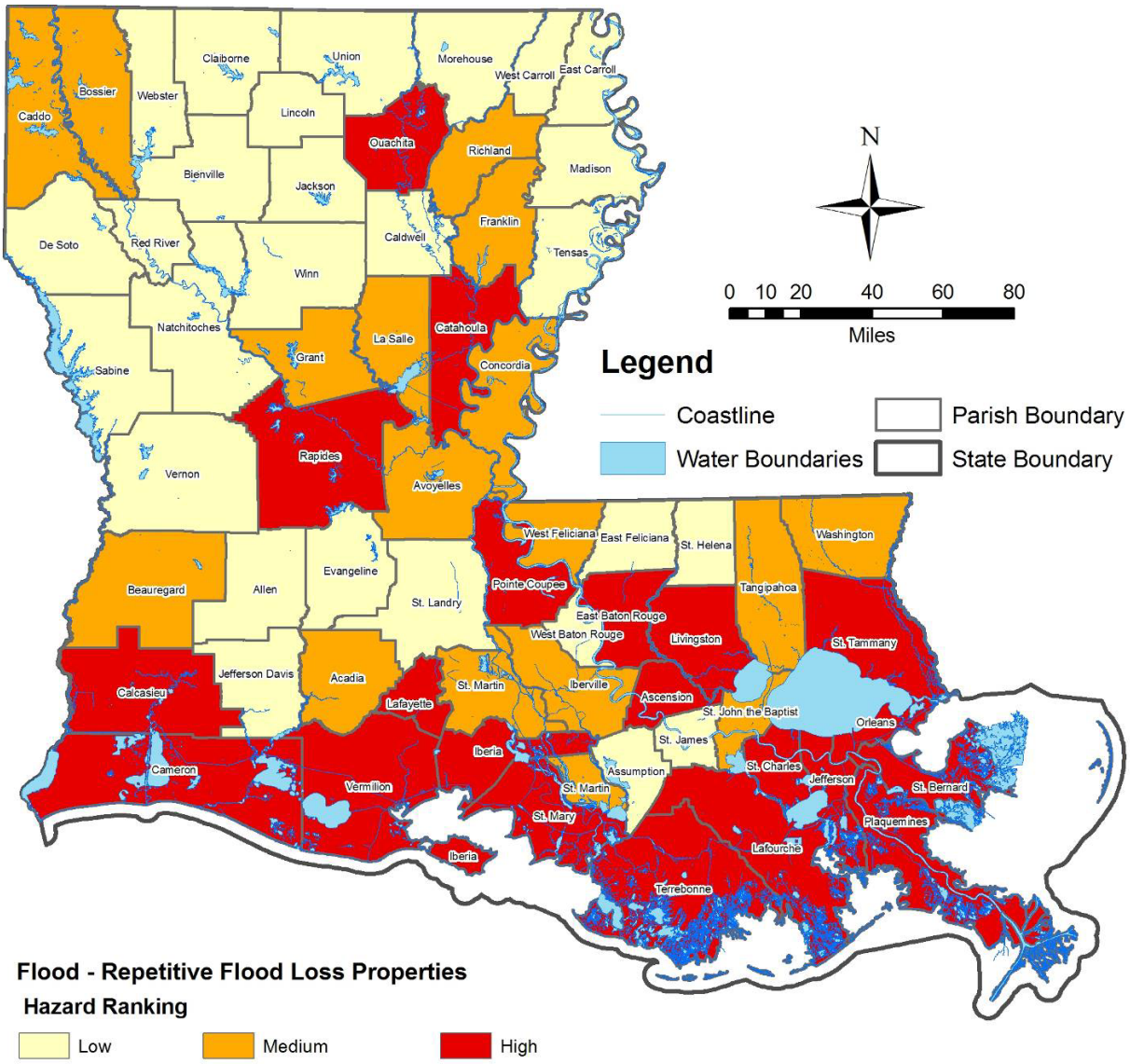
Parish	Rep Loss Count	% of Total Rep Loss	Dollars Paid to Rep Loss	Hazard Ranking	Parish	Rep Loss Count	% of Total Rep Loss	Dollars Paid to Rep Loss	Hazard Ranking
Acadia	31	0.14%	$1,064,145	Medium	Madison	22	0.10%	$545,069	Low
Allen	29	0.13%	$901,703	Low	Morehouse	12	0.06%	$289,053	Low
Ascension	252	1.16%	$7,904,111	High	Natchitoches	34	0.16%	$870,271	Low
Assumption	45	0.21%	$788,263	Low	Orleans	4,649	21.41%	$451,006,098	High
Avoyelles	45	0.21%	$1,026,930	Medium	Ouachita	396	1.82%	$16,384,975	High
Beauregard	49	0.23%	$1,779,691	Medium	Plaquemines	192	0.88%	$15,691,685	High
Bienville	0	0.00%	$0	Low	Pointe Coupee	331	1.52%	$8,234,406	High
Bossier	147	0.68%	$8,888,997	Medium	Rapides	239	1.10%	$10,444,517	High
Caddo	33	0.15%	$1,892,165	Medium	Red River	0	0.00%	$0	Low
Calcasieu	480	2.21%	$42,399,142	High	Richland	37	0.17%	$2,363,949	Medium
Caldwell	17	0.08%	$710,203	Low	Sabine	1	0.00%	$10,969	Low
Cameron	301	1.39%	$44,923,865	High	St. Bernard	449	2.07%	$47,754,780	High
Catahoula	279	1.29%	$5,558,968	High	St. Charles	558	2.57%	$43,312,349	High
Claiborne	0	0.00%	$0	Low	St. Helena	2	0.01%	$27,338	Low
Concordia	172	0.79%	$4,172,552	Medium	St. James	4	0.02%	$335,606	Low
De Soto	3	0.01%	$242,830	Low	St. John the Baptist	56	0.26%	$1,763,382	Medium
East Baton Rouge	652	3.00%	$32,080,072	High	St. Landry	17	0.08%	$676,489	Low
East Carroll	16	0.07%	$187,435	Low	St. Martin	67	0.31%	$1,411,066	Medium
East Feliciana	5	0.02%	$205,241	Low	St. Mary	186	0.86%	$11,966,590	High
Evangeline	6	0.03%	$284,442	Low	St. Tammany	1,906	8.78%	$180,386,407	High
Franklin	21	0.10%	$1,255,961	Medium	Tangipahoa	78	0.36%	$4,231,058	Medium
Grant	37	0.17%	$1,065,976	Medium	Tensas	32	0.15%	$752,625	Low
Iberia	337	1.55%	$26,258,361	High	Terrebonne	1,387	6.39%	$118,505,311	High
Iberville	62	0.29%	$1,193,256	Medium	Union	21	0.10%	$632,242	Low
Jackson	0	0.00%	$0	Low	Vermilion	367	1.69%	$31,688,892	High
Jefferson	6,083	28.02%	$363,454,775	High	Vernon	12	0.06%	$499,622	Low
Jefferson Davis	8	0.04%	$188,370	Low	Washington	40	0.18%	$1,107,204	Medium
Lafayette	213	0.98%	$7,093,474	High	Webster	16	0.07%	$432,031	Low
Lafourche	358	1.65%	$20,517,632	High	West Baton Rouge	10	0.05%	$651,447	Low
La Salle	120	0.55%	$2,688,646	Medium	West Carroll	0	0.00%	$0	Low
Lincoln	1	0.00%	$5,337	Low	West Feliciana	49	0.23%	$1,063,245	Medium
Livingston	725	3.34%	$25,147,846	High	Winn	15	0.07%	$326,153	Low

Map E-8: Repetitive Losses by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Rep Loss)

Figure E-9: Parishes Ranked by Repetitive Losses



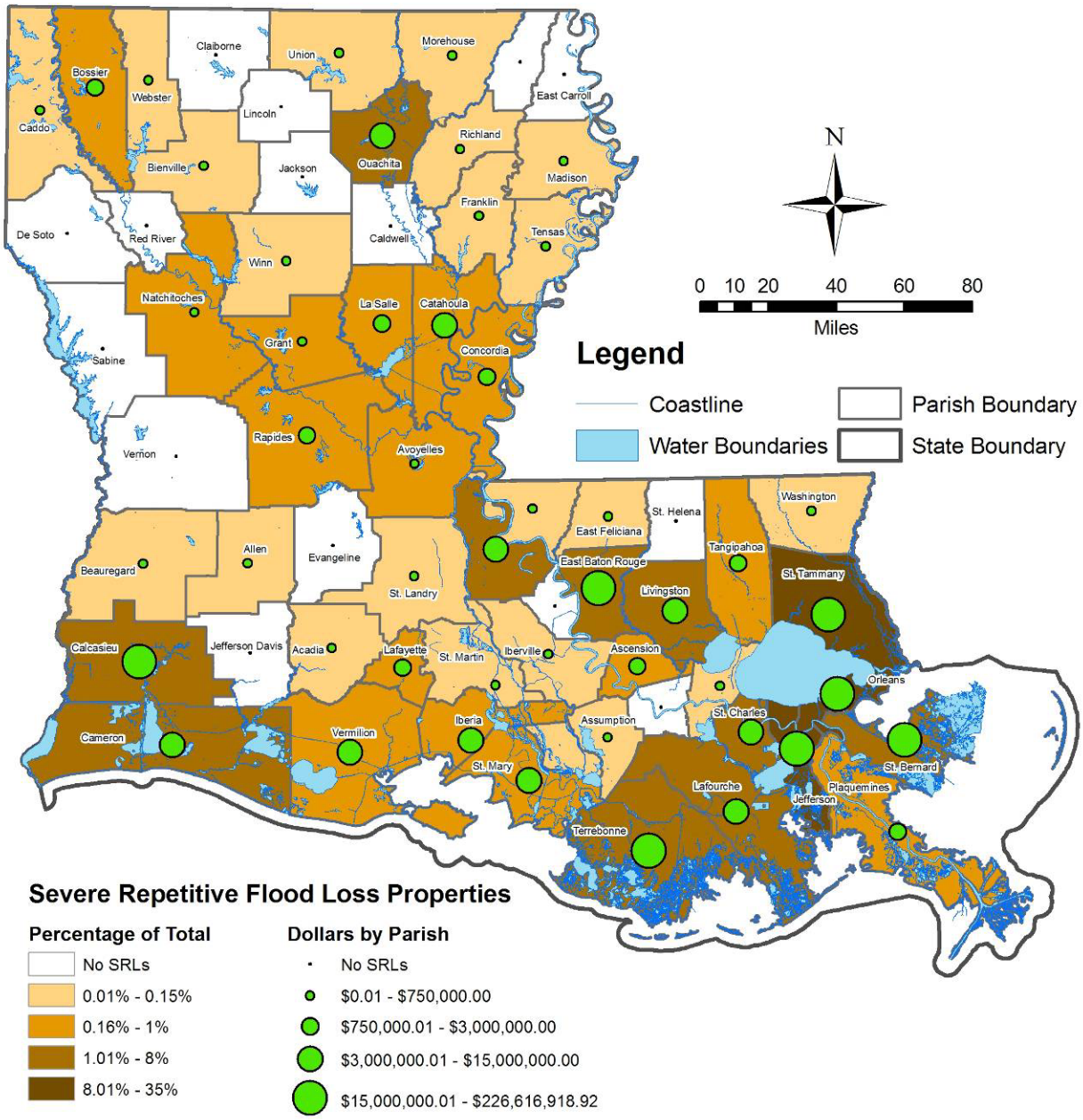
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Rep Loss)

The SRL quantity and costs value by parish are shown in Table E-15 and Map E-10. Map E-11 shows the parishes ranked by quantity and costs.

Table E-15: Severe Repetitive Losses by Parish

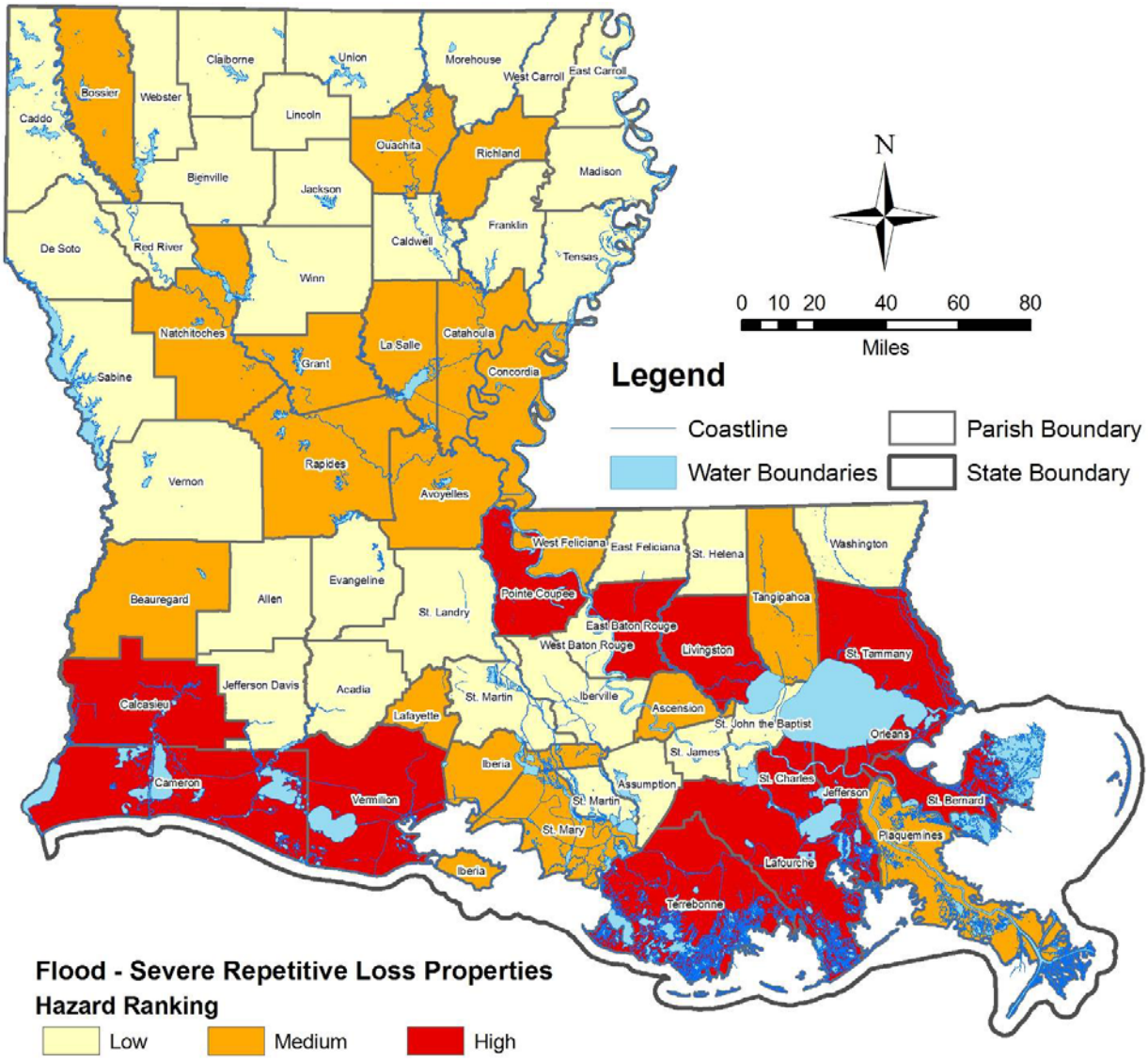
Parish	SRL Count	% of Total SRL	Dollars Paid to SRL	Hazard Ranking	Parish	SRL Count	% of Total SRL	Dollars Paid to SRL	Hazard Ranking
Acadia	2	0.05%	$204,247	Low	Madison	1	0.02%	$274,973	Low
Allen	6	0.14%	$430,575	Low	Morehouse	1	0.02%	$36,608	Low
Ascension	24	0.56%	$2,387,934	Medium	Natchitoches	7	0.16%	$680,883	Medium
Assumption	2	0.05%	$96,670	Low	Orleans	1,118	25.93%	$223,937,187	High
Avoyelles	7	0.16%	$727,120	Medium	Ouachita	45	1.04%	$4,837,868	Medium
Beauregard	5	0.12%	$559,804	Medium	Plaquemines	14	0.32%	$2,589,507	Medium
Bienville	1	0.02%	$85,248	Low	Pointe Coupee	61	1.41%	$6,254,334	High
Bossier	16	0.37%	$1,818,790	Medium	Rapides	28	0.65%	$2,585,604	Medium
Caddo	2	0.05%	$317,929	Low	Red River	0	0.00%	$0	Low
Calcasieu	94	2.18%	$17,657,287	High	Richland	5	0.12%	$597,244	Medium
Caldwell	0	0.00%	$0	Low	Sabine	0	0.00%	$0	Low
Cameron	70	1.62%	$13,235,686	High	St. Bernard	82	1.90%	$16,162,030	High
Catahoula	43	1.00%	$3,552,495	Medium	St. Charles	45	1.04%	$5,714,973	High
Claiborne	0	0.00%	$0	Low	St. Helena	0	0.00%	$0	Low
Concordia	30	0.70%	$2,702,855	Medium	St. James	0	0.00%	$0	Low
De Soto	0	0.00%	$0	Low	St. John the Baptist	3	0.07%	$338,103	Low
East Baton Rouge	159	3.69%	$22,008,985	High	St. Landry	2	0.05%	$259,195	Low
East Carroll	0	0.00%	$0	Low	St. Martin	1	0.02%	$272,475	Low
East Feliciana	1	0.02%	$222,243	Low	St. Mary	22	0.51%	$3,762,009	Medium
Evangeline	0	0.00%	$0	Low	St. Tammany	434	10.06%	$82,504,542	High
Franklin	1	0.02%	$175,013	Low	Tangipahoa	13	0.30%	$1,569,395	Medium
Grant	8	0.19%	$516,446	Medium	Tensas	4	0.09%	$254,246	Low
Iberia	26	0.60%	$3,500,544	Medium	Terrebonne	193	4.48%	$30,753,214	High
Iberville	1	0.02%	$91,017	Low	Union	1	0.02%	$43,881	Low
Jackson	0	0.00%	$0	Low	Vermilion	41	0.95%	$6,437,545	High
Jefferson	1,485	34.44%	$200,166,792	High	Vernon	0	0.00%	$0	Low
Jefferson Davis	0	0.00%	$0	Low	Washington	5	0.12%	$414,984	Low
Lafayette	19	0.44%	$2,134,000	Medium	Webster	3	0.07%	$367,279	Low
Lafourche	49	1.14%	$5,702,635	High	West Baton Rouge	0	0.00%	$0	Low
La Salle	16	0.37%	$974,934	Medium	West Carroll	0	0.00%	$0	Low
Lincoln	0	0.00%	$0	Low	West Feliciana	6	0.14%	$548,912	Medium
Livingston	108	2.50%	$13,293,405	High	Winn	2	0.05%	$264,241	Low

Map E-10: Severe Repetitive Losses by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Severe Repetitive Loss)

Map E-11: Parishes Ranked by Severe Repetitive Losses



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), FEMA December 9, 2009 (Severe Repetitive Loss)

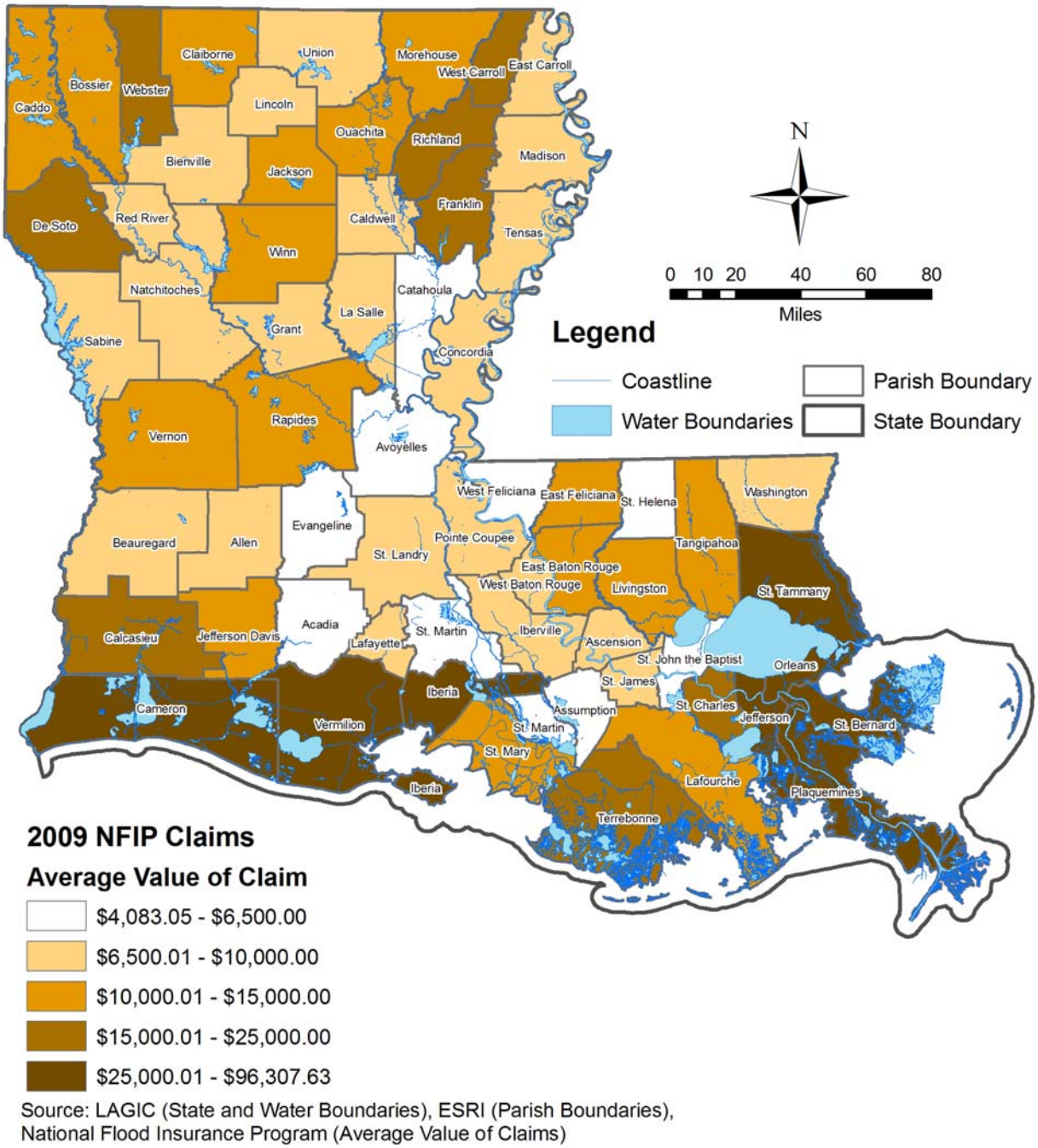
The 2009 average flood losses by parish are shown in Table E-16 and Map E-12. Map E-13 shows the parishes ranked by average loss.

Table E-16: 2009 Average NFIP Claims by Parish

Parish	NFIP Claims 2007	Total NFIP Losses 2007	Average Value of 2007 NFIP Claim	NFIP Claims 2009	Total NFIP Losses 2009	Average Value of 2009 NFIP Claim	% Change from 07 - 09	Hazard Ranking
Acadia	485	$2,226,450	$4,591	401	$2,442,329	$6,091	32.67%	Low
Allen	382	$3,780,298	$9,896	386	$3,814,030	$9,881	-0.15%	Medium
Ascension	1,882	$19,253,319	$10,230	2,188	$19,787,759	$9,044	-11.60%	Medium
Assumption	830	$3,330,319	$4,012	890	$3,633,914	$4,083	1.76%	Low
Avoyelles	1,582	$5,827,864	$3,684	1,666	$7,271,865	$4,365	18.49%	Low
Beauregard	456	$4,230,809	$9,278	463	$4,376,918	$9,453	1.89%	Medium
Bienville	17	$148,982	$8,764	17	$148,982	$8,764	0.00%	Medium
Bossier	526	$6,869,459	$13,060	624	$8,330,720	$13,351	2.23%	Medium
Caddo	1,383	$14,572,616	$10,537	1,933	$26,117,416	$13,511	28.23%	Medium
Calcasieu	4,509	$69,389,534	$15,389	5,693	$130,179,901	$22,867	48.59%	High
Caldwell	483	$3,837,738	$7,946	486	$3,859,236	$7,941	-0.06%	Medium
Cameron	1,952	$108,189,101	$55,425	3,058	$171,990,737	$56,243	1.48%	High
Catahoula	2,479	$13,724,709	$5,536	2,561	$14,869,201	$5,806	4.87%	Low
Claiborne	26	$280,233	$10,778	24	$305,483	$12,728	18.09%	Medium
Concordia	1,475	$9,964,209	$6,755	1,518	$11,245,999	$7,408	9.67%	Low
DeSoto	24	$376,299	$15,679	28	$430,504	$15,375	-1.94%	High
East Baton Rouge	7,336	$91,149,674	$12,425	7,901	$101,481,699	$12,844	3.37%	Medium
East Carroll	89	$371,247	$4,171	110	$845,748	$7,689	84.32%	Medium
East Feliciana	43	$394,624	$9,177	55	$738,405	$13,426	46.29%	Medium
Evangeline	51	$334,780	$6,564	64	$388,825	$6,075	-7.45%	Low
Franklin	202	$1,913,914	$9,475	272	$4,537,305	$16,681	76.06%	High
Grant	421	$3,065,195	$7,281	434	$3,167,209	$7,298	0.23%	Low
Iberia	1,402	$35,541,319	$25,350	2,570	$72,309,365	$28,136	10.99%	High
Iberville	389	$2,061,085	$5,298	35	$228,364	$6,525	23.14%	Low
Jackson	64	$13,334	$208	1	$13,334	$13,334	6300.04%	Medium
Jefferson	117,185	$3,256,960,265	$27,793	124,706	$3,338,489,654	$26,771	-3.68%	High
Jefferson Davis	202	$2,720,598	$13,468	207	$2,747,591	$13,273	-1.45%	Medium
Lafayette	2,550	$22,869,271	$8,968	2,649	$23,676,759	$8,938	-0.34%	Medium
Lafourche	3,841	$47,113,893	$12,266	5,026	$62,685,551	$12,472	1.68%	Medium
La Salle	764	$5,065,987	$6,631	791	$5,429,130	$6,864	3.51%	Low
Lincoln	8	$52,572	$6,572	8	$52,572	$6,572	0.00%	Low
Livingston	5,053	$53,858,132	$10,659	5,488	$61,134,940	$11,140	4.51%	Medium
Madison	189	$1,088,556	$5,760	199	$1,344,561	$6,757	17.31%	Low

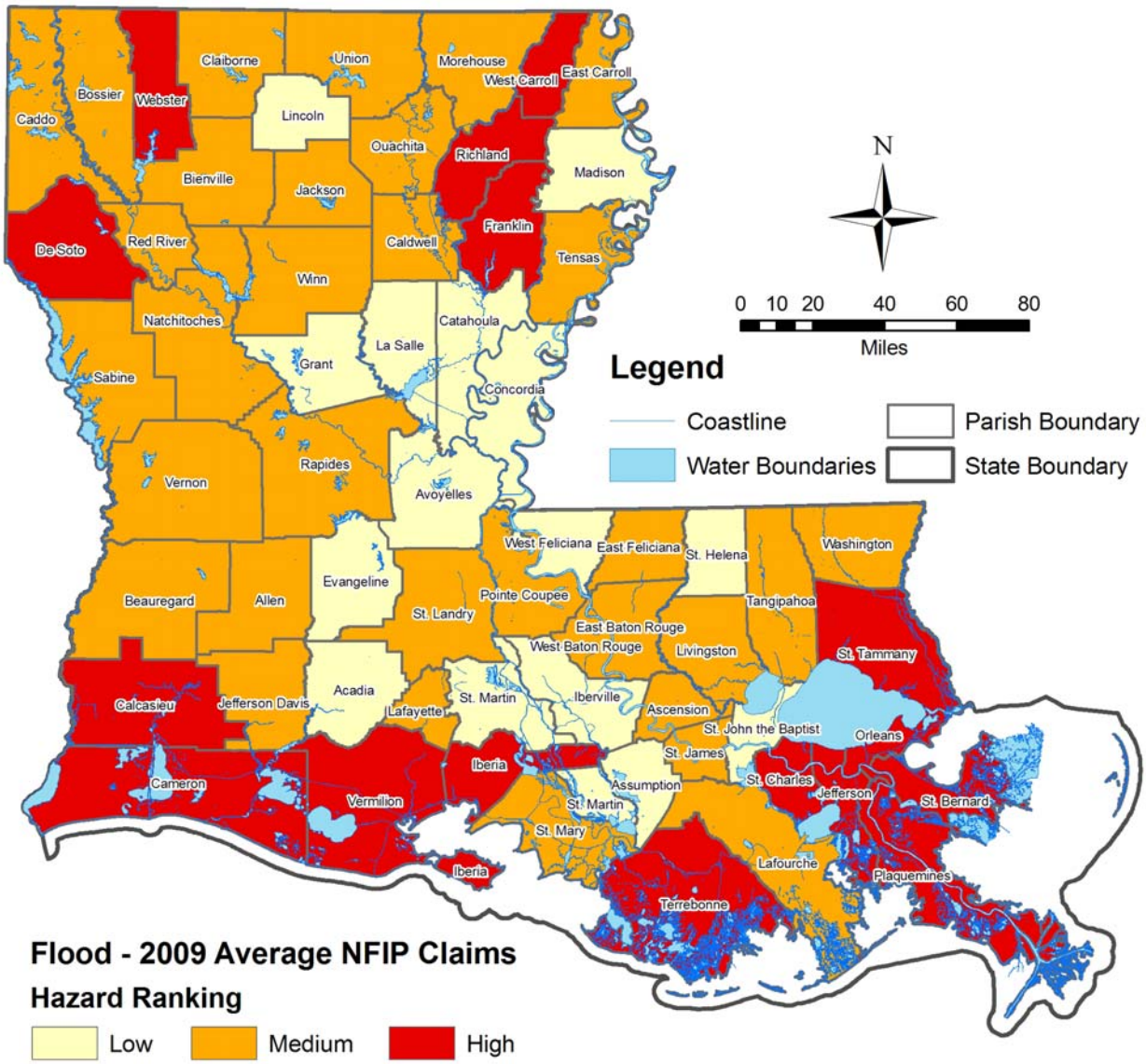
Parish	NFIP Claims 2007	Total NFIP Losses 2007	Average Value of 2007 NFIP Claim	NFIP Claims 2009	Total NFIP Losses 2009	Average Value of 2009 NFIP Claim	% Change from 07 - 09	Hazard Ranking
Morehouse	81	$913,608	$11,279	109	$1,334,233	$12,241	8.53%	Medium
Natchitoches	349	$3,158,772	$9,051	335	$3,100,302	$9,255	2.25%	Medium
Orleans	123,583	$7,095,069,101	$57,411	120,849	$7,165,836,008	$59,296	3.28%	High
Ouachita	4,773	$40,996,884	$8,589	4,239	$50,168,433	$11,835	37.79%	Medium
Plaquemines	4,747	$263,208,757	$55,447	4,883	$265,695,142	$54,412	-1.87%	High
Pointe Coupee	2,537	$16,441,399	$6,481	2,701	$20,311,859	$7,520	16.04%	Medium
Rapides	2,110	$14,004,627	$6,637	2,458	$31,749,901	$12,917	94.61%	Medium
Red River	6	$59,106	$9,851	6	$59,106	$9,851	0.00%	Medium
Richland	212	$2,721,049	$12,835	272	$4,846,146	$17,817	38.81%	High
Sabine	11	$119,514	$10,865	12	$119,514	$9,960	-8.33%	Medium
St. Bernard	23,006	$2,224,522,158	$96,693	23,163	$2,230,773,595	$96,308	-0.40%	High
St. Charles	5,500	$95,158,863	$17,302	5,671	$96,156,394	$16,956	-2.00%	High
St. Helena	11	$51,709	$4,701	11	$51,709	$4,701	0.00%	Low
St. James	88	$717,196	$8,150	95	$720,348	$7,583	-6.96%	Medium
St. John the Baptist	1,306	$7,495,691	$5,739	1,499	$9,110,274	$6,078	5.89%	Low
St. Landry	298	$2,495,899	$8,375	410	$3,418,697	$8,338	-0.44%	Medium
St. Martin	758	$3,982,415	$5,254	819	$5,021,159	$6,131	16.69%	Low
St. Mary	1,500	$21,073,151	$14,049	2,197	$29,524,798	$13,439	-4.34%	Medium
St. Tammany	29,495	$1,517,108,540	$51,436	30,336	$1,531,577,452	$50,487	-1.85%	High
Tangipahoa	877	$7,748,862	$8,836	1,061	$11,521,882	$10,859	22.91%	Medium
Tensas	230	$1,379,321	$5,997	252	$2,005,101	$7,957	32.68%	Medium
Terrebonne	9,514	$203,110,140	$21,349	12,695	$303,945,608	$23,942	12.15%	High
Union	177	$1,634,588	$9,235	220	$2,087,731	$9,490	2.76%	Medium
Vermilion	2,568	$757,791,286	$295,090	3,701	$129,381,160	$34,958	-88.15%	High
Vernon	83	$1,242,127	$14,965	86	$1,253,641	$14,577	-2.59%	Medium
Washington	351	$2,871,773	$8,182	384	$3,537,389	$9,212	12.59%	Medium
Webster	115	$1,458,217	$12,680	152	$2,566,032	$16,882	33.14%	High
West Baton Rouge	93	$648,922	$6,978	123	$977,765	$7,949	13.93%	Medium
West Carroll	11	$144,080	$13,098	20	$403,568	$20,178	54.06%	High
West Feliciana	574	$2,529,727	$4,407	593	$3,000,256	$5,059	14.80%	Low
Winn	112	$1,198,706	$10,703	112	$1,198,706	$10,703	0.00%	Medium

Map E-12: 2009 Average NFIP Claim by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), National Flood Insurance Program (Average Value of Claims)

Map E-13: Parishes Ranked by 2009 Average NFIP Claim



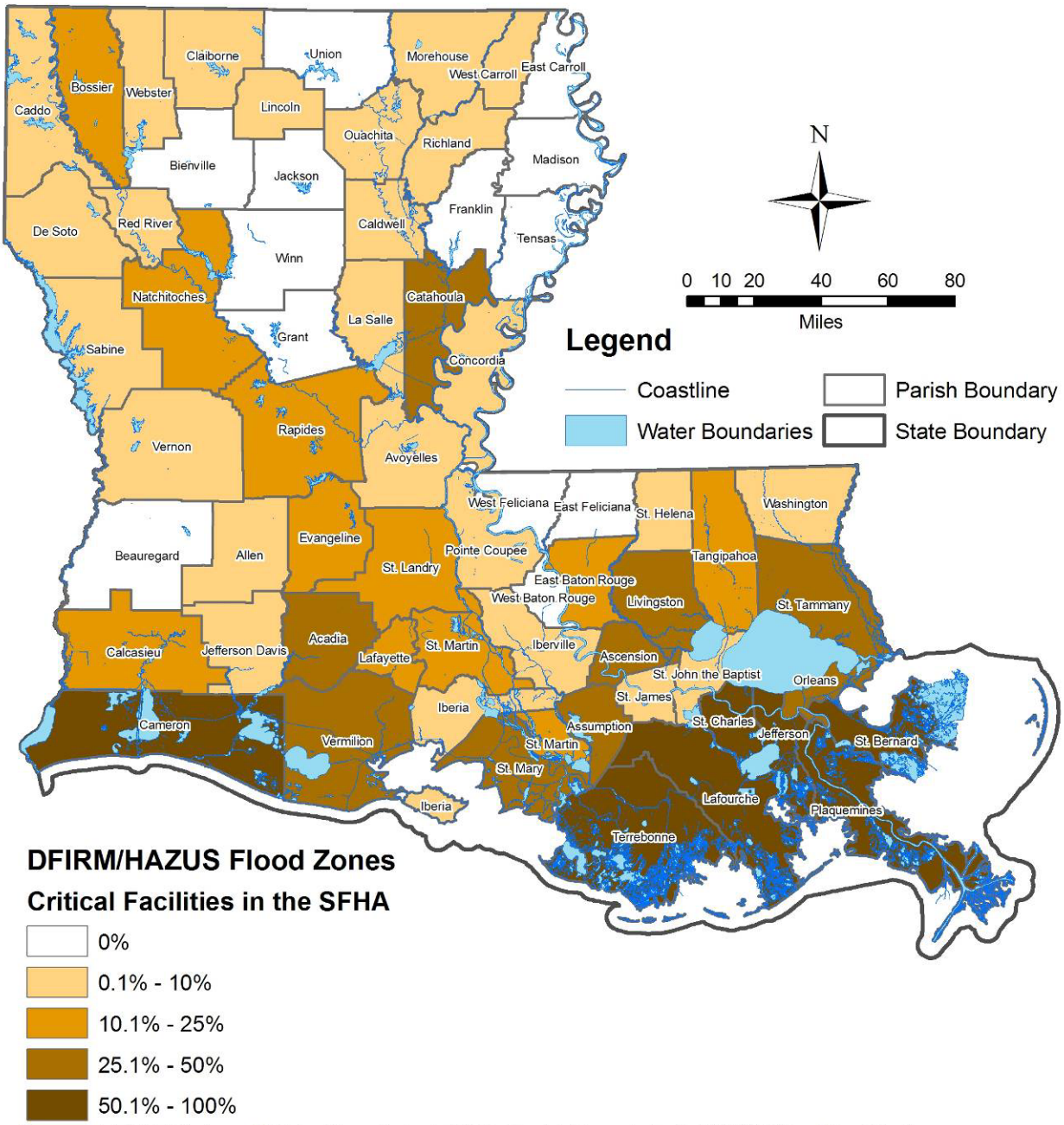
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), National Flood Insurance Program (Average Value of Claims)

The quantity of Critical Facilities by parish within the SHFA is shown in Table E-17 and Map E-14. Map E-15 shows the parishes ranked by quantity.

Table E-17: Critical Facilities per Parish within the SFHA

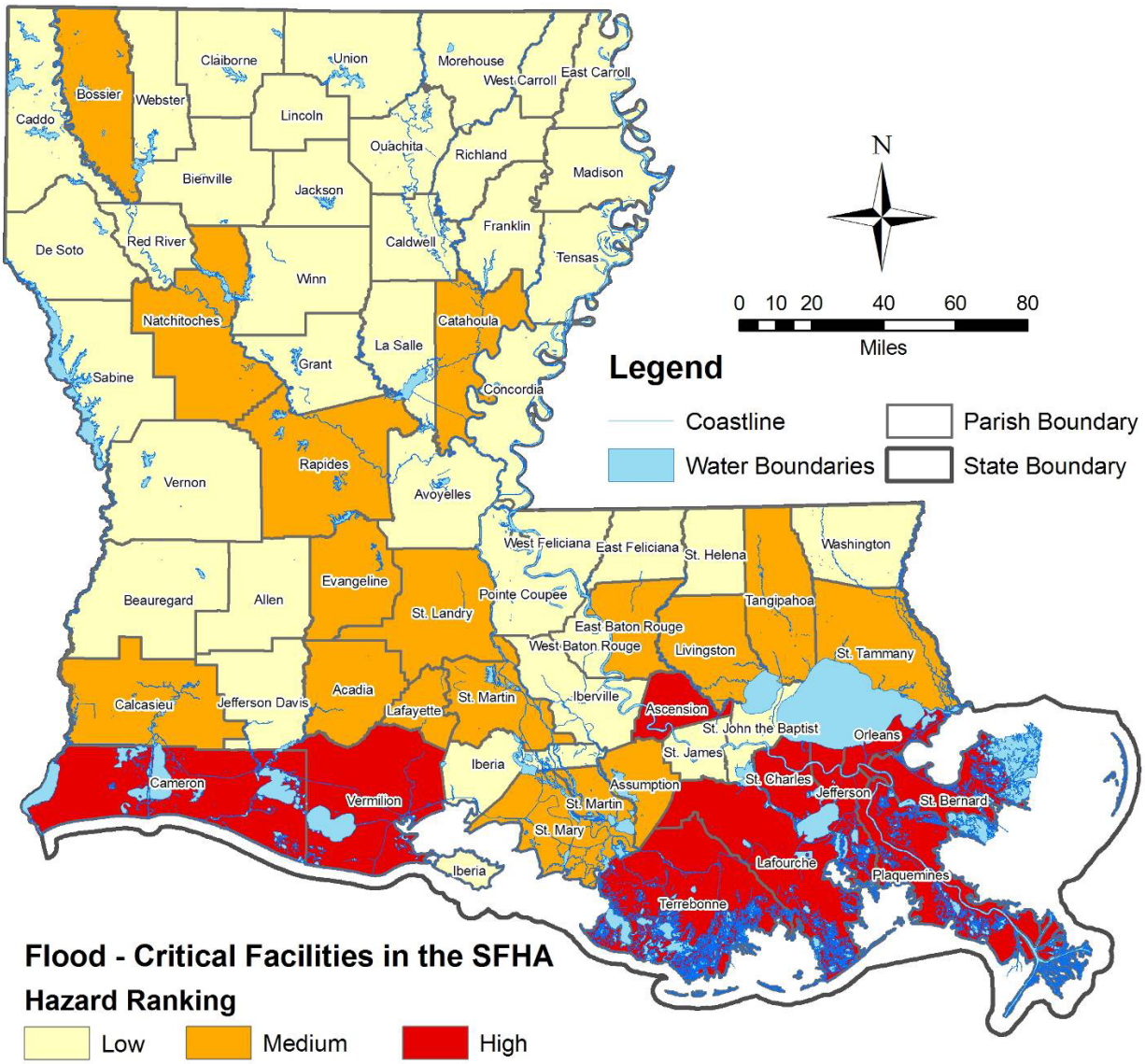
Parish	Total Critical Facilities	Critical Facilities in SFHA	% Critical Facilities in SFHA	Hazard Ranking	Parish	Total Critical Facilities	Critical Facilities in SFHA	% Critical Facilities in SFHA	Hazard Ranking
Acadia	64	19	29.7%	Medium	Madison	19	0	0.0%	Low
Allen	31	1	3.2%	Low	Morehouse	39	1	2.6%	Low
Ascension	64	26	40.6%	High	Natchitoches	46	7	15.2%	Medium
Assumption	27	8	29.6%	Medium	Orleans	169	81	47.9%	High
Avoyelles	64	4	6.3%	Low	Ouachita	119	11	9.2%	Low
Beauregard	45	0	0.0%	Low	Plaquemines	18	12	66.7%	High
Bienville	36	0	0.0%	Low	Pointe Coupee	31	2	6.5%	Low
Bossier	70	8	11.4%	Medium	Rapides	148	25	16.9%	Medium
Caddo	189	1	0.5%	Low	Red River	12	1	8.3%	Low
Calcasieu	141	16	11.3%	Medium	Richland	33	2	6.1%	Low
Caldwell	23	2	8.7%	Low	Sabine	42	1	2.4%	Low
Cameron	19	17	89.5%	High	St. Bernard	19	19	100.0%	High
Catahoula	27	8	29.6%	Medium	St. Charles	57	29	50.9%	High
Claiborne	25	1	4.0%	Low	St. Helena	21	1	4.8%	Low
Concordia	37	2	5.4%	Low	St. James	42	2	4.8%	Low
De Soto	43	1	2.3%	Low	St. John the Baptist	36	2	5.6%	Low
East Baton Rouge	261	48	18.4%	Medium	St. Landry	98	11	11.2%	Medium
East Carroll	13	0	0.0%	Low	St. Martin	46	7	15.2%	Medium
East Feliciana	32	0	0.0%	Low	St. Mary	69	24	34.8%	Medium
Evangeline	49	8	16.3%	Medium	St. Tammany	148	45	30.4%	Medium
Franklin	16	0	0.0%	Low	Tangipahoa	89	14	15.7%	Medium
Grant	29	0	0.0%	Low	Tensas	21	0	0.0%	Low
Iberia	55	3	5.5%	Low	Terrebonne	83	56	67.5%	High
Iberville	41	4	9.8%	Low	Union	29	0	0.0%	Low
Jackson	19	0	0.0%	Low	Vermilion	62	28	45.2%	High
Jefferson	215	150	69.8%	High	Vernon	57	2	3.5%	Low
Jefferson Davis	37	3	8.1%	Low	Washington	51	1	2.0%	Low
Lafayette	126	20	15.9%	Medium	Webster	78	3	3.8%	Low
Lafourche	80	47	58.8%	High	West Baton Rouge	35	0	0.0%	Low
La Salle	33	2	6.1%	Low	West Carroll	35	1	2.9%	Low
Lincoln	51	2	3.9%	Low	West Feliciana	21	0	0.0%	Low
Livingston	102	29	28.4%	Medium	Winn	19	0	0.0%	Low

Map E-14: Critical Facilities per Parish within the SFHA



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Critical Facilities), DFIRM/HAZUS (Special Flood Hazard Area)

Map E-15: Parishes Ranked by Critical Facilities within the SFHA



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Critical Facilities), DFIRM/HAZUS (Special Flood Hazard Area)

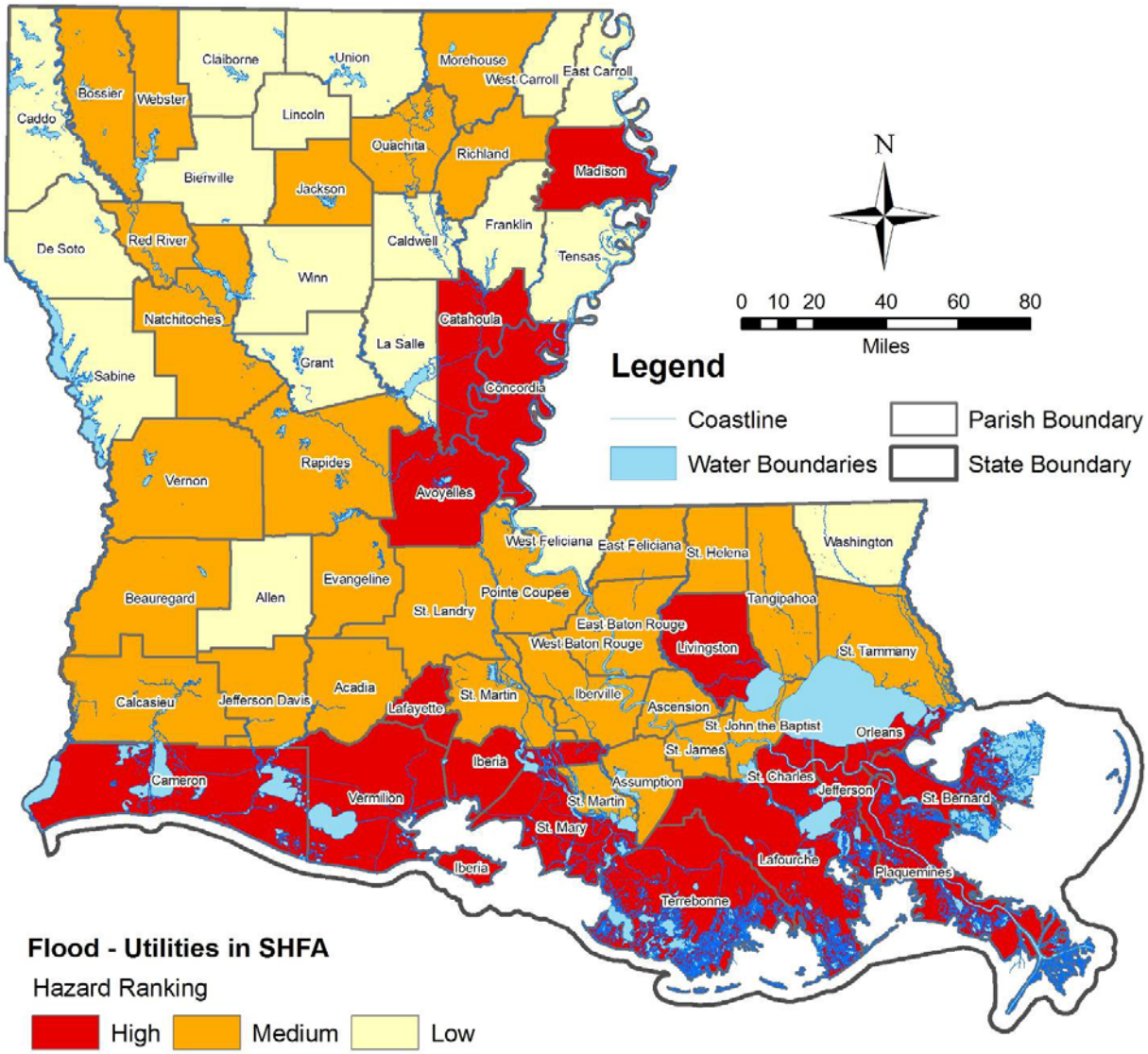
The quantity of utility providers and power lines by parish within the SHFA is shown in Table E-18. Map E-17 shows the parishes ranked by quantity.

Table E-18: Utility Providers and Power Lines per Parish within the SFHA

Parish	Total Utility Providers	Utility Providers in SFHA	% Utility Providers in SFHA	Miles of Power Lines	Miles of Power Lines in SFHA	% Power Lines in SFHA	Hazard Ranking
Acadia	87	25	28.7%	272.71	72.93	26.7%	Medium
Allen	18	3	16.7%	29.36	7.22	24.6%	Low
Ascension	233	74	31.8%	126.03	54.96	43.6%	Medium
Assumption	20	8	40.0%	24.65	10.11	41.0%	Medium
Avoyelles	21	5	23.8%	14.92	13.16	88.2%	High
Beauregard	19	5	26.3%	106.20	10.46	9.9%	Medium
Bienville	17	1	5.9%	85.82	11.16	13.0%	Low
Bossier	65	17	26.2%	24.06	3.27	13.6%	Medium
Caddo	163	20	12.3%	211.32	40.83	19.3%	Low
Calcasieu	551	230	41.7%	515.08	189.71	36.8%	Medium
Caldwell	11	1	9.1%	30.65	1.66	5.4%	Low
Cameron	41	40	97.6%	95.93	93.66	97.6%	High
Catahoula	5	3	60.0%	49.32	13.85	28.1%	High
Claiborne	12	0	0.0%	26.49	1.13	4.2%	Low
Concordia	25	10	40.0%	107.28	53.72	50.1%	High
De Soto	59	3	5.1%	117.57	10.54	9.0%	Low
East Baton Rouge	8508	143	1.7%	381.83	122.07	32.0%	Medium
East Carroll	3	0	0.0%	18.42	0.18	1.0%	Low
East Feliciana	12	2	16.7%	91.81	23.54	25.6%	Medium
Evangeline	31	14	45.2%	99.04	44.40	44.8%	Medium
Franklin	15	3	20.0%	26.67	3.43	12.9%	Low
Grant	12	1	8.3%	39.63	6.07	15.3%	Low
Iberia	107	42	39.3%	80.07	42.51	53.1%	High
Iberville	296	47	15.9%	202.46	74.96	37.0%	Medium
Jackson	16	6	37.5%	50.28	6.52	13.0%	Medium
Jefferson	383	246	64.2%	178.22	149.57	83.9%	High
Jefferson Davis	50	17	34.0%	185.21	54.84	29.6%	Medium
Lafayette	330	104	31.5%	167.52	84.62	50.5%	High
Lafourche	120	97	80.8%	203.53	179.92	88.4%	High
La Salle	14	0	0.0%	62.58	6.31	10.1%	Low
Lincoln	41	3	7.3%	79.64	7.72	9.7%	Low
Livingston	106	63	59.4%	81.86	47.32	57.8%	High
Madison	10	7	70.0%	82.40	41.54	50.4%	High
Morehouse	34	0	0.0%	81.01	38.13	47.1%	Medium

Parish	Total Utility Providers	Utility Providers in SFHA	% Utility Providers in SFHA	Miles of Power Lines	Miles of Power Lines in SFHA	% Power Lines in SFHA	Hazard Ranking
Natchitoches	43	12	27.9%	77.28	31.60	40.9%	Medium
Orleans	174	122	70.1%	131.83	98.21	74.5%	High
Ouachita	172	48	27.9%	165.39	61.29	37.1%	Medium
Plaquemines	147	138	93.9%	130.81	130.45	99.7%	High
Pointe Coupee	79	19	24.1%	179.52	78.69	43.8%	Medium
Rapides	122	38	31.1%	192.24	82.32	42.8%	Medium
Red River	10	3	30.0%	62.27	18.07	29.0%	Medium
Richland	16	5	31.3%	52.59	11.42	21.7%	Medium
Sabine	25	2	8.0%	104.45	8.87	8.5%	Low
St. Bernard	112	96	85.7%	45.90	44.92	97.9%	High
St. Charles	195	95	48.7%	192.05	144.08	75.0%	High
St. Helena	7	2	28.6%	40.47	5.83	14.4%	Medium
St. James	128	53	41.4%	68.73	25.49	37.1%	Medium
St. John the Baptist	95	30	31.6%	79.67	27.78	34.9%	Medium
St. Landry	89	44	49.4%	186.16	78.47	42.1%	Medium
St. Martin	75	23	30.7%	94.98	35.23	37.1%	Medium
St. Mary	101	48	47.5%	61.39	48.37	78.8%	High
St. Tammany	321	136	42.4%	142.12	70.27	49.4%	Medium
Tangipahoa	187	38	20.3%	109.73	52.79	48.1%	Medium
Tensas	5	0	0.0%	0.00	-	0.0%	Low
Terrebonne	167	108	64.7%	79.26	71.43	90.1%	High
Union	17	0	0.0%	110.76	18.57	16.8%	Low
Vermilion	81	45	55.6%	118.76	57.91	48.8%	High
Vernon	52	14	26.9%	89.46	18.16	20.3%	Medium
Washington	52	5	9.6%	116.27	12.01	10.3%	Low
Webster	47	13	27.7%	92.83	15.95	17.2%	Medium
West Baton Rouge	144	19	13.2%	118.54	30.33	25.6%	Medium
West Carroll	10	2	20.0%	43.39	4.02	9.3%	Low
West Feliciana	52	4	7.7%	71.11	9.46	13.3%	Low
Winn	18	0	0.0%	64.62	7.20	11.2%	Low

Map E-16: Parishes Ranked by Utility Providers and Power Lines within the SFHA



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Utility Providers, Power Lines), DFIRM/HAZUS (Special Flood Hazard Area)

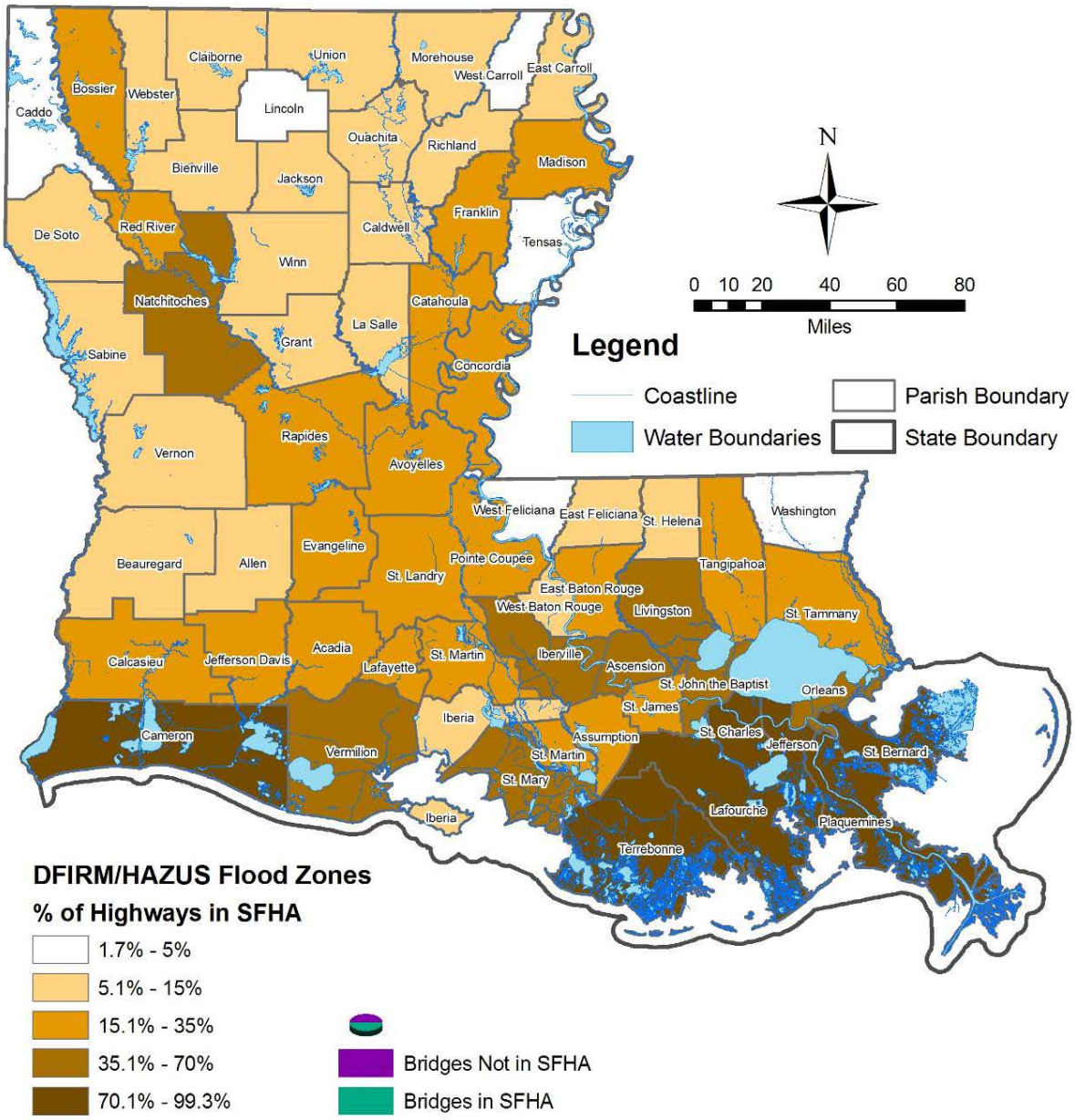
The quantity of transportation infrastructure, bridges, roadways and railways, by parish within the SHFA is shown in Table E-19. Map E-17 shows the Roadways and Bridges, while Map E-18 shows Railways. Map E-19 shows the parishes ranked by quantity.

Table E-19: Bridges, Roadways and Railways per Parish within the SFHA

Parish	Total Bridges	Bridges in SFHA	% Bridges in SFHA	Miles of Highways	Miles of Highways in SFHA	% Highways in SFHA	Miles of Railways	Miles of Railways in SFHA	% Railways in SFHA	Hazard Ranking
Acadia	296	180	60.8%	104.4	30.7	29.4%	60.6	21.7	35.8%	Medium
Allen	183	107	58.5%	102.7	14.8	14.5%	73.9	11.7	15.8%	Medium
Ascension	189	157	83.1%	112.0	42.4	37.9%	73.5	17.8	24.2%	High
Assumption	50	30	60.0%	78.1	20.3	26.0%	10.9	7.3	66.6%	Medium
Avoyelles	156	131	84.0%	125.6	24.4	19.4%	50.1	13.0	26.0%	High
Beauregard	223	147	65.9%	158.4	8.3	5.2%	96.9	8.4	8.6%	Medium
Bienville	191	109	57.1%	148.3	7.7	5.2%	59.6	12.4	20.9%	Medium
Bossier	249	144	57.8%	165.6	40.7	24.6%	107.1	22.6	21.1%	Medium
Caddo	562	174	31.0%	244.0	11.5	4.7%	175.2	6.9	4.0%	Low
Calcasieu	382	210	55.0%	252.6	58.8	23.3%	137.2	41.5	30.2%	Medium
Caldwell	125	69	55.2%	82.9	9.0	10.9%	32.5	0.8	2.5%	Medium
Cameron	53	52	98.1%	127.0	125.4	98.7%	0.0	0.0	0.0%	High
Catahoula	68	35	51.5%	113.1	24.6	21.8%	0.0	0.0	0.0%	Medium
Claiborne	156	97	62.2%	169.6	8.8	5.2%	34.5	7.2	20.9%	Medium
Concordia	37	28	75.7%	127.8	23.4	18.3%	0.0	0.0	0.0%	High
De Soto	225	117	52.0%	191.2	13.2	6.9%	79.5	3.6	4.5%	Medium
East Baton Rouge	457	320	70.0%	189.8	40.2	21.2%	76.8	13.1	17.1%	Medium
East Carroll	59	23	39.0%	61.1	3.5	5.7%	35.5	0.5	1.3%	Low
East Feliciana	143	86	60.1%	61.9	5.3	8.5%	30.7	3.3	10.6%	Medium
Evangeline	185	139	75.1%	111.7	22.5	20.2%	35.1	7.2	20.4%	High
Franklin	143	89	62.2%	95.7	21.0	21.9%	0.0	0.0	0.0%	Medium
Grant	153	79	51.6%	152.1	9.7	6.4%	99.0	5.5	5.5%	Medium
Iberia	125	83	66.4%	57.3	8.3	14.5%	48.1	14.8	30.9%	Medium
Iberville	81	60	74.1%	39.0	13.8	35.3%	61.1	3.9	6.4%	Medium
Jackson	154	74	48.1%	101.3	6.5	6.5%	14.1	2.4	17.4%	Low
Jefferson	252	193	76.6%	151.3	115.7	76.5%	83.4	34.6	41.5%	High
Jefferson Davis	244	183	75.0%	132.3	29.1	22.0%	55.2	13.4	24.3%	Medium
Lafayette	274	201	73.4%	132.7	23.5	17.7%	29.9	7.6	25.4%	Medium
Lafourche	106	101	95.3%	225.8	181.4	80.4%	46.8	26.2	55.9%	High
La Salle	192	94	49.0%	87.6	4.7	5.4%	19.7	0.8	4.3%	Low
Lincoln	190	133	70.0%	123.7	5.9	4.8%	31.7	4.7	14.9%	Medium
Livingston	243	208	85.6%	93.1	35.9	38.5%	25.6	16.7	65.2%	High
Madison	97	68	70.1%	95.1	15.5	16.2%	50.6	8.6	16.9%	Medium

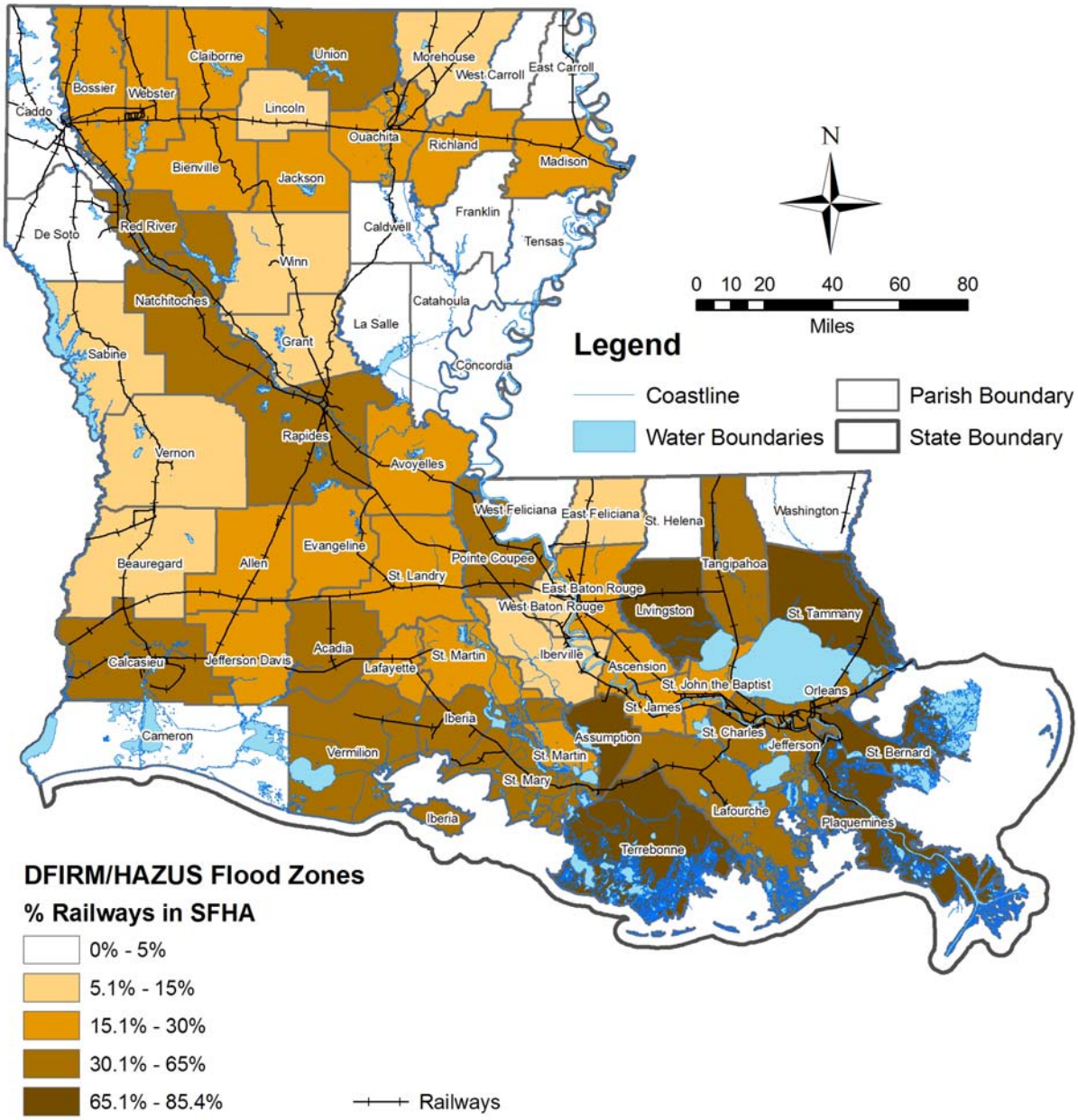
Parish	Total Bridges	Bridges in SFHA	% Bridges in SFHA	Miles of Highways	Miles of Highways in SFHA	% Highways in SFHA	Miles of Railways	Miles of Railways in SFHA	% Railways in SFHA	Hazard Ranking
Morehouse	135	92	68.1%	92.0	5.9	6.4%	78.0	6.6	8.4%	Medium
Natchitoches	287	213	74.2%	208.6	76.3	36.6%	71.6	43.3	60.4%	Medium
Orleans	324	238	73.5%	179.1	123.1	68.7%	115.1	58.7	51.0%	Medium
Ouachita	292	210	71.9%	154.7	23.1	14.9%	110.2	19.8	17.9%	Medium
Plaquemines	32	31	96.9%	108.9	103.5	95.0%	37.7	30.0	79.6%	High
Pointe Coupee	50	39	78.0%	94.4	26.3	27.9%	97.5	30.8	31.6%	High
Rapides	477	254	53.2%	373.6	84.1	22.5%	164.5	55.0	33.4%	Medium
Red River	67	37	55.2%	95.8	27.1	28.3%	63.1	28.5	45.2%	Medium
Richland	225	149	66.2%	128.7	16.3	12.6%	28.1	5.5	19.6%	Medium
Sabine	160	93	58.1%	137.4	9.5	6.9%	51.0	4.8	9.4%	Medium
St. Bernard	24	23	95.8%	46.7	46.4	99.3%	19.1	15.0	78.6%	High
St. Charles	76	61	80.3%	58.6	50.2	85.7%	90.0	50.6	56.2%	High
St. Helena	148	75	50.7%	40.0	2.9	7.3%	0.0	0.0	0.0%	Medium
St. James	23	7	30.4%	79.0	12.7	16.1%	60.6	13.3	22.0%	Low
St. John the Baptist	39	36	92.3%	73.2	40.9	55.9%	74.7	20.8	27.9%	High
St. Landry	327	197	60.2%	181.1	60.1	33.2%	90.9	23.8	26.1%	Medium
St. Martin	112	94	83.9%	72.8	20.3	27.8%	10.5	1.9	18.5%	High
St. Mary	127	94	74.0%	109.5	45.7	41.8%	69.6	33.8	48.6%	Medium
St. Tammany	305	240	78.7%	240.1	71.0	29.6%	35.6	26.0	72.9%	High
Tangipahoa	466	384	82.4%	201.7	52.1	25.8%	68.7	23.2	33.7%	High
Tensas	44	21	47.7%	59.3	2.2	3.7%	0.0	0.0	0.0%	Low
Terrebonne	147	119	81.0%	170.7	128.6	75.4%	17.0	14.6	85.4%	High
Union	110	80	72.7%	120.4	9.8	8.1%	7.4	2.3	31.0%	Medium
Vermilion	263	226	85.9%	139.1	91.2	65.5%	21.6	9.1	42.0%	High
Vernon	288	234	81.3%	262.2	21.0	8.0%	50.4	4.5	8.9%	High
Washington	278	143	51.4%	116.8	5.3	4.5%	26.4	0.6	2.1%	Medium
Webster	194	130	67.0%	159.8	18.1	11.3%	115.2	17.7	15.3%	Medium
West Baton Rouge	61	28	45.9%	46.2	5.8	12.5%	67.9	8.9	13.2%	Low
West Carroll	115	57	49.6%	60.6	1.0	1.7%	0.0	0.0	0.0%	Low
West Feliciana	91	37	40.7%	37.0	1.1	3.0%	5.0	0.0	0.5%	Low
Winn	203	100	49.3%	128.3	6.7	5.2%	50.9	5.6	11.0%	Low

Map E-17: Bridges and Roadways per Parish within the SFHA



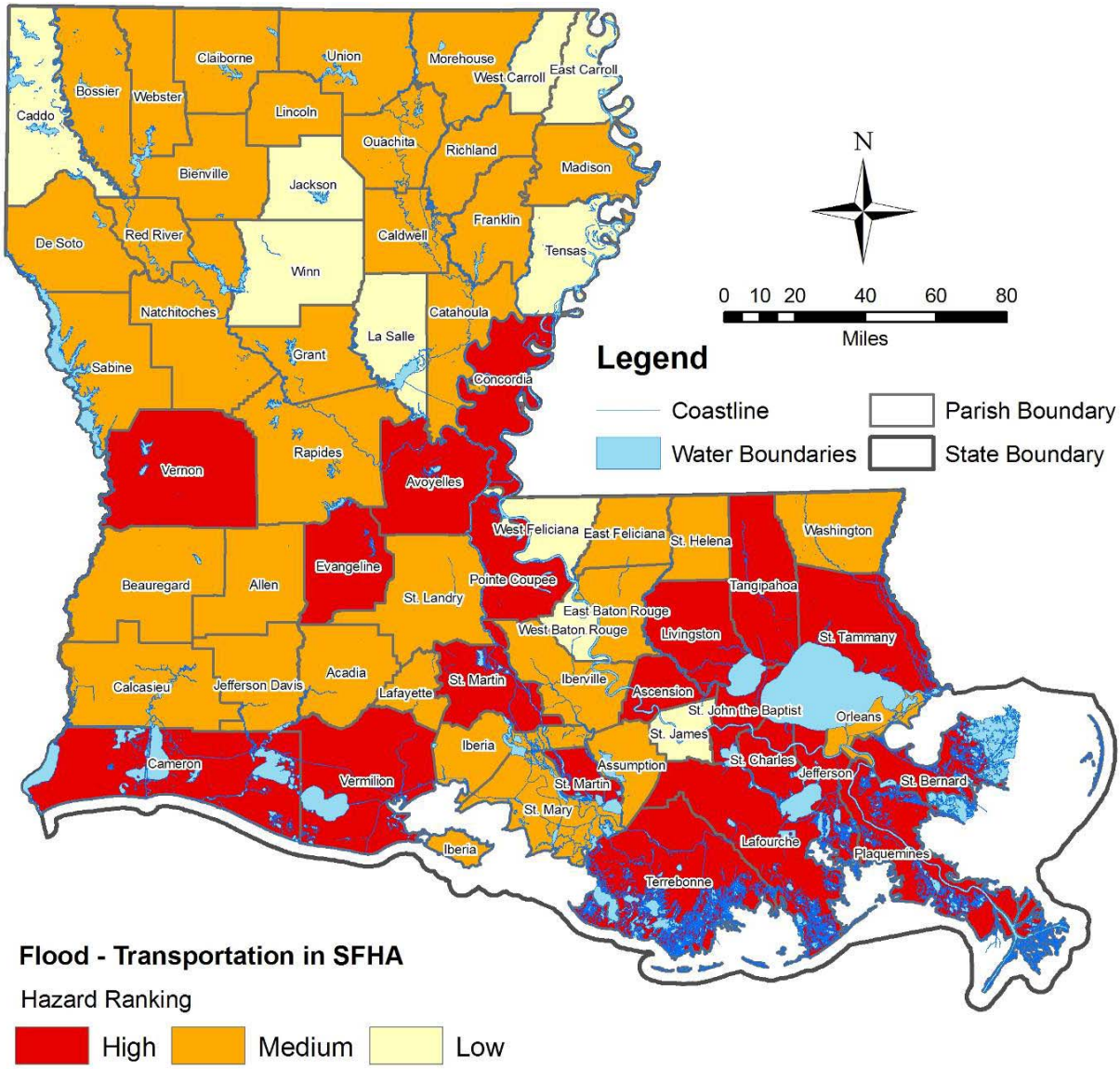
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Highways and Railways), DFIRM/HAZUS (Special Flood Hazard Area), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

Map E-18: Railways per Parish within the SFHA



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Highways and Railways), DFIRM/HAZUS (Special Flood Hazard Area), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

Map E-19: Parishes Ranked by Transportation Infrastructure within the SFHA



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Highways and Railways), DFIRM/HAZUS (Special Flood Hazard Area), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

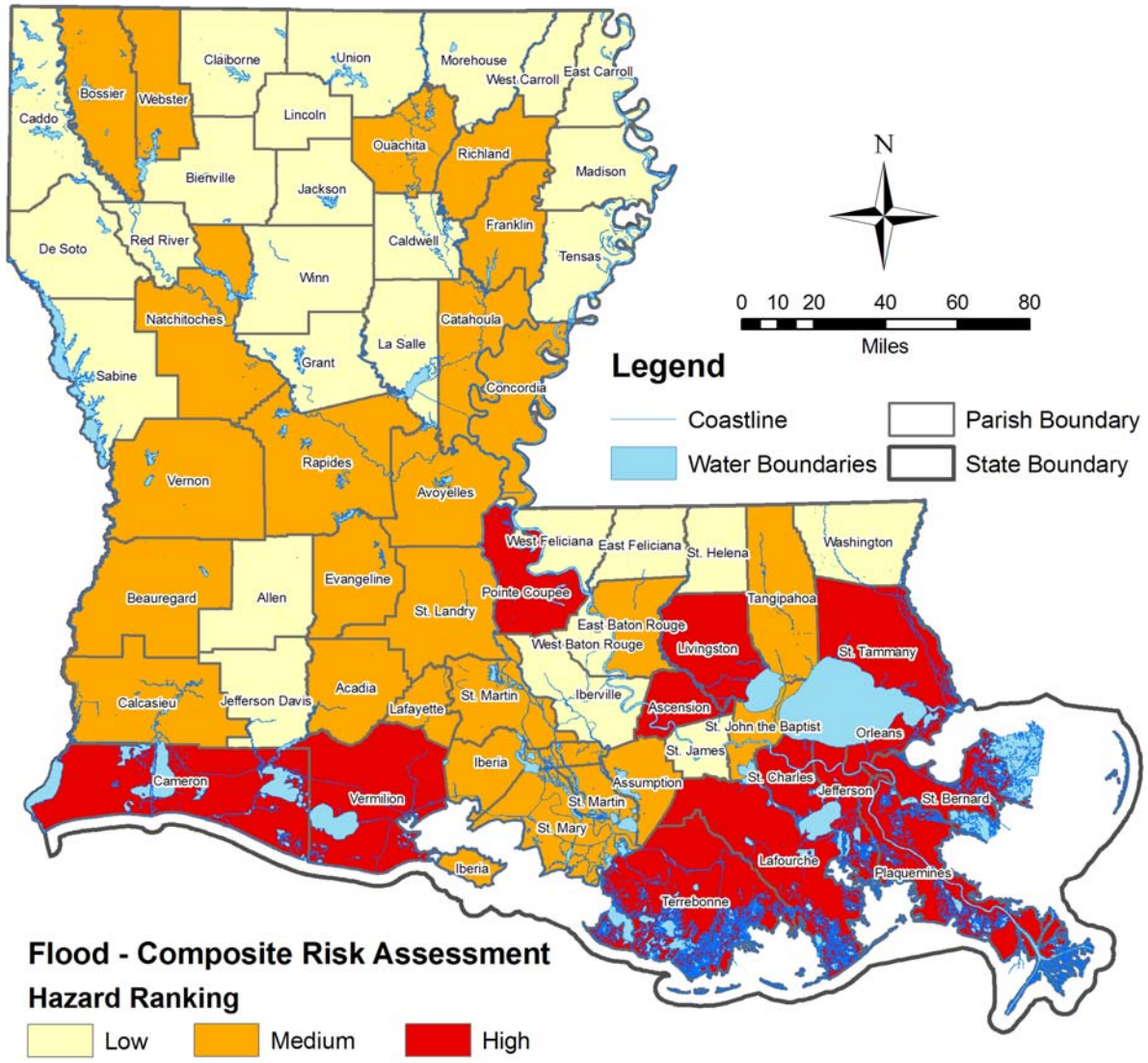
The Composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points and each low ranking one (1) point. Following this methodology the possible range of scores for flood is 3-9. A high Flood Hazard would be assigned to a parish receiving a score of 7 to 9, medium would be for parishes scoring 5 to 6, and low would be for any parish scoring 3 to 4.

Table E-20: Parishes Ranked by Composite Score

Parish	Impacted Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Rep Loss Hazard Ranking	Severe Rep Loss Hazard Ranking	Average NFIP Claim Hazard Ranking	Critical Facilities Hazard Ranking	Utilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
Acadia	Medium	Medium	High	Medium	Low	Low	Medium	Medium	Medium	17
Allen	Medium	Medium	Medium	Low	Low	Medium	Low	Low	Medium	14
Ascension	Medium	High	High	High	Medium	Medium	High	Medium	High	23
Assumption	Medium	Medium	Medium	Low	Low	Medium	Medium	Medium	Medium	16
Avoyelles	Low	Medium	High	Medium	Medium	Medium	Low	High	High	19
Beauregard	Low	Medium	High	Medium	Medium	Medium	Low	Medium	Medium	17
Bienville	Low	Low	Low	Low	Low	Low	Low	Low	Medium	10
Bossier	Low	Medium	High	Medium	Medium	Medium	Medium	Medium	Medium	18
Caddo	Low	Low	High	Medium	Low	Medium	Low	Low	Low	13
Calcasieu	Low	Medium	High	High	High	High	Medium	Medium	Medium	21
Caldwell	Low	Medium	Low	Low	Low	Medium	Low	Low	Medium	12
Cameron	High	High	Medium	High	High	High	High	High	High	26
Catahoula	Medium	High	Medium	High	Medium	Medium	Medium	High	Medium	21
Claiborne	Low	Low	Low	Low	Low	Low	Low	Low	Medium	10
Concordia	Low	Medium	Medium	Medium	Medium	Medium	Low	High	High	18
De Soto	Low	Medium	Medium	Low	Low	Low	Low	Low	Medium	12
East Baton Rouge	Medium	Medium	High	High	High	High	Medium	Medium	Medium	22
East Carroll	Low	Low	Low	Low	Low	Low	Low	Low	Low	9
East Feliciana	Low	Medium	Medium	Low	Low	Low	Low	Medium	Medium	13
Evangeline	Low	Medium	Medium	Low	Low	Low	Medium	Medium	High	15
Franklin	Low	Medium	Medium	Medium	Low	Medium	Low	Low	Medium	14
Grant	Low	Medium	Medium	Medium	Medium	Medium	Low	Low	Medium	15
Iberia	Low	Low	High	High	Medium	High	Low	High	Medium	19
Iberville	Medium	Low	Medium	Medium	Low	Low	Low	Medium	Medium	14
Jackson	Low	Low	Low	Low	Low	Low	Low	Medium	Low	10
Jefferson	High	High	High	High	High	High	High	High	High	27
Jefferson Davis	Low	Medium	Medium	Low	Low	Low	Low	Medium	Medium	13
Lafayette	Low	Medium	High	High	Medium	Medium	Medium	High	Medium	20
Lafourche	High	Medium	High	High	High	High	High	High	High	26

Parish	Impacted Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Rep Loss Hazard Ranking	Severe Rep Loss Hazard Ranking	Average NFIP Claim Hazard Ranking	Critical Facilities Hazard Ranking	Utilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
La Salle	Low	Low	Low	Medium	Medium	Medium	Low	Low	Low	12
Lincoln	Low	Medium	High	Low	Low	Low	Low	Low	Medium	13
Livingston	High	High	High	High	High	High	Medium	High	High	26
Madison	Medium	Medium	Low	Low	Low	Low	Low	High	Medium	14
Morehouse	Low	Low	Medium	Low	Low	Low	Low	Medium	Medium	12
Natchitoches	Low	Medium	High	Low	Medium	Medium	Medium	Medium	Medium	17
Orleans	High	High	High	High	High	High	High	High	Medium	26
Ouachita	Low	Medium	High	High	Medium	High	Low	Medium	Medium	19
Plaquemines	High	High	High	High	Medium	High	High	High	High	26
Pointe Coupee	Medium	High	High	High	High	Medium	Low	Medium	High	22
Rapides	Low	Medium	High	High	Medium	High	Medium	Medium	Medium	20
Red River	Low	Medium	Low	Low	Low	Low	Low	Medium	Medium	12
Richland	Medium	Medium	Medium	Medium	Medium	Medium	Low	Medium	Medium	17
Sabine	Low	Medium	Medium	Low	Low	Low	Low	Low	Medium	12
St. Bernard	High	High	High	High	High	High	High	High	High	27
St. Charles	High	High	High	High	High	High	High	High	High	27
St. Helena	Low	Medium	Low	Low	Low	Low	Low	Medium	Medium	12
St. James	Low	Low	Medium	Low	Low	Low	Low	Medium	Low	11
St. John the Baptist	Low	Low	High	Medium	Low	Medium	Low	Medium	High	16
St. Landry	Low	Medium	High	Low	Low	Medium	Medium	Medium	Medium	16
St. Martin	Medium	Medium	High	Medium	Low	Medium	Medium	Medium	High	19
St. Mary	Medium	Medium	High	High	Medium	Medium	Medium	High	Medium	21
St. Tammany	Medium	High	High	High	High	High	Medium	Medium	High	24
Tangipahoa	Medium	High	High	Medium	Medium	Medium	Medium	Medium	High	21
Tensas	Low	Low	Low	Low	Low	Low	Low	Low	Low	9
Terrebonne	High	High	High	High	High	High	High	High	High	27
Union	Low	Medium	Medium	Low	Low	Low	Low	Low	Medium	12
Vermilion	Medium	Medium	High	High	High	High	High	High	High	25
Vernon	Low	Medium	High	Low	Low	Low	Low	Medium	High	15
Washington	Low	Low	Medium	Medium	Low	Medium	Low	Low	Medium	13
Webster	Low	Medium	Medium	Low	Low	Low	Low	Medium	Medium	13
West Baton Rouge	Low	Low	Low	Low	Low	Low	Low	Medium	Low	10
West Carroll	Low	Medium	Low	Low	Low	Low	Low	Low	Low	10
West Feliciana	Low	Medium	Medium	Medium	Medium	Low	Low	Low	Low	13
Winn	Low	Medium	Medium	Low	Low	Low	Low	Low	Low	11

Map E-20: Parishes Ranked by Composite Score



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population), HSIP (Critical Facilities, Utilities), HAZUS-MH MR4 (Highways, Railways, Buildings), DFIRM/HAZUS (Special Flood Hazard Area), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges), FEMA December 9, 2009 (Rep Loss, SRL), National Flood Insurance Program (Average Losses)

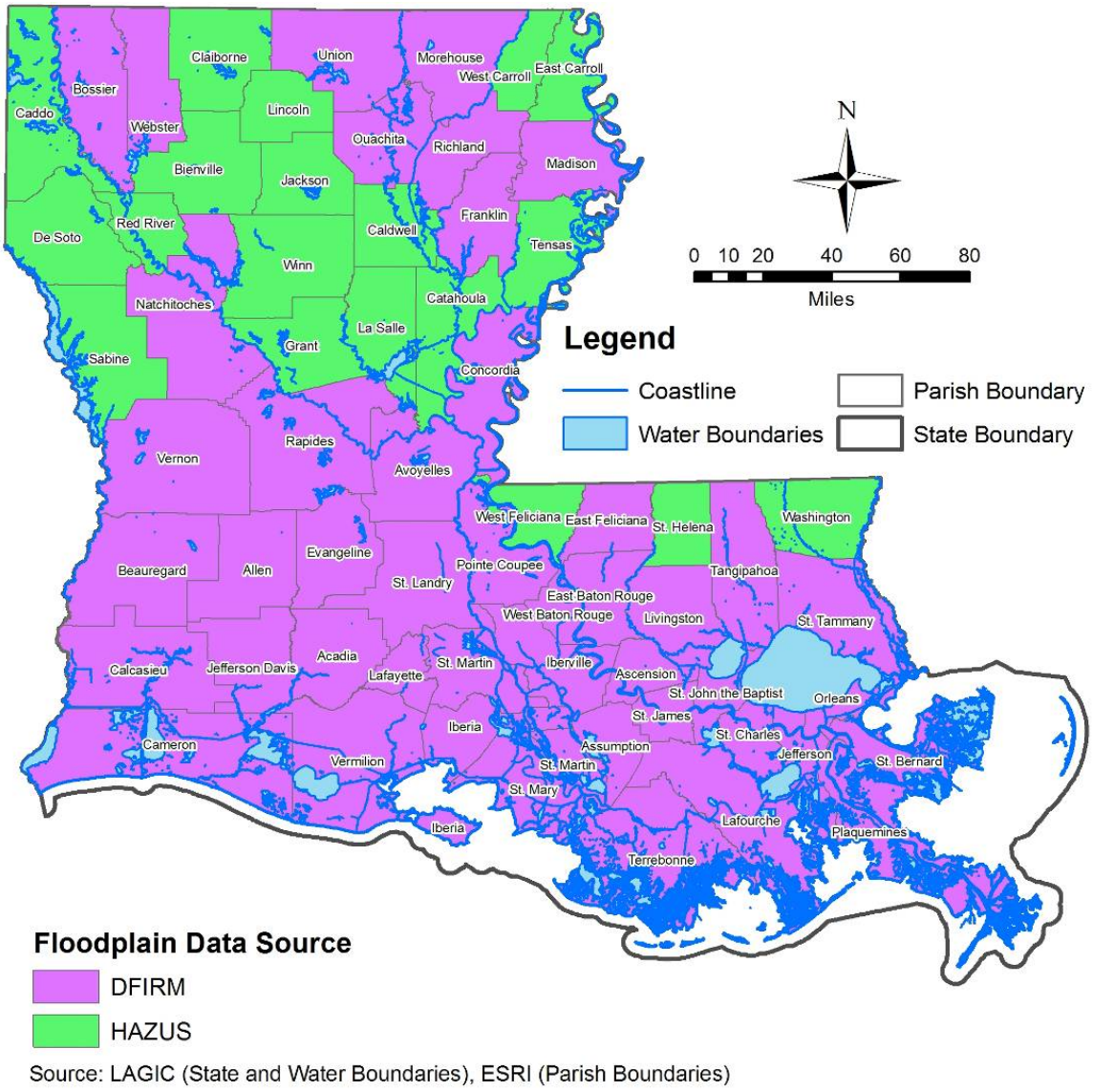
Methodology

The risk assessment utilized historical data from the NFIP flood claims database, based on claims paid to parishes during January 1, 1978 through December 31, 2009. The NFIP claims payments were used to calculate repetitive flood loss and 2009 average flood loss as well as RL and SRL flood losses.

Additionally, the SFHAs were determined using Digital Flood Insurance Rate Maps (DFIRMs) and HAZUS-MH. These in turn were used in conjunction with HAZUS-MH, the National Bridge Inventory, HSIP, and GOHSEP to identify on a statewide parish level the population, building stock, utilities and transportation elements that were within these areas.

Within Louisiana, DFIRMs are available for 45 parishes. The remaining 19 require the use of HAZUS-MH data in conjunction with paper FIRMS to determine the same data. Map E-21 shows the floodplain data source.

Map E-21: Floodplain Data Source



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries)

Data Limitations

Due to the size of the flood hazard shapefile, the ability to process and evaluate it through ArcMap (GIS) was limited. Most computers simply do not have the RAM to allow for manipulation of a shapefile that is well over a half a gigabyte in size. Attempts to make area calculations of the land covered by the SFHA were unsuccessful: either the calculations were clearly inaccurate or the program crashed during the attempt. Thus, an occurrence Risk Assessment showing the prominence of flood zones in certain parishes was not possible.

NFIP provides accurate yearly aggregates of claims made, but a historical time line is not available. Thus, the "Average Loss" shows the typical dollar value of claims in 2009, but it is not annualized—i.e., not representative of historic trends.

Appendix E.5

Hail

The hailstorm hazard ranking was based on parish-wide vulnerability. The level of vulnerability was based on the total number of historical incidents and property and crop damages reported in the NOAA database by parish (for the years 1955 through 2009). Utility providers include nuclear plants, sewage treatment plants, wastewater facilities, electric substations, and power plants. Critical Facilities include fire stations, law enforcement facilities, hospitals, schools, State EOCs, and EMS stations.

The high / medium / low rankings for each parish were developed by:

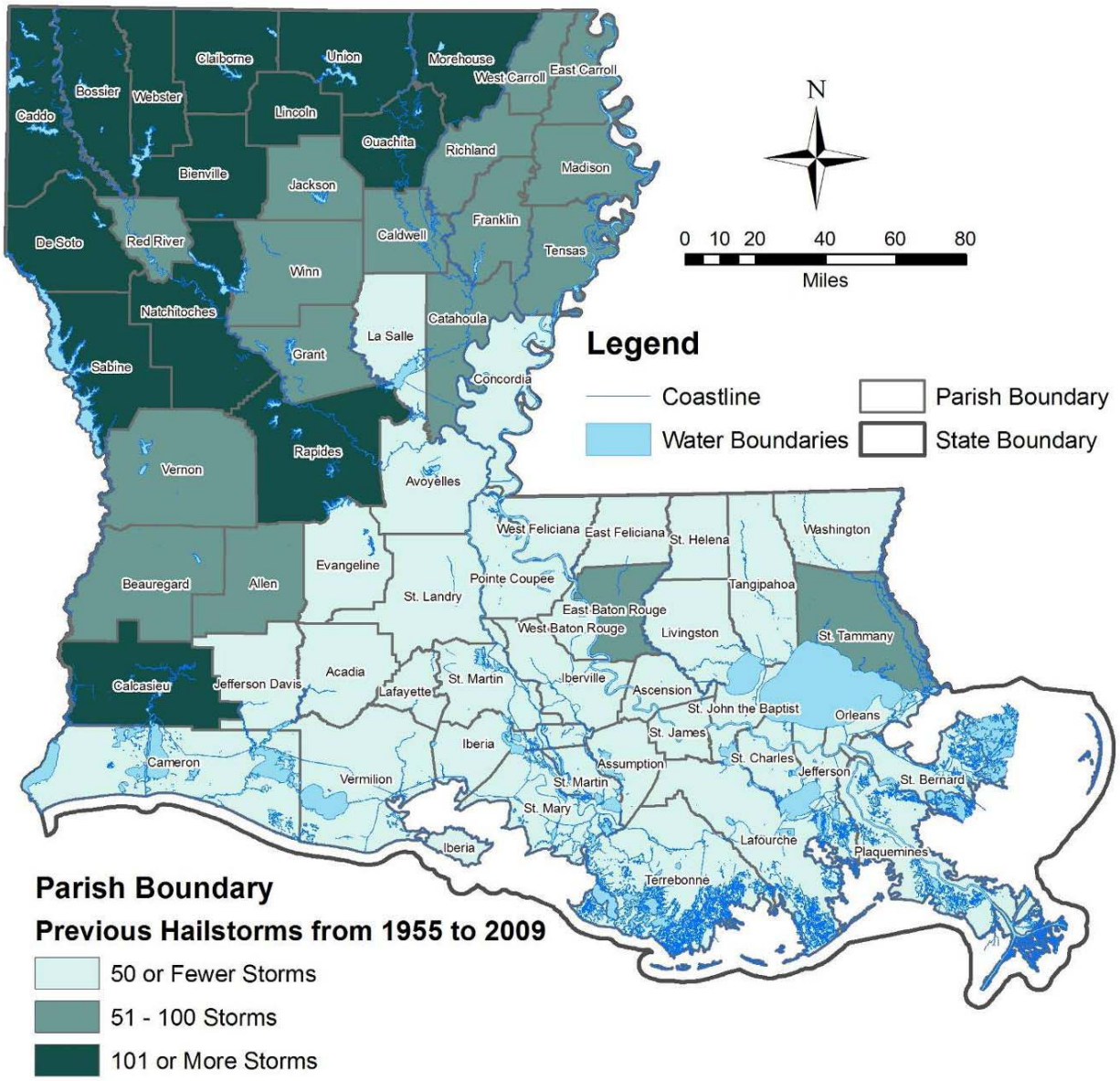
- Obtaining the NOAA data by parish;
- Sorting the list by parish from most to least number of storms
    - Assigning the high rank to parishes with more than 100 historical incidents;
    - Assigning the medium rank to parishes where historical incidents are between 51 and 100; and
    - Assigning the low rank to parishes with 50 or fewer incidents.
- Sorting the list by parish from highest to lowest property losses;
    - Assigning the high rank to parishes with more than $500 thousand in losses
    - Assigning the medium rank to parishes with more than $1 in losses
    - Assigning the low rank to parishes with $0 in losses
- Sorting the list by parish from highest to lowest crop losses;
    - Assigning the high rank to parishes with more than $500 thousand in losses
    - Assigning the medium rank to parishes with more than $1 in losses
    - Assigning the low rank to parishes with $0 in losses
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 10 or more;
    - Assigning the medium composite ranking to parishes with a score of 7 to 9; and
    - Assigning the low composite ranking to parishes with a score of 6 or less.

The hailstorm events by parish are shown in Table E-21 and Map E-22. Map E-23 shows the parishes ranked by number.

Table E-21: Number of Hailstorm Events per Parish

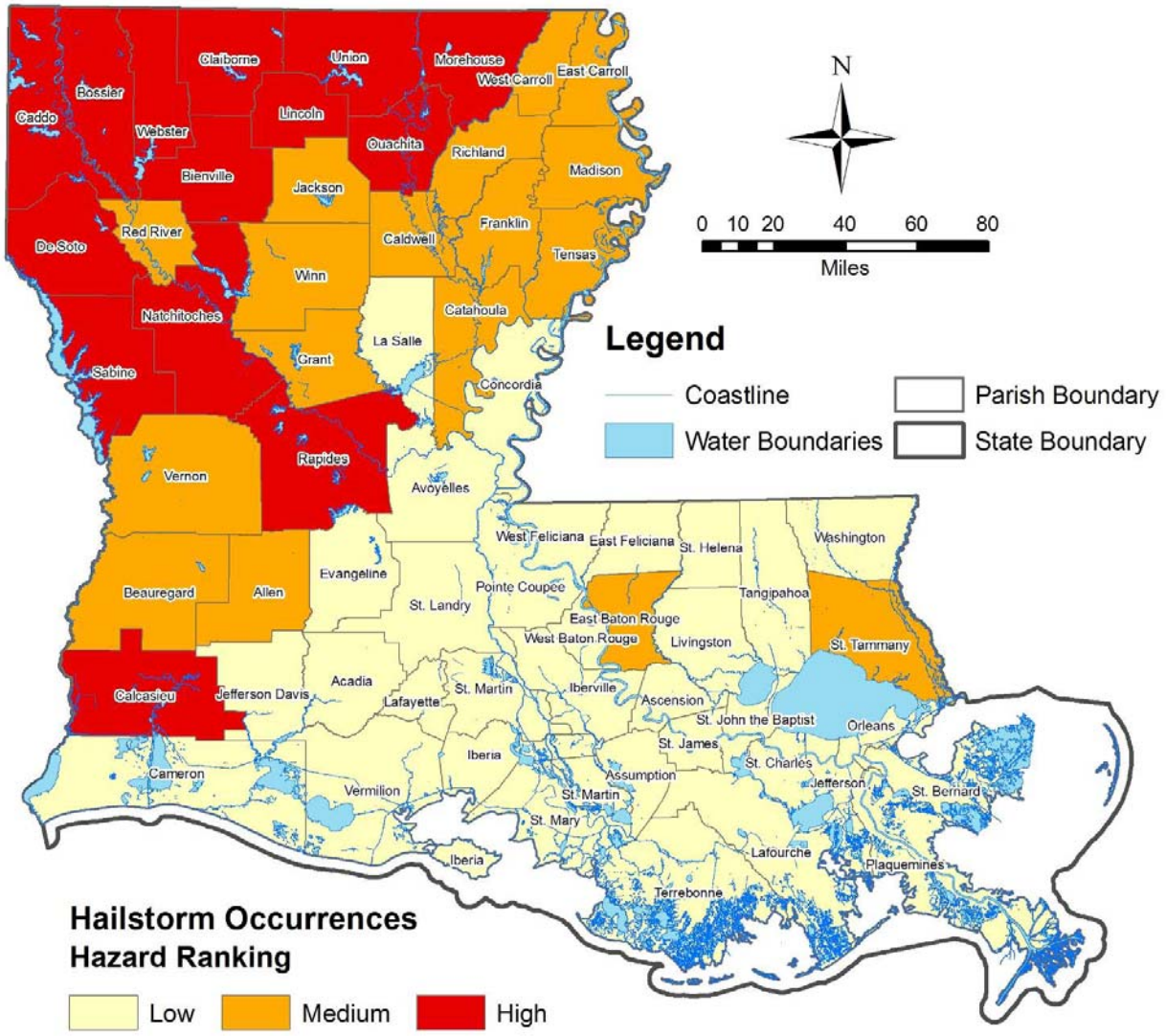
Parish	Number of Storms	Hazard Ranking	Parish	Number of Storms	Hazard Ranking
Acadia	36	Low	Madison	76	Medium
Allen	53	Medium	Morehouse	115	High
Ascension	18	Low	Natchitoches	143	High
Assumption	7	Low	Orleans	28	Low
Avoyelles	49	Low	Ouachita	176	High
Beauregard	73	Medium	Plaquemines	14	Low
Bienville	119	High	Pointe Coupee	26	Low
Bossier	277	High	Rapides	120	High
Caddo	440	High	Red River	64	Medium
Calcasieu	144	High	Richland	76	Medium
Caldwell	57	Medium	Sabine	131	High
Cameron	39	Low	St. Bernard	14	Low
Catahoula	51	Medium	St. Charles	35	Low
Claiborne	109	High	St. Helena	12	Low
Concordia	46	Low	St. James	10	Low
De Soto	161	High	St. John the Baptist	6	Low
East Baton Rouge	52	Medium	St. Landry	47	Low
East Carroll	60	Medium	St. Martin	19	Low
East Feliciana	16	Low	St. Mary	22	Low
Evangeline	37	Low	St. Tammany	59	Medium
Franklin	93	Medium	Tangipahoa	41	Low
Grant	54	Medium	Tensas	75	Medium
Iberia	25	Low	Terrebonne	18	Low
Iberville	23	Low	Union	122	High
Jackson	92	Medium	Vermilion	44	Low
Jefferson	46	Low	Vernon	80	Medium
Jefferson Davis	29	Low	Washington	40	Low
Lafayette	44	Low	Webster	201	High
Lafourche	22	Low	West Baton Rouge	13	Low
La Salle	42	Low	West Carroll	71	Medium
Lincoln	124	High	West Feliciana	11	Low
Livingston	41	Low	Winn	83	Medium

Map E-22: Number of Hailstorm Events per Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (hailstorm events)

Map E-23: Parishes Ranked by Number of Hailstorm Events



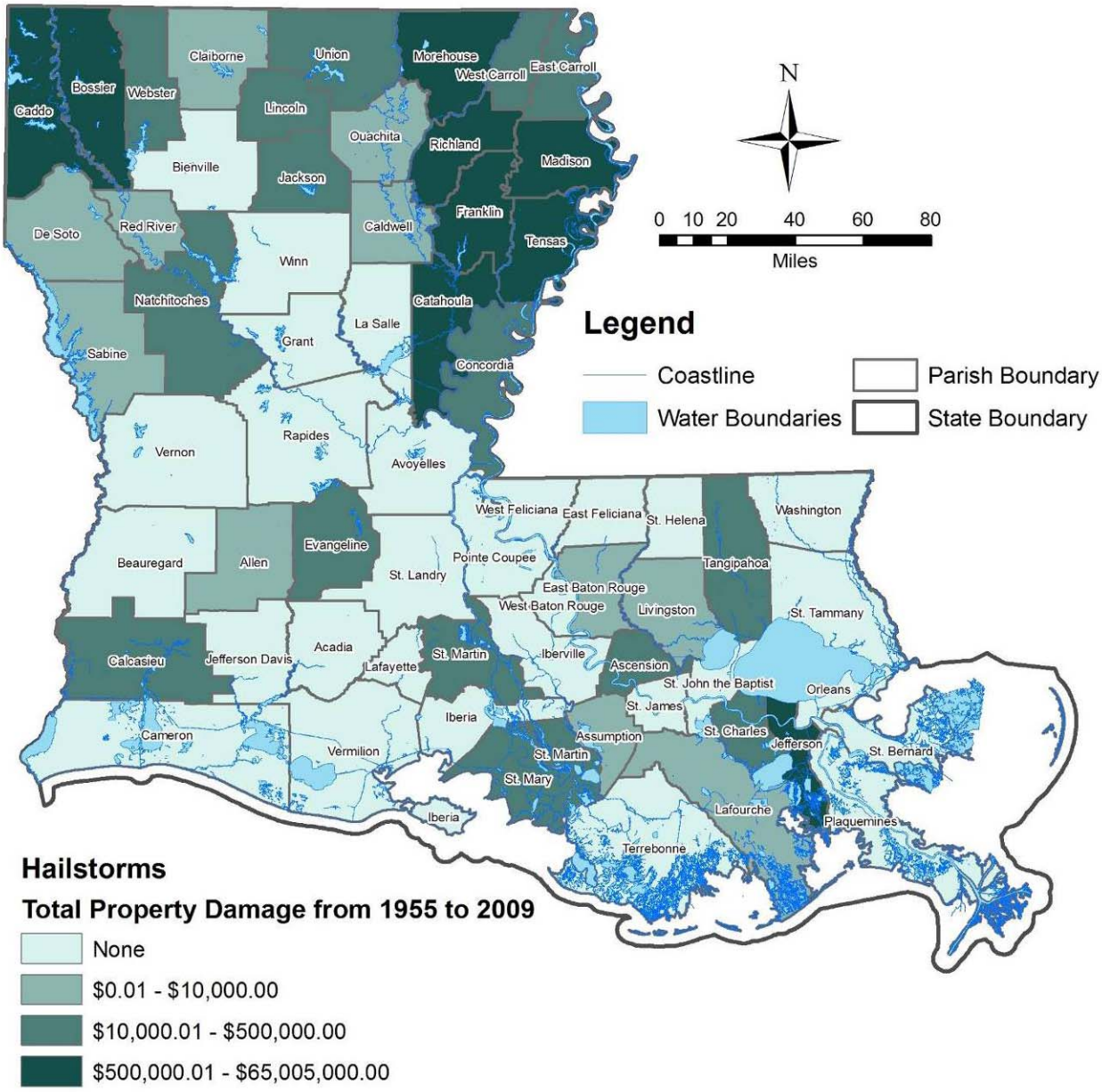
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (hailstorm events)

The total property losses from hailstorm events by parish are shown in Table E-22 and Map E-24. Map E-25 shows the parishes ranked by losses.

Table E-22: Total Property Losses per Parish

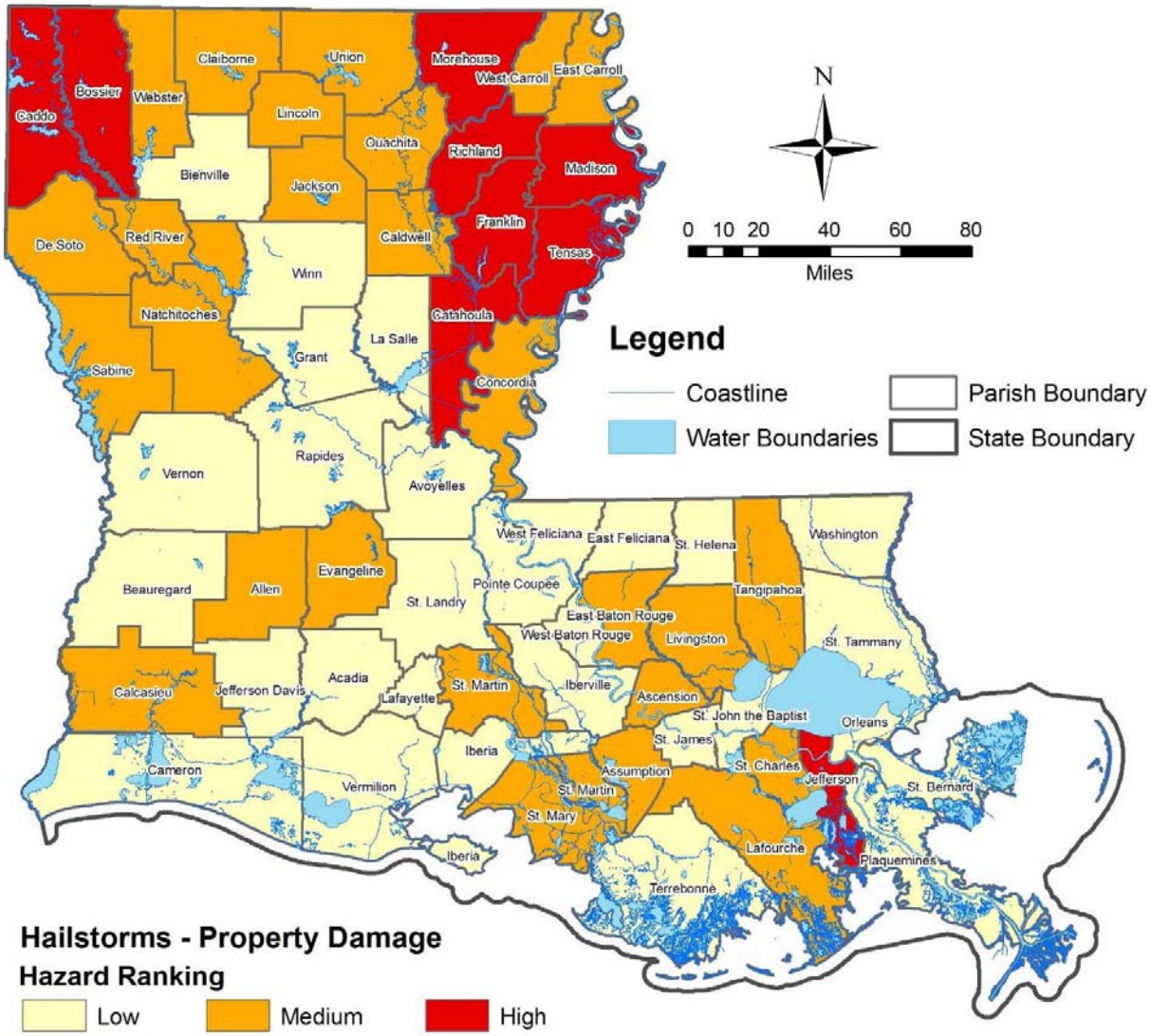
Parish	Total Property Damage 1950 - 2009	Hazard Ranking	Parish	Total Property Damage 1950 - 2009	Hazard Ranking
Acadia	$0	Low	Madison	$1,119,000	High
Allen	$10,000	Medium	Morehouse	$789,000	High
Ascension	$50,000	Medium	Natchitoches	$56,000	Medium
Assumption	$6,000	Medium	Orleans	$0	Low
Avoyelles	$0	Low	Ouachita	$2,000	Medium
Beauregard	$0	Low	Plaquemines	$0	Low
Bienville	$0	Low	Pointe Coupee	$0	Low
Bossier	$50,020,000	High	Rapides	$0	Low
Caddo	$50,123,000	High	Red River	$1,000	Medium
Calcasieu	$56,000	Medium	Richland	$585,000	High
Caldwell	$3,000	Medium	Sabine	$6,000	Medium
Cameron	$0	Low	St. Bernard	$0	Low
Catahoula	$634,000	High	St. Charles	$15,000	Medium
Claiborne	$1,000	Medium	St. Helena	$0	Low
Concordia	$218,000	Medium	St. James	$0	Low
De Soto	$1,000	Medium	St. John the Baptist	$0	Low
East Baton Rouge	$5,000	Medium	St. Landry	$0	Low
East Carroll	$153,000	Medium	St. Martin	$11,000	Medium
East Feliciana	$0	Low	St. Mary	$100,000	Medium
Evangeline	$20,000	Medium	St. Tammany	$0	Low
Franklin	$1,302,000	High	Tangipahoa	$56,000	Medium
Grant	$0	Low	Tensas	$892,000	High
Iberia	$0	Low	Terrebonne	$0	Low
Iberville	$0	Low	Union	$19,000	Medium
Jackson	$50,000	Medium	Vermilion	$0	Low
Jefferson	$65,005,000	High	Vernon	$0	Low
Jefferson Davis	$0	Low	Washington	$0	Low
La Salle	$0	Low	Webster	$42,000	Medium
Lafayette	$0	Low	West Baton Rouge	$0	Low
Lafourche	$1,000	Medium	West Carroll	$156,000	Medium
Lincoln	$252,000	Medium	West Feliciana	$0	Low
Livingston	$2,000	Medium	Winn	$0	Low

Map E-24: Total Property Losses by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (hailstorm events)

Map E-25. Parishes Ranked by Total Property Losses



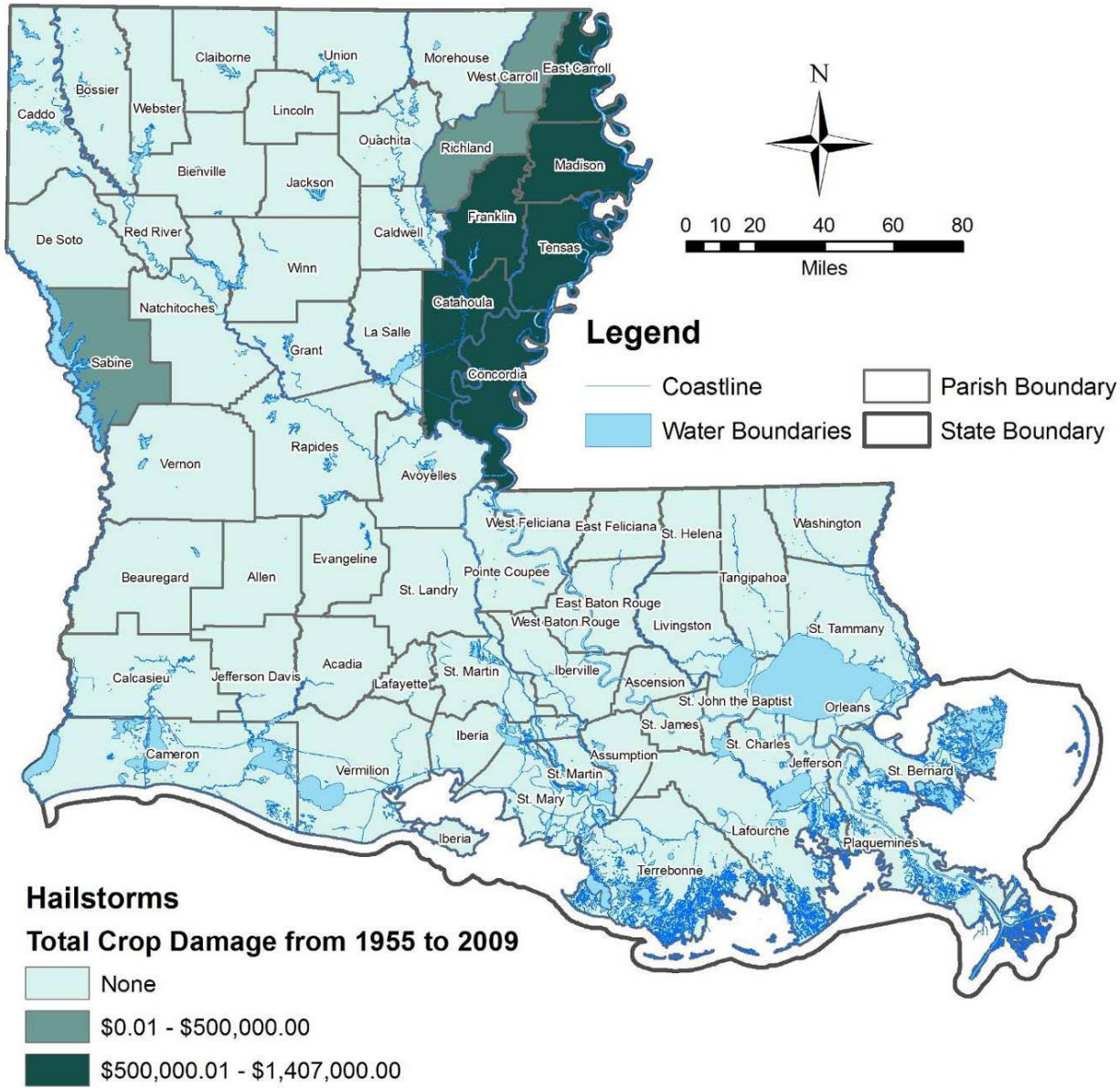
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (hailstorm events)

The total reported crop losses from hailstorm events by parish are shown in Table E-23 and Map E-26. Map E-27 shows the parishes ranked by losses.

Table E-23: Total Crop Losses per Parishes

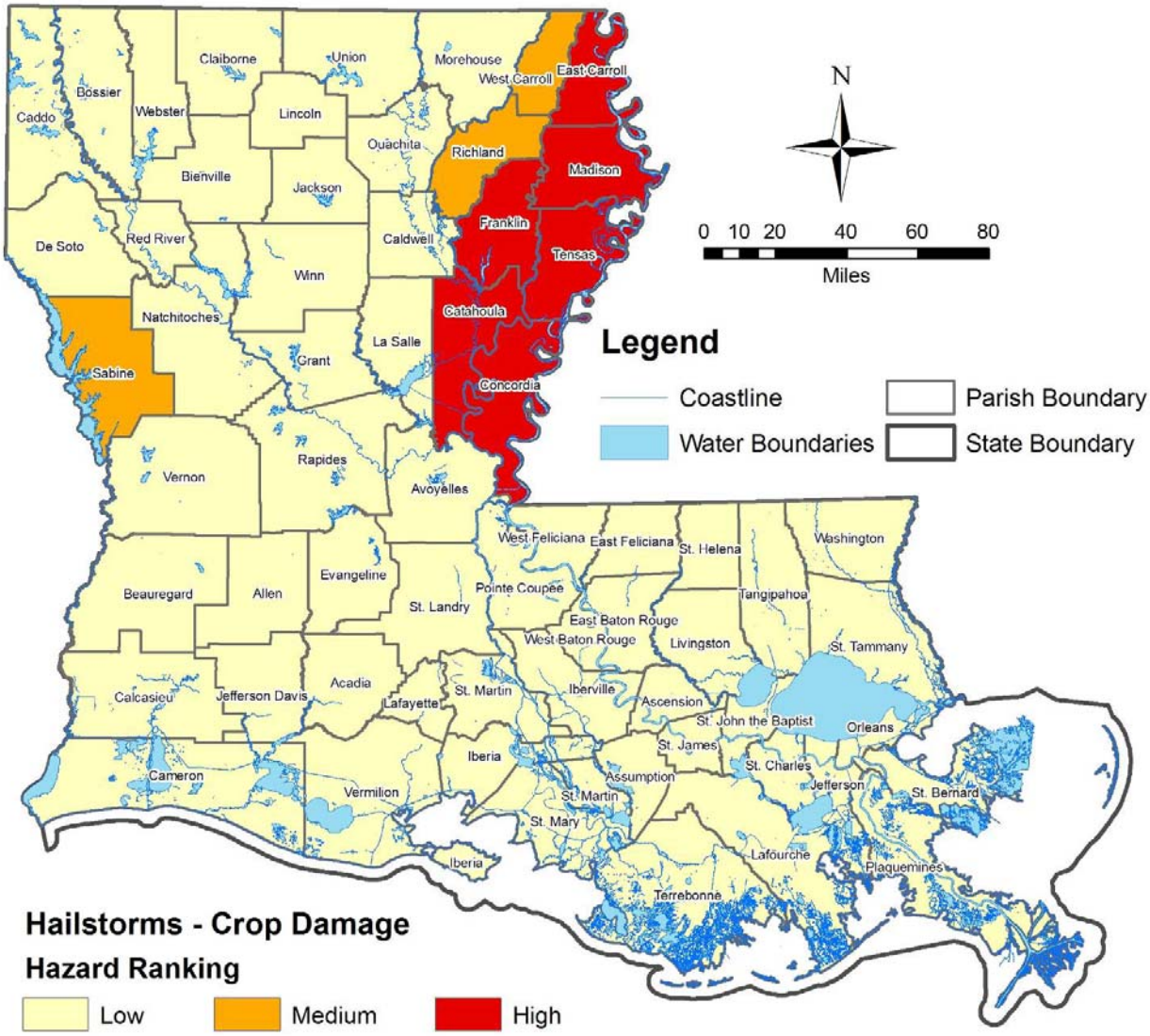
Parish	Total Crop Damage 1950-2009	Hazard Ranking	Parish	Total Crop Damage 1950-2009	Hazard Ranking
Acadia	$0	Low	Madison	$1,200,000	High
Allen	$0	Low	Morehouse	$0	Low
Ascension	$0	Low	Natchitoches	$0	Low
Assumption	$0	Low	Orleans	$0	Low
Avoyelles	$0	Low	Ouachita	$0	Low
Beauregard	$0	Low	Plaquemines	$0	Low
Bienville	$0	Low	Pointe Coupee	$0	Low
Bossier	$0	Low	Rapides	$0	Low
Caddo	$0	Low	Red River	$0	Low
Calcasieu	$0	Low	Richland	$200,000	Medium
Caldwell	$0	Low	Sabine	$50,000	Medium
Cameron	$0	Low	St. Bernard	$0	Low
Catahoula	$680,000	High	St. Charles	$0	Low
Claiborne	$0	Low	St. Helena	$0	Low
Concordia	$600,000	High	St. James	$0	Low
De Soto	$0	Low	St. John the Baptist	$0	Low
East Baton Rouge	$0	Low	St. Landry	$0	Low
East Carroll	$700,000	High	St. Martin	$0	Low
East Feliciana	$0	Low	St. Mary	$0	Low
Evangeline	$0	Low	St. Tammany	$0	Low
Franklin	$1,407,000	High	Tangipahoa	$0	Low
Grant	$0	Low	Tensas	$1,200,000	High
Iberia	$0	Low	Terrebonne	$0	Low
Iberville	$0	Low	Union	$0	Low
Jackson	$0	Low	Vermilion	$0	Low
Jefferson	$0	Low	Vernon	$0	Low
Jefferson Davis	$0	Low	Washington	$0	Low
Lafayette	$0	Low	Webster	$0	Low
Lafourche	$0	Low	West Baton Rouge	$0	Low
La Salle	$0	Low	West Carroll	$102,000	Medium
Lincoln	$0	Low	West Feliciana	$0	Low
Livingston	$0	Low	Winn	$0	Low

Map E-26. Parishes by Total Crop Losses



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (hailstorm events)

Map E-27. Parishes Ranked by Total Crop Losses



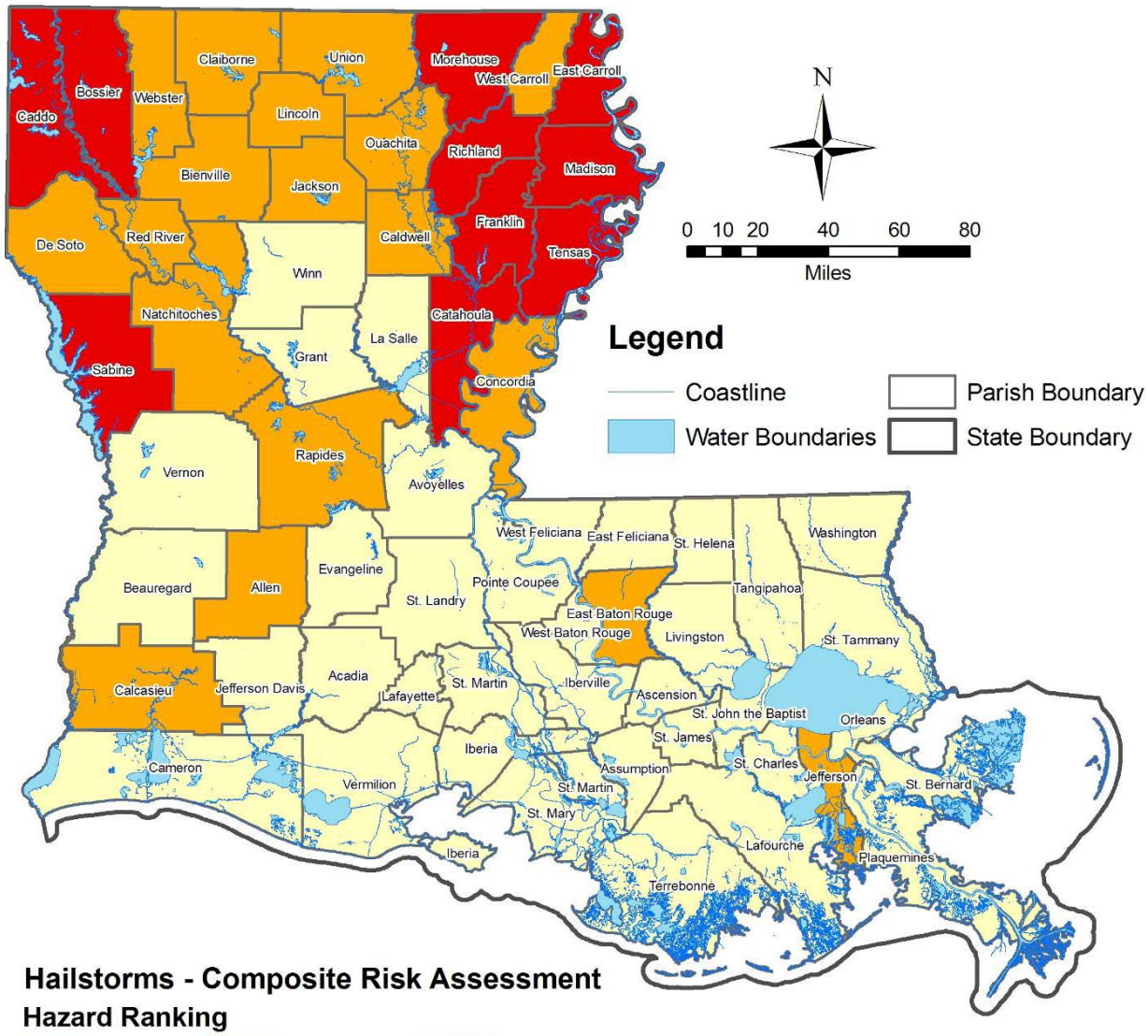
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (hailstorm events)

The Composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points and each low ranking one (1) point. Following this methodology the possible range of scores for hail is 3-9. A high Hail Hazard would be assigned to a parish receiving a score of 7 to 9, medium would be for parishes scoring 5 to 6, and low would be for any parish scoring 3 to 4.

Table E-24: Parishes Ranked by Composite Score

Parish	Occurrence Hazard Ranking	Property Damage Ranking	Crop Damage Ranking	Composite Score	Parish	Occurrence Hazard Ranking	Property Damage Ranking	Crop Damage Ranking	Composite Score
Acadia	Low	Low	Low	3	Madison	Medium	High	High	8
Allen	Medium	Medium	Low	5	Morehouse	High	High	Low	7
Ascension	Low	Medium	Low	4	Natchitoches	High	Medium	Low	6
Assumption	Low	Medium	Low	4	Orleans	Low	Low	Low	3
Avoyelles	Low	Low	Low	3	Ouachita	High	Medium	Low	6
Beauregard	Medium	Low	Low	4	Plaquemines	Low	Low	Low	3
Bienville	High	Low	Low	5	Pointe Coupee	Low	Low	Low	3
Bossier	High	High	Low	7	Rapides	High	Low	Low	5
Caddo	High	High	Low	7	Red River	Medium	Medium	Low	5
Calcasieu	High	Medium	Low	6	Richland	Medium	High	Medium	7
Caldwell	Medium	Medium	Low	5	Sabine	High	Medium	Medium	7
Cameron	Low	Low	Low	3	St. Bernard	Low	Low	Low	3
Catahoula	Medium	High	High	8	St. Charles	Low	Medium	Low	4
Claiborne	High	Medium	Low	6	St. Helena	Low	Low	Low	3
Concordia	Low	Medium	High	6	St. James	Low	Low	Low	3
De Soto	High	Medium	Low	6	St. John the Baptist	Low	Low	Low	3
East Baton Rouge	Medium	Medium	Low	5	St. Landry	Low	Low	Low	3
East Carroll	Medium	Medium	High	7	St. Martin	Low	Medium	Low	4
East Feliciana	Low	Low	Low	3	St. Mary	Low	Medium	Low	4
Evangeline	Low	Medium	Low	4	St. Tammany	Medium	Low	Low	4
Franklin	Medium	High	High	8	Tangipahoa	Low	Medium	Low	4
Grant	Medium	Low	Low	4	Tensas	Medium	High	High	8
Iberia	Low	Low	Low	3	Terrebonne	Low	Low	Low	3
Iberville	Low	Low	Low	3	Union	High	Medium	Low	6
Jackson	Medium	Medium	Low	5	Vermilion	Low	Low	Low	3
Jefferson	Low	High	Low	5	Vernon	Medium	Low	Low	4
Jefferson Davis	Low	Low	Low	3	Washington	Low	Low	Low	3
Lafayette	Low	Low	Low	3	Webster	High	Medium	Low	6
Lafourche	Low	Low	Low	4	West Baton Rouge	Low	Low	Low	3
La Salle	Low	Medium	Low	3	West Carroll	Medium	Medium	Medium	6
Lincoln	High	Medium	Low	6	West Feliciana	Low	Low	Low	3
Livingston	Low	Medium	Low	4	Winn	Medium	Low	Low	4

Map E-28. Parishes Ranked by Composite Score



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (hailstorm events)

Methodology

The methodology for assessing hail risk was straight forward. The National Climatic Data Center records were retrieved and compiled to show the quantities in each of the categories: total number of storms, total property losses and total crop losses. The parishes were then scored based upon high, medium, and low amount in each of the three categories. These scores were then added together to determine the composite score. That in turn was divided into high, medium, and low classifications.

Data Limitations

NCDC Storm Events Database data does not adjust for inflation, so monetary values are likely skewed lower than they should be. Additionally, a spokesperson for NCDC concedes that the monetary figures distinguishing property and crop damage are based on very rough estimates.

NCDC data is reported by event and not by jurisdiction, so a hailstorm that crosses multiple parish boundaries will be given the same data for injuries, fatalities, and damages in each parish rather than showing how those figures were distributed across jurisdictions. Thus, some large multi-parish events may have records that have been double-counted.

The algorithm NCDC uses for searching storms does not distinguish parishes with a character stream that happens to duplicated part of the character stream for a parish with a longer name. Thus, an event that effected Jefferson Davis parish may also show up in Jefferson Parish without having caused impact.

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Appendix E.6:
High Wind - Hurricane

Hurricane wind hazard vulnerability *was* assessed for the population, general building stock *(quantity and value),* critical facilities, utility providers*, as well as* the *average* annual losses for property and crop damages as determined from NOAA historical hurricane events data and HAZUS-MH general building stock data. Utility providers include nuclear plants, sewage treatment plants, wastewater facilities, electric substations, and power plants. Critical Facilities include fire stations, law enforcement facilities, hospitals, schools, State EOCs, and EMS stations.

The high / medium / low rankings for each parish were developed by:

- Obtaining the NOAA and HAZUS data;
- Sorting the list by parish from highest to lowest population in the Category 2 hurricane wind regions;
    - Assigning the high rank to parishes with over 90% population in Category 2 regions;
    - Assigning the medium rank to parishes with up to 90% population in Category 2 regions;
    - Assigning the low rank to parishes with populations outside the Category 2 regions.
- Sorting the list by parish from highest to lowest quantity of buildings in the Category 2 hurricane wind regions;
    - Assigning the high rank to parishes with over 90% building quantity in Category 2 regions;
    - Assigning the medium rank to parishes with up to 90% building quantity in Category 2 regions;
    - Assigning the low rank to parishes with all properties outside the Category 2 regions.
- Sorting the list by parish from highest to lowest building value in the Category 2 hurricane wind regions;
    - Assigning the high rank to parishes with over $2 million of building value in Category 2 regions;
    - Assigning the medium rank to parishes with up to $2 million of building value in Category 2 regions;
    - Assigning the low rank to parishes with no building value in the Category 2 regions.
- Sorting the list by parish from highest to lowest number of critical facilities in the Category 2 hurricane wind regions;
    - Assigning the high rank to parishes with over 90% of its critical facilities in Category 2 regions;
    - Assigning the medium rank to parishes with up to 90% its critical facilities in Category 2 regions;
    - Assigning the low rank to parishes with no critical facilities the Category 2 regions.
- Sorting the list by parish by number of utility providers and power lines in the Category 2 hurricane wind regions;
    - Assigning the high rank to parishes with over 90% of either providers or power lines in Category 2 hurricane areas;
    - Assigning the medium rank to parishes with up to 90% of providers or power lines in Category 2 hurricane areas;
    - Assigning the low rank to parishes with no providers or power lines in Category 2 hurricane areas.
- Sorting the list by parish by amount of average annual property and crop damages from hurricane winds;
    - Assigning the high rank to parishes with over $250 million average annual property damages or $200 million or more in crop damage;
    - Assigning the medium rank to parishes with over $25 million average annual property damages;
    - Assigning the low rank to parishes with up to $25 million average annual property damages.
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 15 or more;
    - Assigning the medium composite ranking to parishes with a score of 11 to 14;
    - Assigning the low composite ranking to parishes with a score of 10 or less.

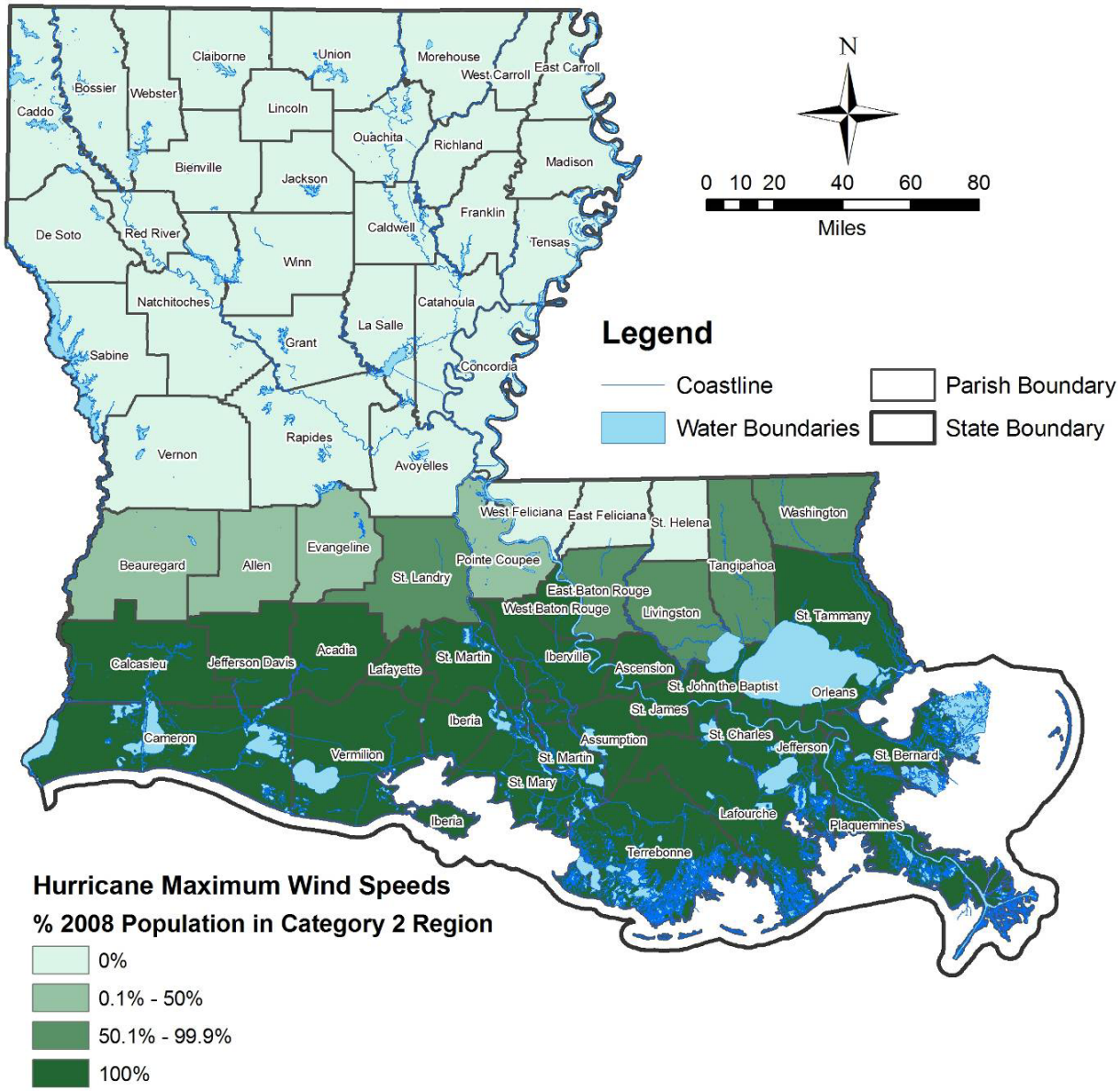
The percentage of population in Category 2 hurricane wind regions are shown in Table E-25 and Map E-29.

Map E-30 presents the ranking by percentage.

Table E-25: Population by Parish in Category 2 Regions

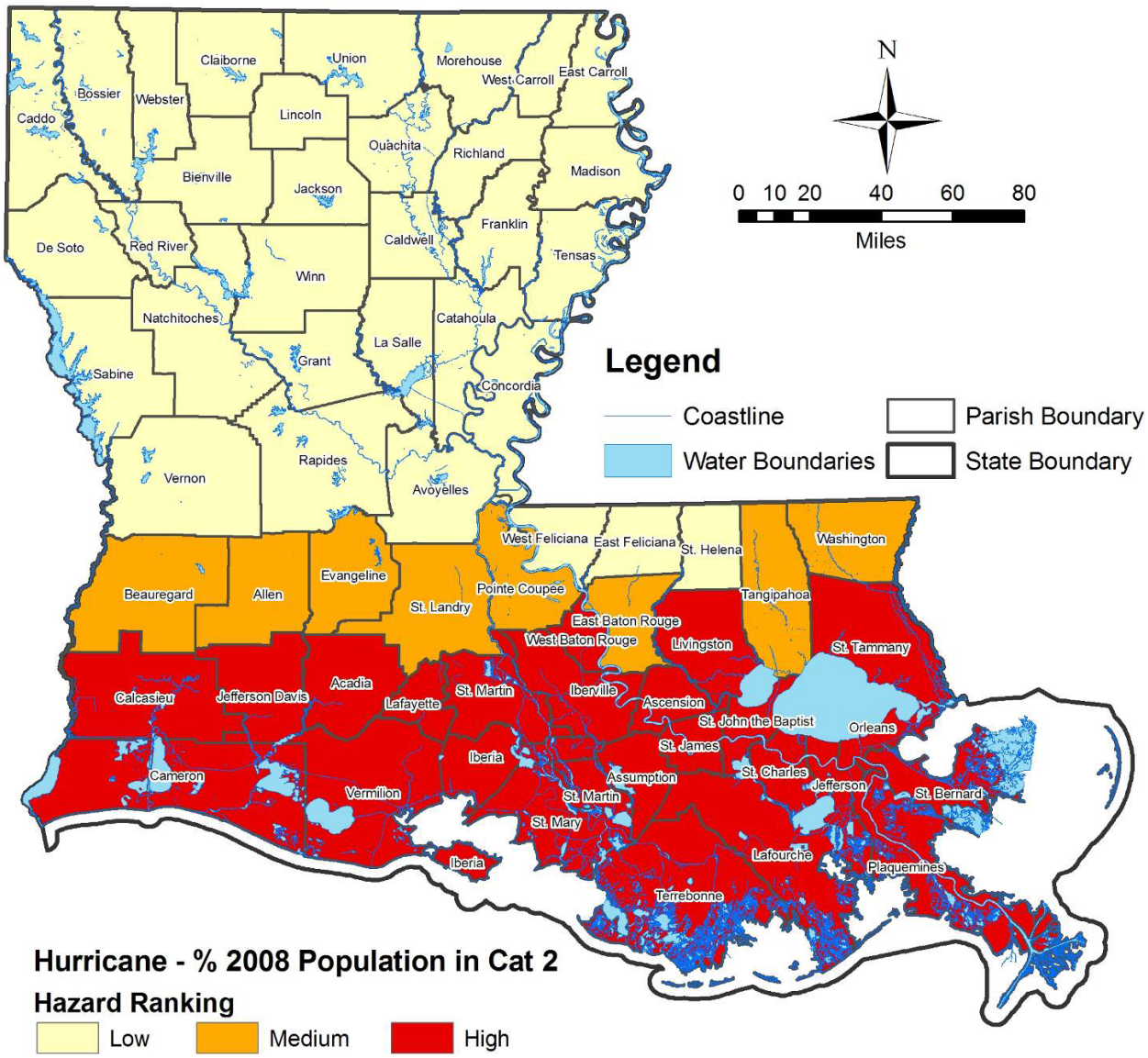
Parish	2008 Population	Pop. in Category 2 Wind Speed Region	% Pop. in Cat 2 Region	Hazard Ranking	Parish	2008 Population	Pop. in Category 2 Wind Speed Region	% Pop. in Cat 2 Region	Hazard Ranking
Acadia	61,385	61,385	100.0%	High	Madison	12,661	0	0.0%	Low
Allen	25,793	7,347	28.5%	Medium	Morehouse	29,920	0	0.0%	Low
Ascension	102,375	102,375	100.0%	High	Natchitoches	39,469	0	0.0%	Low
Assumption	24,068	24,068	100.0%	High	Orleans	321,466	321,466	100.0%	High
Avoyelles	43,112	0	0.0%	Low	Ouachita	151,669	0	0.0%	Low
Beauregard	35,200	12,258	34.8%	Medium	Plaquemines	29,240	29,225	99.9%	High
Bienville	15,511	0	0.0%	Low	Pointe Coupee	23,215	4,438	19.1%	Medium
Bossier	112,084	0	0.0%	Low	Rapides	133,290	0	0.0%	Low
Caddo	257,336	0	0.0%	Low	Red River	9,662	0	0.0%	Low
Calcasieu	189,924	189,924	100.0%	High	Richland	20,982	0	0.0%	Low
Caldwell	10,683	0	0.0%	Low	Sabine	24,239	0	0.0%	Low
Cameron	8,648	8,648	100.0%	High	St. Bernard	25,956	25,956	100.0%	High
Catahoula	10,816	0	0.0%	Low	St. Charles	54,020	54,020	100.0%	High
Claiborne	16,410	0	0.0%	Low	St. Helena	10,655	0	0.0%	Low
Concordia	19,896	0	0.0%	Low	St. James	22,212	22,212	100.0%	High
De Soto	26,799	0	0.0%	Low	St. John the Baptist	48,940	48,940	100.0%	High
East Baton Rouge	434,018	372,396	85.8%	Medium	St. Landry	92,253	80,372	87.1%	Medium
East Carroll	8,814	0	0.0%	Low	St. Martin	52,451	52,451	100.0%	High
East Feliciana	21,353	0	0.0%	Low	St. Mary	52,000	52,000	100.0%	High
Evangeline	36,630	10,029	27.4%	Medium	St. Tammany	239,132	239,132	100.0%	High
Franklin	20,474	0	0.0%	Low	Tangipahoa	117,927	96,507	81.8%	Medium
Grant	21,034	0	0.0%	Low	Tensas	6,196	0	0.0%	Low
Iberia	75,989	75,989	100.0%	High	Terrebonne	111,494	111,494	100.0%	High
Iberville	33,283	33,283	100.0%	High	Union	23,494	0	0.0%	Low
Jackson	15,389	0	0.0%	Low	Vermilion	57,337	57,337	100.0%	High
Jefferson	446,686	446,686	100.0%	High	Vernon	51,009	0	0.0%	Low
Jefferson Davis	31,859	31,859	100.0%	High	Washington	45,756	38,017	83.1%	Medium
Lafayette	206,327	206,327	100.0%	High	Webster	42,081	0	0.0%	Low
Lafourche	95,048	95,048	100.0%	High	West Baton Rouge	22,919	22,919	100.0%	High
La Salle	14,380	0	0.0%	Low	West Carroll	11,804	0	0.0%	Low
Lincoln	43,187	0	0.0%	Low	West Feliciana	15,746	0	0.0%	Low
Livingston	120,877	111,003	91.8%	High	Winn	16,044	0	0.0%	Low

Map E-29: Population by Parish in Category 2 Regions



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Group Population), HAZUS-MH MR4 (Hurricane Wind Speed Modeling)

Map E-30: Parishes Ranked by Population in Category 2 Regions



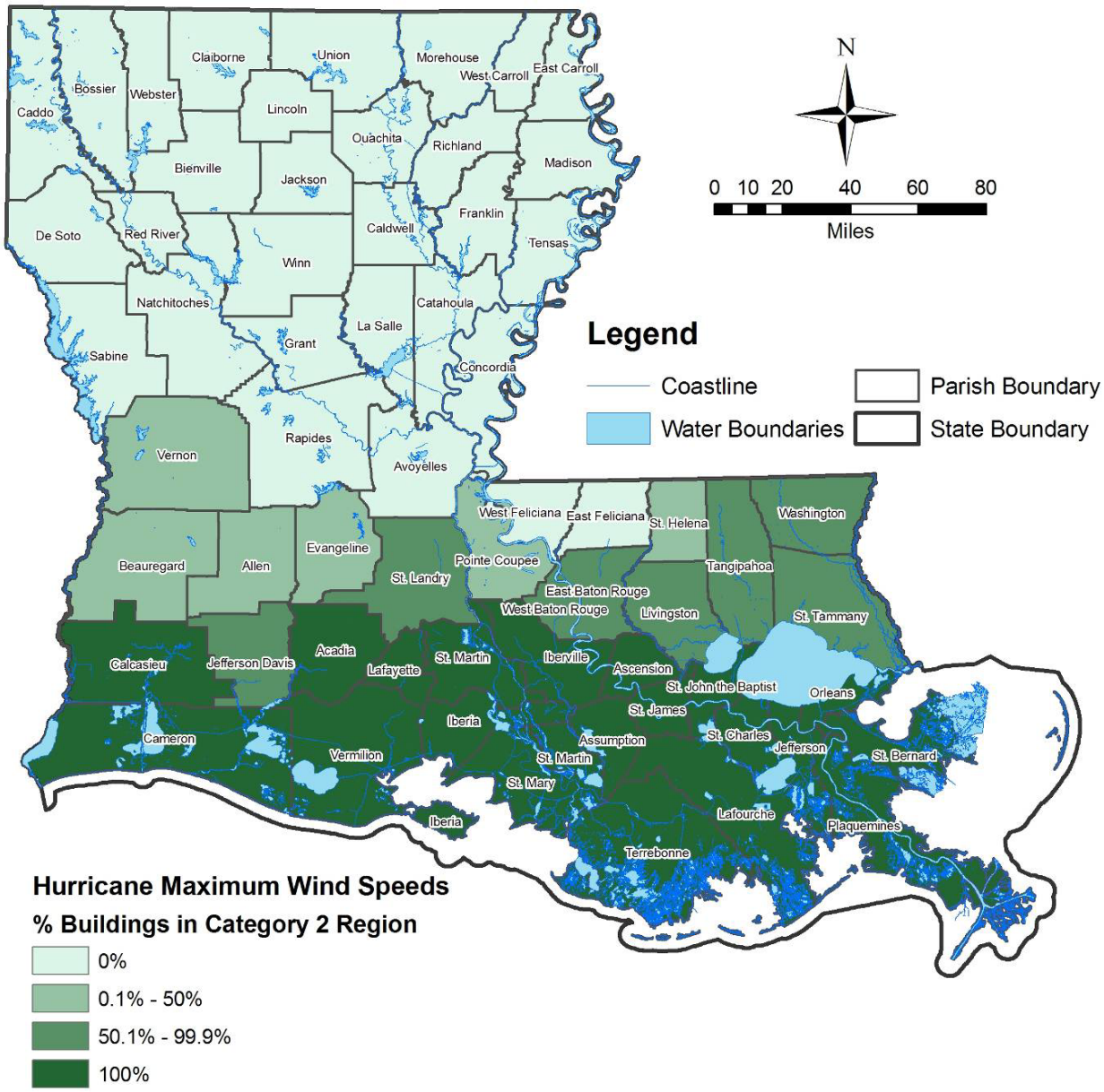
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Group Population), HAZUS-MH MR4 (Hurricane Wind Speed Modeling)

The building quantity in Category 2 hurricane wind regions are shown in Table E-26 and Map E-31. Map E-32 presents the ranking by percentage.

Table E-26: Building Quantity by Parish in Category 2 Regions

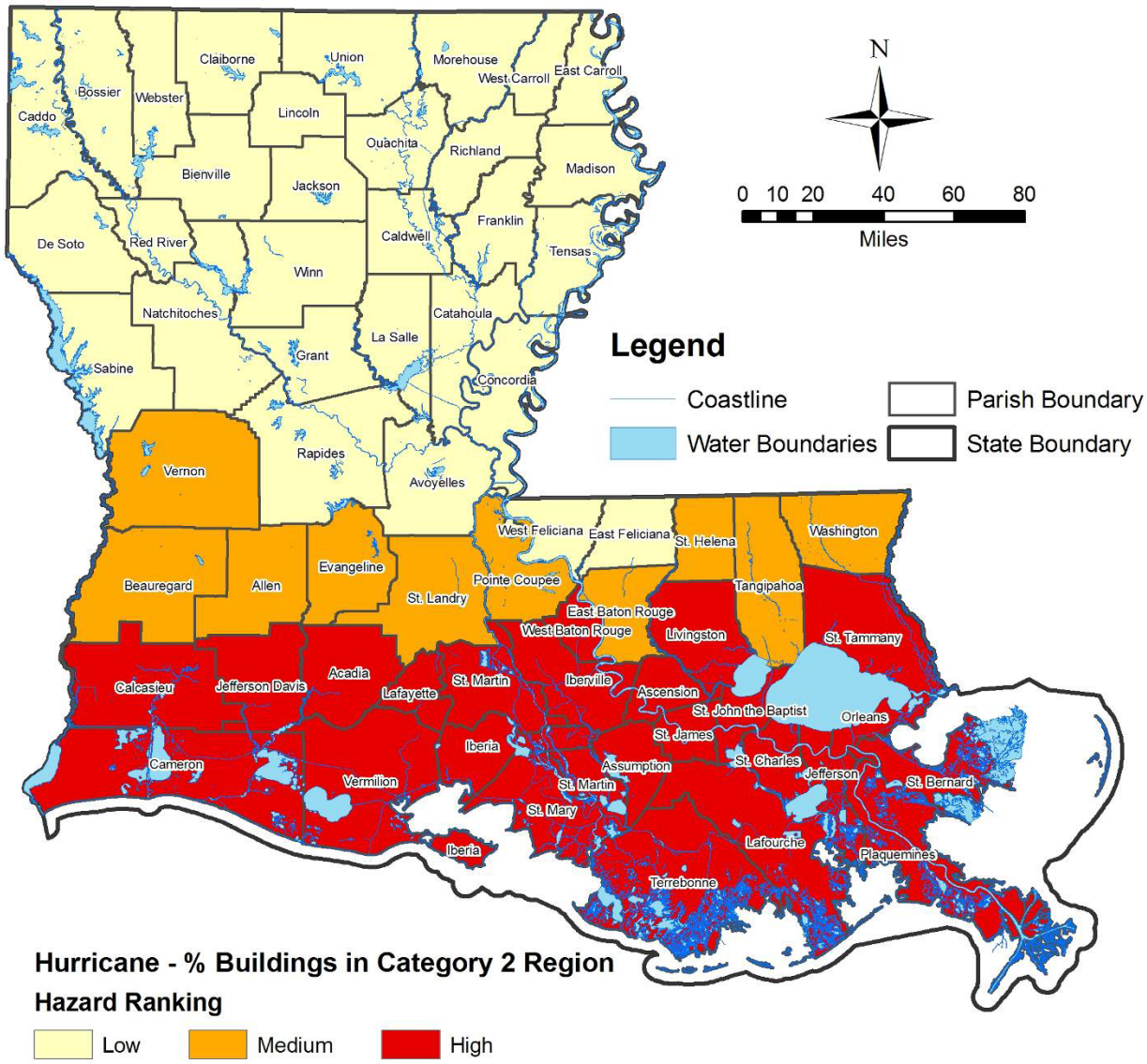
Parish	Total Buildings	Buildings in Cat 2 Region	% Buildings in Cat 2 Region	Hazard Ranking	Parish	Total Buildings	Buildings in Cat 2 Region	% Buildings in Cat 2 Region	Hazard Ranking
Acadia	27,817	27,817	100.0%	High	Madison	6,576	0	0.0%	Low
Allen	11,600	3,583	30.9%	Medium	Morehouse	14,604	0	0.0%	Low
Ascension	33,123	33,123	100.0%	High	Natchitoches	19,780	0	0.0%	Low
Assumption	10,844	10,844	100.0%	High	Orleans	173,671	173,671	100.0%	High
Avoyelles	19,795	0	0.0%	Low	Ouachita	62,493	0	0.0%	Low
Beauregard	17,476	5,413	31.0%	Medium	Plaquemines	12,374	12,374	100.0%	High
Bienville	10,612	0	0.0%	Low	Pointe Coupee	12,092	2,523	20.9%	Medium
Bossier	40,408	0	0.0%	Low	Rapides	58,948	0	0.0%	Low
Caddo	105,041	0	0.0%	Low	Red River	4,767	0	0.0%	Low
Calcasieu	80,762	80,762	100.0%	High	Richland	10,847	0	0.0%	Low
Caldwell	6,011	0	0.0%	Low	Sabine	15,926	0	0.0%	Low
Cameron	6,211	6,211	100.0%	High	St. Bernard	26,842	26,841	100.0%	High
Catahoula	6,483	0	0.0%	Low	St. Charles	19,200	19,200	100.0%	High
Claiborne	9,517	0	0.0%	Low	St. Helena	6,254	378	6.0%	Medium
Concordia	10,636	0	0.0%	Low	St. James	8,815	8,815	100.0%	High
De Soto	13,848	0	0.0%	Low	St. John the Baptist	16,521	16,521	100.0%	High
East Baton Rouge	151,107	128,006	84.7%	Medium	St. Landry	43,957	37,625	85.6%	Medium
East Carroll	4,195	0	0.0%	Low	St. Martin	24,736	24,736	100.0%	High
East Feliciana	10,030	0	0.0%	Low	St. Mary	24,408	24,408	100.0%	High
Evangeline	17,665	4,882	27.6%	Medium	St. Tammany	84,508	84,314	99.8%	High
Franklin	10,757	0	0.0%	Low	Tangipahoa	45,367	36,370	80.2%	Medium
Grant	10,350	0	0.0%	Low	Tensas	4,467	0	0.0%	Low
Iberia	32,309	32,309	100.0%	High	Terrebonne	43,923	43,914	100.0%	High
Iberville	15,059	15,059	100.0%	High	Union	13,760	0	0.0%	Low
Jackson	9,181	0	0.0%	Low	Vermilion	27,475	27,475	100.0%	High
Jefferson	164,539	164,421	99.9%	High	Vernon	21,626	125	0.6%	Medium
Jefferson Davis	16,691	16,461	98.6%	High	Washington	23,350	18,957	81.2%	Medium
Lafayette	81,011	80,991	100.0%	High	Webster	21,865	0	0.0%	Low
Lafourche	40,570	40,558	100.0%	High	West Baton Rouge	10,252	10,127	98.8%	High
La Salle	7,828	0	0.0%	Low	West Carroll	5,945	0	0.0%	Low
Lincoln	18,894	0	0.0%	Low	West Feliciana	5,056	0	0.0%	Low
Livingston	42,671	39,466	92.5%	High	Winn	8,993	0	0.0%	Low

Map E-31: Building Quantity by Parish in Category 2 Regions



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Hurricane Wind Speed Modeling, Buildings)

Map E-32: Parishes Ranked by Building Quantity in Category 2 Regions



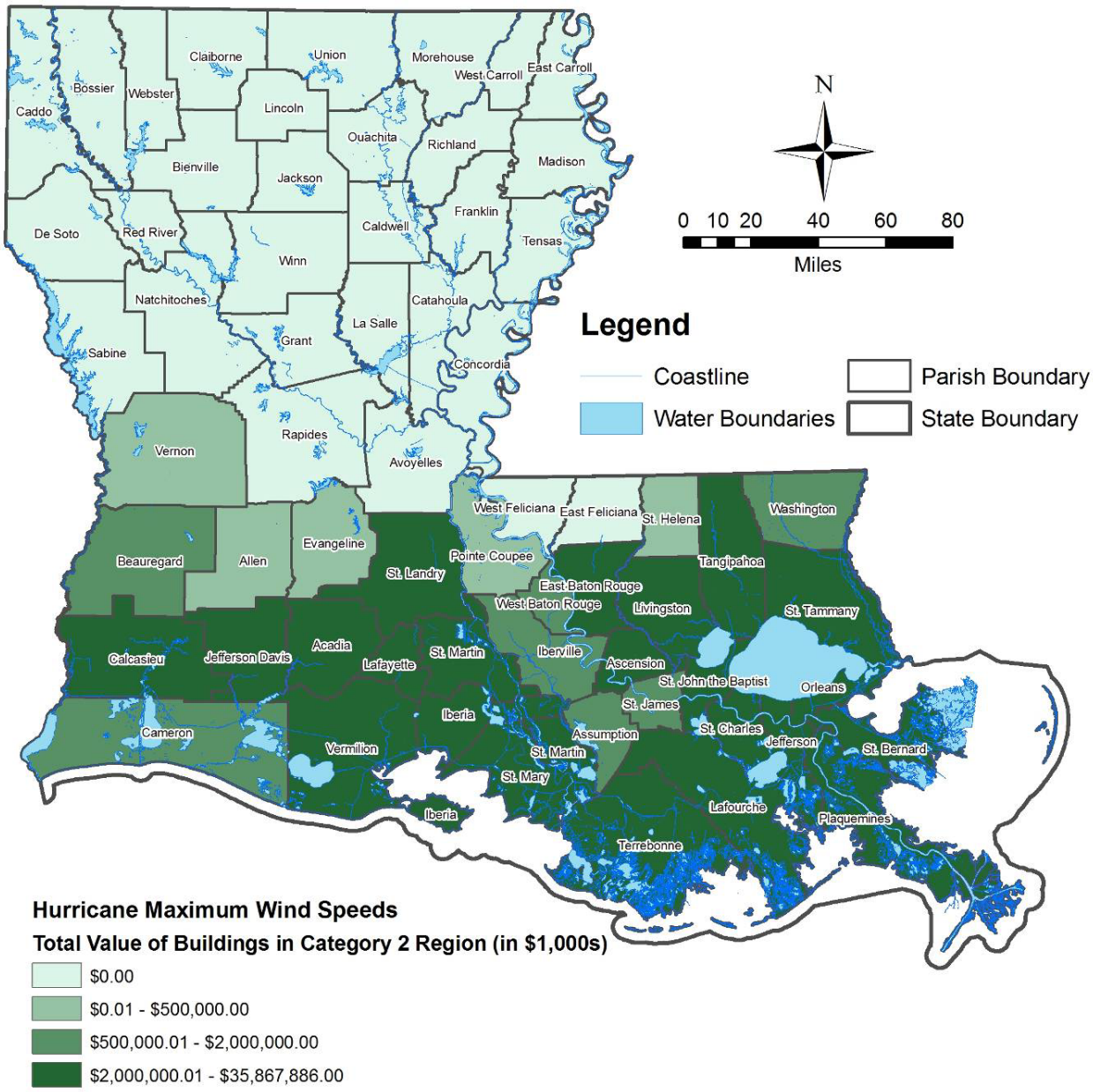
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Hurricane Wind Speed Modeling, Buildings)

The building value in Category 2 hurricane wind regions are shown in Table E-27 and Map E-33. Map E-34 presents the ranking by value.

Table E-27: Building Value by Parish in Category 2 Regions

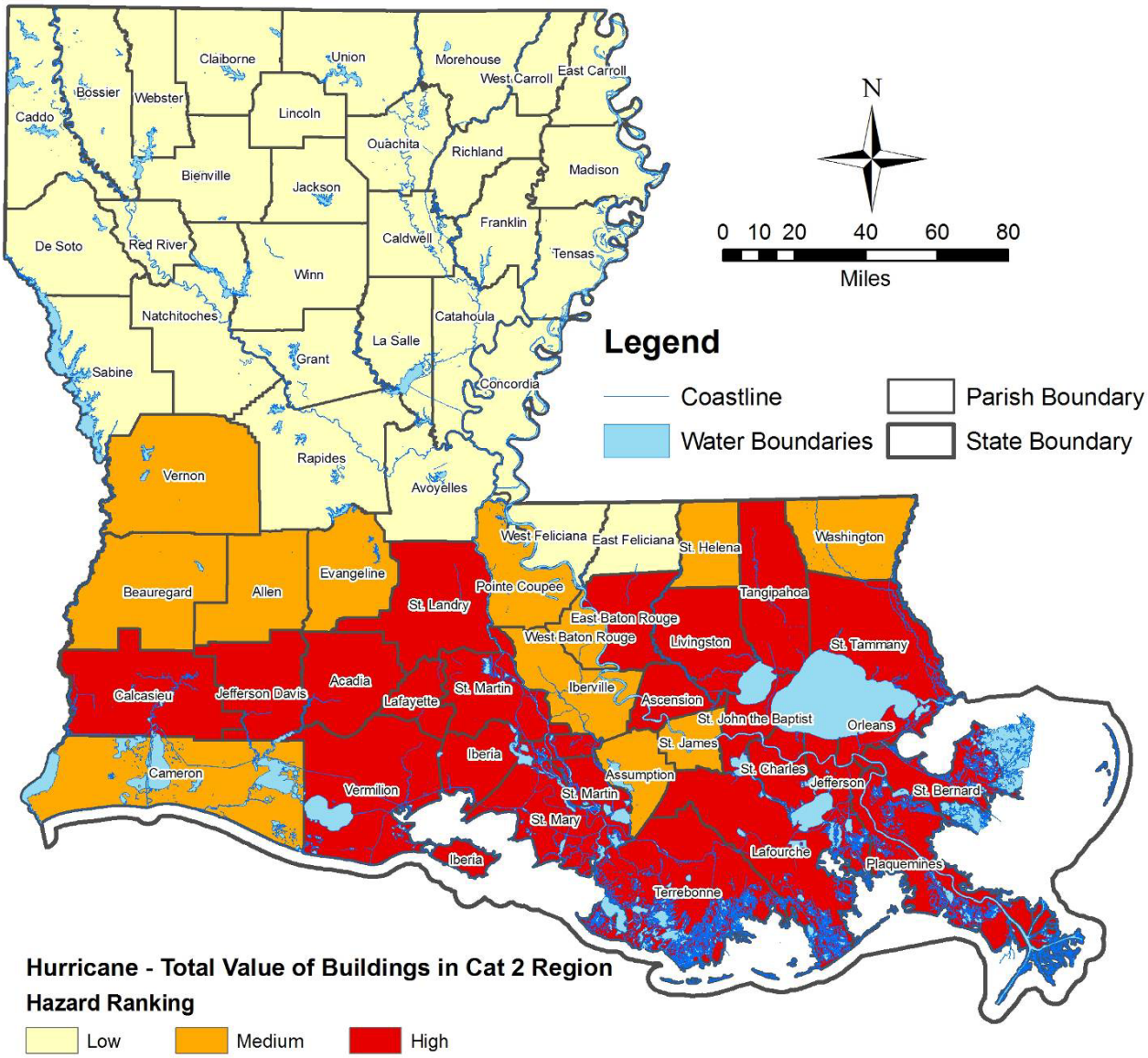
Parish	Total Value of Buildings in Cat 2 Region (in $1000s)	Hazard Ranking	Parish	Total Value of Buildings in Cat 2 Region (in $1000s)	Hazard Ranking
Acadia	$3,463,355	High	Madison	$0	Low
Allen	$484,277	Medium	Morehouse	$0	Low
Ascension	$5,258,105	High	Natchitoches	$0	Low
Assumption	$1,302,583	Medium	Orleans	$35,474,596	High
Avoyelles	$0	Low	Ouachita	$0	Low
Beauregard	$541,498	Medium	Plaquemines	$2,123,009	High
Bienville	$0	Low	Pointe Coupee	$273,367	Medium
Bossier	$0	Low	Rapides	$0	Low
Caddo	$0	Low	Red River	$0	Low
Calcasieu	$12,042,029	High	Richland	$0	Low
Caldwell	$0	Low	Sabine	$0	Low
Cameron	$798,146	Medium	St. Bernard	$4,463,655	High
Catahoula	$0	Low	St. Charles	$3,675,984	High
Claiborne	$0	Low	St. Helena	$38,213	Medium
Concordia	$0	Low	St. James	$1,305,211	Medium
De Soto	$0	Low	St. John the Baptist	$2,840,674	High
East Baton Rouge	$28,836,449	High	St. Landry	$4,229,770	High
East Carroll	$0	Low	St. Martin	$3,004,362	High
East Feliciana	$0	Low	St. Mary	$3,310,774	High
Evangeline	$483,020	Medium	St. Tammany	$13,677,115	High
Franklin	$0	Low	Tangipahoa	$4,569,865	High
Grant	$0	Low	Tensas	$0	Low
Iberia	$4,569,364	High	Terrebonne	$7,469,838	High
Iberville	$1,925,472	Medium	Union	$0	Low
Jackson	$0	Low	Vermilion	$3,301,673	High
Jefferson	$35,867,886	High	Vernon	$10,470	Medium
Jefferson Davis	$2,038,644	High	Washington	$1,875,295	Medium
Lafayette	$14,541,122	High	Webster	$0	Low
Lafourche	$6,020,916	High	West Baton Rouge	$1,459,036	Medium
La Salle	$0	Low	West Carroll	$0	Low
Lincoln	$0	Low	West Feliciana	$0	Low
Livingston	$5,452,706	High	Winn	$0	Low

Map E-33: Building Value by Parish in Category 2 Regions



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Hurricane Wind Speed Modeling, Buildings)

Map E-34: Parishes Ranked by Building Value in Category 2 Regions



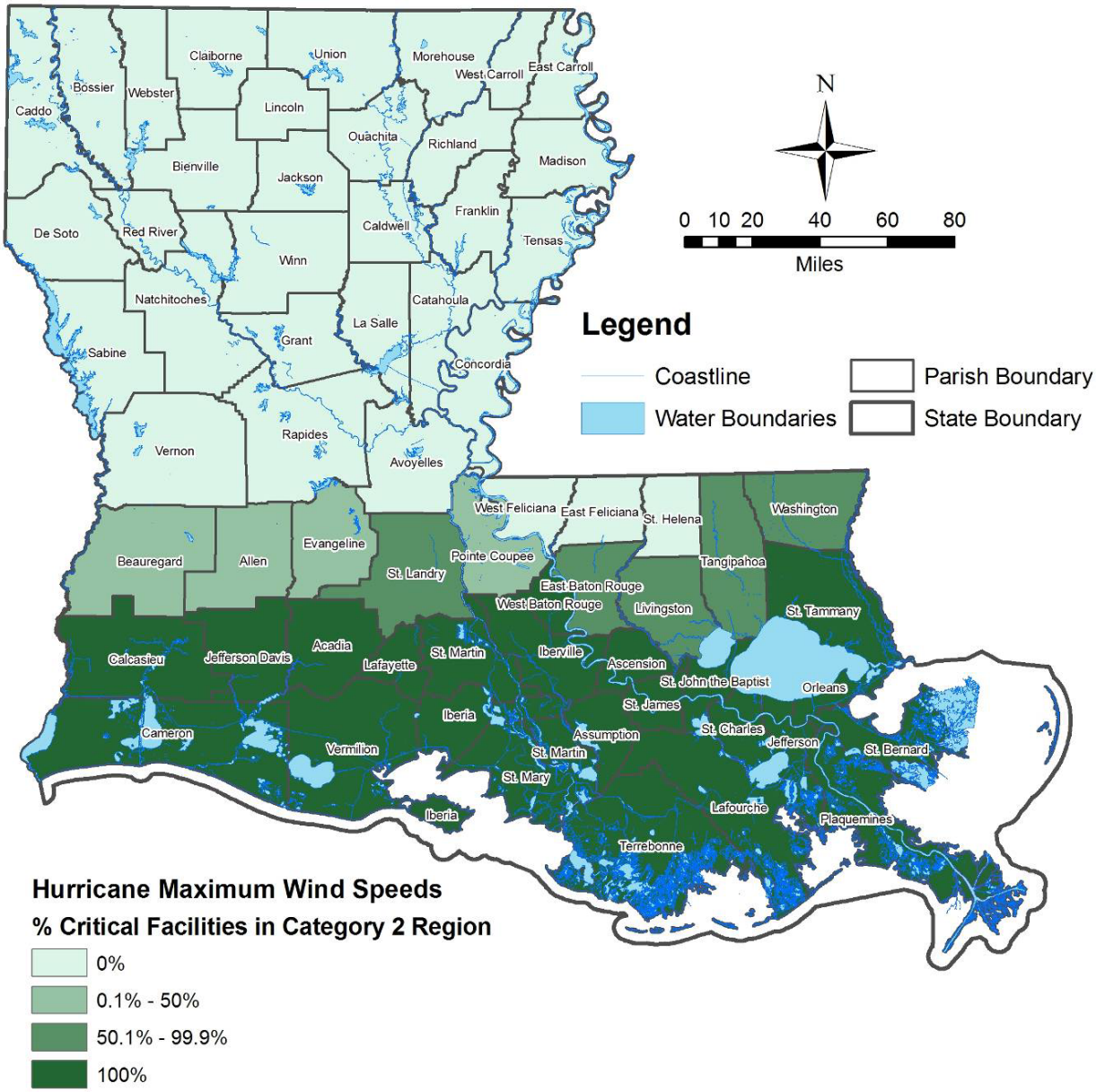
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Hurricane Wind Speed Modeling, Buildings)

The number of critical facilities in Category 2 hurricane wind regions is shown in Table E-28 and Map E-35. Map E-36 presents the ranking by percent.

Table E-28: Number of Critical Facilities by Parish in Category 2 Regions

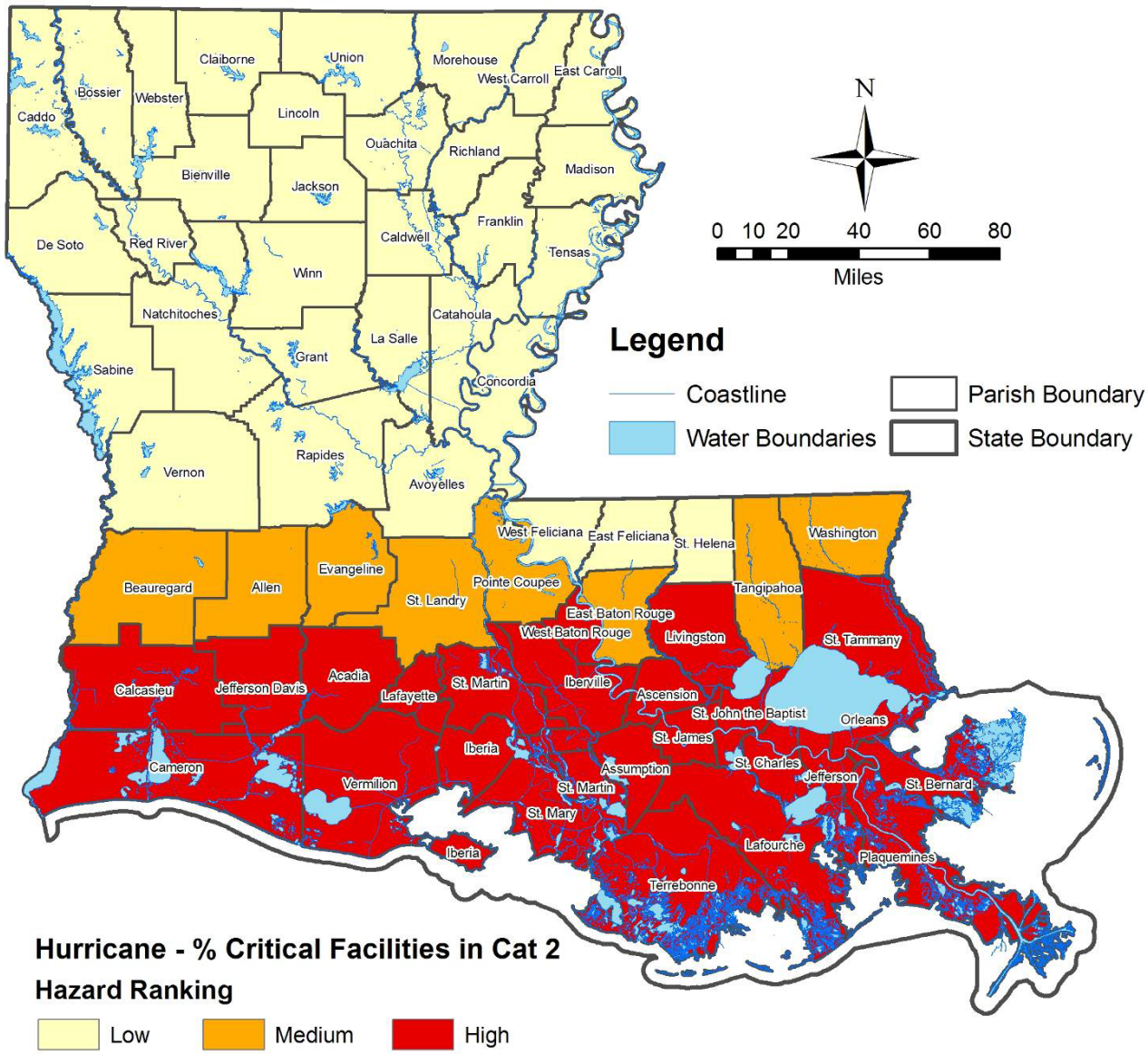
Parish	Total Critical Facilities	Critical Facilities in Cat 2 Region	% Critical Facilities in Cat 2 Region	Hazard Ranking	Parish	Total Critical Facilities	Critical Facilities in Cat 2 Region	% Critical Facilities in Cat 2 Region	Hazard Ranking
Acadia	64	64	100.0%	High	Madison	19	0	0.0%	Low
Allen	31	7	22.6%	Medium	Morehouse	39	0	0.0%	Low
Ascension	64	64	100.0%	High	Natchitoches	46	0	0.0%	Low
Assumption	27	27	100.0%	High	Orleans	169	169	100.0%	High
Avoyelles	64	0	0.0%	Low	Ouachita	119	0	0.0%	Low
Beauregard	45	20	44.4%	Medium	Plaquemines	18	18	100.0%	High
Bienville	36	0	0.0%	Low	Pointe Coupee	31	9	29.0%	Medium
Bossier	70	0	0.0%	Low	Rapides	148	0	0.0%	Low
Caddo	189	0	0.0%	Low	Red River	12	0	0.0%	Low
Calcasieu	141	141	100.0%	High	Richland	33	0	0.0%	Low
Caldwell	23	0	0.0%	Low	Sabine	42	0	0.0%	Low
Cameron	19	19	100.0%	High	St. Bernard	19	19	100.0%	High
Catahoula	27	0	0.0%	Low	St. Charles	57	57	100.0%	High
Claiborne	25	0	0.0%	Low	St. Helena	21	0	0.0%	Low
Concordia	37	0	0.0%	Low	St. James	42	42	100.0%	High
De Soto	43	0	0.0%	Low	St. John the Baptist	36	36	100.0%	High
East Baton Rouge	261	224	85.8%	Medium	St. Landry	98	77	78.6%	Medium
East Carroll	13	0	0.0%	Low	St. Martin	46	46	100.0%	High
East Feliciana	32	0	0.0%	Low	St. Mary	69	69	100.0%	High
Evangeline	49	12	24.5%	Medium	St. Tammany	148	148	100.0%	High
Franklin	16	0	0.0%	Low	Tangipahoa	89	66	74.2%	Medium
Grant	29	0	0.0%	Low	Tensas	21	0	0.0%	Low
Iberia	55	55	100.0%	High	Terrebonne	83	83	100.0%	High
Iberville	41	41	100.0%	High	Union	29	0	0.0%	Low
Jackson	19	0	0.0%	Low	Vermilion	62	62	100.0%	High
Jefferson	215	215	100.0%	High	Vernon	57	0	0.0%	Low
Jefferson Davis	37	37	100.0%	High	Washington	51	42	82.4%	Medium
Lafayette	126	126	100.0%	High	Webster	78	0	0.0%	Low
Lafourche	80	80	100.0%	High	West Baton Rouge	35	35	100.0%	High
La Salle	33	0	0.0%	Low	West Carroll	35	0	0.0%	Low
Lincoln	51	0	0.0%	Low	West Feliciana	21	0	0.0%	Low
Livingston	102	96	94.1%	High	Winn	19	0	0.0%	Low

Map E-35: Number of Critical Facilities by Parish in Category 2 Regions



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Hurricane Wind Speed Modeling), HSIP (Critical Facilities)

Map E-36: Parishes Ranked by Number of Critical Facilities in Category 2 Regions



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Hurricane Wind Speed Modeling), HSIP (Critical Facilities)

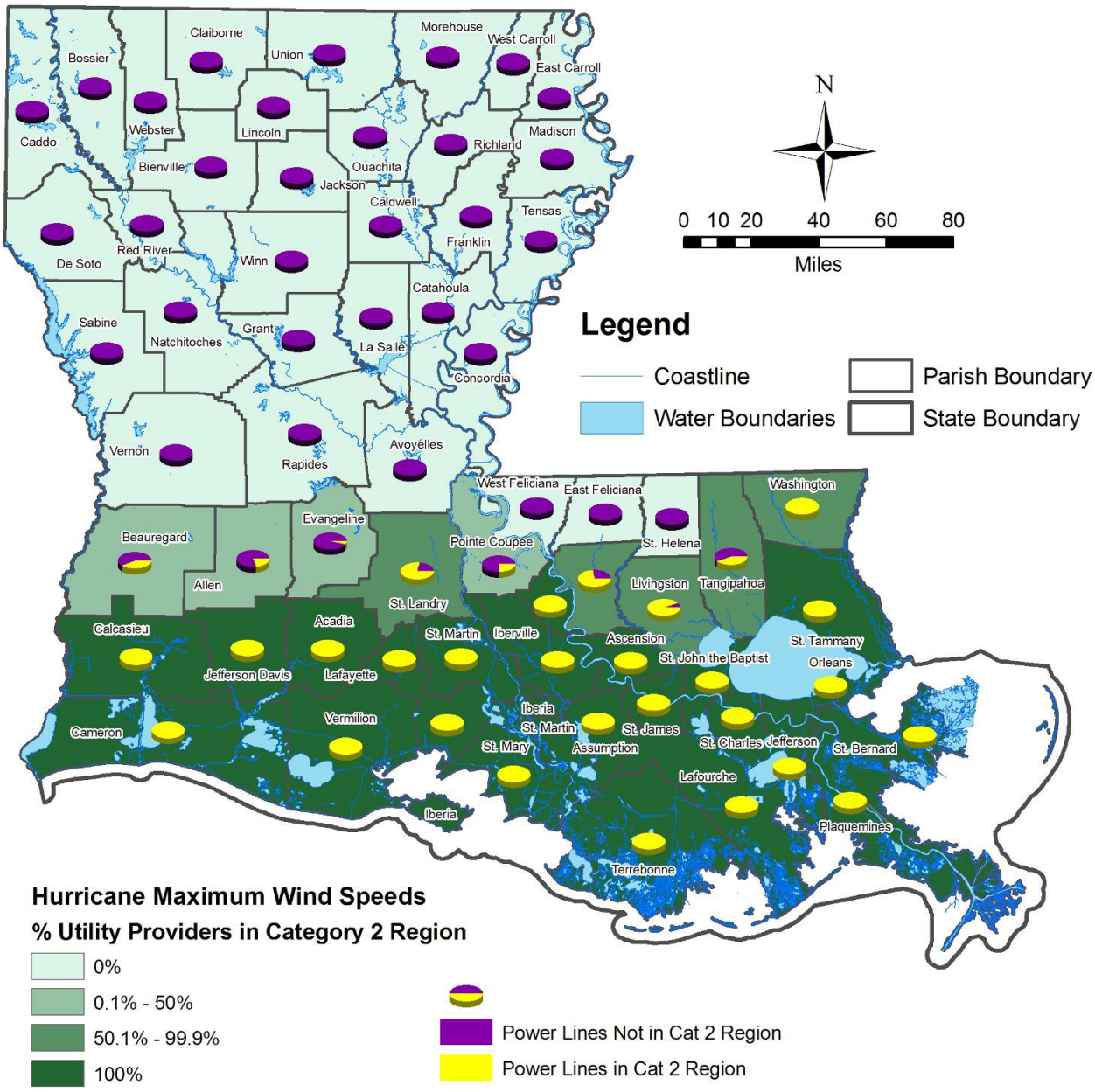
The number of utility providers and power lines in Category 2 hurricane wind regions is shown in Table E-29 and Map E-37. Map E-38 presents the ranking by percent.

Table E-29: Number of Utilities and Power lines by Parish in Category 2 Regions

Parish	Total Utility Providers	Utility Providers in Cat 3 Surge Zone	% Utility Providers in Cat 3 Surge Zone	Miles of Power Lines	Miles of Power Lines in Cat 3 Surge Zone	% Power Lines in Cat 3 Surge Zone	Hazard Ranking
Acadia	87	87	100.0%	272.71	272.71	100.0%	High
Allen	18	6	33.3%	29.36	6.16	21.0%	Medium
Ascension	233	233	100.0%	126.03	126.03	100.0%	High
Assumption	20	20	100.0%	24.65	24.65	100.0%	High
Avoyelles	21	0	0.0%	14.92	0.00	0.0%	Low
Beauregard	19	5	26.3%	106.20	44.68	42.1%	Medium
Bienville	17	0	0.0%	85.82	0.00	0.0%	Low
Bossier	65	0	0.0%	24.06	0.00	0.0%	Low
Caddo	163	0	0.0%	211.32	0.00	0.0%	Low
Calcasieu	551	551	100.0%	515.08	515.08	100.0%	High
Caldwell	11	0	0.0%	30.65	0.00	0.0%	Low
Cameron	41	41	100.0%	95.93	95.93	100.0%	High
Catahoula	5	0	0.0%	49.32	0.00	0.0%	Low
Claiborne	12	0	0.0%	26.49	0.00	0.0%	Low
Concordia	25	0	0.0%	107.28	0.00	0.0%	Low
De Soto	59	0	0.0%	117.57	0.00	0.0%	Low
East Baton Rouge	8508	8,406	98.8%	381.83	278.09	72.8%	High
East Carroll	3	0	0.0%	18.42	0.00	0.0%	Low
East Feliciana	12	0	0.0%	91.81	0.00	0.0%	Low
Evangeline	31	3	9.7%	99.04	4.05	4.1%	Medium
Franklin	15	0	0.0%	26.67	0.00	0.0%	Low
Grant	12	0	0.0%	39.63	0.00	0.0%	Low
Iberia	107	107	100.0%	80.07	80.07	100.0%	High
Iberville	296	296	100.0%	202.46	202.46	100.0%	High
Jackson	16	0	0.0%	50.28	0.00	0.0%	Low
Jefferson	383	383	100.0%	178.22	178.21	100.0%	High
Jefferson Davis	50	50	100.0%	185.21	185.21	100.0%	High
Lafayette	330	330	100.0%	167.52	167.52	100.0%	High
Lafourche	120	120	100.0%	203.53	203.51	100.0%	High
La Salle	14	0	0.0%	62.58	0.00	0.0%	Low
Lincoln	41	0	0.0%	79.64	0.00	0.0%	Low

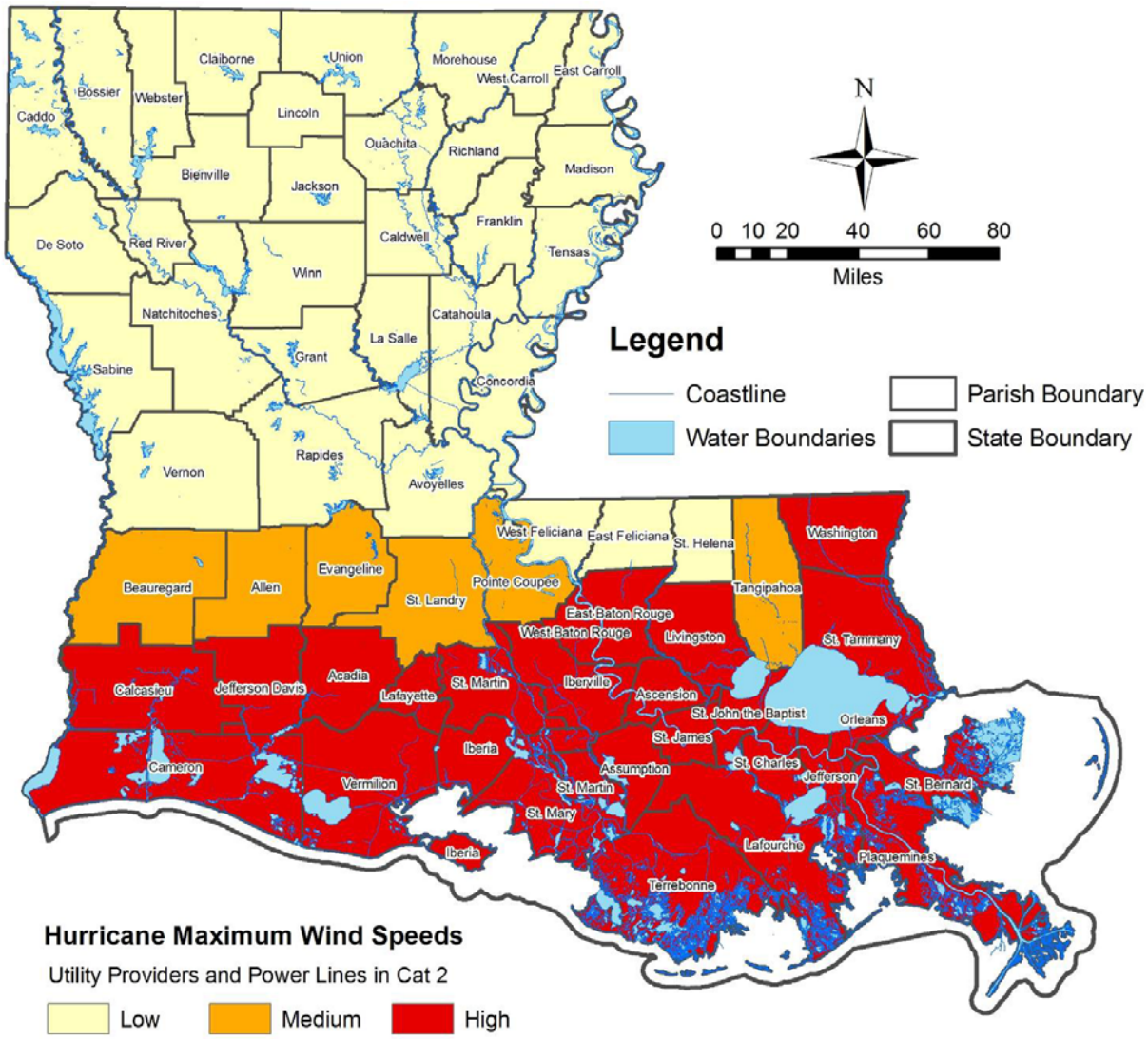
Parish	Total Utility Providers	Utility Providers in Cat 3 Surge Zone	% Utility Providers in Cat 3 Surge Zone	Miles of Power Lines	Miles of Power Lines in Cat 3 Surge Zone	% Power Lines in Cat 3 Surge Zone	Hazard Ranking
Livingston	106	101	95.3%	81.86	76.13	93.0%	High
Madison	10	0	0.0%	82.40	0.00	0.0%	Low
Morehouse	34	0	0.0%	81.01	0.00	0.0%	Low
Natchitoches	43	0	0.0%	77.28	0.00	0.0%	Low
Orleans	174	174	100.0%	131.83	131.83	100.0%	High
Ouachita	172	0	0.0%	165.39	0.00	0.0%	Low
Plaquemines	147	147	100.0%	130.81	130.81	100.0%	High
Pointe Coupee	79	11	13.9%	179.52	44.08	24.6%	Medium
Rapides	122	0	0.0%	192.24	0.00	0.0%	Low
Red River	10	0	0.0%	62.27	0.00	0.0%	Low
Richland	16	0	0.0%	52.59	0.00	0.0%	Low
Sabine	25	0	0.0%	104.45	0.00	0.0%	Low
St. Bernard	112	112	100.0%	45.90	45.90	100.0%	High
St. Charles	195	195	100.0%	192.05	192.05	100.0%	High
St. Helena	7	0	0.0%	40.47	0.00	0.0%	Low
St. James	128	128	100.0%	68.73	68.73	100.0%	High
St. John the Baptist	95	95	100.0%	79.67	79.67	100.0%	High
St. Landry	89	61	68.5%	186.16	145.36	78.1%	Medium
St. Martin	75	75	100.0%	94.98	94.98	100.0%	High
St. Mary	101	101	100.0%	61.39	61.39	100.0%	High
St. Tammany	321	321	100.0%	142.12	142.12	100.0%	High
Tangipahoa	187	149	79.7%	109.73	47.06	42.9%	Medium
Tensas	5	0	0.0%	0.00	0.00	0.0%	Low
Terrebonne	167	167	100.0%	79.26	79.26	100.0%	High
Union	17	0	0.0%	110.76	0.00	0.0%	Low
Vermilion	81	81	100.0%	118.76	118.76	100.0%	High
Vernon	52	0	0.0%	89.46	0.00	0.0%	Low
Washington	52	45	86.5%	116.27	116.27	100.0%	High
Webster	47	0	0.0%	92.83	0.00	0.0%	Low
West Baton Rouge	144	144	100.0%	118.54	118.53	100.0%	High
West Carroll	10	0	0.0%	43.39	0.00	0.0%	Low
West Feliciana	52	0	0.0%	71.11	0.00	0.0%	Low
Winn	18	0	0.0%	64.62	0.00	0.0%	Low

Map E-37: Number of Utilities and Power lines by Parish in Category 2 Regions



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Hurricane Wind Speed Modeling), HSIP (Utility Providers and Power Lines)

Map E-38: Parishes Ranked by Number of Utilities and Power lines in Category 2 Regions



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Hurricane Wind Speed Modeling), HSIP (Utility Providers and Power Lines)

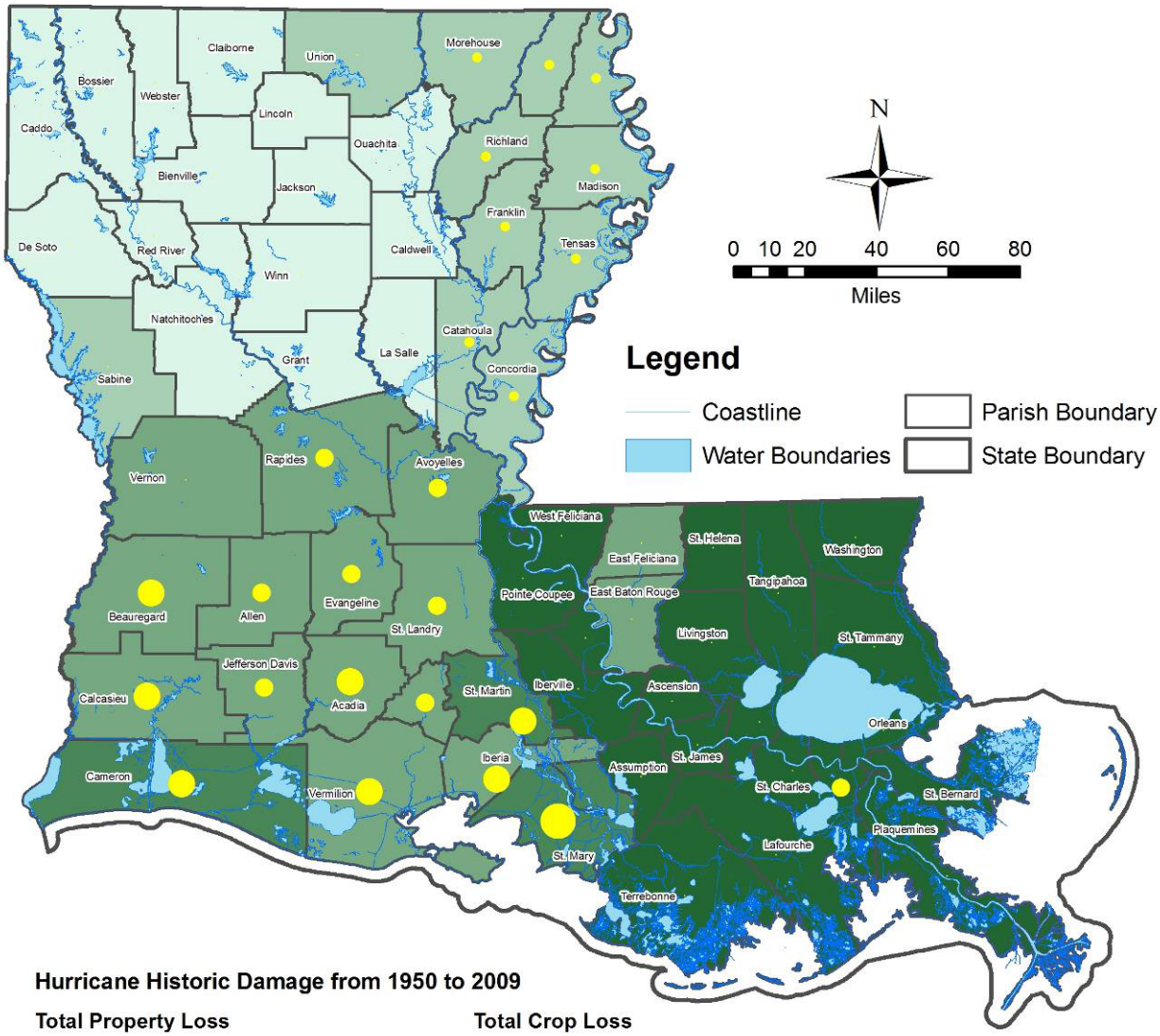
The average annual property and crop losses from hurricane wind are shown in Table E-30 and Map E-39. Map E-40 presents the ranking by loss.

Table E-30: Average Annual Property and Crop Losses

Parish	Property Damage	Crop Damage	Average Annual Loss	Hazard Ranking
Acadia	$4,489,000,000	$223,000,000	$78,533,333	High
Allen	$4,374,000,000	$178,000,000	$75,866,667	Medium
Ascension	$17,243,000,000	$0	$287,383,333	High
Assumption	$17,135,000,000	$0	$285,583,333	High
Avoyelles	$4,388,000,000	$193,000,000	$76,350,000	Medium
Beauregard	$4,420,000,000	$223,000,000	$77,383,333	High
Bienville	$450,000	$0	$7,500	Low
Bossier	$2,000,000	$0	$33,333	Low
Caddo	$1,500,000	$0	$25,000	Low
Calcasieu	$4,500,000,000	$223,000,000	$78,716,667	High
Caldwell	$1,100,000	$0	$18,333	Low
Cameron	$4,510,000,000	$201,700,000	$78,528,333	High
Catahoula	$12,550,000	$55,100,000	$1,127,500	Low
Claiborne	$200,000	$0	$3,333	Low
Concordia	$12,550,000	$55,100,000	$1,127,500	Low
De Soto	$1,250,000	$0	$20,833	Low
East Baton Rouge	$1,713,400,000	$0	$28,556,667	Medium
East Carroll	$6,550,000	$54,800,000	$1,022,500	Low
East Feliciana	$1,713,400,000	$0	$28,556,667	Medium
Evangeline	$4,420,000,000	$193,000,000	$76,883,333	Medium
Franklin	$9,550,000	$55,100,000	$1,077,500	Low
Grant	$1,150,000	$0	$19,167	Low
Iberia	$4,468,000,000	$231,700,000	$78,328,333	High
Iberville	$17,134,000,000	$0	$285,566,667	High
Jackson	$1,250,000	$0	$20,833	Low
Jefferson	$21,785,000,000	$168,000,000	$365,883,333	High
Jefferson Davis	$4,389,000,000	$168,000,000	$75,950,000	Medium
Lafayette	$4,490,000,000	$173,000,000	$77,716,667	Medium
Lafourche	$17,396,000,000	$0	$289,933,333	High
La Salle	$1,150,000	$0	$19,167	Low
Lincoln	$1,250,000	$0	$20,833	Low
Livingston	$17,325,000,000	$0	$288,750,000	High
Madison	$6,550,000	$54,800,000	$1,022,500	Low
Morehouse	$8,350,000	$55,100,000	$1,057,500	Low
Natchitoches	$1,050,000	$0	$17,500	Low

Parish	Property Damage	Crop Damage	Average Annual Loss	Hazard Ranking
Orleans	$17,396,000,000	$0	$289,933,333	High
Ouachita	$500,000	$0	$8,333	Low
Plaquemines	$17,396,000,000	$0	$289,933,333	High
Pointe Coupee	$17,134,000,000	$0	$285,566,667	High
Rapides	$4,388,000,000	$193,000,000	$76,350,000	Medium
Red River	$1,250,000	$0	$20,833	Low
Richland	$8,550,000	$55,100,000	$1,060,833	Low
Sabine	$2,450,000	$0	$40,833	Low
St. Bernard	$17,396,000,000	$0	$289,933,333	High
St. Charles	$17,391,000,000	$0	$289,850,000	High
St. Helena	$17,134,000,000	$0	$285,566,667	High
St. James	$17,236,000,000	$0	$287,266,667	High
St. John the Baptist	$17,391,000,000	$0	$289,850,000	High
St. Landry	$4,468,000,000	$193,000,000	$77,683,333	Medium
St. Martin	$4,529,000,000	$233,000,000	$79,366,667	High
St. Mary	$4,549,000,000	$251,700,000	$80,011,667	High
St. Tammany	$17,398,000,000	$0	$289,966,667	High
Tangipahoa	$17,386,000,000	$0	$289,766,667	High
Tensas	$12,550,000	$55,100,000	$1,127,500	Low
Terrebonne	$17,396,000,000	$0	$289,933,333	High
Union	$3,000,000	$0	$50,000	Low
Vermilion	$4,431,000,000	$236,700,000	$77,795,000	High
Vernon	$4,001,000,000	$0	$66,683,333	Medium
Washington	$17,198,000,000	$0	$286,633,333	High
Webster	$450,000	$0	$7,500	Low
West Baton Rouge	$17,129,000,000	$0	$285,483,333	High
West Carroll	$6,550,000	$54,800,000	$1,022,500	Low
West Feliciana	$17,134,000,000	$0	$285,566,667	High
Winn	$1,400,000	$0	$23,333	Low

Map E-39: Average Annual Property Losses



Hurricane Historic Damage from 1950 to 2009

Total Property Loss

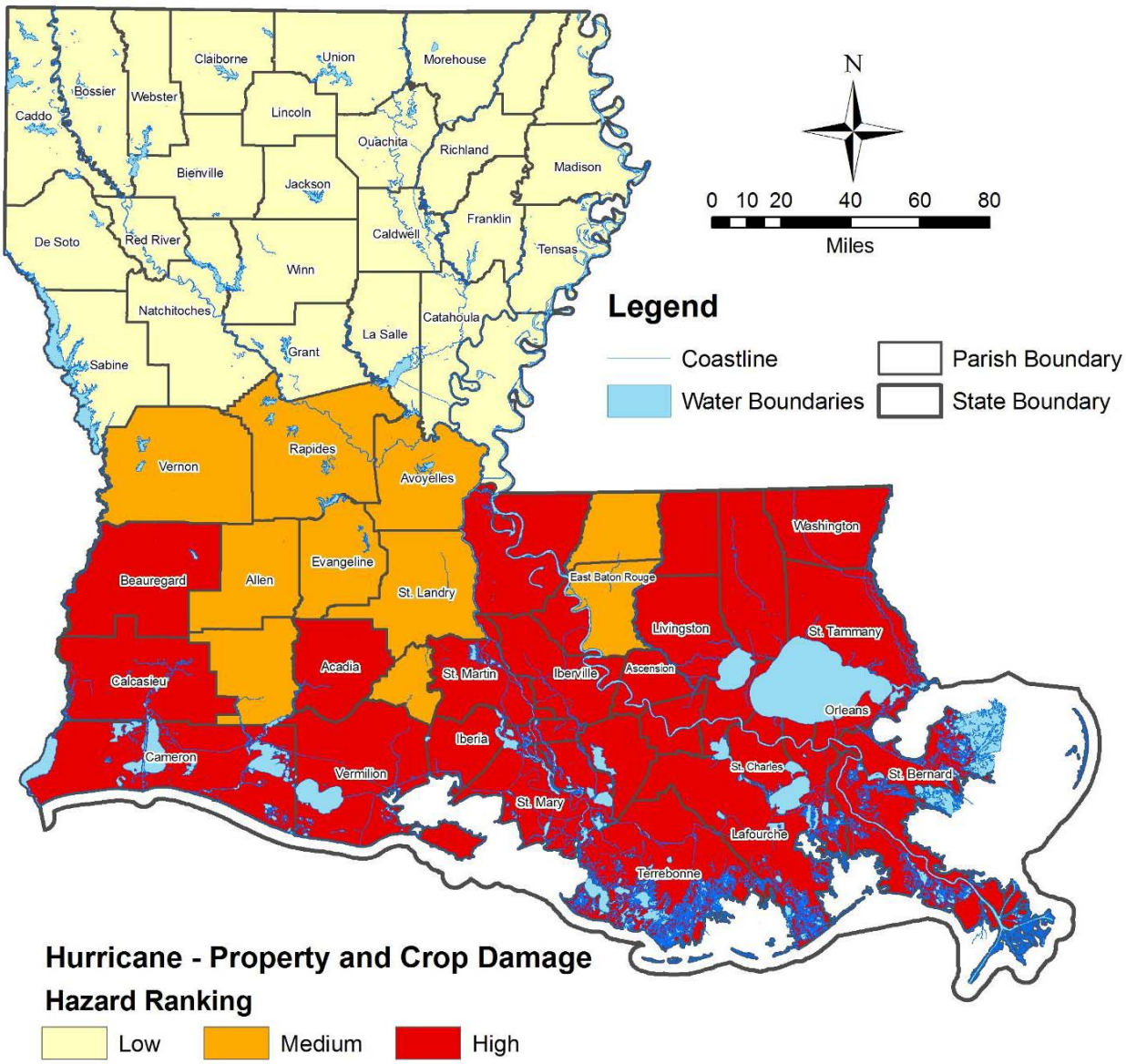
- $200,000.00 - $2,000,000.00
- $2,000,000.01 - $100,000,000.00
- $100,000,000.01 - $4,500,000,000.00
- $4,500,000,000.01 - $10,000,000,000.00
- $10,000,000,000.01 - $21,785,000,000.00

Total Crop Loss

- $0.00
- $0.01 - $60,000,000.00
- $60,000,000.01 - $200,000,000.00
- $200,000,000.01 - $236,700,000.00
- $236,700,000.01 - $251,700,000.00

Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Hurricane/Tropical Storm Events)

Map E-40: Parishes Ranked by Average Annual Property and Crop Losses



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Hurricane/Tropical Storm Events)

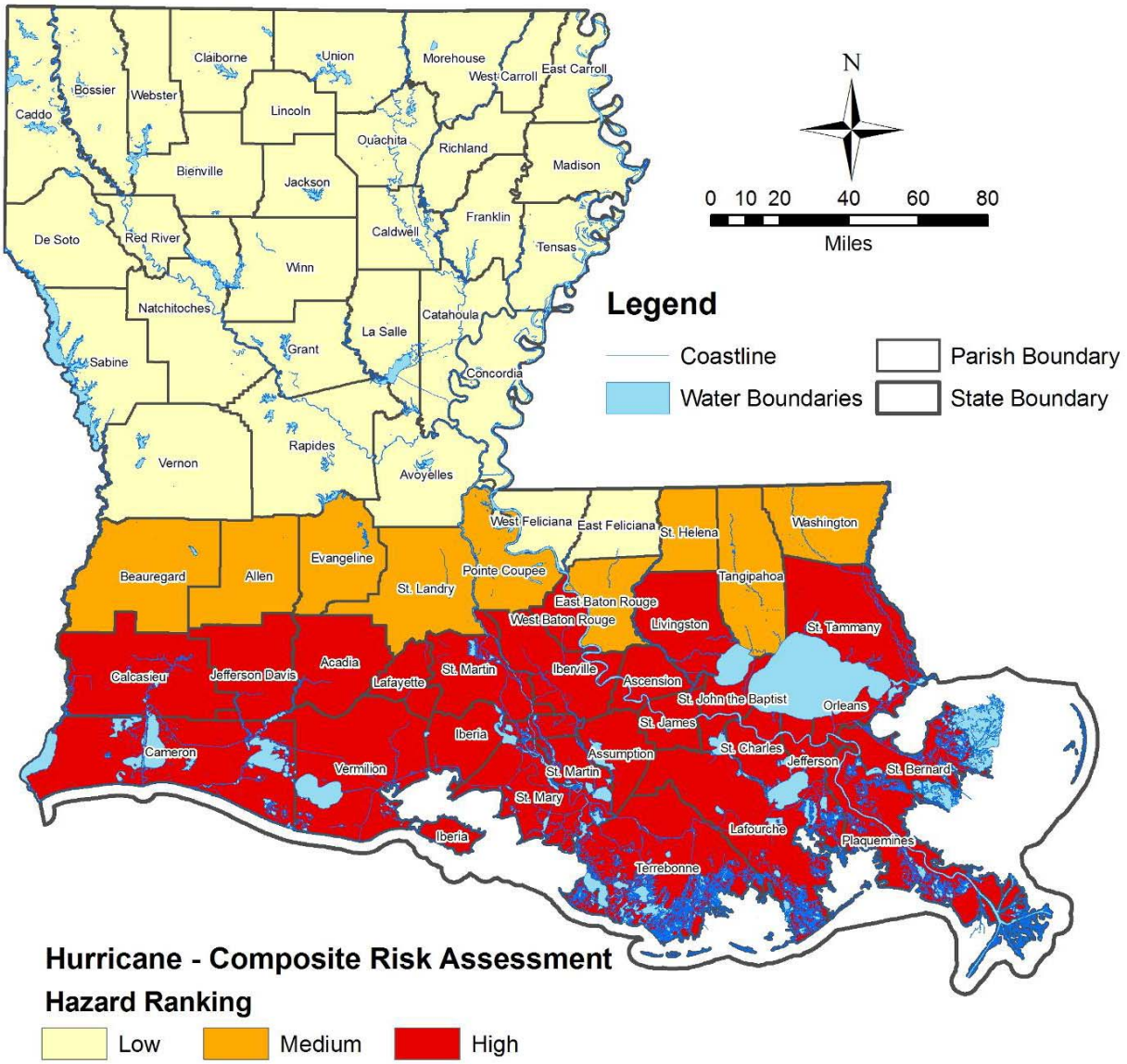
The composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points and each low ranking one (1) point. Following this methodology, the possible range of scores for hurricane wind is 6-18. A high hazard would be assigned to a parish receiving a score of 15 to 18; medium would be for parishes scoring 11-14; and low would be for any parish scoring 6 to 10.

Table E-31: Hurricane Wind Composite Scores

Parish	Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Utility Hazard Ranking	Property Damage Hazard Ranking	Hazard Ranking
Acadia	High	High	High	High	High	High	18
Allen	Medium	Medium	Medium	Medium	Medium	Medium	12
Ascension	High	High	High	High	High	High	18
Assumption	High	High	Medium	High	High	High	17
Avoyelles	Low	Low	Low	Low	Low	Medium	7
Beauregard	Medium	Medium	Medium	Medium	Medium	High	13
Bienville	Low	Low	Low	Low	Low	Low	6
Bossier	Low	Low	Low	Low	Low	Low	6
Caddo	Low	Low	Low	Low	Low	Low	6
Calcasieu	High	High	High	High	High	High	18
Caldwell	Low	Low	Low	Low	Low	Low	6
Cameron	High	High	Medium	High	High	High	17
Catahoula	Low	Low	Low	Low	Low	Low	6
Claiborne	Low	Low	Low	Low	Low	Low	6
Concordia	Low	Low	Low	Low	Low	Low	6
De Soto	Low	Low	Low	Low	Low	Low	6
East Baton Rouge	Medium	Medium	High	Medium	High	Medium	14
East Carroll	Low	Low	Low	Low	Low	Low	6
East Feliciana	Low	Low	Low	Low	Low	Medium	7
Evangeline	Medium	Medium	Medium	Medium	Medium	Medium	12
Franklin	Low	Low	Low	Low	Low	Low	6
Grant	Low	Low	Low	Low	Low	Low	6
Iberia	High	High	High	High	High	High	18
Iberville	High	High	Medium	High	High	High	17
Jackson	Low	Low	Low	Low	Low	Low	6
Jefferson	High	High	High	High	High	High	18
Jefferson Davis	High	High	High	High	High	Medium	17
Lafayette	High	High	High	High	High	Medium	17
Lafourche	High	High	High	High	High	High	18
La Salle	Low	Low	Low	Low	Low	Low	6
Lincoln	Low	Low	Low	Low	Low	Low	6
Livingston	High	High	High	High	High	High	18

Parish	Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Utility Hazard Ranking	Property Damage Hazard Ranking	Hazard Ranking
Madison	Low	Low	Low	Low	Low	Low	6
Morehouse	Low	Low	Low	Low	Low	Low	6
Natchitoches	Low	Low	Low	Low	Low	Low	6
Orleans	High	High	High	High	High	High	18
Ouachita	Low	Low	Low	Low	Low	Low	6
Plaquemines	High	High	High	High	High	High	18
Pointe Coupee	Medium	Medium	Medium	Medium	Medium	High	13
Rapides	Low	Low	Low	Low	Low	Medium	7
Red River	Low	Low	Low	Low	Low	Low	6
Richland	Low	Low	Low	Low	Low	Low	6
Sabine	Low	Low	Low	Low	Low	Low	6
St. Bernard	High	High	High	High	High	High	18
St. Charles	High	High	High	High	High	High	18
St. Helena	Low	Medium	Medium	Low	Low	High	10
St. James	High	High	Medium	High	High	High	17
St. John the Baptist	High	High	High	High	High	High	18
St. Landry	Medium	Medium	High	Medium	Medium	Medium	13
St. Martin	High	High	High	High	High	High	18
St. Mary	High	High	High	High	High	High	18
St. Tammany	High	High	High	High	High	High	18
Tangipahoa	Medium	Medium	High	Medium	Medium	High	14
Tensas	Low	Low	Low	Low	Low	Low	6
Terrebonne	High	High	High	High	High	High	18
Union	Low	Low	Low	Low	Low	Low	6
Vermilion	High	High	High	High	High	High	18
Vernon	Low	Medium	Medium	Low	Low	Medium	9
Washington	Medium	Medium	Medium	Medium	High	High	14
Webster	Low	Low	Low	Low	Low	Low	6
West Baton Rouge	High	High	Medium	High	High	High	17
West Carroll	Low	Low	Low	Low	Low	Low	6
West Feliciana	Low	Low	Low	Low	Low	High	8
Winn	Low	Low	Low	Low	Low	Low	6

Map E-41: Hurricane Wind Composite Scores



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Group Population), HSIP (Critical Facilities, Utilities), NOAA National Climatic Data Center (Hurricane/Tropical Storm Events), HAZUS-MH MR4 (Hurricane Wind Speed Modeling, Buildings)

Methodology

The HAZUS-MH inventory was developed as follows:

The HAZUS-MH general building stock data provided the building valuation for each specific occupancy classification (e.g., single family residential, retail trade) developed from the 2000 Census and Dun & Bradstreet (D&B). The general building stock data set includes the residential, commercial, industrial, governmental, educational, agricultural, and religious buildings for each parish. These data were developed at the census block level and then aggregated at census tract level. This dataset is from the 2000 version of TIGER/Line files and first quarter of 2002 data from D&B. The dataset was developed by applying RS-means replacement values for typical building floor areas and construction for each specific occupancy-type, a formula which is a nationally accepted and annually published for the purpose of calculating construction costs.

Population, general building stock, utilities, power lines, and critical facilities exposure to Category 2 hurricane winds was used to rate parish vulnerability. All population, general building stock, and critical facilities are considered exposed (or vulnerable) to hurricane wind.

Data Limitations

NCDC Storm Events Database data does not adjust for inflation, so monetary values are likely skewed lower than they should be. Additionally, a spokesperson for NCDC concedes that the monetary figures distinguishing property and crop damage are based on very rough estimates.

NCDC data is reported by the event, not by the jurisdiction, so a hurricane that crosses multiple parish boundaries will be given the same data for injuries, fatalities, and damages in each parish rather than showing how those figures were distributed across jurisdictions. Thus, some large multi-parish events may have records that have been double-counted. This will primarily affect the monetary figures (property and crop loss, average annual loss) which will skew heavily among the parishes that have been affected by the most recent devastating hurricanes (Katrina, Rita).

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Appendix E.7:
High Wind - Tornado

The Tornado hazard ranking was based on parish-wide vulnerability. The level of vulnerability was based on the total number of historical incidents and the number of injuries and fatalities and property and crop damages reported in the NOAA National Climatic Data Center data by parish (for the years 1950 through 2009).

The high / medium / low rankings for each parish were developed by:

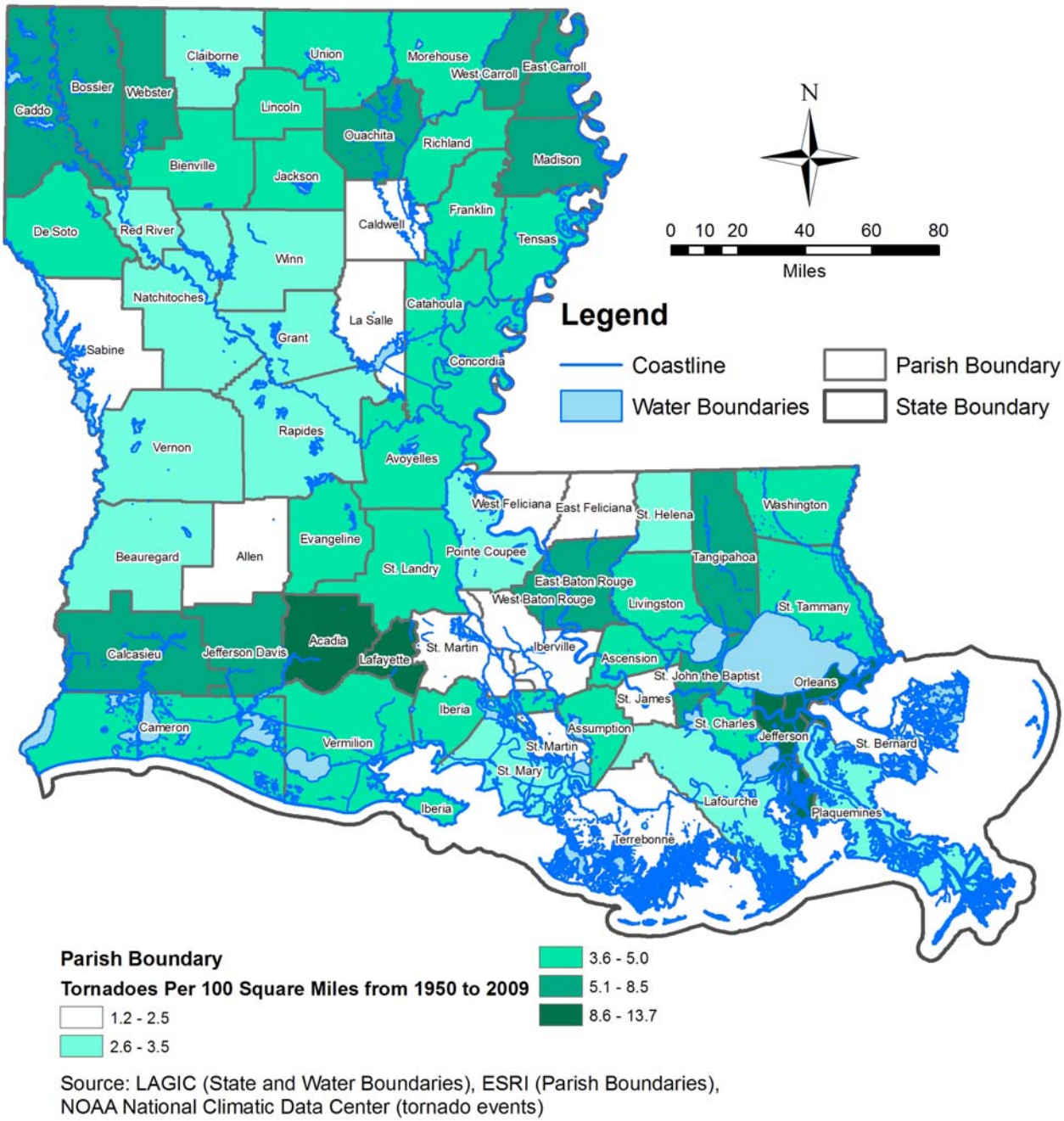
- Obtaining the NOAA data by parish;
- Sorting the list by parish from most to least number of storms by square mile
    - Assigning the high rank to parishes with more than seven tornadoes per square mile;
    - Assigning the medium rank to parishes where historical incidents are five and six and
    - Assigning the low rank to parishes with four or fewer.
- Sorting the list by parish from most to least level of intensity;
    - Assigning the high rank to parishes with F4 or F5 events or 40% or more of the recorded events being of an F2 or higher;
    - Assigning the medium rank to parishes with 20% or more of events over an F2; and
    - Assigning the low rank to parishes with less than 20% of events over F2.
- Sorting the list by parish from most to least number of injuries and fatalities;
    - Assigning the high rank to parishes with over 50 injuries or five or more fatalities;
    - Assigning the medium rank to parishes with 20-50 injuries; and
    - Assigning the low rank to parishes with less than 20 injuries
- Sorting the list by parish from highest to lowest losses;
    - Assigning the high rank to parishes with more than $400 thousand in property losses and $100 thousand or more in crop damage;
    - Assigning the medium rank to parishes with more than $100 thousand in property losses; and
    - Assigning the low rank to parishes with $100 thousand or less in property losses
- Sorting the list by parish from highest to lowest number of mobile homes;
    - Assigning the high rank to parishes with 25% or more of housing stock as mobile homes;
    - Assigning the medium rank to parishes with 15-25% of housing stock as mobile homes; and
    - Assigning the low rank to parishes with less than 15% of building stock as mobile homes;
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 10 or more;
    - Assigning the medium composite ranking to parishes with a score of 7 to 9; and
    - Assigning the low composite ranking to parishes with a score of 6 or less.

The total number of Tornadoes and the number per 100 square miles of land are shown in Table E-32 and Map E-42. Map E-43 shows the parishes ranked by number.

Table E-32: Total Number of Tornadoes and the Number per 100 Square Miles

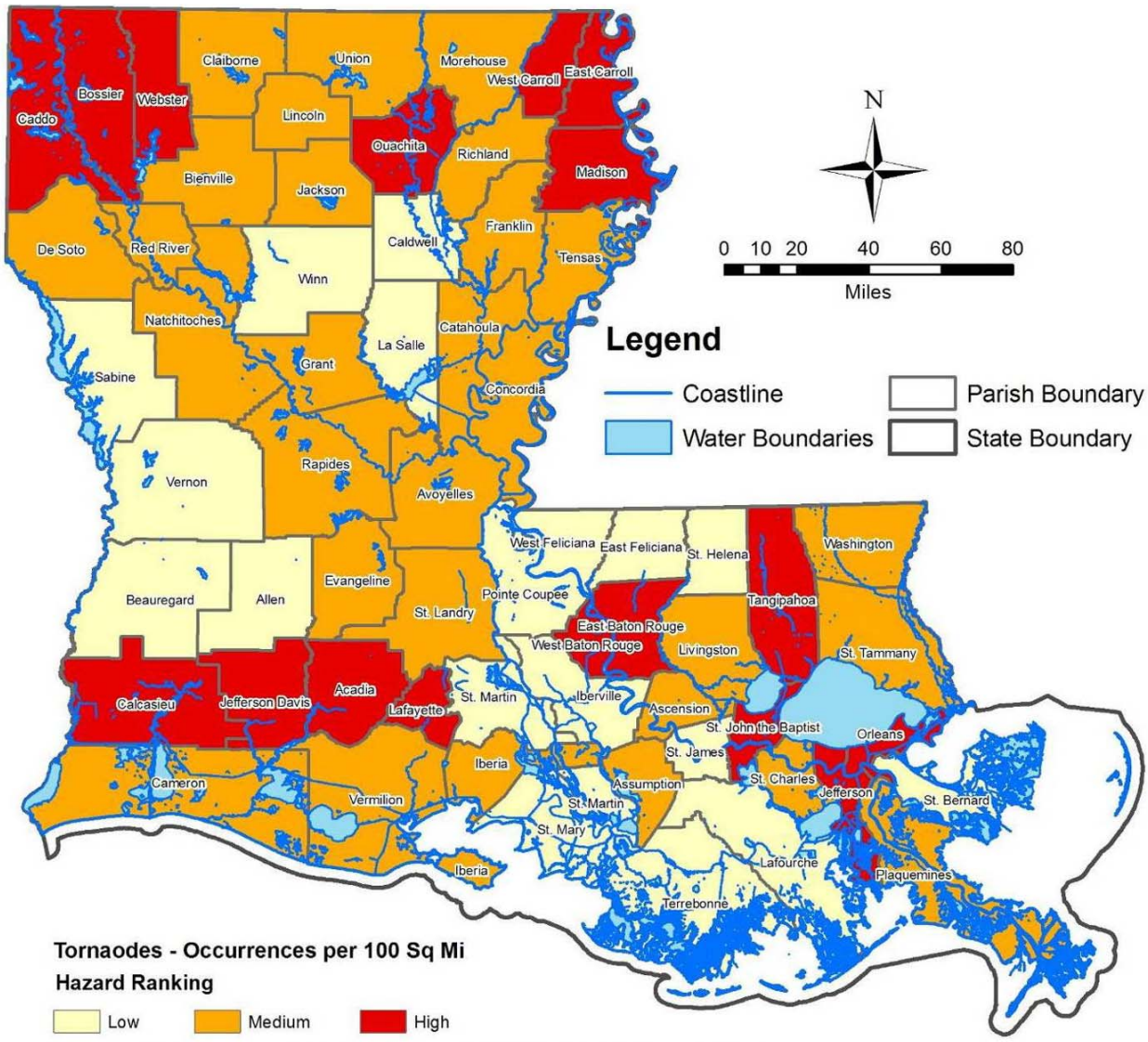
Parish	Total Tornado Count	Square Miles (excluding Water)	Total Tornadoes Per 100 Square Miles of Land	Hazard Ranking	Parish	Total Tornado Count	Square Miles (excluding Water)	Total Tornadoes Per 100 Square Miles of Land	Hazard Ranking
Acadia	59	655.28	9.00	High	Madison	44	624.09	7.05	High
Allen	17	764.50	2.22	Low	Morehouse	32	794.25	4.03	Medium
Ascension	11	291.53	3.77	Medium	Natchitoches	42	1,255.45	3.35	Medium
Assumption	16	338.68	4.72	Medium	Orleans	16	180.56	8.86	High
Avoyelles	31	832.44	3.72	Medium	Ouachita	34	610.53	5.57	High
Beauregard	33	1,160.09	2.84	Low	Plaquemines	28	844.56	3.32	Medium
Bienville	29	810.64	3.58	Medium	Pointe Coupee	16	557.34	2.87	Low
Bossier	48	839.25	5.72	High	Rapides	43	1,322.54	3.25	Medium
Caddo	65	881.99	7.37	High	Red River	13	389.29	3.34	Medium
Calcasieu	76	1,071.12	7.10	High	Richland	23	558.45	4.12	Medium
Caldwell	13	529.42	2.46	Low	Sabine	19	865.27	2.20	Low
Cameron	48	1,312.96	3.66	Medium	St. Bernard	8	465.04	1.72	Low
Catahoula	26	703.65	3.70	Medium	St. Charles	13	283.64	4.58	Medium
Claiborne	24	754.65	3.18	Medium	St. Helena	11	408.36	2.69	Low
Concordia	31	695.91	4.45	Medium	St. James	3	246.13	1.22	Low
De Soto	40	877.20	4.56	Medium	St. John the Baptist	12	218.90	5.48	High
East Baton Rouge	33	455.43	7.25	High	St. Landry	46	928.65	4.95	Medium
East Carroll	25	421.44	5.93	High	St. Martin	17	739.85	2.30	Low
East Feliciana	11	453.40	2.43	Low	St. Mary	17	612.79	2.77	Low
Evangeline	27	664.27	4.06	Medium	St. Tammany	35	854.15	4.10	Medium
Franklin	23	623.61	3.69	Medium	Tangipahoa	48	790.24	6.07	High
Grant	21	645.11	3.26	Medium	Tensas	24	602.48	3.98	Medium
Iberia	24	575.13	4.17	Medium	Terrebonne	29	1,254.93	2.31	Low
Iberville	13	618.64	2.10	Low	Union	35	877.60	3.99	Medium
Jackson	28	569.75	4.91	Medium	Vermilion	53	1,173.78	4.52	Medium
Jefferson	42	306.52	13.70	High	Vernon	38	1,328.41	2.86	Low
Jefferson Davis	36	652.31	5.52	High	Washington	28	669.57	4.18	Medium
Lafayette	37	269.83	13.71	High	Webster	42	595.22	7.06	High
Lafourche	31	1,084.68	2.86	Low	West Baton Rouge	10	191.20	5.23	High
La Salle	13	623.83	2.08	Low	West Carroll	19	359.40	5.29	High
Lincoln	22	471.38	4.67	Medium	West Feliciana	7	406.00	1.72	Low
Livingston	24	648.02	3.70	Medium	Winn	24	950.49	2.53	Low

Map E-42. Total Number of Tornadoes and the Number per 100 Square Miles



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (tornado events)

Map E-43: Parishes Ranked by Number of Tornadoes



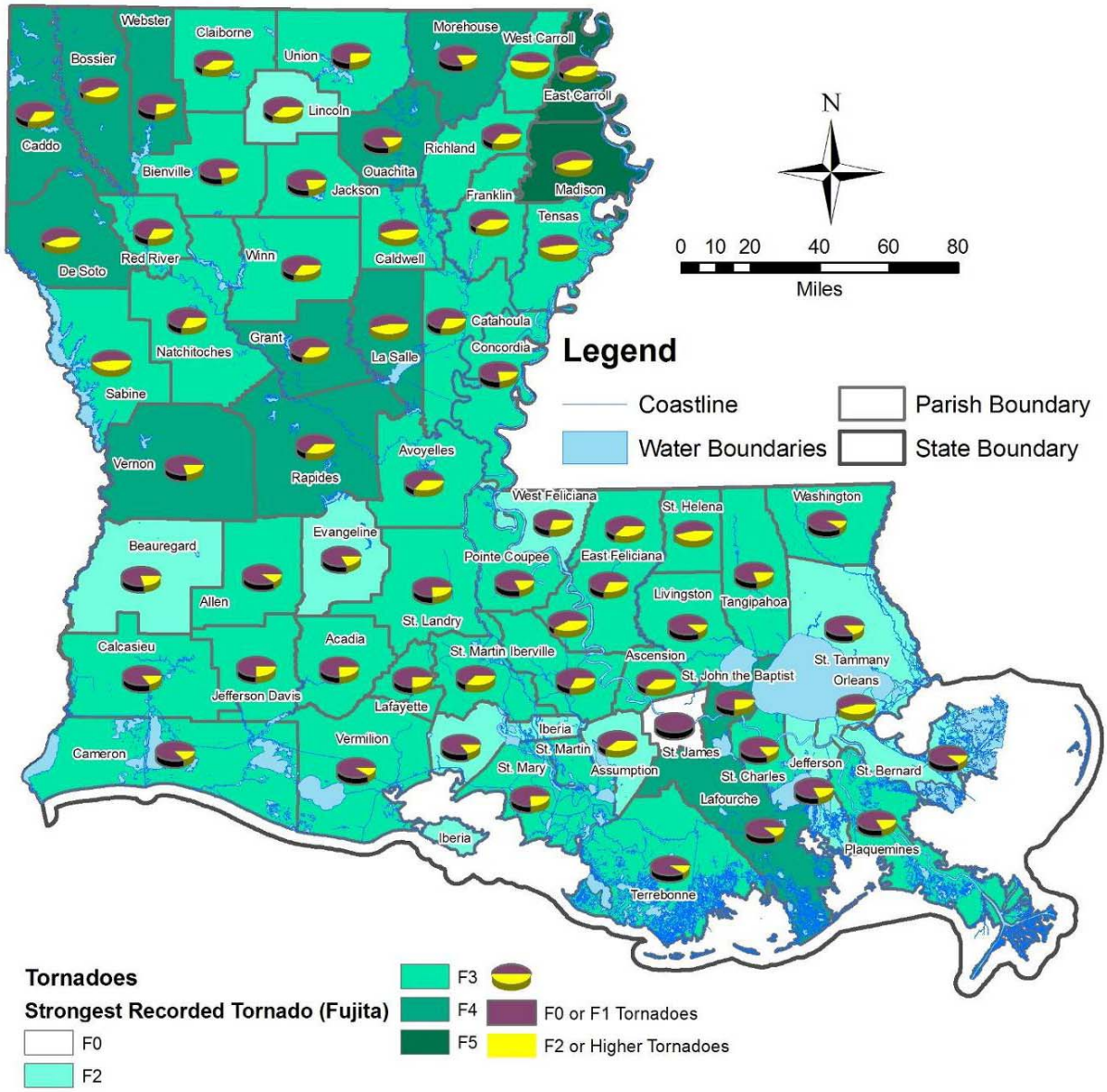
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (tornado events)

The total number of Tornadoes over F2 and the highest recorded intensity are shown in Table E-33 and Map E-44. Map E-45 shows the parishes ranked by intensity.

Table E-33: Strongest Recorded Tornadoes and Percentage of Tornadoes F3 or Higher

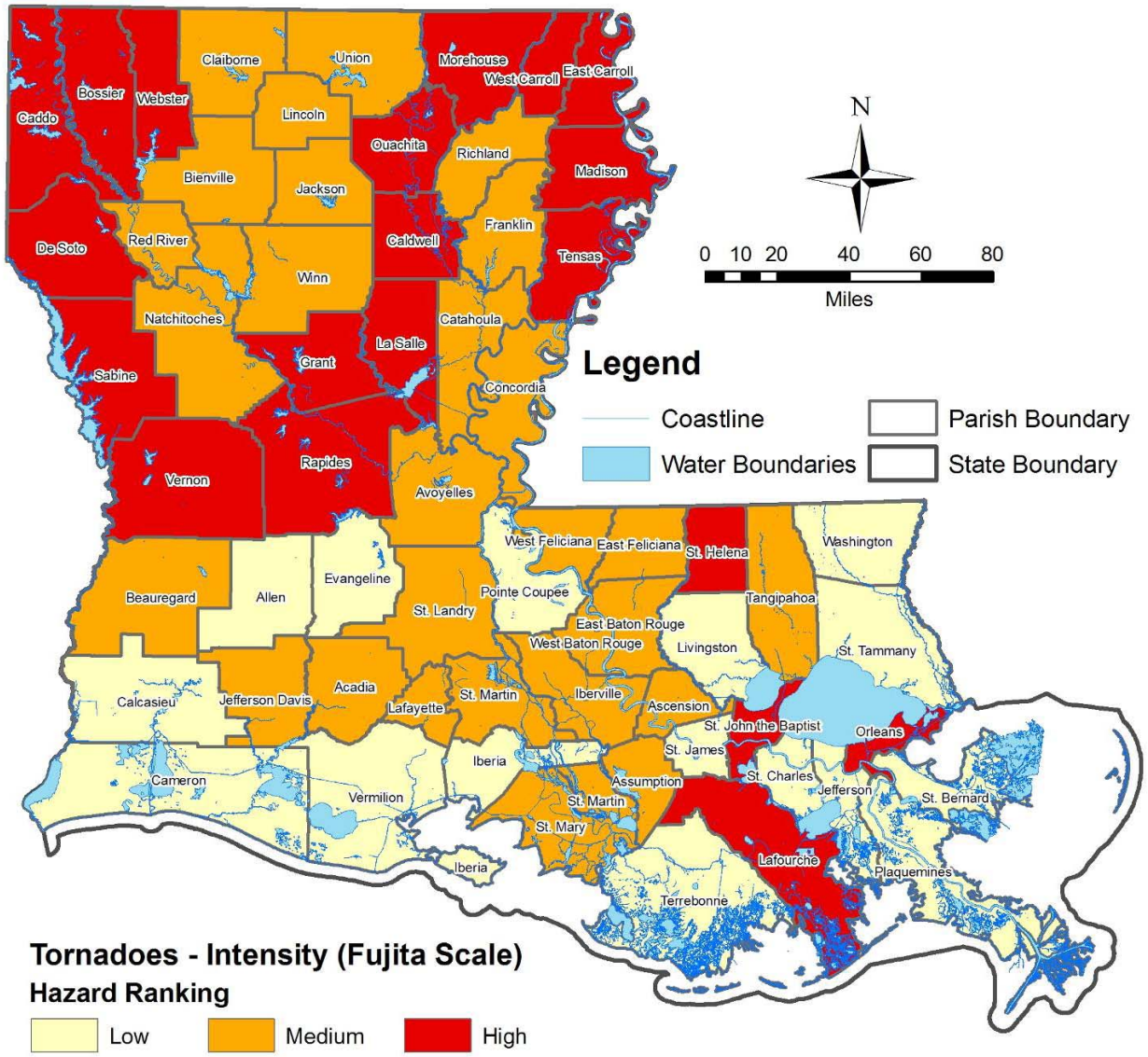
Parish	% of Tornadoes at F2 or Higher	Strongest Recorded Tornado	Hazard Ranking	Parish	% of Tornadoes at F2 or Higher	Strongest Recorded Tornado	Hazard Ranking
Acadia	23.7%	F3	Medium	Madison	43.2%	F5	High
Allen	11.8%	F3	Low	Morehouse	18.8%	F4	High
Ascension	36.4%	F3	Medium	Natchitoches	31.0%	F3	Medium
Assumption	37.5%	F2	Medium	Orleans	43.8%	F2	High
Avoyelles	35.5%	F3	Medium	Ouachita	17.6%	F4	High
Beauregard	21.2%	F2	Medium	Plaquemines	17.9%	F3	Low
Bienville	20.7%	F3	Medium	Pointe Coupee	18.8%	F3	Low
Bossier	41.7%	F4	High	Rapides	34.9%	F4	High
Caddo	32.3%	F4	High	Red River	30.8%	F3	Medium
Calcasieu	15.8%	F3	Low	Richland	34.8%	F3	Medium
Caldwell	46.2%	F3	High	Sabine	47.4%	F3	High
Cameron	14.6%	F3	Low	St. Bernard	12.5%	F2	Low
Catahoula	30.8%	F3	Medium	St. Charles	15.4%	F3	Low
Claiborne	37.5%	F3	Medium	St. Helena	45.5%	F3	High
Concordia	22.6%	F3	Medium	St. James	0.0%	F0	Low
De Soto	42.5%	F4	High	St. John the Baptist	25.0%	F4	High
East Baton Rouge	30.3%	F3	Medium	St. Landry	23.9%	F3	Medium
East Carroll	40.0%	F5	High	St. Martin	35.3%	F3	Medium
East Feliciana	36.4%	F3	Medium	St. Mary	23.5%	F3	Medium
Evangeline	18.5%	F2	Low	St. Tammany	14.7%	F2	Low
Franklin	39.1%	F3	Medium	Tangipahoa	20.8%	F3	Medium
Grant	33.3%	F4	High	Tensas	45.8%	F3	High
Iberia	16.7%	F2	Low	Terrebonne	10.3%	F3	Low
Iberville	30.8%	F3	Medium	Union	25.7%	F3	Medium
Jackson	21.4%	F3	Medium	Vermilion	11.3%	F3	Low
Jefferson	19.5%	F2	Low	Vernon	21.1%	F4	High
Jefferson Davis	25.0%	F3	Medium	Washington	10.7%	F3	Low
Lafayette	24.3%	F3	Medium	Webster	26.2%	F4	High
Lafourche	12.9%	F4	High	West Baton Rouge	40.0%	F3	Medium
La Salle	46.2%	F4	High	West Carroll	52.6%	F3	High
Lincoln	36.4%	F2	Medium	West Feliciana	28.6%	F2	Medium
Livingston	12.5%	F3	Low	Winn	33.3%	F3	Medium

Map E-44: Strongest Recorded Tornadoes and Percentage of Tornadoes F3 or Higher



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Tornado Events)

Map E-45: Parishes Ranked by Tornado Intensity



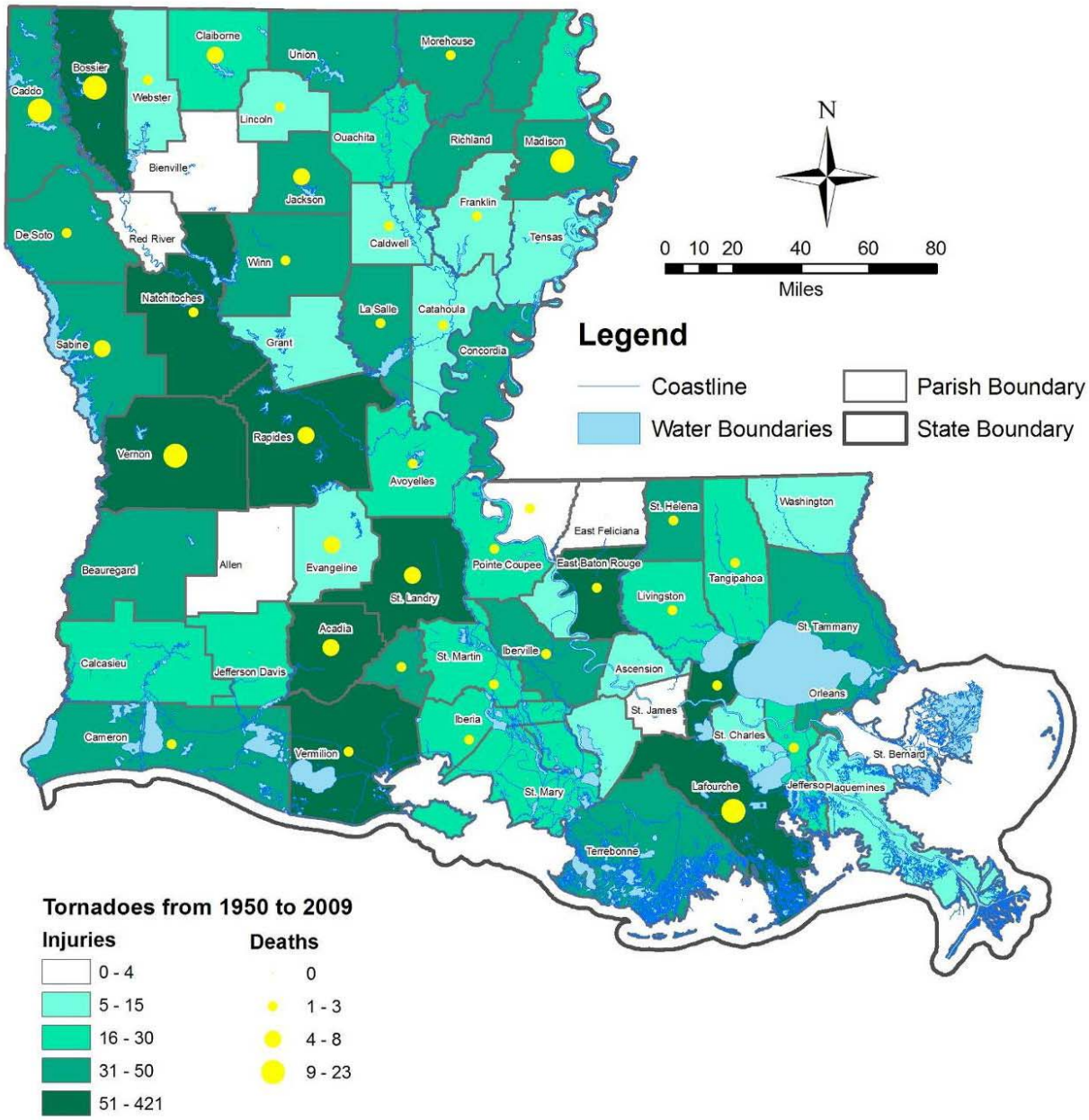
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Tornado Events)

The total number of tornado injuries and fatalities are shown in Table E-34 and Map E-46. Map E-47 shows the parishes ranked by number.

Table E-34: Number of Tornado Caused Injuries and Fatalities per Parish

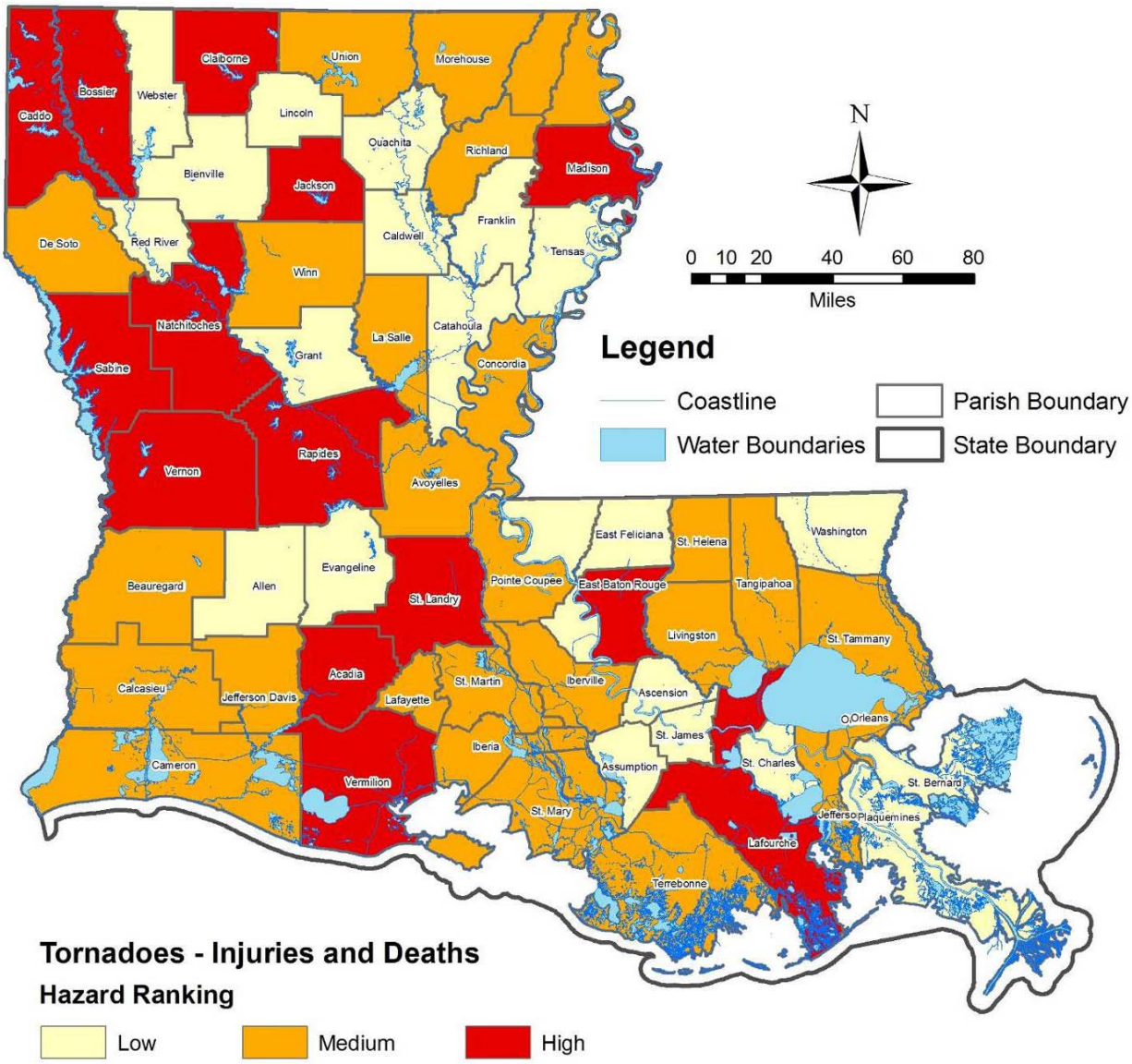
Parish	Tornado Injuries	Tornado Fatalities	Hazard Ranking	Parish	Injuries	Fatalities	Hazard Ranking
Acadia	65	5	High	Madison	35	11	High
Allen	4	0	Low	Morehouse	32	2	Medium
Ascension	15	0	Low	Natchitoches	58	1	High
Assumption	10	0	Low	Orleans	32	1	Medium
Avoyelles	24	1	Medium	Ouachita	16	0	Low
Beauregard	34	0	Medium	Plaquemines	11	0	Low
Bienville	4	0	Low	Pointe Coupee	28	2	Medium
Bossier	421	21	High	Rapides	56	4	High
Caddo	40	9	High	Red River	1	0	Low
Calcasieu	28	0	Medium	Richland	47	0	Medium
Caldwell	8	1	Low	Sabine	38	7	High
Cameron	49	3	Medium	St. Bernard	0	0	Low
Catahoula	10	1	Low	St. Charles	10	0	Low
Claiborne	22	5	High	St. Helena	34	2	Medium
Concordia	35	0	Medium	St. James	0	0	Low
De Soto	42	1	Medium	St. John the Baptist	66	2	High
East Baton Rouge	69	1	High	St. Landry	74	6	High
East Carroll	28	0	Medium	St. Martin	30	1	Medium
East Feliciana	0	0	Low	St. Mary	26	0	Medium
Evangeline	12	4	Low	St. Tammany	50	0	Medium
Franklin	14	1	Low	Tangipahoa	22	1	Medium
Grant	5	0	Low	Tensas	10	0	Low
Iberia	26	2	Medium	Terrebonne	47	0	Medium
Iberville	33	2	Medium	Union	34	0	Medium
Jackson	43	5	High	Vermilion	79	3	High
Jefferson	30	1	Medium	Vernon	51	9	High
Jefferson Davis	29	0	Medium	Washington	15	0	Low
Lafayette	41	2	Medium	Webster	15	2	Low
Lafourche	189	23	High	West Baton Rouge	7	0	Low
La Salle	43	3	Medium	West Carroll	48	0	Medium
Lincoln	14	2	Low	West Feliciana	4	1	Low
Livingston	24	2	Medium	Winn	39	2	Medium

Map E-46: Number of Tornado Caused Injuries and Fatalities per Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Tornado Events)

Map E-47: Parishes Ranked by Number of Tornado Caused Injuries and Fatalities



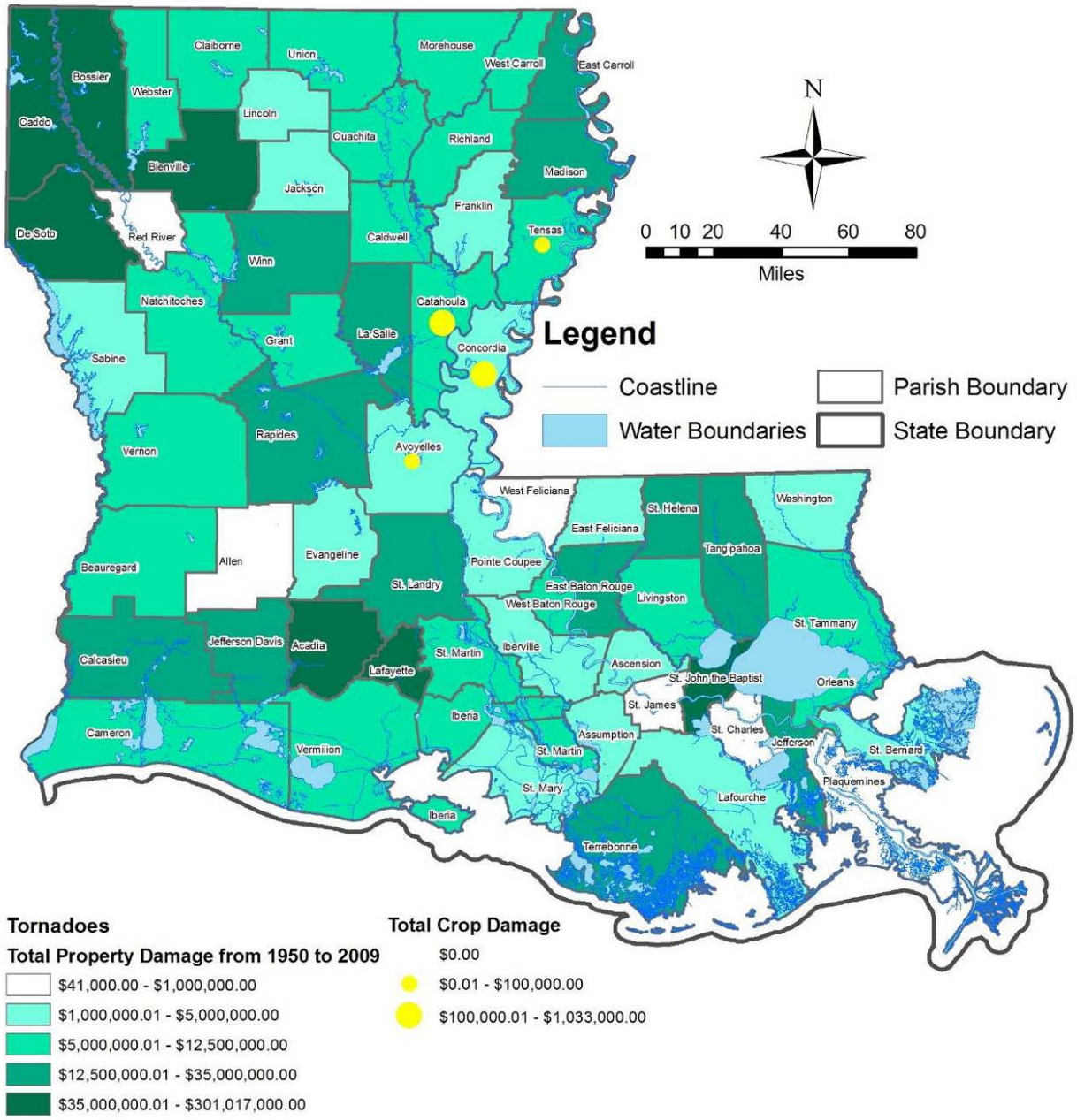
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Tornado Events)

The average annual losses from Tornadoes are shown in Table E-35 and Map E-48. Map E-49 shows the parishes ranked by average.

Table E-35: Property Losses, Crop Losses, and Average Annual Losses per Parish

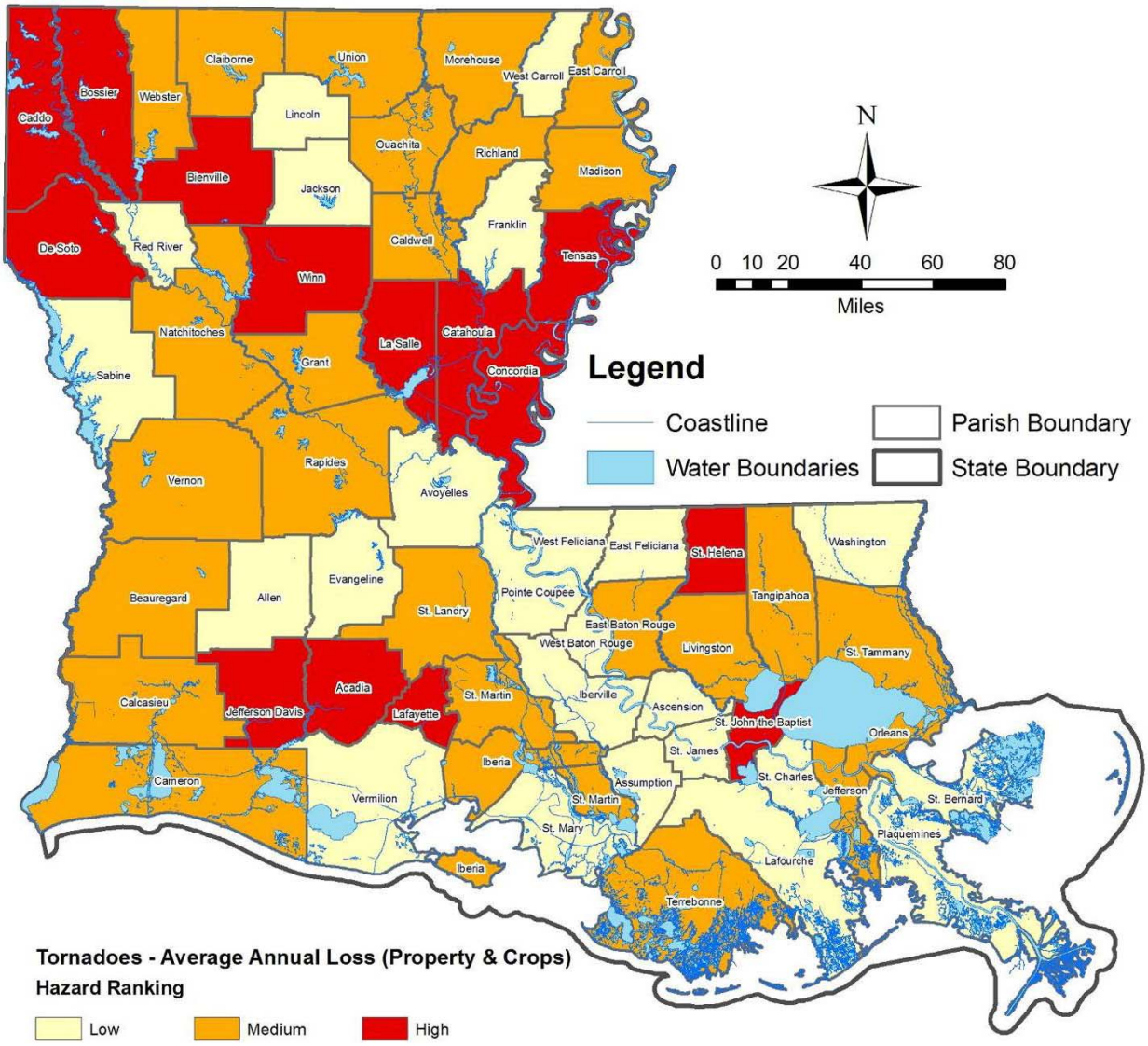
Parish	Property Damage	Crop Damage	Average Annual Loss	Hazard Ranking	Parish	Property Damage	Crop Damage	Average Annual Loss	Hazard Ranking
Acadia	$38,933,000	$0	$648,883	High	Madison	$12,611,000	$0	$210,183	Medium
Allen	$773,000	$0	$12,883	Low	Morehouse	$10,024,000	$0	$167,067	Medium
Ascension	$3,248,000	$0	$54,133	Low	Natchitoches	$11,403,000	$0	$190,050	Medium
Assumption	$2,653,000	$0	$44,217	Low	Orleans	$8,911,000	$0	$148,517	Medium
Avoyelles	$3,620,000	$50,000	$61,167	Low	Ouachita	$7,199,000	$0	$119,983	Medium
Beauregard	$6,254,000	$0	$104,233	Medium	Plaquemines	$680,000	$0	$11,333	Low
Bienville	$51,187,000	$0	$853,117	High	Pointe Coupee	$3,442,000	$0	$57,367	Low
Bossier	$301,017,000	$0	$5,016,950	High	Rapides	$13,853,000	$0	$230,883	Medium
Caddo	$93,709,000	$0	$1,561,817	High	Red River	$575,000	$0	$9,583	Low
Calcasieu	$17,000,000	$0	$283,333	Medium	Richland	$6,391,000	$0	$106,517	Medium
Caldwell	$6,350,000	$0	$105,833	Medium	Sabine	$3,874,000	$0	$64,567	Low
Cameron	$6,861,000	$0	$114,350	Medium	St. Bernard	$1,840,000	$0	$30,667	Low
Catahoula	$7,878,000	$650,000	$142,133	High	St. Charles	$965,000	$0	$16,083	Low
Claiborne	$12,481,000	$0	$208,017	Medium	St. Helena	$25,883,000	$0	$431,383	High
Concordia	$3,403,000	$1,033,000	$73,933	High	St. James	$41,000	$0	$683	Low
De Soto	$54,335,000	$0	$905,583	High	St. John the Baptist	$52,331,000	$0	$872,183	High
East Baton Rouge	$13,656,000	$0	$227,600	Medium	St. Landry	$18,029,000	$0	$300,483	Medium
East Carroll	$12,978,000	$0	$216,300	Medium	St. Martin	$6,476,000	$0	$107,933	Medium
East Feliciana	$1,087,000	$0	$18,117	Low	St. Mary	$3,036,000	$0	$50,600	Low
Evangeline	$4,617,000	$0	$76,950	Low	St. Tammany	$7,630,000	$0	$127,167	Medium
Franklin	$4,369,000	$0	$72,817	Low	Tangipahoa	$12,951,000	$0	$215,850	Medium
Grant	$8,634,000	$0	$143,900	Medium	Tensas	$7,577,000	$100,000	$127,950	High
Iberia	$6,400,000	$0	$106,667	Medium	Terrebonne	$12,626,000	$0	$210,433	Medium
Iberville	$2,903,000	$0	$48,383	Low	Union	$7,256,000	$0	$120,933	Medium
Jackson	$2,638,000	$0	$43,967	Low	Vermilion	$5,601,000	$0	$93,350	Low
Jefferson	$13,306,000	$0	$221,767	Medium	Vernon	$8,462,000	$0	$141,033	Medium
Jefferson Davis	$26,403,000	$0	$440,050	High	Washington	$1,569,000	$0	$26,150	Low
Lafayette	$39,792,000	$0	$663,200	High	Webster	$6,189,000	$0	$103,150	Medium
Lafourche	$4,470,000	$0	$74,500	Low	West Baton Rouge	$5,675,000	$0	$94,583	Low
La Salle	$34,380,000	$0	$573,000	High	West Carroll	$5,085,000	$0	$84,750	Low
Lincoln	$3,209,000	$0	$53,483	Low	West Feliciana	$507,000	$0	$8,450	Low
Livingston	$6,290,000	$0	$104,833	Medium	Winn	$31,699,000	$0	$528,317	High

Map E-48: Total Property and Crop Losses per Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Tornado Events)

Map E-49: Parishes Ranked by Total Property and Crop Losses



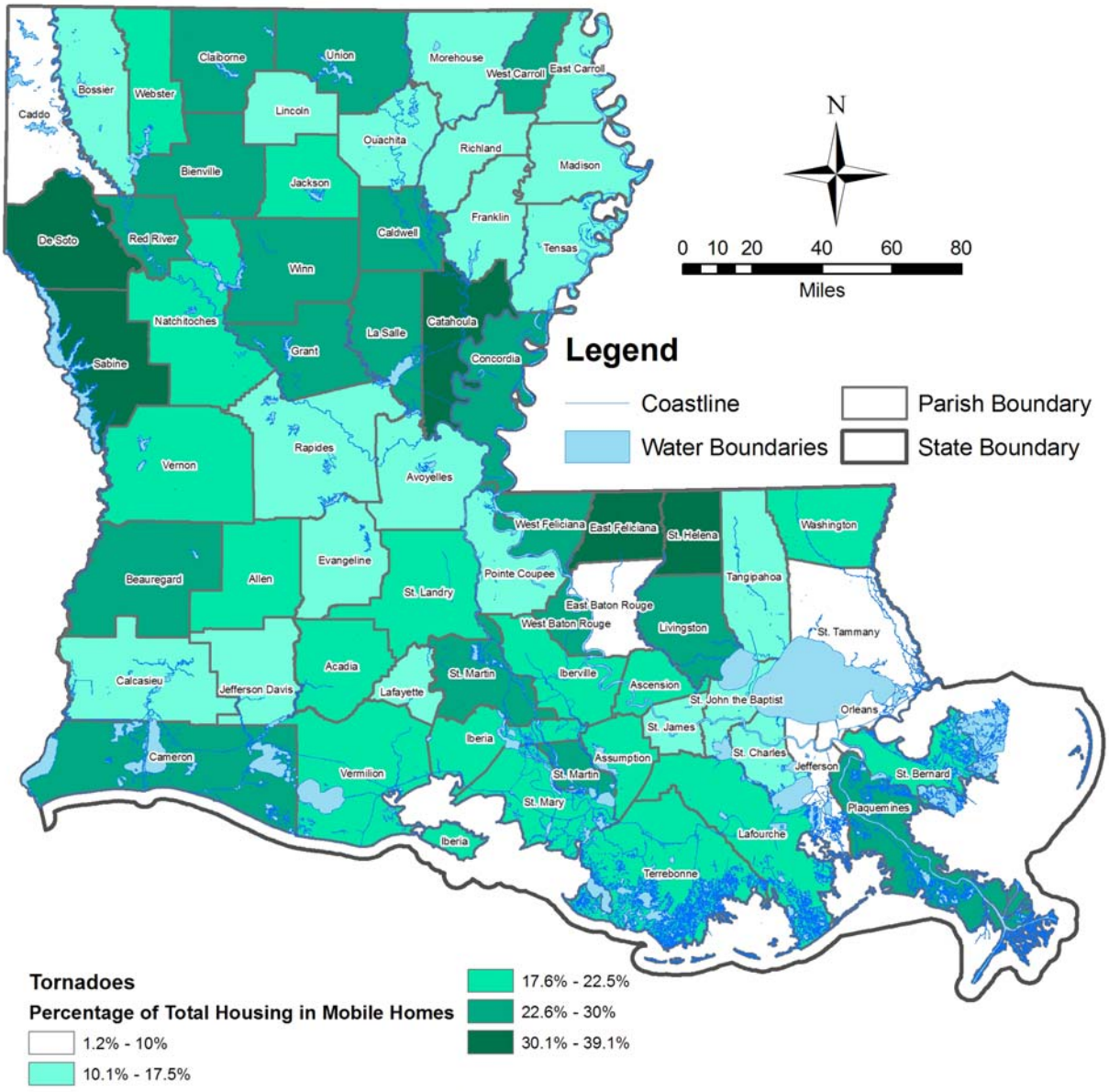
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Tornado Events)

The total number of mobile homes and percentage out of total housing units are shown in Table E-36 and Map E-50. Map E-51 shows the parishes ranked by percentage.

Table E-36: Percentage of Building Stock Made up of Mobile Homes

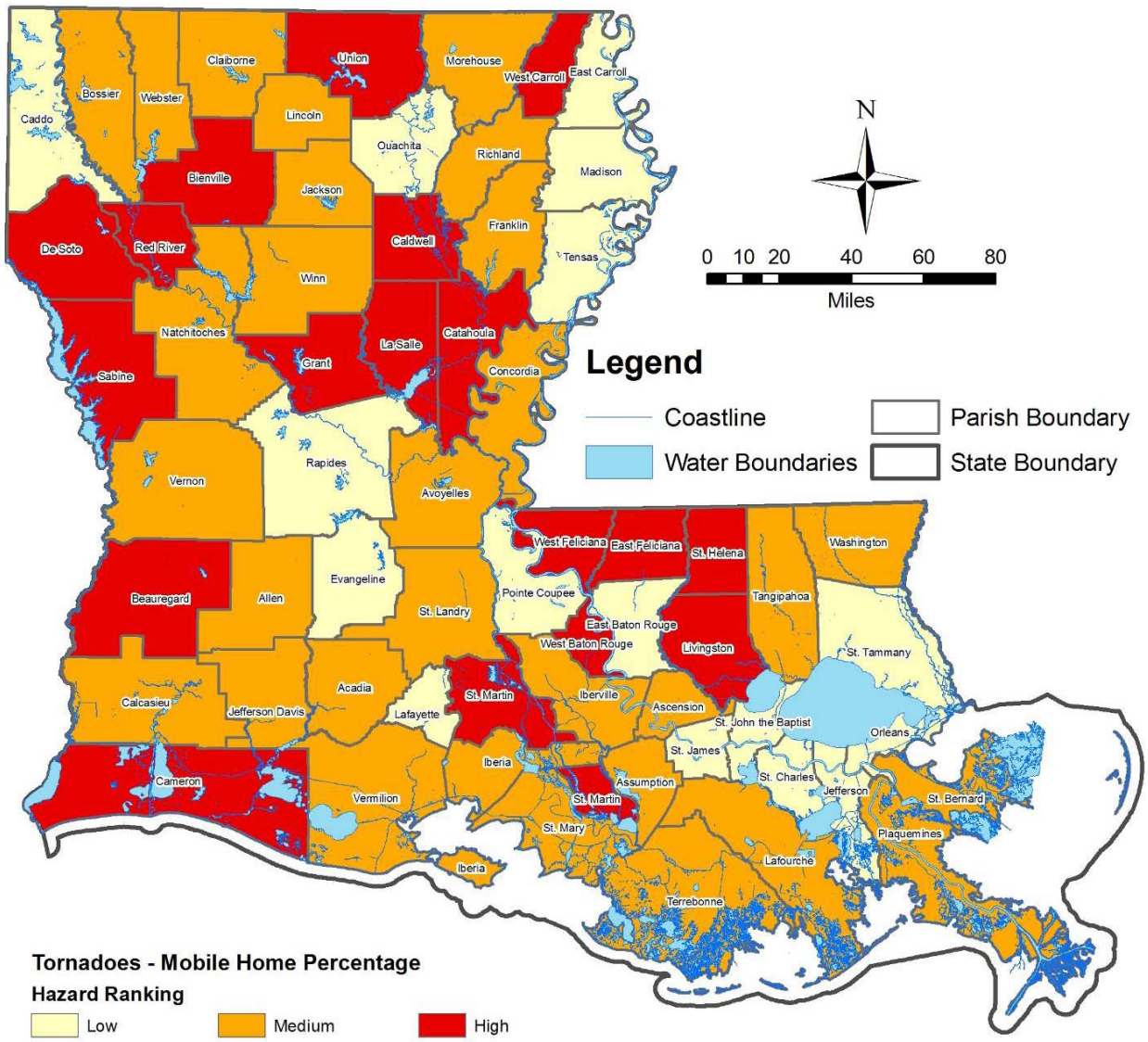
Parish	Total Count of Mobile Homes	% Out of Total Housing Units That Are Mobile Homes	Hazard Ranking	Parish	Total Count of Mobile Homes	% Out of Total Housing Units That Are Mobile Homes	Hazard Ranking
Acadia	4,521	18.3%	Medium	Madison	584	11.7%	Low
Allen	1,834	19.2%	Medium	Morehouse	2,178	16.5%	Medium
Ascension	7,880	19.9%	Medium	Natchitoches	3,923	21.5%	Medium
Assumption	2,071	19.8%	Medium	Orleans	1,948	1.7%	Low
Avoyelles	2,819	15.8%	Medium	Ouachita	8,232	12.8%	Low
Beauregard	4,428	29.0%	High	Plaquemines	1,966	22.6%	Medium
Bienville	2,127	27.2%	High	Pointe Coupee	1,538	13.9%	Low
Bossier	7,605	15.8%	Medium	Rapides	7,404	13.0%	Low
Caddo	9,882	8.7%	Low	Red River	1,042	26.1%	High
Calcasieu	12,673	15.3%	Medium	Richland	1,441	16.3%	Medium
Caldwell	1,433	28.5%	High	Sabine	5,662	39.1%	High
Cameron	1,584	29.7%	High	St. Bernard	1,689	22.2%	Medium
Catahoula	1,615	30.2%	High	St. Charles	2,189	11.1%	Low
Claiborne	1,868	23.9%	Medium	St. Helena	1,851	36.8%	High
Concordia	2,182	23.9%	Medium	St. James	1,165	14.0%	Low
De Soto	3,865	32.8%	High	St. John the Baptist	1,963	11.3%	Low
East Baton Rouge	7,498	4.0%	Low	St. Landry	7,626	19.6%	Medium
East Carroll	486	14.7%	Low	St. Martin	5,947	27.1%	High
East Feliciana	2,583	31.1%	High	St. Mary	4,860	21.5%	Medium
Evangeline	1,953	12.9%	Low	St. Tammany	8,006	8.3%	Low
Franklin	1,431	15.9%	Medium	Tangipahoa	8,244	16.3%	Medium
Grant	2,538	29.8%	High	Tensas	485	14.4%	Low
Iberia	5,650	18.8%	Medium	Terrebonne	9,193	20.7%	Medium
Iberville	2,777	22.0%	Medium	Union	3,501	28.8%	High
Jackson	1,450	19.8%	Medium	Vermilion	5,258	21.8%	Medium
Jefferson	2,094	1.2%	Low	Vernon	4,507	20.4%	Medium
Jefferson Davis	2,232	16.5%	Medium	Washington	4,225	20.8%	Medium
Lafayette	10,518	11.7%	Low	Webster	4,416	22.1%	Medium
Lafourche	7,151	18.7%	Medium	West Baton Rouge	2,391	25.5%	High
La Salle	1,661	26.5%	High	West Carroll	1,263	25.4%	High
Lincoln	2,882	15.6%	Medium	West Feliciana	1,140	25.4%	High
Livingston	11,714	25.2%	High	Winn	1,734	23.1%	Medium

Map E-50: Percentage of Building Stock Made up of Mobile Homes



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Census American Community Survey 2008, 2006-08, or 2000 SF3 (Mobile Homes)

Map E-51: Parishes Ranked by Percentage of Mobile Homes Building Stock



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Census American Community Survey 2008, 2006-08, or 2000 SF3 (Mobile Homes)

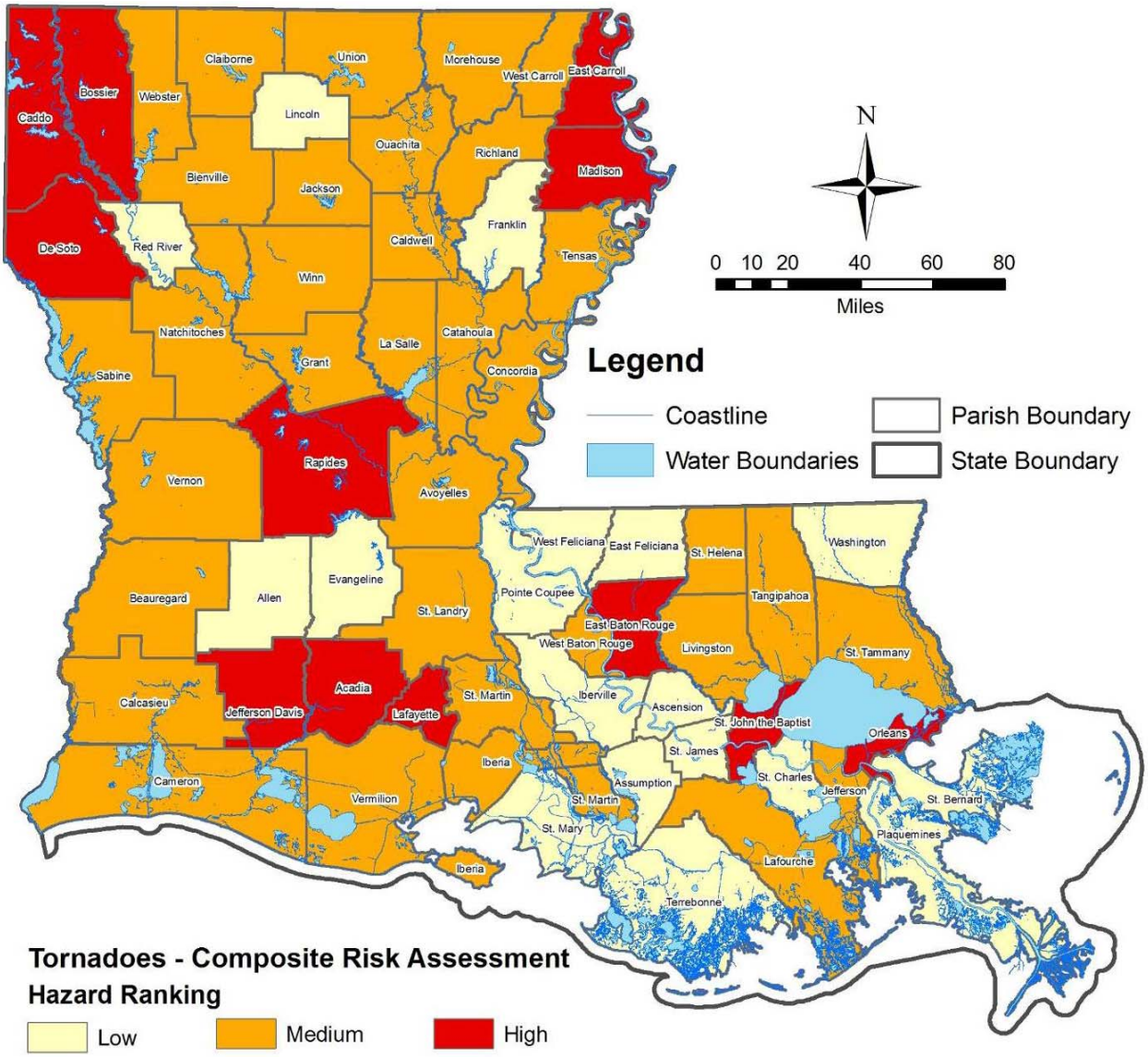
The composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points and each low ranking one (1) point. Following this methodology the possible range of scores for tornado is 5-13. A high Tornado Hazard would be assigned to a parish receiving a score of 12 to 13, medium would be for parishes scoring 9 to 11, and low would be for any parish scoring 5 to 8.

Table E-37: Composite Ranking by Parish

Parish	Occurrence Hazard Ranking	Intensity Hazard Ranking	Injury & Fatality Hazard Ranking	Property and Crop Loss Ranking	Mobile Home Hazard Ranking	Composite Hazard Ranking
Acadia	High	Medium	High	High	Medium	13
Allen	Low	Low	Low	Low	Medium	6
Ascension	Medium	Medium	Low	Low	Medium	8
Assumption	Medium	Medium	Low	Low	Medium	8
Avoyelles	Medium	Medium	Medium	Low	Medium	9
Beauregard	Low	Medium	Medium	Medium	High	10
Bienville	Medium	Medium	Low	High	High	11
Bossier	High	High	High	High	Medium	14
Caddo	High	High	High	High	Low	13
Calcasieu	High	Low	Medium	Medium	Medium	10
Caldwell	Low	High	Low	Medium	High	10
Cameron	Medium	Low	Medium	Medium	High	10
Catahoula	Medium	Medium	Low	High	High	11
Claiborne	Medium	Medium	High	Medium	Medium	11
Concordia	Medium	Medium	Medium	High	Medium	11
De Soto	Medium	High	Medium	High	High	13
East Baton Rouge	High	Medium	High	Medium	Low	11
East Carroll	High	High	Medium	Medium	Low	11
East Feliciana	Low	Medium	Low	Low	High	8
Evangeline	Medium	Low	Low	Low	Low	6
Franklin	Medium	Medium	Low	Low	Medium	8
Grant	Medium	High	Low	Medium	High	11
Iberia	Medium	Low	Medium	Medium	Medium	9
Iberville	Low	Medium	Medium	Low	Medium	8
Jackson	Medium	Medium	High	Low	Medium	10
Jefferson	High	Low	Medium	Medium	Low	9
Jefferson Davis	High	Medium	Medium	High	Medium	12
Lafayette	High	Medium	Medium	High	Low	11
Lafourche	Low	High	High	Low	Medium	10

Parish	Occurrence Hazard Ranking	Intensity Hazard Ranking	Injury & Fatality Hazard Ranking	Property and Crop Loss Ranking	Mobile Home Hazard Ranking	Composite Hazard Ranking
La Salle	Low	High	Medium	High	High	12
Lincoln	Medium	Medium	Low	Low	Medium	8
Livingston	Medium	Low	Medium	Medium	High	10
Madison	High	High	High	Medium	Low	12
Morehouse	Medium	High	Medium	Medium	Medium	11
Natchitoches	Medium	Medium	High	Medium	Medium	11
Orleans	High	High	Medium	Medium	Low	11
Ouachita	High	High	Low	Medium	Low	10
Plaquemines	Medium	Low	Low	Low	Medium	7
Pointe Coupee	Low	Low	Medium	Low	Low	6
Rapides	Medium	High	High	Medium	Low	11
Red River	Medium	Medium	Low	Low	High	9
Richland	Medium	Medium	Medium	Medium	Medium	10
Sabine	Low	High	High	Low	High	11
St. Bernard	Low	Low	Low	Low	Medium	6
St. Charles	Medium	Low	Low	Low	Low	6
St. Helena	Low	High	Medium	High	High	12
St. James	Low	Low	Low	Low	Low	5
St. John the Baptist	High	High	High	High	Low	13
St. Landry	Medium	Medium	High	Medium	Medium	11
St. Martin	Low	Medium	Medium	Medium	High	10
St. Mary	Low	Medium	Medium	Low	Medium	8
St. Tammany	Medium	Low	Medium	Medium	Low	8
Tangipahoa	High	Medium	Medium	Medium	Medium	11
Tensas	Medium	High	Low	High	Low	10
Terrebonne	Low	Low	Medium	Medium	Medium	8
Union	Medium	Medium	Medium	Medium	High	11
Vermilion	Medium	Low	High	Low	Medium	9
Vernon	Low	High	High	Medium	Medium	11
Washington	Medium	Low	Low	Low	Medium	7
Webster	High	High	Low	Medium	Medium	11
West Baton Rouge	High	Medium	Low	Low	High	10
West Carroll	High	High	Medium	Low	High	12
West Feliciana	Low	Medium	Low	Low	High	8
Winn	Low	Medium	Medium	High	Medium	10

Map E-52: Composite Ranking by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Tornado Events)

Methodology

The analysis for tornado loss estimates encompassed several considerations. The first was to determine the number of tornadoes per 100 square miles per parish. This was determined by first acquiring the square mileage for each parish. Secondly, the number of recorded tornadoes per parish utilizing the NCDC data base was determined. Finally, the number of events was divided by the square mileage for the parish to establish the number of events per 100 square miles.

The next consideration was the intensity of storms. Again the NCDC data was utilized to determine the strongest recorded tornado and the number of storms of greater than a F2 magnitude. The total number of F2 and greater tornadoes was then divided by the total number of events, to establish the percentage of high intensity events.

The total numbers of injuries and fatalities as well as the total property and crop losses were determined from NCDC.

The total number of mobile homes as determined by the 2000 census was divided by the total number of houses per parish to establish the percentage of housing stock that is mobile homes.

Data Limitations

NCDC Storm Events Database data does not adjust for inflation, so monetary values are likely skewed lower than they should be. Additionally, a spokesperson for NCDC concedes that the monetary figures distinguishing property and crop damage are based on very rough estimates.

NCDC data is reported by the event, not by the jurisdiction, so a tornado that crosses multiple parish boundaries will be given the same data for injuries, fatalities, and damages in each parish rather than showing how those figures distributed across jurisdictions. Thus, some large multi-parish events may have records that have been double-counted.

The algorithm NCDC uses for searching storms does not distinguish parishes with a character stream that happens to duplicated part of the character stream for a parish with a longer name. Thus, an event that affected Jefferson Davis Parish may also show up in Jefferson Parish without having caused impact.

NCDC cannot distinguish between tornadoes occurring from atmospheric conditions versus those spawned by hurricanes or tropical storms. Thus, the records of tornado events in the southern and coastal parishes may be elevated due to those induced by hurricanes, while most tornadoes in the north of the state would occur independently of other violent weather.

Appendix E.8:
Ice Storm

The ice storm hazard ranking was based on parish-wide vulnerability. The level of vulnerability was based on the total number of historical incidents reported in the NOAA data by parish (for the years 1993 through 2009). In establishing the hazards ranking, all incidents were assumed to have equal impacts, since the level of severity could not be determined from the existing data.

The high / medium / low rankings for each parish were developed by:

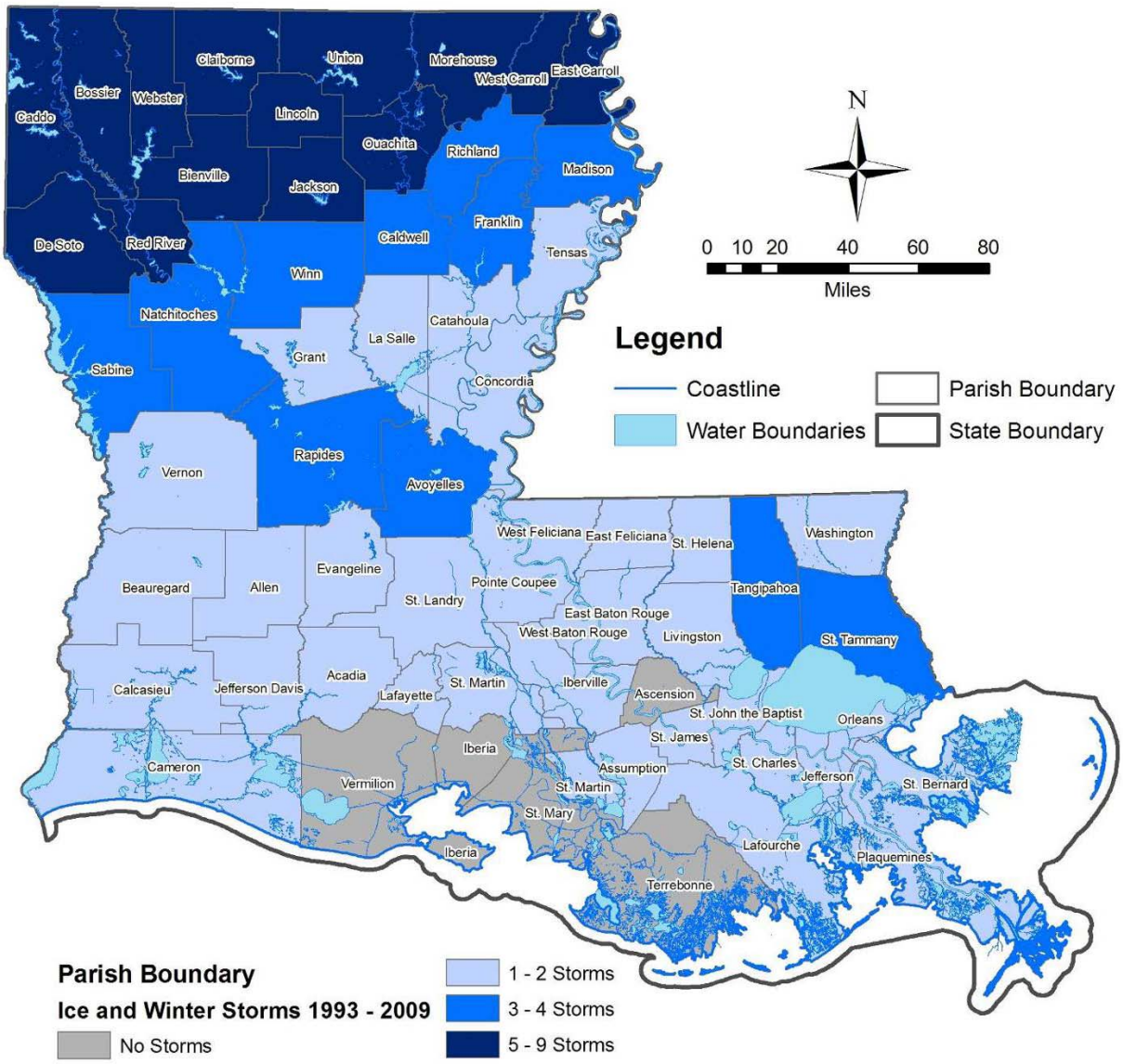
- Obtaining the NOAA data by parish;
- Sorting the list by parish from highest to lowest number of storms;
    - Assigning the High Rank to parishes with 5 or more events;
    - Assigning the Medium Rank to parishes with 2 to 4 events;
    - Assigning the Low Rank to parishes with fewer than 2 events.
- Sorting the list by parish from highest to lowest number of injuries and fatalities;
    - Assigning the High Rank to parishes with11 or more injuries or 3 or more fatalities;
    - Assigning the Medium Rank to parishes with any injuries or 1 or more fatalities;
    - Assigning the Low Rank to parishes with no injuries or fatalities.
- Sorting the list by parish from highest to lowest average annual property losses;
    - Assigning the High Rank to parishes with Over $1 million in annualized losses;
    - Assigning the High Rank to parishes with over $1 in annualized losses;
    - Assigning the High Rank to parishes with non annualized losses
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 8 or more;
    - Assigning the medium composite ranking to parishes with a score of 5 to 7; and
    - Assigning the low composite ranking to parishes with a score of 4 or less.

Table E-38 and Map E-53 show the list of parishes from highest to lowest number of storms. Map E-54 shows the parishes ranked by number of events.

Table E-38: Number of Storms by Parish

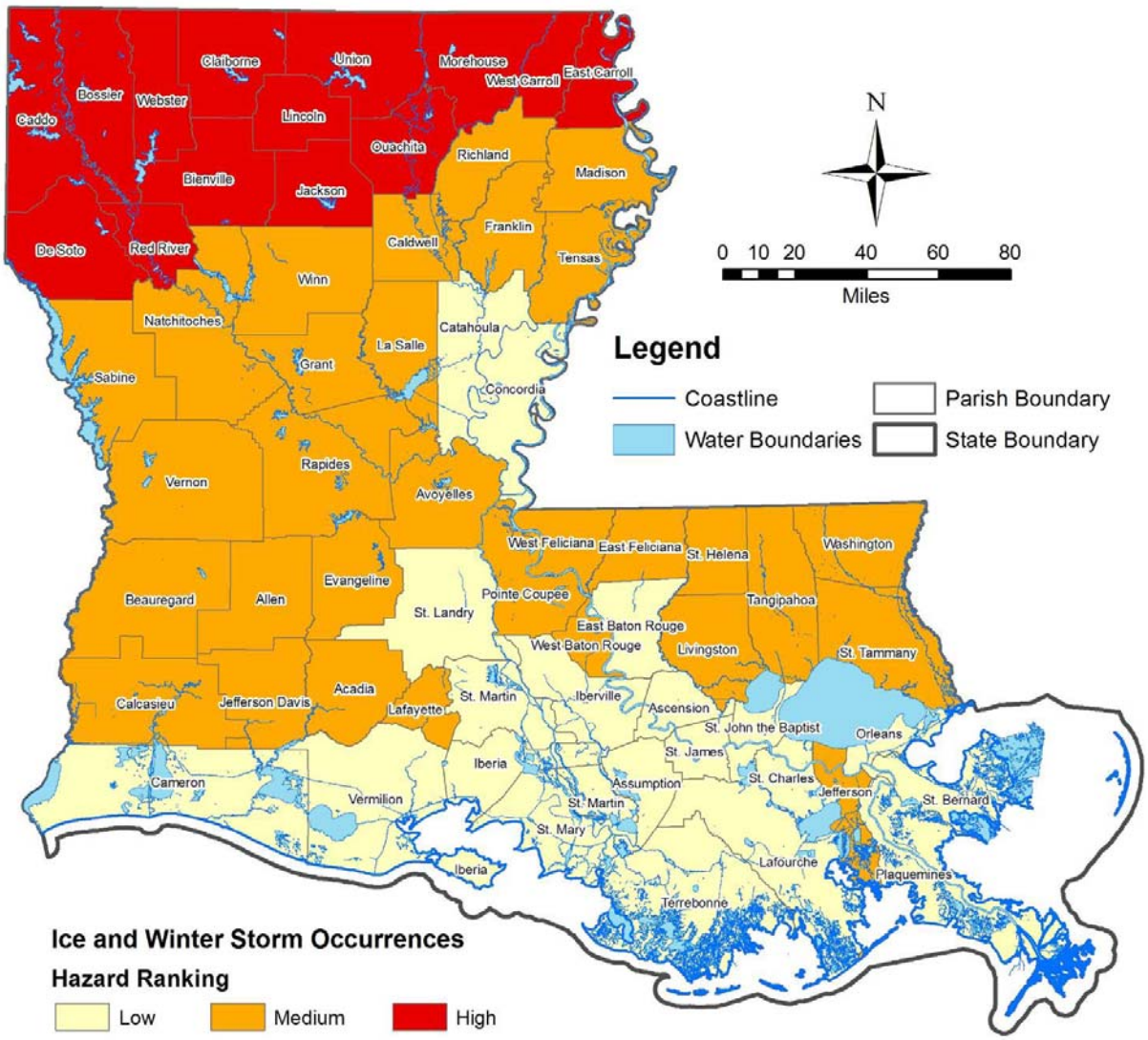
Parish	Ice/Winter Storm Count	Hazard Ranking	Parish	Ice/Winter Storm Count	Hazard Ranking
Acadia	2	Medium	Madison	4	Medium
Allen	2	Medium	Morehouse	5	High
Ascension	0	Low	Natchitoches	3	Medium
Assumption	1	Low	Orleans	1	Low
Avoyelles	4	Medium	Ouachita	7	High
Beauregard	2	Medium	Plaquemines	1	Low
Bienville	7	High	Pointe Coupee	2	Medium
Bossier	7	High	Rapides	3	Medium
Caddo	9	High	Red River	6	High
Calcasieu	2	Medium	Richland	4	Medium
Caldwell	3	Medium	Sabine	3	Medium
Cameron	1	Low	St. Bernard	1	Low
Catahoula	1	Low	St. Charles	1	Low
Claiborne	7	High	St. Helena	2	Medium
Concordia	1	Low	St. James	1	Low
De Soto	6	High	St. John the Baptist	1	Low
East Baton Rouge	1	Low	St. Landry	1	Low
East Carroll	5	High	St. Martin	1	Low
East Feliciana	2	Medium	St. Mary	0	Low
Evangeline	2	Medium	St. Tammany	3	Medium
Franklin	3	Medium	Tangipahoa	3	Medium
Grant	2	Medium	Tensas	2	Medium
Iberia	0	Low	Terrebonne	0	Low
Iberville	1	Low	Union	7	High
Jackson	5	High	Vermilion	0	Low
Jefferson	2	Medium	Vernon	2	Medium
Jefferson Davis	2	Medium	Washington	2	Medium
Lafayette	2	Medium	Webster	7	High
Lafourche	1	Low	West Baton Rouge	2	Medium
La Salle	2	Medium	West Carroll	5	High
Lincoln	7	High	West Feliciana	2	Medium
Livingston	2	Medium	Winn	3	Medium

Map E-53: Number of Storms by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Ice Storm Events)

Map E-54: Parishes Ranked by Number of Ice Storms



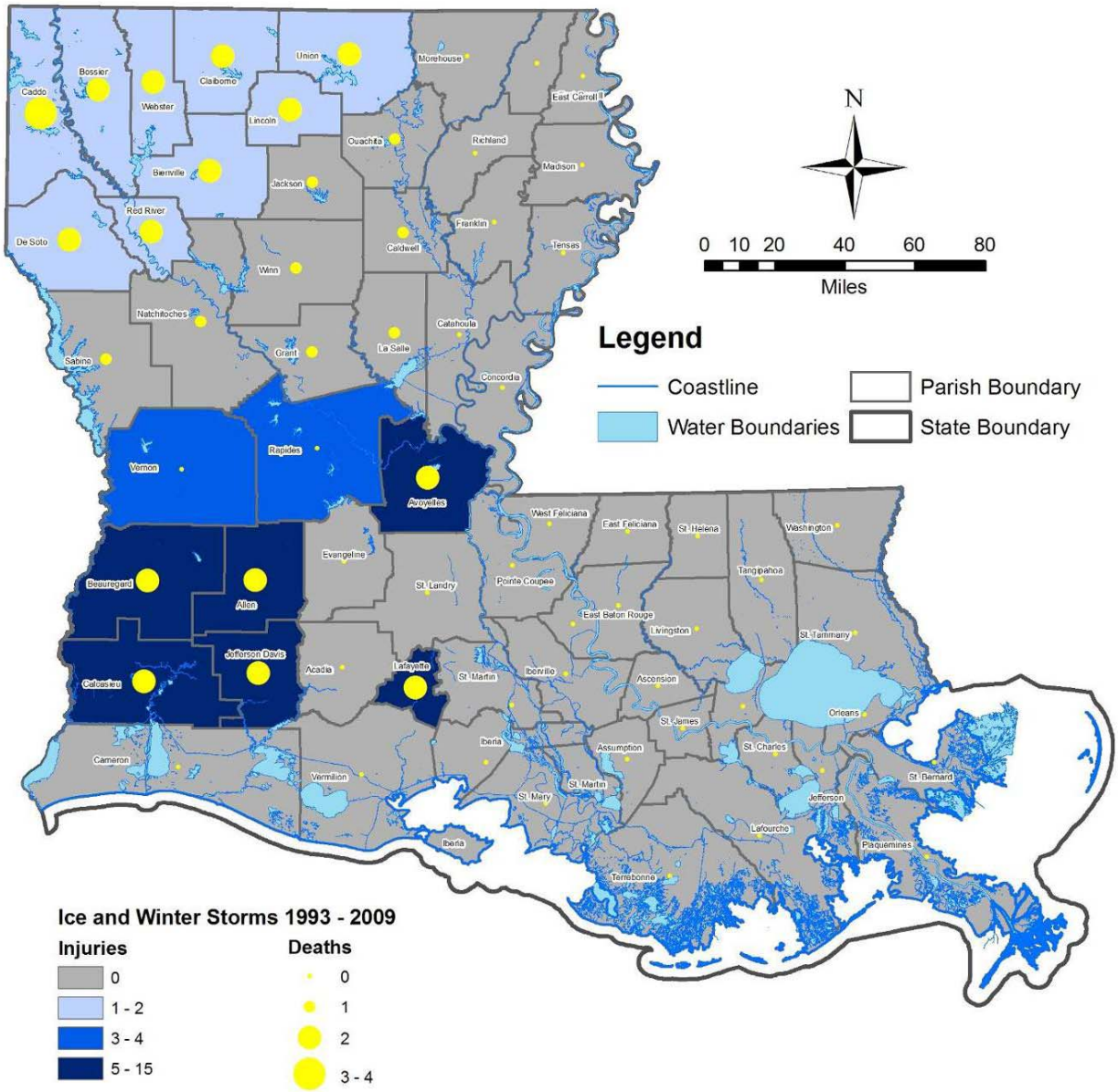
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Ice Storm Events)

Table E-39 and Map E-55 show the list of parishes from highest to lowest ice storm injuries and fatalities. Map E-56 shows the parishes ranked by number of ice storms.

Table E-39: Parishes Ranked by Number of Ice Storm Injuries and Fatalities

Parish	Storm Injuries	Storm Fatalities	Hazard Ranking	Parish	Storm Injuries	Storm Fatalities	Hazard Ranking
Acadia	0	0	Low	Madison	0	0	Low
Allen	15	2	High	Morehouse	0	0	Low
Ascension	0	0	Low	Natchitoches	0	1	Medium
Assumption	0	0	Low	Orleans	0	0	Low
Avoyelles	15	2	High	Ouachita	0	1	Medium
Beauregard	15	2	High	Plaquemines	0	0	Low
Bienville	1	2	Medium	Pointe Coupee	0	0	Low
Bossier	1	2	Medium	Rapides	4	0	Medium
Caddo	2	4	High	Red River	1	2	Medium
Calcasieu	15	2	High	Richland	0	0	Low
Caldwell	0	1	Medium	Sabine	0	1	Medium
Cameron	0	0	Low	St. Bernard	0	0	Low
Catahoula	0	0	Low	St. Charles	0	0	Low
Claiborne	1	2	Medium	St. Helena	0	0	Low
Concordia	0	0	Low	St. James	0	0	Low
De Soto	1	2	Medium	St. John the Baptist	0	0	Low
East Baton Rouge	0	0	Low	St. Landry	0	0	Low
East Carroll	0	0	Low	St. Martin	0	0	Low
East Feliciana	0	0	Low	St. Mary	0	0	Low
Evangeline	0	0	Low	St. Tammany	0	0	Low
Franklin	0	0	Low	Tangipahoa	0	0	Low
Grant	0	1	Medium	Tensas	0	0	Low
Iberia	0	0	Low	Terrebonne	0	0	Low
Iberville	0	0	Low	Union	1	2	Medium
Jackson	0	1	Medium	Vermilion	0	0	Low
Jefferson	0	0	Low	Vernon	4	0	Medium
Jefferson Davis	15	2	High	Washington	0	0	Low
Lafayette	15	2	High	Webster	1	2	Medium
Lafourche	0	0	Low	West Baton Rouge	0	0	Low
La Salle	0	1	Medium	West Carroll	0	0	Low
Lincoln	1	2	Medium	West Feliciana	0	0	Low
Livingston	0	0	Low	Winn	0	1	Medium

Map E-55: Number of Ice Storm Injuries and Fatalities per Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Ice Storm Events)

Map E-56: Parishes Ranked by Number of Ice Storm Injuries and Fatalities

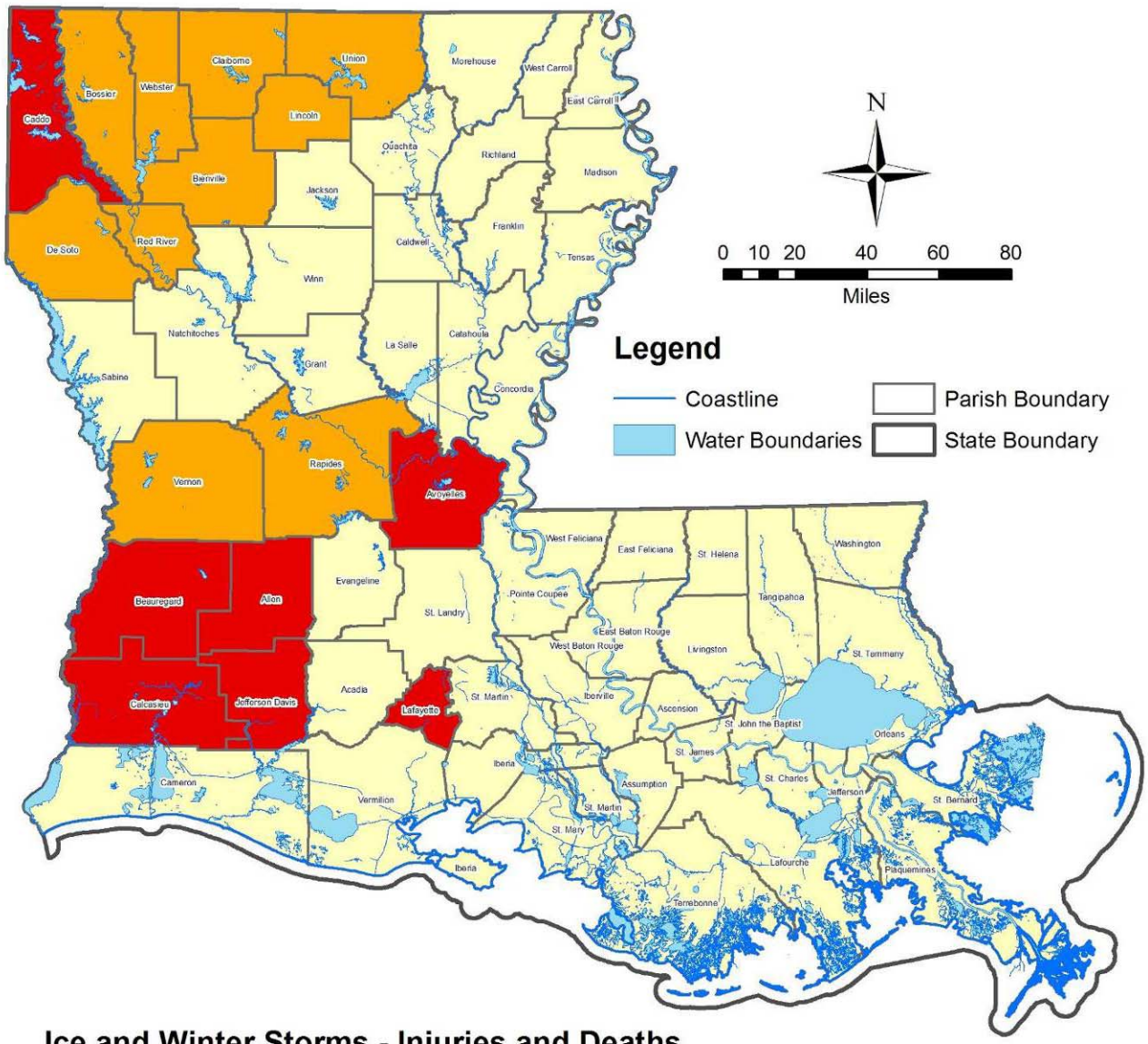
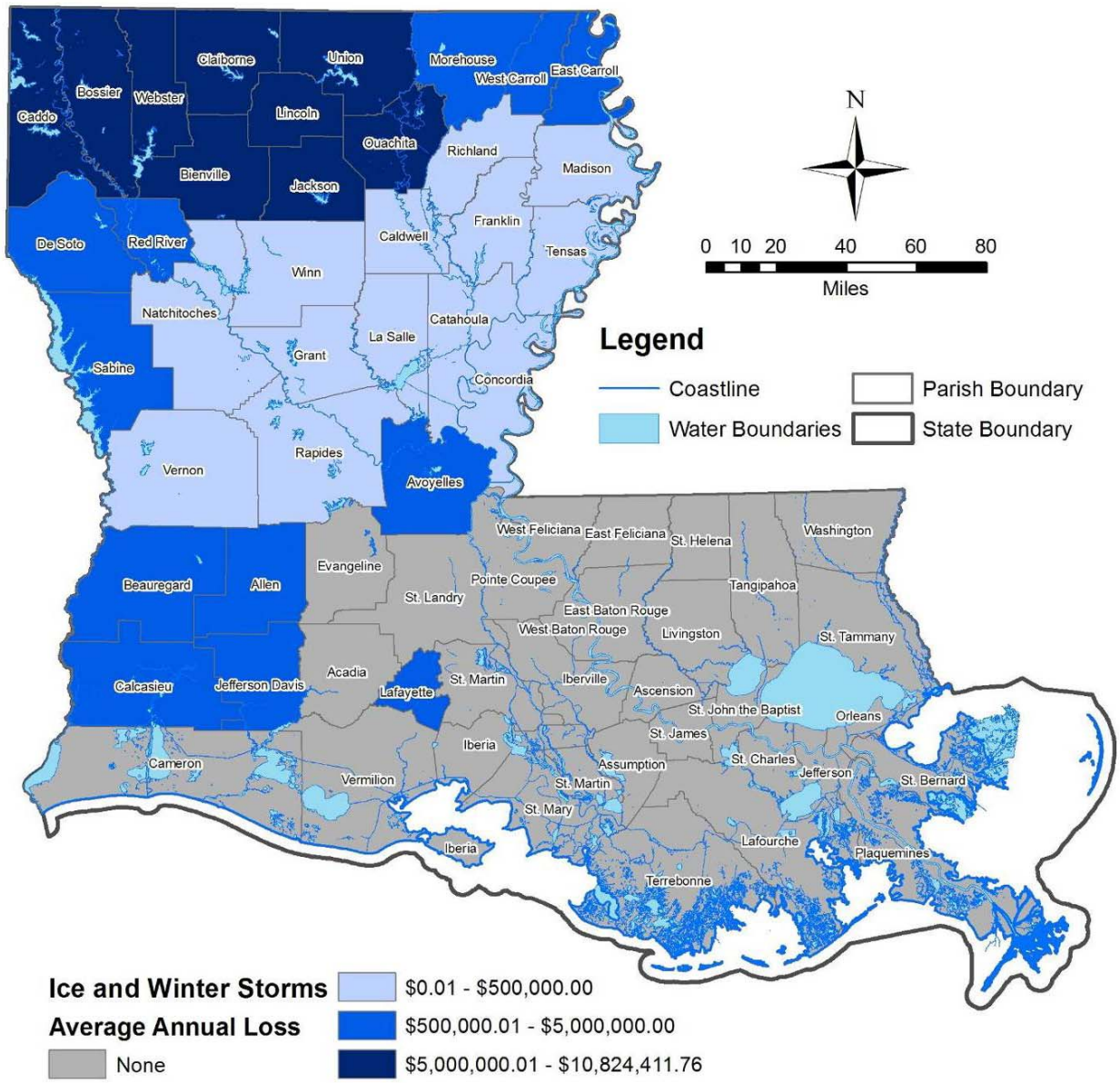


Table E-40 and Map E-57 show the list of parishes from highest to lowest annualized ice storm losses. Map E-58 shows the parishes ranked by annualized Ice Storm losses.

Table E-40: Parishes Ranked by Annualized Ice Storm Losses

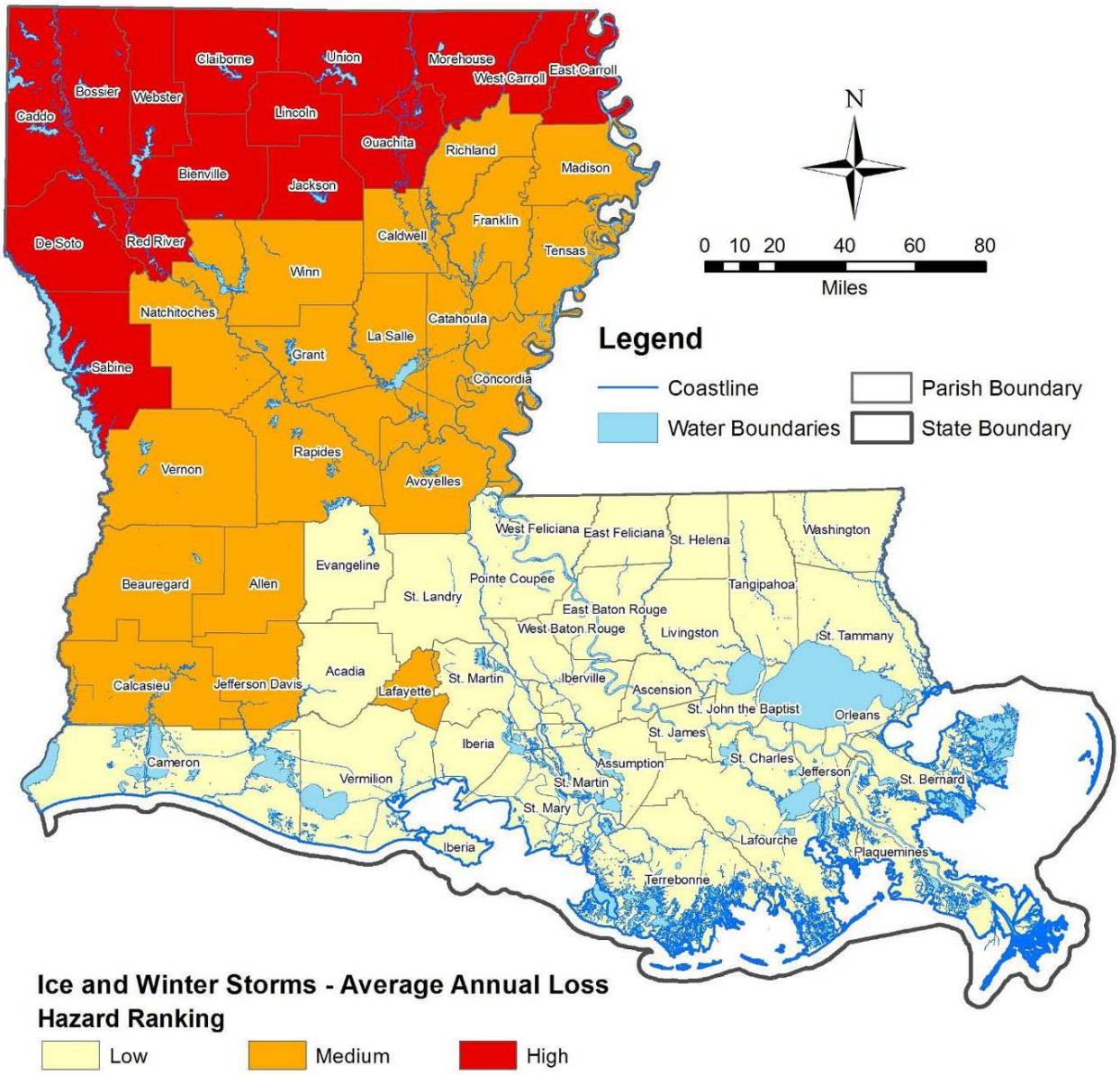
Parish	Property Damage	Average Annual Loss	Hazard Ranking	Parish	Property Damage	Average Annual Loss	Hazard Ranking
Acadia	$0	$0	Low	Madison	$5,620,000	$330,588	Medium
Allen	$11,900,000	$700,000	Medium	Morehouse	$55,670,000	$3,274,706	High
Ascension	$0	$0	Low	Natchitoches	$1,000,000	$58,824	Medium
Assumption	$0	$0	Low	Orleans	$0	$0	Low
Avoyelles	$12,100,000	$711,765	Medium	Ouachita	$157,030,000	$9,237,059	High
Beauregard	$11,900,000	$700,000	Medium	Plaquemines	$0	$0	Low
Bienville	$184,000,000	$10,823,529	High	Pointe Coupee	$0	$0	Low
Bossier	$184,000,000	$10,823,529	High	Rapides	$555,000	$32,647	Medium
Caddo	$184,015,000	$10,824,412	High	Red River	$78,000,000	$4,588,235	High
Calcasieu	$11,900,000	$700,000	Medium	Richland	$5,620,000	$330,588	Medium
Caldwell	$1,000,000	$58,824	Medium	Sabine	$51,000,000	$3,000,000	High
Cameron	$0	$0	Low	St. Bernard	$0	$0	Low
Catahoula	$900,000	$52,941	Medium	St. Charles	$0	$0	Low
Claiborne	$184,000,000	$10,823,529	High	St. Helena	$0	$0	Low
Concordia	$900,000	$52,941	Medium	St. James	$0	$0	Low
De Soto	$78,000,000	$4,588,235	High	St. John the Baptist	$0	$0	Low
East Baton Rouge	$0	$0	Low	St. Landry	$0	$0	Low
East Carroll	$55,670,000	$3,274,706	High	St. Martin	$0	$0	Low
East Feliciana	$0	$0	Low	St. Mary	$0	$0	Low
Evangeline	$0	$0	Low	St. Tammany	$0	$0	Low
Franklin	$5,250,000	$308,824	Medium	Tangipahoa	$0	$0	Low
Grant	$1,000,000	$58,824	Medium	Tensas	$5,000,000	$294,118	Medium
Iberia	$0	$0	Low	Terrebonne	$0	$0	Low
Iberville	$0	$0	Low	Union	$184,000,000	$10,823,529	High
Jackson	$107,000,000	$6,294,118	High	Vermilion	$0	$0	Low
Jefferson	$0	$0	Low	Vernon	$255,000	$15,000	Medium
Jefferson Davis	$11,900,000	$700,000	Medium	Washington	$0	$0	Low
Lafayette	$11,900,000	$700,000	Medium	Webster	$184,000,000	$10,823,529	High
Lafourche	$0	$0	Low	West Baton Rouge	$0	$0	Low
La Salle	$1,000,000	$58,824	Medium	West Carroll	$55,670,000	$3,274,706	High
Lincoln	$184,000,000	$10,823,529	High	West Feliciana	$0	$0	Low
Livingston	$0	$0	Low	Winn	$1,000,000	$58,824	Medium

Map E-57: Parishes by Annualized Ice Storm Losses



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Ice Storm Events)

Map E-58: Parishes Ranked by Annualized Ice Storm Losses



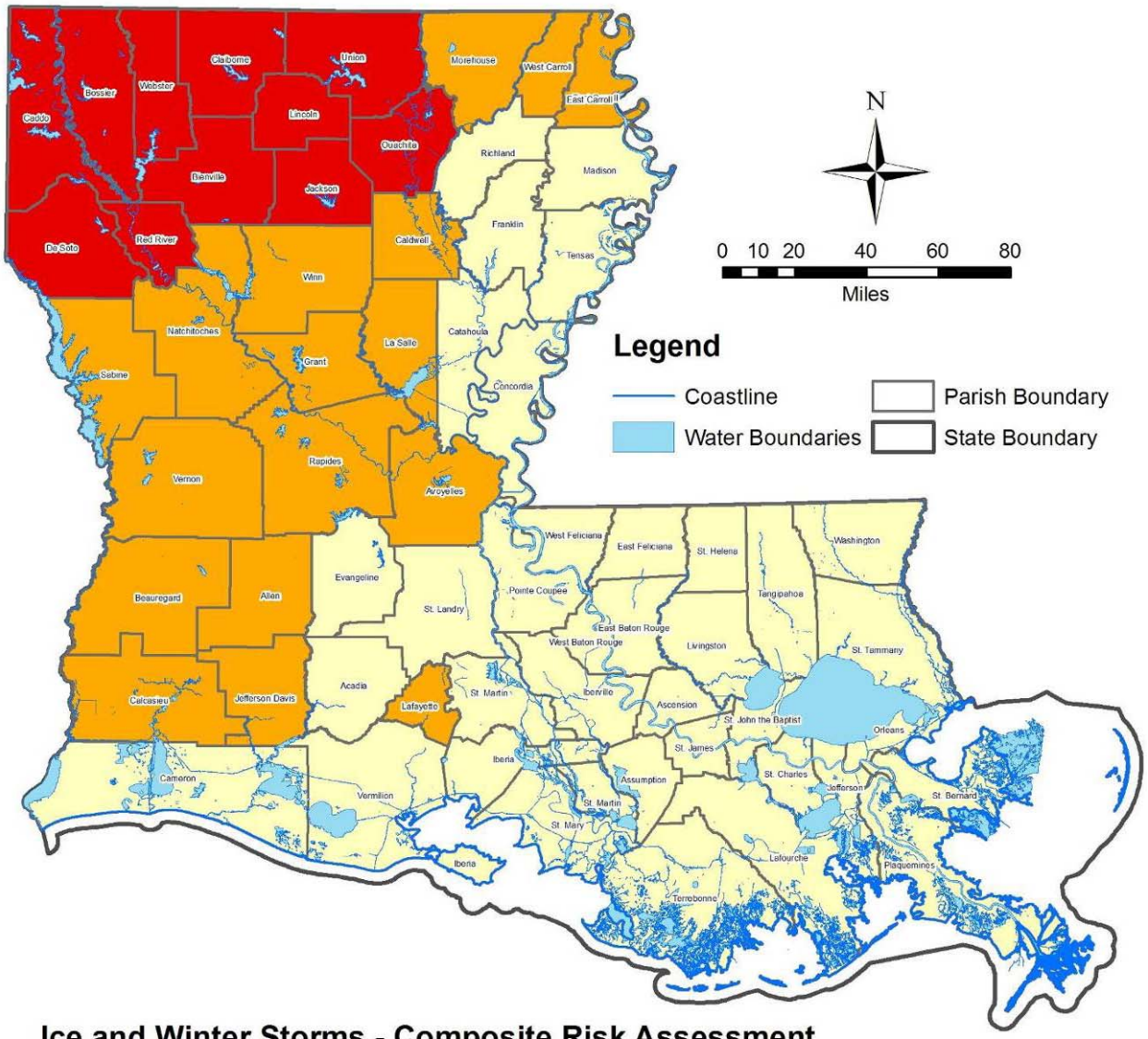
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Ice Storm Events)

The composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points and each low ranking one (1) point. Following this methodology, the possible range of scores for ice storm is 3 to 9. A high ice storm hazard would be assigned to a parish receiving a score of 8 to 9; medium would be for parishes scoring 5 to 7; and low would be for any parish scoring 3 to 4.

Table E-41: Parishes by Composite Ranking

Parish	Occurrence Hazard Ranking	Injury & Fatality Ranking	Property Loss Ranking	Comp. Hazard Ranking	Parish	Occurrence Hazard Ranking	Injury & Fatality Ranking	Property Loss Ranking	Comp. Hazard Ranking
Acadia	Medium	Low	Low	4	Madison	Medium	Low	Medium	5
Allen	Medium	High	Medium	7	Morehouse	High	Low	High	7
Ascension	Low	Low	Low	3	Natchitoches	Medium	Medium	Medium	6
Assumption	Low	Low	Low	3	Orleans	Low	Low	Low	3
Avoyelles	Medium	High	Medium	7	Ouachita	High	Medium	High	8
Beauregard	Medium	High	Medium	7	Plaquemines	Low	Low	Low	3
Bienville	High	Medium	High	8	Pointe Coupee	Medium	Low	Low	4
Bossier	High	Medium	High	8	Rapides	Medium	Medium	Medium	6
Caddo	High	High	High	9	Red River	High	Medium	High	8
Calcasieu	Medium	High	Medium	7	Richland	Medium	Low	Medium	5
Caldwell	Medium	Medium	Medium	6	Sabine	Medium	Medium	High	7
Cameron	Low	Low	Low	3	St. Bernard	Low	Low	Low	3
Catahoula	Low	Low	Medium	4	St. Charles	Low	Low	Low	3
Claiborne	High	Medium	High	8	St. Helena	Medium	Low	Low	4
Concordia	Low	Low	Medium	4	St. James	Low	Low	Low	3
De Soto	High	Medium	High	8	St John the Baptist	Low	Low	Low	3
E. Baton Rouge	Low	Low	Low	3	St. Landry	Low	Low	Low	3
East Carroll	High	Low	High	7	St. Martin	Low	Low	Low	3
East Feliciana	Medium	Low	Low	4	St. Mary	Low	Low	Low	3
Evangeline	Medium	Low	Low	4	St. Tammany	Medium	Low	Low	4
Franklin	Medium	Low	Medium	5	Tangipahoa	Medium	Low	Low	4
Grant	Medium	Medium	Medium	6	Tensas	Medium	Low	Medium	5
Iberia	Low	Low	Low	3	Terrebonne	Low	Low	Low	3
Iberville	Low	Low	Low	3	Union	High	Medium	High	8
Jackson	High	Medium	High	8	Vermilion	Low	Low	Low	3
Jefferson	Medium	Low	Low	4	Vernon	Medium	Medium	Medium	6
Jefferson Davis	Medium	High	Medium	7	Washington	Medium	Low	Low	4
La Salle	Medium	Medium	Medium	6	Webster	High	Medium	High	8
Lafayette	Medium	High	Medium	7	West Baton Rouge	Medium	Low	Low	4
Lafourche	Low	Low	Low	3	West Carroll	High	Low	High	7
Lincoln	High	Medium	High	8	West Feliciana	Medium	Low	Low	4
Livingston	Medium	Low	Low	4	Winn	Medium	Medium	Medium	6

Map E-59: Parishes by Composite Ranking



Ice and Winter Storms - Composite Risk Assessment

Hazard Ranking

Low Medium High

Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (Ice Storm Events)

Methodology

The process for assessing ice storm risk included gathering data from the NCDC data base to determine the total number of storms and the total number of injuries and fatalities. The total property losses, as recorded in NCDC were divided by the number of years in the record (17 years) to establish the average annual losses.

Data Limitations

NCDC Storm Events Database data does not adjust for inflation, so monetary values are likely skewed lower than they should be. Additionally, a spokesperson for NCDC concedes that the monetary figures distinguishing property and crop damage are based on very rough estimates

NCDC data is reported by event and not by jurisdiction, so an ice storm that crosses multiple parish boundaries will be given the same data for injuries, fatalities, and damages in each parish rather than showing how those figures distributed across jurisdictions. Thus, some large multi-parish events may have records that have been double-counted.

Louisiana has relatively few ice storms, so a single serious storm may skew a parish's ranking from "Low" to "Medium" or to "High"; the risk assessment still attempts to capture what has been typical of ice storms since recording in 1993.

The algorithm NCDC uses for searching storms does not distinguish parishes with a character stream that happens to duplicated part of the character stream for a parish with a longer name. Thus, an event that affected Jefferson Davis Parish may also show up in Jefferson Parish without having caused impact.

Since 2001, NCDC has generally shifted its nomenclature from "Ice Storm" to "Winter Storm", though relatively few of the winter storms have shown recorded damage.

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Appendix E.9:
Storm Surge

The storm surge hazard ranking was based on parish-wide vulnerability. Storm surge hazard vulnerability was determined by considering elevations and matching those with the Maximum of Maximums (MOMs) scenarios. The maximum of the maximum (MOM) value (a composite measure that expresses the maximum flood elevation, hereafter referred to as Surge Zone) for Category 3 storm surge from the SLOSH data was used to determine the surge. Category 3 storms are assumed to be average and are comparable to the 100 year flood event. The Surge Zone for a Category 1 is those areas that will potentially flood with even a minor Category 1 storm. Utility providers include nuclear plants, sewage treatment plants, wastewater facilities, electric substations, and power plants. Critical Facilities include fire stations, law enforcement facilities, hospitals, schools, State EOCs, and EMS stations.

The high / medium / low rankings for each parish were developed by:

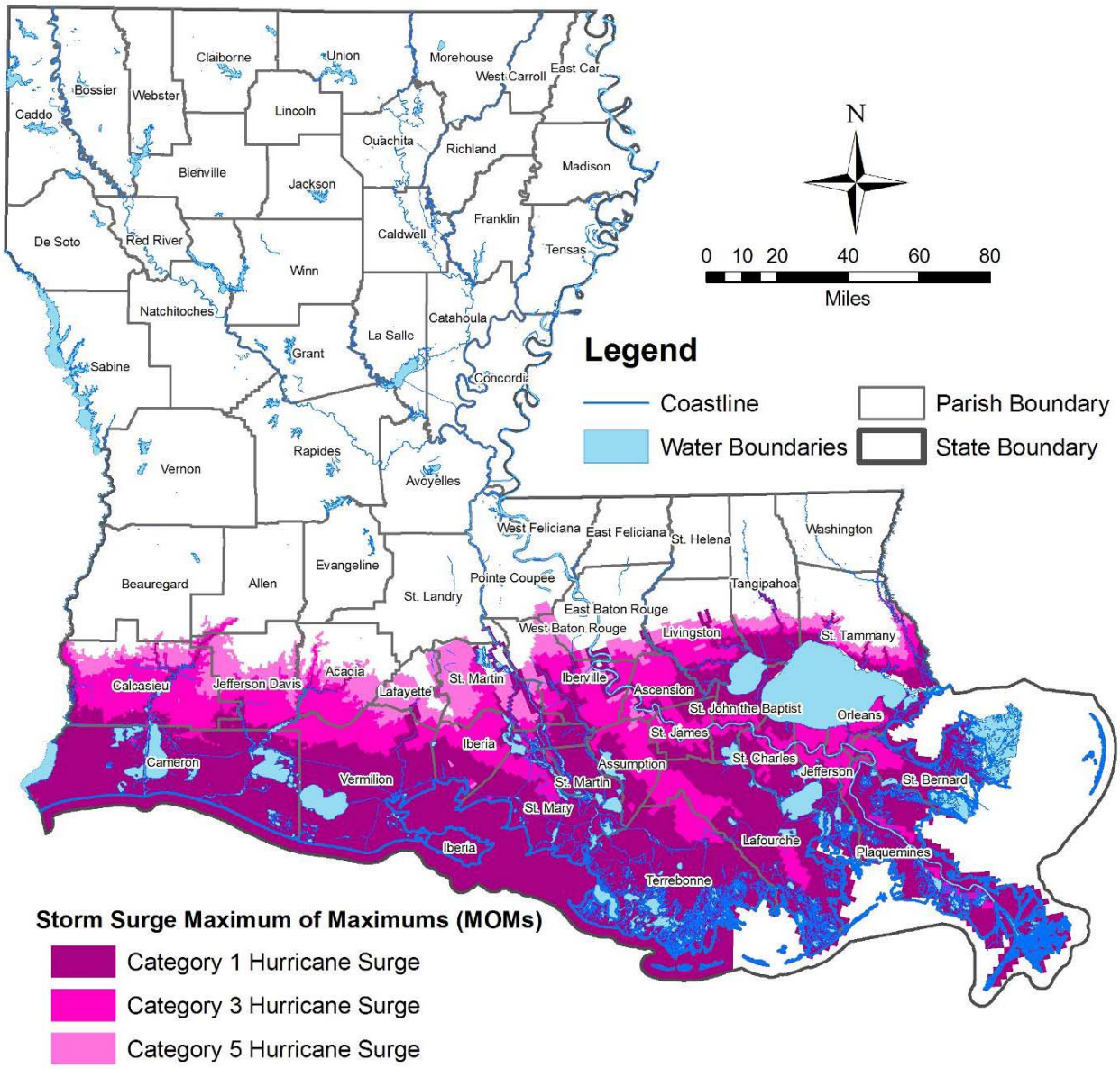
- Obtaining the MOMs data;
- Determining the Category 1 Storm Surge Zone then;
    - Assigning the high rank to parishes with more than 25% of its land area in the Cat 1 Surge Zone;
    - Assigning the medium rank to parishes within the surge zone of Cat 3 or 5 storms; and
    - Assigning the low rank to parishes with outside of the Cat 5 zones.
- Determining the population within the Category 3 Storm Surge Zone, then;
    - Assigning the high rank to parishes with more than 80% of its population in the Cat 3 Surge Zone;
    - Assigning the medium rank to parishes with up to 80% of its population in the Cat 3 surge zone;
    - Assigning the low rank to parishes with no population within the Cat 3 surge zones.
- Determining the number of buildings within the Cat 3 surge zone;
    - Assigning the High rank to parishes with more than 80% of its buildings in the Cat 3 Surge Zone;
    - Assigning the medium rank to parishes with up to 80% of its buildings in the Cat 3 surge zone;
    - Assigning the low rank to parishes with no buildings within the Cat 3 surge zones.
- Determining the value of buildings within the Cat 3 storm surge zone
    - Assigning the High rank to parishes with more than $1 billion of its buildings in the Cat 3 zone;
    - Assigning the medium rank to parishes with up to $1 billion of its buildings in the Cat 3 surge zone;
    - Assigning the low rank to parishes with no building value within the Cat 3 surge zones.
- Determining the number of Critical Facilities within the Cat 3 storm surge zone
    - Assigning the High rank to parishes with more than 80% of its critical facilities in the Cat 3 Zone;
    - Assigning the medium rank to parishes with up to 80% of its critical facilities in the Cat 3 Zone;
    - Assigning the low rank to parishes with no critical facilities within the Cat 3 surge zone.
- Determining the percentage of utility providers or power lines within the Cat 3 storm surge zone
    - Assigning the High rank to parishes with more than 80% in the Cat 3 Zone;
    - Assigning the medium rank to parishes with up to 80% in the Cat 3 Zone;
    - Assigning the low rank to parishes with no critical facilities or power lines within the Cat 3.
- Determining the amount of transportation infrastructure (bridges, highways and railways) in the Cat 3 zone
    - Assigning the High rank to parishes with more than 80% within the Cat 3 Zone;
    - Assigning the medium rank to parishes with up to 80% of its within the Cat 3 Zone;
    - Assigning the low rank to parishes with no transportation facilities within the Cat 3 surge zone.
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 18 or more;
    - Assigning the medium composite ranking to parishes with a score of 10 to 17; and
    - Assigning the low composite ranking to parishes with a score of 9 or less.

Table E-42 shows the Percentage of Land by Parish within the Category 1 Storm Surge Zone. Map E-60 shows the Storm Surge MOMs for Categories 1, 3 and 5. Map E-61 presents the parishes ranked by MOMs.

Table E-42: Percentage of Land by Parish within the Category 1 Storm Surge Zone

Parish	Total Land Area (incl. waterbodies)	Land in Cat 1 MOMs	% Land in Cat 1 MOMs	Hazard Ranking	Parish	Total Land Area (incl. waterbodies)	Land in Cat 1 MOMs	% Land in Cat 1 MOMs	Hazard Ranking
Acadia	657.6	21.1	3.21%	Medium	Madison	650.5	0.0	0.00%	Low
Allen	765.7	0.3	0.04%	Medium	Morehouse	805.2	0.0	0.00%	Low
Ascension	302.9	118.5	39.12%	High	Natchitoches	1,299.3	0.0	0.00%	Low
Assumption	364.6	191.0	52.38%	High	Orleans	350.2	141.6	40.44%	High
Avoyelles	865.7	0.0	0.00%	Low	Ouachita	632.7	0.0	0.00%	Low
Beauregard*	1,166.0	0.0	0.00%	Medium	Plaquemines	2,428.5	921.6	37.95%	High
Bienville	821.8	0.0	0.00%	Low	Pointe Coupee*	590.7	0.0	0.00%	Medium
Bossier	866.9	0.0	0.00%	Low	Rapides	1,362.0	0.0	0.00%	Low
Caddo	936.9	0.0	0.00%	Low	Red River	402.1	0.0	0.00%	Low
Calcasieu	1,094.3	201.3	18.40%	High	Richland	564.5	0.0	0.00%	Low
Caldwell	540.7	0.0	0.00%	Low	Sabine	1,011.5	0.0	0.00%	Low
Cameron	1,931.6	1,603.2	83.00%	High	St. Bernard	1,793.8	348.2	19.41%	High
Catahoula	739.4	0.0	0.00%	Low	St. Charles	410.2	318.2	77.57%	High
Claiborne	767.5	0.0	0.00%	Low	St. Helena	409.5	0.0	0.00%	Low
Concordia	748.7	0.0	0.00%	Low	St. James	257.8	151.8	58.88%	High
De Soto	894.5	0.0	0.00%	Low	St. John the Baptist	347.8	260.6	74.93%	High
East Baton Rouge	470.5	17.1	3.63%	Medium	St. Landry	938.8	1.9	0.20%	Medium
East Carroll	442.5	0.0	0.00%	Low	St. Martin	816.5	326.6	40.00%	High
East Feliciana	455.7	0.0	0.00%	Low	St. Mary	1,118.8	595.6	53.24%	High
Evangeline	679.6	0.0	0.00%	Low	St. Tammany	1,124.1	189.1	16.82%	High
Franklin	635.4	0.0	0.00%	Low	Tangipahoa	823.1	133.8	16.26%	High
Grant	664.6	0.0	0.00%	Low	Tensas	641.2	0.0	0.00%	Low
Iberia	1,030.9	426.1	41.33%	High	Terrebonne	2,079.9	1,367.8	65.76%	High
Iberville	652.8	158.9	24.34%	High	Union	905.3	0.0	0.00%	Low
Jackson	580.3	0.0	0.00%	Low	Vermilion	1,538.3	991.0	64.42%	High
Jefferson	642.4	268.8	41.84%	High	Vernon	1,341.5	0.0	0.00%	Low
Jefferson Davis	658.6	67.6	10.27%	High	Washington	676.0	0.5	0.07%	Medium
Lafayette	270.3	9.8	3.63%	Medium	Webster	615.1	0.0	0.00%	Low
Lafourche	1,472.2	961.1	65.28%	High	West Baton Rouge	203.6	12.2	6.00%	Medium
La Salle	662.4	0.0	0.00%	Low	West Carroll	360.3	0.0	0.00%	Low
Lincoln	472.3	0.0	0.00%	Low	West Feliciana	426.0	0.0	0.00%	Low
Livingston	702.8	193.7	27.56%	High	Winn	956.9	0.0	0.00%	Low

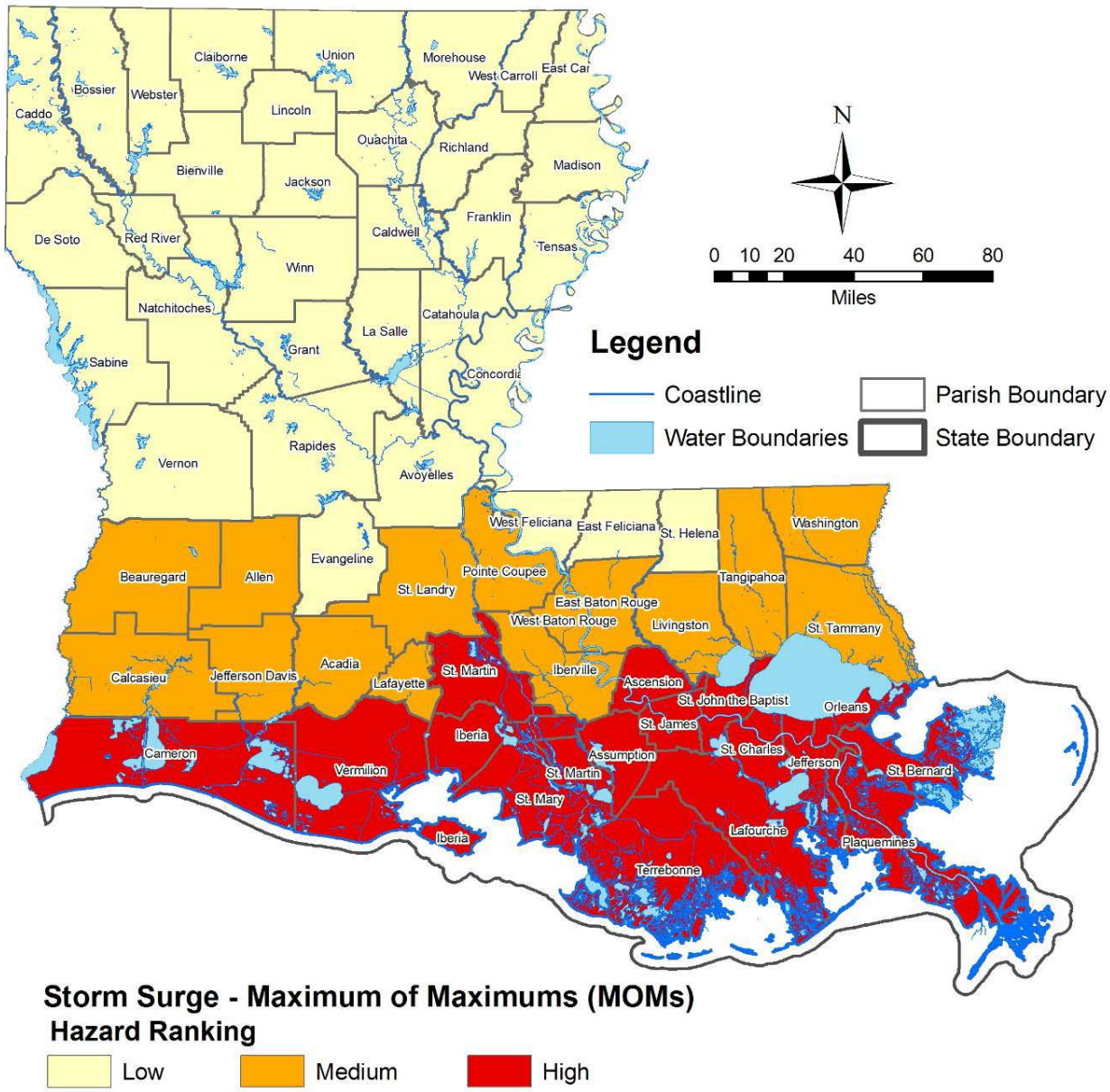
Beauregard and Pointe Coupee Parishes have no land that falls in the Category 1 MOMs but do have land that falls in either Category 3 or 5 MOMs. Thus, they are ranked Medium for having at least some storm surge threat, though they lack Category 1 surge threat. All other parishes lack any surge threat at any category of hurricane.



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge)

Map E-60: Storm Surge Maximum of Maximums

Map E-61: Storm Surge Hazard Ranking



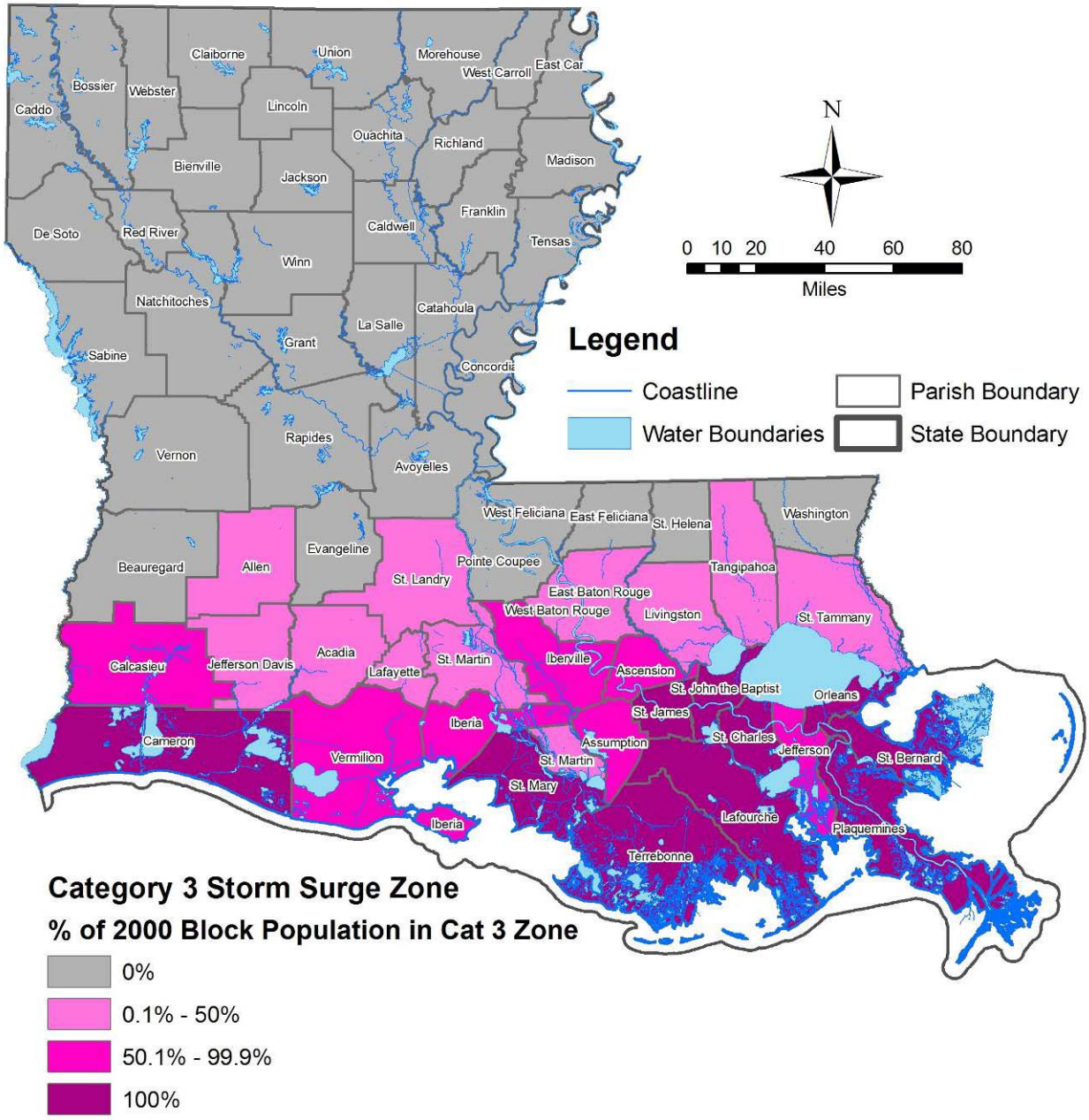
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge)

Table E-43 and Map E-62 shows the percentage of population by parish within the Category 3 Storm Surge Zone. Map E-63 presents the parishes ranked by population.

Table E-43: Percentage of Population by Parish within the Category 3 Storm Surge Zone

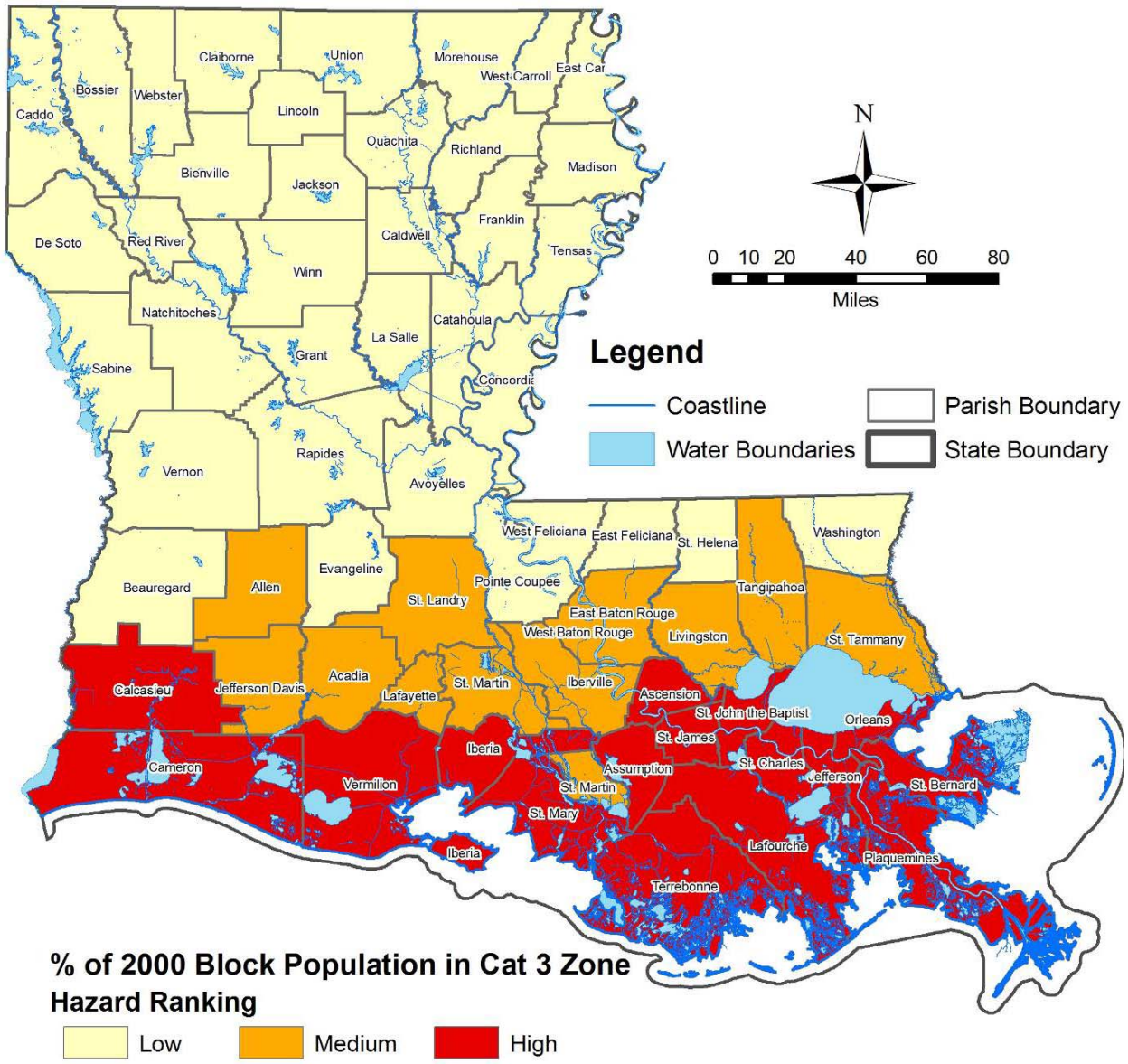
Parish	Total Pop.	Pop. in Blocks Affected by Cat 3 Surge	% Pop. in Cat 3 Surge Zone	Hazard Ranking	Parish	Total Pop.	Pop. in Blocks Affected by Cat 3 Surge	% Pop. in Cat 3 Surge Zone	Hazard Ranking
Acadia	58,861	6,616	11.24%	Medium	Madison	13,728	0	0.00%	Low
Allen	25,440	465	1.83%	Medium	Morehouse	31,021	0	0.00%	Low
Ascension	76,627	65,961	86.08%	High	Natchitoches	39,080	0	0.00%	Low
Assumption	23,388	21,786	93.15%	High	Orleans	484,674	484,672	100.00%	High
Avoyelles	41,481	0	0.00%	Low	Ouachita	147,250	0	0.00%	Low
Beauregard	32,986	0	0.00%	Low	Plaquemines	26,757	26,757	100.00%	High
Bienville	15,752	0	0.00%	Low	Pointe Coupee	22,763	0	0.00%	Low
Bossier	98,310	0	0.00%	Low	Rapides	126,337	0	0.00%	Low
Caddo	252,161	0	0.00%	Low	Red River	9,622	0	0.00%	Low
Calcasieu	183,577	152,953	83.32%	High	Richland	20,981	0	0.00%	Low
Caldwell	10,560	0	0.00%	Low	Sabine	23,459	0	0.00%	Low
Cameron	9,974	9,974	100.00%	High	St. Bernard	67,229	67,229	100.00%	High
Catahoula	10,920	0	0.00%	Low	St. Charles	48,072	48,072	100.00%	High
Claiborne	16,851	0	0.00%	Low	St. Helena	10,525	0	0.00%	Low
Concordia	20,247	0	0.00%	Low	St. James	21,216	21,216	100.00%	High
De Soto	25,494	0	0.00%	Low	St. John the Baptist	43,044	43,044	100.00%	High
East Baton Rouge	412,852	11,900	2.88%	Medium	St. Landry	87,715	1	0.00%	Medium
East Carroll	9,421	0	0.00%	Low	St. Martin	48,583	7,129	14.67%	Medium
East Feliciana	21,360	0	0.00%	Low	St. Mary	53,500	53,500	100.00%	High
Evangeline	35,434	0	0.00%	Low	St. Tammany	191,268	88,976	46.52%	Medium
Franklin	21,263	0	0.00%	Low	Tangipahoa	100,588	9,196	9.14%	Medium
Grant	18,698	0	0.00%	Low	Tensas	6,618	0	0.00%	Low
Iberia	73,266	70,779	96.61%	High	Terrebonne	104,494	104,494	100.00%	High
Iberville	33,320	17,082	51.27%	Medium	Union	22,803	0	0.00%	Low
Jackson	15,400	0	0.00%	Low	Vermilion	53,807	50,934	94.66%	High
Jefferson	455,466	454,155	99.71%	High	Vernon	52,531	0	0.00%	Low
Jefferson Davis	31,435	11,653	37.07%	Medium	Washington	43,926	0	0.00%	Low
Lafayette	190,488	12,769	6.70%	Medium	Webster	41,834	0	0.00%	Low
Lafourche	89,983	89,983	100.00%	High	West Baton Rouge	21,601	1,621	7.50%	Medium
La Salle	14,282	0	0.00%	Low	West Carroll	12,314	0	0.00%	Low
Lincoln	44,288	0	0.00%	Low	West Feliciana	15,111	0	0.00%	Low
Livingston	91,814	16,686	18.17%	Medium	Winn	16,894	0	0.00%	Low

Map E-62: Percentage of Population by Parish within the Category 3 Storm Surge Zone



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population Block Data), SLOSH Modeling (Storm Surge)

Map E-63: Parishes Ranked by Percentage of Population within the Category 3 Storm Surge Zone



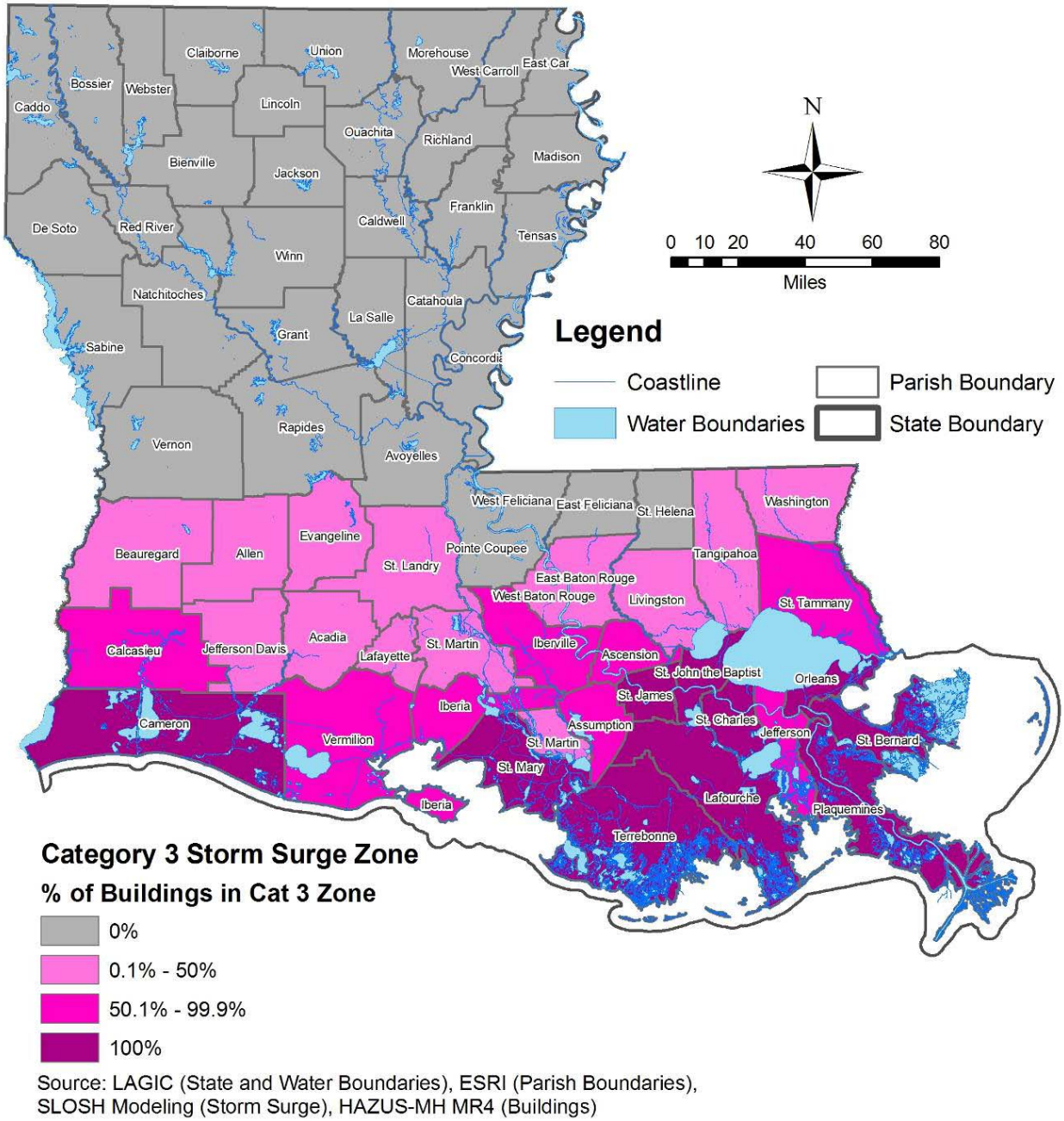
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population Block Data), SLOSH Modeling (Storm Surge)

Table E-44 and Map E-64 show the percentage of buildings by parish within the Category 3 Storm Surge Zone. Map E-65 presents the parishes ranked by percentage.

Table E-44: Percentage of Buildings by Parish within the Category 3 Storm Surge Zone

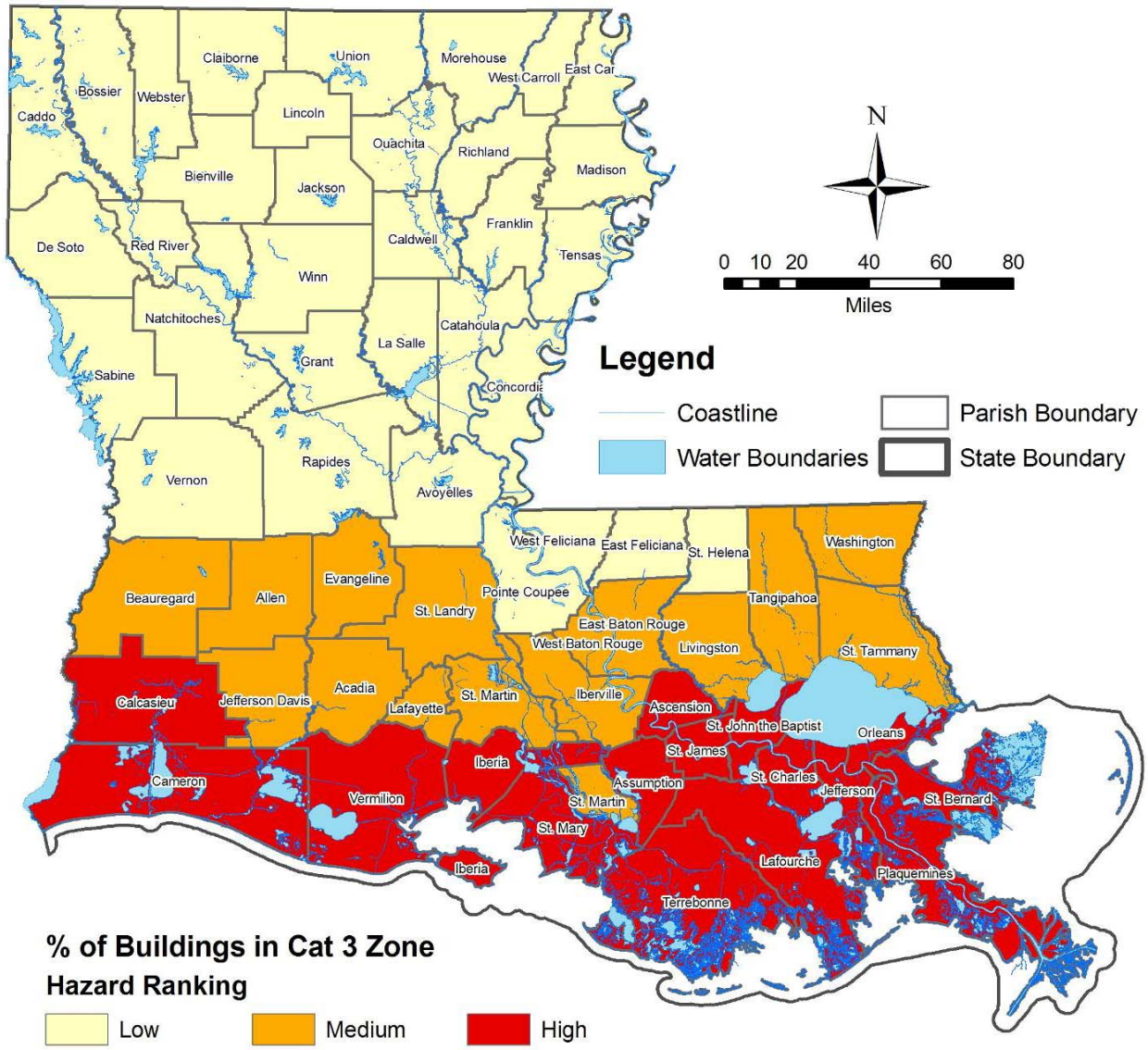
Parish	Total Buildings	Buildings in Cat 3 Surge Zone	% Buildings in Cat 3 Surge Zone	Hazard Ranking	Parish	Total Buildings	Buildings in Cat 3 Surge Zone	% Buildings in Cat 3 Surge Zone	Hazard Ranking
Acadia	27,817	5,253	18.9%	Medium	Madison	6,576	0	0.0%	Low
Allen	11,600	493	4.3%	Medium	Morehouse	14,604	0	0.0%	Low
Ascension	33,123	29,808	90.0%	High	Natchitoches	19,780	0	0.0%	Low
Assumption	10,844	10,512	96.9%	High	Orleans	173,671	173,671	100.0%	High
Avoyelles	19,795	0	0.0%	Low	Ouachita	62,493	0	0.0%	Low
Beauregard	17,476	233	1.3%	Medium	Plaquemines	12,374	12,374	100.0%	High
Bienville	10,612	0	0.0%	Low	Pointe Coupee	12,092	0	0.0%	Low
Bossier	40,408	0	0.0%	Low	Rapides	58,948	0	0.0%	Low
Caddo	105,041	0	0.0%	Low	Red River	4,767	0	0.0%	Low
Calcasieu	80,762	70,386	87.2%	High	Richland	10,847	0	0.0%	Low
Caldwell	6,011	0	0.0%	Low	Sabine	15,926	0	0.0%	Low
Cameron	6,211	6,211	100.0%	High	St. Bernard	26,842	26,840	100.0%	High
Catahoula	6,483	0	0.0%	Low	St. Charles	19,200	19,200	100.0%	High
Claiborne	9,517	0	0.0%	Low	St. Helena	6,254	0	0.0%	Low
Concordia	10,636	0	0.0%	Low	St. James	8,815	8,814	100.0%	High
De Soto	13,848	0	0.0%	Low	St. John the Baptist	16,521	16,521	100.0%	High
East Baton Rouge	151,107	9,599	6.4%	Medium	St. Landry	43,957	94	0.2%	Medium
East Carroll	4,195	0	0.0%	Low	St. Martin	24,736	6,363	25.7%	Medium
East Feliciana	10,030	0	0.0%	Low	St. Mary	24,408	24,408	100.0%	High
Evangeline	17,665	63	0.4%	Medium	St. Tammany	84,508	49,699	58.8%	Medium
Franklin	10,757	0	0.0%	Low	Tangipahoa	45,367	7,315	16.1%	Medium
Grant	10,350	0	0.0%	Low	Tensas	4,467	0	0.0%	Low
Iberia	32,309	31,556	97.7%	High	Terrebonne	43,923	43,923	100.0%	High
Iberville	15,059	8,311	55.2%	Medium	Union	13,760	0	0.0%	Low
Jackson	9,181	0	0.0%	Low	Vermilion	27,475	26,290	95.7%	High
Jefferson	164,539	162,802	98.9%	High	Vernon	21,626	0	0.0%	Low
Jefferson Davis	16,691	8,061	48.3%	Medium	Washington	23,350	50	0.2%	Medium
Lafayette	81,011	9,714	12.0%	Medium	Webster	21,865	0	0.0%	Low
Lafourche	40,570	40,567	100.0%	High	West Baton Rouge	10,252	1,289	12.6%	Medium
La Salle	7,828	0	0.0%	Low	West Carroll	5,945	0	0.0%	Low
Lincoln	18,894	0	0.0%	Low	West Feliciana	5,056	0	0.0%	Low
Livingston	42,671	12,982	30.4%	Medium	Winn	8,993	0	0.0%	Low

Map E-64: Percentage of Buildings by Parish within the Category 3 Storm Surge Zone



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), HAZUS-MH MR4 (Buildings)

Map E-65: Parishes ranked by Percentage of Buildings within the Category 3 Storm Surge Zone



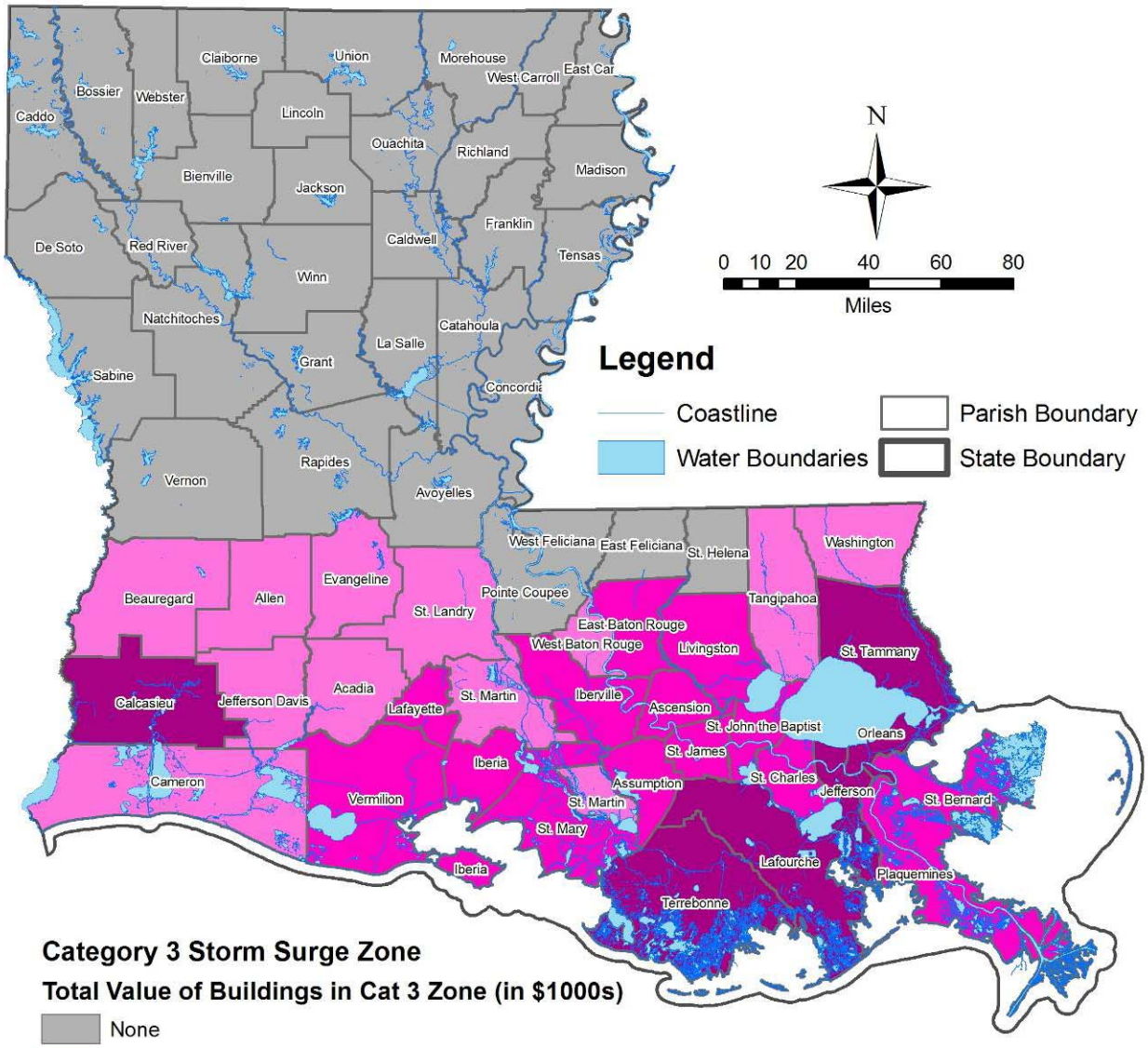
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), HAZUS-MH MR4 (Buildings)

Table E-45 and Map E-66 show the value of buildings by parish within the Category 3 Storm Surge Zone. Map E-67 presents the parishes ranked by value.

Table E-45: Value of Buildings by Parish within the Category 3 Storm Surge Zone

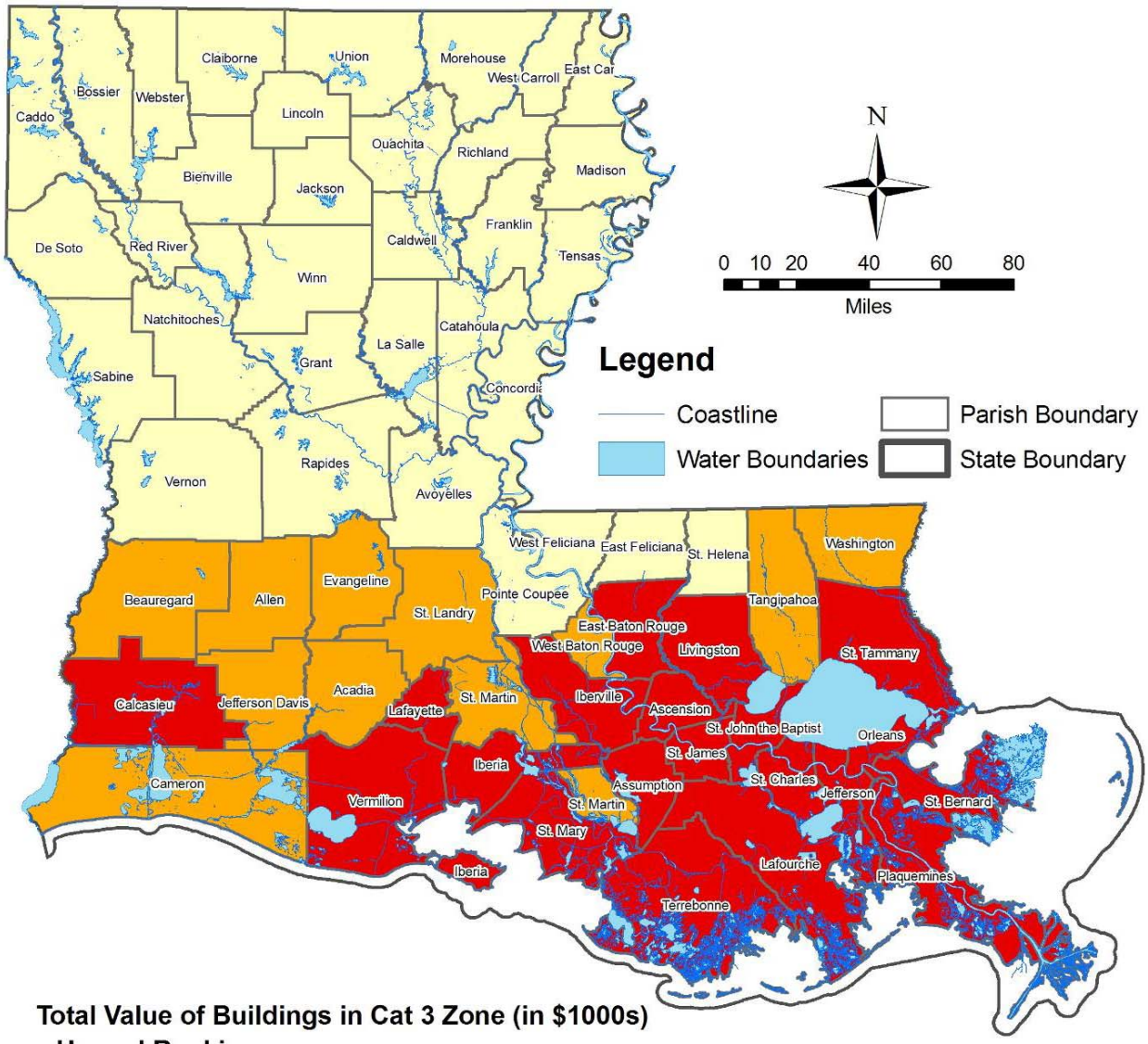
Parish	Total Value of Buildings in Cat 3 Surge Zone (in $1000s)	Hazard Ranking	Parish	Total Value of Buildings in Cat 3 Surge Zone (in $1000s)	Hazard Ranking
Acadia	$607,537	Medium	Madison	$0	Low
Allen	$68,885	Medium	Morehouse	$0	Low
Ascension	$4,783,962	High	Natchitoches	$0	Low
Assumption	$1,257,809	High	Orleans	$35,474,596	High
Avoyelles	$0	Low	Ouachita	$0	Low
Beauregard	$26,912	Medium	Plaquemines	$2,123,009	High
Bienville	$0	Low	Pointe Coupee	$0	Low
Bossier	$0	Low	Rapides	$0	Low
Caddo	$0	Low	Red River	$0	Low
Calcasieu	$10,737,372	High	Richland	$0	Low
Caldwell	$0	Low	Sabine	$0	Low
Cameron	$798,146	Medium	St. Bernard	$4,463,567	High
Catahoula	$0	Low	St. Charles	$3,675,984	High
Claiborne	$0	Low	St. Helena	$0	Low
Concordia	$0	Low	St. James	$1,305,005	High
De Soto	$0	Low	St. John the Baptist	$2,840,674	High
East Baton Rouge	$2,449,364	High	St. Landry	$9,975	Medium
East Carroll	$0	Low	St. Martin	$749,656	Medium
East Feliciana	$0	Low	St. Mary	$3,310,774	High
Evangeline	$6,987	Medium	St. Tammany	$8,287,370	High
Franklin	$0	Low	Tangipahoa	$898,817	Medium
Grant	$0	Low	Tensas	$0	Low
Iberia	$4,461,065	High	Terrebonne	$7,470,543	High
Iberville	$1,146,967	High	Union	$0	Low
Jackson	$0	Low	Vermilion	$3,171,039	High
Jefferson	$35,678,537	High	Vernon	$0	Low
Jefferson Davis	$953,357	Medium	Washington	$5,348	Medium
Lafayette	$2,091,780	High	Webster	$0	Low
Lafourche	$6,022,051	High	West Baton Rouge	$155,047	Medium
La Salle	$0	Low	West Carroll	$0	Low
Lincoln	$0	Low	West Feliciana	$0	Low
Livingston	$1,658,806	High	Winn	$0	Low

Map E-66: Value of Buildings by Parish within the Category 3 Storm Surge Zone



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), HAZUS-MH MR4 (Buildings)

Map E-67: Parishes Ranked by Value of Buildings within the Category 3 Storm Surge Zone



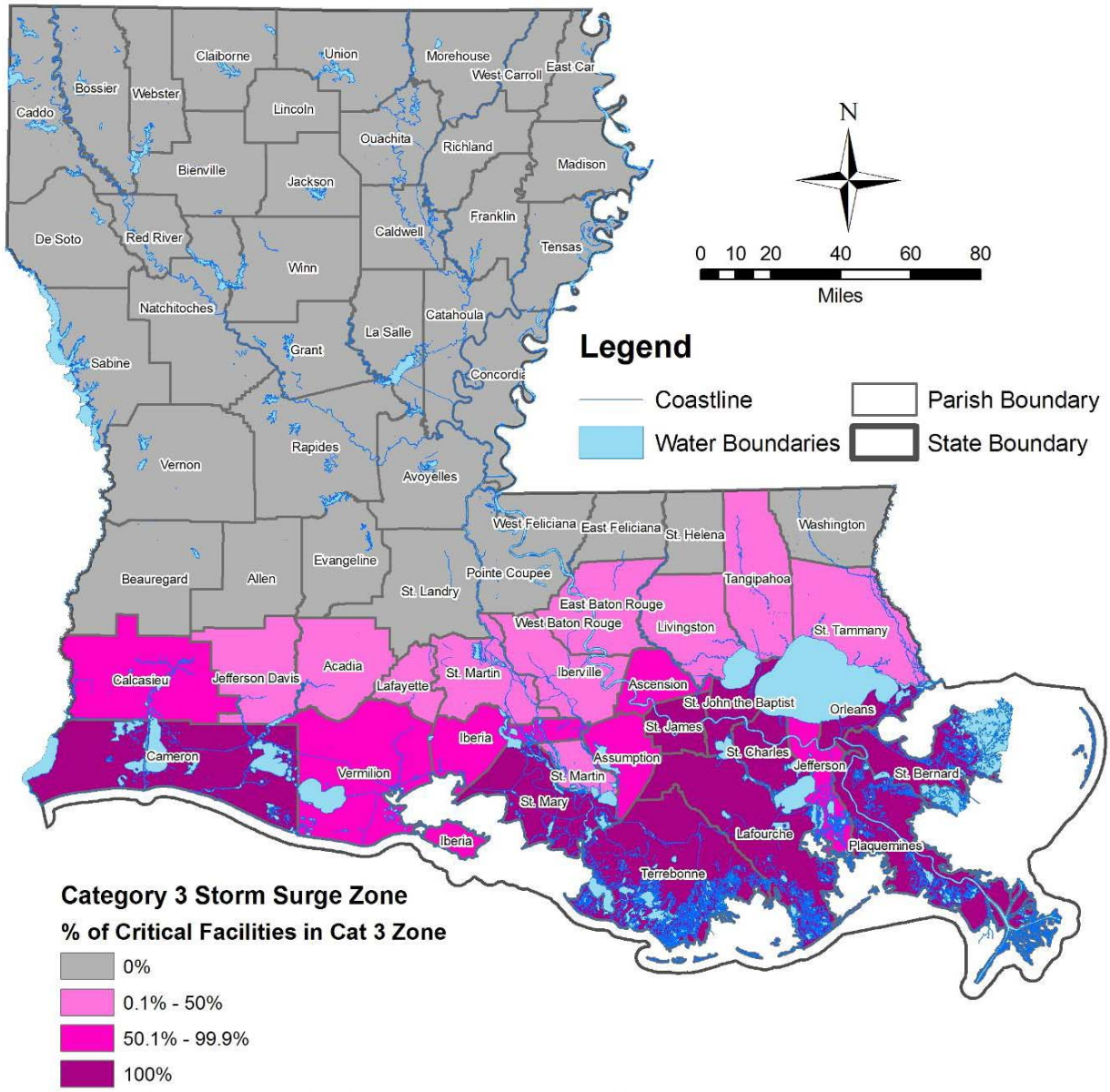
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), HAZUS-MH MR4 (Buildings)

Table E-46 and Map E-68 show the percentage of critical facilities by parish within the Category 3 Storm Surge Zone. Map E-69 presents the parishes ranked by percentage.

Table E-46: Percentage of Critical Facilities by Parish within the Category 3 Storm Surge Zone

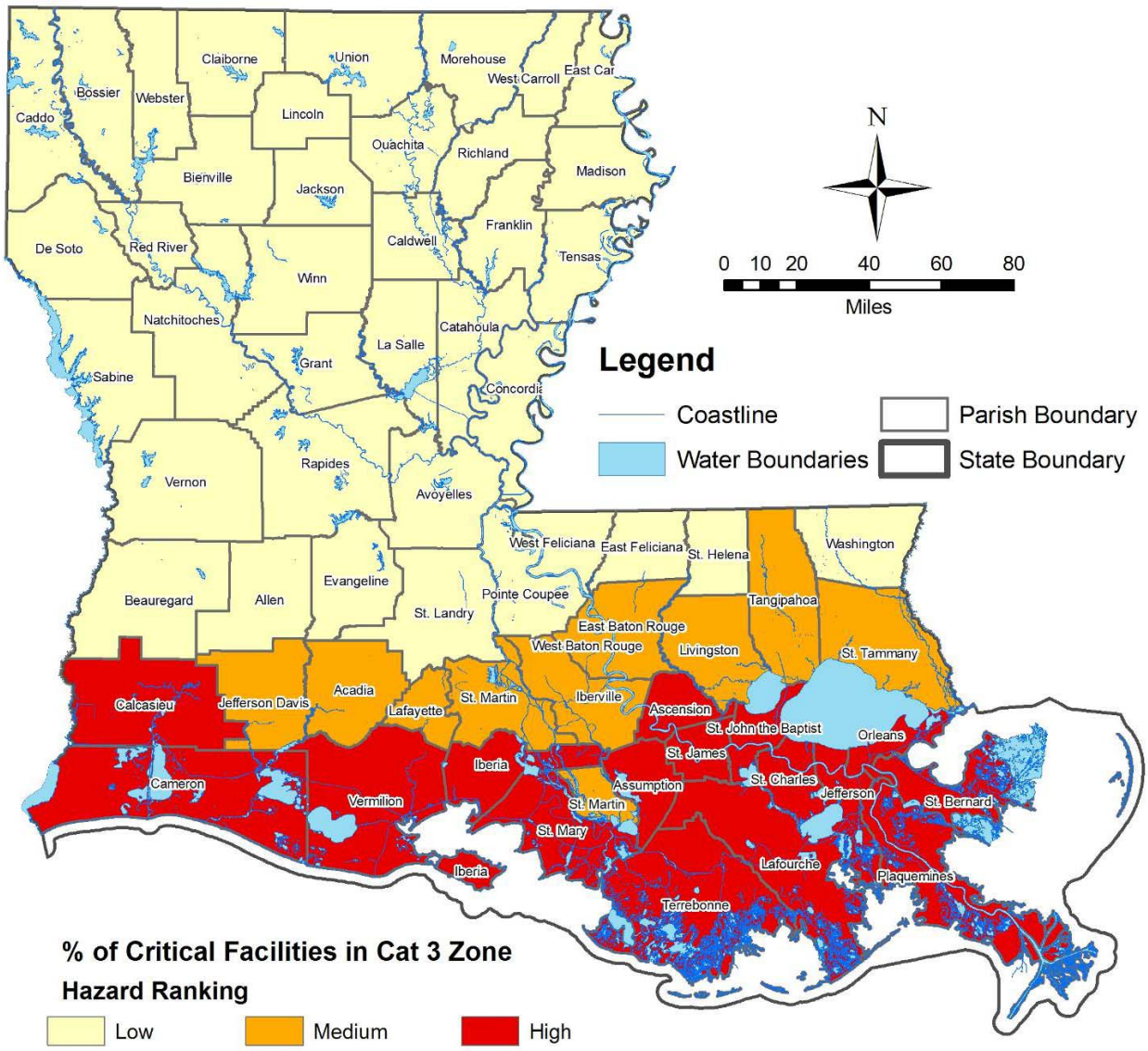
Parish	Total Critical Facilities	Critical Facilities in Cat 3 Zone	% Critical Facilities in Cat 3 Zone	Hazard Ranking	Parish	Total Critical Facilities	Critical Facilities in Cat 3 Zone	% Critical Facilities in Cat 3 Zone	Hazard Ranking
Acadia	64	10	15.6%	Medium	Madison	19	0	0.0%	Low
Allen	31	0	0.0%	Low	Morehouse	39	0	0.0%	Low
Ascension	64	53	82.8%	High	Natchitoches	46	0	0.0%	Low
Assumption	27	24	88.9%	High	Orleans	169	169	100.0%	High
Avoyelles	64	0	0.0%	Low	Ouachita	119	0	0.0%	Low
Beauregard	45	0	0.0%	Low	Plaquemines	18	18	100.0%	High
Bienville	36	0	0.0%	Low	Pointe Coupee	31	0	0.0%	Low
Bossier	70	0	0.0%	Low	Rapides	148	0	0.0%	Low
Caddo	189	0	0.0%	Low	Red River	12	0	0.0%	Low
Calcasieu	141	114	80.9%	High	Richland	33	0	0.0%	Low
Caldwell	23	0	0.0%	Low	Sabine	42	0	0.0%	Low
Cameron	19	19	100.0%	High	St. Bernard	19	19	100.0%	High
Catahoula	27	0	0.0%	Low	St. Charles	57	57	100.0%	High
Claiborne	25	0	0.0%	Low	St. Helena	21	0	0.0%	Low
Concordia	37	0	0.0%	Low	St. James	42	42	100.0%	High
De Soto	43	0	0.0%	Low	St. John the Baptist	36	36	100.0%	High
East Baton Rouge	261	3	1.1%	Medium	St. Landry	98	0	0.0%	Low
East Carroll	13	0	0.0%	Low	St. Martin	46	8	17.4%	Medium
East Feliciana	32	0	0.0%	Low	St. Mary	69	69	100.0%	High
Evangeline	49	0	0.0%	Low	St. Tammany	148	64	43.2%	Medium
Franklin	16	0	0.0%	Low	Tangipahoa	89	7	7.9%	Medium
Grant	29	0	0.0%	Low	Tensas	21	0	0.0%	Low
Iberia	55	53	96.4%	High	Terrebonne	83	83	100.0%	High
Iberville	41	16	39.0%	Medium	Union	29	0	0.0%	Low
Jackson	19	0	0.0%	Low	Vermilion	62	56	90.3%	High
Jefferson	215	211	98.1%	High	Vernon	57	0	0.0%	Low
Jefferson Davis	37	11	29.7%	Medium	Washington	51	0	0.0%	Low
Lafayette	126	5	4.0%	Medium	Webster	78	0	0.0%	Low
Lafourche	80	80	100.0%	High	West Baton Rouge	35	2	5.7%	Medium
La Salle	33	0	0.0%	Low	West Carroll	35	0	0.0%	Low
Lincoln	51	0	0.0%	Low	West Feliciana	21	0	0.0%	Low
Livingston	102	24	23.5%	Medium	Winn	19	0	0.0%	Low

Map E-68: Percentage of Critical facilities by Parish within the Category 3 Storm Surge Zone



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), HSIP (Critical Facilities)

Map E-69: Parishes Ranked by Percentage of Critical facilities within the Category 3 Storm Surge Zone



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), HSIP (Critical Facilities)

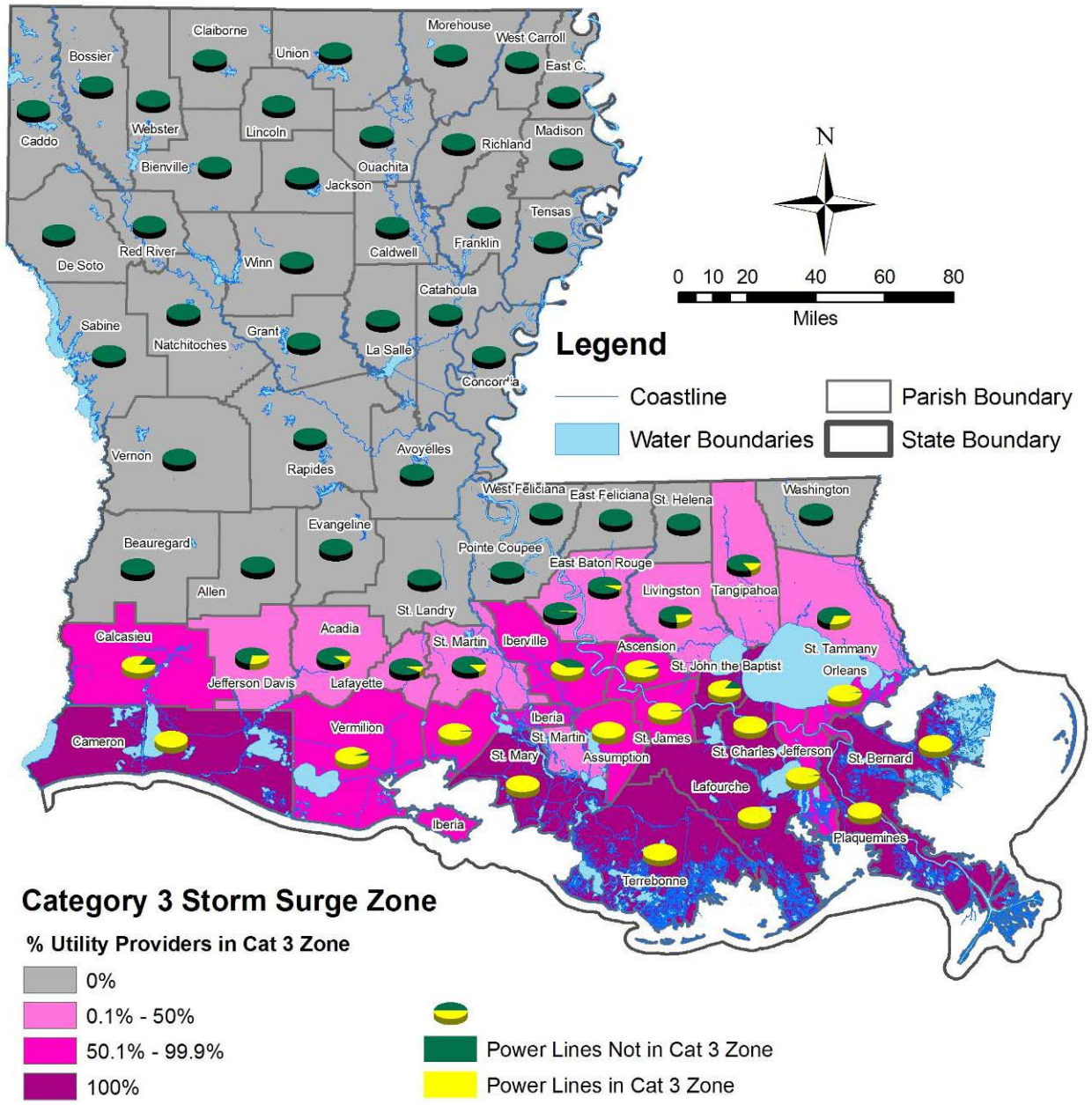
Table E-47 and Map E-70 shows the percentage of by parish within the Category 3 Storm Surge Zone. Map E-71 presents the parishes ranked by percentage.

Table E-47: Percentage Utilities by Parish within the Category 3 Storm Surge Zone

Parish	Total Utility Providers	Utility Providers in Cat 3 Surge Zone	% Utility Providers in Cat 3 Surge Zone	Miles of Power Lines	Miles of Power Lines in Cat 3 Surge Zone	% Power Lines in Cat 3 Surge Zone	Hazard Ranking
Acadia	87	14	16.1%	272.71	31.55	11.6%	Medium
Allen	18	0	0.0%	29.36	0.00	0.0%	Low
Ascension	233	214	91.8%	126.03	119.21	94.6%	High
Assumption	20	19	95.0%	24.65	24.65	100.0%	High
Avoyelles	21	0	0.0%	14.92	0.00	0.0%	Low
Beauregard	19	0	0.0%	106.20	0.00	0.0%	Low
Bienville	17	0	0.0%	85.82	0.00	0.0%	Low
Bossier	65	0	0.0%	24.06	0.00	0.0%	Low
Caddo	163	0	0.0%	211.32	0.00	0.0%	Low
Calcasieu	551	513	93.1%	515.08	440.49	85.5%	High
Caldwell	11	0	0.0%	30.65	0.00	0.0%	Low
Cameron	41	41	100.0%	95.93	95.93	100.0%	High
Catahoula	5	0	0.0%	49.32	0.00	0.0%	Low
Claiborne	12	0	0.0%	26.49	0.00	0.0%	Low
Concordia	25	0	0.0%	107.28	0.00	0.0%	Low
De Soto	59	0	0.0%	117.57	0.00	0.0%	Low
East Baton Rouge	8508	9	0.1%	381.83	24.65	6.5%	Medium
East Carroll	3	0	0.0%	18.42	0.00	0.0%	Low
East Feliciana	12	0	0.0%	91.81	0.00	0.0%	Low
Evangeline	31	0	0.0%	99.04	0.00	0.0%	Low
Franklin	15	0	0.0%	26.67	0.00	0.0%	Low
Grant	12	0	0.0%	39.63	0.00	0.0%	Low
Iberia	107	87	81.3%	80.07	78.20	97.7%	High
Iberville	296	245	82.8%	202.46	120.44	59.5%	High
Jackson	16	0	0.0%	50.28	0.00	0.0%	Low
Jefferson	383	380	99.2%	178.22	175.25	98.3%	High
Jefferson Davis	50	25	50.0%	185.21	51.21	27.6%	Medium
Lafayette	330	20	6.1%	167.52	13.19	7.9%	Medium
Lafourche	120	120	100.0%	203.53	203.53	100.0%	High
La Salle	14	0	0.0%	62.58	0.00	0.0%	Low
Lincoln	41	0	0.0%	79.64	0.00	0.0%	Low
Livingston	106	14	13.2%	81.86	18.68	22.8%	Medium

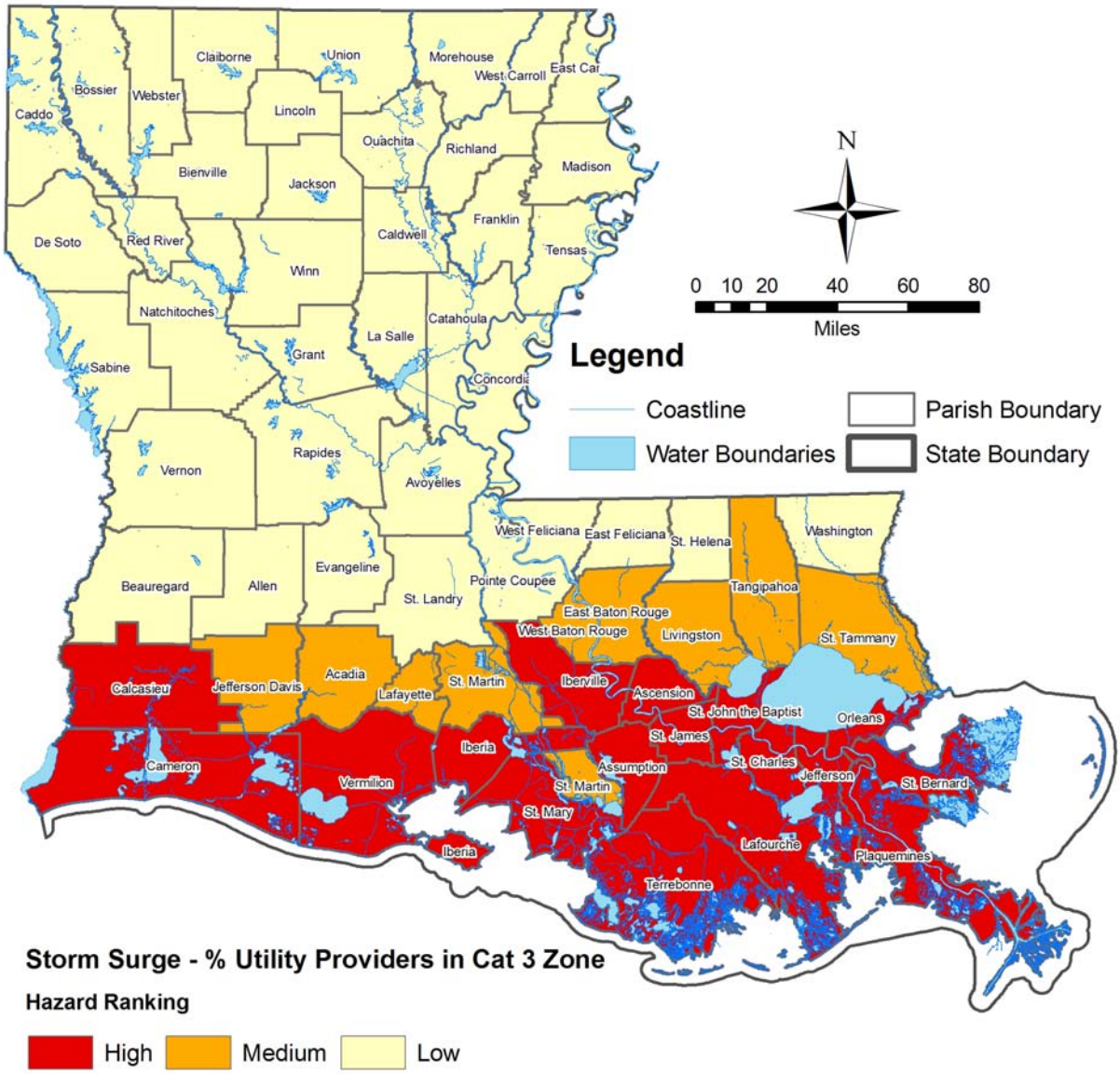
Parish	Total Utility Providers	Utility Providers in Cat 3 Surge Zone	% Utility Providers in Cat 3 Surge Zone	Miles of Power Lines	Miles of Power Lines in Cat 3 Surge Zone	% Power Lines in Cat 3 Surge Zone	Hazard Ranking
Madison	10	0	0.0%	82.40	0.00	0.0%	Low
Morehouse	34	0	0.0%	81.01	0.00	0.0%	Low
Natchitoches	43	0	0.0%	77.28	0.00	0.0%	Low
Orleans	174	173	99.4%	131.83	128.93	97.8%	High
Ouachita	172	0	0.0%	165.39	0.00	0.0%	Low
Plaquemines	147	147	100.0%	130.81	130.81	100.0%	High
Pointe Coupee	79	0	0.0%	179.52	0.00	0.0%	Low
Rapides	122	0	0.0%	192.24	0.00	0.0%	Low
Red River	10	0	0.0%	62.27	0.00	0.0%	Low
Richland	16	0	0.0%	52.59	0.00	0.0%	Low
Sabine	25	0	0.0%	104.45	0.00	0.0%	Low
St. Bernard	112	112	100.0%	45.90	45.90	100.0%	High
St. Charles	195	195	100.0%	192.05	192.05	100.0%	High
St. Helena	7	0	0.0%	40.47	0.00	0.0%	Low
St. James	128	114	89.1%	68.73	67.43	98.1%	High
St. John the Baptist	95	95	100.0%	79.67	66.95	84.0%	High
St. Landry	89	0	0.0%	186.16	0.00	0.0%	Low
St. Martin	75	9	12.0%	94.98	11.73	12.4%	Medium
St. Mary	101	101	100.0%	61.39	61.39	100.0%	High
St. Tammany	321	138	43.0%	142.12	43.07	30.3%	Medium
Tangipahoa	187	7	3.7%	109.73	16.86	15.4%	Medium
Tensas	5	0	0.0%	0.00	0.00	0.0%	Low
Terrebonne	167	167	100.0%	79.26	79.26	100.0%	High
Union	17	0	0.0%	110.76	0.00	0.0%	Low
Vermilion	81	78	96.3%	118.76	113.32	95.4%	High
Vernon	52	0	0.0%	89.46	0.00	0.0%	Low
Washington	52	0	0.0%	116.27	0.00	0.0%	Low
Webster	47	0	0.0%	92.83	0.00	0.0%	Low
West Baton Rouge	144	25	17.4%	118.54	1.71	1.4%	Medium
West Carroll	10	0	0.0%	43.39	0.00	0.0%	Low
West Feliciana	52	0	0.0%	71.11	0.00	0.0%	Low
Winn	18	0	0.0%	64.62	0.00	0.0%	Low

Map E-70: Percentage of Utilities by Parish within the Category 3 Storm Surge Zone



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), HSIP (Utility Providerse and Power Lines)

Map E-71: Parishes Ranked by Percentage of Utilities by Parish within the Category 3 Storm Surge Zone



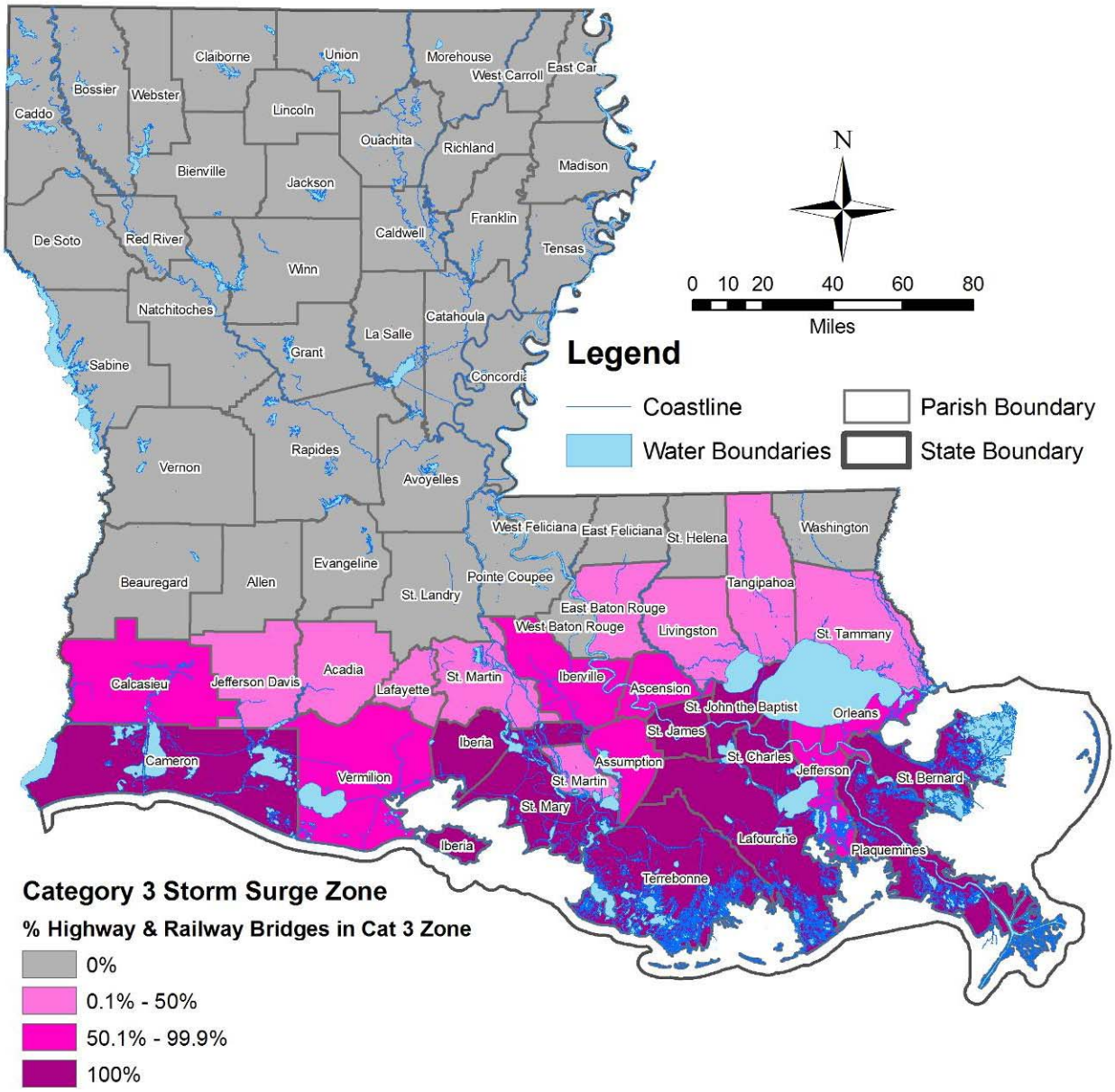
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), HSIP (Utility Providerse and Power Lines)

The most critical and vulnerable transportation elements to storm surge are bridges because of the force of the water impact. Table E-48 and Map E-72 show the percentage of highway and railway bridges by parish within the Category 3 Storm Surge Zone. Map E-73 presents the parishes ranked by percentage.

Table E-48: Percentage of Bridges by Parish within the Category 3 Storm Surge Zone

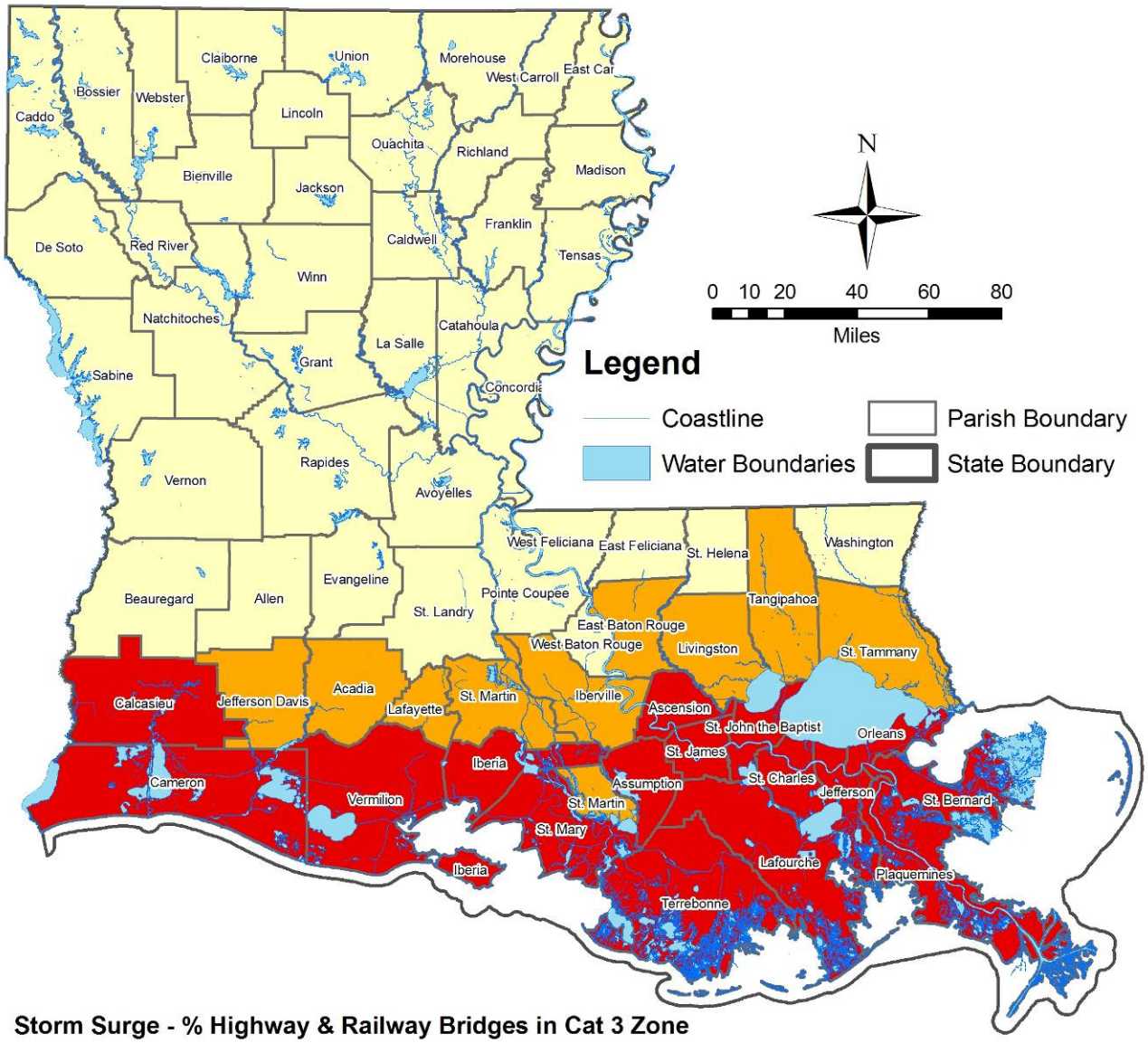
Parish	Total Bridges	Bridges in Cat 3 Surge Zone	% Bridges in Cat 3 Surge Zone	Hazard Ranking	Parish	Total Bridges	Bridges in Cat 3 Surge Zone	% Bridges in Cat 3 Surge Zone	Hazard Ranking
Acadia	296	80	27.0%	Medium	Madison	97	0	0.0%	Low
Allen	183	0	0.0%	Low	Morehouse	135	0	0.0%	Low
Ascension	189	177	93.7%	High	Natchitoches	287	0	0.0%	Low
Assumption	50	48	96.0%	High	Orleans	324	317	97.8%	High
Avoyelles	156	0	0.0%	Low	Ouachita	292	0	0.0%	Low
Beauregard	223	0	0.0%	Low	Plaquemines	32	32	100.0%	High
Bienville	191	0	0.0%	Low	Pointe Coupee	50	0	0.0%	Low
Bossier	249	0	0.0%	Low	Rapides	477	0	0.0%	Low
Caddo	562	0	0.0%	Low	Red River	67	0	0.0%	Low
Calcasieu	382	308	80.6%	High	Richland	225	0	0.0%	Low
Caldwell	125	0	0.0%	Low	Sabine	160	0	0.0%	Low
Cameron	53	53	100.0%	High	St. Bernard	24	24	100.0%	High
Catahoula	68	0	0.0%	Low	St. Charles	76	76	100.0%	High
Claiborne	156	0	0.0%	Low	St. Helena	148	0	0.0%	Low
Concordia	37	0	0.0%	Low	St. James	23	23	100.0%	High
De Soto	225	0	0.0%	Low	St. John the Baptist	39	39	100.0%	High
East Baton Rouge	457	11	2.4%	Medium	St. Landry	327	0	0.0%	Low
East Carroll	59	0	0.0%	Low	St. Martin	112	32	28.6%	Medium
East Feliciana	143	0	0.0%	Low	St. Mary	127	127	100.0%	High
Evangeline	185	0	0.0%	Low	St. Tammany	305	137	44.9%	Medium
Franklin	143	0	0.0%	Low	Tangipahoa	466	59	12.7%	Medium
Grant	153	0	0.0%	Low	Tensas	44	0	0.0%	Low
Iberia	125	125	100.0%	High	Terrebonne	147	147	100.0%	High
Iberville	81	46	56.8%	Medium	Union	110	0	0.0%	Low
Jackson	154	0	0.0%	Low	Vermilion	263	251	95.4%	High
Jefferson	252	251	99.6%	High	Vernon	288	0	0.0%	Low
Jefferson Davis	244	122	50.0%	Medium	Washington	278	0	0.0%	Low
Lafayette	274	27	9.9%	Medium	Webster	194	0	0.0%	Low
Lafourche	106	106	100.0%	High	West Baton Rouge	61	0	0.0%	Low
La Salle	192	0	0.0%	Low	West Carroll	115	0	0.0%	Low
Lincoln	190	0	0.0%	Low	West Feliciana	91	0	0.0%	Low
Livingston	243	63	25.9%	Medium	Winn	203	0	0.0%	Low

Map E-72: Percentage of Bridges by Parish within the Category 3 Storm Surge Zone



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

Map E-73: Parishes Ranked by Percentage of Bridges within the Category 3 Storm Surge Zone



Storm Surge - % Highway & Railway Bridges in Cat 3 Zone

Hazard Ranking

Low Medium High

Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), SLOSH Modeling (Storm Surge), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

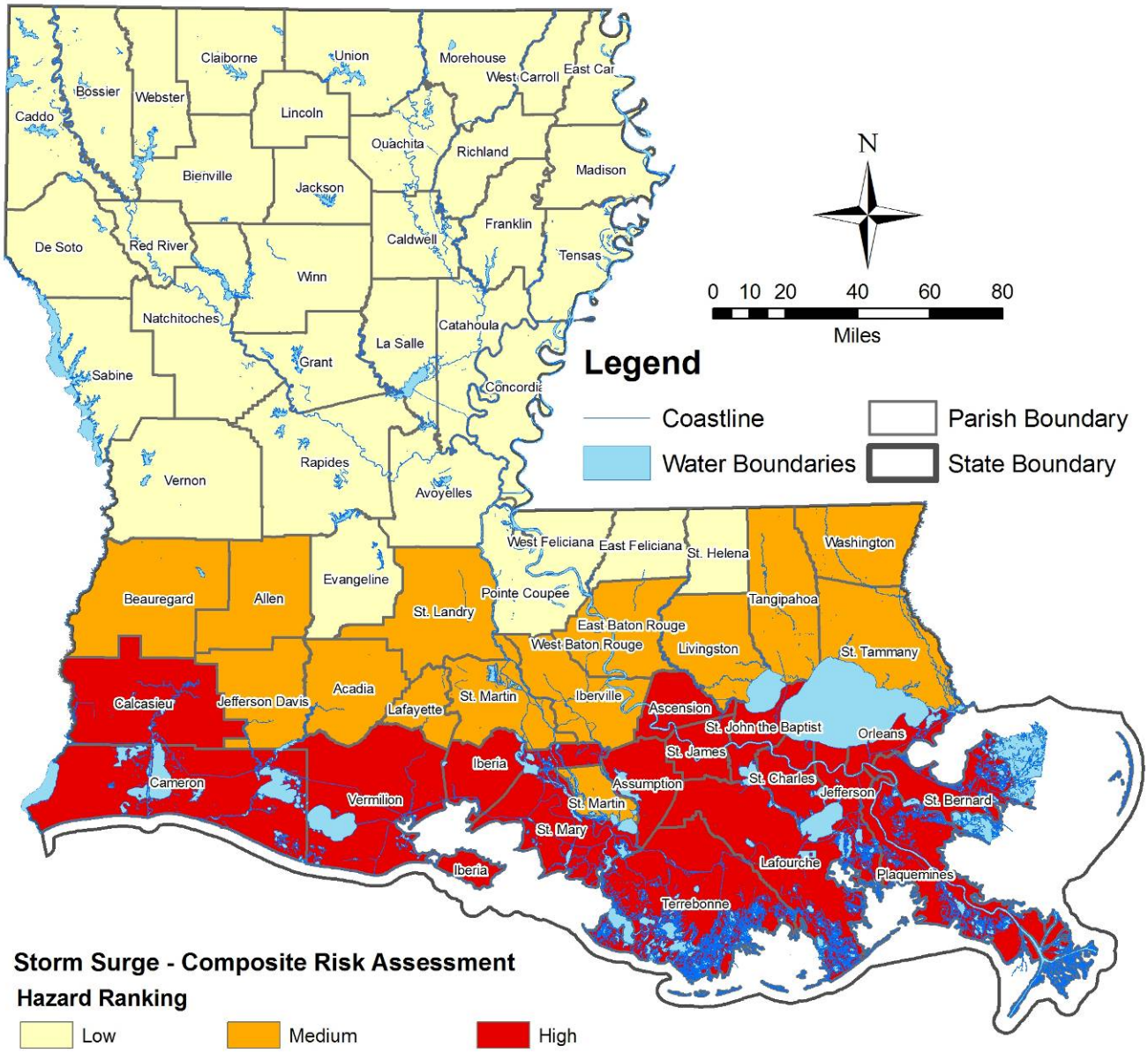
The composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points, and each low ranking one (1) point. Following this methodology, the possible range of scores for Storm Surge is 7 to 21. A high Storm Surge Hazard would be assigned to a parish receiving a score of 18 to 21; medium would be for parishes scoring 10-17; and low would be for any parish scoring 7-9. Table E-49 and Map E-74 show the list of parishes and their respective composite scores.

Table E-49: Composite ranking by Parish

Parish	Cat 1 Storm Surge Occurrences Ranking	Impacted Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Utilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
Acadia	Medium	Medium	Medium	Medium	Medium	Medium	Medium	14
Allen	Medium	Medium	Medium	Medium	Low	Low	Low	11
Ascension	High	High	High	High	High	High	High	21
Assumption	High	High	High	High	High	High	High	21
Avoyelles	Low	Low	Low	Low	Low	Low	Low	7
Beauregard	Medium	Low	Medium	Medium	Low	Low	Low	10
Bienville	Low	Low	Low	Low	Low	Low	Low	7
Bossier	Low	Low	Low	Low	Low	Low	Low	7
Caddo	Low	Low	Low	Low	Low	Low	Low	7
Calcasieu	High	High	High	High	High	High	High	21
Caldwell	Low	Low	Low	Low	Low	Low	Low	7
Cameron	High	High	High	Medium	High	High	High	20
Catahoula	Low	Low	Low	Low	Low	Low	Low	7
Claiborne	Low	Low	Low	Low	Low	Low	Low	7
Concordia	Low	Low	Low	Low	Low	Low	Low	7
De Soto	Low	Low	Low	Low	Low	Low	Low	7
East Baton Rouge	Medium	Medium	Medium	High	Medium	Medium	Medium	15
East Carroll	Low	Low	Low	Low	Low	Low	Low	7
East Feliciana	Low	Low	Low	Low	Low	Low	Low	7
Evangeline	Low	Low	Medium	Medium	Low	Low	Low	9
Franklin	Low	Low	Low	Low	Low	Low	Low	7
Grant	Low	Low	Low	Low	Low	Low	Low	7
Iberia	High	High	High	High	High	High	High	21
Iberville	High	Medium	Medium	High	Medium	High	Medium	17
Jackson	Low	Low	Low	Low	Low	Low	Low	7
Jefferson	High	High	High	High	High	High	High	21
Jefferson Davis	High	Medium	Medium	Medium	Medium	Medium	Medium	15
Lafayette	Medium	Medium	Medium	High	Medium	Medium	Medium	15
Lafourche	High	High	High	High	High	High	High	21
La Salle	Low	Low	Low	Low	Low	Low	Low	7
Lincoln	Low	Low	Low	Low	Low	Low	Low	7

Parish	Cat 1 Storm Surge Occurrences Ranking	Impacted Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Utilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
Livingston	High	Medium	Medium	High	Medium	Medium	Medium	16
Madison	Low	Low	Low	Low	Low	Low	Low	7
Morehouse	Low	Low	Low	Low	Low	Low	Low	7
Natchitoches	Low	Low	Low	Low	Low	Low	Low	7
Orleans	High	High	High	High	High	High	High	21
Ouachita	Low	Low	Low	Low	Low	Low	Low	7
Plaquemines	High	High	High	High	High	High	High	21
Pointe Coupee	Medium	Low	Low	Low	Low	Low	Low	8
Rapides	Low	Low	Low	Low	Low	Low	Low	7
Red River	Low	Low	Low	Low	Low	Low	Low	7
Richland	Low	Low	Low	Low	Low	Low	Low	7
Sabine	Low	Low	Low	Low	Low	Low	Low	7
St. Bernard	High	High	High	High	High	High	High	21
St. Charles	High	High	High	High	High	High	High	21
St. Helena	Low	Low	Low	Low	Low	Low	Low	7
St. James	High	High	High	High	High	High	High	21
St. John the Baptist	High	High	High	High	High	High	High	21
St. Landry	Medium	Medium	Medium	Medium	Low	Low	Low	11
St. Martin	High	Medium	Medium	Medium	Medium	Medium	Medium	15
St. Mary	High	High	High	High	High	High	High	21
St. Tammany	High	Medium	Medium	High	Medium	Medium	Medium	16
Tangipahoa	High	Medium	Medium	Medium	Medium	Medium	Medium	15
Tensas	Low	Low	Low	Low	Low	Low	Low	7
Terrebonne	High	High	High	High	High	High	High	21
Union	Low	Low	Low	Low	Low	Low	Low	7
Vermilion	High	High	High	High	High	High	High	21
Vernon	Low	Low	Low	Low	Low	Low	Low	7
Washington	Medium	Low	Medium	Medium	Low	Low	Low	10
Webster	Low	Low	Low	Low	Low	Low	Low	7
West Baton Rouge	Medium	Medium	Medium	Medium	Medium	Medium	Low	13
West Carroll	Low	Low	Low	Low	Low	Low	Low	7
West Feliciana	Low	Low	Low	Low	Low	Low	Low	7
Winn	Low	Low	Low	Low	Low	Low	Low	7

Map E-74: Composite Ranking by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population), SLOSH Modeling (Storm Surge), HAZUS-MH MR4 (Buildings, Highways, Railroads), HSIP (Critical Facilities, Utilities), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

Methodology

The storm surge hazard ranking was based on the Maximum of Maximums (MOMs) as determined from Sea, Lake and Overland Surges from Hurricanes (SLOSH). SLOSH is a computerized model developed by the Federal Emergency Management Agency (FEMA), United States Army Corps of Engineers (USACE), and the National Weather Service (NWS) to estimate storm surge depths resulting from historical, hypothetical, or predicted hurricanes by taking into account a storm's pressure, size, forward speed, forecast track, wind speeds, and topographical data. MEOW is defined through SLOSH modeling as the Maximum Envelope of Water. A MOM is a series of hundreds of theoretical MEOWs showing a worst case scenario storm surge for a given storm category at any given point in a given basin.

The worst case scenario is for flooding to occur as a result from Category 1-induced surge. The areas of the state that were subject to this level would also be inundated by any storm of a higher magnitude. Additional vulnerability to the storm surge hazard is based on the exposure of the population, buildings, utilities, and infrastructure to a Category 3 storm surge since that is an average level event analogous to a 100-year flood event. Exposure was based on the location of the population and structures within the Category 3 storm surge inundation zones, which are based on the SLOSH data, where the calculated water depth is greater than zero. All other elements were assessed for their vulnerability to a Category 3 event,

The HAZUS-MH general building stock data provide the building valuation for each specific occupancy classification (e.g., single family residential, retail trade) developed from the 2000 Census and Dun & Bradstreet (D&B). The general building stock data set includes the residential, commercial, industrial, governmental, educational, agricultural, and religious buildings for each parish. This data were developed at the census block level and then aggregated at census tract level. This data set is from the 2000 version of TIGER/Line files and first quarter of 2002 data from D&B.

For developing the depth grid files, the SLOSH data were used in combination with ground elevation data from the USGS National Elevation Dataset. The maximum of the maximums (MOM) value (a composite measure that expresses the maximum flood elevation) for Category 3 storm surge from the SLOSH data was used to determine the surge or water elevation. A GRID digital map of floor elevation was produced from the SLOSH shape file data. A simple GIS operation of subtraction was performed with the ground elevation data set to determine the water depth.

The analysis for population exposure used 2000 Census overlaid with SLOSH data to determine the population located in the Category 3 storm surge inundation area, where the calculated water depth is greater than zero.

The analysis for general building stock exposure used HAZUS-MH general building stock data and SLOSH data. Aggregated building quantity data was overlaid with SLOSH data, and the Category 3 surge area, to determine general building stock exposure.

Data Limitations

SLOSH modeling data using the MOMs (Maximum of Maximums) counts most inland water bodies (lakes and rivers) as part of the model. Thus, it is appropriate to also include inland waters as part of the total parish land area, when calculating the percentage of MOMs that comprises each parish. However, the SLOSH MOMs exclude Lake Pontchartrain, which is part of the political boundaries of St. Tammany, Tangipahoa, Orleans, Jefferson, St. Charles, and St. John the Baptist Parishes. The percentage of coverage for these parishes will therefore be skewed low (because we are counting Lake Pontchartrain as part of the land area) since these areas would be impacted by Lake Pontchartrain storm surge even though the SLOSH model does not include it. For example, Orleans Parish may say

it is 30% in Category 1 MOMs but it should actually be closer to 60% when Lake Pontchartrain is removed from the parish's total land area.

In the transportation analysis, bridges are one of the three main variables. The data on bridges encompasses both highway and railway bridges. However, of the 13,378 bridges in Louisiana, only 32 are railway bridges. This number is statistically insignificant so if they comprised a separate analysis, railway bridges could unreasonably skew a parish's hazard ranking. Thus, these 32 bridges are not viewed separately but have been merged with all other bridges.

Appendix E.10
Subsidence

The subsidence hazard ranking was based on parish-wide vulnerability. The level of vulnerability was based on the total percentage each parish's land area within subsidence rate contours over 10,000 years. In establishing the hazards ranking, all incidents were assumed to have equal impacts, since the level of severity could not be determined from the existing data.

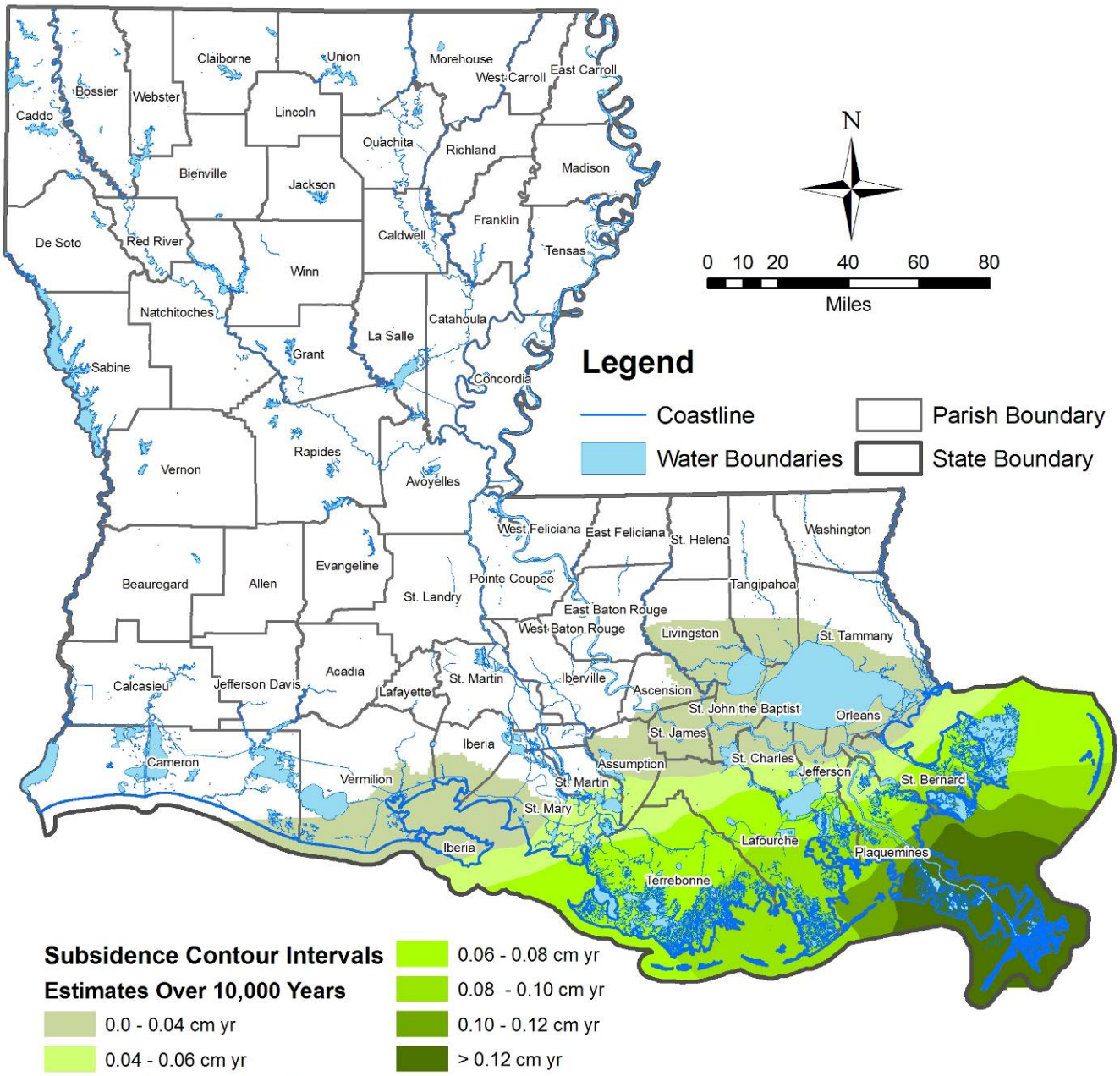
Subsidence hazard vulnerability was assessed for the population and general building stock (i.e., residential, industrial, commercial and governmental; and educational, agricultural, and religious occupancies were grouped together as "other" since there were fewer buildings in these occupancy classes). Projected subsidence rate data, taken from Kulp (2000), 2000 Census, 2006 Census Population Estimates, and HAZUS-MH general building stock data were used to identify subsidence hazard vulnerability in Louisiana coastal parishes.

The high / medium / low rankings for each parish were developed by:

- Obtaining the Contour Data by parish;
- Sorting the list by parish from highest to lowest percentage of land under subsidence threat;
    - Assigning the high rank to parishes with 85% or more of land under subsidence threat;
    - Assigning the medium rank to parishes with up to 85% of land under subsidence threat;
    - Assigning the low rank to parishes outside of the subsidence threat areas.
- Determining the number of buildings under subsidence threat;
    - Assigning the high rank to parishes with more than 85% of its buildings under subsidence threat;
    - Assigning the medium rank to parishes with up to 85% of its buildings under subsidence threat;
    - Assigning the low rank to parishes with no buildings under subsidence threat.
- Determining the value of buildings under subsidence threat;
    - Assigning the high rank to parishes with more than $2 billion of its buildings under threat;
    - Assigning the medium rank to parishes with up to $2 billion of its buildings under threat;
    - Assigning the low rank to parishes with no building value under subsidence threat.
- Determining the number of Critical Facilities under subsidence threat;
    - Assigning the high rank to parishes with more than 85% of its critical facilities under threat;
    - Assigning the medium rank to parishes with up to 85% of its critical facilities under threat;
    - Assigning the low rank to parishes with no critical facilities under subsidence threat.
- Determining the amount of transportation infrastructure (bridges, highways and railways) under subsidence threat
    - Assigning the high rank to parishes with more than 85% of infrastructure under subsidence threat;
    - Assigning the medium rank to parishes with up to 85% if infrastructure under subsidence threat;
    - Assigning the low rank to parishes with no transportation facilities under subsidence threat.
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 12 or more;
    - Assigning the medium composite ranking to parishes with a score of 8 to 11; and
    - Assigning the low composite ranking to parishes with a score of 7 or less.

Map E-75 shows the subsidence contour intervals (areas under subsidence threat). Table E-50 and Map E-76 provide the percentage of each parish affected by each contour interval. Map E-77 shows the parishes ranked by percent.

Map E-75: Subsidence Contour Intervals (areas under subsidence threat)

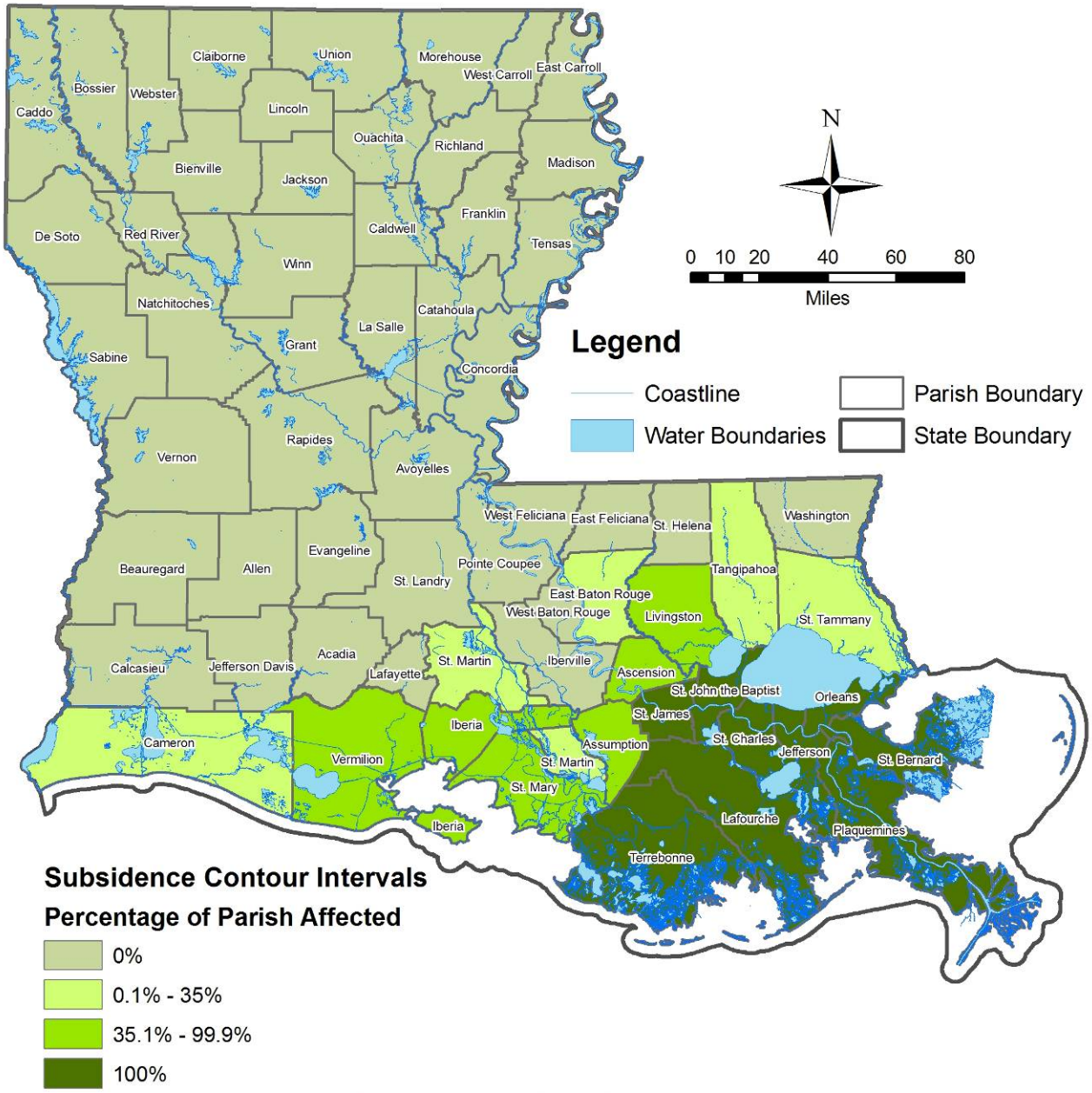


Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Table E-50: Percentage of Each Parish under Subsidence Threat

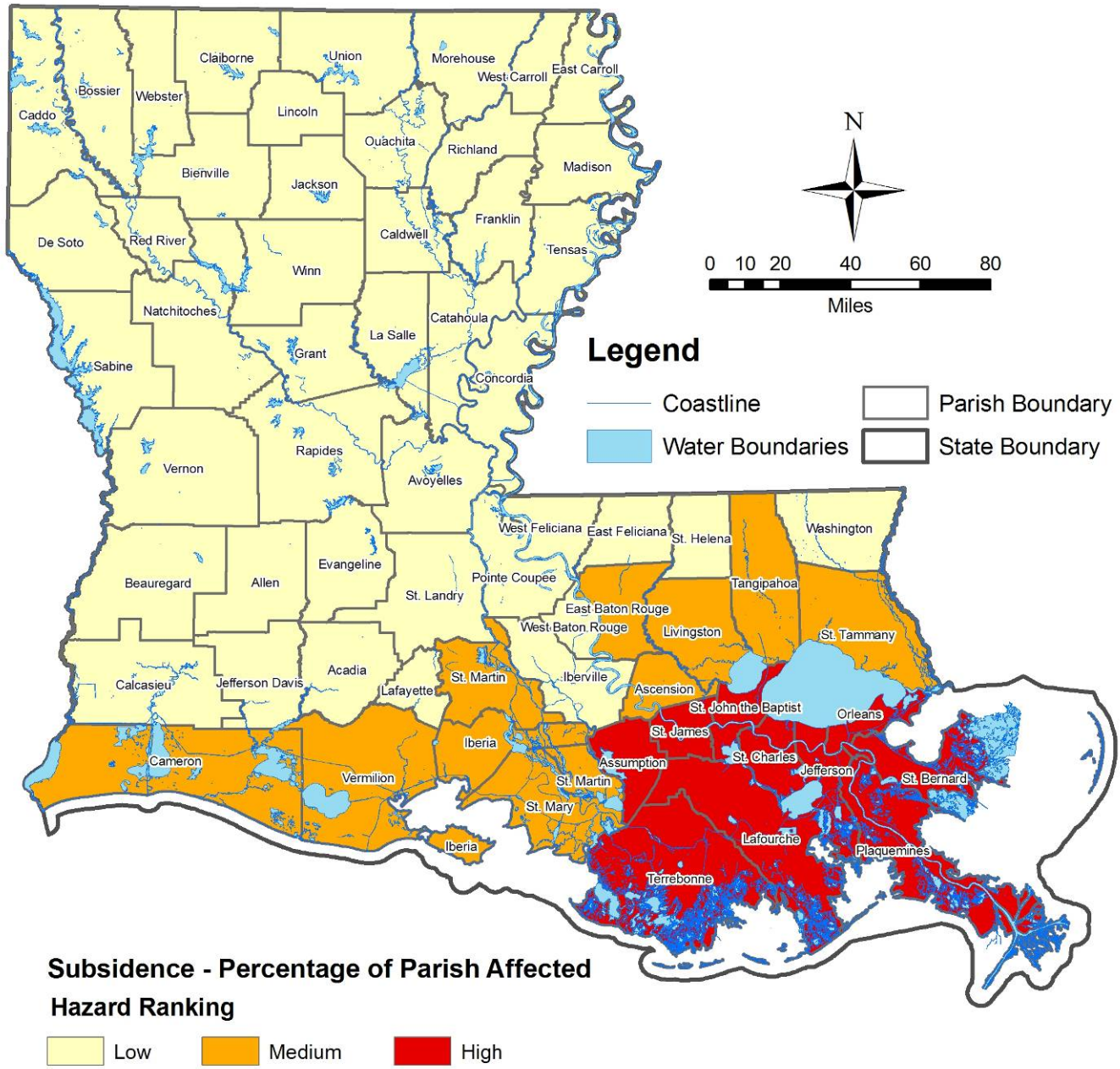
Parish	Land Area in Square Miles	Land Under Subsidence Threat	% Land Under Subsidence Threat	Hazard Ranking	Parish	Land Area in Square Miles	Land Under Subsidence Threat	% Land Under Subsidence Threat	Hazard Ranking
Acadia	656.3	0.0	0.0%	Low	Madison	628.7	0.0	0.0%	Low
Allen	766.3	0.0	0.0%	Low	Morehouse	798.4	0.0	0.0%	Low
Ascension	292.9	119.3	40.7%	Medium	Natchitoches	1,262.5	0.0	0.0%	Low
Assumption	340.7	304.8	89.5%	High	Orleans	189.9	189.9	100.0%	High
Avoyelles	845.9	0.0	0.0%	Low	Ouachita	616.3	0.0	0.0%	Low
Beauregard	1,162.9	0.0	0.0%	Low	Plaquemines	929.6	929.6	100.0%	High
Bienville	811.7	0.0	0.0%	Low	Pointe Coupee	561.0	0.0	0.0%	Low
Bossier	842.5	0.0	0.0%	Low	Rapides	1,327.4	0.0	0.0%	Low
Caddo	885.7	0.0	0.0%	Low	Red River	393.1	0.0	0.0%	Low
Calcasieu	1,076.1	0.0	0.0%	Low	Richland	562.3	0.0	0.0%	Low
Caldwell	531.1	0.0	0.0%	Low	Sabine	867.1	0.0	0.0%	Low
Cameron	1,366.1	45.2	3.3%	Medium	St. Bernard	431.8	431.8	100.0%	High
Catahoula	727.4	0.0	0.0%	Low	St. Charles	288.9	288.9	100.0%	High
Claiborne	755.5	0.0	0.0%	Low	St. Helena	409.3	0.0	0.0%	Low
Concordia	706.8	0.0	0.0%	Low	St. James	247.5	247.5	100.0%	High
De Soto	879.7	0.0	0.0%	Low	St. John the Baptist	220.1	220.1	100.0%	High
East Baton Rouge	457.7	4.7	1.0%	Medium	St. Landry	933.6	0.0	0.0%	Low
East Carroll	425.5	0.0	0.0%	Low	St. Martin	764.5	55.9	7.3%	Medium
East Feliciana	455.2	0.0	0.0%	Low	St. Mary	618.9	457.9	74.0%	Medium
Evangeline	673.5	0.0	0.0%	Low	St. Tammany	861.6	265.9	30.9%	Medium
Franklin	626.4	0.0	0.0%	Low	Tangipahoa	794.2	189.8	23.9%	Medium
Grant	649.0	0.0	0.0%	Low	Tensas	606.7	0.0	0.0%	Low
Iberia	592.1	235.9	39.8%	Medium	Terrebonne	1,272.7	1,272.7	100.0%	High
Iberville	633.5	0.0	0.0%	Low	Union	882.6	0.0	0.0%	Low
Jackson	571.9	0.0	0.0%	Low	Vermilion	1,197.4	439.6	36.7%	Medium
Jefferson	310.1	310.1	100.0%	High	Vernon	1,330.3	0.0	0.0%	Low
Jefferson Davis	653.9	0.0	0.0%	Low	Washington	672.6	0.0	0.0%	Low
Lafayette	270.1	0.0	0.0%	Low	Webster	604.0	0.0	0.0%	Low
Lafourche	1,084.8	1,084.8	100.0%	High	West Baton Rouge	192.1	0.0	0.0%	Low
La Salle	628.5	0.0	0.0%	Low	West Carroll	360.0	0.0	0.0%	Low
Lincoln	472.2	0.0	0.0%	Low	West Feliciana	409.0	0.0	0.0%	Low
Livingston	649.6	367.1	56.5%	Medium	Winn	951.0	0.0	0.0%	Low

Map E-76: Percentage of Each Parish under Subsidence Threat



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Map E-77: Parishes Ranked by Percentage under Subsidence Threat



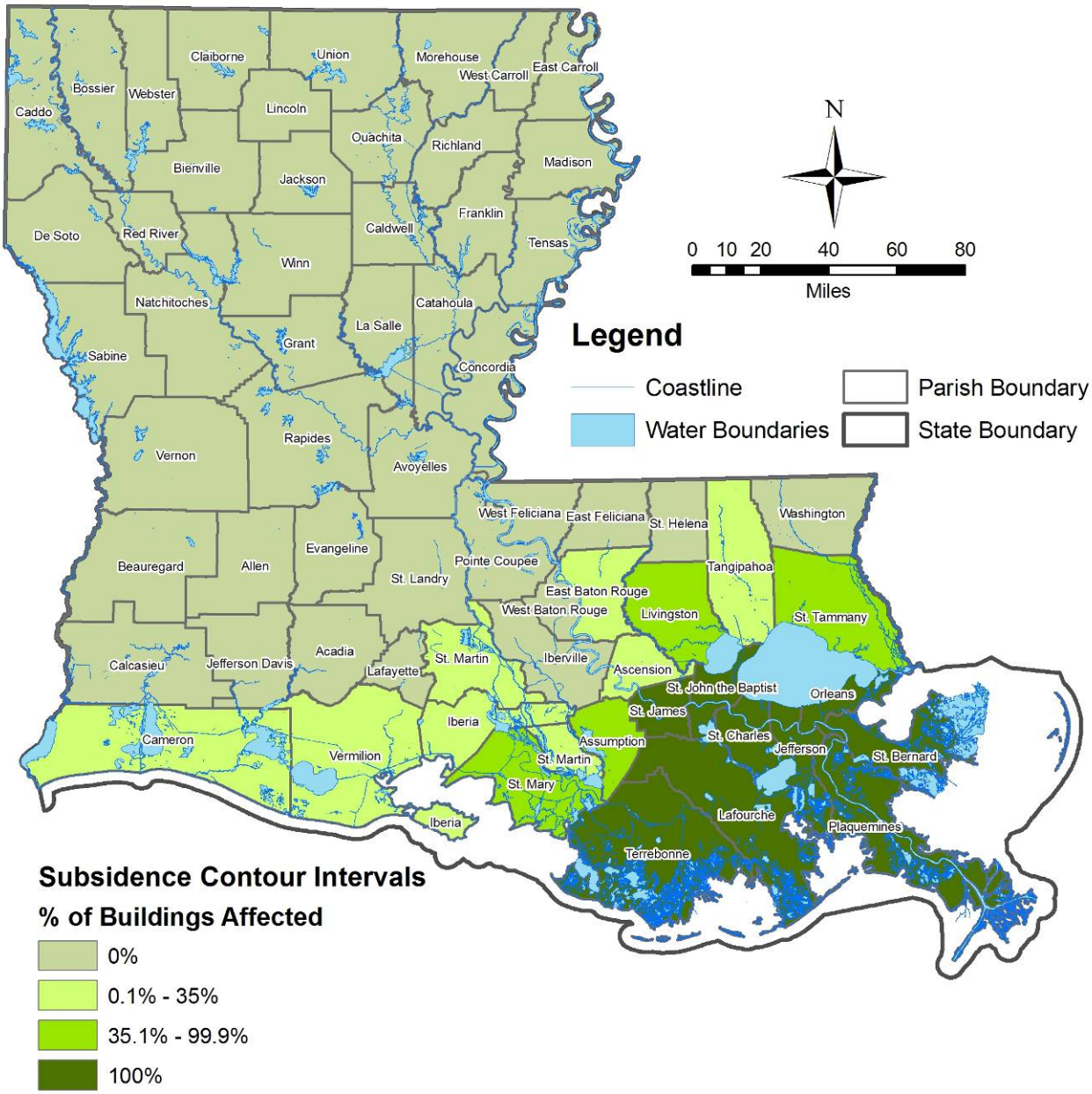
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Table E-51 and Map E-78 provide the percentage of buildings within each parish under subsidence threat. Map E-79 shows the parishes ranked by percent.

Table E-51: Percentage of Buildings by Parish under Subsidence Threat

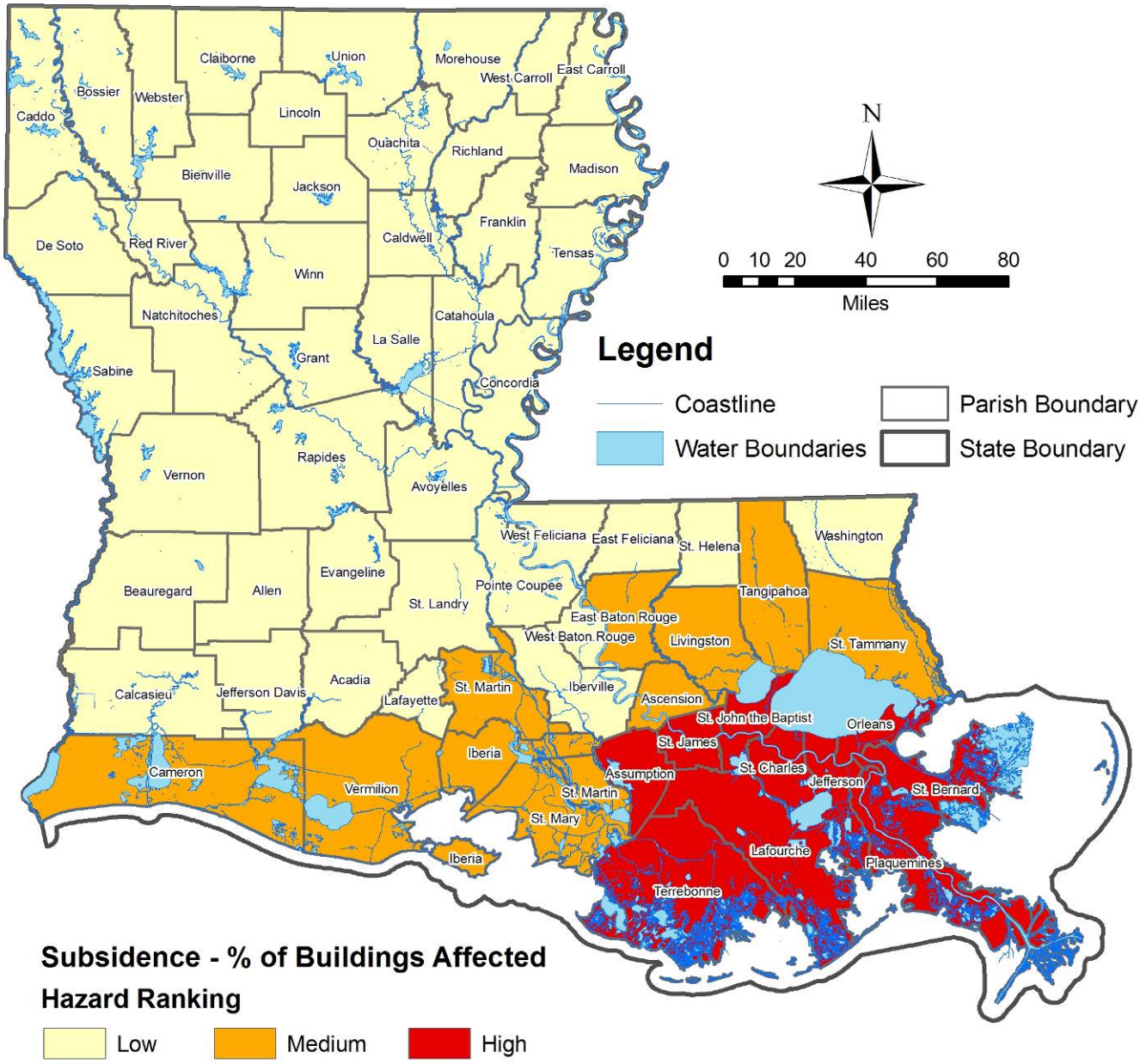
Parish	Total Buildings	Buildings Under Subsidence Threat	% Buildings Under Subsidence Threat	Hazard Ranking	Parish	Total Buildings	Buildings Under Subsidence Threat	% Buildings Under Subsidence Threat	Hazard Ranking
Acadia	27,817	0	0.0%	Low	Madison	6,576	0	0.0%	Low
Allen	11,600	0	0.0%	Low	Morehouse	14,604	0	0.0%	Low
Ascension	33,123	10,983	33.2%	Medium	Natchitoches	19,780	0	0.0%	Low
Assumption	10,844	10,365	95.6%	High	Orleans	173,671	173,671	100.0%	High
Avoyelles	19,795	0	0.0%	Low	Ouachita	62,493	0	0.0%	Low
Beauregard	17,476	0	0.0%	Low	Plaquemines	12,374	12,374	100.0%	High
Bienville	10,612	0	0.0%	Low	Pointe Coupee	12,092	0	0.0%	Low
Bossier	40,408	0	0.0%	Low	Rapides	58,948	0	0.0%	Low
Caddo	105,041	0	0.0%	Low	Red River	4,767	0	0.0%	Low
Calcasieu	80,762	0	0.0%	Low	Richland	10,847	0	0.0%	Low
Caldwell	6,011	0	0.0%	Low	Sabine	15,926	0	0.0%	Low
Cameron	6,211	10	0.2%	Medium	St. Bernard	26,842	26,842	100.0%	High
Catahoula	6,483	0	0.0%	Low	St. Charles	19,200	19,200	100.0%	High
Claiborne	9,517	0	0.0%	Low	St. Helena	6,254	0	0.0%	Low
Concordia	10,636	0	0.0%	Low	St. James	8,815	8,815	100.0%	High
De Soto	13,848	0	0.0%	Low	St. John the Baptist	16,521	16,521	100.0%	High
East Baton Rouge	151,107	2,019	1.3%	Medium	St. Landry	43,957	0	0.0%	Low
East Carroll	4,195	0	0.0%	Low	St. Martin	24,736	1,289	5.2%	Medium
East Feliciana	10,030	0	0.0%	Low	St. Mary	24,408	16,146	66.2%	Medium
Evangeline	17,665	0	0.0%	Low	St. Tammany	84,508	54,914	65.0%	Medium
Franklin	10,757	0	0.0%	Low	Tangipahoa	45,367	13,035	28.7%	Medium
Grant	10,350	0	0.0%	Low	Tensas	4,467	0	0.0%	Low
Iberia	32,309	1,457	4.5%	Medium	Terrebonne	43,923	43,923	100.0%	High
Iberville	15,059	0	0.0%	Low	Union	13,760	0	0.0%	Low
Jackson	9,181	0	0.0%	Low	Vermilion	27,475	1,449	5.3%	Medium
Jefferson	164,539	164,539	100.0%	High	Vernon	21,626	0	0.0%	Low
Jefferson Davis	16,691	0	0.0%	Low	Washington	23,350	0	0.0%	Low
Lafayette	81,011	0	0.0%	Low	Webster	21,865	0	0.0%	Low
Lafourche	40,570	40,570	100.0%	High	West Baton Rouge	10,252	0	0.0%	Low
La Salle	7,828	0	0.0%	Low	West Carroll	5,945	0	0.0%	Low
Lincoln	18,894	0	0.0%	Low	West Feliciana	5,056	0	0.0%	Low
Livingston	42,671	19,317	45.3%	Medium	Winn	8,993	0	0.0%	Low

Map E-78: Percentage of Buildings by Parish under Subsidence Threat



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings)
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Figure E-79: Parish Ranking by Percentage of Buildings under Subsidence Threat



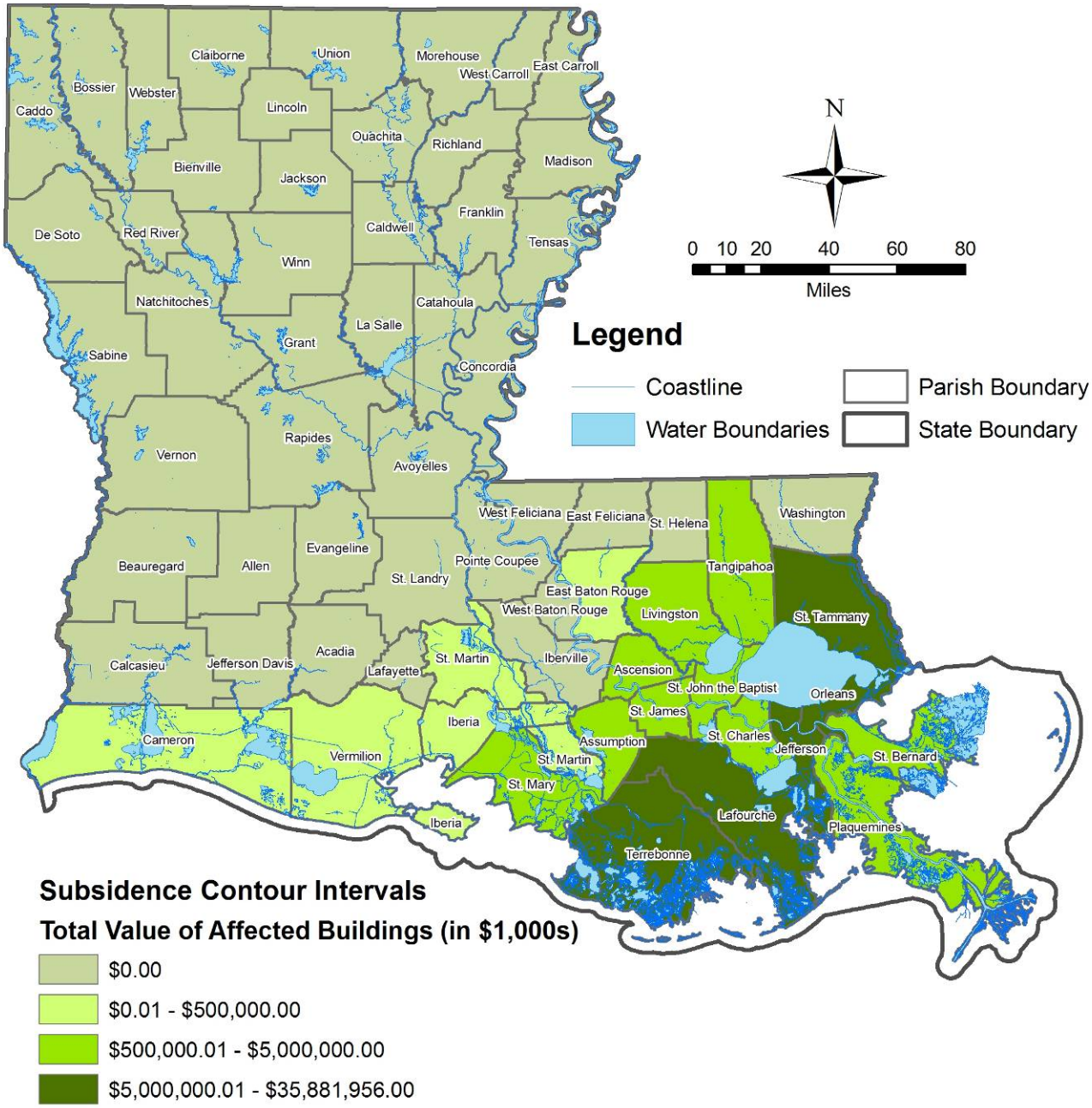
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings)
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Table E-52 and Map E-80 provide the value of buildings within each parish under subsidence threat. Map E-81 shows the parishes ranked by value.

Table E-52: Value of Buildings by Parish under Subsidence Threat

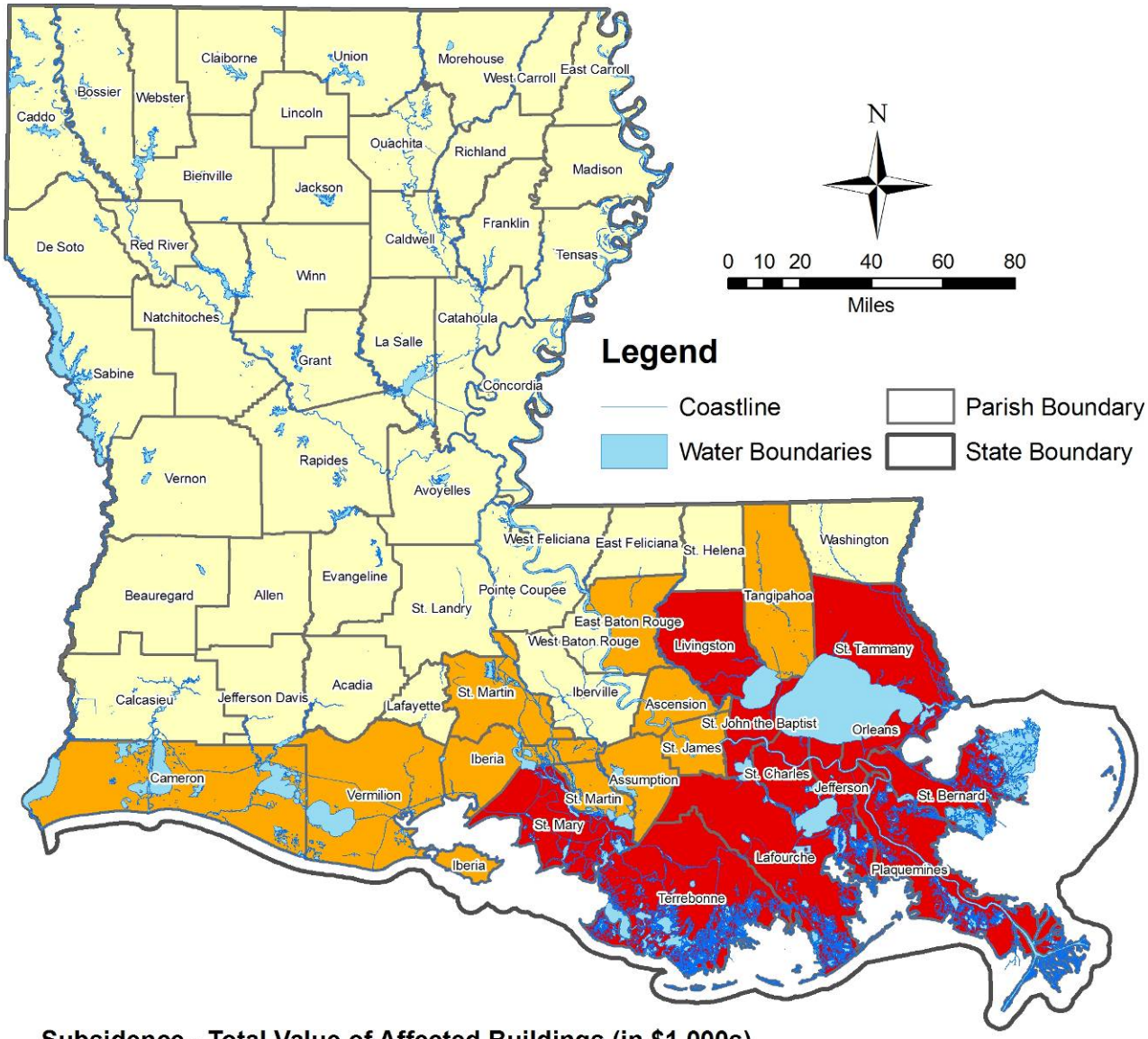
Parish	Total Value of Buildings Under Subsidence Threat (in $1000s)	Hazard Ranking	Parish	Total Value of Buildings Under Subsidence Threat (in $1000s)	Hazard Ranking
Acadia	$0	Low	Madison	$0	Low
Allen	$0	Low	Morehouse	$0	Low
Ascension	$1,416,634	Medium	Natchitoches	$0	Low
Assumption	$1,238,327	Medium	Orleans	$35,474,596	High
Avoyelles	$0	Low	Ouachita	$0	Low
Beauregard	$0	Low	Plaquemines	$2,123,009	High
Bienville	$0	Low	Pointe Coupee	$0	Low
Bossier	$0	Low	Rapides	$0	Low
Caddo	$0	Low	Red River	$0	Low
Calcasieu	$0	Low	Richland	$0	Low
Caldwell	$0	Low	Sabine	$0	Low
Cameron	$738	Medium	St. Bernard	$4,463,743	High
Catahoula	$0	Low	St. Charles	$3,675,984	High
Claiborne	$0	Low	St. Helena	$0	Low
Concordia	$0	Low	St. James	$1,305,211	Medium
De Soto	$0	Low	St. John the Baptist	$2,840,674	High
East Baton Rouge	$453,633	Medium	St. Landry	$0	Low
East Carroll	$0	Low	St. Martin	$145,980	Medium
East Feliciana	$0	Low	St. Mary	$2,289,778	High
Evangeline	$0	Low	St. Tammany	$9,698,212	High
Franklin	$0	Low	Tangipahoa	$1,646,849	Medium
Grant	$0	Low	Tensas	$0	Low
Iberia	$223,490	Medium	Terrebonne	$7,470,543	High
Iberville	$0	Low	Union	$0	Low
Jackson	$0	Low	Vermilion	$201,043	Medium
Jefferson	$35,881,956	High	Vernon	$0	Low
Jefferson Davis	$0	Low	Washington	$0	Low
Lafayette	$0	Low	Webster	$0	Low
Lafourche	$6,022,158	High	West Baton Rouge	$0	Low
La Salle	$0	Low	West Carroll	$0	Low
Lincoln	$0	Low	West Feliciana	$0	Low
Livingston	$2,647,001	High	Winn	$0	Low

Map E-80: Value of Buildings by Parish under Subsidence Threat



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings)
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Map E-81: Parish Ranking by Value of Buildings under Subsidence Threat



Subsidence - Total Value of Affected Buildings (in $1,000s)

Hazard Ranking

Low Medium High

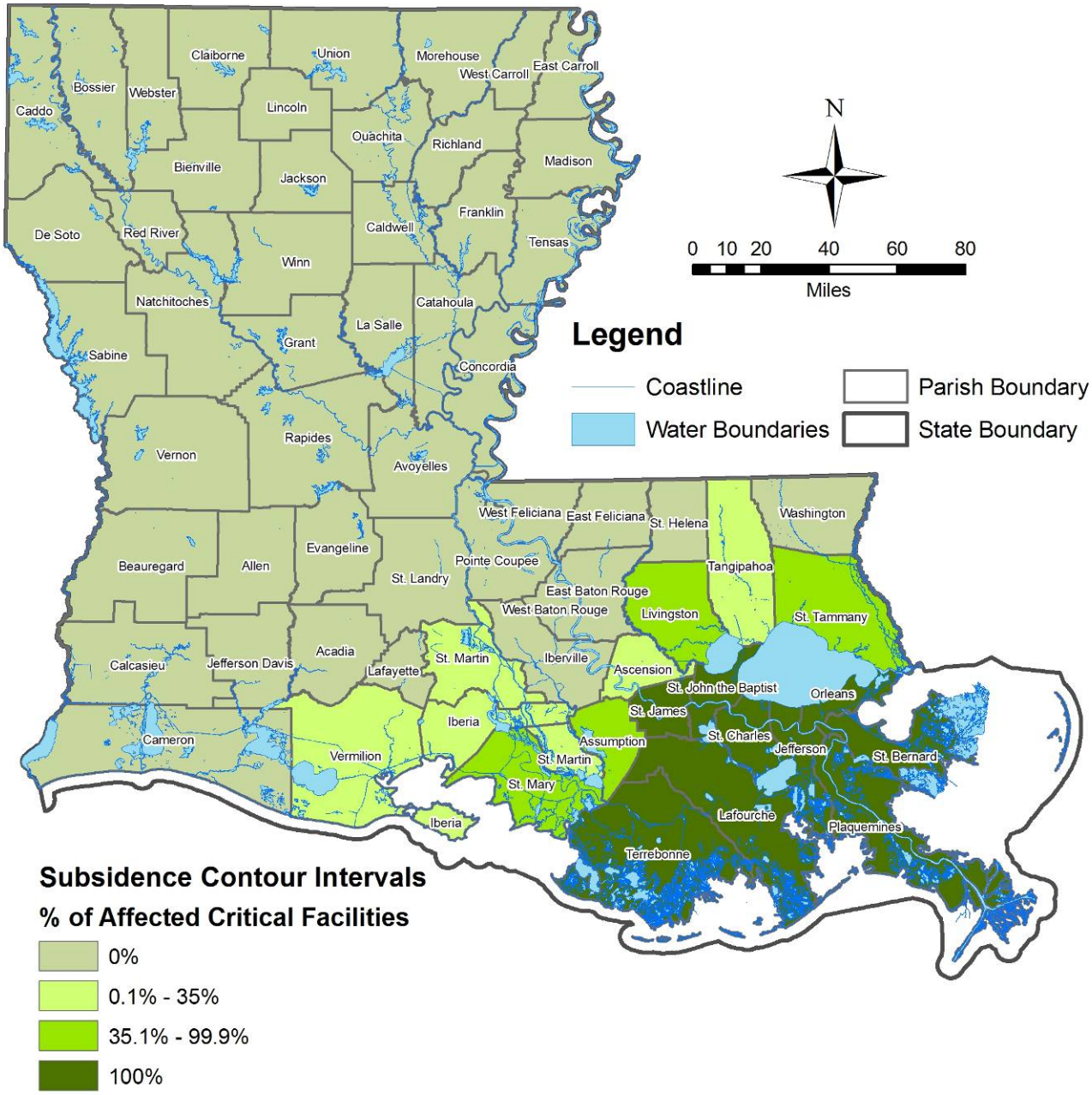
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings)
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Table E-53 and Map E-82 provide the percentage of critical facilities within each parish under subsidence threat. Map E-83 shows the parishes ranked by percent.

Table E-53: Percentage of Critical Facilities by Parish under Subsidence Threat

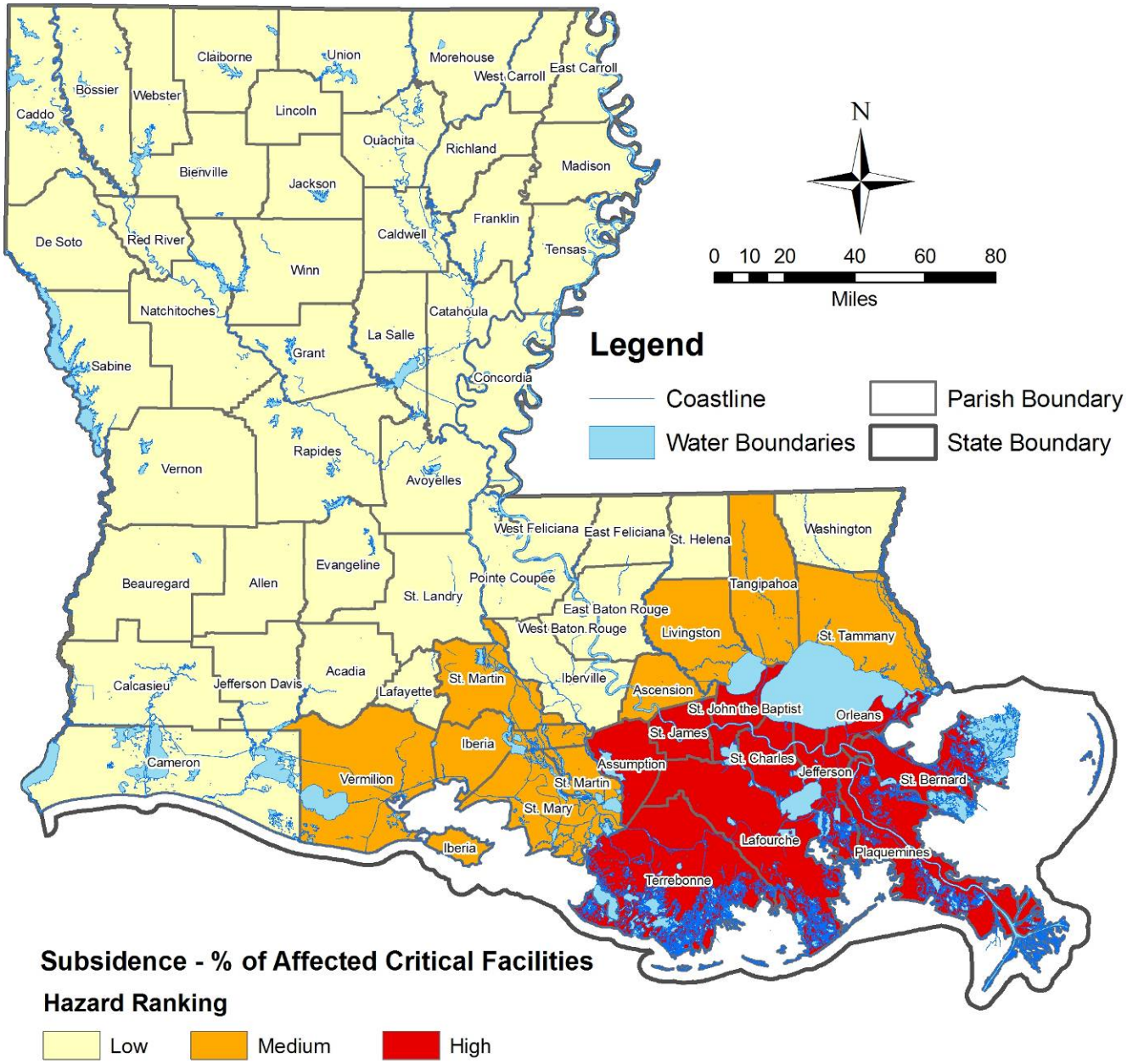
Parish	Total Critical Facilities	Critical Facilities Under Subsidence Threat	% Critical Facilities Under Subsidence Threat	Hazard Ranking	Parish	Total Critical Facilities	Critical Facilities Under Subsidence Threat	% Critical Facilities Under Subsidence Threat	Hazard Ranking
Acadia	64	0	0.0%	Low	Madison	19	0	0.0%	Low
Allen	31	0	0.0%	Low	Morehouse	39	0	0.0%	Low
Ascension	64	19	29.7%	Medium	Natchitoches	46	0	0.0%	Low
Assumption	27	26	96.3%	High	Orleans	169	169	100.0%	High
Avoyelles	64	0	0.0%	Low	Ouachita	119	0	0.0%	Low
Beauregard	45	0	0.0%	Low	Plaquemines	18	18	100.0%	High
Bienville	36	0	0.0%	Low	Pointe Coupee	31	0	0.0%	Low
Bossier	70	0	0.0%	Low	Rapides	148	0	0.0%	Low
Caddo	189	0	0.0%	Low	Red River	12	0	0.0%	Low
Calcasieu	141	0	0.0%	Low	Richland	33	0	0.0%	Low
Caldwell	23	0	0.0%	Low	Sabine	42	0	0.0%	Low
Cameron	19	0	0.0%	Low	St. Bernard	19	19	100.0%	High
Catahoula	27	0	0.0%	Low	St. Charles	57	57	100.0%	High
Claiborne	25	0	0.0%	Low	St. Helena	21	0	0.0%	Low
Concordia	37	0	0.0%	Low	St. James	42	42	100.0%	High
De Soto	43	0	0.0%	Low	St. John the Baptist	36	36	100.0%	High
E. Baton Rouge	261	0	0.0%	Low	St. Landry	98	0	0.0%	Low
East Carroll	13	0	0.0%	Low	St. Martin	46	3	6.5%	Medium
East Feliciana	32	0	0.0%	Low	St. Mary	69	41	59.4%	Medium
Evangeline	49	0	0.0%	Low	St. Tammany	148	72	48.6%	Medium
Franklin	16	0	0.0%	Low	Tangipahoa	89	23	25.8%	Medium
Grant	29	0	0.0%	Low	Tensas	21	0	0.0%	Low
Iberia	55	1	1.8%	Medium	Terrebonne	83	83	100.0%	High
Iberville	41	0	0.0%	Low	Union	29	0	0.0%	Low
Jackson	19	0	0.0%	Low	Vermilion	62	3	4.8%	Medium
Jefferson	215	215	100.0%	High	Vernon	57	0	0.0%	Low
Jefferson Davis	37	0	0.0%	Low	Washington	51	0	0.0%	Low
Lafayette	126	0	0.0%	Low	Webster	78	0	0.0%	Low
Lafourche	80	80	100.0%	High	W. Baton Rouge	35	0	0.0%	Low
La Salle	33	0	0.0%	Low	West Carroll	35	0	0.0%	Low
Lincoln	51	0	0.0%	Low	West Feliciana	21	0	0.0%	Low
Livingston	102	39	38.2%	Medium	Winn	19	0	0.0%	Low

Figure E-82: Percentage of Critical Facilities by Parish under Subsidence Threat



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Critical Facilities)
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Figure E-83: Percentage of Critical Facilities by Parish under Subsidence Threat



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Critical Facilities)
Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

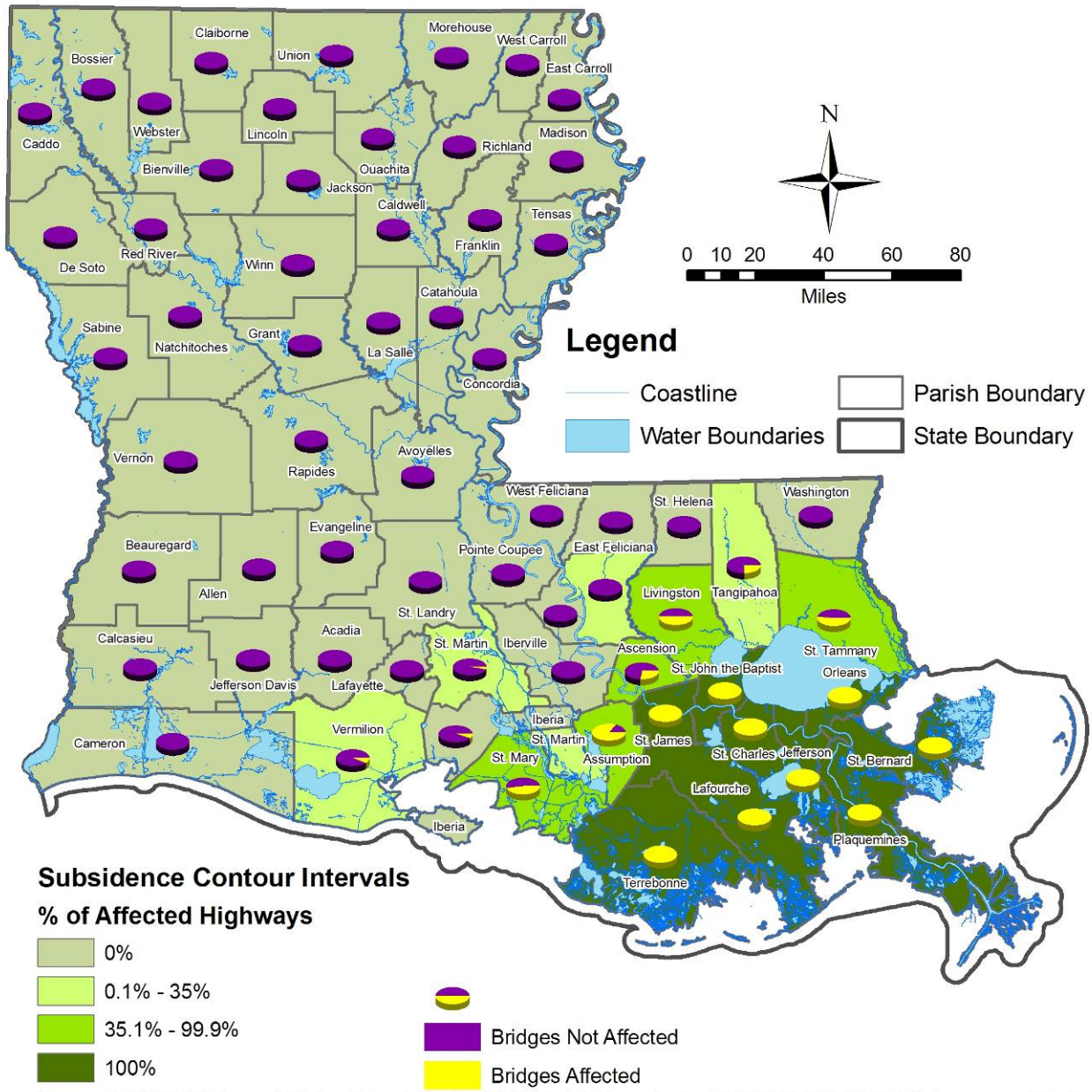
Table E-54 and Map E-84 provide the percentage of highways and bridges within each parish under subsidence threat. Map E-85 shows the percentage of railways within each parish under subsidence threat. Figure E-86 shows the parishes ranked by percent.

Table E-54: Percentage of Transportation Facilities by Parish under Subsidence Threat

Parish	Total Bridges	Bridges Under Subsidence Threat	% Bridges Under Subsidence Threat	Miles of Hwys	Miles of Highways Under Subsidence Threat	% of Highways Under Subsidence Threat	Miles of Rail	Miles of Rail Under Subsidence Threat	% Railways Under Subsidence Threat	Hazard Ranking
Acadia	296	0	0.0%	104.4	0.0	0.0%	60.6	0.0	0.0%	Low
Allen	183	0	0.0%	102.7	0.0	0.0%	73.9	0.0	0.0%	Low
Ascension	189	52	27.5%	112.0	50.3	44.9%	73.5	22.8	31.0%	Medium
Assumption	50	42	84.0%	78.1	65.9	84.3%	10.9	7.3	67.0%	Medium
Avoyelles	156	0	0.0%	125.6	0.0	0.0%	50.1	0.0	0.0%	Low
Beauregard	223	0	0.0%	158.4	0.0	0.0%	96.9	0.0	0.0%	Low
Bienville	191	0	0.0%	148.3	0.0	0.0%	59.6	0.0	0.0%	Low
Bossier	249	0	0.0%	165.6	0.0	0.0%	107.1	0.0	0.0%	Low
Caddo	562	0	0.0%	244.0	0.0	0.0%	175.2	0.0	0.0%	Low
Calcasieu	382	0	0.0%	252.6	0.0	0.0%	137.2	0.0	0.0%	Low
Caldwell	125	0	0.0%	82.9	0.0	0.0%	32.5	0.0	0.0%	Low
Cameron	53	0	0.0%	127.0	0.0	0.0%	0.0	0.0	0.0%	Low
Catahoula	68	0	0.0%	113.1	0.0	0.0%	0.0	0.0	0.0%	Low
Claiborne	156	0	0.0%	169.6	0.0	0.0%	34.5	0.0	0.0%	Low
Concordia	37	0	0.0%	127.8	0.0	0.0%	0.0	0.0	0.0%	Low
De Soto	225	0	0.0%	191.2	0.0	0.0%	79.5	0.0	0.0%	Low
East Baton Rouge	457	1	0.2%	189.8	0.5	0.3%	76.8	0.0	0.0%	Medium
East Carroll	59	0	0.0%	61.1	0.0	0.0%	35.5	0.0	0.0%	Low
East Feliciana	143	0	0.0%	61.9	0.0	0.0%	30.7	0.0	0.0%	Low
Evangeline	185	0	0.0%	111.7	0.0	0.0%	35.1	0.0	0.0%	Low
Franklin	143	0	0.0%	95.7	0.0	0.0%	0.0	0.0	0.0%	Low
Grant	153	0	0.0%	152.1	0.0	0.0%	99.0	0.0	0.0%	Low
Iberia	125	8	6.4%	57.3	0.0	0.0%	48.1	8.5	17.7%	Medium
Iberville	81	0	0.0%	39.0	0.0	0.0%	61.1	0.0	0.0%	Low
Jackson	154	0	0.0%	101.3	0.0	0.0%	14.1	0.0	0.0%	Low
Jefferson	252	252	100.0%	151.3	151.3	100.0%	83.4	83.4	100.0%	High
Jefferson Davis	244	0	0.0%	132.3	0.0	0.0%	55.2	0.0	0.0%	Low
Lafayette	274	0	0.0%	132.7	0.0	0.0%	29.9	0.0	0.0%	Low
Lafourche	106	106	100.0%	225.8	225.8	100.0%	46.8	46.8	100.0%	High
La Salle	192	0	0.0%	87.6	0.0	0.0%	19.7	0.0	0.0%	Low
Lincoln	190	0	0.0%	123.7	0.0	0.0%	31.7	0.0	0.0%	Low

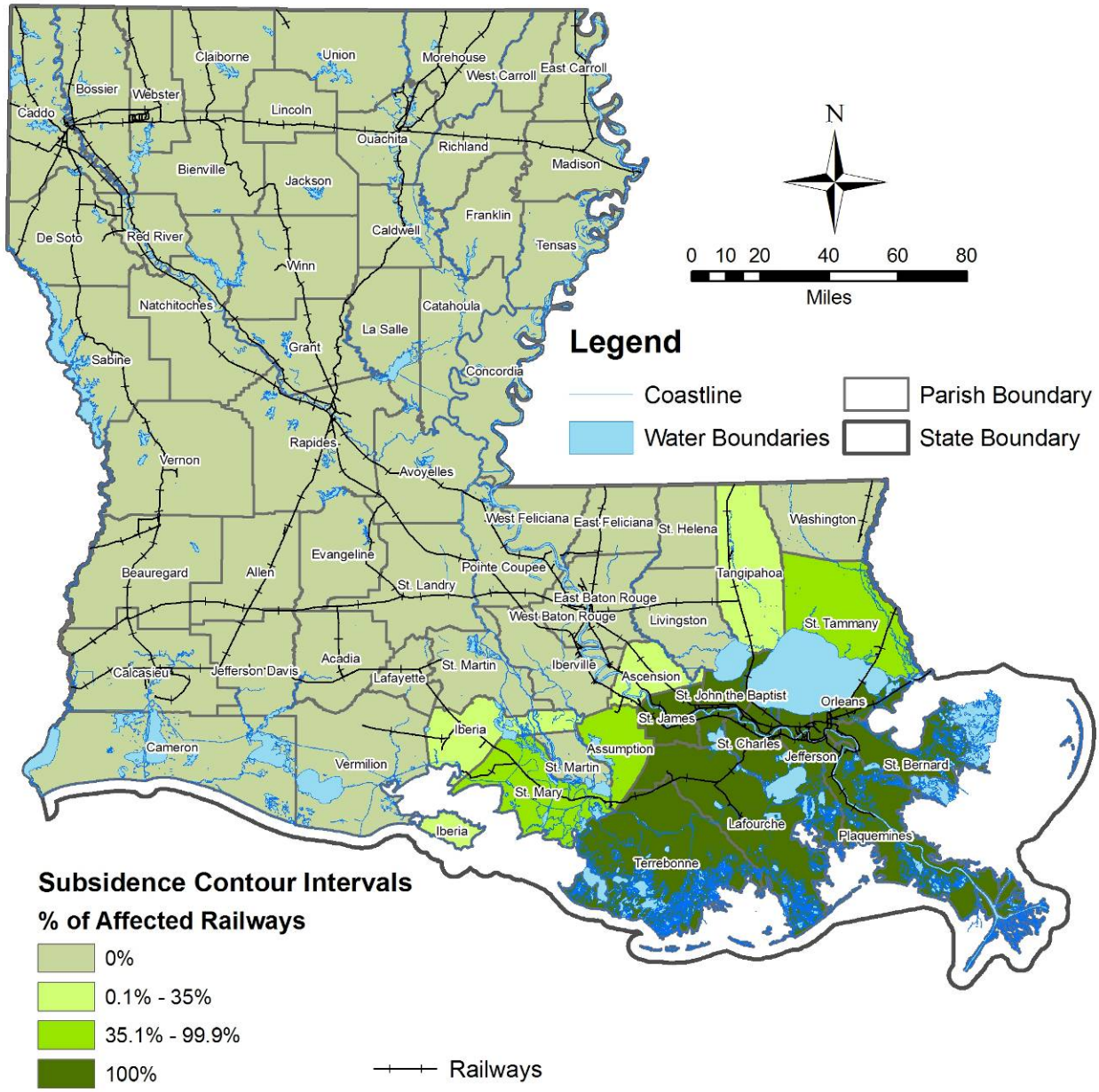
Parish	Total Bridges	Bridges Under Subsidence Threat	% Bridges Under Subsidence Threat	Miles of Hwys	Miles of Highways Under Subsidence Threat	% of Highways Under Subsidence Threat	Miles of Rail	Miles of Rail Under Subsidence Threat	% Railways Under Subsidence Threat	Hazard Ranking
Livingston	243	123	50.6%	93.1	51.4	55.2%	25.6	0.0	0.0%	Medium
Madison	97	0	0.0%	95.1	0.0	0.0%	50.6	0.0	0.0%	Low
Morehouse	135	0	0.0%	92.0	0.0	0.0%	78.0	0.0	0.0%	Low
Natchitoches	287	0	0.0%	208.6	0.0	0.0%	71.6	0.0	0.0%	Low
Orleans	324	324	100.0%	179.1	179.1	100.0%	115.1	115.1	100.0%	High
Ouachita	292	0	0.0%	154.7	0.0	0.0%	110.2	0.0	0.0%	Low
Plaquemines	32	32	100.0%	108.9	108.9	100.0%	37.7	37.7	100.0%	High
Pointe Coupee	50	0	0.0%	94.4	0.0	0.0%	97.5	0.0	0.0%	Low
Rapides	477	0	0.0%	373.6	0.0	0.0%	164.5	0.0	0.0%	Low
Red River	67	0	0.0%	95.8	0.0	0.0%	63.1	0.0	0.0%	Low
Richland	225	0	0.0%	128.7	0.0	0.0%	28.1	0.0	0.0%	Low
Sabine	160	0	0.0%	137.4	0.0	0.0%	51.0	0.0	0.0%	Low
St. Bernard	24	24	100.0%	46.7	46.7	100.0%	19.1	19.1	100.0%	High
St. Charles	76	76	100.0%	58.6	58.6	100.0%	90.0	90.0	100.0%	High
St. Helena	148	0	0.0%	40.0	0.0	0.0%	0.0	0.0	0.0%	Low
St. James	23	23	100.0%	79.0	79.0	100.0%	60.6	60.6	100.0%	High
St. John the Baptist	39	39	100.0%	73.2	73.2	100.0%	74.7	74.7	100.0%	High
St. Landry	327	0	0.0%	181.1	0.0	0.0%	90.9	0.0	0.0%	Low
St. Martin	112	4	3.6%	72.8	13.5	18.6%	10.5	0.0	0.0%	Medium
St. Mary	127	60	47.2%	109.5	58.3	53.3%	69.6	48.1	69.1%	Medium
St. Tammany	305	158	51.8%	240.1	136.8	57.0%	35.6	23.2	65.0%	Medium
Tangipahoa	466	115	24.7%	201.7	54.0	26.8%	68.7	19.3	28.0%	Medium
Tensas	44	0	0.0%	59.3	0.0	0.0%	0.0	0.0	0.0%	Low
Terrebonne	147	147	100.0%	170.7	170.7	100.0%	17.0	17.0	100.0%	High
Union	110	0	0.0%	120.4	0.0	0.0%	7.4	0.0	0.0%	Low
Vermilion	263	22	8.4%	139.1	33.4	24.0%	21.6	0.0	0.0%	Medium
Vernon	288	0	0.0%	262.2	0.0	0.0%	50.4	0.0	0.0%	Low
Washington	278	0	0.0%	116.8	0.0	0.0%	26.4	0.0	0.0%	Low
Webster	194	0	0.0%	159.8	0.0	0.0%	115.2	0.0	0.0%	Low
West Baton Rouge	61	0	0.0%	46.2	0.0	0.0%	67.9	0.0	0.0%	Low
West Carroll	115	0	0.0%	60.6	0.0	0.0%	0.0	0.0	0.0%	Low
West Feliciana	91	0	0.0%	37.0	0.0	0.0%	5.0	0.0	0.0%	Low
Winn	203	0	0.0%	128.3	0.0	0.0%	50.9	0.0	0.0%	Low

Map E-84: Percentage of Highways and Bridges by Parish under Subsidence Threat



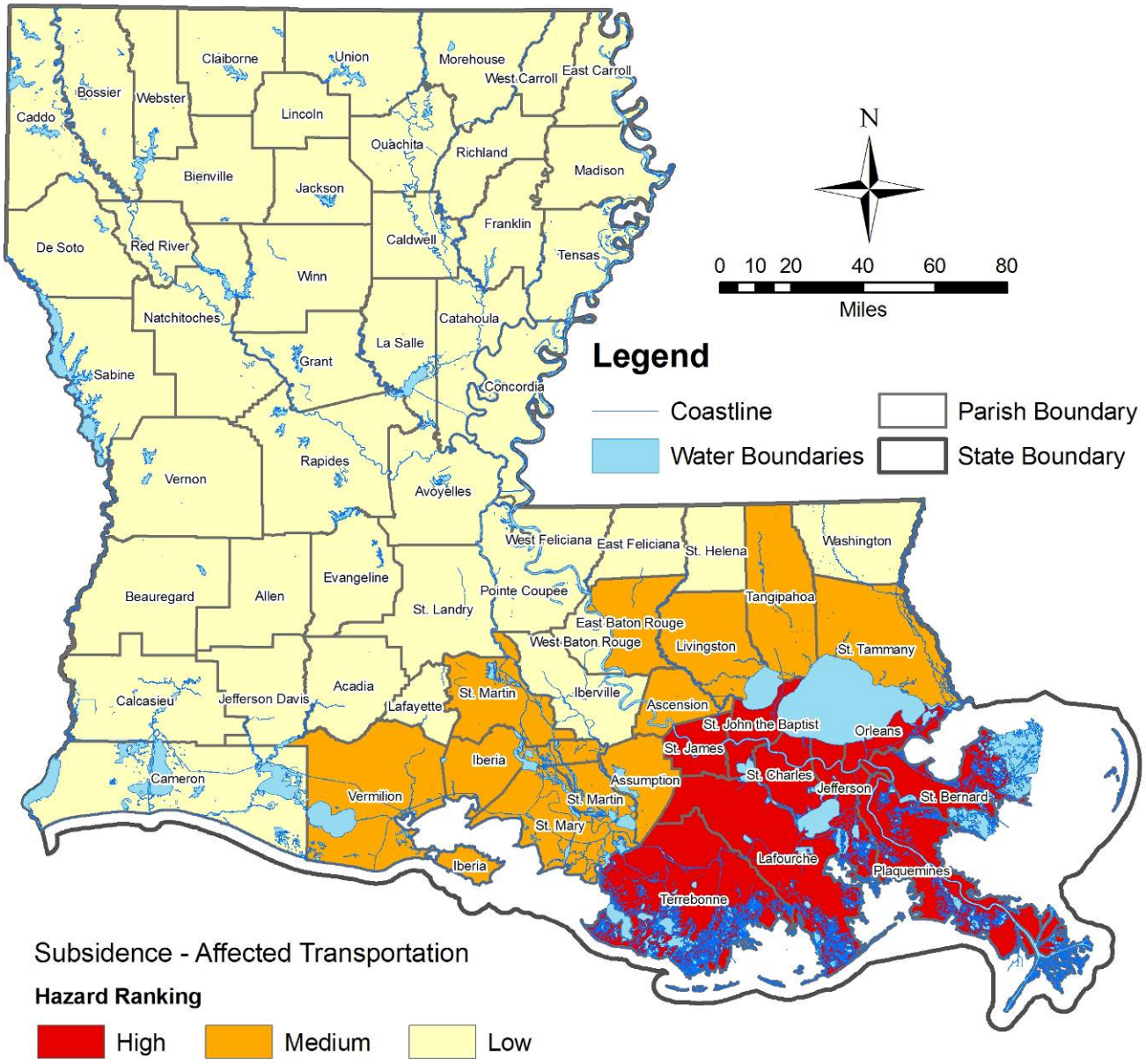
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Highways and Railways), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges), Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Figure E-85: Percentage of Affected Railways by Parish under Subsidence Threat



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Highways and Railways), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges), Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Figure E-86: Parish Hazard Ranking of Highways, Bridges, and Railways under Subsidence Threat



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Highways and Railways), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges), Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

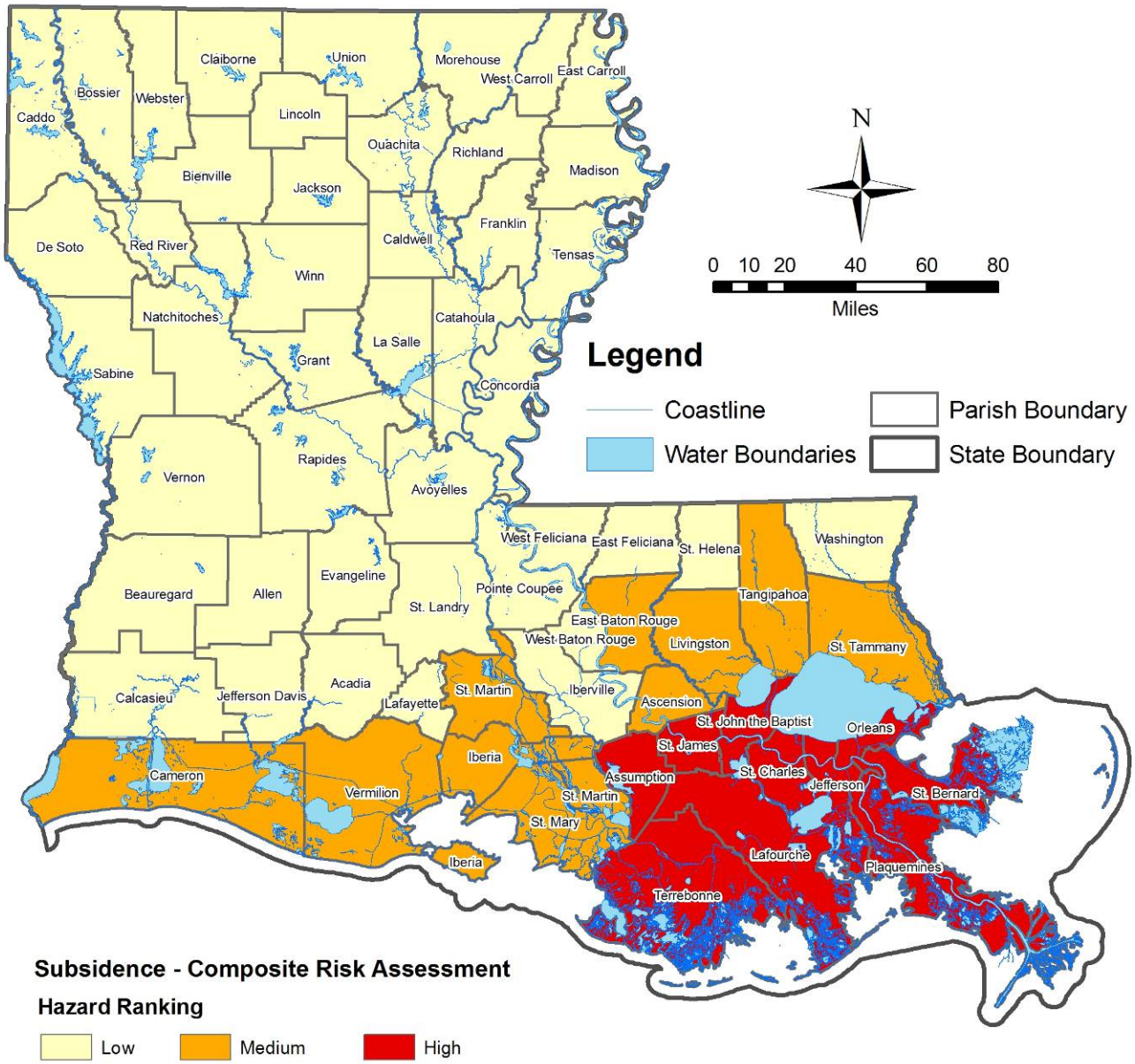
The composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points and each low ranking one (1) point. Following this methodology the possible range of scores for Subsidence is 5 to 15. A high Subsidence Hazard would be assigned to a parish receiving a score of 12-15; medium would be for parishes scoring 8 to 11; and low would be for any parish scoring 5 to 7. Table E-55 and Map E-87 show the list of parishes and their respective composite scores.

Table E-55: Composite Ranking by Parish

Parish	Occurrence Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
Acadia	Low	Low	Low	Low	Low	5
Allen	Low	Low	Low	Low	Low	5
Ascension	Medium	Medium	Medium	Medium	Medium	10
Assumption	High	High	Medium	High	Medium	13
Avoyelles	Low	Low	Low	Low	Low	5
Beauregard	Low	Low	Low	Low	Low	5
Bienville	Low	Low	Low	Low	Low	5
Bossier	Low	Low	Low	Low	Low	5
Caddo	Low	Low	Low	Low	Low	5
Calcasieu	Low	Low	Low	Low	Low	5
Caldwell	Low	Low	Low	Low	Low	5
Cameron	Medium	Medium	Medium	Low	Low	8
Catahoula	Low	Low	Low	Low	Low	5
Claiborne	Low	Low	Low	Low	Low	5
Concordia	Low	Low	Low	Low	Low	5
De Soto	Low	Low	Low	Low	Low	5
East Baton Rouge	Medium	Medium	Medium	Low	Medium	9
East Carroll	Low	Low	Low	Low	Low	5
East Feliciana	Low	Low	Low	Low	Low	5
Evangeline	Low	Low	Low	Low	Low	5
Franklin	Low	Low	Low	Low	Low	5
Grant	Low	Low	Low	Low	Low	5
Iberia	Medium	Medium	Medium	Medium	Medium	10
Iberville	Low	Low	Low	Low	Low	5
Jackson	Low	Low	Low	Low	Low	5
Jefferson	High	High	High	High	High	15
Jefferson Davis	Low	Low	Low	Low	Low	5
Lafayette	Low	Low	Low	Low	Low	5
Lafourche	High	High	High	High	High	15
La Salle	Low	Low	Low	Low	Low	5
Lincoln	Low	Low	Low	Low	Low	5

Parish	Occurrence Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
Livingston	Medium	Medium	High	Medium	Medium	11
Madison	Low	Low	Low	Low	Low	5
Morehouse	Low	Low	Low	Low	Low	5
Natchitoches	Low	Low	Low	Low	Low	5
Orleans	High	High	High	High	High	15
Ouachita	Low	Low	Low	Low	Low	5
Plaquemines	High	High	High	High	High	15
Pointe Coupee	Low	Low	Low	Low	Low	5
Rapides	Low	Low	Low	Low	Low	5
Red River	Low	Low	Low	Low	Low	5
Richland	Low	Low	Low	Low	Low	5
Sabine	Low	Low	Low	Low	Low	5
St. Bernard	High	High	High	High	High	15
St. Charles	High	High	High	High	High	15
St. Helena	Low	Low	Low	Low	Low	5
St. James	High	High	Medium	High	High	14
St. John the Baptist	High	High	High	High	High	15
St. Landry	Low	Low	Low	Low	Low	5
St. Martin	Medium	Medium	Medium	Medium	Medium	10
St. Mary	Medium	Medium	High	Medium	Medium	11
St. Tammany	Medium	Medium	High	Medium	Medium	11
Tangipahoa	Medium	Medium	Medium	Medium	Medium	10
Tensas	Low	Low	Low	Low	Low	5
Terrebonne	High	High	High	High	High	15
Union	Low	Low	Low	Low	Low	5
Vermilion	Medium	Medium	Medium	Medium	Medium	10
Vernon	Low	Low	Low	Low	Low	5
Washington	Low	Low	Low	Low	Low	5
Webster	Low	Low	Low	Low	Low	5
West Baton Rouge	Low	Low	Low	Low	Low	5
West Carroll	Low	Low	Low	Low	Low	5
West Feliciana	Low	Low	Low	Low	Low	5
Winn	Low	Low	Low	Low	Low	5

Map E-87: Composite Ranking by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings, Highways and Railways), HSIP (Critical Facilities), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges), Kulp, M.A. *Holocene Stratigraphy, History and Subsidence*, University of Kentucky, 2000 (Subsidence Contours)

Methodology

The HAZUS-MH general building stock data provides the building valuation for each specific occupancy classification (e.g., single family residential, retail trade) developed from the 2000 Census and Dun & Bradstreet (D&B). The general building stock data set includes the residential, commercial, industrial, governmental, educational, agricultural, and religious buildings for each parish. This data was developed at the census block level and then aggregated at census block level. This data set is from the 2000 version of TIGER/Line files and first quarter of 2002 data from D&B. The dataset was developed by applying RS-means replacement values for typical building floor areas and construction for each specific occupancy, a nationally accepted and annually published formula for estimating construction costs.

Exposure was used to determine vulnerability. Exposure was based on the percentage of land per parish within the subsidence contours as shown in Holocene Stratography History and Subsidence published by the University of Kentucky. Census block data was overlaid with the USGS land loss data to determine the building count and value within those contours. Additionally, the number of critical facilities as listed on the HSIP and the number of highways and railways (from HAZUS), and bridges (from the national bridge inventory and GOHSEP) with the contours were determined.

Data Limitations

The Subsidence data file does not distinguish land from water bodies, making it difficult to show coverage for each parish using the standard data for parish areas. Thus, instead of relying on the Census figures for area, the data depends on geoprocessing that "clips" out the water bodies for both the parishes and the subsidence contour intervals. From that point, the area had to be calculated for both geographies, and it does not necessarily correspond to the parish land area that the US Census bureau provides and has been customary to use for equations during these studies. However, the resulting percentages—created from area calculations derived by the GIS program—should still be accurate when compared to one another, even if they differ slightly from the area measurements used in other research and officially recognized by the Census.

In the transportation analysis, bridges are one of the three main variables. The data on bridges encompasses both highway and railway bridges. However, of the 13,378 bridges in Louisiana, only 32 are railway bridges. This number is statistically insignificant so if comprised a separate analysis, it could unreasonably skew a parish's hazard ranking. Thus, these 32 bridges are not viewed separately but have been merged with all other bridges.

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Appendix E.11:

Wildfire

Wildfire vulnerability was assessed for the population, critical facilities and general building stock (i.e., residential, commercial, industrial, governmental, educational, agricultural and religious) for parishes within hazard areas. The WUI (Wildland Urban Interface) data were used to determine the exposure of the general building stock for the parishes for which the WUI data depicted as having a risk in Louisiana.

Additional assessment was based on a compilation of historic fire data from the Forest Protection Division of the Louisiana Department of Agriculture and Forestry (LDAF). Information on the acres burned for the time period 1996-2009 was analyzed to determine the total acres and average acreage per parish burned over the past ten years as well as each parish's percentage of total fires. It is assumed that this time period is representative of wildfire risk.

The high / medium / low rankings for each parish were developed by:

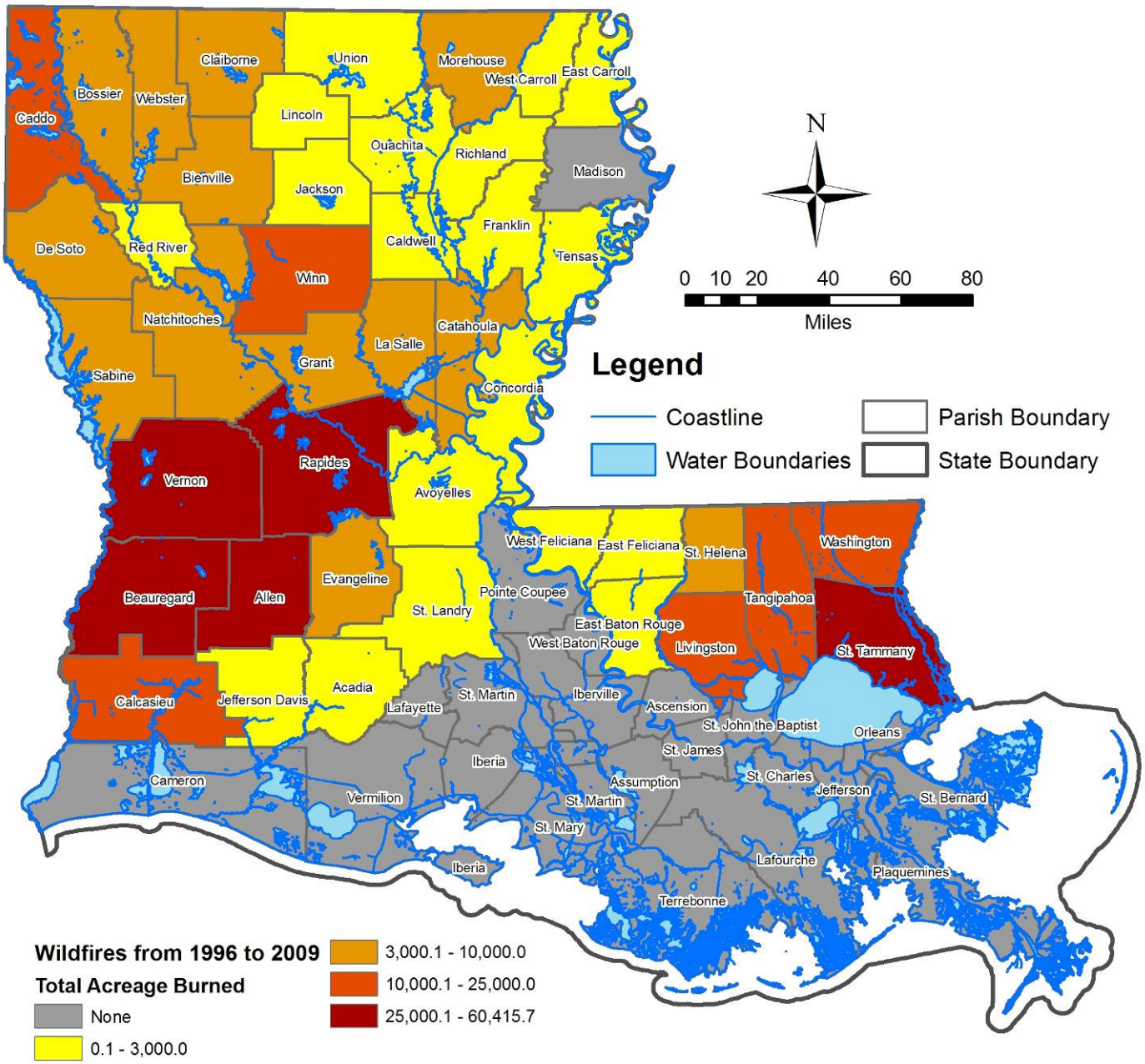
- Obtaining the LDAF and WUI data;
- Sorting the list by parish from highest to lowest number of acres burned;
    - Assigning the High Rank to parishes with more than 5000 total events;
    - Assigning the Medium Rank to parishes with up to 5000 events;
    - Assigning the Low Rank to parishes with zero events.
- Sorting the list by parish from highest to lowest by average size of wildfires;
    - Assigning the High Rank to parishes with 5000 or more average acres burned;
    - Assigning the Medium Rank to parishes with any average acres burned up to 5000;
    - Assigning the Low Rank to parishes with no events.
- Sorting the list by parish from highest to lowest percentage of housing units in WUI areas;
    - Assigning the High Rank to parishes with more than 65% of residential properties in WUI areas;
    - Assigning the Medium Rank to parishes with 40% to 65% of residential properties in WUI areas;
    - Assigning the Low Rank to parishes with less than 40% of residential properties in WUI areas;
- Sorting the list by parish from highest to lowest percentage of building stock in WUI areas;
    - Assigning the High Rank to parishes with more than 85% of all buildings in WUI areas;
    - Assigning the Medium Rank to parishes with 50% to 85% of all buildings in WUI areas;
    - Assigning the Low Rank to parishes with less than 50% of all buildings in WUI areas;
- Sorting the list by parish from highest to lowest value of all buildings in WUI areas; and
    - Assigning the High Rank to parishes with more than $4 billion in building stock in WUI areas;
    - Assigning the Medium Rank to parishes with $1 billion to $4 billion in building stock in WUI areas:
    - Assigning the Low Rank to parishes with less than $1 billion in building stock in WUI areas;
- Sorting the list by parish from highest to lowest percentage of population in WUI areas; and
    - Assigning the High Rank to parishes with more 70% of residents in WUI areas;
    - Assigning the Medium Rank to parishes with 50% to 70% of residents in WUI areas:
    - Assigning the Low Rank to parishes with less than 50% of residents in WUI areas;
- Sorting the list by parish from highest to lowest percentage of critical facilities in WUI areas;
    - Assigning the High Rank to parishes with more than 60% of critical facilities in WUI areas;
    - Assigning the Medium Rank to parishes with 30% to 60% critical facilities in WUI areas:
    - Assigning the Low Rank to parishes with less than 30% of critical facilities in WUI areas;
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 17 or more;
    - Assigning the medium composite ranking to parishes with a score of 12 to 16; and
    - Assigning the low composite ranking to parishes with a score of 11 or less.

The total wildfires by parish are shown in Table E-56 and Map E-88. Map E-89 presents the parishes ranked by total acres burned.

Table E-56: Total Acres Burned by Parish

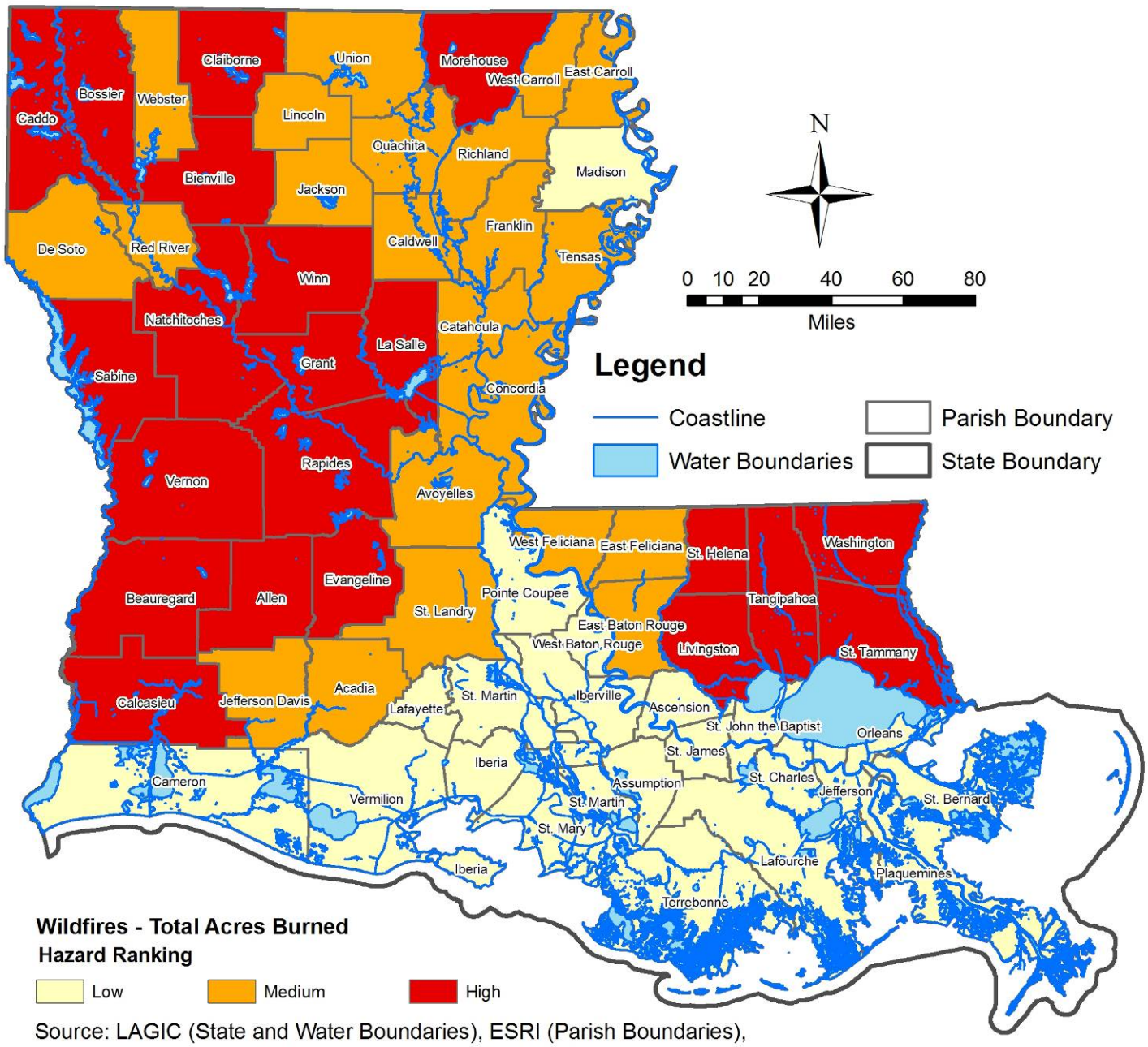
Parish	Number of Fires	Percentage out of Total Fires	Total Acres Burned	Hazard Ranking	Parish	Number of Fires	Percentage out of Total Fires	Total Acres Burned	Hazard Ranking
Acadia	2	0.01%	9.5	Medium	Madison	0	0.00%	-	Low
Allen	2,668	8.34%	52,154.1	High	Morehouse	315	0.98%	5,036.1	High
Ascension	0	0.00%	0.0	Low	Natchitoches	598	1.88%	7,609.1	High
Assumption	0	0.00%	0.0	Low	Orleans	0	0.00%	-	Low
Avoyelles	21	0.07%	871.5	Medium	Ouachita	291	0.91%	2,020.8	Medium
Beauregard	4,092	12.79%	59,979.4	High	Plaquemines	0	0.00%	-	Low
Bienville	601	1.88%	5,532.4	High	Pointe Coupee	0	0.00%	-	Low
Bossier	554	1.73%	7,663.3	High	Rapides	2408	7.54%	29,190.5	High
Caddo	630	1.97%	10,461.1	High	Red River	208	0.65%	1,403.7	Medium
Calcasieu	1,050	3.28%	16,539.9	High	Richland	62	0.20%	933.9	Medium
Caldwell	414	1.30%	2,782.3	Medium	Sabine	751	2.36%	5,804.3	High
Cameron	0	0.00%	0.0	Low	St. Bernard	0	0.00%	-	Low
Catahoula	228	0.71%	3,925.6	Medium	St. Charles	0	0.00%	-	Low
Claiborne	635	1.98%	5,106.4	High	St. Helena	1486	4.62%	8,039.5	High
Concordia	2	0.01%	90.0	Medium	St. James	0	0.00%	-	Low
De Soto	403	1.26%	3,166.8	Medium	St John the Baptist	0	0.00%	-	Low
East Baton Rouge	50	0.16%	797.9	Medium	St. Landry	3	0.01%	47.0	Medium
East Carroll	5	0.02%	51.0	Medium	St. Martin	0	0.00%	-	Low
East Feliciana	354	1.11%	2,535.1	Medium	St. Mary	0	0.00%	-	Low
Evangeline	655	2.05%	7,324.5	High	St. Tammany	2192	6.82%	33,484.8	High
Franklin	38	0.12%	1,536.1	Medium	Tangipahoa	1901	5.91%	19,105.7	High
Grant	653	2.04%	8,119.0	High	Tensas	6	0.02%	200.0	Medium
Iberia	0	0.00%	0.0	Low	Terrebonne	0	0.00%	-	Low
Iberville	0	0.00%	0.0	Low	Union	504	1.57%	2,986.5	Medium
Jackson	359	1.12%	2,076.3	Medium	Vermilion	0	0.00%	-	Low
Jefferson	0	0.00%	0.0	Low	Vernon	2325	7.23%	26,584.4	High
Jefferson Davis	101	0.31%	2,258.0	Medium	Washington	1422	4.42%	10,356.0	High
Lafayette	0	0.00%	0.0	Low	Webster	574	1.79%	4,701.1	Medium
Lafourche	0	0.00%	0.0	Low	West Baton Rouge	0	0.00%	-	Low
La Salle	699	2.19%	7,227.3	High	West Carroll	248	0.77%	2,759.8	Medium
Lincoln	354	1.10%	1,339.3	Medium	West Feliciana	34	0.11%	956.3	Medium
Livingston	1,291	4.04%	12,311.2	High	Winn	802	2.49%	11,754.2	High

Map E-88. Total Acres Burned by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Louisiana Department of Agriculture and Forestry (Wildfires)

Map E-89: Parishes Ranked by Total Acres Burned



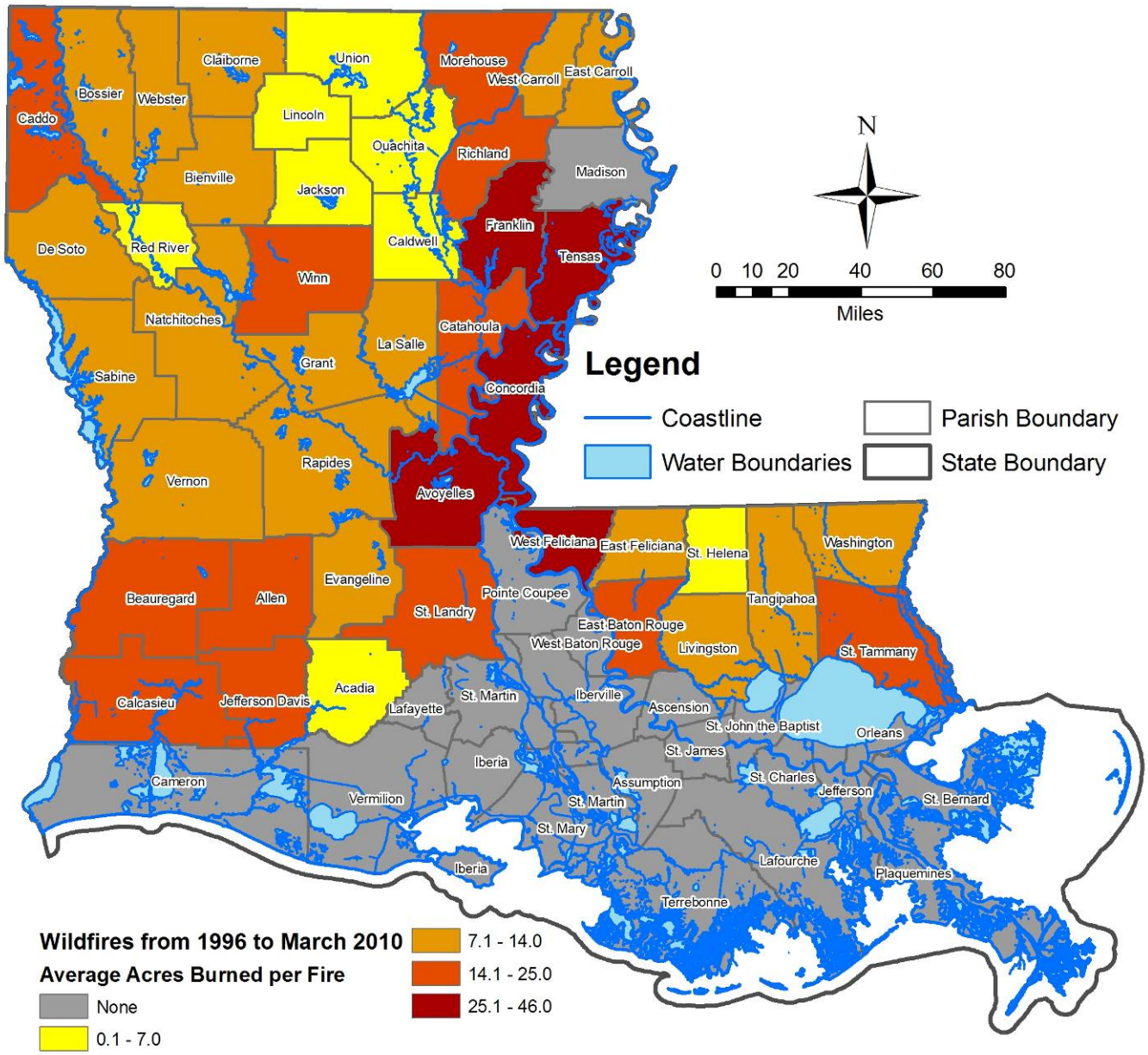
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Louisiana Department of Agriculture and Forestry (Wildfires)

The ranking of parishes by average wildfire size are shown in Table E-57. Map E-90 presents the average wildfire size per parish and Map E-91 show the parishes ranked by average wildfire size.

Table E-57: Average Wildfire Size by Parish

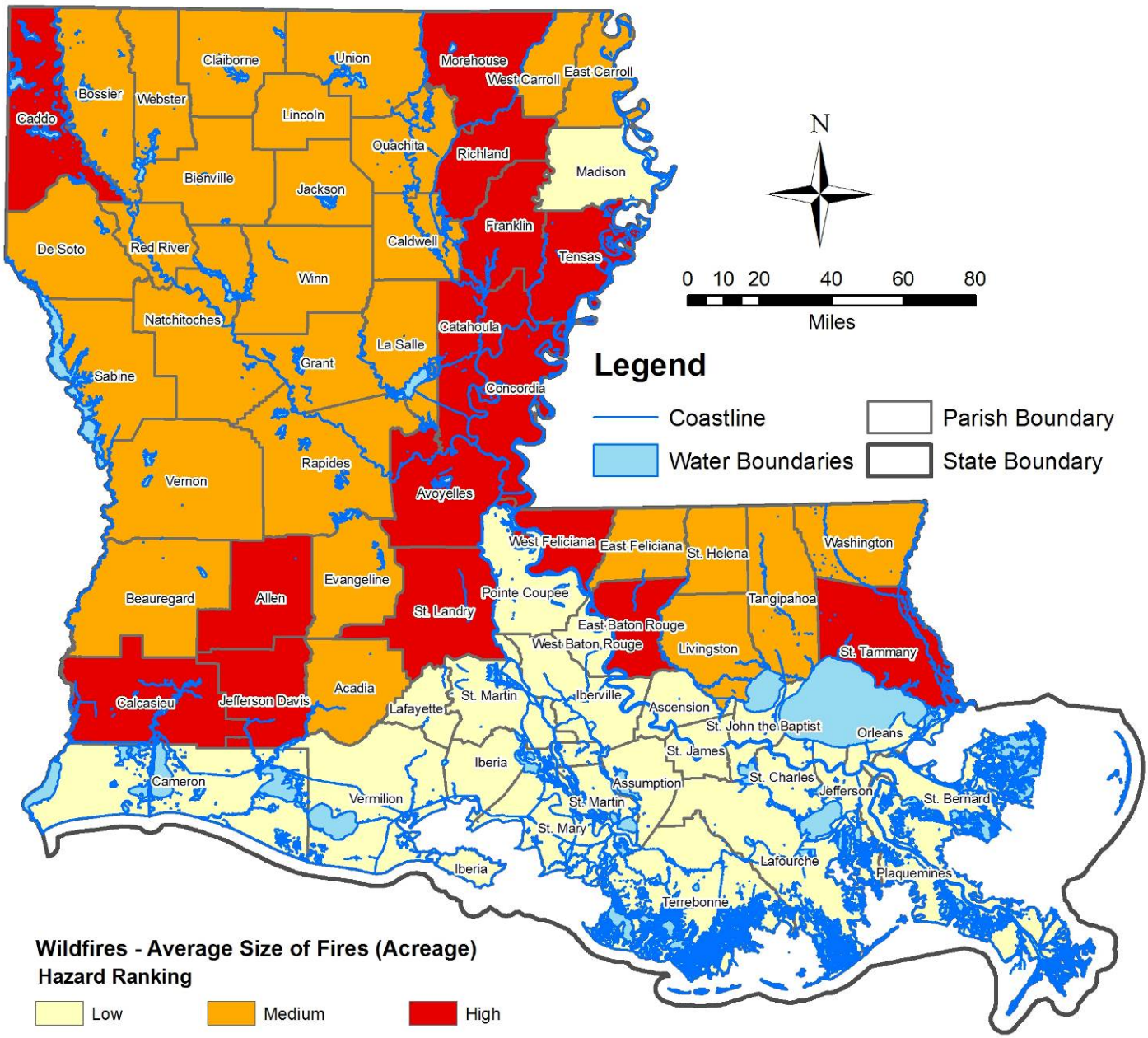
Parish	Average Size of Wildfires (Acres)	Hazard Ranking	Parish	Average Size of Wildfires (Acres)	Hazard Ranking
Acadia	4.750	Medium	Madison	0.000	Low
Allen	19.548	High	Morehouse	15.988	High
Ascension	0.000	Low	Natchitoches	12.724	Medium
Assumption	0.000	Low	Orleans	0.000	Low
Avoyelles	41.500	High	Ouachita	6.944	Medium
Beauregard	14.658	Medium	Plaquemines	0.000	Low
Bienville	9.205	Medium	Pointe Coupee	0.000	Low
Bossier	13.833	Medium	Rapides	12.122	Medium
Caddo	16.605	High	Red River	6.748	Medium
Calcasieu	15.752	High	Richland	15.063	High
Caldwell	6.720	Medium	Sabine	7.729	Medium
Cameron	0.000	Low	St. Bernard	0.000	Low
Catahoula	17.217	High	St. Charles	0.000	Low
Claiborne	8.042	Medium	St. Helena	5.410	Medium
Concordia	45.000	High	St. James	0.000	Low
De Soto	7.858	Medium	St. John the Baptist	0.000	Low
East Baton Rouge	15.958	High	St. Landry	15.667	High
East Carroll	10.200	Medium	St. Martin	0.000	Low
East Feliciana	7.161	Medium	St. Mary	0.000	Low
Evangeline	11.182	Medium	St. Tammany	15.276	High
Franklin	40.424	High	Tangipahoa	10.050	Medium
Grant	12.433	Medium	Tensas	33.333	High
Iberia	0.000	Low	Terrebonne	0.000	Low
Iberville	0.000	Low	Union	5.926	Medium
Jackson	5.784	Medium	Vermilion	0.000	Low
Jefferson	0.000	Low	Vernon	11.434	Medium
Jefferson Davis	22.356	High	Washington	7.283	Medium
Lafayette	0.000	Low	Webster	8.190	Medium
Lafourche	0.000	Low	West Baton Rouge	0.000	Low
La Salle	10.339	Medium	West Carroll	11.128	Medium
Lincoln	3.783	Medium	West Feliciana	28.127	High
Livingston	9.536	Medium	Winn	14.656	Medium

Map E-90: Average Wildfire Size by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Louisiana Department of Agriculture and Forestry (Wildfires)

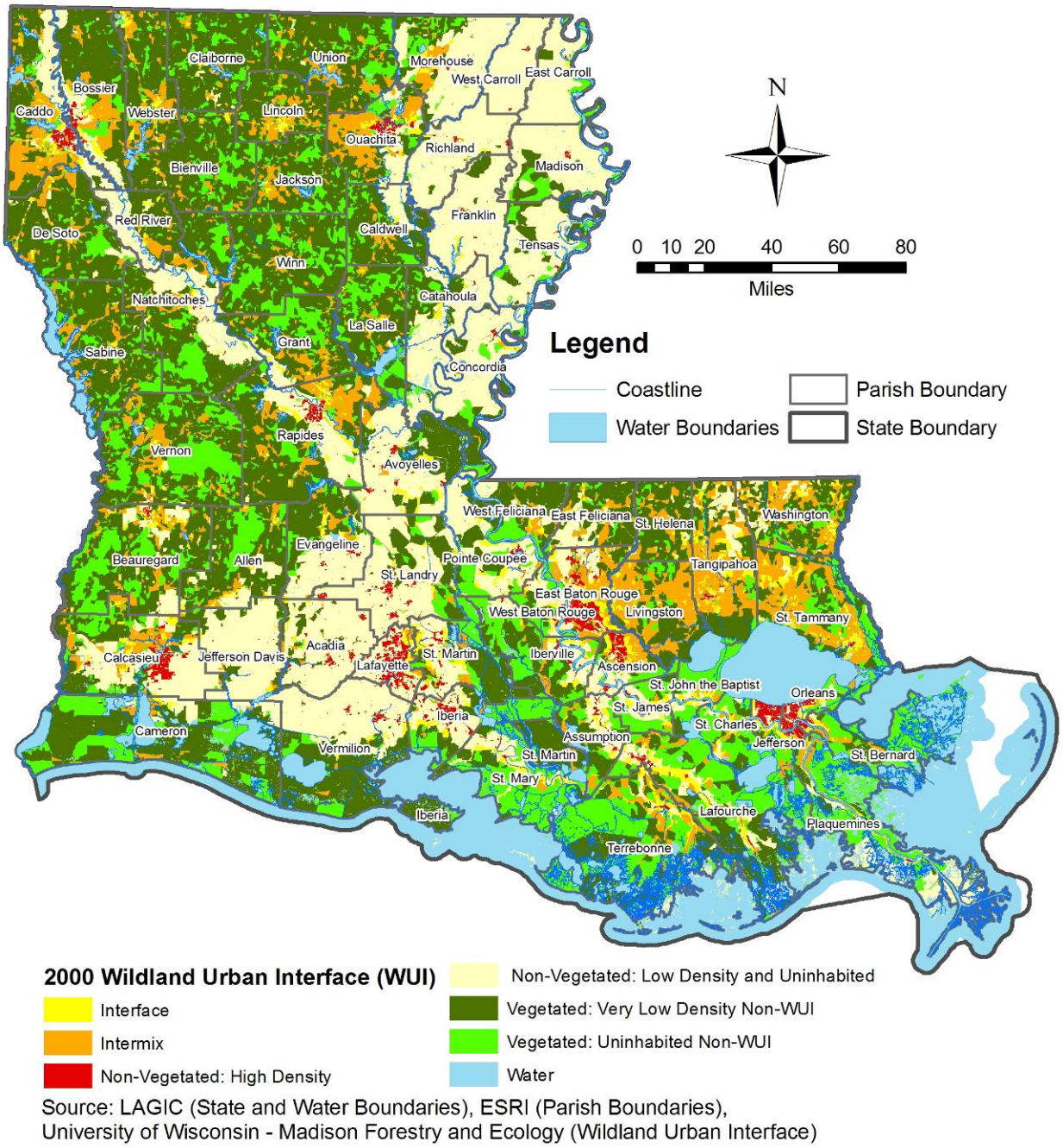
Map E-91: Parishes Ranked by Average Wildfire Size



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), Louisiana Department of Agriculture and Forestry (Wildfires)

As part of the analysis of the wildfire hazard, the Wildland Urban Interface (WUI) was determined. Following that determination the total amount, percentage and value of building stock (residential, commercial, educational, governmental, religious, and agricultural, etc.), population and critical facilities within the risk areas was calculated. The results of that study are shown below. Map E-92 shows the state-wide Wildland Urban Interface areas

Map E-92: Wildland Urban Interface



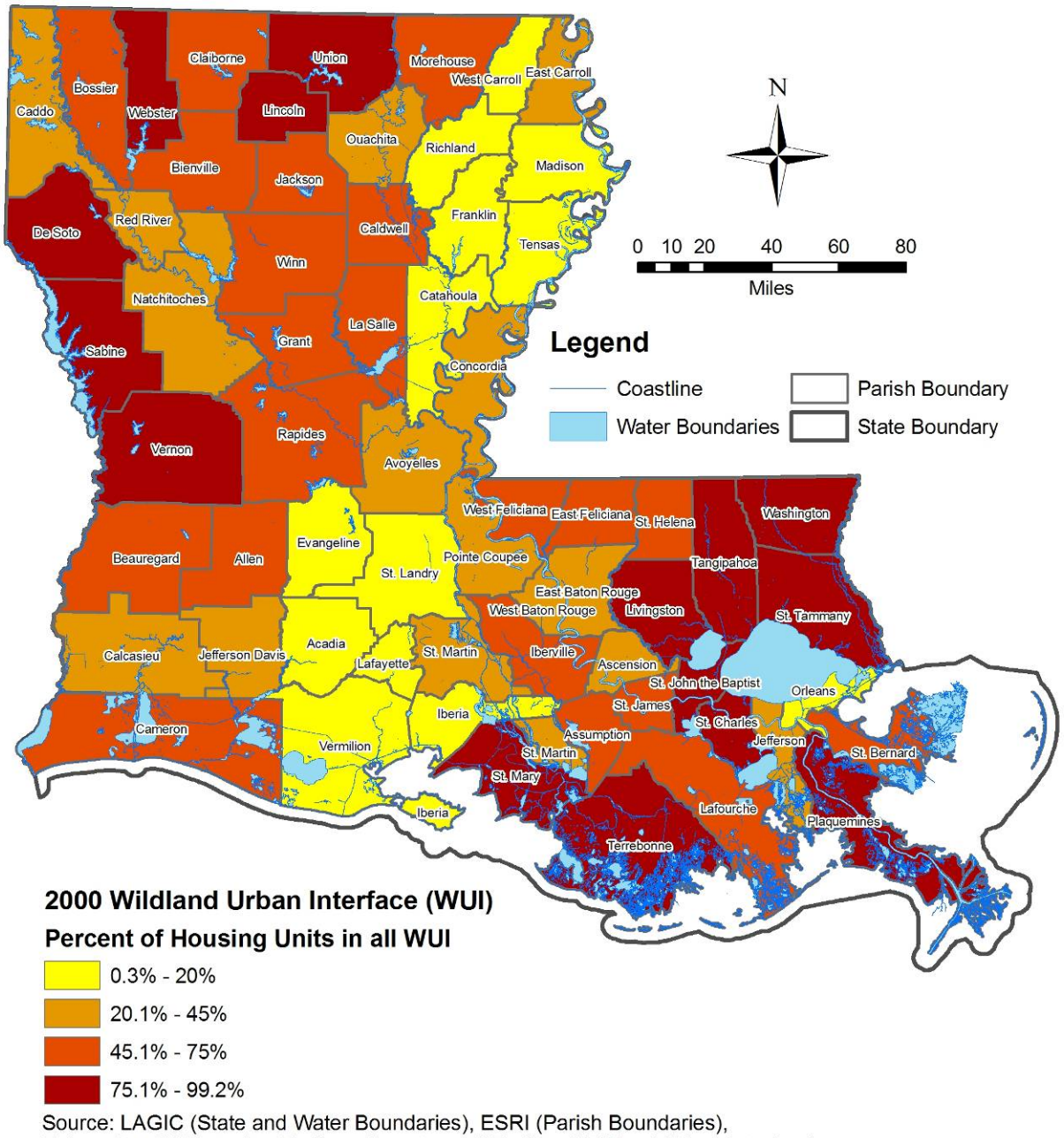
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface)

The percent of housing by parish within the WUI areas are shown in Table E-58. Map E-93 presents the percent of housing by parish within the WUI areas. Map E-94 shows the parishes ranked by percent of housing in the WUI.

Table E-58: Percent of Housing by Parish within the WUI

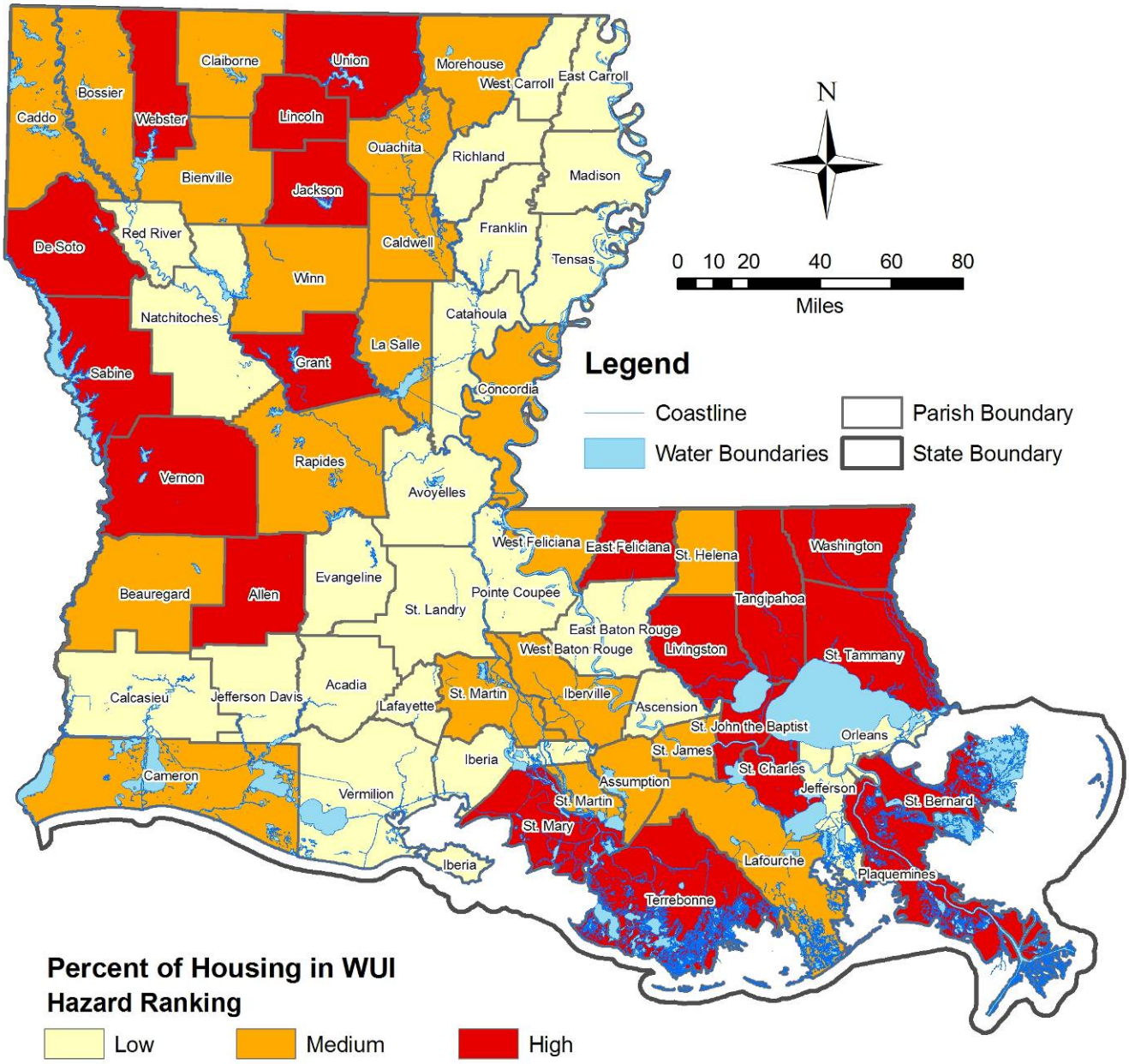
Parish	% of Housing Units in All WUI	Hazard Ranking	Parish	% of Housing Units in All WUI	Hazard Ranking
Acadia	6.11%	Low	Madison	3.12%	Low
Allen	66.87%	High	Morehouse	58.54%	Medium
Ascension	39.50%	Low	Natchitoches	34.97%	Low
Assumption	54.68%	Medium	Orleans	17.71%	Low
Avoyelles	26.65%	Low	Ouachita	44.75%	Medium
Beauregard	60.65%	Medium	Plaquemines	81.75%	High
Bienville	54.07%	Medium	Pointe Coupee	29.52%	Low
Bossier	46.24%	Medium	Rapides	46.22%	Medium
Caddo	43.27%	Medium	Red River	38.73%	Low
Calcasieu	21.42%	Low	Richland	4.90%	Low
Caldwell	53.13%	Medium	Sabine	75.35%	High
Cameron	57.30%	Medium	St. Bernard	65.80%	High
Catahoula	16.71%	Low	St. Charles	99.20%	High
Claiborne	50.51%	Medium	St. Helena	46.01%	Medium
Concordia	41.68%	Medium	St. James	59.81%	Medium
De Soto	78.39%	High	St. John the Baptist	92.61%	High
East Baton Rouge	27.96%	Low	St. Landry	9.81%	Low
East Carroll	36.56%	Low	St. Martin	40.81%	Medium
East Feliciana	66.46%	High	St. Mary	76.29%	High
Evangeline	19.14%	Low	St. Tammany	78.66%	High
Franklin	4.47%	Low	Tangipahoa	82.90%	High
Grant	72.36%	High	Tensas	13.87%	Low
Iberia	8.76%	Low	Terrebonne	85.17%	High
Iberville	46.61%	Medium	Union	79.26%	High
Jackson	71.01%	High	Vermilion	3.79%	Low
Jefferson	30.58%	Low	Vernon	78.45%	High
Jefferson Davis	34.91%	Low	Washington	78.99%	High
Lafayette	8.16%	Low	Webster	76.73%	High
Lafourche	62.04%	Medium	West Baton Rouge	39.00%	Low
La Salle	63.01%	Medium	West Carroll	0.25%	Low
Lincoln	84.54%	High	West Feliciana	52.23%	Medium
Livingston	84.59%	High	Winn	57.79%	Medium

Map E-94: Amount of Housing by Parish within the WUI



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface)

Map E-95: Parishes Ranked by Amount of Housing in the WUI.



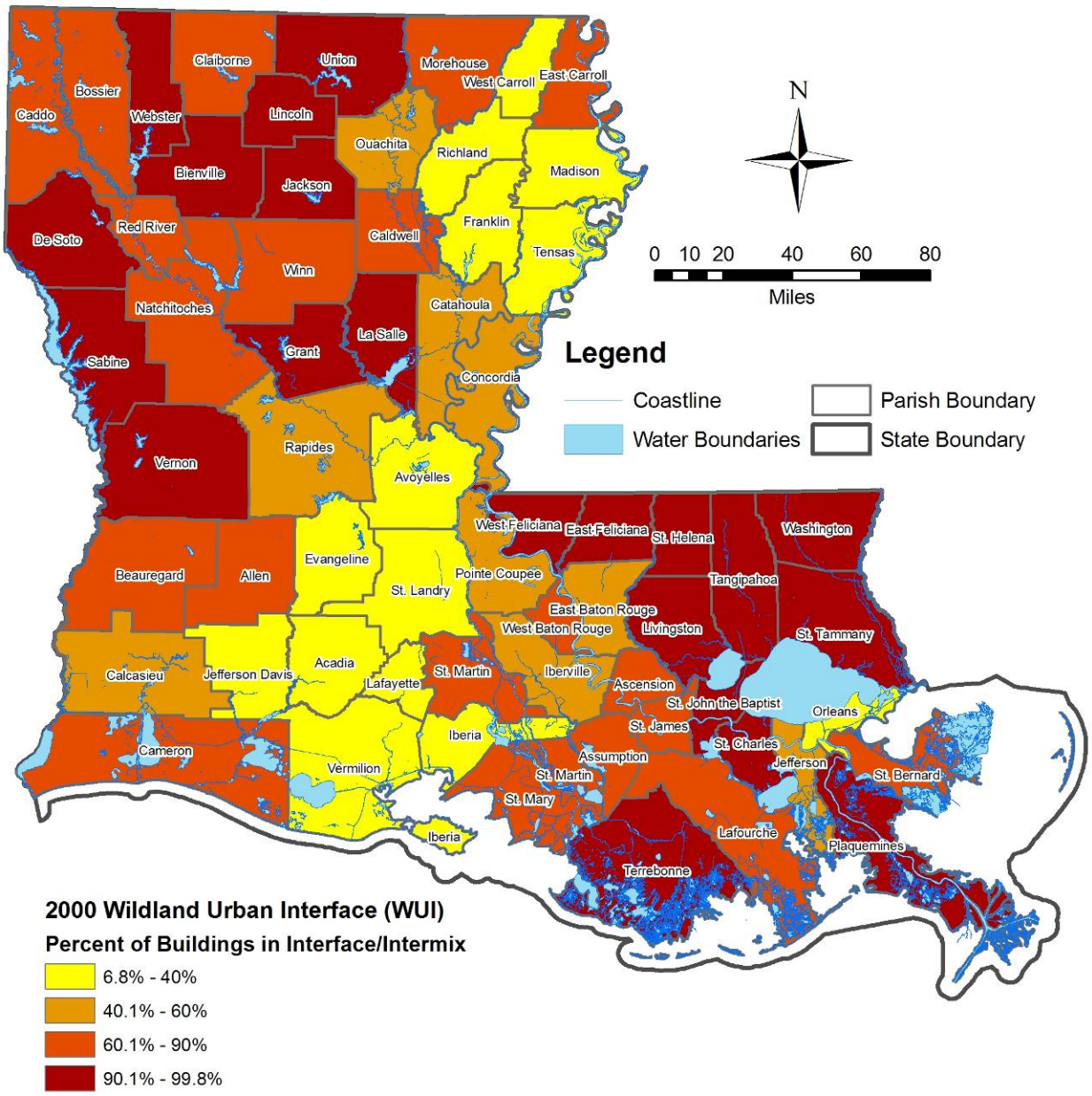
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface)

The amount of building stock by parish within the WUI areas is shown in Table E-59. Map E-96 presents the percent of building stock by parish within the WUI areas. Map E-97 shows the parishes ranked by percent of building stock in the WUI.

Table E-59: Percent of Building Stock by Parish within the WUI

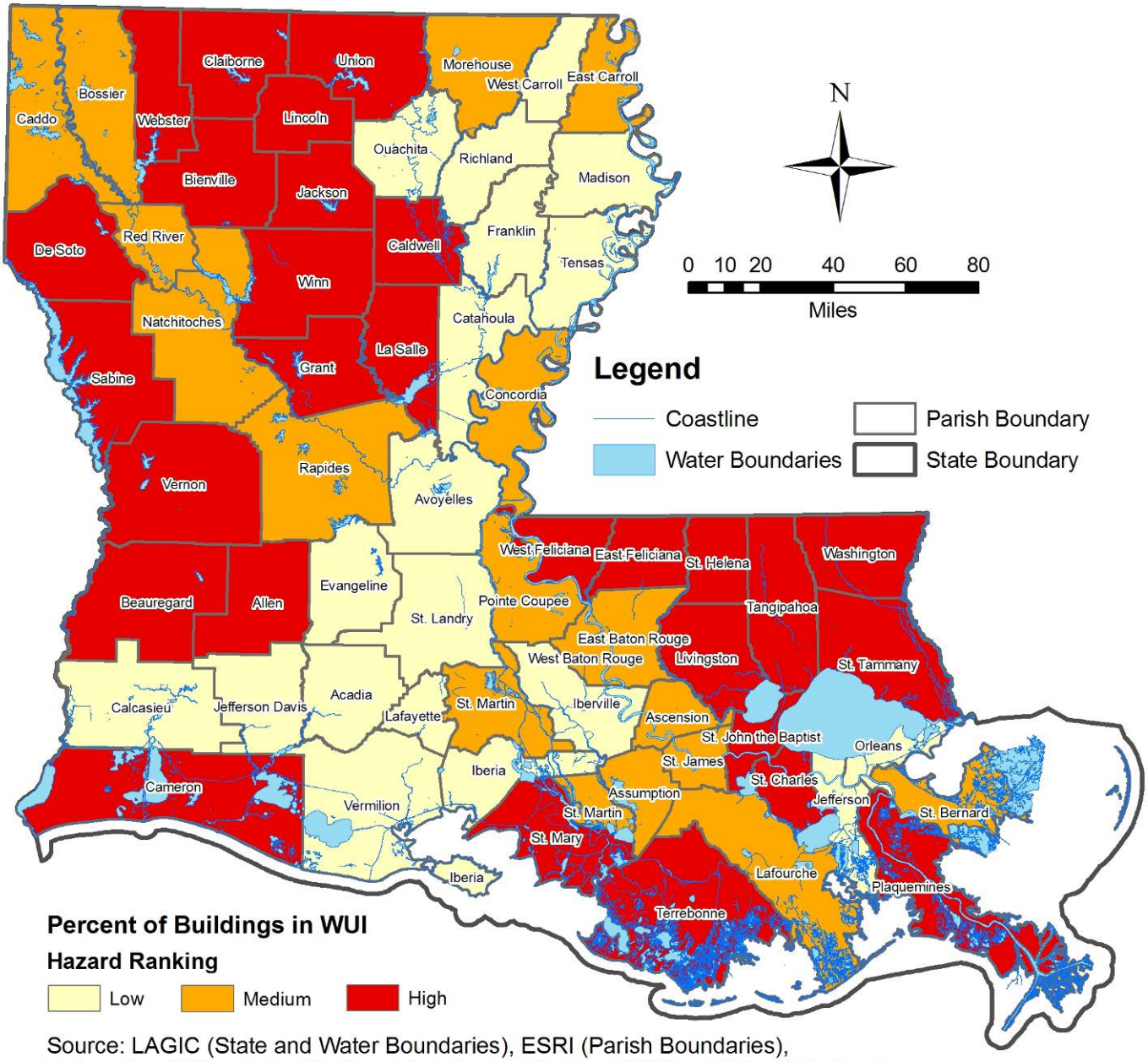
Parish	Total Buildings	Buildings in WUI	% Buildings in WUI	Hazard Ranking	Parish	Total Buildings	Buildings in WUI	% Buildings in WUI	Hazard Ranking
Acadia	27,817	3,671	13.2%	Low	Madison	6,576	552	8.4%	Low
Allen	11,600	10,401	89.7%	High	Morehouse	14,604	10,373	71.0%	Medium
Ascension	33,123	23,297	70.3%	Medium	Natchitoches	19,780	13,832	69.9%	Medium
Assumption	10,844	6,933	63.9%	Medium	Orleans	173,671	59,073	34.0%	Low
Avoyelles	19,795	5,954	30.1%	Low	Ouachita	62,493	29,871	47.8%	Low
Beauregard	17,476	14,937	85.5%	High	Plaquemines	12,374	11,768	95.1%	High
Bienville	10,612	9,672	91.1%	High	Pointe Coupee	12,092	6,131	50.7%	Medium
Bossier	40,408	26,055	64.5%	Medium	Rapides	58,948	30,181	51.2%	Medium
Caddo	105,041	63,697	60.6%	Medium	Red River	4,767	3,637	76.3%	Medium
Calcasieu	80,762	40,090	49.6%	Low	Richland	10,847	2,551	23.5%	Low
Caldwell	6,011	5,329	88.7%	High	Sabine	15,926	14,998	94.2%	High
Cameron	6,211	5,481	88.2%	High	St. Bernard	26,842	21,821	81.3%	Medium
Catahoula	6,483	3,073	47.4%	Low	St. Charles	19,200	19,085	99.4%	High
Claiborne	9,517	8,117	85.3%	High	St. Helena	6,254	5,973	95.5%	High
Concordia	10,636	6,296	59.2%	Medium	St. James	8,815	7,261	82.4%	Medium
De Soto	13,848	12,608	91.0%	High	St. John the Baptist	16,521	15,974	96.7%	High
East Baton Rouge	151,107	82,409	54.5%	Medium	St. Landry	43,957	8,039	18.3%	Low
East Carroll	4,195	2,747	65.5%	Medium	St. Martin	24,736	15,155	61.3%	Medium
East Feliciana	10,030	9,052	90.2%	High	St. Mary	24,408	21,169	86.7%	High
Evangeline	17,665	6,060	34.3%	Low	St. Tammany	84,508	82,474	97.6%	High
Franklin	10,757	1,316	12.2%	Low	Tangipahoa	45,367	43,888	96.7%	High
Grant	10,350	10,004	96.7%	High	Tensas	4,467	677	15.2%	Low
Iberia	32,309	5,363	16.6%	Low	Terrebonne	43,923	40,782	92.8%	High
Iberville	15,059	7,209	47.9%	Low	Union	13,760	12,695	92.3%	High
Jackson	9,181	8,636	94.1%	High	Vermilion	27,475	4,189	15.2%	Low
Jefferson	164,539	68,756	41.8%	Low	Vernon	21,626	20,718	95.8%	High
Jefferson Davis	16,691	5,737	34.4%	Low	Washington	23,350	23,076	98.8%	High
Lafayette	81,011	11,414	14.1%	Low	Webster	21,865	21,273	97.3%	High
Lafourche	40,570	29,942	73.8%	Medium	West Baton Rouge	10,252	6,187	60.3%	Medium
La Salle	7,828	7,463	95.3%	High	West Carroll	5,945	402	6.8%	Low
Lincoln	18,894	18,361	97.2%	High	West Feliciana	5,056	4,587	90.7%	High
Livingston	42,671	42,572	99.8%	High	Winn	8,993	8,008	89.0%	High

Map E-96: Percent of Building Stock by Parish within the WUI



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface), HAZUS-MH MR4 (Building Data)

Map E-97: Parishes Ranked by Percent of Building Stock within the WUI



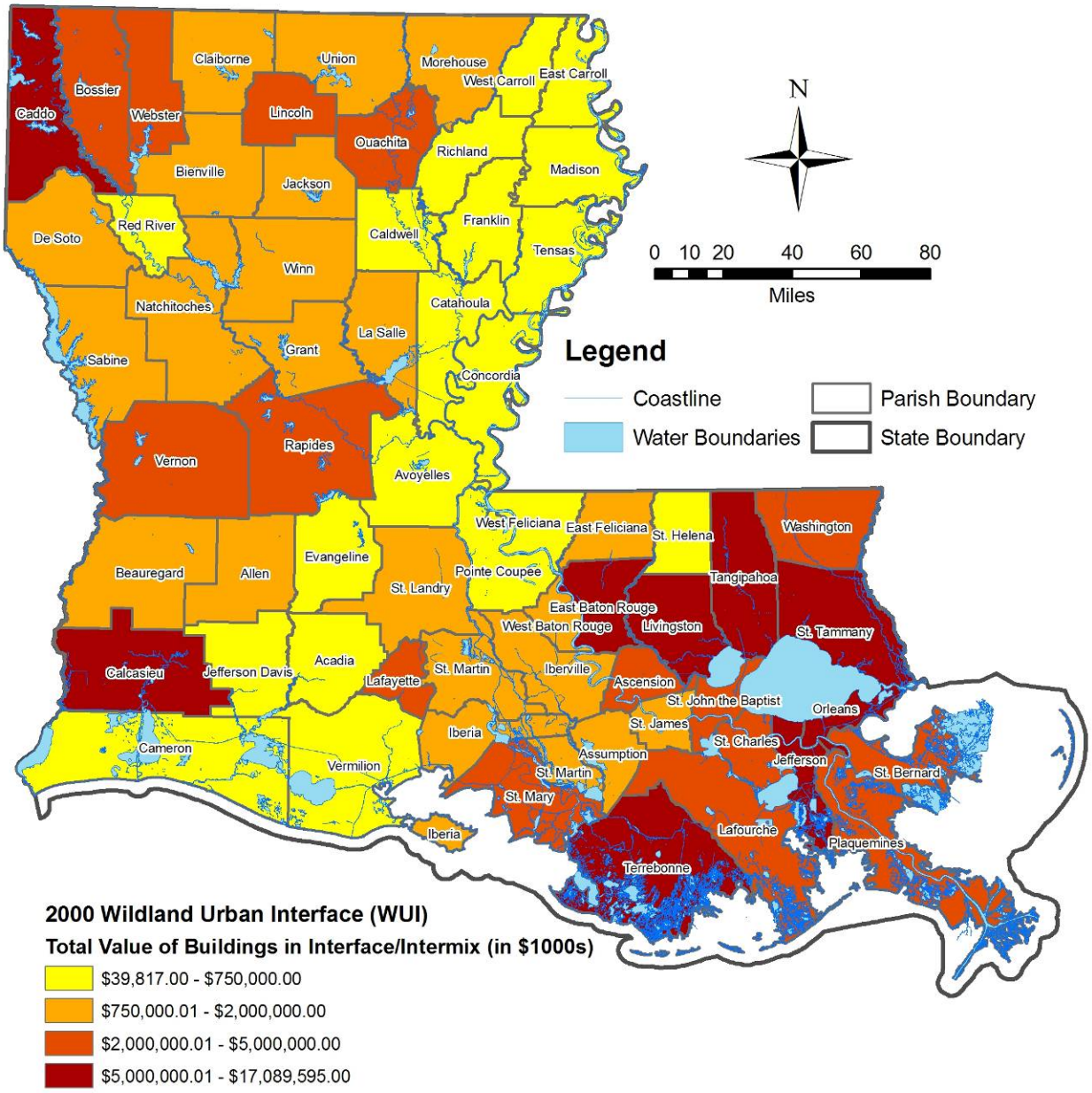
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface), HAZUS-MH MR4 (Building Data)

The total value of buildings by parish within the WUI areas is shown in Table E-60. Map E-98 presents the total value of building stock by parish within the WUI areas. Map E-99 shows the parishes ranked by total value of building stock in the WUI.

Table E-60: Value of Building Stock by Parish within the WUI

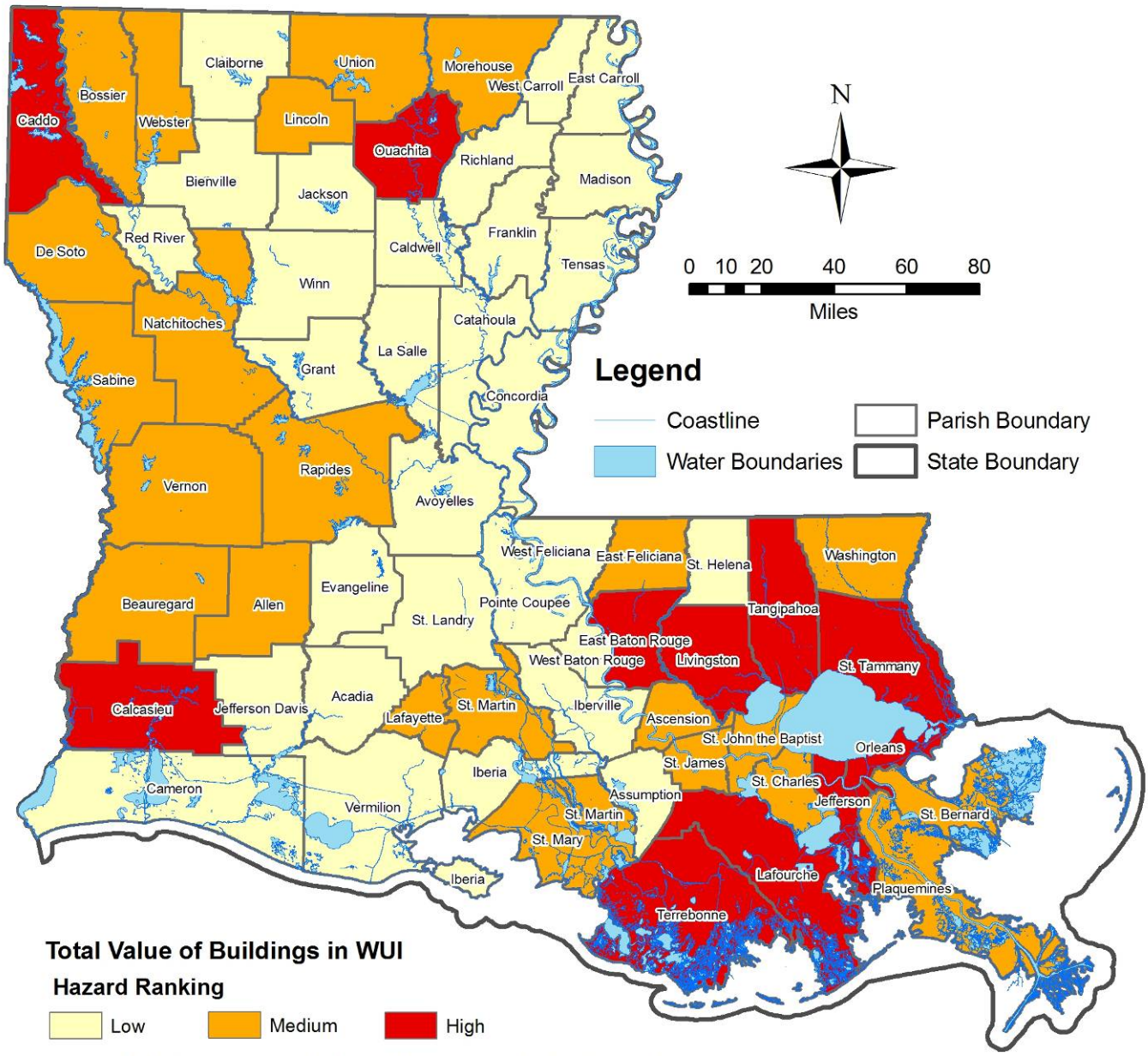
Parish	Total Value of Buildings in WUI (in $1000s)	Hazard Ranking	Parish	Total Value of Buildings in WUI (in $1000s)	Hazard Ranking
Acadia	$448,578	Low	Madison	$64,388	Low
Allen	$1,265,701	Medium	Morehouse	$1,216,065	Medium
Ascension	$3,749,278	Medium	Natchitoches	$1,538,204	Medium
Assumption	$800,034	Low	Orleans	$10,854,636	High
Avoyelles	$678,510	Low	Ouachita	$4,261,788	High
Beauregard	$1,684,393	Medium	Plaquemines	$2,036,909	Medium
Bienville	$871,799	Low	Pointe Coupee	$684,612	Low
Bossier	$3,870,091	Medium	Rapides	$3,931,775	Medium
Caddo	$10,023,743	High	Red River	$412,676	Low
Calcasieu	$5,684,644	High	Richland	$232,222	Low
Caldwell	$538,987	Low	Sabine	$1,351,364	Medium
Cameron	$701,709	Low	St. Bernard	$3,605,752	Medium
Catahoula	$288,770	Low	St. Charles	$3,593,985	Medium
Claiborne	$798,234	Low	St. Helena	$577,471	Low
Concordia	$683,411	Low	St. James	$1,059,741	Medium
De Soto	$1,316,520	Medium	St. John the Baptist	$2,739,065	Medium
East Baton Rouge	$17,089,595	High	St. Landry	$901,769	Low
East Carroll	$269,048	Low	St. Martin	$1,789,793	Medium
East Feliciana	$1,074,767	Medium	St. Mary	$2,808,546	Medium
Evangeline	$670,796	Low	St. Tammany	$13,281,238	High
Franklin	$146,183	Low	Tangipahoa	$5,273,323	High
Grant	$995,198	Low	Tensas	$64,199	Low
Iberia	$768,497	Low	Terrebonne	$6,834,631	High
Iberville	$972,738	Low	Union	$1,332,094	Medium
Jackson	$966,076	Low	Vermilion	$510,679	Low
Jefferson	$13,668,429	High	Vernon	$2,747,692	Medium
Jefferson Davis	$655,752	Low	Washington	$2,249,341	Medium
Lafayette	$2,279,522	Medium	Webster	$2,311,082	Medium
Lafourche	$4,276,863	High	West Baton Rouge	$865,535	Low
La Salle	$751,561	Low	West Carroll	$39,817	Low
Lincoln	$2,563,753	Medium	West Feliciana	$608,100	Low
Livingston	$5,895,301	High	Winn	$818,247	Low

Map E-98: Value of Building Stock by Parish within the WUI



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface), HAZUS-MH MR4 (Building Data)

Map E-99: Parishes Ranked by Value of Building Stock by Parish within the WUI



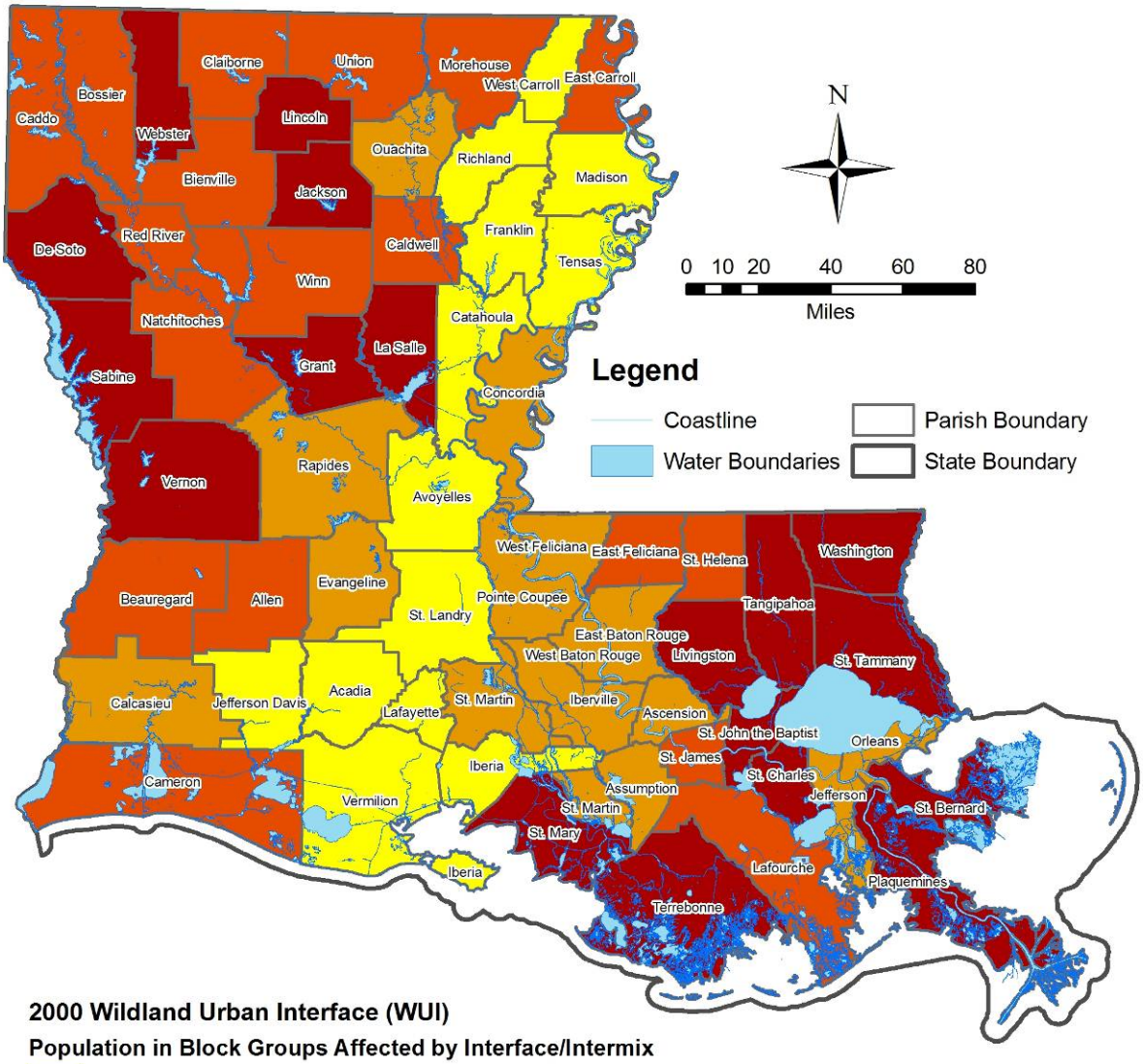
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface), HAZUS-MH MR4 (Building Data)

The percent of residents by parish within the WUI areas is shown in Table E-61. Map E-100 presents the percent of residents by parish within the WUI areas. Map E-101 shows the parishes ranked by percentage of residents in the WUI.

Table E-61: Percent of Residents by Parish within the WUI

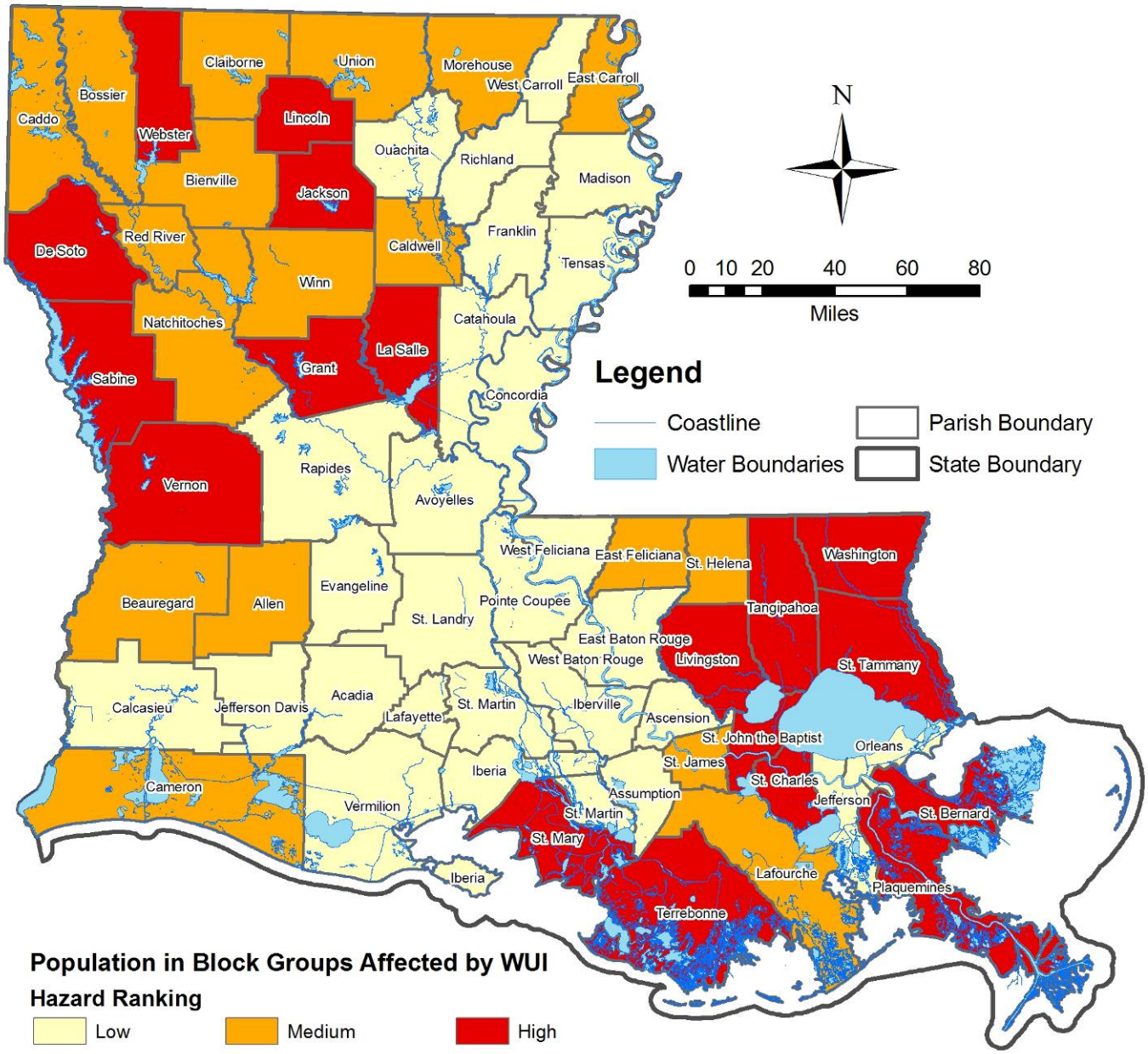
Parish	Total Pop.	Pop. in Blocks Affected by WUI	% Pop. in WUI	Hazard Ranking	Parish	Total Pop.	Pop. in Blocks Affected by WUI	% Pop. in WUI	Hazard Ranking
Acadia	58,861	2,446	4.2%	Low	Madison	13,728	350	2.5%	Low
Allen	25,440	14,700	57.8%	Medium	Morehouse	31,021	17,985	58.0%	Medium
Ascension	76,627	34,467	45.0%	Low	Natchitoches	39,080	20,860	53.4%	Medium
Assumption	23,388	10,487	44.8%	Low	Orleans	484,674	110,007	22.7%	Low
Avoyelles	41,481	4,430	10.7%	Low	Ouachita	147,250	57,881	39.3%	Low
Beauregard	32,986	16,994	51.5%	Medium	Plaquemines	26,757	23,831	89.1%	High
Bienville	15,752	10,471	66.5%	Medium	Pointe Coupee	22,763	6,546	28.8%	Low
Bossier	98,310	50,947	51.8%	Medium	Rapides	126,337	52,188	41.3%	Low
Caddo	252,161	130,395	51.7%	Medium	Red River	9,622	5,038	52.4%	Medium
Calcasieu	183,577	56,439	30.7%	Low	Richland	20,981	1,023	4.9%	Low
Caldwell	10,560	6,740	63.8%	Medium	Sabine	23,459	16,440	70.1%	High
Cameron	9,974	6,505	65.2%	Medium	St. Bernard	67,229	53,479	79.5%	High
Catahoula	10,920	1,719	15.7%	Low	St. Charles	48,072	47,379	98.6%	High
Claiborne	16,851	9,564	56.8%	Medium	St. Helena	10,525	5,962	56.6%	Medium
Concordia	20,247	8,597	42.5%	Low	St. James	21,216	14,215	67.0%	Medium
De Soto	25,494	17,961	70.5%	High	St. John the Baptist	43,044	39,914	92.7%	High
East Baton Rouge	412,852	140,631	34.1%	Low	St. Landry	87,715	5,209	5.9%	Low
East Carroll	9,421	5,528	58.7%	Medium	St. Martin	48,583	21,356	44.0%	Low
East Feliciana	21,360	12,085	56.6%	Medium	St. Mary	53,500	43,552	81.4%	High
Evangeline	35,434	7,089	20.0%	Low	St. Tammany	191,268	177,177	92.6%	High
Franklin	21,263	573	2.7%	Low	Tangipahoa	100,588	84,349	83.9%	High
Grant	18,698	14,041	75.1%	High	Tensas	6,618	217	3.3%	Low
Iberia	73,266	4,469	6.1%	Low	Terrebonne	104,494	90,263	86.4%	High
Iberville	33,320	10,346	31.1%	Low	Union	22,803	15,065	66.1%	Medium
Jackson	15,400	11,394	74.0%	High	Vermilion	53,807	3,505	6.5%	Low
Jefferson	455,466	167,012	36.7%	Low	Vernon	52,531	40,313	76.7%	High
Jefferson Davis	31,435	5,625	17.9%	Low	Washington	43,926	35,153	80.0%	High
Lafayette	190,488	14,261	7.5%	Low	Webster	41,834	36,346	86.9%	High
Lafourche	89,983	60,521	67.3%	Medium	West Baton Rouge	21,601	8,233	38.1%	Low
La Salle	14,282	10,450	73.2%	High	West Carroll	12,314	20	0.2%	Low
Lincoln	44,288	37,221	84.0%	High	West Feliciana	15,111	6,429	42.5%	Low
Livingston	91,814	86,857	94.6%	High	Winn	16,894	9,960	59.0%	Medium

Map E-100: Percent of Residents by Parish within the WUI



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population Block Data), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface)

Map E-101: Parishes Ranked by Percentage of Residents within the WUI



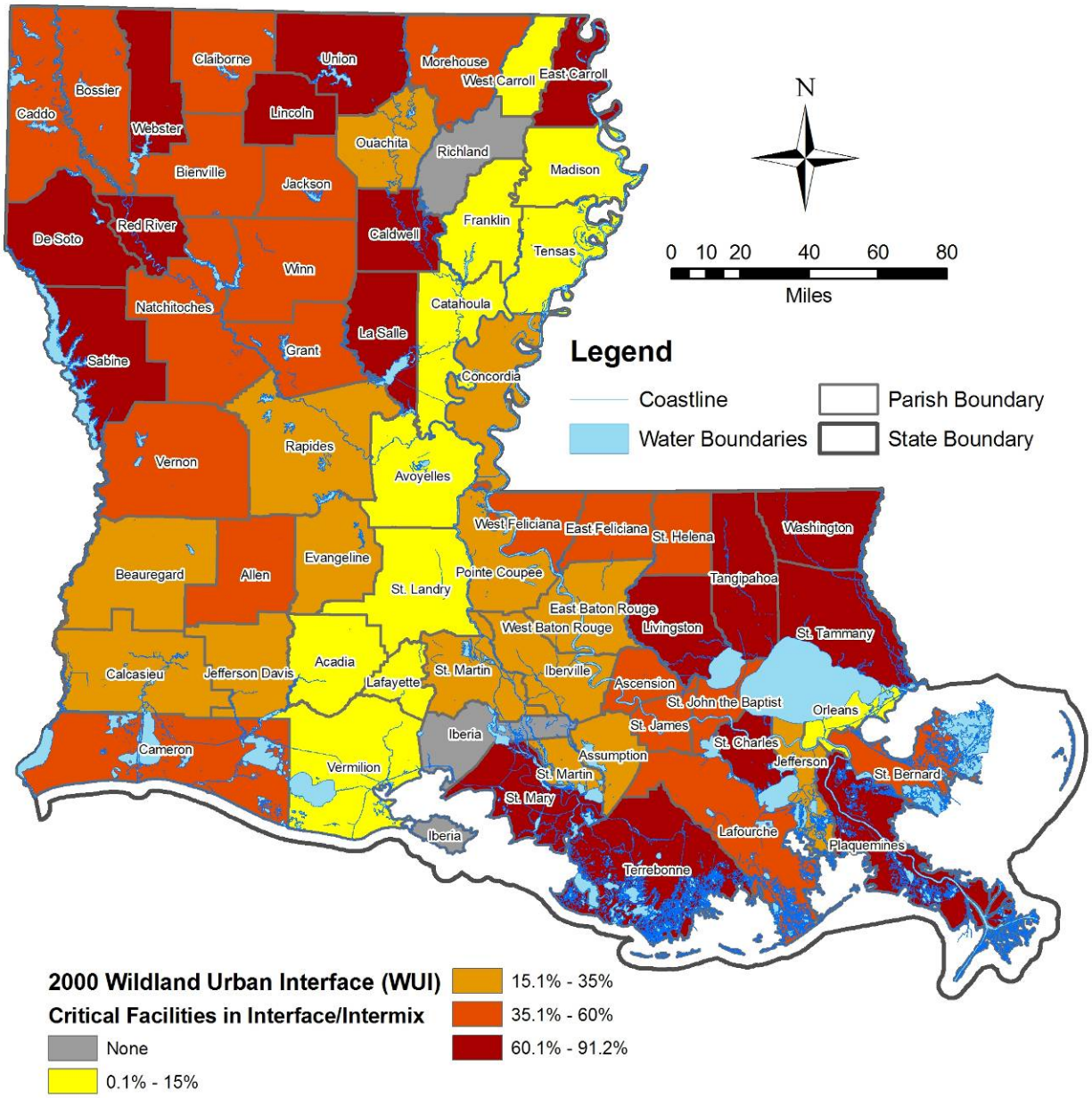
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population Block Data), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface)

The percentage of critical facilities by parish within the WUI areas is shown in Table E-62. Map E-102 presents the percentage of critical facilities by parish within the WUI areas. Map E-103 shows the parishes ranked by percentage of critical facilities in the WUI.

Table E-62: Percentage of Critical Facilities by Parish within the WUI

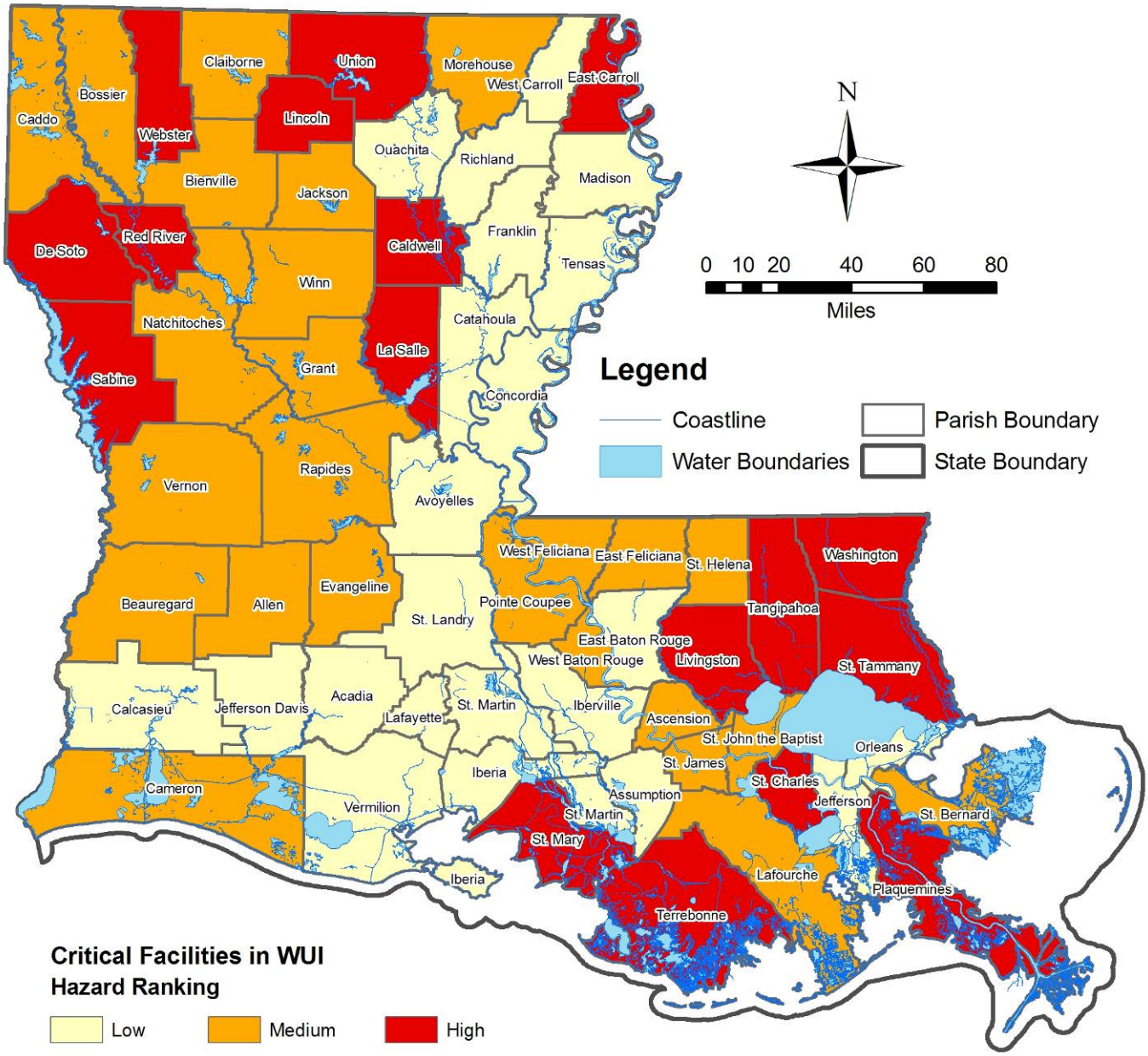
Parish	Total Critical Facilities	Critical Facilities in WUI	% Critical Facilities in WUI	Hazard Ranking	Parish	Total Critical Facilities	Critical Facilities in WUI	% Critical Facilities in WUI	Hazard Ranking
Acadia	64	1	1.6%	Low	Madison	19	1	5.3%	Low
Allen	31	17	54.8%	Medium	Morehouse	39	15	38.5%	Medium
Ascension	64	23	35.9%	Medium	Natchitoches	46	18	39.1%	Medium
Assumption	27	7	25.9%	Low	Orleans	169	25	14.8%	Low
Avoyelles	64	7	10.9%	Low	Ouachita	119	31	26.1%	Low
Beauregard	45	14	31.1%	Medium	Plaquemines	18	12	66.7%	High
Bienville	36	14	38.9%	Medium	Pointe Coupee	31	10	32.3%	Medium
Bossier	70	31	44.3%	Medium	Rapides	148	46	31.1%	Medium
Caddo	189	78	41.3%	Medium	Red River	12	9	75.0%	High
Calcasieu	141	33	23.4%	Low	Richland	33	0	0.0%	Low
Caldwell	23	15	65.2%	High	Sabine	42	30	71.4%	High
Cameron	19	11	57.9%	Medium	St. Bernard	19	8	42.1%	Medium
Catahoula	27	4	14.8%	Low	St. Charles	57	46	80.7%	High
Claiborne	25	9	36.0%	Medium	St. Helena	21	8	38.1%	Medium
Concordia	37	9	24.3%	Low	St. James	42	19	45.2%	Medium
De Soto	43	27	62.8%	High	St. John the Baptist	36	21	58.3%	Medium
East Baton Rouge	261	73	28.0%	Low	St. Landry	98	11	11.2%	Low
East Carroll	13	9	69.2%	High	St. Martin	46	11	23.9%	Low
East Feliciana	32	16	50.0%	Medium	St. Mary	69	46	66.7%	High
Evangeline	49	15	30.6%	Medium	St. Tammany	148	104	70.3%	High
Franklin	16	1	6.3%	Low	Tangipahoa	89	57	64.0%	High
Grant	29	14	48.3%	Medium	Tensas	21	1	4.8%	Low
Iberia	55	0	0.0%	Low	Terrebonne	83	54	65.1%	High
Iberville	41	7	17.1%	Low	Union	29	22	75.9%	High
Jackson	19	10	52.6%	Medium	Vermilion	62	6	9.7%	Low
Jefferson	215	52	24.2%	Low	Vernon	57	34	59.6%	Medium
Jefferson Davis	37	8	21.6%	Low	Washington	51	38	74.5%	High
Lafayette	126	5	4.0%	Low	Webster	78	55	70.5%	High
Lafourche	80	39	48.8%	Medium	West Baton Rouge	35	12	34.3%	Medium
La Salle	33	20	60.6%	High	West Carroll	35	1	2.9%	Low
Lincoln	51	33	64.7%	High	West Feliciana	21	12	57.1%	Medium
Livingston	102	93	91.2%	High	Winn	19	11	57.9%	Medium

Map E-102: Percentage of Critical Facilities by Parish within the WUI



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface), HSIP (Critical Facilities)

Map E-103: Parishes Ranked by Number of Critical Facilities within the WUI



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface), HSIP (Critical Facilities)

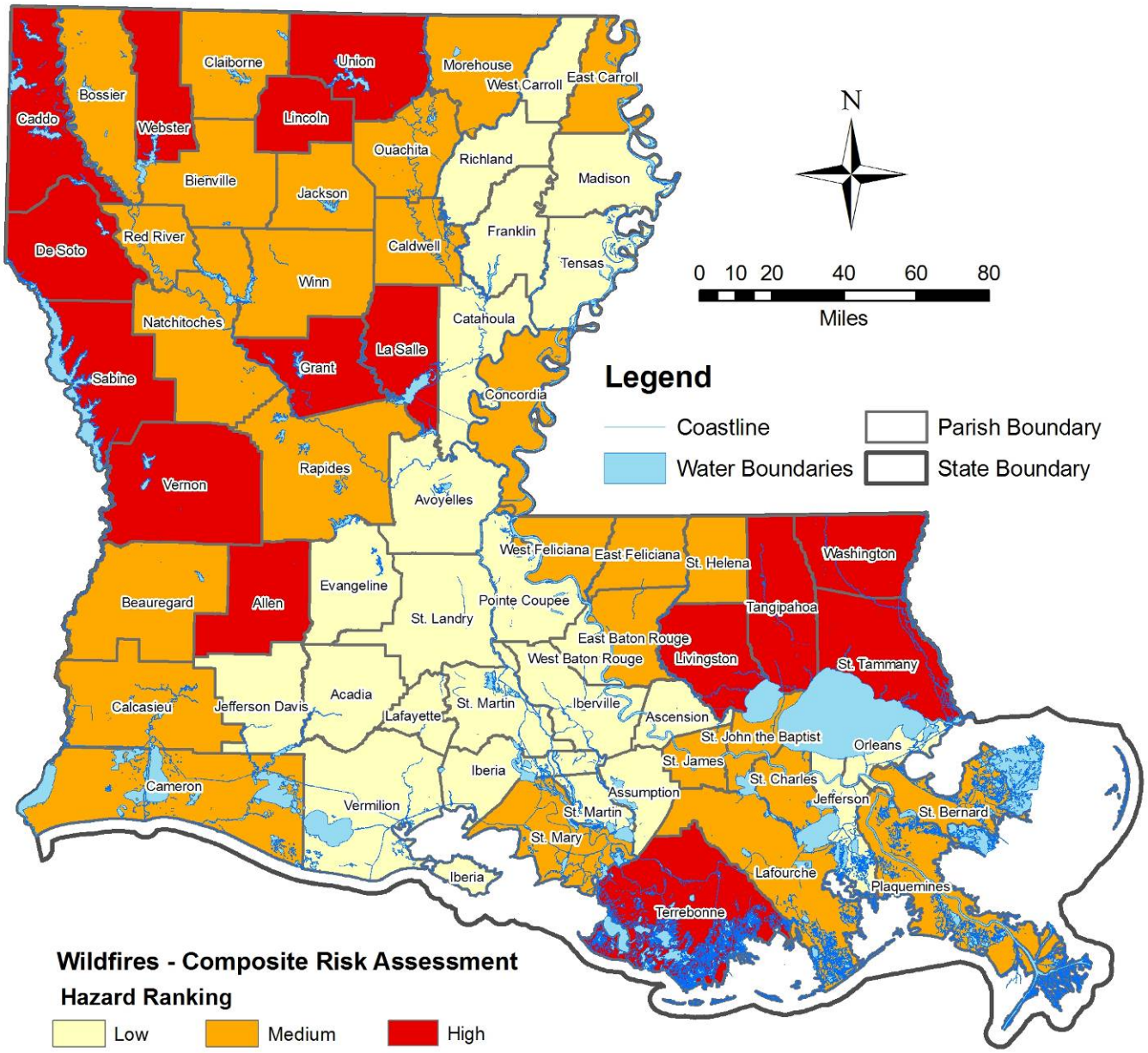
The composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points and each low ranking one (1) point. Following this methodology the possible range of scores for Wildfire is 7 to 21. A high Wildfire Hazard would be assigned to a parish receiving a score of 17 to 21; medium would be for parishes scoring 12-16; and low would be for any parish scoring 7-11. The composite parish rankings are shown in Table E-63. Map E-104 presents the composite ranking of all the parishes with high, medium, and low risk to wildfire.

Table E-63: Composite Wildfire Hazard Ranking

Parish	Occurrence Hazard Ranking	Intensity Hazard Ranking	Housing Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Impacted Population Hazard Ranking	Critical Facilities Hazard Ranking	Composite Hazard Ranking
Acadia	Medium	Medium	Low	Low	Low	Low	Low	9
Allen	High	High	High	High	Medium	Medium	Medium	18
Ascension	Low	Low	Low	Medium	Medium	Low	Medium	10
Assumption	Low	Low	Medium	Medium	Low	Low	Low	9
Avoyelles	Medium	High	Low	Low	Low	Low	Low	10
Beauregard	High	Medium	Medium	High	Medium	Medium	Medium	16
Bienville	High	Medium	Medium	High	Low	Medium	Medium	15
Bossier	High	Medium	Medium	Medium	Medium	Medium	Medium	15
Caddo	High	High	Medium	Medium	High	Medium	Medium	17
Calcasieu	High	High	Low	Low	High	Low	Low	13
Caldwell	Medium	Medium	Medium	High	Low	Medium	High	15
Cameron	Low	Low	Medium	High	Low	Medium	Medium	12
Catahoula	Medium	High	Low	Low	Low	Low	Low	10
Claiborne	High	Medium	Medium	High	Low	Medium	Medium	15
Concordia	Medium	High	Medium	Medium	Low	Low	Low	12
De Soto	Medium	Medium	High	High	Medium	High	High	18
East Baton Rouge	Medium	High	Low	Medium	High	Low	Low	13
East Carroll	Medium	Medium	Low	Medium	Low	Medium	High	13
East Feliciana	Medium	Medium	High	High	Medium	Medium	Medium	16
Evangeline	High	Medium	Low	Low	Low	Low	Medium	11
Franklin	Medium	High	Low	Low	Low	Low	Low	10
Grant	High	Medium	High	High	Low	High	Medium	17
Iberia	Low	Low	Low	Low	Low	Low	Low	7
Iberville	Low	Low	Medium	Low	Low	Low	Low	8
Jackson	Medium	Medium	High	High	Low	High	Medium	16
Jefferson	Low	Low	Low	Low	High	Low	Low	9
Jefferson Davis	Medium	High	Low	Low	Low	Low	Low	10
Lafayette	Low	Low	Low	Low	Medium	Low	Low	8
Lafourche	Low	Low	Medium	Medium	High	Medium	Medium	13
La Salle	High	Medium	Medium	High	Low	High	High	17

Parish	Occurrence Hazard Ranking	Intensity Hazard Ranking	Housing Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Impacted Population Hazard Ranking	Critical Facilities Hazard Ranking	Composite Hazard Ranking
Lincoln	Medium	Medium	High	High	Medium	High	High	18
Livingston	High	Medium	High	High	High	High	High	20
Madison	Low	Low	Low	Low	Low	Low	Low	7
Morehouse	High	High	Medium	Medium	Medium	Medium	Medium	16
Natchitoches	High	Medium	Low	Medium	Medium	Medium	Medium	14
Orleans	Low	Low	Low	Low	High	Low	Low	9
Ouachita	Medium	Medium	Medium	Low	High	Low	Low	12
Plaquemines	Low	Low	High	High	Medium	High	High	16
Pointe Coupee	Low	Low	Low	Medium	Low	Low	Medium	9
Rapides	High	Medium	Medium	Medium	Medium	Low	Medium	14
Red River	Medium	Medium	Low	Medium	Low	Medium	High	13
Richland	Medium	High	Low	Low	Low	Low	Low	10
Sabine	High	Medium	High	High	Medium	High	High	19
St. Bernard	Low	Low	High	Medium	Medium	High	Medium	14
St. Charles	Low	Low	High	High	Medium	High	High	16
St. Helena	High	Medium	Medium	High	Low	Medium	Medium	15
St. James	Low	Low	Medium	Medium	Medium	Medium	Medium	12
St. John the Baptist	Low	Low	High	High	Medium	High	Medium	15
St. Landry	Medium	High	Low	Low	Low	Low	Low	10
St. Martin	Low	Low	Medium	Medium	Medium	Low	Low	10
St. Mary	Low	Low	High	High	Medium	High	High	16
St. Tammany	High	High	High	High	High	High	High	21
Tangipahoa	High	Medium	High	High	High	High	High	20
Tensas	Medium	High	Low	Low	Low	Low	Low	10
Terrebonne	Low	Low	High	High	High	High	High	17
Union	Medium	Medium	High	High	Medium	Medium	High	17
Vermilion	Low	Low	Low	Low	Low	Low	Low	7
Vernon	High	Medium	High	High	Medium	High	Medium	18
Washington	High	Medium	High	High	Medium	High	High	19
Webster	Medium	Medium	High	High	Medium	High	High	18
West Baton Rouge	Low	Low	Low	Medium	Low	Low	Medium	9
West Carroll	Medium	Medium	Low	Low	Low	Low	Low	9
West Feliciana	Medium	High	Medium	High	Low	Low	Medium	14
Winn	High	Medium	Medium	High	Low	Medium	Medium	15

Map E-104. Composite Wildfire Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Group Population), University of Wisconsin - Madison Forestry and Ecology (Wildland Urban Interface), HAZUS-MH MR4 (Building Data), Louisiana Department of Agriculture and Forestry (Wildfire Counts and Acreage), HSIP (Critical Facilities)

Methodology

The HAZUS-MH general building stock data provide the building valuation for each specific occupancy classification (e.g., single family residential, retail trade) developed from the 2000 Census and Dun & Bradstreet (D&B). The general building stock data set includes the residential, commercial, industrial, governmental, educational, agricultural, and religious buildings for each parish. This dataset was developed at the census block level and can be aggregated at census tract or parish levels. This dataset is from the 2000 version of TIGER/Line files and first quarter of 2002 data from D&B.

The wildfire hazard vulnerability assessment used a different dataset than the hazard ranking and therefore produced varied results. The vulnerability assessment was based on WUI data that was available for the parishes. The SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin-Madison used GIS to integrate 2000 Census and USGS National Land Cover data to develop the WUI. Census data was overlaid with WUI data to determine the population located in the expected at risk areas.

The analysis for the general building stock exposure used HAZUS-MH general building stock data and the WUI data. The general building stock data were overlaid with the WUI data to determine the percentage of buildings, housing, and critical facilities that are exposed.

Data Limitations

Wildfire occurrence data for Madison Parish, as reported to the Louisiana Department of Agriculture and Forestry, are most likely non-existent, since it does not logically follow that the parish would have no records of fires when its neighbors have extensive wildfire reporting.

Population impacted by Wildland Urban Interface (WUI) uses 2000 ESRI block data instead of the preferred 2008 ESRI population estimates. The reason for this is that 2008 population data is only available at the Census block group level (which is less precise than the 2000 Census blocks), and for hazards that follow irregular patterns such as WUI, block-level data better accounts for the geographic distribution of Interface and Intermix. In addition, all WUI geographies come from 2000 because more recent data is not yet available.

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Appendix E.12:
Dam Failure

Dam failure hazard vulnerability was assessed for the population, critical facilities, utilities, transportation infrastructure, and building stock, based on the inundation areas of the dams classified as high hazard by the National Inventory of Dams classification. During the public comment period, LDOTD identified fourteen additional high hazard dams; however, due to time and budget constraints, analysis of these dams were not able to be preformed but should be addressed in the next plan update. Table E-64 shows the dam classifications.

Table E-64: Dam Classifications

Category	Loss of Life	Property Damage	Detail
High	Expected	Based only on Loss of Life	Urban development or any permanent structure for human habitation which are potentially inundated with flood. Major damage to land, crops, agricultural, commercial or industrial facilities, loss of use and/or damage to transportation, utilities or other public facilities or values.
Significant	None Expected	Economic Loss, Environmental Damage and disruption of lifeline facilities. Predominantly located in rural areas	No concentrated urban development, 1 or more permanent structures for human habitation which are potentially inundated with flood water. Significant damage to land, crops, agricultural, commercial or industrial facilities, loss of use and/or damage to transportation, utilities or other public facilities or values.
Low	None Expected	Low economic or environmental losses. Losses Principally Limited to Dam Owner's property	No permanent structures for human habitation; Minor damage to land, crops, agricultural, commercial or industrial facilities, transportation, utilities or other public facilities or values.

Louisiana has 557 total dams. Of these, 33 are ranked High Hazard; 71 are ranked Significant Hazard; and 453 are ranked Low Hazard. The hazard profile and risk assessment is confined to the inundation areas of the 19 of the 33 High Hazard dams in Louisiana. As previously noted, during the public comment period, LDOTD identified fourteen additional high hazard dams; however, due to time and budget constraints, analysis of these dams were not able to be preformed but should be addressed in the next plan update.

The high / medium / low rankings for each parish were developed by:

- Determining the inundation area for each dam;
- Sorting the list by parish from highest to lowest square miles in the inundation areas;
    - Assigning the High Rank to parishes with more than 10% of land in the inundation areas;
    - Assigning the Medium Rank to parishes with up to 10% of land in the inundation areas;
    - Assigning the Low Rank to parishes outside the inundation areas.
- Sorting the list by parish from highest to lowest population in the inundation areas;
    - Assigning the High Rank to parishes with more than 10% of the population in the inundation areas;
    - Assigning the Medium Rank to parishes with up to 10% of population in the inundation areas;
    - Assigning the Low Rank to parishes outside the inundation areas.
- Sorting the list by parish from highest to lowest building quantity in the inundation areas;
    - Assigning the High Rank to parishes with more than 10% of buildings in the inundation areas;
    - Assigning the Medium Rank to parishes with up to 10% of buildings in the inundation areas;

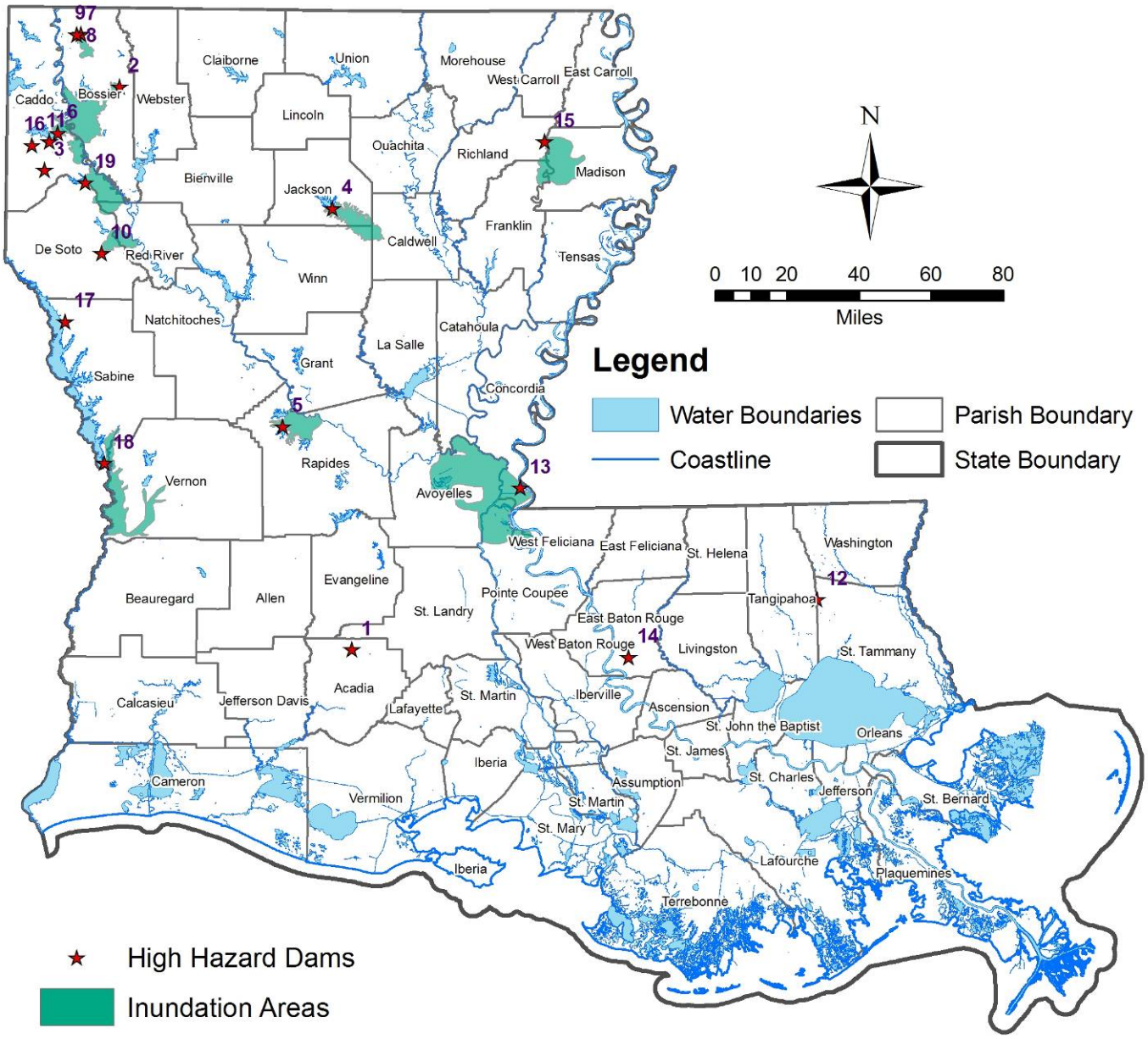
    - Assigning the Low Rank to parishes outside the inundation areas.
- Sorting the list by parish from highest to lowest building value in the inundation areas;
    - Assigning the High Rank to parishes with more than $100 million of buildings at risk
    - Assigning the Medium Rank to parishes with up to $100 million of buildings at risk;
    - Assigning the Low Rank to parishes outside the inundation areas.
- Sorting the list by parish from highest to lowest number of critical facilities in the inundation areas;
    - Assigning the High Rank to parishes with more than 10% of critical facilities threatened;
    - Assigning the Medium Rank to parishes with up to 10% of critical facilities threatened;
    - Assigning the Low Rank to parishes outside the inundation areas.
- Sorting the list by parish from highest to lowest number of utility providers or power lines in the inundation areas;
    - Assigning the High Rank to parishes with more than 10% of either utility providers or power lines threatened;
    - Assigning the Medium Rank to parishes with up to 10% of either utility providers or power lines threatened;
    - Assigning the Low Rank to parishes outside the inundation areas.
- Sorting the list by parish from highest to lowest number of transportation infrastructure in the inundation areas;
    - Assigning the High Rank to parishes with more than 10% of either bridges, roadways or railways threatened;
    - Assigning the Medium Rank to parishes with up to 10% of either bridges, roadways or railways threatened;
    - Assigning the Low Rank to parishes outside the inundation areas.
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 18 or more;
    - Assigning the medium composite ranking to parishes with a score of 11 to 18; and
    - Assigning the low composite ranking to parishes with a score of 10 or less.

The high hazard dams within Louisiana are shown in Table E-65, and their respective inundation areas are shown in Map E-105.

Table E-65: High Hazard Dams within Louisiana

Dam #	Dam Name	County	River
1	App Holding Pond Dam	Acadia	Bayou Mallet
2	Bayou Bodcau Dam	Bossier	Bayou Bodcau
3	Breckenridge Lake Dam	Caddo	Gilmer Bayou
4	Caney Creek Dam	Jackson	Caney Creek
5	Cotile Lake Dam	Rapides	Cotile Creek
6	Cross Lake Dam	Caddo	Cross Bayou
7	Cypress Bayou No 1	Bossier	Tr-Cypress Bayou
8	Cypress Bayou No 2	Bossier	Upper W Fork Cypress Bayou
9	Cypress Bayou No 3	Bossier	Upper W Fork Cypress Bayou
10	Dolet Hills Make-Up Water Pond	Desoto	Sawmill Creek
11	Hideaway Harbor Lake	Caddo	Tr-Bickham Bayou
12	Lilly Bayou Control Structure	E Baton Rouge	Comite Diversion Channel
13	Old River	Concordia	Mississippi
14	Pennington Lake Dam	E Baton Rouge	Off Dawson Creek
15	Poverty Point Reservoir Dam	Richland	Cypress Creek
16	Rice Lake Dam	Caddo	Paige Bayou
17	Sibley Lake Dam	Natchitoches	Youngs Bayou
18	Toledo Bend	Sabine-La	Sabine
19	Wallace Lake Dam	Caddo	Cypress Bayou

Map E-105: High Hazard Dams and Inundation Areas within Louisiana



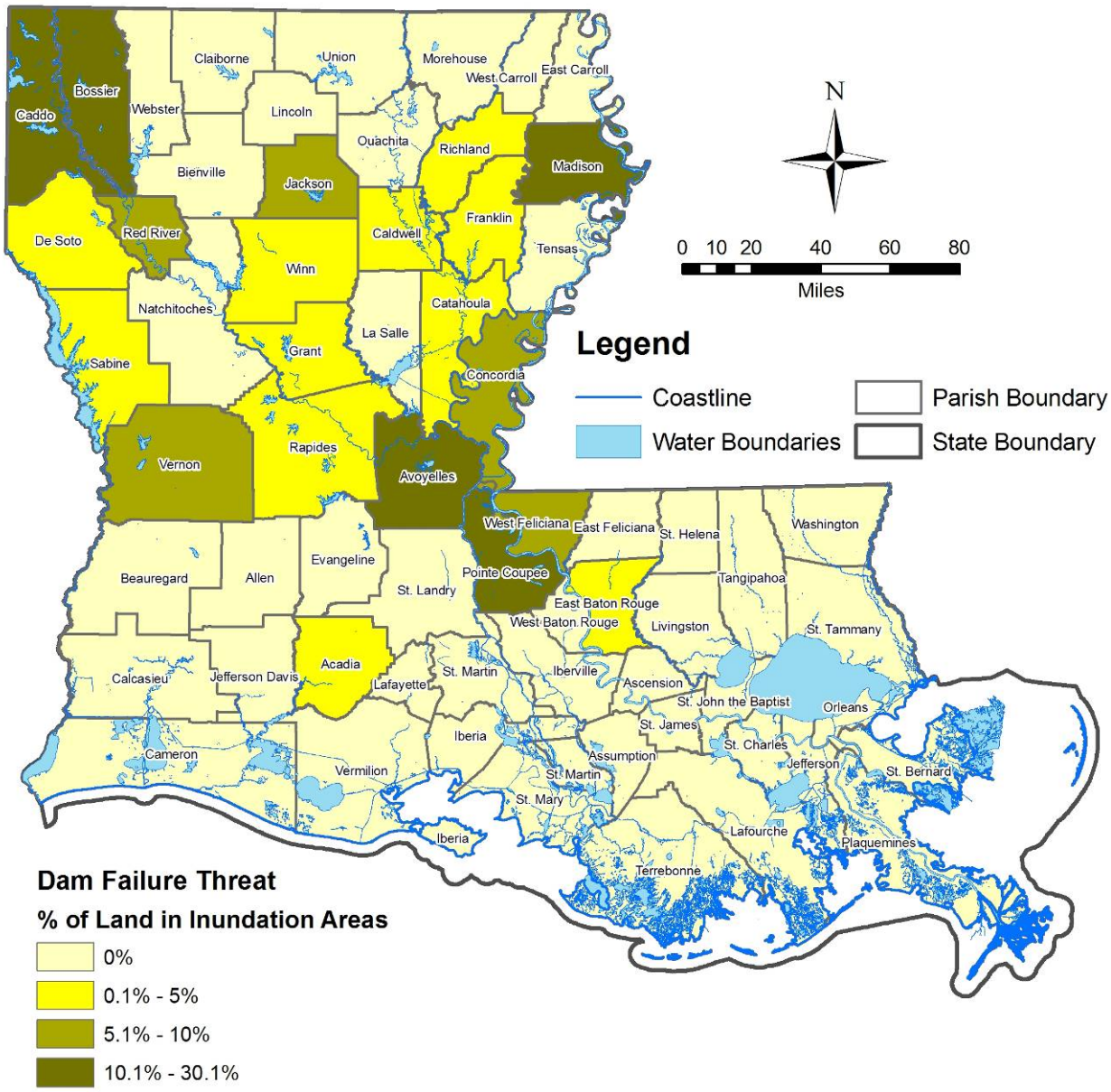
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

The percentage of land by parish within the inundation areas is shown in Table E-66 and Map E-106. Map E-107 shows the parishes ranked by percentage.

Table E-66: Percentage of Land by Parish within the Inundation Areas

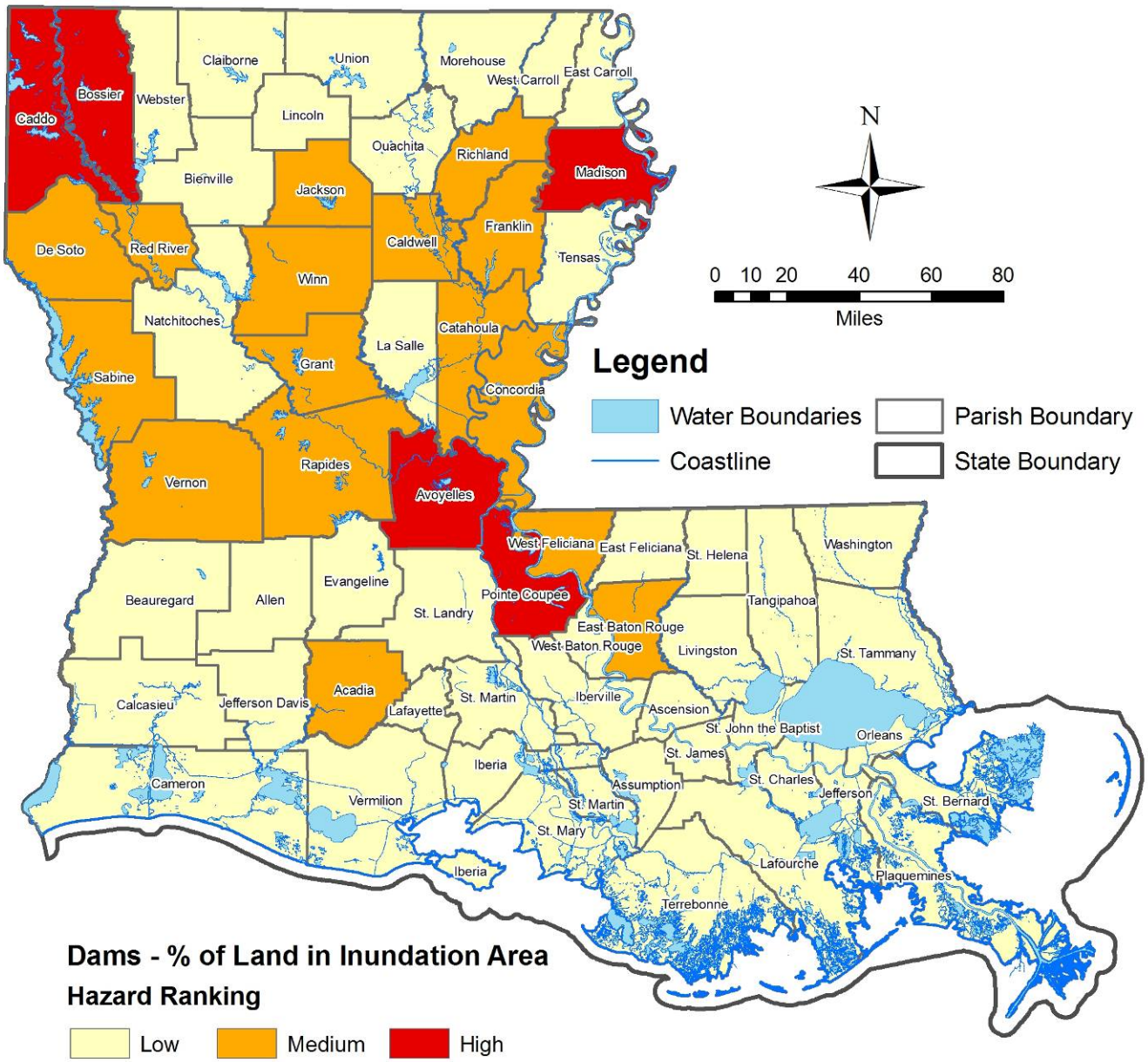
Parish	Land Area in Square Miles	Land in Inundation Area	% Land in Inundation Area	Hazard Ranking	Parish	Land Area in Square Miles	Land in Inundation Area	% Land in Inundation Area	Hazard Ranking
Acadia	656.3	0.9	0.1%	Medium	Madison	628.7	94.1	15.0%	High
Allen	766.3	0.0	0.0%	Low	Morehouse	798.4	0.0	0.0%	Low
Ascension	292.9	0.0	0.0%	Low	Natchitoches	1262.5	0.0	0.0%	Low
Assumption	340.7	0.0	0.0%	Low	Orleans	189.9	0.0	0.0%	Low
Avoyelles	845.9	254.4	30.1%	High	Ouachita	616.3	0.0	0.0%	Low
Beauregard	1162.9	0.0	0.0%	Low	Plaquemines	929.6	0.0	0.0%	Low
Bienville	811.7	0.0	0.0%	Low	Pointe Coupee	561.0	81.9	14.6%	High
Bossier	842.5	121.4	14.4%	High	Rapides	1327.4	63.7	4.8%	Medium
Caddo	885.7	89.6	10.1%	High	Red River	393.1	33.9	8.6%	Medium
Calcasieu	1076.1	0.0	0.0%	Low	Richland	562.3	3.2	0.6%	Medium
Caldwell	531.1	10.0	1.9%	Medium	Sabine	867.1	13.1	1.5%	Medium
Cameron	1366.1	0.0	0.0%	Low	St. Bernard	431.8	0.0	0.0%	Low
Catahoula	727.4	0.1	0.0%	Medium	St. Charles	288.9	0.0	0.0%	Low
Claiborne	755.5	0.0	0.0%	Low	St. Helena	409.3	0.0	0.0%	Low
Concordia	706.8	47.2	6.7%	Medium	St. James	247.5	0.0	0.0%	Low
De Soto	879.7	21.7	2.5%	Medium	St. John the Baptist	220.1	0.0	0.0%	Low
East Baton Rouge	457.7	0.6	0.1%	Medium	St. Landry	933.6	0.0	0.0%	Low
East Carroll	425.5	0.0	0.0%	Low	St. Martin	764.5	0.0	0.0%	Low
East Feliciana	455.2	0.0	0.0%	Low	St. Mary	618.9	0.0	0.0%	Low
Evangeline	673.5	0.0	0.0%	Low	St. Tammany	861.6	0.0	0.0%	Low
Franklin	626.4	18.3	2.9%	Medium	Tangipahoa	794.2	0.0	0.0%	Low
Grant	649.0	0.1	0.0%	Medium	Tensas	606.7	0.0	0.0%	Low
Iberia	592.1	0.0	0.0%	Low	Terrebonne	1272.7	0.0	0.0%	Low
Iberville	633.5	0.0	0.0%	Low	Union	882.6	0.0	0.0%	Low
Jackson	571.9	43.5	7.6%	Medium	Vermilion	1197.4	0.0	0.0%	Low
Jefferson	310.1	0.0	0.0%	Low	Vernon	1330.3	114.6	8.6%	Medium
Jefferson Davis	653.9	0.0	0.0%	Low	Washington	672.6	0.0	0.0%	Low
Lafayette	270.1	0.0	0.0%	Low	Webster	604.0	0.0	0.0%	Low
Lafourche	1084.8	0.0	0.0%	Low	West Baton Rouge	192.1	0.0	0.0%	Low
La Salle	628.5	0.0	0.0%	Low	West Carroll	360.0	0.0	0.0%	Low
Lincoln	472.2	0.0	0.0%	Low	West Feliciana	409.0	33.2	8.1%	Medium
Livingston	649.6	0.0	0.0%	Low	Winn	951.0	17.9	1.9%	Medium

Map E-106: Percentage of Land by Parish within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

Map E-107: Parishes Ranked by Percentage of Land within the Inundation Areas



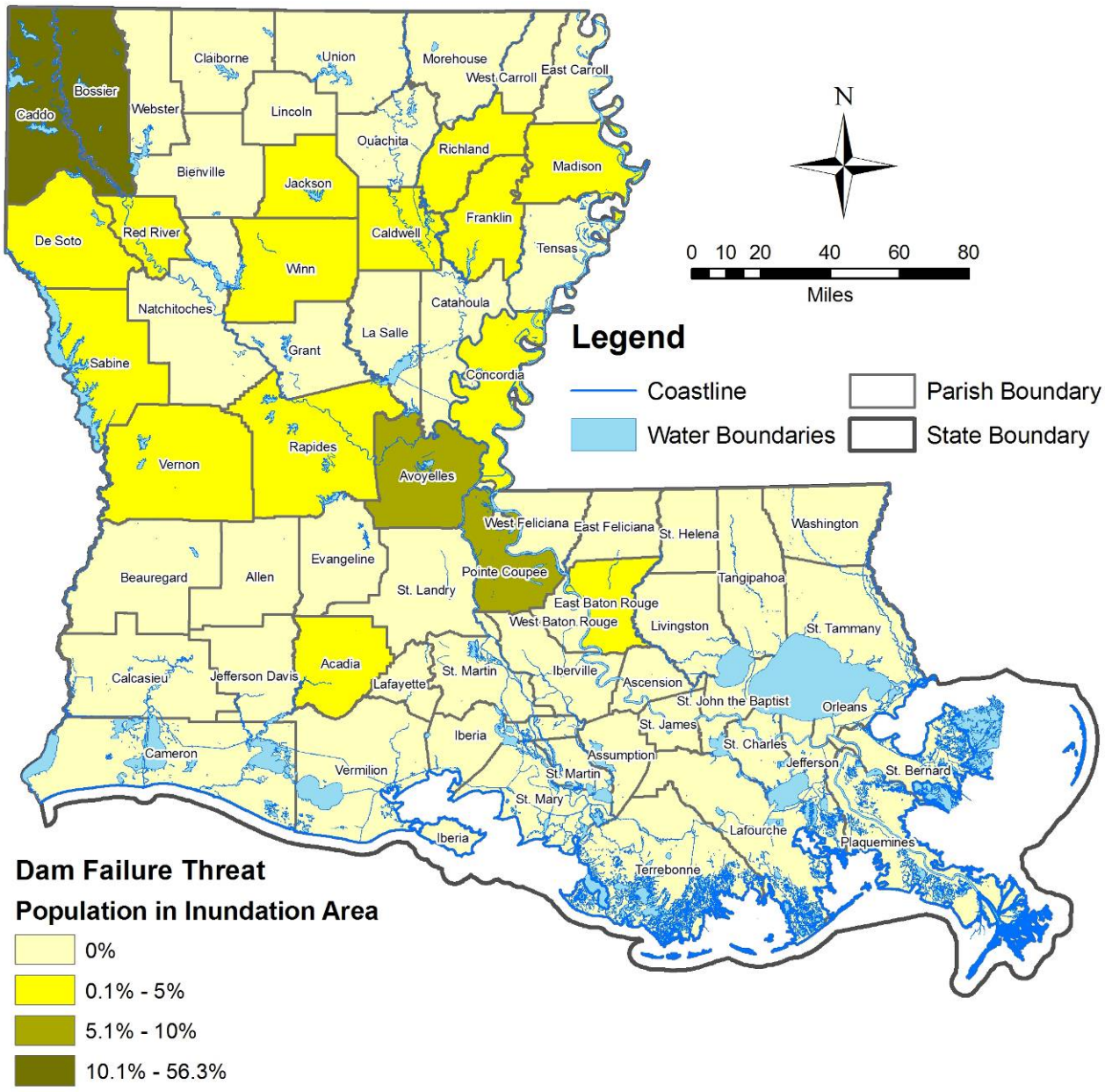
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

The percentage of population by parish within the inundation areas is shown in Table E-67 and Map E-108. Map E-109 shows the parishes ranked by percentage.

Table E-67: Percentage of Parish Population within the Inundation Areas

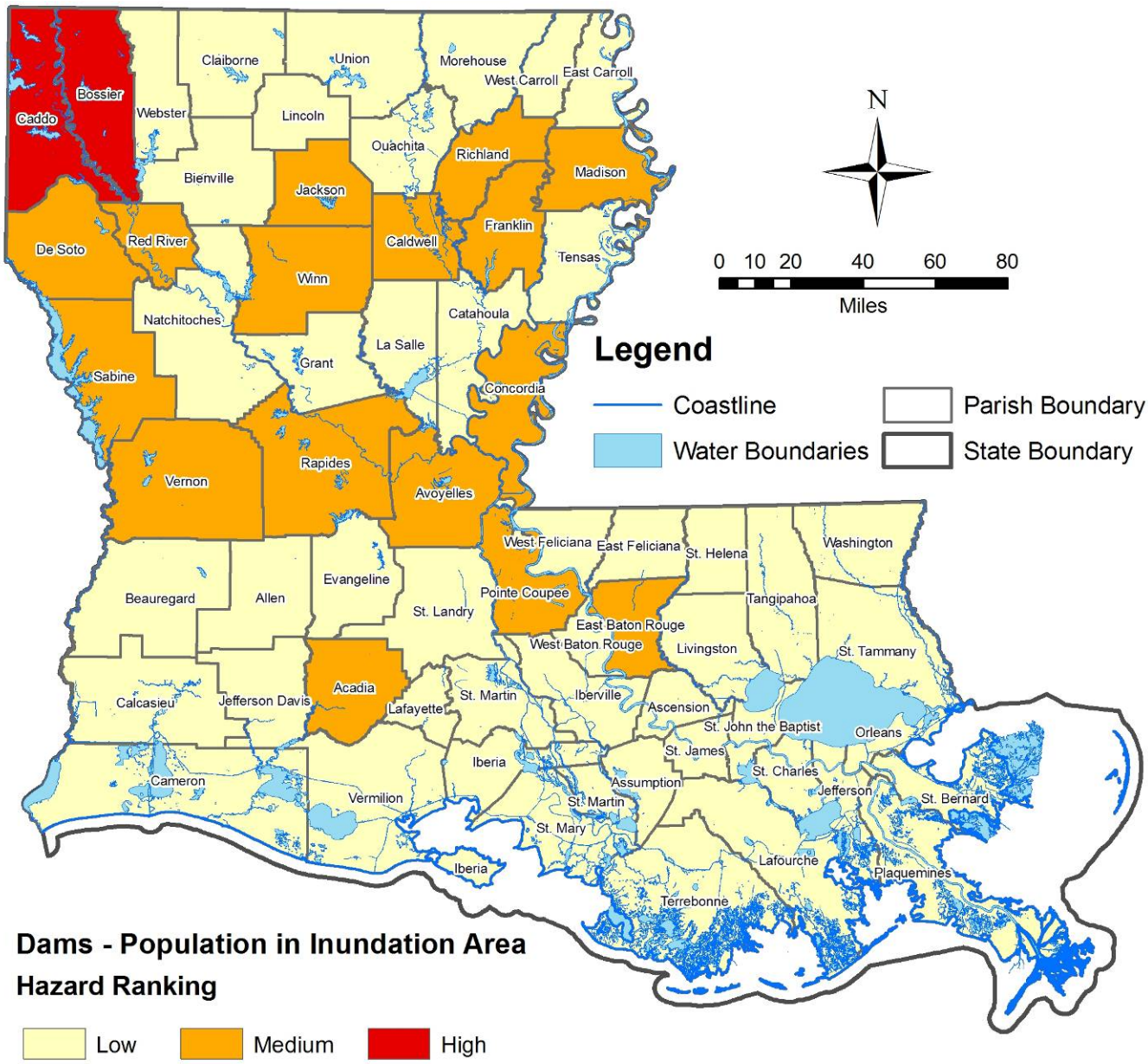
Parish	Total Population 2000	Population of Blocks in Inundation Area	% of Parish Population in Inundation Area	Hazard Ranking	Parish	Total Population 2000	Population of Blocks in Inundation Area	% of Parish Population in Inundation Area	Hazard Ranking
Acadia	58,861	17	0.0%	Medium	Madison	13,728	400	2.9%	Medium
Allen	25,440	0	0.0%	Low	Morehouse	31,021	0	0.0%	Low
Ascension	76,627	0	0.0%	Low	Natchitoches	39,080	0	0.0%	Low
Assumption	23,388	0	0.0%	Low	Orleans	484,674	0	0.0%	Low
Avoyelles	41,481	3,500	8.4%	Medium	Ouachita	147,250	0	0.0%	Low
Beauregard	32,986	0	0.0%	Low	Plaquemines	26,757	0	0.0%	Low
Bienville	15,752	0	0.0%	Low	Pointe Coupee	22,763	1,470	6.5%	Medium
Bossier	98,310	55,355	56.3%	High	Rapides	126,337	3,840	3.0%	Medium
Caddo	252,161	56,578	22.4%	High	Red River	9,622	144	1.5%	Medium
Calcasieu	183,577	0	0.0%	Low	Richland	20,981	315	1.5%	Medium
Caldwell	10,560	54	0.5%	Medium	Sabine	23,459	125	0.5%	Medium
Cameron	9,974	0	0.0%	Low	St. Bernard	67,229	0	0.0%	Low
Catahoula	10,920	0	0.0%	Low	St. Charles	48,072	0	0.0%	Low
Claiborne	16,851	0	0.0%	Low	St. Helena	10,525	0	0.0%	Low
Concordia	20,247	14	0.1%	Medium	St. James	21,216	0	0.0%	Low
De Soto	25,494	149	0.6%	Medium	St. John the Baptist	43,044	0	0.0%	Low
East Baton Rouge	412,852	2,054	0.5%	Medium	St. Landry	87,715	0	0.0%	Low
East Carroll	9,421	0	0.0%	Low	St. Martin	48,583	0	0.0%	Low
East Feliciana	21,360	0	0.0%	Low	St. Mary	53,500	0	0.0%	Low
Evangeline	35,434	0	0.0%	Low	St. Tammany	191,268	0	0.0%	Low
Franklin	21,263	309	1.5%	Medium	Tangipahoa	100,588	0	0.0%	Low
Grant	18,698	0	0.0%	Low	Tensas	6,618	0	0.0%	Low
Iberia	73,266	0	0.0%	Low	Terrebonne	104,494	0	0.0%	Low
Iberville	33,320	0	0.0%	Low	Union	22,803	0	0.0%	Low
Jackson	15,400	85	0.6%	Medium	Vermilion	53,807	0	0.0%	Low
Jefferson	455,466	0	0.0%	Low	Vernon	52,531	1,874	3.6%	Medium
Jefferson Davis	31,435	0	0.0%	Low	Washington	43,926	0	0.0%	Low
Lafayette	190,488	0	0.0%	Low	Webster	41,834	0	0.0%	Low
Lafourche	89,983	0	0.0%	Low	West Baton Rouge	21,601	0	0.0%	Low
La Salle	14,282	0	0.0%	Low	West Carroll	12,314	0	0.0%	Low
Lincoln	44,288	0	0.0%	Low	West Feliciana	15,111	0	0.0%	Low
Livingston	91,814	0	0.0%	Low	Winn	16,894	17	0.1%	Medium

Map E-108: Percentage of Parish Population within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Population), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

Map E-109: Parish Ranking by Percentage of Population within the Inundation Areas



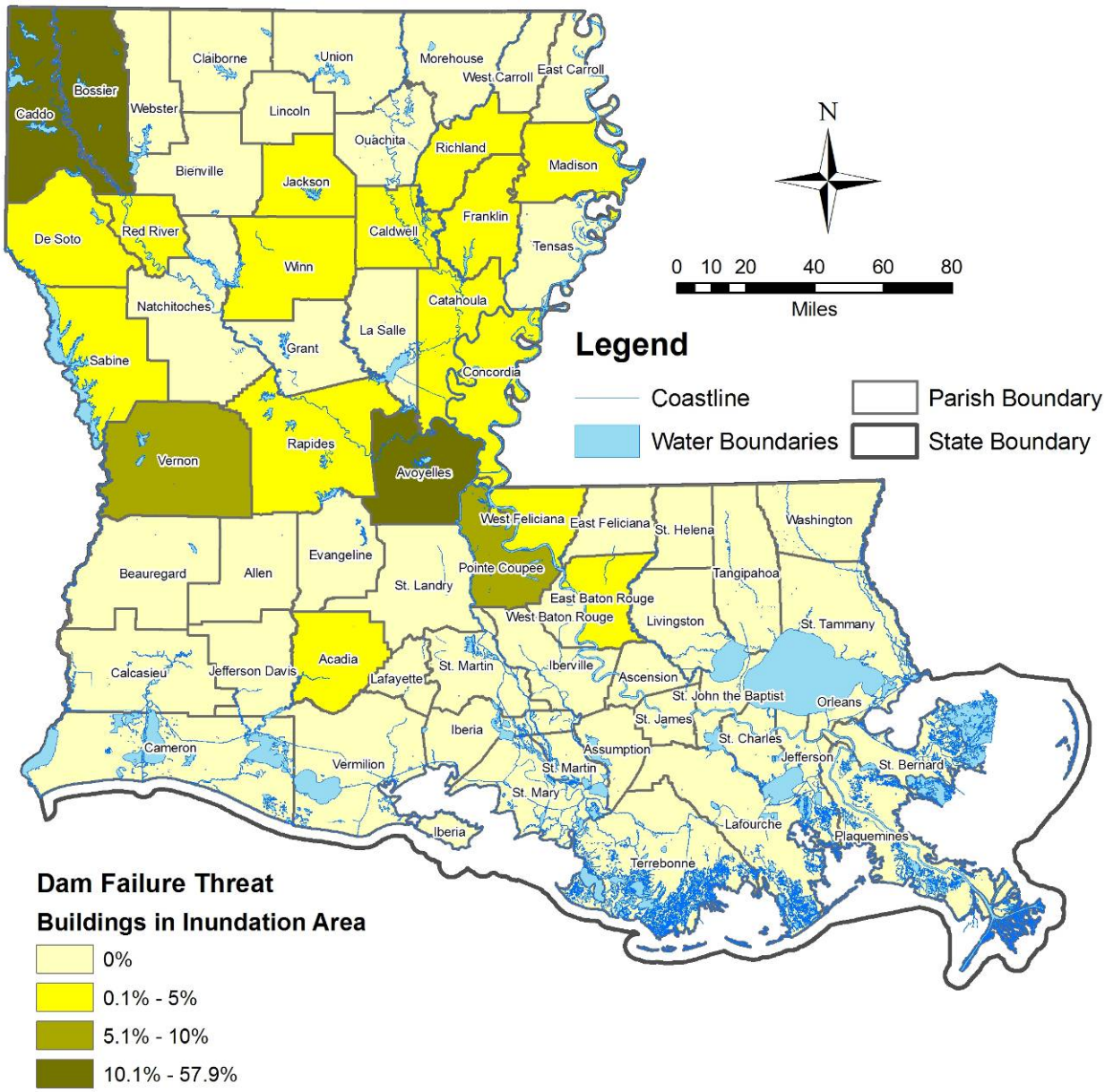
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Population), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

The percentage of buildings by parish within the inundation areas is shown in Table E-68 and Map E-110. Map E-111 shows the parishes ranked by percentage.

Table E-68: Percentage of Parish Buildings within the Inundation Areas

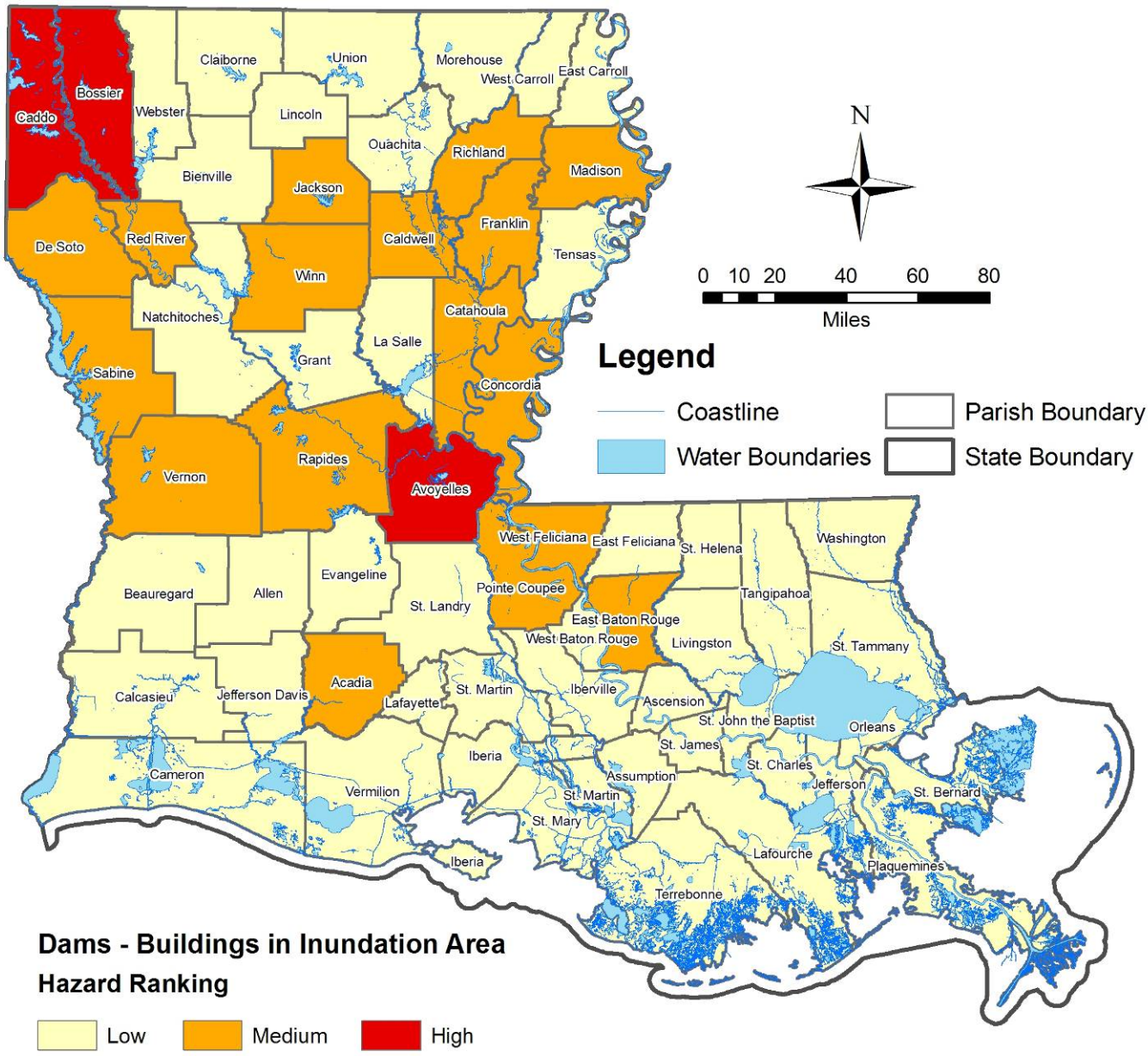
Parish	Total Buildings	Buildings in Inundation Area	% Buildings in Inundation Area	Hazard Ranking	Parish	Total Buildings	Buildings in Inundation Area	% Buildings in Inundation Area	Hazard Ranking
Acadia	27,817	241	0.9%	Medium	Madison	6,576	326	5.0%	Medium
Allen	11,600	0	0.0%	Low	Morehouse	14,604	0	0.0%	Low
Ascension	33,123	0	0.0%	Low	Natchitoches	19,780	0	0.0%	Low
Assumption	10,844	0	0.0%	Low	Orleans	173,671	0	0.0%	Low
Avoyelles	19,795	2,667	13.5%	High	Ouachita	62,493	0	0.0%	Low
Beauregard	17,476	0	0.0%	Low	Plaquemines	12,374	0	0.0%	Low
Bienville	10,612	0	0.0%	Low	Pointe Coupee	12,092	798	6.6%	Medium
Bossier	40,408	23,384	57.9%	High	Rapides	58,948	2,644	4.5%	Medium
Caddo	105,041	28,277	26.9%	High	Red River	4,767	146	3.1%	Medium
Calcasieu	80,762	0	0.0%	Low	Richland	10,847	278	2.6%	Medium
Caldwell	6,011	75	1.2%	Medium	Sabine	15,926	258	1.6%	Medium
Cameron	6,211	0	0.0%	Low	St. Bernard	26,842	0	0.0%	Low
Catahoula	6,483	28	0.4%	Medium	St. Charles	19,200	0	0.0%	Low
Claiborne	9,517	0	0.0%	Low	St. Helena	6,254	0	0.0%	Low
Concordia	10,636	118	1.1%	Medium	St. James	8,815	0	0.0%	Low
De Soto	13,848	317	2.3%	Medium	St. John the Baptist	16,521	0	0.0%	Low
East Baton Rouge	151,107	1,904	1.3%	Medium	St. Landry	43,957	0	0.0%	Low
East Carroll	4,195	0	0.0%	Low	St. Martin	24,736	0	0.0%	Low
East Feliciana	10,030	0	0.0%	Low	St. Mary	24,408	0	0.0%	Low
Evangeline	17,665	0	0.0%	Low	St. Tammany	84,508	0	0.0%	Low
Franklin	10,757	149	1.4%	Medium	Tangipahoa	45,367	0	0.0%	Low
Grant	10,350	0	0.0%	Low	Tensas	4,467	0	0.0%	Low
Iberia	32,309	0	0.0%	Low	Terrebonne	43,923	0	0.0%	Low
Iberville	15,059	0	0.0%	Low	Union	13,760	0	0.0%	Low
Jackson	9,181	222	2.4%	Medium	Vermilion	27,475	0	0.0%	Low
Jefferson	164,539	0	0.0%	Low	Vernon	21,626	1,702	7.9%	Medium
Jefferson Davis	16,691	0	0.0%	Low	Washington	23,350	0	0.0%	Low
Lafayette	81,011	0	0.0%	Low	Webster	21,865	0	0.0%	Low
Lafourche	40,570	0	0.0%	Low	West Baton Rouge	10,252	0	0.0%	Low
La Salle	7,828	0	0.0%	Low	West Carroll	5,945	0	0.0%	Low
Lincoln	18,894	0	0.0%	Low	West Feliciana	5,056	50	1.0%	Medium
Livingston	42,671	0	0.0%	Low	Winn	8,993	67	0.7%	Medium

Map E-110: Percentage of Parish Buildings within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

Map E-111: Parishes Ranked by Percentage of Buildings within the Inundation Areas



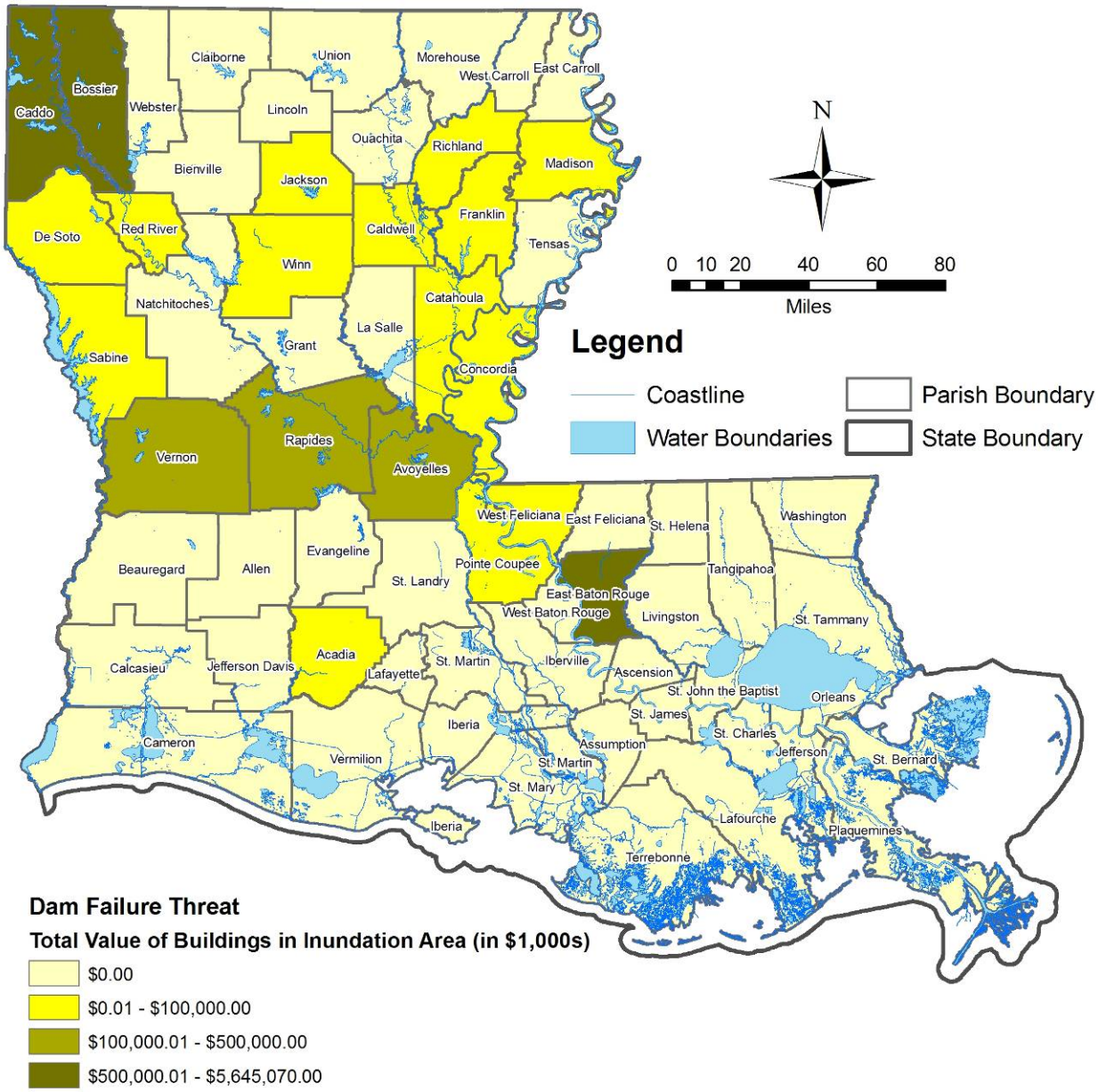
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

The value of buildings by parish within the inundation areas is shown in Table E-69 and Map E-112. Map E-113 shows the parishes ranked by value.

Table E-69: Value of Buildings by Parish within the Inundation Areas

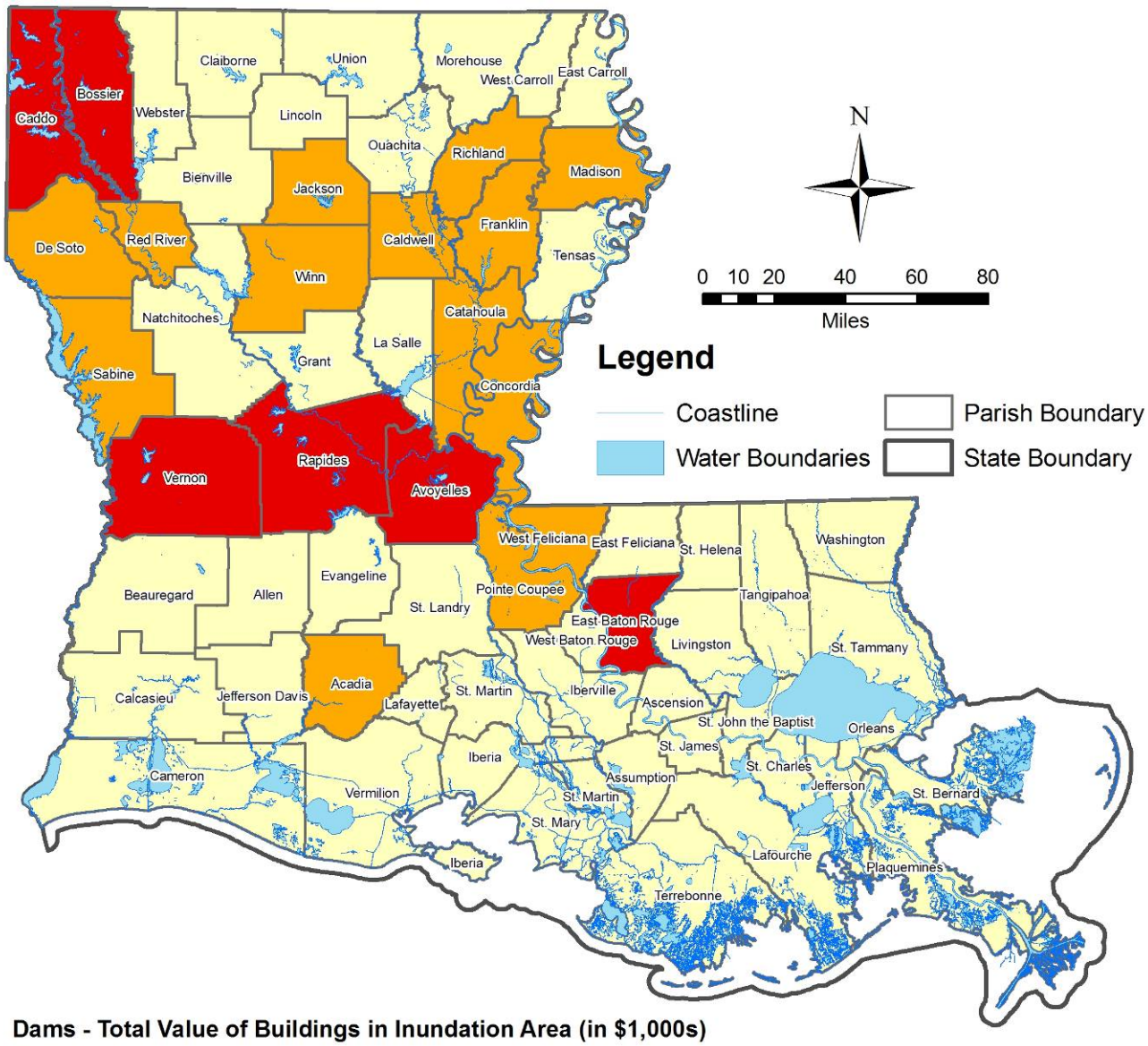
Parish	Total Value of Buildings in Inundation Area (in $1000s)	Hazard Ranking	Parish	Total Value of Buildings in Inundation Area (in $1000s)	Hazard Ranking
Acadia	$38,487	Medium	Madison	$32,372	Medium
Allen	$0	Low	Morehouse	$0	Low
Ascension	$0	Low	Natchitoches	$0	Low
Assumption	$0	Low	Orleans	$0	Low
Avoyelles	$284,182	High	Ouachita	$0	Low
Beauregard	$0	Low	Plaquemines	$0	Low
Bienville	$0	Low	Pointe Coupee	$70,988	Medium
Bossier	$4,436,674	High	Rapides	$287,226	High
Caddo	$5,645,070	High	Red River	$11,943	Medium
Calcasieu	$0	Low	Richland	$27,712	Medium
Caldwell	$7,047	Medium	Sabine	$14,907	Medium
Cameron	$0	Low	St. Bernard	$0	Low
Catahoula	$2,955	Medium	St. Charles	$0	Low
Claiborne	$0	Low	St. Helena	$0	Low
Concordia	$11,550	Medium	St. James	$0	Low
De Soto	$28,549	Medium	St. John the Baptist	$0	Low
East Baton Rouge	$574,582	High	St. Landry	$0	Low
East Carroll	$0	Low	St. Martin	$0	Low
East Feliciana	$0	Low	St. Mary	$0	Low
Evangeline	$0	Low	St. Tammany	$0	Low
Franklin	$21,740	Medium	Tangipahoa	$0	Low
Grant	$0	Low	Tensas	$0	Low
Iberia	$0	Low	Terrebonne	$0	Low
Iberville	$0	Low	Union	$0	Low
Jackson	$21,495	Medium	Vermilion	$0	Low
Jefferson	$0	Low	Vernon	$177,167	High
Jefferson Davis	$0	Low	Washington	$0	Low
Lafayette	$0	Low	Webster	$0	Low
Lafourche	$0	Low	West Baton Rouge	$0	Low
La Salle	$0	Low	West Carroll	$0	Low
Lincoln	$0	Low	West Feliciana	$4,682	Medium
Livingston	$0	Low	Winn	$6,419	Medium

Map E-112: Value of Buildings by Parish within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

Map E-113: Parishes Ranked by Value of Buildings within the Inundation Areas



Dams - Total Value of Buildings in Inundation Area (in $1,000s)

Hazard Ranking

Low Medium High

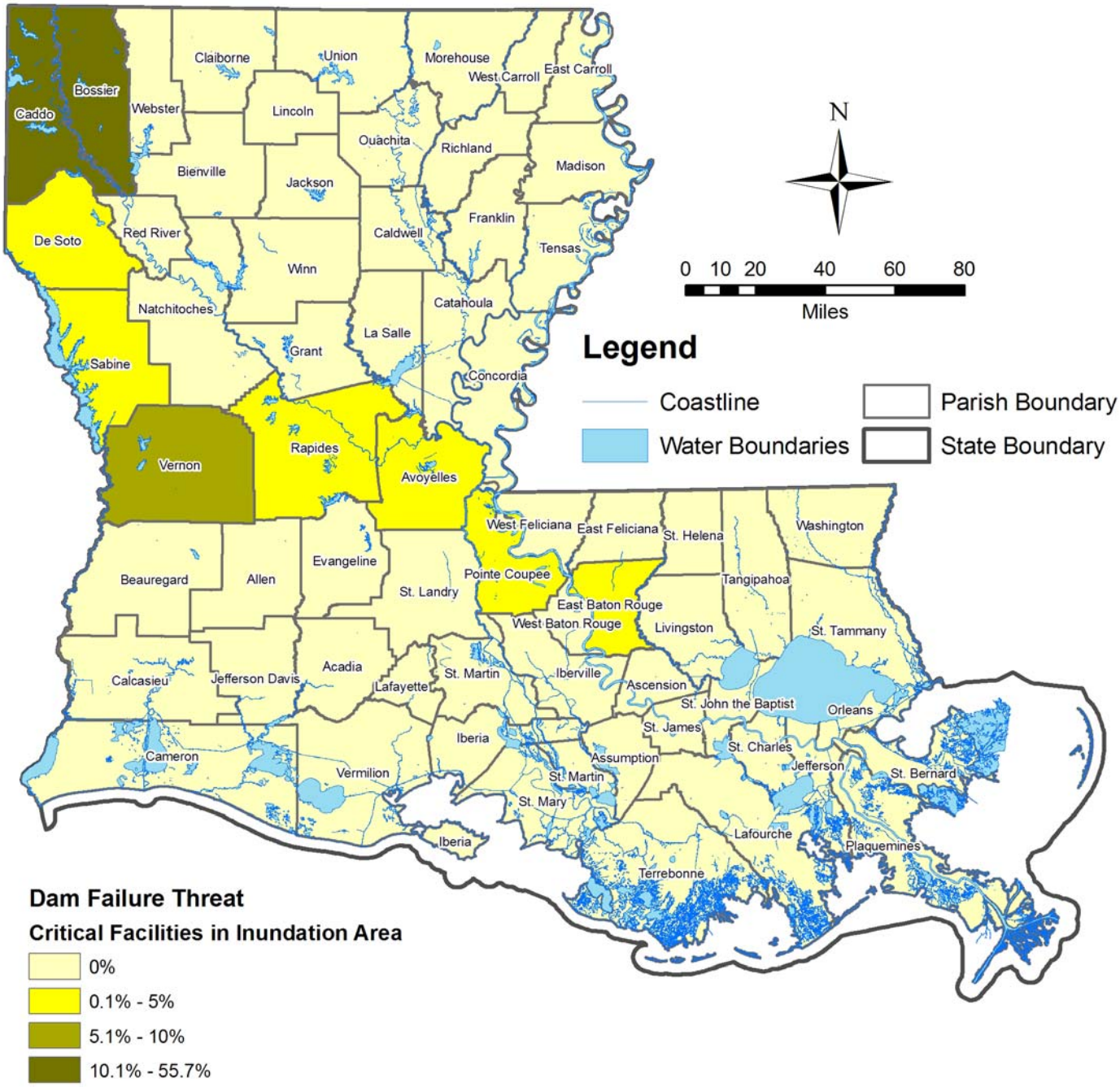
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Buildings), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

The number of critical facilities by parish within the inundation areas is shown in Table E-70 and Map E-114. Map E-115 shows the parishes ranked by percentage.

Table E-70: Critical Facilities by Parish within the Inundation Areas

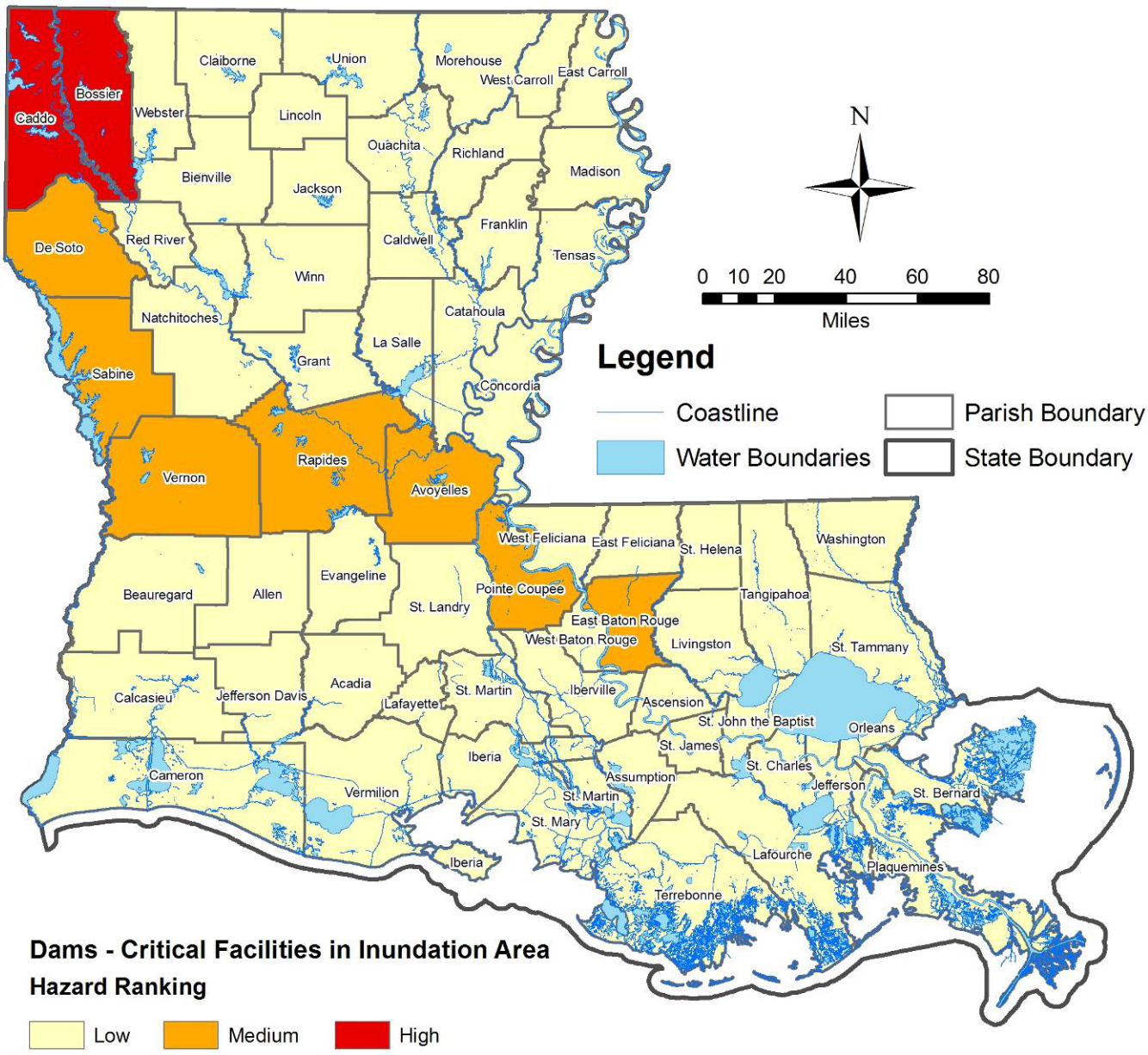
Parish	Total Critical Facilities	Critical Facilities in Inundation Area	% Critical Facilities in Inundation Area	Hazard Ranking	Parish	Total Critical Facilities	Critical Facilities in Inundation Area	% Critical Facilities in Inundation Area	Hazard Ranking
Acadia	64	0	0.0%	Low	Madison	19	0	0.0%	Low
Allen	31	0	0.0%	Low	Morehouse	39	0	0.0%	Low
Ascension	64	0	0.0%	Low	Natchitoches	46	0	0.0%	Low
Assumption	27	0	0.0%	Low	Orleans	169	0	0.0%	Low
Avoyelles	64	3	4.7%	Medium	Ouachita	119	0	0.0%	Low
Beauregard	45	0	0.0%	Low	Plaquemines	18	0	0.0%	Low
Bienville	36	0	0.0%	Low	Pointe Coupee	31	1	3.2%	Medium
Bossier	70	39	55.7%	High	Rapides	148	3	2.0%	Medium
Caddo	189	35	18.5%	High	Red River	12	0	0.0%	Low
Calcasieu	141	0	0.0%	Low	Richland	33	0	0.0%	Low
Caldwell	23	0	0.0%	Low	Sabine	42	1	2.4%	Medium
Cameron	19	0	0.0%	Low	St. Bernard	19	0	0.0%	Low
Catahoula	27	0	0.0%	Low	St. Charles	57	0	0.0%	Low
Claiborne	25	0	0.0%	Low	St. Helena	21	0	0.0%	Low
Concordia	37	0	0.0%	Low	St. James	42	0	0.0%	Low
De Soto	43	1	2.3%	Medium	St. John the Baptist	36	0	0.0%	Low
East Baton Rouge	261	2	0.8%	Medium	St. Landry	98	0	0.0%	Low
East Carroll	13	0	0.0%	Low	St. Martin	46	0	0.0%	Low
East Feliciana	32	0	0.0%	Low	St. Mary	69	0	0.0%	Low
Evangeline	49	0	0.0%	Low	St. Tammany	148	0	0.0%	Low
Franklin	16	0	0.0%	Low	Tangipahoa	89	0	0.0%	Low
Grant	29	0	0.0%	Low	Tensas	21	0	0.0%	Low
Iberia	55	0	0.0%	Low	Terrebonne	83	0	0.0%	Low
Iberville	41	0	0.0%	Low	Union	29	0	0.0%	Low
Jackson	19	0	0.0%	Low	Vermilion	62	0	0.0%	Low
Jefferson	215	0	0.0%	Low	Vernon	57	5	8.8%	Medium
Jefferson Davis	37	0	0.0%	Low	Washington	51	0	0.0%	Low
Lafayette	126	0	0.0%	Low	Webster	78	0	0.0%	Low
Lafourche	80	0	0.0%	Low	West Baton Rouge	35	0	0.0%	Low
La Salle	33	0	0.0%	Low	West Carroll	35	0	0.0%	Low
Lincoln	51	0	0.0%	Low	West Feliciana	21	0	0.0%	Low
Livingston	102	0	0.0%	Low	Winn	19	0	0.0%	Low

Map E-114: Number of Critical Facilities by Parish within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Critical Facilities), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

Map E-115: Parishes Ranked by Critical Facilities within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Critical Facilities), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

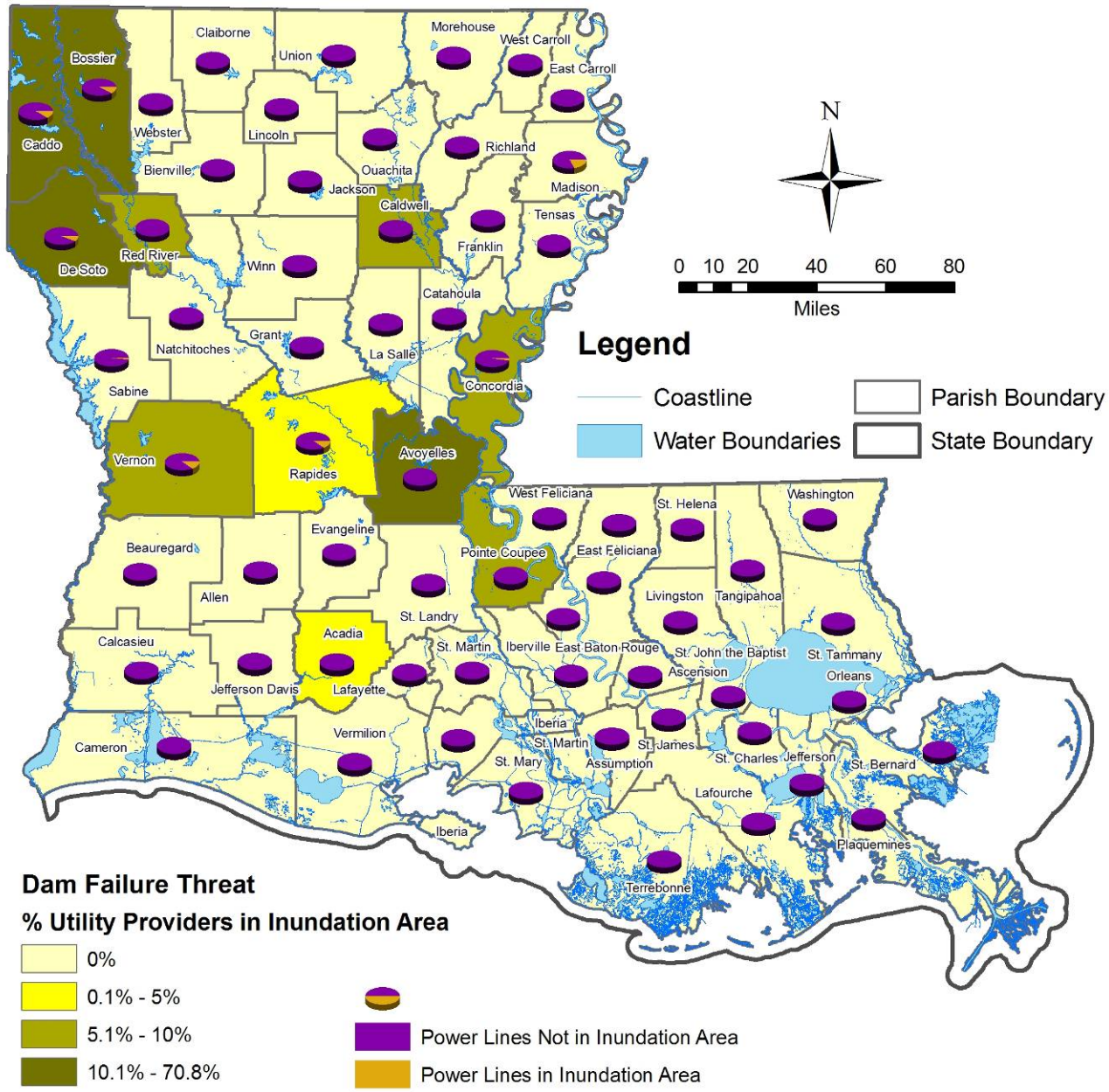
The number of utility providers and the number of power lines by parish within the inundation areas are shown in Table E-70 and Map E-116. Map E-117 shows the parishes ranked by percentage.

Table E-70: Utilities by Parish within the Inundation Areas

Parish	Total Utility Providers	Utility Providers in Inundation Area	% Utility Providers in Inundation Area	Miles of Power Lines	Miles of Power Lines in Inundation Area	% Power Lines in Inundation Area	Hazard Ranking
Acadia	87	1	1.1%	272.71	0.00	0.0%	Medium
Allen	18	0	0.0%	29.36	0.00	0.0%	Low
Ascension	233	0	0.0%	126.03	0.00	0.0%	Low
Assumption	20	0	0.0%	24.65	0.00	0.0%	Low
Avoyelles	21	3	14.3%	14.92	0.00	0.0%	High
Beauregard	19	0	0.0%	106.20	0.00	0.0%	Low
Bienville	17	0	0.0%	85.82	0.00	0.0%	Low
Bossier	65	46	70.8%	24.06	2.15	8.9%	High
Caddo	163	37	22.7%	211.32	22.31	10.6%	High
Calcasieu	551	0	0.0%	515.08	0.00	0.0%	Low
Caldwell	11	1	9.1%	30.65	0.00	0.0%	Medium
Cameron	41	0	0.0%	95.93	0.00	0.0%	Low
Catahoula	5	0	0.0%	49.32	0.00	0.0%	Low
Claiborne	12	0	0.0%	26.49	0.00	0.0%	Low
Concordia	25	2	8.0%	107.28	3.13	2.9%	Medium
De Soto	59	9	15.3%	117.57	8.85	7.5%	High
East Baton Rouge	8508	0	0.0%	381.83	0.87	0.2%	Medium
East Carroll	3	0	0.0%	18.42	0.00	0.0%	Low
East Feliciana	12	0	0.0%	91.81	0.00	0.0%	Low
Evangeline	31	0	0.0%	99.04	0.00	0.0%	Low
Franklin	15	0	0.0%	26.67	0.00	0.0%	Low
Grant	12	0	0.0%	39.63	0.00	0.0%	Low
Iberia	107	0	0.0%	80.07	0.00	0.0%	Low
Iberville	296	0	0.0%	202.46	0.00	0.0%	Low
Jackson	16	0	0.0%	50.28	0.00	0.0%	Low
Jefferson	383	0	0.0%	178.22	0.00	0.0%	Low
Jefferson Davis	50	0	0.0%	185.21	0.00	0.0%	Low
Lafayette	330	0	0.0%	167.52	0.00	0.0%	Low
Lafourche	120	0	0.0%	203.53	0.00	0.0%	Low
La Salle	14	0	0.0%	62.58	0.00	0.0%	Low
Lincoln	41	0	0.0%	79.64	0.00	0.0%	Low
Livingston	106	0	0.0%	81.86	0.00	0.0%	Low
Madison	10	0	0.0%	82.40	15.55	18.9%	High

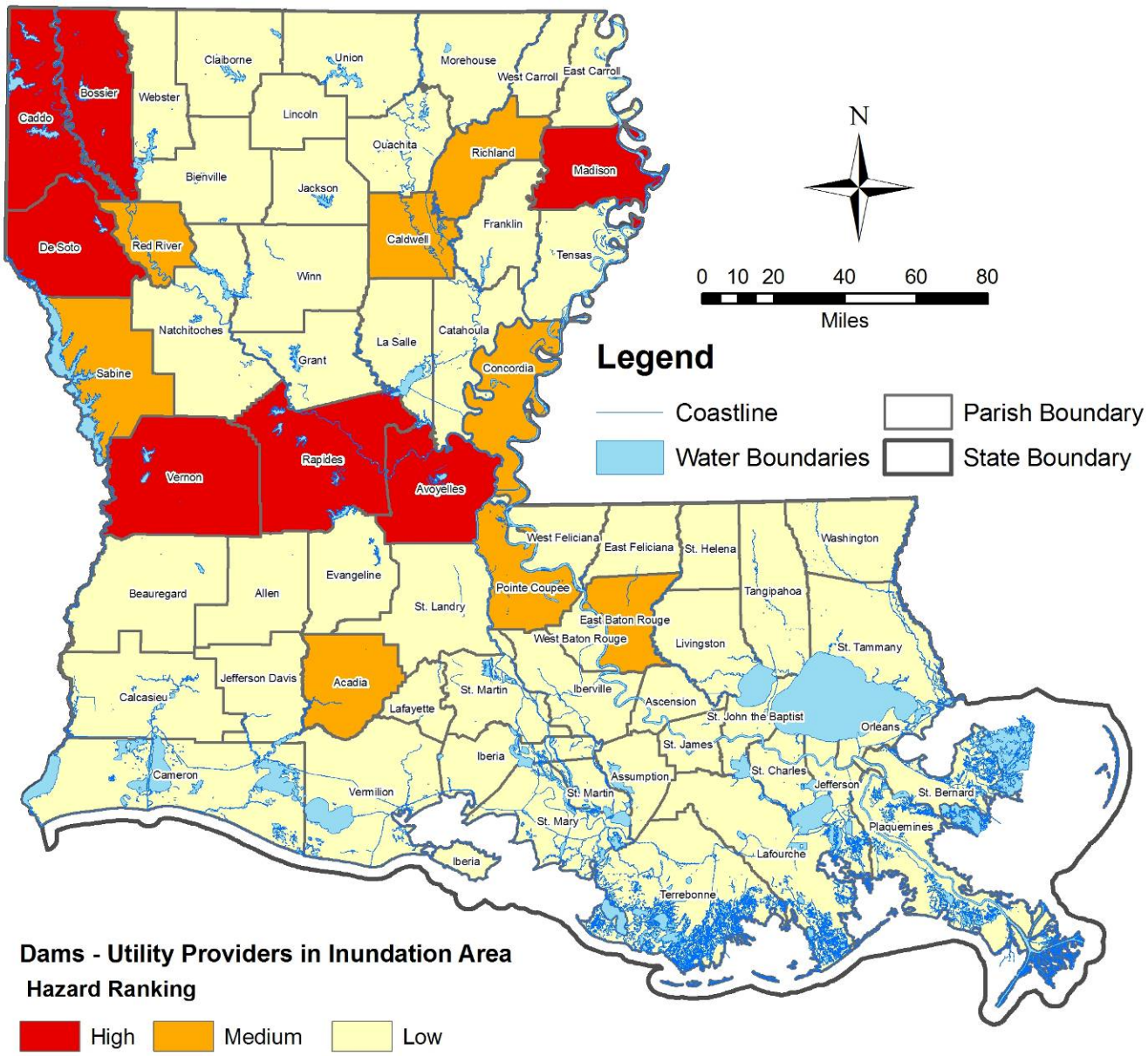
Parish	Total Utility Providers	Utility Providers in Inundation Area	% Utility Providers in Inundation Area	Miles of Power Lines	Miles of Power Lines in Inundation Area	% Power Lines in Inundation Area	Hazard Ranking
Morehouse	34	0	0.0%	81.01	0.00	0.0%	Low
Natchitoches	43	0	0.0%	77.28	0.00	0.0%	Low
Orleans	174	0	0.0%	131.83	0.00	0.0%	Low
Ouachita	172	0	0.0%	165.39	0.00	0.0%	Low
Plaquemines	147	0	0.0%	130.81	0.00	0.0%	Low
Pointe Coupee	79	4	5.1%	179.52	0.00	0.0%	Medium
Rapides	122	5	4.1%	192.24	22.26	11.6%	High
Red River	10	1	10.0%	62.27	0.00	0.0%	Medium
Richland	16	0	0.0%	52.59	0.37	0.7%	Medium
Sabine	25	0	0.0%	104.45	2.29	2.2%	Medium
St. Bernard	112	0	0.0%	45.90	0.00	0.0%	Low
St. Charles	195	0	0.0%	192.05	0.00	0.0%	Low
St. Helena	7	0	0.0%	40.47	0.00	0.0%	Low
St. James	128	0	0.0%	68.73	0.00	0.0%	Low
St. John the Baptist	95	0	0.0%	79.67	0.00	0.0%	Low
St. Landry	89	0	0.0%	186.16	0.00	0.0%	Low
St. Martin	75	0	0.0%	94.98	0.00	0.0%	Low
St. Mary	101	0	0.0%	61.39	0.00	0.0%	Low
St. Tammany	321	0	0.0%	142.12	0.00	0.0%	Low
Tangipahoa	187	0	0.0%	109.73	0.00	0.0%	Low
Tensas	5	0	0.0%	0.00	0.00	0.0%	Low
Terrebonne	167	0	0.0%	79.26	0.00	0.0%	Low
Union	17	0	0.0%	110.76	0.00	0.0%	Low
Vermilion	81	0	0.0%	118.76	0.00	0.0%	Low
Vernon	52	5	9.6%	89.46	10.49	11.7%	High
Washington	52	0	0.0%	116.27	0.00	0.0%	Low
Webster	47	0	0.0%	92.83	0.00	0.0%	Low
West Baton Rouge	144	0	0.0%	118.54	0.00	0.0%	Low
West Carroll	10	0	0.0%	43.39	0.00	0.0%	Low
West Feliciana	52	0	0.0%	71.11	0.00	0.0%	Low
Winn	18	0	0.0%	64.62	0.00	0.0%	Low

Map E-116: Utilities by Parish within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Utility Providers and Power Lines), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

Map E-117: Parishes Ranked by Utilities within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Utility Providers and Power Lines), USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations)

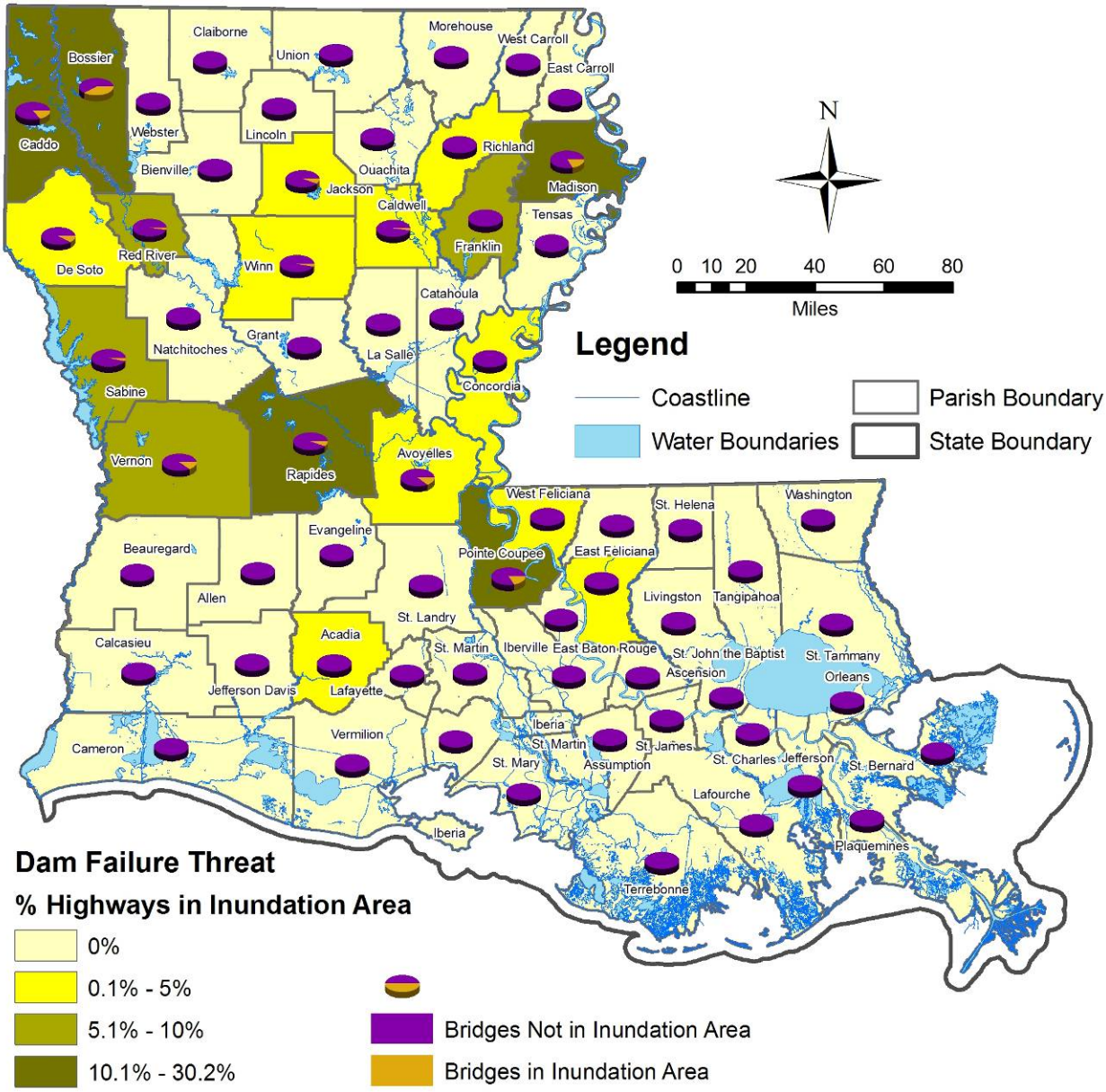
The amount of transportation infrastructure (bridges, roadways and railways) by parish within the inundation areas is shown in Table E-71, Map E-118 Shows Bridges and Roadways, and Map-119 shows railways. Map E-120 shows the parishes ranked by percentage.

Table E-71: Transportation Infrastructure by Parish within the Inundation Areas

Parish	Total Bridges	Bridges in Inundation Areas	% Bridges in Inundation Areas	Miles of Hwys	Miles of Hwys in Inundation Areas	% Hwys in Inundation Areas	Miles of Railways	Miles of Railways in Inundation Areas	% Railways in Inundation Areas	Hazard Ranking
Acadia	296	2	0.7%	104.4	0.95	0.9%	60.6	1.03	1.7%	Medium
Allen	183	0	0.0%	102.7	0.00	0.0%	73.9	0.00	0.0%	Low
Ascension	189	0	0.0%	112.0	0.00	0.0%	73.5	0.00	0.0%	Low
Assumption	50	0	0.0%	78.1	0.00	0.0%	10.9	0.00	0.0%	Low
Avoyelles	156	20	12.8%	125.6	5.47	4.4%	50.1	1.40	2.8%	High
Beauregard	223	0	0.0%	158.4	0.00	0.0%	96.9	0.00	0.0%	Low
Bienville	191	0	0.0%	148.3	0.00	0.0%	59.6	0.00	0.0%	Low
Bossier	249	100	40.2%	165.6	50.07	30.2%	107.1	42.00	39.2%	High
Caddo	562	92	16.4%	244.0	56.44	23.1%	175.2	31.70	18.1%	High
Calcasieu	382	0	0.0%	252.6	0.00	0.0%	137.2	0.00	0.0%	Low
Caldwell	125	3	2.4%	82.9	2.84	3.4%	32.5	0.00	0.0%	Medium
Cameron	53	0	0.0%	127.0	0.00	0.0%	0.0	0.00	0.0%	Low
Catahoula	68	0	0.0%	113.1	0.00	0.0%	0.0	0.00	0.0%	Low
Claiborne	156	0	0.0%	169.6	0.00	0.0%	34.5	0.00	0.0%	Low
Concordia	37	0	0.0%	127.8	5.41	4.2%	0.0	0.00	0.0%	Medium
De Soto	225	22	9.8%	191.2	7.85	4.1%	79.5	5.02	6.3%	Medium
East Baton Rouge	457	3	0.7%	189.8	0.05	0.0%	76.8	0.00	0.0%	Medium
East Carroll	59	0	0.0%	61.1	0.00	0.0%	35.5	0.00	0.0%	Low
East Feliciana	143	0	0.0%	61.9	0.00	0.0%	30.7	0.00	0.0%	Low
Evangeline	185	0	0.0%	111.7	0.00	0.0%	35.1	0.00	0.0%	Low
Franklin	143	0	0.0%	95.7	6.21	6.5%	0.0	0.00	0.0%	Medium
Grant	153	0	0.0%	152.1	0.00	0.0%	99.0	0.00	0.0%	Low
Iberia	125	0	0.0%	57.3	0.00	0.0%	48.1	0.00	0.0%	Low
Iberville	81	0	0.0%	39.0	0.00	0.0%	61.1	0.00	0.0%	Low
Jackson	154	11	7.1%	101.3	4.63	4.6%	14.1	0.00	0.0%	Medium
Jefferson	252	0	0.0%	151.3	0.00	0.0%	83.4	0.00	0.0%	Low
Jefferson Davis	244	0	0.0%	132.3	0.00	0.0%	55.2	0.00	0.0%	Low
Lafayette	274	0	0.0%	132.7	0.00	0.0%	29.9	0.00	0.0%	Low
Lafourche	106	0	0.0%	225.8	0.00	0.0%	46.8	0.00	0.0%	Low
La Salle	192	0	0.0%	87.6	0.00	0.0%	19.7	0.00	0.0%	Low
Lincoln	190	0	0.0%	123.7	0.00	0.0%	31.7	0.00	0.0%	Low
Livingston	243	0	0.0%	93.1	0.00	0.0%	25.6	0.00	0.0%	Low

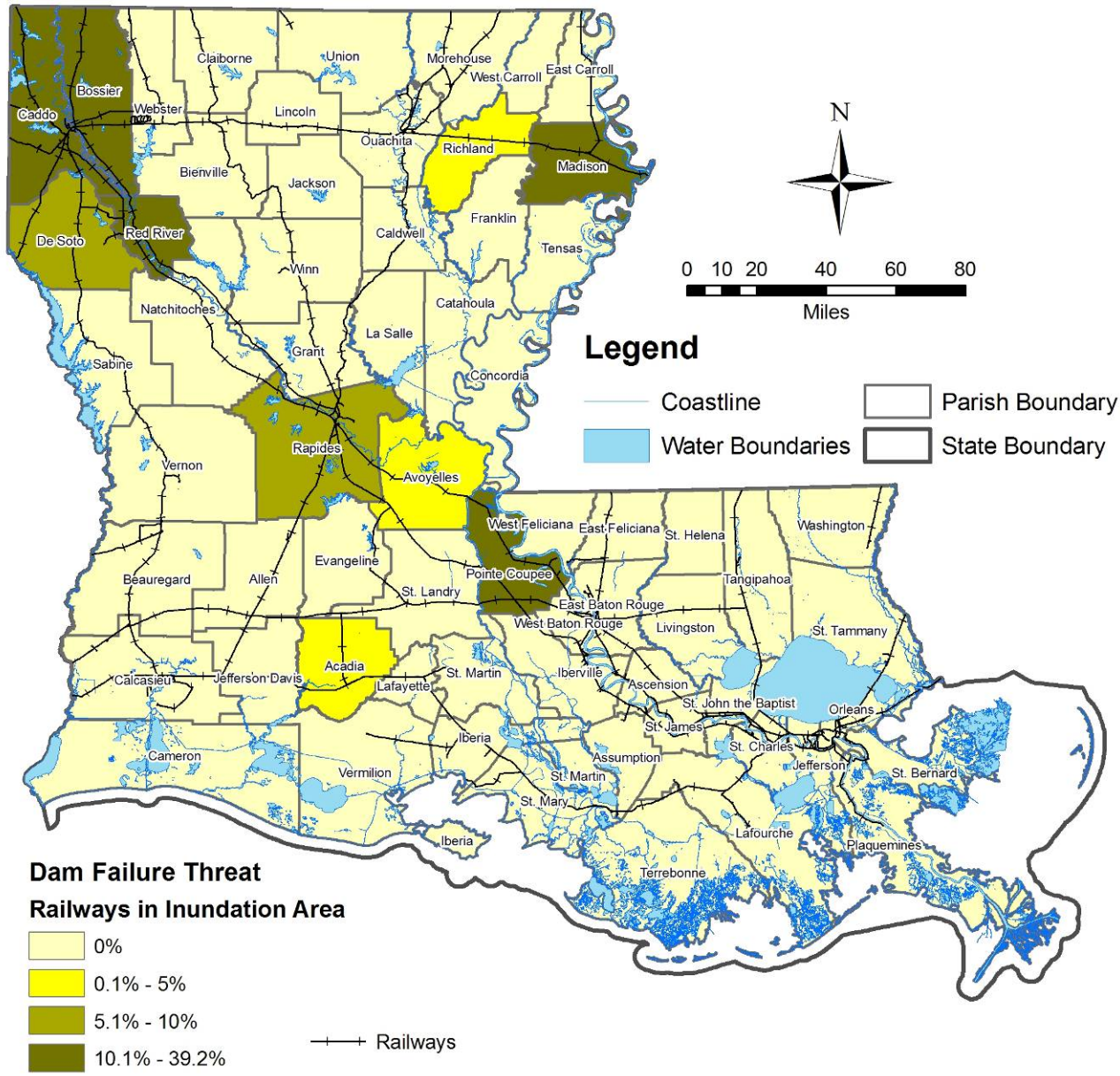
Parish	Total Bridges	Bridges in Inundation Areas	% Bridges in Inundation Areas	Miles of Hwys	Miles of Hwys in Inundation Areas	% Hwys in Inundation Areas	Miles of Railways	Miles of Railways in Inundation Areas	% Railways in Inundation Areas	Hazard Ranking
Madison	97	18	18.6%	95.1	13.34	14.0%	50.6	6.38	12.6%	High
Morehouse	135	0	0.0%	92.0	0.00	0.0%	78.0	0.00	0.0%	Low
Natchitoches	287	0	0.0%	208.6	0.00	0.0%	71.6	0.00	0.0%	Low
Orleans	324	0	0.0%	179.1	0.00	0.0%	115.1	0.00	0.0%	Low
Ouachita	292	0	0.0%	154.7	0.00	0.0%	110.2	0.00	0.0%	Low
Plaquemines	32	0	0.0%	108.9	0.00	0.0%	37.7	0.00	0.0%	Low
Pointe Coupee	50	9	18.0%	94.4	17.84	18.9%	97.5	14.86	15.2%	High
Rapides	477	34	7.1%	373.6	40.26	10.8%	164.5	8.82	5.4%	High
Red River	67	2	3.0%	95.8	7.86	8.2%	63.1	8.22	13.0%	High
Richland	225	2	0.9%	128.7	1.66	1.3%	28.1	0.39	1.4%	Medium
Sabine	160	6	3.8%	137.4	7.38	5.4%	51.0	0.00	0.0%	Medium
St. Bernard	24	0	0.0%	46.7	0.00	0.0%	19.1	0.00	0.0%	Low
St. Charles	76	0	0.0%	58.6	0.00	0.0%	90.0	0.00	0.0%	Low
St. Helena	148	0	0.0%	40.0	0.00	0.0%	0.0	0.00	0.0%	Low
St. James	23	0	0.0%	79.0	0.00	0.0%	60.6	0.00	0.0%	Low
St. John the Baptist	39	0	0.0%	73.2	0.00	0.0%	74.7	0.00	0.0%	Low
St. Landry	327	0	0.0%	181.1	0.00	0.0%	90.9	0.00	0.0%	Low
St. Martin	112	0	0.0%	72.8	0.00	0.0%	10.5	0.00	0.0%	Low
St. Mary	127	0	0.0%	109.5	0.00	0.0%	69.6	0.00	0.0%	Low
St. Tammany	305	0	0.0%	240.1	0.00	0.0%	35.6	0.00	0.0%	Low
Tangipahoa	466	0	0.0%	201.7	0.00	0.0%	68.7	0.00	0.0%	Low
Tensas	44	0	0.0%	59.3	0.00	0.0%	0.0	0.00	0.0%	Low
Terrebonne	147	0	0.0%	170.7	0.00	0.0%	17.0	0.00	0.0%	Low
Union	110	0	0.0%	120.4	0.00	0.0%	7.4	0.00	0.0%	Low
Vermilion	263	0	0.0%	139.1	0.00	0.0%	21.6	0.00	0.0%	Low
Vernon	288	36	12.5%	262.2	22.68	8.7%	50.4	0.00	0.0%	High
Washington	278	0	0.0%	116.8	0.00	0.0%	26.4	0.00	0.0%	Low
Webster	194	0	0.0%	159.8	0.00	0.0%	115.2	0.00	0.0%	Low
West Baton Rouge	61	0	0.0%	46.2	0.00	0.0%	67.9	0.00	0.0%	Low
West Carroll	115	0	0.0%	60.6	0.00	0.0%	0.0	0.00	0.0%	Low
West Feliciana	91	0	0.0%	37.0	0.94	2.5%	5.0	0.00	0.0%	Medium
Winn	203	8	3.9%	128.3	3.19	2.5%	50.9	0.00	0.0%	Medium

Map E-118: Bridges and Roadways by Parish within the Inundation Areas



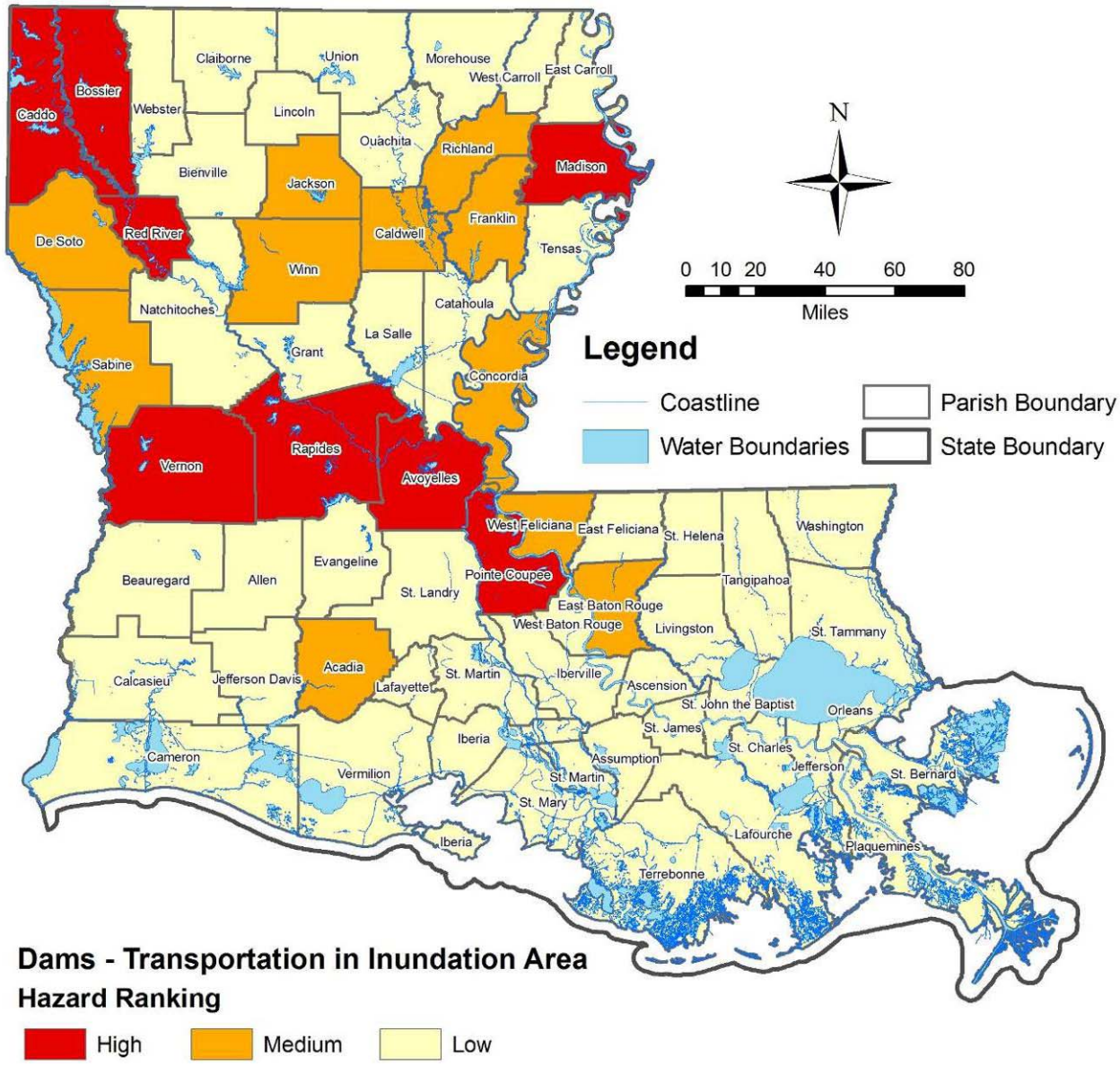
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Highways, Railways) USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations) National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

Map E-119: Railways by Parish within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Highways, Railways) USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations) National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

Map E-120: Transportation by Parish within the Inundation Areas



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Highways, Railways) USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations) National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

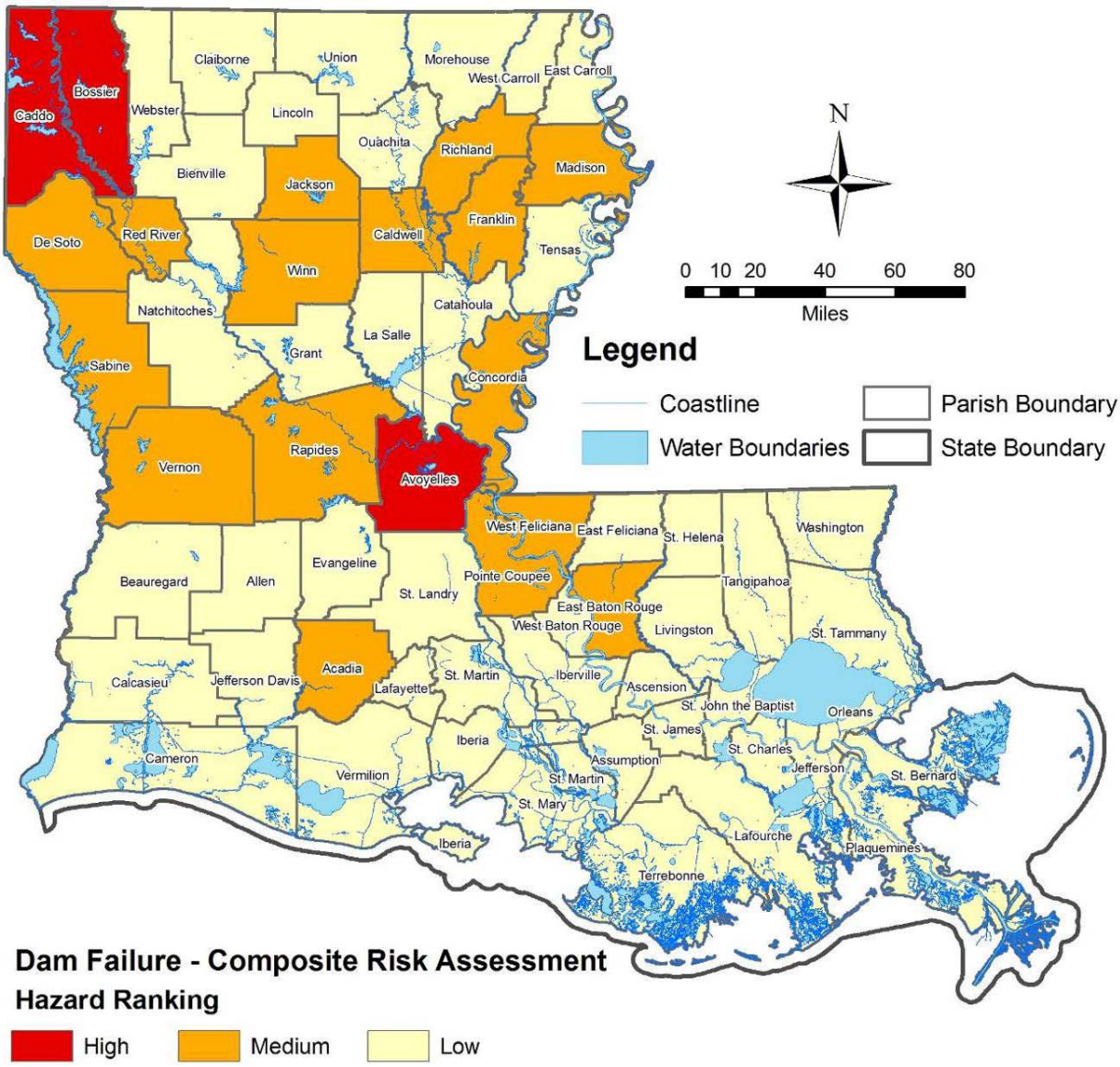
The composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points, and each low ranking one (1) point. Following this methodology the possible range of scores for Dam Failure is 7 to 21. A high Dam Failure Hazard would be assigned to a parish receiving a score of 19 to 21; medium would be for parishes scoring 11 to 18; and low would be for any parish scoring 7 to 10. Table E-72 and Map E-121 show the parishes ranked by score.

Table E-72: Dam Failure Rankings by Parish

Parish	Occurrence Hazard Ranking	Impacted Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Utilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
Acadia	Medium	Medium	Medium	Medium	Low	Medium	Medium	13
Allen	Low	Low	Low	Low	Low	Low	Low	7
Ascension	Low	Low	Low	Low	Low	Low	Low	7
Assumption	Low	Low	Low	Low	Low	Low	Low	7
Avoyelles	High	Medium	High	High	Medium	High	High	19
Beauregard	Low	Low	Low	Low	Low	Low	Low	7
Bienville	Low	Low	Low	Low	Low	Low	Low	7
Bossier	High	High	High	High	High	High	High	21
Caddo	High	High	High	High	High	High	High	21
Calcasieu	Low	Low	Low	Low	Low	Low	Low	7
Caldwell	Medium	Medium	Medium	Medium	Low	Medium	Medium	13
Cameron	Low	Low	Low	Low	Low	Low	Low	7
Catahoula	Medium	Low	Medium	Medium	Low	Low	Low	10
Claiborne	Low	Low	Low	Low	Low	Low	Low	7
Concordia	Medium	Medium	Medium	Medium	Low	Medium	Medium	13
De Soto	Medium	Medium	Medium	Medium	Medium	High	Medium	15
East Baton Rouge	Medium	Medium	Medium	High	Medium	Medium	Medium	15
East Carroll	Low	Low	Low	Low	Low	Low	Low	7
East Feliciana	Low	Low	Low	Low	Low	Low	Low	7
Evangeline	Low	Low	Low	Low	Low	Low	Low	7
Franklin	Medium	Medium	Medium	Medium	Low	Low	Medium	12
Grant	Medium	Low	Low	Low	Low	Low	Low	8
Iberia	Low	Low	Low	Low	Low	Low	Low	7
Iberville	Low	Low	Low	Low	Low	Low	Low	7
Jackson	Medium	Medium	Medium	Medium	Low	Low	Medium	12
Jefferson	Low	Low	Low	Low	Low	Low	Low	7
Jefferson Davis	Low	Low	Low	Low	Low	Low	Low	7
Lafayette	Low	Low	Low	Low	Low	Low	Low	7
Lafourche	Low	Low	Low	Low	Low	Low	Low	7
La Salle	Low	Low	Low	Low	Low	Low	Low	7
Lincoln	Low	Low	Low	Low	Low	Low	Low	7

Parish	Occurrence Hazard Ranking	Impacted Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Utilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
Livingston	Low	Low	Low	Low	Low	Low	Low	7
Madison	High	Medium	Medium	Medium	Low	High	High	16
Morehouse	Low	Low	Low	Low	Low	Low	Low	7
Natchitoches	Low	Low	Low	Low	Low	Low	Low	7
Orleans	Low	Low	Low	Low	Low	Low	Low	7
Ouachita	Low	Low	Low	Low	Low	Low	Low	7
Plaquemines	Low	Low	Low	Low	Low	Low	Low	7
Pointe Coupee	High	Medium	Medium	Medium	Medium	Medium	High	16
Rapides	Medium	Medium	Medium	High	Medium	High	High	17
Red River	Medium	Medium	Medium	Medium	Low	Medium	High	14
Richland	Medium	Medium	Medium	Medium	Low	Medium	Medium	13
Sabine	Medium	Medium	Medium	Medium	Medium	Medium	Medium	14
St. Bernard	Low	Low	Low	Low	Low	Low	Low	7
St. Charles	Low	Low	Low	Low	Low	Low	Low	7
St. Helena	Low	Low	Low	Low	Low	Low	Low	7
St. James	Low	Low	Low	Low	Low	Low	Low	7
St. John the Baptist	Low	Low	Low	Low	Low	Low	Low	7
St. Landry	Low	Low	Low	Low	Low	Low	Low	7
St. Martin	Low	Low	Low	Low	Low	Low	Low	7
St. Mary	Low	Low	Low	Low	Low	Low	Low	7
St. Tammany	Low	Low	Low	Low	Low	Low	Low	7
Tangipahoa	Low	Low	Low	Low	Low	Low	Low	7
Tensas	Low	Low	Low	Low	Low	Low	Low	7
Terrebonne	Low	Low	Low	Low	Low	Low	Low	7
Union	Low	Low	Low	Low	Low	Low	Low	7
Vermilion	Low	Low	Low	Low	Low	Low	Low	7
Vernon	Medium	Medium	Medium	High	Medium	High	High	17
Washington	Low	Low	Low	Low	Low	Low	Low	7
Webster	Low	Low	Low	Low	Low	Low	Low	7
West Baton Rouge	Low	Low	Low	Low	Low	Low	Low	7
West Carroll	Low	Low	Low	Low	Low	Low	Low	7
West Feliciana	Medium	Low	Medium	Medium	Low	Low	Medium	11
Winn	Medium	Medium	Medium	Medium	Low	Low	Medium	12

Map E-121: Dam Failure Rankings by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population), HAZUS-MH MR4 (Highways, Railways, Buildings) USACE National Dam Inventory (Dams and Hazard Potential), Dam Safety Office DSO-98-004, "Prediction of Embankment Dam Breach Parameters" July 1998 (Inundation Area Calcuations), HSIP (Critical Facilities, Utilities) National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

Methodology

Dam vulnerability was assessed for the population, critical facilities, utilities, transportation infrastructure (bridges, utilities, and transportation infrastructure), and general building stock (i.e., residential, commercial, industrial, governmental, educational, agricultural and religious) within the inundation areas for high hazard dams (per USACE National Inventory of Dams classifications). The inundation areas were determined by utilizing a formula from the Bureau of Reclamation whereby three times the height times the width of each dam was calculated. This measurement showed the square footage of land within the inundation area. The square root of this number was calculated to provide a downstream reach of the inundation waters. These calculations are shown in table E-73.

Table E-73: Inundation Area Reach Calculations

Dam #	Dam Name	Length	Height	L x H	x3	Breach area sq/feet	/divide (ft)	sq Miles	Down stream distance
1	App Holding Pond Dam	6250	20	125000	3	375000	5280	71.02	8.43
2	Bayou Bodcau Dam	15850	76	1204600	3	3613800	5280	684.43	26.16
3	Breckenridge Lake Dam	510	21	10710	3	32130	5280	6.09	2.47
4	Caney Creek Dam	6190	78	482820	3	1448460	5280	274.33	16.56
5	Cotile Lake Dam	5870	36	211320	3	633960	5280	120.07	10.96
6	Cross Lake Dam	10820	50	541000	3	1623000	5280	307.39	17.53
7	Cypress Bayou No 1	2500	53	132500	3	397500	5280	75.28	8.68
8	Cypress Bayou No 2	2836	43	121948	3	365844	5280	69.29	8.32
9	Cypress Bayou No 3	1650	32	52800	3	158400	5280	30.00	5.48
10	Dolet Hills Make-Up Water Pond	2700	53	143100	3	429300	5280	81.31	9.02
11	Hideaway Harbor Lake	1390	17	23630	3	70890	5280	13.43	3.66
12	Lilly Bayou Control Structure	132	18	2376	3	7128	5280	1.35	1.16
13	Old River	1004	132.26	132789.04	3	398367.12	5280	75.45	8.69
14	Pennington Lake Dam	3100	21	65100	3	195300	5280	36.99	6.08
15	Poverty Point Reservoir Dam	8650	44.2	382330	3	1146990	5280	217.23	14.74
16	Rice Lake Dam	670	25	16750	3	50250	5280	9.52	3.08
17	Sibley Lake Dam	6500	36	234000	3	702000	5280	132.95	11.53
18	Toledo Bend	10350	135	1397250	3	4191750	5280	793.892	28.18
19	Wallace Lake Dam	4930	48	236640	3	709920	5280	134.45	11.60

The next step in the calculation was to determine the width of the inundation reach. This was found by following the elevation contour (topographical line) at the measurement of half the dam height. This height was selected because any potential water from a failure is unlikely to flow downstream at the full dam height. The final inundation area therefore is the area contained within this contour line out to the down stream distance.

The HAZUS-MH general building stock data provide the building valuation for each specific occupancy classification (e.g., single family residential, retail trade) developed from the 2000 Census and Dun & Bradstreet (D&B). The general building stock data set includes the residential, commercial, industrial, governmental, educational, agricultural, and religious buildings for each parish. This dataset was developed at the census block level and then aggregated at census tract or parish levels. This dataset is from the 2000 version of TIGER/Line files and first quarter of 2002 data from D&B. The dataset was developed by applying RS-means replacement values for typical building

floor areas and construction for each specific occupancy, a nationally accepted and annually published formula for estimating construction costs.

Population and general building stock exposure to dam failure was used to determine vulnerability. Specifically, population exposure to high hazard dams was used to determine vulnerability based on the National Inventory of Dams classifications, as follows:

Exposure to high hazard dams was chosen for analysis because of the potential harm to human life and buildings. High hazard dams are likely to cause fatalities and economic loss.

The analysis for population exposure used 2000 Census data overlaid with the locations of high hazard dams from the National Inventory of Dams to determine populations located in areas at risk.

Data Limitations

Lilly Bayou Control Structure and Sibley Lake Dam were not analyzed for their inundation areas, because the geolocator did not place them correctly—the apparent location of the dams was not in close proximity to any hydrologic features, so it made the digitization of the inundation areas impossible.

Toledo Bend Dam lacks NDI data that would allow the calculation of an estimated inundation area. The dam rests primarily in Texas at the state line, but the most vulnerable portion of the inundation area is in Louisiana, primarily in Vernon Parish. The inundation area was drawn by juxtaposing satellite photography of dam and reservoir with contour lines, and tracing the contours that align with the gravitational flow of water at that site.

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Appendix E.13:

Levee Failure

Levee failure hazard vulnerability and loss estimates were assessed for the population and general property (e.g., buildings, vehicles) based on the population exposed to levee failure. The location of levees was retrieved from the USACE as well as local sources.

The levee hazard ranking was based on the parishes that have the highest population exposure to levee failure. For the levee analysis, The US Army Corps of Engineers (USACE) Levee Protection Zone (LPZ) Boundaries were used. Utility providers include nuclear plants, sewage treatment plants, wastewater facilities, electric substations, and power plants. Critical Facilities include fire stations, law enforcement facilities, hospitals, schools, State EOCs, and EMS stations.

The high / medium / low rankings for each parish were developed by:

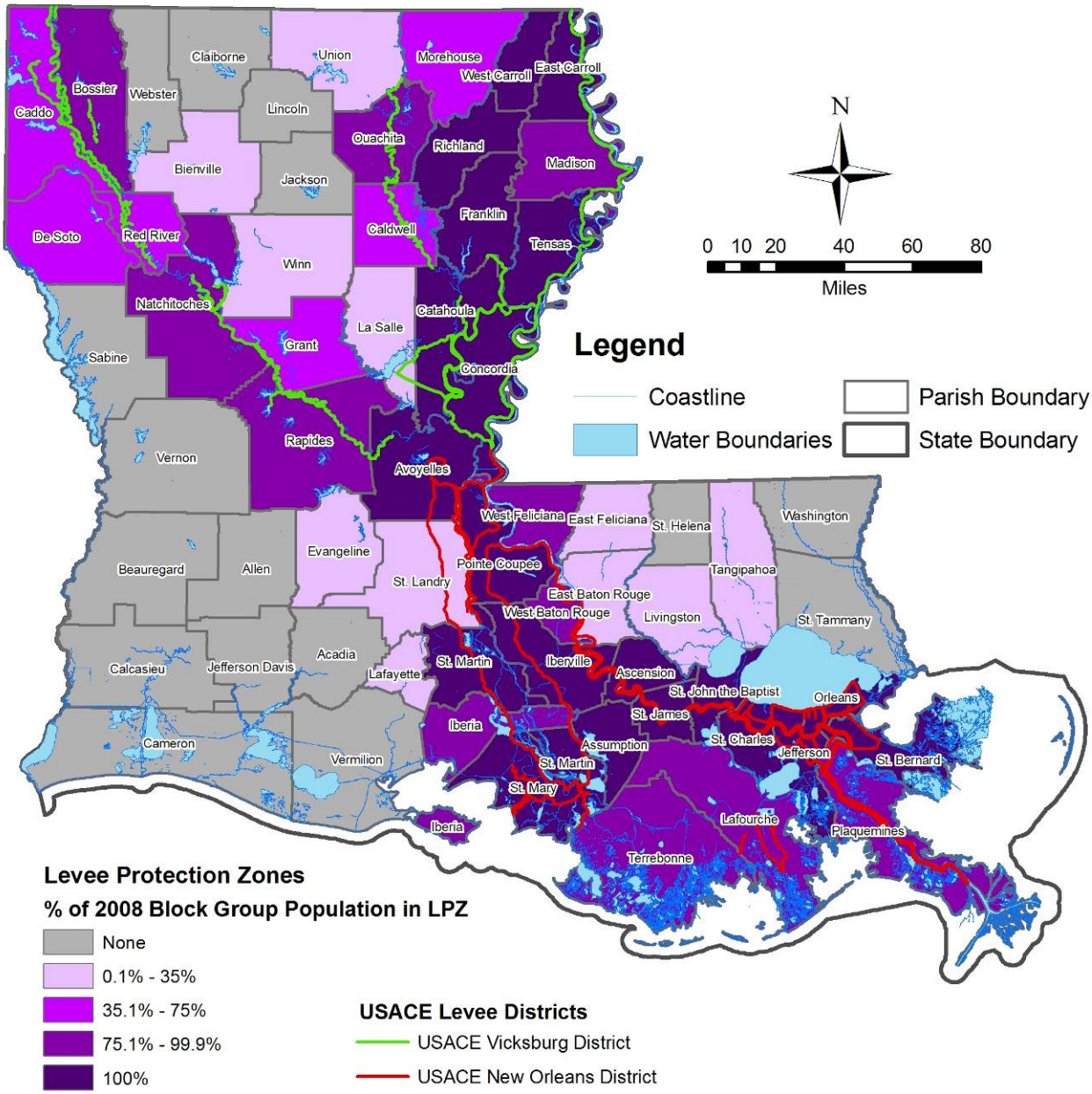
- Obtaining the USACE data by parish;
- Sorting the list by parish from most to least percentage of population within LPZs;
    - Assigning the High ranking to parishes with more than 75% of population within LPZs;
    - Assigning the Medium ranking to parishes with 15% to 75% of population within LPZs;
    - Assigning the Low ranking to parishes with less than 55% of population within LPZs;
- Sorting the list by parish from highest to lowest percentage of buildings in LPZs;
    - Assigning the High ranking to parishes with more than 75% of buildings within LPZs;
    - Assigning the Medium ranking to parishes with 15% to 75% of buildings within LPZs;
    - Assigning the Low ranking to parishes with less than 55% of buildings within LPZs;
- Sorting the list by parish from highest to lowest value of buildings in LPZs;
    - Assigning the High ranking to parishes with more than $3.5 billion of buildings within LPZs;
    - Assigning the Medium ranking to parishes with $750 million to $3.5 billion of buildings within LPZs;
    - Assigning the Low ranking to parishes with less than $750million of buildings within LPZs;
- Sorting the list by parish from highest to lowest percentage of critical facilities in LPZs; and
    - Assigning the High ranking to parishes with more than 75% of buildings within LPZs;
    - Assigning the Medium ranking to parishes with 15% to 75% of buildings within LPZs;
    - Assigning the low ranking to parishes with less than 15% of buildings within LPZs;
- Sorting the list by parish from highest to lowest percentage of either utility providers or power lines in LPZs;
    - Assigning the High ranking to parishes with more than 75% of either utilities or power lines within LPZs;
    - Assigning the Medium ranking to parishes with 15% to 75% of either utilities or power lines within LPZs;
    - Assigning the Low ranking to parishes with less than 15% of either utilities or power lines within LPZs;
- Sorting the list by parish from highest to lowest percentage of transportation infrastructure (bridges, highways and railways) in LPZs; and
    - Assigning the High ranking to parishes with more than 75% within LPZs;
    - Assigning the Medium ranking to parishes with 15% to 75% within LPZs;
    - Assigning the Low ranking to parishes with less than 15% within LPZs;
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the high composite ranking to parishes with a score of 15 or more;
    - Assigning the medium composite ranking to parishes with a score of 10 to 14; and
    - Assigning the low composite ranking to parishes with a score of 9 or less.

The number and percentage of each parish's population within the Levee Protection Zone is shown in Table E-74 and Map E-122. Map E-123 shows the parishes ranked by percentage.

Table E-74: Percentage of Population by Parish within the LPZ

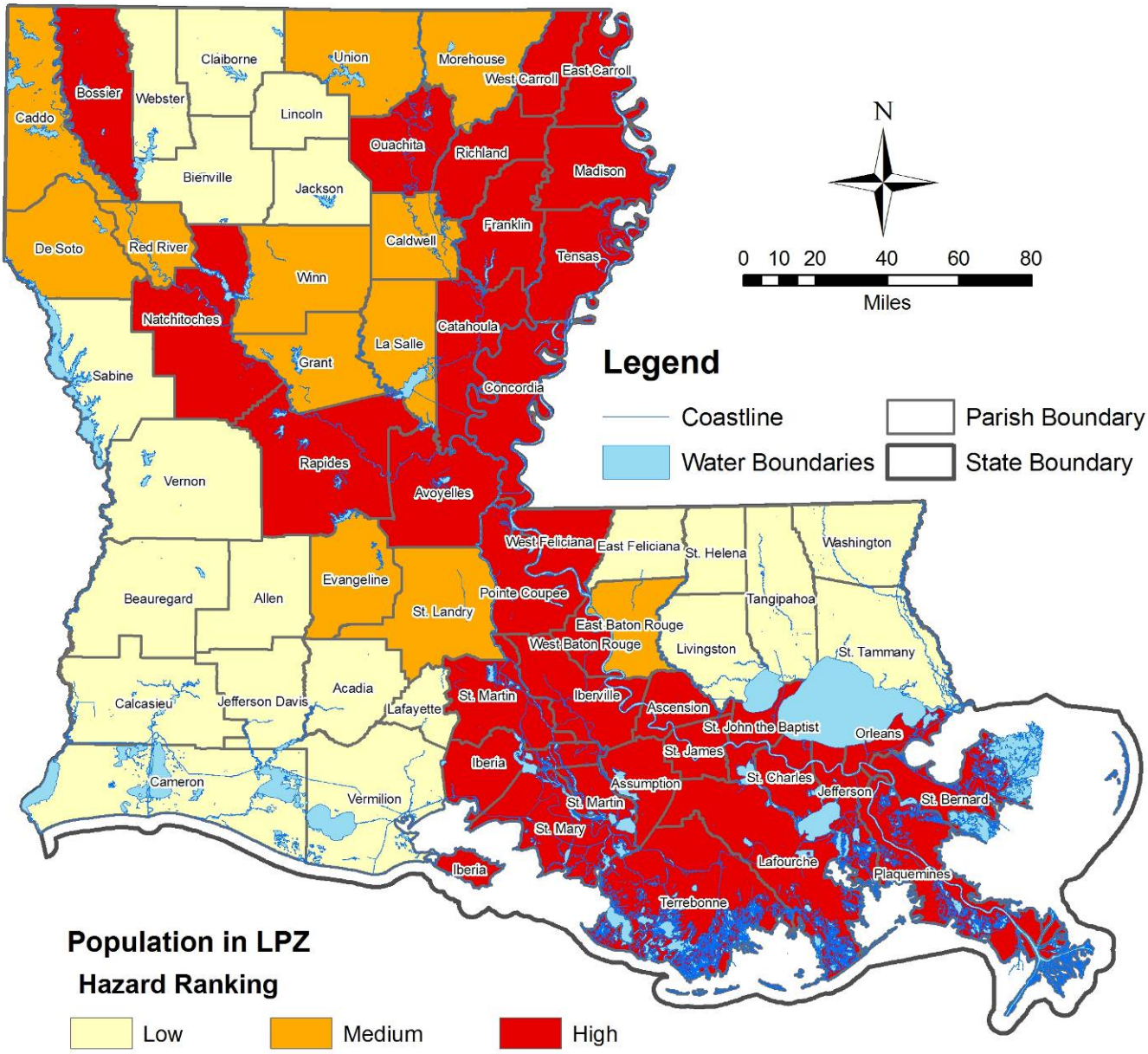
Parish	2008 Population	Population of Block Groups in LPZ	% of Parish Population in LPZ	Hazard Ranking	Parish	2008 Population	Population of Block Groups in LPZ	% of Parish Population in LPZ	Hazard Ranking
Acadia	61,385	0	0.0%	Low	Madison	12,661	12,648	99.9%	High
Allen	25,793	0	0.0%	Low	Morehouse	29,920	14,696	49.1%	Medium
Ascension	102,375	102,375	100.0%	High	Natchitoches	39,469	35,731	90.5%	High
Assumption	24,068	24,068	100.0%	High	Orleans	321,466	321,466	100.0%	High
Avoyelles	43,112	43,112	100.0%	High	Ouachita	151,669	118,694	78.3%	High
Beauregard	35,200	0	0.0%	Low	Plaquemines	29,240	26,347	90.1%	High
Bienville	15,511	575	3.7%	Low	Pointe Coupee	23,215	23,215	100.0%	High
Bossier	112,084	94,831	84.6%	High	Rapides	133,290	109,332	82.0%	High
Caddo	257,336	171,640	66.7%	Medium	Red River	9,662	4,351	45.0%	Medium
Calcasieu	189,924	0	0.0%	Low	Richland	20,982	20,982	100.0%	High
Caldwell	10,683	7,924	74.2%	Medium	Sabine	24,239	0	0.0%	Low
Cameron	8,648	0	0.0%	Low	St. Bernard	25,956	25,956	100.0%	High
Catahoula	10,816	10,816	100.0%	High	St. Charles	54,020	54,020	100.0%	High
Claiborne	16,410	0	0.0%	Low	St. Helena	10,655	0	0.0%	Low
Concordia	19,896	19,896	100.0%	High	St. James	22,212	22,212	100.0%	High
De Soto	26,799	9,397	35.1%	Medium	St. John the Baptist	48,940	48,940	100.0%	High
East Baton Rouge	434,018	74,950	17.3%	Medium	St. Landry	92,253	28,990	31.4%	Medium
East Carroll	8,814	8,814	100.0%	High	St. Martin	52,451	52,451	100.0%	High
East Feliciana	21,353	1,338	6.3%	Low	St. Mary	52,000	52,000	100.0%	High
Evangeline	36,630	6,231	17.0%	Medium	St. Tammany	239,132	0	0.0%	Low
Franklin	20,474	20,474	100.0%	High	Tangipahoa	117,927	5,132	4.4%	Low
Grant	21,034	10,674	50.7%	Medium	Tensas	6,196	6,196	100.0%	High
Iberia	75,989	64,417	84.8%	High	Terrebonne	111,494	110,573	99.2%	High
Iberville	33,283	33,283	100.0%	High	Union	23,494	3,838	16.3%	Medium
Jackson	15,389	0	0.0%	Low	Vermilion	57,337	0	0.0%	Low
Jefferson	446,686	446,669	100.0%	High	Vernon	51,009	0	0.0%	Low
Jefferson Davis	31,859	0	0.0%	Low	Washington	45,756	0	0.0%	Low
Lafayette	206,327	23,450	11.4%	Low	Webster	42,081	0	0.0%	Low
Lafourche	95,048	90,174	94.9%	High	West Baton Rouge	22,919	20,354	88.8%	High
La Salle	14,380	2,296	16.0%	Medium	West Carroll	11,804	11,804	100.0%	High
Lincoln	43,187	0	0.0%	Low	West Feliciana	15,746	12,923	82.1%	High
Livingston	120,877	10,365	8.6%	Low	Winn	16,044	3,112	19.4%	Medium

Map E-122: Percentage of Population by Parish within the LPZ



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population Block Group Estimates), US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems)

Map E-123: Parishes Ranked by Percentage of Population within the LPZ



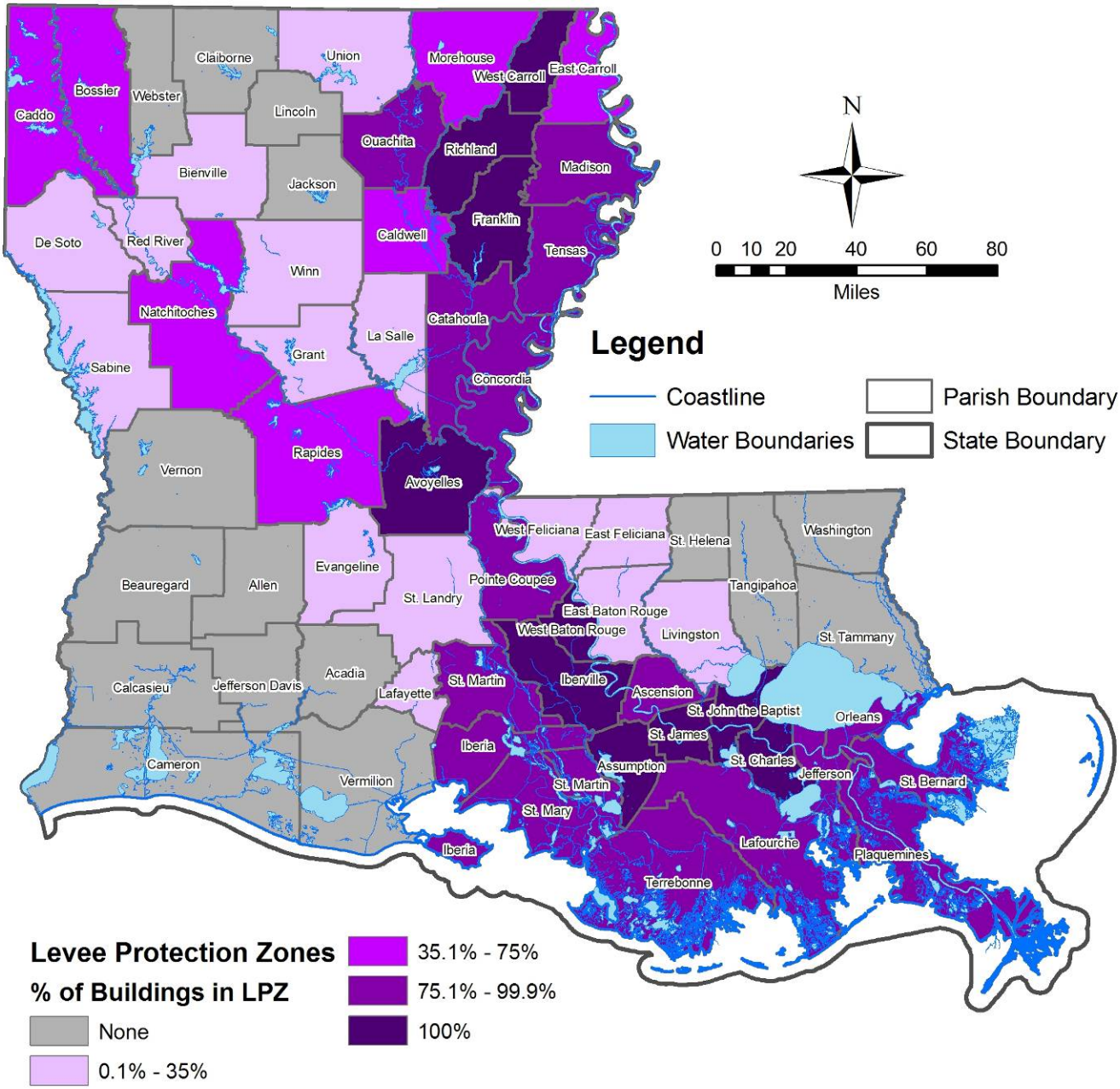
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population Block Group Estimates), US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems)

The number and percentage of each parish's buildings within the Levee Protection Zone is shown in Table E-75 and Map E-124. Map E-125 shows the parishes ranked by percentage.

Table E-75: Percentage of Building Quantity by Parish within the LPZ

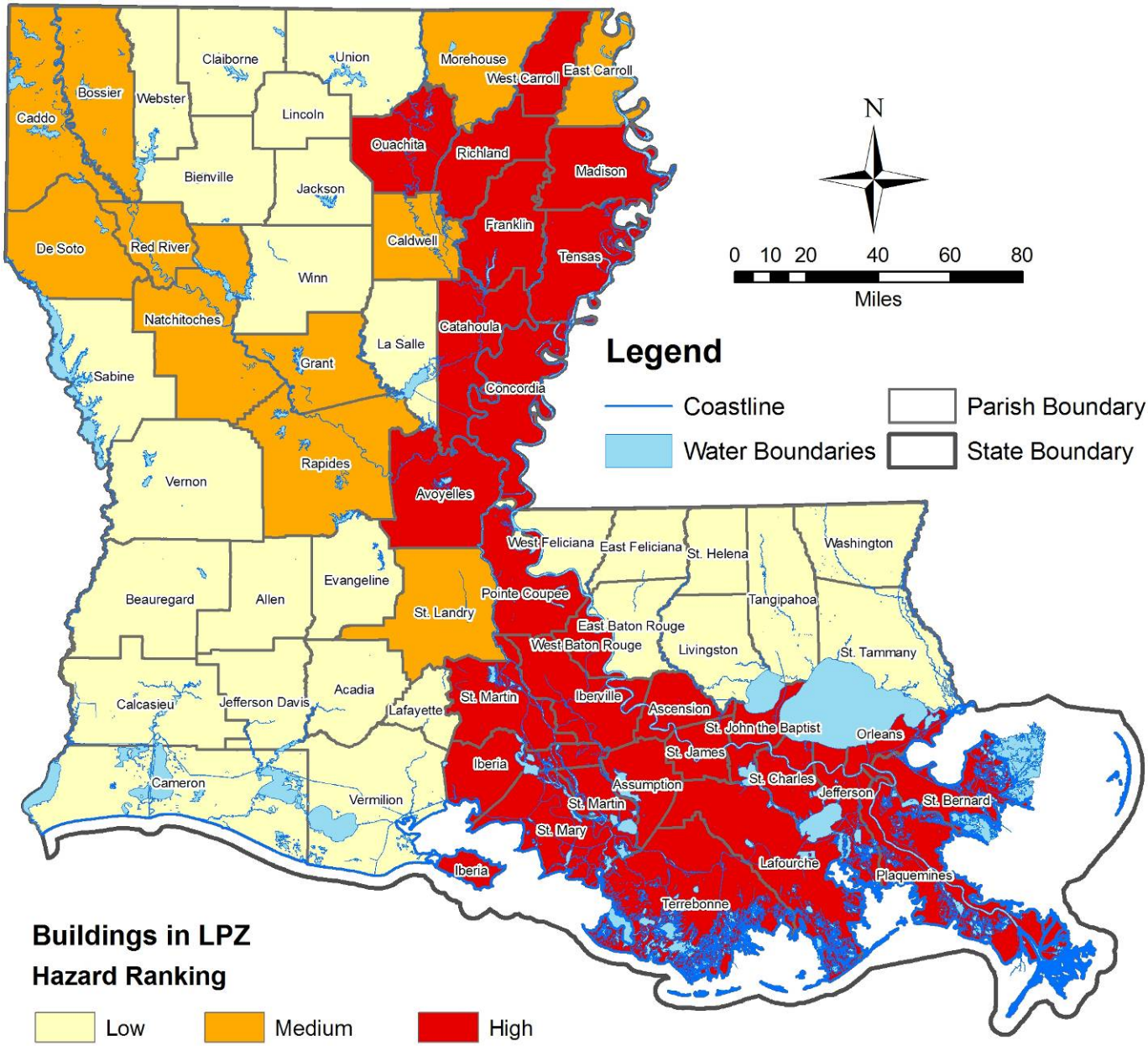
Parish	Total Buildings	Buildings in LPZ	% Buildings in LPZ	Hazard Ranking	Parish	Total Buildings	Buildings in LPZ	% Buildings in LPZ	Hazard Ranking
Acadia	27,817	0	0.0%	Low	Madison	6,576	6,395	97.2%	High
Allen	11,600	0	0.0%	Low	Morehouse	14,604	5,373	36.8%	Medium
Ascension	33,123	32,675	98.6%	High	Natchitoches	19,780	13,672	69.1%	Medium
Assumption	10,844	10,844	100.0%	High	Orleans	173,671	172,679	99.4%	High
Avoyelles	19,795	19,795	100.0%	High	Ouachita	62,493	47,452	75.9%	High
Beauregard	17,476	0	0.0%	Low	Plaquemines	12,374	11,172	90.3%	High
Bienville	10,612	110	1.0%	Low	Pointe Coupee	12,092	12,070	99.8%	High
Bossier	40,408	29,651	73.4%	Medium	Rapides	58,948	43,770	74.3%	Medium
Caddo	105,041	65,142	62.0%	Medium	Red River	4,767	1,155	24.2%	Medium
Calcasieu	80,762	0	0.0%	Low	Richland	10,847	10,847	100.0%	High
Caldwell	6,011	2,707	45.0%	Medium	Sabine	15,926	4	0.0%	Low
Cameron	6,211	0	0.0%	Low	St. Bernard	26,842	25,907	96.5%	High
Catahoula	6,483	6,273	96.8%	High	St. Charles	19,200	19,200	100.0%	High
Claiborne	9,517	0	0.0%	Low	St. Helena	6,254	0	0.0%	Low
Concordia	10,636	10,549	99.2%	High	St. James	8,815	8,815	100.0%	High
De Soto	13,848	2,741	19.8%	Medium	St. John the Baptist	16,521	16,521	100.0%	High
East Baton Rouge	151,107	14,651	9.7%	Low	St. Landry	43,957	12,339	28.1%	Medium
East Carroll	4,195	2,487	59.3%	Medium	St. Martin	24,736	23,958	96.9%	High
East Feliciana	10,030	53	0.5%	Low	St. Mary	24,408	24,036	98.5%	High
Evangeline	17,665	1,317	7.5%	Low	St. Tammany	84,508	0	0.0%	Low
Franklin	10,757	10,757	100.0%	High	Tangipahoa	45,367	0	0.0%	Low
Grant	10,350	2,350	22.7%	Medium	Tensas	4,467	3,606	80.7%	High
Iberia	32,309	25,326	78.4%	High	Terrebonne	43,923	42,187	96.0%	High
Iberville	15,059	15,059	100.0%	High	Union	13,760	376	2.7%	Low
Jackson	9,181	0	0.0%	Low	Vermilion	27,475	0	0.0%	Low
Jefferson	164,539	162,395	98.7%	High	Vernon	21,626	0	0.0%	Low
Jefferson Davis	16,691	0	0.0%	Low	Washington	23,350	0	0.0%	Low
Lafayette	81,011	5,123	6.3%	Low	Webster	21,865	0	0.0%	Low
Lafourche	40,570	36,329	89.5%	High	West Baton Rouge	10,252	10,252	100.0%	High
La Salle	7,828	924	11.8%	Low	West Carroll	5,945	5,945	100.0%	High
Lincoln	18,894	0	0.0%	Low	West Feliciana	5,056	740	14.6%	Low
Livingston	42,671	1,344	3.1%	Low	Winn	8,993	606	6.7%	Low

Map E-124: Percentage of Building Quantity by Parish within the LPZ



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Army Corps of Engineers National Levee Database (Protection Zone), HAZUS-MH MR4 (Building Data)

Map E-125: Parishes Ranked by Building Quantity within the LPZ



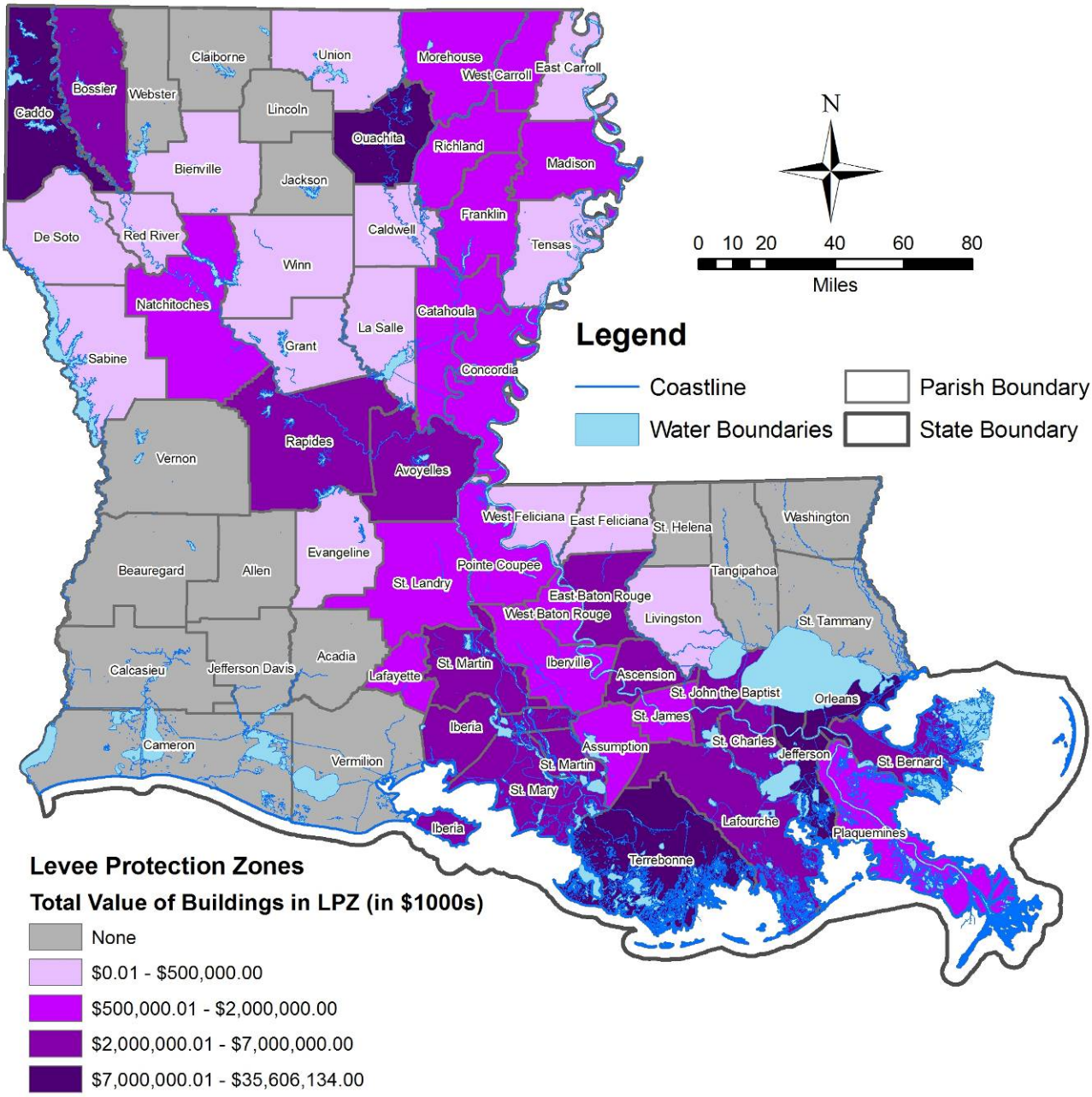
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Army Corps of Engineers National Levee Database (Protection Zone), HAZUS-MH MR4 (Building Data)

The value of each parish's building stock within the Levee Protection Zone is shown in Table E-76 and Map E-126. Map E-127 shows the parishes ranked by value.

Table E-76: Building Value by Parish within the LPZ

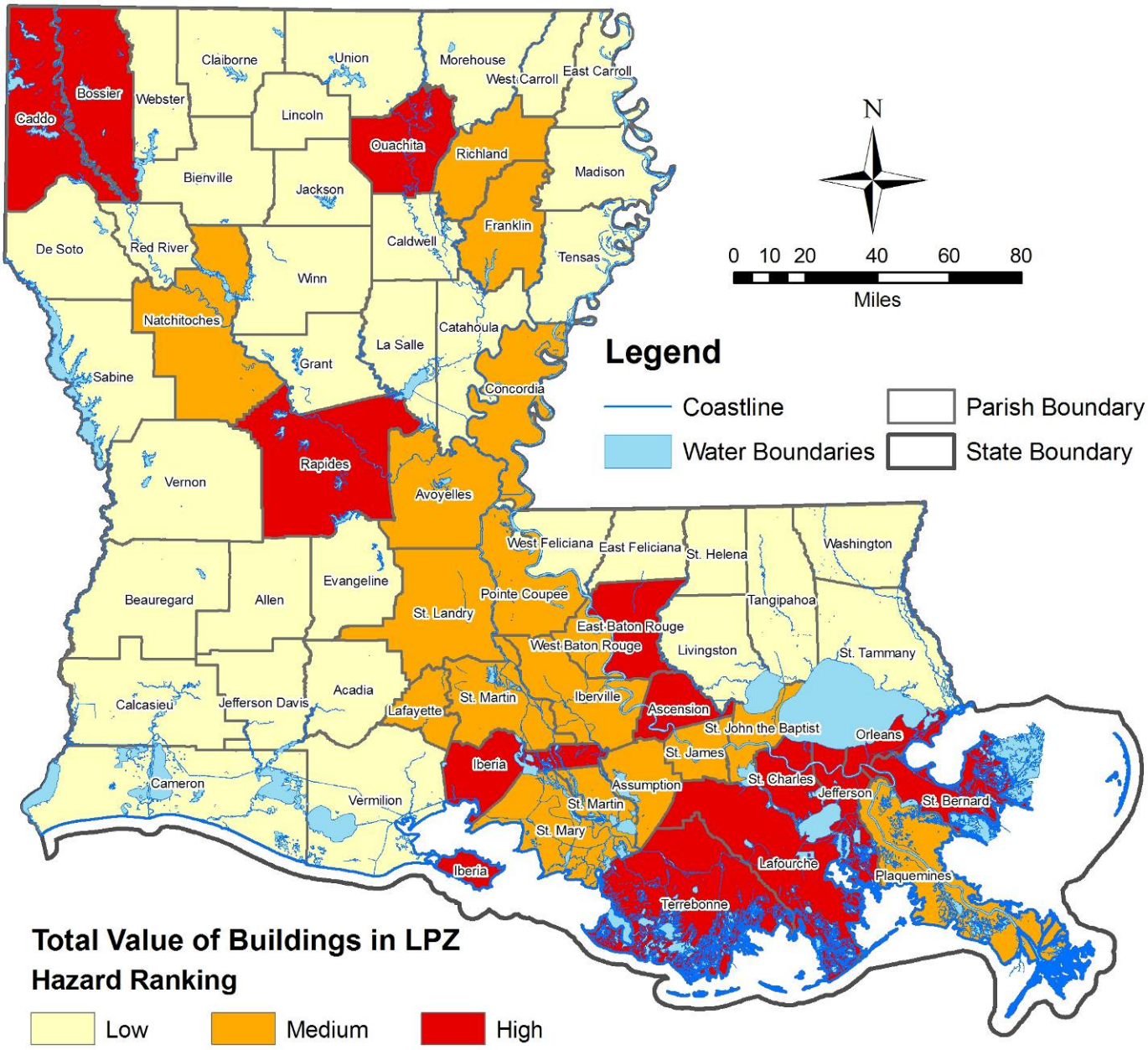
Parish	Total Value of Buildings in LPZ (in $1000s)	Hazard Ranking	Parish	Total Value of Buildings in LPZ (in $1000s)	Hazard Ranking
Acadia	$0	Low	Madison	$722,314	Low
Allen	$0	Low	Morehouse	$564,619	Low
Ascension	$5,188,369	High	Natchitoches	$1,769,313	Medium
Assumption	$1,302,583	Medium	Orleans	$35,337,274	High
Avoyelles	$2,234,094	Medium	Ouachita	$7,783,583	High
Beauregard	$0	Low	Plaquemines	$1,987,300	Medium
Bienville	$14,858	Low	Pointe Coupee	$1,448,263	Medium
Bossier	$5,474,129	High	Rapides	$6,526,114	High
Caddo	$11,034,663	High	Red River	$109,124	Low
Calcasieu	$0	Low	Richland	$1,120,709	Medium
Caldwell	$251,259	Low	Sabine	$341	Low
Cameron	$0	Low	St. Bernard	$4,361,443	High
Catahoula	$587,401	Low	St. Charles	$3,675,984	High
Claiborne	$0	Low	St. Helena	$0	Low
Concordia	$1,089,682	Medium	St. James	$1,305,211	Medium
De Soto	$288,573	Low	St. John the Baptist	$2,840,674	Medium
East Baton Rouge	$3,592,799	High	St. Landry	$1,258,231	Medium
East Carroll	$244,394	Low	St. Martin	$2,858,565	Medium
East Feliciana	$5,684	Low	St. Mary	$3,271,306	Medium
Evangeline	$159,839	Low	St. Tammany	$0	Low
Franklin	$1,143,675	Medium	Tangipahoa	$0	Low
Grant	$231,980	Low	Tensas	$341,525	Low
Iberia	$3,576,438	High	Terrebonne	$7,276,617	High
Iberville	$1,925,472	Medium	Union	$36,935	Low
Jackson	$0	Low	Vermilion	$0	Low
Jefferson	$35,606,134	High	Vernon	$0	Low
Jefferson Davis	$0	Low	Washington	$0	Low
Lafayette	$774,519	Medium	Webster	$0	Low
Lafourche	$5,441,722	High	West Baton Rouge	$1,469,082	Medium
La Salle	$97,189	Low	West Carroll	$656,232	Low
Lincoln	$0	Low	West Feliciana	$153,610	Low
Livingston	$163,100	Low	Winn	$50,731	Low

Figure E-126: Building Value by Parish within the LPZ



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Army Corps of Engineers National Levee Database (Protection Zone), HAZUS-MH MR4 (Building Data)

Figure E-127: Parishes Ranked by Building Value within the LPZ



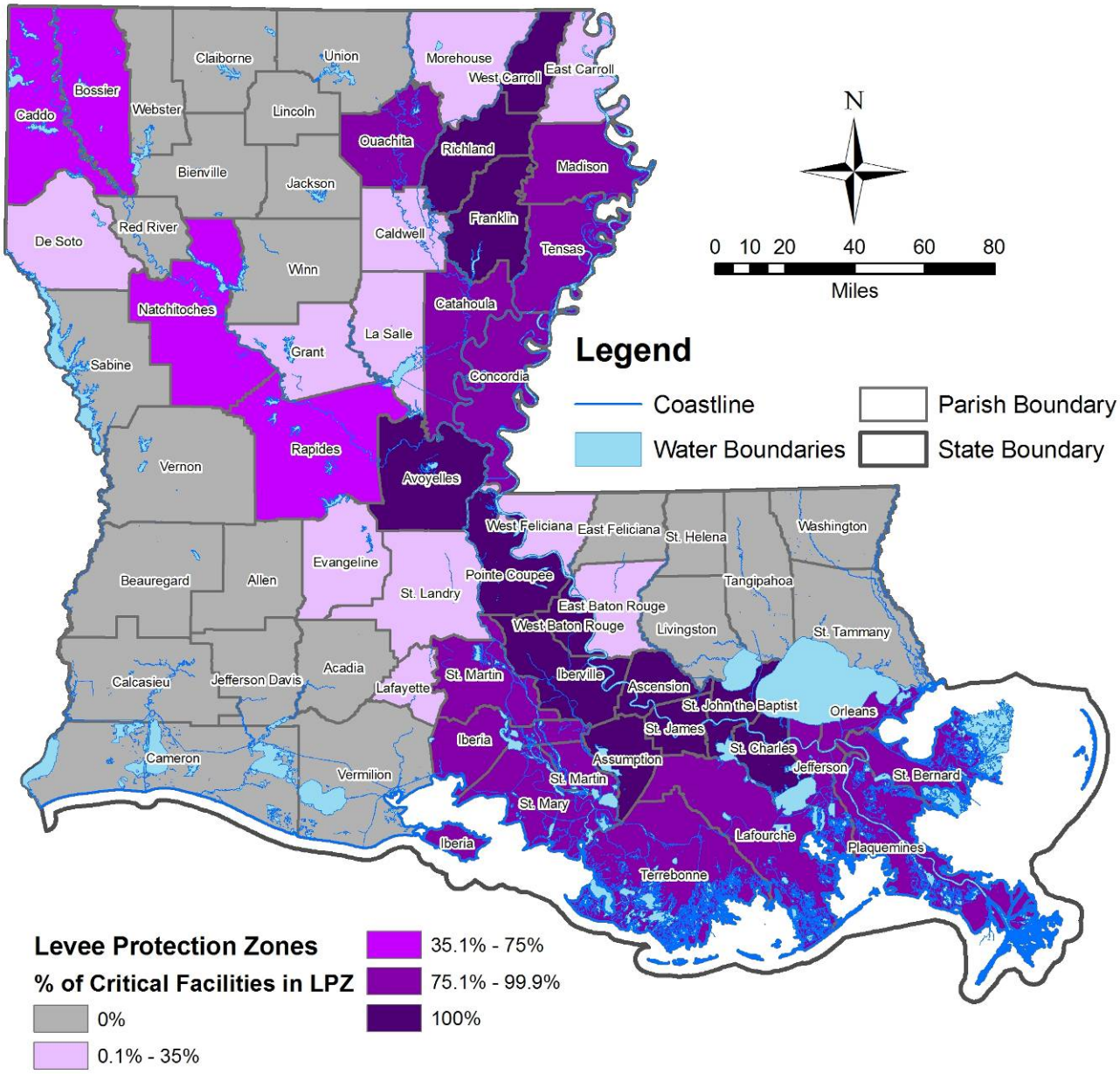
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Army Corps of Engineers National Levee Database (Protection Zone), HAZUS-MH MR4 (Building Data)

The quantity and percentage of each parish's critical facilities within the Levee Protection Zone is shown in Table E-77 and Map E-128. Map E-129 shows the parishes ranked by percentage.

Table E-77: Critical Facility Percentage by Parish within the LPZ

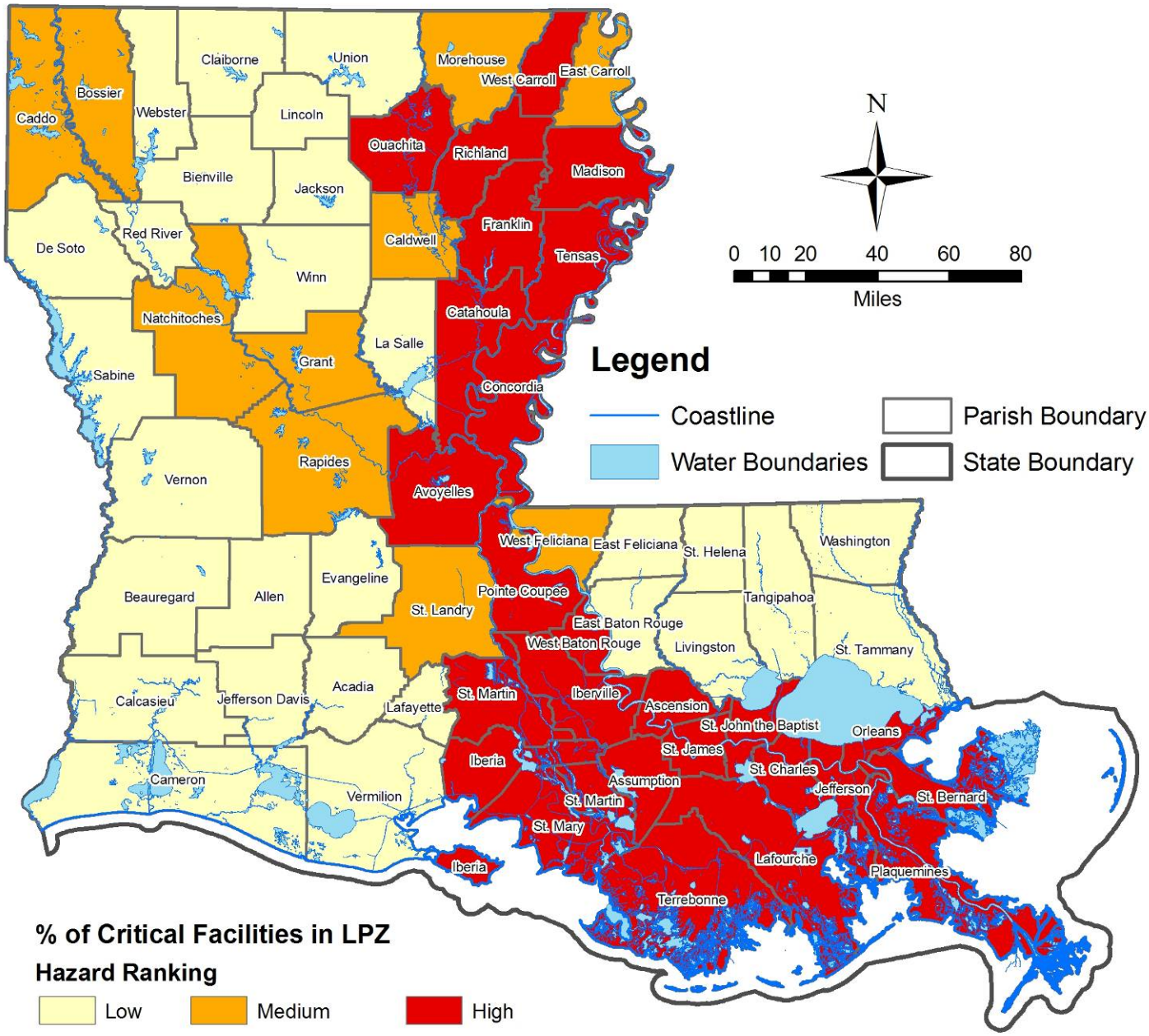
Parish	Total Critical Facilities	Critical Facilities in LPZ	% of Critical Facilities in LPZ	Hazard Ranking	Parish	Total Critical Facilities	Critical Facilities in LPZ	% of Critical Facilities in LPZ	Hazard Ranking
Acadia	64	0	0.0%	Low	Madison	19	18	94.7%	High
Allen	31	0	0.0%	Low	Morehouse	39	13	33.3%	Medium
Ascension	64	64	100.0%	High	Natchitoches	46	32	69.6%	Medium
Assumption	27	27	100.0%	High	Orleans	169	166	98.2%	High
Avoyelles	64	64	100.0%	High	Ouachita	119	91	76.5%	High
Beauregard	45	0	0.0%	Low	Plaquemines	18	16	88.9%	High
Bienville	36	0	0.0%	Low	Pointe Coupee	31	31	100.0%	High
Bossier	70	39	55.7%	Medium	Rapides	148	101	68.2%	Medium
Caddo	189	125	66.1%	Medium	Red River	12	0	0.0%	Low
Calcasieu	141	0	0.0%	Low	Richland	33	33	100.0%	High
Caldwell	23	8	34.8%	Medium	Sabine	42	0	0.0%	Low
Cameron	19	0	0.0%	Low	St. Bernard	19	17	89.5%	High
Catahoula	27	26	96.3%	High	St. Charles	57	57	100.0%	High
Claiborne	25	0	0.0%	Low	St. Helena	21	0	0.0%	Low
Concordia	37	36	97.3%	High	St. James	42	42	100.0%	High
De Soto	43	4	9.3%	Low	St. John the Baptist	36	36	100.0%	High
East Baton Rouge	261	21	8.0%	Low	St. Landry	98	33	33.7%	Medium
East Carroll	13	2	15.4%	Medium	St. Martin	46	45	97.8%	High
East Feliciana	32	0	0.0%	Low	St. Mary	69	67	97.1%	High
Evangeline	49	4	8.2%	Low	St. Tammany	148	0	0.0%	Low
Franklin	16	16	100.0%	High	Tangipahoa	89	0	0.0%	Low
Grant	29	6	20.7%	Medium	Tensas	21	18	85.7%	High
Iberia	55	44	80.0%	High	Terrebonne	83	80	96.4%	High
Iberville	41	41	100.0%	High	Union	29	0	0.0%	Low
Jackson	19	0	0.0%	Low	Vermilion	62	0	0.0%	Low
Jefferson	215	211	98.1%	High	Vernon	57	0	0.0%	Low
Jefferson Davis	37	0	0.0%	Low	Washington	51	0	0.0%	Low
Lafayette	126	3	2.4%	Low	Webster	78	0	0.0%	Low
Lafourche	80	67	83.8%	High	West Baton Rouge	35	35	100.0%	High
La Salle	33	1	3.0%	Low	West Carroll	35	35	100.0%	High
Lincoln	51	0	0.0%	Low	West Feliciana	21	4	19.0%	Medium
Livingston	102	0	0.0%	Low	Winn	19	0	0.0%	Low

Map E-128: Critical Facility Percentage by Parish within the LPZ



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Army Corps of Engineers National Levee Database (Protection Zone), HSIP (Critical Facilities)

Map E-129: Parishes Ranked by Critical Facility Percentage within the LPZ



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Army Corps of Engineers National Levee Database (Protection Zone), HSIP (Critical Facilities)

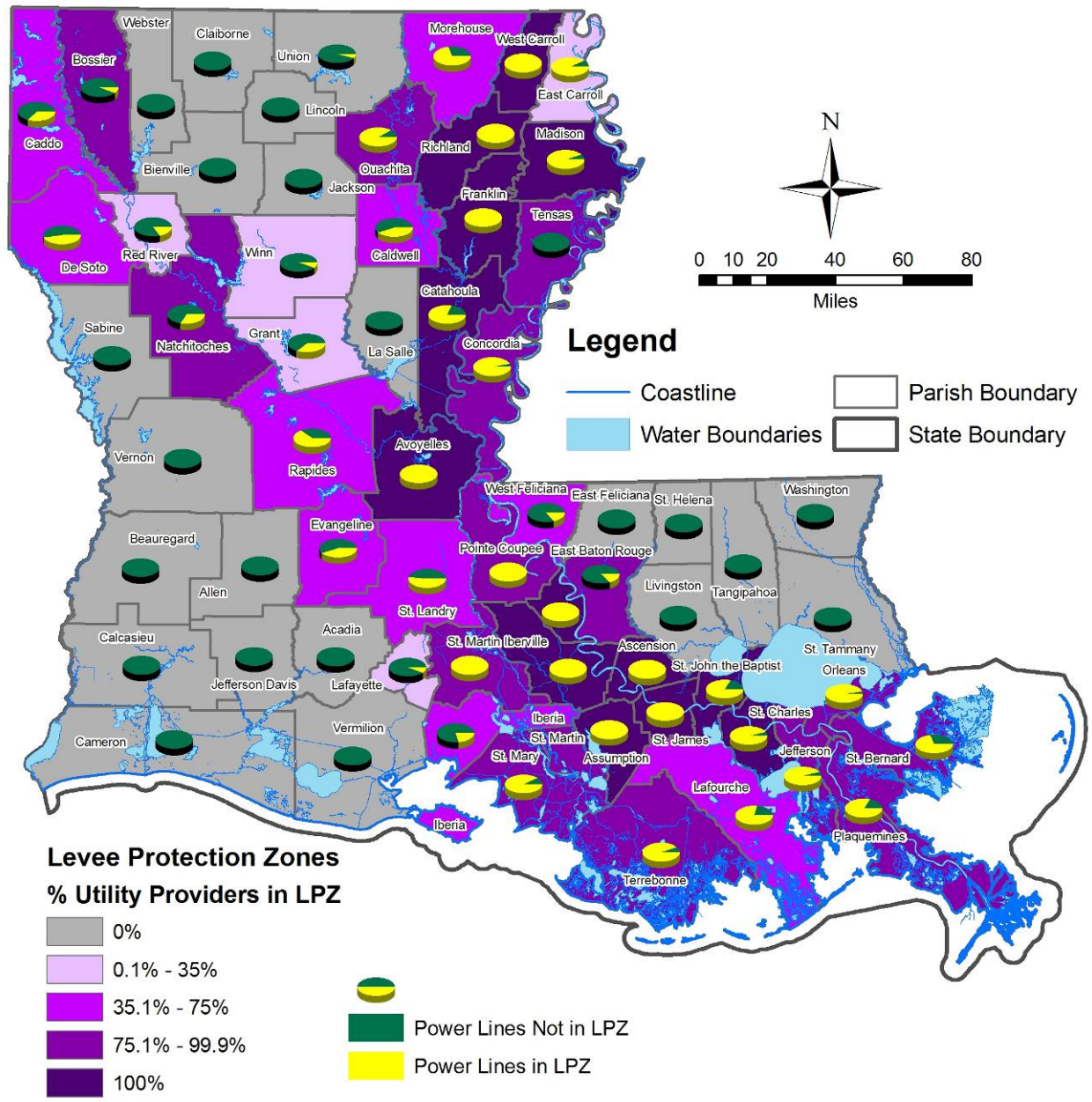
Each parish's percentage of either utility providers or power lines within the Levee Protection Zone is shown in Table E-78 and Map E-130. Map E-131 shows the parishes ranked by percentage.

Table E-78: Percentage of Either Utility Providers or Power lines within the LPZ

Parish	Total Utility Providers	Utility Providers in LPZ	% Utility Providers in LPZ	Miles of Power Lines	Miles of Power Lines in LPZ	% Power Lines in LPZ	Hazard Ranking
Acadia	87	0	0.0%	272.71	0.00	0.0%	Low
Allen	18	0	0.0%	29.36	0.00	0.0%	Low
Ascension	233	233	100.0%	126.03	126.03	100.0%	High
Assumption	20	20	100.0%	24.65	24.65	100.0%	High
Avoyelles	21	21	100.0%	14.92	14.92	100.0%	High
Beauregard	19	0	0.0%	106.20	0.00	0.0%	Low
Bienville	17	0	0.0%	85.82	0.00	0.0%	Low
Bossier	65	54	83.1%	24.06	1.87	7.8%	High
Caddo	163	81	49.7%	211.32	75.01	35.5%	Medium
Calcasieu	551	0	0.0%	515.08	0.00	0.0%	Low
Caldwell	11	6	54.5%	30.65	13.43	43.8%	Medium
Cameron	41	0	0.0%	95.93	0.00	0.0%	Low
Catahoula	5	5	100.0%	49.32	39.55	80.2%	High
Claiborne	12	0	0.0%	26.49	0.00	0.0%	Low
Concordia	25	22	88.0%	107.28	103.04	96.0%	High
De Soto	59	37	62.7%	117.57	55.37	47.1%	Medium
East Baton Rouge	8508	8062	94.8%	381.83	55.12	14.4%	High
East Carroll	3	1	33.3%	18.42	16.74	90.9%	High
East Feliciana	12	0	0.0%	91.81	0.00	0.0%	Low
Evangeline	31	17	54.8%	99.04	43.51	43.9%	Medium
Franklin	15	15	100.0%	26.67	26.67	100.0%	High
Grant	12	4	33.3%	39.63	14.53	36.7%	Medium
Iberia	107	40	37.4%	80.07	17.06	21.3%	Medium
Iberville	296	296	100.0%	202.46	202.46	100.0%	High
Jackson	16	0	0.0%	50.28	0.00	0.0%	Low
Jefferson	383	378	98.7%	178.22	168.99	94.8%	High
Jefferson Davis	50	0	0.0%	185.21	0.00	0.0%	Low
Lafayette	330	13	3.9%	167.52	12.99	7.8%	Low
Lafourche	120	80	66.7%	203.53	158.98	78.1%	High
La Salle	14	0	0.0%	62.58	0.00	0.0%	Low
Lincoln	41	0	0.0%	79.64	0.00	0.0%	Low
Livingston	106	0	0.0%	81.86	0.07	0.1%	Low
Madison	10	10	100.0%	82.40	77.06	93.5%	High
Morehouse	34	12	35.3%	81.01	57.29	70.7%	Medium

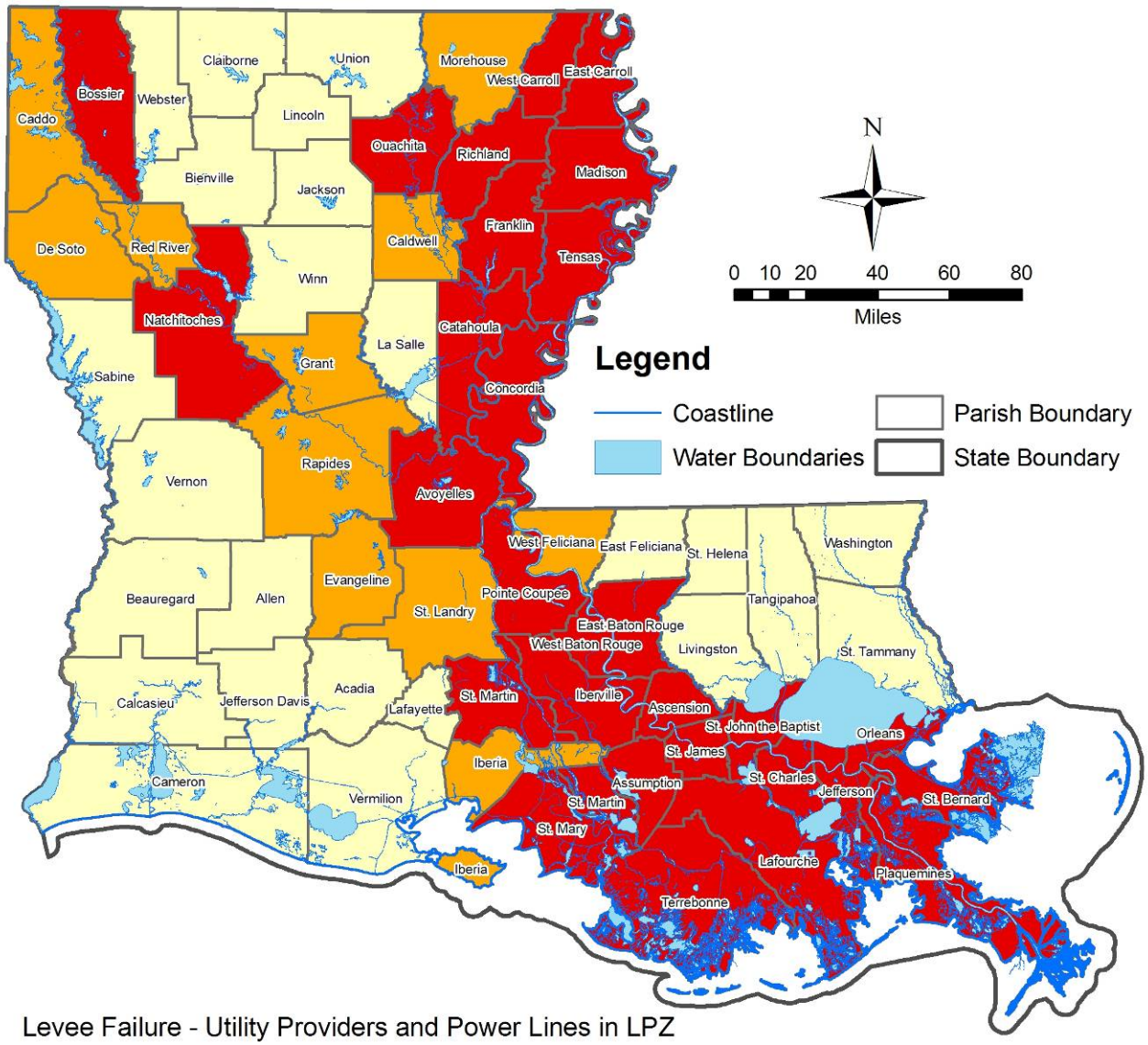
Parish	Total Utility Providers	Utility Providers in LPZ	% Utility Providers in LPZ	Miles of Power Lines	Miles of Power Lines in LPZ	% Power Lines in LPZ	Hazard Ranking
Natchitoches	43	36	83.7%	77.28	24.58	31.8%	High
Orleans	174	170	97.7%	131.83	128.17	97.2%	High
Ouachita	172	147	85.5%	165.39	147.97	89.5%	High
Plaquemines	147	128	87.1%	130.81	107.68	82.3%	High
Pointe Coupee	79	76	96.2%	179.52	179.52	100.0%	High
Rapides	122	91	74.6%	192.24	119.56	62.2%	Medium
Red River	10	2	20.0%	62.27	10.65	17.1%	Medium
Richland	16	16	100.0%	52.59	52.59	100.0%	High
Sabine	25	0	0.0%	104.45	0.00	0.0%	Low
St. Bernard	112	108	96.4%	45.90	32.18	70.1%	High
St. Charles	195	195	100.0%	192.05	182.34	94.9%	High
St. Helena	7	0	0.0%	40.47	0.00	0.0%	Low
St. James	128	128	100.0%	68.73	68.73	100.0%	High
St. John the Baptist	95	95	100.0%	79.67	65.33	82.0%	High
St. Landry	89	44	49.4%	186.16	96.75	52.0%	Medium
St. Martin	75	65	86.7%	94.98	94.98	100.0%	High
St. Mary	101	93	92.1%	61.39	55.68	90.7%	High
St. Tammany	321	0	0.0%	142.12	0.00	0.0%	Low
Tangipahoa	187	0	0.0%	109.73	0.07	0.1%	Low
Tensas	5	4	80.0%	0.00	0.00	0.0%	High
Terrebonne	167	155	92.8%	79.26	73.72	93.0%	High
Union	17	0	0.0%	110.76	6.13	5.5%	Low
Vermilion	81	0	0.0%	118.76	0.00	0.0%	Low
Vernon	52	0	0.0%	89.46	0.00	0.0%	Low
Washington	52	0	0.0%	116.27	0.00	0.0%	Low
Webster	47	0	0.0%	92.83	0.00	0.0%	Low
West Baton Rouge	144	144	100.0%	118.54	118.54	100.0%	High
West Carroll	10	10	100.0%	43.39	43.36	99.9%	High
West Feliciana	52	25	48.1%	71.11	11.75	16.5%	Medium
Winn	18	1	5.6%	64.62	4.71	7.3%	Low

Map E-130: Percentage of Either Utility Providers or Power lines within the LPZ



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems),HSIP (Utility Providers and Power Lines)

Map E-131: Parishes Ranked by Percentage of Either Utility Providers or Power lines within the LPZ



Levee Failure - Utility Providers and Power Lines in LPZ

Hazard Ranking

High Medium Low

Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems),HSIP (Utility Providers and Power Lines)

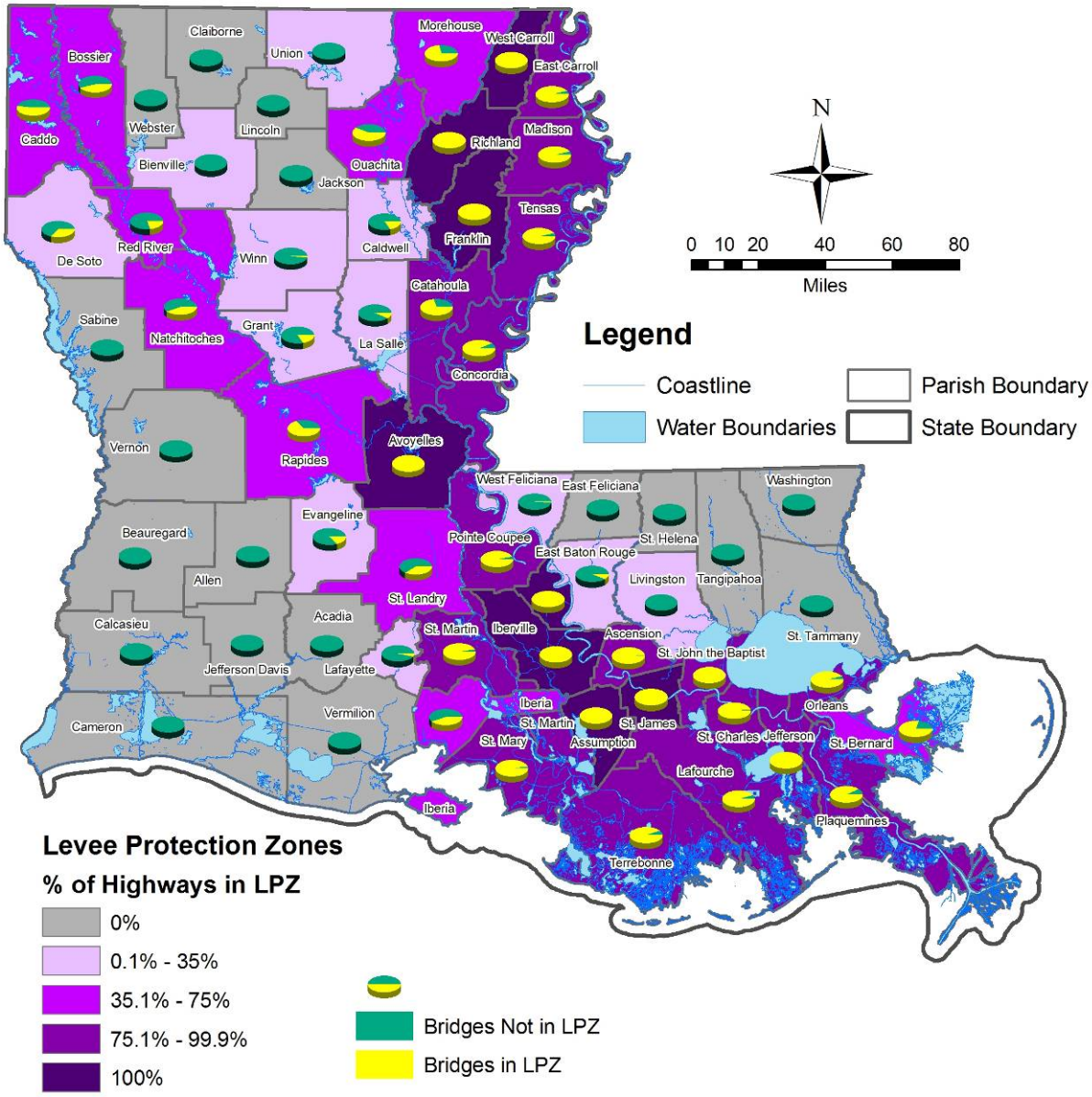
Each parish's percentage of bridges, highways, and railways within the Levee Protection Zone are shown in Table E-79. Map E-132 shows bridges and percentage of highways by parish. Map E-133 presents the percentage of levees in the LPZs. Map E-134 shows the parishes ranked by percentage.

Table E-79: Percentage of Bridges, Highways and Railways within the LPZ

Parish	Total Bridges	Bridges in LPZ	% Bridges in LPZ	Miles of Highways	Miles of Highways in LPZ	% Highways in LPZ	Miles of Railways	Miles of Railways in LPZ	% Railways in LPZ	Hazard Ranking
Acadia	296	0	0.0%	104.4	0.0	0.0%	60.6	0.0	0.0%	Low
Allen	183	0	0.0%	102.7	0.0	0.0%	73.9	0.0	0.0%	Low
Ascension	189	187	98.9%	112.0	111.9	99.9%	73.5	73.5	99.9%	High
Assumption	50	50	100.0%	78.1	78.1	100.0%	10.9	10.9	100.0%	High
Avoyelles	156	156	100.0%	125.6	125.6	100.0%	50.1	50.1	100.0%	High
Beauregard	223	0	0.0%	158.4	0.0	0.0%	96.9	0.0	0.0%	Low
Bienville	191	1	0.5%	148.3	0.2	0.1%	59.6	0.0	0.0%	Low
Bossier	249	113	45.4%	165.6	76.7	46.4%	107.1	50.5	47.1%	Medium
Caddo	562	295	52.5%	244.0	162.5	66.6%	175.2	105.6	60.3%	Medium
Calcasieu	382	0	0.0%	252.6	0.0	0.0%	137.2	0.0	0.0%	Low
Caldwell	125	22	17.6%	82.9	24.7	29.8%	32.5	15.2	46.6%	Medium
Cameron	53	0	0.0%	127.0	0.0	0.0%	0.0	0.0	0.0%	Low
Catahoula	68	48	70.6%	113.1	107.2	94.8%	0.0	0.0	0.0%	Medium
Claiborne	156	0	0.0%	169.6	0.0	0.0%	34.5	0.0	0.0%	Low
Concordia	37	34	91.9%	127.8	112.1	87.7%	0.0	0.0	0.0%	Medium
De Soto	225	78	34.7%	191.2	45.0	23.5%	79.5	20.9	26.2%	Medium
East Baton Rouge	457	39	8.5%	189.8	19.7	10.4%	76.8	10.7	14.0%	Low
East Carroll	59	56	94.9%	61.1	55.4	90.7%	35.5	32.7	92.3%	High
East Feliciana	143	0	0.0%	61.9	0.0	0.0%	30.7	0.0	0.0%	Low
Evangeline	185	27	14.6%	111.7	10.5	9.4%	35.1	8.1	23.0%	Medium
Franklin	143	143	100.0%	95.7	95.7	100.0%	0.0	0.0	0.0%	Medium
Grant	153	27	17.6%	152.1	40.3	26.5%	99.0	18.4	18.6%	Medium
Iberia	125	54	43.2%	57.3	34.2	59.6%	48.1	28.3	58.9%	Medium
Iberville	81	81	100.0%	39.0	39.0	100.0%	61.1	61.1	100.0%	High
Jackson	154	0	0.0%	101.3	0.0	0.0%	14.1	0.0	0.0%	Low
Jefferson	252	250	99.2%	151.3	130.2	86.1%	83.4	83.4	100.0%	High
Jefferson Davis	244	0	0.0%	132.3	0.0	0.0%	55.2	0.0	0.0%	Low
Lafayette	274	12	4.4%	132.7	6.3	4.7%	29.9	2.0	6.5%	Low
Lafourche	106	100	94.3%	225.8	185.9	82.3%	46.8	46.8	100.0%	High
La Salle	192	17	8.9%	87.6	16.7	19.1%	19.7	0.0	0.0%	Medium
Lincoln	190	0	0.0%	123.7	0.0	0.0%	31.7	0.0	0.0%	Low
Livingston	243	2	0.8%	93.1	0.0	0.0%	25.6	0.0	0.0%	Low
Madison	97	92	94.8%	95.1	87.3	91.8%	50.6	47.5	93.8%	High

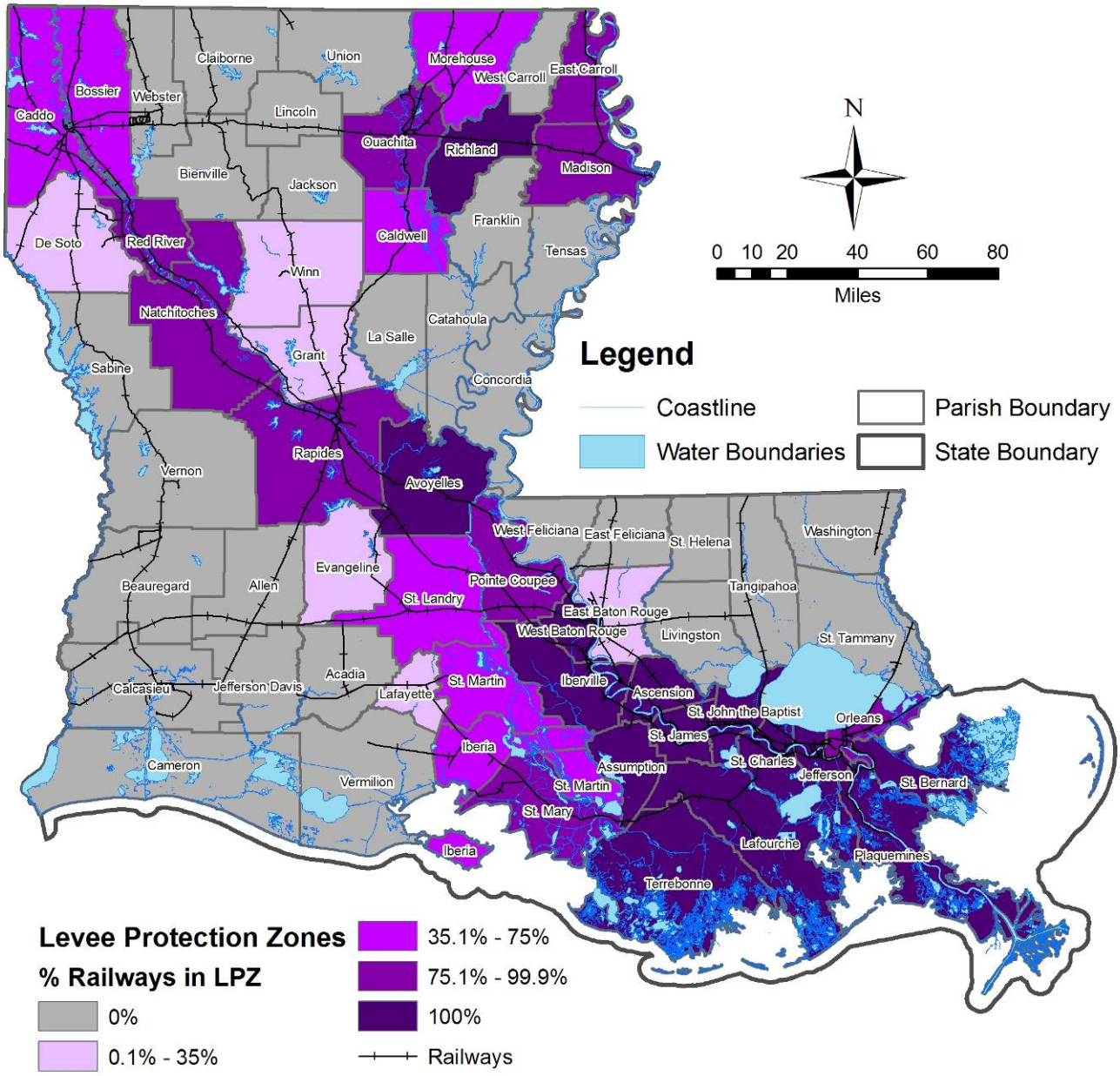
Parish	Total Bridges	Bridges in LPZ	% Bridges in LPZ	Miles of Highways	Miles of Highways in LPZ	% Highways in LPZ	Miles of Railways	Miles of Railways in LPZ	% Railways in LPZ	Hazard Ranking
Morehouse	135	97	71.9%	92.0	60.7	65.9%	78.0	44.9	57.5%	Medium
Natchitoches	287	123	42.9%	208.6	111.1	53.3%	71.6	61.7	86.1%	Medium
Orleans	324	308	95.1%	179.1	158.8	88.6%	115.1	94.7	82.3%	High
Ouachita	292	169	57.9%	154.7	101.0	65.3%	110.2	94.0	85.2%	Medium
Plaquemines	32	29	90.6%	108.9	97.8	89.8%	37.7	37.7	100.0%	High
Pointe Coupee	50	48	96.0%	94.4	90.7	96.1%	97.5	94.7	97.1%	High
Rapides	477	311	65.2%	373.6	231.6	62.0%	164.5	125.0	76.0%	Medium
Red River	67	14	20.9%	95.8	45.2	47.2%	63.1	48.6	77.0%	Medium
Richland	225	225	100.0%	128.7	128.7	100.0%	28.1	28.1	100.0%	High
Sabine	160	0	0.0%	137.4	0.0	0.0%	51.0	0.0	0.0%	Low
St. Bernard	24	19	79.2%	46.7	29.2	62.5%	19.1	19.1	100.0%	Medium
St. Charles	76	75	98.7%	58.6	57.4	97.9%	90.0	90.0	100.0%	High
St. Helena	148	0	0.0%	40.0	0.0	0.0%	0.0	0.0	0.0%	Low
St. James	23	23	100.0%	79.0	79.0	100.0%	60.6	60.6	100.0%	High
St. John the Baptist	39	39	100.0%	73.2	72.9	99.7%	74.7	74.7	100.0%	High
St. Landry	327	129	39.4%	181.1	100.9	55.7%	90.9	50.6	55.7%	Medium
St. Martin	112	108	96.4%	72.8	66.8	91.8%	10.5	4.9	47.1%	Medium
St. Mary	127	123	96.9%	109.5	98.3	89.8%	69.6	63.8	91.6%	High
St. Tammany	305	0	0.0%	240.1	0.0	0.0%	35.6	0.0	0.0%	Low
Tangipahoa	466	0	0.0%	201.7	0.0	0.0%	68.7	0.0	0.0%	Low
Tensas	44	42	95.5%	59.3	55.6	93.7%	0.0	0.0	0.0%	Medium
Terrebonne	147	137	93.2%	170.7	148.0	86.7%	17.0	17.0	100.0%	High
Union	110	1	0.9%	120.4	0.1	0.0%	7.4	0.0	0.0%	Low
Vermilion	263	0	0.0%	139.1	0.0	0.0%	21.6	0.0	0.0%	Low
Vernon	288	0	0.0%	262.2	0.0	0.0%	50.4	0.0	0.0%	Low
Washington	278	0	0.0%	116.8	0.0	0.0%	26.4	0.0	0.0%	Low
Webster	194	0	0.0%	159.8	0.0	0.0%	115.2	0.0	0.0%	Low
West Baton Rouge	61	61	100.0%	46.2	46.2	100.0%	67.9	67.9	100.0%	High
West Carroll	115	115	100.0%	60.6	60.6	100.0%	0.0	0.0	0.0%	Medium
West Feliciana	91	1	1.1%	37.0	1.6	4.3%	5.0	0.0	0.0%	Low
Winn	203	4	2.0%	128.3	4.1	3.2%	50.9	1.5	2.9%	Low

Map E-132: Bridges and Percentage of Highways within the LPZ



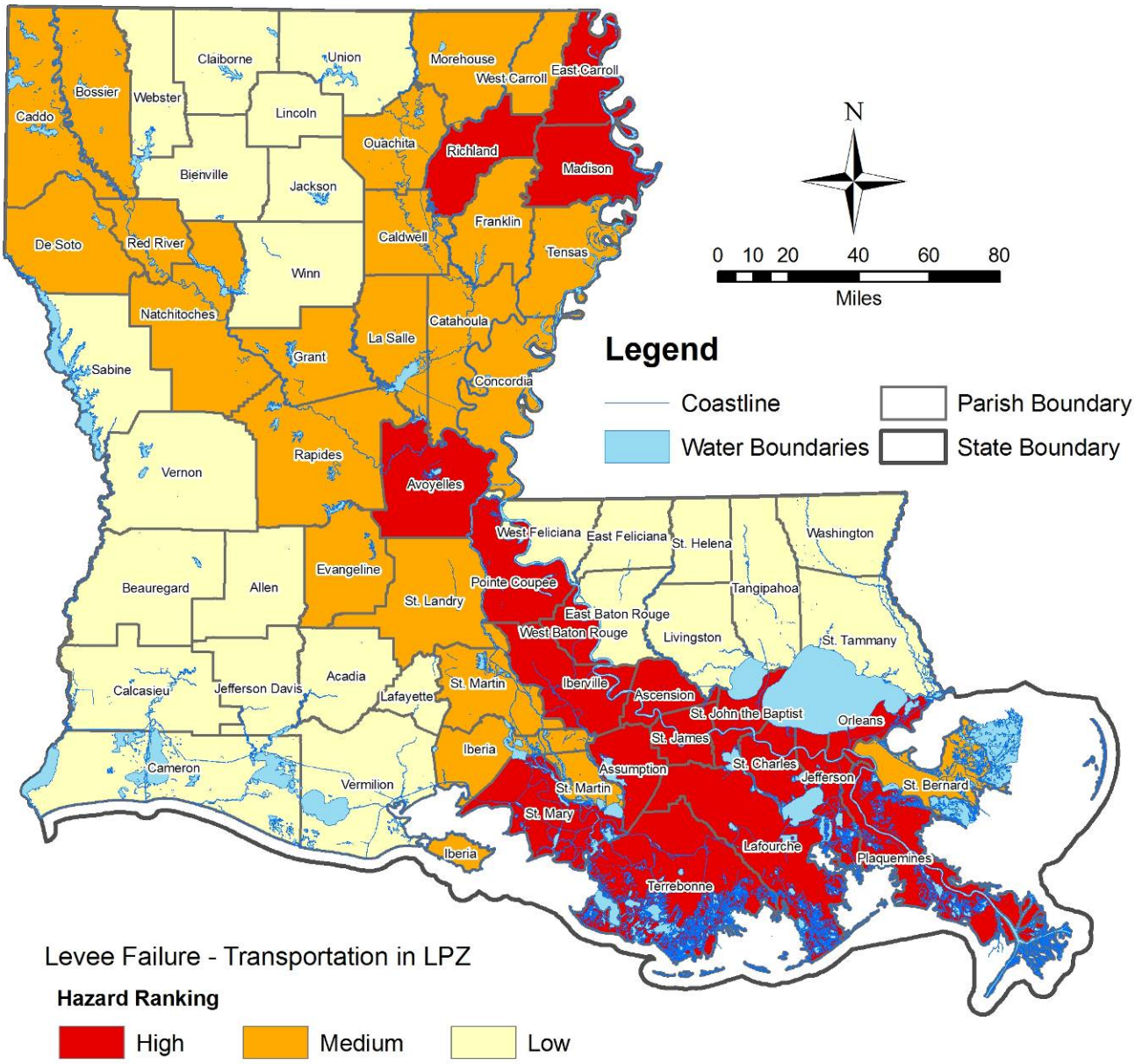
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems), HAZUS-MH MR4 (Highways and Railways), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

Map E-133: Percentage of Railways in the LPZs.



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems),
HAZUS-MH MR4 (Highways and Railways), National Bridge Inventory (Bridges)

Map E-134: Parishes Ranked by Percentage of Transportation Facilities within the LPZs.



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems),
HAZUS-MH MR4 (Highways and Railways), National Bridge Inventory (Highway Bridges),
Louisiana Office of Emergency Preparedness (Railway Bridges)

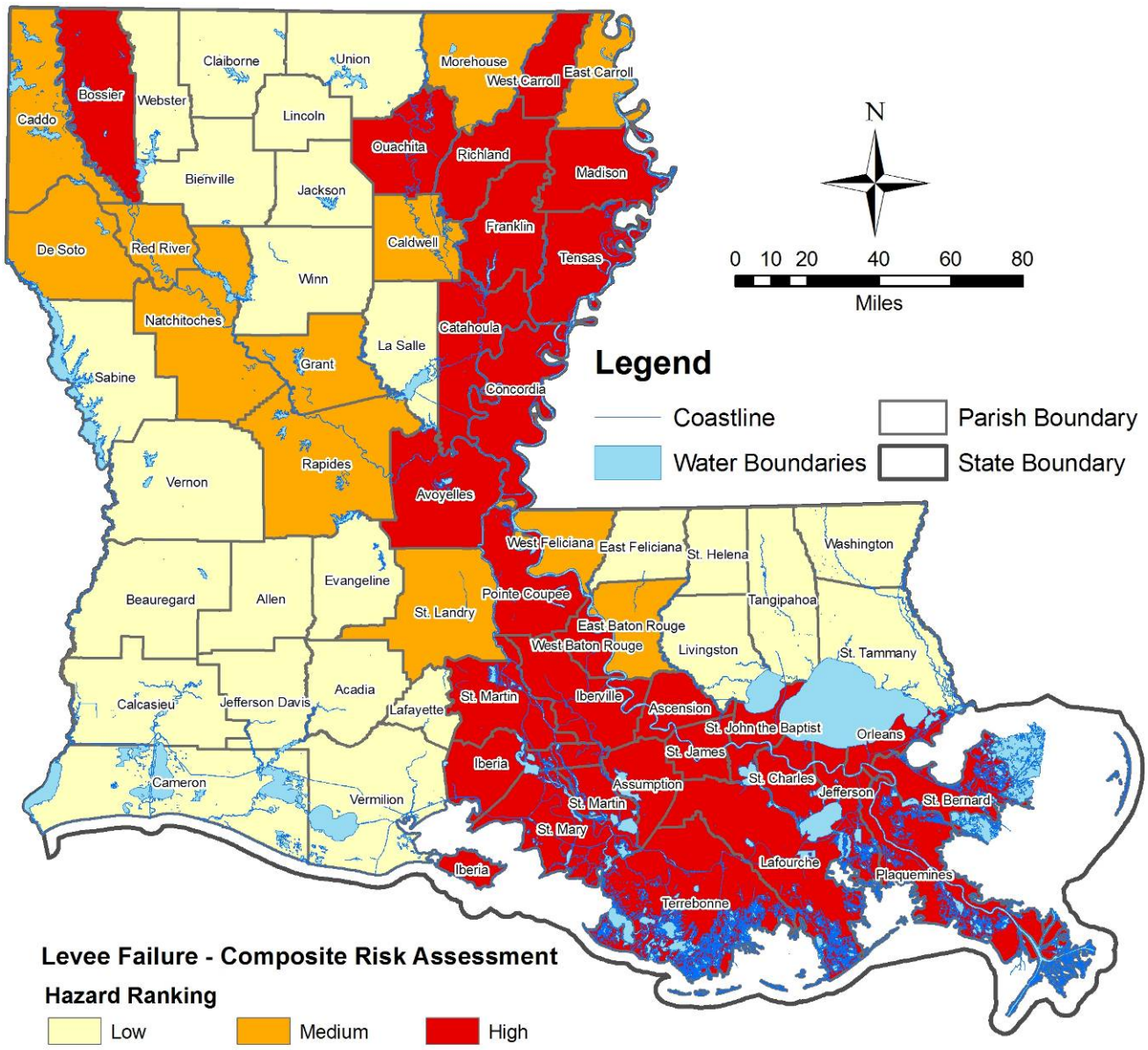
The composite score was generated by giving each high ranking three (3) points, each medium rank two (2) points, and each low ranking one (1) point. Following this methodology the possible range of scores for Levee Failure is 6 to 18. A high Wildfire Hazard would be assigned to a parish receiving a score of 15 to 18; medium would be for parishes scoring 10 to 14; and low would be for any parish scoring 6 to 9. The composite parish rankings for each risk category are shown in Table E-80. Map E-135 presents the composite ranking of all the parishes with high, medium and low risk to levee failure.

Table E-80: Composite Levee Hazard Ranking

Parish	Impacted Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Utilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
Acadia	Low	Low	Low	Low	Low	Low	6
Allen	Low	Low	Low	Low	Low	Low	6
Ascension	High	High	High	High	High	High	18
Assumption	High	High	Medium	High	High	High	17
Avoyelles	High	High	Medium	High	High	High	17
Beauregard	Low	Low	Low	Low	Low	Low	6
Bienville	Low	Low	Low	Low	Low	Low	6
Bossier	High	Medium	High	Medium	High	Medium	15
Caddo	Medium	Medium	High	Medium	Medium	Medium	13
Calcasieu	Low	Low	Low	Low	Low	Low	6
Caldwell	Medium	Medium	Low	Medium	Medium	Medium	11
Cameron	Low	Low	Low	Low	Low	Low	6
Catahoula	High	High	Low	High	High	Medium	15
Claiborne	Low	Low	Low	Low	Low	Low	6
Concordia	High	High	Medium	High	High	Medium	16
De Soto	Medium	Medium	Low	Low	Medium	Medium	10
East Baton Rouge	Medium	Low	High	Low	High	Low	11
East Carroll	High	Medium	Low	Medium	High	High	14
East Feliciana	Low	Low	Low	Low	Low	Low	6
Evangeline	Medium	Low	Low	Low	Medium	Medium	9
Franklin	High	High	Medium	High	High	Medium	16
Grant	Medium	Medium	Low	Medium	Medium	Medium	11
Iberia	High	High	High	High	Medium	Medium	16
Iberville	High	High	Medium	High	High	High	17
Jackson	Low	Low	Low	Low	Low	Low	6
Jefferson	High	High	High	High	High	High	18
Jefferson Davis	Low	Low	Low	Low	Low	Low	6
Lafayette	Low	Low	Medium	Low	Low	Low	7
Lafourche	High	High	High	High	High	High	18
La Salle	Medium	Low	Low	Low	Low	Medium	8
Lincoln	Low	Low	Low	Low	Low	Low	6

Parish	Impacted Population Hazard Ranking	Building Quantity Hazard Ranking	Building Value Hazard Ranking	Critical Facilities Hazard Ranking	Utilities Hazard Ranking	Transportation Hazard Ranking	Composite Hazard Ranking
Livingston	Low	Low	Low	Low	Low	Low	6
Madison	High	High	Low	High	High	High	16
Morehouse	Medium	Medium	Low	Medium	Medium	Medium	11
Natchitoches	High	Medium	Medium	Medium	High	Medium	14
Orleans	High	High	High	High	High	High	18
Ouachita	High	High	High	High	High	Medium	17
Plaquemines	High	High	Medium	High	High	High	17
Pointe Coupee	High	High	Medium	High	High	High	17
Rapides	High	Medium	High	Medium	Medium	Medium	14
Red River	Medium	Medium	Low	Low	Medium	Medium	10
Richland	High	High	Medium	High	High	High	17
Sabine	Low	Low	Low	Low	Low	Low	6
St. Bernard	High	High	High	High	High	Medium	17
St. Charles	High	High	High	High	High	High	18
St. Helena	Low	Low	Low	Low	Low	Low	6
St. James	High	High	Medium	High	High	High	17
St. John the Baptist	High	High	Medium	High	High	High	17
St. Landry	Medium	Medium	Medium	Medium	Medium	Medium	12
St. Martin	High	High	Medium	High	High	Medium	16
St. Mary	High	High	Medium	High	High	High	17
St. Tammany	Low	Low	Low	Low	Low	Low	6
Tangipahoa	Low	Low	Low	Low	Low	Low	6
Tensas	High	High	Low	High	High	Medium	15
Terrebonne	High	High	High	High	High	High	18
Union	Medium	Low	Low	Low	Low	Low	7
Vermilion	Low	Low	Low	Low	Low	Low	6
Vernon	Low	Low	Low	Low	Low	Low	6
Washington	Low	Low	Low	Low	Low	Low	6
Webster	Low	Low	Low	Low	Low	Low	6
West Baton Rouge	High	High	Medium	High	High	High	17
West Carroll	High	High	Low	High	High	Medium	15
West Feliciana	High	Low	Low	Medium	Medium	Low	10
Winn	Medium	Low	Low	Low	Low	Low	7

Map E-135: Composite Levee Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Population), US Army Corps of Engineers National Levee Database (Protection Zone, Levee Systems), HSIP (Critical Facilities, Utilities) HAZUS-MH MR4 (Highways, Railways, Buildings), National Bridge Inventory (Highway Bridges), Louisiana Office of Emergency Preparedness (Railway Bridges)

Methodology

The Risk Assessment for levee failure involved determining the Levee Protection Zones for each parish. This was accomplished by obtaining D-FIRMs and USACE Levee Database records. HAZUS and HSIP data was then utilized to determine population and building quantities and values, the number of critical facilities, utility providers, and miles of power lines within these zones.

The HAZUS-MH general building stock data provide the building valuation for each specific occupancy classification (e.g., single family residential, retail trade) developed from the 2000 Census and Dun & Bradstreet (D&B). The general building stock data set includes the residential, commercial, industrial, governmental, educational, agricultural, and religious buildings for each parish. This dataset was developed at the census block level and can be aggregated at census tract or parish levels. This dataset is from the 2000 version of TIGER/Line files and first quarter of 2002 data from D&B.

Census data was overlaid with LPZ data to determine the population located in the expected at risk areas.

The analysis for the general building stock exposure used HAZUS-MH general building stock data and the LPZ data. The general building stock data were overlaid with the LPZ data to determine the percentage of buildings, housing and critical facilities that are exposed.

Data Limitations

While most hazard risk assessments have used 2000 HAZUS data at the block level because it is more precise (despite being older), the 2008 ESRI population estimates at the block group level were used for levee failure. This was decided because the levee protection area does not have such irregular boundaries and would be less affected by the fact that block groups require a larger, less precise geography. Also, population change in south Louisiana from 2000 to 2008 is largely due to levee failure induced by Hurricane Katrina, so it was seen as particularly valuable to capture population affected using the 2008 estimates.

In the transportation analysis, bridges are one of the three main variables. The data on bridges encompasses both highway and railway bridges. However, of the 13,378 bridges in Louisiana, only 32 are railway bridges. This number is statistically insignificant so railway bridges comprised a separate analysis, as they could unreasonably skew a parish's hazard ranking. Thus, these 32 bridges are not viewed separately but have been merged with all other bridges.

Appendix E.14

Hazardous Materials Incident

Hazardous materials' incident hazard vulnerability were assessed for the population and land exposure based on the fixed site locations of hazardous materials facilities (refineries and pipelines) and transportation routes (highways, railways, and waterways). A buffer zone around these locations was established (½ radius for pipelines, roadways, and waterways and 1 mile for railways) and the land area and populations contained therein were identified.

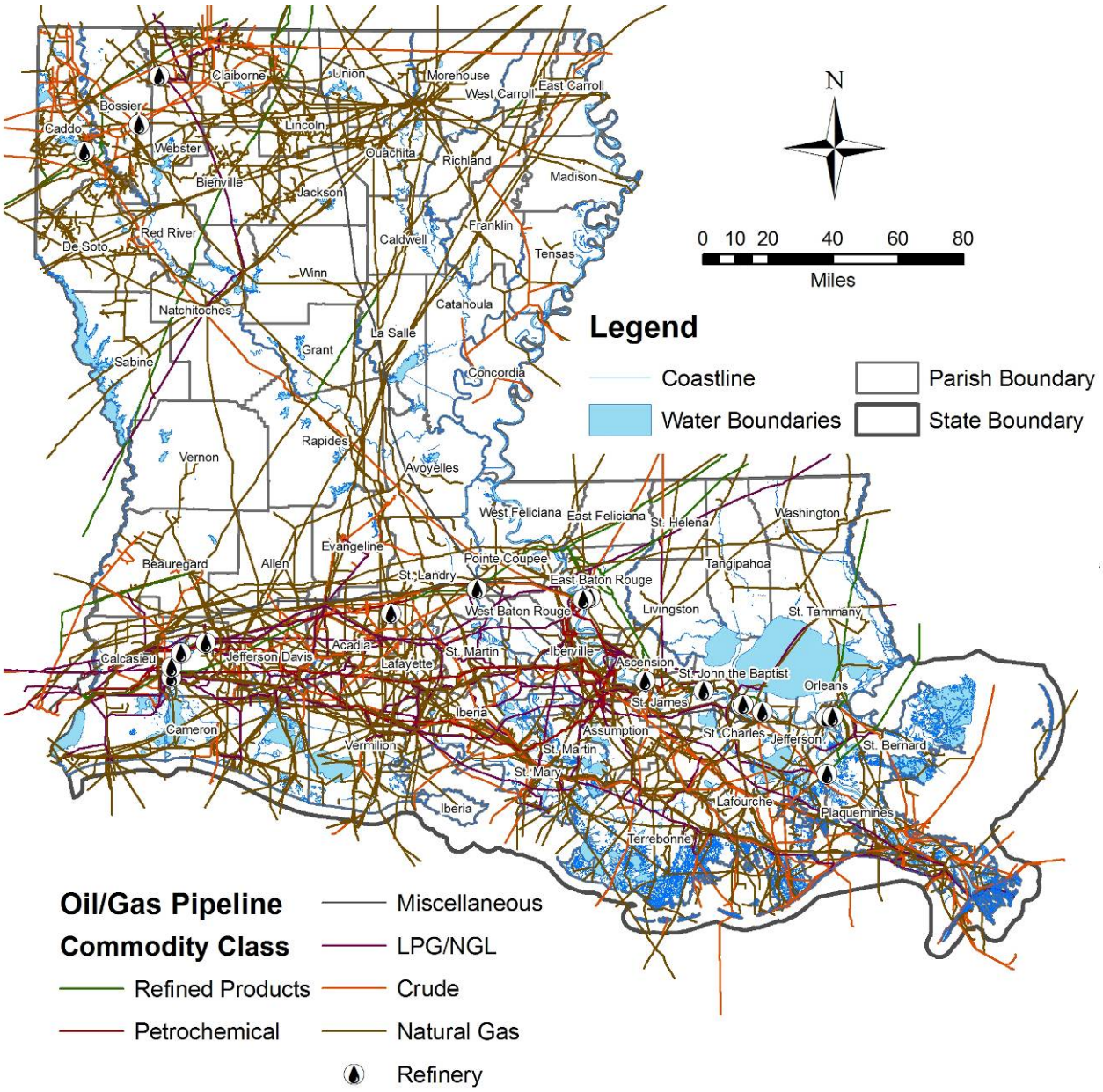
Populations were counted more than once where radii that surround a hazardous materials facility overlap, indicating that these populations are exposed to more than one facility.

The high / medium / low rankings for each parish were developed by:

- Obtaining hazardous materials facilities and transportation infrastructure location data; then
- Sorting the list by parish from highest to lowest density of hazmat incidents per square mile;
    - Assigning the High rank to parishes with greater than one incident per square mile;
    - Assigning the Medium rank to parishes with 0.15 to 1 incident per square mile ; and
    - Assigning the Low rank to parishes with losses less than 0.15 incidents per square mile
- Sorting the list by parish from highest to lowest land area affected by hazmat transport areas;
    - Assigning the High rank to parishes with more than 75% of land within the hazmat transport areas;
    - Assigning the Medium rank to parishes with 40% to 75% of land within the hazmat transport areas;
    - Assigning the Low rank to parishes with less than 40% of land within the hazmat transport areas.
- Sorting the list by parish from highest to lowest population affected by hazmat transport;
    - Assigning the High rank to parishes with more than 80% of population affected;
    - Assigning the Medium rank to parishes with 50% to 80% of population affected;
    - Assigning the Low rank to parishes with less than 50% of land population affected.
- Sorting the parishes by composite ranking
    - Assigning a point value of 3 to all high rankings;
    - Assigning a point value of 2 to all medium rankings;
    - Assigning a point value of 1 to all low rankings; then
    - Assigning the High composite ranking to parishes with a score of 7 or more;
    - Assigning the Medium composite ranking to parishes with a score of 5 to 6; and
    - Assigning the Low composite ranking to parishes with a score of 4 or less

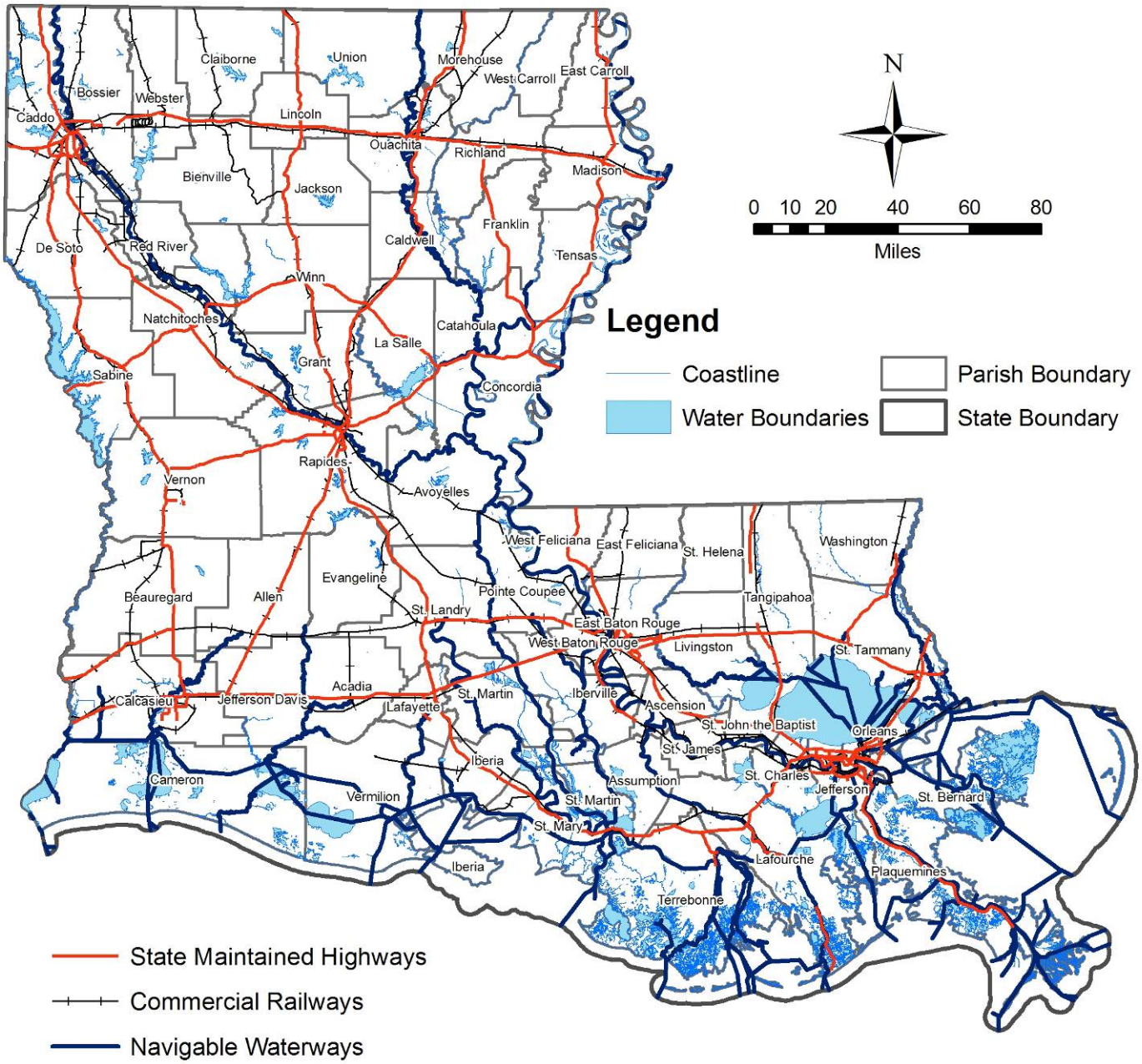
Maps E-136 through E-138 present the hazardous materials transportation lines in the state of Louisiana.

Map E-136: Oil and Gas Pipelines in Louisiana



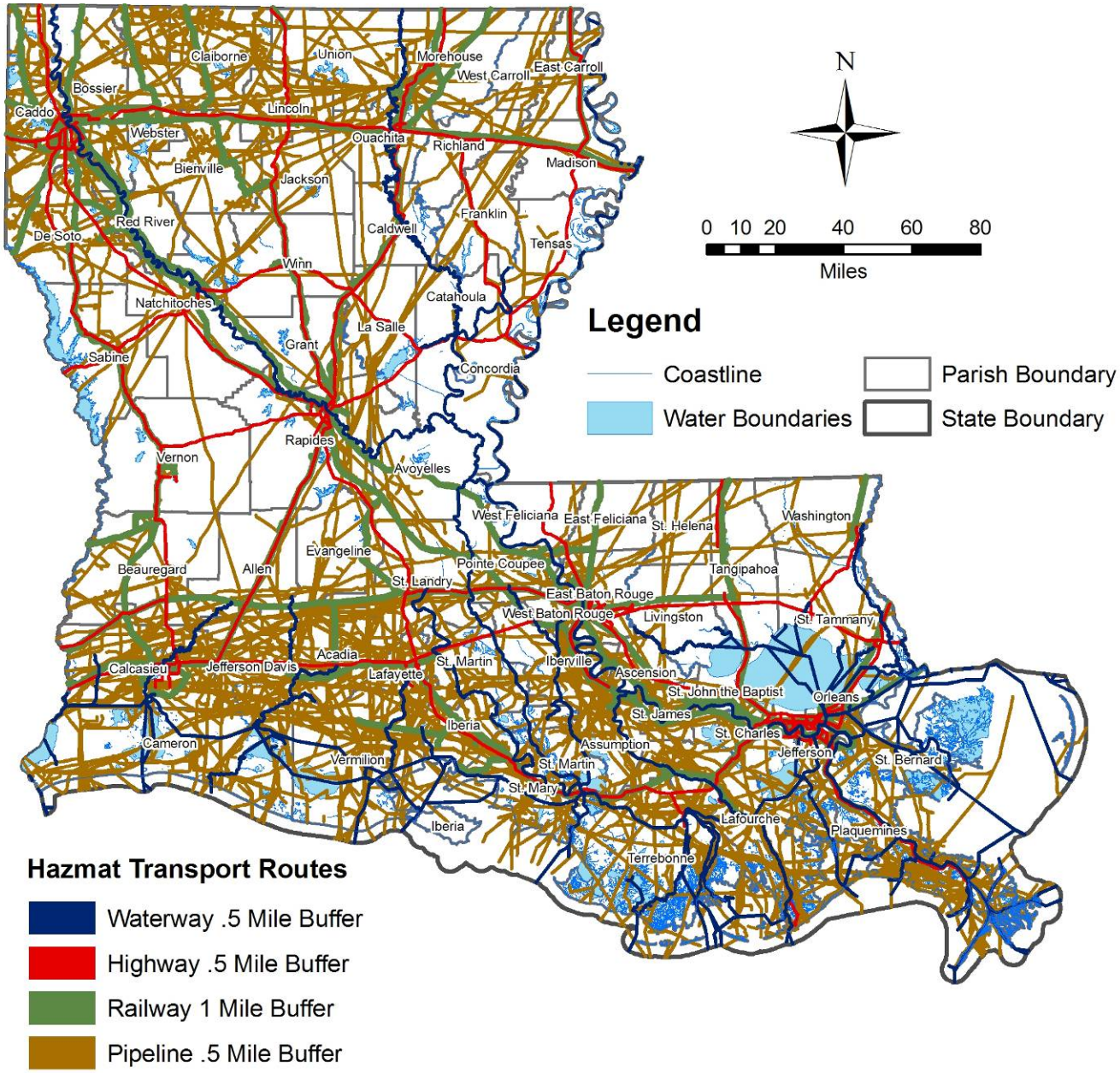
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Refineries and Pipelines)

Map E-137: Oil and Gas Roadways, Waterways and Railways in Louisiana



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HAZUS-MH MR4 (Railways, Highways), Techni Graphic Systems, Inc (Waterways)

Map E-138: Hazardous Materials Transportation Route Buffer zones in Louisiana



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Pipelines), HAZUS-MH MR4 (Highways and Railways), Techni Graphic Systems, Inc (Waterways)

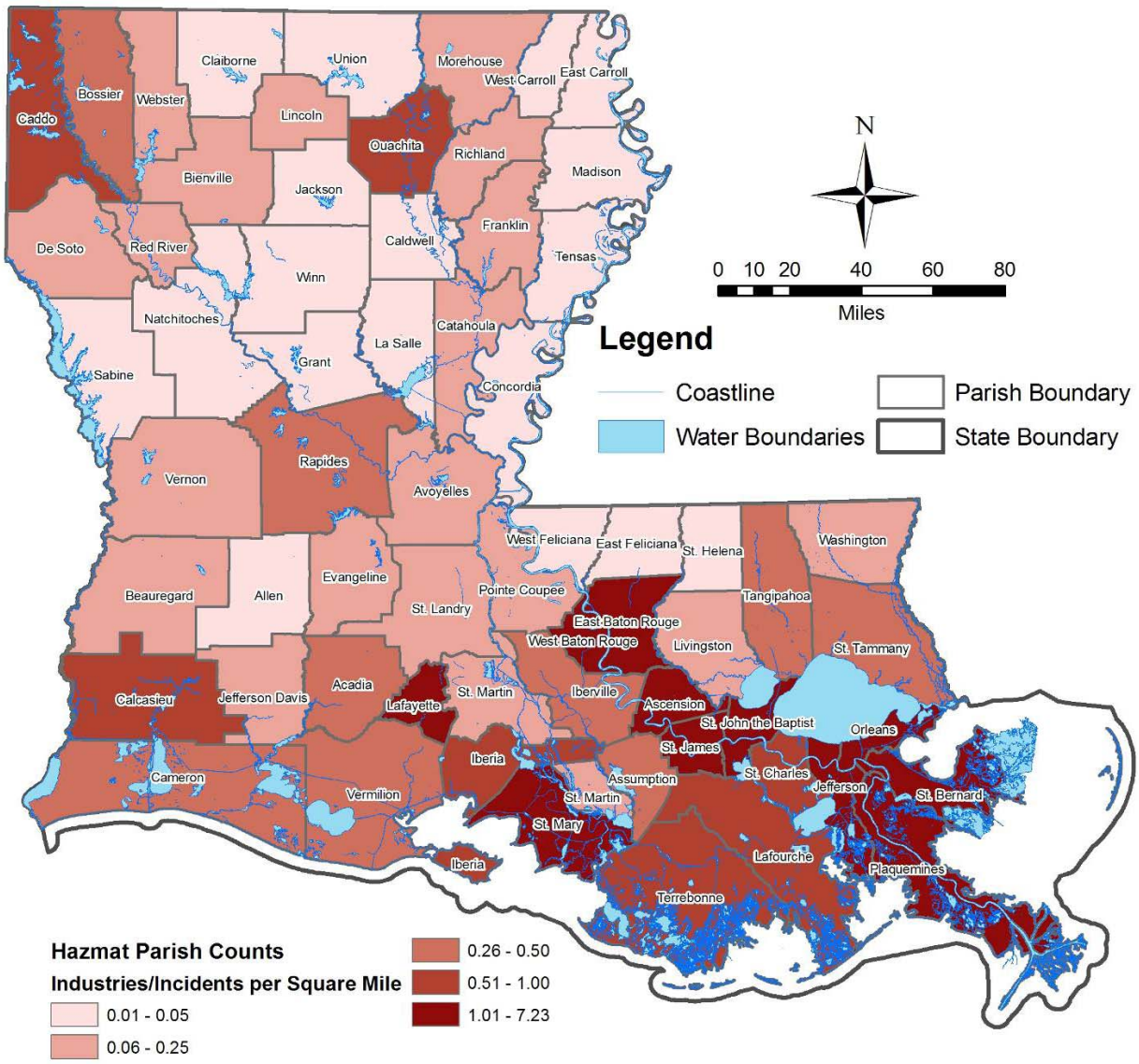
Table E-81 and Map E-139 provide the hazmat incidents per parish. Map E-140 shows the parishes ranked by incident density.

Table E-81: Hazardous Materials Incident Hazard Ranking

Parish	Hazardous Material Industry	RCRA Waste Facilities	Facilities under RMP	NRC Spill Reports	Square Miles of Land	Density of Hazmat Incidents Per Square Mile	Hazard Ranking
Acadia	5	134	7	67	655.28	0.325	Medium
Allen	2	29	0	0	764.50	0.041	Low
Ascension	38	244	22	1,232	291.53	5.269	High
Assumption	0	32	3	88	338.68	0.363	Medium
Avoyelles	2	57	1	10	832.44	0.084	Low
Beauregard	3	90	2	36	1,160.09	0.113	Low
Bienville	0	26	1	19	810.64	0.057	Low
Bossier	4	259	14	57	839.25	0.398	Medium
Caddo	32	694	5	19	881.99	0.850	Medium
Calcasieu	45	762	40	84	1,071.12	0.869	Medium
Caldwell	0	5	0	7	529.42	0.023	Low
Cameron	0	62	7	417	1,312.96	0.370	Medium
Catahoula	2	9	0	31	703.65	0.060	Low
Claiborne	1	26	2	4	754.65	0.044	Low
Concordia	1	11	2	5	695.91	0.027	Low
De Soto	2	32	0	13	877.20	0.054	Low
East Baton Rouge	69	1,488	19	1,715	455.43	7.226	High
East Carroll	0	8	0	0	421.44	0.019	Low
East Feliciana	0	12	0	4	453.40	0.035	Low
Evangeline	2	52	3	4	664.27	0.092	Low
Franklin	3	33	0	4	623.61	0.064	Low
Grant	1	14	0	10	645.11	0.039	Low
Iberia	8	240	5	41	575.13	0.511	Medium
Iberville	26	129	17	113	618.64	0.461	Medium
Jackson	0	17	0	2	569.75	0.033	Low
Jefferson	40	1,672	16	224	306.52	6.368	High
Jefferson Davis	0	71	2	6	652.31	0.121	Low
Lafayette	31	948	7	31	269.83	3.769	High
Lafourche	14	262	4	716	1,084.68	0.918	Medium
La Salle	0	12	0	5	623.83	0.027	Low
Lincoln	3	81	2	11	471.38	0.206	Medium
Livingston	7	112	1	27	648.02	0.227	Medium
Madison	0	14	0	3	624.09	0.027	Low
Morehouse	1	49	1	11	794.25	0.078	Low

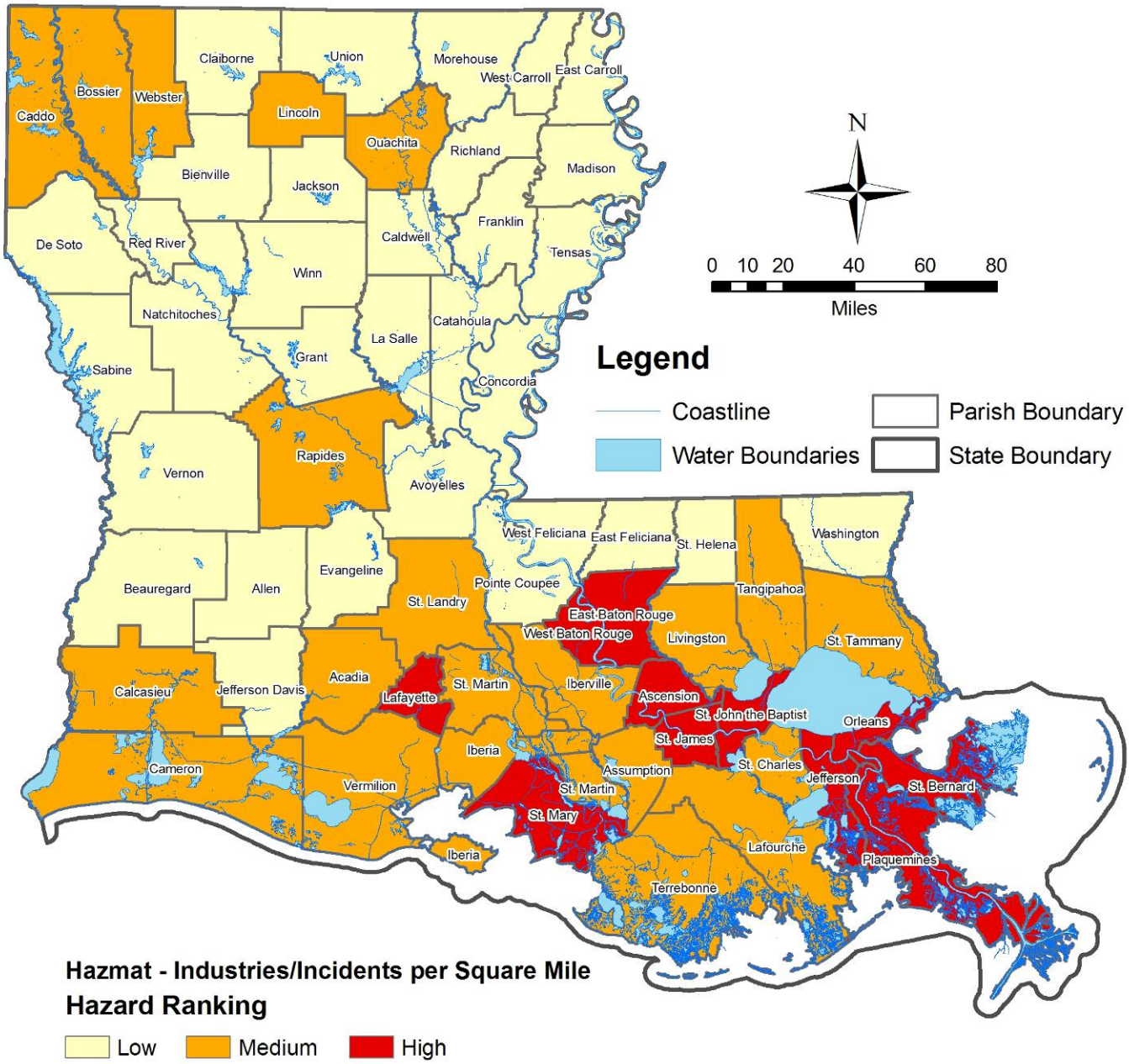
Parish	Hazardous Material Industry	RCRA Waste Facilities	Facilities under RMP	NRC Spill Reports	Square Miles of Land	Density of Hazmat Incidents Per Square Mile	Hazard Ranking
Natchitoches	0	44	4	7	1,255.45	0.044	Low
Orleans	27	1,053	8	55	180.56	6.330	High
Ouachita	18	363	10	9	610.53	0.655	Medium
Plaquemines	6	250	4	1,064	844.56	1.568	High
Pointe Coupee	1	29	3	4	557.34	0.066	Low
Rapides	13	401	15	59	1,322.54	0.369	Medium
Red River	0	17	0	3	389.29	0.051	Low
Richland	4	32	0	11	558.45	0.084	Low
Sabine	0	28	1	3	865.27	0.037	Low
St. Bernard	4	158	8	1,155	465.04	2.849	High
St. Charles	19	139	21	54	283.64	0.821	Medium
St. Helena	1	0	0	6	408.36	0.017	Low
St. James	5	45	5	486	246.13	2.198	High
St. John the Baptist	10	119	12	94	218.90	1.074	High
St. Landry	5	141	5	17	928.65	0.181	Medium
St. Martin	3	115	6	45	739.85	0.228	Medium
St. Mary	8	240	7	533	612.79	1.286	High
St. Tammany	23	368	3	27	854.15	0.493	Medium
Tangipahoa	7	174	6	21	790.24	0.263	Medium
Tensas	0	6	0	0	602.48	0.010	Low
Terrebonne	10	475	7	536	1,254.93	0.819	Medium
Union	3	13	2	14	877.60	0.036	Low
Vermilion	4	148	5	217	1,173.78	0.319	Medium
Vernon	3	81	0	10	1,328.41	0.071	Low
Washington	1	61	7	21	669.57	0.134	Low
Webster	8	105	6	18	595.22	0.230	Medium
West Baton Rouge	13	124	5	76	191.20	1.140	High
West Carroll	1	15	0	1	359.40	0.047	Low
West Feliciana	0	10	0	2	406.00	0.030	Low
Winn	1	29	3	7	950.49	0.042	Low
TOTALS	540	12,469	336	9,571	MEDIAN:	0.158	

Map E-139: Hazardous Materials Incident Hazard Ranking



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
National Response Center (Hazardous Material Spill Reports), LOSCO/EPA (Hazmat Industries, RCRA, RMPs)

Map E-140: Parishes Ranked by Incident Density



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries),
National Response Center (Hazardous Material Spill Reports), LOSCO/EPA (Hazmat Industries, RCRA, RMPs)

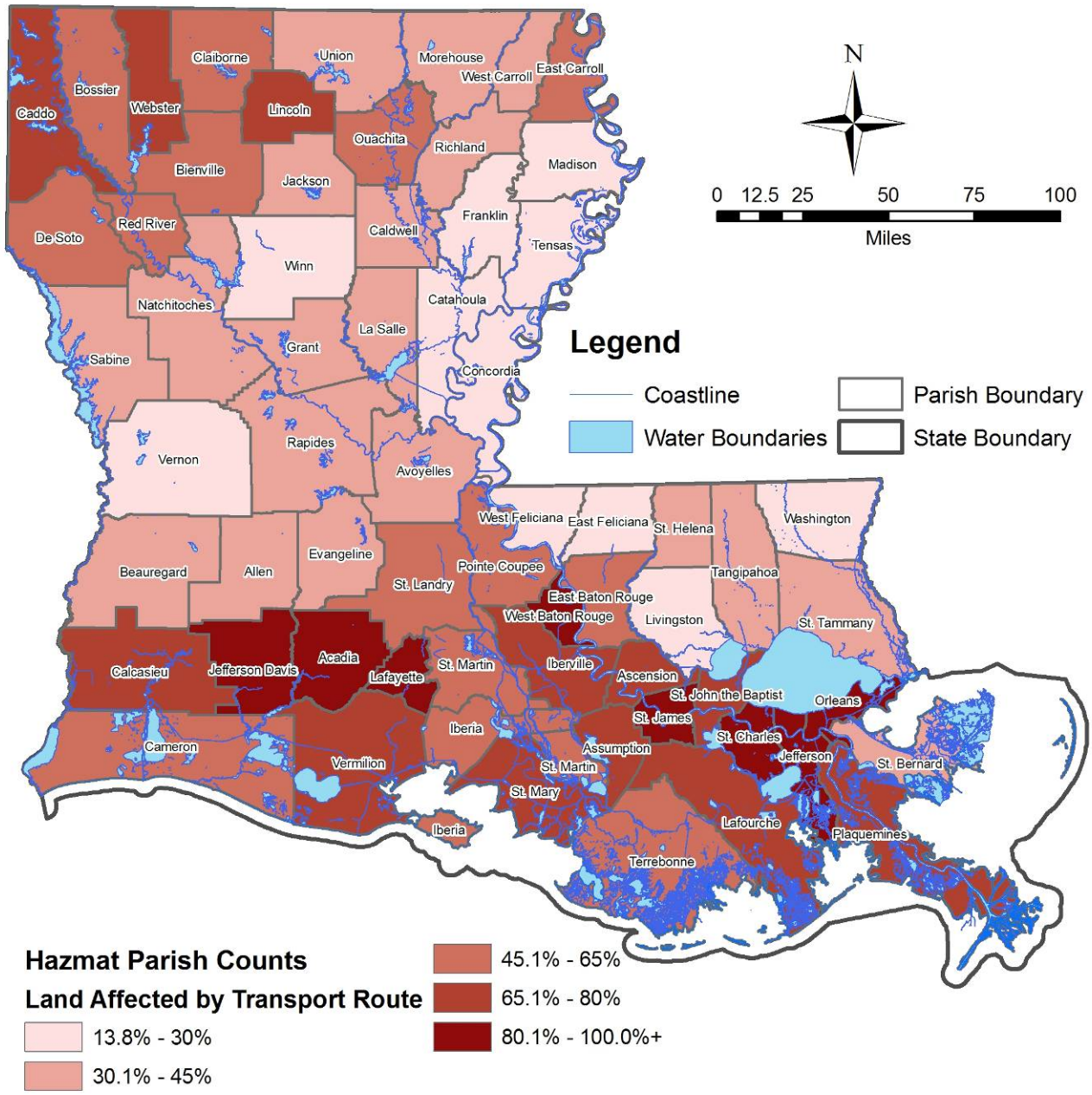
Table E-82 and Map E-141 show the percent of land area per parish affected by hazmat transport routes and buffer zones. Figure E-142 shows the parishes ranked by percent.

Table E-82: Percent of Land Area Affected By Hazmat Transport

Parish	Land Area in Square Miles	Land Area Affected	% of Land Area Affected	Hazard Ranking	Parish	Land Area in Square Miles	Land Area Affected	% of Land Area Affected	Hazard Ranking
Acadia	655.28	531.80	81.2%	High	Madison	624.09	181.29	29.0%	Low
Allen	764.50	286.23	37.4%	Low	Morehouse	794.25	326.47	41.1%	Medium
Ascension	291.53	216.71	74.3%	Medium	Natchitoches	1255.45	422.33	33.6%	Low
Assumption	338.68	241.07	71.2%	Medium	Orleans*	180.56	226.80	125.6%	High
Avoyelles	832.44	260.40	31.3%	Low	Ouachita	610.53	374.26	61.3%	Medium
Beauregard	1160.09	439.73	37.9%	Low	Plaquemines	844.56	664.29	78.7%	High
Bienville	810.64	368.05	45.4%	Medium	Pointe Coupee	557.34	348.79	62.6%	Medium
Bossier	839.25	455.99	54.3%	Medium	Rapides	1322.54	534.40	40.4%	Medium
Caddo	881.99	624.66	70.8%	Medium	Red River	389.29	186.40	47.9%	Medium
Calcasieu	1071.12	832.81	77.8%	High	Richland	558.45	180.90	32.4%	Low
Caldwell	529.42	158.85	30.0%	Low	Sabine	865.27	262.01	30.3%	Low
Cameron	1312.96	788.96	60.1%	Medium	St. Bernard	465.04	188.20	40.5%	Medium
Catahoula	703.65	161.77	23.0%	Low	St. Charles	283.64	244.78	86.3%	High
Claiborne	754.65	470.01	62.3%	Medium	St. Helena	408.36	134.40	32.9%	Low
Concordia	695.91	170.75	24.5%	Low	St. James	246.13	212.73	86.4%	High
De Soto	877.20	476.22	54.3%	Medium	St. John the Baptist	218.90	156.95	71.7%	Medium
East Baton Rouge	455.43	289.71	63.6%	Medium	St. Landry	928.65	537.12	57.8%	Medium
East Carroll	421.44	195.72	46.4%	Medium	St. Martin	739.85	431.93	58.4%	Medium
East Feliciana	453.40	130.62	28.8%	Low	St. Mary	612.79	479.20	78.2%	High
Evangeline	664.27	288.21	43.4%	Medium	St. Tammany	854.15	379.48	44.4%	Medium
Franklin	623.61	173.66	27.8%	Low	Tangipahoa	790.24	254.10	32.2%	Low
Grant	645.11	269.99	41.9%	Medium	Tensas	602.48	146.00	24.2%	Low
Iberia	575.13	345.97	60.2%	Medium	Terrebonne	1254.93	726.76	57.9%	Medium
Iberville	618.64	403.97	65.3%	Medium	Union	877.60	378.85	43.2%	Medium
Jackson	569.75	199.30	35.0%	Low	Vermilion	1173.78	788.56	67.2%	Medium
Jefferson	306.52	287.00	93.6%	High	Vernon	1328.41	183.57	13.8%	Low
Jefferson Davis	652.31	526.56	80.7%	High	Washington	669.57	152.23	22.7%	Low
Lafayette	269.83	224.59	83.2%	High	Webster	595.22	387.45	65.1%	Medium
Lafourche	1084.68	765.56	70.6%	Medium	West Baton Rouge	191.20	154.69	80.9%	High
La Salle	623.83	196.40	31.5%	Low	West Carroll	359.40	124.08	34.5%	Low
Lincoln	471.38	319.30	67.7%	Medium	West Feliciana	406.00	87.02	21.4%	Low
Livingston	648.02	191.35	29.5%	Low	Winn	950.49	211.84	22.3%	Low

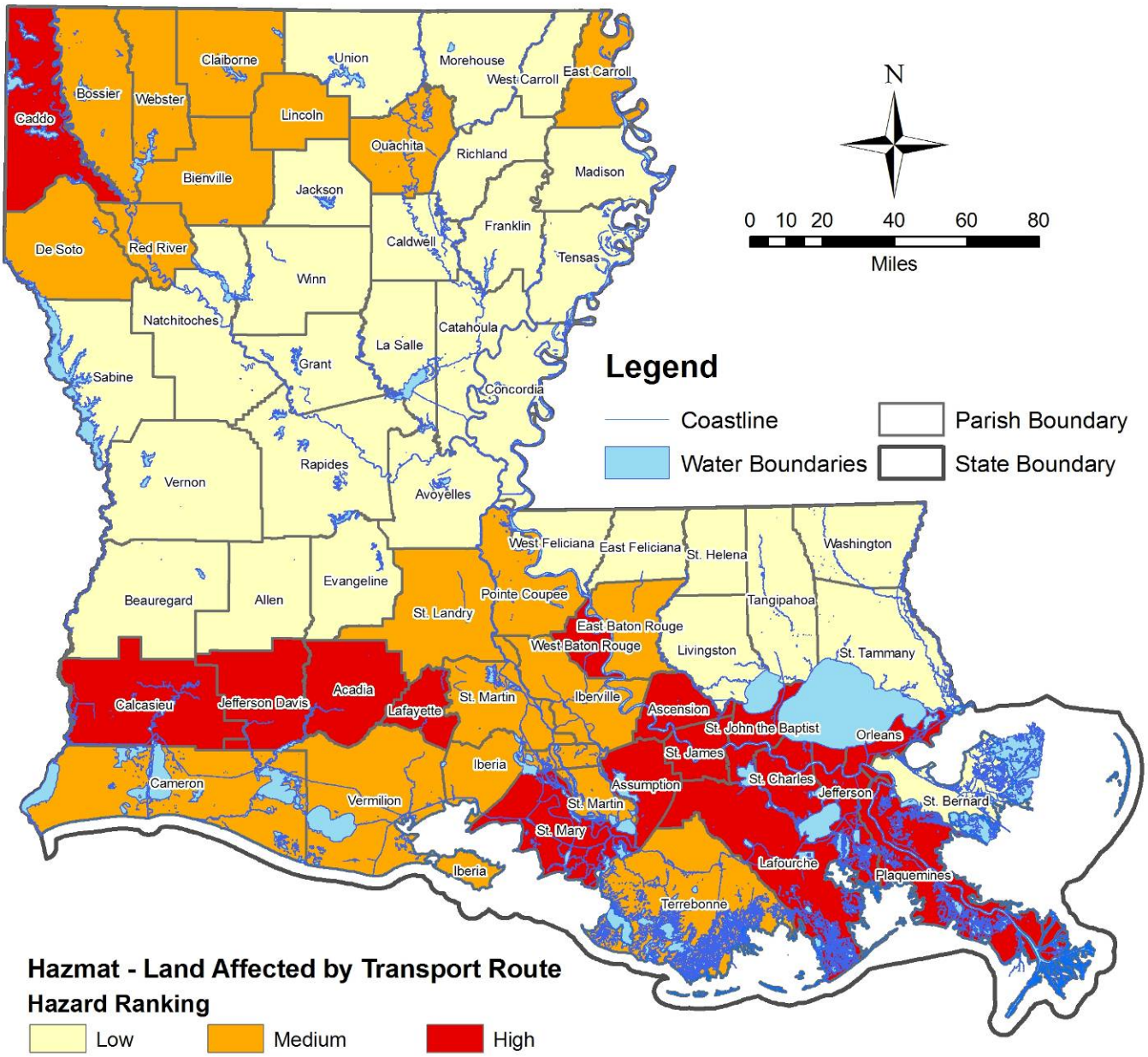
* Lake Pontchartrain comprises a significant portion of the political limits of Orleans Parish, so the parish's actual area including lake and water is much higher--about 350 square miles. A number of the hazmat transportation routes in Orleans Parish involve bridges that cross lake Pontchartrain or water routes. Thus, the total hazmat buffer zone is higher than the square miles *of land* in Orleans Parish. Lake Pontchartrain also covers a significant amount of the parishes of Jefferson, St. Charles, St. John the Baptist, and St. Tammany, elevating the percentage of the land area affected by the transport of hazmat.

Map E-141: Percent of Land Area Affected By Hazmat Transport



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Pipelines)
HAZUS-MH MR4 (Railways, Highways), Techni Graphic Systems, Inc (Waterways)

Map E-142: Parishes Ranked by Percent of Land Area Affected By Hazmat Transport



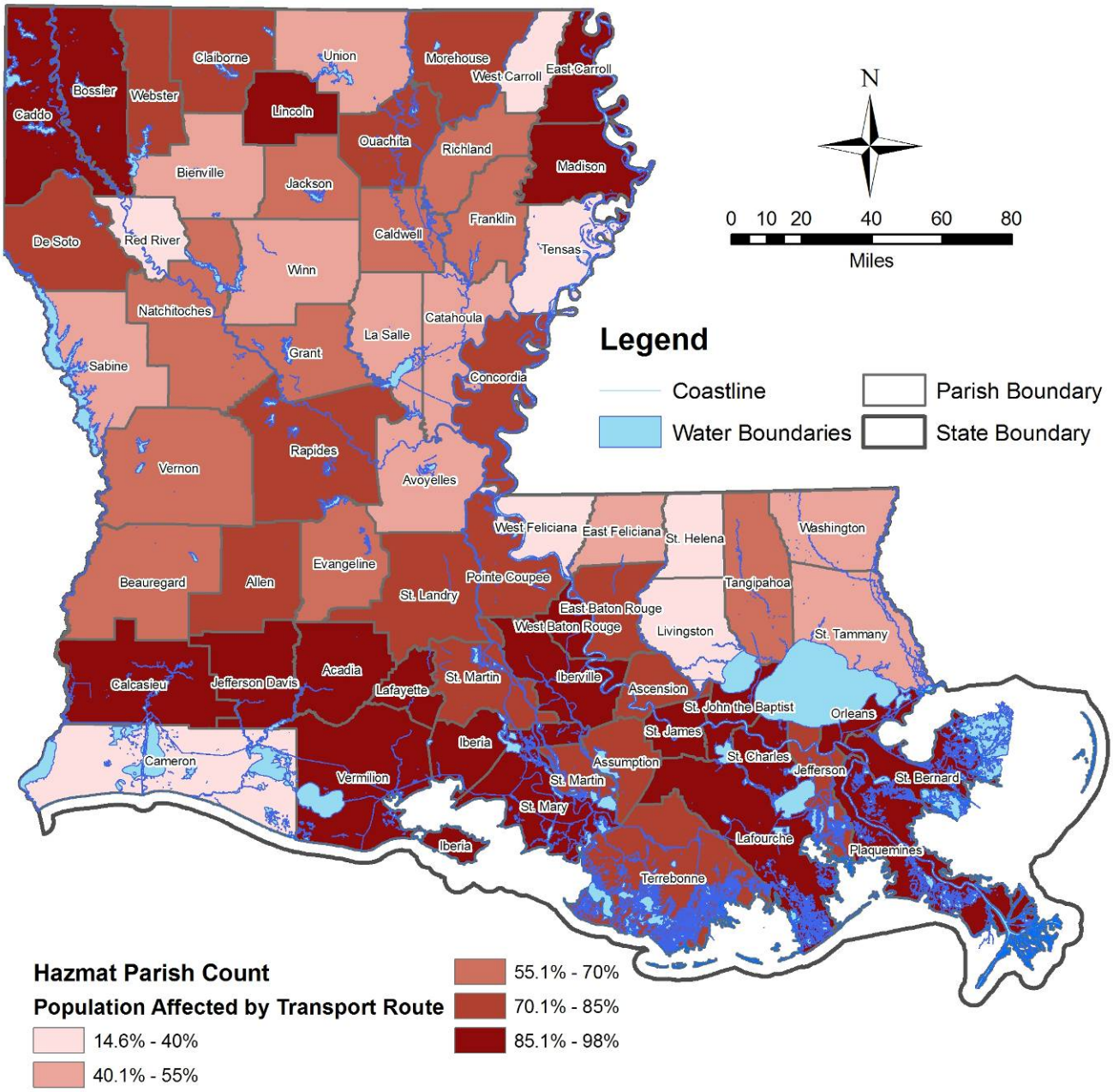
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), HSIP (Pipelines)
HAZUS-MH MR4 (Railways, Highways), Techni Graphic Systems, Inc (Waterways)

Table E-83 and Map E-143 indicate the population per parish affected by hazmat transport routes and buffer zones. Map E-144 shows the parishes ranked by percent.

Table E-83: Percent of Population Affected By Hazmat Transport

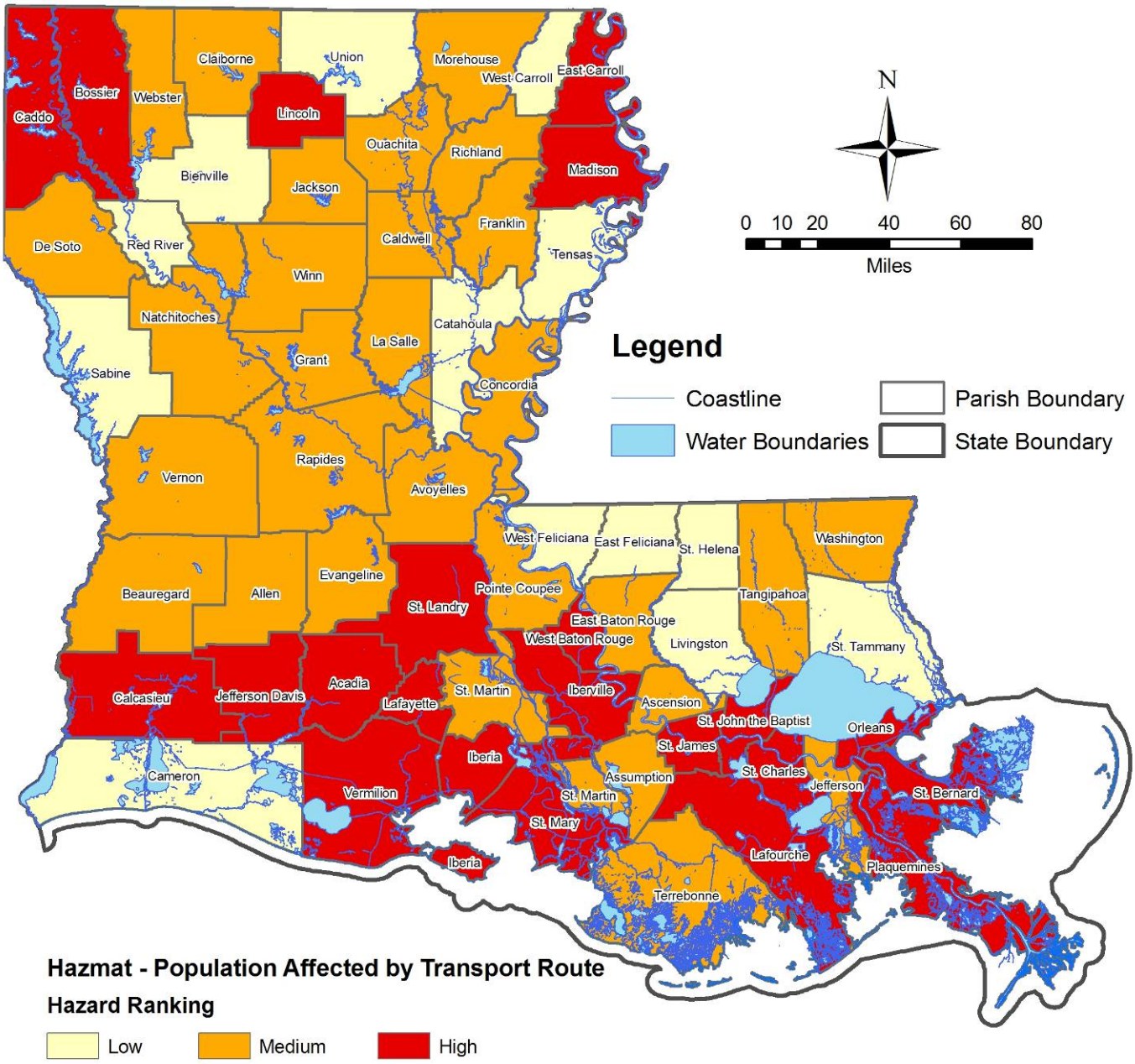
Parish	Total Population	Population of Blocks Affected	% of Parish Population Affected	Hazard Ranking	Parish	Total Population	Population of Blocks Affected	% of Parish Population Affected	Hazard Ranking
Acadia	58,861	50,118	85.1%	High	Madison	13,728	11,982	87.3%	High
Allen	25,440	19,908	78.3%	Medium	Morehouse	31,021	23,569	76.0%	Medium
Ascension	76,627	53,869	70.3%	Medium	Natchitoches	39,080	25,539	65.4%	Medium
Assumption	23,388	17,326	74.1%	Medium	Orleans	484,674	450,349	92.9%	High
Avoyelles	41,481	22,264	53.7%	Medium	Ouachita	147,250	114,415	77.7%	Medium
Beauregard	32,986	20,728	62.8%	Medium	Plaquemines	26,757	25,688	96.0%	High
Bienville	15,752	7,811	49.6%	Low	Pointe Coupee	22,763	16,704	73.4%	Medium
Bossier	98,310	87,591	89.1%	High	Rapides	126,337	96,009	76.0%	Medium
Caddo	252,161	217,865	86.4%	High	Red River	9,622	3,766	39.1%	Low
Calcasieu	183,577	164,165	89.4%	High	Richland	20,981	13,488	64.3%	Medium
Caldwell	10,560	6,402	60.6%	Medium	Sabine	23,459	11,159	47.6%	Low
Cameron	9,974	3,368	33.8%	Low	St. Bernard	67,229	65,857	98.0%	High
Catahoula	10,920	4,790	43.9%	Low	St. Charles	48,072	45,200	94.0%	High
Claiborne	16,851	13,132	77.9%	Medium	St. Helena	10,525	3,126	29.7%	Low
Concordia	20,247	14,784	73.0%	Medium	St. James	21,216	18,634	87.8%	High
De Soto	25,494	18,240	71.5%	Medium	St. John the Baptist	43,044	36,853	85.6%	High
East Baton Rouge	412,852	303,298	73.5%	Medium	St. Landry	87,715	72,160	82.3%	High
East Carroll	9,421	8,049	85.4%	High	St. Martin	48,583	34,460	70.9%	Medium
East Feliciana	21,360	9,462	44.3%	Low	St. Mary	53,500	49,171	91.9%	High
Evangeline	35,434	20,572	58.1%	Medium	St. Tammany	191,268	84,977	44.4%	Low
Franklin	21,263	12,022	56.5%	Medium	Tangipahoa	100,588	57,518	57.2%	Medium
Grant	18,698	12,109	64.8%	Medium	Tensas	6,618	1,447	21.9%	Low
Iberia	73,266	65,259	89.1%	High	Terrebonne	104,494	81,293	77.8%	Medium
Iberville	33,320	30,483	91.5%	High	Union	22,803	10,533	46.2%	Low
Jackson	15,400	10,212	66.3%	Medium	Vermilion	53,807	47,134	87.6%	High
Jefferson	455,466	323,629	71.1%	Medium	Vernon	52,531	29,305	55.8%	Medium
Jefferson Davis	31,435	28,366	90.2%	High	Washington	43,926	22,685	51.6%	Medium
Lafayette	190,488	163,106	85.6%	High	Webster	41,834	31,412	75.1%	Medium
Lafourche	89,983	78,722	87.5%	High	West Baton Rouge	21,601	19,759	91.5%	High
La Salle	14,282	7,596	53.2%	Medium	West Carroll	12,314	3,850	31.3%	Low
Lincoln	44,288	38,522	87.0%	High	West Feliciana	15,111	2,212	14.6%	Low
Livingston	91,814	30,770	33.5%	Low	Winn	16,894	9,160	54.2%	Medium

Map E-143: Percent of Population Affected By Hazmat Transport



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Populations), HSIP (Pipelines) HAZUS-MH MR4 (Railways, Highways), Techni Graphic Systems, Inc (Waterways)

Map E-144: Parishes Ranked by Percent of Population Affected By Hazmat Transport



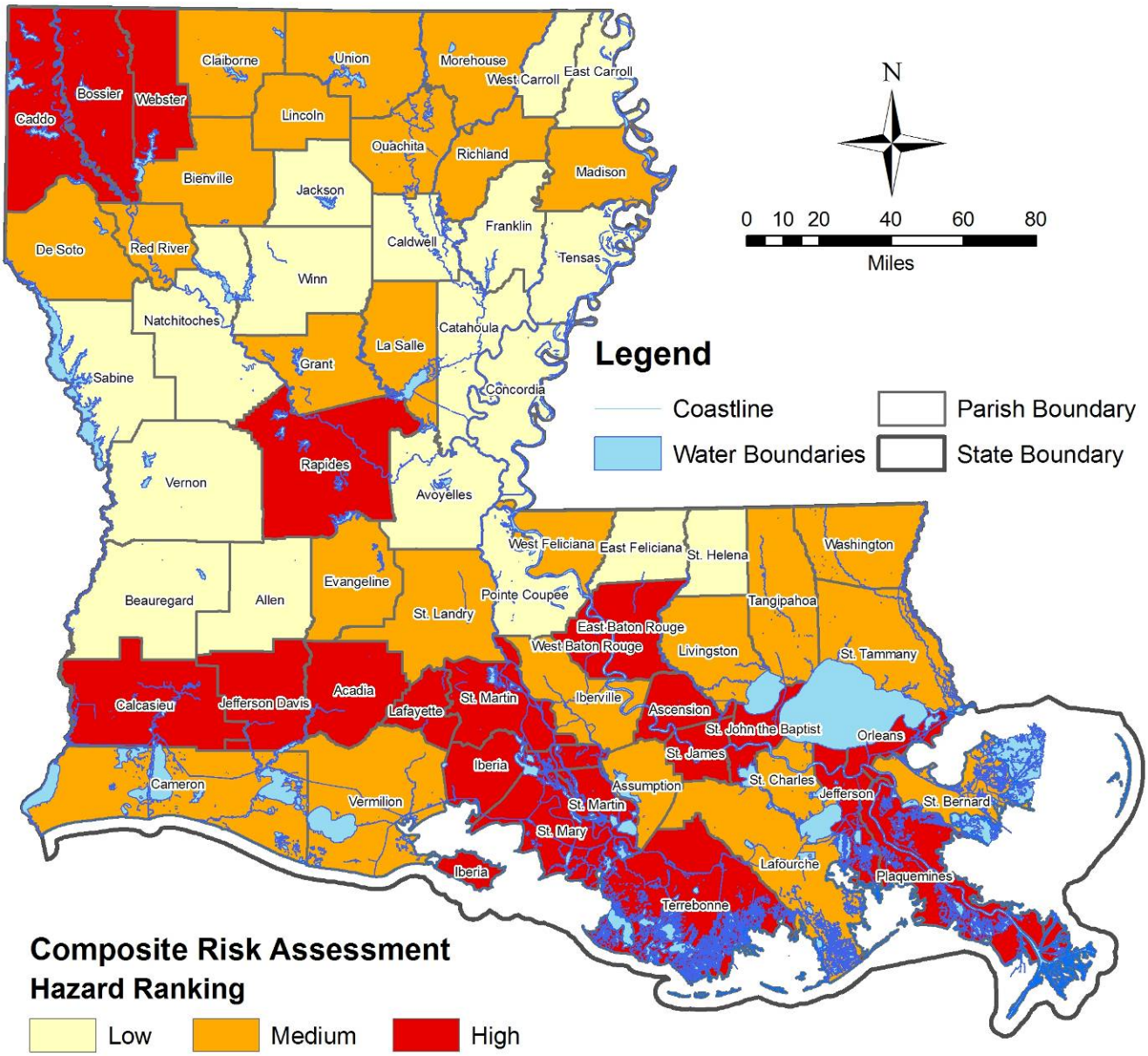
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Populations), HSIP (Pipelines) HAZUS-MH MR4 (Railways, Highways), Techni Graphic Systems, Inc (Waterways)

The composite score high ranking three (3) points, each medium rank two (2) points, and each low ranking one (1) point. Following this methodology, the possible range of scores for Hazmat is 8 to 9. A high Wildfire Hazard would be assigned to a parish receiving a score of 5 to 7; medium would be for parishes scoring 12-16; and low would be for any parish scoring 3 to 4. Table E-84 and Map E-145 show the composite scores by parish for the hazmat hazard.

Table E-84: Hazmat Composite Score by Parish

Parish	Occur. Hazard Ranking	Land Coverage Hazard Ranking	Pop. Hazard Ranking	Comp. Hazard Ranking	Parish	Occur. Hazard Ranking	Land Coverage Hazard Ranking	Pop. Hazard Ranking	Comp. Hazard Ranking
Acadia	Medium	High	Medium	7	Madison	Low	Low	High	5
Allen	Low	Low	Medium	4	Morehouse	Low	Medium	Medium	5
Ascension	High	Medium	Medium	7	Natchitoches	Low	Low	Medium	4
Assumption	Medium	Medium	Medium	6	Orleans	High	High	Medium	8
Avoyelles	Low	Low	Medium	4	Ouachita	Medium	Medium	Medium	6
Beauregard	Low	Low	Low	3	Plaquemines	High	High	Medium	8
Bienville	Low	Medium	High	6	Pointe Coupee	Low	Medium	Low	4
Bossier	Medium	Medium	High	7	Rapides	Medium	Medium	High	7
Caddo	Medium	Medium	High	7	Red River	Low	Medium	High	6
Calcasieu	Medium	High	Medium	7	Richland	Low	Low	High	5
Caldwell	Low	Low	Low	3	Sabine	Low	Low	Medium	4
Cameron	Medium	Medium	Low	5	St. Bernard	High	Medium	Low	6
Catahoula	Low	Low	Medium	4	St. Charles	Medium	High	Low	6
Claiborne	Low	Medium	Medium	5	St. Helena	Low	Low	Medium	4
Concordia	Low	Low	Medium	4	St. James	High	High	Medium	8
De Soto	Low	Medium	Medium	5	St. John the Baptist	High	Medium	Medium	7
East Baton Rouge	High	Medium	High	8	St. Landry	Medium	Medium	Medium	6
East Carroll	Low	Medium	Low	4	St. Martin	Medium	Medium	High	7
East Feliciana	Low	Low	Medium	4	St. Mary	High	High	Low	7
Evangeline	Low	Medium	Medium	5	St. Tammany	Medium	Medium	Medium	6
Franklin	Low	Low	Medium	4	Tangipahoa	Medium	Low	Medium	5
Grant	Low	Medium	High	6	Tensas	Low	Low	Medium	4
Iberia	Medium	Medium	High	7	Terrebonne	Medium	Medium	High	7
Iberville	Medium	Medium	Medium	6	Union	Low	Medium	High	6
Jackson	Low	Low	Medium	4	Vermilion	Medium	Medium	Medium	6
Jefferson	High	High	High	9	Vernon	Low	Low	Medium	4
Jefferson Davis	Low	High	High	7	Washington	Low	Low	High	5
Lafayette	High	High	High	9	Webster	Medium	Medium	High	7
Lafourche	Medium	Medium	Medium	6	West Baton Rouge	High	High	High	9
La Salle	Low	Low	High	5	West Carroll	Low	Low	Medium	4
Lincoln	Medium	Medium	Low	5	West Feliciana	Low	Low	High	5
Livingston	Medium	Low	Medium	5	Winn	Low	Low	Low	3

Map E-145: Hazmat Composite Score by Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries, Block Populations), HSIP (Pipelines) HAZUS-MH MR4 (Railways, Highways), Techni Graphic Systems, Inc (Waterways), National Response Center (Hazardous Material Spill Reports), LOSCO/EPA (Hazmat Industries, RCRA, RMPs)

Methodology

The US EPA maintains a listing of facilities that store or handle hazardous materials. The list is called the Toxic Release Inventory (TRI). The 2002 TRI listing was used for this study. As of 2002, the State of Louisiana had 374 facilities that were included on the TRI listing. Population exposure to potentially hazardous materials (HAZMAT) was identified for all 374 facilities in the State of Louisiana. The Areal Locations of Hazardous Atmospheres (ALOHA) model was used to determine loss estimates for the 20 sites with the highest affected population. Map E-23 shows the locations of the HAZMAT sites in relationship to population. The vulnerability level is based on the proximity of the affected population to the site: high risk (within a one mile radius; medium [two to four miles]; and low [four to five miles]).

The analyses were performed by creating three circles of different radii (1-, 2-, and 5-mile) around each of the identified 20 facilities. Each circle correlates to a level of risk: *high risk* for the 1-mile radius; *high to medium risk* for the 2-mile radius; and *medium to low risk* for the 5-mile radius. The exposure within each circular area was determined and one-tenth of the population and structures were assumed to be affected. The one-tenth proportion was used to account for the unknown contaminant plume shape and unknown wind direction. No attempt was made to differentiate the effect of different chemicals due to data limitations and time constraints.

Losses associated with hazardous materials incidents include social loss (i.e., casualty) and/or economic loss (i.e., business interruption and building clean-up costs). After the radii of the circle proximity to the HAZMAT sites were established, the ALOHA model was run for the 20 sites with the highest affected population to determine losses. Only 20 sites were modeled because estimating losses using the ALOHA model requires site-specific detailed information. For example, the quantity of material at each site is one key type of information needed, so unfortunately this information was unavailable for most facilities. Additionally, the ALOHA model can only be run for one chemical at a time. For sites that store multiple chemicals, multiple ALOHA scenarios must be run. Not all of the chemicals used at the facilities are in the ALOHA database, so additional research would be required if additional sites and complete chemical inventories were to be modeled.

Determining the appropriate size of radii to represent the potential affected area surrounding a facility was modeled using ALOHA. ALOHA simulations were run with set assumption of atmospheric conditions (i.e., assumed average wind speed and temperate) and an assumed amount of released material (the most-likely “worst case scenario” amount of release). The most prevalently found chemicals on site in Louisiana facilities (TRI 2002) were chosen to be the proxy of all chemicals. The resulting plume sizes for various chemicals are provided in Table E-51. The modeled results indicate that the chemical plume will impact population and structures within 0.4 to five miles of the release.

Tables E-85 through E-88 depicts population exposure to hazardous materials facilities by parish, and population and building exposure in number and valuation to hazardous materials facilities.

Table E-85: Population Exposure to Hazardous Materials Facilities for Louisiana Parishes

	Within 1 Mile Radius (High)			1 - 2 Mile Radius (Medium)			2 - 5 Mile Radius (Low)		
Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Acadia	1,179	157	197	992	124	149	4,281	580	580
Allen	273	40	48	737	76	85	433	64	67
Ascension	1,094	81	61	3,057	282	258	23,344	1,853	1,882
Assumption	462	30	55	329	37	40	1,214	132	148
Avoyelles	276	40	44	329	61	58	2,033	262	295
Beauregard	349	35	34	878	121	116	3,077	401	340
Bienville	93	15	14	342	65	52	815	150	127
Bossier	3,536	383	514	7,878	996	1,133	44,879	5,962	5,398
Caddo	12,274	1,427	1,889	29,353	3,900	4,596	150,067	21,239	19,279
Calcasieu	3,649	451	413	12,299	1,553	1,131	110,194	14,175	10,969
Caldwell	-	-	-	-	-	-	-	-	-
Cameron	16	1	1	104	11	12	155	17	16
Catahoula	-	-	-	-	-	-	-	-	-
Claiborne	-	-	-	-	-	-	-	-	-
Concordia	60	9	6	439	68	64	221	23	35
De Soto	539	76	103	673	111	110	1,873	289	303
East Baton Rouge	9,450	839	1,239	27,473	2,596	3,872	158,246	16,435	21,427
East Carroll	628	48	38	976	155	84	4,012	621	497
East Feliciana	-	-	-	-	-	-	-	-	-
Evangeline	120	16	20	330	45	76	2,303	328	467
Franklin	180	40	31	491	80	101	352	47	48
Grant	17	2	2	38	6	5	230	31	27
Iberia	524	40	46	1,305	106	115	21,488	2,487	2,824
Iberville	1,851	108	115	3,673	216	230	15,558	1,516	1,637
Jackson	165	30	29	148	23	28	640	123	93
Jefferson	21,712	3,009	2,724	78,412	10,021	9,240	514,855	61,510	67,437
Jefferson Davis	-	-	-	-	-	-	-	-	-
La Salle	202	26	37	366	48	44	546	88	66
Lafayette	3,788	346	411	11,619	981	1,254	70,216	7,399	7,571
Lafourche	2,029	276	269	3,219	377	372	4,738	438	413
Lincoln	732	109	133	2,224	273	376	7,505	786	1,010
Livingston	2,206	217	198	5,389	549	454	19,136	1,623	1,518
Madison	481	52	88	639	75	101	95	11	10
Morehouse	773	140	123	1,028	157	165	546	82	72
Natchitoches	652	49	106	1,573	177	229	7,965	915	1,179
Orleans	4,073	497	569	18,461	1,942	2,968	99,791	11,784	14,015

	Within 1 Mile Radius (High)			1 - 2 Mile Radius (Medium)			2 - 5 Mile Radius (Low)		
Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Ouachita	4,412	554	748	11,360	1,579	1,732	46,007	6,113	5,995
Plaquemines	3,246	207	161	6,239	435	382	53,569	4,547	4,593
Pointe Coupee	187	20	17	144	17	14	1,418	178	172
Rapides	3,567	453	482	5,232	782	733	31,920	4,200	4,143
Red River	174	25	34	242	35	33	165	24	25
Richland	165	33	26	245	36	40	167	20	23
Sabine	481	66	76	375	55	64	1,282	192	193
St. Bernard	1,876	294	235	5,453	710	427	24,097	2,781	2,861
St. Charles	6,442	936	534	12,092	1,547	1,187	70,592	7,791	6,717
St. Helena	40	6	5	33	6	4	323	47	48
St. James	293	30	35	1,476	176	153	4,608	482	502
St. John the Baptist	1,624	183	189	6,091	614	663	21,573	1,858	1,906
St. Landry	1,136	137	211	1,919	297	396	4,681	649	849
St. Martin	380	31	38	806	69	87	5,547	484	572
St. Mary	482	50	60	430	31	51	2,536	289	367
St. Tammany	3,634	427	204	5,699	532	341	14,280	1,356	991
Tangipahoa	709	78	86	1,865	235	275	6,133	621	811
Tensas	-	-	-	-	-	-	-	-	-
Terrebonne	216	17	20	644	53	52	5,445	596	565
Union	62	8	7	142	16	23	1,400	163	189
Vermilion	586	78	71	1,234	191	230	3,019	412	408
Vernon	1,101	37	73	1,212	89	140	1,900	64	146
Washington	1,077	188	221	1,863	341	337	716	105	99
Webster	470	72	88	1,107	185	207	1,594	285	183
West Baton Rouge	1,819	144	170	3,815	367	456	81,871	8,037	13,564
West Carroll	-	-	-	-	-	-	-	-	-
West Feliciana	9	1	1	30	3	3	527	52	45
Winn	14	2	2	27	4	3	294	45	36

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities

Facility Name	Parish	High Risk			Medium Risk			Low Risk		
		Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Crompton Corp.	Jefferson	2,478	229	307	7,825	827	822	32,671	3,759	4,706
Shell Oil Prods. Us	Jefferson	2,019	308	335	8,891	1,191	1,244	42,897	6,023	6,501
Capitol Steel Inc.	East Baton Rouge	1,972	171	352	5,804	630	1,040	19,419	2,321	2,712
Delta Petroleum Co. Inc.	St Charles	1,852	359	194	6,776	1,133	825	38,749	5,607	5,212
Delta Petroleum Co. Inc.	Jefferson	1,852	359	194	6,776	1,133	825	38,749	5,607	5,212
Hobson Galvanizing Inc.	Plaquemines	1,820	110	89	4,088	266	245	19,777	1,817	1,962
U.S. Gypsum Co.	Orleans	1,701	215	166	4,808	558	514	24,588	3,091	3,571
Schering-Plough Veterinary Ops. Inc.	East Baton Rouge	1,509	200	128	3,753	531	291	17,527	2,056	1,740
Bollinger Algiers L.L.C.	Orleans	1,468	181	270	9,041	974	1,906	46,758	5,822	7,359
Hay Wilk Galvanizing Inc.	Jefferson	1,408	181	212	5,253	708	786	37,843	3,832	5,246
Chemcentral /New Orleans	Jefferson	1,335	184	228	6,563	950	919	41,307	5,894	6,041
Crystal Clean Services L.L.C.	Caddo	1,300	112	188	3,572	428	579	16,240	2,346	2,107
Pennzoil-Quaker State Co.	Caddo	1,290	112	188	3,672	435	591	16,286	2,361	2,127
Pennzoil - Quaker State Co.	Caddo	1,289	154	210	4,221	482	698	16,225	2,351	2,258
Calumet Lubricants Co. Shreveport Refy.	Caddo	1,276	150	206	4,373	504	724	16,120	2,338	2,260
Caddo Paint Co. Inc.	Caddo	1,229	152	187	4,589	627	767	15,861	2,244	2,351
Purina Mills L.L.C.	Caddo	1,220	170	234	4,520	655	672	16,769	2,470	2,309
Kik- Louisiana Inc.	St Tammany	1,199	168	59	3,140	345	211	7,685	745	545
Jefferson Fiberglass Co. Inc.	Jefferson	1,137	174	137	5,422	577	606	30,570	3,008	4,014
Bollinger Quick Repair L.L.C.	Jefferson	1,134	190	179	6,310	843	1,032	38,979	3,984	5,605
Chevrontexaco Used Oil Recycling Plant	Jefferson	1,130	214	205	6,536	940	970	36,480	3,776	5,344
Evans Harvey Corp.	Jefferson	1,098	89	128	5,212	568	578	31,168	3,079	3,996
Evans Harvey Inc.	Jefferson	1,098	89	128	5,212	568	578	31,168	3,079	3,996
Qpl Inc.	Lafourche	1,082	146	159	2,284	290	291	3,697	395	411
Marble Quarry Inc.	St Tammany	1,079	105	57	2,536	245	108	5,202	491	214
Chalmette Refining L.L.C.	St Bernard	1,045	174	142	4,488	661	426	18,841	2,209	2,212
Sigma Coatings Usa B.V.	Jefferson	1,044	123	110	5,275	568	590	31,132	3,056	4,057

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities										
		High Risk			Medium Risk			Low Risk		
Facility Name	Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Capitol Steel Slidell	St Tammany	1,000	96	51	2,759	265	139	6,761	657	500
Central Oil & Supply Monroe Bulk Facility	Ouachita	948	116	192	2,874	327	518	9,089	1,207	1,313
U.S. Air Force Barksdale Afb La	Bossier	917	95	49	1,972	223	153	9,959	1,325	1,094
Milk Prods. Lp. Dba Borden Dairy	Lafayette	893	143	131	3,853	475	528	12,847	1,369	1,499
Body Masters Sports Industry	Acadia	889	121	149	1,078	136	173	1,552	179	220
Associated Printing	Bossier	885	113	174	2,454	319	388	12,082	1,612	1,618
New Orleans Shipyard	Jefferson	882	101	55	3,495	491	286	17,692	2,336	1,771
Libbey Glass Inc.	Caddo	868	113	149	2,744	322	425	13,456	1,808	1,997
Rhodia Inc.	East Baton Rouge	853	84	133	1,838	181	257	8,730	758	1,144
Coca-Cola Bottling Co. Ouachita	Ouachita	841	78	142	2,607	297	511	8,673	1,155	1,291
Murphy Oil USA Inc. Meraux Refy.	St Bernard	831	120	93	2,841	342	235	12,585	1,576	1,311
New Ngc Inc.	Jefferson	824	121	109	5,220	623	709	31,553	3,849	4,677
Northwest Pipe Co.	Bossier	811	89	155	2,902	389	512	13,512	1,825	1,814
Wechem Inc.	Jefferson	803	148	57	3,303	528	300	26,244	3,843	2,932
U.S. Army Joint Readiness Training Center (JRTC) & Fort Polk	Vernon	789	1	18	1,236	5	53	1,936	22	109
International Paper Co. Louisiana Mill	Morehouse	773	140	123	1,801	297	288	2,347	379	361
X-Chem Inc.	Jefferson	764	155	57	2,860	430	251	24,047	3,445	2,742
Exxonmobil Refining & Supply Baton Rouge Refy.	East Baton Rouge	756	47	115	3,374	275	579	15,313	1,613	2,468
Baker Mfg. Co. Inc.	Rapides	731	99	123	1,720	267	309	7,091	1,009	1,005
Cameco Inds. - Thibodaux Facility	Lafourche	704	108	87	2,091	270	273	3,533	387	397
Colfax Treating Co. L.L.C.	Rapides	690	93	124	1,963	295	370	7,140	1,021	1,001
Frymaster	Caddo	664	131	78	2,579	459	332	13,224	1,912	1,532
Driscoll Management L.L.C.	East Baton Rouge	655	73	95	2,372	204	354	12,877	1,248	1,969
Nexair L.L.C.	Ouachita	643	99	137	3,220	471	513	9,562	1,295	1,333

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities

Facility Name	Parish	High Risk			Medium Risk			Low Risk		
		Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
East Jordan Iron Works Inc.	Livingston	638	75	54	1,700	186	134	5,988	524	397
Carboline Co.	Calcasieu	637	111	147	2,083	302	392	8,662	1,189	1,145
Barnes Hardwood Inc. Sondheimer Div.	East Carroll	628	48	38	1,604	203	122	5,615	824	619
Cp Louisiana Inc.	Jefferson	627	72	66	4,544	762	426	28,820	4,251	3,160
Dsm Copolymer Inc.	East Baton Rouge	589	41	94	2,962	239	459	14,049	1,461	2,210
Exxonmobil Chemical Baton Rouge Chemical Plant	East Baton Rouge	589	41	95	3,099	247	485	14,124	1,491	2,225
Cmp Coatings Inc.	Plaquemines	585	37	15	3,001	185	147	15,121	1,291	1,303
Silco (Dba Elco Forest Prods.)	St Landry	552	69	116	1,921	272	397	3,846	529	710
Orleans Marble Inc.	Jefferson	542	79	71	2,859	458	272	27,839	4,002	3,346
Gaylord Container Corp.	Washington	542	94	112	1,470	265	279	1,828	317	329
Bunge N.A. Inc.	St Charles	540	29	15	832	57	33	2,661	220	156
Gaylord Chemical Corp.	Washington	535	94	109	1,469	264	279	1,828	317	329
Esgard Inc.	Lafayette	532	42	49	1,599	127	165	10,510	1,134	1,290
Bollinger Gulf Repair L.L.C.	Orleans	528	64	80	4,970	610	687	29,691	3,706	4,450
Monsanto - Luling	St Charles	509	59	30	1,212	115	69	3,684	302	218
Occidental Chemical Corp. - Luling	St Charles	509	59	30	1,212	115	69	3,684	302	218
Sci Fabrication Shop	Ascension	507	25	16	1,515	79	50	5,474	287	209
Shell Chemical L.P. St. Rose Facility	St Charles	503	40	39	880	75	63	4,006	318	262
Northrop Grumman Ship Sys. Avondale Ops.	Jefferson	500	104	43	2,466	361	226	21,330	2,919	2,446
Exide Techs.	Caddo	499	53	42	1,214	105	125	4,931	561	544
Edo Specialty Plastics	East Baton Rouge	498	25	15	1,287	59	53	9,839	692	549
Bercen, Inc. Southern Div.	Livingston	496	39	34	1,405	150	106	5,324	463	369
Orion Refining Corp.	St Charles	495	41	40	1,584	130	85	3,064	301	203
Mckinney Oil Co. Of Tallulah Inc.	Madison	473	51	87	1,096	123	186	1,158	130	193
Plymouth Tube Co.	Ouachita	472	64	69	1,532	239	223	7,961	1,087	1,086
Lott Oil Co.	De Soto	437	58	86	838	126	148	946	144	163

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities

Facility Name	Parish	High Risk			Medium Risk			Low Risk		
		Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Mariah Corp.	Lafayette	436	27	39	861	57	64	4,575	359	345
Steel Forgings Inc.	Caddo	434	13	63	1,085	112	165	9,377	1,225	1,514
Borden Chemical Inc.	Rapides	433	55	68	1,012	139	141	5,507	804	816
Resin Sys. Inc.	Calcasieu	433	46	27	1,434	197	115	3,425	393	299
Resolution Performance Prods. L.L.C.	St Charles	430	73	42	522	84	49	2,377	227	153
Flint Ink N.A.	Ouachita	428	65	65	1,771	292	222	7,711	1,057	1,008
Gulf Coast Chemical Inc.	Vermilion	426	59	57	1,327	196	239	2,124	306	320
Cerro Copper Tube Co.	Bossier	425	38	37	1,241	81	84	6,107	659	597
Lott Oil Co.	Bossier	421	40	90	2,630	346	486	13,364	1,792	1,820
FMC Corp. Agriculture Prods. Group	St Landry	421	44	68	938	133	177	3,522	502	689
Shaw Shreveport	Caddo	412	21	60	1,307	125	258	12,314	1,581	1,806
Delta Environmental Prods. Inc.	Livingston	407	40	34	1,677	179	127	5,425	477	378
Federal Home Prods.	Lincoln	400	58	85	1,406	176	254	2,816	331	440
Baton Rouge Plastics Plant	East Baton Rouge	394	50	59	1,944	180	258	7,918	723	995
St. Mary Galvanizing Co.	St Mary	389	43	46	578	59	70	2,534	287	354
Riverwood Intl. Corp.	Ouachita	384	51	66	1,445	200	221	8,525	1,136	1,214
Pumpelly Oil Co.	Calcasieu	381	47	26	1,261	166	88	3,733	428	323
Castrol N.A. Inc.	West Baton Rouge	371	53	50	829	103	114	10,034	1,020	1,702
Univar USA	Lafayette	369	37	41	1,173	112	132	4,162	348	438
Lard Oil Co. Inc.	Livingston	364	34	52	1,210	103	166	4,157	420	590
Shell Norco Chemical Plant East Site	St Charles	361	65	33	600	93	59	2,340	222	146
Bioproducts Of Louisiana L.L.C.	Iberville	358	9	7	414	16	14	943	61	64
Air Prods. & Chemicals Inc.	Iberville	355	9	7	457	20	20	929	61	67
Deltech Corp.	East Baton Rouge	354	14	31	857	73	99	5,281	496	660
Ohmstede Ltd.	Calcasieu	353	42	23	1,301	177	96	3,664	420	314
Harcros Chemicals Inc.	Iberville	349	8	6	445	19	18	954	62	66
Shaw SSS Fabricators Inc.	West Baton Rouge	348	24	27	661	51	49	1,996	130	287
Shaw Alloy Piping Prods. Inc.	Caddo	344	57	93	2,066	282	443	13,708	1,823	2,008

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities										
		High Risk			Medium Risk			Low Risk		
Facility Name	Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Ondeo Nalco Energy Services Scott Blend Plant	Lafayette	342	23	42	1,542	144	230	11,461	1,289	1,466
Eclectic Prods. Inc.	Rapides	334	45	37	803	109	83	3,665	457	437
Willamette Valley Co.	Rapides	334	45	37	803	109	83	3,665	457	437
Gmtg Shreveport Assembly	Caddo	316	33	29	825	76	82	3,980	424	382
Lott Oil Co.	Vernon	312	36	55	1,077	120	160	2,277	168	250
Jotun Paints Inc.	Plaquemines	308	23	16	769	72	40	7,456	508	461
Lott Oil Co.	Natchitoches	293	19	52	1,101	111	158	2,473	271	367
Hughes Christensen-Lafayette	Lafayette	292	19	22	1,457	89	125	8,655	901	858
Varco Amelia South Coating Plant Tuboscope Div.	Assumption	290	19	34	308	20	36	628	49	70
Catalyst Recovery Of Louisiana L.L.C.	Lafayette	287	14	31	1,216	91	110	10,138	1,119	1,120
Vivian Inds. Inc.	Caddo	287	49	45	471	85	74	570	101	88
Dis-Tran Wood Prods. L.L.C.	Rapides	285	38	30	795	111	82	3,880	484	487
Bollinger Gretna L.L.C.	Jefferson	281	20	10	1,956	133	81	12,021	921	981
Beaird Inds. Inc.	Caddo	275	46	41	2,211	368	283	12,453	1,821	1,404
Louisiana Blasting & Coating Inc.	Iberia	273	21	25	525	40	45	1,799	135	144
Ampacet Corp.	Beauregard	268	25	24	662	84	80	1,760	224	206
Motiva Enterprises L.L.C.	St Charles	265	50	22	524	84	51	2,270	215	137
Procter & Gamble Mfg. Co.	Rapides	263	36	18	865	125	75	3,674	469	435
Motiva Kenner Terminal	Jefferson	257	22	44	2,823	260	334	17,088	2,046	1,362
Inland Paperboard & Packaging	Webster	254	37	47	922	144	171	1,911	309	284
Dpc Enterprises	St John The Baptist	250	31	28	674	75	77	3,412	288	301
Exide Techs. Baton Rouge Smelter	East Baton Rouge	249	26	22	816	84	64	4,905	508	502
Starling Inc.	Livingston	242	24	19	1,438	130	102	5,025	434	362
Conocophillips Lake Charles Refy.	Calcasieu	241	30	36	669	91	74	6,420	947	794
Capitol Mfg. Co.	Acadia	240	31	43	917	126	147	2,017	285	281
Cytec Inds. Inc. Fortier Plant	Jefferson	239	19	27	836	65	92	13,807	1,644	1,166

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities										
		High Risk			Medium Risk			Low Risk		
Facility Name	Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Arizona Chemical	Allen	234	35	43	907	105	119	1,037	123	140
Datachem Inc.	St John The Baptist	233	29	27	684	80	81	2,833	258	278
Taylortec Inc.	Tangipahoa	225	24	25	1,265	172	193	4,830	507	652
Shaw Process Fabricators Inc.	Ouachita	224	25	21	1,362	179	154	5,708	807	686
Spectrum Control Tech. Inc.	Orleans	222	18	29	1,705	139	171	9,221	725	950
Shell Norco Chemical Plant West Site	St Charles	221	37	22	812	114	70	2,326	224	139
Union Carbide Corp. Cypress Catalyst Plant	St Charles	221	37	22	812	114	70	2,326	224	139
Du Pont Pontchartrain Works	St John The Baptist	220	17	24	1,519	120	149	4,126	315	332
Dupont Dow Elastomers L.L.C. Pontchartrain Site	St John The Baptist	220	17	24	1,519	120	149	4,126	315	332
Air Liquide America Corp.	St Charles	219	43	15	358	65	33	2,396	230	153
Vulcan Performance Chemicals Shreveport Plant	Caddo	218	23	41	716	86	119	3,437	442	425
Royal Fiberglass Pools Inc.	St Martin	217	21	27	523	52	65	2,403	238	297
Cleanharbors Baton Rouge L.L.C.	East Baton Rouge	217	14	18	322	26	26	4,268	418	491
Ppg Grow Baton Rouge	East Baton Rouge	217	14	18	283	21	23	3,864	379	429
International Paper Pineville Mill	Rapides	213	17	18	285	26	24	2,576	319	313
Dura-Wood L.L.C.	Rapides	211	17	18	320	28	25	2,340	280	267
Georgia Gulf Lake Charles L.L.C.	Calcasieu	204	21	30	739	91	81	4,544	600	490
Amite Fndy. & Machine Inc.	Tangipahoa	199	28	25	736	88	101	1,308	156	188
Polychemie Pearl River Plant	St Tammany	194	24	28	508	51	64	1,794	155	171
W. B. Mccartney Oil Co. Inc. Bulk Plant	La Salle	190	25	35	411	57	60	744	122	102
Sasol N.A. Inc. Lake Charles Chemical Complex	Calcasieu	189	22	29	714	93	78	5,469	769	635
Deep South Chemical Inc.	Lafayette	189	12	22	703	44	61	3,322	192	247

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities

Facility Name	Parish	High Risk			Medium Risk			Low Risk		
		Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Borden Chemicals & Plastics Operating L.P.	West Baton Rouge	189	14	15	389	27	31	2,341	209	261
Bayou Steel Corp.	St John The Baptist	187	21	19	644	67	54	4,108	330	319
St. Romain Oil Co.	Avoyelles	184	26	32	301	47	51	1,280	165	177
Micro Chemical Co.	Franklin	180	40	31	671	120	132	1,022	167	179
Lott Oil Co.	Sabine	180	28	27	374	58	66	600	90	100
Ondeo Nalco Chemical Co.	West Baton Rouge	176	16	13	347	30	24	6,813	599	1,161
Hood Inds. Inc.	Red River	174	25	34	417	60	67	582	84	91
Weyerhaeuser Zwolle Div.	Sabine	174	22	32	234	30	40	451	66	68
Deep South Petroleum Inc.	Lafayette	172	11	11	1,169	73	96	6,842	685	662
Chevron Oronite Corp.	Plaquemines	171	7	12	293	18	22	2,825	179	143
Seegott Inc. Magnolia	Jefferson	168	15	12	376	31	27	1,424	168	87
J. Ray Mcdermott Inc. Fab.	Assumption	167	11	21	298	19	35	460	36	56
Stone Container Corp. Hodge Inc.	Jackson	165	30	29	313	54	57	953	176	150
Tifton Aluminum Co. Inc.	Richland	165	33	26	410	69	66	577	89	90
Trinity Marine Prods. #38	St Tammany	163	35	10	391	55	23	2,171	268	106
Union Carbide Corp. Cypress Polypropylene Plant	St Charles	150	24	13	651	98	64	2,283	217	134
Biolab Inc.	Calcasieu	149	22	19	592	83	67	8,019	1,180	951
Ineos Oxide	Iberville	147	17	18	415	44	47	1,982	214	230
Coastal Chemical Co. L.L.C.	Vermilion	147	18	14	473	70	62	2,586	360	379
Exxonmobil Chemical Co. Baton Rouge Polyolefins Plant	East Baton Rouge	143	9	11	942	85	104	4,987	482	605
Big River Inds. - Gravelite	Pointe Coupee	137	14	11	234	24	20	483	49	45
Halliburton Energy Services Cps Mfg. Gulf Coast	St Martin	135	8	8	496	33	38	2,648	170	183

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities										
		High Risk			Medium Risk			Low Risk		
Facility Name	Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Exxonmobil Chemical Co. Baton Rouge Resin Finishing Plant	East Baton Rouge	134	11	11	1,246	112	159	5,855	566	702
Sanderson Farms Inc.	Tangipahoa	134	13	15	214	20	25	993	98	119
Certainteed Corp.	Calcasieu	134	12	7	498	63	34	5,636	781	552
Amax Metals Recovery Inc.	Plaquemines	133	15	8	655	57	27	9,616	864	752
Angus Chemical Co.	Ouachita	132	18	15	272	41	30	414	64	41
Koch Nitrogen Co.	Ouachita	132	18	15	232	32	26	413	63	41
International Painting Corp.	West Baton Rouge	128	12	9	261	23	20	976	104	70
Stowe Woodward	Lincoln	127	24	23	723	100	139	2,786	329	432
Sii Chem Tech	Lafayette	126	6	9	430	25	29	2,927	190	204
Praxair Distribution Inc.	St Charles	124	16	14	555	86	53	2,356	224	150
Seegott Inc. Magnolia	Lafayette	123	10	12	1,326	84	116	8,193	871	813
Tomah Reserve Inc.	St John The Baptist	122	17	16	687	80	82	2,533	231	268
Valero Refining Co. Louisiana	St Landry	119	18	19	127	19	20	210	26	30
Conagra Poultry Co.	Natchitoches	118	5	16	398	19	61	2,482	274	362
Kencoil Inc.	Plaquemines	118	2	6	474	17	32	7,503	447	420
Weatherford Gemoco	Terrebonne	117	11	12	515	56	46	953	111	83
Calumet Lubricants Co. L.P. Calumet Cotton Valley	Webster	116	20	18	176	30	26	259	40	34
Nasa Michoud Assembly Facility	Orleans	115	11	19	1,237	88	141	7,547	556	789
Stockhausen Louisiana L.L.C.	St John The Baptist	113	16	14	432	55	56	1,703	216	198
Bollinger Larose L.L.C.	Lafourche	108	12	12	590	70	55	1,255	149	107
Dow Chemical Co. Louisiana Div.	Iberville	106	6	10	220	18	23	1,994	218	228
Sid Richardson Carbon Co.	West Baton Rouge	106	6	10	229	17	20	1,943	210	213
Placid Refining Co. L.L.C.	West Baton Rouge	104	8	10	717	86	101	11,348	1,114	1,904
Ondeo Nalco Co.	St John The Baptist	103	14	13	431	55	56	1,703	216	198

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities

Facility Name	Parish	High Risk			Medium Risk			Low Risk		
		Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Marathon Ashland Petroleum L.L.C.	St John The Baptist	102	12	14	441	58	58	1,554	158	174
Springhill Wood Prods.	Webster	100	15	23	480	83	98	1,002	194	159
Westside Galanizing Services Inc.	West Baton Rouge	100	2	9	197	6	17	6,706	638	1,086
Discovery Aluminas Inc. (Dba Port Allen Works-Activated)	West Baton Rouge	99	2	9	194	6	16	7,653	747	1,269
Richard Oil & Fuel Inc.	Ascension	99	11	8	196	19	16	1,328	144	168
Trus Joist A Weyerhaeuser Business	Natchitoches	99	10	15	379	51	60	2,388	267	355
Grand Isle Shipyard	Jefferson	96	12	10	111	15	12	151	20	16
Alliance Compressors	Natchitoches	95	10	15	257	33	41	2,370	266	351
Bollinger Shipyards Lockport L.L.C.	Lafourche	95	7	7	157	12	12	842	92	83
Westlake Petrochemicals Corp.	Calcasieu	95	9	5	369	30	24	3,365	381	289
Westlake Petrochemicals L.P.	Calcasieu	95	9	5	369	30	24	3,365	381	289
Westlake Styrene L.P.	Calcasieu	95	9	5	369	30	24	3,365	381	289
Westlake Styrene L.P. - Marine Terminal Facility	Calcasieu	95	9	5	369	30	24	3,365	381	289
Universal Fabricators L.L.C.	Iberia	94	7	9	321	24	31	3,388	390	463
Guide Louisiana L.L.C.	Ouachita	93	8	15	98	9	16	2,431	221	305
Uop Shreveport Plant	Caddo	93	9	8	277	34	27	1,169	143	114
Albemarle Corp.	East Baton Rouge	92	7	13	2,374	166	342	14,104	1,483	2,257
Elder Wood Preserving Co. Inc.	Avoyelles	92	14	12	304	54	52	1,358	198	220
Triad Nitrogen L.L.C.	Ascension	90	9	7	263	32	29	1,389	149	174
Waterbury Cos. Inc.	Tangipahoa	88	7	8	263	21	26	926	94	108
Ineos Fluor Americas L.L.C.	Iberville	88	10	11	481	23	24	865	60	68
St. James Terminal	St James	85	10	10	216	26	26	508	54	55
Melamine Chemical Inc.	Ascension	85	9	6	370	45	42	1,395	149	174
Firestone Polymers	Calcasieu	81	9	7	833	110	57	3,801	439	317
Honeywell Intl. Inc. - Baton Rouge Plant	East Baton Rouge	79	4	18	1,594	165	274	14,453	1,447	2,379

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities										
		High Risk			Medium Risk			Low Risk		
Facility Name	Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Calumet Lubricants Co. L.P.	Bossier	78	7	9	215	20	24	1,269	127	102
Syngenta Crop Protection Inc. St. Gabriel Facility	Iberville	75	8	10	486	24	25	913	61	70
Cameron 130130	Evangeline	75	13	16	351	53	85	1,497	207	303
Daybrook Fisheries Inc.	Plaquemines	74	10	11	136	18	20	391	47	55
Boise Cascade Corp. Florien Plywood	Sabine	71	9	10	123	16	17	276	39	37
Ecological Tanks Inc.	Ouachita	70	5	5	143	12	12	631	63	55
Ferro Corp. Baton Rouge Site	East Baton Rouge	69	3	5	122	8	7	2,016	191	139
Ge Commercial Transformer Business	Caddo	66	7	7	591	59	50	3,031	307	278
Vulcan Materials Co. Chemicals Div.	Ascension	64	4	4	137	12	10	2,186	185	174
Bollinger Marine Fabricators L.L.C.	St Mary	63	5	10	242	14	28	483	40	59
Purina Mills L.L.C.	Tangipahoa	63	8	12	95	11	17	649	79	105
Gulf Island L.L.C. Main Yard West Yard & Southport	Terrebonne	63	3	6	303	11	23	5,048	525	521
Cf Inds. Inc.	Ascension	63	7	5	429	54	56	1,453	159	185
Meadwestvaco South Carolina L.L.C.	Beauregard	63	8	8	489	67	63	1,627	209	188
Pinnacle Polymers Co.	St John The Baptist	61	7	8	296	38	37	1,602	167	181
Brenntag Southwest Inc. St. Gabriel	Iberville	60	7	8	508	26	28	894	59	68
Arch Chemcials Inc.	Calcasieu	60	9	8	549	79	64	8,150	1,210	969
Lyondell Chemical Co.	Calcasieu	60	9	8	549	79	64	8,150	1,210	969
Ciba Specialty Chemicals Corp.	Iberville	60	6	7	492	24	25	898	58	66
Alcoa World Chemicals Vidalia Works	Concordia	60	9	6	499	76	70	720	99	105
Imc Phosphates Mp Inc. Faustina Plant	St James	59	5	6	213	19	19	897	103	107
Shaw Sunland Fabricators Inc.	Livingston	58	5	5	166	16	17	812	71	74
Pioneer Americas L.L.C.	Iberville	58	6	8	486	24	25	914	61	71

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities

Facility Name	Parish	High Risk			Medium Risk			Low Risk		
		Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Arnold Forest Prods. Corp.	Caddo	58	6	6	164	17	17	544	57	57
Chevron Phillips Chemical Co. L.P.	St James	58	5	6	219	20	20	1,084	122	134
Polyone Corp.	Iberville	56	8	8	294	34	35	2,111	221	246
Basell USA Inc. Lake Charles Plant	Calcasieu	56	6	3	154	18	8	4,466	533	364
Athens Caddo Brick	Caddo	54	6	5	169	21	17	552	62	59
Southern Ionics Inc.	Calcasieu	52	5	5	160	14	12	2,665	290	178
W. R. Grace & Co.-Conn. Davison Catalysts	Calcasieu	52	5	5	154	15	10	2,432	250	159
Citgo Petroleum Corp.	Calcasieu	51	5	2	136	14	6	4,358	514	345
Enterprise Prods. Operating L.P.	West Baton Rouge	51	1	5	514	47	73	12,095	1,203	2,064
Kaiser Aluminum & Chemcal Corp. Gramercy Works	St James	51	6	8	548	75	60	1,621	191	177
Exxonmobil Port Allen Lubricants	West Baton Rouge	51	1	5	424	36	59	11,146	1,122	1,913
Intercontinental Terminals Co.	West Baton Rouge	51	1	5	494	45	68	11,533	1,165	1,967
Baker Petrolite Rayne Facility	Acadia	49	6	5	176	19	25	2,883	396	424
Ormet Primary Aluminum Corp.	Ascension	47	5	4	100	10	8	891	81	83
Weyerhaeuser Lillie Div.	Union	46	6	6	167	20	26	1,031	96	136
Weyerhaeuser Louisiana Particleboard	Lincoln	46	6	6	167	20	26	1,031	96	136
Weyerhaeuser Simsboro Ewp Div.	Lincoln	46	6	6	167	20	26	1,031	96	136
Cabot Corp. Ville Platte Plant	Evangeline	45	4	4	99	8	11	1,256	182	259
Steel Fabricators Of Monroe Inc.	Ouachita	45	7	7	217	35	34	661	91	101
Martco Ptnr.	St Landry	44	7	8	69	10	12	157	26	27
Shintech Louisiana L.L.C. Addis Plant A	West Baton Rouge	44	3	4	342	31	34	2,108	224	235
Great Lakes Carbon Corp.	East Baton Rouge	43	1	3	210	14	17	2,343	219	263

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities										
		High Risk			Medium Risk			Low Risk		
Facility Name	Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Aviation Exteriors Louisiana Inc.	Iberia	43	3	3	224	18	18	4,444	523	577
Conagra Poultry Co.	Bienville	43	8	5	64	12	7	499	92	74
St.-Gobain Containers	Lincoln	42	6	5	170	20	26	1,023	95	135
Alpha Omega Laser Inc.	Caddo	41	4	6	60	6	8	199	23	25
Valentine Paper Inc.	Lafourche	40	3	3	125	11	11	650	66	55
Amerchol Corp. Greensburg La Facility	St Helena	40	6	5	72	11	9	396	58	58
Asco-Us Venice	Plaquemines	39	5	4	46	5	5	154	14	17
Haynes Intl. Inc.	Bienville	39	5	8	337	61	53	478	90	73
Boise Cascade Corp. Oakdale Plywood	Allen	38	5	5	103	11	14	406	57	60
Imc Phosphates Mp Inc. Taft Plant	St Charles	36	3	3	186	15	21	1,728	190	143
Skagit Smatco	Terrebonne	36	3	3	42	3	3	304	29	32
4-D Corrosion Control Specialists Inc.	Iberia	36	3	3	234	19	21	3,821	459	509
Big Cajun 2	Pointe Coupee	35	3	3	52	4	4	1,114	138	132
Mid-States Wood Preservers Inc.	Lincoln	35	4	4	107	13	12	354	44	46
Weyerhaeuser Co. Red River Mill	Natchitoches	35	4	6	55	7	9	332	37	54
Safety-Kleen Sys. (607304)	Rapides	33	4	4	113	11	10	585	66	74
Natco New Iberia Mfg.	Iberia	33	2	3	199	16	19	3,357	386	453
Cleco Power L.L.C. Rodemacher Power Station	Rapides	32	4	4	64	8	8	288	34	42
Conagra Poultry Co. Feedmill	Sabine	32	5	4	62	9	9	584	88	99
Omega Natchiq	Iberia	31	2	3	164	14	14	3,470	402	455
U.S. Marine Inc.	Orleans	30	7	4	109	23	14	406	51	61
Louisiana Pigment Co. L.P.	Calcasieu	30	3	3	580	69	36	4,225	487	347
Barnes Hardwood Inc. Simsboro Div.	Lincoln	30	3	4	151	17	18	850	78	111

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities

Facility Name	Parish	High Risk			Medium Risk			Low Risk		
		Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Borden Chemical Inc. Geismar Formaldehyde Plant	Ascension	30	2	3	90	7	8	1,271	101	93
Du Pont Burnside Plant	Ascension	29	3	2	145	15	12	840	81	82
Arch Chemicals Inc.	Caddo	28	4	2	48	11	4	673	68	32
Atofina Petrochemicals Inc.	Iberville	28	3	3	102	11	13	853	57	58
Cos-Mar Co.	Iberville	28	3	3	78	9	10	868	57	58
St. Martin Oil & Gas Inc.	St Martin	27	2	3	168	15	23	1,683	176	217
Balmar L.L.C.	Lafayette	26	2	2	79	7	7	1,992	271	294
Acme Romac Inc.	De Soto	26	5	3	45	9	5	982	151	167
Georgia Gulf Chemicals & Vinyls L.L.C.	Iberville	25	3	3	82	9	12	1,633	195	213
Gandy Tire & Timber L.L.C.	Sabine	24	4	3	63	9	8	227	31	28
Chemical Waste Management Lake Charles Facility	Calcasieu	24	2	2	71	6	5	608	50	35
Georgia-Pacific Logansport Plywood	De Soto	24	4	4	80	13	15	333	51	54
Univar USA	Ascension	24	3	2	119	14	14	1,194	136	160
Formosa Plastics Corp. Louisiana	East Baton Rouge	23	2	3	1,502	122	206	12,788	1,276	2,060
Koppers Inc.	De Soto	21	4	4	160	26	30	315	49	51
Air Prods. & Chemicals Inc.	Iberville	20	2	2	89	7	7	1,651	139	130
Basf Corp.	Ascension	20	2	2	123	11	12	1,412	117	111
Air Liquide America Plaquemine Asu	Iberville	20	2	3	83	8	13	1,538	187	205
Boise Cascade Corp.	Beauregard	19	2	2	75	6	7	916	124	96
Convent Refy.	St James	18	1	2	156	15	14	622	59	57
Ohmstede Ltd.	Iberville	18	2	2	395	12	9	1,141	73	75
Farmland Inds. Inc.	Grant	17	2	2	56	8	7	286	39	33
Westlake Polymers L.P.	Calcasieu	17	2	2	431	51	27	4,285	491	346
Bollinger Calcasieu L.L.C.	Calcasieu	17	2	1	87	8	8	501	31	36

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities										
		High Risk			Medium Risk			Low Risk		
Facility Name	Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Georgia-Pacific Corp. Port Hudson Ops.	East Baton Rouge	17	1	1	223	14	14	510	43	39
Conagra Poultry Co.	Union	16	2	2	38	5	4	574	91	82
Topside Fabrication	Iberia	16	2	1	155	14	12	2,984	333	377
Nan Ya Plastics Corp. America	Pointe Coupee	16	3	2	46	9	7	153	29	26
Columbian Chemicals Co.	St Mary	14	1	2	14	1	2	187	19	29
Lake Charles Carbon Co.	Calcasieu	14	0	1	226	11	15	1,949	152	121
Garyville La Terminal	St John The Baptist	13	2	2	389	50	51	1,587	162	176
Superior Tie & Timber	Caddo	13	2	2	155	30	25	576	101	89
Dolet Hills Power Station	De Soto	13	2	2	28	4	5	146	23	21
Omega Protein Inc. Abbeville Plant	Vermilion	13	2	1	19	2	1	130	14	10
Martco Ptnr.	Natchitoches	13	2	2	35	6	6	145	26	24
Georgia-Pacific Corp. Urania Complex	La Salle	12	1	1	158	17	20	370	40	44
Praxair Inc.	Ascension	12	2	1	50	6	6	915	56	52
Acme Brick Co. Dixie Plant	Bienville	12	2	2	34	7	5	274	49	46
Gulf Coast Lubes Plant	Calcasieu	11	1	1	147	14	9	3,024	320	193
Hendrix Mfg. Co. Inc.	De Soto	10	2	2	51	9	7	275	48	44
Twin Brothers Marine L.L.C.	St Mary	10	1	1	37	3	5	49	4	6
Temple Southwest Louisiana Lumber Ops.	Calcasieu	10	1	0	29	2	2	212	19	19
Shell Chemical L.P.	Ascension	10	1	1	101	9	9	1,096	98	94
Weyerhaeuser Co. Dodson Div.	Winn	10	1	1	17	2	2	139	24	16
Air Prods. & Chemicals Inc. New Orleans La Facility	Orleans	9	2	2	665	48	104	4,113	273	372
Tembec Usa L.L.C.	West Feliciana	9	1	1	39	3	3	566	55	48
Tetra Chemicals Inc.	Calcasieu	9	1	1	670	87	69	6,180	898	677
International Paper	De Soto	9	1	1	11	2	2	88	10	15

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities

Facility Name	Parish	High Risk			Medium Risk			Low Risk		
		Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Boise Cascade Alexandria Ewp	Rapides	8	1	1	56	7	7	309	35	44
Complex Chemicals Co. Inc.	Madison	8	1	1	23	4	3	57	8	6
Cs Metals Of Louisiana L.L.C.	St James	8	1	1	132	16	15	484	47	49
Occidental Chemical Corp.	St James	8	1	1	147	18	17	476	47	49
Southern Mfg. Co.	Cameron	8	1	1	13	1	1	62	6	5
Borden Chemicals & Plastics Operating L.P.	Ascension	7	0	1	71	7	7	1,484	99	86
Omega Protein Inc.	Cameron	7	1	1	107	12	12	188	21	21
Weyerhaeuser Co. Arcadia Osb Div.	Lincoln	7	1	1	66	16	8	570	99	81
Union Carbide Corp. Taft/Star Mfg. Plant	St Charles	7	1	1	220	24	22	2,283	217	146
Imc-Phosphates Mp Inc. Uncle Sam Plant	St James	6	1	1	138	17	18	686	65	61
Ppg Inds. Inc.	Calcasieu	5	1	1	331	41	29	6,589	947	693
Degussa Engineered Carbons L.P.	St Mary	5	0	1	26	2	3	50	4	6
Dow Chemical Co. Grand Bayou Ops.	Assumption	4	1	1	185	28	24	916	114	117
Dynea USA Inc. Winnfield	Winn	4	1	0	24	3	3	197	26	24
Crompton Manufacturing Co. Inc.	Ascension	4	0	0	87	9	9	1,140	93	87
Barriere Construction Boutte Plant No. 625	St Charles	4	0	1	118	10	18	3,056	253	174
Rubicon Inc.	Ascension	3	0	0	93	9	9	963	84	79
Trinity Marine Prods. Inc.	West Baton Rouge	3	0	0	37	3	2	815	63	59
Calcasieu Refining Co.	Calcasieu	2	0	0	75	5	5	1,517	109	88
Honeywell Intl. Inc. Geismar Plant	Ascension	1	0	0	93	9	9	962	62	62
Pcs Nitrogen Fertilizer L.P.	Ascension	1	0	0	93	9	9	951	62	61
Williams Olefins L.L.C. Geismar Ethylene Plant	Ascension	1	0	0	77	7	7	1,152	72	70

Table E-86: Population (General and Sensitive) Exposure to Hazardous Materials Facilities										
		High Risk			Medium Risk			Low Risk		
Facility Name	Parish	Population	Elderly	Low Income	Population	Elderly	Low Income	Population	Elderly	Low Income
Asco-Us Cameron 06	Cameron	1	0	0	1	0	0	26	3	2
Cabot Corp. Canal Plant	St Mary	0	0	0	14	1	2	145	16	23
Asco-Us Fourchon 16	Lafourche	0	0	0	1	0	0	9	1	2
Clean Harbors Plaquemine L.L.C.	Iberville	0	0	0	0	0	0	0	0	0
Conocophillips Co. Alliance Refy.	Plaquemines	0	0	0	21	3	4	164	18	18
Crompton Corp. Polymer Additives Div.	St Charles	0	0	0	153	17	15	2,018	204	140
Dynegy Midstream Services Venice Terminal	Plaquemines	0	0	0	3	1	1	47	6	6
Morton Intl. Inc. Advanced Materials	Iberia	0	0	0	7	1	1	54	5	6
Nexen Chemical USA	St Charles	0	0	0	228	22	23	1,803	190	140
Occidental Chemical Corp.	St Charles	0	0	0	148	17	16	1,831	193	141
Shell Chemical Taft Plant	St Charles	0	0	0	153	17	15	1,886	194	135
Venture Coke Co. L.L.C. Lake Charles Calcining Plant	Calcasieu	0	0	0	0	0	0	0	0	0

No data were available in the HAZUS-MH inventory database for the facilities highlighted in pink.

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana									
		Building Count (Number)							
Facility Name	Parish	Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Delta Petroleum Co. Inc.	St Charles	859	10	2	1	1	1	1	875
Delta Petroleum Co. Inc.	Jefferson	859	10	2	1	1	1	1	875
Shell Oil Prods. Us	Jefferson	726	10	1	1	1	1	1	741
Crompton Corp.	Jefferson	641	7	1	1	1	1	1	653
Hobson Galvanizing Inc.	Plaquemines	641	6	1	1	1	1	1	652
Capitol Steel Inc.	East Baton Rouge	588	5	1	1	1	3	1	600
Bollinger Algiers L.L.C.	Orleans	507	60	2	1	2	2	1	576
U.S. Gypsum Co.	Orleans	546	3	1	1	1	0	1	553
Schering-Plough Veterinary Ops. Inc.	East Baton Rouge	511	9	2	1	1	1	1	526
Pennzoil - Quaker State Co.	Caddo	499	4	1	1	1	0	1	507
Calumet Lubricants Co. Shreveport Refy.	Caddo	499	4	1	1	1	0	1	507
Kik- Louisiana Inc.	St Tammany	482	7	1	1	1	1	1	493
Chemcentral/New Orleans	Jefferson	478	7	2	1	1	0	0	489
Hay Wilk Galvanizing Inc.	Jefferson	474	7	3	1	1	1	1	488
Caddo Paint Co. Inc.	Caddo	471	2	1	1	1	1	1	479
Chevrontexaco Used Oil Recycling Plant	Jefferson	441	5	1	0	1	0	1	449
Purina Mills L.L.C.	Caddo	437	5	1	1	1	0	1	446
Marble Quarry Inc.	St Tammany	429	5	1	1	1	1	1	439
Pennzoil-Quaker State Co.	Caddo	425	5	1	0	1	0	1	432
Crystal Clean Services L.L.C.	Caddo	424	3	1	0	1	0	1	429
Bollinger Quick Repair L.L.C.	Jefferson	412	7	3	1	1	1	1	425
Jefferson Fiberglass Co. Inc.	Jefferson	393	7	3	1	1	1	1	406
Chalmette Refining L.L.C.	St Bernard	400	2	1	1	1	0	1	406
Capitol Steel Slidell	St Tammany	387	2	1	1	1	1	1	394
Qpl Inc.	Lafourche	372	4	1	1	1	1	1	380
Sigma Coatings Usa B.V.	Jefferson	359	6	3	1	1	1	1	372
Wechem Inc.	Jefferson	323	28	7	1	1	2	1	362

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
X-Chem Inc.	Jefferson	328	19	6	1	1	1	1	357
Murphy Oil USA Inc. Meraux Refy.	St Bernard	343	3	1	1	1	1	1	351
Body Masters Sports Industry	Acadia	343	2	1	2	1	1	1	350
New Ngc Inc.	Jefferson	337	4	1	1	1	1	1	347
Milk Prods. Lp. Dba Borden Dairy	Lafayette	335	6	2	1	1	1	1	346
New Orleans Shipyard	Jefferson	335	1	1	1	1	0	1	340
U.S. Air Force Barksdale Afb La	Bossier	323	2	1	1	1	1	1	331
Evans Harvey Corp.	Jefferson	313	5	3	1	1	1	0	324
Evans Harvey Inc.	Jefferson	313	5	3	1	1	1	0	324
International Paper Co. Louisiana Mill	Morehouse	306	3	1	1	1	1	1	314
Libbey Glass Inc.	Caddo	292	4	1	0	1	1	1	300
Cameco Inds. - Thibodaux Facility	Lafourche	280	4	1	1	1	1	1	289
Central Oil & Supply Monroe Bulk Facility	Ouachita	277	1	2	0	1	1	1	283
Baker Mfg. Co. Inc.	Rapides	269	2	1	1	1	1	1	277
Exxonmobil Refining & Supply Baton Rouge Refy.	East Baton Rouge	269	2	1	1	1	1	1	276
Barnes Hardwood Inc. Sondheimer Div.	East Carroll	267	1	1	1	1	0	1	272
Associated Printing	Bossier	258	7	1	1	1	2	1	271
Sci Fabrication Shop	Ascension	260	2	1	1	1	0	0	265
East Jordan Iron Works Inc.	Livingston	255	4	1	1	1	1	1	264
Edo Specialty Plastics	East Baton Rouge	251	4	1	1	1	1	0	258
Colfax Treating Co. L.L.C.	Rapides	249	2	1	1	1	1	1	256
Northrop Grumman Ship Sys. Avondale Ops.	Jefferson	242	6	3	1	1	1	1	255
Northwest Pipe Co.	Bossier	241	7	1	1	1	2	1	254
Coca-Cola Bottling Co. Ouachita	Ouachita	250	1	1	0	1	0	0	253
Carboline Co.	Calcasieu	239	1	1	0	1	0	0	242

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Bunge N.A. Inc.	St Charles	235	1	1	0	1	0	1	239
Gaylord Container Corp.	Washington	229	3	1	1	1	1	1	236
Gaylord Chemical Corp.	Washington	228	3	1	1	1	1	1	235
Orleans Marble Inc.	Jefferson	200	21	6	1	1	1	1	232
Frymaster	Caddo	221	4	1	1	1	0	1	230
Nexair L.L.C.	Ouachita	210	10	2	1	1	1	1	227
Plymouth Tube Co.	Ouachita	219	3	1	1	1	1	1	226
Cp Louisiana Inc.	Jefferson	178	31	8	1	1	2	1	222
Esgard Inc.	Lafayette	213	2	1	1	1	0	1	219
Driscoll Management L.L.C.	East Baton Rouge	213	1	1	0	1	1	1	218
Exxonmobil Chemical Baton Rouge Chemical Plant	East Baton Rouge	212	2	1	0	1	1	1	218
Dsm Copolymer Inc.	East Baton Rouge	210	2	1	0	1	1	1	216
Exide Techs.	Caddo	204	4	1	1	1	1	1	212
Rhodia Inc.	East Baton Rouge	204	1	1	0	1	0	0	207
Bercen, Inc. Southern Div.	Livingston	194	2	1	0	1	1	1	199
Monsanto - Luling	St Charles	193	1	1	1	1	1	0	198
Occidental Chemical Corp. – Luling	St Charles	193	1	1	1	1	1	0	198
Orion Refining Corp.	St Charles	186	1	1	1	1	1	0	191
Resin Sys. Inc.	Calcasieu	183	4	1	1	1	1	1	191
Cmp Coatings Inc.	Plaquemines	186	1	1	0	1	0	1	190
Silco (Dba Elco Forest Prods.)	St Landry	184	1	1	1	1	0	0	188
Flint Ink N.A.	Ouachita	179	3	1	1	1	1	1	187
Mariah Corp.	Lafayette	177	2	1	1	1	1	1	185
Gulf Coast Chemical Inc.	Vermilion	177	1	1	1	1	1	1	183
Cerro Copper Tube Co.	Bossier	175	1	1	1	1	1	1	182
Resolution Performance Prods. L.L.C.	St Charles	177	1	1	0	0	0	1	180
Riverwood Intl. Corp.	Ouachita	169	1	1	1	1	0	1	175
Pumpelly Oil Co.	Calcasieu	160	3	1	1	1	0	1	167
Delta Environmental Prods. Inc.	Livingston	159	2	1	0	1	1	1	165

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Shell Chemical L.P. St. Rose Facility	St Charles	158	1	1	1	1	1	1	164
St. Mary Galvanizing Co.	St Mary	158	1	1	1	0	1	0	162
Bollinger Gulf Repair L.L.C.	Orleans	152	4	1	1	1	0	1	160
Ohmstede Ltd.	Calcasieu	150	3	1	1	0	0	1	156
Castrol N.A. Inc.	West Baton Rouge	148	1	1	1	1	1	1	155
Shell Norco Chemical Plant East Site	St Charles	152	1	1	0	0	0	1	155
FMC Corp. Agriculture Prods. Group	St Landry	151	1	1	0	1	0	0	154
Borden Chemical Inc.	Rapides	150	1	1	0	1	0	0	153
Lott Oil Co.	Bossier	136	9	1	1	1	2	1	151
Lott Oil Co.	De Soto	143	1	1	1	1	1	1	149
Federal Home Prods.	Lincoln	144	2	1	1	1	1	0	149
Eclectic Prods. Inc.	Rapides	141	1	1	1	1	1	1	147
Willamette Valley Co.	Rapides	141	1	1	1	1	1	1	147
Univar USA	Lafayette	140	3	1	1	1	0	0	146
Mckinney Oil Co. Of Tallulah Inc.	Madison	138	2	1	1	1	1	1	145
Gmtg Shreveport Assembly	Caddo	136	2	5	0	1	0	0	144
Baton Rouge Plastics Plant	East Baton Rouge	132	1	1	1	1	1	1	138
Ondeo Nalco Energy Services Scott Blend Plant	Lafayette	132	1	1	1	1	1	0	138
Shaw SSS Fabricators Inc.	West Baton Rouge	132	1	1	1	1	1	0	137
Vivian Inds. Inc.	Caddo	132	1	1	0	1	0	1	136
Hughes Christensen-Lafayette	Lafayette	120	4	1	1	1	0	1	128
Dis-Tran Wood Prods. L.L.C.	Rapides	121	1	1	1	1	1	1	127
Lard Oil Co. Inc.	Livingston	121	1	1	1	1	1	1	127
U.S. Army Joint Readiness Training Center (Jrtc) & Fort Polk	Vernon	120	1	0	0	0	4	1	125
Lott Oil Co.	Vernon	117	3	1	1	1	1	1	125
Motiva Enterprises L.L.C.	St Charles	116	1	1	0	0	0	1	119

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Varco Amelia South Coating Plant Tuboscope Div.	Assumption	110	2	2	1	1	1	1	118
Shaw Shreveport	Caddo	103	7	1	1	1	1	0	114
Ampacet Corp.	Beauregard	109	1	1	1	0	0	0	113
Shaw Alloy Piping Prods. Inc.	Caddo	98	8	1	1	1	1	1	111
Catalyst Recovery Of Louisiana L.L.C.	Lafayette	98	5	1	1	1	1	1	108
Beaird Inds. Inc.	Caddo	103	2	1	1	1	0	0	108
Arizona Chemical	Allen	103	1	1	1	1	1	0	108
Louisiana Blasting & Coating Inc.	Iberia	104	1	1	0	0	0	0	106
Dpc Enterprises	St John The Baptist	100	1	1	0	1	1	1	106
Motiva Kenner Terminal	Jefferson	91	9	1	1	1	1	0	104
Inland Paperboard & Packaging	Webster	100	1	1	0	1	0	1	104
Jotun Paints Inc.	Plaquemines	99	1	1	1	1	0	0	103
Shaw Process Fabricators Inc.	Ouachita	97	1	1	0	1	1	0	101
Conocophillips Lake Charles Refy.	Calcasieu	94	2	1	1	1	1	1	101
Datachem Inc.	St John The Baptist	96	1	1	0	1	1	1	101
Grand Isle Shipyard	Jefferson	94	1	1	1	1	1	1	100
Starling Inc.	Livingston	95	1	1	0	0	0	0	97
Air Liquide America Corp.	St Charles	95	1	1	0	0	0	0	97
Shell Norco Chemical Plant West Site	St Charles	92	1	1	0	0	0	1	95
Union Carbide Corp. Cypress Catalyst Plant	St Charles	92	1	1	0	0	0	1	95
Polychemie Pearl River Plant	St Tammany	89	1	0	0	1	0	0	91
Royal Fiberglass Pools Inc.	St Martin	89	1	1	0	0	0	0	91
Cytec Inds. Inc. Fortier Plant	Jefferson	86	1	1	0	1	0	0	89
Taylortec Inc.	Tangipahoa	82	3	1	0	1	1	1	89
Trinity Marine Prods. #38	St Tammany	84	1	1	0	1	0	1	88

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
International Paper Pineville Mill	Rapides	84	1	1	1	1	0	0	88
Lott Oil Co.	Natchitoches	82	1	1	1	1	1	0	87
Dura-Wood L.L.C.	Rapides	83	1	1	1	1	0	0	87
Stone Container Corp. Hodge Inc.	Jackson	82	1	1	0	1	1	0	86
Bayou Steel Corp.	St John The Baptist	80	1	0	0	1	0	0	82
Lott Oil Co.	Sabine	75	2	1	1	1	1	1	81
Steel Forgings Inc.	Caddo	71	5	1	1	1	1	1	81
Capitol Mfg. Co.	Acadia	80	1	0	0	0	0	0	81
Micro Chemical Co.	Franklin	76	1	1	1	1	1	0	81
Deep South Petroleum Inc.	Lafayette	74	3	1	1	1	0	1	80
Cleanharbors Baton Rouge L.L.C.	East Baton Rouge	74	1	1	0	1	1	1	79
Ppg Grow Baton Rouge	East Baton Rouge	74	1	1	0	1	1	1	79
Du Pont Pontchartrain Works	St John The Baptist	78	1	0	0	0	0	0	79
Dupont Dow Elastomers L.L.C. Pontchartrain Site	St John The Baptist	78	1	0	0	0	0	0	79
Borden Chemicals & Plastics Operating L.P.	West Baton Rouge	75	1	1	0	1	1	0	79
Deep South Chemical Inc.	Lafayette	72	1	1	1	1	1	1	78
Exide Techs. Baton Rouge Smelter	East Baton Rouge	74	1	0	1	0	1	1	78
Weyerhaeuser Zwolle Div.	Sabine	71	1	1	1	1	1	1	77
Procter & Gamble Mfg. Co.	Rapides	74	1	1	0	1	0	0	77
Exxonmobil Chemical Co. Baton Rouge Polyolefins Plant	East Baton Rouge	72	1	1	0	1	1	1	77
St. Romain Oil Co.	Avoyelles	70	1	1	1	1	1	1	76
Bollinger Gretna L.L.C.	Jefferson	71	1	1	1	1	0	0	75
Vulcan Performance Chemicals Shreveport Plant	Caddo	68	1	1	1	1	1	1	74
Georgia Gulf Lake Charles L.L.C.	Calcasieu	71	1	1	1	0	0	0	74

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
W. B. Mccartney Oil Co. Inc. Bulk Plant	La Salle	70	1	0	0	1	1	1	74
Sasol N.A. Inc. Lake Charles Chemical Complex	Calcasieu	70	1	1	1	0	0	0	73
Tifton Aluminum Co. Inc.	Richland	69	1	0	1	1	1	0	73
Biolab Inc.	Calcasieu	66	1	1	0	1	1	1	72
Seegott Inc. Magnolia	Jefferson	66	1	1	1	0	0	0	69
Union Carbide Corp. Cypress Polypropylene Plant	St Charles	65	1	1	0	0	0	1	68
J. Ray Mcdermott Inc. Fab.	Assumption	61	2	2	1	1	1	1	68
Ineos Oxide	Iberville	62	1	1	1	1	1	0	67
Ondeo Nalco Chemical Co.	West Baton Rouge	63	1	1	1	1	0	0	67
Coastal Chemical Co. L.L.C.	Vermilion	60	1	1	0	1	1	0	64
Seegott Inc. Magnolia	Lafayette	55	4	1	1	1	0	1	62
Big River Inds. - Gravelite	Pointe Coupee	60	1	1	0	0	0	0	62
Angus Chemical Co.	Ouachita	56	1	1	0	1	1	1	61
Koch Nitrogen Co.	Ouachita	56	1	1	0	1	1	1	61
Sanderson Farms Inc.	Tangipahoa	56	1	1	1	1	0	1	61
Amite Fndy. & Machine Inc.	Tangipahoa	55	1	1	0	1	1	1	60
Exxonmobil Chemical Co. Baton Rouge Resin Finishing Plant	East Baton Rouge	54	1	1	0	1	1	1	59
Halliburton Energy Services Cps Mfg. Gulf Coast	St Martin	54	2	1	0	1	1	0	58
Hood Inds. Inc.	Red River	51	1	1	1	1	1	1	57
Valero Refining Co. Louisiana	St Landry	54	1	0	0	1	1	0	57
International Painting Corp.	West Baton Rouge	53	1	1	1	0	0	0	56
Calumet Lubricants Co. L.P. Calumet Cotton Valley	Webster	56	0	0	0	0	0	0	56

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Tomah Reserve Inc.	St John The Baptist	51	1	1	0	1	1	1	56
Deltech Corp.	East Baton Rouge	52	1	1	0	1	0	0	55
Amax Metals Recovery Inc.	Plaquemines	51	1	1	0	1	0	0	54
Certainteed Corp.	Calcasieu	48	2	2	1	0	0	1	53
Weatherford Gemoco	Terrebonne	48	1	1	0	0	1	1	52
Sii Chem Tech	Lafayette	46	2	1	0	1	1	1	52
Stowe Woodward	Lincoln	49	1	0	0	1	0	0	51
Dow Chemical Co. Louisiana Div.	Iberville	46	1	1	0	1	1	0	50
Sid Richardson Carbon Co.	West Baton Rouge	46	1	1	0	1	1	0	50
Spectrum Control Tech. Inc.	Orleans	41	3	2	0	1	2	1	50
Chevron Oronite Corp.	Plaquemines	47	0	0	0	0	0	0	47
Universal Fabricators L.L.C.	Iberia	43	1	1	1	1	0	0	47
Praxair Distribution Inc.	St Charles	47	0	0	0	0	0	0	47
Ferro Corp. Baton Rouge Site	East Baton Rouge	42	1	1	1	0	1	0	46
Bollinger Larose L.L.C.	Lafourche	42	1	1	0	0	1	1	46
Uop Shreveport Plant	Caddo	40	1	1	1	1	0	1	45
Stockhausen Louisiana L.L.C.	St John The Baptist	43	1	0	0	0	0	0	44
Trus Joist A Weyerhaeuser Business	Natchitoches	39	1	1	1	1	1	0	44
Westlake Petrochemicals Corp.	Calcasieu	41	1	1	0	0	0	0	43
Westlake Petrochemicals L.P.	Calcasieu	41	1	1	0	0	0	0	43
Westlake Styrene L.P.	Calcasieu	41	1	1	0	0	0	0	43
Westlake Styrene L.P. - Marine Terminal Facility	Calcasieu	41	1	1	0	0	0	0	43
Alliance Compressors	Natchitoches	38	1	1	1	1	1	0	43
Bollinger Shipyards Lockport L.L.C.	Lafourche	38	1	1	1	0	1	0	42
Springhill Wood Prods.	Webster	38	1	1	1	1	0	0	42
Ondeo Nalco Co.	St John The Baptist	40	1	0	0	0	0	0	41

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Albemarle Corp.	East Baton Rouge	36	1	1	0	1	0	0	39
Firestone Polymers	Calcasieu	34	2	1	1	0	0	1	39
Elder Wood Preserving Co. Inc.	Avoyelles	38	1	0	0	0	0	0	39
Daybrook Fisheries Inc.	Plaquemines	35	1	1	0	0	1	0	38
Triad Nitrogen L.L.C.	Ascension	35	1	1	0	0	0	0	37
Guide Louisiana L.L.C.	Ouachita	34	1	1	0	1	0	0	37
Marathon Ashland Petroleum L.L.C.	St John The Baptist	35	1	0	0	1	0	0	37
Waterbury Cos. Inc.	Tangipahoa	33	1	1	1	0	0	0	36
Ge Commercial Transformer Business	Caddo	28	2	5	0	1	0	0	36
Conagra Poultry Co.	Natchitoches	31	1	1	1	1	1	0	36
Melamine Chemical Inc.	Ascension	33	1	1	0	0	0	0	35
Boise Cascade Corp. Florien Plywood	Sabine	31	1	1	0	1	0	0	34
Calumet Lubricants Co. L.P.	Bossier	34	0	0	0	0	0	0	34
Ineos Fluor Americas L.L.C.	Iberville	33	1	0	0	0	0	0	34
Westside Galanizing Services Inc.	West Baton Rouge	29	1	1	0	1	1	0	33
Great Lakes Carbon Corp.	East Baton Rouge	33	0	0	0	0	0	0	33
Ecological Tanks Inc.	Ouachita	29	1	1	1	0	1	0	33
Arnold Forest Prods. Corp.	Caddo	27	1	1	0	1	1	1	32
Syngenta Crop Protection Inc. St. Gabriel Facility	Iberville	29	1	1	0	0	1	0	32
Arch Chemcials Inc.	Calcasieu	28	1	1	0	1	1	0	32
Lyondell Chemical Co.	Calcasieu	28	1	1	0	1	1	0	32
Discovery Aluminas Inc. (Dba Port Allen Works-Activated)	West Baton Rouge	28	1	1	0	1	0	0	31
Bioproducts Of Louisiana L.L.C.	Iberville	27	1	1	0	1	1	0	31
St. James Terminal	St James	31	0	0	0	0	0	0	31

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Meadwestvaco South Carolina L.L.C.	Beauregard	29	1	0	0	0	0	0	30
Richard Oil & Fuel Inc.	Ascension	30	0	0	0	0	0	0	30
Alcoa World Chemicals Vidalia Works	Concordia	29	1	0	0	0	0	0	30
Cameron 130130	Evangeline	25	1	1	1	1	0	1	30
Polyone Corp.	Iberville	27	1	1	1	0	0	0	30
Placid Refining Co. L.L.C.	West Baton Rouge	26	1	1	0	1	0	0	29
Bollinger Marine Fabricators L.L.C.	St Mary	21	2	2	1	1	1	1	28
Basell USA Inc. Lake Charles Plant	Calcasieu	27	0	0	0	0	0	0	27
Gulf Island L.L.C. Main Yard West Yard & Southport	Terrebonne	23	1	1	0	1	1	0	27
Cf Inds. Inc.	Ascension	25	1	1	0	0	0	0	27
Air Prods. & Chemicals Inc.	Iberville	23	1	1	0	0	1	0	26
Purina Mills L.L.C.	Tangipahoa	23	1	0	1	1	0	0	26
Nasa Michoud Assembly Facility	Orleans	17	3	2	0	1	2	1	26
Honeywell Intl. Inc. - Baton Rouge Plant	East Baton Rouge	23	1	1	0	0	1	0	26
Ciba Specialty Chemicals Corp.	Iberville	23	1	1	0	0	1	0	26
Citgo Petroleum Corp.	Calcasieu	26	0	0	0	0	0	0	26
Conagra Poultry Co.	Bienville	21	1	1	1	1	1	0	26
Imc Phosphates Mp Inc. Faustina Plant	St James	22	1	1	0	1	0	0	25
Chevron Phillips Chemical Co. L.P.	St James	22	1	1	0	1	0	0	25
Vulcan Materials Co. Chemicals Div.	Ascension	23	1	1	0	0	0	0	25
Kencoil Inc.	Plaquemines	25	0	0	0	0	0	0	25
Southern Ionics Inc.	Calcasieu	22	1	1	0	1	0	0	25
W. R. Grace & Co.-Conn. Davison Catalysts	Calcasieu	22	1	1	0	1	0	0	25

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Brenntag Southwest Inc. St. Gabriel	Iberville	22	1	1	0	0	0	0	24
Harcros Chemicals Inc.	Iberville	21	1	1	0	0	1	0	24
Athens Caddo Brick	Caddo	24	0	0	0	0	0	0	24
Pioneer Americas L.L.C.	Iberville	22	1	0	0	0	0	0	23
Asco-Us Venice	Plaquemines	20	1	1	0	0	0	0	22
Pinnacle Polymers Co.	St John The Baptist	20	1	0	0	1	0	0	22
Shaw Sunland Fabricators Inc.	Livingston	22	0	0	0	0	0	0	22
Valentine Paper Inc.	Lafourche	18	1	1	1	1	0	0	22
Steel Fabricators Of Monroe Inc.	Ouachita	21	0	0	0	0	0	0	21
Shintech Louisiana L.L.C. Addis Plant A	West Baton Rouge	17	1	1	0	1	1	0	21
Ormet Primary Aluminum Corp.	Ascension	19	1	0	0	0	0	0	20
Baker Petrolite Rayne Facility	Acadia	17	1	1	1	0	0	0	20
Cabot Corp. Ville Platte Plant	Evangeline	20	0	0	0	0	0	0	20
4-D Corrosion Control Specialists Inc.	Iberia	16	1	1	1	1	0	0	20
Martco Ptnr.	St Landry	19	1	0	0	0	0	0	20
Kaiser Aluminum & Chemcal Corp. Gramercy Works	St James	19	0	0	0	0	0	0	19
Weyerhaeuser Lillie Div.	Union	17	1	1	0	0	0	0	19
Weyerhaeuser Louisiana Particleboard	Lincoln	17	1	1	0	0	0	0	19
Weyerhaeuser Simsboro Ewp Div.	Lincoln	17	1	1	0	0	0	0	19
Haynes Intl. Inc.	Bienville	14	1	1	1	1	0	0	18
Natco New Iberia Mfg.	Iberia	14	1	1	1	1	0	0	18
Omega Natchiq	Iberia	14	1	1	1	1	0	0	18
Amerchol Corp. Greensburg La Facility	St Helena	18	0	0	0	0	0	0	18
St. Martin Oil & Gas Inc.	St Martin	14	1	1	1	1	0	0	18

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Boise Cascade Corp. Oakdale Plywood	Allen	18	0	0	0	0	0	0	18
Imc Phosphates Mp Inc. Taft Plant	St Charles	14	1	1	1	0	0	0	17
Louisiana Pigment Co. L.P.	Calcasieu	13	2	1	0	0	0	1	17
Skagit Smatco	Terrebonne	17	0	0	0	0	0	0	17
Conagra Poultry Co. Feedmill	Sabine	14	1	1	0	1	0	0	17
U.S. Marine Inc.	Orleans	15	1	1	0	0	0	0	17
St.-Gobain Containers	Lincoln	15	1	1	0	0	0	0	17
Weyerhaeuser Co. Red River Mill	Natchitoches	17	0	0	0	0	0	0	17
Acme Romac Inc.	De Soto	11	1	1	1	1	1	0	16
Mid-States Wood Preservers Inc.	Lincoln	16	0	0	0	0	0	0	16
Arch Chemicals Inc.	Caddo	12	1	1	1	0	0	1	16
Barnes Hardwood Inc. Simsboro Div.	Lincoln	15	1	0	0	0	0	0	16
Gandy Tire & Timber L.L.C.	Sabine	12	1	1	0	1	0	1	16
Chemical Waste Management Lake Charles Facility	Calcasieu	10	1	1	1	0	1	1	15
Safety-Kleen Sys. (607304)	Rapides	12	1	1	1	0	0	0	15
Cleco Power L.L.C. Rodemacher Power Station	Rapides	15	0	0	0	0	0	0	15
Balmar L.L.C.	Lafayette	11	1	1	1	1	0	0	15
Georgia Gulf Chemicals & Vinyls L.L.C.	Iberville	11	1	1	0	1	1	0	15
Ohmstede Ltd.	Iberville	10	2	1	0	0	1	0	14
Univar USA	Ascension	11	1	0	0	1	0	0	13
Borden Chemical Inc. Geismar Formaldehyde Plant	Ascension	11	1	1	0	0	0	0	13
Formosa Plastics Corp. Louisiana	East Baton Rouge	9	1	1	0	1	1	0	13

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Du Pont Burnside Plant	Ascension	12	0	0	0	0	0	0	12
Martco Ptnr.	Natchitoches	9	1	1	0	1	0	0	12
Georgia-Pacific Logansport Plywood	De Soto	12	0	0	0	0	0	0	12
Air Liquide America Plaquemine Asu	Iberville	9	0	0	1	1	0	0	11
Big Cajun 2	Pointe Coupee	11	0	0	0	0	0	0	11
Nan Ya Plastics Corp. America	Pointe Coupee	10	1	0	0	0	0	0	11
Koppers Inc.	De Soto	11	0	0	0	0	0	0	11
Omega Protein Inc.	Cameron	7	1	1	1	1	0	0	11
Bollinger Calcasieu L.L.C.	Calcasieu	10	0	0	0	0	0	0	10
Boise Cascade Corp.	Beauregard	10	0	0	0	0	0	0	10
Atofina Petrochemicals Inc.	Iberville	10	0	0	0	0	0	0	10
Cos-Mar Co.	Iberville	10	0	0	0	0	0	0	10
Alpha Omega Laser Inc.	Caddo	10	0	0	0	0	0	0	10
Southern Mfg. Co.	Cameron	10	0	0	0	0	0	0	10
Superior Tie & Timber	Caddo	8	1	1	0	0	0	0	10
Topside Fabrication	Iberia	8	1	1	0	0	0	0	10
Westlake Polymers L.P.	Calcasieu	8	1	1	0	0	0	0	10
Georgia-Pacific Corp. Port Hudson Ops.	East Baton Rouge	8	1	1	0	0	0	0	10
Tetra Chemicals Inc.	Calcasieu	5	1	2	1	0	0	1	10
Air Prods. & Chemicals Inc.	Iberville	7	1	1	0	0	0	0	9
Basf Corp.	Ascension	7	1	1	0	0	0	0	9
Omega Protein Inc. Abbeville Plant	Vermilion	9	0	0	0	0	0	0	9
Farmland Inds. Inc.	Grant	9	0	0	0	0	0	0	9
Georgia-Pacific Corp. Urania Complex	La Salle	6	1	1	0	1	0	0	9
Lake Charles Carbon Co.	Calcasieu	7	1	0	0	1	0	0	9
Convent Refy.	St James	8	1	0	0	0	0	0	9
Praxair Inc.	Ascension	7	1	1	0	0	0	0	9
Conagra Poultry Co.	Union	9	0	0	0	0	0	0	9
Garyville La Terminal	St John The Baptist	7	1	0	0	1	0	0	9

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Acme Brick Co. Dixie Plant	Bienville	8	0	0	0	0	0	0	8
Ppg Inds. Inc.	Calcasieu	4	1	2	1	0	0	0	7
Hendrix Mfg. Co. Inc.	De Soto	7	0	0	0	0	0	0	7
Dolet Hills Power Station	De Soto	7	0	0	0	0	0	0	7
International Paper	De Soto	6	1	0	0	0	0	0	7
Williams Olefins L.L.C. Geismar Ethylene Plant	Ascension	3	1	1	0	0	1	0	6
Shell Chemical L.P.	Ascension	4	1	1	0	0	0	0	6
Aviation Exteriors Louisiana Inc.	Iberia	3	1	1	0	0	0	1	6
Enterprise Prods. Operating L.P.	West Baton Rouge	4	1	1	0	0	0	0	6
Borden Chemicals & Plastics Operating L.P.	Ascension	4	1	1	0	0	0	0	6
Exxonmobil Port Allen Lubricants	West Baton Rouge	4	1	1	0	0	0	0	6
Intercontinental Terminals Co.	West Baton Rouge	4	1	1	0	0	0	0	6
Columbian Chemicals Co.	St Mary	6	0	0	0	0	0	0	6
Temple Southwest Louisiana Lumber Ops.	Calcasieu	6	0	0	0	0	0	0	6
Gulf Coast Lubes Plant	Calcasieu	5	0	0	0	0	0	0	5
Crompton Manufacturing Co. Inc.	Ascension	3	1	1	0	0	0	0	5
Honeywell Intl. Inc. Geismar Plant	Ascension	3	1	1	0	0	0	0	5
Cabot Corp. Canal Plant	St Mary	2	1	1	0	0	1	0	5
Trinity Marine Prods. Inc.	West Baton Rouge	3	1	1	0	0	0	0	5
Weyerhaeuser Co. Arcadia Osb Div.	Lincoln	5	0	0	0	0	0	0	5
Boise Cascade Alexandria Ewp	Rapides	5	0	0	0	0	0	0	5
Union Carbide Corp. Taft/Star Mfg. Plant	St Charles	5	0	0	0	0	0	0	5

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Complex Chemicals Co. Inc.	Madison	4	0	0	0	0	0	0	4
Twin Brothers Marine L.L.C.	St Mary	4	0	0	0	0	0	0	4
Cs Metals Of Louisiana L.L.C.	St James	4	0	0	0	0	0	0	4
Occidental Chemical Corp.	St James	4	0	0	0	0	0	0	4
Rubicon Inc.	Ascension	2	1	1	0	0	0	0	4
Imc-Phosphates Mp Inc. Uncle Sam Plant	St James	4	0	0	0	0	0	0	4
Calcasieu Refining Co.	Calcasieu	3	1	0	0	0	0	0	4
Dynegy Midstream Services Venice Terminal	Plaquemines	2	1	1	0	0	0	0	4
Tembec Usa L.L.C.	West Feliciana	4	0	0	0	0	0	0	4
Dow Chemical Co. Grand Bayou Ops.	Assumption	3	0	0	0	0	0	0	3
Weyerhaeuser Co. Dodson Div.	Winn	3	0	0	0	0	0	0	3
Degussa Engineered Carbons L.P.	St Mary	3	0	0	0	0	0	0	3
Air Prods. & Chemicals Inc. New Orleans La Facility	Orleans	3	0	0	0	0	0	0	3
Asco-Us Cameron 06	Cameron	3	0	0	0	0	0	0	3
Asco-Us Fourchon 16	Lafourche	3	0	0	0	0	0	0	3
Barriere Construction Boutte Plant No. 625	St Charles	3	0	0	0	0	0	0	3
Dynea USA Inc. Winnfield	Winn	3	0	0	0	0	0	0	3
Pcs Nitrogen Fertilizer L.P.	Ascension	3	0	0	0	0	0	0	3
Morton Intl. Inc. Advanced Materials	Iberia	0	1	1	0	0	0	0	2
Clean Harbors Plaquemine L.L.C.	Iberville	0	0	0	0	0	0	0	0
Conocophillips Co. Alliance Refy.	Plaquemines	0	0	0	0	0	0	0	0
Crompton Corp. Polymer Additives Div.	St Charles	0	0	0	0	0	0	0	0

Table E-87: Building Exposure (Number) to Hazardous Materials Facilities in Louisiana

Facility Name	Parish	Building Count (Number)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Nexen Chemical USA	St Charles	0	0	0	0	0	0	0	0
Occidental Chemical Corp.	St Charles	0	0	0	0	0	0	0	0
Shell Chemical Taft Plant	St Charles	0	0	0	0	0	0	0	0
Venture Coke Co. L.L.C. Lake Charles Calcining Plant	Calcasieu	0	0	0	0	0	0	0	0

Table E-88: Building Exposure (Valuation) to HAZMAT Facilities in Louisiana

Table E-88: Building Exposure (Valuation) to HAZMAT Facilities in Louisiana									
		Building Exposure ($1,000)							
Facility Name	Parish	Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Bollinger Algiers L.L.C.	Orleans	113,673	119,502	9,583	73	4,419	2,188	413	249,850
Delta Petroleum Co. Inc.	St Charles	114,439	16,561	3,319	159	927	90	153	135,648
Delta Petroleum Co. Inc.	Jefferson	114,439	16,561	3,319	159	927	90	153	135,648
Shell Oil Prods. Us	Jefferson	102,887	16,241	3,526	69	539	90	156	123,507
Crompton Corp.	Jefferson	110,961	9,713	335	111	789	84	208	122,200
Wechem Inc.	Jefferson	45,910	45,949	13,805	244	494	1,315	1,019	108,736
Cp Louisiana Inc.	Jefferson	33,206	52,083	18,318	253	635	1,315	945	106,755
Hobson Galvanizing Inc.	Plaquemines	93,108	8,028	2,064	23	634	11	488	104,356
Capitol Steel Inc.	East Baton Rouge	78,817	10,227	784	77	747	2,253	1,112	94,017
Schering-Plough Veterinary Ops. Inc.	East Baton Rouge	72,992	14,896	4,749	90	623	471	87	93,907
X-Chem Inc.	Jefferson	46,545	28,757	12,450	278	384	241	275	88,930
U.S. Gypsum Co.	Orleans	76,273	5,704	2,123	20	301	0	102	84,523
Chemcentral/New Orleans	Jefferson	66,917	12,415	4,196	64	326	0	0	83,919
Hay Wilk Galvanizing Inc.	Jefferson	61,857	13,764	6,992	18	382	532	268	83,814
Marble Quarry Inc.	St Tammany	68,412	8,625	538	52	439	63	118	78,246
Kik- Louisiana Inc.	St Tammany	65,619	9,043	497	43	481	45	362	76,089
Bollinger Quick Repair L.L.C.	Jefferson	55,227	13,245	6,392	18	287	532	268	75,968
Orleans Marble Inc.	Jefferson	27,728	33,262	12,533	234	660	307	146	74,870
Jefferson Fiberglass Co. Inc.	Jefferson	54,015	12,952	6,719	11	308	161	54	74,219
Chevrontexaco Used Oil Recycling Plant	Jefferson	57,643	6,833	940	0	329	0	195	65,939
Sigma Coatings Usa B.V.	Jefferson	45,382	12,531	7,183	44	319	440	10	65,909
Purina Mills L.L.C.	Caddo	52,433	11,495	533	33	1,080	0	226	65,800
Milk Prods. Lp. Dba Borden Dairy	Lafayette	50,854	9,038	3,597	53	471	63	217	64,292
Pennzoil - Quaker State Co.	Caddo	54,983	6,680	380	5	463	0	203	62,714
Evans Harvey Corp.	Jefferson	43,915	11,574	6,429	44	285	445	0	62,691
Evans Harvey Inc.	Jefferson	43,915	11,574	6,429	44	285	445	0	62,691
Calumet Lubricants Co. Shreveport Refy.	Caddo	54,917	6,158	379	5	365	0	203	62,028
Pennzoil-Quaker State Co.	Caddo	50,515	8,527	550	0	944	0	150	60,685
Caddo Paint Co. Inc.	Caddo	55,115	3,857	639	5	701	58	137	60,511
Qpl Inc.	Lafourche	50,544	5,928	514	47	613	217	316	58,179
Crystal Clean Services L.L.C.	Caddo	50,521	5,570	550	0	944	0	150	57,734
New Ngc Inc.	Jefferson	49,288	4,526	1,009	38	531	264	204	55,860
Associated Printing	Bossier	39,073	12,751	1,192	80	972	1,332	277	55,677
Capitol Steel Slidell	St Tammany	47,827	5,596	575	30	494	27	435	54,984
Nexair L.L.C.	Ouachita	29,321	18,412	3,404	10	1,185	470	470	53,271
Chalmette Refining L.L.C.	St Bernard	46,541	3,982	591	68	387	0	62	51,631
U.S. Air Force Barksdale Afb La	Bossier	47,021	3,448	217	5	237	365	183	51,476

Table E-88: Building Exposure (Valuation) to HAZMAT Facilities in Louisiana

Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Northwest Pipe Co.	Bossier	36,845	10,875	1,033	20	459	1,363	174	50,769
Northrop Grumman Ship Sys. Avondale Ops.	Jefferson	31,267	9,042	5,192	50	237	179	171	46,139
Cameco Inds. - Thibodaux Facility	Lafourche	36,670	7,608	403	51	312	299	127	45,468
International Paper Co. Louisiana Mill	Morehouse	37,441	5,132	1,259	90	657	479	261	45,318
New Orleans Shipyard	Jefferson	42,075	2,092	236	29	170	0	204	44,806
Edo Specialty Plastics	East Baton Rouge	36,226	6,036	1,377	99	256	135	0	44,130
Murphy Oil USA Inc. Meraux Refy.	St Bernard	40,144	2,754	508	35	212	16	93	43,761
Libbey Glass Inc.	Caddo	36,492	5,073	1,217	0	257	154	220	43,413
Body Masters Sports Industry	Acadia	35,902	2,808	1,037	2,536	206	101	240	42,831
Frymaster	Caddo	33,261	6,081	424	39	283	0	60	40,148
U.S. Army Joint Readiness Training Center (Jrtc) & Fort Polk	Vernon	36,486	463	0	0	0	2,946	49	39,944
Sci Fabrication Shop	Ascension	33,075	3,071	810	58	183	0	0	37,197
Exxonmobil Refining & Supply Baton Rouge Refy.	East Baton Rouge	31,188	2,773	1,700	3	334	163	254	36,414
Baker Mfg. Co. Inc.	Rapides	32,336	2,516	440	44	370	173	262	36,140
Central Oil & Supply Monroe Bulk Facility	Ouachita	29,956	1,769	3,169	0	189	165	193	35,440
Shaw Alloy Piping Prods. Inc.	Caddo	15,640	13,801	3,467	115	533	970	640	35,167
East Jordan Iron Works Inc.	Livingston	27,773	5,506	621	17	835	209	131	35,091
Bunge N.A. Inc.	St Charles	33,776	521	114	0	28	0	29	34,467
Barnes Hardwood Inc. Sondheimer Div.	East Carroll	32,321	1,228	291	34	145	0	95	34,114
Lott Oil Co.	Bossier	17,258	12,761	1,817	21	441	1,537	138	33,973
Colfax Treating Co. L.L.C.	Rapides	29,775	2,374	399	28	311	173	372	33,432
Gaylord Container Corp.	Washington	26,963	4,838	821	13	112	69	144	32,959
Gaylord Chemical Corp.	Washington	26,774	4,854	821	13	112	69	144	32,787
Rhodia Inc.	East Baton Rouge	31,480	661	339	0	56	0	0	32,536
Bollinger Gulf Repair L.L.C.	Orleans	23,895	7,001	746	42	614	0	160	32,459
Cmp Coatings Inc.	Plaquemines	28,365	1,752	1,029	0	13	0	380	31,540
Carboline Co.	Calcasieu	29,264	1,408	23	0	217	0	0	30,912
Driscoll Management L.L.C.	East Baton Rouge	28,018	1,423	920	0	285	16	23	30,684
Coca-Cola Bottling Co. Ouachita	Ouachita	27,149	2,241	711	0	445	0	0	30,546
Exide Techs.	Caddo	22,919	5,494	1,103	6	879	72	22	30,495
Exxonmobil Chemical Baton Rouge Chemical Plant	East Baton Rouge	23,628	2,936	2,558	0	258	163	53	29,596
Dsm Copolymer Inc.	East Baton Rouge	23,528	2,718	2,558	0	232	155	53	29,243
Motiva Kenner Terminal	Jefferson	9,904	15,591	1,989	44	174	118	0	27,820

Table E-88: Building Exposure (Valuation) to HAZMAT Facilities in Louisiana

Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Resin Sys. Inc.	Calcasieu	19,610	5,975	1,355	44	80	38	203	27,304
Flint Ink N.A.	Ouachita	19,058	5,944	1,491	102	233	53	71	26,951
Monsanto - Luling	St Charles	24,448	1,678	48	23	362	32	0	26,591
Occidental Chemical Corp. - Luling	St Charles	24,448	1,678	48	23	362	32	0	26,591
Shaw Shreveport	Caddo	14,052	8,857	2,927	174	55	141	0	26,207
Plymouth Tube Co.	Ouachita	19,070	5,053	1,521	97	298	53	71	26,163
Esgard Inc.	Lafayette	21,976	2,597	1,195	6	132	0	19	25,925
Mariah Corp.	Lafayette	20,546	3,563	1,026	51	152	15	111	25,465
Catalyst Recovery Of Louisiana L.L.C.	Lafayette	12,948	9,360	2,588	93	32	11	142	25,174
Cerro Copper Tube Co.	Bossier	22,735	1,271	512	23	137	153	12	24,843
Pumpelly Oil Co.	Calcasieu	17,615	5,394	1,273	44	19	0	105	24,450
Orion Refining Corp.	St Charles	22,275	1,031	938	13	155	13	0	24,425
Shell Chemical L.P. St. Rose Facility	St Charles	19,366	1,249	2,553	46	264	68	114	23,660
Hughes Christensen- Lafayette	Lafayette	13,999	7,187	1,700	99	100	0	142	23,227
Lott Oil Co.	Vernon	16,583	5,395	101	54	553	270	71	23,027
Ohmstede Ltd.	Calcasieu	16,301	5,115	1,273	13	0	0	105	22,807
Gmtg Shreveport Assembly	Caddo	11,432	2,546	7,756	0	364	0	0	22,098
Resolution Performance Prods. L.L.C.	St Charles	21,045	710	130	0	0	0	23	21,907
Bercen, Inc. Southern Div.	Livingston	19,509	1,394	568	0	59	44	131	21,704
Mckinney Oil Co. Of Tallulah Inc.	Madison	17,205	2,960	151	36	163	537	148	21,200
Federal Home Prods.	Lincoln	17,138	3,148	438	65	286	57	0	21,132
Steel Forgings Inc.	Caddo	12,038	6,212	2,077	113	10	124	168	20,742
Gulf Coast Chemical Inc.	Vermilion	18,361	1,191	50	16	38	98	108	19,862
Lott Oil Co.	De Soto	16,220	2,312	911	4	172	165	68	19,853
Univar USA	Lafayette	15,127	3,088	760	60	195	0	0	19,230
Beaird Inds. Inc.	Caddo	14,138	3,291	207	79	1,213	0	0	18,928
Shell Norco Chemical Plant East Site	St Charles	17,759	766	130	0	0	0	23	18,677
Silco (Dba Elco Forest Prods.)	St Landry	17,514	916	99	27	29	0	0	18,584
Castrol N.A. Inc.	West Baton Rouge	16,510	1,633	181	32	94	25	84	18,557
Conocophillips Lake Charles Refy.	Calcasieu	10,212	1,848	5,593	7	535	64	72	18,331
Baton Rouge Plastics Plant	East Baton Rouge	15,176	2,177	435	37	102	219	134	18,280
Borden Chemical Inc.	Rapides	17,122	856	17	0	26	0	0	18,021
Delta Environmental Prods. Inc.	Livingston	15,383	1,758	617	0	87	44	131	18,019
Riverwood Intl. Corp.	Ouachita	14,952	1,726	374	7	211	0	71	17,341
FMC Corp. Agriculture Prods. Group	St Landry	15,985	604	215	0	137	0	0	16,940

Table E-88: Building Exposure (Valuation) to HAZMAT Facilities in Louisiana

Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Lard Oil Co. Inc.	Livingston	14,573	966	432	86	231	146	253	16,685
Eclectic Prods. Inc.	Rapides	13,409	1,931	753	33	306	122	132	16,685
Willamette Valley Co.	Rapides	13,409	1,931	753	33	306	122	132	16,685
St. Mary Galvanizing Co.	St Mary	16,030	408	57	10	0	52	0	16,556
Ampacet Corp.	Beauregard	12,933	2,814	73	12	0	0	0	15,833
Taylortec Inc.	Tangipahoa	11,411	3,889	171	0	100	54	12	15,636
Spectrum Control Tech. Inc.	Orleans	7,772	2,966	2,921	0	227	1,650	55	15,591
Procter & Gamble Mfg. Co.	Rapides	12,434	1,692	691	0	105	0	0	14,922
Motiva Enterprises L.L.C.	St Charles	13,822	766	130	0	0	0	23	14,740
Dis-Tran Wood Prods. L.L.C.	Rapides	11,637	1,796	746	21	217	122	132	14,672
Ge Commercial Transformer Business	Caddo	2,655	3,682	8,100	0	165	0	0	14,602
Deep South Petroleum Inc.	Lafayette	8,105	4,828	1,164	70	112	0	253	14,533
Jotun Paints Inc.	Plaquemines	13,292	777	155	15	102	0	0	14,340
Certainteed Corp.	Calcasieu	5,797	2,649	5,801	13	0	0	32	14,292
Vivian Inds. Inc.	Caddo	12,910	1,043	192	0	56	0	27	14,228
Inland Paperboard & Packaging	Webster	11,380	1,175	1,336	0	241	0	10	14,142
Arizona Chemical	Allen	10,502	2,718	498	21	198	70	0	14,007
Varco Amelia South Coating Plant Tuboscope Div.	Assumption	7,545	3,132	3,119	9	82	21	27	13,935
Sasol N.A. Inc. Lake Charles Chemical Complex	Calcasieu	7,666	535	5,512	7	0	0	0	13,720
Dpc Enterprises	St John The Baptist	10,100	2,007	918	0	212	41	325	13,604
Exide Techs. Baton Rouge Smelter	East Baton Rouge	12,983	387	0	11	0	19	93	13,493
Seegott Inc. Magnolia	Lafayette	4,895	6,547	1,405	82	100	0	142	13,171
Datachem Inc.	St John The Baptist	9,557	2,109	918	0	212	41	325	13,163
Deltech Corp.	East Baton Rouge	12,247	467	339	0	56	0	0	13,108
Ondeo Nalco Energy Services Scott Blend Plant	Lafayette	9,524	2,229	779	7	57	63	0	12,659
Air Liquide America Corp.	St Charles	11,665	433	444	0	0	0	0	12,542
Trinity Marine Prods. #38	St Tammany	11,401	351	74	0	229	0	94	12,150
Shaw Process Fabricators Inc.	Ouachita	9,614	1,749	429	0	211	53	0	12,056
Cleanharbors Baton Rouge L.L.C.	East Baton Rouge	10,954	567	339	0	28	19	81	11,988
Ppg Grow Baton Rouge	East Baton Rouge	10,954	567	339	0	28	19	81	11,988
Lott Oil Co.	Sabine	7,599	3,177	72	10	298	597	191	11,944
Shaw SSS Fabricators Inc.	West Baton Rouge	10,988	526	262	15	24	39	0	11,854
Nasa Michoud Assembly Facility	Orleans	4,442	2,772	2,700	0	60	1,650	55	11,677
J. Ray Mcdermott Inc. Fab.	Assumption	5,267	3,132	3,119	9	82	21	27	11,657

Table E-88: Building Exposure (Valuation) to HAZMAT Facilities in Louisiana

Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Shell Norco Chemical Plant West Site	St Charles	10,595	883	78	0	0	0	23	11,579
Union Carbide Corp. Cypress Catalyst Plant	St Charles	10,595	883	78	0	0	0	23	11,579
Bollinger Gretna L.L.C.	Jefferson	10,822	499	63	15	13	0	0	11,412
Deep South Chemical Inc.	Lafayette	7,843	2,190	1,060	17	26	76	41	11,253
Cytec Inds. Inc. Fortier Plant	Jefferson	9,438	387	1,162	0	28	0	0	11,015
Biolab Inc.	Calcasieu	6,593	1,782	1,817	0	509	64	72	10,836
Sii Chem Tech	Lafayette	4,964	3,146	2,246	0	35	179	41	10,612
Lott Oil Co.	Natchitoches	8,861	849	92	581	51	22	0	10,456
Georgia Gulf Lake Charles L.L.C.	Calcasieu	7,845	668	1,754	11	0	0	0	10,278
Micro Chemical Co.	Franklin	8,164	1,636	223	3	148	30	0	10,204
Stone Container Corp. Hodge Inc.	Jackson	8,907	656	141	0	323	71	0	10,098
Hood Inds. Inc.	Red River	7,207	2,078	44	32	306	50	189	9,905
Grand Isle Shipyard	Jefferson	9,091	258	196	19	91	119	100	9,873
Capitol Mfg. Co.	Acadia	9,362	170	0	0	0	0	0	9,532
Halliburton Energy Services Cps Mfg. Gulf Coast	St Martin	5,576	2,078	1,661	0	9	104	0	9,427
Starling Inc.	Livingston	8,496	575	325	0	0	0	0	9,395
Tetra Chemicals Inc.	Calcasieu	297	1,369	7,406	13	0	0	32	9,116
Louisiana Blasting & Coating Inc.	Iberia	7,648	834	370	0	0	0	0	8,852
St. Romain Oil Co.	Avoyelles	8,086	460	62	6	26	36	21	8,695
Firestone Polymers	Calcasieu	3,158	4,304	1,060	8	0	0	105	8,633
Union Carbide Corp. Cypress Polypropylene Plant	St Charles	7,729	739	78	0	0	0	23	8,569
Vulcan Performance Chemicals Shreveport Plant	Caddo	7,338	502	237	54	35	219	184	8,567
Bollinger Marine Fabricators L.L.C.	St Mary	2,375	2,930	3,081	9	82	21	27	8,525
Royal Fiberglass Pools Inc.	St Martin	7,950	372	41	0	0	0	0	8,362
Seegott Inc. Magnolia	Jefferson	7,718	272	122	22	0	0	0	8,133
Ondeo Nalco Chemical Co.	West Baton Rouge	7,346	566	148	27	38	0	0	8,124
International Paper Pineville Mill	Rapides	7,831	114	29	5	24	0	0	8,002
Dura-Wood L.L.C.	Rapides	7,735	114	29	5	24	0	0	7,907
Tifton Aluminum Co. Inc.	Richland	6,943	903	0	6	30	17	0	7,899
Polychemie Pearl River Plant	St Tammany	7,797	18	0	0	57	0	0	7,872
Du Pont Pontchartrain Works	St John The Baptist	7,616	129	0	0	0	0	0	7,745
Dupont Dow Elastomers L.L.C. Pontchartrain Site	St John The Baptist	7,616	129	0	0	0	0	0	7,745

Table E-88: Building Exposure (Valuation) to HAZMAT Facilities in Louisiana

Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Bayou Steel Corp.	St John The Baptist	7,520	86	0	0	19	0	0	7,625
Bioproducts Of Louisiana L.L.C.	Iberville	5,325	600	953	0	86	468	0	7,431
Tomah Reserve Inc.	St John The Baptist	4,948	1,274	788	0	114	30	117	7,271
Exxonmobil Chemical Co. Baton Rouge Polyolefins Plant	East Baton Rouge	6,123	608	339	0	28	19	81	7,198
Amite Fndy. & Machine Inc.	Tangipahoa	6,587	387	12	0	27	35	81	7,128
Albemarle Corp.	East Baton Rouge	4,041	470	2,554	0	35	0	0	7,100
Weyerhaeuser Zwolle Div.	Sabine	6,294	408	41	5	123	48	15	6,934
Ineos Oxide	Iberville	5,903	492	212	14	58	108	0	6,787
Amax Metals Recovery Inc.	Plaquemines	6,247	316	144	0	52	0	0	6,760
Angus Chemical Co.	Ouachita	5,698	555	156	0	206	5	79	6,699
Koch Nitrogen Co.	Ouachita	5,698	555	156	0	206	5	79	6,699
Borden Chemicals & Plastics Operating L.P.	West Baton Rouge	6,167	340	123	0	24	39	0	6,692
W. B. Mccartney Oil Co. Inc. Bulk Plant	La Salle	6,559	7	0	0	22	13	79	6,679
Exxonmobil Chemical Co. Baton Rouge Resin Finishing Plant	East Baton Rouge	5,514	633	339	0	56	19	81	6,642
International Painting Corp.	West Baton Rouge	6,217	272	122	22	0	0	0	6,633
Honeywell Intl. Inc. - Baton Rouge Plant	East Baton Rouge	2,945	751	2,078	0	0	679	0	6,453
Air Prods. & Chemicals Inc.	Iberville	4,922	512	953	0	0	30	0	6,417
Ppg Inds. Inc.	Calcasieu	205	731	5,436	7	0	0	0	6,379
Harcros Chemicals Inc.	Iberville	4,729	496	953	0	0	30	0	6,208
Coastal Chemical Co. L.L.C.	Vermilion	5,300	516	40	0	14	137	0	6,007
Big River Inds. - Gravelite	Pointe Coupee	5,940	12	33	0	0	0	0	5,985
Gulf Island L.L.C. Main Yard West Yard & Southport	Terrebonne	3,039	1,995	804	0	50	50	0	5,938
Arch Chemcials Inc.	Calcasieu	2,468	1,086	1,781	0	378	23	0	5,736
Lyondell Chemical Co.	Calcasieu	2,468	1,086	1,781	0	378	23	0	5,736
Praxair Distribution Inc.	St Charles	5,674	0	0	0	0	0	0	5,674
Stowe Woodward	Lincoln	5,319	191	0	0	103	0	0	5,612
Alliance Compressors	Natchitoches	3,697	1,191	91	70	511	8	0	5,569
Calumet Lubricants Co. L.P. Calumet Cotton Valley	Webster	5,548	0	0	0	0	0	0	5,548
Weatherford Gemoco	Terrebonne	4,704	494	52	0	0	28	216	5,495
Trus Joist A Weyerhaeuser Business	Natchitoches	3,807	1,170	51	59	399	8	0	5,494
Bollinger Shipyards Lockport L.L.C.	Lafourche	4,444	918	20	12	0	92	0	5,485
Sanderson Farms Inc.	Tangipahoa	4,654	87	498	15	114	0	94	5,463

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Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Guide Louisiana L.L.C.	Ouachita	3,713	867	459	0	379	0	0	5,418
Louisiana Pigment Co. L.P.	Calcasieu	935	3,440	896	0	0	0	105	5,376
Springhill Wood Prods.	Webster	3,977	512	543	8	26	0	0	5,066
Universal Fabricators L.L.C.	Iberia	3,466	1,009	480	3	45	0	0	5,002
Chevron Oronite Corp.	Plaquemines	4,940	0	0	0	0	0	0	4,940
Placid Refining Co. L.L.C.	West Baton Rouge	3,100	324	1,471	0	45	0	0	4,940
Formosa Plastics Corp. Louisiana	East Baton Rouge	812	910	3,130	0	35	8	0	4,896
Bollinger Larose L.L.C.	Lafourche	4,165	426	17	0	0	28	216	4,852
Dow Chemical Co. Louisiana Div.	Iberville	4,030	202	202	0	159	108	0	4,700
Sid Richardson Carbon Co.	West Baton Rouge	4,030	202	202	0	159	108	0	4,700
Valero Refining Co. Louisiana	St Landry	4,276	93	0	0	91	40	0	4,499
Melamine Chemical Inc.	Ascension	3,284	331	856	0	0	0	0	4,470
Uop Shreveport Plant	Caddo	3,225	348	481	25	269	0	111	4,458
Triad Nitrogen L.L.C.	Ascension	3,460	29	856	0	0	0	0	4,344
Conagra Poultry Co.	Natchitoches	3,198	380	77	581	51	22	0	4,308
Cameron 130130	Evangeline	3,012	286	743	16	86	0	65	4,208
Ohmstede Ltd.	Iberville	924	1,327	1,453	0	0	468	0	4,171
Westlake Petrochemicals Corp.	Calcasieu	4,073	20	42	0	0	0	0	4,135
Westlake Petrochemicals L.P.	Calcasieu	4,073	20	42	0	0	0	0	4,135
Westlake Styrene L.P.	Calcasieu	4,073	20	42	0	0	0	0	4,135
Westlake Styrene L.P. - Marine Terminal Facility	Calcasieu	4,073	20	42	0	0	0	0	4,135
Marathon Ashland Petroleum L.L.C.	St John The Baptist	3,515	558	0	0	57	0	0	4,131
Stockhausen Louisiana L.L.C.	St John The Baptist	4,046	52	0	0	0	0	0	4,098
Syngenta Crop Protection Inc. St. Gabriel Facility	Iberville	2,610	496	953	0	0	30	0	4,089
Westside Galanizing Services Inc.	West Baton Rouge	2,504	937	489	0	121	8	0	4,059
Elder Wood Preserving Co. Inc.	Avoyelles	3,814	10	0	0	0	0	0	3,824
Ondeo Nalco Co.	St John The Baptist	3,748	52	0	0	0	0	0	3,801
Cf Inds. Inc.	Ascension	2,487	368	864	0	0	0	0	3,720
Richard Oil & Fuel Inc.	Ascension	3,569	0	0	0	0	0	0	3,569
Ciba Specialty Chemicals Corp.	Iberville	2,068	512	953	0	0	30	0	3,563
Ferro Corp. Baton Rouge Site	East Baton Rouge	3,228	124	29	5	0	83	0	3,470
Basell USA Inc. Lake Charles Plant	Calcasieu	3,397	0	0	0	0	0	0	3,397
Discovery Aluminas Inc. (Dba	West Baton	2,445	542	277	0	121	0	0	3,384

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Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Port Allen Works-Activated)	Rouge								
Citgo Petroleum Corp.	Calcasieu	3,274	0	0	0	0	0	0	3,274
Conagra Poultry Co.	Bienville	1,951	521	105	3	434	201	0	3,214
Arnold Forest Prods. Corp.	Caddo	2,608	265	49	0	98	123	11	3,153
Boise Cascade Corp. Florien Plywood	Sabine	2,958	132	32	0	25	0	0	3,147
4-D Corrosion Control Specialists Inc.	Iberia	1,241	1,089	666	38	45	0	0	3,079
Haynes Intl. Inc.	Bienville	1,407	366	795	316	98	0	0	2,981
Weyerhaeuser Lillie Div.	Union	2,067	20	887	0	0	0	0	2,973
Weyerhaeuser Louisiana Particleboard	Lincoln	2,067	20	887	0	0	0	0	2,973
Weyerhaeuser Simsboro Ewp Div.	Lincoln	2,067	20	887	0	0	0	0	2,973
Ineos Fluor Americas L.L.C.	Iberville	2,956	16	0	0	0	0	0	2,972
Daybrook Fisheries Inc.	Plaquemines	2,811	68	5	0	0	21	0	2,904
Kencoil Inc.	Plaquemines	2,887	0	0	0	0	0	0	2,887
Meadwestvaco South Carolina L.L.C.	Beauregard	2,836	34	0	0	0	0	0	2,870
Omega Natchiq	Iberia	1,077	1,037	666	3	45	0	0	2,827
St.-Gobain Containers	Lincoln	1,892	20	887	0	0	0	0	2,798
Alcoa World Chemicals Vidalia Works	Concordia	2,755	7	0	0	0	0	0	2,762
Waterbury Cos. Inc.	Tangipahoa	2,685	32	5	25	0	0	0	2,747
Vulcan Materials Co. Chemicals Div.	Ascension	2,177	302	264	0	0	0	0	2,743
Polyone Corp.	Iberville	2,440	219	11	14	0	0	0	2,683
Omega Protein Inc.	Cameron	525	1,307	783	19	36	0	0	2,669
St. James Terminal	St James	2,658	0	0	0	0	0	0	2,658
Natco New Iberia Mfg.	Iberia	1,069	1,009	480	3	45	0	0	2,605
Pinnacle Polymers Co.	St John The Baptist	1,926	558	0	0	57	0	0	2,542
Brenntag Southwest Inc. St. Gabriel	Iberville	1,985	145	378	0	0	0	0	2,507
Valentine Paper Inc.	Lafourche	2,061	332	38	8	59	0	0	2,498
Imc Phosphates Mp Inc. Faustina Plant	St James	2,317	65	10	0	57	0	0	2,449
Baker Petrolite Rayne Facility	Acadia	1,768	406	243	8	0	0	0	2,424
Chevron Phillips Chemical Co. L.P.	St James	2,283	65	10	0	57	0	0	2,415
Imc Phosphates Mp Inc. Taft Plant	St Charles	1,486	445	370	18	0	0	0	2,319
Enterprise Prods. Operating L.P.	West Baton Rouge	629	221	1,445	0	0	0	0	2,295

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Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Williams Olefins L.L.C. Geismar Ethylene Plant	Ascension	26	1,142	1,075	0	0	30	0	2,273
Exxonmobil Port Allen Lubricants	West Baton Rouge	607	221	1,445	0	0	0	0	2,273
Intercontinental Terminals Co.	West Baton Rouge	607	221	1,445	0	0	0	0	2,273
Calumet Lubricants Co. L.P.	Bossier	2,261	0	0	0	0	0	0	2,261
Cabot Corp. Ville Platte Plant	Evangeline	2,227	0	0	0	0	0	0	2,227
Great Lakes Carbon Corp.	East Baton Rouge	2,154	0	0	0	0	0	0	2,154
Asco-Us Venice	Plaquemines	1,172	765	205	0	0	0	0	2,141
Ecological Tanks Inc.	Ouachita	1,939	14	32	15	0	27	0	2,026
Aviation Exteriors Louisiana Inc.	Iberia	696	840	32	0	0	0	455	2,024
Purina Mills L.L.C.	Tangipahoa	1,656	149	0	23	124	0	0	1,952
Pioneer Americas L.L.C.	Iberville	1,929	16	0	0	0	0	0	1,945
U.S. Marine Inc.	Orleans	1,550	57	319	0	0	0	0	1,926
Athens Caddo Brick	Caddo	1,922	0	0	0	0	0	0	1,922
Ormet Primary Aluminum Corp.	Ascension	1,880	28	0	0	0	0	0	1,908
Skagit Smatco	Terrebonne	1,878	0	0	0	0	0	0	1,878
Steel Fabricators Of Monroe Inc.	Ouachita	1,847	0	0	0	0	0	0	1,847
Shintech Louisiana L.L.C. Addis Plant A	West Baton Rouge	1,376	127	202	0	28	108	0	1,841
Martco Ptnr.	St Landry	1,791	28	0	0	0	0	0	1,819
Shaw Sunland Fabricators Inc.	Livingston	1,794	0	0	0	0	0	0	1,794
Southern Ionics Inc.	Calcasieu	1,623	27	28	0	58	0	0	1,735
W. R. Grace & Co.-Conn. Davison Catalysts	Calcasieu	1,623	27	28	0	58	0	0	1,735
Conagra Poultry Co. Feedmill	Sabine	1,073	446	110	0	73	0	0	1,701
Kaiser Aluminum & Chemcal Corp. Gramercy Works	St James	1,651	0	0	0	0	0	0	1,651
Westlake Polymers L.P.	Calcasieu	512	892	139	0	0	0	0	1,543
Arch Chemicals Inc.	Caddo	1,138	160	28	38	0	0	150	1,513
Acme Romac Inc.	De Soto	1,055	109	255	6	28	19	0	1,472
Chemical Waste Management Lake Charles Facility	Calcasieu	723	284	147	5	0	2	231	1,391
St. Martin Oil & Gas Inc.	St Martin	1,156	128	70	7	30	0	0	1,391
Amerchol Corp. Greensburg La Facility	St Helena	1,366	0	0	0	0	0	0	1,366
Honeywell Intl. Inc. Geismar Plant	Ascension	26	792	500	0	0	0	0	1,317
Boise Cascade Corp. Oakdale Plywood	Allen	1,303	0	0	0	0	0	0	1,303
Weyerhaeuser Co. Red River Mill	Natchitoches	1,288	0	0	0	0	0	0	1,288
Safety-Kleen Sys. (607304)	Rapides	1,107	37	120	7	0	0	0	1,271

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Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Mid-States Wood Preservers Inc.	Lincoln	1,258	0	0	0	0	0	0	1,258
Georgia-Pacific Logansport Plywood	De Soto	1,199	0	0	0	0	0	0	1,199
Big Cajun 2	Pointe Coupee	1,199	0	0	0	0	0	0	1,199
Garyville La Terminal	St John The Baptist	550	558	0	0	57	0	0	1,165
Du Pont Burnside Plant	Ascension	1,160	0	0	0	0	0	0	1,160
Cleco Power L.L.C. Rodemacher Power Station	Rapides	1,142	0	0	0	0	0	0	1,142
Barnes Hardwood Inc. Simsboro Div.	Lincoln	1,130	5	0	0	0	0	0	1,134
Alpha Omega Laser Inc.	Caddo	1,131	0	0	0	0	0	0	1,131
Borden Chemical Inc. Geismar Formaldehyde Plant	Ascension	784	174	153	0	0	0	0	1,111
Balmar L.L.C.	Lafayette	966	9	5	12	94	0	0	1,086
Topside Fabrication	Iberia	619	207	198	0	0	0	0	1,025
Gandy Tire & Timber L.L.C.	Sabine	861	85	26	0	26	0	23	1,020
Air Prods. & Chemicals Inc.	Iberville	500	261	244	0	0	0	0	1,006
Basf Corp.	Ascension	493	261	244	0	0	0	0	998
Univar USA	Ascension	951	16	0	0	25	0	0	992
Koppers Inc.	De Soto	964	0	0	0	0	0	0	964
Georgia Gulf Chemicals & Vinyls L.L.C.	Iberville	873	5	23	0	26	34	0	961
Morton Intl. Inc. Advanced Materials	Iberia	0	42	905	0	0	0	0	947
Georgia-Pacific Corp. Urania Complex	La Salle	486	324	22	0	111	0	0	943
Praxair Inc.	Ascension	528	174	153	0	0	0	0	855
Martco Ptnr.	Natchitoches	699	47	48	0	57	0	0	851
Air Liquide America Plaquemine Asu	Iberville	787	0	0	25	26	0	0	839
Atofina Petrochemicals Inc.	Iberville	830	0	0	0	0	0	0	830
Cos-Mar Co.	Iberville	830	0	0	0	0	0	0	830
Omega Protein Inc. Abbeville Plant	Vermilion	822	0	0	0	0	0	0	822
Boise Cascade Corp.	Beauregard	821	0	0	0	0	0	0	821
Nan Ya Plastics Corp. America	Pointe Coupee	780	37	0	0	0	0	0	817
Southern Mfg. Co.	Cameron	741	0	0	0	0	0	0	741
Farmland Inds. Inc.	Grant	724	0	0	0	0	0	0	724
Lake Charles Carbon Co.	Calcasieu	575	101	0	0	27	0	0	702
Bollinger Calcasieu L.L.C.	Calcasieu	702	0	0	0	0	0	0	702
Superior Tie & Timber	Caddo	612	48	7	0	0	0	0	667
Convent Refy.	St James	603	17	0	0	0	0	0	620

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Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Conagra Poultry Co.	Union	608	0	0	0	0	0	0	608
Borden Chemicals & Plastics Operating L.P.	Ascension	253	174	153	0	0	0	0	579
Acme Brick Co. Dixie Plant	Bienville	559	0	0	0	0	0	0	559
Georgia-Pacific Corp. Port Hudson Ops.	East Baton Rouge	464	58	13	0	0	0	0	535
International Paper	De Soto	406	96	0	0	0	0	0	502
Dolet Hills Power Station	De Soto	499	0	0	0	0	0	0	499
Hendrix Mfg. Co. Inc.	De Soto	498	0	0	0	0	0	0	498
Columbian Chemicals Co.	St Mary	489	0	0	0	0	0	0	489
Crompton Manufacturing Co. Inc.	Ascension	146	174	153	0	0	0	0	473
Rubicon Inc.	Ascension	139	174	153	0	0	0	0	466
Shell Chemical L.P.	Ascension	386	40	21	0	0	0	0	447
Temple Southwest Louisiana Lumber Ops.	Calcasieu	417	0	0	0	0	0	0	417
Weyerhaeuser Co. Dodson Div.	Winn	401	0	0	0	0	0	0	401
Gulf Coast Lubes Plant	Calcasieu	393	0	0	0	0	0	0	393
Union Carbide Corp. Taft/Star Mfg. Plant	St Charles	370	0	0	0	0	0	0	370
Weyerhaeuser Co. Arcadia Osb Div.	Lincoln	347	0	0	0	0	0	0	347
Tembec Usa L.L.C.	West Feliciana	329	0	0	0	0	0	0	329
Complex Chemicals Co. Inc.	Madison	299	0	0	0	0	0	0	299
Boise Cascade Alexandria Ewp	Rapides	298	0	0	0	0	0	0	298
Cs Metals Of Louisiana L.L.C.	St James	289	0	0	0	0	0	0	289
Occidental Chemical Corp.	St James	289	0	0	0	0	0	0	289
Twin Brothers Marine L.L.C.	St Mary	274	0	0	0	0	0	0	274
Imc-Phosphates Mp Inc. Uncle Sam Plant	St James	261	0	0	0	0	0	0	261
Cabot Corp. Canal Plant	St Mary	27	137	49	0	0	34	0	247
Air Prods. & Chemicals Inc. New Orleans La Facility	Orleans	214	0	0	0	0	0	0	214
Trinity Marine Prods. Inc.	West Baton Rouge	107	70	13	0	0	0	0	190
Dow Chemical Co. Grand Bayou Ops.	Assumption	170	0	0	0	0	0	0	170
Dynea USA Inc. Winnfield	Winn	144	0	0	0	0	0	0	144
Degussa Engineered Carbons L.P.	St Mary	132	0	0	0	0	0	0	132
Barriere Construction Boutte Plant No. 625	St Charles	124	0	0	0	0	0	0	124
Asco-Us Fourchon 16	Lafourche	103	0	0	0	0	0	0	103
Calcasieu Refining Co.	Calcasieu	82	14	0	0	0	0	0	96

Table E-88: Building Exposure (Valuation) to HAZMAT Facilities in Louisiana

Facility Name	Parish	Building Exposure ($1,000)							
		Residential	Commercial	Industrial	Agricultural	Religious	Governmental	Educational	Total
Dynegy Midstream Services Venice Terminal	Plaquemines	4	72	5	0	0	0	0	81
Asco-Us Cameron 06	Cameron	72	0	0	0	0	0	0	72
Pcs Nitrogen Fertilizer L.P.	Ascension	26	0	0	0	0	0	0	26
Clean Harbors Plaquemine L.L.C.	Iberville	0	0	0	0	0	0	0	0
Conocophillips Co. Alliance Refy.	Plaquemines	0	0	0	0	0	0	0	0
Crompton Corp. Polymer Additives Div.	St Charles	0	0	0	0	0	0	0	0
Nexen Chemical USA	St Charles	0	0	0	0	0	0	0	0
Occidental Chemical Corp.	St Charles	0	0	0	0	0	0	0	0
Shell Chemical Taft Plant	St Charles	0	0	0	0	0	0	0	0
Venture Coke Co. L.L.C. Lake Charles Calcining Plant	Calcasieu	0	0	0	0	0	0	0	0

Data Limitations

One of the most critical records of hazardous materials in Louisiana, the Tier 2 reports [required under the federal Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and commonly known as SARA Title III], was not available at the deadline. This database would feature all businesses in the state that store 500 pounds or more of materials regulated by the Department of Public Safety. Drafters of the SHMPU are still awaiting this list from GOHSEP and hope to integrate it into the risk assessment for later drafts.

Buffer zones for hazmat transport demand greater scrutiny. At this point, only rail receives a mile buffer, because of the volume of hazmat capable of being transported through freight. Waterways may also justify a mile buffer, if measurements determine that barges can carry a comparable volume to freight rail.

Appendix E.15:
Social Vulnerability Index (SoVI)

The goal of this multi-file research and analysis product is to offer a comprehensive array of variables by which to determine which parishes in Louisiana would be most vulnerable to widespread social disarray or casualties in the event of a national disaster, as well as to determine Louisiana's own vulnerability in comparison to other neighboring states. The variables derive directly from an article in pages 932 to 942 of the September 2005 issue of *Journal for Coastal Research*, entitled "Erosion Hazard Vulnerability of US Coastal Counties" by Bryan J. Boruff, Christopher Emrich, and Susan L. Cutter. The list and descriptions of social variables used comes from Table 1 of this journal article, on page 934. This list, as well as the sources for the various variables, can be seen in Table E-89 below.

Table E-89: Variables tested in SoVI Study.

Table E-89: Variables tested in SoVI Study

Variables	Louisiana State		Louisiana Parishes*	
	General Data Source	Detailed Table Code	General Data Sources	Detailed Table Code
Median age	ACS 2008 Data Profiles: Demographic	B01002	ACS 2008 Demographic[1]	B01002[1]
			ACS 2006-08 Demographic[2]	B01002[2]
			2000 Decennial:SF1[3]	P13[3]
Per capita income (in dollars)	ACS 2008 Data Profiles: Economic	B19301	ACS 2008 Economic[1]	B19301[1]
			ACS 2006-08 Economic[2]	B19301[2]
			2000 Decennial:SF3[3]	P82[3]
Median dollar value of owner-occupied housing	ACS 2008 Data Profiles: Housing	B25077	ACS 2008 Housing[1]	B25077[1]
			ACS 2006-08 Housing[2]	B25077[2]
			2000 Decennial:SF3[3]	H85[3]
Median rent (in dollars) for renter-occupied housing units (median gross rent)	ACS 2008 Data Profiles: Housing	B25064	ACS 2008 Housing[1]	B25064[1]
			ACS 2006-08 Housing[2]	B25064[2]
			2000 Decennial:SF3[3]	H63[3]
Vote cast for president—percent voting for leading party (Republican)				
Birth rate (number of births per 1000 population)	Louisiana Department of Health		Louisiana Department of Health	
Net international migration	US Census Population Estimates - States	Cumulative Components of Population Change (2008)	US Census Population Estimates - Counties	Cumulative Components of Population Change (2008)
Land in farms as a percent of total land	USDA: 2007 Agriculture Census	Volume 1, Chapter 1 - Table 9	USDA: 2007 Agriculture Census	Volume 1, Chapter 2 - Table 8

Table E-89: Variables tested in SoVI Study

Variables	Louisiana State		Louisiana Parishes*	
	General Data Source	Detailed Table Code	General Data Sources	Detailed Table Code
Percent African American	ACS 2008 Data Profiles: Demographic	B02001	ACS 2008 Demographic[1]	B02001[1]
			ACS 2006-08 Demographic[2]	B02001[2]
			2000 Decennial:SF1[3]	P3[3]
Percent Native American (American Indian or Alaska Native)	ACS 2008 Data Profiles: Demographic	B02001	ACS 2008 Demographic[1]	B02001[1]
			ACS 2006-08 Demographic[2]	B02001[2]
			2000 Decennial:SF1[3]	P3[3]
Percent Asian	ACS 2008 Data Profiles: Demographic	B02001	ACS 2008 Demographic[1]	B02001[1]
			ACS 2006-08 Demographic[2]	B02001[2]
			2000 Decennial:SF1[3]	P3[3]
Percent Hispanic	ACS 2008 Data Profiles: Demographic	B03002	ACS 2008 Demographic[1]	B03002[1]
			ACS 2006-08 Demographic[2]	B03002[2]
			2000 Decennial:SF1[3]	P11[3]
Percent of population under 5 years old	ACS 2008 Data Profiles: Demographic	B01001	ACS 2008 Demographic[1]	B01001[1]
			ACS 2006-08 Demographic[2]	B01001[2]
			2000 Decennial:SF1[3]	P12[3]
Percent of population over 65 years	ACS 2008 Data Profiles: Demographic	B01001	ACS 2008 Demographic[1]	B01001[1]
			ACS 2006-08 Demographic[2]	B01001[2]
			2000 Decennial:SF1[3]	P12[3]
Percent of civilian labor force that is unemployed	ACS 2008 Data Profiles: Economic	None, must use Data Profiles	ACS 2008 Economic[1]	None, must use Data Profiles for each county[1]
			ACS 2006-08 Economic[2]	None, must use Data Profiles for each county[2]
			2000 Decennial:SF3[3]	P43[3]
Average number of people per household	ACS 2008 Data Profiles: Social	B09016, then take persons in households & divide by total households	ACS 2008 Social[1]	B09016, use formula[1]
			ACS 2006-08 Social[2]	B09016, use formula[2]
			2000 Decennial:SF1[3]	P16 and use formula, or P17[3]
Percent of households	ACS 2008	B19001	ACS 2008 Economic[1]	B19001[1]

Table E-89: Variables tested in SoVI Study

Variables	Louisiana State		Louisiana Parishes*	
	General Data Source	Detailed Table Code	General Data Sources	Detailed Table Code
earning more than $100,000	Economic		ACS 2006-08 Economic[2]	B19001[2]
			2000 Decennial:SF3[3]	P52[3]
Percent living in poverty	ACS 2008 Economic	B17001	ACS 2008 Economic[1]	B17001[1]
			ACS 2006-08 Economic[2]	B17001[2]
			2000 Decennial:SF3[3]	P87[3]
Percent renter-occupied housing units	ACS 2008 Housing	B25003	ACS 2008 Housing[1]	B25003[1]
			ACS 2006-08 Housing[2]	B25003[2]
			2000 Decennial:SF1[3]	H4[3]
Percent rural farm population	2000 Decennial: SF3	P5	2000 Decennial: SF3	P5
General local government debt to revenue ratio	Moody's Investor Services: Caroline, results pending	Service costs over $10,000 annually		
Percent of housing units that are mobile homes	ACS 2008 Housing	B25024	ACS 2008 Housing[1]	B25024[1]
			ACS 2006-08 Housing[2]	B25024[2]
			2000 Decennial:SF3[3]	H30[3]
Percent of population 25 years or older with no high school diploma	ACS 2008 Social	B15003	ACS 2008 Social[1]	B15003[1]
			ACS 2006-08 Social[2]	B15003[2]
			2000 Decennial:SF3[3]	P37[3]
Number of housing units per square mile	ACS 2008 Housing	B25001	ACS 2008 Housing[1]	B25001[1]
			ACS 2006-08 Housing[2]	B25001[2]
			2000 Decennial:SF1[3]	H1[3]
Number of housing permits per new residential construction per square mile	Census: Business & Industry > Building Permits > 2008	Building Permits by State/County or Place	Census: Business & Industry > Building Permits > 2008	Building Permits by County/Place
Number of manufacturing establishments per square mile	Annual economic survey	2007 County Business Patterns; filter by geography and by Industry (NAICS 31-33)	Annual economic survey	2007 County Business Patterns; filter by geography and by Industry (NAICS 31-33)
Earnings (in $1000) in all industries per square mile	2002 Economic census	Economy-wide key statistics (Payroll is more complete and updated than sales/revenue)		

Table E-89: Variables tested in SoVI Study

Variables	Louisiana State		Louisiana Parishes*	
	General Data Source	Detailed Table Code	General Data Sources	Detailed Table Code
Number of commercial establishments per square mile	Annual economic survey	2007 County Business Patterns; filter by geography and by Industry (NAICS 42, 44-45, 48-49)	Annual economic survey	2007 County Business Patterns; filter by geography and by Industry (NAICS 42, 44-45, 48-49)
Value of all property and farm products sold per square mile	USDA: Agriculture Census	Volume 1, Chapter 1 - Table 2 and 42	Volume 1, Chapter 2 - Table 2 and 8	
Percent of the population participating in the labor force	ACS 2008 Data Profiles: Economic	None, must use Data Profiles	ACS 2008 Economic[1]	None, must use Data Profiles for each county[1]
			ACS 2006-08 Economic[2]	None, must use Data Profiles for each county[2]
			2000 Decennial:SF3[3]	P43[3]
Percent females participating in civilian labor force	ACS 2008 Economic	None, must use Data Profiles	ACS 2008 Economic[1]	None, must use Data Profiles for each county[1]
			ACS 2006-08 Economic[2]	None, must use Data Profiles for each county[2]
			2000 Decennial:SF3[3]	P43[3]
Percent employed in primary extractive industries (farming, fishing, mining, and forestry)	ACS 2008 Economic	None, must use Data Profiles	ACS 2008 Economic[1]	None, must use Data Profiles for each county[1]
			ACS 2006-08 Economic[2]	None, must use Data Profiles for each county[2]
			2000 Decennial:SF1[3]	P49[3]
Percent employed in transportation, communications, and other public utilities	ACS 2008 Economic	None, must use Data Profiles	ACS 2008 Economic[1]	None, must use Data Profiles for each county[1]
			ACS 2006-08 Economic[2]	None, must use Data Profiles for each county[2]
			2000 Decennial:SF1[3]	P49[3]
Percent employed in service occupations	ACS 2008 Economic	None, must use Data Profiles	ACS 2008 Economic[1]	None, must use Data Profiles for each county[1]
			ACS 2006-08 Economic[2]	None, must use Data Profiles for each county[2]
			2000 Decennial:SF1[3]	P50[3]

Table E-89: Variables tested in SoVI Study

Variables	Louisiana State		Louisiana Parishes*	
	General Data Source	Detailed Table Code	General Data Sources	Detailed Table Code
Percent population change 1990/2000	1990/2000 Decennials: SF1	P1 and P001	1990/2000 Decennials: SF1	P1 and P001
Percent urban population	2008 ACS Detailed Tables	B01003 - Show "Urban/Rural" Geographic Identifiers	2008 ACS Detailed only[1]	B01003 - Show "Urban/Rural" geographic identifiers[1]
			2006-08 ACS Detailed only[2]	B01003 - Show "Urban/Rural" geographic identifiers[2]
			2000 Decennial:SF1[3]	P2[3]
Percent females	ACS 2008 Demographic	B01001	ACS 2008 Demographic[1]	B01001[1]
			ACS 2006-08 Demographic[2]	B01001[2]
			2000 Decennial:SF1[3]	P12[3]
Percent female headed households, no spouse present	ACS 2008 Social	B11005	ACS 2008 Social[1]	B11005[1]
			ACS 2006-08 Social	B11005
			2000 Decennial:SF1[3]	P18[3]
Percentage social security recipients out of all households	ACS 2008 Economic	B19055	ACS 2008 Economic[1]	B19055[1]
			ACS 2006-08 Economic[2]	B19055[2]
			2000 Decennial:SF3[3]	P62[3]
Current Population	US Census Population Estimates - States	Annual Estimates of Resident Pop - derived from 2008 ACS	US Census Population Estimates - Counties	Annual Estimates of Resident Pop - derived from 2008 ACS
Land Area in Square Miles	2000 Decennial: SF1	G1 - "Show Geographic Identifiers Option"	2000 Decennial: SF1	G1 - "Show Geographic Identifiers Option"

[1]ACS 2008 Data ONLY includes the following parishes: Ascension, Bossier, Caddo, Calcasieu, East Baton Rouge, Iberia, Jefferson, Lafayette, Lafourche, Livingston, Orleans, Ouachita, Rapides, Saint Landry, Saint Tammany, Tangipahoa, Terrebonne

[2]ACS 2006-08 Data is suitable for the majority of parishes: Acadia, Allen, Assumption, Avoyelles, Beauregard, De Soto, East Feliciana, Evangeline, Franklin, Iberville, Jefferson Davis, Lincoln, Morehouse, Natchitoches, Plaquemines, Pointe Coupee, Richland, Sabine, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Martin, St. Mary, Union, Vermilion, Vernon, Washington, Webster, West Baton Rouge

[3]Only 2000 Decennial Census is available for these rural parishes: Bienville, Caldwell, Cameron, Catahoula, Claiborne, Concordia, East Carroll, Grant, Jackson, La Salle, Madison, Red River, Saint Helena, Tensas, Union, West Carroll, West Feliciana, Winn

Other Exceptions:

For all race variables, the following parishes use ACS 2006-08 Data: Iberia, Lafourche, Livingston.

For all race variables, the following parishes use ACS 2006-08 Collapsed Tables (C03002): De Soto, Morehouse, St. Landry

For Hispanic ethnicity variables, the following parishes use ACS 2006-08 Data: Ascension, Lafayette, Rapides, St. Tammany

For Hispanic ethnicity variables, the following parishes use ACS 2006-08 Collapsed Tables (C03002): Acadia, Allen, Avoyelles, Beauregard, Bossier, De Soto, Iberia, Iberville, Jefferson Davis Lafourche, Lincoln, Livingston, Morehouse, Ouachita, Sabine, St. Bernard, St. Charles, St. John the Baptist, St. Landry, St. Martin, St. Mary, Tangipahoa, Terrebonne, Union, Vermillion, Washington, Webster, West Baton Rouge

For all race and Hispanic ethnicity variables, the following parishes use 2000 Decennial Data: Assumption, East Feliciana, Franklin, Plaquemines, Pointe Coupee, Richland, St. James

For mobile home variables, the following parishes use ACS 2006-08 Collapsed Tables (C25032): Assumption, Franklin, Pointe Coupee, St. James

For labor force service occupation variables, the following parish uses ACS 2006-08 Data: Iberia

For labor force service occupation variables, the following parishes use 2000 Decennial Data: Franklin, Jefferson Davis, Plaquemines, Pointe Coupee, St. Bernard, Union

For all labor force composition variables (female, unemployment), the following parish uses 2000 Decennial Data: St. Bernard

The ultimate ambition was to populate two tables with the complete data sets as they pertain to these variables, for both the State of Louisiana and each of its 64 parishes. Most data derives from various reports and documents provided by the Census Bureau, but a few of the data elements come from other sources. The matrix on data sources listed below provides detailed descriptions on the origins of each element of data, so that this entire process of collecting Social Vulnerability Indicators can be repeated for another state and its respective counties.

Methodology

The goal in building this database was for the data to remain as centralized as possible. The various reports released by the US Census Bureau thus provided optimal data for about 90% of the selections. Only if the US Census Bureau did not provide adequately viable data does Social Vulnerability project employ another source. In these instances, the reason for eschewing Census Bureau data involved one of the following: the geographic region demanded was too small or precise; more current data was available elsewhere; the Census Bureau outsourced the data collection to another federal agency; and/or representatives at the Census Bureau recommended that the research use data from another source.

A few of the variables from the original study by Boruff, Emrich, and Cutter were not pursued. These variables have been grayed out on the table above (Table E-89). Researchers excluded these variables from the study for differing reasons: the "Vote Cast for President" was deemed as insufficiently important for the purposes of the study; the "General Local Government Debt to Revenue Ratio" was available through Moody's Investor Services but was too expensive to procure; and the "Earnings in All Industries Per Square Mile" was too ambiguous of a variable and too difficult to aggregate in such a generalized fashion. With the exception of these three variables, however, the researchers were able to access all other variables from the *Journal for Coastal Research* study.

Sources and Hierarchies for Data Collection

The majority of the data for the Louisiana Social Vulnerability Indicators study comes from the US Census Bureau. However, not all data is available at a uniform capacity for each of the geographies (state and parishes). The aforementioned Guide to Colors at the bottom of the Table E-89 helps identify which parishes refer to specific data sources, but it doesn't explain the rationale behind this approach. The paragraphs below, accompanied by the matrix in Table E-89, effectively explain the hierarchy for data selection that uses the most up-to-date and reliable data source whenever possible.

The basic hierarchy is illustrated as follows:

1st choice: 2008 American Community Survey (1-year study)
2nd choice: 2006-08 American Community Survey (3-year study)
3rd choice: 2000 Decennial Census

Obviously the 2008 ACS is preferred because the data is most recent and accurately reflecting the current demographics in Louisiana parishes. However, this data is only available at the state level and for a few of the most heavily populated parishes in the state, colored in purple on the data set. Thus, when it is unavailable, the researchers referred to the next best option, the 2006-08 American Community Survey (which includes information for the majority of Louisiana parishes, colored in orange on the data set). A few of the parishes are so sparsely populated that they have not been included in American Community Survey at all. In such instances, the researchers had to use 2000 Decennial Census data records.

Within this hierarchy are other, more complicated hierarchies which the researchers were forced to play in isolated instances that proved to be the exception to the norm. These instances are listed in the "Other Exceptions" section at the bottom of the Table E-89, but this process is somewhat confusing so it is worthy of more explanation. The exceptions denote segments of data that did not fall into the aforementioned three-tier Census hierarchy. For example: even though Iberia, Livingston, and Lafourche Parishes normally had available data through the 2008 American Community Survey, variables pertaining to race were not available. Thus, in such cases the data had to be "demoted" to the next tier, which was the 2006-08 American Community Survey. In another example, the parishes of De Soto and Morehouse (normally available through the 2006-08 American Community Survey's Detailed Tables) had to be demoted to the Collapsed Tables on the 2006-08 ACS, which is a more aggregated, simplified version of 2006-08 ACS and is therefore not preferable if the normal detailed tables are available. Meanwhile, the parish of St. Landry, normally available on the 2008 ACS, was not available on the 2006-08 ACS until it was demoted a second time to the 2006-08 ACS Collapsed Tables. Thus, in the case of these rare exceptions when the data does not appear as expected, a new hierarchy is in order:

1st choice: 2008 American Community Survey (1-year study)
2nd choice: 2006-08 American Community Survey (3-year study) Detailed Tables
3rd choice: 2006-08 American Community Survey (3-year study) Collapsed Tables
4th choice: 2000 Decennial Census

The "Exceptions" section dutifully lists any instance where the researchers had to employ an exception to the rules, and a parish had to be demoted because the data was not available in its properly designated location. The areas where the Exception/Demotion practice had to be employed the most frequently were in variables dealing with race/ethnicity or labor force.

Whenever possible, the state and parish SoVI data sets include both the fields (columns) that provide the exact data needed in the variable—usually a percentage—as well as the raw data used to derive that percentage. The data sets typically include the component parts necessary when a piece of data is an aggregate.

Interpretation and Use

These excel files (for both the state of Louisiana and its 64 parishes) should be fully useable in ArcMap when they are translated into DBF-readable format through ACCESS. At that point, they will function as attribute tables. If the cartographer has a suitable shapefile of the State of Louisiana or of the 64 parishes, the attribute table can be linked to the shapefile through a tabular join. From this point, the cartographer can commence an analysis of social vulnerability at both the state level and through comparing the state's different parishes.

Another advantage to the integration of SoVI into the vulnerability rankings of parishes is that, whenever possible, it uses more current data from the US Census Bureau that accounts for the tremendous diaspora from southeast Louisiana after 2005's Hurricane Katrina. Without SoVI, the NISMAT ranking of parish vulnerability derives exclusively from 2000 data, which by this point is quite different from the demographic and socioeconomic conditions

in many parts of the state. The majority of Louisiana's parishes have fallen under the purview of the US Census Bureau's one-year 2008 American Community Survey (ACS), or the three-year 2006-08 ACS, which means that changes in population, racial composition, poverty, and industry since 2000 will be accounted for through the Social Vulnerability Index. Some of the parishes with the most radical changes between 2000 and 2008 are featured in Table E-90 below, for certain key SoVI variables.

Table E-90: Changes between 2000 and 2008 Data, Revealed through SoVI Variables.

	Parish	2008	2000	% Change
Population	Ascension	101789	76627	32.8%
	Bossier	110250	98310	12.1%
	Cameron	7238	9991	-27.6%
	East Baton Rouge	428360	412852	3.8%
	East Carroll	8166	9421	-13.3%
	Jefferson	436181	455466	-4.2%
	Livingston	120256	91814	31.0%
	Madison	11790	13728	-14.1%
	Orleans	311853	484674	-35.7%
	Plaquemines	21276	26757	-20.5%
	St. Bernard	37722	67229	-43.9%
	St. Tammany	228456	191268	19.4%
	Tangipahoa	117011	100588	16.3%
	Tensas	5694	6618	-14.0%
	Vernon	45639	52531	-13.1%
African American Population	Ascension	21942	15539	41.2%
	Bossier	23663	20468	15.6%
	East Baton Rouge	191303	165526	15.6%
	Jefferson	117602	104121	12.9%
	Lafayette	53680	45346	18.4%
	Lafourche	12860	11349	13.3%
	Livingston	6562	3874	69.4%
	Orleans	190516	325947	-41.6%
	St. Bernard	3022	5122	-41.0%
	St. Charles	14051	12130	15.8%
	St. John the Baptist	23370	19268	21.3%
	St. Tammany	26916	18929	42.2%
	Tangipahoa	33034	28519	15.8%
	Terrebonne	21230	18594	14.2%
	Vernon	6798	8962	-24.1%
Caucasian Population	Ascension	77169	59304	30.1%
	Bossier	82246	73403	12.0%
	East Baton Rouge	220063	231886	-5.1%
	Jefferson	280197	318002	-11.9%
	Livingston	107371	86625	23.9%
	Morehouse	15525	17297	-10.2%
	Orleans	106707	135956	-21.5%

	St. Bernard	24197	59356	-59.2%
	St. Tammany	190717	166458	14.6%
	Tangipahoa	80596	70175	14.9%
	Vernon	35969	38717	-7.1%
Hispanic or Latino Population (all Races)	Ascension	3670	1883	94.9%
	Beauregard	875	468	87.0%
	Bossier	5003	3063	63.3%
	Caddo	5809	3750	54.9%
	Calcasieu	3976	2463	61.4%
	East Baton Rouge	12150	7363	65.0%
	Evangeline	1347	368	266.0%
	Jefferson	41006	32418	26.5%
	Lafayette	5105	3320	53.8%
	Lafourche	1987	1284	54.8%
	Lincoln	755	492	53.5%
	Livingston	2084	1017	104.9%
	Morehouse	75	230	-67.4%
	Orleans	14152	14826	-4.5%
	Rapides	2762	1739	58.8%
	St. Bernard	2115	3425	-38.2%
	St. Charles	2034	1346	51.1%
	St. John the Baptist	2023	1230	64.5%
	St. Martin	610	405	50.6%
	St. Tammany	8172	4737	72.5%
	Tangipahoa	2529	1536	64.6%
	Terrebonne	2680	1631	64.3%
	Union	765	461	65.9%
	Washington	545	334	63.2%
	West Baton Rouge	1091	313	248.6%
Percentage of Persons whose Income in the Past 12 Months is Below Poverty Level*	Ascension	8.3%	12.9%	-35.6%
	Beauregard	12.5%	15.6%	-19.7%
	Bossier	14.8%	13.7%	8.1%
	Calcasieu	15.2%	15.4%	-1.4%
	De Soto	17.9%	25.1%	-28.7%
	Evangeline	23.9%	32.2%	-25.8%
	Franklin	31.5%	28.4%	10.9%
	Iberia	17.5%	23.6%	-25.8%
	Iberville	18.2%	23.1%	-21.3%
	Jefferson Davis	16.0%	20.9%	-23.2%
	Morehouse	29.9%	26.8%	11.7%
	Natchitoches	30.4%	26.5%	14.5%
	Orleans	22.6%	27.9%	-19.0%
	Ouachita	23.5%	20.7%	13.4%
	Plaquemines	11.2%	18.0%	-37.7%
	Pointe Coupee	25.6%	23.1%	10.5%
	Rapides	18.0%	20.5%	-12.4%

	Richland	20.1%	27.9%	-27.9%
	St. Bernard	16.4%	13.1%	24.8%
	St. James	16.0%	20.7%	-22.7%
	St. Martin	17.5%	21.5%	-18.6%
	Terrebonne	15.4%	19.1%	-19.4%
	Union	21.4%	18.6%	14.8%
	Vermilion	17.0%	22.1%	-23.1%
	Vernon	17.3%	15.3%	13.5%
	West Baton Rouge	19.6%	17.0%	15.4%

*(NOTE: 2008 Poverty data generally not available for Parishes below 20,000 Inhabitants)

Data Limitations

The greatest criticism of Social Vulnerability Index (SoVI) and particularly, Susan Cutter's employment of it comes from other academic sources. Bankoff (2006) argues that Social Vulnerability is often unreasonably Western-centric and paternalistically condescending to developing countries' cultural practices: "The devastation wrought by the Indian Ocean Tsunami on the coastal regions of Aceh in Northern Sumatra . . . was perceived as compounded by the chronic conflict situation existing in Indonesia prior to the hazard with its already traumatized and victimized population, the disproportionate mortality among women unable to swim (estimated in one report to account for four out of every five victims) that was blamed on Islamic cultural inhibitions on public displays of female nudity, and to the area's poverty that was somehow seen as inherent to that particular culture and place." Bankoff also argues that Social Vulnerability assessments are just as guilty as infrastructure improvements at imposing cultural hegemony on poorer societies: "Low and medium developed countries are continually being made to adopt technologically based solutions to hazards that they can ill-afford and that often prove to be of dubious efficacy." Few disaster recovery initiatives show much concern for lower cost solutions such as land re-zoning and community-based disaster planning or management.

Hewitt (1997) perceives that Social Vulnerability as a perspective is juxtaposed with hazard and active perspectives—all lenses for viewing the field of risk and disaster, within the greater context of some of the most catastrophic disasters of the twentieth century. While this is useful, Social Vulnerability as a perspective often understands people only as passive victims, failing to account for their own subjective interpretations of disastrous events.

Some final considerations as they pertain to SoVI within the hazard mitigation plan are also worthy of mention:

- Many of the variables that deal with density per square mile are extremely small. For example, manufacturing establishments are relatively infrequent in Louisiana (less than 3500 total) so there is far less than one establishment per square mile. The data set has provided an alternative method of analyzing this, by using mean number of square miles to each manufacturing establishment, which simply takes the numerator and denominator and flips them. The same technique applies to commercial establishments per square mile as well.
- The percentage of rural farm population out of the entire state (or out of entire parishes) is also extremely small, making comparisons difficult. It may be advisable to create a different base/denominator to derive quotients that are more easily comparable.

Appendix E.16:

Composite Risk Assessment

Composite risk rankings were based on the vulnerability and loss estimates assessed for the population and general property (e.g., buildings, vehicles) for each hazard.

Hazard Ranking

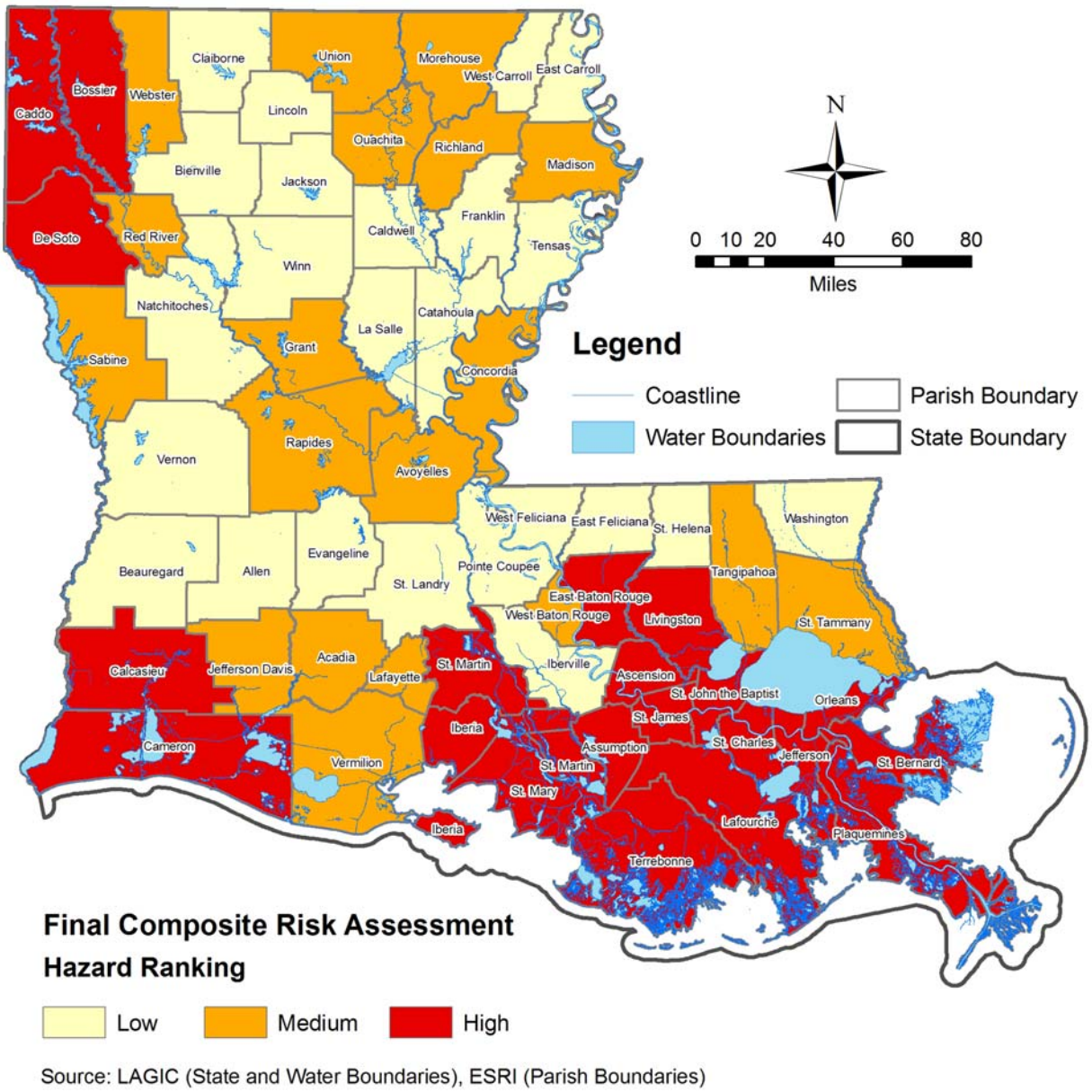
The composite ranking was based on the rankings for each of the eight hazards profiled. For the analysis, each hazard was given an inverse multiplier based upon its ranking in Section 4. That multiplier was then applied to the particular parish's vulnerability ranking on a hazard by hazard basis. The parishes ranked according to composite risk exposure are reported in Table E-91 and Map E-146.

Table E-91: Parishes Ranked by Composite Risk Score

Ranking	Parish	Score	Vulnerability
1	Jefferson	145	High
2	Orleans	142	High
3	Calcasieu	128	High
4	St. Bernard	128	High
5	Terrebonne	126	High
6	Lafourche	124	High
7	St. John the Baptist	124	High
8	St. Charles	123	High
9	St. Tammany	119	High
10	Plaquemines	118	High
11	Iberia	115	High
12	Vermilion	114	High
13	St. Mary	112	High
14	East Baton Rouge	111	High
15	Livingston	108	High
16	Ouachita	106	High
17	Ascension	105	High
18	St. Martin	104	High
19	Tangipahoa	103	High
20	Caddo	102	High
21	Bossier	100	High
22	Rapides	99	Medium
23	Lafayette	96	Medium
24	Acadia	95	Medium
25	Cameron	95	Medium
26	St. Landry	94	Medium
27	Jefferson Davis	91	Medium

Ranking	Parish	Score	Vulnerability
28	Assumption	90	Medium
29	St. James	83	Medium
30	Natchitoches	82	Medium
31	Beauregard	81	Medium
32	Avoyelles	77	Medium
33	Iberville	77	Medium
34	Vernon	77	Medium
35	Catahoula	75	Medium
36	De Soto	75	Medium
37	La Salle	75	Medium
38	Allen	74	Medium
39	West Baton Rouge	74	Medium
40	Webster	73	Medium
41	Bienville	72	Medium
42	Pointe Coupee	72	Medium
43	Franklin	71	Low
44	Morehouse	71	Low
45	Richland	70	Low
46	Concordia	69	Low
47	Claiborne	68	Low
48	East Carroll	67	Low
49	Madison	67	Low
50	Sabine	67	Low
51	Washington	67	Low
52	Caldwell	66	Low
53	Winn	66	Low
54	Grant	65	Low
55	St. Helena	63	Low
56	Evangeline	61	Low
57	Union	60	Low
58	Jackson	59	Low
59	Red River	58	Low
60	East Feliciana	57	Low
61	Lincoln	57	Low
62	West Carroll	57	Low
63	West Feliciana	57	Low
64	Tensas	56	Low

Map E-146 Composite Risk Ranking



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Appendix E.17:

Summary

This sub appendix contains two summary tabulations. The first, Table E-92, is a compilation of the criteria used to develop the hazard rankings for all the hazards.

Table E-92: Hazards Ranking: Criteria

Hazard	Criteria	Low Ranking	Medium Ranking	High Ranking
Flood	Average annual NFIP losses	<$100K	>/=$100K <$1M	>/= $1M
Hurricane Wind	Annual estimated losses	<$400K	>/= $400K <$5M	>/= $5M
Tornado	Annual estimated losses	<$75	>/= $75K < $200K	>/= $200K
Ice Storm	Number of recorded ice storms	No recorded ice storms	1 – 4 recorded ice storms	> 4 recorded ice storms
Storm Surge*	Annual estimated losses	<$250M	>/=$250M <$15 B	>/= $15 B
Subsidence**	Estimated Subsidence Rate	Rates < 0.02 cm yr	Rates between 0.02 and 0.08 cm yr	Rates > 0.08 cm yr
Wildfire	Annual average burnt area	0 (No record)	> 0 Acre < 1,000 Acre	>/= 1,000 Acre (10-year average recorded burnt area)
Dams***	Presence of dams with established hazard rankings	Low hazard dam in parish	Significant hazard dam in parish	High hazard dam in parish
Levees	Exposure of population	< 1,000 potentially affected population	>/= 1,000 potentially affected population	>/= 10,000 potentially affected population
HAZMAT	Exposure of population	< 90 potentially affected population	>/= 90 potentially affected population	>/= 1,000 potentially affected population

*Storm surge ranking includes "N", for parishes that are outside of the Category 3 storm surge inundation area based on SLOSH data.
**Subsidence ranking was based on estimated subsidence rate and population.
*** Dam ranking includes "N", for parishes that do not have any dams located within the parish boundary.

The second summary table is a compilation of all the hazard rankings for all the parishes.

Table E-93 – Hazard Ranking Compilation for Louisiana Parishes

Parish	Flood	Hurricane	Tornado	Ice Storm	Surge	Wildfire	Dams	Levees	Subsidence	Hazmat
Acadia	L	H	H	L	L	L	L	L	L	H
Allen	M	M	L	M	N	H	M	L	L	M
Ascension	M	H	L	L	M	L	L	M	L	H
Assumption	M	H	L	L	M	L	L	L	M	M
Avoyelles	M	M	L	M	N	M	L	M	L	M
Beauregard	M	M	M	M	N	H	M	L	L	M
Bienville	L	L	H	H	N	M	M	L	L	M
Bossier	M	M	H	H	N	M	H	M	L	H
Caddo	M	M	H	H	N	H	H	M	L	H
Calcasieu	H	H	H	M	M	H	L	L	L	H
Caldwell	M	L	M	M	N	M	M	L	L	L
Cameron	H	H	M	L	L	L	N	L	L	L
Catahoula	M	M	M	M	N	M	M	L	L	L
Claiborne	L	L	H	H	N	M	M	L	L	L
Concordia	M	M	L	M	N	M	H	L	L	L
DeSoto	L	L	H	H	N	H	H	L	L	M
East Baton Rouge	H	H	H	L	N	M	H	M	L	H
East Carroll	L	L	H	M	N	M	N	L	L	M
East Feliciana	L	M	L	L	N	M	M	L	L	L
Evangeline	L	M	M	L	N	M	M	L	L	M
Franklin	L	M	M	M	N	M	M	L	L	M
Grant	M	L	M	M	N	M	L	L	L	L
Iberia	H	H	M	L	M	L	L	L	M	M
Iberville	L	M	L	L	L	L	N	M	L	H
Jackson	L	L	L	H	N	M	H	L	L	M
Jefferson	H	H	H	L	H	L	N	H	H	H
Jefferson Davis	L	H	H	M	L	M	N	L	L	L
La Salle	M	L	H	M	N	M	N	L	L	M
Lafayette	M	H	H	L	N	L	L	L	L	H
Lafourche	H	H	M	L	M	L	L	L	H	H
Lincoln	L	L	L	H	N	M	L	L	L	M
Livingston	H	H	M	L	M	H	L	L	L	H
Madison	L	L	H	M	N	M	N	L	L	M
Morehouse	L	M	M	M	N	M	M	L	L	M
Natchitoches	M	M	M	M	N	H	H	L	L	M
Orleans	H	H	M	L	H	L	M	H	M	H
Ouachita	H	M	M	H	N	M	M	H	L	H
Plaquemines	H	H	L	L	L	L	N	H	H	H

Parish	Flood	Hurricane	Tornado	Ice Storm	Surge	Wildfire	Dams	Levees	Subsidence	Hazmat
Pointe Coupee	M	M	L	L	N	L	L	M	L	M
Rapides	M	M	H	M	N	H	H	M	L	H
Red River	L	L	L	H	N	M	M	L	L	M
Richland	L	M	M	M	N	M	L	L	L	M
Sabine	L	M	L	M	N	H	H	L	L	M
St. Bernard	H	H	L	L	M	L	N	H	H	H
St. Charles	H	H	L	L	M	L	N	H	M	H
St. Helena	L	L	H	L	N	H	L	L	L	L
St. James	L	H	L	L	M	L	L	M	L	M
St. John the Baptist	M	H	H	L	M	L	N	H	L	H
St. Landry	L	H	H	L	N	M	M	M	L	H
St. Martin	M	H	M	L	L	L	M	M	M	M
St. Mary	M	H	L	L	M	L	L	H	M	M
St. Tammany	H	H	M	L	M	H	M	L	L	H
Tangipahoa	M	H	H	L	L	H	L	L	L	M
Tensas	L	L	M	M	N	M	N	L	L	L
Terrebonne	H	H	H	L	M	L	N	L	H	M
Union	L	L	M	H	N	M	L	L	L	L
Vermilion	H	H	M	L	M	L	N	L	M	M
Vernon	L	M	M	M	N	H	M	L	L	H
Washington	L	M	L	L	N	H	M	L	L	H
Webster	L	M	M	H	N	M	L	L	L	M
West Baton Rouge	L	M	M	L	N	L	N	M	L	H
West Carroll	L	L	M	M	N	M	L	L	L	L
West Feliciana	L	M	L	L	N	M	M	L	L	L
Winn	L	L	H	M	N	H	L	L	L	L

Appendix E.18

Metadata Used for Jurisdiction Assessments

Base Maps *E-359*

Boundary:

1. State of Louisiana (ESRI)
2. Parish (ESRI)
3. Census Tract (ESRI
4. Census Block (ESRI)

Water bodies (LAGIC)

Coastline [DFIRMs (Louisiana DOTD), HAZUS (HAZUS-MH MR4 Models)]

Building Stock *E-391*

Inventory (HAZUS):

1. Building exposure by occupancy
2. Content exposure by occupancy

Population *E-403*

Inventory (ESRI):

Demographics

Facilities and Infrastructures *E-408*

Essential Facilities (HSIP):

1. Medical Care Facilities
2. Schools
3. Police Stations
4. Fire Stations
5. Emergency Operations Centers (EOC)

Transportation Systems (HAZUS):

1. Highway Segments
2. Railway Track Segments
3. Airports
4. Port Facilities

Utility Systems (HSIP)

1. Water Treatment Plants/Potable Water Facilities
2. Waste Water Treatment Plants
3. Oil Facilities
4. Natural Gas Facilities

High Potential Loss Facilities (HAZUS, USACE and HSIP):

1. Hazardous Material Sites (HSIP)
2. Dams (USACE)

Hazards *E-470*

Hurricane

1. Essential Facilities (HAZUS) – Building Specification
2. Wind Speed for 100/500 year return period (HAZUS)

Flood

1. DFIRMs (Louisiana DOTD)
2. HAZUS (HAZUS-MH MR4 Models)

Wildfire

1. Wildland Urban Interface and Louisiana Department of Agriculture and Forestry

Additional Data Used In the Plan Update E-485

1. Advisory Base Flood Elevation Data (ABFE)
2. Severe Weather Event Data - NCDC

Base Maps

Boundary

1. State of Louisiana

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: (ESRI)

Publication_Date: 2006

Title: U.S. States (layer)

1.2 Description:

Abstract:

U.S. States (layer) is a symbolized and labeled display presentation of the United States states data set. The geographic and attribute data of United States states are symbolized and labeled to create the layer. All features are uniquely symbolized based on the STATE_NAME attribute and labeled based on the STATE_NAME attribute. </abstract>
<supplinf>

For more information about the data set, see its metadata.

Purpose:

U.S. States provides detailed boundaries that are consistent with the block group, tract, and county data sets and are effective at regional and state levels.

Supplemental_Information:

Largest scale when displaying the data: 1:100,000

1.3 Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 2006

Currentness_Reference: publication date: 200601, 20050519; ground condition: 2000, 1997</current>

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: Anually

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -178.227822

East_Bounding_Coordinate: -65.244128

North_Bounding_Coordinate: 71.390482

South_Bounding_Coordinate: 17.881242

1.6 Keywords:

Theme:

Theme_Keyword: layer

Theme_Keyword: polygon

Theme_Keyword: area

Theme_Keyword: detail

Theme_Keyword: demographics

Theme_Keyword: population

Theme_Keyword: households

Theme_Keyword: farm information

Theme_Keyword: boundaries

Theme_Keyword: society

Place:

Place_Keyword: United States

Place_Keyword: States

Place_Keyword: Louisiana

1.7 Access_Constraints: License Only

1.8 Use_Constraints:

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1.9 Point_of_Contact

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: ESRI
Contact_Person: Data Team
Contact_Position: Data Team
Contact_Address:
Address_Type: mailing address
Address: 380 New York Street
City: Redlands
State_or_Province: CA
Postal_Code: 92373-8100
Contact_Voice_Telephone: 909-793-2853
Contact_Facsimile_Telephone: 909-793-5953
Contact_Electronic_Mail_Address: <URL:mailto: info@esri.com>

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report:
Dataset has polygon topology with no dangles and no unlabeled polygons.
2.3 Completeness_Report: Yep, the whole state is there.
2.4 Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Type_of_Source_Media: computer file
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 2006
Source_Currentness_Reference: date compilation of parish boundaries dataset was completed
Source_Citation_Abbreviation: PARISHES
Source_Contribution: state boundary
Process_Step:
Process_Description:
Process_Date: 2006
Process_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: ESRI
Contact_Person: Data Team
Contact_Address:
Address_Type: mailing address
Address:
City: Redlands
State_or_Province: CA
Postal_Code: 92373-8100
Contact_Voice_Telephone: 909-793-2853
Contact_Electronic_Mail_Address: info@esri.com

3. Spatial_Data_Organization_Information

4. Spatial_Reference_Information

5. Entity_and_Attribute_Information:

5.1Detailed_Description

Entity_Type:
Entity_Type_Label: la-boundary.dbf
Entity_Type_Definition:
A type of governmental unit that is the primary legal subdivision of the United States
Entity_Type_Definition: Department of Commerce, Census Bureau.

6. Distribution Information

6.1 Distributor
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: ESRI
Contact_Person: Data Team
Contact_Position: Data Team
Contact_Address:
Address_Type: mailing address
Address: 380 New York Street
City: Redlands
State_or_Province: CA
Postal_Code: 92373-8100
Contact_Voice_Telephone: 909-793-2853
Contact_Facsimile_Telephone: 909-793-5953
Contact_Electronic_Mail_Address: <URL:mailto: info@esri.com >
6.2 Resource Description: la-boundary
6.3 Distribution Liability

7. Metadata_Reference_Information

7.1 Metadata_Date: 20061001
7.2 Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact: ESRI
Contact_Person: Data Team
Contact_Position: Data Team
Contact_Address:
Address_Type: mailing and physical address
Address: 380 New York Street
City: Redlands
State_or_Province: CA
Postal_Code: 92373-8100
Contact_Voice_Telephone: 909-793-2853
Contact_Facsimile_Telephone: 909-793-5953
Contact_Electronic_Mail_Address: <URL:mailto: info@esri.com >
7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata
7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

2. Parish

1. Identification_Information:

1.1 Citation:
Citation Information:
Originator: Louisiana Oil Spill Coordinator's Office (LOSCO)
Publication_Date: 1999
Title: Parish Boundaries of Louisiana from LDOTD source data, Geographic NAD83, LOSCO (1999) [parishes]

1.2 Description:

Abstract:

This dataset depicts the polygon boundaries of the 64 parishes comprising the state of Louisiana. Parish boundaries extend 3 miles out into the Gulf of Mexico from the coastline. This dataset was derived from many data sources and conveys the best currently (1999) available representation of the parishes of Louisiana and as a consequence, the best currently available representation of the territorial bounds of the state.

The dataset has as attributes, many demographic variables from 1990 Census data.

Purpose:

This data set provides a representation of parish polygons for the purposes of portraying nominal and statistical attributes for each parish. Individual (or groups of) parish polygons may be used to subset other geospatial data.

Supplemental_Information:

These metadata describe the Arc/Info coverage of name 'parishes' and the shapefile of the same name derived from it. These metadata also describe the dataset 'parishes,' which is how this dataset was named on the 'Louisiana GIS CD: A Digital Map of the State.'

The metadata for this data set are encapsulated into several documents and graphics files. The metadata are not complete if you did not receive the following files along in the data set:

parishes.mtd - this metadata in mp (metadata parser) compatible ASCII text form

parishes.html - this metadata in HTML form

parishes_faq.html - this metadata presented as Questions and Answers

parishes.sgml - this metadata in SGML form

parishes1.gif - thumbnail graphic of data set

1.3 Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 199912

Currentness_Reference: Date compilation of source data was completed

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: none planned

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -94.0432

East_Bounding_Coordinate: -88.7583

North_Bounding_Coordinate: 33.0196

South_Bounding_Coordinate: 28.8542

1.6 Keywords:

Theme:

Theme_Keyword_Thesaurus: none

Theme_Keyword: parish

Theme_Keyword: administrative boundary

Theme_Keyword: governmental units

Place:

Place_Keyword_Thesaurus: none

Place_Keyword: Louisiana

1.7 Access_Constraints: None

1.8 Use_Constraints:

These unaltered data may not be redistributed without all of the elements of the metadata listed in the Supplemental_Information section of this metadata document. It is recommended that third parties wishing to use these data obtain them from the Distributor listed in this metadata document.

If these data are altered or incorporated into another dataset, they are not to be redistributed without also: altering the name of the dataset, including a Content Standards for Digital Geospatial Metadata (FGDC-STD-001-1998) compliant metadata file that describes the dataset and reflects the alteration steps that makes the new dataset different from this one, and citing this dataset in the metadata as a source for the altered dataset using the source citation specified below.

If these digital data are used in the production of a report or in the compilation of a standalone printed map, then this dataset is to be cited in the report or on the map using the source citation specified below.

The following source citation is to be used when citing this dataset: LOSCO Environmental Baseline Inventory Dataset 'Parish Boundaries of Louisiana from LDOTD source data, Geographic NAD83, LOSCO (1998) [parishes]'

Users hereby agree to abide by the use and reproduction conditions specified above. By using the data described in these metadata, the user acknowledges that the terms and conditions of use have been read and that the user is bound by these criteria.

1.9 Point_of_Contact

Contact_Information:

Contact_Person_Primary:

Contact_Organization: Louisiana State University Department of Geography & Anthropology

Contact_Person: DeWitt Braud

Contact_Address:

Address_Type: physical address

Address: Louisiana State University

Address: Department of Geography & Anthropology

City: Baton Rouge

State_or_Province: LA

Postal_Code: 70803

Contact_Voice_Telephone: (504) 388-6177

Contact_Facsimile_Telephone: (504) 388-4420

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report:

Anomalies will be noted between these data compiled from LDOTD realizations of legal descriptions of boundaries and boundaries that are depicted in other reference data sets (e.g. USGS DRGs). The depiction of boundaries in this data set has been heavily researched and is believed to be a better representation of the actual boundary than USGS sources.

Two parishes in Louisiana each consist of two separated areas. These are St. Martin and West Feliciana. Because the data set is a 'region' dataset, both areas of a parish are selected as one object, and the attributes for that parish represents the sum for the two areas.

2.3 Completeness_Report: All parishes present, all attributes populated.

2.4 Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The positional accuracy of these boundaries is estimated to be +/- 40 feet.

2.5 Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Louisiana Department of Transportation and Development (LDOTD)

Title: Parish Boundaries

Type_of_Source_Media: computer file

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1999

Source_Currentness_Reference: approximate date source data were received from LDOTD

Source_Citation_Abbreviation: LDOTDPARISH

Source_Contribution: interior parish boundaries and remaining state boundary not compiled from other sources

Source_Information:

Source_Citation:

Citation_Information:
Originator: Louisiana Office of State Lands (LOSL)
Title: Parish boundary descriptions
Type_of_Source_Media: legal descriptions
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1999
Source_Currentness_Reference: approximate date source data were received from LOSL
Source_Citation_Abbreviation: LOSLLAKES
Source_Contribution: Descriptions of interior parish boundaries over lakes, bays, and larger water bodies
Source_Information:
Source_Citation:
Citation_Information:
Originator: LOSL
Title: Texas/Louisiana boundary along Sabine River
Type_of_Source_Media: computer file
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1999
Source_Currentness_Reference: approximate date the source data were received from LOSL
Source_Citation_Abbreviation: LOSLSABINE
Source_Contribution: Representation of Texas/Louisiana border along the Sabine River that had been compiled by LOSL from 1:62500 map sheets upon which a boundary was drawn in a recent Supreme Court decree
Source_Information:
Source_Citation:
Citation_Information:
Originator: LOSL
Title: Mississippi/Louisiana boundary along the Pearl River
Type_of_Source_Media: computer file
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1999
Source_Currentness_Reference: approximate date the source data were received from LOSL
Source_Citation_Abbreviation: LOSLPEARL
Source_Contribution: Representation of the Louisiana/Mississippi boundary along the Pearl River that was digitized from legal description of mutually agreed coordinates.
Source_Information:
Source_Citation:
Citation_Information:
Originator: Minerals Management Service (MMS)
Title: State Federal Offshore boundary
Type_of_Source_Media: computer file
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1999
Source_Currentness_Reference: approximate date the source data were received from MMS
Source_Citation_Abbreviation: STATE_FEDERAL

Source_Contribution: representation of the Louisiana offshore boundary

Source_Information:

Source_Citation:

Citation_Information:

Originator: Environmental Systems Research Institute (ESRI)

Publication_Date: 1998

Title: U.S. Counties

Larger_Work_Citation:

Citation_Information:

Originator: ESRI

Publication_Date: 1998

Title: ESRI Data & Maps 1998

Other_Citation_Details: This is a four CD-ROM package of data that is provided when a copy of ArcView is purchased

Type_of_Source_Media: computer file

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1998

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: MAPS&DATA

Source_Contribution: attributes for parishes

Process_Step:

Process_Description:

LDOTDPARISH data (64 files) were projected from polyconic to UTM zone 15, NAD27 coordinates to be compatible with reference data (DRGs). All other digital vector data (LOSLSABINE, LOSLPEARL, STATE_FEDERAL) were projected to UTM zone 15, NAD27 coordinates using Intergraph MGE software. The digital vector data in the common coordinate system were spliced together. The legal description data (LOSLLAKES) was converted to a digital representation and spliced into the other composite data. Line cleaning and processing was performed on the composite.

The resultant .dgn file was converted to an Arc/Info coverage, topology was built, and the dataset projected to geographic coordinates NAD83. The Arc/Info dataset was converted to a shapefile and the attributes of each parish polygon populated using the MAPS&DATA data.

Process_Date: 1999

Process_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: LSU Department of Geography and Anthropology
Contact_Person: Hampton Peele

Contact_Address:

Address_Type: mailing address
Address: Louisiana State University
City: Baton Rouge
State_or_Province: LA
Postal_Code: 70803

Contact_Voice_Telephone:

Contact_Electronic_Mail_Address: hampton@lsu.edu

3. Spatial_Data_Organization_Information

3.1 Direct_Spatial_Reference_Method: vector

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Latitude Resolution: 0.00001

Longitude Resolution: 0.00001
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983
Ellipsoid_Name: Geodectic Reference System 80
Denominator_of_Flattening_Ratio: 298.257

5. Entity_and_Attribute_Information:

5.1 Detailed_Description

Entity_Type:
Entity_Type_Label: parishes.dbf
Entity_Type_Definition: attribute table for parish polygons
Entity_Type_Definition_Source: 3001, Inc.

Attribute:
Attribute_Label: parish
Attribute_Definition: name of Louisiana parish
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: county name
Codeset_Source:
FIPS PUB 6-4, Counties and Equivalent Entities of the United States, Its Possessions, and Associated Areas

Attribute:
Attribute_Label: area_sqm
Attribute_Definition: area of parish in square meters
Attribute_Definition_Source: LSU Department of Geography and Anthropology
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 524858999.409
Range_Domain_Maximum: 6647606371.787
Attribute_Units_of_Measure: square meters

Attribute:
Attribute_Label: perim_m
Attribute_Definition: perimeter of parish polygon in meters
Attribute_Definition_Source: LSU Department of Geography and Anthropology
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 125269.592
Range_Domain_Maximum: 460239.623
Attribute_Units_of_Measure: meters

Attribute:
Attribute_Label: area_ac
Attribute_Definition: area of parish in acres
Attribute_Definition_Source: LSU Department of Geography and Anthropology
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 129694.964
Range_Domain_Maximum: 1642652.738
Attribute_Units_of_Measure: acres

Attribute:
Attribute_Label: FIPS

Attribute_Definition: The concatenation of the FIPS numeric code for Louisiana, 22, and the FIPS numeric code for the parish.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: state numeric code / county numeric code
Codeset_Source:
FIPS PUB 6-4, Counties and Equivalent Entities of the United States, Its Possessions, and Associated Areas

Attribute:
Attribute_Label: PRSH_FIPS
Attribute_Definition: the parish FIPS code
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name: county numeric code
Codeset_Source:
FIPS PUB 6-4, Counties and Equivalent Entities of the United States, Its Possessions, and Associated Areas

Attribute:
Attribute_Label: POP1990
Attribute_Definition: the population of the county in 1990 based on the US Census
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 7103
Range_Domain_Maximum: 496938

Attribute:
Attribute_Label: POP90_SQMI
Attribute_Definition: the population of the parish in 1990 per square mile
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 6
Range_Domain_Maximum: 2326

Attribute:
Attribute_Label: AREA
Attribute_Definition:
the area of the county in square miles based on an Albers Equal Area Projection
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 198.3781
Range_Domain_Maximum: 1605.4614

Attribute:
Attribute_Label: POP_1998
Attribute_Definition: population estimate for 1998 from the US Census
Attribute_Definition_Source: Louisiana State University
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 6631
Range_Domain_Maximum: 465538

Attribute:
Attribute_Label: HOUSEHOLDS
Attribute_Definition: total number of households
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 2515
Range_Domain_Maximum: 188235
Attribute:
Attribute_Label: MALES
Attribute_Definition: number of males
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 3242
Range_Domain_Maximum: 230883
Attribute:
Attribute_Label: FEMALES
Attribute_Definition: number of females
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 3861
Range_Domain_Maximum: 266055
Attribute:
Attribute_Label: WHITE
Attribute_Definition: number of people identified as white
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 3292
Range_Domain_Maximum: 351170
Attribute:
Attribute_Label: BLACK
Attribute_Definition: number of people identified as black
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 503
Range_Domain_Maximum: 307728
Attribute:
Attribute_Label: AMERI_ES
Attribute_Definition:
number of people identified as American Indian, Eskimo, or Aleut
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 4
Range_Domain_Maximum: 4905
Attribute:
Attribute_Label: ASIAN_PI

Attribute_Definition: number of people identified as Asian or Pacific Islander
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 2
Range_Domain_Maximum: 9986

Attribute:
Attribute_Label: OTHER
Attribute_Definition:
number of people identified as belonging to a race other than white, black, American Indian, or Asian
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 8
Range_Domain_Maximum: 6355

Attribute:
Attribute_Label: HISPANIC
Attribute_Definition:
number of people of all races identified as being of Hispanic origin
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 40
Range_Domain_Maximum: 26611

Attribute:
Attribute_Label: AGE_UNDER5
Attribute_Definition: number of people 0 to 4 years of age
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 571
Range_Domain_Maximum: 38574

Attribute:
Attribute_Label: AGE_5_17
Attribute_Definition: number of people 5 to 17 years of age
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 1733
Range_Domain_Maximum: 97888

Attribute:
Attribute_Label: AGE_18_29
Attribute_Definition: number of people 18 to 29 years of age
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 1000
Range_Domain_Maximum: 98481

Attribute:
Attribute_Label: AGE_30_49
Attribute_Definition: number of people 30 to 49 years of age

Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 1729
Range_Domain_Maximum: 138571

Attribute:
Attribute_Label: AGE_50_64
Attribute_Definition: number of people 50 to 64 years of age
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 873
Range_Domain_Maximum: 59461

Attribute:
Attribute_Label: AGE_65_UP
Attribute_Definition: number of people 65 years of age and over
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 887
Range_Domain_Maximum: 64658

Attribute:
Attribute_Label: NEVERMARRY
Attribute_Definition: number of people who have never been married
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 1352
Range_Domain_Maximum: 145032

Attribute:
Attribute_Label: MARRIED
Attribute_Definition: number of people who are married
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 2532
Range_Domain_Maximum: 187667

Attribute:
Attribute_Label: SEPARATED
Attribute_Definition: number of people who are separated from their spouse
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 156
Range_Domain_Maximum: 19880

Attribute:
Attribute_Label: WIDOWED
Attribute_Definition: number of people whose spouse died
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:

Range_Domain_Minimum: 397
Range_Domain_Maximum: 37497

Attribute:
Attribute_Label: DIVORCED
Attribute_Definition: number of people who are divorced
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 312
Range_Domain_Maximum: 37944

Attribute:
Attribute_Label: HSEHLD_1_M
Attribute_Definition: number of one-person male households
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 227
Range_Domain_Maximum: 26520

Attribute:
Attribute_Label: HSEHLD_1_F
Attribute_Definition: Number of one-person female households
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 279
Range_Domain_Maximum: 34153

Attribute:
Attribute_Label: MARHH_CHD
Attribute_Definition: Number of households with a married couple and related children
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 595
Range_Domain_Maximum: 46462

Attribute:
Attribute_Label: MARHH_NO_C
Attribute_Definition:
Number of households with a married couple and no related children
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 603
Range_Domain_Maximum: 43269

Attribute:
Attribute_Label: MHH_CHILD
Attribute_Definition: Number of households with a man and children but no wife
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 63
Range_Domain_Maximum: 3750

Attribute:
Attribute_Label: FHH_CHILD
Attribute_Definition: Number of households with a woman and children but no husband
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 161
Range_Domain_Maximum: 32339

Attribute:
Attribute_Label: HSE_UNITS
Attribute_Definition: Total number of housing units
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 3334
Range_Domain_Maximum: 225573

Attribute:
Attribute_Label: VACANT
Attribute_Definition: Number of housing units that are vacant
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 434
Range_Domain_Maximum: 37338

Attribute:
Attribute_Label: OWNER_OCC
Attribute_Definition: Number of housing units that are occupied by the owner
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 1802
Range_Domain_Maximum: 104611

Attribute:
Attribute_Label: RENTER_OCC
Attribute_Definition: Number of housing units that are occupied by renters
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 470
Range_Domain_Maximum: 105956

Attribute:
Attribute_Label: MEDIAN_VAL
Attribute_Definition: Median value of all housing units
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 30100
Range_Domain_Maximum: 74900

Attribute:
Attribute_Label: MEDIANRENT
Attribute_Definition: Median rent charged for all housing units that are rented

Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 99
Range_Domain_Maximum: 334

Attribute:
Attribute_Label: UNITS_1DET
Attribute_Definition: Number of housing units with one detached unit in the structure
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 2005
Range_Domain_Maximum: 114515

Attribute:
Attribute_Label: UNITS_1ATT
Attribute_Definition: Number of housing units with one attached unit in the structure
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 18
Range_Domain_Maximum: 43248

Attribute:
Attribute_Label: UNITS2
Attribute_Definition: Number of housing units with two units in the structure
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 2
Range_Domain_Maximum: 27844

Attribute:
Attribute_Label: UNITS3_9
Attribute_Definition:
Number of housing units with three to nine units in the structure
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 13
Range_Domain_Maximum: 36877

Attribute:
Attribute_Label: UNITS10_49
Attribute_Definition: Number of housing units with 10 to 49 units in the structure
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 0
Range_Domain_Maximum: 19194

Attribute:
Attribute_Label: UNITS50_UP
Attribute_Definition: Number of housing units with 50 or more units in the structure
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:

Range_Domain:
Range_Domain_Minimum: 0
Range_Domain_Maximum: 11908
Attribute:
Attribute_Label: MOBILEHOME
Attribute_Definition: Number of mobile homes or trailers
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 371
Range_Domain_Maximum: 9824
Attribute:
Attribute_Label: NO_FARMS87
Attribute_Definition: Total number of farms
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 7
Range_Domain_Maximum: 1189
Attribute:
Attribute_Label: AVG_SIZE87
Attribute_Definition: Average farm size in acres
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 2
Range_Domain_Maximum: 982
Attribute:
Attribute_Label: CROP_ACR87
Attribute_Definition: The total area of cropland in acres
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 5324
Range_Domain_Maximum: 256688
Enumerated_Domain:
Enumerated_Domain_Value: -99
Enumerated_Domain_Value_Definition: no information available
Enumerated_Domain_Value_Definition_Source: Louisiana State University
Attribute:
Attribute_Label: AVG_SALE87
Attribute_Definition:
Average sales of agricultural products per farm, in thousands of dollars
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 6757
Range_Domain_Maximum: 277441
Enumerated_Domain:
Enumerated_Domain_Value: -99
Enumerated_Domain_Value_Definition: no information available
Enumerated_Domain_Value_Definition_Source: Louisiana State University

6. Distribution Information

6.1 Distributor

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Louisiana Oil Spill Coordinator's Office

Contact_Person: David Gisclair

Contact_Position: Technical Assistance Program (TAP) Director

Contact_Address:

Address_Type: mailing address

Address: Louisiana Oil Spill Coordinator's Office

Address: Office of the Governor

Address: P.O. Box 94095

City: Baton Rouge

State_or_Province: LA

Postal_Code: 70804

Contact_Voice_Telephone: (225)925-6606

Contact_Facsimile_Telephone: (225) 219-5802

Contact_Electronic_Mail_Address: <URL:mailto:tapgis@linknet.idt.net>

6.2 Resource Description: la-boundary

6.3 Distribution Liability

The data herein, including but not limited to geographic data, tabular data, analytical data, electronic data structures or files, are provided "as is" without warranty of any kind, either expressed or implied, or statutory, including, but not limited to, the implied warranties or merchantability and fitness for a particular purpose. The entire risk as to the quality and performance of the data is assumed by the user. No guarantee of accuracy is granted, nor is any responsibility for reliance thereon assumed. In no event shall the Louisiana Oil Spill Coordinator's Office (LOSCO) be liable for direct, indirect, incidental, consequential or special damages of any kind, including, but not limited to, loss of anticipated profits or benefits arising out of use of or reliance on the data. The LOSCO does not accept liability for any damages or misrepresentation caused by inaccuracies in the data or as a result of changes to the data caused by system transfers or other transformations or conversions, nor is there responsibility assumed to maintain the data in any manner or form.

These data have been developed from the best available sources. Although efforts have been made to ensure that the data are accurate and reliable, errors and variable conditions originating from physical sources used to develop the data may be reflected in the data supplied. Users must be aware of these conditions and bear responsibility for the appropriate use of the information with respect to possible errors, scale, resolution, rectification, positional accuracy, development methodology, time period, environmental and climatic conditions and other circumstances specific to these data. The user is responsible for understanding the accuracy limitations of the data provided herein. The burden for determining fitness for use lies entirely with the user. The user should refer to the accompanying metadata notes for a description of the data and data development procedures.

Although these data have been processed successfully on computers at the LOSCO, no guarantee, expressed or implied, is made by LOSCO regarding the use of these data on any other system, nor does the act of distribution constitute or imply any such warranty. Distribution of these data is intended for information purposes and should not be considered authoritative for navigational, engineering, legal and other site-specific uses.

7. Metadata_Reference_Information

7.1 Metadata_Date: 19991210

7.2 Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: 3001, Inc.

Contact_Person: Hugh Phillips

Contact_Position: GIS Analyst

Contact_Address:

Address_Type: mailing and physical address

Address: 3655 SW 2nd Ave., Suite 3C

City: Gainesville

State_or_Province: FL

Postal_Code: 32607

Contact_Voice_Telephone: (352) 379-3001
Contact_Facsimile_Telephone: (352) 377-4234
Contact_Electronic_Mail_Address: <URL:mailto:hphillips@gnv.3001data.com>

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

3. Census Tract

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: PBS&J, Atlanta GA, developed this database under contract to the National Institute of Building Sciences.

Publication_Date: 20030000

Title: HAZUS-MH: Boundary: CensusTract

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

This data set portrays the 2000 U.S. Census tracts polygons of the United States in the fifty states, the District of Columbia, and the territories. PBS&J developed this data set from the 2000 version of TIGER/Line files.

The contact information for the Census Bureau is: U.S. Department of Commerce, U.S. Census Bureau, Geography Division. 8903 Presidential Parkway, Room 303 WP I, Upper Marlboro, Maryland, 20772. Telephone: (301) 457-1128. E-Mail Address: tiger@census.gov. The U.S. Census Bureau website address is http://www.census.gov/geo/www/tiger/index.html.

Purpose:

This data set is intended for geographic analysis and display using HAZUS. HAZUS is designed to produce loss estimates for use by state, regional and local governments in planning for earthquake, flood, and wind loss mitigation, emergency preparedness and response and recovery.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: Unknown

Ending_Date: 20000000

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: Because the Census 2000 TIGER/Line(r) was prepared by the U.S. Census Bureau for the decennial census of 2000, no changes or updates will be made in the future

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -179.147 degrees

East_Bounding_Coordinate: -179.778 degrees

North_Bounding_Coordinate: 71.389 degrees

South_Bounding_Coordinate: 14.605 degrees

1.6 Keywords:

Theme:

Theme_Keyword: HAZUS

Theme_Keyword: HAZUS-MH

Theme_Keyword: Inventory

Theme_Keyword: Tract

Theme_Keyword: Boundary

Theme_Keyword: Census Tract

Place:

Place_Keyword: USA

Place_Keyword: Alabama

Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin

Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints: None

1.8 Use_Constraints: None

1.9 Point_of_Contact

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report: Unknown

2.3 Completeness_Report: Unknown

2.4 Positional_Accuracy: The digital data source from were those data sets were extracted was the 2000 Version of Census TIGER/LineT files. Because the U.S. Census Bureau's mission is "to count and profile the Nation's people and institutions" it dose not require high levels of positional accuracy for its geographic products such as TIGER/LineT files . Showing relative position of elements is the major in its files and maps.

Census TIGER/Line (r) files is the outcome of a variety of source (USGS topographic maps, GBF/DIME-files, aerial photography, etc.). The U.S. Census Bureau express that they cannot specify the accuracy of feature updates added by its field staff or of features derived from the GBF/DIME-Files or other map or digital sources. Only the positional accuracy of USGS sources that accomplish with the United States National Map Accuracy Standards can be approximate. The positional accuracy varies with the scale of the source map used (such as 1:100,000, 1:24,000, 1: 63,000, 1:20,000 and 1:30,000)

2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Polygons

3.3 Point_and_Vector_Object_Information: 66266

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

Census Tract database file and the individual state and territory files contain 6 fields.

Entity_and_Attribute_Detail_Citation: Tract	Census Tract
Entity_and_Attribute_Detail_Citation: CountyFips	County Fips
Entity_and_Attribute_Detail_Citation: BldgSchemesId	Building Scheme Id
Entity_and_Attribute_Detail_Citation: Tract6	Census Tract 6 digits
Entity_and_Attribute_Detail_Citation: TractArea	Area (km^2)
Entity_and_Attribute_Detail_Citation: NumAggrBocks	Number of Census Blocks
Entity_and_Attribute_Detail_Citation: CenLat	Latitude
Entity_and_Attribute_Detail_Citation: CenLongit	Longitude
Entity_and_Attribute_Detail_Citation: Length	Aggregate length of street segments

6. Distribution Information

6.1 Distributor

Contact Organization Primary: FEMA Distribution Center

Contact Address:

Address_Type: mailing address

Address: P.O. Box 2012

City: Jessup

State or Province: MD

Postal Code: 20794-2012

Contact Voice Telephone: 800-480-2530

Contact FAX Number: 301-362-5335

6.2 Resource Description

N/A

6.3 Distribution Liability

No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will replace if the product is determined unusable, or when the physical medium is delivered in damaged condition.

6.4 Standard Order Process

The HAZUS order form can be downloaded from the FEMA website (http://www.fema.gov/hazus/hazus6c.htm). Completed order forms should be mailed or faxed to the FEMA distribution center.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20030000

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences

1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

4. Census Block

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: ABSG Consulting, Irvine CA, developed this database under contract to the National Institute of Building Sciences.

Publication_Date: 20030000

Title: HAZUS-MH: Boundary: CensusBlock

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

This data set portrays the 2000 U.S. Census block polygons of the United States in the fifty states, the District of Columbia, and the territories. ABSG developed this data set from the 2000 version of TIGER/Line files.

The contact information for the Census Bureau is: U.S. Department of Commerce, U.S. Census Bureau, Geography Division. 8903 Presidential Parkway, Room 303 WP I, Upper Marlboro, Maryland, 20772. Telephone: (301) 457-1128. E-Mail Address: tiger@census.gov. The U.S. Census Bureau website address is http://www.census.gov/geo/www/tiger/index.html.

The contact information for Dun & Bradstreet is: Dun & Bradstreet, 3 Sylvan Way, Parsippany, New Jersey 07054. Telephone (800) 526-0651. The D&B website address is http:///www.dnb.com.

Purpose:

This data set is intended for geographic analysis and display using HAZUS. HAZUS is designed to produce loss estimates for use by state, regional and local governments in planning for earthquake, flood, and wind loss mitigation, emergency preparedness and response and recovery.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: Unknown

Ending_Date: 20000000

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: Because the Census 2000 TIGER/Line(r) was prepared by the U.S. Census Bureau for the decennial census of 2000, no changes or updates will be made until the decennial census. D&B updates their data on a quarterly basis, but to ensure alignment with the Census data, no updates are expected to D&B data only.

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -179.147 degrees

East_Bounding_Coordinate: -179.778 degrees

North_Bounding_Coordinate: 71.389 degrees

South_Bounding_Coordinate: 14.605 degrees

1.6 Keywords:

Theme:

Theme_Keyword: HAZUS

Theme_Keyword: HAZUS-MH

Theme_Keyword: Inventory

Theme_Keyword: Block

Theme_Keyword: Boundary

Theme_Keyword: Census Block

Place:

Place_Keyword: USA

Place_Keyword: Alabama

Place_Keyword: Alaska

Place_Keyword: Arizona

Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands

Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints: None

1.8 Use_Constraints: None

1.9 Point_of_Contact

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report: Unknown

2.3 Completeness_Report: Unknown

2.4 Positional_Accuracy: The digital data source from where the data sets were extracted was the 2000 Version of Census TIGER/LineT files. Because the U.S. Census Bureau's mission is "to count and profile the Nation's people and institutions" it dose not require high levels of positional accuracy for its geographic products such as TIGER/LineT files. Showing relative position of elements is the major in its files and maps.

Census TIGER/Line (r) files is the outcome of a variety of source (USGS topographic maps, GBF/DIME-files, aerial photography, etc.). The U.S. Census Bureau express that they cannot specify the accuracy of feature updates added by its field staff or of features derived from the GBF/DIME-Files or other map or digital sources. Only the positional accuracy of USGS sources that accomplish with the United States National Map Accuracy Standards can be approximate. The positional accuracy varies with the scale of the source map used (such as 1:100,000, 1:24,000, 1: 63,000, 1:20,000 and 1:30,000):

D&B utilizes the Census Bureau Tiger/line files to geolocate and reference businesses in their database by the reported address of the business office. D&B aggregated the data to the Census block level utilizing the assigned block polygon from the geolocation process.

2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Polygons

3.3 Point_and_Vector_Object_Information: 8,099,654

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

Census Block database file and the individual state and territory files contain 24 fields.

Entity_and_Attribute_Detail_Citation: CensusBlock	Census Block
Entity_and_Attribute_Detail_Citation: Tract	Census Tract
Entity_and_Attribute_Detail_Citation: BldgSchemesId	Building Scheme Id
Entity_and_Attribute_Detail_Citation: BlockType	Controlling Hazard for the Block
Entity_and_Attribute_Detail_Citation: BlockArea	Area (km^2)
Entity_and_Attribute_Detail_Citation: CenLat	Latitude
Entity_and_Attribute_Detail_Citation: CenLongit	Longitude
Entity_and_Attribute_Detail_Citation: PctWithBasemnt	Residential Units with Basements
Entity_and_Attribute_Detail_Citation: Pct1StoryRes1	1-Story Single-Family
Entity_and_Attribute_Detail_Citation: Pct2StoryRes1	2-Story Single-Family
Entity_and_Attribute_Detail_Citation: Pct3StoryRes1	3-Story Single-Family
Entity_and_Attribute_Detail_Citation: PctSplitLvlRes1	Split Level Single-Family
Entity_and_Attribute_Detail_Citation: Pct1To2StryRes3	1-2 Story Multi-family
Entity_and_Attribute_Detail_Citation: Pct3To4StryRes3	3-4 Story Multi-Family
Entity_and_Attribute_Detail_Citation: Pct5StryPlusRes3	5-Story and up Multi-Family
Entity_and_Attribute_Detail_Citation: PctLowRiseOther	All Other Occupancies Low Rise
Entity_and_Attribute_Detail_Citation: PctMidRiseOther	All Other Occupancies Mid Rise
Entity_and_Attribute_Detail_Citation: PctHighRiseOther	All other Occupancies High Rise
Entity_and_Attribute_Detail_Citation: Pct1CarGarage	Single-Family w/1-Car Garage
Entity_and_Attribute_Detail_Citation: Pct2Cargarage	Single-Family w/2-Car Garage
Entity_and_Attribute_Detail_Citation: Pct3CarGarage	Single Family w/3-Car Garage
Entity_and_Attribute_Detail_Citation: PctCarPort	Single Family w/Car Port
Entity_and_Attribute_Detail_Citation: PctNoGarage	Single Family w/No Garage
Entity_and_Attribute_Detail_Citation: IncomeRatio	Ratio of Block Group to State Income

6. Distribution Information

6.1 Distributor

Contact Organization Primary: FEMA Distribution Center

Contact Address:

Address_Type: mailing address

Address: P.O. Box 2012

City: Jessup

State or Province: MD

Postal Code: 20794-2012

Contact Voice Telephone: 800-480-2530

Contact FAX Number: 301-362-5335

6.2 Resource Description

N/A

6.3 Distribution Liability

No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will replace if the product is determined unusable, or when the physical medium is delivered in damaged condition.

6.4 Standard Order Process

The HAZUS order form can be downloaded from the FEMA website (http://www.fema.gov/hazus/hazus6c.htm). Completed order forms should be mailed or faxed to the FEMA distribution center.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20030000

7.2 Metadata_Contact:

Contact_Information:
Contact_Person_Primary:
Contact_Person: Philip Schneider
Contact_Address:
Address_Type: mailing and physical address
Address:
National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700
City: Washington
State: D.C.
Postal Code: 20005
Contact_Voice_Telephone: 202-289-7800
Contact_Electronic_Mail_Address: pschneider@nibs.org
7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata
7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

Water Bodies

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: Louisiana Oil Spill Coordinator's Office (LOSCO)

Publication_Date: 1999

Title: Major Waters of Louisiana from ESRI/GDT source data, Geographic NAD83, LOSCO (1999) [majorwatbods]

1.2 Description:

Abstract:

The Louisiana major water dataset is a region dataset that contains areas that are major water features - lakes and streams wide enough to be represented as areal features on large scale maps. By representing the data as regions, all portions of a discontinuous or multi-part named feature can be selected as a single entity, and regions of land totally surrounded by these waterbodies appear as 'holes.' There are 3420 regions in this dataset.

This dataset was derived from an ESRI data set created from Geographic Data Technology Dynamap 2000 v7.3 release data.

Purpose:

This data set in geographic coordinates, NAD83 is a reference 'lakes' theme data set for the Louisiana Oil Spill Coordinator's Office (LOSCO).

Supplemental_Information:

The metadata for this data set are encapsulated into several documents and graphics files. The metadata are not complete if you did not receive the following files along with the data set:

majorwatbods.mtd - this document in mp (metadata parser) compatible ASCII text form

majorwatbods.html - this document in HTML form

majorwatbods_faq.html - this document in HTML form

majorwatbods.sgml - this document in SGML form

majorwatbods1.gif - thumbnail graphic of data set

1.3 Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1998

Currentness_Reference: Date when ESRI data became available

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: none planned

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -096.000000

East_Bounding_Coordinate: -088.000000

North_Bounding_Coordinate: +34.000000

South_Bounding_Coordinate: +29.000000

1.6 Keywords:

Theme:

Theme_Keyword_Thesaurus: none

Theme_Keyword: water

Theme_Keyword: lakes

Theme_Keyword: rivers

Place:

Place_Keyword_Thesaurus: none

Place_Keyword: Louisiana

1.7 Access_Constraints: These data are only available as part of a larger data distribution package, the 'Louisiana GIS CD: A Digital Map of the State'

1.8 Use_Constraints:

By use of these data the user acknowledges that the Data and Related Materials contain proprietary and confidential property of ESRI (Environmental Systems Research Institute, Redlands, CA) and its licensor(s). The Data and Related Materials are owned by ESRI and its licensor(s) and are protected by United States copyright laws and applicable international copyright treaties and/or conventions. In the case of this data set, the licensor to ESRI is Geographic Data Technology, Inc., Lyme, New Hampshire.

As a result of ESRI/GDT data redistribution rights restrictions, these data may not be redistributed as a stand-alone dataset. They may only be distributed as part of the 'Louisiana GIS CD: A Digital Map of the State' that has been recognized by ESRI as a 'Value-Added Software Application developed by ESRI Business Partners on a royalty-free basis with proper metadata or source attribution to the respective data vendor(s).'

Static images including hard-copy renditions of these data that are plotted or printed, and/or .gif or .jpeg images with metadata or source attribution acknowledging ESRI/GDT may be redistributed.

1.9 Point_of_Contact

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Louisiana Oil Spill Coordinator's Office

Contact_Person: David Gisclair

Contact_Position: Technical Assistance Program (TAP) Director

Contact_Address:

Address_Type: mailing address

Address: Louisiana Oil Spill Coordinator's Office

Address: Office of the Governor

Address: P.O. Box 94095

City: Baton Rouge

State_or_Province: LA

Postal_Code: 70804

Contact_Voice_Telephone: (225) 219-5800

Contact_Facsimile_Telephone: (225) 219-5802

Contact_Electronic_Mail_Address: <URL:mailto:tapgis@linknet.idt.net>

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report:

Attribute ranges were obtained from statistical tests on the attributes.

2.3 Completeness_Report:

Rivers that extended beyond the state boundary were manually truncated so that only Louisiana features were available. Lakes that went beyond the border were not truncated to preserve the shape and extent of the lake.

2.4 Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: ESRI

Publication_Date: 1998

Title: U.S. Major Water

Larger_Work_Citation:

Citation_Information:

Originator: ESRI

Publication_Date: 1998

Title: ESRI Data & Maps

Type_of_Source_Media: CD-ROM

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1998

Source_Currentness_Reference: date when data became available

Source_Citation_Abbreviation: MJWATER

Source_Contribution: Locations and names of major water features of Louisiana

Process_Step:

Process_Description:

Louisiana features were extracted from MJWATER using spatial overlay in ArcView. Rivers that extended beyond the Louisiana border were then manually truncated. Some were allowed to extend slightly beyond the state boundary. Lakes that extended beyond the state boundary were not truncated. The data were then projected to NAD83 geographic coordinates.

Process_Date: 1999

Process_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Department of Geography and Anthropology, Louisiana State University

Contact_Person: DeWitt Braud

Contact_Address:

Address_Type: mailing address

Address: Louisiana State University

City: Baton Rouge

State_or_Province: LA

Postal_Code: 70803

Contact_Voice_Telephone:

Contact_Electronic_Mail_Address: dbraud1@unix1.sncc.lsu.edu

3. Spatial_Data_Organization_Information

3.1 Direct_Spatial_Reference_Method: vector

3.2 Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: GT-Polygon composed of chains

Point_and_Vector_Object_Count: 6212

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Latitude Resolution: 0.00001

Longitude Resolution: 0.00001

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: North American Datum of 1983

Ellipsoid_Name: Geodectic Reference System 80

Semi-major_Axis: 6378137

Denominator_of_Flattening_Ratio: 298.257

5. Entity_and_Attribute_Information:

5.1 Detailed_Description

Entity_Type:

Entity_Type_Label: majorwatbods.dbf

Entity_Type_Definition: region attribute table for majorwatbods

Entity_Type_Definition_Source: Louisiana State University

Attribute:

Attribute_Label: name

Attribute_Definition: The proper name of the water feature

Attribute_Definition_Source: ESRI

Attribute_Domain_Values:

Unrepresentable_Domain: free text water feature name

Attribute:

Attribute_Label: area_sqm
Attribute_Definition: area of water feature in square meters
Attribute_Definition_Source: Louisiana State University
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 144.491
Range_Domain_Maximum: 1637138338.435
Attribute_Units_of_Measure: square meters

Attribute:

Attribute_Label: perim_m
Attribute_Definition: perimeter of water feature in meters
Attribute_Definition_Source: Louisiana State University
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 75.905
Range_Domain_Maximum: 1522186.896
Attribute_Units_of_Measure: meters

Attribute:

Attribute_Label: area_ac
Attribute_Definition: area in acres
Attribute_Definition_Source: Louisiana State University
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum: 0.036
Range_Domain_Maximum: 404544.075
Attribute_Units_of_Measure: acres

6. Distribution Information

6.1 Distributor

Contact_Information:

Contact_Organization_Primary:
Contact_Organization: Louisiana Oil Spill Coordinator's Office
Contact_Person: David Gisclair
Contact_Position: Technical Assistance Program (TAP) Director

Contact_Address:
Address_Type: mailing address
Address: Louisiana Oil Spill Coordinator's Office
Address: Office of the Governor
Address: P.O. Box 94095
City: Baton Rouge
State_or_Province: LA
Postal_Code: 70804

Contact_Voice_Telephone: (225) 219-5800
Contact_Facsimile_Telephone: (225) 219-5802
Contact_Electronic_Mail_Address: <URL:mailto:tapgis@linknet.idt.net>

6.2 Resource Description: la-boundary

6.3 Distribution Liability

The data herein, including but not limited to geographic data, tabular data, analytical data, electronic data structures or files, are provided "as is" without warranty of any kind, either expressed or implied, or statutory, including, but not limited to, the implied warranties or merchantability and fitness for a particular purpose. The entire risk as to the quality and performance of the data is assumed by the user. No guarantee of accuracy is granted, nor is any responsibility for reliance thereon assumed. In no event shall the Louisiana Oil Spill Coordinator's Office (LOSCO) be liable for direct, indirect, incidental, consequential or special damages of

any kind, including, but not limited to, loss of anticipated profits or benefits arising out of use of or reliance on the data. The LOSCO does not accept liability for any damages or misrepresentation caused by inaccuracies in the data or as a result of changes to the data caused by system transfers or other transformations or conversions, nor is there responsibility assumed to maintain the data in any manner or form.

These data have been developed from the best available sources. Although efforts have been made to ensure that the data are accurate and reliable, errors and variable conditions originating from physical sources used to develop the data may be reflected in the data supplied. Users must be aware of these conditions and bear responsibility for the appropriate use of the information with respect to possible errors, scale, resolution, rectification, positional accuracy, development methodology, time period, environmental and climatic conditions and other circumstances specific to these data. The user is responsible for understanding the accuracy limitations of the data provided herein. The burden for determining fitness for use lies entirely with the user. The user should refer to the accompanying metadata notes for a description of the data and data development procedures.

Although these data have been processed successfully on computers at the LOSCO, no guarantee, expressed or implied, is made by LOSCO regarding the use of these data on any other system, nor does the act of distribution constitute or imply any such warranty. Distribution of these data is intended for information purposes and should not be considered authoritative for navigational, engineering, legal and other site-specific uses.

7. Metadata_Reference_Information

7.1 Metadata_Date: 19991130

7.2 Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: 3001, Inc.

Contact_Person: Mendi Johnson

Contact_Position: GIS Analyst

Contact_Address:

Address_Type: mailing and physical address

Address: 3655 SW 2nd Ave., Suite 3C

City: Gainesville

State_or_Province: FL

Postal_Code: 32607

Contact_Voice_Telephone: (352) 379-3001

Contact_Facsimile_Telephone: (352) 377-4234

Contact_Electronic_Mail_Address: <URL:mailto: mjohnson@gnv.3001data.com>

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

Coastline

N/A

Building Stock

Inventory

1. Building Exposure By Occupancy

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: ABSG Consulting, Irvine CA, developed this database under contract to the National Institute of Building Sciences.

Publication_Date: 20030000

Title: HAZUS-MH: Inventory: Exposure by Occupancy

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

This data set provides the building valuation for each HAZUS specific occupancy classifications developed from the 2000 U.S. Census and Dun& Bradstreet. All data was developed at the census block level (for the United States in the fifty states, the District of Columbia, and the territories), and then aggregated at census tract level. ABSG developed this data set from the 2000 version of TIGER/Line files and first quarter of 2002 data from D&B. This dataset was developed by applying RS Means replacement values for typical building floor areas and construction for each specific occupancy.

The contact information for the Census Bureau is: U.S. Department of Commerce, U.S. Census Bureau, Geography Division. 8903 Presidential Parkway, Room 303 WP I, Upper Marlboro, Maryland, 20772. Telephone: (301) 457-1128. E-Mail Address: tiger@census.gov. The U.S. Census Bureau website address is http://www.census.gov/geo/www/tiger/index.html.

The contact information for Dun & Bradstreet is: Dun & Bradstreet, 3 Sylvan Way, Parsippany, New Jersey 07054. Telephone (800) 526-0651. The D&B website address is http:///www.dnb.com.

The contact information for RS Mean's is: RSMeans Company, Inc. Construction Publishers & Consultants, Construction Plaza, 63 Smiths Lane, Kingston, MA 02364-080. Telephone: (781) 585-7880. The RSMeans website address is: http://www.rsmeans.com/.

Purpose:

This data set is intended for geographic analysis and display using HAZUS. HAZUS is designed to produce loss estimates for use by state, regional and local governments in planning for earthquake, flood, and wind loss mitigation, emergency preparedness and response and recovery.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: Unknown

Ending_Date: 20000000

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: Because the Census 2000 TIGER/Line(r) was prepared by the U.S. Census Bureau for the decennial census of 2000, no changes or updates will be made until the decennial census. D&B updates their data on a quarterly basis, but to ensure alignment with the Census data, no updates are expected to D&B data only. RS Means is updated annually, and occasional service packs may be provided to keep the exposure values in time now dollars.

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -179.147 degrees

East_Bounding_Coordinate: -179.778 degrees

North_Bounding_Coordinate: 71.389 degrees

South_Bounding_Coordinate: 14.605 degrees

1.6 Keywords:

Theme:

Theme_Keyword: HAZUS

Theme_Keyword: HAZUS-MH

Theme_Keyword: Inventory
Theme_Keyword: Tract
Theme_Keyword: Census Tract
Theme_Keyword: Exposure
Theme_Keyword: Valuation
Theme_Keyword: General Occupancy
Theme_Keyword: Specific Occupancy

Place:

Place_Keyword: USA
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina

Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints: None

1.8 Use_Constraints: None

1.9 Point_of_Contact

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report: Unknown

2.3 Completeness_Report: Unknown

2.4 Positional_Accuracy: The digital data source from where the data sets were extracted was the 2000 Version of Census TIGER/LineT files. Because the U.S. Census Bureau's mission is "to count and profile the Nation's people and institutions" it dose not require high levels of positional accuracy for its geographic products such as TIGER/LineT files. Showing relative position of elements is the major in its files and maps.

Census TIGER/Line (r) files is the outcome of a variety of source (USGS topographic maps, GBF/DIME-files, aerial photography, etc.). The U.S. Census Bureau express that they cannot specify the accuracy of feature updates added by its field staff or of features derived from the GBF/DIME-Files or other map or digital sources. Only the positional accuracy of USGS sources that accomplish with the United States National Map Accuracy Standards can be approximate. The positional accuracy varies with the scale of the source map used (such as 1:100,000, 1:24,000, 1: 63,000, 1:20,000 and 1:30,000):

D&B utilizes the Census Bureau Tiger/line files to geolocate and reference businesses in their database by the reported address of the business office. D&B aggregated the data to the Census block level utilizing the assigned block polygon from the geolocation process.

2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Polygons

3.3 Point_and_Vector_Object_Information: 65,313

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

The Exposure By Occupancy database file and the individual state and territory files contain 42 fields.

Entity_and_Attribute_Detail_Citation: Tract	Census Tract
Entity_and_Attribute_Detail_Citation: RESI	Total Residential Bldg Value
Entity_and_Attribute_Detail_Citation: COMI	Total Commercial Bldg Value
Entity_and_Attribute_Detail_Citation: INDI	Total Industrial Bldg Value
Entity_and_Attribute_Detail_Citation: AGRI	Total Agriculture Bldg Value
Entity_and_Attribute_Detail_Citation: RELI	Total Religious Bldg Value
Entity_and_Attribute_Detail_Citation: GOVI	Total Government Bldg Value
Entity_and_Attribute_Detail_Citation: EDUI	Total Education Bldg Value
Entity_and_Attribute_Detail_Citation: RES1I	Total Single-Family Bldg Value t
Entity_and_Attribute_Detail_Citation: RES2I	Total Manuf Housing Bldg Value
Entity_and_Attribute_Detail_Citation: RES3AI	Total Bldg Value Duplex
Entity_and_Attribute_Detail_Citation: RES3BI	Total Bldg Value 3-4 Units
Entity_and_Attribute_Detail_Citation: RES3CI	Total Bldg Value 5-9 Units
Entity_and_Attribute_Detail_Citation: RES3DI	Total Bldg Value 10-19 Units
Entity_and_Attribute_Detail_Citation: RES3EI	Total Bldg Value 20-49 Units
Entity_and_Attribute_Detail_Citation: RES3FI	Total Bldg Value 50+ Units
Entity_and_Attribute_Detail_Citation: RES4I	Total Bldg Value Temp Lodging
Entity_and_Attribute_Detail_Citation: RES5I	Total Bldg Value Institutional
Entity_and_Attribute_Detail_Citation: RES6I	Total Bldg Value Nursing Home
Entity_and_Attribute_Detail_Citation: COM1I	Total Bldg Value Retail Trade
Entity_and_Attribute_Detail_Citation: COM2I	Total Bldg Value Wholesale Trd
Entity_and_Attribute_Detail_Citation: COM3I	Total Bldg Value Personal Srvc
Entity_and_Attribute_Detail_Citation: COM4I	Total Bldg Value Professional
Entity_and_Attribute_Detail_Citation: COM5I	Total Bldg Value Banking
Entity_and_Attribute_Detail_Citation: COM6I	Total Bldg Value Hospital
Entity_and_Attribute_Detail_Citation: COM7I	Total Bldg Value Medical Ofc
Entity_and_Attribute_Detail_Citation: COM8I	Total Bldg Value Entertainment
Entity_and_Attribute_Detail_Citation: COM9I	Total Bldg Value Theaters
Entity_and_Attribute_Detail_Citation: COM10I	Total Bldg Value Parking
Entity_and_Attribute_Detail_Citation: IND1I	Total Bldg Value Heavy Ind
Entity_and_Attribute_Detail_Citation: IND2I	Total Bldg Value Light Ind
Entity_and_Attribute_Detail_Citation: IND3I	Total Bldg Value Food/Drug
Entity_and_Attribute_Detail_Citation:IND4I	Total Bldg Value Metals
Entity_and_Attribute_Detail_Citation: IND5I	Total Bldg Value High Tech
Entity_and_Attribute_Detail_Citation: IND6I	Total Bldg Value Construction
Entity_and_Attribute_Detail_Citation: AGR1I	Total Bldg Value Agriculture

Entity_and_Attribute_Detail_Citation: REL1I
Entity_and_Attribute_Detail_Citation: GOV1I
Entity_and_Attribute_Detail_Citation: GOV2I
Entity_and_Attribute_Detail_Citation: EDU1I
Entity_and_Attribute_Detail_Citation: EDU2I

Total Bldg Value Religious
Total Bldg Value General Svcs
Total Bldg Value Emergency Ctr
Total Bldg Value Schools
Total Bldg Value Colleges

6. Distribution Information

6.1 Distributor

Contact Organization Primary: FEMA Distribution Center

Contact Address:

Address_Type: mailing address
Address: P.O. Box 2012
City: Jessup
State or Province: MD
Postal Code: 20794-2012

Contact Voice Telephone: 800-480-2530
Contact FAX Number: 301-362-5335

6.2 Resource Description

N/A

6.3 Distribution Liability

No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will replace if the product is determined unusable, or when the physical medium is delivered in damaged condition.

6.4 Standard Order Process

The HAZUS order form can be downloaded from the FEMA website (http://www.fema.gov/hazus/hazus6c.htm). Completed order forms should be mailed or faxed to the FEMA distribution center.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20030000

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address
Address:
National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700
City: Washington
State: D.C.
Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800
Contact_Electronic_Mail_Address: pschneider@nibs.org

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

2. Content Exposure By Occupancy

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: ABSG Consulting, Irvine CA, developed this database under contract to the National Institute of Building Sciences.

Publication_Date: 20030000

Title: HAZUS-MH: Inventory: Content Exposure by Occupancy

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

This data set provides the content valuation for each HAZUS specific occupancy classifications. All data was developed at the census block level (for the United States in the fifty states, the District of Columbia, and the territories), and then aggregated at census tract level. ABSG developed this data set from the 2000 version of TIGER/Line files and first quarter of 2002 data from D&B. The dataset was generated though the application of proportions of contents to building value over the total building value for each specific occupancy.

The contact information for the Census Bureau is: U.S. Department of Commerce, U.S. Census Bureau, Geography Division. 8903 Presidential Parkway, Room 303 WP I, Upper Marlboro, Maryland, 20772. Telephone: (301) 457-1128. E-Mail Address: tiger@census.gov. The U.S. Census Bureau website address is http://www.census.gov/geo/www/tiger/index.html.

The contact information for Dun & Bradstreet is: Dun & Bradstreet, 3 Sylvan Way, Parsippany, New Jersey 07054. Telephone (800) 526-0651. The D&B website address is http:///www.dnb.com.

The contact information for RS Mean's is: RSMeans Company, Inc. Construction Publishers & Consultants, Construction Plaza, 63 Smiths Lane, Kingston, MA 02364-080. Telephone: (781) 585-7880. The RSMeans website address is: http://www.rsmeans.com/.

Purpose:

This data set is intended for geographic analysis and display using HAZUS. HAZUS is designed to produce loss estimates for use by state, regional and local governments in planning for earthquake, flood, and wind loss mitigation, emergency preparedness and response and recovery.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: Unknown

Ending_Date: 20000000

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: Because the Census 2000 TIGER/Line(r) was prepared by the U.S. Census Bureau for the decennial census of 2000, no changes or updates will be made until the decennial census. D&B updates their data on a quarterly basis, but to ensure alignment with the Census data, no updates are expected to D&B data only.

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -179.147 degrees

East_Bounding_Coordinate: -179.778 degrees

North_Bounding_Coordinate: 71.389 degrees

South_Bounding_Coordinate: 14.605 degrees

1.6 Keywords:

Theme:

Theme_Keyword: HAZUS

Theme_Keyword: HAZUS-MH

Theme_Keyword: Inventory

Theme_Keyword: Tract

Theme_Keyword: Census Tract

Theme_Keyword: Exposure

Theme_Keyword: Contents
Theme_Keyword: General Occupancy
Theme_Keyword: Specific Occupancy

Place:

Place_Keyword: USA
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah

Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints: None

1.8 Use_Constraints: None

1.9 Point_of_Contact

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report: Unknown

2.3 Completeness_Report: Unknown

2.4 Positional_Accuracy: The digital data source from where the data sets were extracted was the 2000 Version of Census TIGER/LineT files. Because the U.S. Census Bureau's mission is "to count and profile the Nation's people and institutions" it dose not require high levels of positional accuracy for its geographic products such as TIGER/LineT files. Showing relative position of elements is the major in its files and maps.

Census TIGER/Line (r) files is the outcome of a variety of source (USGS topographic maps, GBF/DIME-files, aerial photography, etc.). The U.S. Census Bureau express that they cannot specify the accuracy of feature updates added by its field staff or of features derived from the GBF/DIME-Files or other map or digital sources. Only the positional accuracy of USGS sources that accomplish with the United States National Map Accuracy Standards can be approximate. The positional accuracy varies with the scale of the source map used (such as 1:100,000, 1:24,000, 1: 63,000, 1:20,000 and 1:30,000):

D&B utilizes the Census Bureau Tiger/line files to geolocate and reference businesses in their database by the reported address of the business office. D&B aggregated the data to the Census block level utilizing the assigned block polygon from the geolocation process.

2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Polygons

3.3 Point_and_Vector_Object_Information: 65,313

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown
Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983
4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

The Content Exposure By Occupancy database file and the individual state and territory files contain 42 fields.

Entity_and_Attribute_Detail_Citation: Tract	Census Tract
Entity_and_Attribute_Detail_Citation: RESI	Total Residential Content Value
Entity_and_Attribute_Detail_Citation: COMI	Total Commercial Content Value
Entity_and_Attribute_Detail_Citation: INDI	Total Industrial Content Value
Entity_and_Attribute_Detail_Citation: AGRI	Total Agriculture Content Value
Entity_and_Attribute_Detail_Citation: RELI	Total Religious Content Value
Entity_and_Attribute_Detail_Citation: GOVI	Total Government Content Value
Entity_and_Attribute_Detail_Citation: EDUI	Total Education Content Value
Entity_and_Attribute_Detail_Citation: RES1I	Total Single-Family Content Value t
Entity_and_Attribute_Detail_Citation: RES2I	Total Manuf Housing Content Value
Entity_and_Attribute_Detail_Citation: RES3AI	Total Content Value Duplex
Entity_and_Attribute_Detail_Citation: RES3BI	Total Content Value 3-4 Units
Entity_and_Attribute_Detail_Citation: RES3CI	Total Content Value 5-9 Units
Entity_and_Attribute_Detail_Citation: RES3DI	Total Content Value 10-19 Units
Entity_and_Attribute_Detail_Citation: RES3EI	Total Content Value 20-49 Units
Entity_and_Attribute_Detail_Citation: RES3FI	Total Content Value 50+ Units
Entity_and_Attribute_Detail_Citation: RES4I	Total Content Value Temp Lodging
Entity_and_Attribute_Detail_Citation: RES5I	Total Content Value Institutional
Entity_and_Attribute_Detail_Citation: RES6I	Total Content Value Nursing Home
Entity_and_Attribute_Detail_Citation: COM1I	Total Content Value Retail Trade
Entity_and_Attribute_Detail_Citation: COM2I	Total Content Value Wholesale Trd
Entity_and_Attribute_Detail_Citation: COM3I	Total Content Value Personal Srvc
Entity_and_Attribute_Detail_Citation: COM4I	Total Content Value Professional
Entity_and_Attribute_Detail_Citation: COM5I	Total Content Value Banking
Entity_and_Attribute_Detail_Citation: COM6I	Total Content Value Hospital
Entity_and_Attribute_Detail_Citation: COM7I	Total Content Value Medical Ofc
Entity_and_Attribute_Detail_Citation: COM8I	Total Content Value Entertainment
Entity_and_Attribute_Detail_Citation: COM9I	Total Content Value Theaters
Entity_and_Attribute_Detail_Citation: COM10I	Total Content Value Parking
Entity_and_Attribute_Detail_Citation: IND1I	Total Content Value Heavy Ind
Entity_and_Attribute_Detail_Citation: IND2I	Total Content Value Light Ind
Entity_and_Attribute_Detail_Citation: IND3I	Total Content Value Food/Drug
Entity_and_Attribute_Detail_Citation:IND4I	Total Content Value Metals
Entity_and_Attribute_Detail_Citation: IND5I	Total Content Value High Tech
Entity_and_Attribute_Detail_Citation: IND6I	Total Content Value Construction
Entity_and_Attribute_Detail_Citation: AGR1I	Total Content Value Agriculture
Entity_and_Attribute_Detail_Citation: REL1I	Total Content Value Religious
Entity_and_Attribute_Detail_Citation: GOV1I	Total Content Value General Svcs
Entity_and_Attribute_Detail_Citation: GOV2I	Total Content Value Emergency Ctr
Entity_and_Attribute_Detail_Citation: EDU1I	Total Content Value Schools
Entity_and_Attribute_Detail_Citation: EDU2I	Total Content Value Colleges

6. Distribution Information

6.1 Distributor

Contact Organization Primary: FEMA Distribution Center

Contact Address:

Address_Type: mailing address

Address: P.O. Box 2012

City: Jessup

State or Province: MD

Postal Code: 20794-2012

Contact Voice Telephone: 800-480-2530

Contact FAX Number: 301-362-5335

6.2 Resource Description

N/A

6.3 Distribution Liability

No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will replace if the product is determined unusable, or when the physical medium is delivered in damaged condition.

6.4 Standard Order Process

The HAZUS order form can be downloaded from the FEMA website (http://www.fema.gov/hazus/hazus6c.htm). Completed order forms should be mailed or faxed to the FEMA distribution center.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20030000

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences

1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

Population

Inventory

Demographics

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: Tele Atlas North America, Inc

Publication_Date: 20061001

Title: U.S. Census Block GroupsOn-line Linkage: http://www.teleatlas.com/

1.2 Description:

Abstract:

U.S. Census Block Groups represents the U.S. Census block groups of the United States.

Purpose:

U.S. Census Block Groups provides boundaries and demographic information for the U.S. Census block groups within United States. The boundaries are consistent with the tract, county, and state data sets..

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20021204

Ending_Date: 200601

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: Anually

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -178.227822

East_Bounding_Coordinate: -65.244128

North_Bounding_Coordinate: 71.390482

South_Bounding_Coordinate: 17.881242

1.6 Keywords:

Theme:

Theme_Keyword: None

Theme_Keyword: polygon

Theme_Keyword: census block groups

Theme_Keyword: demographics

Theme_Keyword: population

Theme_Keyword: households

Theme_Keyword: boundaries

Theme_Keyword: society

Place:

Place_Keyword: USA

Place_Keyword: None

1.7 Access_Constraints: Access granted to Licensee only

1.8 Use_Constraints: The data are provided by multiple, third party data vendors under license to ESRI for inclusion on ESRI Data & Maps for use with ESRI® software. Each data vendor has its own data licensing policies and may grant varying redistribution rights to end users. Please consult the redistribution rights below for this data set provided on ESRI Data & Maps. As used herein, “Geodata” shall mean any digital data set consisting of geographic data coordinates and associated attributes. The redistribution rights for this data set: Redistribution rights are granted by the data vendor for hard-copy renditions or static, electronic map images (e.g. .gif, .jpeg, etc.) that are plotted, printed, or publicly displayed with proper metadata and source/copyright attribution to the respective data vendor(s). Geodata is redistributable with a Value-Added Software Application developed by ESRI Business Partners on a royalty-free basis with proper metadata and source/copyright attribution to the respective data vendor(s). [Applicable to Department of Commerce, Census Bureau and

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1.9 Point_of_Contact

Contact_Information: ESRI

Contact_Person_Primary: ESRI Data Team

Contact_Person: ESRI Data Team

Contact_Address:

Address_Type: mailing and physical address

Address: 380 New York Street

City: Red Lands

State: CA

Postal Code: 92373-8100

Contact_Voice_Telephone: 909-793-2853

Contact_Electronic_Mail_Address: info@esri.com

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report: Unknown

2.3 Completeness_Report: Completed

2.4 Positional_Accuracy: The geospatial part of this data set was extracted from the 2000 Census TIGER/Line® files. The positional accuracy of the TIGER/Line coordinates varies with the source materials used but at best meets the established National Map Accuracy standards (+/- 167 feet approximately) where 1:100,000-scale maps from the USGS are the source. The Census Bureau cannot specify the accuracy of feature updates added by its field staff or of features derived from the GBF/DIME-Files or other map sources. Thus, the level of positional accuracy in the TIGER/Line files is not suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface

2.5 Lineage: Dynamap/Census Boundaries v. 7.0 (source 1 of 3) Tele Atlas North America, Inc., 200601, Dynamap/Census Boundaries v. 7.0: Dynamap®/Census Boundaries Version 7.0, Tele Atlas North America, Inc., Lebanon, New Hampshire, USA. Online links: http://www.teleatlas.com/ Type of source media: DVD–ROM Source scale denominator: 100000 Source contribution: Attribute and geospatial data Census SF1 (source 2 of 3) Department of Commerce, Census Bureau, 2001, Summary File 1 (SF1): Summary File 1 (SF1) 2000, Department of Commerce, Census Bureau, USA. Other citation details: The Summary File 1 (SF1) data is based on the 2000 Census of Population. Type of source media: CD–ROM Source contribution: Attribute data ESRI Community Data (source 3 of 3) ESRI, 20050519, ESRI Community Data: ESRI® Community™ Data 2005, ESRI, Redlands, California, USA. Online links: http://www.esri.com Other citation details: Provides the POP2005 attribute. Type of source media: DVD–ROM Source contribution: Attribute data Date: 20060405 (change 1 of 1) The following steps were performed by ESRI: Extracted block group geography from Dynamap/Census Boundaries v. 7.0. Removed Alaskan islands west of 180 degrees longitude. Created region features from the polygon features. Attached and formatted the attributes from 2005 U.S. Census Block Groups. Put "0" values into the attributes for the new features. Put "-99" values into all number attributes (except SQMI) for Puerto Rico. Replaced attribute POP2004 with POP2005 and attribute POP04_SQMI with POP05_SQMI. Calculated new values for attributes POP00_SQMI, POP05_SQMI, and SQMI. Converted the data set to SDC. Created ArcGIS® layer file (.lyr), projection file (.prj), and spatial indices. Data sources used in this process: Dynamap/Census Boundaries v. 7.0 Census SF1 ESRI Community Data

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Polygons

3.3 Point_and_Vector_Object_Information: 65,313

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: D_WGS_1984

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

The Demographics database file and the individual state and territory files contain 60 fields.

Entity_and_Attribute_Detail_Citation: Tract	Census Tract
Entity_and_Attribute_Detail_Citation: Population	Total Census Tract Population
Entity_and_Attribute_Detail_Citation: Households	Total Census Tract Households
Entity_and_Attribute_Detail_Citation: GroupQuarters	Population in Group Quarters
Entity_and_Attribute_Detail_Citation: MaleLess16	Males less than 16-yrs old
Entity_and_Attribute_Detail_Citation: Male16to65	Males between 16 and 65
Entity_and_Attribute_Detail_Citation: MaleOver65	Males over 65-yrs old
Entity_and_Attribute_Detail_Citation: FemaleLess16	Females less than 16-yrs old
Entity_and_Attribute_Detail_Citation: Female16to65	Females between 16 and 65
Entity_and_Attribute_Detail_Citation: FemaleOver65	Females over 65-yrs Old

Entity_and_Attribute_Detail_Citation: MalePopulation	Total Male Population
Entity_and_Attribute_Detail_Citation: FemalePopulation	Total Female Population
Entity_and_Attribute_Detail_Citation: White	Population Stating White
Entity_and_Attribute_Detail_Citation: Black	Population Stating Black
Entity_and_Attribute_Detail_Citation: NativeAmerican	Population Stating Native American
Entity_and_Attribute_Detail_Citation: Asian	Population Stating Asian
Entity_and_Attribute_Detail_Citation: Hispanic	Population Stating Hispanic
Entity_and_Attribute_Detail_Citation: PacificIslander	Population Stating Pacific Islander
Entity_and_Attribute_Detail_Citation: OtherRaceOnly	Population Stating Other Race Only
Entity_and_Attribute_Detail_Citation: OwnersingleUnits	Owner Occupied Single Family Units
Entity_and_Attribute_Detail_Citation: OwnerMultUnits	Owner Occupied Multi-Family Units
Entity_and_Attribute_Detail_Citation: OwnerMultStructs	Owner Occup Multi-Family Structures
Entity_and_Attribute_Detail_Citation: OwnerMHs	Owner Occupied Manuf Housing
Entity_and_Attribute_Detail_Citation: RenterSingleUnits	Renter Occupied Single Family Units
Entity_and_Attribute_Detail_Citation: RenterMultUnits	Renter Occupied Multi-Family Units
Entity_and_Attribute_Detail_Citation: RenterMultStructs	Renter Occup Multi-Family Structures
Entity_and_Attribute_Detail_Citation: RenterMHs	Renter Occupied Manuf Housing
Entity_and_Attribute_Detail_Citation: VacantSingleUnits	Vacant Single Family Units
Entity_and_Attribute_Detail_Citation: VacantMultUnits	Vacant Multi-Family Units
Entity_and_Attribute_Detail_Citation: VacantMultStructs	Vacant Multi-Family Structures
Entity_and_Attribute_Detail_Citation: STATE_FIPS	County FIPS
Entity_and_Attribute_Detail_Citation: CNTY_FIPS	State and County FIPS
Entity_and_Attribute_Detail_Citation: STCOFIPS	Block Group
Entity_and_Attribute_Detail_Citation: BLKGRP	Combined FIPS Numbers
Entity_and_Attribute_Detail_Citation: FIPS	Population 2000
Entity_and_Attribute_Detail_Citation: POP 2000	Population 2005
Entity_and_Attribute_Detail_Citation: POP 2005	Population 2000 per square mile
Entity_and_Attribute_Detail_Citation: POP00_SQMI	Population 2005 per square mile
Entity_and_Attribute_Detail_Citation: POP05_SQMI	Area in square miles
Entity_and_Attribute_Detail_Citation: SQMI	

6. Distribution Information

6.1 Distributor

Contact Organization Primary: ESRI

Contact Address:

Address_Type: mailing address

Address: 308 New York Street

City: Redlands

State or Province: CA

Postal Code: 92373-8100

Contact Voice Telephone: 909-793-2853

Contact FAX Number: 909-793-5953

6.2 Resource Description

N/A

6.3 Distribution Liability

N/A

6.4 Standard Order Process

ESRI Data & Maps is available only as part of ESRI® software. In the United States, contact the ESRI Telebusiness staff at 800-447-9778 for more information about our software and data. Outside the United States, please direct all inquiries to your local ESRI International Distributor. This information can be found at http://gis.esri.com/intldist/contactint.cfm.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20021204

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: ESRI Data Team

Contact_Address:

Address_Type: mailing and physical address

Address: 308 New York Street

City: Redlands

State: CA

Postal Code: 92373-8100

Contact_Voice_Telephone: 909-793-2853

Contact_Electronic_Mail_Address: info@esri.com

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

Facilities and Infrastructure

Essential Facilities:

1. Medical Care Facilities

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: Techni Graphic Systems, Inc.

Publication_Date: 20070328

Title: HAZUS-MH: HSIP Gold Urgent Care 2007 Q2

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

Urgent Care Facilities in the United States Urgent care is defined as the delivery of ambulatory medical care outside of a hospital emergency department on a walk-in basis without a scheduled appointment. (Source: Urgent Care Association of America) The Urgent Care dataset consists of any location that is capable of providing emergency medical care and must provide emergency medical treatment beyond what can normally be provided by an EMS unit, must be able to perform surgery, or must be able to provide recuperative care beyond what is normally provided by a doctor's office. In times of emergency, the facility must be able to accept patients from the general population or patients from a significant subset of the general population (e.g., children). Entities that are excluded from this dataset are administrative offices, physician offices, workman compensation facilities, and hospitals. Urgent Care facilities that are operated by and collocated with a hospital are also excluded because they are included in the hospital dataset. Although the above expresses what is intended to be included and excluded from this dataset, there are some possible exceptions. Although it is intended that this dataset include all Urgent Care facilities, in many cases only the main facility is included. Some entities may remain in the dataset that are administrative offices only. Some Urgent Care facilities may remain in the dataset that do not meet the criteria. TGS replaced vendor provided data with data gathered from the Urgent Care Associates of America (UCAOA). All information for entities that are located on the grounds of a military base is considered to be treated as "For Official Use Only". These entities are indicated by "-DOD" appended to the end of the entity's name in the [NAME] attribute and by "UNCLASSIFED – TREAT AS FOUO" in the [SECCLASS] attribute. At the request of NGA, text fields in this dataset have been set to all upper case to facilitate consistent database engine search results. At the request of NGA, all diacritics (e.g., the German umlaut or the Spanish tilde) have been replaced with their closest equivalent English character to facilitate use with database systems that may not support diacritics. No entities for American Samoa, Guam, the Virgin Islands, or the Northern Mariana Islands are included in this dataset. The currentness of this dataset is indicated by the [CONTDATE] attribute. Based upon this attribute, the oldest record is dated 02/25/2004 and the newest record is dated 1/2/2007.

Purpose:

Homeland Security Use Cases: Use cases describe how the data may be used and help to define and clarify requirements. 1) A disaster has overwhelmed local medical facilities and capacity must be found in the surrounding area. 2) A threat against urgent care facilities has been identified and measures must be taken to protect the urgent care facility. 3) An assessment as to the adequacy of the total capacity to handle emergency medical care in a given area needs to be made as part of a disaster mitigation plan. 4) A disaster has occurred, or is in the process of occurring, and facilities in the vicinity with people needing evacuation assistance must be identified.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20040225

Ending_Date: 20070102

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: Quarterly - TGS provides NGA with quarterly updates of this dataset. The data is updated at a rate such that all entities in the dataset will be updated over a three year period. Ionic/MCH provides quarterly updates to NGA of their commodity "Hospitals" dataset. The rate at which Ionic/MCH is planning on updating their dataset is unknown

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -158.181557

East_Bounding_Coordinate: -66.040804

North_Bounding_Coordinate: 64.839135

South_Bounding_Coordinate: 18.219368

1.6 Keywords:

Theme:

Theme_Keyword: Clinics
Theme_Keyword: Surgical Clinics
Theme_Keyword: Ambulatory medical care
Theme_Keyword: ISO 19115 Topic Category
Theme_Keyword: health
Theme_Keyword: structure

Place:

Place_Keyword: United States Territories and possessions
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico

Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming

1.7 Access_Constraints: The following applies to records with "-DOD" appended to the end of the [NAME] attribute and ([SECCLASS] = "UNCLASSIFIED - TREAT AS FOUO"): The information provided for these entities should be treated as "For Official Use Only" The following applies to records provided by Ionic/MCH ([SOURCE] = "Ionic/MCH") and ([SECCLASS] <> "UNCLASSIFIED - TREAT AS FOUO": Homeland Security persons and officials at US Federal Government Agencies, State and local agencies; Not for public distribution. The following clauses describe the usage restrictions for all of the data supplied by IONIC/MCH to NGA under the Homeland Security Infrastructure Program (HSIP): The data provided under this contract will be used for homeland security purposes only, to include but not be limited to, planning and response to disasters, acts of terrorism and other catastrophes. [IONIC/MCH] shall deliver the databases with a Federal Government license to include the unrestricted right to access, use, modify, reproduce, release, perform, display, and/or otherwise disclose contents among the Federal Government and its contractors. US Federal Government Agencies, State and local agencies may access these data via a non-secure thin client interface. The following applies to records provided by other sources ([SOURCE] <> "Ionic/MCH") and ([SECCLASS] <> "UNCLASSIFIED - TREAT AS FOUO"): There are no access constraints

1.8 Use_Constraints: The following applies to records with "-DOD" appended to the end of the [NAME] attribute and ([SECCLASS] = "UNCLASSIFIED - TREAT AS FOUO"): The information provided for these entities should be treated as "For Official Use Only" The following applies to records provided by Ionic/MCH ([SOURCE] = "Ionic/MCH") and ([SECCLASS] <> "UNCLASSIFIED - TREAT AS FOUO"): Homeland security purposes only The following applies to records provided by other sources ([SOURCE] <> "Ionic/MCH") and ([SECCLASS] <> "UNCLASSIFIED - TREAT AS FOUO"): There are no use constraints

1.9 Point_of_Contact

Contact_Information:

Contact_Person_Primary:

Contact_Person: Mike Thompson

Contact_Address:

Address_Type: mailing and physical address

Address:

2000 Noble Drive

City: Wooster

State: OH

Postal Code: 44691

Contact_Voice_Telephone: 330-263-6222

Contact_Electronic_Mail_Address: mthompson@tgstech.com

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report: States and territories: This dataset does not contain any Urgent Care facilities in American Samoa, Guam, the Virgin Islands, or the Northern Mariana Islands. Counties: This dataset does not contain at least one Urgent Care facility for 56 of 532 counties in the United States and its territories with a population of 100,000 or greater. Many of these counties may not have any Urgent Care facilities in reality. During future updates of this dataset, TGS intends to confirm whether or not these counties have Urgent Care facilities. > >DELAWARE, PA Pop: 550864 >LANCASTER, PA Pop: 470658 >SAN JUAN, PR Pop: 434374 >WESTMORELAND, PA Pop: 369993 >ROCKINGHAM, NH Pop: 277359 >ST CLAIR, IL Pop: 256082 >BAYAMON, PR Pop: 224044 >WASHINGTON, PA Pop: 202897 >WEBB, TX Pop: 193117 >PONCE, PR Pop: 186475 >CAROLINA, PR Pop: 186076 >BEAVER, PA Pop: 181412 >BUTLER, PA Pop: 174083 >KENT, RI Pop: 167090 >GUAM, GU Pop: 154805 >CAMBRIA, PA Pop: 152598 >HAMPSHIRE, MA Pop: 152251 >KENTON, KY Pop: 151464 >CARROLL, MD Pop: 150897 >SCHUYLKILL, PA Pop: 150336 >DAVIDSON, NC Pop: 147246 >CUMBERLAND, NJ Pop: 146438 >MONROE, MI Pop: 145945 >SHELBY, AL Pop: 143293 >CHARLOTTE, FL Pop: 141627 >MONROE, PA Pop: 138687 >CALHOUN, MI Pop: 137985 >TOLLAND, CT Pop: 136364 >CENTRE, PA Pop: 135758 >STEARNS, MN

Pop: 133166 >SUMNER, TN Pop: 130449 >FRANKLIN, PA Pop: 129313 >HUMBOLDT, CA Pop: 126518 >RAPIDES, LA Pop: 126337 >FLORENCE, SC Pop: 125761 >OLMSTED, MN Pop: 124277 >OSWEGO, NY Pop: 122377 >LEBANON, PA Pop: 120327 >MERCER, PA Pop: 120293 >LYCOMING, PA Pop: 120044 >CITRUS, FL Pop: 118085 >MACON, IL Pop: 114706 >POTTER, TX Pop: 113546 >COLUMBIANA, OH Pop: 112075 >ST LAWRENCE, NY Pop: 111931 >LA SALLE, IL Pop: 111509 >HOUSTON, GA Pop: 110765 >PICKENS, SC Pop: 110757 >LA PORTE, IN Pop: 110106 >ALLEGAN, MI Pop: 105665 >TERREBONNE, LA Pop: 104503 >KANKAKEE, IL Pop: 103833 >WARREN, NJ Pop: 102437 >TANGIPAHOA, LA Pop: 100588 >ONTARIO, NY Pop: 100224 >ARECIBO, PR Pop: 100131 Cities: This dataset does not contain at least one Urgent Care facility within the city limits for 15 of 238 cities in the United States and its territories with a population of 100,000 or greater. Many of these cities may not have any Urgent Care facilities in reality. During future updates of this dataset, TGS intends to confirm whether or not these cities have Urgent Care facilities. >Laredo, TX Pop: 176576 >Providence, RI Pop: 173618 >Paterson, NJ Pop: 149222 >Santa Rosa, CA Pop: 147595 >Fullerton, CA Pop: 126003 >Flint, MI Pop: 124943 >Concord, CA Pop: 121780 >Elizabeth, NJ Pop: 120568 >Stamford, CT Pop: 117083 >Vallejo, CA Pop: 116760 >Waterbury, CT Pop: 107271 >Gary, IN Pop: 102746 >Berkeley, CA Pop: 102743 >Cape Coral, FL Pop: 102286 >Cambridge, MA Pop: 101355 Entities that are excluded from this dataset are administrative offices, physician offices, workman compensation facilities, and hospitals. Urgent Care facilities that are operated by and collocated with a hospital are also excluded because they are included in the hospital dataset

2.3 Completeness_Report: Unknown

2.4 Positional_Accuracy: Unknown

2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Point

3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor

Contact Organization Primary:

Contact Address:

Address_Type: mailing address
Address:
City:
State or Province:
Postal Code:

Contact Voice Telephone:
Contact FAX Number:

6.2 Resource Description

N/A

6.3 Distribution Liability

6.4 Standard Order Process

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date:

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person:

Contact_Address:

Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:

Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

2. Schools

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator:
Publication_Date:
Title: HAZUS-MH:
On-line Linkage:

1.2 Description:

Abstract:

PBS&J developed this database from the Public Elementary/Secondary School Universe Survey Data and the Private School Universe Survey Data maintained by National Center for Education Statistics, US Department of Education. Original dataset are listing—without x,y information)—of all public and private elementary and secondary schools in the

country. A proprietary geocoding application was then used to assign geographical coordinates to each school based on the address.

The contact information for the National Center for Education Statistics: 1990 K Street, NW, Washington, DC 20006, USA, Phone: (202) 502-7300. The NCES, Inc website address is http://nces.ed.gov/.

Data provided by URS Corporation was incorporated for the state of Alaska. For each item or feature provided, a note was included under the Comment field. For metadata information about this data, please contact:

Laura Young
URS Corporation
2700 Gambell, Suite 200
Anchorage, Alaska 99503
Phone - 907.261.9704
Fax - 907.562.1297

For metadata information on the South Carolina Data, please contact:

Gloria Forthun
South Carolina Emergency Division (SCEMD)
1100 Fish Hatchery Rd
West Columbia, SC 29172
Phone: 803-737-8588

Purpose:

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date:

Ending_Date:

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate:

East_Bounding_Coordinate:

North_Bounding_Coordinate:

South_Bounding_Coordinate:

1.6 Keywords:

Theme:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Place:

Place_Keyword: USA

Place_Keyword: Alabama

Place_Keyword: Alaska

Place_Keyword: Arizona

Place_Keyword: Arkansas

Place_Keyword: California

Place_Keyword: Colorado

Place_Keyword: Connecticut

Place_Keyword: Delaware

Place_Keyword: District of Columbia

Place_Keyword: Florida

Place_Keyword: Georgia

Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints:
1.8 Use_Constraints:
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:

Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:
3.2 Direct_Spatial_Reference_Method: Point
3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:
4.1.1 Geographic:
Geographic Coordinate System (Longitude/Latitude)
Latitude Resolution: Unknown
Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983
4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description
5.2.1 Entity_and_Attribute_Overview:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
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Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor
Contact Organization Primary:
Contact Address:
Address_Type: mailing address
Address:
City:
State or Province:
Postal Code:
Contact Voice Telephone:
Contact FAX Number:
6.2 Resource Description
N/A
6.3 Distribution Liability
6.4 Standard Order Process
6.5 Custom Order Process
N/A

7. Metadata_Reference_Information

7.1 Metadata_Date:
7.2 Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:
7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata
7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

3. Police Stations

1. Identification_Information:

1.1 Citation:
Citation Information:
Originator:
Publication_Date:
Title: HAZUS-MH: Essential Facilities:
On-line Linkage:
1.2 Description:
Abstract:
Purpose:

1.3 Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date:
Ending_Date:
1.4 Status:
Progress:
Maintenance_and_Update_Frequency:
1.5 Spatial_Domain
Bounding_Coordinates:
West_Bounding_Coordinate:
East_Bounding_Coordinate:
North_Bounding_Coordinate:
South_Bounding_Coordinate:
1.6 Keywords:
Theme:
Theme_Keyword: HAZUS
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Place:
Place_Keyword: USA
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana

Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints:
1.8 Use_Constraints:
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

2. Data_Quality_Information

2.1 Attribute_Accuracy:
2.2 Logical_Consistency_Report:
2.3 Completeness_Report:
2.4 Positional_Accuracy:
2.5 Lineage:

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Point

3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name:

4.2 Vertical_Coordinate_System_Definition:

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor

Contact Organization Primary:

Contact Address:

Address_Type: mailing address

Address:

City:

State or Province:

Postal Code:

Contact Voice Telephone:

Contact FAX Number:

6.2 Resource Description

N/A

6.3 Distribution Liability
6.4 Standard Order Process
6.5 Custom Order Process
N/A

7. Metadata_Reference_Information

7.1 Metadata_Date:
7.2 Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:
7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata
7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

4. Fire Stations

1. Identification_Information:

1.1 Citation:
Citation Information:
Originator:
Publication_Date:
Title: HAZUS-MH: Essential Facilities:
On-line Linkage:
1.2 Description:
Abstract:
Purpose:
1.3 Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date:
Ending_Date:
1.4 Status:
Progress: Complete
Maintenance_and_Update_Frequency:
1.5 Spatial_Domain
1.5 Spatial_Domain
Bounding_Coordinates:
West_Bounding_Coordinate:
East_Bounding_Coordinate:
North_Bounding_Coordinate:
South_Bounding_Coordinate:
1.6 Keywords:
Theme:
Theme_Keyword:

Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:

Place:

Place_Keyword: USA
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee

Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints:
1.8 Use_Constraints:
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:
3.2 Direct_Spatial_Reference_Method: Point
3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:
4.1.1 Geographic:
Geographic Coordinate System (Longitude/Latitude)
Latitude Resolution: Unknown
Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983
4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description
5.2.1 Entity_and_Attribute_Overview:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor

Contact Organization Primary:

Contact Address:

Address_Type: mailing address

Address:

City:

State or Province:

Postal Code

Contact Voice Telephone:

Contact FAX Number:

6.2 Resource Description

N/A

6.3 Distribution Liability

6.4 Standard Order Process

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person:

Contact_Address:

Address_Type: mailing and physical address

Address:

City:

State:

Postal Code:

Contact_Voice_Telephone:

Contact_Electronic_Mail_Address:

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

5. Emergency Operations Centers

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator:

Publication_Date:

Title: HAZUS-MH: Essential Facilities:

On-line Linkage:

1.2 Description:

Abstract:

Purpose:

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: Unknown

Ending_Date:

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency:

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate:

East_Bounding_Coordinate:

North_Bounding_Coordinate:

South_Bounding_Coordinate:

1.6 Keywords:

Theme:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Place:

Place_Keyword: USA

Place_Keyword: Alabama

Place_Keyword: Alaska

Place_Keyword: Arizona

Place_Keyword: Arkansas

Place_Keyword: California

Place_Keyword: Colorado

Place_Keyword: Connecticut

Place_Keyword: Delaware

Place_Keyword: District of Columbia

Place_Keyword: Florida

Place_Keyword: Georgia

Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints:
1.8 Use_Constraints:
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:

Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

2. Data_Quality_Information
2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information
3.1 Indirect_Spatial_Reference:
3.2 Direct_Spatial_Reference_Method: Point
3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information
4.1 Horizontal_Coordinate_System_Definition:
4.1.1 Geographic:
Geographic Coordinate System (Longitude/Latitude)
Latitude Resolution: Unknown
Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983
4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:
5.2 Overview_Description
5.2.1 Entity_and_Attribute_Overview:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor

Contact Organization Primary:

Contact Address:

Address_Type: mailing address
Address:
City:
State or Province:
Postal Code:

Contact Voice Telephone:
Contact FAX Number:

6.2 Resource Description

N/A

6.3 Distribution Liability

6.4 Standard Order Process

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20010301

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person:

Contact_Address:

Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:

Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

Transportation Systems:

1. Highway Segments

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: PBS&J Atlanta GA, developed this database under contract with te National Institute of Building Sciences.

Publication_Date:

Title: HAZUS-MH: Transportation Lifelines: Highway Segments Database

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

This database was developed with data from the 2000 version of TIGER/Line files, produced by the U.S. Census Bureau. PBS&J extracted the major roads segments for Hazus-MH.

The contact information for the Census Bureau is: U.S. Department of Commerce, U.S. Census Bureau, Geography Division. 8903 Presidential Parkway, Room 303 WP I, Upper Marlboro, Maryland, 20772. Telephone: (301) 457-1128. E-Mail Address: tiger@census.gov. The U.S. Census Bureau website address is http://www.census.gov/geo/www/tiger/index.html

Data provided by URS Corporation was incorporated for the state of Alaska. For each item or feature provided, a note was included under the Comment field. For metadata information about this data, please contact:

For metadata information on the South Carolina Data, please contact:

Gloria ForthunSouth Carolina Emergency Division (SCEMD)

1100 Fish Hatchery Rd

West Columbia, SC 29172

Phone: 803-737-8588

Purpose:

This data is used to estimate the damage (and resulting loss of functionality) associated with Highway Segments for a given flood, hurricane, and/or earthquake scenario. The damage estimates are subsequently used to compute the estimated cost to repair or replace the damaged transportation network of the region.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: Unknown

Ending_Date: 20000000

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: - 170.837

East_Bounding_Coordinate: 144.914

North_Bounding_Coordinate: 65.827

South_Bounding_Coordinate: -14.378

1.6 Keywords:

Theme:

Theme_Keyword: HAZUS

Theme_Keyword: HAZUS-MH

Theme_Keyword: Inventory

Theme_Keyword: Transportation Lifelines

Theme_Keyword Highways

Place:

Place_Keyword: USA

Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia

Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints: None

1.8 Use_Constraints: None

1.9 Point_of_Contact

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report: Unknown

2.3 Completeness_Report: Unknown

2.4 Positional_Accuracy: The digital data source from were those data sets were extracted was the 2000 Version of Census TIGER/LineT files. Because the U.S. Census Bureau's mission is "to count and profile the Nation's people and institutions" it dose not require high levels of positional accuracy for its geographic products such as TIGER/LineT files . Showing relative position of elements is the major in its files and maps.

Census TIGER/Line (r) files is the outcome of a variety of source (USGS topographic maps, GBF/DIME-files, aerial photography, etc.). The U.S. Census Bureau express that they cannot specify the accuracy of feature updates added by its field staff or of features derived from the GBF/DIME-Files or other map or digital sources. Only the positional accuracy of USGS sources that accomplish with the United States National Map Accuracy Standards can be approximate. The positional accuracy varies with the scale of the source map used (such as 1:100,000, 1:24,000, 1: 63,000, 1:20,000 and 1:30,000):

2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Line

3.3 Point_and_Vector_Object_Information: 169,082

4. Spatial_Reference_Information

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

The Highway segments database file and the individual state and territory files contain 10 fields.

Entity_and_Attribute_Detail_Citation: HighwaySegId	HAZUS-MH Internal ID
Entity_and_Attribute_Detail_Citation: SegmentClass	Analysis Class
Entity_and_Attribute_Detail_Citation: CountyFips	County Fips
Entity_and_Attribute_Detail_Citation: Name	Highway Segment Name
Entity_and_Attribute_Detail_Citation: Owner	Owner of Highway Segment
Entity_and_Attribute_Detail_Citation: Length	Section Length (km)
Entity_and_Attribute_Detail_Citation: Traffic	Daily Traffic (cars/day)
Entity_and_Attribute_Detail_Citation: Cost	Replacement Cost (thous. $)
Entity_and_Attribute_Detail_Citation: NumLanes	Number of lanes
Entity_and_Attribute_Detail_Citation: Pavement	Pavement type
Entity_and_Attribute_Detail_Citation: Width	Road width (m)
Entity_and_Attribute_Detail_Citation: Capacity	Daily Capacity (cars/day)
Entity_and_Attribute_Detail_Citation: Comment	Misc. Comments

6. Distribution Information

6.1 Distributor

Contact Organization Primary: FEMA Distribution Center

Contact Address:

Address_Type: mailing address

Address: P.O. Box 2012

City: Jessup

State or Province: MD

Postal Code: 20794-2012

Contact Voice Telephone: 800-480-2530

Contact FAX Number: 301-362-5335

6.2 Resource Description

N/A

6.3 Distribution Liability

No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will replace if the product is determined unusable, or when the physical medium is delivered in damaged condition.

6.4 Standard Order Process

The HAZUS order form can be downloaded from the FEMA website (http://www.fema.gov/hazus/hazus6c.htm). Completed order forms should be mailed or faxed to the FEMA distribution center.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20030000

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences

1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

2. Railway Track Segments

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: PBS&J, Atlanta GA, developed this database under contract to the National Institute of Building Sciences.

Publication_Date:

Title: HAZUS-MH: Transportation Lifelines: Railway Track Segments Database

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

This database was developed with data from the National Rail Network database, obtained from the Bureau of Transportation Statistics (US Department of Transportation). PBS&J converted Railway Track Segments features from this database into a format that was compatible with the HAZUS software from the Bureau of Transportation Statistics (US Department of Transportation).

The contact information for the BTC is : Bureau of Transportation Statistics, 400 7th Street, SW • Room 3103 • Washington, DC 20590 (L'Enfant Plaza Metrorail Station (7th and D Streets exit), 800-853-1351. The BTC website address is http://www.bts.gov/gis/

For metadata information on the South Carolina Data, please contact:

Gloria ForthunSouth Carolina Emergency Division (SCEMD)

1100 Fish Hatchery Rd

West Columbia, SC 29172

Phone: 803-737-8588

Purpose:

This data is used to estimate the damage (and resulting loss of functionality) associated with Railway Track Segments for a given flood, hurricane, and/or earthquake scenario. The damage estimates are subsequently used to compute the estimated cost to repair or replace the damaged transportation network of the region.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: Unknown

Ending_Date: 20000000

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: - 170.837

East_Bounding_Coordinate: 144.914

North_Bounding_Coordinate: 65.827

South_Bounding_Coordinate: -14.378

1.6 Keywords:

Theme:

Theme_Keyword: HAZUS

Theme_Keyword: HAZUS-MH

Theme_Keyword: Inventory

Theme_Keyword: Transportation Lifelines

Theme_Keyword Railway

Theme_Keyword: Railway Track

Place:

Place_Keyword: USA
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia

Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints: None
1.8 Use_Constraints: None
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:
Contact_Person: Philip Schneider
Contact_Address:
Address_Type: mailing and physical address
Address:
National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700
City: Washington
State: D.C.
Postal Code: 20005
Contact_Voice_Telephone: 202-289-7800
Contact_Electronic_Mail_Address: pschneider@nibs.org

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown.
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:
3.2 Direct_Spatial_Reference_Method: Line
3.3 Point_and_Vector_Object_Information: 169,082

4. Spatial_Reference_Information

4.1.1 Geographic:
Geographic Coordinate System (Longitude/Latitude)
Latitude Resolution: Unknown
Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description
5.2.1 Entity_and_Attribute_Overview:
The Railway Tracks database file and the individual state and territory files contain 10 fields.

Entity_and_Attribute_Detail_Citation: RailwaylSegId	HAZUS-MH Internal ID
Entity_and_Attribute_Detail_Citation: SegmentClass	Analysis Class
Entity_and_Attribute_Detail_Citation: CountyFips	County Fips
Entity_and_Attribute_Detail_Citation: Name	Track Segment Name

Entity_and_Attribute_Detail_Citation: Owner	Owner of Track Segment
Entity_and_Attribute_Detail_Citation: Length	Section Length (km)
Entity_and_Attribute_Detail_Citation: NumTracks	Number of Tracks
Entity_and_Attribute_Detail_Citation: Traffic	Daily Traffic (trains/day)
Entity_and_Attribute_Detail_Citation: Cost	Replacement Cost (thous. $)
Entity_and_Attribute_Detail_Citation: Comment	Misc. Comments

6. Distribution Information

6.1 Distributor

Contact Organization Primary: FEMA Distribution Center

Contact Address:

Address_Type: mailing address

Address: P.O. Box 2012

City: Jessup

State or Province: MD

Postal Code: 20794-2012

Contact Voice Telephone: 800-480-2530

Contact FAX Number: 301-362-5335

6.2 Resource Description

N/A

6.3 Distribution Liability

No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will replace if the product is determined unusable, or when the physical medium is delivered in damaged condition.

6.4 Standard Order Process

The HAZUS order form can be downloaded from the FEMA website (http://www.fema.gov/hazus/hazus6c.htm). Completed order forms should be mailed or faxed to the FEMA distribution center.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20030000

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences

1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

3. Airports

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: PBS&J, Atlanta GA, developed this database under contract to the National Institute of Building Sciences.

Publication_Date:

Title: HAZUS-MH: Transportation Lifelines: Airport Facilities Database

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

This database was developed from data obtained from the Bureau of Transportation Statistics (US Department of Transportation), Federal Aviation Administration. PBS&J converted to database into a format that was compatible with the HAZUS software. Heliports were not included. The contact information for the BTC is : Bureau of Transportation Statistics, 400 7th Street, SW • Room 3103 • Washington, DC 20590 (L'Enfant Plaza Metrorail Station (7th and D Streets exit), 800-853-1351. The BTC website address is http://www.bts.gov/gis/

Data provided by URS Corporation was incorporated for the state of Alaska. For each item or feature provided, a note was included under the Comment field. For metadata information about this data, please contact:

Laura Young

URS Corporation

2700 Gambell, Suite 200

Anchorage, Alaska 99503

Phone - 907.261.9704

Fax - 907.562.1297

For metadata information on the South Carolina Data, please contact:

Gloria ForthunSouth Carolina Emergency Division (SCEMD)

1100 Fish Hatchery Rd

West Columbia, SC 29172

Phone: 803-737-8588

Purpose:

This data is used to estimate the damage (and resulting loss of functionality) associated with airport facilities for a given flood, hurricane, and/or earthquake scenario. The damage estimates are subsequently used to compute the estimated cost to repair or replace the damaged airport facilities.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 19951000

Ending_Date: 19990100

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: - 177.379520

East_Bounding_Coordinate: -174.113620

North_Bounding_Coordinate: 71.285450

South_Bounding_Coordinate: -14.331020

1.6 Keywords:

Theme:

Theme_Keyword: HAZUS

Theme_Keyword: HAZUS-MH

Theme_Keyword: Inventory

Theme_Keyword: Transportation Lifelines

Theme_Keyword: Airport Facilities
Theme_Keyword: Airports

Place:

Place_Keyword: USA
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont

Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints: None

1.8 Use_Constraints: None

1.9 Point_of_Contact

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report: Unknown

2.3 Completeness_Report: Unknown

2.4 Positional_Accuracy: As reported by Bureau of Transportation Statistics: the Horizontal positional accuracy is based on coordinate data provided in the NFDC 5010 database. These coordinate data identify the approximate location of the Airport Reference Point (ARP) as reported by the landing facility on the NFDC 5010 form. According to NFDC guidelines, the location of the ARP should be reported to a horizontal accuracy of one arc second of latitude and longitude. The accuracy of these reported coordinates are not verified by FAA. The records were loaded into a GIS and checked for any unusual or obviously erroneous locations.

2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Point

3.3 Point_and_Vector_Object_Information: 13,722

4. Spatial_Reference_Information

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

The airport facilities database file and the individual state and territory files contain 21 fields.

Entity_and_Attribute_Detail_Citation: AirportFltyId	HAZUS-MH Internal ID
Entity_and_Attribute_Detail_Citation: TranspFcltyClass	Analysis Class
Entity_and_Attribute_Detail_Citation: Tract	Census Tract
Entity_and_Attribute_Detail_Citation: Name	Facility Name
Entity_and_Attribute_Detail_Citation: Address	Facility Address
Entity_and_Attribute_Detail_Citation: City	City
Entity_and_Attribute_Detail_Citation: Statea	State
Entity_and_Attribute_Detail_Citation: Zipcode	ZIP Code
Entity_and_Attribute_Detail_Citation: Owner	Facility Owner
Entity_and_Attribute_Detail_Citation: Contact	Contact Person
Entity_and_Attribute_Detail_Citation: PhoneNumber	Telephone Number
Entity_and_Attribute_Detail_Citation: Use	Function of Facility
Entity_and_Attribute_Detail_Citation: YearBuilt	Year Facility Was Built
Entity_and_Attribute_Detail_Citation: Cost	Replacement Cost (thous. $)
Entity_and_Attribute_Detail_Citation: Cargo	Capacity (tons/day)
Entity_and_Attribute_Detail_Citation: NumFlights	Capacity (flights/day)
Entity_and_Attribute_Detail_Citation: NumPassengers	Capacity (passengers/day)
Entity_and_Attribute_Detail_Citation: BackupPower	Back-up Power (Y = Yes, N= No)
Entity_and_Attribute_Detail_Citation: Latitude	Latitude of Facility
Entity_and_Attribute_Detail_Citation: Longitude	Longitude of Facility
Entity_and_Attribute_Detail_Citation: Comment	Misc. Comments

6. Distribution Information

6.1 Distributor

Contact Organization Primary: FEMA Distribution Center

Contact Address:

Address_Type: mailing address

Address: P.O. Box 2012

City: Jessup

State or Province: MD

Postal Code: 20794-2012

Contact Voice Telephone: 800-480-2530

Contact FAX Number: 301-362-5335

6.2 Resource Description

N/A

6.3 Distribution Liability

No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will replace if the product is determined unusable, or when the physical medium is delivered in damaged condition.

6.4 Standard Order Process

The HAZUS order form can be downloaded from the FEMA website (http://www.fema.gov/hazus/hazus6c.htm). Completed order forms should be mailed or faxed to the FEMA distribution center.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20030000

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address
Address:
National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700
City: Washington
State: D.C.
Postal Code: 20005
Contact_Voice_Telephone: 202-289-7800
Contact_Electronic_Mail_Address: pschneider@nibs.org

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

4. Port Facilities

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: PBS&J, Atlanta GA, developed this database under contract to the National Institute of Building Sciences.

Publication_Date:

Title: HAZUS-MH: Transportation Lifelines: Port Facilities Database

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

This database was developed from the dataset Port and Waterway Facilities obtained from the U.S. Army Corps of Engineers/CEIWR, Navigation Data Center, Ports and Waterways Division. PBS&J converted to database into a format that was compatible with the HAZUS software. The contact information for the USACE is : Department of the Army Corps of Engineers, CEIWR-NDC-N, 7701 Telegraph Road, Alexandria, Virginia 22315-3868. The USACE website address is http://www.usace.army.mil/

Data provided by URS Corporation was incorporated for the state of Alaska. For each item or feature provided, a note was included under the Comment field. For metadata information about this data, please contact:

Laura Young
URS Corporation
2700 Gambell, Suite 200
Anchorage, Alaska 99503
Phone - 907.261.9704
Fax - 907.562.1297

For metadata information on the South Carolina Data, please contact:

Gloria ForthunSouth Carolina Emergency Division (SCEMD)
1100 Fish Hatchery Rd
West Columbia, SC 29172
Phone: 803-737-8588

Purpose:

This data is used to estimate the damage (and resulting loss of functionality) associated with port facilities for a given flood, hurricane, and/or earthquake scenario. The damage estimates are subsequently used to compute the estimated cost to repair or replace the damaged port facilities.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 19870000
Ending_Date: 20000100

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: - 176.653
East_Bounding_Coordinate: -68.775
North_Bounding_Coordinate: 66.90833
South_Bounding_Coordinate: -19.642

1.6 Keywords:

Theme:

Theme_Keyword: HAZUS
Theme_Keyword: HAZUS-MH
Theme_Keyword: Inventory
Theme_Keyword: Transportation Lifelines
Theme_Keyword: Port Facilities
Theme_Keyword: Ports

Place:

Place_Keyword: USA
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio

Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints: None
1.8 Use_Constraints: None
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:
Contact_Person: Philip Schneider
Contact_Address:
Address_Type: mailing and physical address
Address:
National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700
City: Washington
State: D.C.
Postal Code: 20005
Contact_Voice_Telephone: 202-289-7800
Contact_Electronic_Mail_Address: pschneider@nibs.org

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown.
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:
3.2 Direct_Spatial_Reference_Method: Point
3.3 Point_and_Vector_Object_Information: 8,138

4. Spatial_Reference_Information

4.1.1 Geographic:
Geographic Coordinate System (Longitude/Latitude)
Latitude Resolution: Unknown

Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

The port facilities database file and the individual state and territory files contain 21 fields.

Entity_and_Attribute_Detail_Citation: PortFltyId	HAZUS-MH Internal ID
Entity_and_Attribute_Detail_Citation: TranspFcltyClass	Analysis Class
Entity_and_Attribute_Detail_Citation: Tract	Census Tract
Entity_and_Attribute_Detail_Citation: Name	Facility Name
Entity_and_Attribute_Detail_Citation: Address	Facility Address
Entity_and_Attribute_Detail_Citation: City	City
Entity_and_Attribute_Detail_Citation: Statea	State
Entity_and_Attribute_Detail_Citation: Zipcode	ZIP Code
Entity_and_Attribute_Detail_Citation: Owner	Facility Owner
Entity_and_Attribute_Detail_Citation: Contact	Contact Person
Entity_and_Attribute_Detail_Citation: PhoneNumber	Telephone Number
Entity_and_Attribute_Detail_Citation: Use	Function of Facility
Entity_and_Attribute_Detail_Citation: YearBuilt	Year Facility Was Built
Entity_and_Attribute_Detail_Citation: BackupPower	Back-up Power
Entity_and_Attribute_Detail_Citation: Cost	Replacement Cost (thous. $)
Entity_and_Attribute_Detail_Citation: Capacity	Capacity (tons/day)
Entity_and_Attribute_Detail_Citation: NumBerths	Number of Berths
Entity_and_Attribute_Detail_Citation: NumCranes	Number of Cranes
Entity_and_Attribute_Detail_Citation: Latitude	Latitude of Facility
Entity_and_Attribute_Detail_Citation: Longitude	Longitude of Facility
Entity_and_Attribute_Detail_Citation: Comment	Misc. Comments

6. Distribution Information

6.1 Distributor

Contact Organization Primary: FEMA Distribution Center

Contact Address:

Address_Type: mailing address
Address: P.O. Box 2012
City: Jessup
State or Province: MD
Postal Code: 20794-2012

Contact Voice Telephone: 800-480-2530
Contact FAX Number: 301-362-5335

6.2 Resource Description

N/A

6.3 Distribution Liability

No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will replace if the product is determined unusable, or when the physical medium is delivered in damaged condition.

6.4 Standard Order Process

The HAZUS order form can be downloaded from the FEMA website (http://www.fema.gov/hazus/hazus6c.htm). Completed order forms should be mailed or faxed to the FEMA distribution center.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20030000

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences

1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

Utility Systems

1. Water Treatment Plants/Potable Water Facilities

1. Identification_Information:

1.1 Citation:
- Citation Information:
  - Originator:
  - Publication_Date:
  - Title: HAZUS-MH: Utility Lifelines:
  - On-line Linkage:

1.2 Description:
- Abstract:
- Purpose:

1.3 Time_Period_of_Content:
- Time_Period_Information:
  - Range_of_Dates/Times:
    - Beginning_Date: Unknown
    - Ending_Date:

1.4 Status:
- Progress: Complete
- Maintenance_and_Update_Frequency:

1.5 Spatial_Domain
- Bounding_Coordinates:
  - West_Bounding_Coordinate:
  - East_Bounding_Coordinate:
  - North_Bounding_Coordinate:
  - South_Bounding_Coordinate:

1.6 Keywords:
- Theme:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
- Place:
  - Place_Keyword: USA
  - Place_Keyword: Alabama
  - Place_Keyword: Alaska
  - Place_Keyword: Arizona
  - Place_Keyword: Arkansas
  - Place_Keyword: California
  - Place_Keyword: Colorado
  - Place_Keyword: Connecticut
  - Place_Keyword: Delaware
  - Place_Keyword: District of Columbia
  - Place_Keyword: Florida
  - Place_Keyword: Georgia

Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints:
1.8 Use_Constraints:
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:

Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:
3.2 Direct_Spatial_Reference_Method: Point
3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:
4.1.1 Geographic:
Geographic Coordinate System (Longitude/Latitude)
Latitude Resolution: Unknown
Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983
4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description
5.2.1 Entity_and_Attribute_Overview:
The Potable Water Facilities database file and the individual state and territory files contain 24 fields.

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor

Contact Organization Primary:

Contact Address:

Address_Type: mailing address
Address:
City:
State or Province:
Postal Code:

Contact Voice Telephone:
Contact FAX Number:

6.2 Resource Description

N/A

6.3 Distribution Liability

6.4 Standard Order Process

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date:

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person:

Contact_Address:

Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:

Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

2. Waste Water Treatment Plants

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator:
Publication_Date:
Title: HAZUS-MH: Utility Lifelines:
On-line Linkage:

1.2 Description:

Abstract:
Purpose:

1.3 Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: Unknown
Ending_Date: 2001
1.4 Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed
1.5 Spatial_Domain
Bounding_Coordinates:
West_Bounding_Coordinate:
East_Bounding_Coordinate:
North_Bounding_Coordinate:
South_Bounding_Coordinate:
1.6 Keywords:
Theme:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Place:
Place_Keyword: USA
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana

Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints:
1.8 Use_Constraints:
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Point

3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor

Contact Organization Primary:

Contact Address:

Address_Type: mailing address

Address:

City:

State or Province:

Postal Code:

Contact Voice Telephone:

Contact FAX Number:

6.2 Resource Description

N/A

6.3 Distribution Liability

6.4 Standard Order Process

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date:

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person:

Contact_Address:

Address_Type: mailing and physical address

Address:

City:

State:

Postal Code:

Contact_Voice_Telephone:

Contact_Electronic_Mail_Address:

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

3. Oil Facilities

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator:

Publication_Date:

Title: HAZUS-MH: Utility Lifelines:

On-line Linkage:

1.2 Description:

Abstract:

Purpose:

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: Unknown

Ending_Date:

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate

East_Bounding_Coordinate:

North_Bounding_Coordinate:

South_Bounding_Coordinate:

1.6 Keywords:

Theme:

Theme_Keyword:

Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:
Theme_Keyword:

Place:

Place_Keyword: USA
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii
Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota

Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints:
1.8 Use_Constraints:
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:
3.2 Direct_Spatial_Reference_Method: Point
3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:
4.1.1 Geographic:
Geographic Coordinate System (Longitude/Latitude)
Latitude Resolution: Unknown
Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983
4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description
5.2.1 Entity_and_Attribute_Overview:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor

Contact Organization Primary:

Contact Address:

Address_Type: mailing address
Address:
City:
State or Province:
Postal Code:

Contact Voice Telephone:
Contact FAX Number:

6.2 Resource Description

N/A

6.3 Distribution Liability

6.4 Standard Order Process

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date:

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person:

Contact_Address:

Address_Type: mailing and physical address
Address:
City:
State:
Postal Code:

Contact_Voice_Telephone
Contact_Electronic_Mail_Address:

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

4. Natural Gas Facilities

1. Identification_Information:

1.1 Citation:
- Citation Information:
  - Originator:
  - Publication_Date:
  - Title: HAZUS-MH:
  - On-line Linkage:

1.2 Description:
- Abstract:
- Purpose:

1.3 Time_Period_of_Content:
- Time_Period_Information:
  - Range_of_Dates/Times:
    - Beginning_Date:
    - Ending_Date:

1.4 Status:
- Progress: Complete
- Maintenance_and_Update_Frequency:

1.5 Spatial_Domain
- Bounding_Coordinates:
  - West_Bounding_Coordinate:
  - East_Bounding_Coordinate:
  - North_Bounding_Coordinate:
  - South_Bounding_Coordinate:

1.6 Keywords:
- Theme:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
  - Theme_Keyword:
- Place:
  - Place_Keyword: USA
  - Place_Keyword: Alabama
  - Place_Keyword: Alaska
  - Place_Keyword: Arizona
  - Place_Keyword: Arkansas
  - Place_Keyword: California
  - Place_Keyword: Colorado
  - Place_Keyword: Connecticut
  - Place_Keyword: Delaware
  - Place_Keyword: District of Columbia
  - Place_Keyword: Florida
  - Place_Keyword: Georgia
  - Place_Keyword: Hawaii
  - Place_Keyword: Idaho
  - Place_Keyword: Illinois
  - Place_Keyword: Indiana

Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: U.S. Virgin Islands
Place_Keyword: Guam
Place_Keyword: Northern Mariana Island
Place_Keyword: American Samoa

1.7 Access_Constraints:
1.8 Use_Constraints:
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Address:
Address_Type: mailing and physical address
Address:

City:
State:
Postal Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:
3.2 Direct_Spatial_Reference_Method: Point
3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:
4.1.1 Geographic:
Geographic Coordinate System (Longitude/Latitude)
Latitude Resolution: Unknown
Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983
4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description
5.2.1 Entity_and_Attribute_Overview:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor
Contact Organization Primary:

Contact Address:

Address_Type: mailing address

Address

City:

State or Province:

Postal Code:

Contact Voice Telephone:

Contact FAX Number:

6.2 Resource Description

N/A

6.3 Distribution Liability

6.4 Standard Order Process

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date:

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person:

Contact_Address:

Address_Type: mailing and physical address

Address:

City:

State:

Postal Code:

Contact_Voice_Telephone:

Contact_Electronic_Mail_Address:

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

High Potential Loss Facilities

1. Hazardous Materials Sites

1. Identification_Information:

1.1 Citation:
- Citation Information:
  - Originator:
  - Publication_Date:
  - Title:

1.2 Description:
- Abstract:
- Purpose:

1.3 Time_Period_of_Content:
- Time_Period_Information:
  - Range_of_Dates/Times:
    - Beginning_Date:
    - Ending_Date:

1.4 Status:
- Progress: Complete
- Maintenance_and_Update_Frequency:

1.5 Spatial_Domain
- Bounding_Coordinates:
  - West_Bounding_Coordinate:
  - East_Bounding_Coordinate:
  - North_Bounding_Coordinate:
  - South_Bounding_Coordinate:

1.6 Keywords:
- Theme:
  - Theme_Keyword:
  - Theme_Keyword:
- Place:
  - Place_Keyword:
  - Place_Keyword:

1.7 Access_Constraints:

1.8 Use_Constraints:

1.9 Point_of_Contact

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown

2.2 Logical_Consistency_Report: Unknown

2.3 Completeness_Report: Unknown

2.4 Positional_Accuracy: Unknown.

2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

- 3.1 Indirect_Spatial_Reference:
- 3.2 Direct_Spatial_Reference_Method: Point
- 3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

- 4.1.1 Geographic:
- Geographic Coordinate System (Longitude/Latitude)
- Latitude Resolution: Unknown
- Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition:

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:
Entity_and_Attribute_Detail_Citation:

2. Dams

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: U.S. Army Corps of Engineers in cooperation with FEMA's National Dam Safety Program

Publication_Date: 20070322

Title: HAZUS-MH: High Potential Loss Facilities: National Inventory of Dams

On-line Linkage: http://www.esri.com/metadata/esriprof80.html

1.2 Description:

Abstract:

The National Inventory of Dams database contains information on 82,642 dams throughout the United States and its territories. The National Inventory of Dams began in 1972 with the National Dam Inspection Act and continues to be updated with the Water Resources Development Act of 1986 and 1996. The Corps of Engineers is authorized to maintain and publish the inventory. Significant changes have been made to the inventory data over the last 20 years, including the addition of new dam records and removal of breached dams, and duplicate dam records. The data is submitted from all 50 states, US territories and 16 federal agencies. The NID includes all high and significant hazard potential classification dams. Low hazard potential dams must exceed 25 feet in height and15 acre-feet in storage or exceed 50 acre-feet in storage and 6 feet in height. This inclusion criteria is applied to all dams submitted to the NID. The Corps calculates two fields, NID height and NID storage, which are the maximum values in their multiple respective fields and these values are used in the inclusion criteria process. Since the last update in 2005, there have been no field additions or deletions. Three data fields were collected by the Corps but no published in the NID: Nearest City, Distance to Nearest City and Hazard Potential Classification. All 110th congressional information contained in the NID was populated based on a GIS query of the dam coordinates. If a dam has no coordinates, no congressional information is associated with that dam.

Purpose:

The 2007 National Inventory of Dams is provided as an update to the 2005 National Inventory of Dams. The database record for a dam in the National Inventory consists of data from participating agencies submitted in accordance with the update methodology, the name of the agency providing data and the date the data was submitted. About 20,000 records were merged from multiple data sources.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20050805

Ending_Date: 20060628

1.4 Status:

Progress: Complete but not publicly published

Maintenance_and_Update_Frequency: About every two years

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -94.026000

East_Bounding_Coordinate: - 89.793330

North_Bounding_Coordinate: 33.016800

South_Bounding_Coordinate: 29.733000

1.6 Keywords:

Theme:

Theme_Keyword: None

Theme_Keyword: hydrography

Theme_Keyword: dams

Theme_Keyword: dam safety

Theme_Keyword: Tri - Service Spatial Data Standard

Theme_Keyword: Hydrography

Place:

Place_Keyword: None

Place_Keyword: USA

Place_Keyword: Alabama

Place_Keyword: Alaska

Place_Keyword: Arizona

Place_Keyword: Arkansas

Place_Keyword: California

Place_Keyword: Colorado

Place_Keyword: Connecticut

Place_Keyword: Delaware

Place_Keyword: District of Columbia

Place_Keyword: Florida

Place_Keyword: Georgia

Place_Keyword: Hawaii

Place_Keyword: Idaho

Place_Keyword: Illinois

Place_Keyword: Indiana

Place_Keyword: Iowa

Place_Keyword: Kansas

Place_Keyword: Kentucky

Place_Keyword: Louisiana

Place_Keyword: Maine

Place_Keyword: Maryland

Place_Keyword: Massachusetts

Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New Mexico
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Puerto Rico
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virgin Islands
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming

1.7 Access_Constraints: None
1.8 Use_Constraints: None
1.9 Point_of_Contact
Contact_Information: U.S. Army Corps of Engineers
Contact_Person_Primary:
Contact_Person: National Inventory of Dams
Contact_Address:
Address_Type: mailing and physical address
Address:
City: 7701 Telegraph Road
State: VA
Postal Code: 22315
Contact_Voice_Telephone: 703-428-6820
Contact_Electronic_Mail_Address: rebecca.ragon@usace.army.mil

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown.
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:

3.2 Direct_Spatial_Reference_Method: Point

3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1.1 Geographic:

Geographic Coordinate System (Longitude/Latitude)

Latitude Resolution: Unknown

Longitude Resolution: Unknown

Geographic Coordinate Units: Decimal Degrees

4.1.4 Geodetic_Model:

Horizontal Datum Name: D_WGS_1984

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

The National Inventory of Dams database contains over 60 data fields. Definitions for each field can be found in the NID data dictionary, //crunch.tec.army.mil/nid/webpages/niddatadictiona ry.html. Entity_and_Attribute_Detail_Citation: RecordID

Entity_and_Attribute_Detail_Citation: Dam_name

Entity_and_Attribute_Detail_Citation: Other_dam_name

Entity_and_Attribute_Detail_Citation: Dam_former_name

Entity_and_Attribute_Detail_Citation: StateID

Entity_and_Attribute_Detail_Citation: NIDID

Entity_and_Attribute_Detail_Citation: Longitude

Entity_and_Attribute_Detail_Citation: Latitude

Entity_and_Attribute_Detail_Citation: Section

Entity_and_Attribute_Detail_Citation: County

Entity_and_Attribute_Detail_Citation: River

Entity_and_Attribute_Detail_Citation: City

Entity_and_Attribute_Detail_Citation: Distance

Entity_and_Attribute_Detail_Citation: Owner_name

Entity_and_Attribute_Detail_Citation: Owner_type

Entity_and_Attribute_Detail_Citation: Dam_designer

Entity_and_Attribute_Detail_Citation: Private_dam

Entity_and_Attribute_Detail_Citation: Dam_type

Entity_and_Attribute_Detail_Citation: Core

Entity_and_Attribute_Detail_Citation: Foundation

Entity_and_Attribute_Detail_Citation: Purposes

Entity_and_Attribute_Detail_Citation: Year_completed

Entity_and_Attribute_Detail_Citation: Year_modified

Entity_and_Attribute_Detail_Citation: Dam_length

Entity_and_Attribute_Detail_Citation: Dam_height

Entity_and_Attribute_Detail_Citation: Structural_height

Entity_and_Attribute_Detail_Citation: Hydraulic_height

Entity_and_Attribute_Detail_Citation: NID_height

Entity_and_Attribute_Detail_Citation: Max_discharge

Entity_and_Attribute_Detail_Citation: Max_storage

Entity_and_Attribute_Detail_Citation: Normal_storage

Entity_and_Attribute_Detail_Citation: NID_storage

Entity_and_Attribute_Detail_Citation: Surface_area

Entity_and_Attribute_Detail_Citation: Drainage_area
Entity_and_Attribute_Detail_Citation: Hazard
Entity_and_Attribute_Detail_Citation: EAP
Entity_and_Attribute_Detail_Citation: Inspection_date
Entity_and_Attribute_Detail_Citation: Inspection_frequency
Entity_and_Attribute_Detail_Citation: State_reg_dam
Entity_and_Attribute_Detail_Citation: State_reg_agency
Entity_and_Attribute_Detail_Citation: Spillway_type
Entity_and_Attribute_Detail_Citation: Spillway_width
Entity_and_Attribute_Detail_Citation: Outlet_gates
Entity_and_Attribute_Detail_Citation: Volume
Entity_and_Attribute_Detail_Citation: Number_of_locks
Entity_and_Attribute_Detail_Citation: Fed_funding
Entity_and_Attribute_Detail_Citation: Fed_design
Entity_and_Attribute_Detail_Citation: Fed_construction
Entity_and_Attribute_Detail_Citation: Fed_regulatory
Entity_and_Attribute_Detail_Citation: Fed_inspection
Entity_and_Attribute_Detail_Citation: Fed_owner
Entity_and_Attribute_Detail_Citation: Fed_other
Entity_and_Attribute_Detail_Citation: Source_agency
Entity_and_Attribute_Detail_Citation: State
Entity_and_Attribute_Detail_Citation: Submit_date
Entity_and_Attribute_Detail_Citation: Cong_name
Entity_and_Attribute_Detail_Citation: Party
Entity_and_Attribute_Detail_Citation: Cong_dist

6. Distribution Information

6.1 Distributor

Contact Organization Primary: US Army Corps of Engineers

Contact Address:

Address_Type: mailing address
Address: 7701 Telegraph Road
City: Alexandria
State or Province: VA
Postal Code: 22315

Contact Voice Telephone: 703-428-6820
Contact FAX Number:

6.2 Resource Description

N/A

6.3 Distribution Liability

N/A

6.4 Standard Order Process

N/A

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20070322

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person:

Contact_Address:

Address_Type: mailing and physical address
Address:
7701 Telegraph Road
City: Alexandria
State: VA
Postal Code: 22315
Contact_Voice_Telephone: 703-428-6820
Contact_Electronic_Mail_Address: rebecca.ragon@usace.army.mil
7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata
7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

Hazards

Hurricane

1. Essential Facilities

(NOTE: The following metadata is applied to all HAZUS essential facilities; medical care, school, police station, fire station, and emergency operation center)

Facilities Hurricane Specific Attributes

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: Applied Research Associates, Inc., Raleigh, NC, developed this database under contract to the National Institute of Building Sciences.

Publication_Date: 20030000

Title: HAZUS-MH: Essential Facilities: Facilities Hurricane Specific Attributes Database

On-line Linkage: http://www.fema.gov/hazus/, http://www.nibs.org/hazus/.

1.2 Description:

Abstract:

This database contains the Hurricane Specific Attributes related to the Essential Facilties features.

Purpose:

This data is used to estimate the damage (and resulting loss of functionality) associated with emergency response facilities for a given hurricane scenario. By evaluating this information, the HAZUS user can determine whether the emergency response capabilities of the region are likely to be overwhelmed by the hurricane scenario.

1.3 Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20030000

Ending_Date: 20030000

1.4 Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: -170.350 degrees

East_Bounding_Coordinate: -131.494 degrees

North_Bounding_Coordinate: 70.462 degrees

South_Bounding_Coordinate: 54.128 degrees

1.6 Keywords:

Theme:

Theme_Keyword: HAZUS

Theme_Keyword: Inventory

Theme_Keyword: Essential Facilities

Theme_Keyword: Emergency Response Facilities

Theme_Keyword: Schools

Place:

Place_Keyword: USA

Place_Keyword: Alabama

Place_Keyword: Connecticut

Place_Keyword: Delaware

Place_Keyword: District of Columbia

Place_Keyword: Florida

Place_Keyword: Georgia

Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Mississippi
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: Pennsylvania
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: Texas
Place_Keyword: Vermont
Place_Keyword: Virginia
Place_Keyword: West Virginia

1.7 Access_Constraints: None
1.8 Use_Constraints: None
1.9 Point_of_Contact
Contact_Information:
Contact_Person_Primary:
Contact_Person: Philip Schneider
Contact_Address:
Address_Type: mailing and physical address
Address:
National Institute of Building Sciences
1090 Vermont Avenue, NW; Suite 700
City: Washington
State: D.C.
Postal Code: 20005
Contact_Voice_Telephone: 202-289-7800
Contact_Electronic_Mail_Address: pschneider@nibs.org

2. Data_Quality_Information

2.1 Attribute_Accuracy: Unknown
2.2 Logical_Consistency_Report: Unknown
2.3 Completeness_Report: Unknown
2.4 Positional_Accuracy: Unknown
2.5 Lineage: Unknown

3. Spatial_Data_Organization_Information

3.1 Indirect_Spatial_Reference:
3.2 Direct_Spatial_Reference_Method: Point
3.3 Point_and_Vector_Object_Information:

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:
4.1.1 Geographic:
Geographic Coordinate System (Longitude/Latitude)
Latitude Resolution: Unknown
Longitude Resolution: Unknown
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983

4.2 Vertical_Coordinate_System_Definition: Not Applicable

5. Entity_and_Attribute_Information:

5.2 Overview_Description

5.2.1 Entity_and_Attribute_Overview:

The facilities hurricane specific attributes database file and the individual state files contain 3 fields.

Entity_and_Attribute_Detail_Citation: FltyID	HAZUS-MH Internal ID
Entity_and_Attribute_Detail_Citation: huBldgSchemeName	Wind Building Characteristics Mapping Scheme Name
Entity_and_Attribute_Detail_Citation: sbtName	Wind Specific Building Type

6. Distribution Information

6.1 Distributor

Contact Organization Primary: FEMA Distribution Center

Contact Address:

Address_Type: mailing address

Address: P.O. Box 2012

City: Jessup

State or Province: MD

Postal Code: 20794-2012

Contact Voice Telephone: 800-480-2530

Contact FAX Number: 301-362-5335

6.2 Resource Description

N/A

6.3 Distribution Liability

No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will replace if the product is determined unusable, or when the physical medium is delivered in damaged condition.

6.4 Standard Order Process

The HAZUS order form can be downloaded from the FEMA website (http://www.fema.gov/hazus/hazus6c.htm). Completed order forms should be mailed or faxed to the FEMA distribution center.

6.5 Custom Order Process

N/A

7. Metadata_Reference_Information

7.1 Metadata_Date: 20030313

7.2 Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Philip Schneider

Contact_Address:

Address_Type: mailing and physical address

Address:

National Institute of Building Sciences

1090 Vermont Avenue, NW; Suite 700

City: Washington

State: D.C.

Postal Code: 20005

Contact_Voice_Telephone: 202-289-7800

Contact_Electronic_Mail_Address: pschneider@nibs.org

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

2. Wind Speeds (100/500 year return period) Maps

N/A – Generated when study regioin has been aggregated

Flood

DFIRM

1. Identification_Information:

1.1 Citation:

Citation Information:

Originator: Federal Emergency Management Agency

Publication_Date: 2010

Title: DFIRM_XLeveeSFHA_Dissolve

1.2 Description:

Abstract:

A brief narrative summary of the data set

Purpose:

A summary of the intentions with which the data set was developed

Parish name	Shapefile name
Acadia	acadia
Allen	allen
Ascension	ascension
Assumption	assumption
Avoyelles	avoyelles
Bossier	bossier
Calcasieu	calcasieu
Cameron	cameron
Catahoula	catahoula
Concordia	concordia
East Baton Rouge	ebatonrouge
Franklin	franklin
Grant	grant
Iberia	iberia
Iberville	iberville
Jefferson	jefferson
Lafayette	lafayette
Lafourche	laFourche
Livingston	livingston
Madison	madison
Natchitoches	natchitoches
Orleans	orleans
Ouachita	ouachita
Plaquemines	plaquemines
Pointe Coupee	pointecoupee
Rapides	rapides
St. Bernard	stbernard
St. Charles	StCharles
St. James	StJames
St. John the Baptist	StJohnBaptist
St. Landry	StLandry
St. Martin	stmartin
St. Mary	StMary
St. Tammany	StTammany
Tangipahoa	tangipahoa
Terrebonne	terrebonne

Vermilion vermilion

1.3 Time_Period_of_Content:

Time_Period_Information:

Single Dates/Times:

Calendar_Date: N/A

N/A

1.4 Status:

Progress: N/A

Maintenance_and_Update_Frequency: None Planned

1.5 Spatial_Domain

Bounding_Coordinates:

West_Bounding_Coordinate: N/A

East_Bounding_Coordinate: N/A

North_Bounding_Coordinate: N/A

South_Bounding_Coordinate: N/A

1.6 Keywords:

Theme:

Theme_Keyword_Thesauras:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Theme_Keyword:

Place:

Place_Keyword_Thesauras:

Place_Keyword:

1.7 Access_Constraints: None

1.8 Use_Restrictions: None.

1.9 Point_of_Contact

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Contact_Person:

Contact_Position:

Contact_Address:

Address_Type: mailing address

Address:

Address:

Address:

City:

State_or_Province:

Postal_Code:

Contact_Voice_Telephone:

Contact_Facsimile_Telephone:

Contact_Electronic_Mail_Address:

2. Data_Quality_Information

2.1 Attribute_Accuracy:

2.2 Logical_Consistency_Report:

2.3 Completeness_Report:

2.4 Positional_Accuracy:

Horizontal_Positional_Accuracy

Horizontal_Positional_Accuracy_Report:
2.5 Lineage:
Source Information:
Source Citation:
Originator: Federal Emergency Management Agency
Publication_Date: 2010
Title: DFIRM_XLeveeSFHA_Dissolve
Type_of_Source_Media: computer file
Source_Time_Period_of_Content:
Single_Date/Time:
Calendar_Date: 2010
Source_Currentness_Reference:
Source_Citation_Abbreviation:
Source_Contribution:
Process_Step
Process Description:
Process_Date: 2010
Process_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: Federal Emergency Management Agency
Contact_Person:
Contact_Address:
Address_Type: mailing address
Address:
City:
State_or_Province:
Postal_Code:
Contact_Voice_Telephone:
Contact_Electronic_Mail_Address:

3. Spatial_Data_Organization_Information

3.1 Direct_Spatial_Reference_Method: Vector

4. Spatial_Reference_Information

4.1 Horizontal_Coordinate_System_Definition:
4.1.1 Geographic:
Latitude Resolution: .000009
Longitude Resolution: .000009
Geographic Coordinate Units: Decimal Degrees
4.1.4 Geodetic_Model:
Horizontal Datum Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major Axis: 6378137
Denominator of Flattening Ratio: 298.275

5. Entity_and_Attribute_Information:

5.2 Overview_Description
5.2.1 Entity_and_Attribute_Overview:
5.2.2 Entity_and_Attribute_Detail_Citation:

6. Distribution Information

6.1 Distributor
Contact_Information:
Contact_Organization_Primary:

Contact_Organization: Federal Emergency Management Agency
Contact_Person:
Contact_Position:
Contact_Address:
Address_Type: mailing address
Address:
Address:
Address:
City:
State_or_Province:
Postal_Code:
Contact_Voice_Telephone:
Contact_Facsimile_Telephone:
Contact_Electronic_Mail_Address:

6.2 Distribution Liability

7. Metadata_Reference_Information

7.1 Metadata_Date: 2010

7.2 Metadata_Contact:

Contact_Information:
Contact_Organization_Primary:
Contact_Organization: FEMA
Contact_Person:
Contact_Position:
Contact_Address:
Address_Type: mailing and physical address
Address:
City:
State_or_Province:
Postal_Code:
Contact_Voice_Telephone:
Contact_Facsimile_Telephone:
Contact_Electronic_Mail_Address:

7.3 Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

7.4 Metadata_ Standard_Version: FGDC-STD-001-1998

Wildland Urban Interface

Data format: ArcInfo Coverage
File or table name: wiwui
Coordinate system: Albers Conical Equal Area
Theme keywords: Wildland Urban Interface, WUI, wildfire, fragmentation, sprawl

Abstract: The Wildland-Urban Interface (WUI) is the area where houses meet or intermingle with undeveloped wildland vegetation. This makes the WUI a focal area for human-environment conflicts such as wildland fires, habitat fragmentation, invasive species, and biodiversity decline. Using geographic information systems (GIS), we integrated U.S. Census and USGS National Land Cover Data, to map the Federal Register definition of WUI (Federal Register 66:751, 2001). These data are useful within a GIS for mapping and analysis at national, state, and local levels.

FGDC and ESRI Metadata:

- Identification Information
- Data Quality Information
- Spatial Data Organization Information
- Spatial Reference Information
- Entity and Attribute Information
- Distribution Information
- Metadata Reference Information

  Metadata elements shown with blue text are defined in the Federal Geographic Data Committee's (FGDC) *Content Standard for Digital Geospatial Metadata (CSDGM)*. Elements shown with green text are defined in the *ESRI Profile of the CSDGM.* Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog. ArcCatalog adds hints indicating which FGDC elements are mandatory; these are shown with gray text.

Identification Information:

Citation:

Citation information:

Originators: SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin-Madison

*Title:

wiwui

*File or table name: wiwui

Publication date: Unknown

*Geospatial data presentation form: vector digital data

*Online linkage: \\THE-BISHOP\D$\wui_data\wui00\ftpdata\wiwui

Larger work citation:

Citation information:

Title:

Please cite: Radeloff, V. C., R. B. Hammer, A. Treves and S. I. Stewart. 2003. The wildland-urban interface in the United States. The 17th Annual Meeting of the Society for Conservation Biology, 28 June - 2 July, Duluth, Minnesota.

Description:

Abstract:

The Wildland-Urban Interface (WUI) is the area where houses meet or intermingle with undeveloped wildland vegetation. This makes the WUI a focal area for human-environment conflicts such as wildland fires, habitat fragmentation, invasive species, and biodiversity decline. Using geographic information systems (GIS), we integrated U.S. Census and USGS National Land Cover Data, to map the Federal Register definition of WUI (Federal Register 66:751, 2001). These data are useful within a GIS for mapping and analysis at national, state, and local levels.

Purpose:

To provide a spatially detailed national assessment of the Wildland Urban Interface (WUI) across the coterminous U.S. to support inquiries into the effects of housing growth on the environment, and to inform both national policy and local land management concerning the WUI and associated issues.

*Language of dataset: en
Time period of content:
Time period information:
Single date/time:
Calendar date: 2000
Currentness reference: ground condition
Status:
Progress: Complete
Maintenance and update frequency: As needed
Spatial domain:
Bounding coordinates:
*West bounding coordinate: -93.026187
*East bounding coordinate: -85.976797
*North bounding coordinate: 47.386405
*South bounding coordinate: 42.282764
Local bounding coordinates:
*Left bounding coordinate: 242559.004566
*Right bounding coordinate: 763744.766396
*Top bounding coordinate: 2714499.218534
*Bottom bounding coordinate: 2180084.951767
Keywords:
Theme:
Theme keywords: Wildland Urban Interface, WUI, wildfire, fragmentation, sprawl
Theme keyword thesaurus: REQUIRED: Reference to a formally registered thesaurus or a similar authoritative source of theme keywords.
Place:
Place keywords: United States
Access constraints: None
Use constraints:
None. Acknowledgment of the USDA Forest Service North Central Research Station in products, presentations, and publications utilizing these data would be appreciated.
Point of contact:
Contact information:
Contact person primary:
Contact person: Dr. Volker C. Radeloff
Contact organization: Department of Forest Ecology and Management, University of Wisconsin-Madison
Contact position: Assistant Professor
Contact voice telephone: (608) 263-4349
Contact facsimile telephone: (608) 262-9922
Contact electronic mail address: radeloff@wisc.edu
Hours of service: Monday-Friday, 8-5, Central Time
*Native dataset format: ArcInfo Coverage
*Native data set environment:
Microsoft Windows 2000 Version 5.0 (Build 2195) Service Pack 4; ESRI ArcCatalog 8.3.0.800

Data Quality Information:

Logical consistency report:
Topology maintained by ArcInfo. All fuzzy tolerances during processing were set to 0.00000001 to prevent data loss.
Lineage:
Source information:
Source citation:
Citation information:
Originators: U.S. Department of Commerce, U.S. Census Bureau, Geography Division

Title: TIGER/Line Files, UA Census 2000
Publication date: 2002
Edition: UA Census 2000
Geospatial data presentation form: raster digital data
Series information:
Series name: TIGER/Line Files
Publication information:
Publication place: Washington, DC
Publisher: U.S. Department of Commerce, Census Bureau, Geography Division
Online linkage: http://edcwww.cr.usgs.gov/programs/lccp/nationallandcover.html
Source scale denominator: 100,000
Type of source media: CD-ROM
Source citation abbreviation: TIGER
Source contribution:
U.S. Census TIGER block polygons and associated 2000 housing density. Census Block housing density obtained from Summary Tape File 1 available from the U.S. Census Bureau.
Source time period of content:
Time period information:
Single date/time:
Calendar date: 2000
Source currentness reference: ground condition
Process step:
Process description:
1992 National Land Cover Data integrated into TIGER block geography using ArcInfo GRID ZONALSUM. FOREST (NLCD classes 41, 42, and 43) and VEGETATION (NLCD classes 33, 41, 42, 43, 51, 71, 91, and 92) items calculated by summing the percentages of the respective NLCD classes.
Process software and version: Workstation ArcInfo
Source used citation abbreviation: TIGER
Source used citation abbreviation: NLCD
Source used citation abbreviation: NLCD
Process contact:
Contact information:
Contact person primary:
Contact person:
Contact organization: Department of Forest Ecology and Management, University of Wisconsin-Madison
Contact position: GIS Specialist
Contact address:
Address type: mailing address
Address:
120 Russell Labs
City: Madison
State or province: WI
Postal code: 53706
Country: U.S.A.
Contact voice telephone: (608) 261-1050
Contact facsimile telephone: (608) 262-9922
Contact electronic mail address: jfmckeefry@wisc.edu
Hours of service: Monday-Friday, 8-5, Central Time

Spatial Data Organization Information:

*Direct spatial Rreference method: Vector
Point and vector object information:
SDTS terms description:

*Name: arc
*SDTS point and vector object type: Complete chain
*Point and vector object count: 518421
SDTS terms description:
*Name: label
*SDTS point and vector object type: Label point
*Point and vector object count: 217176
SDTS terms description:
*Name: polygon
*SDTS point and vector object type: GT-polygon composed of chains
*Point and vector object count: 217176
SDTS terms description:
*Name: tic
*SDTS point and vector object type: Point
*Point and vector object count: 4
ESRI terms description:
*Name: arc
*ESRI feature type: Simple
*ESRI feature geometry: Arc
*ESRI topology: FALSE
*ESRI feature count: 518421
*Spatial index: FALSE
*Linear referencing: FALSE
ESRI terms description:
*Name: label
*ESRI feature type: Simple
*ESRI feature geometry: Label
*ESRI topology: FALSE
*ESRI feature count: 217176
*Spatial index: FALSE
*Linear referencing: FALSE
ESRI terms description:
*Name: polygon
*ESRI feature type: Simple
*ESRI feature geometry: Polygon
*ESRI topology: TRUE
*ESRI feature count: 217176
*Spatial index: FALSE
*Linear referencing: FALSE
ESRI terms description:
*Name: tic
*ESRI feature type: Simple
*ESRI feature geometry: Tic
*ESRI topology: FALSE
*ESRI feature count: 4
*Spatial index: FALSE
*Linear referencing: FALSE

Spatial Reference Information:

Horizontal coordinate system definition:
Coordinate system name:
*Projected coordinate system name: NAD_1983_Albers

*Geographic coordinate system name: GCS_North_American_1983
Planar:
Map projection:
*Map projection name: Albers Conical Equal Area
Albers conical equal area:
*Standard parallel: 29.500000
*Standard parallel: 45.500000
*Longitude of central meridian: -96.000000
*Latitude of projection origin: 23.000000
*False easting: 0.000000
*False northing: 0.000000
Planar coordinate information:
*Planar coordinate encoding method: coordinate pair
Coordinate representation:
*Abscissa resolution: 0.004095
*Ordinate resolution: 0.004095
*Planar distance units: meters
Geodetic model:
*Horizontal datum name: North American Datum of 1983
*Ellipsoid name: Geodetic Reference System 80
*Semi-major axis: 6378137.000000
*Denominator of flattening ratio: 298.257222

Entity and Attribute Information:

Detailed description:
*Name: wiwui.pat
Entity type:
*Entity type label: wiwui.pat
*Entity type type: Feature Class
*Entity type count: 217176
Attribute:
*Attribute label: FID
*Attribute alias: FID
*Attribute definition: Internal feature number.
*Attribute definition source: ESRI
*Attribute type: OID
*Attribute width: 4
*Attribute precision: 0
*Attribute scale: 0
Attribute domain values:
*Unrepresentable domain: Sequential unique whole numbers that are automatically generated.
Attribute:
*Attribute label: Shape
*Attribute alias: Shape
*Attribute definition: Feature geometry.
*Attribute definition source: ESRI
*Attribute type: Geometry
*Attribute width: 0
*Attribute precision: 0
*Attribute scale: 0
Attribute domain values:
*Unrepresentable domain: Coordinates defining the features.

Attribute:
*Attribute label: AREA
*Attribute definition: Area of feature in internal units squared.
*Attribute definition source: ESRI
*Attribute type: Float
*Attribute width: 8
*Attribute output width: 18
*Attribute number of decimals: 5
Attribute domain values:
*Unrepresentable domain: Positive real numbers that are automatically generated.
Attribute:
*Attribute label: PERIMETER
*Attribute definition: Perimeter of feature in internal units.
*Attribute definition source: ESRI
*Attribute type: Float
*Attribute width: 8
*Attribute output width: 18
*Attribute number of decimals: 5
Attribute domain values:
*Unrepresentable domain: Positive real numbers that are automatically generated.
Attribute:
*Attribute label: WIWUI#
*Attribute definition: Internal feature number.
*Attribute definition source: ESRI
*Attribute type: Binary
*Attribute width: 4
*Attribute output width: 5
Attribute domain values:
*Unrepresentable domain: Sequential unique whole numbers that are automatically generated.
Attribute:
*Attribute label: WIWUI-ID
*Attribute definition: User-defined feature number.
*Attribute definition source: ESRI
*Attribute type: Binary
*Attribute width: 4
*Attribute output width: 5
Attribute:
*Attribute label: BLK00
Attribute definition: A unique number assigned to Census Blocks concatenated from State, County, Tract, and Block, and Water fields from UA Census 2000 TIGER. The Census Bureau defines a block as â€œthe smallest geographic area for which the Bureau of the Census collects and tabulates decennial census data, [and] are formed by streets, roads, railroads, streams and other bodies of water, other visible and cultural features, and the legal boundaries shown on Census Bureau maps (US Census Bureau, 1994).
*Attribute type: Character
*Attribute width: 18
*Attribute output width: 18
Attribute:
*Attribute label: HDENBLK00
Attribute definition: 2000 block-scale housing density (units per sq. km).
*Attribute type: Float
*Attribute width: 8
*Attribute output width: 22
*Attribute number of decimals: 4

Attribute:
*Attribute label: WATER00
Attribute definition: 2000 water flag (1=water, 0=not water)
*Attribute type: Integer
*Attribute width: 1
*Attribute output width: 1
Attribute:
*Attribute label: ZSUM11PC
Attribute definition: % of block covered by NLCD code 11 (see Entity Attribute Overview Description)
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM21PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM22PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM23PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM31PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM32PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM33PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description

*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM41PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM42PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM43PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM51PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM61PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM71PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4
*Attribute output width: 12
*Attribute number of decimals: 4
Attribute:
*Attribute label: ZSUM81PC
Attribute definition: see zsum11pc and Entity Attribute Overview Description
*Attribute type: Float
*Attribute width: 4

*Attribute output width: 12
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Attribute definition: Wildland Urban Interface (WUI) classification

*Attribute type: Character

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Enumerated domain:

Enumerated domain value: Med_Dens_Interface

Enumerated domain value definition: Housing density >= 49.42108 and < 741.3162, Vegetation <= 50%, within 2.414 km of area with >= 75% Vegetation

Enumerated domain:

Enumerated domain value: High_Dens_Interface

Enumerated domain value definition: Housing density >=741.3162, Vegetation <= 50%, within 2.414 km of area with >= 75% Vegetation

Enumerated domain:

Enumerated domain value: Wildland_Intermix

Enumerated domain value definition:

Housing density > 0 and < 6.177635, Vegetation > 50%

Enumerated domain:

Enumerated domain value: Low_Dens_Intermix

Enumerated domain value definition: Housing density >= 6.177635 and < 49.42108, Vegetation > 50%

Enumerated domain:

Enumerated domain value: Med_Dens_Intermix

Enumerated domain value definition: Housing density >= 49.42108 and < 741.3162, Vegetation > 50%

Enumerated domain:

Enumerated domain value: High_Dens_Intermix

Enumerated domain value definition: Housing density >= 741.3162, Vegetation > 50%

Enumerated domain:

Enumerated domain value: Uninhabited_NoVeg

Enumerated domain value definition:

Housing density = 0, Vegetation <= 50%

Enumerated domain:

Enumerated domain value: Uninhabited_Veg

Enumerated domain value definition:

Housing density = 0, Vegetation > 50%

Enumerated domain:

Enumerated domain value: Wildland_NoVeg

Enumerated domain value definition: Housing density > 0 and < 6.177635, Vegetation <= 50%

Enumerated domain:

Enumerated domain value: Low_Dens_NoVeg

Enumerated domain value definition: Housing density >= 6.177635 and < 49.42108, Vegetation <= 50%

Enumerated domain:

Enumerated domain value: Med_Dens_NoVeg

Enumerated domain value definition: Housing density >= 49.42108 and < 741.3162, Vegetation <= 50%

Enumerated domain:

Enumerated domain value: High_Dens_NoVeg

Enumerated domain value definition: Housing density >= 741.3162, Vegetation <= 50%

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Enumerated domain:

Enumerated domain value: 90

Enumerated domain value definition: Water

Overview description:

Entity and attribute overview: Spatial objects (features) do not model any real world entities. Spatial objects (features) can be thought of as uniform areas of housing density and landcover, which have been assigned a Wildland Urban Interface classification. Items pertaining to National Land Cover Data (NLCD) make use of the following enumerated domain:

Water - All areas of open water or permanent ice/snow cover.

11. Open Water - areas of open water, generally with less than 25 percent or greater cover of water (per pixel).

12. Perennial Ice/Snow - All areas characterized by year-long cover of ice and/or snow.

Developed - areas characterized by high percentage (approximately 30% or greater) of constructed materials (e.g. asphalt, concrete, buildings, etc).

21. Low Intensity Residential - Includes areas with a mixture of constructed materials and vegetation. Constructed materials account for 30-80 percent of the cover. Vegetation may account for 20 to 70 percent of the cover. These areas most commonly include single-family housing units. Population densities will be lower than in high intensity residential areas.

22. High Intensity Residential - Includes heavily built up urban centers where people reside in high numbers. Examples include apartment complexes and row houses. Vegetation accounts for less than 20 percent of the cover. Constructed materials account for 80-100 percent of the cover.

23. Commercial/Industrial/Transportation - Includes infrastructure (e.g. roads, railroads, etc.) and all highways and all developed areas not classified as High Intensity Residential.

Barren - Areas characterized by bare rock, gravel, sand, silt, clay, or other earthen material, with little or no "green" vegetation present regardless of its inherent ability to support life. Vegetation, if present, is more widely spaced and scrubby than that in the "green" vegetated categories; lichen cover may be extensive.

31. Bare Rock/Sand/Clay - Perennially barren areas of bedrock, desert, pavement, scarps, talus, slides, volcanic material, glacial debris, and other accumulations of earthen material.

32. Quarries/Strip Mines/Gravel Pits - Areas of extractive mining activities with significant surface expression.

33. Transitional - Areas of sparse vegetative cover (less than 25 percent that are dynamically changing from one land cover to another, often because of land use activities. Examples include forest clearcuts, a transition phase between forest and agricultural land, the temporary clearing of vegetation, and changes due to natural causes (e.g. fire, flood, etc.)

Forested Upland - Areas characterized by tree cover (natural or Semi-natural woody vegetation, generally greater than 6 meters tall); Tree canopy accounts for 25-100 percent of the cover.

41. Deciduous Forest - Areas dominated by trees where 75 percent or more of the tree species shed foliage simultaneously in response to seasonal change.

42. Evergreen Forest - Areas characterized by trees where 75 percent or more of the tree species maintain their leaves all year. Canopy is never without green foliage.

43. Mixed Forest - Areas dominated by trees where neither deciduous nor evergreen species represent more than 75 percent of the cover present.

Shrubland - Areas characterized by natural or semi-natural woody vegetation with aerial stems, generally less than 6 meters tall with individuals or clumps not touching to interlocking. Both evergreen and deciduous species of true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions are included.

51. Shrubland - Areas dominated by shrubs; shrub canopy accounts for 25-100 percent of the cover. Shrub cover is generally greater than 25 percent when tree cover is less than 25 percent. Shrub cover may be less than 25 percent in cases when the cover of other life forms (e.g. herbaceous or tree) is less than 25 percent and shrubs cover exceeds the cover of the other life forms.

Non-natural Woody - Areas dominated by non-natural woody vegetation; non-natural woody vegetative canopy accounts for 25-100 percent of the cover. The non-natural woody classification is subject to the availability of sufficient ancillary data to differentiate non-natural woody vegetation from natural woody vegetation.

61. Orchards/Vineyards/Other - Orchards, vineyards, and other areas planted or maintained for the production of fruits, nuts, berries, or ornamentals.

Herbaceous Upland - Upland areas characterized by natural or semi- natural herbaceous vegetation; herbaceous vegetation accounts for 75-100 percent of the cover.

71. Grasslands/Herbaceous - Areas dominated by upland grasses and forbs. In rare cases, herbaceous cover is less than 25 percent, but exceeds the combined cover of the woody species present. These areas are not subject to intensive management, but they are often utilized for grazing. Planted/Cultivated - Areas characterized by herbaceous vegetation That has been planted or is intensively managed for the production of food, feed, or fiber; or is maintained in developed settings for specific purposes. Herbaceous vegetation accounts for 75-100 percent of the cover.

81. Pasture/Hay - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.

82. Row Crops - Areas used for the production of crops, such as corn, soybeans, vegetables, tobacco, and cotton.

83. Small Grains - Areas used for the production of graminoid crops such as wheat, barley, oats, and rice

84. Fallow - Areas used for the production of crops that are temporarily barren or with sparse vegetative cover as a result of being tilled in a management practice that incorporates prescribed alternation between cropping and tillage.

85. Urban/Recreational Grasses - Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Examples include parks, lawns, golf courses, airport grasses, and industrial site grasses.

Wetlands - Areas where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al.

91. Woody Wetlands - Areas where forest or shrubland vegetation accounts for 25-100 percent of the cover and the soil or substrate is periodically saturated with or covered with water.

92. Emergent Herbaceous Wetlands - Areas where perennial herbaceous vegetation accounts for 75-100 percent of the cover and the soil or substrate is periodically saturated with or covered with water.

Distribution Information:

Resource description: Downloadable Data

Distribution liability:

No warranty, expressed or implied, is made by the U.S. Forest Service or the University of Wisconsin-Madison regarding the use of these data, nor does the act of distribution constitute any such warranty.

Standard order process:

Digital form:

Digital transfer information:

*Transfer size: 144.722

*Dataset size: 144.722

Metadata Reference Information:

*Metadata date: 20040331

*Language of metadata: en

Metadata contact:

Contact information:

Contact person primary:

Contact person: Jason McKeefry

Contact organization: Department of Forest Ecology and Management, University of Wisconsin-Madison

Contact organization primary:

Contact person: REQUIRED: The person responsible for the metadata information.

Contact organization: REQUIRED: The organization responsible for the metadata information.

Contact position: GIS Specialist

Contact address:

Address type: mailing address

Address: 120 Russell Labs

Address: 1630 Linden Dr.

City: Madison

State or province: WI

Postal code: 53706

Country: U.S.A.

Contact voice telephone: (608) 261-1050

Contact facsimile telephone: (608) 262-9922

Contact electronic mail address: jfmckeefry@wisc.edu

Hours of service: Monday-Friday, 8-5, Central Time

*Metadata standard name: FGDC Content Standards for Digital Geospatial Metadata

*Metadata standard version: FGDC-STD-001-1998

*Metadata time convention: local time

Metadata access constraints: None

Metadata use constraints: None

Metadata extensions:

*Online linkage: http://www.esri.com/metadata/esriprof80.html

*Profile name: ESRI Metadata Profile

Additional Data Used in the Plan

HURRICANE KATRINA SURGE INUNDATION AND ADVISORY BASE FLOOD ELEVATION MAPS – SUMMARY OF METHODS

FEMA Contract No. EMW-2000-CO-0247

Task Order No. 436 (Louisiana)

Version 3, June 9, 2006

1. Introduction

Hurricane Katrina was a long-lived hurricane that made landfall three times along the United States coast and reached Category 5 at its peak intensity. The storm initially developed as a tropical depression in the southeastern Bahamas on August 23, 2005. Two days later, it strengthened into a Category 1 hurricane a few hours before making its first landfall between Hallandale Beach and North Miami Beach, Florida. After crossing the tip of the Florida peninsula, Katrina followed a westward track across the Gulf of Mexico before turning to the northwest towards the Gulf Coast.

Hurricane Katrina made its second landfall as a strong Category 4 hurricane in Plaquemines Parish, Louisiana on August 29, 2005. Wind speeds of over 140 miles per hour (mph) were recorded in southeastern Louisiana and winds gusted to over 100 mph in New Orleans, just west of the eye. As Katrina made its third and final landfall four hours later along the Mississippi/Louisiana border, it was a Category 3 storm with wind speeds of approximately 125 mph. Hurricane-force winds extended up to 190 miles from the center of the storm and tropical storm-force winds extended for approximately 440 miles.

The strength and extent of Hurricane Katrina's wind field resulted in a storm surge greater than historical maximums. The combination of a storm surge of up to 30 feet, wave action, and high winds resulted in destruction of buildings and roads in the affected areas. Although recovery and reconstruction efforts will last several years, there is an urgent need for technical information to enable safer, sustainable redevelopment along the Gulf Coast.

The Federal Emergency Management Agency (FEMA) undertook this project to provide timely, up-to-date, and accurate coastal flood hazard information to local, regional, state and Federal officials to guide reconstruction in the portions of the Gulf Coast most severely affected by Hurricane Katrina. This information is being provided in the form of high-resolution maps that show coastal flood impacts from Hurricane Katrina. This report outlines the data sources and methods used to produce the Hurricane Katrina Surge Inundation and Advisory Base Flood Elevation maps (herein referred to as the "Katrina Recovery Maps").

2. Methodology

Katrina Recovery Maps provide the following essential elements of information:

* Preliminary surveyed coastal high water mark (HWM) flood elevations from Hurricane Katrina's storm surge (i.e., excluding HWMs reflecting surge plus local wave effects);

* Hurricane Katrina coastal surge inundation limits (outside of levees only); and

* Advisory Base Flood Elevations (ABFEs).

The methods for generating each of these essential elements of information are discussed in greater detail in the sections that follow. In addition to the detailed Katrina Recovery Map panels that show these elements, FEMA has also produced an overview map for the Lake Pontchartrain basin. This overview map, which is explained in greater detail in Section 3, shows some of the same essential elements as well as regional surge elevation contours derived from the surge-only HWMs.

2.1 Hurricane Katrina Coastal High Water Mark Collection

Under separate task orders, field-based flagger and survey crews from URS and URS Team subconsultants, ESP and PBS&J, were deployed to interview residents, find evidence of coastal high water levels, take digital photographs, and survey coastal HWMs from Hurricane Katrina. Coastal HWMs included mud lines, water stains, debris, wrack lines, and eyewitness testimony.

The coastal HWM flagging crews received notice to proceed on August 30, 2005. Deployment of flagging crews was delayed due to ongoing recovery efforts, the concern for obtaining gasoline and other essential supplies, the lack of lodging, and the approach of Hurricane Rita. Once conditions improved, the flaggers were deployed along the affected areas of Louisiana and began flagging HWMs on September 9, 2005.

For each HWM, the flaggers completed a form that contained detailed information about the mark. To the extent possible, field crews noted the coastal flooding characteristics captured by the coastal HWM, including storm surge, wave runup, and wave height. These designations represent the field crew's best estimate of this characteristic based on a combination of physical flood evidence and interviews with witnesses at the time of collection. These characteristics are described as follows:

> Surge - represents the rise in the normal water level, also called stillwater flooding

> Wave runup - represents the height of water rise above the stillwater level due to water rush up from a breaking wave

> Wave height - represents the coastal HWM elevation due to more direct wave action

Typically, storm surge coastal HWMs are associated with a slow-rising flood that causes more water damage than structural damage. Wave height usually results in a higher elevation than just storm surge. All attempts were made to flag storm surge elevations, but in areas where storm surge characteristics were not obvious, wave runup or wave height may have been captured. For example, witnesses might claim the flooding was associated with a storm surge when in fact the flooding was from wave runup or riverine flooding.

The survey crews followed the flaggers and used static Global Positioning System (GPS) methods to determine an accurate elevation for each coastal HWM. Since static GPS requires an area with no tree cover to return an accurate result, in some cases it was necessary to perform a short level loop survey from the GPS point to the coastal HWM. Coastal HWM locations were surveyed horizontally in the North American Datum of 1983 (NAD 83), State Plane – Louisiana South (1702) feet, and vertically in the North American Vertical Datum of 1988 (NAVD 88) US survey feet. Coastal HWM locations have been surveyed to within accuracies of ±0.25 foot vertically and ±10 feet horizontally, with a 95% confidence level.

A more detailed discussion of the coastal HWM collection and final results were published by FEMA in a separate report. To access this report, please see the following website:

http://www.fema.gov/pdf/hazard/flood/recoverydata/katrina/katrina_la_hwm_public.pdf

2.2 Hurricane Katrina Storm Surge Inundation Mapping

Flood inundation limits were created for the Louisiana coastal parishes by mapping the coastal HWM elevations onto digital, pre-storm topographic data. These inundation limits represent the estimated inland extent of flooding caused by the Hurricane Katrina storm surge. Because of ongoing studies of the impacts of Hurricane Katrina, include analyses by the Interagency Performance Evaluation Task Force (IPET), detailed surge inundation mapping in this project was limited to areas outside of levees.

Note: Hurricane Rita inundated many of the same Louisiana parishes in September 2005; areas where HWMs show that Rita's coastal flood levels exceeded those of Katrina are being mapped under a separate FEMA project. See the following FEMA Rita Recovery Mapping website for more information: http://www.fema.gov/hazard/flood/recoverydata/rita/index.shtm

The HWMs surveyed by URS and its subconsultants were imported into a Geographic Information System (GIS) (ArcGIS 9.x) as points and pre-processed prior to analysis and mapping. The pre-processing of the HWMs included the Anselin Local Moran's I statistical analysis to identify those points that did not match the general trend of elevations in each point's immediate area. These HWMs were not used for the inundation mapping. In addition, HWMs identified as including wave effects or described to be of poor quality or have a low confidence were also excluded from the surge inundation mapping. Once the HWMs to be used were identified, a three-dimensional, raster surface was created using a standard interpolation function (Second Power Inverse Distance Weighting).

In a parallel effort, a digital elevation model (DEM) was developed for this project using pre-Katrina topographic data. The data were derived from Light Detection and Ranging (LIDAR) measurements collected in 2003 by 3001, Inc., a remote-sensing firm operating under subcontract to Watershed Concepts; this work was funded jointly by the State of Louisiana and FEMA. The LIDAR data were obtained for the recovery mapping effort from Atlas, the Louisiana statewide GIS (http://atlas.lsu.edu/). The LIDAR data have a posting interval of five meters, and are referenced to NAVD 88.

To create the Hurricane Katrina surge inundation limit, the interpolated HWM raster surface was intersected with the LIDAR DEM and then smoothed using PAEK smoothing algorithms. The inundation limit was then refined to remove small-scale, isolated areas of inundated and non-inundated terrain based on knowledge of overland surge propagation and engineering judgment.

2.3 Hurricane Katrina Surge Elevation Contour Mapping

Surge contours were mapped at one-foot intervals across the southeastern Louisiana coastal parishes that were flooded by Hurricane Katrina. These contours, provided in one-foot increments, show the geographic variability of the storm's surge. To

create the contours, the coastal HWMs were examined to find patterns in the coastal storm surge as it pushed against the open coast and into the inland bays and waterways. The known path and landfall location of Hurricane Katrina, together with the knowledge of how storm surge propagates inland, allowed surge contours to be drawn across the areas where the coastal HWMs indicate a change in storm surge elevation. Engineering judgment had to be applied in some locations to allow the contours to "step" up or down at one-foot intervals.

Because of the inherent uncertainty in and the random and irregular spacing of coastal HWMs, the surge contours represent a generalized maximum storm surge elevation, and required professional judgment in their creation. Within certain surge contours, coastal HWMs may be higher or lower than the contours if they did not fit the overall pattern discerned from the coastal HWMs. Local wave effects (wave heights and wave runup), which increase the total water surface above the surge elevation, were not considered in this contouring effort. Coastal HWMs that include wave effects may be several feet higher than the surge contours in a particular area.

Predictive numerical models of surge flooding, such as Hurricane Katrina forecasts from the National Oceanic and Atmospheric Administration's (NOAA's) Sea, Lake and Overland Surge from Hurricane (SLOSH) computer model, were used qualitatively to help refine the surge contours in areas of complex topographic and bathymetric changes. NOAA will be developing hindcasts of Hurricane Katrina's surge in the coming months. Consequently, the results presented here should be viewed as preliminary and subject to update as additional data become available.

2.4 Advisory Base Flood Elevations

ABFEs are advisory flood hazard data that may be used by communities as best-available data when FEMA determines that the existing, effective Flood Insurance Rate Maps (FIRMs) understate the true, 1%-annual-chance (100-year) flood risk. The general approach for mapping the ABFEs both outside and inside of levees is described in the sub-sections below, including any explanations of parish-specific mapping techniques or zones where coastal engineering judgment had to be applied.

2.4.1 Procedures for Determining and Mapping ABFEs Outside of Levee-Protected Areas (Jefferson,

Orleans, Plaquemines, St. Bernard, St. Charles, St. John the Baptist, St. Tammany, and Tangipahoa Parishes)

As explained in the Flood Recovery Guidance published by FEMA for each Louisiana parish (http://www.fema.gov/hazard/flood/recoverydata/katrina/katrina_la_resources.shtm), ABFEs for this project were determined by adding freeboard to the Base Flood Elevations (BFEs) shown on each community's FIRM for areas outside of levees. (Mapping of ABFEs for levee-protected areas is described in the next sub-section.) To apply the freeboard specified in the Flood Recovery Guidance for each parish, the flood zone boundaries and elevations were first transferred electronically from the FIRM into a GIS format, where necessary. In the GIS, the specified freeboard value (usually one foot) was then added to the BFE, and the combined value was placed on the Recovery Map in the form of "ABFE" followed by the flood zone designation (e.g., "Zone VE") and advisory elevation in feet (e.g., " EL 11"). In addition, wherever possible, ABFEs were determined for approximate A Zone areas shown on the effective FIRMs. Further, some A and AE Zones were changed to V or VE Zones, respectively, where the increased flood levels would make damaging waves possible. The methods used to develop ABFEs in approximate areas and to change the flood zone type are described in further detail below.

ABFEs are generally limited to portions of the current FIRM's Special Flood Hazard Area (SFHA) (or 100-year floodplain) that were inundated by Hurricane Katrina. A thick yellow line labeled, "Limit of ABFEs," marks the end of the area where the coastal ABFEs apply in St. John the Baptist, St. Tammany, and Tangipahoa Parishes, where there are ground elevations that exceed the Katrina surge inundation levels. In addition, since these ABFEs pertain to the 1%-annual-chance (100-year) coastal flood elevations, a "Limit of ABFEs" line is also shown wherever detailed riverine flood elevations from the FIRM are higher than the coastal ABFEs. Lastly, areas shown on the effective FIRMs as shaded Zone X (0.2%-annua-chance or 500-year floodplain) or that are inside of certified levees (per the effective FIRM) are labeled as "See Effective FIRMs" on the Katrina Recovery Maps.

In some cases, supplemental data and coastal engineering judgment were also used to refine advisory flood zone delineations or to develop ABFEs where necessary (e.g., for approximate A Zones and AO Zones). Procedures applied in the development of the ABFEs for areas outside of levees are described below (organized by parish):

Jefferson Parish:

As specified in the Flood Recovery Guidance, 1 foot of freeboard was applied to all Gulf of Mexico flood zones located outside of levees and south of Mississippi River. The only exception was for an approximate Zone A shown on the effective FIRM in the Metairie Outfall Canal (Katrina Recovery Map panels LA-DD30 and LA-EE30). An ABFE of 10 feet was assigned based on the

treatment of the Orleans Outfall Canal and the London Avenue Outfall Canal in Orleans Parish, both of which show AE Zones with a BFE of 10 feet.

Orleans Parish:

As specified in the Flood Recovery Guidance, 1 foot of freeboard was applied to all Gulf of Mexico flood zones located outside of levees.

Plaquemines Parish:

As specified in the Flood Recovery Guidance, freeboard was applied to all Gulf of Mexico flood zones outside of levees. For areas located west of the Mississippi River and areas east of the River from the Gulf of Mexico up to Parish ABFE Levee Sub-Basin "h", 1 foot of freeboard was applied; north of Levee Sub-Basin "h," 3 feet of freeboard was applied. The only exception was for a large approximate Zone A shown on the effective FIRM west of the hurricane protection levees on the west bank of the Mississippi River (Katrina Recovery Map panels LA-T33, LA-T34, LA-AA33, and LA-AA34). This area was assigned an ABFE of 7 feet based on the Zone AE elevation 8 feet located to the south (panels LA-T33 and LA-S33), and an adjacent Zone AE elevation 7 feet (panels LA-X31 and LA-Y31) in Jefferson Parish.

St. Bernard Parish:

As specified in the Flood Recovery Guidance, freeboard was applied to all Gulf of Mexico flood zones outside of levees. For areas located for areas north and east of the Mississippi River Gulf Outlet (MRGO) Canal, 1 foot of freeboard was applied; for areas south and west of the MRGO Canal, 3 feet of freeboard was applied.

St. Charles Parish:

As specified in the Flood Recovery Guidance, 1 foot of freeboard was applied to all flood zones outside of levees.

St. John the Baptist Parish:

As specified in the Flood Recovery Guidance, 1 foot of freeboard was applied to all flood zones. Advisory elevations have also been determined in areas shown as approximate Zone A on the effective FIRMs. The large Zone A area in the center of the Parish was determined to have an ABFE of 12 feet, which is based on the effective coastal stillwater level of approximately 11 feet plus 1 foot of freeboard. On the north side of the Mississippi River (East Bank), the effective FIRM showed detailed riverine flood elevations that have now been converted to coastal approximate A Zones, with an ABFE of 12 feet. This is because the effective coastal stillwater elevation in this area is 11 feet, and once the freeboard is added, the ABFE of 12 feet is higher then any of the detailed riverine elevations in this area. This advisory A Zone is visible on many panels, starting with the GG series of maps.

St. Tammany Parish:

As specified in the Flood Recovery Guidance, one foot of freeboard was applied to flood zones located north and west of Interstate 10. Initially, ABFEs for areas south and east of Interstate 10 were to be calculated using advisory stillwater elevations plus a simplified wave-height calculation. This simplified method was applied by FEMA in the Mississippi Katrina recovery mapping (http://www.fema.gov/hazard/flood/recoverydata/katrina/katrina_ms_index.shtm). Once applied to southeastern St. Tammany Parish, however, a large (5-10 foot) discontinuity appeared at the point where the two methods met (Interstate 10). Rather than forcing the simplified method-derived (or southeastern) ABFEs to step down rapidly to meet the freeboard-derived (northern) ABFEs across the interstate, FEMA elected to employ a hybrid approach – namely, the advisory stillwater elevations were used to estimate an appropriate, higher freeboard value for the southeastern area.

Generally, FEMA's advisory stillwater elevations reflected an increase of approximately 3 feet over the effective stillwater levels in the same area. An increase in stillwater flood depth of 3 feet will also result in an increase in wave heights above the surge (stillwater) level; this wave height increase would be on the order of 1 to 2 feet at the shoreline. Without detailed wave height analyses like those done in official Flood Insurance Studies, FEMA could not determine exactly what additional wave height would occur inland from the shoreline. As a result, FEMA conservatively estimated that a freeboard of 4 feet would be adequate to account for the increased stillwater level and additional wave effects. This four-foot freeboard was applied uniformly across the area south and east of Interstate 10.

Once freeboard of 1 foot or 4 feet was applied throughout the parish, each ABFE zone was evaluated to determine whether the potential for high velocity flow due to wave action should be a concern. Specifically, AE Zones bordering VE Zones on the effective FIRM would be areas where the ABFE's increased flood depth could mean that waves in excess of 3 feet in height are

now possible. For example, in the northwestern part of the parish (along the Lake Pontchartrain shoreline), the flood elevation threshold where VE Zones give way to AE Zones on the FIRM was

11 feet. Thus, any ABFE zone where the new flood elevation was 11 feet or higher could be susceptible to V Zone wave conditions. As a result, where physical conditions concerning obstructions (or lack thereof) warranted, the flood zone designation was changed from AE to VE on the advisory maps.

Tangipahoa Parish:

As specified in the Flood Recovery Guidance, 1 foot of freeboard was applied to all flood zones. Advisory elevations have also been determined in areas shown as approximate Zone A on the effective FIRMs. This includes an elevation of 12 feet currently used by the Parish's local floodplain administrator based on information received by the U.S. Army Corps of Engineers (USACE), New Orleans District. The subject zone covers much of the northernmost Katrina Recovery Maps in Tangipahoa. In addition, this flood zone designation was changed from approximate Zone A to approximate Zone V due to the increased potential for damaging waves resulting from the increased flood depth.

2.4.2 Procedures for Determining and Mapping ABFEs in Levee-Protected Areas (Jefferson, Orleans, Plaquemines, St. Bernard, and St. Charles Parishes)

For levee-protected areas, the FEMA Flood Recovery Guidance states that the ABFE should be the higher of the effective BFE shown on the community's current FIRM or 3 feet above the highest existing adjacent grade (HEAG) on the property. The HEAG is defined as the highest natural elevation of the ground surface prior to construction next to the proposed walls of structure. To assist with the application of this guidance, three key datasets were shown inside levee-protected areas on the Katrina Recovery Maps for these parishes:

(1) Locations of the levees used as the basis of the Flood Recovery Guidance;

(2) Effective flood zone boundaries and BFEs from the current FIRMs; and

(3) A separate data layer depicting where, based on an analysis of the BFEs and the available LIDAR topographic data, the 3-foot-above-HEAG elevation exceeds the BFE.

Each of these datasets is described in further detail below.

Levee Mapping

There are many riverine and coastal surge flood-control structures and devices located throughout the five subject parishes, some constructed and/or maintained by the Federal Government, others by state or local agencies. Identification of all such structures was far beyond the scope of this recovery mapping project. However, since FEMA's Flood Recovery Guidance was predicated on the eventual repair and/or enhancement of certain levees and related structures (e.g., flood gates or floodwalls), it was important that these key features be shown on the Katrina Recovery Maps to aid map users in interpreting the guidance.

At the time of this project, no comprehensive geospatial dataset of levee locations was available, which then required FEMA to compile information from existing resources. An initial dataset of levee locations in polyline Shapefile format was developed by FEMA's GIS staff at the Joint Field Office in Baton Rouge, Louisiana. In late May 2006, the USACE provided a preliminary GIS Shapefile containing the locations of levees and other flood-control structures in southeastern Louisiana. Prior to recovery map production, all of these data were quality-checked against the LIDAR DEM (see Section 2.2) and pre-Katrina aerial imagery to ensure correct placement. In locations where a levee could not be identified clearly in the topographic DEM or on the aerial photography, the linework was omitted from the Katrina Recovery Map panel(s). Some levees not included in the Flood Recovery Guidance but otherwise identified by FEMA or local officials have been presented on the index map for each parish for orientation or informational purposes only; these levees had no impact on the ABFE mapping.

Please note: The levee data depicted on the Katrina Recovery Maps may still contain errors; therefore, these data are provided for informational purposes only.

Effective Flood Hazard Data

When digitizing effective flood hazard data from paper FIRMs that are upwards of 10 to 20 years old, flood zone boundaries must often be adjusted to preserve spatial relationships between these lines and base map features that are unlikely to have moved since the original flood map was produced (e.g., roads, railroads, other large infrastructure). While not an issue unique to the mapping of levee-protected areas, the higher density of development and the presence of numerous flood-control structures in the vicinity of New Orleans (which may have influenced some zone boundary locations) required great attention to detail during the digitization process.

Where necessary, the flood zone boundaries in the levee-protected parishes were adjusted to conform to the aerial imagery used as the base map for the Katrina Recovery Maps. Adjustment of flood zone boundaries was most often required around levee locations. In all cases of flood zone boundary adjustment, the revised linework was verified against the effective FIRM to ensure that the original intent of the FIRM was retained. That is, if a particular parcel of land (as defined by intersecting roads or other obvious features) appeared to be in a particular flood zone, care was take to ensure that same parcel was shown in the same flood zone on the recovery map. In addition, adjacent ponding areas having the same flood zone type and BFE on the FIRM were merged into a single zone for recovery mapping purposes. For example, on Orleans Parish FIRM 225203, panel 0095E, ponding areas 15 and 19 have a BFE of -1.5 feet. On the corresponding Katrina Recovery Map (panel LA-DD32), these two areas were merged into one ABFE zone.

In addition to adjustments to the flood zone boundaries described above, some effective flood zones in levee-protected areas were modified to clarify the recommended elevation for rebuilding. Specifically, areas shown as Zones A, A99, AO, B, or X on the effective FIRMs lack BFEs (AO elevation values represent depths). This means there is no numeric elevation that can be compared against the 3-feet-above-HEAG elevation, which could be problematic for map users seeking a specific elevation that must be used to raise or rebuild a structure. As better data concerning anticipated flood elevations in these flood zones are not yet available, the recovery maps indicate that the 3-feet-above-HEAG guidance should be applied in these areas.

Comparing BFEs and the 3-Feet-Above-HEAG Requirements

FEMA recognized that property owners may not have the data necessary to properly determine whether the BFE or an elevation of 3 feet above the HEAG should be used as the elevation for rebuilding or repairing structures on a site. To aid map users, an overlay was calculated that depicts the areas where the 3-feet-above-HEAG criterion exceeds the current BFE shown on the FIRM (if any BFE is provided). First, a surface representing the elevation of the effective BFEs was created by constructing a Triangular Irregular Network (TIN) from the effective FIRM flood zone polygons. This BFE TIN was then converted to a DEM with a raster resolution equivalent to the topographic DEM (see Section 2.2). Next, the elevations in the topographic DEM were increased by 3 feet, and these modified elevations were converted to the vertical datum of the parish-specific FIRMs (National Geodetic Vertical Datum of 1929). The BFE DEM and the modified topographic DEM were then intersected in the GIS environment, generating a polygon coverage that depicted areas where the modified topographic DEM surface was higher than the BFE DEM surface. These areas are where the 3-foot-above-HEAG criterion applies, and are shown on the Katrina Recovery Maps using light green shading.

2.5 National Geodetic Survey Monuments

Because of subsidence in the region, determining the elevation of a site or building relative to a reference datum (e.g., NDVD29 or NAVD88) can be challenging. For the five New Orleans-area parishes (Jefferson, Orleans, Plaquemines, St. Bernard, and St. Charles), National Geodetic Survey (NGS) Monument locations and elevations (in NAVD88) have been plotted on the Katrina Recovery Maps. These data were retrieved from station control sheets that are available on the NGS website (http://www.ngs.noaa.gov). The monuments shown reflect recent adjustments to orthometric heights in coastal Louisiana to correct for land subsidence. For more information, please see the following website: http://www.ngs.noaa.gov/heightmod/LouisianaControl.shtml.

3. Presentation of Results

The results of the technical analysis are presented in a series of Katrina Recovery Maps, on a regional overview map, and in the form of GIS files. Each of these products is summarized below:

> Hurricane Katrina Surge Inundation and ABFE Maps (399 panels covering Jefferson, Orleans, Plaquemines, St. Bernard, St. Charles, St. John the Baptist, St. Tammany, and Tangipahoa parishes): When plotted at their native size (ANSI D, 34 inches by 22 inches), the data on these maps are shown at a scale of 1 inch = 500 feet. Each map depicts the coastal HWMs used in the inundation mapping, the surge inundation limit (outside levees only), and ABFEs (including areas where the HEAG criterion applies inside of levees), all shown on a base map of aerial photographs collected by the U.S. Department of Agriculture (USDA) National Agriculture Imagery Program in 2004. For Jefferson Parish, surge inundation limits for Hurricane Rita are shown outside of levees on the West Bank panels (south of the Mississippi River), since HWM data showed that Rita's coastal flooding was more severe than that of Katrina in the area.

> Parish Index Maps (eight maps, one for each parish): The maps' native size is ANSI E (44 inches by 34 inches), but can be scaled to print on smaller sheets. Each map depicts geographic boundaries of the parish, corporate limits, the Katrina Recovery Map paneling scheme (or index), the coastal HWM locations, the surge inundation limit, and the surge elevation contours (outside of levees only). In the case of Jefferson Parish, surge elevation contours and inundation limits for Hurricane Rita are shown on the West Bank (south of the Mississippi River).

> Overview Map: This map covers the initial four-parish study area, including Lake Pontchartrain. Like the parish index maps, its native size is ANSI E. The overview map shows geographic boundaries of the parishes, corporate limits, the Katrina Recovery Map paneling schemes, the coastal HWM locations, the surge inundation limit, and the surge elevation contours.

> GIS Data: GIS-compatible data for the following themes are provided for download on FEMA's Katrina Recovery Map site (www.fema.gov/hazards/floods/recoverydata/katrina_la_gis.shtm):

- Surge inundation limits for each parish (outside of levees only);
- ABFEs for each parish;
- For Jefferson, Orleans, Plaquemines, St. Bernard, and St. Charles Parishes, areas inside of levees where the 3-feet-above-HEAG criterion applies;
- Surge elevation contours for the eight-parish region; and
- HWMs for the full, eight-parish Hurricane Katrina region, including both the surge-only points used in the inundation mapping and points with wave effects or quality concerns (as of the date of this report).

P2.6 SVRGIS: GEOGRAPHIC INFORMATION SYSTEM (GIS) GRAPHICAL DATABASE OF TORNADO, LARGE HAIL, AND DAMAGING WIND REPORTS IN THE UNITED STATES (1950-2005)

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1. INTRODUCTION

Severe weather report data is currently organized into graphical user friendly formats and in interrogation programs. An existing program called SeverePlot v2.0 (Hart 1993), is a graphical and table-based software package that is PC-based and examines attributes, or specific information, of a portion of the United States archived severe weather database. The implementation of Geographic Information Systems (GIS) into mainstream meteorology tasks has been increasing in recent years. SVRGIS is a GIS-based methodology developed at Ball State University that is based on a similar principle to SeverePlot's severe reports graphical database. In addition to SeverePlot's capabilities, the GIS user can access more advanced spatial and statistical tools which provide the user with data querying (data characteristic sorting) capabilities. Additionally, GIS functions include options to select and query large quantities of data and data types and extract user-specified data (e.g., type, quantity, time, space, etc.). A few options include querying the existing database in a tabular format and selecting files to be analyzed, (e.g., tornadoes with specified proximity sounding temporal and spatial criteria), converting classes or "fields" in the database (e.g., time from LST to UTC), or applying spatial or statistical functions to queried data. In addition to severe report data, other data such as geographic and archived meteorological data can be input into SVRGIS. The GIS user can select desired data by querying data by its attributes, location, or both. This is especially helpful when working with large datasets. One advantage of a GIS-based system is the ability to view data in layers. This feature enables the user to quickly examine different variables (e.g., severe reports, municipal areas, transportation routes, and meteorological data) and examine any relationships between the variables.

This study's purpose is to examine the methodology of importing severe report databases into a Geographical Information System (GIS) and highlight a few advantages and capabilities of using a GIS. Outlined are a few of the methods the author used to organize the severe report database into a GIS and include other data types (e.g., geographical) for comparison. A few severe report comparisons will be presented herein and will serve as examples to the many advantages and capabilities a GIS-based severe report database may have in analyzing severe data.

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2. DATA COLLECTION / DATABASE MANAGEMENT

2a. Severe Reports

The severe reports used in this study originated from the National Climatic Data Center (NCDC) and were downloaded as text files (.txt) from the Storm Prediction Center (SPC) Tornado/Severe Thunderstorm Database (Schaefer and Edwards 1999) located at the following web address <http://www.spc.noaa.gov/wcm/>. It must be noted that description of the severe report attribute format used is available for download from the previously listed SPC web address. The reports are associated with descriptive data such as date, time, state(s) affected, F-scale, latitude and longitude coordinates, and monetary damage to name a few. In order to input the large number of recorded reports in a database table, the .txt files were imported into MS Office Access. Access converted the data into tables within an ArcGIS personal geodatabase. Necessary file-converting and file creating steps, not mentioned here, were completed in ArcGIS to create severe report files for display. A visual basic (.bas) script file was used to create and display tornado tracks from tornado touchdown and endpoints in ArcGIS.

Once the files with spatial coordinates were created, they were overlaid on projected maps of the contiguous United States. Other geographic data was input into the GIS for visual purposes. Density files were used, which were determined by values originating from a central grid cell with a radius distance turned 360 degrees for values of other grid cells. Lastly, point density layers and line density layers were created for different variables and some of their associated magnitudes (e.g., baseball-sized hail, significant tornado tracks) using the ArcGIS spatial analyst extension. It is worth noting that there were a few error values found in the severe database. Because of these errors, (e.g., null data values, missing or incomplete latitude/longitude coordinate pair), a few minor data filtering methods were required.

2b. Miscellaneous Data

Various types of geographic data can be input into SVRGIS and examined in many ways. Free data from the internet originated from different sources including the U.S. government and National Weather Service. Most of the miscellaneous data was geographic-based. A few examples of data types include county and state maps, cities and towns, National Weather Service County Warning Areas (CWA's), orthoimagery, elevation and topographic data, and transportation routes.

3. APPLICATION

Meteorologists have investigated past severe weather report distribution (i.e. tornadoes, large hail, and severe convective wind reports) and have for many years qualitatively and quantitatively assessed areas where higher frequencies of severe weather have occurred (Brooks et al. 2003, Hart 2005, Hart 2006). More sophisticated studies are now possible. For example, tornado analysis indicates that nearly half of the tornadoes in the 1950-2005 archived database were either brief touchdowns or do not have a recorded tornado end point. Therefore, tornado track studies have inherent limitations to determining geographical distributions of tornado path length and associated tornado incidence as documented in *Storm Data*. Using this database, a simple plot of tornado tracks can be plotted over metropolitan areas (Fig. 1). A more advanced plot of violent tornado (F4-F5) track densities (Fig. 2) and significant hail (2 in. (5 cm.) or greater in diameter) (Fig. 3) can be calculated from grid cells and displayed with overlaying geographic data (e.g., municipal boundaries).

Another useful application of a GIS permits the user to query severe report data relatively quickly. The following two query examples used methods that queried by location, then by attributes, and finally a combination of both querying steps. In the first example, cool season (October-March) tornadoes that affected portions of Ohio Valley states from 1995-2006 were selected (Fig. 4). Then tornado touchdown reports were further queried to be within rawinsonde launches defined by temporal/spatial criteria (i.e. 200 km and +-3 hr) (Fig. 5). In the second example, useful features such as buffering enable users to query wind reports around a 25 mi. radius of Minneapolis, Minnesota (Fig. 6) and then perform statistical summaries of the data (not shown). The previously mentioned examples are a few of the many possible ways to analyze the severe report database.

4. SUMMARY AND DISCUSSION

Building on the capabilities of SeverePlot and other graphical interface programs, a GIS severe report graphical and statistical database was constructed to complement existing severe weather graphical databases. SVRGIS is not meant to replace Severeplot and other existing programs, but rather complement these user-friendly programs in situations where more in-depth analysis is necessary. SVRGIS is much more than a tool to query only severe weather because its utility is far-reaching and cross disciplinary. SVRGIS is unique from other graphical databases because it allows the GIS user to import other data types (e.g., geographical data) and analyze the data by it's attributes by means of both spatial and statistical methods in layer formats. There are countless ways to investigate severe reports and more analysis possibilities exist within a GIS. It is not new to qualitatively and quantitatively assess regions of the contiguous U. S. with key elements, such as dollar loss, population areas at risk, et cetera. By using a GIS, it is now possible to assess these variables and many more through examination of a plethora of possible relationships between variables all in one database.

The possible users of a GIS severe report database include governmental organizations, researchers, academic professionals and students, the emergency management community, and private sector concerns such as insurance companies and private weather firms.

4. SOFTWARE

The software used for completing the GIS-based database included ESRI's ArcGIS 9 and Microsoft Office Access.

It is recommended that SVRGIS data files be viewed using the latest ESRI ArcGIS version. However, free downloadable GIS software applications such as ESRI's ArcExplorer can be run on the following supporting platforms: Windows, Macintosh, Solaris, AIX, HP-UX, and Linux.

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6. ILLUSTRATIONS AND TABLES

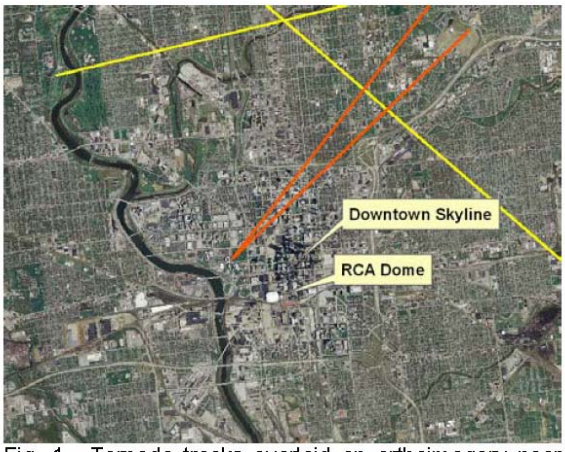

Fig. 1. Tornado tracks overlaid on orthoimagery near downtown Indianapolis, Indiana (1950-2005). (F1-yellow, F2-orange).

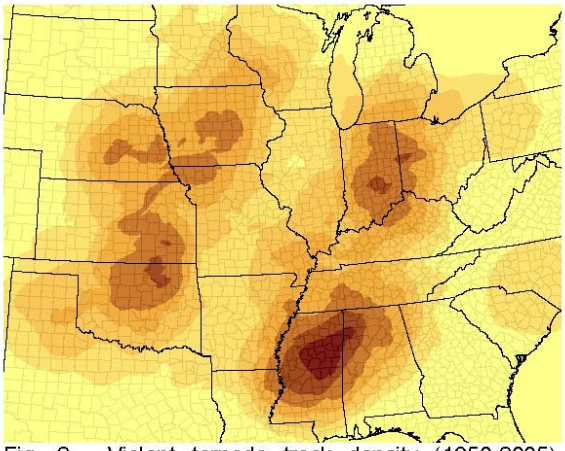

Fig. 2. Violent tornado track density (1950-2005). (1 km horizontal grid cell resolution and 200 km area radius). Darker (lighter) colors indicate higher (lower) density.

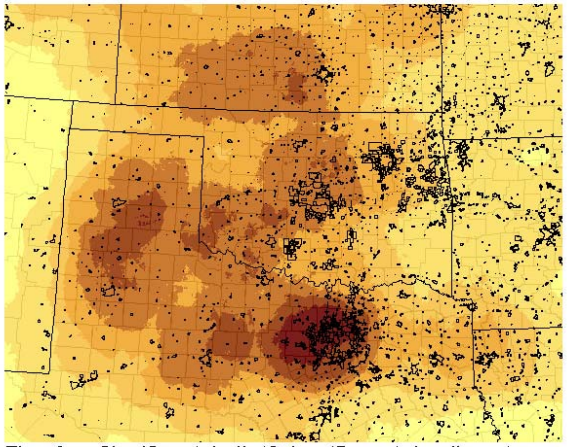

Fig. 3. Significant hail (2 in. (5 cm.) in diameter or larger) point density in the south central Plains (1980-2005). (1 km horizontal grid resolution and 100 km area radius). Darker (lighter) colors indicate higher (lower) density and outlined city areas (black).

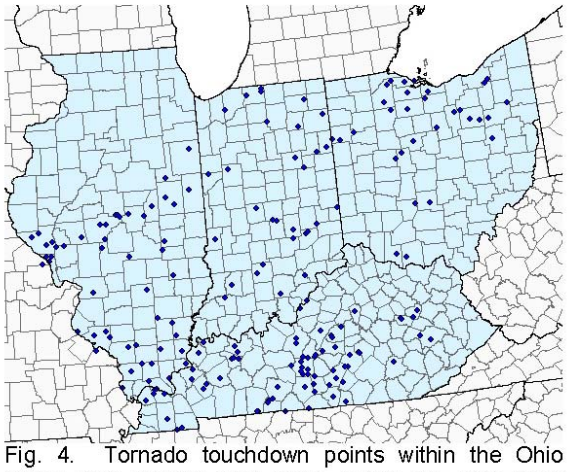

Fig. 4. Tornado touchdown points within the Ohio Valley cool season (Oct.-Mar.) during the 1995-2006 period. Tornado touchdowns (blue) and Ohio Valley states (light blue).

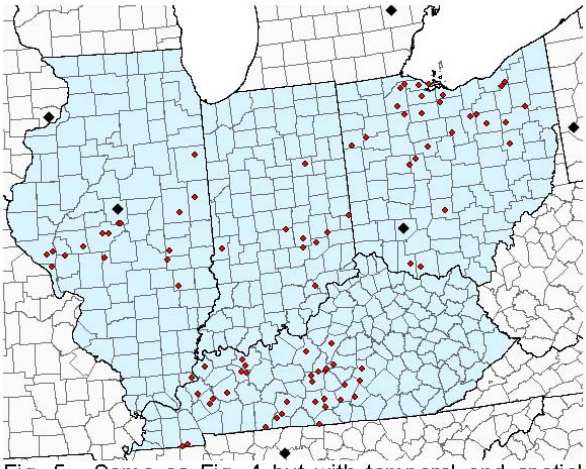

Fig. 5. Same as Fig. 4 but with temporal and spatial restrictions (+ - 3 hr and 200 km) of a rawinsonde. Tornado touchdown points (red) and rawinsonde locations (black).

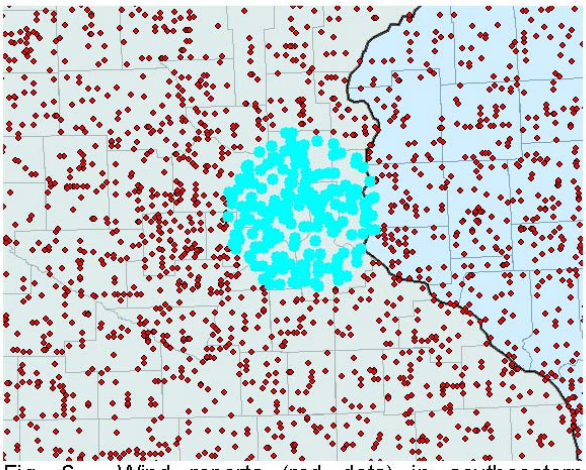

Fig. 6. Wind reports (red dots) in southeastern Minnesota and western Wisconsin (1980-2005). Selected wind reports (blue dots) within 25 mi. radius of Minneapolis, Minnesota.

Appendix E.19:

Compilation of Parish and Municipal Hazard Mitigation Plans

The following pages are tabulations of the results of reviewing existing parish and municipal hazard mitigation plans as well as surveys of participants in the Planning Pilot Grant Program (PPGP):

- Table E.94 Hazards – identifying the range of hazards included in parish and municipal hazard mitigation plans
- Table E.95 Hazard Mitigation Goals – identifying the range of goal statements included in parish and municipal hazard mitigation plans
- Table E.96 Hazard Mitigation Project Types – identifying the range of project types included in parish and municipal hazard mitigation plans
- Table E.97 ESF-14 – identifying any relevant recommendations from ESF-14 recovery plans developed in the wake of hurricanes Katrina and Rita

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Table E-94: Hazards

Parish / Municipality	Flooding	Thunderstorms	Lightning	High Wind	Tornadoes	Drought	Land Subsidence	Hailstorms	Wildfire	Extreme Heat	Dam Failure	Levee Failure	Hazardous Materials Incidents	Biological Hazards	Severe Storms	Hurricanes	Expansive Soils	Winter Storms	Tropical Storms	Utility Failure / Power Loss	Sheltering	Earthquakes	Terrorism	Civil Disturbance	Transportation Hazards	Military Cargo	Coastal Storms	Coastal Erosion	Ice Storms	Mosquito Bourne Disease	Chemical Spills	Storm Surge	Technological Hazards	Saltwater Intrusion	Pipeline Ruptures	Groundwater Contamination	Fog	Termites	Extreme Low	Nuclear Accidents
Acadia Parish	X	X	X	X	X	X	X	X							X	X																								
Allen Parish	X	X		X	X	X		X	X	X	X	X	X			X		X																						
Ascension Parish	X	X	X	X	X	X	X	X		X						X	X	X																						
Assumption Parish	X	X			X	X			X		X	X				X		X																						
Avoyelles Parish	X			X	X	X			X				X			X		X	X	X	X																			
Bienville Parish	X	X	X	X	X	X		X	X	X	X	X		X		X		X				X																		
Beauregard Parish	X	X	X	X	X	X		X	X	X	X				X	X		X	X																					
Bossier Parish	X	X	X	X	X	X		X	X	X	X		X	X		X		X				X	X	X	X	X														
Caddo Parish	X	X			X	X		X	X	X	X	X	X	X		X		X				X	X	X	X	X														
Calcasieu Parish	X	X	X	X	X	X		X	X	X	X				X	X	X	X	X																					
Caldwell Parish	X	X	X	X	X	X		X	X						X	X		X																						
Cameron Parish	X	X	X	X	X	X	X	X	X	X					X	X			X								X	X												
Catahoula Parish	X	X	X	X	X	X		X										X																						
Claiborne Parish	X	X			X	X		X	X	X	X		X					X																						
Concordia Parish	X	X	X	X	X	X			X	X	X	X	X	X		X		X				X	X																	
De Soto Parish	X	X	X	X	X	X		X	X	X	X		X	X		X		X				X	X																	
East Baton Rouge Parish	X				X	X	X	X	X		X				X				X										X											
East Carroll Parish	X	X			X	X		X	X			X						X	X			X	X							X	X									
East Feliciana Parish	X	X			X	X	X		X		X	X				X		X														X								

Parish / Municipality	Flooding	Thunderstorms	Lightning	High Wind	Tornadoes	Drought	Land Subsidence	Hailstorms	Wildfire	Extreme Heat	Dam Failure	Levee Failure	Hazardous Materials Incidents	Biological Hazards	Severe Storms	Hurricanes	Expansive Soils	Winter Storms	Tropical Storms	Utility Failure / Power Loss	Sheltering	Earthquakes	Terrorism	Civil Disturbance	Transportation Hazards	Military Cargo	Coastal Storms	Coastal Erosion	Ice Storms	Mosquito Bourne Disease	Chemical Spills	Storm Surge	Technological Hazards	Saltwater Intrusion	Pipeline Ruptures	Groundwater Contamination	Fog	Termites	Extreme Low	Nuclear Accidents
Evangeline Parish	X	X			X	X	X		X		X	X				X		X														X								
Franklin Parish	X	X	X	X	X	X		X		X					X	X		X																						
Grant Parish	X	X	X	X	X	X		X	X						X	X		X																						
Jefferson Parish	X	X	X	X	X	X	X	X	X							X	X	X														X								
Jefferson Davis Parish	X	X		X	X	X			X	X			X			X		X																						
Iberia Parish	X	X	X	X	X	X		X			X	X				X			X									X												
Iberville Parish	X				X							X			X	X			X				X										X							
Jackson Parish	X	X			X	X		X	X	X	X	X	X	X		X		X				X	X		X															
Lafayette Parish	X	X	X	X	X	X	X	X	X							X																								
Lafourche Parish	X	X	X		X	X	X	X	X				X			X		X					X					X		X		X		X						
LaSalle Parish	X	X	X	X	X	X		X	X						X	X		X																						
Lincoln Parish	X		X	X	X	X		X	X				X					X					X		X					X										
Livingston Parish	X	X	X	X	X	X	X	X	X							X		X																						
Madison Parish	X	X	X	X	X			X		X					X	X		X																						
Morehouse Parish	X	X	X	X	X	X		X		X					X	X		X				X																		
Natchitoches Parish	X	X	X	X	X	X		X							X	X																								
Ouachita Parish	X				X	X		X	X	X	X	X	X	X		X			X			X							X				X		X	X			X	
Orleans Parish	X	X	X		X	X	X	X				X				X		X					X								X									
Plaquemines Parish	X	X	X		X	X	X	X				X	X			X		X										X						X						

Parish / Municipality	Flooding	Thunderstorms	Lightning	High Wind	Tornadoes	Drought	Land Subsidence	Hailstorms	Wildfire	Extreme Heat	Dam Failure	Levee Failure	Hazardous Materials Incidents	Biological Hazards	Severe Storms	Hurricanes	Expansive Soils	Winter Storms	Tropical Storms	Utility Failure / Power Loss	Sheltering	Earthquakes	Terrorism	Civil Disturbance	Transportation Hazards	Military Cargo	Coastal Storms	Coastal Erosion	Ice Storms	Mosquito Bourne Disease	Chemical Spills	Storm Surge	Technological Hazards	Saltwater Intrusion	Pipeline Ruptures	Groundwater Contamination	Fog	Termites	Extreme Low	Nuclear Accidents
Pointe Coupee Parish	X				X	X										X		X									X													
Rapides Parish	X	X	X	X	X	X		X	X	X						X		X																						
Red River Parish	X	X	X	X	X	X	X	X	X	X	X		X	X		X		X				X	X																	
Richland Parish	X	X	X	X	X	X		X							X	X		X																						
Sabine Parish	X			X	X	X			X		X		X			X		X																						
St. Bernard Parish	X	X	X	X	X		X	X	X							X																		X						
St. Charles Parish	X	X	X		X	X	X	X		X		X	X			X		X	X									X						X						X
St. Helena Parish	X	X			X	X	X		X							X		X																						
St. James Parish	X	X	X	X	X		X	X	X			X				X		X																						
St. John the Baptist	X	X	X	X	X	X		X		X						X	X	X																						
St. Landry Parish	X	X			X	X	X		X							X		X																						
St. Martin Parish	X				X											X																								
St. Mary Parish	X				X		X					X				X	X										X	X												
St. Tammany Parish	X				X	X	X	X	X		X	X				X		X	X			X															X	X		
Tangipahoa Parish	X	X	X	X	X	X	X	X	X	X						X	X	X																X						
Tensas Parish	X	X			X	X		X	X			X						X	X				X							X	X									
Terrebonne Parish	X	X	X	X	X	X	X	X								X	X	X														X		X						
Union Parish	X	X			X	X		X	X									X	X				X							X	X									
Vermilion Parish	X	X	X	X	X	X	X	X	X							X	X	X										X				X		X						
Vernon Parish	X				X	X		X	X	X	X	X	X	X		X		X				X	X		X	X														

Parish / Municipality	Flooding	Thunderstorms	Lightning	High Wind	Tornadoes	Drought	Land Subsidence	Hailstorms	Wildfire	Extreme Heat	Dam Failure	Levee Failure	Hazardous Materials Incidents	Biological Hazards	Severe Storms	Hurricanes	Expansive Soils	Winter Storms	Tropical Storms	Utility Failure / Power Loss	Sheltering	Earthquakes	Terrorism	Civil Disturbance	Transportation Hazards	Military Cargo	Coastal Storms	Coastal Erosion	Ice Storms	Mosquito Bourne Disease	Chemical Spills	Storm Surge	Technological Hazards	Saltwater Intrusion	Pipeline Ruptures	Groundwater Contamination	Fog	Termites	Extreme Low	Nuclear Accidents
Washington Parish	X	X	X	X	X	X	X	X	X	X						X		X																						
Webster Parish	X			X	X	X		X	X				X					X																						
West Baton Rouge Parish	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X				X	X																	
West Carroll Parish	X	X	X	X	X		X	X		X					X	X		X				X																		
West Feliciana Parish	X	X			X	X	X		X		X	X				X		X																						
Winn Parish	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X				X	X																	
City of Donaldsonville	X	X	X	X	X	X	X	X							X	X	X	X																						
City of Harahan	X	X	X	X	X	X	X	X				X				X	X	X														X								
City of Lake Charles	X				X	X			X	X					X	X	X		X																					
City of Mandeville	X	X	X	X	X			X								X																X								
City of Monroe	X	X	X	X	X	X		X	X	X		X	X			X		X																						
City of Opelousas	X	X	X	X	X	X		X		X						X																								
City of Slidell	X	X			X		X		X							X																								
City of Thibodaux	X	X	X	X	X	X		X								X																X								
City of West Monroe	X		X		X	X	X	X	X	X	X	X	X	X		X	X	X				X	X												X	X	X			
City of Bossier City	X	X	X	X	X	X		X		X						X		X																						
City of Covington	X	X	X	X	X		X	X								X	X	X																						

Table E-95: Mitigation Goals

Parish / Municipality	Protect life and Property from Hazards	Enhance Public Awareness and Understanding of Disaster Preparedness	Build Capacity to Reduce Vulnerability	Address Repetitive Loss Structures and Areas through a Comprehensive and Proactive Mitigation Strategy	Facilitate Sound Development/Floodplain Management
Acadia Parish	X	X		X	X
Allen Parish	X			X	
Ascension Parish	X	X		X	X
Assumption Parish	X	X	X		X
Avoyelles Parish	X	X			
Bienville Parish	X				
Beauregard Parish	X			X	
Bossier Parish	X		X		
Caddo Parish	X		X		
Calcasieu Parish	X		X	X	
Caldwell Parish	X	X	X	X	X
Cameron Parish	X			X	
Catahoula Parish	X	X	X	X	X
Claiborne Parish	X	X	X		X
Concordia Parish	X	X	X	X	
De Soto Parish	X	X	X	X	
East Baton Rouge Parish	X	X	X		X
East Carroll Parish	X	X	X		
East Feliciana Parish	X		X		
Evangeline Parish	X	X	X		
Franklin Parish	X	X		X	X
Grant Parish	X	X		X	X
Iberia Parish	X	X			
Iberville Parish	X		X		X
Jackson Parish	X				X
Jefferson Parish	X	X			X
Jefferson Davis Parish	X				X
Lafayette Parish	X	X		X	X
Lafourche Parish	X	X		X	X
LaSalle Parish	X	X			X
Lincoln Parish	X	X		X	X
Livingston Parish	X	X		X	X
Madison Parish	X	X		X	X
Morehouse Parish	X	X		X	X
Natchitoches Parish	X	X		X	X
Ouachita Parish	X	X			

Parish / Municipality	Protect life and Property from Hazards	Enhance Public Awareness and Understanding of Disaster Preparedness	Build Capacity to Reduce Vulnerability	Address Repetitive Loss Structures and Areas through a Comprehensive and Proactive Mitigation Strategy	Facilitate Sound Development/Floodplain Management
Orleans Parish	X	X		X	
Plaquemines Parish	X		X	X	
Pointe Coupee Parish	X	X	X		
Rapides Parish	X	X		X	X
Red River Parish	X				
Richland Parish	X	X		X	X
St. Bernard Parish	X	X		X	X
St. Charles Parish	X		X		
St. Helena Parish	X	X	X		X
St. James Parish	X	X		X	X
St. John the Baptist Parish	X	X		X	X
St. Landry Parish	X	X	X		
St. Martin Parish	X	X		X	
St. Mary Parish		X	X	X	X
St. Tammany Parish	X		X		X
Sabine Parish		X	X	X	
Tangipahoa Parish	X	X		X	X
Tensas Parish	X	X		X	X
Terrebonne Parish	X	X		X	X
Union Parish	X	X	X		
Vermilion Parish	X	X		X	X
Vernon Parish	X		X		
Washington Parish	X	X		X	X
Webster Parish	X		X		
West Baton Rouge Parish	X	X	X		
West Carroll Parish	X	X		X	X
West Feliciana Parish		X	X		
Winn Parish	X	X	X		
City of Donaldsonville	X	X		X	X
City of Harahan	X	X	X	X	X
City of Lake Charles	X				
City of Mandeville	X	X		X	X
City of Monroe					
City of Opelousas	X	X		X	X
City of Slidell		X	X		X
City of Thibodaux	X	X		X	X
City of West Monroe		X	X		
City of Bossier City	X	X		X	X
City of Covington	X	X		X	X

Table E-96: Hazard Mitigation Project Types

Parish / Municipality	Retrofitting / Hardening Buildings	Floodproofing	Structural Flood Control	Drainage	Planning / Studies	NFIP / CRS	Public Awareness	Warning Systems	Generators	Building Codes	Zoning / Land Use	Safe Rooms / Shelters	Acquisition / Green Space	Elevation	Relocation	Training	Wetland Preservation
Acadia Parish	X			X			X	X	X	X			X				
Allen Parish		X	X	X	X	X	X	X	X	X			X	X	X	X	
Ascension Parish			X	X	X	X	X		X	X	X						
Assumption Parish				X	X	X	X	X	X	X	X	X					
Avoyelles Parish	X				X		X			X			X				X
Bienville Parish	X						X	X	X	X			X				
Beauregard Parish	X					X	X				X						
Bossier Parish	X						X	X		X	X	X	X				
Caddo Parish	X						X	X		X	X	X	X				
Calcasieu Parish	X				X	X	X				X						
Caldwell Parish	X	X		X	X		X		X	X	X		X	X			
Cameron Parish	X				X	X	X				X						
Catahoula Parish	X	X		X	X		X		X	X	X		X				
Claiborne Parish					X		X	X	X	X							
Concordia Parish	X			X			X	X		X	X		X	X			
De Soto Parish	X	X	X	X	X		X	X		X	X		X	X	X		
East Baton Rouge Parish				X	X		X	X	X	X		X					
East Carroll Parish	X		X	X			X	X	X	X	X		X		X		
East Feliciana Parish				X	X		X	X		X	X		X				
Evangeline Parish				X			X			X	X						
Franklin Parish	X	X		X	X	X	X			X	X		X	X			
Grant Parish	X	X		X	X	X	X			X	X		X	X			
Jefferson Parish		X	X	X		X	X		X	X	X	X		X			
Jefferson Davis Parish	X			X			X	X	X	X			X				
Iberia Parish		X	X	X			X	X	X		X		X	X			X
Iberville Parish	X		X	X	X	X	X			X							
Jackson Parish	X						X		X	X	X					X	
Lafayette Parish	X	X		X			X	X		X			X	X	X		
Lafourche Parish	X			X			X	X		X	X		X				

Parish / Municipality	Retrofitting / Hardening Buildings	Floodproofing	Structural Flood Control	Drainage	Planning / Studies	NFIP / CRS	Public Awareness	Warning Systems	Generators	Building Codes	Zoning / Land Use	Safe Rooms / Shelters	Acquisition / Green Space	Elevation	Relocation	Training	Wetland Preservation
LaSalle Parish		X	X	X		X	X		X	X	X	X		X			
Lincoln Parish	X			X			X	X		X	X		X				
Livingston Parish	X			X			X	X		X	X		X				
Madison Parish	X			X			X	X		X	X		X				
Morehouse Parish	X			X			X	X		X	X		X				
Natchitoches Parish	X			X			X	X		X	X		X				
Ouachita Parish	X	X		X			X	X		X				X			X
Orleans Parish		X	X	X	X		X		X	X		X		X	X		X
Plaquemines Parish				X			X	X		X	X		X	X			
Pointe Coupee Parish	X		X				X	X		X	X		X		X		X
Rapides Parish	X	X		X			X			X			X	X	X		
Red River Parish	X	X		X			X	X		X			X	X	X		
Richland Parish	X			X			X	X		X	X		X				
Sabine Parish	X			X	X		X			X	X		X	X			
St. Bernard Parish	X			X			X	X		X	X		X				
St. Charles Parish	X						X	X		X	X		X	X			
St. Helena Parish					X		X	X			X		X				
St. James Parish	X			X			X	X		X	X		X				
St. John the Baptist Parish	X			X			X	X		X	X		X				
St. Landry Parish			X				X	X					X				
St. Martin Parish		X		X	X		X				X		X	X	X		
St. Mary Parish		X		X			X				X		X	X	X		
St. Tammany Parish	X		X										X	X	X		
Tangipahoa Parish	X	X		X	X		X	X	X	X	X		X	X			
Tensas Parish	X		X	X	X		X	X	X	X	X		X				
Terrebonne Parish	X	X		X	X	X	X		X		X		X	X			
Union Parish	X			X	X		X	X	X		X		X				
Vermilion Parish	X	X	X				X	X	X	X	X	X	X	X			
Vernon Parish			X						X	X	X	X	X	X		X	
Washington Parish	X	X		X	X	X	X		X	X	X		X				

Parish / Municipality	Retrofitting / Hardening Buildings	Floodproofing	Structural Flood Control	Drainage	Planning / Studies	NFIP / CRS	Public Awareness	Warning Systems	Generators	Building Codes	Zoning / Land Use	Safe Rooms / Shelters	Acquisition / Green Space	Elevation	Relocation	Training	Wetland Preservation
Webster Parish	X		X	X			X	X		X	X					X	
West Baton Rouge Parish	X	X		X			X		X	X	X	X	X	X			
West Carroll Parish	X	X		X	X	X	X			X	X		X	X			
West Feliciana Parish				X			X	X		X	X			X			
Winn Parish	X			X			X		X	X	X	X	X	X	X		
City of Donaldsonville	X	X		X	X	X	X			X	X		X	X			
City of Harahan		X		X		X	X		X	X	X		X	X			
City of Lake Charles	X					X	X	X			X	X				X	
City of Mandeville		X	X	X	X	X	X		X	X	X		X	X			
City of Monroe				X	X			X	X	X							
City of Opelousas	X	X		X	X	X	X			X	X		X	X			
City of Slidell	X		X	X	X	X	X	X		X		X					
City of Thibodaux	X	X		X	X	X	X			X	X		X	X			
City of West Monroe	X			X	X	X	X	X				X	X				
City of Bossier City	X	X		X	X	X	X			X	X		X	X			
City of Covington	X	X		X	X	X	X			X	X	X	X	X			

Table E-97: ESF-14 – Identifying any Relevant Recommendations from ESF-14 Recovery Plans

Does the Parish have an ESF-14 Plan?	Yes	No	Identify Projects with Mitigation Implications
Acadia Parish	X		No Available Information
Allen Parish	X		Prepare Hospital Hazard Mitigation Plan Upgrade and Repair Bayou Blue & Kinder Drainage Establish Building Code & Home Repair Program
Ascension Parish		X	
Assumption Parish	X		No Available Information
Avoyelles Parish		X	
Beauregard Parish	X		None
Bienville Parish		X	
Calcasieu Parish	X		Housing and Community Development - Restore Frazar Memorial Library Flood Protection and Coastal Restoration - Construct a new Lock Supplement Flood Protection and Coastal Restoration - Construct Tide Gate at Bayou D'Inde Flood Protection and Coastal Restoration - Restore the SW Louisiana Coastline Barrier Flood Protection and Coastal Restoration - Restore/Protect Cheniers for Hurricane Protection
Caldwell Parish		X	
Cameron Parish	X		Public Safety - Construct Auxiliary Parish Operations Center (APOC) Public Safety - Repair Cameron Parish Justice & Government Center Flood Protection and Coastal Restoration Establish Stormwater Action Plans Flood Protection and Coastal Restoration Restore Coast Reduce Erosion Flood Protection and Coastal Restoration Restore/Protect Cheniers for Hurricane Protection
Catahoula Parish		X	
East Baton Rouge Parish	X		Education - Renovate Banks & Harding Elementary Education - Renovate Crestworth & Glen Oak Middle Schools Education - Renovate Scotlandville Elem/Mid School
East Feliciana Parish		X	
Evangeline Parish		X	
Franklin Parish		X	

Does the Parish have an ESF-14 Plan?	Yes	No	Identify Projects with Mitigation Implications
Iberia Parish	X		Public Safety - Construct Shelters of Last Resort Flood Protection and Coastal Restoration - Restore the Vermilion Bay Shoreline
Iberville Parish		X	Prepare a Master Drainage & Flood control Plan Construct Shelters of Last Resort Create Marsh at Weeks Bay Create Marsh at Marsh Island Restore the Vermilion Bay Shorline
Jefferson Parish	X		Transportation and Infrastructure - Repair and Upgrade Drainage Canals and Floodgates Public Safety - Construct Emergency Operation Centers Flood Protection and Coastal Restoration - Implement Shoreline Protection Measures Flood Protection and Coastal Restoration - Stabilize Lafitte/Barataria Shoreline
Jefferson Davis Parish	X		Housing and Community Development - Rebuild & Protect the Lake Arthur Waterfront Dist. Public Safety - Construct Emergency Preparedness Facilities Public Safety - Develop Evacuation Shelters
Lafayette Parish	X		No Available Information
Lafourche Parish	X		Public Safety - Update Lafourche Emergency Operations Plans Flood Protection and Coastal Restoration - Restore the Lafourche Parish Coast
LaSalle Parish		X	
Lincoln Parish		X	
Livingston Parish		X	
Madison Parish		X	
Morehouse Parish		X	
Natchitoches Parish		X	
Orleans Parish	X		Divert freshwater to Bayou Bienvenue Prepare a secondary flood protection system study Protect East New Orleans land bridge shoreline Restore wetlands through improved WW treatment Stabilize NO East landbridge Hwy 90 bank.
Ouachita Parish		X	

Does the Parish have an ESF-14 Plan?	Yes	No	Identify Projects with Mitigation Implications
Plaquemines Parish	X		Public Safety - Consolidate and Enhance Sheriff's Office Public Safety - Develop Emergency Preparedness Operations Ctrl CC Flood Protection and Coastal Restoration Restore Spanish Pass Freshwater Diversion Flood Protection and Coastal Restoration Restore White Ditch Freshwater Diversion
Pointe Coupee Parish		X	
Rapides Parish		X	
Richland Parish		X	
St. Bernard Parish	X		Public Safety Build a Central Public Safety/Emergency Operations Center Flood Protection and Coastal Restoration Divert Freshwater into Bayou Lamoque
St. Charles Parish	X		Public Safety Construct Consolidated Emergency Operations Center
St. Helena Parish		X	
St. James Parish	X		No Available Information
St. Mary Parish	X		Flood Protection and Coastal Restoration - Improve Flood Ctrl Pump Stations West of Wax Lake
St. Martin Parish	X		No Available Information
St. Tammany Parish	X		Public Safety - Expand Slidell Park Police Substation Public Safety - Rebuild Covington Community/Emergency Operations Center Public Safety - Renovate Sheriff's Pearl River Training Facility Public Safety - Upgrade Mandeville EOC Dispatch Center Flood Protection and Coastal Restoration - Restore St. Tammany Marsh Flood Protection and Coastal Restoration - Improve Parish Drainage Capacity Priority 1
Tangipahoa Parish	X		Environmental - Construct Tangipahoa/Pontchartrain Shore Protection
Tensas Parish		X	
Terrebonne Parish	X		No Available Information
Union Parish		X	

Does the Parish have an ESF-14 Plan?	Yes	No	Identify Projects with Mitigation Implications
Vermilion Parish	X		Education - Build Schools Free From Floods Public Safety - Construct Communications Shelter Public Safety - Restore Fire Department Coverage Flood Protection and Coastal Restoration - Restore Natural Drainage from Freshwater Basins Flood Protection and Coastal Restoration - Stabilize Freshwater Bayou Bank Flood Protection and Coastal Restoration - Stabilize Rockefeller Refuge Gulf Shoreline
Washington Parish	X		Parish-wide emergency broadcast system Construct new central EOC Replace/expand four fire stations Purchase generators.
West Baton Rouge Parish		X	
West Feliciana Parish		X	
Winn Parish		X	
UPDATES			
WITT CONSULTANT			
APPLICATION PENDING			

Appendix F
Risk Assessment for State-Owned Assets

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This appendix provides detailed documentation in support of Section Six – Risk Assessment for State-Owned Assets.

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Appendix F.1:
Flood

Vulnerability Assessment Parameters, Methodology and Results

The flood hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Location within the Floodplain: Structures located within the 100-year floodplain were determined based on a combination of Digital Flood Insurance Rate Map (DFIRM) data, available for 45 parishes, and HAZUS-MH MR4 Flood Modeling for the remaining 19 parishes (see Map F-4). . Map F-1 (Location of Critical Facilities – Flood) shows the area of the 100-year floodplain in the State of Louisiana based on the combined data in relation to State-Owned Facilities.
- Pre-FIRM vs. Post-FIRM Construction: Pre-FIRM structures are defined as buildings that were constructed in a community prior to their entry into the National Flood Insurance Program (NFIP). Pre-FIRM structures did not have to be elevated above the 100-year (or base) flood elevation or meet other NFIP requirements. Post-FIRM structures were built after the community's enrollment into the NFIP (and establishment of a FIRM), and must be elevated at or above the 100-year (or base) flood elevation and meet other requirements of the NFIP and the local floodplain management ordinance. In this Plan Update any structures with a move-in date after 1982 (i.e., 1983 or later) were recognized as post-FIRM. This date was established by taking the average date that communities in Louisiana joined the NFIP.

Based on these two parameters, a vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are defined below.

- Low Hazard Vulnerability: Structures located outside the 100-year floodplain.
- Medium Hazard Vulnerability: Post-FIRM structures located within the 100-year floodplain.
- High Hazard Vulnerability: Pre-FIRM structures located within the 100-year floodplain.

Map F-2, Vulnerability Assessment– Flood, shows State-owned critical facilities by level of vulnerability to the flood hazard.

Loss Estimate Parameters, Methodology and Results

The flood loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Flood Hazard Vulnerability: As stated above, flood vulnerability assessments involved an analysis of two major parameters: location within the 100-year floodplain and whether the structure is of pre-FIRM or post-FIRM construction. Low, medium, and high vulnerability for flood are defined above.
- Average Flood Depth: Although the 100-year flood elevations were available from the NFIP's DFIRM data for some parishes, the flood depths for individual State-owned buildings and critical facilities could not be determined due to the lack of available first floor elevations for each structure. Therefore, average flood depths for individual structures were estimated based on their corresponding flood hazard vulnerability level. These basic flood depths are summarized below.
    - For low hazard vulnerability structures, no flood depth was used, since the structures were located outside the 100-year floodplain.

- For medium hazard vulnerability structures, an average flood depth of 0 feet above the first floor was used, since the structures were post-FIRM and assumed to be elevated at or above the 100-year flood elevation as required by the NFIP.
- For high hazard vulnerability structures, an average flood depth of 3 feet above the first floor was estimated, since the structures were pre-FIRM and did not have to be elevated at or above the 100-year flood elevation as required by the NFIP.

- Average Building Type: Although the building types for each structure were described in the statewide Geographic Information System (GIS) database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, to conduct basic analyses, individual loss estimates assumed an average building type of a single story structure without a basement. This average building type was determined based on experience with typical buildings and foundation construction techniques in Louisiana.
- Depth-Damage Functions (DDFs): Physical (building) damage, contents damage and loss of function (LOF) costs for each structure were estimated based on a series of DDFs. These DDFs were developed by the Flood Insurance Administration (FIA) based on flood claim data collected nationwide over many years for a wide range of building types. DDFs are used by FEMA in evaluating flood risk and determining cost effectiveness for its mitigation grant programs. The DDFs for building damage, contents damage and LOF days used for the flood loss estimates are summarized in the Table F.1-1.

Table F.1-1

Flood Hazard Vulnerability Level	Average Building Type	Average Flood Depth (above FFE)	Building DDF (%BRV)	Contents DDF (%BRV)	LOF (days)
Low	1 Story without Basement	None	0.0%	0.0%	0
Medium	1 Story without Basement (Post-FIRM)	0 feet	9.0%	7.0%	9
High	1 Story without Basement (Pre-FIRM)	3 feet	27.0%	20.5%	27

NOTES: 1.) FFE = First Floor Elevation
2.) Assume contents replacement value = 50% BRV

- Physical Damage: Physical damages were estimated as a percentage of the Building Replacement Value (BRV). For each structure, the BRV was determined based on building values obtained from the statewide GIS database. The physical damage costs were computed by multiplying the BRV by the corresponding building DDF.
- Contents Damage: Contents damages were estimated as a percentage of the contents replacement value. For each structure, the contents replacement value was estimated based on a percentage of the BRV determined from the statewide GIS database. Based on an analysis of Hazards U.S. (HAZUS) data for various building types, the contents replacement values were equal to an average of 50 percent of the BRVs. The contents damage costs were determined by multiplying the contents replacement value by the corresponding contents DDF.
- Loss of Function: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, is distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the

actual square footage by a Criticality Factor (CF) based on the criticality of each structure. A summary of CFs is provided in Table F.1-2.

By applying the CF to the square footage of each structure, it allows higher criticality facilities (such as fire stations) to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding Flood Damage Functions (FDFs) for LOF (measured in days).

Table F.1-2

Criticality Level	Criticality Factor (CF)
1 – High	10
2 – Medium High	8
3 – Medium	6
4 – Medium Low	4
5 - Low	2

Once these parameters were determined, the combined loss estimate (building, contents, and loss of function) in dollars for each structure was determined using the following formula:

Combined Loss Estimate = (Physical Damage + Contents Damage + LOF)

Map 6-3 presents the results of the combined flood loss estimate computations. The ten critical facilities in Louisiana with the highest combined loss estimates for the flood hazard are shown on Map F-3 (also Map 6-3) and are summarized in Table 6-7.

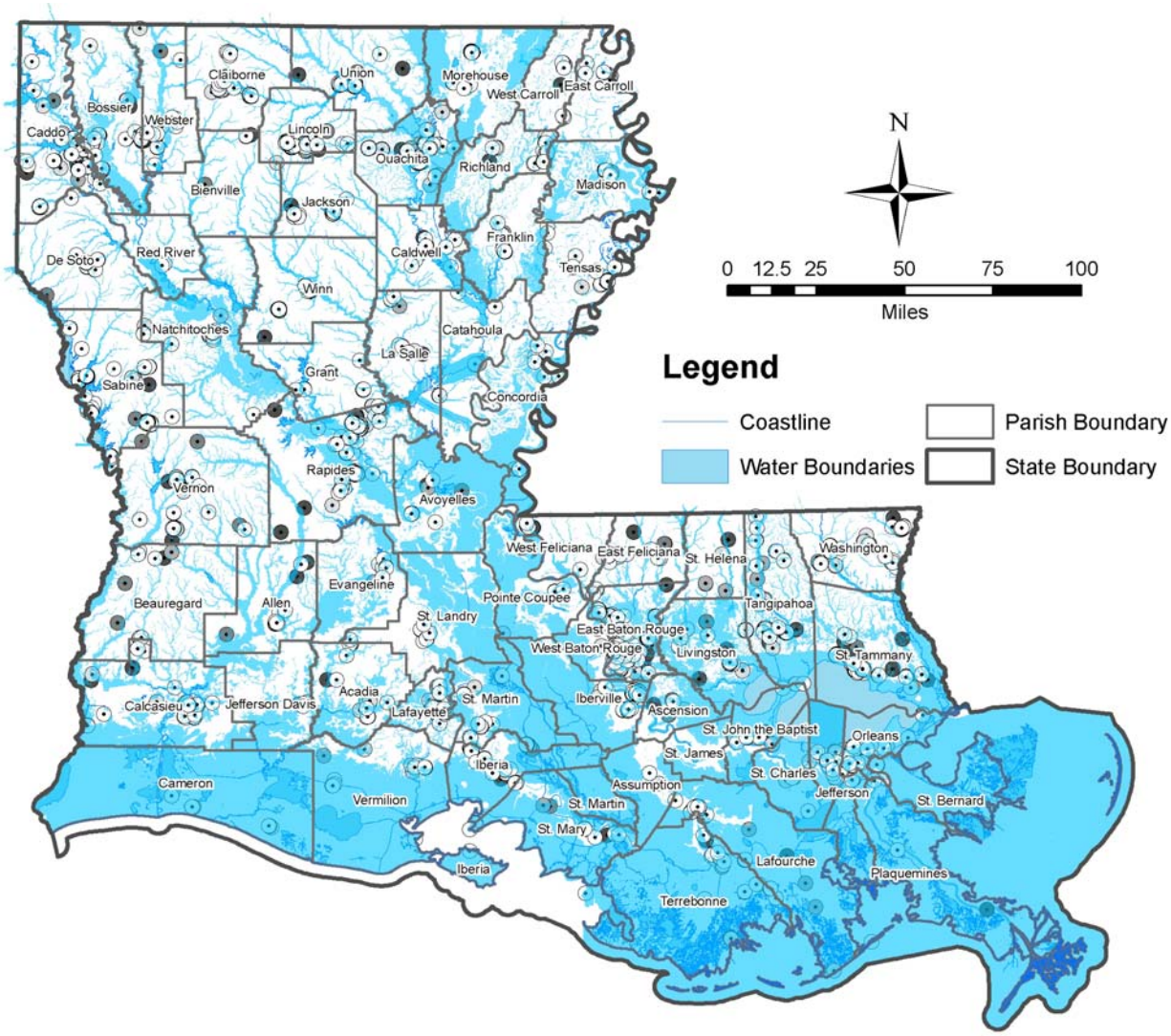
List of Assumptions

The flood loss estimate is based on the following assumptions.

- General: Flood loss estimates for individual structures are based on the 100-year flood taken from the available DFIRM and HAZUS data. Assigning numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, flood loss estimates for individual structures should not be used for estimating flood insurance coverage or other needs that require a high degree of accuracy.
- Flood Hazard Vulnerability and Average Flood Depth: Structures constructed outside the 100-year floodplain incur zero flood damages. All post-FIRM structures have been constructed with their first floor elevation at the 100-year flood elevation in accordance with NFIP regulations. All pre-FIRM structures have been constructed with their first floor elevation an average of 3 feet below the 100-year flood elevation and do not comply with NFIP regulations. In the event the statewide GIS database did not provide a move-in date for an individual structure, the structure was considered to be pre-FIRM. In Louisiana, any structures built after 1982 (i.e., 1983 or later) were recognized as post-FIRM. This date was established by taking the average date that communities in Louisiana joined the NFIP; these dates vary between 1970 and 2010, but most were in the 1970s and 1980s.
- Average Building Type and DDFs: The physical and contents damages to individual State-owned buildings and critical facilities from flooding will be considered the same as a single story structure without a basement (i.e., slab-on-grade) constructed using standard residential building materials.
- Physical Damage: For each structure, the BRV is consistent with the building values obtained from the statewide GIS database. In the event the statewide GIS database did not provide a BRV for an individual structure, the BRV was estimated to be zero.

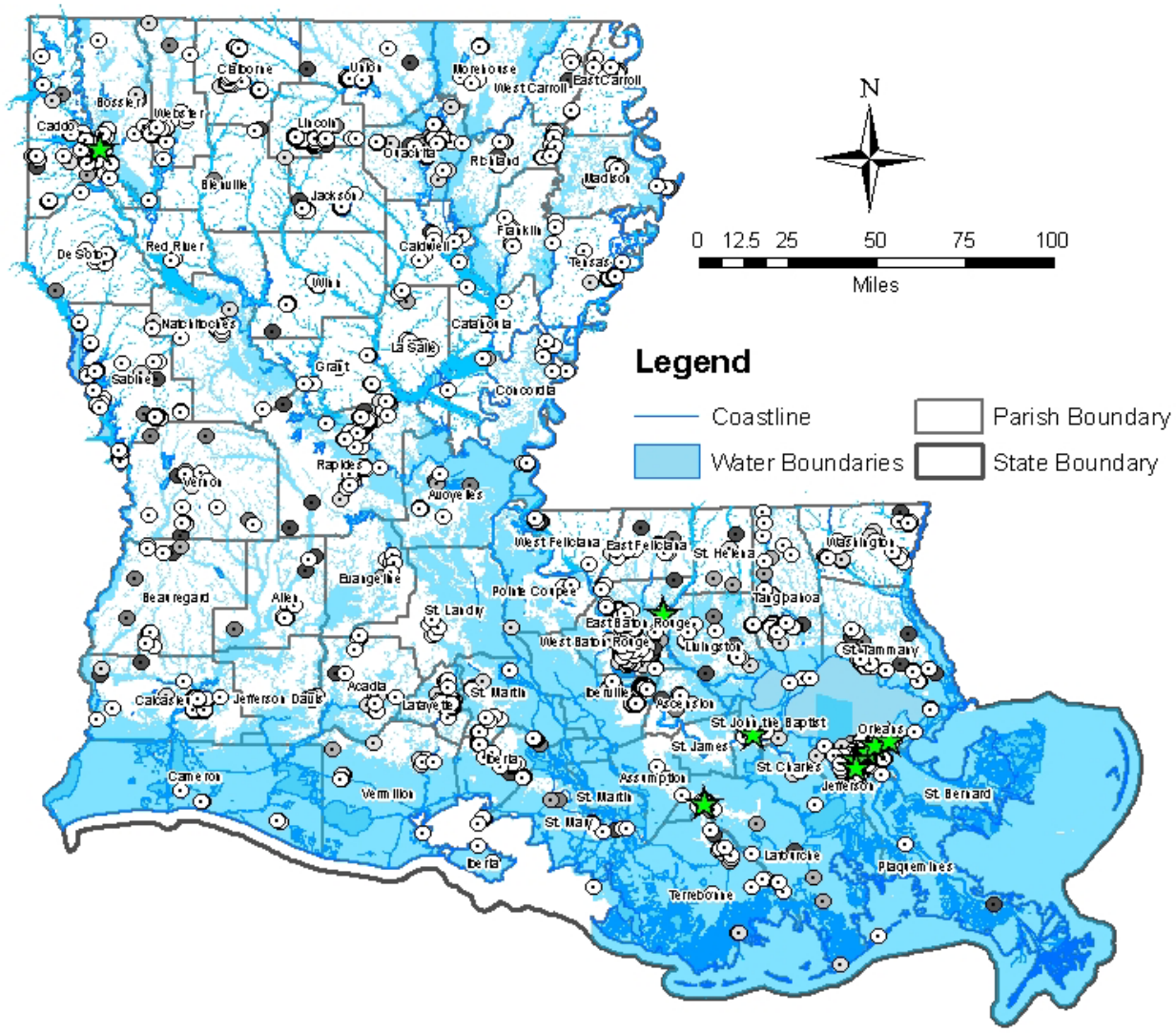
- Contents Damage: For each structure, the contents replacement value is equal to 50 percent of the BRV.
- LOF: The $28.9 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The CFs were derived based loosely on FEMA's *What is a Benefit?,* draft guidance document dated May 1, 2001 and engineering judgment.

Map F-1: Location of Critical Facilities – Flood



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), LDOTD (DFIRM Boundaries), and HAZUS (Flood Boundaries)

Map F-2: Vulnerability Assessment - Flood

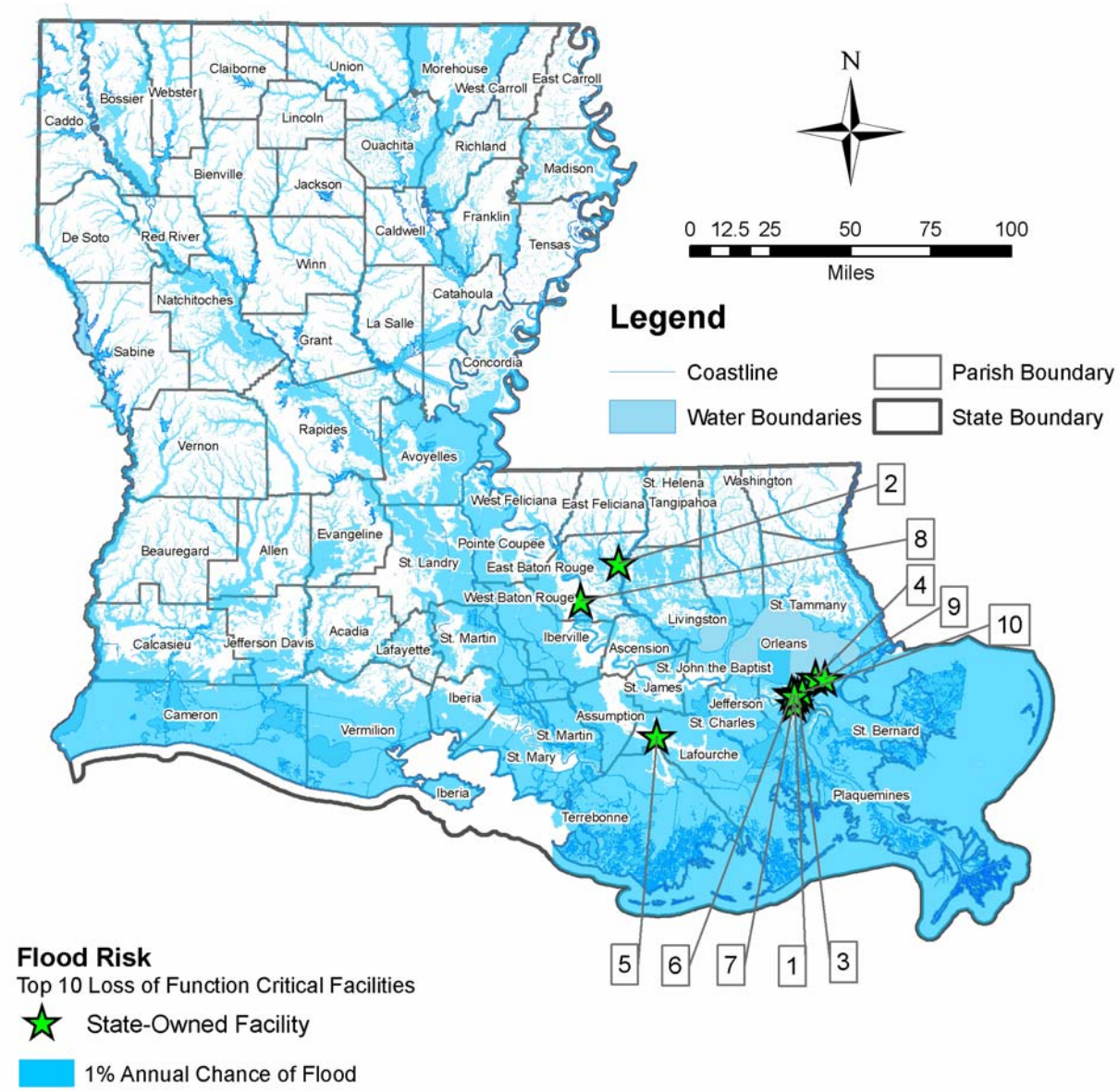


Flood Risk
State-Owned Critical Facilities

1 (High) 2 (Medium-High) 3 (Medium) 4 (Medium-Low) 5 (Low)

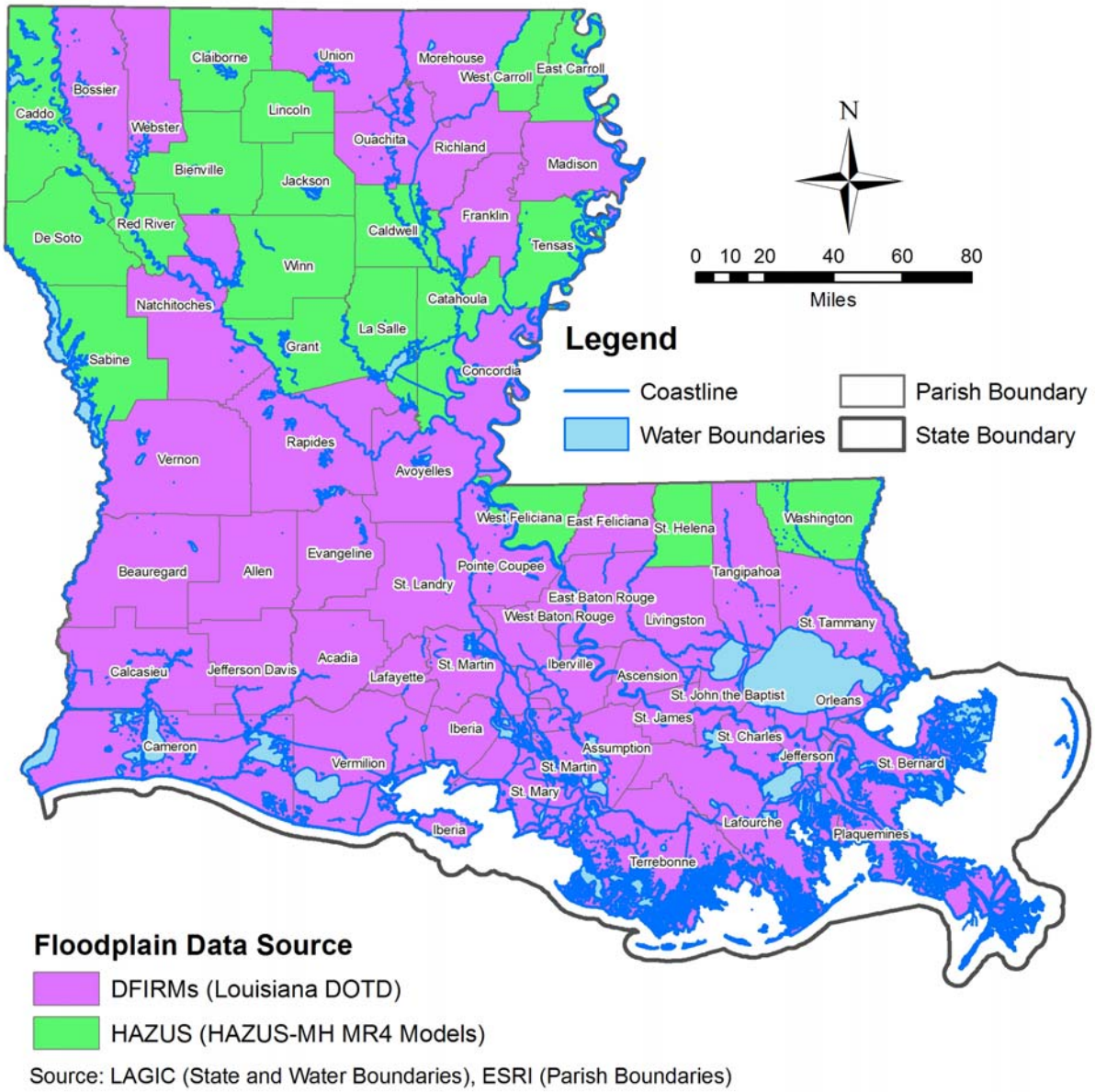
Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), LDOTD (DFIRM Flood Boundaries), HAZUS (Flood Boundaries)

Map F-3: Loss Estimate – Flood – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), LDOTD (DFIRM Boundaries), HAZUS (Flood Boundaries)

Map F-4: Source of Floodplain Data



Appendix F.2:
High Wind (Hurricane)

Vulnerability Assessment Parameters, Methodology and Results

The hurricane wind hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Design Wind Speed: The design wind speed was determined based on a combination of American Society of Civil Engineers (ASCE) Standard 7-05, *Minimum Design Loads for Buildings and Other Structures* and a 100-year event modeled in HAZUS. ASCE 7-05 is the basis for wind design in the new International Building Code, and has been available as an alternate basis for wind design under the old Standard Building Code (SBC). The minimum design wind speeds in ASCE 7-05 are based on the maximum 3-second peak wind gust speeds recorded over a 100-year recurrence interval in coastal areas and a 50-year recurrence interval in inland areas. The design wind speed zones from ASCE 7-05 for Louisiana are represented graphically on Map 4-16, Hazard Profile – High Wind (Hurricane). Note that the ASCE 7-05 design wind speed map was derived from a variety of sources, and accounts for wind decay modeling of various category hurricane events such as those presented in the *State of Louisiana Hazard Mitigation Plan: Hazard Profiles* dated April 18, 2003. Map F-5 indicates the location of State-owned critical facilities in Louisiana in relation to average 100-year event wind speed zones as modeled by HAZUS.
- Pre-Wind Code vs. Post-Wind Code Construction: Pre-wind code structures are buildings with a move-in date prior to the 1991 SBC. The 1991 SBC was the first building code adopted statewide in Louisiana, and provided a standardized method for analyzing and designing for basic hurricane-force wind pressures. Post-wind code structures have a move-in date after the 1991 SBC was adopted statewide, and were designed to account for basic hurricane-force wind pressures. In Louisiana, any structures built after 1991 (i.e., 1992 or later) are recognized as post-wind code.

Based on these two parameters, a hazard vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are summarized in Table F.2-1.

Table F.2-1

Hazard Vulnerability Level	Design Wind Speed (mph)	Pre-Wind Code vs. Post-Wind Code
Low	≤ 90	Post-Wind Code
Low	≤ 90	Pre-Wind Code
Low	91-110	Post-Wind Code
Medium	91-110	Pre-Wind Code
Medium	> 110	Post-Wind Code
High	> 110	Pre-Wind Code

Map F-5 shows State-owned critical facilities by level of vulnerability to the hurricane wind hazard.

Loss Estimate Parameters, Methodology and Results

The hurricane wind loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Hurricane Wind Hazard Vulnerability: As stated on the preceding page, hurricane wind hazard vulnerability assessments involved an analysis of two major parameters: design wind speed and whether the structure was pre-wind code or post-wind code construction. See Table F.2-1 for hurricane wind vulnerability levels.
- Average Building Type: Although the building types for each structure were described in the statewide GIS database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, to conduct basic analyses, individual loss estimates assumed an average building type of a lightly engineered building. This average building type was determined based on experience with typical building construction in Louisiana.
- Hurricane Wind Damage Functions: Physical (building) damage, contents damage and LOF costs for each structure were estimated based on a series of Wind Damage Functions (WDFs). These WDFs were developed based on damage functions for FEMA's *Full Data Benefit-Cost Module for Hurricane Wind Projects* (version 5.1a dated March 13, 2003). The WDFs for building damage, contents damage and LOF are summarized in the Table F.2-2.

Table F.2-2

Design Wind Speed	Average Building Type	Design Wind Speed (mph)	Building WDF (%BRV)	Contents WDF (%BRV)	LOF (days)
≤ 90 mph	Lightly Engineered (Post-Wind Code)	≤ 90	2.5%	0.6%	2.5
≤ 90 mph	Lightly Engineered (Pre-Wind Code)	≤ 90	5.0%	1.3%	5
91 - 110 mph	Lightly Engineered (Post-Wind Code)	91 - 110	7.5%	3.8%	7.5
91 - 110 mph	Lightly Engineered (Pre-Wind Code)	91 - 110	15.0%	7.5%	15
> 110 mph	Lightly Engineered (Post-Wind Code)	> 110	15.0%	10.0%	15
> 110 mph	Lightly Engineered (Pre-Wind Code)	> 110	30.0%	20.0%	30

NOTE: Assume contents value = 50% BRV

- Physical Damage: Physical damages were estimated as a percentage of the BRV. For each structure, the BRV was determined based on building values obtained from the statewide GIS database. The physical damage costs were computed by multiplying the BRV by the corresponding building WDF.
- Contents Damage: Contents damages were estimated as a percentage of the contents replacement value. For each structure, the contents replacement value was estimated based on a percentage of the BRV determined from the statewide GIS database. Based on an analysis of HAZUS data for various building types, the contents replacement values were equal to an average of 50 percent of the BRVs. The contents damage costs were determined by multiplying the contents replacement value by the corresponding contents WDF (see Table F.2-2).

- Loss of Function: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, was distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the actual square footage by a CF based on the criticality of each structure. A summary of CFs is provided in Table F.1-2. By applying the CF to the square footage of each structure, higher criticality facilities (such as fire stations) can obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding WDF for LOF (measured in days).

Once these parameters were determined, the combined loss estimate (building, contents, and loss of function) in dollars for each structure was determined using the following formula:

Combined Loss Estimate = (Physical Damage + Contents Damage + LOF)

Map F-6 (also Map 6-5) presents the results of the combined hurricane wind loss estimate computations. The ten critical facilities in Louisiana with the highest combined loss estimates for the hurricane wind hazard shown on Map F-6 (also Map 6-5) are summarized in Table 6-13.

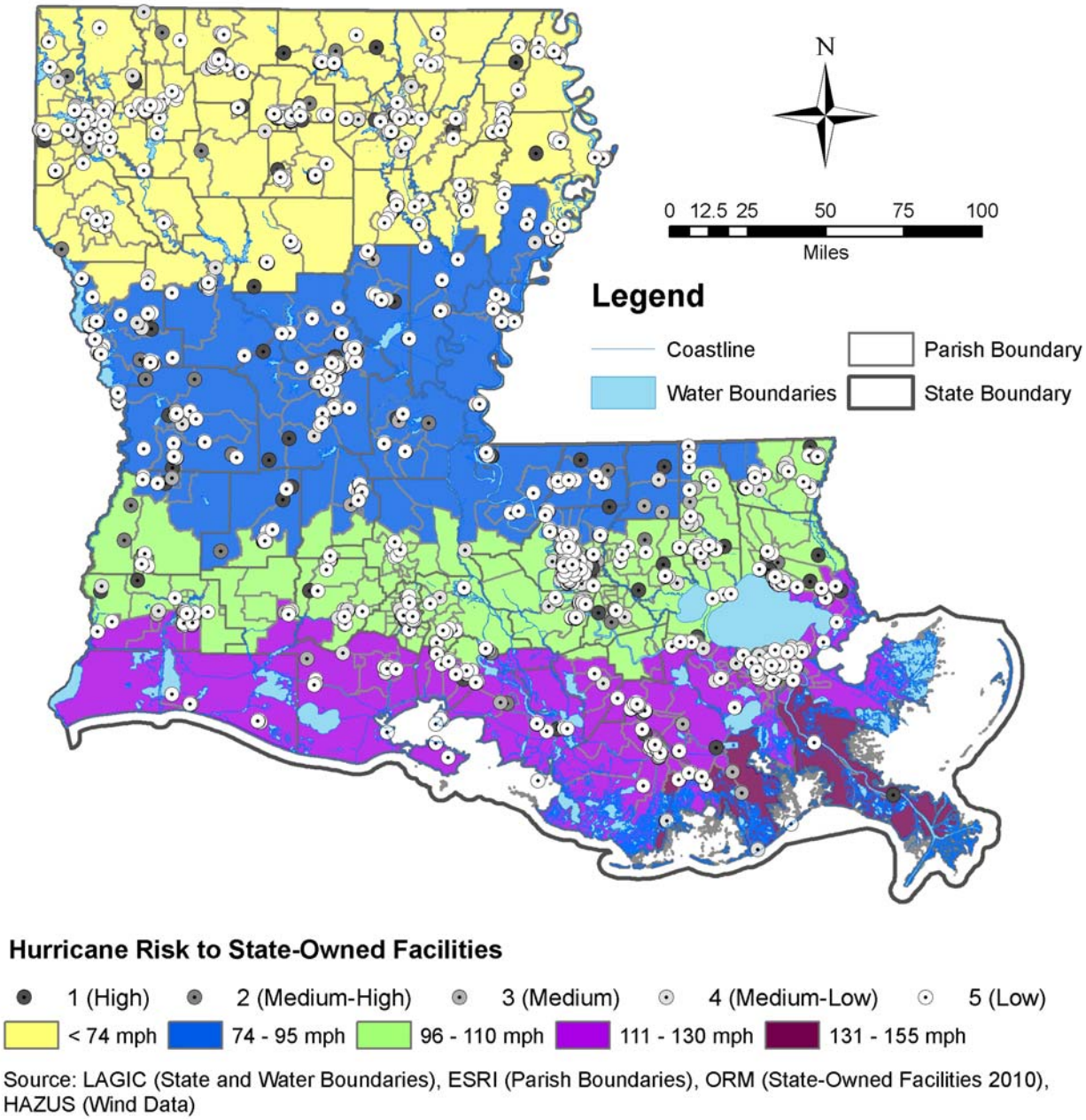
List of Assumptions

The hurricane wind loss estimate is based on the following assumptions.

- General: Hurricane wind loss estimates for individual structures are based on the 100-year wind event as modeled by HAZUS. Assigning numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, hurricane wind loss estimates for individual structures should not be used for estimating property insurance coverage or other needs that require a high degree of accuracy.
- Hurricane Wind Hazard Vulnerability: Structures located in the 74 - 95-mph wind zone will experience wind damages associated with Category 1 hurricane winds. Structures located in the 96 - 110-mph wind zones will experience wind damages associated with Category 2 hurricane winds. Structures located in the 111 - 130-mph wind zone will experience wind damages associated with Category 3 hurricane winds. Structures located in the 131 - 155-mph wind zone will experience wind damages associated with Category 4 hurricane winds.
- Average Building Type and Hurricane WDFs: The physical and contents damages to individual State-owned buildings and critical facilities from hurricane wind will be considered the same as lightly engineered buildings. Structures of this building type may combine masonry, light steel framing, open-web steel joists, wood framing, and wood rafters. Some portions of lightly engineered buildings have received engineering attention while others have not. WDFs for pre-wind code structures were taken directly from FEMA's *Full Data Benefit-Cost Module for Hurricane Wind Projects* (version 5.1a dated March 13, 2003). WDFs for post-wind code structures were reduced by 50 percent from the pre-wind code structures to account for the wind mitigation benefits derived from newer, code-compliant design. In the event the statewide GIS database did not provide a construction date for an individual structure, the structure was considered to be pre-wind code.
- Physical Damage: For each structure, the BRV is consistent with the building values obtained from the statewide GIS database. In the event the statewide GIS database did not provide a BRV for an individual structure, the BRV was estimated to be zero.
- Contents Damage: For each structure, the contents replacement value is equal to 50 percent of BRV.
- Loss of Function: The $28.9 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored

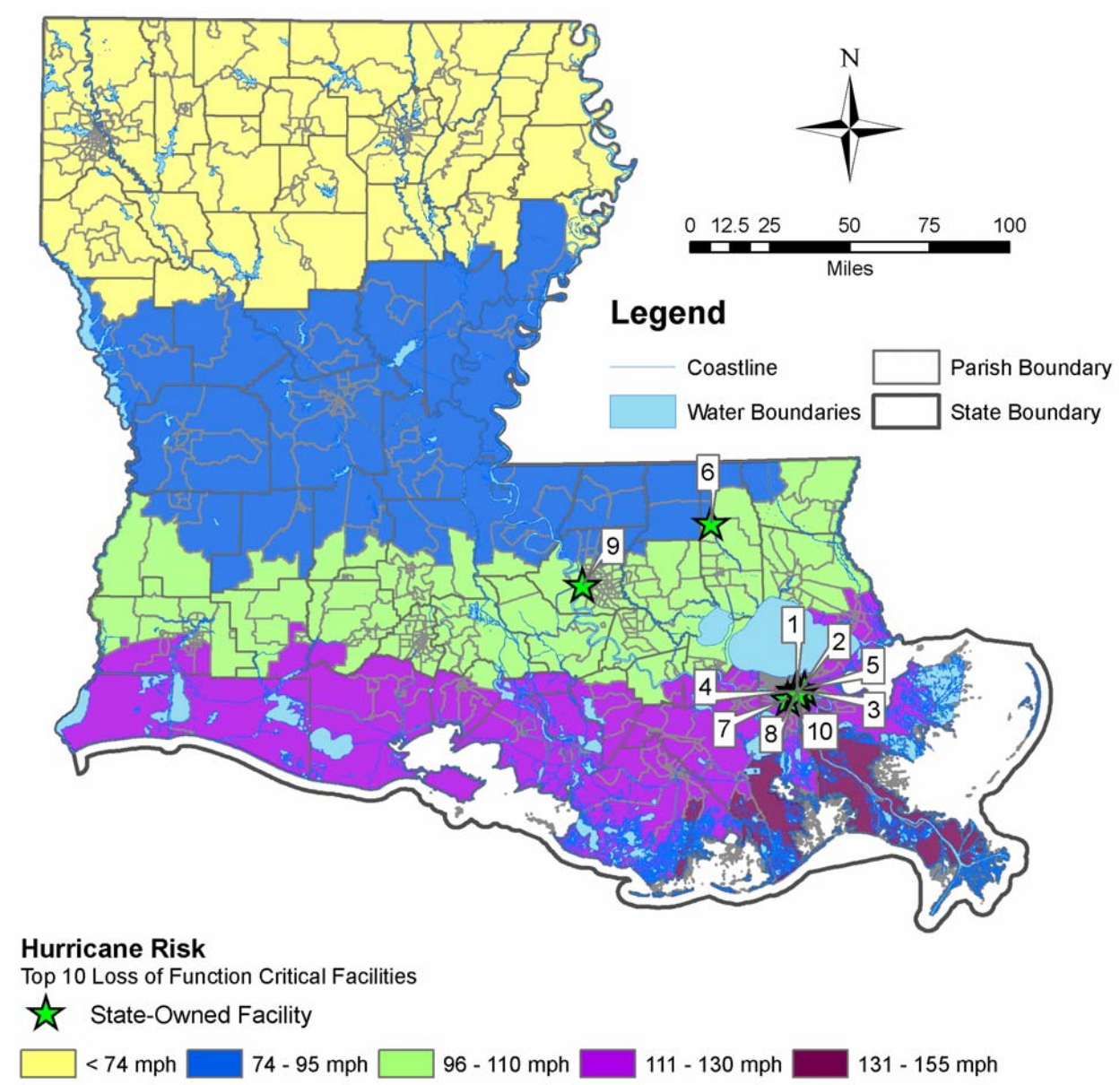
square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The CFs were derived based loosely on FEMA's *What is a Benefit?* draft guidance document dated May 1, 2001 and engineering judgment.

Map F-5: Location of Critical Facilities – High Winds



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), HAZUS (Wind Data)

Map F-6: Loss Estimate – High Winds – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), HAZUS (Wind Data)

Appendix F.3:
High Wind (Tornado)

Vulnerability Assessment Parameters, Methodology and Results

The tornado wind hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Tornado Wind Hazard Vulnerability: The vulnerability analysis is based on a 59 year NOAA data record that includes the historical tracks of 1,174 tornadoes in Louisiana that include tornadoes of all intensities. The data is used to represent the relative frequency of tornadoes that can be anticipated on an annual basis in each Parish. The size of each track, in square miles, was used to identify the total area of each Parish previously impacted by tornadoes.
- Average Number of Tornadoes Per 100 Square Miles: The total area of each Parish previously impacted by tornadoes (in square miles), was divided by the average tornado track (in square miles) to generate an average number of tornadoes per Parish. This number was then used to determine the average number of tornadoes per 100 square miles based upon the area of each Parish (in square miles.)

Based on these two parameters, a hazard vulnerability assessment ranking (1, 2, 3, 4 or 5) was assigned for each Parish. The five hazard vulnerability categories are summarized in Table F.3-1.

Table F.3-1

Hazard Vulnerability Ranking	Criteria	Number of Parishes
5	<.5 tornadoes per 100 square miles	6
4	.5 to 1.5 tornadoes per 100 square miles	8
3	1.5 to 2.5 tornadoes per 100 square miles	8
1	2.5 to 3.5 tornadoes per 100 square miles	25

Map F-7 shows the Parishes by level of vulnerability to the hurricane wind hazard.

Loss Estimate Parameters, Methodology and Results

The tornado wind loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Tornado Wind Hazard Vulnerability: As stated above, tornado wind hazard vulnerability assessments involved an analysis of two major parameters.
- Percentage of Parish Land Impacted by Tornadoes: The percentage of each Parish previously impacted by tornadoes was determined as part of the Tornado Wind Hazard Vulnerability methodology.
- Total Value of State-Owned Critical Facilities Per Parish: The State Owned Facilities dataset was used to generate a total value of state-owned critical facilities for each Parish. It was assumed that the percentage of land impacted would be equal to the percentage of critical facilities impacted.

Once these parameters were determined, the loss estimates for each Parish (at 25%, 50%, 75%, and 100% damage intervals) in dollars were determined using the following formula:

> Loss Estimate = Total Value of State-Owned Critical Facilities Per Parish x Percentage of Land Impacted (as a decimal) x damage interval (.25, .5. .75. or 1)

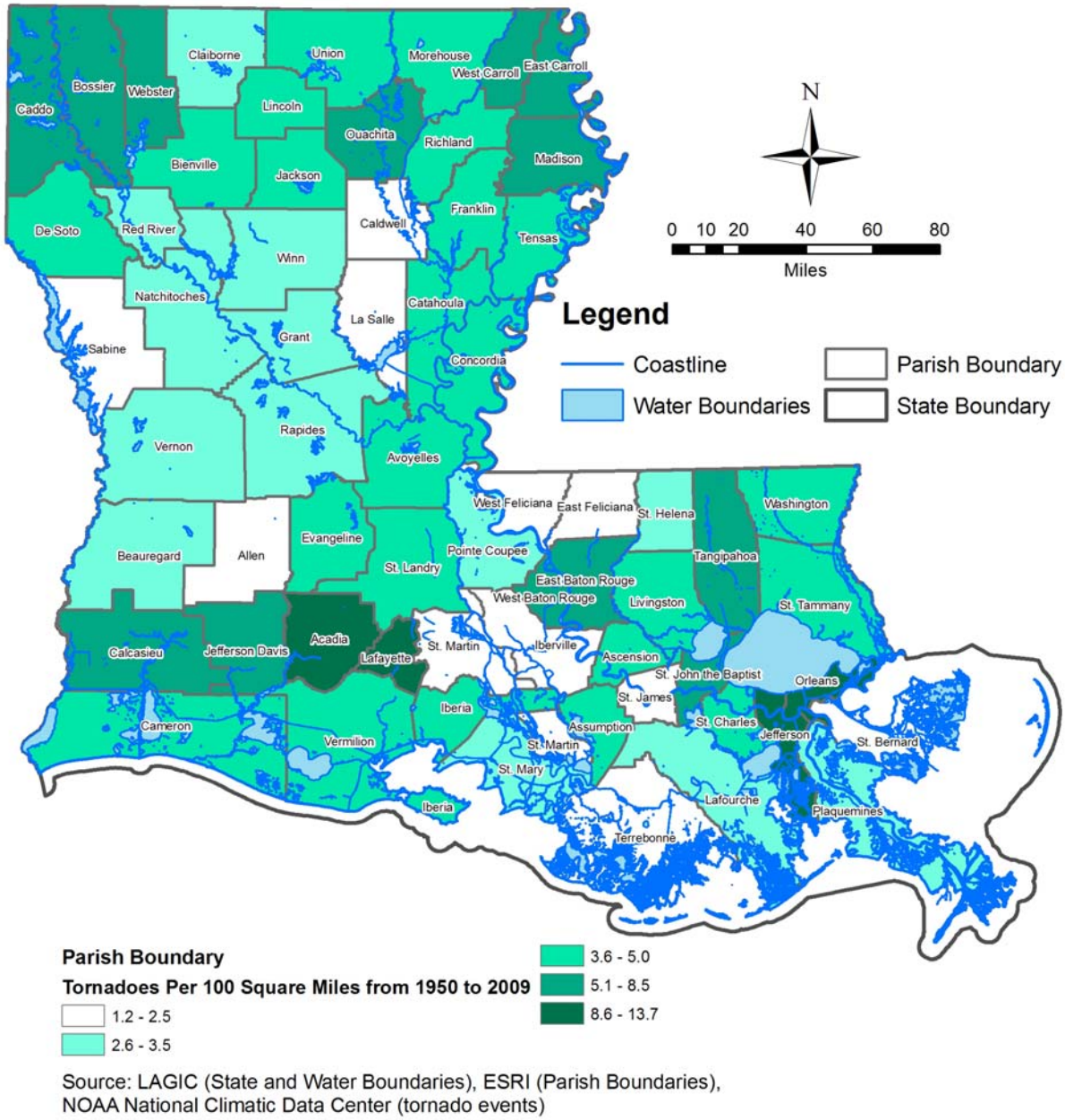
Map F-8 presents the Vulnerability of State-Owned Facilities.

List of Assumptions

The tornado wind loss estimate is based on the following assumptions.

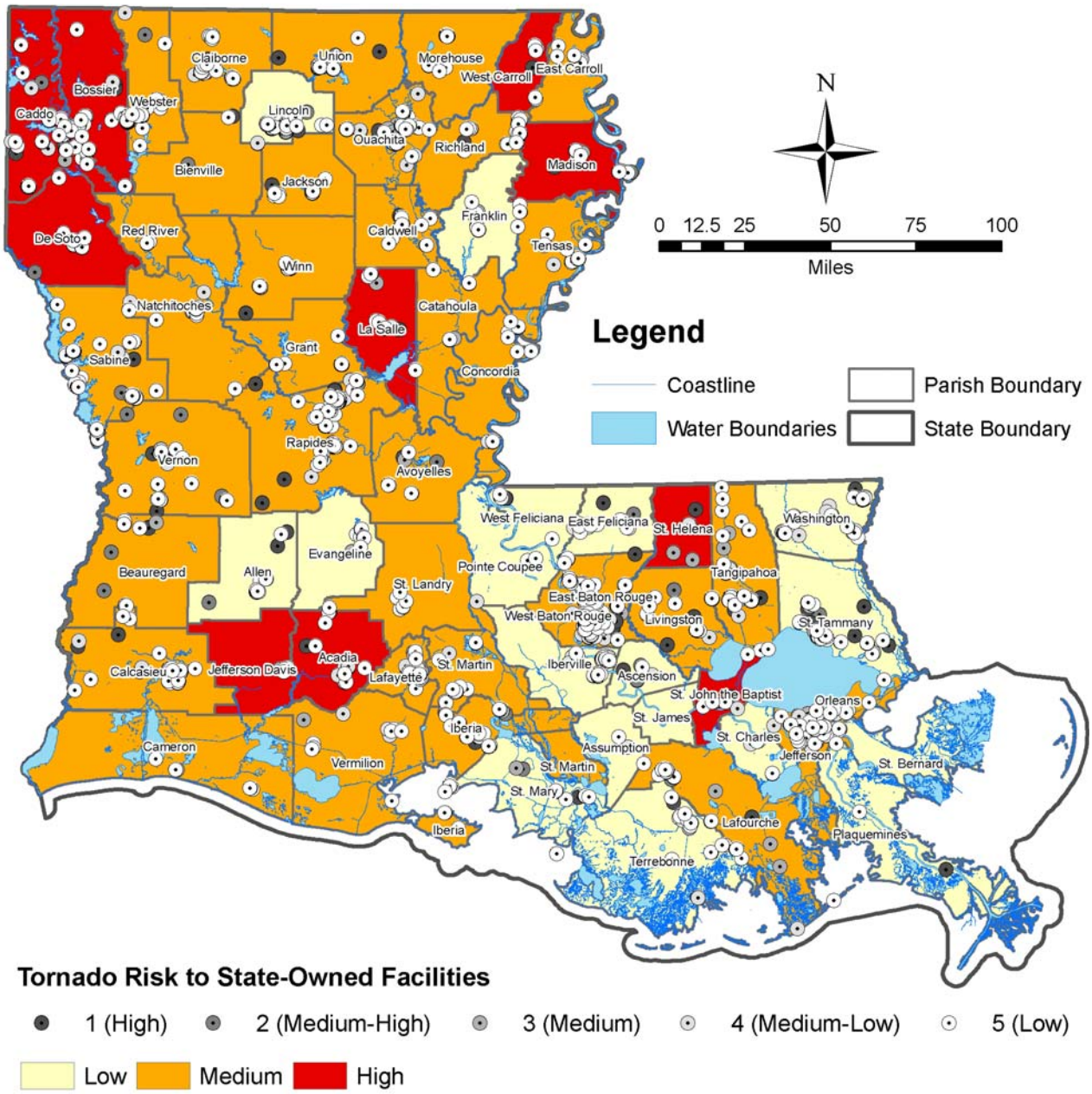
- Tornado Wind Hazard Vulnerability: This analysis is based upon the assumption that historical tornadoes can serve as a predictor for future tornadoes. Additionally, the analysis relies upon a limited sample or measured tornado tracks which only represents a third of recorded tornado strikes within the State. It should be noted, however, that many of the tornadoes which do not have measured tracks simply had too small of an impact to measure.
- Physical Damages to Critical Facilities: The loss estimates are based upon the assumption that the percentage of the Parish impacted by tornadoes is representative of the percentage of critical facilities impacted. This assumes that critical facilities are evenly dispersed throughout the Parish, instead of centered upon higher population areas. Additionally, this analysis assumes that tornadoes have an equal likelihood of striking in any spot within the Parish.

Map F-7: Vulnerability Assessment – High Winds – Tornado



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), NOAA National Climatic Data Center (tornado events)

Map F-8: Exposure High Winds



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010), NCDC (Storm Event Data)

Appendix F.4:
Ice Storm

Vulnerability Assessment Parameters, Methodology and Results

The ice storm hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of the number of recorded ice storms within each parish based on data provided by the National Climactic Data Center (NCDC) between 1993 and the present.

Based on this information, a hazard vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are defined below.

- Low Hazard Vulnerability: Structures located in parishes with no recorded ice storms.
- Medium Hazard Vulnerability: Structures located in parishes with one to four recorded ice storms.
- High Hazard Vulnerability: Structures located in parishes with more than four recorded ice storms.

Map 4-18, Hazard Profile – Ice Storms, shows the number of recorded ice storms for each parish in the State of Louisiana based on NCDC data. Map F-11 indicates the location of State-owned critical facilities (ranked from low to high criticality) in Louisiana in relation to the number of ice storms.

Map F-12 shows State-owned critical facilities by level of vulnerability to the ice storm hazard.

Loss Estimate Parameters and Methodology

The ice storm loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Ice Storm Hazard Vulnerability: As stated above, ice storm hazard vulnerability assessments involved an analysis of the number of recorded ice storms within each parish based on data provided by the NCDC between 1993 and the present. Low, medium and high vulnerability for ice storm are defined above.
- Average Building Type: Although the building types for each structure were described in the statewide GIS database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, to conduct basic analyses, individual loss estimates assumed a single building type for each ice storm hazard vulnerability level based on experience with typical ice storm damages and building construction in Louisiana.
- Ice Storm Damage Functions (ISDFs): Physical (building) damage, contents damage and LOF costs for each hazard vulnerability level were estimated based on a series of ISDFs. These ISDFs were developed based on experience with ice storm damages in Louisiana and similar geographic areas.

  The ISDFs for building damage, contents damage and LOF used for the ice storm loss estimates are summarized in Table F.4-1.

Table F.4-1

Hazard Vulnerability Level	Building ISDF	Contents ISDF	LOF (days)
Low	0	0	0
Medium	Varies (see Notes)	0	1
High	Varies (see Notes)	0	3

NOTES: 1.) Assume building ISDF values as a function of the building footprint based on the following formulas:
For Medium Hazard Vulnerability Level - assume gutters are 50% damaged ($5/LF repair cost).
Building Damage = 4x$5x[(Building Area)/(No. of Stories)]^0.5
For High Hazard Vulnerability Level - assume gutters are 50% damaged ($10/LF repair cost).
Building Damage = 4x$10x[(Building Area)/(No. of Stories)]^0.5
2.) Assume zero contents damages from ice storms.
3.) Assume LOF values based on experience with ice storms in Louisiana and similar geographic areas.

- Physical Damage: For ice storms, physical damages were estimated as a function of the building footprint area. For each structure, the square root of the building footprint area was multiplied by four to arrive at an estimated building perimeter length. This building perimeter length was used to estimate the physical damages for each of the hazard vulnerability levels as shown below.
  - For low hazard vulnerability structures, assume zero physical damages.
  - For medium hazard vulnerability structures, assume physical damages are the estimated building perimeter length x $5/LF for gutter repairs (50% damage).
  - For high hazard vulnerability structures, assume physical damages are the estimated building perimeter length x $10/LF for gutter repairs (100% damage).
- Contents Damage: Contents damages were estimated to be zero for all ice storm hazard vulnerability levels in Louisiana.
- Loss of Function: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, was distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the actual square footage by a CF based on the criticality of each structure. A summary of CFs for all structures in Louisiana is provided in Table F.12. By applying the CF to the square footage of each structure, higher criticality facilities (such as fire stations) can obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding ISDF for LOF (measured in days).

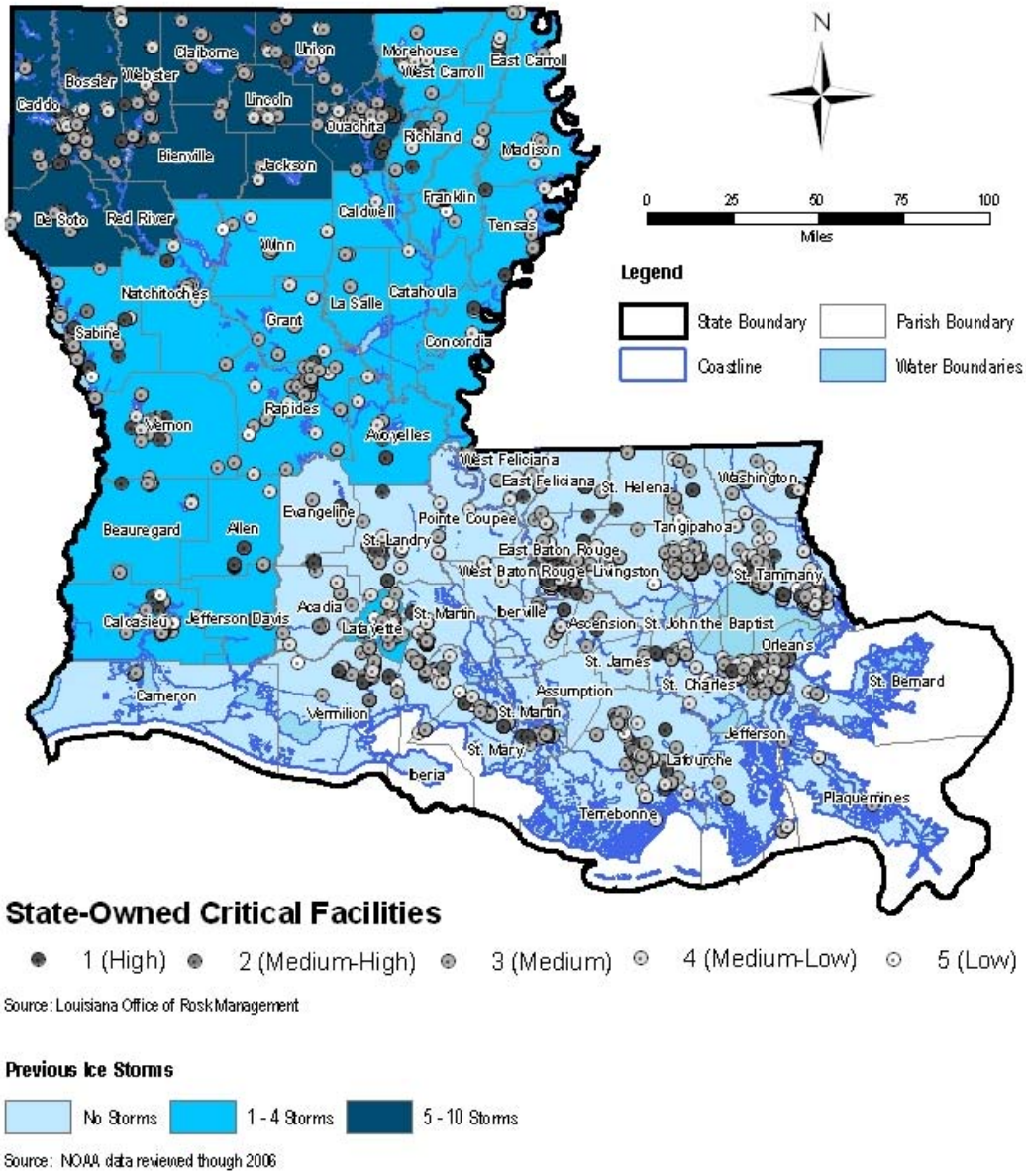
Map F-13 (also Map 6-7) presents the results of the ice storm loss estimate computations. The ten critical facilities in Louisiana with the highest combined loss estimates for the ice storm hazard are shown on Map F-14 (also Map 6-7) and are summarized in Table 6-15.

List of Assumptions

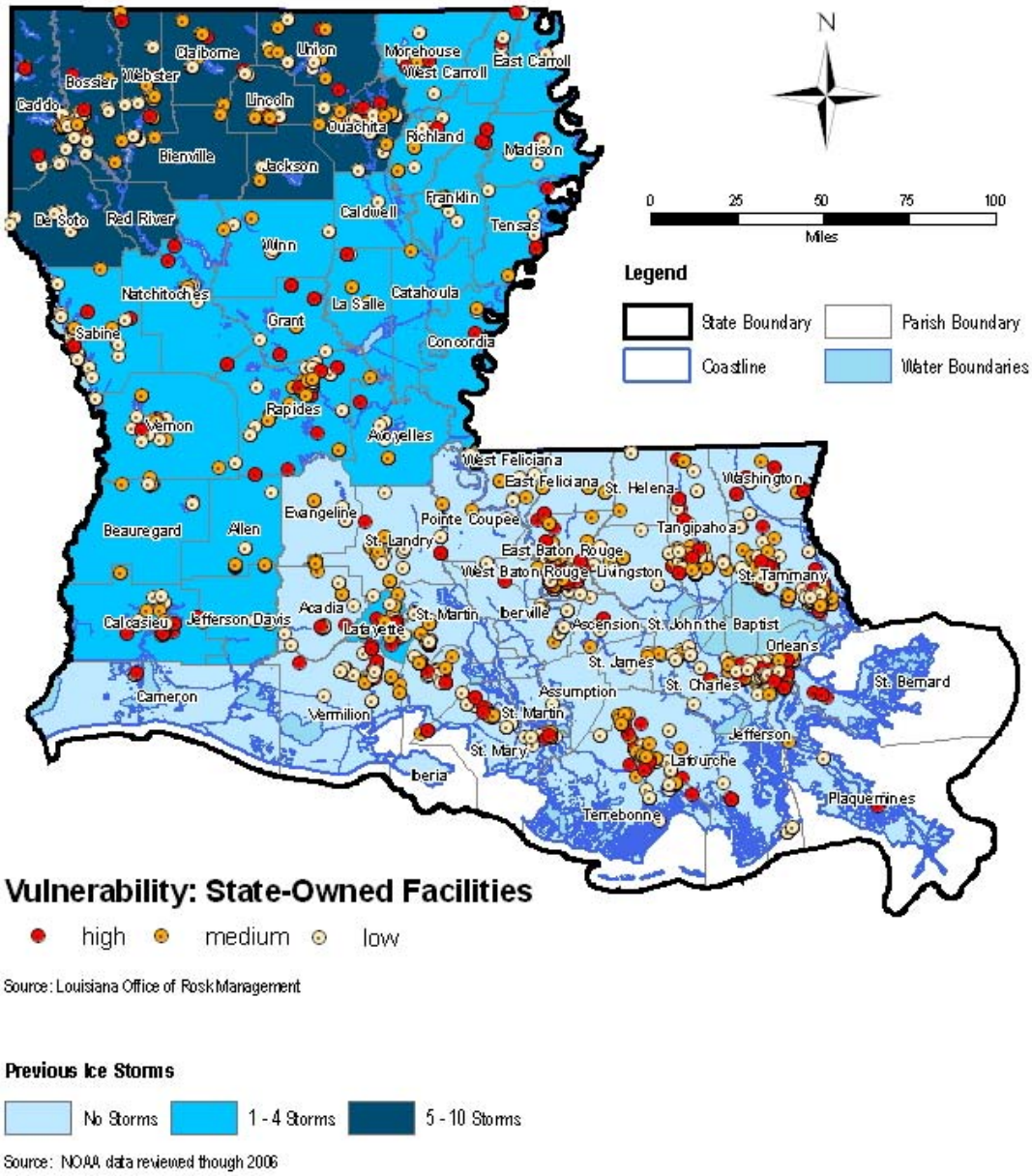
The ice storm loss estimate is based on the following assumptions.

- General: Loss estimates for individual structures are based on the number of ice storms that typically occur in a given area. Assigning numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, ice storm loss estimates for individual structures should not be used for estimating property insurance coverage or other needs that require a high degree of accuracy.
- Ice Storm Hazard Vulnerability: Structures located in low hazard vulnerability areas will experience no ice storm damages. Structures located in medium hazard vulnerability areas will experience light to moderate damages. Structures located in high hazard vulnerability areas will experience moderate to heavy damages.
- Average Building Type and ISDFs: The physical and contents damages to individual State-owned buildings and critical facilities from ice storm will be considered the same for all buildings depending on the ice storm hazard vulnerability level. Differences in building type will not have an impact on typical ice storm damages such as damages to gutters and storm-related functional downtime (LOF).
- Physical Damage: For each structure, the BRV is consistent with the building values obtained from the statewide GIS database. In the event the statewide GIS database did not provide a BRV for an individual structure, the BRV was estimated to be zero. For each structure, the only physical damages are to gutters along the building perimeter, depending on the ice storm hazard vulnerability level.
- Contents Damage: For each structure, the contents replacement value is considered zero. The climate of Louisiana does not produce ice storms of the intensity and duration necessary to collapse building roofs resulting in contents damage.
- Loss of Function: The $28.9 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The CFs were derived based loosely on FEMA's *What is a Benefit?,* draft guidance document dated May 1, 2001 and engineering judgment.

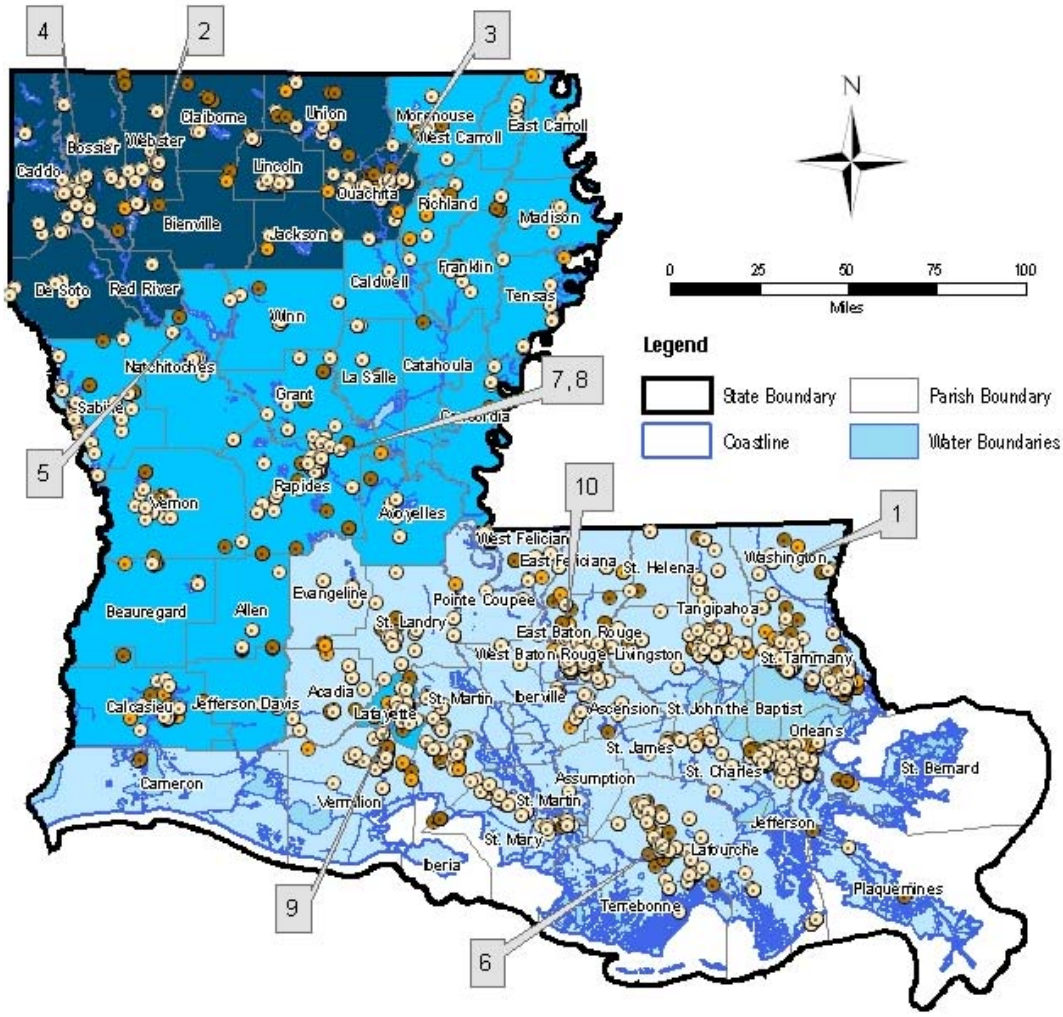
Map F-11: Critical Facilities – Ice Storm



Map F-12: Vulnerability Assessment - Ice Storm



Map F-13: Loss Estimate – Ice Storm – Total Losses



Estimated Losses

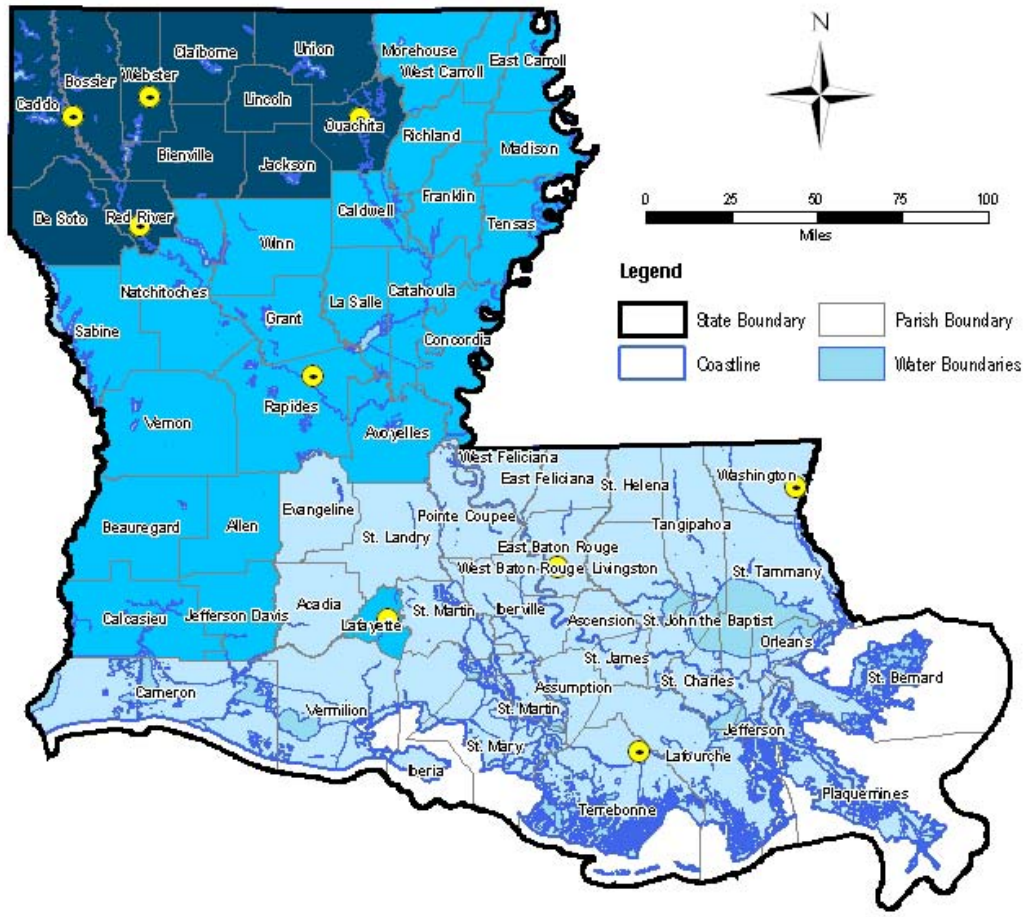
Low: $0.00 Medium: $0.01 - $1,500.00 High: $1,500.01 - $2,000,000.00

Previous Ice Storms

No Storms 1 - 4 Storms 5 - 10 Storms

Source: NOAA data reviewed though 2006

Map F-14: Loss Estimate – Ice Storm – Top Ten



Highest Losses

Source: Louisiana Office of Risk Management

Previous Ice Storms

No Storms | 1 - 4 Storms | 5 - 10 Storms

Source: NOAA data reviewed though 2006

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Appendix F.5
Storm Surge

Vulnerability Assessment Parameters, Methodology and Results

The storm surge hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of Sea, Lake, and Overland Surges from Hurricanes (SLOSH) models prepared by the National Oceanographic and Atmospheric Administration (NOAA) for Category 1-5 hurricanes in Louisiana. The SLOSH analysis results were then used to prepare storm surge zones based on average surge inundation depths projected by the models.

Based on this information, a hazard vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are summarized below.

- Low Hazard Vulnerability: Structures located outside the storm surge hazard zone.
- Medium Hazard Vulnerability: Structures located within the storm surge hazard zone with surge inundation depths less than 12 feet.
- High Hazard Vulnerability: Structures located within the storm surge hazard zone with surge inundation depths greater than 12 feet.

Map 4-10, Hazard Profile – Storm Surge, shows the storm surge hazard zones and potential surge inundation depths throughout the State of Louisiana. Map F-15 shows Louisiana State-owned critical facilities in relation to the storm surge hazard zones.

Map F-16 shows State-owned critical facilities by level of vulnerability to the storm surge hazard.

Loss Estimate Parameters, Methodology and Results

The storm surge loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Storm Surge Hazard Vulnerability: As stated above, storm surge hazard vulnerability assessments involved an analysis of SLOSH models prepared by NOAA for Category 1-5 hurricanes. Low, medium and high storm surge vulnerability are defined above.
- Average Surge Depth: Although the surge inundation depths above grade were available from the SLOSH model analysis results, the surge depths for individual State-owned buildings and critical facilities could not be determined due to the lack of available first floor elevations for each structure. Therefore, average surge depths for individual structures were estimated based on their corresponding storm surge hazard vulnerability level. These basic surge inundation depths are summarized below.
    - For low hazard vulnerability structures, no surge inundation depth was used, since the structures were located outside the storm surge hazard zone.
    - For medium hazard vulnerability structures, an average surge depth of four feet above the first floor was estimated, since the first floor elevations of structures were assumed to be elevated between four feet and eight feet above grade over the surge zones with inundation depths less than 12 feet above grade.
    - For high hazard vulnerability structures, an average surge depth greater than eight feet above the first floor was estimated, since the first floor elevations of structures were assumed to be elevated an average of four feet above grade over the surge zones with inundation depths greater than 12 feet above grade.

- Average Building Type: Although the building types for each structure were described in the statewide GIS database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, to conduct basic analyses, individual loss estimates assumed an average building type of a single story structure without a basement or obstructions, such as large dunes or sea walls. This average building type was determined based on experience with typical coastal buildings and foundation construction techniques in Louisiana.
- Storm Surge Damage Functions: Physical (building) damage, contents damage and LOF costs for each structure were estimated based on a series of Storm Surge Damage Functions (SSDFs). These SSDFs were based on damage functions for FEMA's *Full Data Benefit-Cost Module for Coastal V-Zone Flood* (version 5.2.2 dated December 31, 1998). The SSDFs for building damage, contents damage and LOF days used for the storm surge loss estimates are summarized in Table F.5-1.

Table F.5-1

Storm Surge Hazard Vulnerability Level	Average Building Type	Average Surge Depth (above FFE)	Building SSDF (%BRV)	Contents SSDF (%BRV)	LOF (days)
Low	1 Story without Basement	None	0.0%	0.0%	0
Medium	1 Story without Basement	4 feet	58.0%	29.0%	30
High	1 Story without Basement	>8 feet	76.0%	38.0%	30

NOTES: 1.) FFE = First Floor Elevation
2.) Assume below 12-ft surge depth zone = 4-ft average surge depth above FFE
3.) Assume above 12-ft surge depth zone = >8-ft average surge depth above FFE
4.) Assume contents replacement value = 50% BRV

- Physical Damage: Physical damages were estimated as a percentage of the BRV. For each structure, the BRV was determined based on building values obtained from the statewide GIS database. The physical damage costs were computed by multiplying the BRV by the corresponding building SSDF.
- Contents Damage: Contents damages were estimated as a percentage of the contents replacement value. For each structure, the contents replacement value was estimated based on a percentage of the BRV determined from the statewide GIS database. Based on an analysis of HAZUS data for various building types, the contents replacement values were equal to an average of 50 percent of the BRVs. The contents damage costs were determined by multiplying the contents replacement value by the corresponding contents SSDF.
- Loss of Function: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, was distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the actual square footage by a CF based on the criticality of each structure. A summary of CFs for all structures in Louisiana is provided in Table F.1-2. By applying the CF to the square footage of each structure, it allows higher criticality facilities (such as fire stations) to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding SSDF for LOF (measured in days).

Once these parameters were determined, the combined loss estimate (building, contents, and loss of function) in dollars for each structure was determined using the following formula:

Combined Loss Estimate = (Physical Damage + Contents Damage + LOF)

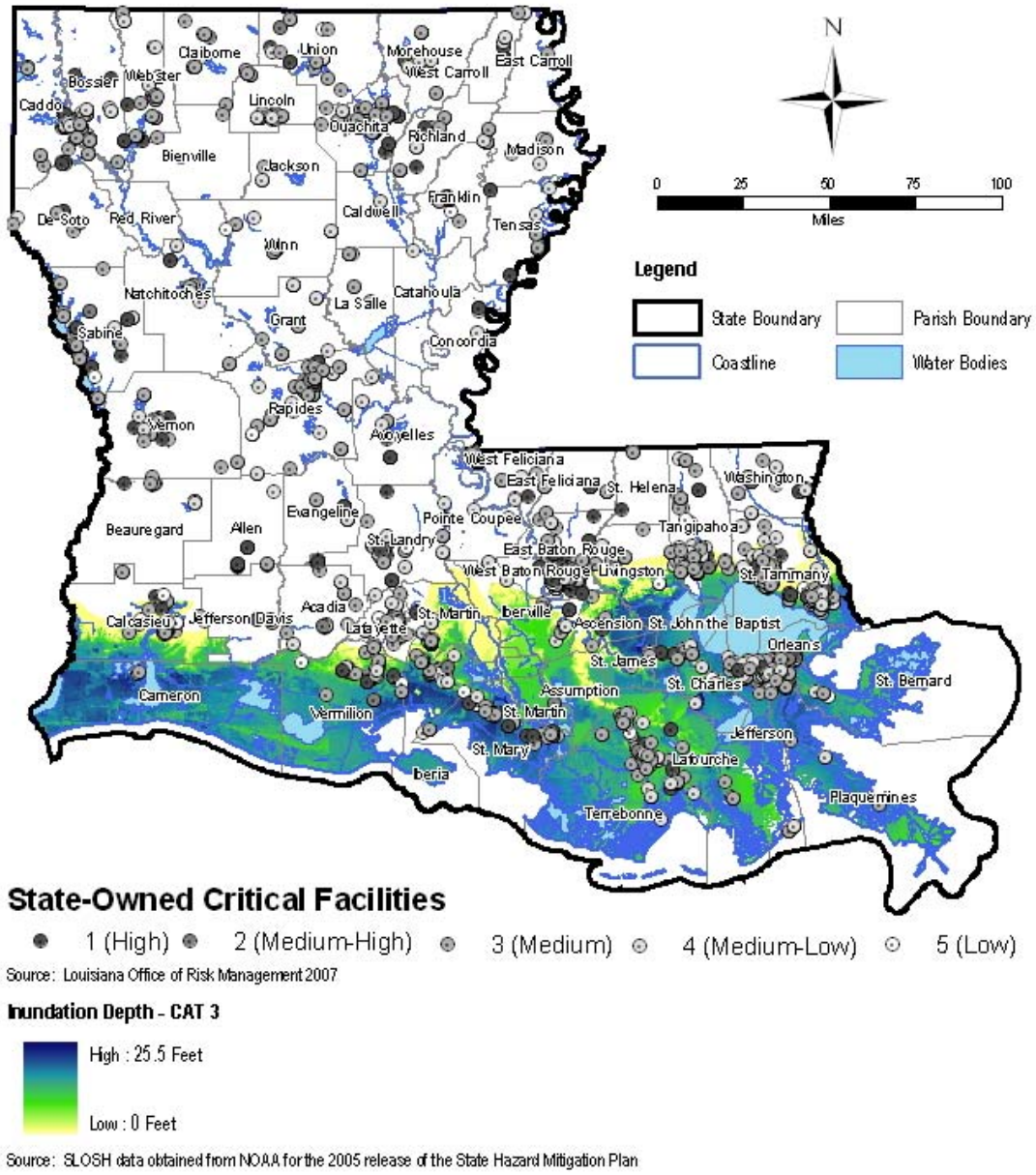
Map F-17 (also Map 6-8) presents the results of the combined storm surge loss estimate computations. The ten critical facilities in Louisiana with the highest combined loss estimates for the storm surge hazard are shown on Map F-18 (also Map 6-8) and are summarized in Table 6-18.

List of Assumptions

The storm surge loss estimate is based on the following assumptions.

- General: Storm surge loss estimates for individual structures are based on the storm surge inundation depths taken from the available SLOSH model analysis results. Assigning numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, storm surge loss estimates for individual structures should not be used for estimating flood insurance coverage or other needs that require a high degree of accuracy.
- Storm Surge Hazard Vulnerability and Average Surge Depth: No storm surge effects are experienced by structures constructed outside storm surge zones. Storm surge effects equivalent to four feet of water above the first floor elevation are experienced by structures in storm surge zones with average inundation depths less than 12 feet above grade. Storm surge effects equivalent to over eight feet of water above the first floor elevation are experienced by structures in storm surge zones with average inundation depths greater than 12 feet above grade.
- Average Building Type and SSDFs: The physical and contents damages to individual State-owned buildings and critical facilities from flooding will be considered the same as a single story structure without a basement (i.e., slab-on-grade) constructed using standard residential building materials without obstructions to surge, such as high dunes or sea walls.
- Physical Damage: For each structure, the BRV is consistent with the building values obtained from the statewide GIS database. In the event the statewide GIS database did not provide a BRV for an individual structure, the BRV was estimated to be zero.
- Contents Damage: For each structure, the contents replacement value is equal to 50 percent of the BRV.
- Loss of Function: The $28.9 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The CFs were derived based loosely on FEMA's *What is a Benefit?* draft guidance document dated May 1, 2001 and engineering judgment.

Map F-15: Location of Critical Facilities – Storm Surge



State-Owned Critical Facilities

1 (High) 2 (Medium-High) 3 (Medium) 4 (Medium-Low) 5 (Low)

Source: Louisiana Office of Risk Management 2007

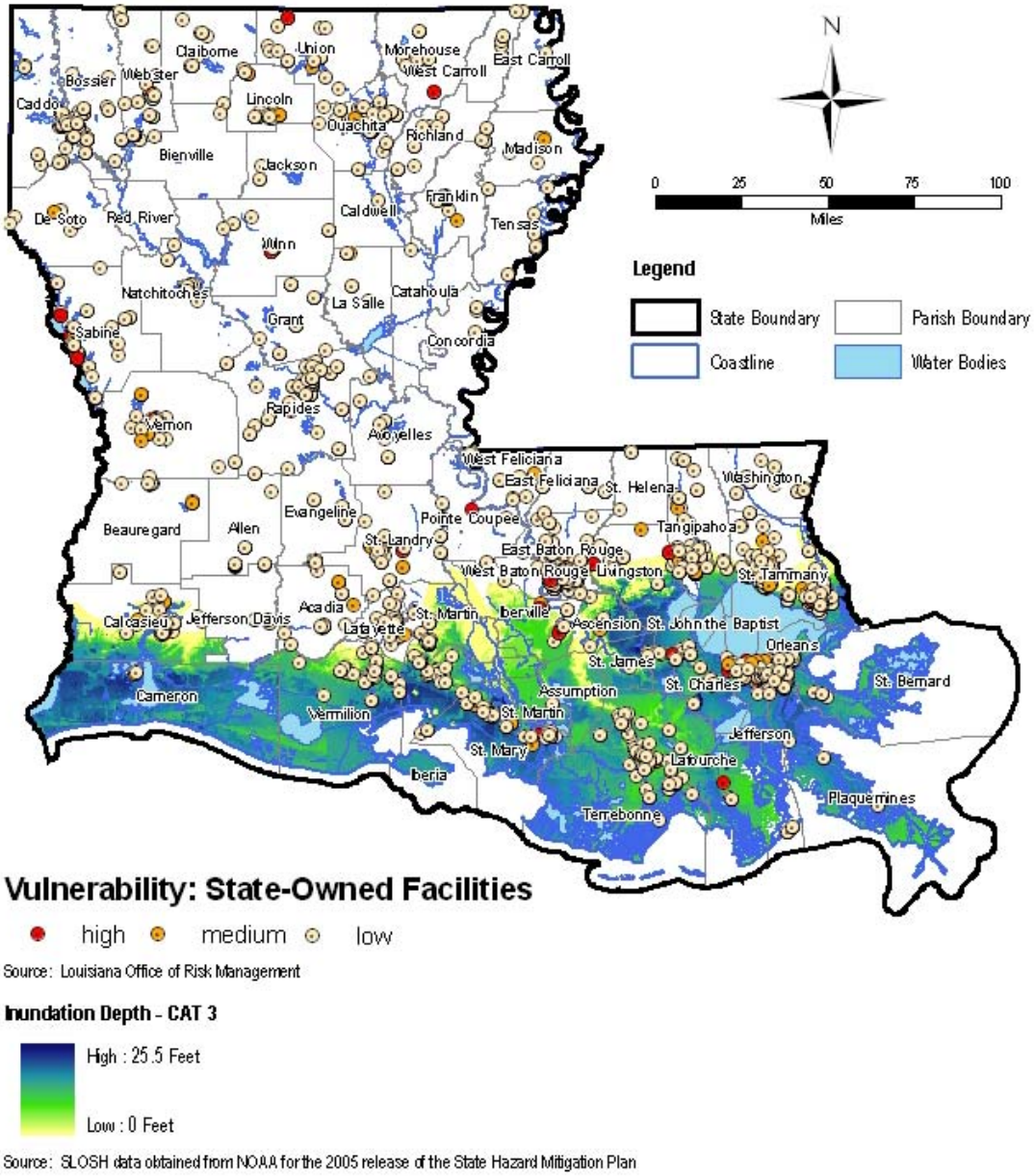
Inundation Depth - CAT 3

High : 25.5 Feet

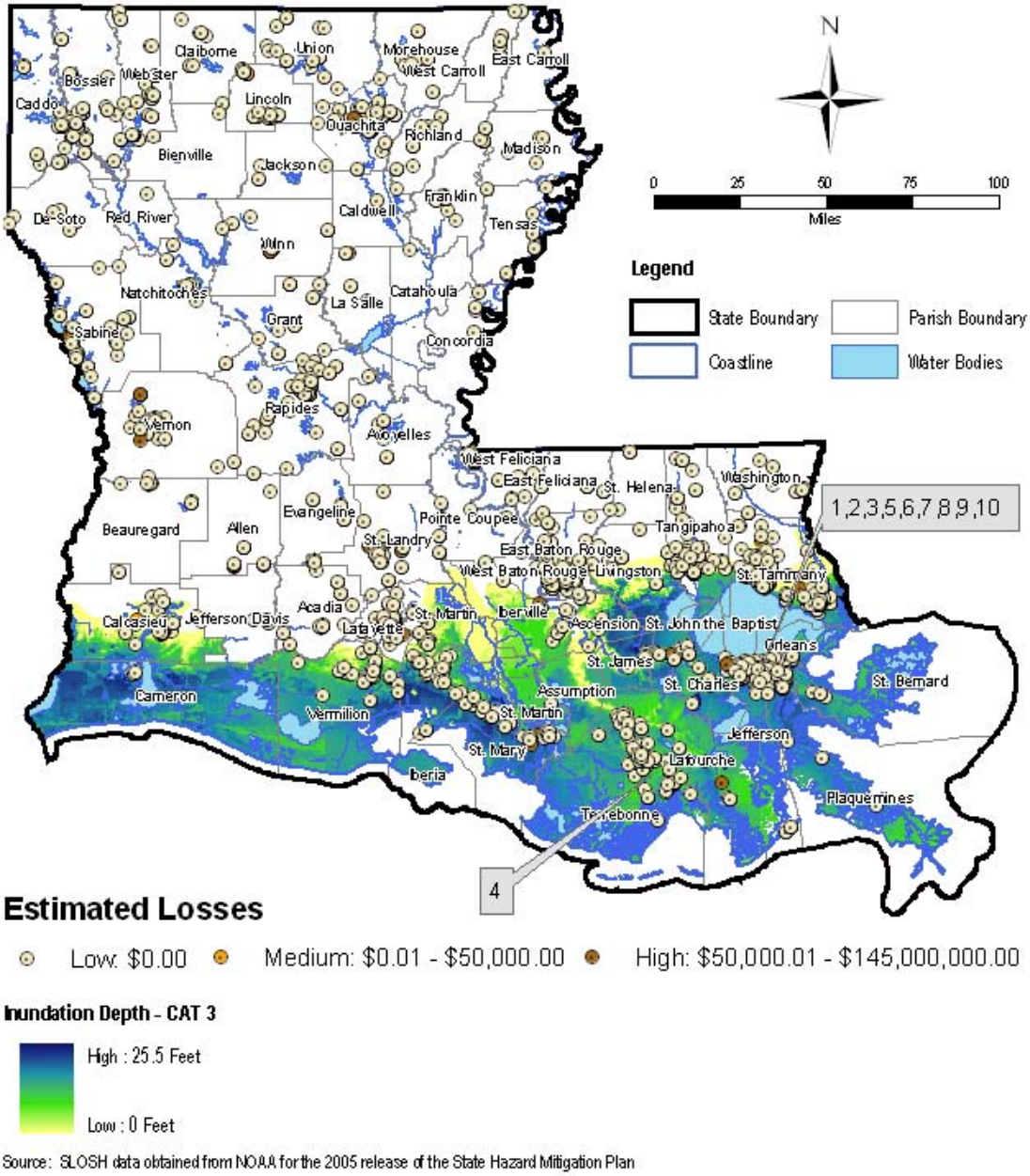
Low : 0 Feet

Source: SLOSH data obtained from NOAA for the 2005 release of the State Hazard Mitigation Plan

Map F-16: Vulnerability Assessment – Storm Surge

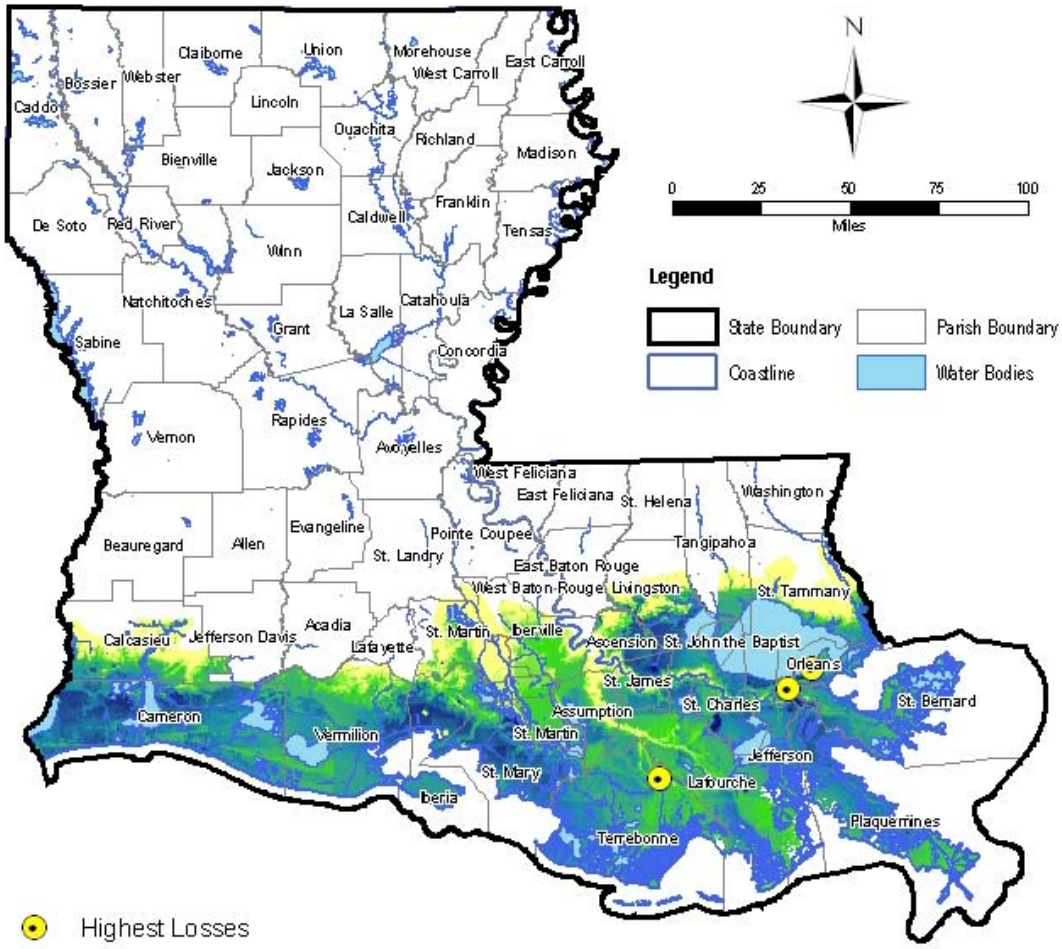


Map F-17: Loss Estimate – Storm Surge - Total



Source: SLOSH data obtained from NOAA for the 2005 release of the State Hazard Mitigation Plan

Map F-18: Loss Estimate – Storm Surge – Top Ten



Source: Louisiana Office of Risk Management

Inundation Depth - CAT 3

Source: SLOSH data obtained from NOAA for the 2005 release of the State Hazard Mitigation Plan

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Appendix F.6
Subsidence

Vulnerability Assessment Parameters, Methodology and Results

The subsidence hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of subsidence studies such as the *Louisiana Speaks* report prepared by the Louisiana Recovery Authority (LRA) in the wake of Hurricanes Katrina and Rita.. The results of these subsidence studies were then used to prepare subsidence zones based on three ranges of subsidence rates.

Based on this information, a hazard vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are defined below.

- Low Hazard Vulnerability: Structures located within an area with projected subsidence rates less than .02 cm/yr.
- Medium Hazard Vulnerability: Structures located within an area with the projected subsidence rates between .02 and .08 cm/yr.
- High Hazard Vulnerability: Structures located within an area with the highest projected subsidence rates.

Map 4-11, Hazard Profile – Subsidence, shows the projected subsidence rates throughout the State of Louisiana. Map F-19 indicates the location of State-owned critical facilities in Louisiana in relation to the subsidence rates.

Map F-20 shows State-owned critical facilities by level of vulnerability to the subsidence hazard.

Loss Estimate Parameters and Methodology

The loss estimate due to subsidence for State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Subsidence Hazard Vulnerability: As stated above, subsidence hazard vulnerability assessments involved an analysis of subsidence rate studies such as the *Louisiana Speaks* report. Low, medium, and high vulnerability for subsidence is defined above.
- Average Subsidence Rates: Although the subsidence rates were available from the Louisiana Speaks report analysis results, the actual subsidence for individual State-owned buildings and critical facilities could not be estimated due to the lack of available site-specific data for each structure. Therefore, average subsidence rates for individual structures were estimated over a 100-year time period based on their corresponding subsidence hazard vulnerability level. The corresponding reductions in elevation are defined below.
    - For low hazard vulnerability structures, no elevation reduction was used since the structures experienced very low subsidence rates.
    - For medium hazard vulnerability structures, an average elevation reduction of one to three feet was estimated to account for the average subsidence rate within the medium subsidence hazard zone over a 100-year period.
    - For high hazard vulnerability structures, an average elevation reduction of four to six feet was estimated to account for the average subsidence rate within the high subsidence hazard zone over a 100-year period.
- Average Building Type: Although the building types for each structure were described in the statewide GIS database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, to conduct basic analyses, individual loss estimates assumed an average building type of a single story structure without a basement. This average building type was determined based on experience with typical buildings and foundation construction techniques in Louisiana.

- Subsidence Damage Functions: Physical (building) damage, contents damage and LOF costs for each structure were estimated based on a series of Subsidence Damage Functions (SDFs). These SDFs were based on qualitative estimates of structural damage due to subsidence over a period of 100 years. The SDFs for building damage, contents damage and LOF days used for the subsidence estimates are summarized in the Table F.6-1.

Table F.6-1

Subsidence Hazard Vulnerability Level	Average Building Type	Average Subsidence Rate (elevation in feet/century)	Building SDF (%BRV)	Contents SDF (%BRV)	LOF (days)
Low	1 Story without Basement	None	0.0%	0.0%	0
Medium	1 Story without Basement	1 - 3 feet	50.0%	0.0%	0
High	1 Story without Basement	4 - 6 feet	100.0%	0.0%	30

NOTES: 1.) FFE = First Floor Elevation
2.) Assume average FFE is approximately 4 feet above sea level.
3.) Assume building SDF values based on the following formulas:
For Medium Hazard Vulnerability Level - assume building has suffered some structural damage due to subsidence rate below the FFE.
For High Hazard Vulnerability Level - assume building has suffered severe or structural damage and must be abandoned due to subsidence rate above the FFE.
4.) Assume zero contents damages from subsidence.

- Physical Damage: Physical damages were estimated as a percentage of the BRV. For each structure, the BRV was determined based on building values obtained from the statewide GIS database. The physical damage costs were computed by multiplying the BRV by the corresponding building SDF.
- Contents Damage: Contents damages were estimated to be zero for all subsidence hazard vulnerability levels in Louisiana.
- Loss of Function: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, was distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the actual square footage by a CF based on the criticality of each structure. A summary of CFs for all structures in Louisiana is provided in Table F.1-2. Note that by applying the CF to the square footage of each structure, it allows higher criticality facilities (such as fire stations) to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding SDF for LOF (measured in days).

Once these parameters were determined, the combined loss estimate (building, contents, and LOF) in dollars for each structure was determined using the following formula:

Combined Loss Estimate = (Physical Damage + LOF)

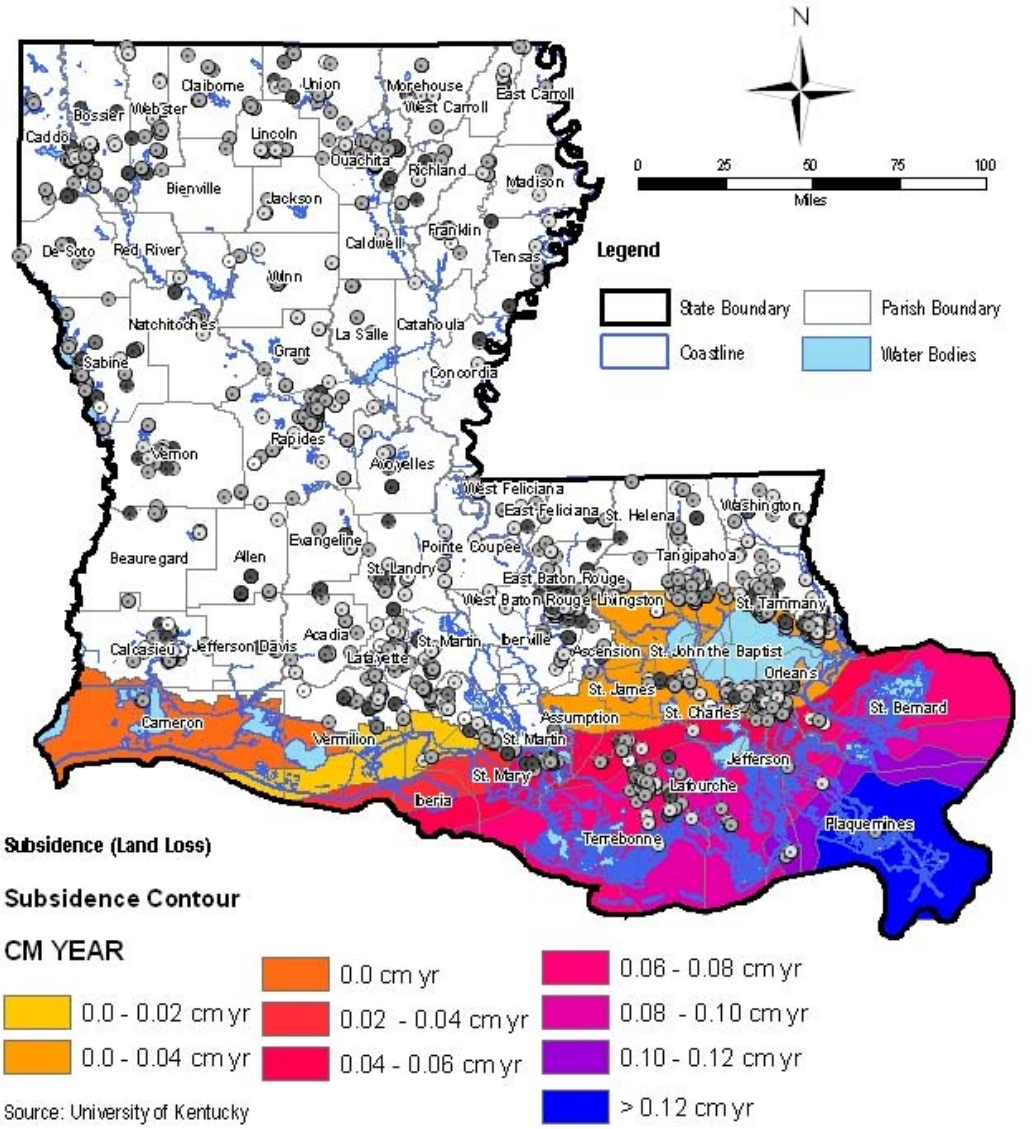
Map F-21 (also Map 6-9) provides the results of the combined loss estimate computations for the subsidence hazard. The ten critical facilities in Louisiana with the highest combined loss estimates for the subsidence hazard are shown on Map F-22 (also Map 6-9) and are summarized in Table 6-21.

List of Assumptions

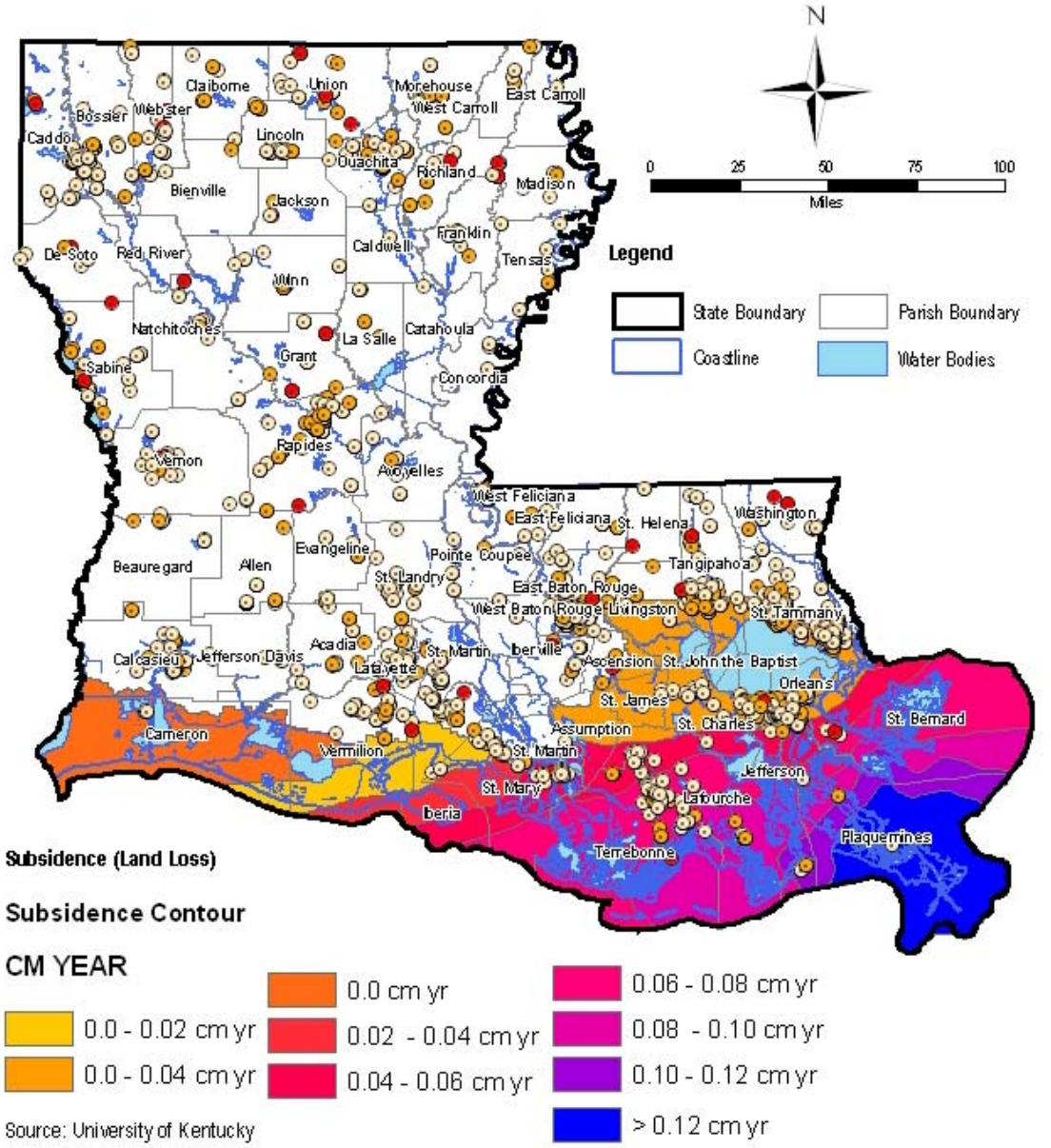
The loss estimate for subsidence is based on the following assumptions.

- General: Loss estimates for individual structures due to subsidence are based on the estimates taken from the available subsidence analysis results. Assigning numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, loss estimates for individual structures due to subsidence should not be used for estimating general property insurance coverage or other needs that require a high degree of accuracy.
- Subsidence Hazard Vulnerability and Average Subsidence: No subsidence effects are experienced by structures constructed in zones with a projected subsidence rate of less than .02 cm/yr. Subsidence effects equivalent to a first floor elevation drop of one to three feet are experienced by structures in zones with projected subsidence rates between .02 and .08 cm/yr. Subsidence effects equivalent to a first floor elevation drop of four to six feet are experienced by structures in zones with projected subsidence rates greater than .08 cm/yr.
- Average Building Type and LLDFs: The physical and contents damages to individual State-owned buildings and critical facilities from subsidence will be considered the same as a single story structure without a basement (i.e., slab-on-grade) constructed using standard residential building materials.
- Physical Damage: For each structure, the BRV is consistent with the building values obtained from the statewide GIS database. In the event the statewide GIS database did not provide a BRV for an individual structure, the BRV was estimated to be zero.
- Contents Damage: For each structure, the contents replacement value is considered zero. Since subsidence events occur gradually over a long period of time, the contents can be protected from damage by removing them before the subsidence becomes an immediate threat to the structure.
- Loss of Function: The $28.9 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The CFs were derived based loosely on FEMA's *What is a Benefit?* draft guidance document dated May 1, 2001 and engineering judgment. The LOF for structures that must be abandoned due to subsidence is capped at 30 days to maintain consistency with loss estimates for other hazards such as flood and wind.

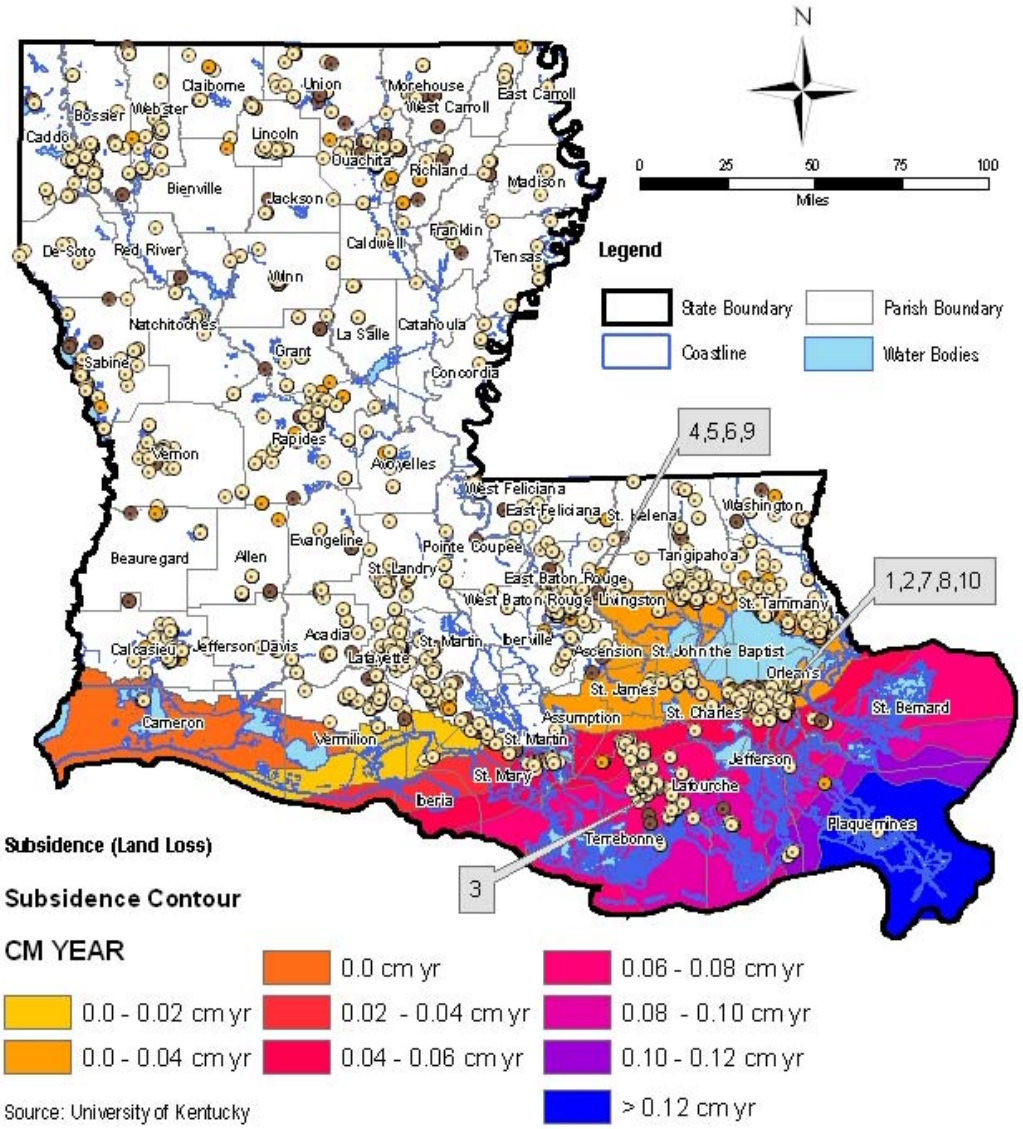
Map F-19: Critical Facilities - Subsidence



Map F-20: Vulnerability Analysis - Subsidence



Map F-21: Loss Estimate – Subsidence - Total



Subsidence (Land Loss)

Subsidence Contour

CM YEAR

- 0.0 - 0.02 cm yr
- 0.0 - 0.04 cm yr
- 0.0 cm yr
- 0.02 - 0.04 cm yr
- 0.04 - 0.06 cm yr
- 0.06 - 0.08 cm yr
- 0.08 - 0.10 cm yr
- 0.10 - 0.12 cm yr
- > 0.12 cm yr

Source: University of Kentucky

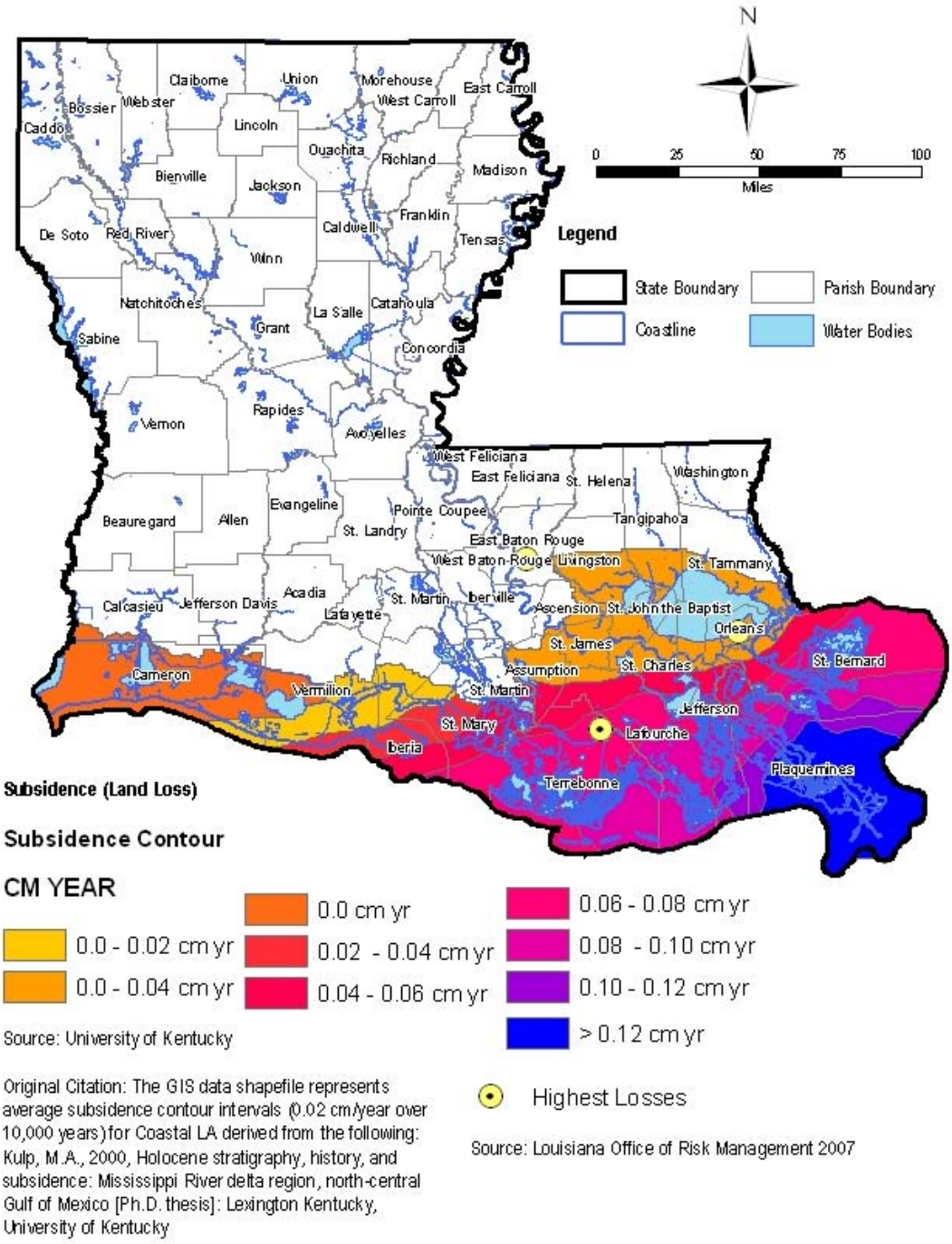
Original Citation: The GIS data shapefile represents average subsidence contour intervals (0.02 cm/year over 10,000 years) for Coastal LA derived from the following: Kulp, M.A., 2000, Holocene stratigraphy, history, and subsidence: Mississippi River delta region, north-central Gulf of Mexico [Ph.D. thesis]: Lexington Kentucky, University of Kentucky

Estimated Losses

- Low: $0.00
- Medium: $0.01 - $50,000.00
- High: $50,000.01 - $145,000,000.00

Source: Louisiana Office of Risk Management Top Ten

Map F-223: Loss Estimate – Subsidence – Top Ten



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Appendix F.7: Wildfire

Vulnerability Assessment Parameters, Methodology and Results

The wildfire hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of the number of recorded wildfires and the number of acres burned by wildfires within each parish between 1991 and 2000, based on data provided by the State of Louisiana.

Based on this information, a hazard vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are defined below.

- Low Hazard Vulnerability: Structures located in parishes with no recorded wildfires.
- Medium Hazard Vulnerability: Structures located in parishes where the average number of acres burned by wildfires between 1991 and 2000 was less than the State-wide average for all parishes.
- High Hazard Vulnerability: Structures located in parishes where the average number of acres burned by wildfires between 1991 and 2000 was greater than the State-wide average for all parishes.

Map 4-12, Hazard Profile – Wildfires, shows the number of acres burned by wildfires for each parish based on state data. Map F-23 indicates the location of State-owned critical facilities in Louisiana in relation to the average number of acres burned by wildfires.

Map F-24 shows State-owned critical facilities by level of vulnerability to the wildfire hazard.

Loss Estimate Parameters, Methodology and Results

The wildfire loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Wildfire Hazard Vulnerability: As stated above, wildfire hazard vulnerability assessments involved an analysis of the average number of acres burned by wildfires within each parish based on data provided by the State of Louisiana between 1991 and 2000. Low, medium, and high wildfire vulnerability for wildfire are defined above.
- Average Building Type: Although the building types for each structure were described in the statewide GIS database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, to conduct basic analyses, individual loss estimates assumed a single building type for each wildfire hazard vulnerability level based on experience with typical wildfire damages and building construction in Louisiana.
- Wildfire Suppression Cost Functions: Physical (building) damage, contents damage and Loss of Function (LOF) costs for each hazard vulnerability level were estimated based on a series of Wildfire Suppression Cost Functions (WSCFs). These WSCFs were developed based on experience with wildfire damages in Louisiana and similar geographic areas.

  The WSCFs for buildings, contents and LOF (days) used for the wildfire loss estimates are summarized Table F.7-1.

Table F.7-1

Hazard Vulnerability Level	Building WSCF	Contents WSCF	LOF (days)
Low	0	0	0
Medium	Varies (see Notes)	0	1
High	Varies (see Notes)	0	3

NOTES: 1.) Assume building WSCF values as a function of the building footprint based on the following formulas:
For Medium Hazard Vulnerability Level - assume 50% suppression cost over 100 LF perimeter ($0.05/SF repair cost) around the building footprint and a $0.05/SF wildfire suppression cost:.
Building Suppression Costs = 0.5x100X$0.05x4x[(Building Area)/(No. of Stories)]^0.5
For High Hazard Vulnerability Level - assume 100% suppression cost over 100 LF perimeter ($0.05/SF repair cost) around the building footprint and a $0.05/SF wildfire suppression cost:
Building Suppression Costs = 1.0x100X$0.05x4x[(Building Area)/(No. of Stories)]^0.5
2.) Assume zero contents damages from wildfires.
3.) Assume LOF values based on experience with wildfires in Louisiana and similar geographic areas.

- Physical Damage: For wildfires, physical (building) damages were estimated as a function of the wildfire suppression cost over the factored building footprint area. The factored building footprint for each structure was determined by multiplying the actual building footprint square footage by a Criticality Factor (CF) based on the criticality of each structure. A summary of CFs for all structures in Louisiana is provided Table F.1-2.

  Applying the CF to the square footage of each structure allows higher criticality facilities (such as fire stations) to define a larger area of protection from wildfire, thereby increasing their wildfire suppression costs to reflect their importance. For each structure, the square foot of the factored building footprint area was multiplied by four to arrive at an estimated building perimeter length. This building perimeter length was then multiplied by 100 LF to arrive at the perimeter area around the building footprint that will require wildfire suppression to avoid physical damage to the building. Finally, using an average wildfire suppression cost of $0.05/SF, the wildfire suppression cost necessary to protect the perimeter area and avoid physical damage was estimated for each of the hazard vulnerability levels as shown below.

  - For low hazard vulnerability structures, a zero wildfire suppression cost was assumed.
  - For medium hazard vulnerability structures, the wildfire suppression cost was assumed to equal 50% of the perimeter area around the building x $0.05/SF.
  - For high hazard vulnerability structures, the wildfire suppression cost was assumed to equal 100% of the perimeter area around the building x $0.05/SF.

- Contents Damage: Contents damages were estimated to be zero for all wildfire hazard vulnerability levels in Louisiana.

- Loss of Function: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, was distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the actual square footage by a CF based on the criticality of each structure. A summary of CFs for all structures in Louisiana is provided in Table F.1-2. Note that by applying the CF to the square footage of each structure, it allows higher criticality facilities (such as fire stations) to obtain a larger proportion of the statewide annual

budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding WSCF for LOF (measured in days).

Once these parameters were determined, loss estimates (building, contents, and LOF) in dollars for each structure were determined using the following formula:

Loss Estimate = (Physical Damage + LOF)

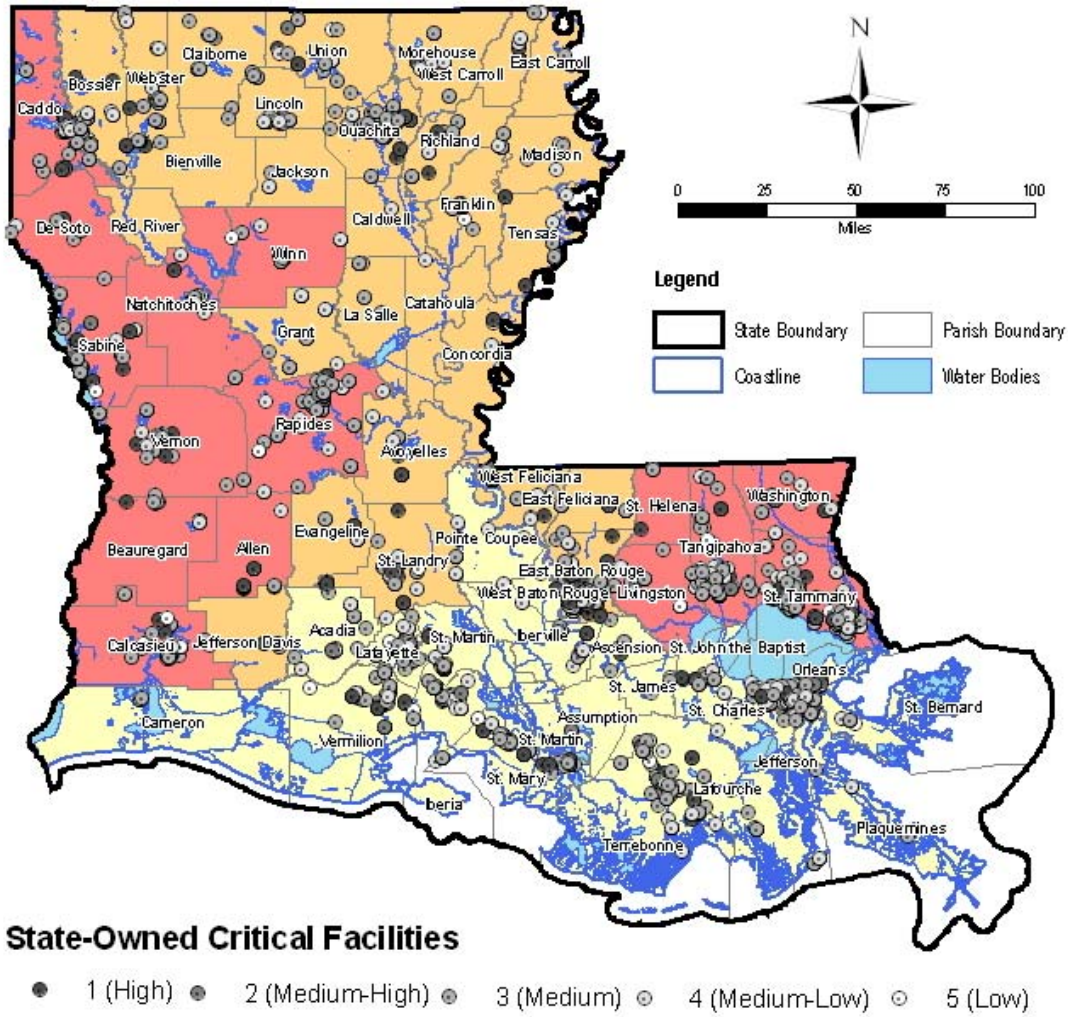
Map F-25 (also Map 6-10) presents the results of the wildfire loss estimate computations. The ten critical facilities in Louisiana with the highest combined loss estimates for the wildfire hazard are shown on Map F-26 (also Map 6-10) and are summarized in Table 6-24.

List of Assumptions

The wildfire loss estimate is based on the following assumptions.

- General: Since actual wildfire damage to State-owned buildings and critical facilities is extremely rare, loss estimates for individual structures are based on fire suppression and LOF costs associated with wildfires. Note that the assigning of numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, wildfire loss estimates for individual structures should not be used for estimating property insurance coverage or other needs that require a high degree of accuracy.
- Wildfire Hazard Vulnerability: Structures located in low hazard vulnerability areas will experience no wildfire damages. Structures located in medium hazard vulnerability areas will experience light to moderate wildfire suppression costs. Structures located in high hazard vulnerability areas will experience moderate to heavy wildfire suppression costs.
- Average Building Type and WSCFs: The physical and contents damages to individual State-owned buildings and critical facilities from wildfire will be considered the same for all buildings depending on criticality and the wildfire hazard vulnerability level. Differences in building type will not have an impact on typical wildfire impacts such as suppression costs and fire-related functional downtime (LOF).
- Physical Damage: For each structure, the BRV is consistent with the building values obtained from the statewide GIS database. In the event the statewide GIS database did not provide a BRV for an individual structure, the BRV was estimated to be zero. For each structure, the only physical damages are cost associated with fire suppression around the building perimeter, depending on the wildfire hazard vulnerability level.
- Contents Damage: For each structure, the contents replacement value is considered zero. Since wildfire suppression costs are intended to prevent damage to the physical building, the contents are protected from damage.
- Loss of Function: The $28.9 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The CFs were derived based loosely on FEMA's *What is a Benefit?* draft guidance document dated May 1, 2001 and engineering judgment.

Map F-23: Location of Critical Facilities – Wildfire Risk



State-Owned Critical Facilities

1 (High) 2 (Medium-High) 3 (Medium) 4 (Medium-Low) 5 (Low)

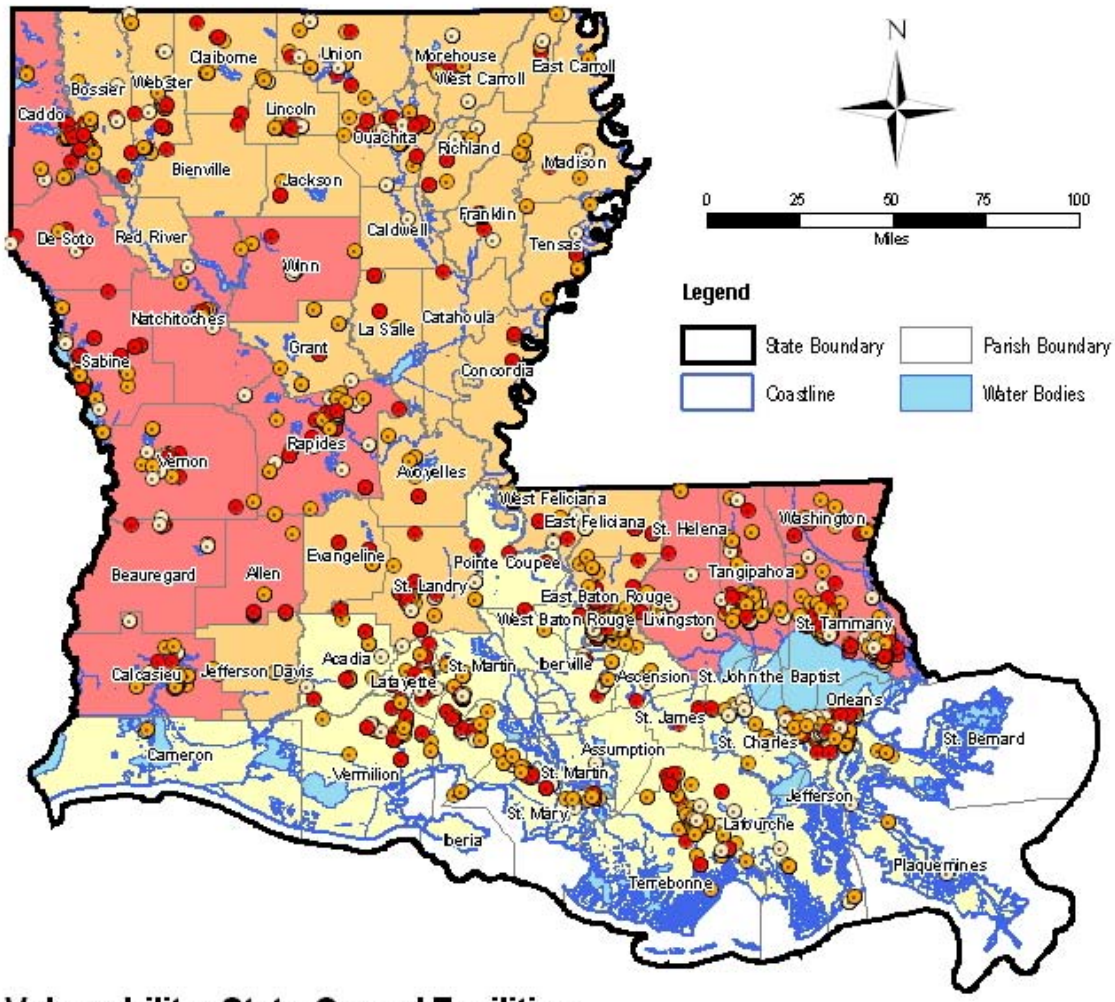
Source: Louisiana Office of Risk Management 2007

Wildfire Risk

High Risk Medium Risk Low Risk

Source: The 2003 was data provided by the Louisiana Department of Agriculture and Forestry

Map F-24: Vulnerability Assessment - Wildfire



Vulnerability: State-Owned Facilities

High Medium Low

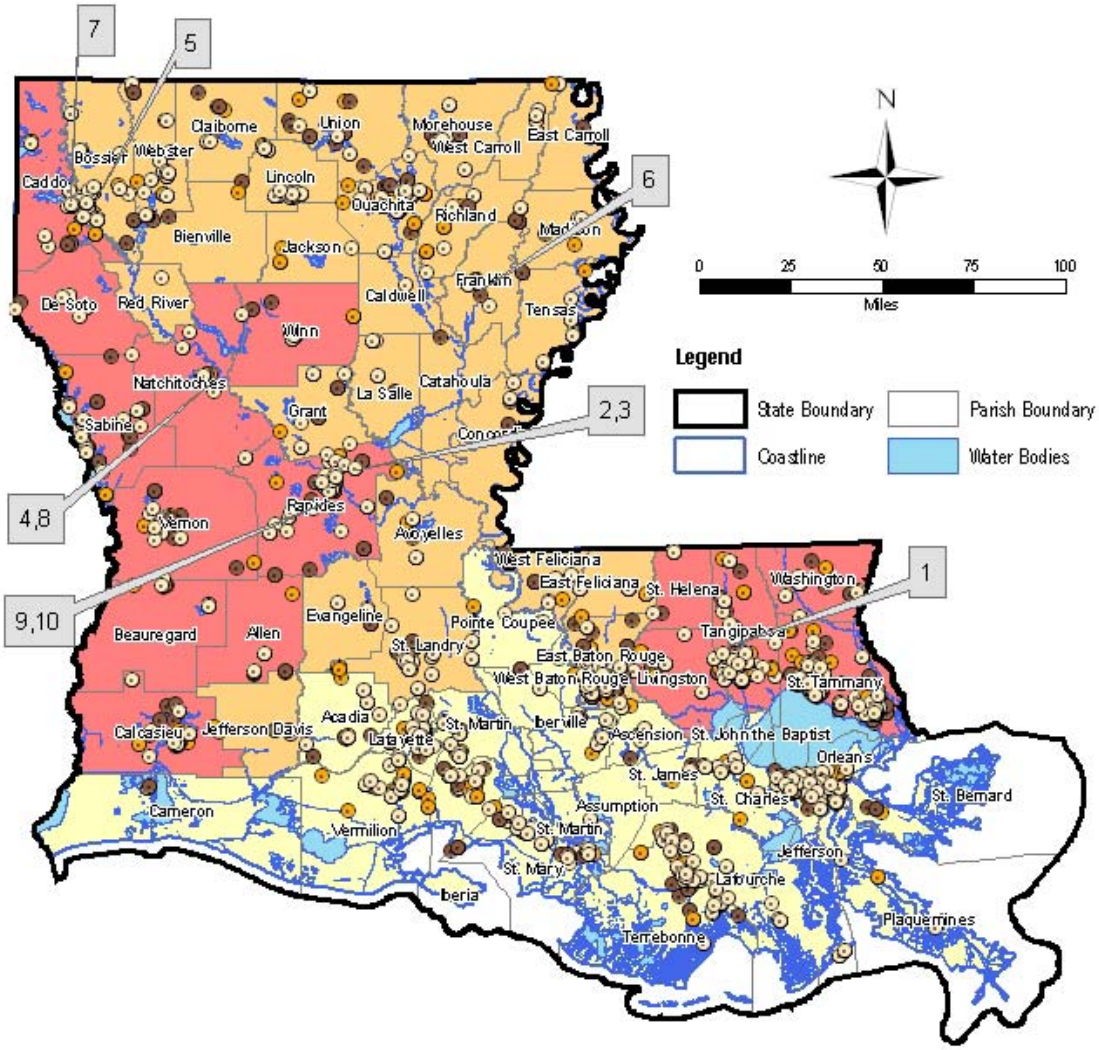
Source: Louisiana Office of Risk Management 2007

Wildfire Risk

High Risk Medium Risk Low Risk

Source: The 2003 was data provided by the Louisiana Department of Agriculture and Forestry

Map F-25: Loss Estimate – Wildfire – Total



Estimated Losses

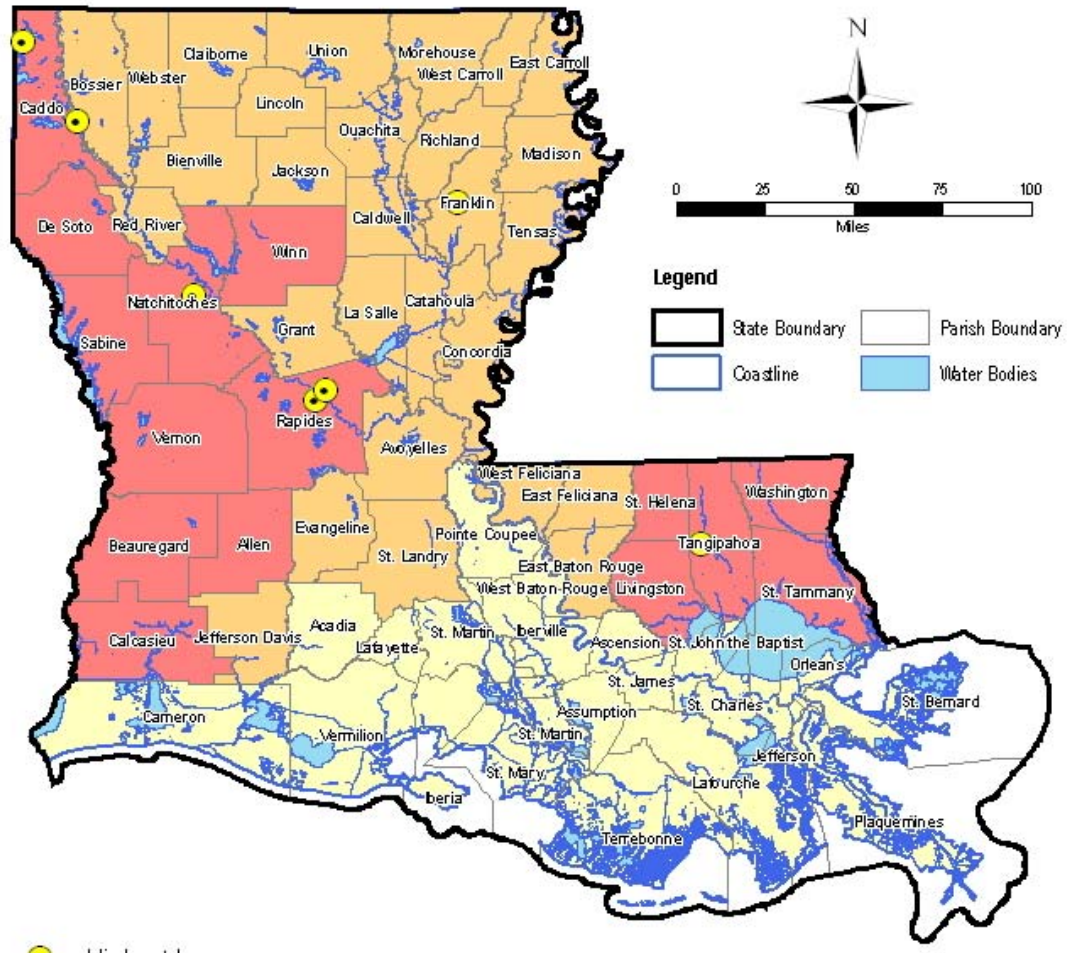
Low: $0.00 Medium: $0.01 - $1,500.00 High: $1,500.01 - $3,400,000.00

Wildfire Risk

High Risk Medium Risk Low Risk

Source: The 2003 was data provided by the Louisiana Department of Agriculture and Forestry

Map F-26: Loss Estimate – Wildfire – Top Ten



Source: Louisiana Office of Risk Management 2007

Wildfire Risk

High Risk | Medium Risk | Low Risk

Source: The 2003 was data provided by the Louisiana Department of Agriculture and Forestry

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Appendix F.8:
Dam Failure

Vulnerability Assessment Parameters, Methodology and Results

The dam failure hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of potential inundation areas from 19 possible high hazard dam failures statewide. The potential inundation areas were estimated based on an algorithm which distributed dam capacities provided by the State over a failure hazard radius of a selected depth around each dam. The results were then used to prepare dam failure hazard zones based on proximity to the failure hazard radii computed by the algorithms. During the public comment period, LDOTD identified fourteen additional high hazard dams; however, due to time and budget constraints, analysis of these dams were not able to be preformed but should be addressed in the next plan update.

Based on this information, a hazard vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are defined below.

- Low Hazard Vulnerability: Structures located outside the dam failure hazard radius.
- Medium Hazard Vulnerability: Structures located within the area greater than 50% but less than 100% of the dam failure hazard radius.
- High Hazard Vulnerability: Structures located within the area less than or equal to 50% of the dam failure hazard radius.

Map 4-13, Hazard Profile – Dam Failure, shows the locations of various dams in parishes throughout the State of Louisiana. Map F-27 indicates the location of State-owned critical facilities in Louisiana in relation to the dam failure hazard radii.

Map F-28 shows State-owned critical facilities by level of vulnerability to the dam failure hazard.

Loss Estimate Parameters, Methodology and Results

The dam failure loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Dam Failure Hazard Vulnerability: As stated above, dam failure hazard vulnerability assessments involved an analysis of potential inundation zones prepared by an algorithm which distributed dam capacities provided by the State over a failure hazard radius around each dam. Low, medium, and high dam failure vulnerability for dam failure are defined above.
- Average Inundation Depth: The dam failure hazard radii were estimated based on an algorithm that distributed dam capacities over a radius with an average inundation depth of three feet. The actual inundation depths for individual State-owned buildings and critical facilities could not be determined due to the lack of available first floor elevations for each structure. Therefore, the average inundation depths for individual structures were estimated at three feet based on the corresponding dam failure hazard vulnerability level, as summarized below.
    - For low hazard vulnerability structures, no dam failure inundation depth was used since the structures were located outside the dam failure hazard radius.
    - For medium hazard vulnerability structures, an average dam failure inundation depth of three feet above the first floor was estimated assuming A Zone conditions, since the average dam failure inundation depth of three feet is assumed to be distributed equally and moving at a lower velocity within the area between 50% and 100% of the dam failure hazard radius.

- For high hazard vulnerability structures, an average dam failure inundation depth of three feet above the first floor was estimated assuming V Zone conditions, since the average dam failure inundation depth of three feet is assumed to be distributed equally and moving at a high velocity within 50% of the dam failure hazard radius.

- Average Building Type: Although the building types for each structure were described in the statewide GIS database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, to conduct basic analyses, individual loss estimates assumed an average building type of a single story structure without a basement. This average building type was determined based on experience with typical buildings and foundation construction techniques in Louisiana.
- Inundation Depth-Damage Functions: Physical (building) damage, contents damage and LOF costs for each structure were estimated based on a series of Inundation Depth-Damage Functions (IDDFs). These IDDFs were a combination of DDFs developed by the FIA based on nationwide flood claims data and damage functions for FEMA's *Full Data Benefit-Cost Module for Coastal V-Zone Flood* (version 5.2.2 dated December 31, 1998). The IDDFs for building damage, contents damage and LOF days used for the dam failure loss estimates are summarized in Table F.8-1.

Table F.8-1

Dam/Levee Failure Hazard Vulnerability Level	Average Building Type	Average Inundation Depth (above FFE)	Building IDDF (%BRV)	Contents IDDF (%BRV)	LOF (days)
Low	1 Story without Basement	None	0.0%	0.0%	0
Medium	1 Story without Basement	3 feet (A Zone)	27.0%	20.5%	27
High	1 Story without Basement	3 feet (V Zone)	50.0%	25.0%	30

NOTES: 1.) FFE = First Floor Elevation
2.) Assume contents replacement value = 50% BRV

- Physical Damage: Physical damages were estimated as a percentage of the BRV. For each structure, the BRV was determined based on building values obtained from the statewide GIS database. The physical damage costs were computed by multiplying the BRV by the corresponding building IDDF.
- Contents Damage: Contents damages were estimated as a percentage of the contents replacement value. For each structure, the contents replacement value was estimated based on a percentage of the BRV determined from the statewide GIS database. Based on an analysis of HAZUS data for various building types, the contents replacement values were equal to an average of 50% of the BRVs. The contents damage costs were determined by multiplying the contents replacement value by the corresponding contents IDDF.
- Loss of Function: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, was distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the actual square footage by a Criticality Factor (CF) based on the criticality of each structure. A summary of CFs for all structures in Louisiana is provided in Table F.1-2. Note that by applying the CF to the square footage of each structure, it allows higher criticality facilities (such as fire stations) to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding IDDF for LOF (measured in days).

Once these parameters were determined, the combined loss estimate (building, contents, and loss of function) in dollars for each structure was determined using the following formula:

Combined Loss Estimate = (Physical Damage + Contents Damage + LOF)

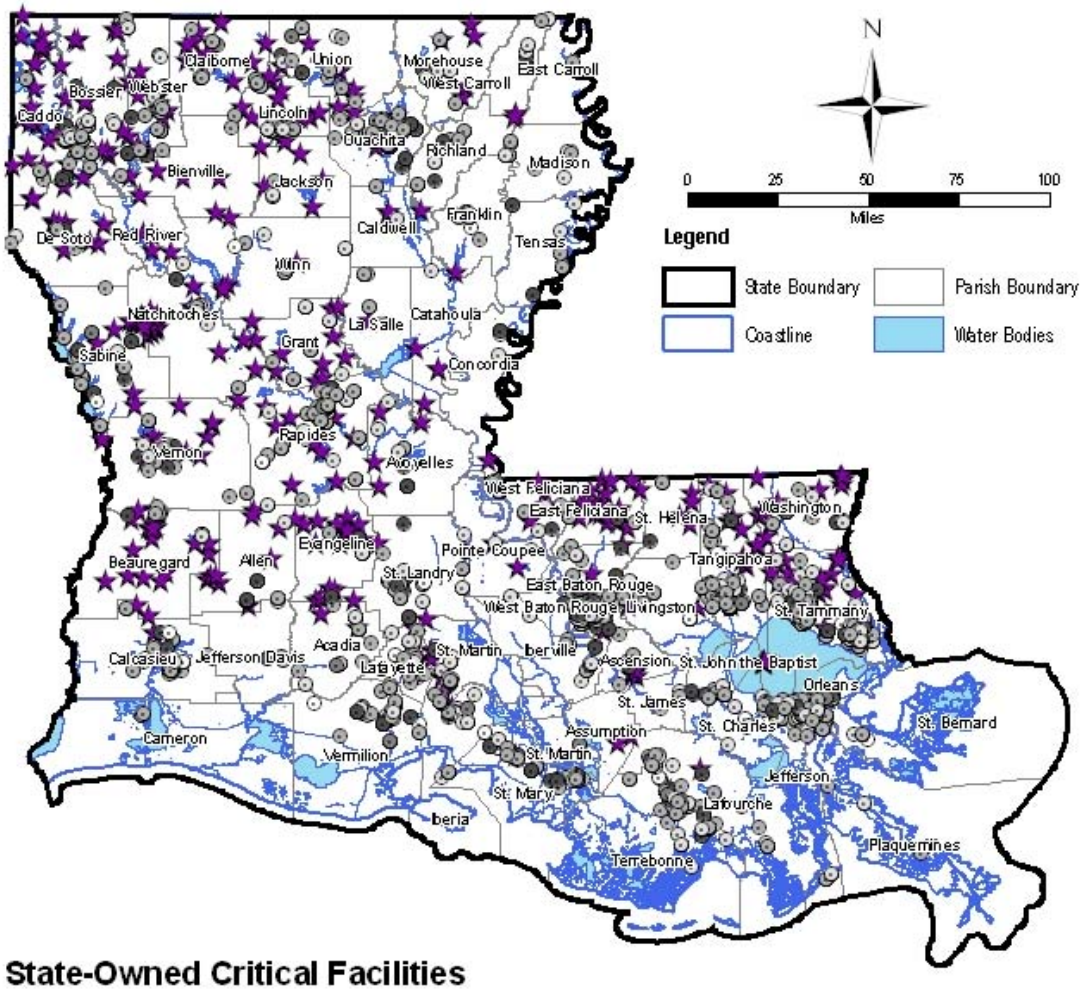
Map F-29 (also Map 6-11) presents the results of the combined dam failure loss estimate computations. The ten critical facilities in Louisiana with the highest combined loss estimates for the dam failure hazard are shown on Map F-30 (also Map 6-11) and are summarized in Table 6-27.

List of Assumptions

The dam failure loss estimate is based on the following assumptions:

- General: Dam failure hazard loss estimates are based on an algorithm that distributed dam capacities provided by the State over a failure hazard radius of a selected depth around each dam. In addition, for high hazard dams in Louisiana, dam failure loss estimates were refined based on the dam failure hazard radius originating at the dam and spreading out in direction of the dam flow in an arc equal to one-fourth of the circular area defined by the failure hazard radius. In either case, the assigning of numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, dam failure loss estimates for individual structures should not be used for estimating flood insurance coverage or other needs that require a high degree of accuracy.
- Dam Failure Hazard Vulnerability and Average Inundation Depth: No dam failure effects are experienced by structures constructed outside dam failure zones. Dam failure effects equivalent to three feet of water above the first floor elevation moving at low velocity without significant wave effects (A Zone) are experienced by structures in dam failure zones within the area between 50% and 100% of the dam failure hazard radius. Dam failure effects equivalent to three feet of water above the first floor elevation moving at high velocity with significant wave effects (V Zone) are experienced by structures in dam failure zones within 50% of the dam failure hazard radius or within the one-fourth circular arc defined by the failure hazard radius for high hazard dams. The average inundation depth of three feet was selected based on engineering judgment and experience with similar hazards.
- Average Building Type and IDDFs: The physical and contents damages to individual State-owned buildings and critical facilities from dam failure will be considered the same as a single story structure without a basement (i.e., slab-on-grade) constructed using standard residential building materials without obstructions to dam failure inundation such as berms or retaining walls.
- Physical Damage: For each structure, the BRV is consistent with the building values obtained from the statewide GIS database. In the event the statewide GIS database did not provide a BRV for an individual structure, the BRV was estimated to be zero.
- Contents Damage: For each structure, the contents replacement value is equal to 50 percent of the BRV.
- Loss of Function: The $28.9 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The Criticality Factors were derived based loosely on FEMA's *What is a Benefit?* draft guidance document dated May 1, 2001 and engineering judgment.

Map F-27: Location of Critical Facilities – Dam Failure Risk



State-Owned Critical Facilities

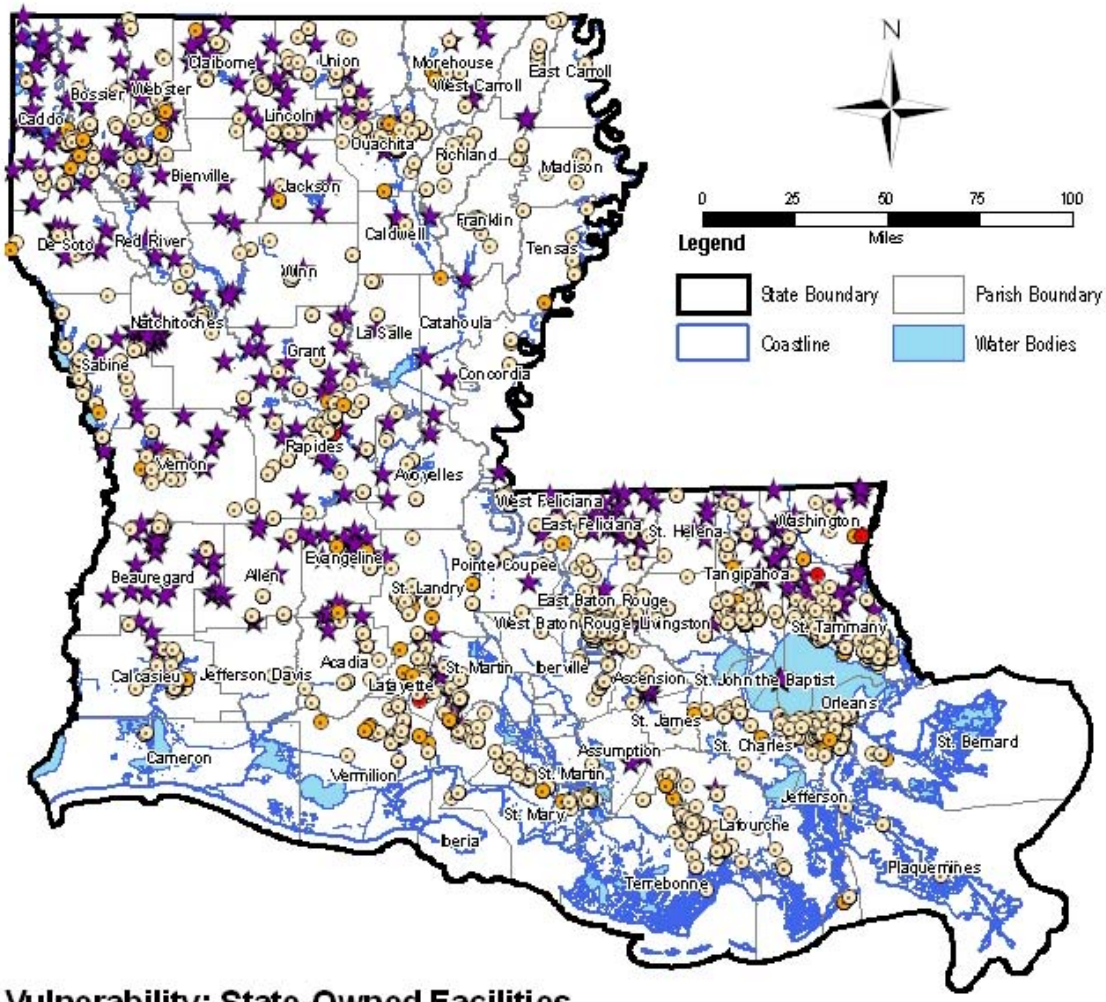
● 1 (High) ● 2 (Medium-High) ● 3 (Medium) ⊙ 4 (Medium-Low) ⊙ 5 (Low)

Source: Louisiana Office of Risk Management 2007

★ Dam Locations

Source: U.S. Army Corp of Engineers National Inventory of Dams

Map F-28: Vulnerability Assessment – Dam Failure



Vulnerability: State-Owned Facilities

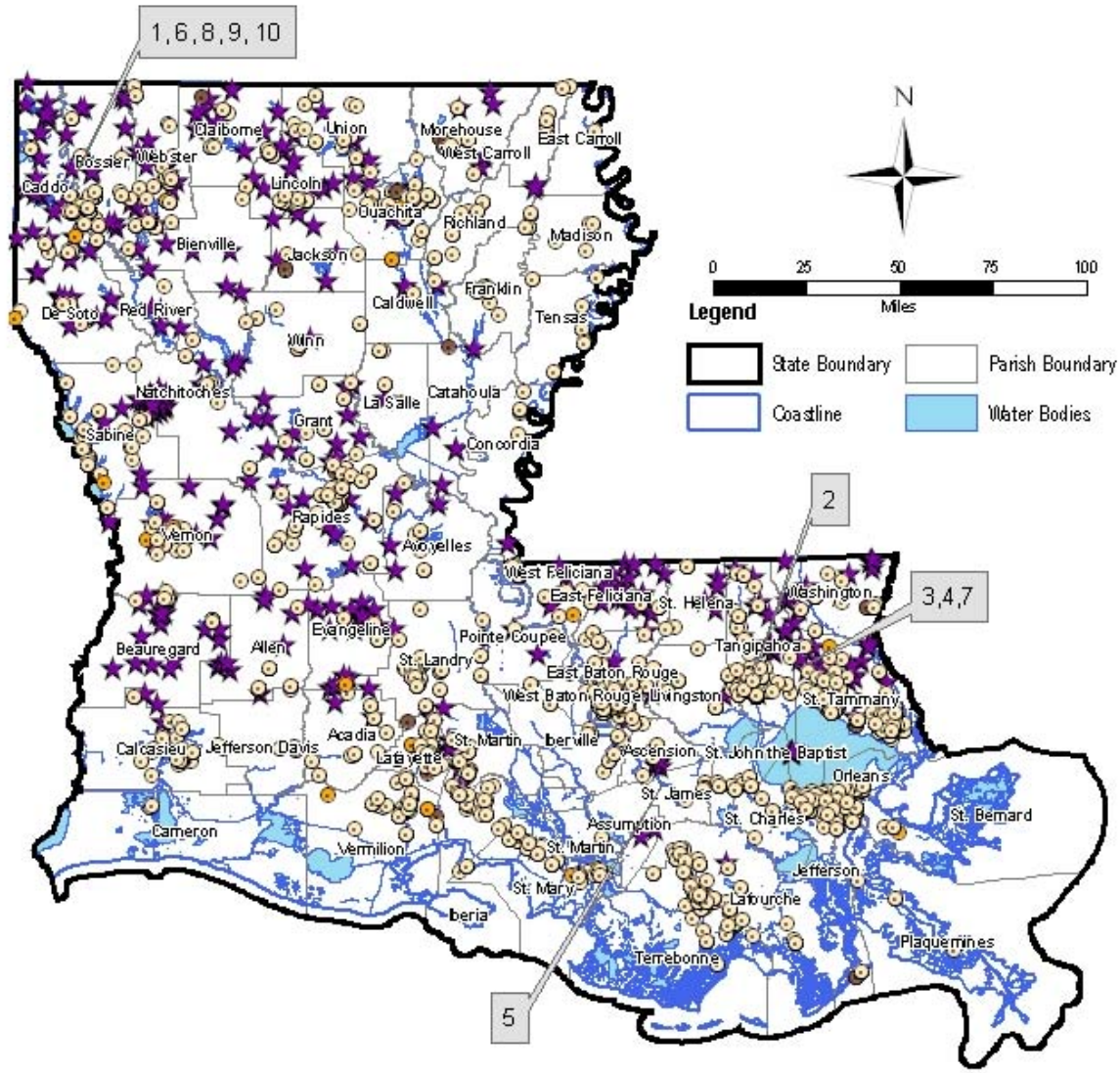
● high ● medium ● low

Source: Louisiana Office of Risk Management 2007

★ Dam Locations

Source: U.S. Army Corp of Engineers National Inventory of Dams

Map F-29: Loss Estimate – Dam Failure – Total



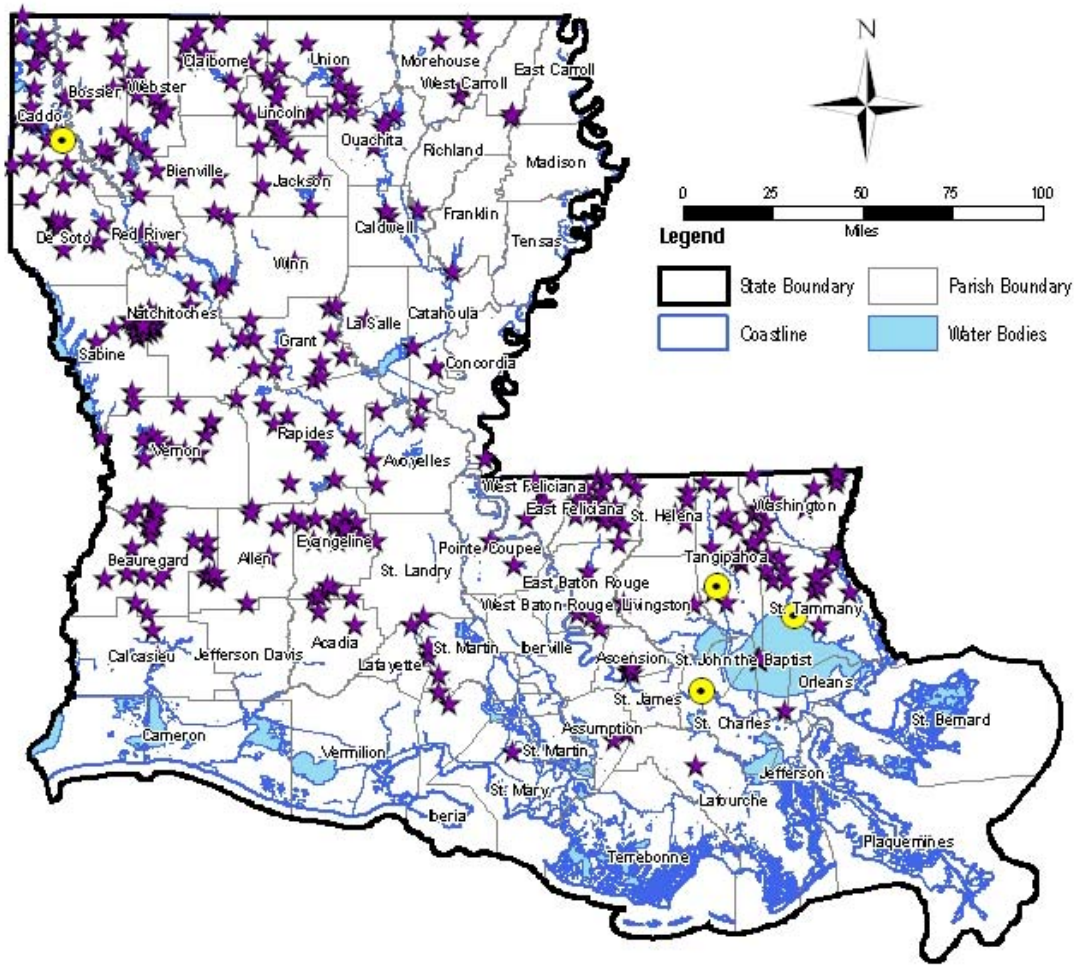
Estimated Losses

Low: $0.00 Medium: $0.01 - $50,000.00 High: $50,000.01 - $60,000,000.00

Dam Locations

Source: U.S. Army Corp of Engineers National Inventory of Dams

Map F-30: Loss Estimate – Dam Failure – Top 10



Highest Losses

Source: Louisiana Office of Risk Management 2007

Dam Locations

Source: U.S. Army Corp of Engineers National Inventory of Dams

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Appendix F.9:
Levee Failure

Vulnerability Assessment Parameters, Methodology and Results

The levee failure hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of potential inundation areas from levee failure. The potential inundation areas were identified based on levee locations across the State as provided by the New Orleans District of the US Army Corps of Engineers (USACE), as well as non-USACE levees. The results were then used to prepare levee failure hazard zones based on the perpendicular distance from the levee wall.

Based on this information, a hazard vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are defined below.

- Low Hazard Vulnerability: Structures located more that two miles away from the levee wall.
- Medium Hazard Vulnerability: Structures located between one-half mile and two miles away from the levee wall.
- High Hazard Vulnerability: Structures located within one-half mile of the levee wall.

Map 4-32, Hazard Profile – Levee Failure, shows the locations of various levees in parishes throughout the State of Louisiana. Map F-31 indicates the location of State-owned critical facilities in Louisiana in relation to the levee failure zones.

Map F-32 shows State-owned critical facilities by level of vulnerability to the levee failure hazard.

Loss Estimate Parameters, Methodology and Results

The dam failure loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Levee Failure Hazard Vulnerability: As stated above, levee failure hazard vulnerability assessments involved an analysis of potential inundation zones based on the perpendicular distance from levees in Louisiana. Low, medium, and high levee failure vulnerability are defined above.
- Average Inundation Depth: The levee failure hazard areas were estimated based on an engineering judgment for an average inundation depth of three feet. The actual inundation depths for individual State-owned buildings and critical facilities could not be determined due to the lack of available first floor elevations for each structure. Therefore, the average inundation average inundation depths for individual structures were estimated at three feet based on the corresponding levee failure hazard vulnerability level, as summarized below.
    - For low hazard vulnerability structures, no levee failure inundation depth was used, since the structures were located outside the levee failure hazard zone.
    - For medium hazard vulnerability structures, an average levee failure inundation depth of three feet above the first floor was estimated assuming A Zone conditions, since the average levee failure inundation depth of three feet is assumed to be distributed equally and moving at a lower velocity within the area between one-half mile and two miles of the levee wall.
    - For high hazard vulnerability structures, an average levee failure inundation depth of three feet above the first floor was estimated assuming V Zone conditions, since the average levee failure inundation depth of three feet is assumed to be distributed equally and moving at a high velocity within one-half mile of the levee wall.

- Average Building Type: Although the building types for each structure were described in the statewide GIS database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, in order to conduct basic analyses, individual loss estimates assumed an average building type of a single story structure without a basement. This average building type was determined based on experience with typical buildings and foundation construction techniques in Louisiana.
- Inundation Depth-Damage Functions: Physical (building) damage, contents damage and LOF costs for each structure were estimated based on a series of Inundation Depth-Damage Functions (IDDFs) (refer to F.14). The IDDFs for building damage, contents damage and LOF days used for the levee failure loss estimates are summarized in Table F.9-1.

Table F.9-1

Dam/Levee Failure Hazard Vulnerability Level	Average Building Type	Average Inundation Depth (above FFE)	Building IDDF (%BRV)	Contents IDDF (%BRV)	LOF (days)
Low	1 Story without Basement	None	0.0%	0.0%	0
Medium	1 Story without Basement	3 feet (A Zone)	27.0%	20.5%	27
High	1 Story without Basement	3 feet (V Zone)	50.0%	25.0%	30

NOTES: 1.) FFE = First Floor Elevation
2.) Assume contents replacement value = 50% BRV

- Physical Damage: Physical damages were estimated as a percentage of the BRV. For each structure, the BRV was determined based on building values obtained from the statewide GIS database. The physical damage costs were computed by multiplying the BRV by the corresponding building IDDF.
- Contents Damage: Contents damages were estimated as a percentage of the contents replacement value. For each structure, the contents replacement value was estimated based on a percentage of the BRV determined from the statewide GIS database. Based on an analysis of HAZUS data for various building types, the contents replacement values were equal to an average of 50 percent of the BRVs. The contents damage costs were determined by multiplying the contents replacement value by the corresponding contents IDDF.
- Loss of Function: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, was distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the actual square footage by a Criticality Factor (CF) based on the criticality of each structure. A summary of CFs for all structures in Louisiana is provided in Table F.1-2. Applying the CF to the square footage of each structure allows higher criticality facilities (such as fire stations) to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding IDDF for LOF (measured in days).

Once these parameters were determined, the combined loss estimate (building, contents, and LOF) in dollars for each structure was determined using the following formula:

Combined Loss Estimate = (Physical Damage + Contents Damage + LOF)

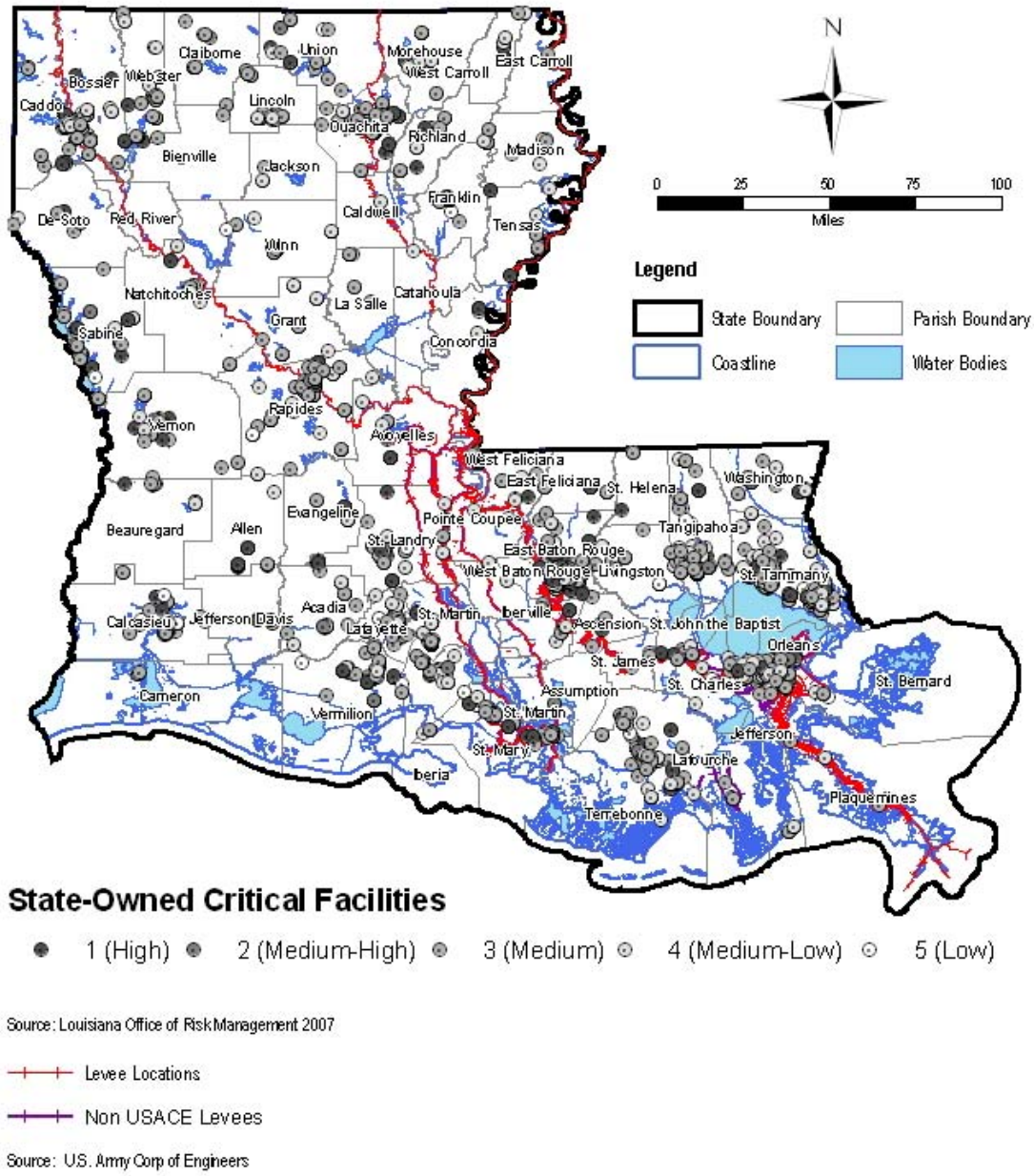
Map F-33 (also Map 6-12) presents the results of the combined levee failure loss estimate computations. The ten critical facilities in Louisiana with the highest combined loss estimates for the levee failure hazard are shown on Map F-34 (also Map 6-12) and are summarized in Table 6-29.

List of Assumptions

The levee failure loss estimate is based on the following assumptions.

- General: Levee failure hazard loss estimates are based on the proximity of facilities to levees and potential inundation depths estimated by engineering judgment. Assigning numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, levee failure loss estimates for individual structures should not be used for estimating flood insurance coverage or other needs that require a high degree of accuracy.
- Levee Failure Hazard Vulnerability and Average Inundation Depth: No levee failure effects are experienced by structures constructed outside levee failure zones. Levee failure effects equivalent to three feet of water above the first floor elevation moving at low velocity without significant wave effects (A Zone) are experienced by structures located between one-half mile and two miles of the levee wall. Levee failure effects equivalent to three feet of water above the first floor elevation moving at high velocity with significant wave effects (V Zone) are experienced by structures located within one-half mail of the levee wall. The average inundation depth of three feet was selected based on engineering judgment and experience with similar hazards.
- Average Building Type and IDDFs: The physical and contents damages to individual State-owned buildings and critical facilities from flooding will be considered the same as a single story structure without a basement (i.e., slab-on-grade) constructed using standard residential building materials without obstructions to levee failure inundation such as berms or retaining walls.
- Physical Damage: For each structure, the BRV is consistent with the building values obtained from the statewide GIS database. In the event the statewide GIS database did not provide a BRV for an individual structure, the BRV was estimated to be zero.
- Contents Damage: For each structure, the contents replacement value is equal to 50 percent of the BRV
- Loss of Function: The $28.9 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The CFs were derived based loosely on FEMA's *What is a Benefit?* draft guidance document dated May 1, 2001 and engineering judgment.

Map F-31: Location of Critical Facilities – Levee Failure



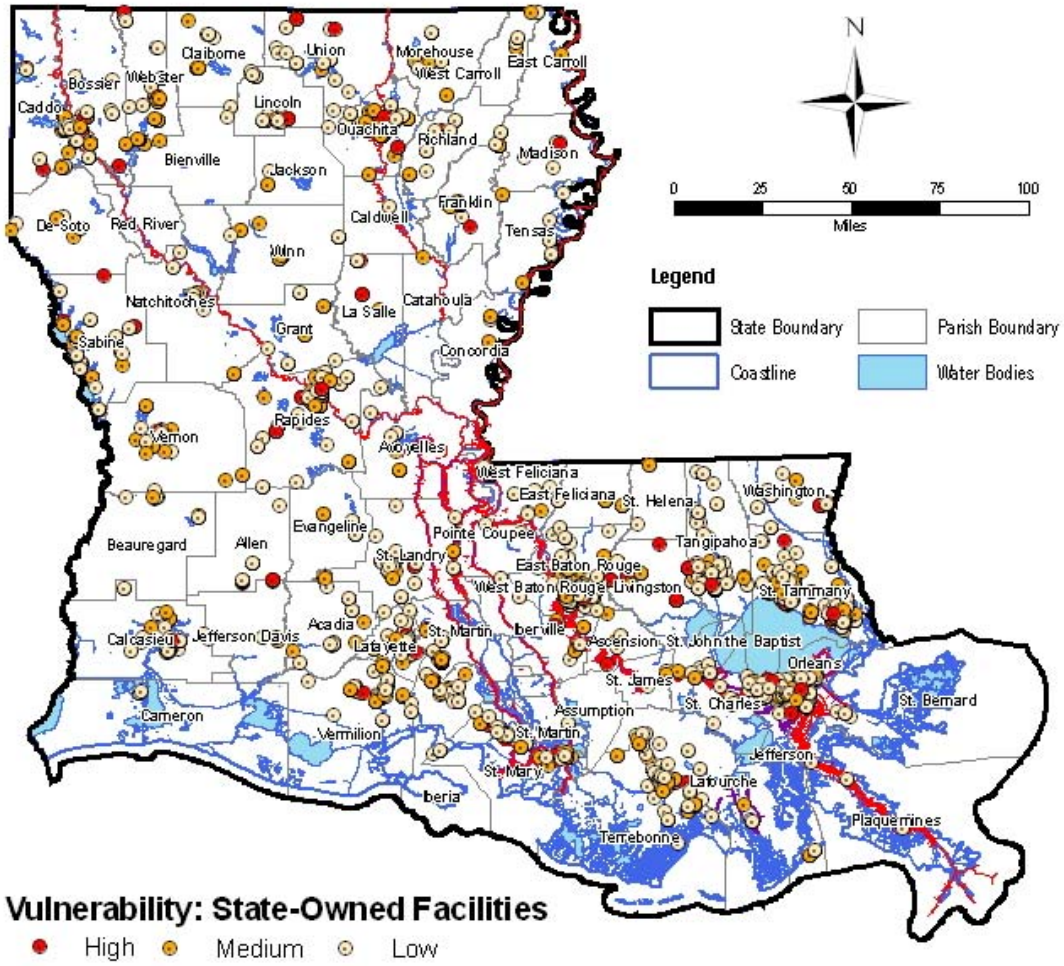
Source: Louisiana Office of Risk Management 2007

Levee Locations

Non USACE Levees

Source: U.S. Army Corp of Engineers

Map F-32: Vulnerability Assessment – Levee Failure



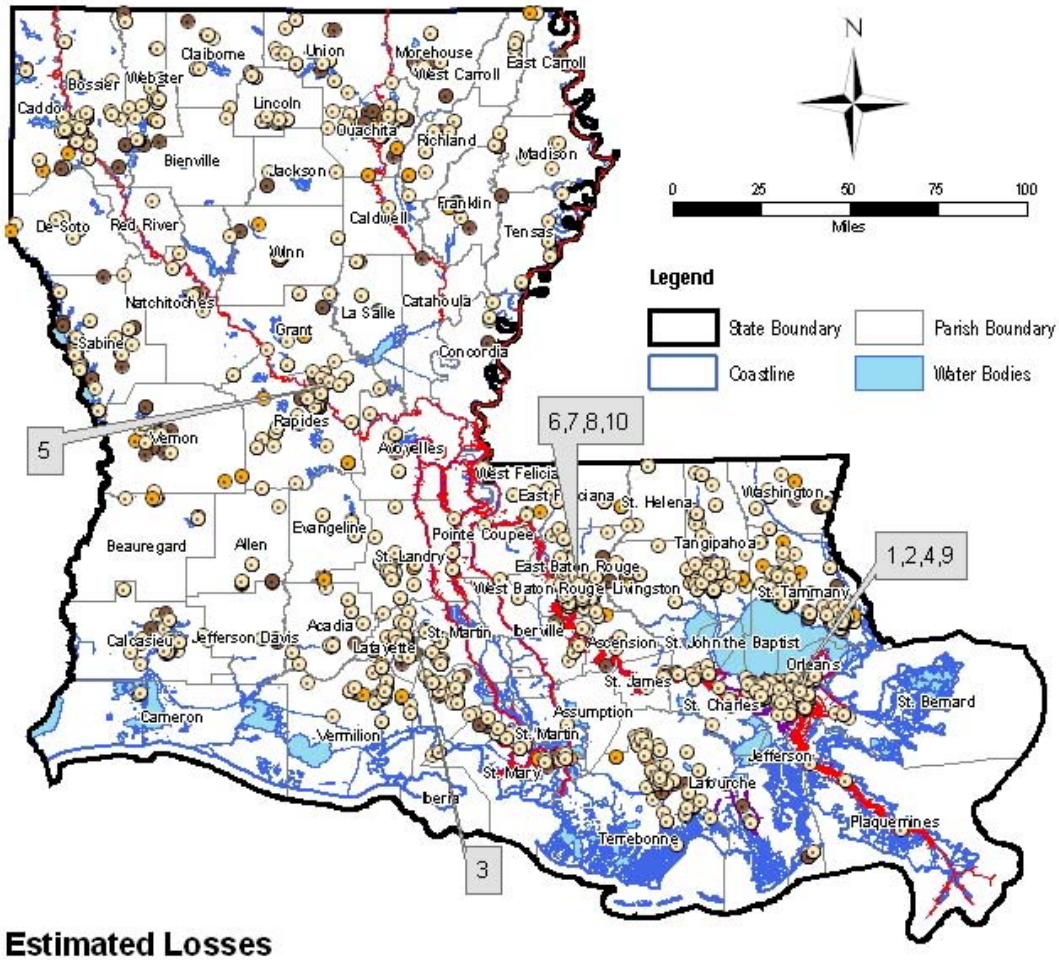
Source: Louisiana Office of Risk Management 2007

Levee Locations

Non USACE Levees

Source: U.S. Army Corp of Engineers

Map F-33: Loss Estimate – Levee Failure – Total



Estimated Losses

Low: $0.00 Medium: $0.01 - $50,000.00 High: $50,000.01 - $215,000,000.00

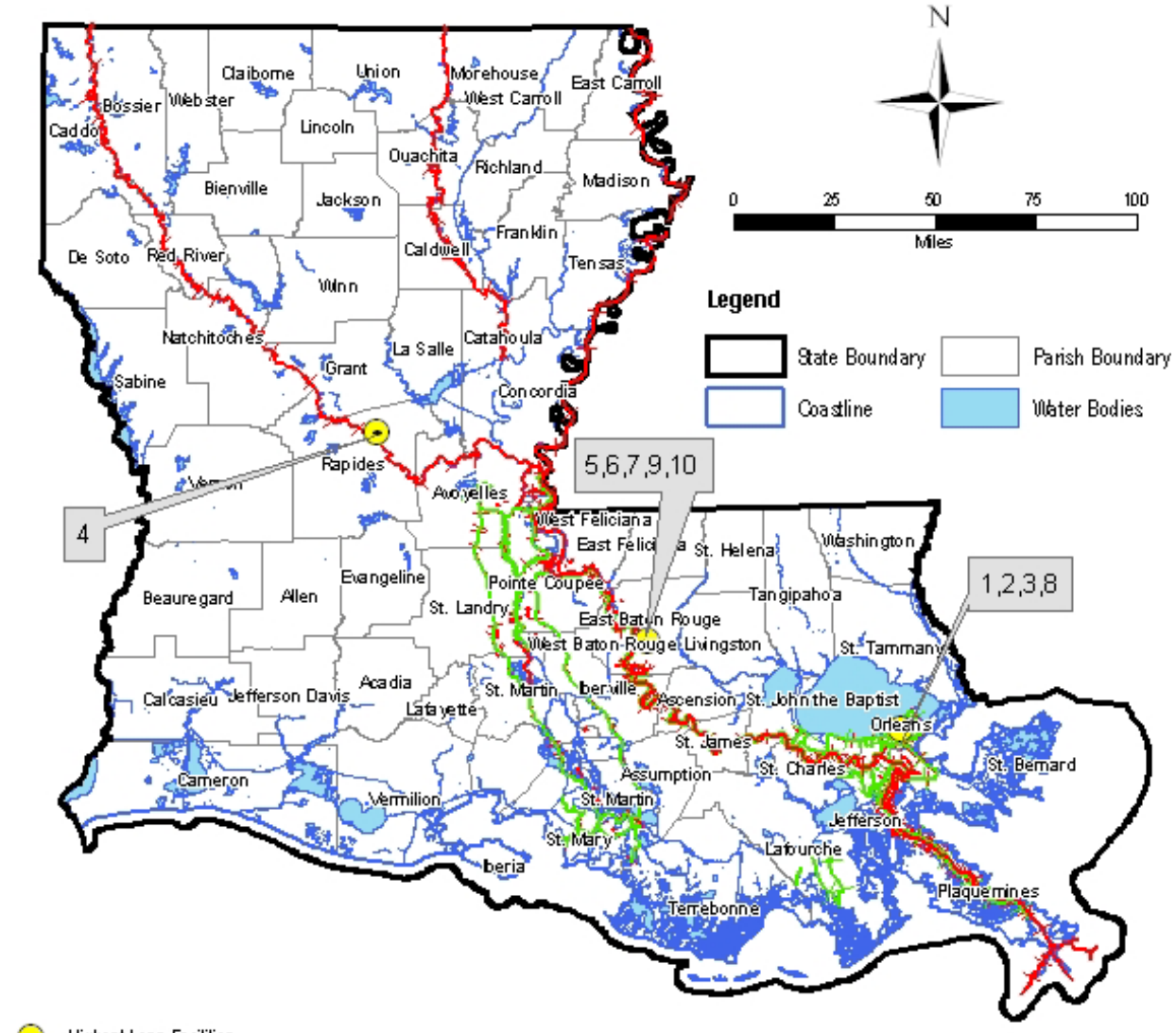
Source: Louisiana Office of Risk Management 2007

Levee Locations

Non USACE Levees

Source: U.S. Army Corp of Engineers

Map F-34: Loss Estimate – Levee Failure – Top 10



Source: U.S. Army Corp of Engineers and the Louisiana Speaks Project 2007; Facility Data Louisiana Office of Risk Management 2007

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Appendix F.10
Hazardous Material Incident

Vulnerability Assessment Parameters, Methodology and Results

The hazardous material incident hazard vulnerability assessment of State-owned buildings and critical facilities in Louisiana involved an analysis of potential impact areas from a hazardous materials (HAZMAT) release from a fixed site. The potential impact areas were identified based on HAZMAT site locations provided by the US Environmental Agency (EPA) Toxic Release Inventory, 2004. The results were then used to prepare hazardous material incident hazard zones based on the distance from the HAZMAT site.

Based on this information, a hazard vulnerability assessment level (low, medium or high) was assigned for each of the State-owned buildings and critical facilities. The three hazard vulnerability levels are defined below.

- Low Hazard Vulnerability: Structures located outside a two mile radius from a HAZMAT site.
- Medium Hazard Vulnerability: Structures located between a one and two mile radius from a HAZMAT site.
- High Hazard Vulnerability: Structures located within a one mile radius of a HAZMAT site.

Map 4-15, Hazard Profile – Hazardous Material Incident, shows the locations of various HAZMAT sites in parishes throughout the State of Louisiana. Map F-35 shows the location of State-owned critical facilities in Louisiana in relation to the HAZMAT sites.

Map F-36 shows State-owned critical facilities by level of vulnerability to the hazardous material incident hazard.

Loss Estimate Parameters, Methodology and Results

The hazardous material incident loss estimate of State-owned buildings and critical facilities in Louisiana involved an analysis of the parameters described below.

- Hazardous Material Incident Hazard Vulnerability: As stated above, hazardous material incident hazard vulnerability assessments involved an analysis of potential impact zones based on distance from the HAZMAT sites in Louisiana (locations complied by the EPA). Low, medium and high hazardous materials incident vulnerability is defined above.
- Average Building Type: Although the building types for each structure were described in the statewide GIS database, an analysis of all building types for individual State-owned buildings and critical facilities was beyond the scope of this loss estimate. Therefore, to conduct basic analyses, individual loss estimates assumed an average building type of a lightly engineered building. This average building type was determined based on experience with typical building construction in Louisiana.
- Hazardous Material Incident Damage Functions: Physical (building) damage, contents damage and LOF costs for each structure were estimated based on a series of Hazardous Material Incident Functions (HIDFs). These HIDFs were based on engineering judgment and a review of damages and losses for similar incidents. The HIDFs for building damage, contents damage and LOF used for the hazardous material incident loss estimates are summarized in Table F.10-1.

Table F.10-1

Hazard Vulnerability Level	Building HIDF	Contents HIDF	LOF (days)
Low	0.0%	0.0%	0
Medium	5.0% LOF (see Notes)	0.0%	1
High	10.0% LOF (see Notes)	0.0%	2

NOTES: 1.) Assume building HIDF values as a function of the LOF cost based on the following formulas:
For Medium Hazard Vulnerability Level - assume evacuation and/or cleanup cost equal to 5% of the LOF cost.
For High Hazard Vulnerability Level - assume evacuation and/or cleanup cost equal to 10% of the LOF cost.
2.) Assume zero contents damages from hazardous materials incidents.
3.) Assume LOF values based on experience with hazardous materials incidents in similar geographic areas.

- Physical Damage: Physical damages were estimated as a percentage of the LOF cost. For each structure, the LOF cost was estimated as a proportion of the annual operating budget for each structure. The physical damage costs were computed by multiplying the LOF cost by the corresponding building HIDF percentage.
- Contents Damage: Contents damages were estimated to be zero for all hazardous material incidents hazard vulnerability levels in Louisiana.
- Loss of Function: LOF costs were estimated as a proportion of the annual operating budget for each structure. The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $28.9 billion, was distributed to individual State-owned buildings and critical facilities based on the *factored square footage* of each structure. The factored square footage for each structure was determined by multiplying the actual square footage by a CF based on the criticality of each structure. A summary of CFs for all structures in Louisiana is provided in Table F.1-2. Applying the CF to the square footage of each structure allows higher criticality facilities (such as fire stations) to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance. Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding HIDF for LOF (measured in days).

Once these parameters were determined, the combined loss estimate (building, contents, and LOF) in dollars for each structure was determined using the following formula:

Combined Loss Estimate = (Physical Damage + LOF)

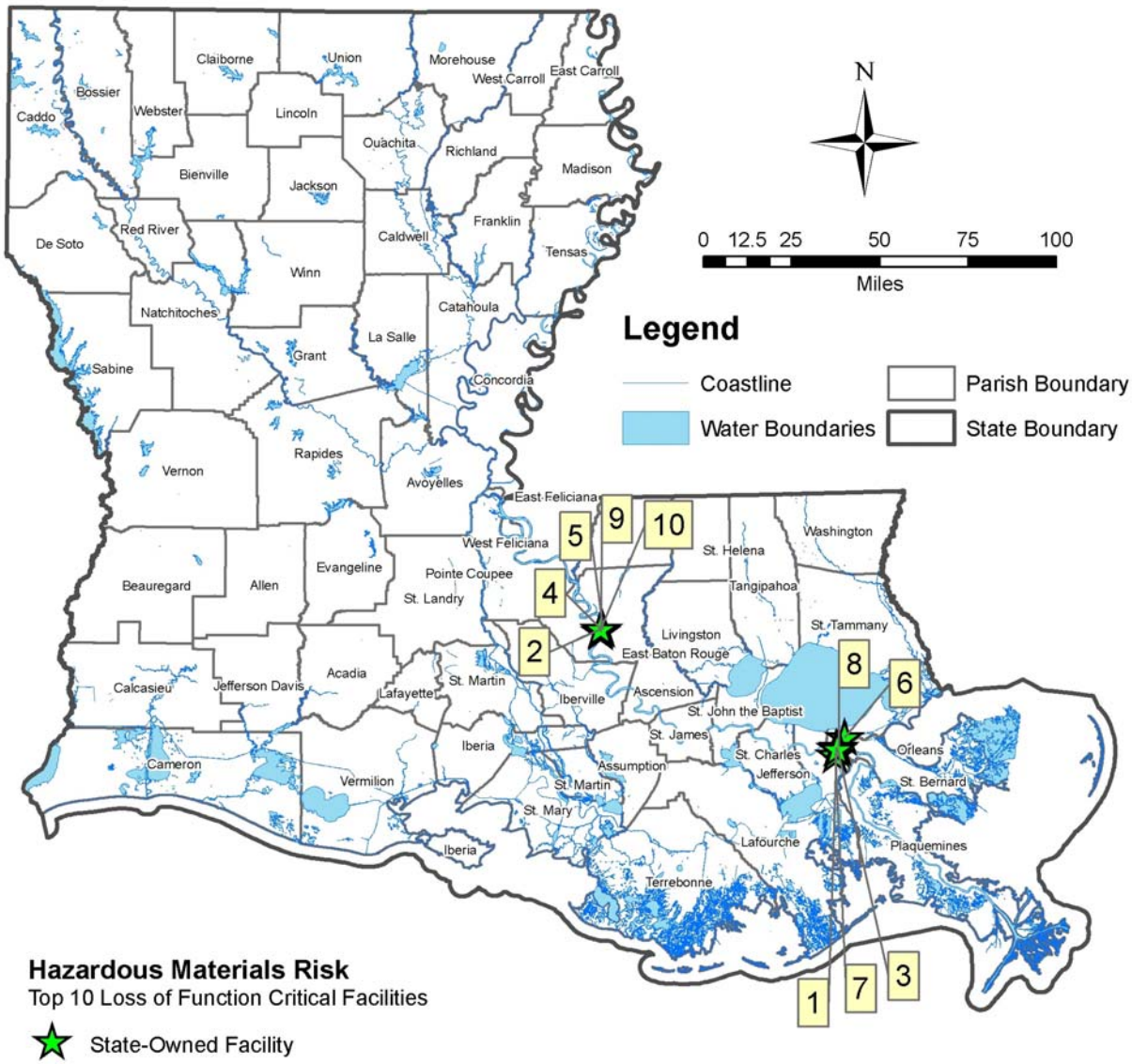
Map F-37 (also Map 6-13) presents the results of the combined hazardous material incident loss estimate computations. The ten critical facilities in Louisiana with the highest combined loss estimates for hazardous material incidents are shown on Map F-38 (also Map 6-13) and are summarized in Table 6-33.

List of Assumptions

The hazardous material incident loss estimate is based on the following assumptions.

- General: Hazardous material incident hazard loss estimates for individual structures are based on the proximity of facilities to HAZMAT sites (locations provided by the EPA) and potential impacts estimated by engineering judgment. Note that the assigning of numerical values and factors for loss estimate parameters is often qualitative in nature and based on data from a number of sources with varying degrees of accuracy. For this reason, hazardous material incident loss estimates for individual structures should not be used for estimating property insurance coverage or other needs that require a high degree of accuracy.
- Hazardous Materials Incident Hazard Vulnerability: No impacts are experienced by structures located outside a radius of two miles or more from a HAZMAT incident. Impacts equal to 1.05 days of LOF costs plus are experienced by structures located between one and two mile radii from a HAZMAT incident. Structures located within a one mile radius of a HAZMAT site that experienced impacts equal to 2.2 LOF days were assigned high hazard vulnerability.
- Physical Damage and LOF: Physical damages were for cleanup costs at the building site associated with a hazardous material incident. The $28.9 billion current annual operating budget for the State of Louisiana is distributed among all State-owned buildings and critical facilities in the statewide GIS database based on the factored square footage of each structure. In the event the statewide GIS database did not provide a square footage and/or criticality level for an individual structure, that square footage and/or criticality level was estimated based on the average square footage and/or criticality level for all structures in the statewide GIS database with available data. The CFs were derived based loosely on FEMA's *What is a Benefit?* draft guidance document dated May 1, 2001 and engineering judgment.
- Contents Damage: For each structure, the contents replacement value is considered zero. Since hazardous material incident costs are associated with evacuation and cleanup costs to the physical building, there is no contents damage.

Map F-38: Loss Estimates – Hazardous Material Incidents – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010)

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Appendix F.11: Summary

As a final step, the losses from all the hazards were combined and the top ten State-owned assets with the highest total estimated losses were identified for the State as a whole (shown on Map F-39 and 6-15).

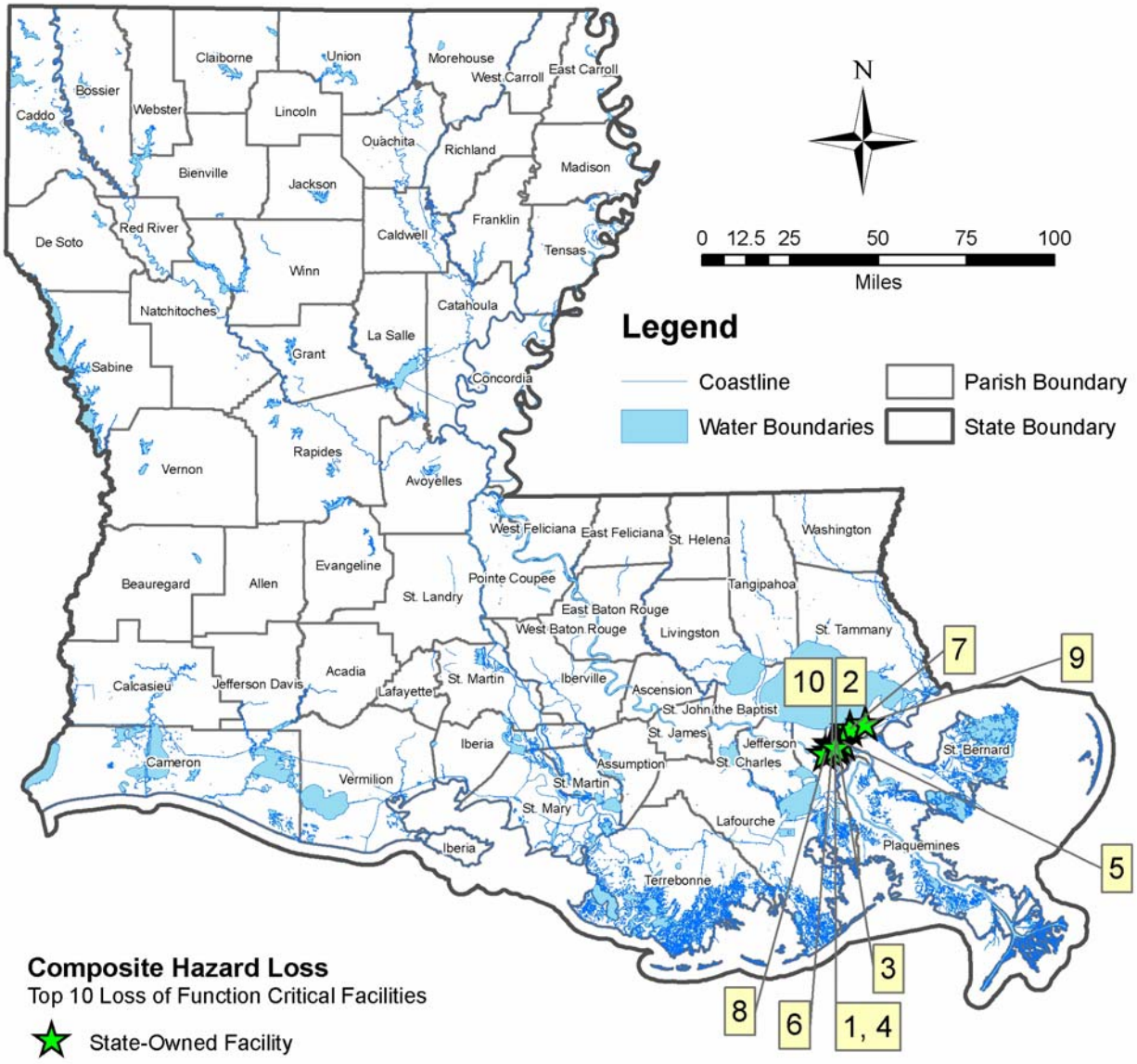
Section Six Subsection 6.15 also contains summary tabulations for:

- Combined Hazard Loss Estimates (Table 6-37);
- Critical Facilities with Highest Vulnerability Rankings per Hazard per State Agency (Table 6-38); and
- Top Ten Critical Facilities per Hazard per State Agency (Table 6-38).

The results of the analyses described in Section Six can be presented in various forms. The following examples are provided:

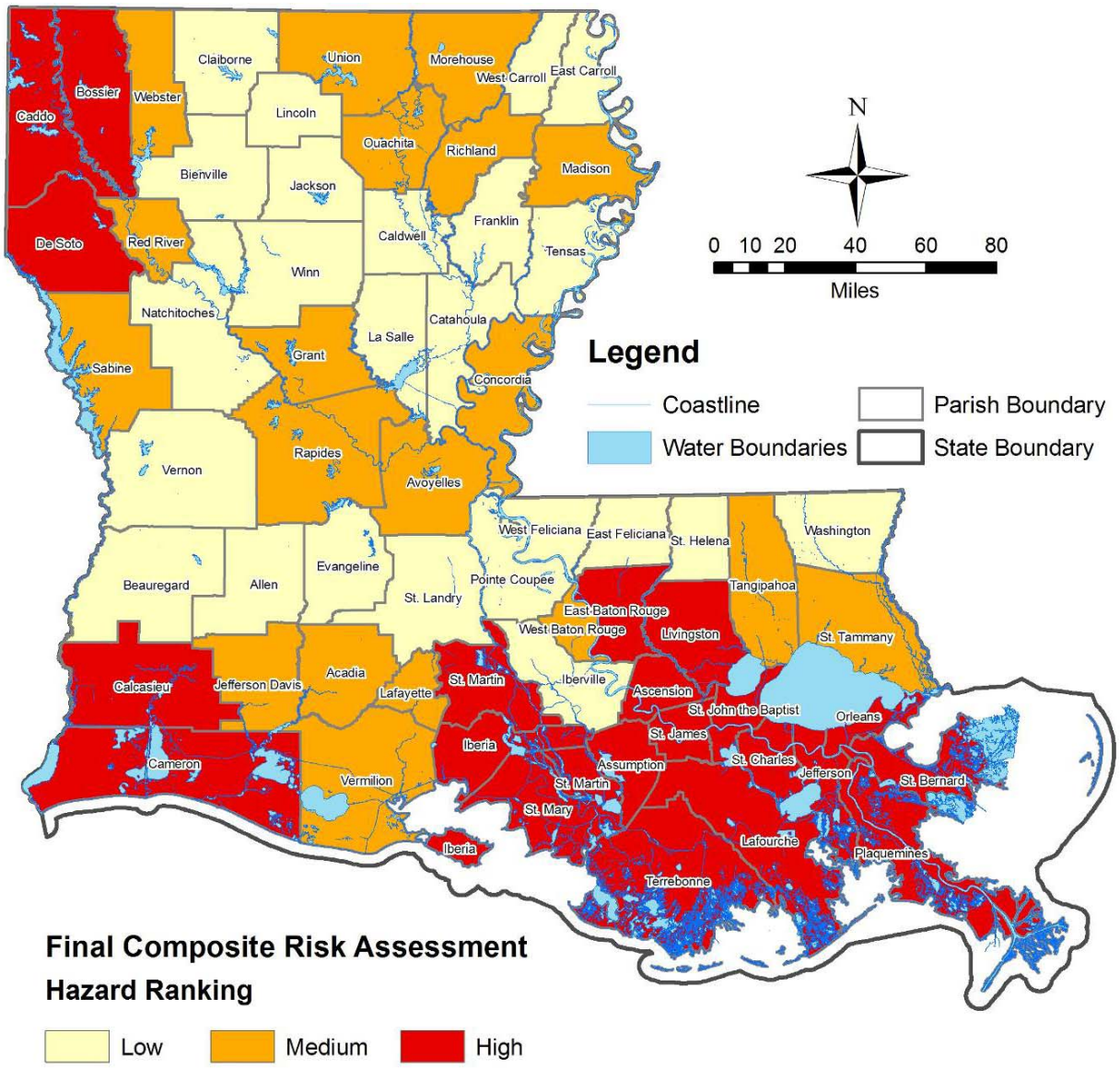
- A map showing the combined hazard loss estimates by Parish

Map F-39: Loss Estimate – All Hazards – Top Ten



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries), ORM (State-Owned Facilities 2010)

Map F-40 Composite Hazard Ranking By Parish



Source: LAGIC (State and Water Boundaries), ESRI (Parish Boundaries)

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Appendix F.12:
Critical Infrastructure Risk Assessment

Introduction

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and the State Hazard Mitigation Planning Committee (SHMPC) undertook the risk assessment for State-owned bridges in three stages:

- Identification of State-owned bridges;
- Vulnerability Assessment; and
- Loss Estimation.

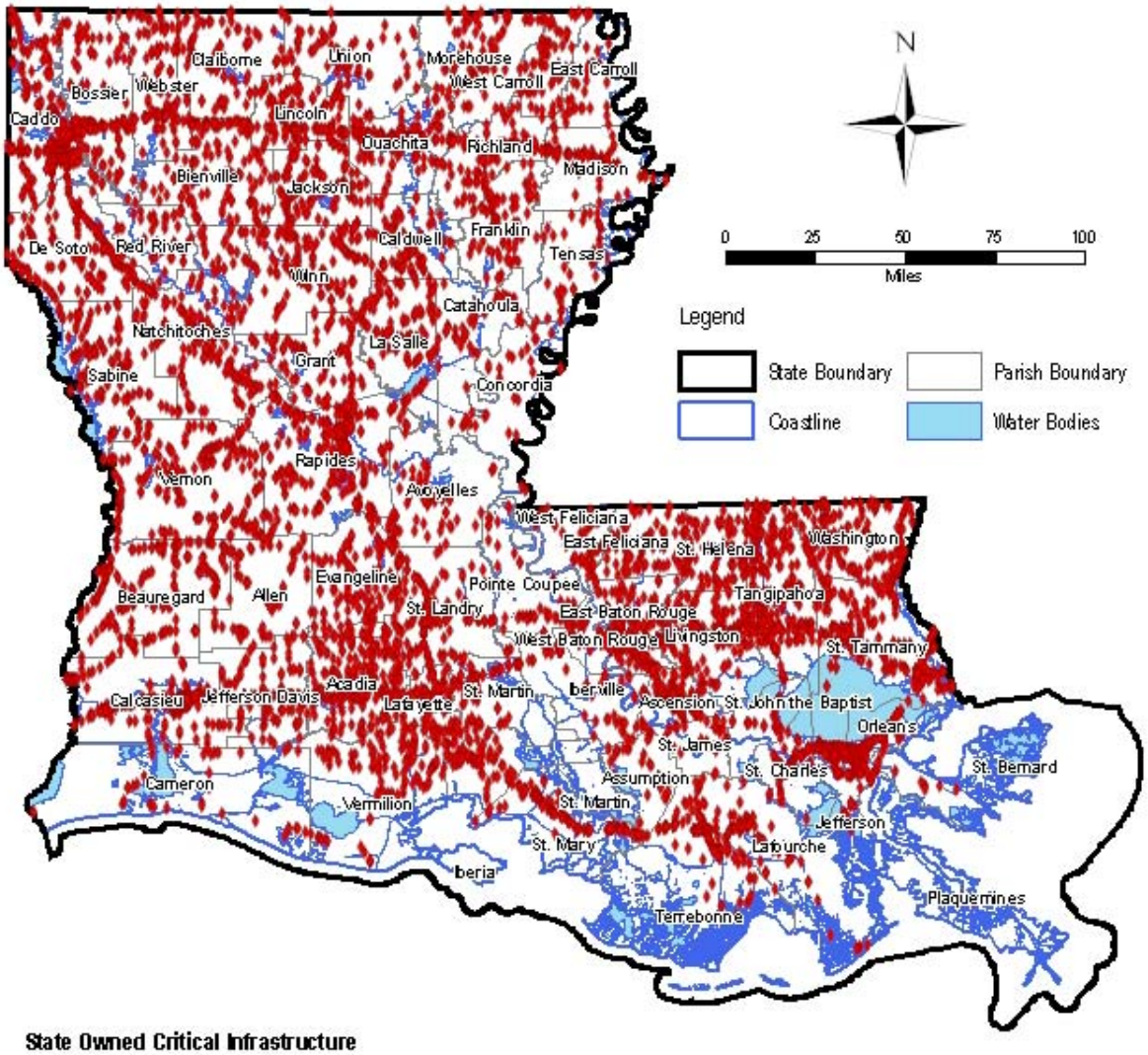
Identification of Critical Infrastructure

The Infrastructure Protection Branch of GOHSEP develops and maintains a classified listing of critical infrastructure and key resources in the State of Louisiana consistent with seventeen (17) sectors defined by the US Department of Homeland Security:

- Agriculture and Food
- Defense Industrial base
- Energy
- Public Health and Healthcare
- National Monuments and Icons
- Banking and Finance
- Drinking Water and Waste Treatment Facilities
- Chemical
- Commercial Facilities
- Dams
- Emergency Services
- Commercial Nuclear Reactors, Materials and Waste
- Information Technology
- Telecommunications
- Postal and Shipping
- Transportation Systems
- Government Facilities

However, GOHSEP is still in the process of gathering information from several Parishes and the listing is currently only reflective of 16 Parishes. As a result, the State of Louisiana used the HAZUS a database listing all bridges within the State and identified those which were State-owned. The attributes in the database include the location, age, and traffic counts of the bridges. The total number of assets included in the database is 7,584. The general locations of these assets are shown in Map F-41.

Map F-41: Critical Infrastructure - Bridges



GOHSEP and the SHMPC decided to assign "criticality" levels based upon traffic count. The different levels that were developed by GOHSEP are shown in Table 6-38.

Table F.11-1: State-Owned Bridges Criticality Level Descriptions

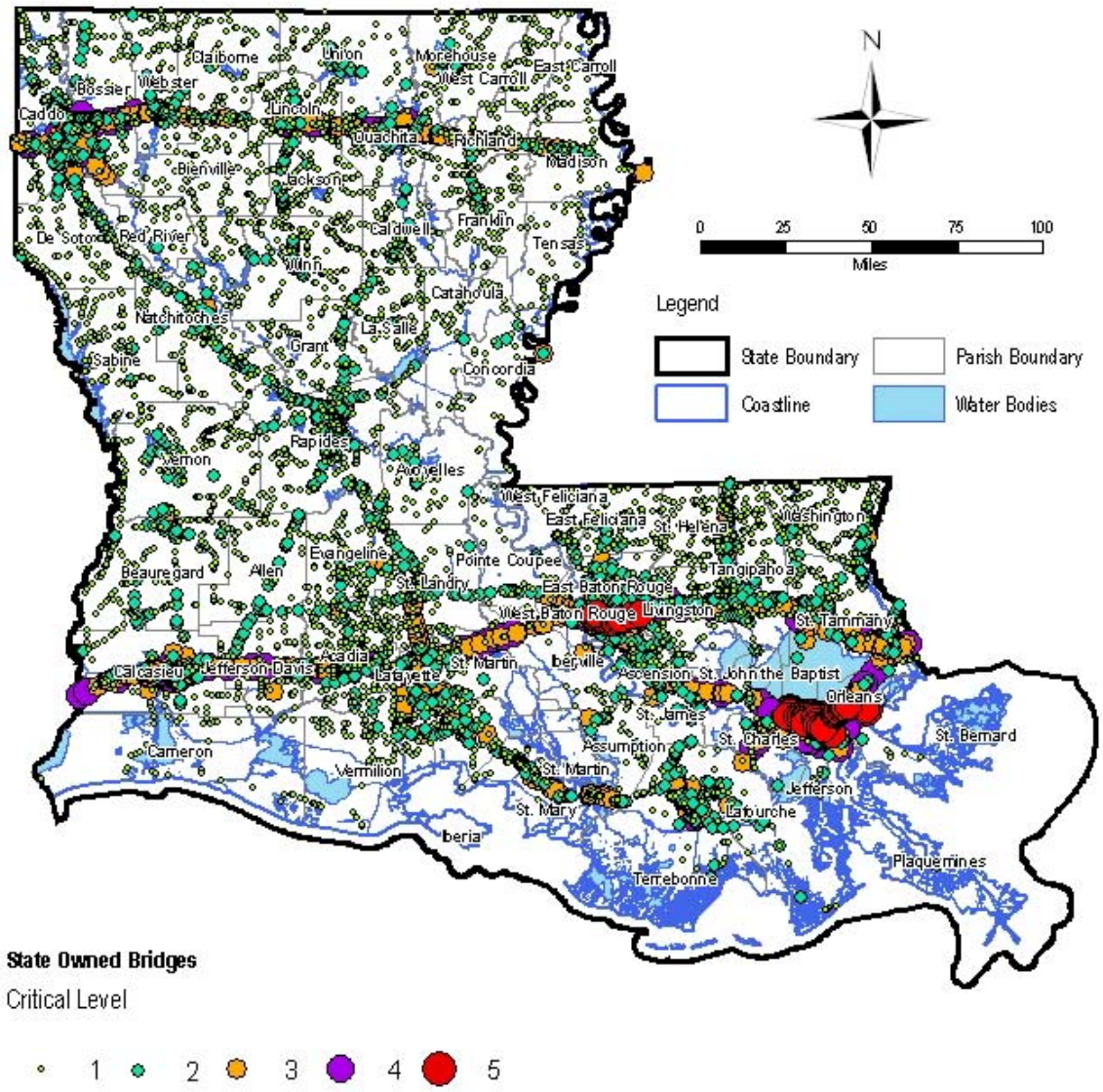
Criticality Level	Description
Level 1 - High importance/Most critical	Traffic Count > 55,750
Level 2 - Medium-high importance	Traffic Count >29,000 and < 55,750
Level 3 - Medium importance	Traffic Count >14,000 and <29,000
Level 4 - Medium-low importance	Traffic Count > 4,500 and < 14,000
Level 5 - Low importance	Traffic Count < 4,500

Table F.11-2 shows the numbers of State-owned bridges per criticality ranking; this information is also illustrated in Map F-42.

Table F.11-2: Number of State-Owned Assets (Bridges) by Criticality Ranking

Criticality Level	Number of Assets (Critical Facilities)
1 – High	79
2 – Medium High	300
3 – Medium	886
4 – Medium Low	1,838
5 - Low	4,481
Total	7,584

Map F-42: Critical Infrastructure – Bridges- Criticality



Source: HAZUS, 2003

Vulnerability Assessment Methodology for State-owned Bridges

Hazard vulnerability assessments provide a means of indicating whether a given bridge in Louisiana is at a low, medium or high vulnerability to damage from a given hazard. Although there are a variety of potential hazards, the hazard vulnerability assessments for State-owned bridges in Louisiana adopted the same general approach for all hazards. This general approach is outlined by the three-step methodology listed below:

- Step 1 – Review Hazard Profile Maps: The first step in the hazard vulnerability assessments was to review the hazard profile map for the hazard under consideration. The hazard profile maps helped identify and establish which parishes or areas in the State of Louisiana have historically been the most prone to a given hazard, and provided a useful means of establishing hazard vulnerability levels (Step 2). The hazard profile maps for each hazard may be found in Section Four of this Plan.
- Step 2 – Establish Hazard Vulnerability Levels by Location: Using information from Step 1, two or more hazard vulnerability levels were established for State-owned bridges based on location. In general, bridges located outside established hazard zones were designated as having a low hazard vulnerability level, while bridges located within the established hazard zones were designated with a medium or high hazard vulnerability level. The basis for the medium and high distinctions is described for each hazard in the materials starting with Subsection 6.4.
- Step 3 – Establish Hazard Vulnerability Levels using Additional Parameters if Needed: In some cases, the location of a bridge is not sufficient to specify a low, medium or high vulnerability level. In these situations, the next step was to establish additional parameters to make a more specific determination. Examples of parameters used to establish hazard vulnerability levels include the age of the bridge relative to the adoption of a floodplain ordinance. The assumption is that in general terms, bridges constructed after the establishment of an ordinance are designated to have a lower hazard vulnerability level than those that were constructed before it was established, since the ordinance would require construction that is more resistant to these hazards.

Loss Estimation Methodology for State-owned Critical Infrastructure

Loss estimations are intended to provide a means of quantifying the potential dollar losses from a given hazard in terms of combined physical (building) damage, contents damage, and loss of function (LOF) costs. Due to limitations inherent in the data, loss estimations for bridges consider only loss of function. As described for the vulnerability assessment methodology above, although there are a variety of potential hazards, the loss estimations for State-owned bridges in Louisiana adopted the same general approach for all hazards. This general approach is outlined by the two-step methodology listed below.

- Step 1 – Estimate Damage Levels by Hazard Vulnerability Level: The first step in preparing loss estimates for individual bridges was to establish a loss of function designation from a given hazard. The three hazard vulnerability levels established by the hazard vulnerability assessment for each facility provided a useful indication of the potential levels of damage that may occur from a given hazard. In general, structures with a low hazard vulnerability level are expected to experience a shorter loss of function, structures with a medium hazard vulnerability level are subject to a moderate loss of function, and structures with a high hazard vulnerability level will likely experience a longer term loss of function.
- Step 2 – Establish Damage Functions: The final step in preparing loss estimates was to establish a series of damage functions to estimate LOF costs associated with a given hazard. The damage functions allowed damages to be estimated for the three potential damage levels established in Step 1. The damage functions were applied to individual bridges based on the factored traffic count. The traffic count values were taken directly from the information in the HAZUS database.

  The factored traffic count for each bridge was determined by multiplying the actual traffic count by a Criticality Factor (CF) based on the criticality level assigned to each structure; the relationship of the

criticality level to the CF is shown in Table F.11-3.

Table F.11-3: Relationship of Criticality Level to Criticality Factor

Criticality Level	Criticality Factor (CF)
1 – High	5
2 – Medium High	4
3 – Medium	3
4 – Medium Low	2
5 - Low	1

Once the factored traffic count was obtained for each bridge, the LOF costs were computed by using a formula derived from the FEMA Benefit Cost Toolkit 3.0. The formula is:

Traffic count (per hour) x Detour Time (in hours) x LOF (in hours) x $25

A detour time of one hour was assumed for all bridges.

The subsections that follow provide step by step descriptions of the risk assessment methodology for State-owned bridges for each hazard type.

Flood

1) Determine traffic counts for all bridges.
2) Assign a Vulnerability Ranking of low, medium, or high.
    a. Low Vulnerability = Bridges outside of the 100 year floodplain.
    b. Medium Vulnerability = Bridges within the 100 year floodplain and built after 1983.
    c. High Vulnerability = Bridges within the 100 year floodplain and built prior to 1983.
3) Determine Loss of Function in days.
    a. Low Vulnerability = 0 days.
    b. Medium Vulnerability = 9 days.
    c. High Vulnerability = 27 days.
4) Assume a one hour detour time for all impacted bridges.
5) Loss Estimate = Factored Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25
6) Rank bridges based upon Loss Estimates.

High Wind – Hurricane

1) Determine traffic counts for all bridges.
2) Assign a Vulnerability Ranking of low, medium, or high.
    a. Low Vulnerability = Bridges in a wind zone of less than 90mph.
    b. Medium Vulnerability = Bridges in a wind zone of between 91-110 mph.
    c. High Vulnerability = Bridges in a wind zone of greater than 110mph.
3) Determine Loss of Function in days.
    a. Low Vulnerability = 2.5 days.

b. Medium Vulnerability = 7.5 days.

c. High Vulnerability = 15 days.

4) Assume a one hour detour time for all impacted bridges.

5) Loss Estimate = Factored Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25

6) Rank bridges based upon Loss Estimates.

High Wind – Tornado

1) Determine traffic counts for all bridges.

2) Determine total Factored Traffic Counts per Parish.

3) Assign a Vulnerability Ranking of 1,2,3,4, or 5.

   a. Category 1 = Parishes with an average of 0 - .5 tornadoes per 100 square miles.

   b. Category 2 = Parishes with an average of .5 – 1.5 tornadoes per 100 square miles.

   c. Category 3 = Parishes with an average of 1.5 – 2.5 tornadoes per 100 square miles.

   d. Category 4 = Parishes with an average of 2.5 – 3.5 tornadoes per 100 square miles.

   e. Category 5 = Parishes with an average of greater than 3.5 tornadoes per 100 square miles.

4) Determine Loss of Function in days.

   a. Category 1 = 1 day.

   b. Category 2 = 2 days.

   c. Category 3 = 5 days.

   d. Category 4 = 7 days

   e. Category 5 = 10 days

5) Assume a one hour detour time for all impacted bridges.

6) Determine Percentage of Parish Historically Impacted by Tornadoes and Multiply by Factored Traffic Count.

7) Calculate Loss Estimates

   a. 25% Loss = Parish Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25 x .25

   b. 50% Loss = Parish Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25 x .5

   c. 75% Loss = Parish Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25 x .75

   d. 100% Loss = Parish Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25

8) Rank Parishes based upon Loss Estimates.

Ice Storm

1) Determine traffic counts for all bridges.

2) Assign a Vulnerability Ranking of low, medium, or high.

   a. Low Vulnerability = Bridges in a Parish with no ice storms.

   b. Medium Vulnerability = Bridges in a Parish with 1-4 ice storms.

   c. High Vulnerability = Bridges in a Parish with more than 4 ice storms.

3) Determine Loss of Function in days.
    a. Low Vulnerability = 0 days.
    b. Medium Vulnerability = 1 day.
    c. High Vulnerability = 3 days.
4) Assume a one hour detour time for all impacted bridges.
5) Loss Estimate = Factored Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25
6) Rank bridges based upon Loss Estimates.

Storm Surge

1) Determine traffic counts for all bridges.
2) Assign a Vulnerability Ranking of low, medium, or high.
    a. Low Vulnerability = Bridges outside of the surge zone.
    b. Medium Vulnerability = Bridges within a surge zone of under 12 feet.
    c. High Vulnerability = Bridges within a surge zone of over 12 feet.
3) Determine Loss of Function in days.
    a. Low Vulnerability = 0 days.
    b. Medium Vulnerability = 30 days.
    c. High Vulnerability = 30 days.
4) Assume a one hour detour time for all impacted bridges.
5) Loss Estimate = Factored Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25
6) Rank bridges based upon Loss Estimates.

Subsidence

1) Determine traffic counts for all bridges.
2) Assign a Vulnerability Ranking of low, medium, or high.
    a. Low Vulnerability = Bridges in an area with a subsidence rate of less than .02 cm/yr.
    b. Medium Vulnerability = Bridges in an area with a subsidence rate between .02 and .08 cm/yr.
    c. High Vulnerability = Bridges in an area with a subsidence rate greater than .08.
3) Determine Loss of Function in days.
    a. Low Vulnerability = 0 days.
    b. Medium Vulnerability = 0 days.
    c. High Vulnerability = 30 days.
4) Assume a one hour detour time for all impacted bridges.
5) Loss Estimate = Factored Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25
6) Rank bridges based upon Loss Estimates.

Wildfire

1) Determine traffic counts for all bridges.
2) Assign a Vulnerability Ranking of low, medium, or high.
    a. Low Vulnerability = Bridges within a Parish with 0 acres burnt.
    b. Medium Vulnerability = Bridges within a Parish with less acres burnt than the State average.
    c. High Vulnerability = Bridges within a Parish with more acres burnt than the State average.
3) Determine Loss of Function in days.
    a. Low Vulnerability = 0 days.
    b. Medium Vulnerability = 1 day.
    c. High Vulnerability = 3 days.
4) Assume a one hour detour time for all impacted bridges.
5) Loss Estimate = Factored Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25
6) Rank bridges based upon Loss Estimates.

Dam Failure

1) Determine traffic counts for all bridges.
2) Assign a Vulnerability Ranking of low, medium, or high.
    a. Low Vulnerability = Bridges outside of the dam failure hazard radius.
    b. Medium Vulnerability = Bridges within the 50-100% area of a dam failure hazard radius.
    c. High Vulnerability = Bridges within the less than 50% area of a dam failure hazard radius.
3) Determine Loss of Function in days.
    a. Low Vulnerability = 0 days.
    b. Medium Vulnerability = 27 days.
    c. High Vulnerability = 30 days.
4) Assume a one hour detour time for all impacted bridges.
5) Loss Estimate = Factored Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25
6) Rank bridges based upon Loss Estimates.

Levee Failure

1) Determine traffic counts for all bridges.
2) Assign a Vulnerability Ranking of low, medium, or high.
    a. Low Vulnerability = Bridges further than 2 miles from a levee.
    b. Medium Vulnerability = Bridges between .5 and 2 miles from a levee.
    c. High Vulnerability = Bridges within .5 miles from a levee.
3) Determine Loss of Function in days.
    a. Low Vulnerability = 0 days.
    b. Medium Vulnerability = 27 days.
    c. High Vulnerability = 30 days.
4) Assume a one hour detour time for all impacted bridges.
5) Loss Estimate = Factored Traffic Count (per hour) x Detour Time (in hours) x LOF (in hours) x $25
6) Rank bridges based upon Loss Estimates.

Appendix G
Capability Assessment

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Appendix G.1: Funding Programs

Federal Funding through the Federal Emergency Management Agency (FEMA)

Through FEMA, the Federal government has several programs to support hazard mitigation, including:

- Pre-Disaster Mitigation Program (PDM)
- Hazard Mitigation Grant Program (HMGP)
- Public Assistance (PA)
- Flood Mitigation Assistance Program (FMA)
- Repetitive Flood Claims Program (RFC)
- Severe Repetitive Loss Program (SRL)
- Map Modernization
- Unmet Needs

Information regarding additional funding though federal sources (including US Army Corps of Engineers (USACE), US Small Business Administration (SBA), US Department of Housing and Urban Development (HUD), National Resources Conservation Service (NCRS), National Oceanic and Atmospheric Administration (NOAA), and others), as well as through state sources (including the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), Louisiana Department of Transportation and Development (DOTD), Louisiana Division of Administration (DOA), Louisiana Department of Environmental Quality (DEQ), Louisiana Department of Natural Resources (DNR), Louisiana Coastal Protection and Restoration Authority (CPRA), and others) can be found in Volume I, Section Seven of the Plan Update.

Pre-Disaster Mitigation (PDM) Program

The PDM program was authorized by §203 of the Stafford Act, 42 USC, as amended by §102 of the Disaster Mitigation Act of 2000 (DMA 2000). Funding for the program is provided through the National Pre-Disaster Mitigation Fund to assist States and local governments (including Indian Tribal governments) in implementing cost-effective hazard mitigation activities that complement a comprehensive mitigation program. All applicants must be participating in the National Flood Insurance Program (NFIP) if they have been identified through the NFIP as having a Special Flood Hazard Area (a Flood Hazard Boundary Map (FHBM) or Flood Insurance Rate Mate (FIRM) has been issued). In addition, the community must not be suspended or on probation from the NFIP.

Table G.1-1: PDM Applicants, Activities, and Funding

PDM
Eligible Applicants and Sub-applicants
Applicant:
GOHSEP
Sub-applicants:*
State-level Agencies
Tribal Governments
Local Governments
Public Colleges and Universities

Table G.1-1: PDM Applicants, Activities, and Funding (continued)

Eligible Activities	Limit
Mitigation Planning	$3 million limit, not to exceed 3 years
Mitigation Projects	$3 million limit, not to exceed 3 years
Acquisition or Relocation of Hazard-Prone Structure/Property	
Construction of "Safe Rooms"	
Structural and Non-Structural Retrofitting	
Minor Structural Mitigation Projects	
Localized Flood Control Projects	
Generators for Critical Facilities/Key Assets	
Information Dissemination Activities	10% of Cost Limit for Information Dissemination
Funding	Description
FEMA Share:	Up to 75% of Project Cost**
Non-Federal Share	At least 25% of Project Cost
Funding Level:	FY 03 = $25 million LA received $355,000 FY 04 = $148 million LA received $217,000 FY 05 = $150 million LA received $588,000 FY 06 = $$50 million LA received $0 FY 07 = $100 million LA received $1.1 million FY 08 LA received $0 FY 09 LA received $0 FY 10 LA $5.53 million
*Must participate in the NFIP and have a FEMA-Approved All-Hazard Mitigation Plan **Small, impoverished communities may be eligible for a 90% Federal Cost Share	

Hazard Mitigation Grant Program (HMGP)

Authorized under Section 404 of the Stafford Act, the HMGP administered by FEMA provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

Table G.1-2: HMGP Applicants, Activities, and Funding

HMGP
Eligible Applicants
State Governmental Agencies
Local Governments*
Private Non-Profit Organizations
Medical (Hospitals, Outpatient Care, Rehabilitation, or Long-Term Care Facilities)
Custodial Care (Nursing Homes or Congregate Living Facilities)
Educational (Elementary and Secondary Schools or Institutions of Higher Education)
Emergency (Fire Departments, Ambulance, and Other Rescue Services)
Utility (Telephone, Power, Sewage, etc.)
Other (Public Services)
Eligible Activities
Structural Hazard Control or Protection Projects
Drainage System Improvements
Elevation of Structure

Table G.1-2: HMGP Applicants, Activities, and Funding (continued)

Land Contour Alteration	
Wind Break Installation	
Floodwall Installation	
Construction Activities	
Elevation of Roads	
Drainage Systems	
Acquisition and Relocation or Demolition of Structures	
Development of State or Local Mitigation Standards	
Building Codes and Regulations	
Land Use Laws	
Comprehensive Mitigation Program Development	
Hazard Mitigation Plans	
Building Code Development	
Development or Improvement of Warning Systems	
Funding	Description
FEMA Share:	Up to 75% of Project Cost
Non-Federal Share:	At least 25% of Project Cost
Funding Level:	FY 03 = $648 million FY 04 = $267 million FY 05 = Unidentified
Non-Federal Share Sources:	
Contracted Services (Local Government Revenues, Non-Government Organization Funds, Community Development Block Grants)	
In Kind Resources (Supplies, Materials, Equipment, Personnel)	
Third Party In-Kind Resources (Volunteer, Donated, or Loaned Equipment, Supplies, or Space)	
*Must have a FEMA-approved All-Hazard Mitigation Plan	

Public Assistance (PA) Program

The PA Program provides supplemental Federal disaster grant assistance for the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations.

Table G.1-3: PA Applicants, Activities, and Funding

PA
Eligible Applicants
State Government
Local Governments
Indian Tribes
Private Non-Profit Organizations
Medical (Hospitals, Outpatient Care, Rehabilitation, or Long-Term Care Facilities)
Custodial Care (Nursing Homes or Congregate Living Facilities)
Educational (Elementary and Secondary Schools or Institutions of Higher Education)
Emergency (Fire Departments, Ambulance, and Other Rescue Services)
Utility (Telephone, Power, Sewage, etc.)
Other (Public Services)
Eligible Activities
Emergency Work

Table G.1-3: PA Applicants, Activities, and Funding (continued)

Debris Removal	
Emergency Protective Measures	
Permanent Work (Repair)	
Roads, Bridges, and Associated Features	
Water Control Facilities	
Buildings/Structures	
Utility Distribution Systems	
Public Recreational Facilities	
Funding	Description
FEMA Share:	Up to 75% of Project Cost
Non-Federal Share:*	At least 25% of Project Cost

*State determines how the non-Federal share is split with the applicants

Flood Mitigation Assistance Program (FMA)

The FMA was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the NFIP. Flood Mitigation Assistance (FMA) regulations can be found in 44 CFR Part 78. Funding for the program is provided through the National Flood Insurance Fund. FMA provides funding to assist States and communities implement measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP.

States are encouraged to prioritize FMA Project Grant applications that include repetitive loss properties. State and communities are also encouraged to develop plans that address the mitigation of these target repetitive loss properties.

Table G.1-4: FMAP Applicants, Activities, and Funding

FMAP	
Eligible Applicants	
State Government	
Communities that participate in the NFIP*	
Grant Types	Description
Planning	Flood Mitigation Plans
Project	Flood Loss Reduction Projects
Technical Assistance	Administration of Flood Mitigation Program
Eligible Activities	
Acquisition of Structure/Property	
Demolition of Structure/Property	
Relocation of Structure	
Elevation of Structure	
Floodproofing of Structure	
Dune Renourishment	
Minor Structural Flood Mitigation Projects	
Funding	Description
FEMA Share:	Up to 75% of Project Cost
Non-Federal Share	At least 25% of Project Cost
Funding Source:	National Flood Insurance Fund

Table G.1-4: FMAP Applicants, Activities, and Funding (continued)

Funding Level:	$20 million Nationally

*Excluding communities on probation or suspended from NFIP

Repetitive Flood Claims Program (RFC)

RFC grants provide up to 100% of state/local match for FMA property acquisitions, as well as other flood-related mitigation measures, if the applicant has demonstrated an inability to manage or provide the 25% FMA match.

Table G.1-5: RFC Applicants, Activities, and Funding

RFC	
Eligible Applicants and Sub-applicants	
Applicant:	
OHSEP	
Sub-applicants:*	
State-level Agencies	
Tribal Governments	
Local Governments	
Public Colleges and Universities	
Eligible Activities	
Mitigation Projects	
Acquisition and Relocation or Demolition, where the property is deed-restricted for open space uses in perpetuity	
Elevations	
Dry floodproofing of non-residential structures	
Minor Localized Flood Control Projects	
Funding	Description
FEMA Share:	Up to 100% of Project Cost
Funding Level:	Up to $10 million annually

*Must participate in the NFIP

Severe Repetitive Loss Program (SRL)

SRL grants target acquisition funds to NFIP-insured properties that have either had four or more claims of $5,000; two or more claims with a cumulative value of $20,000; or two or more claims whose net value exceeds the property's value. SRL typically requires a 25% state/local match; the state/local match can be decreased to as low as 10% in cases in which a FEMA-approved Standard or Enhanced Hazard Mitigation Plan exists, and includes a strategy for mitigating existing and future SRL properties.

Table G.1-6: SRL Applicants, Activities, and Funding

SRL
Eligible Applicants and Sub-applicants
Applicant:
GOHSEP
Sub-applicants:*
State-level Agencies
Tribal Governments
Local Governments
Public Colleges and Universities

Table G.16: SRL Applicants, Activities, and Funding (continued)

Eligible Activities	
Mitigation Projects	
Floodproofing (historic structures only)	
Relocation	
Elevation	
Acquisition	
Mitigation reconstruction	
Minor physical localized flood control projects	
Funding	**Description**
FEMA Share:	Up to 75% of Project Cost**
Non-Federal Share	At least 25% of Project Cost
Funding Level:	Up to $40 million for 2005-09

*Must participate in the NFIP

**up to 90% Federal Cost Share is available for grantees with a FEMA-approved Standard or Enhanced Hazard Mitigation Plan, which includes a strategy for mitigating existing and future SRL properties.

Map Modernization

FEMA's flood hazard maps are one of the essential tools for flood hazard mitigation in the United States. FEMA's Flood Map Modernization is a federal program to increase the reliability of flood maps. This program requires the cooperation and input of State and local agencies and jurisdictions to collect and update flood data.

The Louisiana Mapping Project (LaMP) is being executed under this program. In July 2005, FEMA initiated a study for the majority of the Louisiana coastal parishes as part of the Map Modernization effort. This study was necessary because the flood hazard and risk information shown on many FIRMs was developed during the 1970s, and the physical terrain had changed significantly. Following Hurricanes Katrina and Rita, FEMA expanded the scope of this study to include all of coastal Louisiana. The LaMP effort will result in homeowners, business owners, State and local government officials, and other citizens of 15 parishes in Louisiana receiving more accurate flood hazard and risk information, including:

- Developing up-to-date flood hazard data for all floodprone areas nationwide to support sound floodplain management and prudent flood insurance decisions;
- Providing the maps and data in digital format to improve the efficiency and precision with which mapping program customers can use this information;
- Fully integrating FEMA's community and state partners into the mapping process to build on local knowledge and efforts; and
- Improving customer services to speed processing of flood map orders and raise public awareness of flood hazards.

Risk MAP

Risk MAP is a FEMA program which was established for the purpose of streamlining floodplain mapping; risk assessment; and mitigation planning into a single program. The program has fostered beneficial relationships between stakeholders and in many cases has led to a reduction in flood losses.

Unmet Needs

FEMA's Unmet Needs program is authorized by Congress for specific major disaster related events where the needs of the citizens are not met through existing services. The Unmet Needs program is not implemented for every disaster, but only when deemed appropriate by Congress.

Project eligibility is also determined by Congress, but will usually conform to the existing criteria under the HMGP unless specifically waived. In every appropriation of Unmet Needs funding the only recurring criteria was the project must be a result of the disaster that is being supplemented and in the declared area.

Table G.1-7: Unmet Needs Applicants, Activities, and Funding

Unmet Needs	
Eligible Applicants	
State Governmental Agencies	
Local Governments*	
Private Non-Profit Organizations	
Medical (Hospitals, Outpatient Care, Rehabilitation, or Long-Term Care Facilities)	
Custodial Care (Nursing Homes or Congregate Living Facilities)	
Educational (Elementary and Secondary Schools or Institutions of Higher Education)	
Emergency (Fire Departments, Ambulance, and Other Rescue Services)	
Utility (Telephone, Power, Sewage, etc.)	
Other (Public Services)	
Eligible Activities	
Structural Hazard Control or Protection Projects	
Construction Activities	
Retrofitting of Facilities	
Acquisition and Relocation or Demolition of Structures	
Development of State or Local Mitigation Standards	
Comprehensive Mitigation Program Development	
Development or Improvement of Warning Systems	
Debris Removal	
Funding	Description
FEMA Share:	Up to 75% of Project Cost
Non-Federal Share:	At least 25% of Project Cost
Funding Level:	Varies by Disaster
Non-Federal Share Sources:	
Contracted Services (Local Government Revenues, Non-Government Organization Funds, Community Development Block Grants)	
In Kind Resources (Supplies, Materials, Equipment, Personnel)	
Third Party In-Kind Resources (Volunteer, Donated, or Loaned Equipment, Supplies, or Space)	

*Must have a FEMA-approved All-Hazard Mitigation Plan

PDM, FMA, and HMGP in Louisiana, 1998-2007

Since 1998, there have been no fewer than 275 mitigation projects approved in Louisiana, many of them including work on multiple properties or sites. Table G.1-8 shows federally funded mitigation projects in Louisiana (HMGP, FMA, and PDM only) in the past decade.

Table G.1-8: Mitigation Projects by Grant Type,* 1998-2007

Type	HMGP	FMA	PDM	TOTAL**
Plan	50	21	11	82
Elevation	40	1	0	41
Demo/Rebuild	14	1	0	15
Acquisition	17	1	1	19
Acq./Elevation	16	4	0	20
Drainage	33	2	0	35
Floodprooofing	2	0	0	2
Retrofit	42	0	1	43
Other	18	0	0	18
TOTAL**	232	30	13	275

Source: GOHSEP, 2008
*Figures reflect approved projects
**Projects reported are subject to undercounting, and Unmet Needs grants are not included

State and local match for these federal funds has been considerable. Table G.1-9 shows match for HMGP funds approved for Louisiana over the past decade. No less than $61.8 million, including approximately $49 million to date in Katrina/Rita global match, have been used to match federal funds.

Table G.1-9: Federal and Non-Federal Share of HMGP-Funded Projects,* 1998-2007

Disaster	Fed Share	Non-Fed Share	Admin Funds	TOTAL**
1264 (ice storm)	$0	$0	$0	$0
1269 (tornadoes)	$0	$0	$0	$0
1314 (ice storm)	$0	$0	$0	$0
1357 (ice storm)	$0	$0	$0	$0
1380 (TS Alison)	$6,546,371	$2,182,125	$126,490	$8,854,986
1435 (TS Isadore)	$4,065,615	$1,355,205	$146,230	$5,567,050
1437 (H Lili)	$28,975,206	$9,238,672	$225,838	$38,439,716
1521 (flood)	$163,500	$54,500	$0	$218,000
1548 (H Ivan)	$400,663	$133,554	$0	$534,217
1601 (H Cindy)	$212,000	$70,666	$0	$282,666
1603 (H Katrina)	$130,085,904	$36,145,954***	$283,485	$166,515,344
1607 (H Rita)	$37,565,683	$12,637,192***	$105,332	$50,308,207
1668 (storms and flooding)	$0	$0	$0	$0
1685 (storms and flooding)	$0	$0	$0	$0
TOTAL**	$208,014,942	$61,817,818	$887,375	$270,720,186

Source: GOHSEP, 2008
*Figures reflect approved projects
**Totals reported are subject to undercounting
**Figures reflect global match funds

Table G.1-10 shows the number of HMGP-funded projects in Louisiana by year, including projects approved since the April 2005 Plan's completion.

Table G.1-10: Number of HMGP-Funded Projects by Year,* 1998-2007

Disaster	Year	Projects
1246 (H Georges)	1998	9
1264 (ice storm)	1998	0
1269 (tornadoes)	1999	0
1314 (ice storm)	2000	0
1357 (ice storm)	2000	0
1380 (TS Alison)	2001	10
1435 (TS Isadore)	2001	23
1437 (H Lili)	2002	63
1521 (flood)	2004	2
1548 (H Ivan)	2004	4
1601 (H Cindy)	2005	1
1603 (H Katrina)	2005	99
1607 (H Rita)	2005	30
1668 (storms and flooding)	2006	0
1685 (storms and flooding)	2007	0

Source: GOHSEP, 2008
*Figures reflect approved projects; single "projects" may include more than one mitigated property

Tables G.1-11 provides additional detail regarding Louisiana's efforts to identify and mitigate severe repetitive loss properties since 2005. It shows the geographical distribution of completed severe repetitive loss mitigation measures (projects) by parish.

Table G.1-11: Mitigated Severe Repetitive Loss Properties since 2005*, by Parish**

Parish	Number of Properties
St. Bernard	151
Orleans	138
Jefferson	110
St. Tammany	102
Terrebonne	35
Plaquemines	9
Calcasieu	7
Livingston	6
Ascension	5
Cameron	5
Vermilion	4
Lafourche	3
East Baton Rouge	2
LaSalle	2
St. Mary	2
Allen	1
Catahoula	1
Concordia	1
Rapides	1
St. Charles	1
Tensas	1
TOTAL	587

Source: GOHSEP, 2008
* All properties listed are either identified as having been completely mitigated since 2005, or have no date coded
** Figures include municipalities within parish lines

Federal Funding through Other Federal Agencies (OFA)

Through these OFAs, the Federal Government provides financial support for mitigation, including:

- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Agriculture (USDA)
- U.S. Department of Commerce (DOC)
- U. S. Department of the Interior (DOI)
- U.S. Department of Housing and Urban Development (HUD)
- U.S. Environmental Protection Agency (EPA)
- U.S. Small Business Administration (SBA)

USACE Programs

- USACE Post-Katrina Supplemental Appropriations
- USACE Beneficial Use of Dredged Material Program: To maintain shipping waterways, the Corps dredges on average 64 million cubic yards of materials, which can be used to create wetlands, which help reduce the impacts of tropical storms and hurricanes. For more information call the New Orleans District Office (504) 862-2201 or go to mvn.usace.army.mil/index.asp
- USACE Continuing Authorities
- USACE Floodplain Management Services
- USACE Flood Control Act Funds
- USACE General Investigations
- USACE Non-Structural Alternative to Structural Rehabilitation of Damaged Flood Control Works
- USACE Planning Assistance to States: The Corps allocates up to $500,000 nation-wide, and provides grants between $25,000 and $75,000 with a 50% cost share for planning studies. Typical studies deal with water and land related resource issues, including floodplain management and coastal zone management and protection. For more information phone (504) 862-2572 or send an email to Christopher.n.sims@usace.army.mil
- USACE Project Modification for Improvement of the Environment
- USACE Water Resources Development Act

USDA Programs

- USDA Farm Ownership Loans

- USDA Farm Services Agency: Transfer of Inventory Farm Properties to Federal and State Agencies for Conservation Purposes
- USDA Natural Resources Conservation Service (NRCS), Emergency Watershed Protection Program
- USDA NRCS, Emergency Watershed Program – Floodplain Easement
- USDA NRCS, Land Protection
- USDA NRCS, Watershed Protection and Flood Prevention Program
- USDA NRCS, Watershed Surveys and Planning
- USDA NRCS, Wetlands Reserve Program
- USDA Rural Development Assistance(RDA)—Housing
- USDA RDA–Utilities
- USDA RDA, Section 502 Loan and Guaranteed Loan Program
- USDA RDA, Section 504 Loans for Housing

DOC Programs

- DOC Economic Development Administration (EDA), Disaster Mitigation Planning and Technical Assistance: For more information, contact EDA's Austin Regional Office (512) 381-8144 or send an email to pdavidson@eda.doc.gov.
- DOC EDA, Post-Disaster Economic Recovery Grants and Assistance: For more information, contact EDA's Austin Regional Office (512) 381-8144 or send an email to pdavidson@eda.doc.gov.
- DOC National Oceanic and Atmospheric Administration, Coastal Management Program: This program leverages federal, state and local funds to address coastal issues. Funds can be used to stem shoreline erosion and natural resource protection, which actions can mitigate the impacts of coastal storms and hurricanes. For more information, call the LA Department of Natural Resources at 1-800-267-4019 or go to http://coastalmanagement.noaa.gov/mystate/la.html.

DOI Programs

- DOI Bureau of Indian Affairs, Indian Housing Assistance: For information contact the BIA Eastern Regional Office. Phone number: (615) 564-6700 or go to indianaffairs.gov.
- DOI, U.S. Geological Survey, Stream Gauging and Flood Monitoring Network

HUD Programs

- HUD Community Development Block Grant (CDBG)

- HUD CDBG, State Administered Program
- HUD CDBG, Entitlement Communities Program
- HUD Disaster Recovery Initiative
- HUD HOME Investment Partnership Program
- HUD Public Housing Modernization Reserve for Disasters and Emergencies
- HUD Section 108 Loan Guarantee Program

EPA Programs

- EPA, Clean Water State Revolving Funds
- EPA, Clean Water Act Section 319 Grants
- EPA, Wetlands Protection-Development Grants

SBA Program

- SBA Disaster Assistance Program

Appendix G.2:

State Hazard Mitigation Capabilities Survey

State of Louisiana Mitigation Plan

State Inventory of Capabilities to Support Hazard Mitigation

A. Agency Personnel and Technical Capability

1. How many people are employed by your agency? *[05Q1]*

2. How many employees at your agency would be able and available to **directly carry out** mitigation actions (for example: public outreach efforts, education, State Hazard Mitigation Team involvement)? *[05Q2]*

   a. Of these employees, how many currently have any of their job duties dedicated to mitigation actions and/or strategies?

3. How many employees at your agency would be able and available to **provide technical assistance** in carrying out mitigation actions? *[05Q3]*

4. Please describe where the employees who would be able and available to directly carry out mitigation actions fall in your agency's organizational structure. (For example, most of your mitigation employees may work in a "Hazard Mitigation Department," while others may work in other departments or divisions) *[05Q4]*

5. Please describe where the employees who would be able and available to provide technical assistance fall into your organizational structure. (For example, half of your technical assistance personnel may work in an Information Technology Division, while the other half may work in a Data Processing Division.) *[05Q5]*

6. Does your office or agency have Geographic Information System (GIS) capability? (If "yes", please answer a – e.)

   Y ___ N ___

   a. How many staff are devoted to operating and maintaining the GIS?

b. What is your budget for GIS staff and technology?

c. What GIS data or layers do you maintain or use?

d. What hazard-mitigation purposes are the GIS data used for?

e. With what other GIS databases/sources is your data coordinated?

B. Agency Mitigation Programs and Activities

7. Does your office or agency directly administer any hazard mitigation programs? (If "yes," please answer a – d.) *[05Q6]*

Y ___ N ___

a. Please list these programs.

b. Who are they intended to assist?

c. What are the goals of these programs?

d. On a scale of 1 to 5 (1=low), how effective have these programs been at mitigating losses from hazards? Please explain.

1 __ 2 __ 3 __ 4 __ 5 __ don't know __

8. Does your agency directly participate in any public outreach or education programs or initiatives intended to further hazard mitigation goals (for example., pamphlets, public speaking engagements, websites, or workshops)? (If "yes," please answer a – e.) *[05Q7]*

Y ___ N ___

a. Please describe your agency's public outreach and education initiatives.

b. On a scale of 1 to 5 (1=low), how effective has this outreach and education been at mitigating losses from hazards? Please explain.

1 __ 2 __ 3 __ 4 __ 5 __ don't know __

9. What role does your agency play in ensuring that State and local governments (municipal and/or parish) uphold Federal regulations intended to reduce losses due to hazards? *[05Q8]*

a. On a scale of 1 to 5 (1=low), how effective has upholding these regulations been at mitigating losses from hazards? Please explain.

1 __ 2 __ 3 __ 4 __ 5 __ don't know __

10. Please describe any technical resources your office or agency provides to State and local governments to achieve hazard mitigation goals? *[05Q9]*

a. On a scale of 1 to 5 (1=low), how effective have these technical resources been at mitigating losses from hazards? Please explain.

1 __ 2 __ 3 __ 4 __ 5 __ don't know __

11. Please describe any financial resources your agency provides to local governments in support of hazard mitigation. *[05Q10]*

a. On a scale of 1 to 5 (1=low), how effective have these resources been at mitigating impacts of hazards? Please explain.

1 __ 2 __ 3 __ 4 __ 5 __ don't know __

12. Please describe any other hazard mitigation activities that have not been discussed so far that your agency either facilitates or participates in. *[05Q16]*

a. On a scale of 1 to 5 (1=low), how effective have these activities been at mitigating impacts from hazards? Please explain.

1 __ 2 __ 3 __ 4 __ 5 __ don't know __

13. Of all the mitigation programs, actions, or activities your agency has participated in, which have been the most effective in reducing losses?

14. Of all the mitigation programs, actions, or activities your agency has participated in, which have been less effective at reducing losses?

a. Why do you believe these programs have been less effective?

15. Based on the lessons you and your agency have learned with all of the hazard mitigation programs, actions, or activities you are involved in, what advice would you provide to more effectively implement or administer these actions?

16. What, if any, types of mitigation programs, policies, or actions that are not currently being implemented by your agency do you believe would be successful in reducing losses if they were implemented?

C. Policies, Regulations, and Practices

17. Are there any types of mitigation activities that your agency is capable of, but cannot perform because they are prohibited by law? *(For example, does the State prohibit the use of public funds to purchase private property or, do historic preservation regulations prevent increases to structural resilience?) [05Q11]*

    Y ___ N ___

    a. What capabilities is your agency not performing due to legal restrictions?

18. Are any of the mitigation actions that your agency currently performs limited by law or by the policies of your agency? (*For example, priority listing for HMGP funds is limited by the Target Repetitive Loss Structure List*). *[05Q12]*

    Y ___ N ___

    a. What mitigation actions are limited by law?

    b. What mitigation actions are limited by agency policy?

19. In your opinion, what are the five resources that are the most important to your agency in terms of implementing mitigation actions? *[05Q14]*

20. In your opinion, what are the 5 most prominent programs, policies, regulations, funding, or practices in place that hinder your agency's mitigation actions? *[05Q15]*

D. Interagency Coordination

21. Below is a list of organizations that may play a key role in your agency's ability to implement mitigation actions. Please indicate those organizations integral to your agency's hazard mitigation actions and strategies. *[05Q13]*

The organizations in the first set are line agencies within the Executive Branch of Louisiana's State Government:

		Y	N
a.	Department of Agriculture and Forestry	___	___
b.	Department of Corrections	___	___
c.	Department of Culture, Recreation, and Tourism	___	___
d.	Louisiana Economic Development	___	___
e.	Department of Education	___	___
f.	Department of Environmental Quality	___	___
g.	Department of Health and Hospitals	___	___
h.	Department of Insurance	___	___
i.	Department of Labor	___	___
j.	Department of Natural Resources	___	___
k.	Department of Public Safety	___	___
l.	Department of Revenue	___	___
m.	Department of Social Services	___	___
n.	Department of Transportation and Development	___	___
o.	Department of the Treasury	___	___
p.	Department of Wildlife and Fisheries	___	___

The next set will include other Louisiana State governmental entities and offices:

		Y	N
q.	GOHSEP	___	___
r.	Office of Risk Management (DOA)	___	___
s.	Office of Community Development (DOA)	___	___
t.	Louisiana Recovery Authority	___	___
u.	Coastal Protection and Restoration Authority	___	___
v.	Louisiana National Guard	___	___
w.	Office of Coastal Restoration and Management (DNR)	___	___
x.	Office of Public Health (DPS)	___	___
y.	Louisiana State Police (DPS)	___	___
z.	Louisiana Housing Finance Agency	___	___
aa.	Louisiana Public Service Commission (DPS)	___	___
bb.	Louisiana Division of Historic Preservation (CRT)	___	___
cc.	Louisiana Office of State Parks (CRT)	___	___

The last set of organizations includes non-state entities, non-governmental organizations and non-profits:

	Y	N
dd. Louisiana Homebuilders Association	___	___
ee. Louisiana Manufactured Housing Association	___	___
ff. Wetland Societies or Conservation/ Land Trusts	___	___
gg. Regional Planning Commissions or Planning and Development Districts	___	___

hh. Please list any other governmental or non-governmental organizations that are integral to your agency's mitigation actions.

22. Please list any specific instances in which agency missions or "turf" issues create duplication of services or otherwise hamper effective hazard mitigation planning or implementation. Please explain.

23. Please describe any opportunities you see for reorganizing, consolidating, or otherwise realigning hazard mitigation to achieve more effective and cost-efficient outcomes.

24. Please note any other comments or concerns regarding mitigation that we have not addressed in this survey.

Appendix G.3:
State Agency Capabilities Report

Table G.3-1 shows the status of the information contained below. All information is based upon research completed for the April 2005 Plan and 2008 Plan, and it has been updated to differing degrees, as shown below.

Table G.3-1: Update Status of State Agency Information

Agency	Completely rewritten or updated by agency staff (as of 2007)	Updated based upon agency review of existing text, state agency survey data, interviews, website research, or other inputs (as of 2007)	Not updated (accurate as of 2005)
GOHSEP	X		
DAF			X
DOC	X		
DEQ		X	
DNR	X		
DOTD		X	
DWF			X
DOA/FPC		X	
DOE	X		
LED			X
LSU AgCenter		X	
DOA/OCD		X	
CRT			X
DOI		X	
DPS		X	
LFMA			X
LaNG			X
LRA		X	
LSU Hurricane Center		X	
UNO CHART		X	

The following five Tables provide an overview of State agency mitigation capability as determined through the 2008 and 2010 survey instrument (see section G-2 above), and capture information on survey response levels, mitigation staffing, inter-agency and inter-organizational coordination. It should be noted that the data is based on survey response data only. However, the Tables are useful for identifying possible trends in mitigation staffing as well as breaks, changes and gaps in coordination. As such, the data highlights the SHMT's ongoing priority to both discern key factors affecting agency mitigation capabilities and to improve them in the future.

The 2010 State Agency Information Table shows the degree to which each state agency provided updated information on its (mitigation) capabilities in 2008 and 2010. This Capability Assessment obtained the information through a State Agency Survey provided to each agency (See section G-2 above). The format for the Table is drawn from Appendix G.3, Table G.3-1 (above), 2008 LA SHMP.

It is interesting to note that for 2008 and 2010 surveys combined, approximately 55% of survey respondents "Mostly" or "Moderately" updated their agency information. This figure falls in line with what social science research indicates regarding the level of response to be expected from a survey instrument – Approximately 50% of people surveyed will typically provide a moderate but incomplete survey response. With regard to the SHMPU's determination of agency mitigation capabilities, this trend deems the survey instrument useful for gathering a significant portion of such information, but brings to light the SHMT's ongoing priority to further investigate these capabilities through interviews, focus groups, and other research tools, and to go beyond research to promote the development of mitigation capabilities through working groups, coordinated program implementation, and other professional settings.

Table G.3-2: State Agency Information: Degree of Response to Survey in 2008 v. 2010

Agency 2008 (Δ) Agency 2010 (X)	Completely rewritten or updated by agency staff	Fully Updated Based on Complete Survey Response	Mostly Updated Based on Near-Complete Survey Response	Moderately Updated Based on Incomplete Survey Response	Partially Updated Based on Very Limited Survey Response	Not Updated Based on No Response as of 3/19/2010
GOHSEP			Δ			
			X			
DAF					Δ	
			X			
DEQ				Δ		
		X				
DHH				Δ		
				X		
DNR				Δ		
			X			
DOC				Δ		

				X		
DOE					Δ	
			X			
DOI					Δ	
						X
DOL						
DOR						Δ
			X			
DOTD				Δ		
				X		
DOTR (Treasury)						Δ
						X
DPS					Δ	
						X
DSS			Δ			
					X	
Agency 2008 Agency 2010	Completely rewritten or updated by agency staff	Fully Updated Based on Complete Survey Response	Mostly Updated Based on Near-Complete Survey Response	Moderately Updated Based on Incomplete Survey Response	Partially Updated Based on Very Limited Survey Response	Not Updated Based on No Survey Response
DWF*				Δ		
				X		
FPC (DOA)				Δ		
		X				
LED						Δ
					X	
LSU AgCenter						
CRT						
LFMA						

LaNG						
LRA						
LSU Hurricane Center						
OCD/DRU (DOA)					Δ	
			X			
UNO CHART						

* DWF 2010 response data provided by Divisions of Wildlife and Coastal and Non-Game Resources only.

NOTE – Yellow highlights indicate "other" non-Line Agency state organizations per Survey.
NOTE – Purple highlights indicate agencies not identified on Survey roster per inter-agency coordination query. FPC provided Survey response.

Next, to summarize the trends in Mitigation Staffing, Table G.3-3 (below) provides data from 2008 and 2010 Surveys, (See Ch.7, p. 227 for a description of mitigation staffing trends) . The Table provides a snap-shot of state agency responses to the following four Survey queries:

1. How many people are employed by your agency?

2. How many employees at your agency would be able and available to directly carry out mitigation actions?

3. Of these employees, how many currently have any of their job duties dedicated to mitigation actions and/or strategies?
4. How many employees at your agency would be able and available to provide technical assistance in carrying out mitigation actions?

Note on G.3-3: Blank cells indicate that a survey was not received from a given agency; NR (No Response) indicates that a survey was received, but no answer was provided for the related query.

Table G.3-3: Mitigation Staffing Levels in 2008 v. 2010

2008 ---------- 2010	Total Agency Employment	Number Available for Mitigation	Number Employed in Mitigation	Number Available for Mitigation Technical Assistance	Comments
GOHSEP	295	89	62	NA - TA through Disaster Recovery Division	
	350	100	100	90 - TA through Disaster Recovery	

				Division	
DAF	NR	NR	NR	NR	
	650	450	0	9	
DCRT					
DEQ	1050	234	52	220	
	889	173	173	7	2010 survey provides departmental breakdown for mitigation personnel
DHH	12,500	2	1	NR	
	12,000	3	1	1	
DNR	550	200	145	NR	
	399	7	7	7	
DOC	10,100	10,100	100	1,500	
	5,900	NR	NR	NR	
DOE	620	0	NR	NR	
	640	20	10	10	2010 survey provides departmental breakdown for mitigation personnel
DOI	NR	NR	NR	NR	NR
DOR					
	856	60	0	60	2010 survey indicates all TA capability is in Information Technology
DOTD	4,800	30	30	NR	
	4,500	25	25	25	
DOTR					
DPS	NR	NR	NR	NR	NR
DSS	NR	NR	NR	NR	
	4,923	4	4	NR	2010 survey indicates ESF 6 (EP) capability only.
DWF*	850	NR	0	0	
	NR	NR	1	NR	
FPC (DOA)	63	30	3	NR	
	70	31	0	31	2010 survey indicates only 2 or 3 available for mitigation at a given time.
LED					
	NR	NR	NR	NR	
OCD/DRU (DOA)**	NR	NR	NR	NR	
	48	38	38	42	2010 survey provides departmental breakdown for mitigation personnel

NOTE * - DWF 2010 Survey response obtained from Coastal and Non-Game Resources only.

NOTE** - OCD is a (non-Line Agency) state organization

Tables G.3-4, G.3-5 and G.3-6(below) capture state inter-agency coordination and state agency coordination with other state offices and support organizations in the implementation of hazard mitigation programs as reported in 2008 and 2010 Mitigation Capability Surveys, as discussed in Chapter 7, "Hazard Mitigation Programs, Policies and Activities" and summarized in Table 7.6, p. 217. Various changes in coordination from 2008 to 2010 are noted by the BOLD outlined cells, and reflect changes (new partners), and breaks (partnerships not carried over from 2008 to 2010).

Table G.3-4

LA STATE AGENCY MITIGATION PROGRAM COORDINATION 2008 V. 2010

2008 2010	GOHSEP*	DAF*	DCRT**	DOC*	DEQ*	DHH*	DNR*	DOE*	DOI**	DOL	DOR	DSS	DOTD*	DOTR (Treasury)	DPS**	DWF*	FPC* (DOA)	LED**
GOHSEP*																		
DAF*	NR		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		NR
DCRT**																		
DOC*																		
DEQ*																		
DHH*																		
DNR*																		
DOE*	NR	NR	NR	NR	NR	NR	NR		NR	NR	NR	NR	NR	NR	NR	NR		NR
DOI**	NR	NR	NR	NR	NR	NR	NR	NR		NR	NR	NR	NR	NR	NR	NR		NR
DOL																		
DOR																		
DSS	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		NR	NR	NR	NR		NR
DOTD*																		
DOTR (Treasury)																		
DPS**	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		NR		NR
DWF*																		
FPC* (DOA)																		
LED**																		
	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
OCD	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		NR

Note * - Denotes agencies serving on the 2008 State Hazard Mitigation Team (SHMT) as identified in the 2008 SHMP.

Note ** - Denotes line agencies identified as "Support Agencies and Organizations" in the 2008 SHMP.

Note - BOLD cell borders indicate changes in coordination 2008 to 2010.

Note - Organizations (in purple) not listed in the 2008 or 2010 survey interagency coordination query. Only FPC provided data.

Note - Empty cells indicates agency did not participate in the survey; NR indicates the coordination query was not answered.

Table G.3-5

STATE AGENCY COORDINATION WITH OTHER GOVERNMENTAL ENTITIES 2008 v. 2010

2008 ------- 2010	CPRA	LDHP (CRT)	LFMA	LHFA	LaNG	LOSP (CRT)	LPSC (DPS)	LRA	LSP (DPS)	LSU/Ag	LSU/ Hurricane	OCD	OCRM (DNR)	ORM (DOA)	OPH (DPS)	UNO CHART
GOHSEP*																
DAF*	NR	NR		NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	
DCRT**																
DOC*																
DEQ*																
DHH*																
DNR*																
DOE*	NR	NR		NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	
DOI**	NR	NR		NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	
DOL																
DOR																
DSS	NR	NR		NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	
DOTD*																
DOTR (Treasury)																
DPS**	NR	NR		NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	
DWF*																
FPC* (DOA)																
LED**																
	NR	NR		NR	NR	NR	NR	NR	NR			NR	NR	NR	NR	
OCD***	NR	NR	NR		NR	NR	NR	NR	NR				NR	NR	NR	

Note * - Denotes agencies serving on the 2008 State Hazard Mitigation Team (SHMT) as identified in the 2008 SHMP.

Note ** - Denotes line agencies identified as "Support Agencies and Organizations" in the 2008 SHMP.

Note*** - OCD is the only (non-line agency) or organization that provided survey response.

Note - Organizations (in purple) not listed in the 2008 or 2010 survey coordination query. Only FPC provided data.

Note - Blank cells indicates no survey submitted by agency; NR indicates No Reponse on a submitted survey.

Note - BOLD outlined cells indicates changes in inter-organizational coordination from 2008 to 2010.

Table G.3-6

STATE AGENCY COORDINATION WITH OTHER SUPPORT ORGANIZATIONS 2008 v. 2010

2008 2010	LHA	LMHA	WETLAND & CONSERVATION TRUSTS	REGIONAL PLANNING & DEVELOPMENT DISTRICTS	OTHER
GOHSEP					NR
					Levee Boards
DAF	NR	NR	NR	NR	NR
					LA Cattleman's Assoc; LSU/SVM; LSU/So.Ag Ext; Foster Farms IMT; LVMA; LBVM;Natl. Pet Aid NOG
DEQ					NR
					EPA; Fed Agency for Toxic Substance and Disease Control (ATSDR); USCG; NOAA; FEMA
DHH					NR
					NR
DNR					LA Offc. of State Lands, Gov. Offc. of Coastal Activities, LA SeaGrant and Ag. Ext. Svc.; Univ. academics, Parish/Local Govts.
					None
DOC					NR
					Louisiana Sheriff's Association, Louisiana Fire Marshall's Office (within DPS)
DOE	NR	NR	NR	NR	NR
					NR
DOI	NR	NR	NR	NR	NR
					NR
DOR					NR
					NR
DOTD					NR
					NR
DPS	NR	NR	NR	NR	NR
					NR
DSS	NR	NR	NR	NR	NR
					American Red Cross, United Way
DWF					NR
					USFWS, FEMA, National Marine Fisheries
FPC (DOA)					
					FEMA, Offc. Of State Fire Marshal, LA Contractors Licensing Board
LED					NR
					NR
OCD* (DOA)					NR
					FEMA and its ENV partners, i.e.,Nat'l Park Svc., LA SHPO

Note - **Bold** outlined cells indicates changes in coordination.
Note - Blank cells indicates no survey submitted by agency; **NR** indicates No Response provided to the query.
Note* - OCD is a (non-Line Agency) state organization.

State Agencies represented on the State Hazard Mitigation Planning Committee (SHMPC)

Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP)

SHMPC Contact

Casey Levy
State Hazard Mitigation Officer
Governor's Office of Homeland Security and Emergency Preparedness
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Mission Statement

GOHSEP leads, coordinates, and supports the emergency management system in order to protect lives and prevent the loss of property from all hazards. GOHSEP ensures that the State is prepared to respond to and recover from all natural and manmade emergencies. The office will provide the leadership and support to reduce the loss of life and property through an all-hazards emergency management program of mitigation, preparedness, response, and recovery.

Personnel

- As of 2010, GOHSEP employs 350 individuals on a full-time basis, 100 of whom have job duties dedicated specifically to hazard mitigation planning and implementation. Technical assistance is obtained from the Disaster Recovery (DR) Division. (For more detail on GOHSEP staffing, see Table G.3-7a and G.3-7b).
- The State Hazard Mitigation Officer (SHMO) oversees state mitigation programs, activities, and planning efforts and coordinates mitigation programs with local governments and emergency preparedness officials. The SHMO also works with Federal agencies, specifically FEMA, to coordinate funding for mitigation programs and to ensure that state and local programs are in compliance with Federal guidelines.

At this time, to obtain support resources from the agency, mitigation falls under the DR Division. This is important for accounting support, field inspections, and project support. See Appendix G.8 for relevant organizational charts.

Table G.3-7a: GOHSEP Agency-Wide Staffing Levels (full-time only)

	Authorized (Total)	Filled	Vacant
TO*	163	138	25
Non-TO**	230	157	73
Total	393	295	98

Source: GOHSEP, Feb. 2008
* TO=Table of Organization, permanent positions approved by the Legislature
** Non-TO=non-Table of Organization, long-term temporary special assignments approved by the Civil Service

Table G.3-7b: GOHSEP Hazard Mitigation Staffing Levels (full-time only)

	Authorized (Total)	Filled	Vacant
TO*	14	13	1
Non-TO**	75	49	26
Total	89	62	27

Source: GOHSEP, Feb. 2008

* TO=Table of Organization, permanent positions approved by the Legislature

** Non-TO=non-Table of Organization, long-term temporary special assignments approved by the Civil Service

Activities

GOHSEP participates in numerous community outreach programs conducted jointly with FEMA, state, and local officials. GOHSEP also offers a variety of training programs in conjunction with the Department of Homeland Security Office for Domestic Preparedness, Louisiana State University (LSU) Health Sciences, LSU's Fire and Emergency Training Institute, Louisiana State Police, and the Southern Anti-Terrorist Regional Training Academy.

Programs (Post-Disaster)

GOHSEP administers several hazard mitigation related programs designed to assist state and local governments, homeowners, business owners, and the general public. As the grantee, GOHSEP staff works with applicants to develop eligible cost-effective mitigation projects for consideration by the State Hazard Mitigation Team (SHMT), which awards projects based on available funding. GOHSEP administers the following programs, which are specifically geared toward hazard mitigation actions.

Following a Presidential Disaster Declaration, FEMA's Individual and Family Grants (IFG) program is available to individuals and families in declared disaster parishes who meet certain eligibility criteria. Individual and Family Grants (IFG) can provide up to $15,000 per family for disaster-related losses. Federal disaster assistance also includes temporary housing, food, relocation assistance, legal and tax assistance, and a Cora Brown Fund of $2,000.

The 404 Hazard Mitigation Grant Program (HMGP), which is authorized by the Stafford Act, makes federal funds available to states following a Presidential Disaster Declaration. The HMGP provides grants to states, local governments, Native American Tribes and certain non-profit agencies for long-term mitigation projects designed to reduce loss of life and property from future events. HMGP funds can be used to make improvements to public and private property. It is based on a 75%/25% cost sharing basis. All projects must be economically justified and be in a declared parish.

The Public Assistance (PA) Program, which is authorized by the Stafford Act, makes federal funds available to states following a Presidential Disaster Declaration. The PA funds provide grants to states, local governments, Native American Tribes and certain non-profit agencies to assist with recovery and reconstruction related activities. Specifically, the program provides assistance for debris removal, emergency protective measures, and permanent work. It is based on a 75%/25% cost sharing basis. The program also encourages protection from future damages by providing for hazard mitigation measures during the recovery process. Section 406 of the Stafford Act supplements the FEMA Public Assistance Program, by providing additional funding for proposed hazard mitigation measures. These grants are also based on a 75% federal /25 non-federal% cost sharing basis and all work must be in a declared parish and the damages must have happened during the declared event.

Congress may specifically authorize Unmet Needs funding via FEMA or a related federal agency following a major disaster-related event wherein additional funds may be provided for projects not normally funded. Such funding requires a letter of "intent to apply" once Congress has provided authorization and is only available in conjunction with specific authorization by the President.

State-awarded emergency funds are available through the Interim Emergency Board (IEB) and are used whenever an event does not meet the criteria of a Federal disaster declaration. Based upon a 75%/25% cost share, applicants must be in a declared area and makes submission to the State disaster package requesting funding under the IEB program.

FEMA's Fire Management Assistance Grant Program provides grants for mobilization, response, equipment, supplies, personnel, and demobilization. It is available to any state or local government for mitigation, management, and control of any major fire burn on public or private forest land or grassland that threatens destruction that would constitute a major disaster. The grant is based on 75/%25% cost sharing basis.

Programs (Pre-Disaster)

GOHSEP also administers pre-disaster FEMA grant programs in Louisiana. FEMA's Pre-Disaster Mitigation (PDM) Program provides annual nationwide competitive funds to states, local governments, and Native American Tribes, subject to federal appropriations[1], for hazard mitigation planning and implementation of cost effective mitigation projects prior to a disaster event. Pre-disaster funding of these plans and projects reduces the overall risk to population and property as well reducing the reliance on future post disaster funding. PDM projects are funded on a competitive basis and are based on 75% federal /25% non-federal cost sharing. All projects must be submitted through the local government to the SHMO and recommended by the SHMT before they can be forwarded to FEMA for consideration.

FEMA's Flood Mitigation Assistance (FMA) program provides annual funds to states, local governments, Native the American Tribes and certain non-profit agencies, subject to federal appropriations[1], to implement long-term mitigation projects designed to reduce or eliminate long-term risk of flood damage to structures insured under the NFIP that have one or more flood claims payments. The goal of the FMA is to reduce or eliminate claims under the NFIP through the funding of mitigation activities. FMA projects are funded based upon a 75%/25% cost share, of which no more than one half can be provided from in-kind contributions. All projects must be submitted through the local government to the SHMO and recommended by the SHMT before they can be forwarded to FEMA for consideration. A more detail discussion of the NFIP is provided as part of the agency capability for the Louisiana Department of Transportation and Development DOTD.

FEMA's Repetitive Flood Claims (RFC) program provides annual funds to states, local governments, Native the American Tribes and certain non-profit agencies, subject to federal appropriations[1], to implement long-term mitigation projects designed to reduce or eliminate long-term risk of flood damage to structures insured under the NFIP that have one or more flood claims payments. The eligible activities under the RFC are limited to acquisition of insured structures that have one or more flood claims payments. The long-term goal of the RFC is to reduce or eliminate claims under the NFIP through the funding of mitigation activities. All RFC projects are funded at 100% cost share. All projects must be submitted through the local government to the SHMO and recommended by the SHMT before they can be forwarded to FEMA for consideration.

FEMA's Severe Repetitive Loss (SRL) Pilot Program provides annual funds to states, local governments, Native the American Tribes and certain non-profit agencies, subject to federal appropriations[1], to implement long-term mitigation projects designed to reduce or eliminate long-term risk of flood damage to severe repetitive loss residential properties and the associated drain on the NFIP from these properties. SRL are residential properties that have incurred flood losses that resulted in either (1) four or more flood claims payments that each exceeded $5,000 with at least two of the payments occurring within a ten year period, or (2) two or more flood claims payments that cumulatively exceeded the value of the property. The goal of the SRL is to reduce or eliminate claims under the NFIP through the funding of mitigation activities. SRL projects are funded based upon a 75%/25% cost share. The 25% cost share

[1] According to the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, if a state has a FEMA-approved mitigation plan that specifies how the state intends to reduce the number of severe repetitive loss properties and FEMA determines that the state has taken such actions, then the cost sharing formula is changed to 90% federal / 10% non-federal.

can be adjusted to 10% if the state has a FEMA approved mitigation plan that address the State's long-term strategy for reducing the number of severe repetitive loss properties. All projects must be submitted through the local government to the SHMO and recommended by the SHMT before they can be forwarded to FEMA for consideration.

Limitations

GOHSEP abides by Federal, state, and local laws and policies to ensure that mitigation plans, programs, and actions are appropriately funded. GOHSEP works with the SHMT to establish flood mitigation project priority based on FEMA's list of Repetitive Flood Loss[2] properties and available funding.

Interactions with Other Entities

As of 2010, GOHSEP regularly works with the following agencies to achieve common mitigation goals:

- Coastal Protection and Restoration Authority
- Office of Coastal Restoration and Management
- Department of Agriculture and Forestry
- Department of Culture, Recreation, and Tourism
  - Division of Historic Preservation
  - Louisiana Office of State Parks
- Department of Environmental Quality
- Department of Health and Hospitals
- Department of Education
- Department of Insurance
- Department of Natural Resources
- Department of Social Services
- Department of Transportation and Development
- Department of the Treasury
- Department of Wildlife and Fisheries
- Division of Administration
- Office of Risk Management
- Office of Community Development
- Louisiana National Guard
- Louisiana Recovery Authority
- Louisiana Homebuilders Association
- Louisiana Manufactured Housing Association
- Wetland Societies and Conservation/Land Trusts
- Regional Planning and Development Districts

[2] FEMA defines repetitive loss properties as: a) Four or more paid flood losses of more than $1,000 each; or b) Two paid flood losses within a 10-year period that, in the aggregate, equal or exceed the current value of the insured property; or c) Three or more paid losses that, in the aggregate, equal or exceed the current value of the insured property.

Louisiana Department of Agriculture and Forestry (DAF)

SHMPC Contact

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Mission Statement

The mission of the Louisiana DAF is to administer the laws, rules, and regulations of the State regarding the growing, harvesting, processing, storing, and sale of forest, crop, and livestock commodities.

These laws, rules, and regulations are to ensure that foods are prepared in sanitary processing facilities and are safe to eat, that the State's food manufacturing sector receives the full benefit of the agency's marketing expertise, that the State's soil and water resources are protected to ensure the optimum growth and yield of crops and forests, that the State's forests are protected from harmful diseases and fires, and that Louisiana livestock receives the best in veterinary care.

The department also works with other state, regional, national, and international sectors of business and government in fulfillment of its goal to provide general oversight services and administrative assistance in the conduct of the affairs of rural Louisiana.

Personnel

The DOC has 650 agency employees.

Support is provided on "as needed" basis, meaning that, if necessary, 450 DAF employees would be able and available to perform mitigation actions, although no employees currently regular job duties dedicated to mitigation.

9 employees would be able and available to provide technical assistance.

Activities

As directed by the Governor's Office, DAF distributes information regarding the Coastal Restoration and Preservation Program on their website.

Programs

DAF's Office of Forestry promotes several sound forest management programs, chief among them a fire/weather forecasting program that suppresses timberland wildfires and another that specializes in the production of reforestation seedlings. The Office of Forestry also oversees the network of statewide programs that enforce timber laws, including the investigation of timber theft. This same office facilitates educational programs, disseminating information, and assisting in urban forestry programs.

Within Animal Health Services, programs to protect the food chain and public health ensure that meat, seafood, poultry, eggs, fruits, and vegetables are properly identified, labeled, inspected, and accurately graded. This includes protection of the livestock industry from theft and animal disease.

There are also several soil and water conservation programs in DAF, including work with landowners and governments in planning and implementing soil and water conservation measures.

The DAF's Formosan Termite Initiative is an extensive tree treatment program in Greater New Orleans and Lake Charles to help put a stop to the destructive invasion of these insects.

Finally, DAF has created an environmental education program called Louisiana Project Learning Tree designed for educators working with K-12 students.

Organizational Structure

The commissioner of agriculture and forestry heads the department and exercises all functions of the State relating to the promotion, protection, and advancement of agriculture and forestry, except research and educational functions expressly allocated by the constitution or by law to other state agencies.

To best serve the citizens of Louisiana, the DAF is divided into seven areas of service: 1) Agriculture and Environmental Sciences, 2) Agro-Consumer Services, 3) Animal Health Services, 4) Forestry, 5) Management and Finance, 6) Marketing, and 7) Soil and Water Conservation. Housed in these offices are programs such as Boll Weevil Eradication, Weights and Measures, the Livestock Sanitary Board, Information Services, Market Development, and Forest Management.

Interactions with Other Entities

As of 2010, DAF works with the following agencies toward mitigation goals:

- Department of Environmental Quality
- Department of Health and Hospitals
- Department of Insurance
- Department of Labor
- Department of Natural Resources
  - Office of Coastal Restoration and Management
- Department of Social Services
- Department of Transportation and Development
- Department of the Treasury
- Department of Public Safety
  - Louisiana State Police
  - Office of Public Health
- Department of Wildlife and Fisheries
- Coastal Protection and Restoration Authority
- Homeland Security and Emergency Preparedness
- Louisiana Cattleman's Association
- LSU – School of Veterinary Medicine
- LSU – Southern Agricultural Extension
- Louisiana National Guard
- Office of Community Development
- Wetland Societies and Conservation/Land Trusts
- Regional Planning and Development Districts

Louisiana Department of Corrections (DOC)

SHMPC Contact

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Mission Statement

The mission of the DOC is to provide for custody, control, care, and treatment of adjudicated offenders through enforcement of laws and management of programs designed to ensure the safety of the public, staff, and inmates and promote the reintegration of offenders into society.

Personnel

According to the 2010 State Agency survey, the DOC has 5,900 agency employees in 2010, down from 10,100 agency employees in 2008.

In 2008, support was provided on "as needed" basis, meaning that, if necessary, all DOC employees would be able and available to perform mitigation actions. Approximately 100 employees currently have some portion of their job duties dedicated to mitigation. 1,500 employees would be able and available to provide technical assistance. As of 2010, no change in the above staffing levels has been reported.

Activities

DOC works with the Office of Risk Management and the Loss Prevention Unit toward the prevention and reduction of employee related accidents and injuries and losses of public property.

DOC has an Incident Management Center in their Headquarters building for formal command center operations.

DOC provides secondary support through the Incident Management Center Representatives on the Emergency Operations Center (EOC) task force.

DOC provides general support for Information/Business Continuity with the (DOA) through the Living Disaster Recovery Program (LDRP)

As a technical resource, DOC offers manpower and physical support.

DOC can provide backup generation support during ice storms and road work.

Programs

Through department policy and initiatives including emergency management planning at the state and local levels, provides for emergency evacuation and mass care (an Emergency Support Function under the National Response Plan) (ESF-6) support to municipal and parish correctional facilities, both pre- and post-incident. This support includes activities across the entire mass care spectrum, including housing, feeding, medical and mental healthcare, etc.

Through medical policy and initiatives designed to assist the general public and the inmate population alike, health care is provided for all institutionalized inmates, including annual tests for tuberculosis. Some facilities have "negative air" rooms to house inmates who test positive for TB.

DOC also provides numerous public outreach programs aimed primarily at children and victims' groups.

Limitations

DOC is not currently limited, through law or agency policy, in their mitigation activities.

Interactions with Other Entities

As of 2010, DOC works with the following agencies toward mitigation goals:

Department of Agriculture and Forestry
Department of Economic Development
Department of Education
Department of Health and Hospitals
Department of Insurance
Department of Labor
Department of Natural Resources
    Office of Coastal Restoration and Management
Department of Public Safety
    Louisiana Sheriff's Association
    Louisiana Fire Marshal's Office

Department of Social Services
Department of Transportation and Development
Department of Wildlife and Fisheries
Coastal Protection and Restoration Authority
Homeland Security and Emergency Preparedness
Louisiana National Guard
Office of Public Health
Office of Risk Management
Louisiana State Police

Resources

The most prominent resources toward mitigation for DOC are manpower, professional experience, funding, technical resources, and commodities. However, DOC feels that their agency lacks funding specifically for hazard mitigation.

Organizational Structure

For technical assistance, all DOC employees work on assigned tasks in a paramilitary structure. The Secretary serves as the department CEO, with Deputy Undersecretary and other executive staff reporting directly to the Secretary. Also reporting directly to the Secretary are the following positions: Corrections Services Deputy Undersecretary, the Undersecretary (the office of management and finance reports to this person), the Assistant Secretary for the Office of Adult Services, Chief of Operations. Incident management has its own organizational structure.

Louisiana Department of Environmental Quality (DEQ)

SHMPC Contact

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Department of Environmental Quality
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Mission Statement

The DEQ's mission is to provide service to the people of Louisiana through comprehensive environmental protection in order to promote and protect health, safety, and welfare while considering sound policies regarding employment and economic development.

Personnel

- The DEQ has 889 agency employees, down from 1050 agency employees in 2008.
- 173 employees would be able and available to perform mitigation actions, down from 234 in 2008 (65 with Remediation Services, 59 in Emergency Response (including Radiation Emergency Preparedness and Response), 35 with the Underground Storage Tank Division, 6 with Drinking Water Well Protection Program, 5 with Motor Vehicle Inspection and Enforcement, and 2 with the Ozone Action Program and one SHMT representative.
- Of those 173 employees, all currently have some portion of their job duties dedicated to mitigation (as identified above) .
- Of those 173 employees, 7 would be able and available to provide technical assistance, as needed, through the Global Information System (GIS) Center.

Activities

- DEQ provides lesson plans for teachers/parents and information for the general public on a variety of subjects. These include:
  - Environmental rule-making and education
  - Air quality
  - Radiation protection
  - Solid waste and recycling
  - Hazardous waste safety
  - Water quality and pollution prevention
- In accordance with "Right to Know" laws, the general public is able to obtain DEQ records.
- DEQ's role within the EOC is to assure compliance with state, local, and Federal environmental laws.
- DEQ provides air, soil, and waste monitoring, as well as sampling and analysis for the State and localities as needed.
- Chemical Radiation Disaster Training provides drills for facility personnel and local planning groups.

Programs

DEQ administers the Remediation Program, the Nuclear Power Plant Off-site Emergency Preparedness Program, The Drinking Water Well Protection Program, and Radiological Emergency Planning and Response.

The motor vehicle Inspection and Enforcement Program is aimed at the control and abatement of emissions in the five-parish Baton Rouge ozone non-attainment area.

DEQ's ozone pollution and prevention programs include both OzoneAction! and RAC's RideShare.

Limitations

DEQ is not currently limited, through law or agency policy, in their mitigation activities.

Interaction with Other Entities

DEQ works with GOHSEP through agency participation in the SHMT. Other agencies that DEQ works with toward mitigation are:

- Department of Agriculture and Forestry
- Department of Corrections
- Department of Health and Hospitals
- Department of Natural Resources
- Department of Public Safety
  - Louisiana State Police
  - Office of Public Health
- Department of Social Services
- Department of Treasury
- Department of Wildlife and Fisheries
- Homeland Security and Emergency Preparedness

Resources

DEQ's most valuable resources in terms of implementing mitigation actions include the following:

- Emergency Response Program Group
- Accident Prevention Group
- GIS Center
- Radiological Emergency Planning and Response

Organizational Structure

Remediation Services is under Environmental Assessment. The Surveillance group is under Environmental Compliance.

Louisiana Department of Health and Hospitals (DHH)

SHMPC Contact

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Mission Statement

The mission of the Department of Health and Hospitals (DHH) is to protect and promote health and to ensure access to medical, preventive, and rehabilitative services for all citizens of the State of Louisiana.

Personnel

As of 2010, DHH is the largest State agency in Louisiana and has the largest budget. Among DHH personnel are:

- 12,000 agency employees, down from 12,500 in 2008.
- Three employees who would be able and available to perform mitigation actions (Mr. Hollowell, however, is the only employee with any mitigation-specific job duties.)
- One employee (Mr. Hollowell) who would be able and available to provide technical assistance (Although DHH has an IT section, they are usually too busy to take on new projects.)
- Six Public Information Officers

Activities

- The State Health Officer and Medical Director distribute information on preparedness for hazards such as hurricanes and the West Nile virus.
- During an event, DHH provides special needs shelters that are only open to individuals who have specific medical needs or other circumstances. These are not open to the general public.
- The following activities are managed through the Office of Public Health (OPH) in order to assure public safety:
    - Testing oyster fields for safety
    - Monitoring beaches for bacteria and safety
    - Testing drinking water for quality
    - Testing milk from different producers
    - Performing restaurant inspections
- DHH has a Bioterrorism Unit that maintains portable hospitals in nine regions within Louisiana. This unit also trains parish employees, police departments, and others on how to respond to a bioterrorism event.

Programs

The Fight the Bite Program distributes information to the general public on the West Nile virus and other mosquito-borne illnesses.

DHH has a Bioterrorism Unit and a Regional Response Team for each of the nine emergency management regions in Louisiana to assist special needs residents.

DHH also has Immunization Teams and Mobile Field Units consisting of one 200-bed portable hospital, two "smart" trailers containing supplies, and nine decontamination units.

DHH requires an evacuation plan before nursing homes and home health agencies can be licensed.

Nine immunization teams, one for each region, serve to prevent disease outbreaks in Louisiana.

Limitations

DHH is not currently limited, through law or agency policy, in their mitigation activities.

Interactions with Other Entities

As of 2010, DHH works with the DEQ in their efforts to maintain water quality. DHH also works with GOHSEP through agency participation in the SHMT, the functions of DHH's Bioterrorism Unit, and through the State Health Officer's and Medical Director's efforts to distribute preparedness information. Joint activities unrelated to mitigation efforts include interactions with the following agencies:

- Department of Environmental Quality
- Department of Public Safety
- Department of Social Services
- Homeland Security and Emergency Preparedness

Resources

The most prominent resource toward mitigation at DHH is the public outreach that is done through the State Health Officer and Medical Director. Other resources that would play key roles implementing a mitigation action are not yet determined.

Organizational Structure

Mr. Hollowell works for the Deputy Undersecretary under the Office of Management and Finance. Dr. Guidry, the State Health Officer and Medical Director, works directly under the Office of the Secretary.

Louisiana Department of Natural Resources (DNR)

SHMPC Contact

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Mission Statement

The mission of the Louisiana Department of Natural Resources (DNR) is to preserve and enhance the nonrenewable natural resources of the State—consisting of land, water, oil, gas, and other minerals—through conservation, regulation, management, and exploitation to ensure that the State of Louisiana realizes appropriate economic benefit from its asset base.

DNR exercises a variety of complex regulatory and permitting functions through the offices of Conservation and Coastal Management. The Department serves as one of State government's major revenue-generating agencies by way of oil and gas bonuses, rentals, and royalties.

Using a business plan approach, DNR's aim is to exercise prudent and effective management through long-range planning strategies. The department's governing philosophy is to be open and receptive to innovative ideas and technologies and to support the promotion of a cleaner, safer environment. The department strives to facilitate an excellent working relationship with industry and a strong emphasis is placed on attaining mutual goals. DNR also endeavors to assist the citizens of the State through education programs, its many services, and its public outreach efforts.

Personnel

- As of 2010, 399 agency employees, down from 550 agency employees in 2008
- 200 employees would be able and available to perform some type of mitigation activity
- Of those 200, 145 have duties which are directly associated with some type of mitigation activity, primarily related to permitting or restoration activities in the State's coastal zone, coastal wetlands, or marshes

  Note: 2010 State agency survey identifies 7 employees with mitigation related duties, 7 available for mitigation activities, and 7 able to provide technical assistance. This significant decrease in reported mitigation staffing levels may result from survey error or from the consolidation of staff from DNR and DOTD into the newly formed OCPR.

Activities

- Working with Federal agencies, State and local governments, and the general public in the design and implementation of coastal restoration projects, including feasibility studies and funding.
- Publishing and disseminating information about coastal land loss and its impacts upon the State and nation, as well as what the State is doing to combat coastal land loss. To help with information dissemination, the DNR maintains a detailed website that seamlessly combines both a GIS and a relational database (called SONRIS) and provides a means for data and information to be easily queried and downloaded. Data and information available via the DNR website includes, but is not limited to, spatial data related to project boundaries and infrastructure, background or base map imagery such as aerial photography, biological

monitoring program data, soil borings, and digital copies of most documents generated by the coastal restoration program. Additional spatial data is available on the state's oil and gas infrastructure.

- Working with local governments to educate the public on hazards such as the destruction of coastal wetlands.
- Utilizing a permitting process to prevent loss of wetland functions and values in the coastal zone and to provide for mitigation for unavoidable damages to wetlands and other habitats of local concern within the State's coastal zone.
- Implementing other programs to enhance the State's coastal areas.

Programs

The Office of Coastal Management (OCM) in the Louisiana Department of Natural Resources (DNR) currently administers most of the programs designed to conserve, restore, enhance, and manage Louisiana's coastal wetlands and other coastal resources. These activities reduce the impact of hurricane winds and surge by reducing coastal land loss and sustaining the health of coastal wetlands. The Coastal Management Division (CMD) is charged with implementing the U.S. National Oceanic and Atmospheric Administration (NOAA)-funded Coastal Zone Management program in Louisiana, including issuance of Coastal Use Permits and the mitigation of unavoidable losses of wetland function and value due to permitted activities in the Coastal Zone, as well as other support and coordination functions. OCRM's Coastal Restoration Division (CRD) and Coastal Engineering Division (CED) are responsible for the planning, design, construction, monitoring, and maintenance of projects aimed at creating, protecting and restoring the state's wetlands. OCRM also oversees the beneficial use of dredged material program, the dedicated dredging program (a marsh creation and nourishment program to assist private individuals and other agencies in restoring critical wetlands), and the Barrier Island Stabilization and Preservation Fund.

In response to the hurricanes of 2005, Act 8 of the First Extraordinary Session of the 2005 State Legislature mandated the development of a comprehensive master coastal protection plan along with subsequent annual plans that establish clear priorities for activities and expenditures for coastal restoration and protection. A team led by staff from DNR and DOTD developed *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast*, which was approved by the Louisiana legislature in June 2007. This plan recognizes the important role of coastal restoration as an integral strategy in hurricane and flood protection and portrays the state's vision of comprehensive protection that includes structural, management, and institutional components of short- and long-term efforts. The Master Plan is coordinated with the development of the U.S. Army Corps of Engineers (USACE)'s Louisiana Coastal Protection and Restoration (LaCPR) plan.

The Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA or "Breaux Act") historically has provided the majority of the cost-shared funding for Louisiana's coastal restoration projects. Funded at an average of $60 million per year, CWPPRA was passed in 1990 and is authorized until 2019. The CWPPRA Task Force manages the CWPPRA program including project selection and construction and is composed of the following members: USACE, U.S. Fish and Wildlife Service, U.S. Natural Resources Conservation Service, EPA, U.S. National Marine Fisheries Service, and the State of Louisiana (Governor's Office). As of December 2006, a total of 78 CWPPRA projects have been constructed.

The Coastal Impact Assistance Program (CIAP) is a revenue-sharing program which was authorized by Section 384 of the Energy Policy Act of 2005, to assist coastal producing states and their political subdivisions (parishes, counties, and boroughs) in mitigating the impacts from Outer Continental Shelf (OCS) oil and gas production. Louisiana is one of the seven coastal states selected to receive funds under this appropriation to implement this program. The program provides funds for four years (fiscal years 2007 through 2010), disbursed through the Department of the Interior's Minerals Management Service. Louisiana's CIAP Plan was the first to be submitted and approved. DNR administers the state's portion of the funds which are primarily dedicated to implementing projects and programs for restoration and conservation of coastal habitats.

The Louisiana Coastal Area (LCA) Ecosystem Restoration Plan is a jointly-funded, concerted and collaborative effort between the State of Louisiana and USACE. The LCA study area encompasses all of Louisiana's coastal area from Mississippi to Texas. The LCA Plan resulted from Louisiana's recognition that the relatively small projects funded through CWPPRA were not of sufficient magnitude to minimize or ameliorate Louisiana's devastating land loss problems. The goal of the LCA Plan is to reverse the current trend of degradation of Louisiana's coastal ecosystem. The funding requested to implement the first phase of the LCA Ecosystem Restoration Plan is estimated at $1,805,442,000. The LCA Plan was submitted in November 2004 for funding by Congress through the Water Resources Development Act (WRDA) and was finally authorized in the 2007 WRDA.

The DNR manages many State-funded restoration projects and programs. The Parish Coastal Wetlands Restoration Program (PCWRP) or "Christmas Tree Program" is funded and offered annually by the DNR to the 19 coastal zone parishes and, as of November 2006, has constructed approximately 45 projects. Christmas tree brush fences are beneficial in three primary ways: recycling, public awareness/education, and habitat restoration/creation. The Vegetation Planting Program is a unique, three agency (DNR, Natural Resources Conservation Service, and Soil and Water Conservation Committee) partnership through which native marsh vegetation is planted and monitored throughout the coastal zone of Louisiana. As of November 2006, approximately 394 project sites have been planted. The State has also constructed approximately 44 additional projects ranging from large freshwater diversions to smaller shoreline protection projects.

Adaptive Management is a management process that continually incorporates the best available science and engineering knowledge into planning, design, and operation of all components of the State's coastal restoration program. Adaptive management allows for large-scale ecosystem restoration to proceed even as researchers work to reduce those uncertainties by providing this feedback element in the process.

The Coastwide Reference Monitoring System (CRMS) has two objectives to strengthen the current CWPPRA-required monitoring strategy. The first objective is to provide a network of reference sites by which to evaluate the effectiveness of projects initiated under CWPPRA. The second objective is to ensure that the comprehensive restoration plan for coastal restoration is effective in restoring hydrologic basins and entire coastal ecosystems and not just the areas directly affected by individual projects. The variables measured at each site are crucial in determining the effectiveness of the CWPPRA program, as well as those considered most important in affecting growth of vegetation. The data are also used by numerous researchers and others for various purposes.

The Rules and Regulations for Permits and Mitigation promulgated as part of the Louisiana Coastal Resources Program require compensatory mitigation for impacts to vegetated wetlands in the Louisiana Coastal Zone. These requirements state that the secretary shall not grant a Coastal Use Permit for an individual activity unless authorization is conditioned to include a requirement for compensatory mitigation to offset any net loss of wetland ecological value that is anticipated to occur. The permitting process is carried out by the Coastal Management Division of the Office of Coastal Restoration and Management.

The Atchafalaya Basin Program was created in 1998 with a mission to conserve, restore, and enhance the natural habitat and give all people the opportunity to enjoy the Atchafalaya Basin—the largest river-swamp in the country. Implementation of the program involves collaborative efforts with other entities within State government, as well as entities at the local and Federal levels. Funding for all approved projects is derived from the Federal government (primarily the USACE), State government, and local matching funds.

Limitations

DNR's work is limited by the Federal and/or State laws governing its activities, by funding constraints, and by availability of trained professional staff.

Interactions with Other Entities

DNR works extensively with the five Federal CWPPRA agencies (USACE, U.S. Fish and Wildlife Service, U.S. Natural Resource Conservation Service, EPA, and U.S. National Marine Fisheries Service) in constructing coastal restoration projects. Its CIAP projects require review and approval by the Minerals Management Service. The services of the U.S. Geological Survey and its National Wetlands Research Center are used extensively for GIS and other scientific and technical assistance. DNR works with FEMA for repairs to constructed projects after a disaster.

DNR also works with the following State agencies and other entities toward common mitigation goals:

- Department of Agriculture and Forestry
- Department of Environmental Quality
- Department of Wildlife and Fisheries
- Coastal Protection and Restoration Authority
- Louisiana Office of State Lands
- Governor's Office of Coastal Activities
- Louisiana SeaGrant and LSU AgCenter Extension Service
- University Academics
- Wetland Societies and Conservation Trusts
- Local and Parish Governments

Resources

To successfully implement mitigation actions, DNR needs funding; personnel; the commitment of the Governor, Louisiana Legislature, and Congressional Delegation; and the support of local governments and the general public.

Organizational Structure

The Secretary of the Department of Natural Resources is ultimately responsible for overseeing all aspects of the DNR's work, including mitigation activities, etc. Along with the Office of the Secretary there are three primary offices of the department. They are the Office of Coastal Management, the Office of Conservation, and the Office of Mineral Resources. The mitigation work within DNR is carried out through the Office of Coastal Management. Some of the activities carried out by the Office of Conservation, especially its data on oil and gas infrastructure, could also be considered in support of hazard mitigation related to oil and gas activities. The Atchafalaya Basin Program is administered through the Office of the Secretary.

Louisiana Department of Transportation and Development (DOTD)

SHMPC Contact

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State Floodplain Manager
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Baton Rouge, LA 70807

Mission Statement

The Louisiana DOTD mission is to develop, implement, and administer programs and projects that impact the State's highways, bridges, airports, waterways, rain, and public transportation systems. In doing so, it aims to enhance the quality of life and foster economic growth in an environmentally-sensitive manner by managing resources, planning effectively, improving safety, preserving and operating infrastructure, and advancing mobility and access.

Committed to public service through its embrace of teamwork, quality, innovation, and excellence, DOTD's vision is to be the leader in transportation and water resources by exceeding customers' expectations.

Personnel

As of 2010, DOTD employs approximately 4,500 individuals on a full-time basis, down from 4,800 in 2008. Among these DOTD personnel, in 2008 there were 30 employees whose job duties involve hazard mitigation and who would be available for hazard mitigation activities:

- 14 in Flood Protection programs
- 11 in Hurricane Protection operations
- 5 in Water Resource programs

In 2010, the reported number of mitigation-related staff was 25, although no break-down according to programs (above) was available. The Staff working with hurricane protection operations have been moved to the newly created Office of Coastal Protection and Restoration.

Activities

DOTD participates in numerous community outreach programs conducted jointly with FEMA, State, and local officials. Because DOTD manages the Louisiana NFIP, agency personnel conduct workshops to educate local professionals and the public regarding the benefits of the NFIP, CRS, and associated practices. In addition, the State Floodplain Manager serves on the SHMT.

DOTD provides highway contra-flow for evacuations prior to disaster events and provides evacuation transportation out of risk areas for populations who are unable to provide it for themselves.

Permits from DOTD are required for all new construction and modifications to dams in the State of Louisiana. In addition, DOTD inspects each dam in the state on a rotating basis..

DOTD also works with the USACE and Levee Districts as follows:

- Participates in the USACE annual inspections of Federally controlled levees; and

- Provides technical assistance to each levee district by: reviewing requests for permits for any type of activity (construction or modification) within 1500 feet of their levee; and attending meetings of the Levee Boards.

Programs

The Floodplain Management Program promotes local government compliance with NFIP regulations to minimizing loss of life and property due to catastrophic flooding and ensuring the availability of low-cost flood insurance. This is accomplished through on-site assessments, technical assistance on local government ordinance development, and participation in post-disaster mitigation activities. The program is funded in coordination with the Louisiana Office of Emergency Preparedness on the basis of a 75%/25% cost share.

To the extent required to protect life and property, the Dam Safety Program involves supervision and overview of the construction, modification, operation, and maintenance of dams.

Funded by the Transportation Trust Fund, the Ports Construction and Development Priority Program serves to construct, improve, rehabilitate, and expand deep draft port facilities, including inter-modal facilities and maritime-related industrial park infrastructure developments.

Funded by Capital Outlay, the Statewide Flood Control Program works in cooperation with local governments, DOTD engineering and technical assistance provides surveys, cost estimates, hydraulic designs, plans, right-of-way maps, specifications, advertising for bids, construction of levees, canals, dams locks, spillways, reservoirs, water wells and test holes, drainage systems, irrigation systems, navigation projects, flood control, and other types of public works projects.

Limitations

The priority listing for HMGP funds is limited by the Repetitive Loss Structure list.

Interactions with Other Entities

DOTD regularly works with the following agencies to achieve common mitigation goals.

- GOHSEP
- Coastal Protection and Restoration Authority
- Louisiana Division of Historic Preservation
- Louisiana Housing Finance Agency
- Louisiana National Guard
- Louisiana Office of State Parks
- Louisiana Public Service Commission
- Louisiana State Police
- Office of Coastal Restoration and Management
- Office of Public Health

Resources

To successfully implement mitigation actions, DOTD needs capital outlay funding, mitigation-specific funding (HMGP, FMA, and PDM), and legislation to support mitigation practices, such as the National Flood Insurance Reform Act of 2004.

Organizational Structure

The majority of hazard mitigation activities occur within the Public Works and Water Resources Division of DOTD.

Office of Coastal Protection and Restoration

A New Beginning

In response to the hurricanes of 2005, Act 8 of the First Extraordinary Session of the 2005 State Legislature mandated the development of a comprehensive master coastal protection plan along with subsequent annual plans that establish clear priorities for activities and expenditures for coastal restoration and protection. A team led by staff from DNR and DOTD developed *Integrated Ecosystem Restoration and Hurricane Protection: Louisiana's Comprehensive Master Plan for a Sustainable Coast*, which was approved by the Louisiana legislature in June 2007. This plan recognizes the important role of coastal restoration as an integral strategy in hurricane and flood protection and portrays the state's vision of comprehensive protection that includes structural, management, and institutional components of short- and long-term efforts. The Master Plan is coordinated with the development of the U.S. Army Corps of Engineers (USACE)'s Louisiana Coastal Protection and Restoration (LaCPR) plan.

As a result of this work, the state established a new Office of Coastal Protection and Restoration composed of staff from DNR and DOTD to support the work of the CPRA. This new group is responsible for the planning, design, construction, monitoring, and maintenance of projects aimed at creating, protecting and restoring the state's coastal landscape. This groups also oversees the beneficial use of dredged material program, the dedicated dredging program (a marsh creation and nourishment program to assist private individuals and other agencies in restoring critical wetlands), and the Barrier Island Stabilization and Preservation Fund.

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sites have been planted. The State has also constructed approximately 44 additional projects ranging from large freshwater diversions to smaller shoreline protection projects.

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Louisiana Department of Wildlife and Fisheries (DWF)

SHMPC Contact

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Louisiana Department of Wildlife and Fisheries
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Baton Rouge, LA 70809

Mission Statement

The Louisiana DWF is the State agency responsible for the management of the State's renewable natural resources, including all wildlife and all aquatic species.

Prudent stewardship of the State's renewable natural resources contributes significantly to the quality of life of the State's citizens and to the economic well-being of the State. DWF serves almost two million direct users and countless others who benefit indirectly. DWF supports a strong work ethic in its employees and incorporates the use of good science, accurate information, and technology in carrying out its mission. The department continually looks for ways to improve the way it manages resources to ensure their sustainability and availability for all users, both now and in the future.

Personnel

As of 2010, DWF employs approximately 850 individuals statewide on a full-time basis, with one staff member employed in mitigation in support of specific hazard mitigation efforts. DWF personnel provide indirect mitigation support in terms of biological assessment, environmental impact, and support of the SHMT.

Activities

DWF administers and maintains a public information library and the Woodworth Education Center that include various natural resource related publications, the *Louisiana Conservationist* journal, wildlife management area maps, historic books and documents, regulation pamphlets, and a selection of VHS tapes. The department provides a

communication network and resources in the response and recovery phases that indirectly contribute to mitigation. DWF also has representation on the SHMT.

In addition, DWF operates staging facilities for post-disaster Search and Rescue activities, and utilizes FEMA-compliant standards and techniques for DWF building elevations and hardening projects as part of its reconstruction efforts.

Programs

The main DWF program that provides indirect mitigation support is the Land Acquisition for Wildlife Management Program. Although the primary goal is to acquire land for wildlife management purposes, a secondary effect is reduction of floodplain development.

In addition, the DWF's Scenic Rivers Program serves to protect Louisiana's rivers which, in turn, reduce human, property, and environmental losses through the restrictions on development near these streams.

Limitations

DWF is limited by funding in the purchase and acquisition of private lands for the purposes of conservation. Furthermore, the Scenic Rivers Program does not allow for structural flood hazard mitigation techniques such as channelization.

Interactions with Other Entities

DWF regularly works with the following agencies to achieve common mitigation goals:

- Department of Natural Resources
- Coastal Protection and Restoration Authority
- Homeland Security and Emergency Preparedness
- Office of Coastal Restoration and Management
- Office of Community Development
- Office of Risk Management

Resources

To assist with implementation of mitigation actions, DWF would need to have a clearly defined role to support mitigation actions in the State of Louisiana, mitigation-specific funding, and informational resource support.

Organizational Structure

DWF is composed of four offices, each containing several divisions:

- Office of the Secretary
  - Enforcement Division
  - Louisiana Seafood Promotion and Marketing Board
- Office of Management and Finance
  - Public Information
  - Fiscal
  - Human Resources
  - Administrative Services

  - Socioeconomic Research and Development
  - Property Control
  - Licensing
  - Computer Center
- Office of Wildlife
  - Wildlife Division
  - Fur and Refuge Division
- Office of Fisheries
  - Marine Fisheries Division
  - Inland Fisheries Division

Louisiana Division of Administration (DOA): Office of Facility Planning & Control (FPC)

SHMPC Contact

Bill Morrison, Assistant Director
Louisiana Division of Administration, Office of Facilities Planning and Control
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Baton Rouge, LA 70802

Mission

The Office of Facility Planning & Control's (FPC) mission is to assist in management of the State's finances and fixed assets by administering the comprehensive capital outlay budget process and implementing a comprehensive centralized facility management program. The FPC also provides appropriate owned or leased facilities to house the operations of State government and meet the space and functional needs of each user agency.

Personnel

FPC employs 63 individuals statewide on a full-time basis. About 30 of these are qualified to serve in a hazard mitigation capacity, although no more than three would be available at any given time, and their responsibilities are limited to mitigation of state-owned facilities.

Programs

For projects other than those funded from self-generated cash, Federal funds, or dedicated revenues, the only anticipated source of funding available is the sale of general obligation bonds. It is therefore necessary to limit capital outlay projects that do not have a cash source of funding to those that have an anticipated useful life of twenty years or more and a value or cost of at least $100,000.

Examples of projects that qualify for inclusion in the capital outlay budget are:

- land acquisition
- site development and improvement

- acquisition or construction of buildings or other structures
- additions or expansion to existing facilities
- major repair or renovation of existing facilities
- installation, extension, or replacement of utility systems or major building system components
- roof replacement
- hazardous materials abatement
- fixed equipment that is connected to building utility systems
- initial equipment and furnishings for new buildings

The State Capital Outlay Act traditionally has included funding for non-State entity capital projects. The State Capital Outlay Act appropriates funds for these non-State projects to FPC, who administers the projects under cooperative endeavor agreements between the State and the non-State entities. The Non-State Entity Capital Outlay Administrative Guidelines are part of the standard cooperative endeavor agreement.

Activities

After enactment of the capital outlay bill it is administered by FPC. With limited exceptions including the Legislature, the Military, the Louisiana Stadium and Exhibition District, and certain others, all funds for building construction are appropriated to FPC. This includes general fund, self generated funds, Federal funds and revenue bonds as well as general obligation bonds. These funds are administered by FPC through contracts with private sector consultants, construction contractors and others. FPC sets standards for the construction of all State owned buildings with the exception of those noted above.

All capital improvement projects for State facilities exceeding $150,000 ($250,000 for higher education) are required to go through capital outlay whatever the means of financing This will include any mitigation projects for State facilities involving capital improvements. FPC sets standards for these improvements and enforces them.

FPC enforces the contracts with private sector consultants, construction contractors and others and ensures the States interests are protected.

FPC is responsible for the purchase of real property for the State of Louisiana.

In addition to State owned buildings, FPC administers the funds appropriated to non-State entities for capital improvements. These are administered through cooperative endeavor agreements with the local entities.

FPC is also the building code authority for all State buildings, whether funded through capital outlay or not.

FPC leases from private sector providers all property rented for State agencies. The Real Estate Leasing Section sets the standards for leased property.

Funding

The FPC section prepares the capital outlay bill, omnibus bond bill, and concurrent resolution. During the legislative session, committee hearings are conducted and the capital outlay bill moves through the legislature to enactment. The capital outlay act includes only those projects that have been proposed, reviewed, and evaluated in accordance with constitutional and statutory provisions and excludes any project deemed not feasible after evaluation. During the legislative process, the FPC monitors changes to the capital outlay bill, omnibus bond bill, and concurrent resolution.

After enactment of the capital outlay act, the FPC prepares any veto messages the Governor may have. After the Governor's signature of the act, capital outlay appropriation letters are sent to notify agencies of capital outlay appropriations and of procedures required to initiate funded projects.

Limitations

PFC is limited in its mitigation activities by Louisiana public bid law's requirement to procure design and construction services by low-bid, and by the state's complete reliance on federal sources for mitigation funding. Additionally, FPC cites inadequate recognition by FEMA/NFIP of the risks of levee failure, unrealistic expectations from FEMA regarding building hardening, excessive justification required by FEMA/GOHSEP for alternative mitigation measures, state insistence that all FEMA disbursements be "audit proof," and duplication of efforts between FPC and GOHSEP in the administration of FEMA-funded projects.

Interactions with Other Entities

DWF regularly works with the following agencies to achieve common mitigation goals:

- Department of Agriculture and Forestry
- Department of Corrections
- Department of Culture, Recreation and Tourism
- Department of Education
- Department of Environmental Quality
- Department of Health and Hospitals
- Department of Public Safety
- Department of Transportation and Development
- Department of Wildlife and Fisheries
- Louisiana National Guard
- GOHSEP
- Office of Risk Management (DOA)

Louisiana Department of Education (DOE)

SHMPC Contact

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Mission

To build a world-class education system for Louisiana's children that fosters higher academic achievement for all students, closes the achievement gap between races and classes, and prepares students to be effective citizens in a global market.

Personnel

As of 2010, DOE has 640 employees, an increase from 620 in 2008. Twenty employees are available to support mitigation activities, while 10 have regular job duties related to mitigation, and 10 are available to provide mitigation-

related technical assistance. By contrast, in 2008, none of the department's employees were available to carry out mitigation activities on an ongoing basis.

Activities and Programs

DOE is actively working with FEMA and GOHSEP to mitigate hazard risks through the replacement and renovation of schools throughout the state primarily focused in Southern Louisiana, and the New Orleans Metro area's Recovery School District. In addition, the department conducts and attends workshops, seminars, and trade shows on new site construction methods for reducing potential damage to buildings.

Interactions with Other Entities

DOE regularly works with the following agencies to achieve common mitigation goals:

- Department of Labor
- Department of Public Safety
- Department of Social Services
- Department of Transportation and Development
- Homeland Security and Emergency Preparedness
- Louisiana National Guard
- Office of Community Development
- Office of Risk Management
- Regional Planning and Development Districts

Support Agencies and Organizations

Louisiana Economic Development (LED)

Mission

Louisiana's LED works to implement strategies that will facilitate the development of a higher value-added economy, thereby increasing jobs, incomes, and wealth for Louisiana residents. Central to this effort is the re-creation of the State as a "Learning Enterprise," a rich, diverse, and complex organism in which all businesses, institutions, and citizens are actively engaged in the pursuit of knowledge.

The LED works to help position the State's colleges and universities as important sources of expertise for problem-solving, sources of technology for commercialization, and sources of well-educated graduates as potential employees. Ultimately, the goal is to have Louisiana rank among the top ten states in the nation in standard of living indicators by the year 2020.

Activities/Programs

LED Activities and Programs include:

Maintaining an in-house research division;

Assisting businesses with infrastructure through the Louisiana Economic Development Corporation;

Requesting satellite overviews in support of disaster assistance;

Administering post-Katrina and Rita SBA loans, in cooperation with LRA policy.

LED may indirectly assist individual community mitigation efforts by assisting with the development of community infrastructure.

LSU Agricultural Center

Mission

The Louisiana Board of Regents' Master Plan for Higher Education calls for the LSU Agricultural Center (AgCenter) to play an integral role in supporting agricultural industries, sustaining rural areas, and encouraging the efficient use of resources through research and educational programs conducted by its Experiment Station and Extension Service.

Under that plan, the Experiment Station is responsible for research in agriculture and resource development, forestry, wildlife and fisheries, home economics, food science, and related areas. It seeks to enhance the quality of life for people through basic and applied research that identifies and develops the best use of natural resources, conserves and protects the environment, permits further development of new and existing agricultural and related enterprises, and develops human and community resources in rural and urban areas.

The Extension Service is responsible for statewide off-campus, informal teaching of agricultural and natural resource technology and management techniques, as well as other off-campus programs focused on family and consumer sciences, youth development, overall improvement of the State's economy, and the efficient use of community and personal resources. In addition to the Experiment Station and Extension Service, the AgCenter also has an

International Programs Office that assists in the development and implementation of agricultural research and educational programs through institutional and human resource development and the exchange of information with other nations.

Activities/Programs

Approximately 350 Ag Center educators contribute to hazard mitigation in the State of Louisiana by adding mitigation messages and units to their programs or developing mitigation materials. In addition to creating their own advisory committees, extension personnel frequently participate in State, parish, and community boards and planning committees.

Communications and IT staff generate news releases, educational publications, exhibits, and websites. Educators can also provide technical assistance for hazard mitigation purposes.

The LSU Ag Center supports a variety of programs promoting hazard mitigation that are designed to assist farmers, children, senior citizens, community officials and leaders, and coastal resource managers.

The Ag Center hosts two websites. The Louisiana Floods website[3] helps citizens take proactive steps to protect their property from flood losses. The Louisiana House website[4], while serving as a landscaping and horticulture resource center, also provides guidance regarding threats such as hurricanes, tornadoes, and termite infestation. The Ag Center also numerous conferences and outreach on coastal restoration and preservation efforts.

The Ag Center sponsors and distributes FEMA's *"Are You Ready?"* series of educational materials covering preparation of disaster supply kits, emergency planning for people with disabilities, and how to locate and evacuate to shelters. In the academic arena, the Ag Center hosts Agro security conferences that bring together national experts involved in preventing acts of bio-terror on the nation's food supply.

With the help of the Louisiana Mosquito Control Association (LMCA), the Ag Center established the Louisiana Mosquito Abatement Plan (LAMAP) in order to help prevent outbreaks of West Nile virus, St. Louis encephalitis, and other serious mosquito-borne diseases such as dengue and malaria. The Ag Center supports the Fight the Bite program, an educational initiative on these diseases aimed primarily at senior citizens. In partnership with DHH, the Ag Center is likewise involved in the Skeeter Busters program that extends the State's mosquito campaign to Louisiana's youth.

Louisiana Division of Administration (LDA): Office of Community Development (OCD)

Mission

The Office of Community Development's mission is to award and administer Federal financial assistance to units of general local government in Federally-designated areas of the State.

Activities/Programs

The primary objective of the Louisiana Community Development Block Grant (LCDBG) Program is to provide assistance to units of general local government in non-entitlement areas for the development of viable communities. Principally for persons of low and moderate income, the program helps provide decent housing, a suitable living

[3] www.louisianafloods.org
[4] www.louisianahouse.org

environment, and expanding economic opportunities. Non-entitlement areas are municipalities with a population of less than 50,000 and parishes with an unincorporated population of less than 200,000.

All post-Katrina/Rita HUD CDBG funding ($13.4 billion) was also administered by OCD through January 2008, and policy for these funds was set by LRA (see below). This includes the Road Home program, parish infrastructure grants, and other recovery programs.

Louisiana Department of Culture, Recreation, and Tourism (CRT)

Mission

The Department of Culture, Recreation, and Tourism strives to provide the highest quality of service and programs through the preservation, promotion, and development of Louisiana's historical, cultural, educational, natural, and recreational resources. These efforts enhance the quality of life for Louisiana's citizens and encourage economic growth while promoting Louisiana as a great place to live, work, and play.

Activities/Programs

The Division of Historic Preservation is responsible for reviewing and approving all hazard mitigation projects involving designated historic properties. FEMA-funded projects must satisfy the Division's requirements.

Louisiana Department of Insurance (DOI)

Mission

The mission of the Department of Insurance is to enforce the insurance laws and regulations of the State impartially, honestly, and expeditiously.

Activities/Programs

The Louisiana Department of Insurance accepted an invitation to join the Neighbor Works National Insurance Task Force (NITF) in March, 2003. The purpose of the NITF is to develop partnerships with leaders from community-based organizations and the insurance industry to better inform consumers in low-income and moderate-income areas about the property and casualty insurance products and services available to them. The project will also help homeowners reduce risk, improve the safety of their homes, and create a better-educated consumer.

The Commissioner of Insurance also oversees the Louisiana Citizens Property Insurance Corporation. Louisiana Citizens Property Insurance Corporation is a non-profit, legislatively created public corporation charged to provide a residual market for residential and commercial property applicants who are in good faith entitled, but unable, to procure insurance through the voluntary insurance marketplace. Its board consists of elected officials or their designees and appointments made by the governor. It operates pursuant to a plan of operation approved by the Senate and House Committees on Insurance, and it is subject to oversight by the Commissioner of Insurance.

In addition, the Department of Insurance routinely produces and distributes publications, press releases, materials, brochures, and website information related to preparedness actions to reduce damages and protect individuals and their property from weather hazards.

DOI also runs the Consumer 101 public education program, which educates consumers about their coverage in the event of a catastrophe.

Louisiana Department of Public Safety (DPS)

Mission

The Department of Public Safety's mission is to provide safety services to both the State's citizens and visitors by upholding and enforcing the laws, administering regulatory programs, managing records, educating the public, and managing emergencies, both directly and through interaction with other agencies. These efforts include public safety services education, prevention, and the use of technology.

Activities/Programs

In 2000, the Department of Public Safety adopted the Louisiana Traffic Safety Incident Management System. In addition to its effectiveness at reducing highway transportation incidents, the Incident Command System (ICS) has evolved into an all-risk management process for all types of emergencies and all law enforcement activities. Response to natural and technological disasters, civil disturbances, security and crowd control details, and the entire gamut of law enforcement activities can be managed through ICS's implementation and use.

Louisiana Department of Social Services (DSS)

Mission

The mission of the Department of Social Service (DSS) is to strengthen the State by helping individuals, children, and families achieve safer and more independent lives through integrated quality services and partnerships in an environment of opportunity and accountability.

Activities/Programs

The DSS sponsors an Individual and Family Grant Program that provides funds to disaster victims to assist them in meeting disaster-related expenses for which assistance from other means is either insufficient or unavailable. The department also administers the Disaster Supplemental Nutrition Program (DSNAP) –which assists persons / families affected by a storm with nutritional assistance purchasing (formerly known as the Disaster Food Stamp Program DFSP).

The Division of Information Services provides computer services to all offices within the DSS, as well as computer services for the Department of Health and Hospitals.

Personnel

DSS employs 4,923 individuals. Four staff members are available to perform mitigation related activities, and four have regular job duties related to hazard mitigation, and focus on ESF 6 activities (Emergency Preparedness).

Interactions with Other Entities

As of 2010, DSS regularly works with the following agencies to achieve common mitigation goals:

- Department of Agriculture and Forestry
- Department of Corrections
- Department of Education
- Department of Health and Hospitals
- Department of Labor
- Department of Public Safety
- Department of Transportation and Development
- Department of Wildlife and Fisheries
- Homeland Security and Emergency Preparedness
- Louisiana National Guard
- Louisiana State Police
- Office of Public Health

Louisiana Floodplain Management Association

Activities/Programs

The Association maintains a consumer flood management website providing preparedness and recovery-related information regarding flood-proofing for home and business owners.

Information is available at: http://www.louisianafloods.org/Professionals/LFMA/default.asp

Louisiana National Guard

Mission

The Louisiana National Guard's Federal mission is to provide trained and ready soldiers, airmen, and units for deployment in support of national military objectives as designated by the President of the United States. The Guard's State mission is to preserve and protect life, property, peace, order, and public safety under State authority and as directed by the Governor of Louisiana. At the community level, the Guard's mission is to focus initiatives to enhance community relationships and provide mutually beneficial support.

Activities/Programs

All hazard mitigation projects involving the Louisiana National Guard are initiated by GOHSEP.

Louisiana Recovery Authority (LRA)

Mission

The Louisiana Recovery Authority is the planning and coordinating body that was created in the aftermath of Hurricanes Katrina and Rita by Governor Blanco to plan for the recovery and rebuilding of Louisiana. The authority works to plan for Louisiana's future, coordinate across jurisdictions, support community recovery and resurgence, and ensure integrity and effectiveness. Working in collaboration with local, state and federal agencies, the authority also addresses short-term recovery needs while simultaneously guiding the long-term planning process.

Activities/Programs

The primary hazard mitigation programs and projects involving LRA include HMGP grants and the HMGP-funded components of the Road Home program, as well as mitigation-related parish and other recovery projects funded through CDBG.

LRA sets policy and oversees administration of recovery funding specific *only* to Disaster Declarations 1603 and 1607—hurricanes Katrina and Rita, respectively. In January 2008, LRA began overseeing administration of the funds in its programs; prior to this date, LRA only set policy for the funds.

LSU Hurricane Center

Mission

The mission of the LSU Hurricane Center is to advance the state-of-knowledge of hurricanes and their impacts on the natural, built, and human environments and to assist the State, the nation, and the world in solving hurricane-related problems.

Activities/Programs

The Hurricane Center has ongoing research programs concerning hurricane frequency and intensity, modeling (storms, storm surge, evacuation traffic patterns, HAZMAT incidents due to extreme weather, etc.), hurricane impacts on natural systems, hurricane impacts on the built environment (infrastructure, petroleum/chemical facilities, building stock, and levees), hurricane impacts on the human health and socio-economic systems, numerous facets of preparedness, real-time data (weather, flood, traffic, etc.), and development of hurricane curricula for undergraduates and graduate students.

Specific to mitigation, the Hurricane Center conducts research and work on comprehensive community planning to reduce hurricane and flood damage and to assist communities in recovery, floodplain management, coastal protection and restoration measures, design of wind resistant landscape, design of wind and flood resistant hurricane shelters, and preparing historic buildings for hurricanes.

University of New Orleans – Center for Hazards Assessment, Response, and Technology (CHART)

Mission

The focus of CHART is to support Louisiana community sustainability in light of natural, technological, environmental, and terrorist risks to which the region is vulnerable. The center undertakes applied social science research to understand ways in which Louisiana communities and the coastal region respond to these risks, assists in the development of best practices for reducing risks, and helps in implementing these practices to achieve comprehensive community sustainability. The second focus of CHART is the reverse dynamic, the social, political, and economic impacts of community activity, on the ecosystems within the coastal and southeast region of the State.

Activities/Programs

CHART researches a number of issues pertinent to hurricanes and preparedness, including evacuation, social impacts of certain preparedness measures, and issues related to low-income populations. Specific to mitigation, CHART has been engaged in a project on mapping repetitive flood loss properties in Southeast Louisiana, and is now developing strategies to mitigate such losses through individual and local area measures.

Appendix G.4:
Regional Hazard Mitigation Capabilities Survey

Below is the survey instrument used to administer the Regional Hazard Mitigation Capabilities Survey. The methodology for this survey is discussed in Section Seven.

A. GOHSEP Regional Coordinator and Staff/Tech Capability

1. What is your position or title?

2. How long have you held this position?

3. Describe the educational degrees, professional certifications and/or professional experience that are most relevant in your current role?

4. Please describe your job responsibilities:

5. Do you have any job responsibilities that relate to hazard mitigation? If so, pls. describe.

   Y ___ N ___

6. Do you oversee any staff? (if "yes," ask follow-ups and questions 7 and 8; if "no," skip to question 9)

   Y ___ N ___

   a. Full-time:

   b. Part-time:

c. Contractor or student worker:

d. Volunteer:

7. How many of the staff whom you oversee work directly in hazard mitigation?
   a. Full-time:

   b. Part-time:

   c. Contractor or student worker:

   d. Volunteer:

8. How many of your hazard mitigation staff have training or expertise directly relevant to hazard mitigation?

9. Does your office have GIS capability? (if "yes," ask follow-ups below)

   Y ___ N ___

   f. How many staff are devoted to operating and maintaining the GIS?

   g. What is your budget for GIS staff and technology?

   h. What hazard-mitigation purposes, specifically, are the GIS data used for?

   i. With what other GIS databases/sources is your data coordinated?

10. Would your office be interested, willing, and/or able to take on a greater hazard mitigation role? Pls. explain/discuss your response.

    Y ___ N ___

B. Interagency and Intergovernmental Coordination

11. Please describe and—if applicable—identify problems among the following organizational relationships (this should not be limited to hazard mitigation):

    a. Your office and the parish OHS/EP offices

    b. Your office and your regional director's office

    c. Your office and the state GOHSEP office

    d. The parish OHS/EP offices and the state GOHSEP office

12. Do the parishes you coordinate face hazards that cross jurisdictional boundaries (for example: flooding)? (if "yes," ask follow-ups)

    Y ___ N ___

    a. Please describe any inter-governmental cooperation for emergency management, disaster recovery or hazard mitigation in the parishes you coordinate.

    b. Could existing inter-governmental cooperation be improved? How so?

13. Please list any neighboring GOHSEP regional coordination offices that your office coordinates with for emergency management, disaster recovery or hazard mitigation.

14. Please list any other regional agencies that your office coordinates with for emergency management, disaster recovery or hazard mitigation (for example: regional planning commissions or regional offices of state agencies)

15. Please list any state agencies (other than GOHSEP) that that your office coordinates with for emergency management, disaster recovery or hazard mitigation.

16. Of all the partners you listed above, which are the most valuable relationships for emergency management, disaster recovery or hazard mitigation?

17. Are there any potential partners that you do not currently work with that you believe might be useful for emergency management, disaster recovery or hazard mitigation?

18. Please list any specific instances in your region (or between your region and others) in which jurisdictional boundaries create duplication of services or hamper effective hazard mitigation. Please explain/discuss.

19. Please list any specific instances in your region (or between your region and others) in which agency missions or "turf" issues create duplication of services or otherwise hamper effective hazard mitigation. Please explain/discuss.

20. Please describe any opportunities you see for reorganizing, consolidating, or otherwise realigning hazard mitigation and emergency operations in order to achieve better outcomes. (These might include, for example: multi-parish emergency operations, regional hazard mitigation planning, or state-coordinated data management and risk assessment.)

C. Local Hazard Mitigation Planning, Implementation and Regulatory Effectiveness

21. Are you familiar with Parish Hazard Mitigation Plans? (if "yes," ask next question)

    Y ___ N ___ Barely (i.e., aware of what it is, but not how its used) ___

22. On a scale of 1 to 5, how effectively do the parishes you coordinate administer their Hazard Mitigation Plans in order to achieve effective hazard mitigation? Please explain/discuss and note any variations between the different parishes.

    1 __ 2 __ 3 __ 4 __ 5 __ don't know __

23. Are you familiar with the state Uniform Construction Code (UCC)? (if "yes," ask next question)

    Y ___ N ___ Barely (i.e., aware of what it is, but not how its used) ___

24. On a scale of 1 to 5, how effectively do the parishes you coordinate administer and enforce the Uniform Construction Code in order to achieve effective hazard mitigation? Please explain/discuss and note any variations between the different parishes.

    1 __ 2 __ 3 __ 4 __ 5 __ don't know __

25. Are you familiar with Floodplain Management and NFIP programs? (if "yes," ask next question)

    Y ___ N ___ Barely (i.e., aware of what it is, but not how its used) ___

26. On a scale of 1 to 5, how effectively do the parishes you coordinate administer and enforce their Floodplain Management programs in order to achieve effective hazard mitigation? Please explain/discuss and note any variations between the different parishes.

    1 __ 2 __ 3 __ 4 __ 5 __ don't know __

27. Are you familiar with local Comprehensive (or Master) Planning? (if "yes," ask next question) ("Master Planning" refers to planning for growth and land use planning, and is provides a framework for zoning, among other things.)

    Y ___ N ___ Barely (i.e., aware of what it is, but not how its used) ___

28. On a scale of 1 to 5, how effectively do the parishes you coordinate administer and enforce their comprehensive plans (Master Plans), zoning ordinances, subdivision ordinances, and other land-use and development ordinances in order to achieve effective hazard mitigation? Please explain/discuss and note any variations between the different parishes.

    1 __ 2 __ 3 __ 4 __ 5 __ don't know __

29. Are you familiar with hazard mitigation under the FEMA Public Assistance (PA) grant program (a/k/a Sec 406)? (if "yes," ask next question)

    Y ___ N ___ Barely (i.e., aware of what it is, but not how its used) ___

30. Please describe your involvement or familiarity with this program.

31. Are you familiar with the FEMA Hazard Mitigation Grant Program (HMGP) (a/k/a Sec 404)? (if "yes," ask next question)

    Y ___ N ___ Barely (i.e., aware of what it is, but not how its used) ___

32. Please describe your involvement or familiarity with this program.

33. Are you familiar with the FEMA Pre-Disaster Mitigation (PDM) grant program? (if "yes," ask next question)

    Y ___ N ___ Barely (i.e., aware of what it is, but not how its used) ___

34. Please describe your involvement or familiarity with this program.

35. Of the hazard mitigation programs, actions, and activities the parishes you oversee have participated in, which have been the most effective in reducing losses?

36. Of the hazard mitigation programs, actions, or activities parishes you oversee have participated in, which have been less effective at reducing losses in those parishes?

b. Why do you believe these programs have been less effective?

37. Based on the lessons you and the parishes you coordinate have learned with their emergency management and/or hazard mitigation programs, actions, or activities, what advice would you provide to other jurisdictions that may be considering implementing the same programs?

38. What types of mitigation programs, policies, or actions that are not currently being implemented in the parishes you coordinate do you believe would be successful in reducing losses if they were implemented?

39. Given the opportunity, what key changes would you make your region or in the parishes you coordinate in order to enhance hazard mitigation (for example: more staff, more budget, better GIS, better inter-governmental communication, etc.)?

D. Administering the Local Capability/Capacity Survey

40. Would you be interested and available to administer a survey similar to this one to the OHS/EP supervisors in the parishes you oversee? This would take place between now and the middle of November.
    Y ___ N ___

41. Why not?

42. Would you be interested in being informed of these interviews so that you could call in and listen?
    Y ___ N ___

43. Why not?

44. Do you have any other comments, questions or concerns regarding this survey or hazard mitigation?

45. Would you be interested in serving on the State Hazard Mitigation Plan Advisory Board?

Y ___ N ___

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Appendix G.5:
Regional Hazard Mitigation Capabilities Findings

Below are the complete results of the Regional Capability Assessment Survey. The methodology for this survey is discussed in Section Seven.

Table G.5-1: Complete Results of the Regional Capability Assessment Survey

2. How long have you held this position?	
Region 1	
Region 2	13 Months
Region 3	12 Months
Region 4	3 Months
Region 5	13 Months
Region 6	
Region 7	12 Months
Region 8	14 Months
Region 9	13 Months

3. Describe the educational degrees, professional certifications and/or professional experience that are most relevant in your current role?	
Region 1	
Region 2	25 military active duty/ intel, communications, management, leadership of military experience
Region 3	LEM certification
Region 4	Training Branch manager for GOHSEP, NIMS qualifications, Operational Office at GOHSEP, 15 years national guard
Region 5	LEPA certification; experience of management also helped
Region 6	
Region 7	BA in applied sc (not related), la EM cert (LEM), 4 yrs in Caddo/Bossier ofc of HS
Region 8	M criminal justice, numerous prof development courses, ICS 100, 200, 300, 400, 700, 800
Region 9	ICS 100, 200, 300, 400, 700, 800, FEMA Indep Study courses, Professional Development

4. Please describe your job responsibilities:	
Region 1	
Region 2	Emergency preparedness and helping my parish directors in my 8 parishes preparing for any incident-helping with grants
Region 3	Liaison between the state and the local parish—(6 parishes in region);Primary point of contact for GOHSEP Coordinate local meetings, collect and maintain critical operations, facilitate training, deploy in declared emergencies, assist state in anything else the state determines to be necessary
Region 4	Help coordinate the parishes with their training/planning; liaison between them and GOHSEP
Region 5	Coordination of 5 parishes; make sure there is a smooth transition between state, region, and parishes.

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 6	
Region 7	HS & EP sides: preparedness & training, grants, recovery, (damage assessment, PDAs, IA & PA, involved w/ JFO, liaison between state & local in response, use EMC tool for acquisition for locals
Region 8	Coord liaison with the 12 parish OEP directors that make up region 8 for issues dealing with preparing for a responding to all-hazard events
Region 9	Liaison between GOHSEP and region 9-work on grant issues, will begin working on hazard mit soon. Work on training/exercises

5. Do you have any job responsibilities that relate to hazard mitigation?			If so, please describe.
	Yes	No	
Region 1			
Region 2	x		Key node in regional coordination with communities
Region 3		X	Most of the hazard mitigation is handled with the local public works department, however it varies from parish to parish
Region 4		X	Parishes handle mitigation
Region 5	x		We deal with mitigation planning at the parish and region level. We deal with the HMGP.
Region 6			
Region 7		X	Involved in HM plan – coordinating plan writing; involved in HMGP (both in PREVIOUS role)
Region 8		X	
Region 9		X	

6. Do you oversee any staff?		
	Yes	No
Region 1		
Region 2		X
Region 3		X
Region 4		X
Region 5		X
Region 6		
Region 7		X
Region 8		X
Region 9		X

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

9. Does your office have GIS capability?			a. Staff to operate/ maintain GIS?	b. Budget for GIS staff and technology?	c. What hazard-mitigation purposes, is GIS used for?	d. With what other GIS is data coordinated?
	Yes	No				
Region 1						
Region 2	x		1	Regional support does, not myself specifically	We use it during real time incidents, flooding	
Region 3		x				
Region 4	x		The State maintains	Don't know	Haven't had to use it yet for those purposes.	
Region 5	x		1	We use the state resources—I don't have a budget for it—state does	Weather systems – get an idea of wind and water over certain areas when a hurricane comes in.	With the weather systems
Region 6						
Region 7		x				
Region 8		x				
Region 9		x				

10. Would your office be interested, willing, and/or able to take on a greater hazard mitigation role?			Pls. explain/discuss your response.
	Yes	No	
Region 1			
Region 2	x		No Response
Region 3	x		Interested depending on schedule
Region 4	x		All of the above
Region 5	x		Depends on funding
Region 6			
Region 7			
Region 8		X	Not without assistance
Region 9	x		No Response

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

11. describe these relation-ships:	a. Your office and the parish OHS/EP offices	b. Your office and your regional director's office
Region 1		
Region 2	No issues—we are very well received	No issues-great interaction with them
Region 3	We get along fine. We usually agree to disagree	It used to be better than what it is right now. Tense because of politics
Region 4	The relationships vary. Overall great coordination.	Excellent
Region 5	Are tasked to lead, though don't have authority. I am taking the heat from the locals for the state representing them	Good relationship—here to help each other
Region 6		
Region 7	Good; worked here already, either here or in other region parishes; I'm the liaison; if they have anything they need from GOHSEP they go thru me & vice versa. Talk w/ all parish directors on a weekly basis.	Same as above – see him on regular basis; good coordination.
Region 8	Communication, OEP are part time—their duties are not full time related to OEP	Don't know of any right now
Region 9	No Issues	No Issues

11. Describe these relation-ships:	c. Your office and the state GOHSEP office	d. The parish OHS/EP offices and the state GOHSEP office
Region 1		
Region 2	We work very well together from a team perspective	There are some scars from Katrina still, about the way they were treated.
Region 3	Fine	The parishes comply with what they are asked to comply with. I think they have a bad taste in their mouth for state GOHSEP because of previous Katrina emergency response
Region 4	Excellent	Good Relationship
Region 5	It is improving—depends on the day—get different people with different answers	Parishes are upset with the priorities of the State—put interviewee in bad spot.
Region 6		

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 7	Same thing – there once-3s/mo. Regional coord have staff mtgs, trainings (virtual la, net EOP, etc.) so they can train locals; PDA, IA, PA; field trainings; in constant contact; BB is constant/useful tool; situational awareness good; very functional	Direct relationship? Fairly decent. A lot of what's done goes through me, but RD is in direct contact w/ GOHSEP, same w/ other parishes. And vice versa. Not perfect, but familiarity is there.
Region 8	Communication-sometimes there is a lack of clear direction on what is expected on a particular project	Lack of knowledge on the GOHSEP part for exactly what goes on with the parish directors in my region because most of them are part time. There is a lack of knowledge on the part of the directors as to the need of information and requests that GOHSEPs make of the parish directors as to why information is needed etc.
Region 9	No Issues	State has been getting involved in local politics of the parishes and election and causing conflict, locals feel state is not customer service oriented. Feel like an outsider in the state EOC. Disconnect on communications (deadlines etc)

12. Do the parishes you coordinate face hazards that cross jurisdictional boundaries?			a. Please describe any inter-governmental cooperation for emergency management, disaster recovery or hazard mitigation in the parishes you coordinate.	b. Could existing inter-governmental cooperation be improved? How so?
	Yes	No		
Region 1				
Region 2	x		Mutual Aide Agreements, BRAMAS (working group for baton rouge and chemical facilities), also internal parish aide among districts	Will improve with regionalization
Region 3	x		We were the first region to have a regional mutual aide agreement with sheriff and OEP. Parish Rapid assessment team (PRAT) they pay for insurance and training and can cross jurisdictional boundaries. Region 1,3, 9 have a mutual compact as well—hurricane task force that meets quarterly	Governmental relationships between the local and GOHSEP will probably improve due to the election process this time around. Local politics cause an issue between local sheriffs and local OEP directors
Region 4	x		Mutual Aide Agreements	Yes, having someone in charge of and having the Mutual aide agreements available in one central location
Region 5	x		We have a robust system of mutual aide—they have monthly meetings	Could be better organized. Right now, much more between fire to fire, than parish to parish. We are working on that now.
Region 6				

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 7	x		Mutual aide, esp w/ Caddo-Bossier. Only 2-parish HS in state.	Always room for imp., better communication, etc.
Region 8	x		It certainly exists with the water covering many different parishes.	Always—communication—there is a disconnect when it comes to emergency management and parish governments
Region 9	x		Mutual aide agreements between parishes	There is always room for improvement

13. Please list any neighboring GOHSEP regional coordination offices that your office coordinates with for emergency management, disaster recovery or hazard mitigation.	
Region 1	
Region 2	Coordinate with all of them
Region 3	We meet once a month with all region, but my closest are region 1, 9, and 2
Region 4	Regions 5 and 6
Region 5	We are always talking to each other and comparing notes; An established set of goals would help us to coordinate—hard with different population sized regions
Region 6	
Region 7	None for Hazard Mitigation
Region 8	All of them, but the region 7 (west of me) and I talk quite frequently esp. regarding potential hazards. Also region 6 which does not have a coordinator right now.
Region 9	Regions 1, 2, 3, but I get help from all of the regional coordinator

14. Please list any other regional agencies that your office coordinates with for emergency management, disaster recovery or hazard mitigation (for example: regional planning commissions or regional offices of state agencies)	
Region 1	
Region 2	DHH, OPH, DEQ, state/local police, work with state planners
Region 3	Regional planning commission, DHH, we haven't had much success with DSS, DEQ, state police
Region 4	DHH, regional planning commission
Region 5	DHH, DSS
Region 6	
Region 7	Work w/ DHH/ OPH region 7, regional hospital, la 7 regional response, recom (regional communications), regional fire group (LFS); none for HM
Region 8	North Delta regional planning commission; regional office for DHH, regional office for DSS, regional DOTD, Red Cross, National Guard
Region 9	DSS, DHH, Southeast LA hurricane task force, dept of wildlife fisheries.

15. Please list any state agencies (other than GOHSEP) that that your office coordinates with for emergency management, disaster recovery or hazard mitigation.	
Region 1	
Region 2	DHH, OPH, DEQ, state/local police, work with state planners
Region 3	Regional planning commission, DHH, we haven't had much success with DSS, DEQ, state police

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 4	DHH, regional planning commission
Region 5	DHH, DSS—don't have a really positive relationship with them; Region and state police work well together
Region 6	
Region 7	DSS (sheltering), LFART (la animal response team); none for HM
Region 8	DHH, DSS, DOTD, National Guard
Region 9	DSS, DHH, Southeast LA hurricane task force, dept of wildlife fisheries.

16. Of all the partners you listed above, which are the most valuable relationships for emergency management, disaster recovery or hazard mitigation?	
Region 1	
Region 2	DHH and OPH
Region 3	DHH and state police
Region 4	Relationships with the parish directors
Region 5	State GOHSEP
Region 6	
Region 7	N/A HM planning/grants go thru FP admin & parish admin
Region 8	Depends on what the situation is as to which agency would be most beneficial
Region 9	Office of Public Health

17. Are there any other potential partners that you didn't mention that you believe might be useful for emergency management, disaster recovery or hazard mitigation?	
Region 1	
Region 2	Coast Guard
Region 3	Coast Guard
Region 4	None
Region 5	None
Region 6	
Region 7	Regional HM reps from GOHSEP; that kind of presence from whomever is administering HM in the area would be very beneficial … K/R related ("parish tour")
Region 8	FEMA, Fed HHS, FBI etc
Region 9	None

18. Please list any specific instances in your region (or between your region and others) in which jurisdictional boundaries create duplication of services or hamper effective hazard mitigation. Please explain/discuss.	
Region 1	
Region 2	None
Region 3	Can't think of any
Region 4	Yes, sometimes with occurs with lack of coordination
Region 5	None
Region 6	

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 7	Hard question. FP mgr/ parish admin knows better.
Region 8	Can't say
Region 9	Don't see much duplication of efforts

19. Please list any specific instances in your region (or between your region and others) in which agency missions or "turf" issues create duplication of services or otherwise hamper effective hazard mitigation. Please explain/discuss.	
Region 1	
Region 2	FEMA now has their own regional coordinators—bit of a crossover
Region 3	ESF was a turf issue for Katrina
Region 4	None
Region 5	Local agency turf issues, too many chiefs working on state emergencies—DHH DSS, GOHSEP fighting in emergency
Region 6	
Region 7	Hard question. FP mgr/ parish admin knows better.
Region 8	None
Region 9	None

20. Please describe any opportunities you see for reorganizing, consolidating, or otherwise realigning hazard mitigation and emergency operations in order to achieve better outcomes. (These might include, for example: multi-parish emergency operations, regional hazard mitigation planning, or state-coordinated data management and risk assessment.)	
Region 1	
Region 2	Multi-parish emergency operations, regional hazard mitigation planning, or state-coordinated data management and risk assessment.
Region 3	Not asked
Region 4	Not asked
Region 5	Need one head making the decisions in emergency declarations
Region 6	
Region 7	Hard to say. After plan was created/approved, I haven't had … haven't known what to do w/ it. Don't know what can be done to improve that or better coordinate it.
Region 8	Probably regional planning or haz mitigation project—talking in terms of flood mitigation primarily
Region 9	None

21. Are you familiar with Parish Hazard Mitigation Plans?		
	Yes	No
Region 1		
Region 2	x	
Region 3		X
Region 4	x	

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 5	x	
Region 6		
Region 7	x	
Region 8		X
Region 9	x	

22. On a scale of 1 to 5, how effectively do the parishes you coordinate administer their Hazard Mitigation Plans in order to achieve effective hazard mitigation? Please explain/discuss and note any variations between the different parishes.							Comments
	1	2	3	4	5	Don't know	
Region 1							
Region 2		x					
Region 3							aware they have them but have not reviewed them
Region 4		x					
Region 5	x						What they have written and what they do are two different things
Region 6							
Region 7						x	
Region 8						x	
Region 9				X			

23. Are you familiar with the state Uniform Construction Code (UCC)?			Comments
	Yes	No	
Region 1			
Region 2		x	
Region 3	X		
Region 4		x	
Region 5		x	Barely (i.e., aware of what it is, but not how its used)
Region 6			
Region 7		x	
Region 8		x	
Region 9		x	

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

24. On a scale of 1 to 5, how effectively do the parishes you coordinate administer and enforce the Uniform Construction Code in order to achieve effective hazard mitigation? Please explain/discuss and note any variations between the different parishes.							Comments
	1	2	3	4	5	Don't know	
Region 1							
Region 2						x	
Region 3			x				
Region 4						x	
Region 5			x				Better everyday—questions arise everyday and it takes so long to get answers people are really waiting to build
Region 6							
Region 7						x	
Region 8						x	
Region 9						x	

25. Are you familiar with Floodplain Management and NFIP programs?			Comments
	Yes	No	
Region 1			
Region 2	x		
Region 3	x		
Region 4	x		
Region 5		X	Barely (i.e., aware of what it is, but not how its used)
Region 6			
Region 7		X	
Region 8		X	
Region 9	x		

26. On a scale of 1 to 5, how effectively do the parishes you coordinate administer and enforce their Floodplain Management programs in order to achieve effective hazard mitigation? Please explain/discuss and note any variations between the different parishes.							Comments
	1	2	3	4	5	Don't know	
Region 1							

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 2		x					
Region 3			x				
Region 4						x	
Region 5						x	
Region 6							
Region 7						x	
Region 8						x	
Region 9						x	

27. Are you familiar with local Comprehensive (or Master) Planning? ("Master Planning" refers to planning for growth and land use planning, and is provides a framework for zoning, among other things.)			Comments
	Yes	No	
Region 1			
Region 2		X	
Region 3	x		
Region 4		X	
Region 5		X	(i.e., aware of what it is, but not how its used)
Region 6			
Region 7		X	
Region 8		X	
Region 9		X	

28. On a scale of 1 to 5, how effectively do the parishes you coordinate administer and enforce their comprehensive plans (Master Plans), zoning ordinances, subdivision ordinances, and other land-use and development ordinances in order to achieve effective hazard mitigation? Please explain/discuss and note any variations between the different parishes.							Comments
	1	2	3	4	5	Don't know	
Region 1						x	
Region 2							
Region 3			x	X			4 in some, 3 in others
Region 4						x	
Region 5						x	
Region 6							

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 7						x	
Region 8						x	
Region 9						x	

29. Are you familiar with hazard mitigation under the FEMA Public Assistance (PA) grant program (a/k/a Sec 406)?			Comments
	Yes	No	
Region 1			
Region 2	x		
Region 3	x		
Region 4	x		
Region 5	x		(i.e., aware of what it is, but not how its used)
Region 6			
Region 7		X	
Region 8	x		
Region 9	x		

30. Pls. describe your involvement or familiarity with this program.	
Region 1	
Region 2	Conducted PDA in my regional parishes
Region 3	Some of the parishes have submitted applications for it, but I don't know the specifics of the program necessarily
Region 4	Vaguely familiar
Region 5	Know how it works
Region 6	
Region 7	Am familiar w/ PA for 1603
Region 8	Aware of the basics of it
Region 9	I was the head of PA for 2 disasters for the state.

31. Are you familiar with the FEMA Hazard Mitigation Grant Program (HMGP) (a/k/a Sec 404)?			comments
	Yes	No	
Region 1			
Region 2	X		
Region 3	X		
Region 4	X		
Region 5	X		(i.e., aware of what it is, but not how its used)

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 6			
Region 7	X		
Region 8	X		
Region 9	X		

32. Pls. describe your involvement or familiarity with this program.	
Region 1	
Region 2	Familiar with it on a basic level
Region 3	Same as above (question 30), an overview knowledge—we don't get hands on with it.
Region 4	Direct knowledge, worked with the program
Region 5	I have a working knowledge
Region 6	
Region 7	Coordinating agency; brought right agency to the table (in prev job); as RC haven't done it; haven't had any disasters in our area
Region 8	Aware of it yes, basic info but that's about it
Region 9	Assisting parishes

33. Are you familiar with the FEMA Pre-Disaster Mitigation (PDM) grant program?			comments
	Yes	No	
Region 1			
Region 2		X	
Region 3		X	
Region 4		X	
Region 5	X		Barely (i.e., aware of what it is, but not how its used)
Region 6			
Region 7		X	
Region 8		Not asked	
Region 9	X		

34. Pls. describe your involvement or familiarity with this program.	
Region 1	
Region 2	N/A
Region 3	N/A
Region 4	N/A
Region 5	Know of it and how it works
Region 6	
Region 7	Briefed on it, never seen it working

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 8	Not asked
Region 9	Assisting parishes

35. Of the hazard mitigation programs, actions, and activities the parishes you oversee have participated in, which have been the most effective in reducing losses?	
Region 1	
Region 2	They are all factors that lead to a coordinated effort. Need to know what is in harms way to begin with.
Region 3	Elevations
Region 4	HMGP
Region 5	Not asked
Region 6	
Region 7	Don't know for fact, but from speaking w/ admin in Caddo, FP has been very effective; don't know about other parishes
Region 8	Not asked
Region 9	Varied depending on circumstances depending on environment – all effective in own ways

36. Of the hazard mitigation programs, actions, or activities parishes you oversee have participated in, which have been less effective at reducing losses in those parishes?		a. Why do you believe these programs have been less effective?
Region 1		
Region 2	None	
Region 3	Buyouts	They buy them out and then turn right back around and buy in the same area
Region 4	None	
Region 5	Not asked	
Region 6		
Region 7	Don't know	
Region 8	Not asked	
Region 9	Can't answer	

37. Based on the lessons you and the parishes you coordinate have learned with their emergency management and/or hazard mitigation programs, actions, or activities, what advice would you provide to other jurisdictions that may be considering implementing the same programs?	
Region 1	
Region 2	Accurate evaluation and assessments of potential incidents in necessary
Region 3	Not asked
Region 4	Not asked
Region 5	Not asked
Region 6	

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 7	Not asked
Region 8	Not asked
Region 9	Not asked

38. What types of mitigation programs, policies, or actions that are not currently being implemented in the parishes you coordinate do you believe would be successful in reducing losses if they were implemented?	
Region 1	
Region 2	Initial steps are critical and I don't think they are being done as much as they should be in my parishes
Region 3	Not asked
Region 4	Not asked
Region 5	Not asked
Region 6	
Region 7	Not asked
Region 8	Not asked
Region 9	Not asked

39. Given the opportunity, what key changes would you make your region or in the parishes you coordinate in order to enhance hazard mitigation (for example: more staff, more budget, better GIS, better inter-governmental communication, etc.)	
Region 1	
Region 2	Need to hire full time directors in the parishes
Region 3	Not asked
Region 4	Not asked
Region 5	Not asked
Region 6	
Region 7	Not asked
Region 8	Not asked
Region 9	Not asked

40. Do you feel sufficiently familiar with this subject matter to administer a survey similar to this one to the OHS/EP supervisors in the parishes you oversee?			Comments
	Yes	No	
Region 1			
Region 2	x		
Region 3		X	
Region 4	x		
Region 5		X	Would do intros
Region 6			

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

Region 7	x		
Region 8		X	
Region 9	x		

40b. Would you be interested and available to administer such a survey? This would take place between now and the middle of November.		
	Yes	No
Region 1		
Region 2		X
Region 3		X
Region 4	X	
Region 5		
Region 6		
Region 7	X	
Region 8		X
Region 9	X	

41. Why not?	
Region 1	
Region 2	To much to do
Region 3	Not asked
Region 4	N/A
Region 5	N/A
Region 6	
Region 7	N/A
Region 8	Not asked
Region 9	N/A

42. Would you be interested in being informed of these interviews so that you could call in and listen?		
	Yes	No
Region 1		
Region 2	x	
Region 3	x	
Region 4	N/A	
Region 5	x	
Region 6		
Region 7	N/A	
Region 8	x	
Region 9	N/A	

Table G.5-1: Complete Results of the Regional Capability Assessment Survey (continued)

44. Do you have any other comments, questions or concerns regarding this survey or hazard mitigation?	
Region 1	
Region 2	No
Region 3	Are you planning on calling all or some
Region 4	No
Region 5	None
Region 6	
Region 7	What is going to be the result of these surveys?
Region 8	Not of this survey—would love to learn more about hazard mitigation
Region 9	None

45. Would you be interested in serving on the State Hazard Mitigation Plan Advisory Board?		
	Yes	No
Region 1		
Region 2		X
Region 3	X	
Region 4	X	
Region 5	X	
Region 6		
Region 7	Not asked	
Region 8	X	
Region 9	X	

Table G.5-1: Complete Results of the Regional Capability Assessment Survey Supplemental Questionnaire

1. When considering ways to improve Hazard Mitigation planning and implementation in Louisiana, what can be done to improve coordination between the State and Parishes and Municipalities from a Regional Coordinator's perspective?	
Region 1	N/A
Region 2	Recurrent training – possibly by region for OEP Directors, their staff as well as for GOHSEP employees, specifically Regional Coordinators. It would be greatly beneficial for Regional Support to spend extra training time with Haz Mit staff. Offer training periodically throughout the year.
Region 3	I think Hazard Mitigation needs to provide more technical assistance to the Parishes/Municipalities. They have limited staff and knowledge on completion on documents that are required to meet compliance.
Region 4	Having all personnel properly trained and informed of the HM planning and implementation process.
Region 5	Teach prior two. Learning the how to's as you go along is both time consuming & exhausting. A good example is the reimbursement process. Parish do everything they think is right only to find out that

	did something wrong in ordering the work. Either get the required documents or get no reimbursement. It can go on for long time trying to get monies back. Turns off the parish to do additional projects
Region 6	Mandatory training for new OEP Directors and Coordinators shortly after he or she takes the position. Possible training with an overview of Hazard Mitigation yearly for each region.
Region 7	Continuing communications and coordination including regional coordinators as we have regular contact with the locals. It is important to keep all relevant parties "in the loop" to ensure that important information is shared in order to improve Hazard Mitigation planning and grant implementation
Region 8	HazMit planning and implementation is "run" through the Parish OEP. Most Parish OEP Directors have little or no knowledge of the programs and most do not wish to obtain that knowledge. Most Directors look at HazMit as something that should be handled by the parish/city engineers and not by the OEP. Remove OEP Directors from the process and have HazMit run through another department of the parish/city.
Region 9	N/A In some parishes mitigation is not handled through OEPs so they are not aware of how vital this program is to their parishes nor do they understand the connection between how one can directly affect the other i.e. if we mitigate from Katrina chances are we will not have that damage when another storm comes

2. If training was available that would give you additional knowledge with the policies and guidelines of the Hazard Mitigation Grant Program and ultimately increase your purview in this area, would you be interested in receiving such training?

	Yes	No
Region 1		
Region 2	X	
Region 3	X	
Region 4	X	
Region 5		X
Region 6	X	
Region 7	X	
Region 8	X	
Region 9	X	

3. What can be done to strengthen the OHS/EP directors and/other Parish officials relationship with Regional Coordinators when it comes to Hazard Mitigation Planning and Project Implementation?	
Region 1	
Region 2	Regional Coordinators must be trained and well versed regarding Hazard Mitigation Planning and Projects. Many Directors prefer to have the RC directly involved in all aspects of their parishes because of the relationships that have been developed. RC must be knowledgeable of basic information and best practices to identify needs of the Parish as well as keep GOHSEP informed of potential issues. Even if RC only coordinates meetings, etc., the RC is always heavily involved in all aspects mostly due to request of the Director. Adequate training and communication could offer some resolution.
Region 3	Include RCs in the loop on meetings/projects etc
Region 4	Having the Regional Coordinators aware of when any HM personnel are in the area meeting with any parish officials. Once again offering training to the RCs.
Region 5	Relationship with OHS/EP directors and Regional Coordinators are currently outstanding. Areas that need to increase are with parish and city leaders that actually build and process applications. This is the group that has been driven down over the years and State level creditability is at a all time low. Must start rebuilding creditability between HM Parish Personnel and State level HM.
Region 6	Knowledge would strengthen the relationship between Directors and Coordinators. Some Directors have limited knowledge concerning HMGP and do not want to work with the state directly; therefore they turn to their Regional Coordinators. However, if the Regional Coordinators are not trained, they are not considered an asset to the Director.
Region 7	Same as #1…keeping lines of communication open and all involved parties up-to-date with pertinent information
Region 8	The relationship between Parish Directors and Regional Coordinators is not the issue. That relationship has been built over several years and continues to grow. As a general rule, in Region 8 most OEP Directors have a rough understanding of Hazard Mitigation but do not have any interest in furthering that knowledge. Most Directors see Hazard Mitigation as a function of engineer's not emergency management.
Region 9	I think just letting us know about meetings and status already has helped, it lets the directors know this is something we are aware of projects and / or problems and maybe getting them (OEPs) a status report could; also posted process and procedures regardless of personnel; not a user friendly process and then folks change so just need consistency

4. What issues seem to be common when communicating with other Regional Coordinators regarding Hazard Mitigation?	
Region 1	
Region 2	None as of this date.
Region 3	RCs not involved in the process/procedures. This is in part due to the fact RCs have direct interaction with OEP Directors and not all OEPs handle the hazard mitigation projects.
Region 4	No communication of when HM personnel are in the area meeting with parish officials. No formal type training plan for RCs.
Region 5	The same, redo's of both the application and reimbursement application due to poor communication and assumptions
Region 6	n/a (as of yet!)
Region 7	No issues communicating with other regional coordinators

Region 8	Most OEP Directors do not want to have anything to do with hazard mitigation. Some of that is due to a lack of knowledge of the various programs.
Region 9	Information flow

5. What problems/issues have you experienced when working with other State/Public entities related to Hazard Mitigation?	
Region 1	
Region 2	None as of this date.
Region 3	Have not been involved enough to answer this question.
Region 4	OEP Directors unaware of when HM personnel are meeting with public officials in their own parishes. Just as awareness.
Region 5	Turn over rate. Too many various people to work with within one parish not to mention a whole region. Process are not standard, learn as you go.
Region 6	N/A
Region 7	One of the problems is getting all of the right people educated. Parish OHSEPs experience this problem as well in that it is difficult to get the right local officials (especially elected officials, when needed) to attend planning and training outreach. Mostly they will send representatives who may or may not be the one who would actually be involved in the work. This is not a problem in every parish, it has just been expressed by a few directors.
Region 8	Lack of understanding, lack of knowledge, and overall apathy for the paperwork required.
Region 9	Eligibility, duplication of benefits

6. What can be done to make the Regional Coordinator's responsibilities and duties focus more on Hazard Mitigation?	
Region 1	
Region 2	Consistent Meetings held with Haz Mit to keep information flowing so that RC is kept current with Parish Projects, issues, needs, etc.
Region 3	Education and inclusion in the discussion/projects with the Parish Governments
Region 4	I am sure if we are trained in HM, we will be able to assist our parishes more, just as a POC for HM.
Region 5	Executive and Section Chief question.
Region 6	If my parishes had projects open in Hazard Mitigation, however the majority of my parishes are not currently utilizing HMGP funds
Region 7	Clearly defined goals and objectives and the ability to apply relevance to the needs of a specific parish or municipality on a consistent basis.
Region 8	Regional Coordinators (RC) work every aspect of emergency management and numerous aspects of homeland security. As such, beyond a working knowledge, it would be difficult if not almost impossible to increase a RC responsibilities in just one area. RCs are already tasked by every section of GOHSEP from preparedness to response to recovery and mitigation.
Region 9	Allow us to communicate freely with the Haz Mit section of GOHSEP then they can communicate more freely with FEMA

7. How can GOHSEP do more to assist in the overall operational success of the Regional Coordinators as it relates to Hazard Mitigation?	
Region 1	
Region 2	Training.
Region 3	I think the Educate to Mitigate program will be a great learning tool for us.
Region 4	Training and involvement with HM
Region 5	Define where operational processes stop and where recovery operations begin. There is overlap and these phase need to be considered in the definition. Operations should remain in charge of all HM processes until a clear and defined hand off has taken place, both at parish and state level.
Region 6	Allow for and provide training.
Region 7	Consistency in establishing and maintaining credibility. Every training must be relevant to the audience and time-efficient. Grant practices must be consistently on-time and efficiently processed in a professional manner.
Region 8	Continue to educate the OEP Directors and public officials to the need and benefits of hazard mitigation
Region 9	Allow us to communicate freely with the Haz Mit section of GOHSEP then they can communicate more freely with FEMA

8. Based on your experience what percentage of your time is spent in assisting with work related to Hazard Mitigation?	
Region 1	
Region 2	Have been involved in very few meetings up to this point.
Region 3	5%.
Region 4	Varies with incidents 5%-15%
Region 5	15-20 %
Region 6	I have only attended one meeting concerning Hazard Mitigation. Essentially 1% or less
Region 7	Approx 15%
Region 8	That is difficult to determine. Immediately following a declared disaster as much as 50% or more. On a "normal" time frame 10% to 20%
Region 9	2- 5%

9. Do you feel that knowledge of floodplain management would assist you in your Hazard Mitigation duties as a Regional Coordinator?			
	Yes	No	Maybe
Region 1			
Region 2	X		
Region 3		X	
Region 4	X		

Region 5	X		
Region 6	X		
Region 7	X		
Region 8	X		X
Region 9	X	X	

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Appendix G.6
Local Hazard Mitigation Capabilities Survey

Below is the complete survey instrument used in the Local Capability Assessment Survey. The methodology for this survey is discussed in Section Seven.

A. Local Capability/Capacity

1. What is your position or title?

2. How long have you held this job?

3. Did you participate in a similar survey for the 2005 State Hazard Mitigation Plan?

   Y ___ N ___ don't remember ___

4. Describe the educational degrees, professional certifications and/or professional experience that are most relevant in your current role?

5. How many staff do you directly oversee? *['05Q2]*
   a. Full-time:

   b. Part-time:

   c. Contractor or student worker:

   d. Volunteer:

6. How many of the staff whom you oversee work directly in hazard mitigation? *['05Q3]*
   a. Full-time:

   b. Part-time:

   c. Contractor or student worker:

d. Volunteer:

7. How many of your hazard mitigation staff have training or expertise directly relevant to hazard mitigation?

8. How many staff in other departments/agencies/offices also work in a hazard-mitigation capacity? (if the answer is "more than zero," ask the follow-ups below)

a. In what department(s), agency(ies), or office(s) are they located?

b. Do you have a formal communication structure for interacting with these staff? Please describe or explain.

Y ___ N ___

9. Does your office have access to GIS data? (if "yes," ask follow-ups below; if "no" skip to question 12) *['05Q4]*

a. What GIS data or layers does your office use?

b. What hazard-mitigation purposes, specifically, are the GIS data used for?

c. With what other GIS databases/sources is this data coordinated?

10. Do you house GIS in your office? (if "yes," ask the follow-ups below and omit question 10; if "no" omit follow-ups below and ask question 11)

a. How many staff are devoted to operating, updating and maintaining the GIS?

b. What is your budget for GIS staff and technology?

11. Please list any other locations that house GIS data that you use (for example: a local planning and zoning department, area university, state agency, etc.)?

12. in your opinion, where would GIS data ideally be maintained and distributed from? (I'm going to read five possible choices – you choose one.)
    - ___ Your office
    - ___ A parish office or clearinghouse
    - ___ A regional office or clearinghouse
    - ___ A state agency or clearinghouse
    - ___ A university or non-profit office or clearinghouse

B. Interagency and Intergovernmental Coordination

13. Please list other local offices/agencies that your office coordinates with in order to plan and/or implement hazard mitigation (for example, the office of emergency preparedness, the department of public works, the planning and zoning commission, etc.)

14. Please list any neighboring jurisdictions that your office coordinates with in order to plan and/or implement hazard mitigation.

15. Please list any regional agencies that your office coordinates with in order to plan and/or implement hazard mitigation (for example, GOHSEP regional coordinators, regional planning commissions, etc.)

16. Please list any state agencies (other than GOHSEP) that that your office coordinates with in order to plan and/or implement hazard mitigation.

17. Of all the partners you listed above, which are the most valuable relationships in terms of effective hazard mitigation?

18. What other potential partners do you believe might be useful in helping your parish effectively mitigate hazard? (We're looking for groups with whom you do not currently work.)

C. Hazard Mitigation Planning, Implementation and Regulatory Capability/Capacity

19. Does your parish have a FEMA-approved Hazard Mitigation Plan?

    Y ___ N ___ don't know ___

20. For future hazard mitigation planning, would you prefer to have the state provide standard definitions of various hazards? (for example, defining "ice storm" vs "winter storm" vs "blizzard" vs "sleet" vs "hail")

    Y ___ N ___ unfamiliar with the issue ___

21. For future hazard mitigation planning, would you prefer to have the state provide standard risk assessment methodologies? (for example, a method for objectively assessing the level of risk posed by flood, or a method for determining whether a higher risk is posed by flood or by ice storms)

    Y ___ N ___ unfamiliar with the issue ___

22. Is your parish enforcing the Uniform Construction Code? (if "yes," ask the follow-ups below) *['05Q7]*

    Y ___ N ___ don't know ___

    a. How many UCC-trained inspectors do you employ?

b. If you share UCC-trained inspectors with other parishes, which parishes are they?

c. About how many building permits (for new construction) are pulled annually in your parish?

23. What department or agency administers floodplain management in your parish?

24. Does your parish have a comprehensive plan (or Master Plan)? (if "yes," ask the follow-ups below)

Y ___ N ___ don't know ___

a. Is hazard mitigation explicitly addressed in the plan? (if "yes," ask next question)

Y ___ N ___ don't know ___

b. Please explain how this is accomplished in the plan.

25. Does your parish have a zoning ordinance? (if "yes," ask the follow-ups below)

a. Is hazard mitigation explicitly regulated by your zoning code (for example, the presence of a coastal conservation zone)? (if "yes," ask next question)

Y ___ N ___ don't know ___

b. Please explain how this is accomplished in the ordinance.

26. Does your parish have a subdivision ordinance? (if "yes," ask the follow-ups below)

Y ___ N ___ don't know ___

a. Is hazard mitigation explicitly considered in your subdivision permitting process? (if "yes," ask next question)

Y ___ N ___ don't know ___

b. Please explain how this is accomplished in the ordinance.

27. Please list any other plans or land development regulations in your parish that are intended to manage risk or mitigate hazard (for example: a watershed management plan or a floodplain plan; a floodplain development regulations or mandatory set-backs from certain water bodies; etc.). *['05Q7]*

28. Please list any plans or regulations that are applicable to your parish that may (unintentionally) hinder hazard mitigation efforts (for example: historic preservation regulations, development incentives that may encourage building in floodplains, etc.).

29. Of the mitigation programs, actions, and activities your parish has participated in, which have been the most effective in reducing losses in your parish? *['05Q8]*

30. Of the programs, actions, or activities your parish has participated in, which have been less effective than others at reducing losses in your parish? *['05Q9]*

a. Why do you believe these programs have been less effective? *['05Q10]*

31. Based on the lessons you and your parish have learned with these hazard mitigation programs, actions, or activities, what advice would you provide to other jurisdictions that may be considering implementing the same programs? *['05Q11]*

32. What types of mitigation programs, policies, or actions that are not currently being implemented in your parish do you believe would be successful in reducing losses if they were implemented? *['05Q12]*

33. Do you have any other comments, questions or concerns regarding this survey or hazard mitigation? *['05Q13]*

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Appendix G.7:
Local Jurisdiction Capabilities Findings

Below are the complete findings of the Local Capabilities Assessment Survey. The methodology of this survey is discussed in Section Seven of the Plan Update. The response rate was too low to conduct any comparative analysis of local hazard mitigation capability at the regional level. Some regional analysis, now dated, is available in Appendix G of the April 2005 Plan, along with additional detail regarding mitigation activities on a parish-by-parish basis.

Table G.7-1: Survey Respondents' GOHSEP Region (where applicable; EOPs only)

Acadia	OEP	4
Avoyelles	OEP	6
Beauregard	OEP	5
Bienville	OEP	7
Caddo	FPM	
Caddo/Bossier	OEP	7
Calcasieu	OEP	5
Calcasieu	BO	
Claiborne	OEP	7
DeSoto	OEP	7
DeSoto	FPM	
Jefferson	FPM	
LaSalle	OEP	6
Lincoln	OEP	8
New Iberia (city)	BO	
Red River	OEP	7
St. Helena	OEP	9
St. James	OEP	2
St. James	BO	
St. Landry	OEP	4
St. Martin	OEP	4
St. Tammany	FPM	
Tangipahoa	FPM	
Tensas	OEP	8
Terrebonne	BO	
Thibodaux (city)	BO	
Washington	OEP	9
Webster	OEP	7

Map G.7-1 Louisiana/GOHSEP Emergency Management Regions

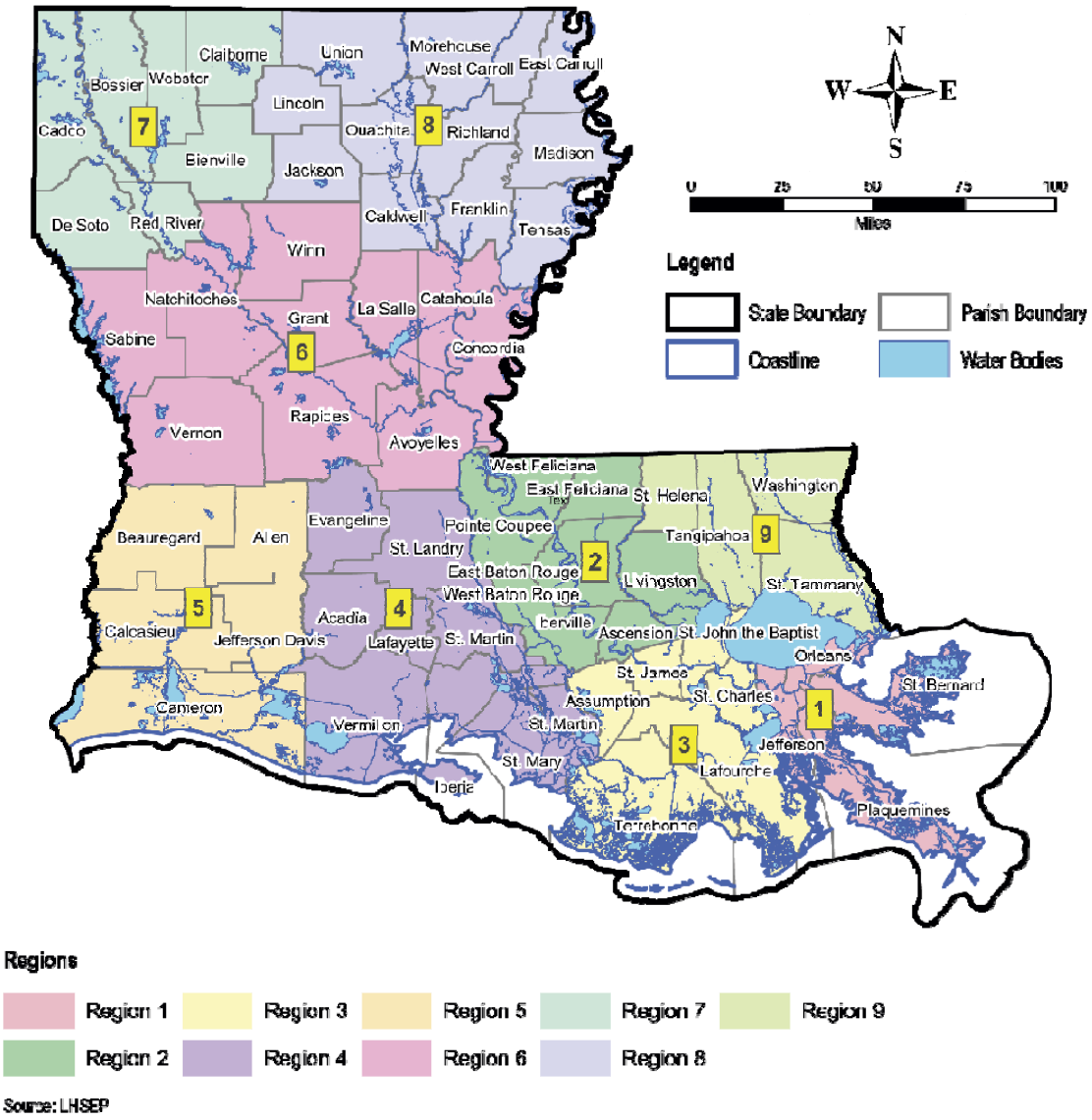

Table G.7-2: Complete Results of the Local Capability Assessment Survey

2. How long have you held this job? (years)			OEP	FPM	BO
Acadia	OEP	2.5	2.5		
Avoyelles	OEP	0.6	0.6		
Beauregard	OEP	20.0	20		
Bienville	OEP	8.0	8		
Caddo	FPM	8.0		8	
Caddo/Bossier	OEP	6.0	6		
Calcasieu	OEP	12.0	12		
Calcasieu	BO	0.9			0.9
Claiborne	OEP	4.0	4		
DeSoto	OEP	7.0	7		
DeSoto	FPM	5.5		5.5	
Jefferson	FPM	7.0		7	
LaSalle	OEP	15.0	15		
Lincoln	OEP	3.5	3.5		
New Iberia (city)	BO	1.5			1.5
Red River	OEP	16.0	16		
St. Helena	OEP	1.5	1.5		
St. James	OEP	1.5	1.5		
St. James	BO	15.0			15
St. Landry	OEP	4.3	4.3		
St. Martin	OEP	1.5	1.5		
St. Tammany	FPM	5.0		5	
Tangipahoa	FPM	14.0		14	
Tensas	OEP	16.0	16		
Terrebonne	BO	20.0			20
Thibodaux (city)	BO	3.0			3
Washington	OEP	16.0	16		
Webster	OEP	4.0	4		
Avgs		7.8	7.7	7.9	8.1

4. Describe the educational degrees, professional certifications and/or professional experience that are most relevant in your current role?		
Acadia	OEP	22 years in fire service, 10 years as fire chief, LA certified Emergency Manager, numerous EMI courses.
Avoyelles	OEP	Served as parish FPM. Taking training to become Certified Building Official.
Beauregard	OEP	Training in all federal requirements
Bienville	OEP	Experience as a Sheriff's deputy and military background. Also, Bachelor's Degree in Business Administration

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Caddo	FPM	CFM, completed EMI floodplain management course, participant in LA floodplain forum, completed FEMA elevation training course, completed NFIP CRS course, completed EMI Management through NFIP training course, completed EMI IS700 NIMS course.
Caddo/Bossier	OEP	Bachelor's Degree and Certified Louisiana Emergency Manager
Calcasieu	OEP	Louisiana Emergency Manager Training, various NIMS training, and FEMA courses
Calcasieu	BO	ICC Certification for Building Officials, Masters Plumbing License, 5 years schooling at local plumbers and steamfitters, 30 years of construction experience.
Claiborne	OEP	No answer
DeSoto	OEP	Law enforcement for 27 years and 7 years as Emergency Manager.
DeSoto	FPM	Degree in Engineering
Jefferson	FPM	Graduate of US Army General Staff and College, Diploma in Business Administration, CFM Certification
LaSalle	OEP	15 years experience in Homeland Security
Lincoln	OEP	OEP Training, 14 years on the job experience, trained in Incident Command, FEMA-NIMS Training
New Iberia (city)	BO	State Contractors License (held for 2 years), in the process of taking Certification for Building Official (CBO)
Red River	OEP	Hands on experience, training, workshops, and seminars
St. Helena	OEP	Experience as Deputy for Sheriff's Department, Greensburg Police Department, Montpelier Police Department
St. James	OEP	17 years of emergency management experience, Louisiana EM Certification, Certified Fire Fighter 1
St. James	BO	Degree in Engineering, Emergency Preparedness Director for 15 months, NIMS Certified, over 15 years on the job experience in Emergency Management.
St. Landry	OEP	Associates in Applied Science: Fire Science and Public & Industrial Science
St. Martin	OEP	26 + years law enforcement
St. Tammany	FPM	BA Mass Communication, Participant in several National Hurricane Conferences, NFIP conferences, BCA education.
Tangipahoa	FPM	CFM
Tensas	OEP	Bachelors in business and 18 experience in Emergency Management
Terrebonne	BO	Degree in city and regional planning, 20 years experience
Thibodaux (city)	BO	Certified inspector for; electrical, plumbing, mechanical, and building. Certified Building Official (through ICC), 9 years of on the job experience. State license in plumbing.
Washington	OEP	Certified Louisiana Emergency Manager, FETI Trained, NIMS Certified, 24 years in the Fire Service.
Webster	OEP	No answer

5. How many staff do you directly oversee? *['05Q2]*

		Full-time	Part-time	Contractor or Student	Volunteer
Acadia	OEP	1	0	0	0
Avoyelles	OEP	2	0	0	0
Beauregard	OEP	0	0	0	6
Bienville	OEP	0	0	0	0
Caddo	FPM	0	0	0	0
Caddo/Bossier	OEP	1	0	0	0
Calcasieu	OEP	9	0	0	10
Calcasieu	BO	6	0	1	0

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Claiborne	OEP	0	0	0	0
DeSoto	OEP	0	0	0	0
DeSoto	FPM	8	0	0	0
Jefferson	FPM	0	0	5	0
LaSalle	OEP	0	1	0	0
Lincoln	OEP	0	0	0	0
New Iberia (city)	BO	4	0	0	0
Red River	OEP	0	0	0	1
St. Helena	OEP	2	1	3	0
St. James	OEP	6	0	0	0
St. James	BO	110	12	varies	only in disaster response
St. Landry	OEP	0	0	0	0
St. Martin	OEP	2	0	0	0
St. Tammany	FPM	0	0	0	0
Tangipahoa	FPM	4	0	0	0
Tensas	OEP	0	2	0	45
Terrebonne	BO	17	0	2	0
Thibodaux (city)	BO	2	0	2	0
Washington	OEP	0	1	0	0
Webster	OEP	0	0	0	0

6. How many of the staff whom you oversee work directly in hazard mitigation? *['05Q3]*					
		Full-time	Part-time	Contractor or Student	Volunteer
Acadia	OEP	1	0	0	0
Avoyelles	OEP	0	0	0	0
Beauregard	OEP	0	0	0	0
Bienville	OEP	0	0	0	0
Caddo	FPM	0	0	0	0
Caddo/Bossier	OEP	0	0	0	0
Calcasieu	OEP	3	0	0	0
Calcasieu	BO	6	0	1	0
Claiborne	OEP	0	0	0	0
DeSoto	OEP	0	0	0	0
DeSoto	FPM	0	0	0	0
Jefferson	FPM	0	0	5	0
LaSalle	OEP	0	1	0	0
Lincoln	OEP	0	0	0	0
New Iberia (city)	BO	0	0	0	0
Red River	OEP	0	0	0	0
St. Helena	OEP	0	1	0	0
St. James	OEP	0	0	0	0
St. James	BO	15	0	0	0
St. Landry	OEP	0	0	0	0
St. Martin	OEP	0	0	0	0
St. Tammany	FPM	0	0	0	0

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Tangipahoa	FPM	1	0	0	0
Tensas	OEP	0	1	0	3.5
Terrebonne	BO	17	0	2	0
Thibodaux (city)	BO	0	0	0	0
Washington	OEP	0	1	0	0
Webster	OEP	0	0	0	0

7. How many of your hazard mitigation staff have training or expertise directly relevant to hazard mitigation?		
Acadia	OEP	1
Avoyelles	OEP	0
Beauregard	OEP	2
Bienville	OEP	0
Caddo	FPM	0
Caddo/Bossier	OEP	0
Calcasieu	OEP	7
Calcasieu	BO	0
Claiborne	OEP	0
DeSoto	OEP	0
DeSoto	FPM	0
Jefferson	FPM	5
LaSalle	OEP	0
Lincoln	OEP	0
New Iberia (city)	BO	0
Red River	OEP	0
St. Helena	OEP	0
St. James	OEP	0
St. James	BO	0
St. Landry	OEP	0
St. Martin	OEP	0
St. Tammany	FPM	0
Tangipahoa	FPM	0
Tensas	OEP	0
Terrebonne	BO	2
Thibodaux (city)	BO	0
Washington	OEP	0
Webster	OEP	0

8. How many staff in other departments/agencies/offices also work in a hazard-mitigation capacity?			a. Where are they located?	b. Formal communi-cation structure?	Explanation
Acadia	OEP	1	Police Jury	no	informal phone calls
Avoyelles	OEP	0			

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Beauregard	OEP	7	Permitting Department	yes	Review site plans and building plans before permits are issued. (Prompted by interviewer)
Bienville	OEP	0			
Caddo	FPM	Exact numbers not known	Fire, Sherriff, public works, facility and maintenance, Caddo school board-part of planning team for development of hazard mitigation plan	yes	Phone notification for Sheriff Department, Department of Public Works, Parish Administrator, Caddo Parish Office EMA
Caddo/Bossier	OEP	0			
Calcasieu	OEP	0			
Calcasieu	BO	0			
Claiborne	OEP	0			
DeSoto	OEP	1	Parish Police Jury Administrator	yes	
DeSoto	FPM	Exact numbers not known	OHSEP	no	
Jefferson	FPM	0			
LaSalle	OEP	0			
Lincoln	OEP	25	Department of Public Works	no	informal communication
New Iberia (city)	BO	0			
Red River	OEP	5 or 6	Police Jury and Public Works	yes	Police Jury President and Road Maintenance Supervisor
St. Helena	OEP	0			
St. James	OEP	Not sure	Department of Public Works	no	
St. James	BO	6	OEP	yes	ICS Structure
St. Landry	OEP	1	Public Works	yes	no response
St. Martin	OEP	0			
St. Tammany	FPM	1	Engineering Department	no	
Tangipahoa	FPM	4	OEP, Grants	yes	OEP deals with post disaster strategies, then FPA does drainage assessments. All grants are applied for through our grant writer.
Tensas	OEP	Exact numbers unknown	Administrative and Public Works	no	
Terrebonne	BO	0			
Thibodaux (city)	BO	0			
Washington	OEP	0			
Webster	OEP	0			

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

9. Does your office have access to GIS data? *['05Q4]*		yes	no	a. What GIS data or layers does your office use?	b. What hazard-mitigation purposes, specifically, are the GIS data used for?	c. With what other GIS data is this data coordinated?
Acadia	OEP	X		Highway, fire departments, schools	Overlaying facilities with hazard maps (Interviewer prompted this response)	Don't know
Avoyelles	OEP	X		Traffic, chemical release layers	None	None
Beauregard	OEP	x		911 data, flood data, storm data, population data, school data	Floods, schools, populations	
Bienville	OEP	X		Virtual Louisiana	None yet	None yet
Caddo	FPM	X		Flood hydrology layers, topography layers, DFIRM, critical and government facilities layers	Overlay government and critical facilities with hazard maps	None
Caddo/Bossier	OEP	X		Virtual Louisiana	Don't know	Don't know
Calcasieu	OEP	x		demographic/physical	floodplain planning, chemical facility planning, transportation hazards	
Calcasieu	BO	x		Elevation, flood, aerial, street layers	None	None
Claiborne	OEP	X		DOQQ's 2002, streets, highways, structure points, water, city limits.	None at the present	All office and State shape files
DeSoto	OEP		x			
DeSoto	FPM		x			
Jefferson	FPM	X		Flood maps overlays, drainage system overlays, canal overlays	Identification of Repetitive Loss structures	None
LaSalle	OEP		x			
Lincoln	OEP	X		Aerial, contours, street, streams, parcel, structural layers	Flood map overlay on parcel layers to determine if new construction needs to be elevated.	None
New Iberia (city)	BO	X		Subdivision, street, water, sewer, infrastructure layers.	None at this time	
Red River	OEP	X		Google Earth	None	Google Earth
St. Helena	OEP					
St. James	OEP	X		LIDAR, streets, water, sewer, parcel layers	None	None
St. James	BO	X		Streets, waterlines, gas lines, sewage lines, aerial photography, hydrology	Drainage Projects	Don't know
St. Landry	OEP		x			

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

St. Martin	OEP	X		Don't know	Don't know	Parish government, parish assessor, school board
St. Tammany	FPM	X		Roads and sewers	None	N/A
Tangipahoa	FPM		x			
Tensas	OEP	X		Virtual Louisiana	none	None
Terrebonne	BO	X		Floodplain/ flood zones, land use, aerial, street/address, structural, water and gas lines, parcel layers.	Determining if parcels are in the floodplain	Don't know
Thibodaux (city)	BO		x			
Washington	OEP	X		Roads, waterways, others	Addressing, GPS Coordinates, Flood zones	Virtual LA
Webster	OEP		x			

10. Do you house GIS in your office?		Yes	No	a. How many staff are devoted to operating, updating and maintaining the GIS?	b. What is your budget for GIS staff and technology?
Acadia	OEP		x		
Avoyelles	OEP		x		
Beauregard	OEP	x		0	$400.00
Bienville	OEP		x		
Caddo	FPM		x	2	$100,000
Caddo/Bossier	OEP	x		1	$0
Calcasieu	OEP	x		Exact numbers not known	Don't know
Calcasieu	BO		x		
Claiborne	OEP		x		
DeSoto	OEP				
DeSoto	FPM				
Jefferson	FPM		x		
LaSalle	OEP				
Lincoln	OEP		x	7	$432,000
New Iberia (city)	BO		x		
Red River	OEP		x		
St. Helena	OEP				
St. James	OEP		x	2.5	$200,000
St. James	BO		x	3	$202,000
St. Landry	OEP		x		
St. Martin	OEP	x		0	N/A
St. Tammany	FPM		x		
Tangipahoa	FPM				
Tensas	OEP		x		
Terrebonne	BO		x		
Thibodaux (city)	BO		x		
Washington	OEP		x		

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Webster	OEP		x			
TOTAL		4	19	2.2	$	155,733.33

11. Please list any other locations that house GIS data that you use (for example: a local planning and zoning department, area university, state agency, etc.).		
Acadia	OEP	Don't know
Avoyelles	OEP	911 dispatch
Beauregard	OEP	Sheriff, public works, city planner
Bienville	OEP	None
Caddo	FPM	City of Shreveport has a GIS Department, ML COG
Caddo/Bossier	OEP	North Louisiana Council of Governments and Bossier Parish 911.
Calcasieu	OEP	Police Jury
Calcasieu	BO	None
Claiborne	OEP	911 Dispatch
DeSoto	OEP	
DeSoto	FPM	None
Jefferson	FPM	The parish GIS Department in located in Jefferson, Louisiana
LaSalle	OEP	N/A
Lincoln	OEP	City of Ruston GIS Department, Louisiana Tech University, State data (Aerial photography), mystateusa.com
New Iberia (city)	BO	Waste Water Department maintains GIS data that is used by the Building Department.
Red River	OEP	Police Jury and USDA
St. Helena	OEP	
St. James	OEP	None
St. James	BO	US Census data, South Central Planning
St. Landry	OEP	N/A
St. Martin	OEP	Parish government, parish assessor, school board
St. Tammany	FPM	University of New Orleans (Interviewee has limited access)
Tangipahoa	FPM	
Tensas	OEP	None
Terrebonne	BO	Don't know
Thibodaux (city)	BO	N/A
Washington	OEP	None
Webster	OEP	None

12. In your opinion, where would GIS data ideally be maintained and distributed from? (Choose one)		Interviewee's office	Parish office	Regional office	State Agency	University or non-profit
Acadia	OEP			x		
Avoyelles	OEP		x			

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Beauregard	OEP	X				x
Bienville	OEP				x	
Caddo	FPM		x			
Caddo/Bossier	OEP			x		
Calcasieu	OEP		x			
Calcasieu	BO		x			
Claiborne	OEP		x			
DeSoto	OEP	X				
DeSoto	FPM					x
Jefferson	FPM		x			
LaSalle	OEP	X				
Lincoln	OEP		x			
New Iberia (city)	BO		x			
Red River	OEP		x			
St. Helena	OEP					
St. James	OEP		x			
St. James	BO		x			
St. Landry	OEP		x			
St. Martin	OEP		x			
St. Tammany	FPM		x			
Tangipahoa	FPM	X				
Tensas	OEP					x
Terrebonne	BO	x				
Thibodaux (city)	BO	x				
Washington	OEP		x			
Webster	OEP		x			
TOTALS		4	16	2	1	3

14. Please list other local offices/agencies that your office coordinates with in order to plan and/or implement hazard mitigation.		
Acadia	OEP	Don't know
Avoyelles	OEP	Local Hazard Mitigation Planning Team
Beauregard	OEP	Police jury, public works, city planner, tax assessors office, school board, county ag department, law enforcement agencies
Bienville	OEP	Parish OHSEP, Public Works, Sheriff's Office, and Fire Districts
Caddo	FPM	Caddo Bossier OEP, City of Shreveport Engineer, Caddo Sheriff, Shreveport City Police, Shreveport City Fire Department, District Fire Chief, Caddo School Board, Caddo Parish Health Unit.
Caddo/Bossier	OEP	Bossier Parish Police Jury, Caddo Parish Commission, City of Shreveport Engineers's Office, and Bossier City's Engineer's Office
Calcasieu	OEP	Planning, public works, water board, sewer board, regional planning
Calcasieu	BO	Don't know
Claiborne	OEP	E911, Sheriff's Department, Fire Departments, OHSEP and Police Jury

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

DeSoto	OEP	DeSoto Parish Police Jury
DeSoto	FPM	Not asked
Jefferson	FPM	Department of Public Works, Department of Inspection and Code Enforcement, Department of Capital Projects
LaSalle	OEP	None
Lincoln	OEP	None
New Iberia (city)	BO	Don't know
Red River	OEP	Police Jury, School Board, Municipalities, Parish Departments
St. Helena	OEP	None
St. James	OEP	Interviewee does not deal with hazard mitigation
St. James	BO	Sheriff Office and OEP
St. Landry	OEP	Drainage Boards, Engineer, Municipalities
St. Martin	OEP	Parish government, public works, zoning
St. Tammany	FPM	Building Department (Permit office, building code inspectors, floodplain manager).
Tangipahoa	FPM	OEP, Grants and Finance, Department of Public Works, Planning, Municipalities within Parish, Water & Sewer District, Critical Facility Managers, School Board, Sheriff Department
Tensas	OEP	None
Terrebonne	BO	Department of Public Works, Levee Districts, Emergency Preparedness Office, Sheriff and police departments, several non-profit organizations
Thibodaux (city)	BO	Department of Public Works
Washington	OEP	LA GOHSEP, Communications District (911), Public Works, Finance Department, Municipalities
Webster	OEP	Police Jury

15. Please list any neighboring jurisdictions that your office coordinates with in order to plan and/or implement hazard mitigation.		
Acadia	OEP	Don't know
Avoyelles	OEP	None
Beauregard	OEP	Calcasieu
Bienville	OEP	None
Caddo	FPM	Bossier Parish
Caddo/Bossier	OEP	None
Calcasieu	OEP	Beauregard, Allen, Jefferson Davis, Cameron
Calcasieu	BO	Don't know
Claiborne	OEP	None
DeSoto	OEP	None
DeSoto	FPM	Not asked
Jefferson	FPM	Don't know
LaSalle	OEP	None
Lincoln	OEP	None
New Iberia (city)	BO	Don't know
Red River	OEP	Parish OHSEP
St. Helena	OEP	None
St. James	OEP	Interviewee does not deal with hazard mitigation
St. James	BO	None
St. Landry	OEP	Not asked
St. Martin	OEP	Don't know

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

St. Tammany	FPM	None
Tangipahoa	FPM	None
Tensas	OEP	None
Terrebonne	BO	Public Works may work with surrounding parishes for infrastructure projects that cross parish boundaries. Also working with Lafourche Parish on Hurricane Protection Levee Project (90%of levee is in Terrebonne Parish, 10% in Lafourche).
Thibodaux (city)	BO	None
Washington	OEP	None
Webster	OEP	None

16. Please list any regional agencies that your office coordinates with in order to plan and/or implement hazard mitigation (for example, GOHSEP regional coordinators, regional planning commissions, etc.).		
Acadia	OEP	GOHSEP regional coordinator, Acadian Regional Development District
Avoyelles	OEP	GOHSEP regional coordinators
Beauregard	OEP	GOHSEP regional coordinators
Bienville	OEP	None
Caddo	FPM	None
Caddo/Bossier	OEP	None
Calcasieu	OEP	Metropolitan Planning Organization, GOHSEP regional coordinators
Calcasieu	BO	Not asked
Claiborne	OEP	GOHSEP regional coordinators
DeSoto	OEP	None
DeSoto	FPM	Not asked
Jefferson	FPM	Don't know
LaSalle	OEP	GOHSEP regional coordinators
Lincoln	OEP	GOHSEP Region 8
New Iberia (city)	BO	Not asked
Red River	OEP	None
St. Helena	OEP	Not asked
St. James	OEP	Interviewee does not deal with hazard mitigation
St. James	BO	South Central Planning
St. Landry	OEP	GOHSEP regional coordinator
St. Martin	OEP	GOHSEP regional coordinator
St. Tammany	FPM	GOHSEP regional coordinators
Tangipahoa	FPM	GOHSEP regional coordinators
Tensas	OEP	GOSHEP regional coordinator
Terrebonne	BO	None
Thibodaux (city)	BO	South Central Planning
Washington	OEP	GOHSEP regional coordinators
Webster	OEP	None

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

17. Please list any state agencies (other than GOHSEP) that that your office coordinates with in order to plan and/or implement hazard mitigation.		
Acadia	OEP	Not asked
Avoyelles	OEP	DODT & OPH
Beauregard	OEP	LSU, DOTD, DEQ, State Police
Bienville	OEP	None
Caddo	FPM	DODT
Caddo/Bossier	OEP	Don't know
Calcasieu	OEP	DNR
Calcasieu	BO	Not asked
Claiborne	OEP	None
DeSoto	OEP	None
DeSoto	FPM	Not asked
Jefferson	FPM	DODT
LaSalle	OEP	None
Lincoln	OEP	None
New Iberia (city)	BO	Not asked
Red River	OEP	Department of Agriculture and Forestry
St. Helena	OEP	Not asked
St. James	OEP	Interviewee does not deal with hazard mitigation
St. James	BO	None
St. Landry	OEP	Not asked
St. Martin	OEP	Don't know
St. Tammany	FPM	State Historic Preservation Office
Tangipahoa	FPM	None
Tensas	OEP	None
Terrebonne	BO	DODT
Thibodaux (city)	BO	None
Washington	OEP	DOTD, Department of Wildlife & Fisheries, National Guard
Webster	OEP	None

18. Of all the partners you listed above, which are the most valuable relationships in terms of effective hazard mitigation?		
Acadia	OEP	Not asked
Avoyelles	OEP	All agencies are valuable
Beauregard	OEP	Public works, city planner's office
Bienville	OEP	Public Works, Sheriff's Office and Fire Districts
Caddo	FPM	Caddo Bossier OEP
Caddo/Bossier	OEP	All equal in their value.
Calcasieu	OEP	Parish Planning Office

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Calcasieu	BO	Not asked
Claiborne	OEP	N/A
DeSoto	OEP	DeSoto Parish Police Jury
DeSoto	FPM	Not asked
Jefferson	FPM	GOHSEP, FEMA 6, DODT
LaSalle	OEP	GOHSEP
Lincoln	OEP	GOHSEP
New Iberia (city)	BO	Not asked
Red River	OEP	GOSHEP
St. Helena	OEP	Not asked
St. James	OEP	Interviewee does not deal with hazard mitigation
St. James	BO	GOHSEP
St. Landry	OEP	GOHSEP and Drainage Boards
St. Martin	OEP	Parish government, public works, zoning
St. Tammany	FPM	GOHSEP
Tangipahoa	FPM	GOHSEP
Tensas	OEP	None
Terrebonne	BO	GOHSEP
Thibodaux (city)	BO	Don't know
Washington	OEP	DOTD, National Guard
Webster	OEP	N/A

19. What other potential partners do you believe might be useful in helping your parish effectively mitigate hazard? (We're looking for groups with whom you do not currently work.)		
Acadia	OEP	Not asked
Avoyelles	OEP	Representation from federal level (FEMA) in local hazard mitigation plan development.
Beauregard	OEP	None, but would like better coordination from the State
Bienville	OEP	Private Industry
Caddo	FPM	None
Caddo/Bossier	OEP	USACE
Calcasieu	OEP	Don't know
Calcasieu	BO	Not asked
Claiborne	OEP	LSU AgCenter and surrounding parishes
DeSoto	OEP	City Departments
DeSoto	FPM	Not asked
Jefferson	FPM	USACE
LaSalle	OEP	None
Lincoln	OEP	State Police & DODT
New Iberia (city)	BO	Not asked
Red River	OEP	Community Members
St. Helena	OEP	Not asked
St. James	OEP	Interviewee does not deal with hazard mitigation

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

St. James	BO	None
St. Landry	OEP	Not asked
St. Martin	OEP	Don't know
St. Tammany	FPM	None
Tangipahoa	FPM	None
Tensas	OEP	Engineering Department
Terrebonne	BO	State Planning Office (recommended in "Louisiana Speaks")
Thibodaux (city)	BO	Don't know
Washington	OEP	USACE, Department of Agriculture, State Police
Webster	OEP	A local liaison with State Floodplain Manager

20. Does your parish have a FEMA-approved Hazard Mitigation Plan?				
		Yes	No	Don't know
Acadia	OEP	X		
Avoyelles	OEP	X		
Beauregard	OEP	X		
Bienville	OEP	X		
Caddo	FPM	X		
Caddo/Bossier	OEP	X		
Calcasieu	OEP	X		
Calcasieu	BO			x
Claiborne	OEP	X		
DeSoto	OEP	X		
DeSoto	FPM	X		
Jefferson	FPM	X		
LaSalle	OEP	X		
Lincoln	OEP	X		
New Iberia (city)	BO			x
Red River	OEP	X		
St. Helena	OEP	X		
St. James	OEP	X		
St. James	BO	X		
St. Landry	OEP	X		
St. Martin	OEP	X		
St. Tammany	FPM	X		
Tangipahoa	FPM	X		
Tensas	OEP	X		
Terrebonne	BO	X		
Thibodaux (city)	BO		x	
Washington	OEP	X		

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Webster	OEP	X		
TOTALS		25	1	2

21. For future hazard mitigation planning, would you prefer to have the state provide standard definitions of various hazards? (for example, defining "ice storm" vs "winter storm" vs "blizzard" vs "sleet" vs "hail")				
		Yes	no	unfamiliar with issue
Acadia	OEP	X		
Avoyelles	OEP	X		
Beauregard	OEP		x	
Bienville	OEP	X		
Caddo	FPM	X		
Caddo/Bossier	OEP		x	
Calcasieu	OEP	X		
Calcasieu	BO			x
Claiborne	OEP		x	
DeSoto	OEP	X		
DeSoto	FPM	X		
Jefferson	FPM	X		
LaSalle	OEP	X		
Lincoln	OEP	X		
New Iberia (city)	BO			x
Red River	OEP	X		
St. Helena	OEP	X		
St. James	OEP	X		
St. James	BO	X		
St. Landry	OEP		x	
St. Martin	OEP	X		
St. Tammany	FPM	X		
Tangipahoa	FPM	X		
Tensas	OEP	X		
Terrebonne	BO	X		
Thibodaux (city)	BO		x	
Washington	OEP	X		
Webster	OEP	X		
TOTALS		21	5	2

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

22. For future hazard mitigation planning, would you prefer to have the state provide standard risk assessment methodologies? (for example, a method for objectively assessing the level of risk posed by flood, or a method for determining whether a higher risk is posed by flood or by ice storms)				
		Yes	no	unfamiliar with issue
Acadia	OEP	X		
Avoyelles	OEP	X		
Beauregard	OEP		x	
Bienville	OEP	X		
Caddo	FPM	X		
Caddo/Bossier	OEP		x	
Calcasieu	OEP	X		
Calcasieu	BO			x
Claiborne	OEP	X		
DeSoto	OEP	X		
DeSoto	FPM	X		
Jefferson	FPM	X		
LaSalle	OEP	X		
Lincoln	OEP	X		
New Iberia (city)	BO			x
Red River	OEP	X		
St. Helena	OEP	X		
St. James	OEP		x	
St. James	BO	X		
St. Landry	OEP	X		
St. Martin	OEP	X		
St. Tammany	FPM	X		
Tangipahoa	FPM		x	
Tensas	OEP	X		
Terrebonne	BO	X		
Thibodaux (city)	BO		x	
Washington	OEP		x	
Webster	OEP	X		
TOTALS		20	6	2

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

23. Is your parish enforcing the Uniform Construction Code? (if "yes," ask the follow-ups below) *['05Q7]*		Y	N	DN	a. How many UCC-trained inspectors do you employ?	b. If you share UCC-trained inspectors with other parishes, which parishes are they?	c. How many building permits (for new construction) are pulled annually in your parish?
Acadia	OEP	x			0 (third party contractor)	N/A	150
Avoyelles	OEP	x			0 (third party contractor)	N/A	250-300
Beauregard	OEP	x			1 (+3rd party contractor)		Don't know
Bienville	OEP	x			0 (contract to IBTS)		45
Caddo	FPM	x			0 (third party contractor)	N/A	100-125
Caddo/Bossier	OEP			x			
Calcasieu	OEP	x			4	Cameron Parish	Don't know
Calcasieu	BO	x			6	Cameron and Jeff Davis Parishes	1200
Claiborne	OEP	x			0	None	50
DeSoto	OEP	x			None	Don't know	Don't know
DeSoto	FPM		X				100-150
Jefferson	FPM	x			Don't know	Don't know	800-1000
LaSalle	OEP	x			Don't know	Don't know	Don't know
Lincoln	OEP	x			0 (third party contractor)	N/A	150
New Iberia (city)	BO	x			1	None	Don't know
Red River	OEP		X				
St. Helena	OEP	x			1	East Feliciana	300
St. James	OEP	x			Don't know	Assumption, St John, Terrebonne, Lafourche	Don't know
St. James	BO	x			0 (third party contractor)		50
St. Landry	OEP	x			2 (contractors)		300-330
St. Martin	OEP	x			Don't know	Don't know	Don't know
St. Tammany	FPM	x			Don't know	Don't know	Don't know
Tangipahoa	FPM	x			3	No	700
Tensas	OEP			x			
Terrebonne	BO	x			0 (third party contractor)	N/A	300
Thibodaux (city)	BO	x			1	No	Unauthorized to answer
Washington	OEP	x			4	No	Don't know
Webster	OEP	x			0 (third party contractor)	Caddo, Bossier, Claiborne, DeSoto, Red River, Bienville	Don't know
TOTALS		24	2	2			

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

24. What department or agency administers floodplain management in your parish?		
Acadia	OEP	OHSEP
Avoyelles	OEP	Permitting/ Building/ Engineering
Beauregard	OEP	DPW
Bienville	OEP	Parish Admin./ Police July
Caddo	FPM	DPW
Caddo/Bossier	OEP	Permitting/ Building/ Engineering
Calcasieu	OEP	Planning/ P&Z
Calcasieu	BO	Planning/ P&Z
Claiborne	OEP	Parish Admin./ Police July
DeSoto	OEP	Parish Admin./ Police July
DeSoto	FPM	Parish Admin./ Police July
Jefferson	FPM	OHSEP
LaSalle	OEP	Parish Admin./ Police Jury
Lincoln	OEP	Permitting/ Building/ Engineering
New Iberia (city)	BO	Permitting/ Building/ Engineering
Red River	OEP	Don't know
St. Helena	OEP	OHSEP
St. James	OEP	DPW
St. James	BO	Planning/ P&Z
St. Landry	OEP	Permitting/ Building/ Engineering
St. Martin	OEP	Parish Admin./ Police Jury
St. Tammany	FPM	Permitting/ Building/ Engineering
Tangipahoa	FPM	Permitting/ Building/ Engineering
Tensas	OEP	Parish Admin./ Police July
Terrebonne	BO	Planning/ P&Z
Thibodaux (city)	BO	Planning/ P&Z
Washington	OEP	DPW
Webster	OEP	Parish Admin./ Police July

25. Does your parish have a comprehensive plan (or Master Plan)?					a. Is hazard mitigation explicitly addressed in the plan?			b. How this is accomplished in the plan?
		Y	N	DN	Y	N	DN	
Acadia	OEP			x				
Avoyelles	OEP	x					x	
Beauregard	OEP		X					
Bienville	OEP			x				
Caddo	FPM		X					

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Caddo/Bossier	OEP	x			x			Hazard mitigation process is mentioned within the flooding annex of the Caddo-Bossier Emergency Operations Plan.
Calcasieu	OEP	x			x			Zoning ordinances take hazard mitigation into account, sewer ordinances, etc.
Calcasieu	BO			x				
Claiborne	OEP	x					x	
DeSoto	OEP	x				x		
DeSoto	FPM							
Jefferson	FPM			x				
LaSalle	OEP			x				
Lincoln	OEP							
New Iberia (city)	BO			x				
Red River	OEP		X					
St. Helena	OEP			x				
St. James	OEP		X					
St. James	BO			x				
St. Landry	OEP			x				
St. Martin	OEP			x				
St. Tammany	FPM	x			x			All development must follow all applicable flood ordinance requirements (1 foot of freeboard for all new construction in the floodplain.)
Tangipahoa	FPM		X					
Tensas	OEP			x				
Terrebonne	BO	x				x		
Thibodaux (city)	BO			x				
Washington	OEP			x				
Webster	OEP	x			x			Addressed according to GOHSEP Pelican Crosswalk
TOTALS		8	5	12	4	2	2	

26. Does your parish have a zoning ordinance?					a. Is hazard mitigation explicitly regulated by your zoning code?			b. How this is accomplished in the ordinance?
		Y	N	DN	Y	N	DN	
Acadia	OEP		X					
Avoyelles	OEP		X					
Beauregard	OEP		X					
Bienville	OEP		X					
Caddo	FPM	x			x			Drainage studies, road construction specifications, septic inspections, 1 foot freeboard requirement, elevation certificates on all structures built in the SFHA .
Caddo/Bossier	OEP			x				
Calcasieu	OEP	x			x			Zoning ordinances take hazard mitigation into account, sewer ordinances, etc.

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Calcasieu	BO	x			x			Elevation requirement for structures in flood zone. (Prompted by interviewer)
Claiborne	OEP		X					
DeSoto	OEP			x				
DeSoto	FPM							
Jefferson	FPM	x			x			Floodplain management including coastal areas.
LaSalle	OEP			x				
Lincoln	OEP							
New Iberia (city)	BO	x			x			Regulates elevation of construction in flood zones.
Red River	OEP		X					Town of Coushatta has zoning ordinance
St. Helena	OEP		X					
St. James	OEP		X					
St. James	BO		X					
St. Landry	OEP		X					
St. Martin	OEP			x				
St. Tammany	FPM	x			x			All development must follow all applicable flood ordinance requirements (1 foot of freeboard for all new construction in the floodplain.)
Tangipahoa	FPM		X					
Tensas	OEP		X					
Terrebonne	BO		X					
Thibodaux (city)	BO	x					x	
Washington	OEP							
Webster	OEP		X					
TOTALS		7	14	4	6	0	1	

27. Does your parish have a subdivision ordinance?					a. Is hazard mitigation explicitly considered in your subdivision permitting process?			b. How this is accomplished in the ordinance?
		Y	N	DN	Y	N	DN	
Acadia	OEP	x					x	
Avoyelles	OEP	x				x		
Beauregard	OEP	x				x		
Bienville	OEP		X					
Caddo	FPM	x			x			Site and building plans, drainage information, must comply with all zoning requirements.
Caddo/Bossier	OEP			x				
Calcasieu	OEP	x					x	

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Calcasieu	BO	x					x	
Claiborne	OEP		X					
DeSoto	OEP			x				
DeSoto	FPM	x			x			Flood ordinance is enforced in subdivision ordinance. Must have elevation certificate if in a flood zone.
Jefferson	FPM	x					x	
LaSalle	OEP			x				
Lincoln	OEP	x			x			Subdivisions in flood zones must build 1 foot above BFE.
New Iberia (city)	BO	x					x	
Red River	OEP		X					
St. Helena	OEP	x			x			
St. James	OEP	x					x	
St. James	BO	x			x			Required to build to base flood elevation
St. Landry	OEP		X					
St. Martin	OEP			x				
St. Tammany	FPM		X					
Tangipahoa	FPM	x			x			Corps must approve for wetlands before final approval.
Tensas	OEP			x				
Terrebonne	BO	x			x			Require flood zones to be placed on all parcel maps with property elevations. Structures must be built above the base flood elevation.
Thibodaux (city)	BO	x					x	
Washington	OEP							
Webster	OEP	x						
TOTAL		17	5	5	7	2	7	

28. Please list any other plans or land development regulations in your parish that are intended to manage risk or mitigate hazard? (for example: a watershed management plan or a floodplain plan; a floodplain development regulations or mandatory set-backs from certain water bodies; etc.) *['05Q7]*		
Acadia	OEP	Don't know
Avoyelles	OEP	Flood damage ordinance
Beauregard	OEP	Floodplain plan
Bienville	OEP	None
Caddo	FPM	Crosslake Watershed Commission regulates development in the Crosslake Watershed, Storm Water Management Plan
Caddo/Bossier	OEP	Don't know
Calcasieu	OEP	Floodplain development regulations
Calcasieu	BO	Don't know
Claiborne	OEP	Floodplain plan
DeSoto	OEP	Floodplain plan
DeSoto	FPM	Don't know

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Jefferson	FPM	Don't know
LaSalle	OEP	Not asked
Lincoln	OEP	Floodplain development regulations.
New Iberia (city)	BO	Don't know
Red River	OEP	None
St. Helena	OEP	Not asked
St. James	OEP	Not asked
St. James	BO	None
St. Landry	OEP	None
St. Martin	OEP	Don't know
St. Tammany	FPM	None
Tangipahoa	FPM	CRS
Tensas	OEP	None
Terrebonne	BO	Storm Drainage Design Manual (require any development be built to 25 year storm event)
Thibodaux (city)	BO	Not asked
Washington	OEP	Not asked
Webster	OEP	Don't know

29. Please list any plans or regulations that are applicable to your parish that may (unintentionally) hinder hazard mitigation efforts (for example: historic preservation regulations, development incentives that may encourage building in floodplains, etc.).		
Acadia	OEP	Not asked
Avoyelles	OEP	None
Beauregard	OEP	None
Bienville	OEP	None
Caddo	FPM	None
Caddo/Bossier	OEP	Don't know
Calcasieu	OEP	Not asked
Calcasieu	BO	Don't know
Claiborne	OEP	None
DeSoto	OEP	None
DeSoto	FPM	Don't know
Jefferson	FPM	Don't know
LaSalle	OEP	Not asked
Lincoln	OEP	None
New Iberia (city)	BO	Don't know
Red River	OEP	None
St. Helena	OEP	Not asked
St. James	OEP	Not asked
St. James	BO	None

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

St. Landry	OEP	None
St. Martin	OEP	Don't know
St. Tammany	FPM	The parish conforms to all State historic preservation laws.
Tangipahoa	FPM	None
Tensas	OEP	None
Terrebonne	BO	None
Thibodaux (city)	BO	Not asked
Washington	OEP	Not asked
Webster	OEP	Don't know

30. Of the mitigation programs, actions, and activities your parish has participated in, which have been the most effective in reducing losses in your parish? *['05Q8]*		
Acadia	OEP	Not asked
Avoyelles	OEP	Repetitive loss buyout program, (interviewer prompted- suggested building codes) floodplain regulations
Beauregard	OEP	Flood program
Bienville	OEP	None
Caddo	FPM	Floodplain Management Program, CRS Program, Drainage Maintenance Program
Caddo/Bossier	OEP	Flood mitigation projects
Calcasieu	OEP	Floodplain Management
Calcasieu	BO	Not asked
Claiborne	OEP	Floodplain
DeSoto	OEP	Don't know
DeSoto	FPM	Not asked
Jefferson	FPM	Repetitive loss properties, drainage projects
LaSalle	OEP	Not asked
Lincoln	OEP	Flood Control Ordinances.
New Iberia (city)	BO	Not asked
Red River	OEP	Drainage
St. Helena	OEP	None are complete yet.
St. James	OEP	Not asked
St. James	BO	Use of HMGP funds
St. Landry	OEP	Not asked
St. Martin	OEP	Don't know about past programs
St. Tammany	FPM	Flood Hazard Mitigation Program- mitigating flood prone properties.
Tangipahoa	FPM	CRS
Tensas	OEP	None
Terrebonne	BO	Abolishment of the Flood Appeals Board. (Parish has not granted a variance since 1985 when the Flood Appeals Board was abolished.)
Thibodaux (city)	BO	Not asked

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Washington	OEP	Not asked
Webster	OEP	N/A

31. Of the programs, actions, or activities your parish has participated in, which have been less effective than others at reducing losses in your parish? *['05Q9]*			a. Why do you believe these programs have been less effective?
Acadia	OEP	Not asked	
Avoyelles	OEP	Not sure	
Beauregard	OEP	None	
Bienville	OEP	N/A	
Caddo	FPM	None	
Caddo/Bossier	OEP	Don't know	
Calcasieu	OEP	Wind load Building Code	Has not been in effect very long. Resistance among contractors-cost increases. Poor State implementation.
Calcasieu	BO	Not asked	
Claiborne	OEP	Don't know	
DeSoto	OEP	Don't know	
DeSoto	FPM	Not asked	
Jefferson	FPM	Not sure	
LaSalle	OEP	Not asked	
Lincoln	OEP	Don't know	
New Iberia (city)	BO	Not asked	
Red River	OEP	None	
St. Helena	OEP	Not asked	
St. James	OEP	Not asked	
St. James	BO	Maintenance dredging	Can be cost prohibitive
St. Landry	OEP	Not asked	
St. Martin	OEP	Don't know about past programs	
St. Tammany	FPM	None	
Tangipahoa	FPM	None	
Tensas	OEP	None	
Terrebonne	BO	Community education and outreach has not worked well.	Citizens do not provide feedback.
Thibodaux (city)	BO	Not asked	
Washington	OEP	Not asked	
Webster	OEP	N/A	

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

32. Based on the lessons you and your parish have learned with these hazard mitigation programs, actions, or activities, what advice would you provide to other jurisdictions that may be considering implementing the same programs? *['05Q11]*		
Acadia	OEP	Not asked
Avoyelles	OEP	Planning is an extremely important component of effective mitigation.
Beauregard	OEP	Ensure a good contractor is used to develop the local plan. Hold several meetings to meet time requirements. Make sure plan is being implemented. Involve wide variety of stakeholders.
Bienville	OEP	N/A
Caddo	FPM	Know ordinances, plan for limiting development in certain areas that are not suited for building; i.e. floodplains
Caddo/Bossier	OEP	Don't know
Calcasieu	OEP	Need to have staff dedicated to mitigation program
Calcasieu	BO	Not asked
Claiborne	OEP	Don't know
DeSoto	OEP	Don't know
DeSoto	FPM	Not asked
Jefferson	FPM	Attend the GOHSEP kickoff meetings when grant money becomes available.
LaSalle	OEP	Not asked
Lincoln	OEP	Don't know
New Iberia (city)	BO	Not asked
Red River	OEP	It is important to plan and implement projects
St. Helena	OEP	None
St. James	OEP	Not asked
St. James	BO	Do whatever the State asks
St. Landry	OEP	Not asked
St. Martin	OEP	Seek a consultant familiar with parish
St. Tammany	FPM	Get as much education as possible. (EMI courses, seminar courses, etc.)
Tangipahoa	FPM	CRS- reduces floodplain premiums while reducing risk.
Tensas	OEP	None
Terrebonne	BO	Develop a department specifically for hazard mitigation or contract out. Do not try to manage with current staff that may already be spread thin.
Thibodaux (city)	BO	Not asked
Washington	OEP	Not asked
Webster	OEP	N/A

33. What types of mitigation programs, policies, or actions that are not currently being implemented in your parish do you believe would be successful in reducing losses if they were implemented? *['05Q12]*		
Acadia	OEP	Not asked
Avoyelles	OEP	This question was inadvertently omitted by interviewer
Beauregard	OEP	None
Bienville	OEP	Hardening Critical Infrastructure.
Caddo	FPM	Repetitive Loss buyouts (especially Severe Repetitive Loss Properties)

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Caddo/Bossier	OEP	Don't know
Calcasieu	OEP	Not asked
Calcasieu	BO	Not asked
Claiborne	OEP	Don't know
DeSoto	OEP	Don't know
DeSoto	FPM	Not asked
Jefferson	FPM	Severe Repetitive Loss Program (FEMA grant program)
LaSalle	OEP	Not asked
Lincoln	OEP	Don't know
New Iberia (city)	BO	Not asked
Red River	OEP	Public Education and Awareness
St. Helena	OEP	Not asked
St. James	OEP	Not asked
St. James	BO	Zoning
St. Landry	OEP	Not asked
St. Martin	OEP	Don't know
St. Tammany	FPM	More public education and information on mitigation.
Tangipahoa	FPM	Stronger CRS actions
Tensas	OEP	None
Terrebonne	BO	Parish should pass a 6 foot elevation requirement for all new construction.
Thibodaux (city)	BO	Not asked
Washington	OEP	Not asked
Webster	OEP	N/A

34. Do you have any other comments, questions or concerns regarding this survey or hazard mitigation? *['05Q13]*		
Jefferson	FPM	None
St. James	OEP	None
Terrebonne	BO	Regulatory branch of FEMA needs to coordinate with NFIP and to standardize claim payouts process. (Specifically a permit must be applied for before claim is paid.)
Thibodaux (city)	BO	More community education outreach to citizens for preparedness.
St. James	BO	None
Acadia	OEP	Needs to be standard definitions and more consistency from State and FEMA in procedures and required information.
St. Landry	OEP	Some of the issues for mitigating certain hazards are not eligible for mitigation funds. Would be helpful to open the program to cover more projects
St. Martin	OEP	Don't understand the survey
New Iberia (city)	BO	None
Beauregard	OEP	Why does FEMA require RFQ or bids to update local hazard mitigation plan when community wants to use consultant that originally developed the plan.
Calcasieu	OEP	Need consistency from the State and continuity of personnel.

Table G.7-2: Complete Results of the Local Capability Assessment Survey (continued)

Calcasieu	BO	None
Avoyelles	OEP	Interviewee requested the need for a standard definition for "Start of Construction" and "Recreational Buildings".
LaSalle	OEP	GOHSEP needs better communication with locals. Provide list of possible contractors for mitigation projects. Small parishes cannot front the money for mitigation projects-number one problem with mitigation. Policy change-reimbursement does not work! No money has been offered to small parishes such as LaSalle for mitigation projects; it all seems to go to New Orleans. The State needs to provide more funding to local OEPs.
Bienville	OEP	None
Caddo/Bossier	OEP	The survey should be expanded to include other individuals separate from the OHSEP office to include those in the parish who administer hazard mitigation dollars.
Claiborne	OEP	None
Red River	OEP	None
DeSoto	OEP	None
Webster	OEP	None
Caddo	FPM	More information needs to be freely exchange by the USACE to the locals.
DeSoto	FPM	None
Lincoln	OEP	None
Tensas	OEP	The State needs to take a closer look at the risk posed by the levees on the Mississippi River in northern parishes.
St. Helena	OEP	Generators need to be included in Hazard Mitigation money. In critical facilities, generators should be paid for.
Washington	OEP	Not asked
St. Tammany	FPM	None
Tangipahoa	FPM	None

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Appendix H

Recommended Practices for Hazard Mitigation in the State of Louisiana

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Appendix H.1: Introduction

The State's Mitigation Goals, as described in Section Eight, can be separated into two broad categories - those that the State can directly address and those that the State can only indirectly influence.

The State can directly address and/or influence the activities of parishes and State agencies for the first three Goals described in Section Eight, generally categorized as:

- Education and outreach (Goal 1);
- Data collection, use and sharing (Goal 2); and
- Capabilities and coordination (Goal 3).

The State can achieve the desired results over time by providing support and guidance for these activities (as described in the Objectives associated with each Goal). The Mitigation Action Plan, also in Section Eight, describes this process in more detail.

The State can only indirectly influence the activities of parishes for the fourth Goal:

- Construction of hazard mitigation projects to reduce the impact of hazards (Goal 4).

The State can directly address the fourth Goal only for its own properties and facilities, through state funded and managed construction projects, as described in the Mitigation Action Plan (Section Eight). However, since virtually all substantial local mitigation projects require funding beyond the capabilities of the municipalities and parishes, and since the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and the State Hazard Mitigation Team (SHMT) play a significant role in the Federal and State grant processes, municipalities and parishes may use the information in Appendix H to gain a sense of the types of mitigation actions and activities that are consistent with and/or advance state mitigation priorities.

The following materials provide:

- An overview of the types of mitigation actions that might be applied at the local and community levels given the results (where available) of the Vulnerability Assessment and Loss Estimates (Section Five);
- A general evaluation of these actions in terms of cost-effectiveness, environmental impacts, and technical feasibility; and
- Recommended mitigation practices for consideration and implementation by State agencies and for general application across the State.

Note: The following information is presented on a hazard-by-hazard basis and there is some overlap between similar hazards. For example, elevation of structures is included under all hazards that involve inundation, i.e., Flooding, Storm Surge, etc.

Appendix H.2:
Coastal Erosion

Identifying and Evaluating Possible Mitigation Actions

Coastal erosion in this Plan Update is defined as the rapid or catastrophic loss of coastal land due to discrete storm events. Although the much broader issue of coastal land loss in Louisiana is considered primarily a slow-moving disaster, erosion associated with discrete storm events can be significant, and both coastal erosion and scour can cause significant damage to coastal construction.

Both the State Hazard Mitigation Plan and the Coastal Protection and Restoration Authority of Louisiana's 2007 Comprehensive Master Plan for a Sustainable Coast (The Master Plan) strive to reduce loss of life and physical damages to improved property and critical infrastructure caused by natural hazards. Through the restoration of natural resources and ecosystems, such as marshes, natural ridges, swamps, wetlands, and barrier islands, it is possible to buffer and diffuse damaging energy associated with severe weather, including low-energy storms as well as brutal hurricanes, and provide protection to improved property and critical infrastructure through a defense system that utilizes multiple measures of hazard reduction, including structural and non-structural approaches.

According to the Master Plan, recent modeling and scientific studies have found that, in South Louisiana, "the incremental reductions in storm surge and wave energy provided by coastal landscape features, working in concert with hurricane protection structures can mean the difference between an area that survives a storm and one that suffers catastrophic damage."

In the wake of Katrina and Rita, the Master Plan recognizes that state "plans for hurricane protection must rely on multiple lines of defense … using natural features such as barrier islands, marshes, cheniers, and forested ridges to complement man-made structures such as highways, levees, and raised homes. Such an approach avoids reliance on single protection measures, which, if compromised, would leave vulnerable areas without recourse." Without efforts to maintain the coastal ecosystem, mitigation efforts, such as residential elevations and reconstructions, currently underway will soon be insufficient due to the continued degradation of the Louisiana coastline, which will result in increased frequency and depths of flood events.

It should be noted that significant coastal land loss is widely documented in Louisiana, where an estimated 1,900 square miles of coastal land has been submerged in the 20th century. Causes are primarily hydrologic modification, nutrient/sediment starvation, and subsidence (rate in some areas of up to 1.48 feet per 50 years). The extreme gravity of the situation has been brought to public forefront by the large body of academic investigation (mostly in biophysical sciences of geology, ecology and engineering), which focuses on cause/effect, magnitude of loss, and mitigation strategies. This fact, however, is coupled with a lack of detailed study of the economic impact on society. Because this subject lacks appeal of more main stream reported problems, such as levee failure, mitigation efforts have suffered, literally catastrophically, from lack of funding.

Coastal and barrier Island erosion clearly impacts mainland infrastructure and current hazard mitigation efforts, but also importantly, the large network of offshore petroleum pipelines. Coastal land and barrier islands provide protection to the extensive network of oil and gas pipelines running from the mainland out into the northern Gulf of Mexico. Pipelines are often buried to protect and stabilize them. When wetlands and barrier islands erode, sections of pipelines are exposed and subjected to destructive winds and wave action. Potential damages include pipe movement, destabilization and breakage, leading to spills and expensive recovery and repair efforts. Storm generated wave surge velocity, empirically, is zero on the bottom of the Gulf; the pipelines were, and still are not designed for surface Gulf storm events.

Pipelines are vulnerable when near the surface. However, according to the Department of Natural Resources, it could cost up to $1,000,000 per mile to bury a pipeline. Any pipeline break would cause large-scale environmental effects/impacts to both coastal waters and land. Costs would include monumental environmental clean-up and restoration (historically ordered by the State of Louisiana for each incident). Such a scenario has come to pass during the Deepwater Horizon drilling rig explosion and the subsequent oil spill in the Gulf of Mexico.

There are more than 130 pipeline companies in Louisiana operating about 68,000 miles of pipelines. Roughly 70 of the pipelines carry natural gas and 60 carry hazardous liquids such as gasoline and jet fuel. Louisiana is a principal provider of the oil and natural gas produced in the nation, rating first in crude oil production, and 2nd in natural gas. Nearly 34 percent of the Nation's natural gas supply and over 29 percent of the Nation's crude oil supply, moves through the state and is connected to nearly 50 percent of U.S. refining capacity. The Louisiana Offshore Oil Port, or LOOP, is located off the Louisiana coast near the town of Port Fourchon. LOOP is the United States' only port capable of accommodating deep draft tankers, and the network of pipelines connects to about 50 percent of the nation's refining capacity. Also located in the Gulf of Mexico near Erath is the Henry Hub. The Gulf Gateway Deepwater Port/Energy Bridge, located south of Cameron parish, is the only offshore liquefied natural gas terminal in the United States. The natural coastal land that provides protection to the pipelines is being reduced consistently by large and small events, such as hurricanes. Maintenance of coastal land and barrier islands is essential to protection of the pipelines.

Louisiana's coastal wetlands and barrier island systems also enhance protection of the state's other key economic and ecologic factors. According to USACE, five of the busiest ports in the nation, which handle 18 percent of all annual waterborne commerce, are located in Louisiana's coastal region. In 2006, Louisiana commercial fish landings exceeded 844 million pounds with a value of $202 million. This is approximately 21% of the total catch by weight in the lower 48 states (USDOC 2007). Data from the Louisiana Department of Wildlife and Fisheries show expenditures on recreational fishing in Louisiana to be between $895 million and $1.2 billion. Hunting expenditures amounted to approximately $175 million in 2003 (LDWF 2005). A 2007 NOAA assessment of the economic impacts of hurricanes Katrina and Rita on Gulf Fisheries estimated over $151 million in losses to fisheries dealers, processors, commercial fishermen, and recreational fisheries in the Timbalier, Terrebonne and Atchafalaya Basins. Barrier islands provide habitat to several threatened and endangered species, including the piping plover, the brown pelican, West Indian manatee and five species of threatened and endangered sea turtles. Over 5 million migratory waterfowl winter in Louisiana, making the Louisiana coastal wetlands crucial habitat to these birds.

The unmitigated and continued loss of Louisiana's coastal wetlands will significantly affect the ecology, society, and economy of Louisiana's southern and coastal regions, the nation, and the world. The continued decline of the natural ecosystem will result in a decrease in various functions associated with wetlands, including diminished biological productivity and increased risk to critical habitat of federally listed threatened and endangered species. The capacity of the coastal wetlands to buffer storm surges from tropical storm events will continue to diminish, which will increase the risk of significant damage to urban areas, the culture of coastal communities, oil, gas, transportation, fisheries, water supply, and other private and public infrastructure and agriculture lands.

The following mitigation actions are possible to reduce the impacts of short-term and long-term coastal erosion and scour in Louisiana. For additional information, refer to the *Coastal Construction Manual* (FEMA 55, 3rd Edition, 2000).

- Structural Elevation: Short-term coastal erosion damages to buildings in Louisiana occur during hurricanes or other coastal storm events that remove sand from beaches and generate scour around solid foundation elements. Elevation is one of the most effective mitigation techniques available for reducing or eliminating damages caused by storm-induced erosion and scour. Buildings and other structures may be elevated on piers, piles or other deeply embedded foundation elements to above a specified design flood elevation (usually the 100-year flood elevation). The embedment depth of foundation elements should be sufficient to resist the effects of short- and long-term erosion and scour.

- ✓ The cost of structural elevation will vary depending on the type of deep foundation, site conditions, age, and design flood elevation of the existing structure. The cost-effectiveness of structural elevations will vary based on project cost and the level of erosion risk.
- ✓ Structural elevations are technically feasible and highly effective for most buildings at reducing erosion and scour effects as well as flood damage; however, careful evaluation of the site and the existing structure is necessary prior to starting the work.
- ✓ The environmental impacts of structural elevation projects are typically minimal, provided the footprint of the elevated structure does not change.

For some structures located in areas with high property values, two alternative elevation techniques are available. The first technique, known as "mitigation reconstruction", involves demolition of the existing structure and construction of a new elevated structure which adheres to current codes and National Flood Insurance Program (NFIP) standards on the existing footprint. The second technique, known as "second-story conversion", involves retrofit of a single-story structure into an elevated structure. The conversion process involves removing the walls and occupied areas of the first floor, enhancing the structural design of the remaining structure, and constructing the new NFIP and code-compliant building on top of the remaining elevated frame. Both of these alternative elevation techniques, particularly second-story conversion, have become increasingly attractive in Louisiana where most existing buildings are difficult to elevate and acquisition options are limited. However, the eligibility of alternative elevation techniques for funding under various Federal Emergency Management Agency (FEMA) hazard mitigation programs is currently under review. This is because many regulatory issues related to alternative elevation techniques remain unclear, such as the basis used for determining eligible project costs, measuring cost-effectiveness, and potential tax consequences.

- Acquisition: Some existing buildings in Louisiana are located in coastal areas prone to ongoing, significant long-term erosion. Acquisition of erosion-prone structures can eliminate future damages and improve the community at large. Acquisition involves buying the property and the structure from the owner and demolishing the existing structure. The original site of the acquired structure can then be converted to undeveloped open space, parkland or public beaches in perpetuity. The cost of acquisition will vary depending on market value of the property (structure and land). The cost-effectiveness of acquisition will vary based on project cost and the level of erosion risk.

  Acquisitions are technically feasible and fully effective for all buildings. However, acquisition may not be feasible in some parishes where most of the population is located in the coastal floodplain and/or in parishes with high market real estate values. The environmental impacts of acquisition projects will vary based on the age of the structure and the materials present in the structure to be demolished (i.e., asbestos, lead-based paint, etc.)

- Relocation: Relocation of structures subject to significant long-term and short-term erosion can eliminate future damages and improve the community at large. Relocation involves buying the property from the owner and moving the existing structure to a new site outside the erosion hazard area, typically outside the floodplain. The original site of the relocated structure can then be converted to undeveloped open space, parkland or public beaches. The cost of relocation will vary depending on the market value of the property (structure and land) and the type of foundation, age and condition of the existing structure. The cost-effectiveness of relocation will vary based on project cost and the level of erosion risk. Relocations are technically feasible and fully effective for some buildings but of limited effectiveness or feasibility for many older or very large structures. However, careful evaluation of the sites and the existing structure is necessary prior to starting the work on a relocation project. In addition, relocation may not be feasible in some parishes where most of the population is located in the coastal floodplain and/or in parishes with high market real estate values. The environmental impacts of relocation projects vary based on the environmental condition of the site.

- Shoreline Protection Structures: Short- and long-term coastal erosion can lead to dramatic shoreline changes that can severely impact coastal buildings and facilities. Shoreline protection structures such as revetments,

groins or jetties can help limit or control most short-term and some long-term erosion effects on coastal buildings and facilities. Revetments are offshore structures constructed of rip-rap or concrete blocks placed parallel to the shoreline that protect against coastal erosion and wave impacts. Groins or jetties are offshore structures constructed of rip-rap or concrete blocks placed perpendicular to the shoreline that help control coastal erosion by preventing eroded soils from drifting along the shoreline. The cost of shoreline protection structures will vary depending on the size, materials and difficulty of construction. Since the cost of shoreline protection structures is usually high and the coastal erosion risk in Louisiana is relatively low, few shoreline protection projects are expected to be cost-effective. Shoreline protection structures are technically feasible and very effective for protecting coastal facilities against short-term erosion, but their effectiveness is limited for long-term erosion - shoreline protection structures can increase erosion and scour at adjacent locations. The environmental impacts of shoreline protection structures need to be carefully reviewed and approved by the U.S. Army Corps of Engineers (USACE) and local floodplain managers prior to construction.

- Restoration of Coastal Barrier Islands: There is no federal or state agency legislated with sole responsibility for Coastal Restoration projects. It is a shared effort among federal and state entities that recognize the critical need for coastal restoration and possess, at different times, the means to assist with the effort. While funding for such projects is available from sources such as the Coastal Impact Assistance Program (CIAP) and the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), those sources cannot on their own provide enough funding to successfully carry the burden of protecting the whole of Louisiana's coast.

  The Isles Dernieres barrier island chain, which includes Whiskey Island off the southern end of Terrebonne Parish, is considered one of the most rapidly deteriorating barrier shorelines in the United States. Measured retreat rates in the island chain during the last 100 years are on the order of 36.4 ft/yr on the Gulf side and 2 ft/yr on the Bay side. The Gulf side retreat has been about 15 times greater than the Bay side. Consequently, the islands are converging and narrowing while migrating. The islands are not rolling over and preserving land area as would be predicted by conventional coastal engineering theory. Higher retreats and loss rates are observed in the middle of the island chain including Whiskey and Trinity Islands, as compared to the ends of the chain system which include Raccoon and East Islands. This would indicate that the two interior islands are acting as feeders for the two exterior islands in this chain. Chain breakup has resulted from major storm actions and the loss of nourishing sediment from the natural system. Whiskey Island has lost an average of 24 acres per year from 1978 to 1996. The Isles Dernieres barrier island chain is losing its structural integrity and the capability to perform its function within the coastal and estuarine ecosystems. Chief among these is the chain's storm buffering capacity (which includes storm surges) and the protection it provides to human population centers, oil and gas infrastructure, inland bays, estuaries, and wetlands.

  To address the potential loss of Whiskey Island the Ship Shoal-Whiskey Island West Flank Restoration Project (TE-47), was authorized for federal and state funding by the Coastal Wetlands Planning, Protection, and Restoration Act (Public Law 101 – 646, Title III) (CWPPRA). However, this project has not yet received funding.

  The name Isle Derniere means "last island" in French and was given to the chain in the 1800s to describe a single large island, which at the time was not separated by tidal inlets. The island was created by the dispersion of sediments from the adjacent delta as it gradually submerged 600 to 800 years ago. Today, the plural form of the original name "Isles Dernieres" is used to account for the multiple islands and inlets that that have formed through island breaching and tidal inlet development. The remaining islands contain regressive beach ridges, wash over deposits, primary dunes and back barrier marshes. Several restoration projects involving this chain were recently constructed: East Island, Trinity Island, Raccoon Island, Whiskey Island East Flank, and East Timbalier Island.

This project (Ship Shoal-Whiskey Island West Flank Restoration Project) is located on the West Flank of Whiskey Island 17.5 miles southwest from Cocodrie, Louisiana in Terrebonne Parish. The overall project objectives are:

- Restoring the integrity of the West Flank of Whiskey Island to retain its structural function
- Adding new offshore sediment to the West Flank of Whiskey Island from Ship Shoal to increase sediment supply and strengthen island formation
- Rebuilding the natural structural framework within the coastal ecosystem to provide for separation of the gulf and the estuary
- Creating a continuous protective barrier for back bays and inland marshes
- Reducing wave energies thereby helping to reduce land loss
- Strengthening the long shore transport system of sediment for continuous island building
- Providing a unique and sustainable barrier island habitat for numerous indigenous biological species, some of which are threatened or endangered.
- Restoring roughly 500 acres of barrier island habitat into the island's West Flank
- Demonstrating the feasibility and long term efficacy of moving Ship Shoal sands to the Isles Dernieres and other barrier islands for future restoration projects

The estuarine marsh inland of the island as well as the inland communities will reap the protective benefits of the project. It has been estimated that every kilometer (km) of barrier island shoreline protects 30 square km (12 square miles or 7680 ac) of wetland-estuarine habitat. In conjunction with other Isle Dernieres restoration projects, Whiskey Island is estimated to protect 80,000 acres of estuarine habitat including inland infrastructure. By bolstering the natural physical barrier provided by Whiskey Island, the project will provide storm surge protection to Terrebonne Parish. Reducing the storm surge at the coastline prevents the flood waters being propagated through the marshland to residential areas. Additionally, Governor Jindal has been successful in obtaining funds to create sand berms in response to the Deepwater Horizon oil spill.

It should be noted that funding should not be traditionally limited to FEMA's 440 Hazard Mitigation Grant Program (HMGP). FEMA has not funded projects of this nature since the 1990's. Funding is available from other federal agencies (Alternative Funding). Coastal Restoration should consider using this publication to seek out funding options, other than FEMA. For example, EPA funded restoration of East Whiskey Island. Additionally,

- Enhanced Vegetation: Soils with vegetation are generally more cohesive than those without. Enhancement of vegetation, such as planting beach grass, creates a 'root mat' in the soil that can provide a natural defense against coastal erosion and improve slope stability of sand dunes. The cost of enhanced vegetation will vary depending on the existing soil conditions and the area to be covered by the vegetation. The cost-effectiveness of enhanced vegetation will vary based on project cost and the level of erosion risk. Enhanced vegetation is technically feasible, but effectiveness may be limited for large storm events. In addition, enhancement of vegetation will not work if the vegetation is not protected and maintained so it can grow. The environmental impacts of enhanced vegetation will vary based on the interaction of the enhanced vegetation with existing plant and animal life.

- Beach Nourishment: Short- and long-term coastal erosion can lead to a reduction or loss of beach areas that protect public buildings and facilities. Beach nourishment can help restore beach soils that are lost to erosion. A typical beach nourishment program involves placement of sand to a specific cross section and then maintaining the cross section through placement of additional sand on a periodic basis. The cost of beach nourishment will vary depending on the quantity and cost of beach sand to be placed, and the level of maintenance required. Since the cost of beach nourishment programs can be high and the coastal erosion risk in Louisiana is low, few beach nourishment projects are expected to be cost-effective. Beach nourishment programs are technically feasible and very effective for protecting coastal facilities against short-term erosion, but their effectiveness is

limited for long-term erosion without proper maintenance and other measures such as enhanced vegetation. Also, the cost of beach nourishment may not be eligible for reimbursement following a Federally-declared disaster unless it is designed and maintained according to specific FEMA criteria. The environmental impacts of beach nourishment programs need to be carefully analyzed by the USACE and other agencies prior to enactment.

Recommended Practices for Mitigation – Coastal Erosion

Based on the overview and evaluation of possible coastal erosion mitigation actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of erosion and scour in Louisiana. A coastal engineer should be consulted to identify whether selected mitigation actions are appropriate for protecting a given building or facility.

- Elevation
- Acquisition
- Relocation
- Shoreline Protection Structures
- Restoration of Coastal Barrier Islands
- Enhanced Vegetation
- Beach Renourishment

Appendix H.3:
Flood

Identification and Evaluation of Possible Mitigation Actions

The following mitigation actions are possible to reduce the impacts of floods to State-owned buildings and critical facilities in Louisiana, and generally across the state. For additional information, refer to the *Flood Hazard Mitigation Handbook for Public Facilities* (FEMA, 2002), *Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings* (FEMA 259, 2nd Edition, 2001) and *Selecting Appropriate Mitigation Measures for Floodprone Structures* (FEMA 551, 2007).

- Structural Elevation: Most flood damages to buildings and other facilities come from inundation by floodwaters. Elevation is one of the most effective mitigation techniques available for reducing or eliminating flood damages caused by inundation. Buildings and other structures may be elevated on piers, piles, or perimeter foundation walls to above a specified design flood elevation (usually the 100-year flood elevation).If walls are used to elevate, they must be vented to accommodate hydrostatic forces. For some structures located in areas with high property values, two alternative elevation techniques are available. The first technique, known as "demolish and rebuild", involves demolition of the existing structure and construction of a new elevated structure constructed to current codes and NFIP standards on the existing footprint. Another alternative form of structural elevation used in Louisiana is known as "second-story conversion". Second-story conversion projects involve the retrofit of a single-story structure into an elevated structure. The conversion process involves removing the walls and occupied areas of the first floor, enhancing the structural design of the remaining structure, and constructing the new NFIP and code-compliant building on top of the remaining elevated frame. Although second-story conversions are becoming increasingly popular in Louisiana, the eligibility for funding to demolish and rebuild and second-story conversion projects under various FEMA hazard mitigation programs is currently under review. The cost of structural elevation will vary depending on the type of foundation, age, condition and design flood elevation of the existing structure. The cost-effectiveness of structural elevations will vary based on project cost and the level of flood risk. Structural elevations are technically feasible and highly effective for most buildings. However, careful evaluation of the site and the existing structure is necessary prior to starting the work. The environmental impacts of structural elevation project are typically minimal, provided the footprint of the elevated structure does not change.
- Acquisition: Some existing buildings and facilities in Louisiana are located in areas prone to frequent, significant flood events. Acquisition of flood-prone structures can eliminate future damages and improve the resiliency of the community at large. Acquisition involves buying the property and the structure from the owner and demolishing the existing structure. The original site of the acquired structure can then be converted to open space or parkland. The cost of acquisition will vary depending on market value of the property (structure and land). The cost-effectiveness of acquisition will vary based on project cost and the level of flood risk. Acquisitions are technically feasible and fully effective for all buildings. However, acquisition of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located in the floodplain and/or has a high market value. The environmental impacts of acquisition projects will vary based on the age of the structure and the materials present in the structure to be demolished (i.e., asbestos, lead-based paint, etc.)
- Relocation: Relocation of structures subject to frequent flood events can eliminate future damages and improve the resiliency of the community at large. Relocation involves buying the property from the owner and moving the existing structure to a new site outside the floodplain area. The original site of the relocated structure can then be converted to open space or parkland. The cost of relocation will vary depending on the market value of the property (structure and land) and the type of foundation, age and condition of the existing structure. The cost-effectiveness of relocation will vary based on project cost and the level of flood risk. Relocations are technically

feasible and fully effective for many buildings. However, careful evaluation of the sites and the existing structure is necessary prior to starting the work on a relocation project.

In addition, relocation of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located in the floodplain and/or has a high market value. The environmental impacts of relocation projects will vary based on the environmental condition of the relocation site.

- Wet Flood Proofing: Many existing buildings and facilities in Louisiana are located in areas prone to frequent, but low-level, flood events. Wet flood proofing techniques can help mitigate damages resulting from shallow, short duration, low-velocity flood events with adequate warning time. Wet flood proofing allows floodwaters to inundate selected portions of the building, but minimizes the damage by using water-resistant construction materials and protecting vulnerable systems – such as electrical equipment – by elevating or shielding. The cost of wet flood proofing will vary depending on the type of foundation, wall construction, utility systems, and flood depth of the existing structure. The cost-effectiveness of wet flood proofing projects will vary based on project cost and the level of flood risk. Wet flood proofing can be technically feasible and somewhat effective for protecting buildings with high-value contents. However, some flood damages and clean-up costs will remain. The environmental impacts of wet flood proofing are typically negligible, provided the flooding of a facility does not spread toxic or hazardous materials.
- Dry Flood Proofing: Dry flood proofing techniques can help mitigate damages from shallow, short duration, low-velocity flood events with adequate warning time. Dry flood proofing prevents floodwaters from entering the building by sealing the building with waterproof materials and using shields to protect openings. However, flood depths should be limited to 2 feet or less, and structural capacity and buoyancy checks are needed for the purpose of ensuring that the structure will not be compromised in any way during a flood event. The cost of dry flood proofing will vary depending on the site soils, type of foundation, wall construction, condition, and flood depth of the existing structure. The cost-effectiveness of dry flood proofing projects will vary based on project cost and the level of flood risk. Dry flood proofing can be technically feasible and very effective for protecting buildings and facilities. However, dry flood proofing usually relies on human intervention to be effective (active mitigation) and may increase flood damages and clean-up costs if the flood depth exceeds the flood proofing design depth. The environmental impacts of dry flood proofing are typically negligible.
- Barriers: Barriers are flood control structures that are placed around a facility, neighborhood or larger area to effectively protect it from short duration, low-velocity flood events up to the design height of the barrier. Barriers can consist of floodwalls, levees or berms. Floodwalls are walls constructed of reinforced concrete or masonry. Levees are embankments constructed of compacted earth fill with an impermeable clay core. Small levees that protect a single structure or a small grouping of properties without USACE certification are sometimes called "berms". For the purposes of the Plan Update, a berm is a fundable mitigation project under federal hazard mitigation grant programs (such as the Hazard Mitigation Planning Grant (HMPG)), but a levee is not. The cost of barriers will vary depending on the site soil conditions, quantity of available land, and flood depth surrounding the existing structure. The cost-effectiveness of barriers projects will vary based on project cost and the level of flood risk. Floodwalls and levees can be technically feasible and very effective for protecting buildings and facilities. However, floodwalls and levees may not be permitted by the local floodplain management ordinance, and they provide no protection if the flood depth exceeds the design depth. The environmental impacts of barriers will vary depending on their location in the floodplain.
- Mitigation Reconstruction: Also known as "demolish and rebuild," mitigation reconstruction involves the demolition of a substantially damaged structure, and its replacement on the same site with a mitigation structure. Under FEMA's Pilot Reconstruction Program, eligible applicants may receive HMGP funds to demolish an existing structure and construct an improved, elevated structure on the same site. This may include pre-existing structures that were substantially damaged or destroyed because of the declared event. The grant is only available to property owners who owned the property at the time of the event for which funding is authorized. Mitigation reconstruction projects are not eligible if located in floodways as identified on the effective Flood

Insurance Rate Maps (FIRMs). Alternative mitigation actions must be considered, and elevation determined to be the most cost effective and beneficial action.

Recommended Practices for Mitigation - Flood

Based on the overview and evaluation of possible flood mitigation actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of floods to State-owned buildings and critical facilities in Louisiana. A structural engineer should be consulted to identify whether selected structural mitigation actions are appropriate for a given building or facility.

- Structural Elevation
- Acquisition
- Mitigation Reconstruction
- Wet Flood proofing
- Dry Flood proofing

Appendix H.4:
High Wind (Hurricane)

Identification and Evaluation of Possible Mitigation Actions

A hurricane is an intense, rotating oceanic weather system that produces maximum sustained winds exceeding 74 mph (Category 1), and may exceed 155 (Category 5). They form and intensify over tropical oceanic regions.

Typically, traditional buildings are not designed for the extreme wind speed conditions described above. Depending on the parish and according to local building codes, new buildings are typically designed for wind speeds in the range of 70 to 110 mph. Older (pre-code) structures may be susceptible to damages from even lighter winds.

The following mitigation actions are possible options for reducing the impacts of hurricane winds to State-owned buildings and critical facilities in Louisiana, and are generally applicable across the State. For additional information, refer to the FEMA How-To Series, *Protecting Your Property from Wind*s and *Protecting Your Business from Disasters* (http://www.fema.gov/fima/).

- Construct Safe Rooms. A small windowless room, such as a closet or bathroom, readily accessible from all parts of a structure, can be designed to provide occupant protection during a tornado or extreme hurricane. The concept is applicable to both existing residences and newly constructed ones, and is economically practical, whereas constructing the entire house to provide occupant protection is cost prohibitive. The accessibility of a shelter within the house makes the in-residence shelter highly advantageous over an outdoor cellar or community shelter because it eliminates the extreme danger of being struck by flying debris while attempting to reach a cellar or community shelter. Unlike the cellar, the in-residence shelter has a daily functional use, such as bathroom, closet, utility room, etc. It permits a family to continue regular living patterns during a weather watch with the peace of mind of knowing that a place of safety from extreme winds is only a few seconds away. Properly reinforced basements with concrete roofs offer safe and readily accessible shelters from storms, but in many areas of the country they are not commonly provided in residences. The cost of an in-residence shelter is substantially less than that of a basement. FEMA compliant in-residence shelters require the following: rapid accessibility, resistance to wind forces up to 250 mph, adequate fasteners, adequate coverage, and resistance to wind-borne missile perforation up to 100 mph. Ventilation should be provided if the shelter is also intended to provide protection from hurricanes. Construction using reinforced concrete masonry or layered plywood and steel on wood studs are both viable. (Information from the Texas Tech Wind Science and Engineering Center). For more information, download *Taking Shelter from the Storm, Building a Safe Room Inside Your House* (FEMA 320) from the FEMA Information Resource Library at www.fema.gov. In areas of extremely high tornado risk and to provide for the safety of residents without the means to construct a safe room, construction of Community Shelters may also be appropriate. See "Construct a Shelter," below.

- Code Adoption and Improved Code Compliance: An analysis of recent hurricane damages in Louisiana and along the Gulf Coast indicates that many newer buildings experienced wind damage because they did not have a current building code in place or meet the requirements of the existing building code. Adoption of and improved compliance with current building codes for new and existing buildings will reduce wind damages from future hurricanes and tropical storms. Techniques for code adoption include development and passing of local legislation to enact the current version of building codes such as the International Building Code (IBC) and associated standards. Techniques for improved code compliance include increased inspections and education and outreach activities to contractors to help increase understanding of how to construct buildings to meet and exceed current code requirements. The cost of code adoption and improved code compliance can be difficult to estimate due to the level of effort and cooperation required on the part of community officials, building inspectors and private contractors. The cost-effectiveness of code adoption and improved code compliance will vary based

on the cost of implementing these activities in relation to the wind hazard risk level, although, in general, code adoption and compliance are standard functions of local governments, are funded through their general budgets, and the costs are exceeded by the long-term potential damage to buildings and infrastructure from wind-related hazards. Code adoption and improved code compliance is technically feasible and can improve the quality of building construction, but, overall effectiveness can be difficult to measure, and increased education and inspections are needed to maintain effectiveness over time. The environmental impacts of code adoption and improved code compliance are typically negligible.

Fortified Construction: This is a disaster-resistant new home construction initiative of the Institute for Business & Home Safety (IBHS), a national organization, headquartered in Tampa, FL. The pilot program features affordable construction options designed to safeguard homes and families against high winds, flooding, and wildfires. Fortification includes the following methods:

- Non-combustible roof materials that also better withstand high winds
- Windows and patio doors made of impact-resistant glass or protected by shutters
- Connections that securely tie the house together from roof to foundation
- Securely anchored exterior structures such as carports and porches
- Reinforced, impact-resistant entry and garage doors
- Building site and landscaping techniques that reduce wildfire and flooding vulnerability

Fortified buildings' insurance premiums are significantly lower than unfortified structure rates. In many areas of the greater New Orleans area, for example, where insurance rates have increased 2 to 4 times the pre-Katrina rates, fortification offers cost relief. Following are comparative quotes:

	Fortified	Fortified	110 mph code	110 mph code
Coverage>	$ 100,000.00	$ 150,000.00	$ 100,000.00	$ 150,000.00
Jefferson Parish	$ 794.85	$ 1,117.20	$ 1,589.70	$ 2,234.40
St Bernard	$ 994.35	$ 1,408.05	$ 1,988.70	$ 2,816.10
Orleans	$ 896.70	$ 1,264.20	$ 1,793.40	$ 2,528.40

- Minimize Potential Windborne Debris: Many buildings, utilities and other facilities are damaged in high wind events when tree limbs or other debris are picked up by the wind and impact structures. Minimizing the potential for windborne debris can help reduce damages from high or extreme wind events. Mitigation techniques include removing dead and dying trees near structures and along utility lines, and anchoring storage sheds to their foundations or replacing them with more durable reinforced concrete structures, and anchoring rooftop utility equipment. The cost of minimizing potential windborne debris will vary based on the amount of debris around the site. The cost-effectiveness of minimizing potential windborne debris will vary based on the level of wind risk. Minimizing potential windborne debris is technically feasible and highly effective for most buildings and facilities. For minimizing potential windborne debris, cutting or trimming certain trees and vegetation may be restricted by environmental considerations.

- Strengthen Building Framing Connections: Buildings in high wind events are often damaged when wind pressures on framing connections lead to uplift failure and collapse of roofs, walls, or the entire structure. Strengthening building framing connections can help reduce the risk of damages during high wind events. Mitigation techniques for framing connections include bracing roof framing between roof trusses and at gable ends, installing hurricane straps between the roof framing and the walls, anchoring structures to their

foundations using anchor bolts or tie-down straps, using adhesive to bond roof underlayment to rafters, and overlapping exterior sheathing in sufficient number and strength to resist wind uplift (suction) pressures. The cost to strengthen building framing connections will vary based on the age, type, level of code compliance and condition of the existing structure and connections. The cost-effectiveness of strengthening building framing connections will vary based on project cost and the level of wind risk. Strengthening building framing connections is technically feasible and highly effective for most buildings, however, it is most effective when combined with other measures such as protecting exterior sheathing and exterior openings. The environmental impacts of strengthening building framing connections are typically negligible.

- Protect Exterior Sheathing: The building envelope of a structure consists of the exterior sheathing (roof materials and exterior walls). Protection of the exterior sheathing is essential to prevent increased internal wind pressures, damage to the interior, and possible structural damage or collapse. Mitigation of exterior sheathing can be accomplished by securing roof underlayment materials to rafters with adhesives, securing wood shingle, built-up and single-ply roofing materials with additional fasteners, securing metal siding and roofs with fasteners and brackets at the edges and corners to reduce the risk of 'blow off' in high wind events, and eliminating gravel ballast roof systems. The cost to protect exterior sheathing will vary based on the age, type, level of code compliance and condition of the existing structure and sheathing. The cost-effectiveness of protecting exterior sheathing will vary based on project cost and the level of wind risk. Protecting exterior sheathing is technically feasible and highly effective for most buildings, however, it is most effective when combined with other measures such as strengthening building framing connections and protecting exterior openings. The environmental impacts of protecting exterior sheathing are typically negligible.
- Protect Exterior Openings: The exterior openings (exterior doors, windows, and vents) form part of the building envelope. As with exterior sheathing, protection of the exterior openings is essential to prevent increased internal wind pressures, interior damage, and possible structural damage or collapse. Exterior doors can be mitigated by reinforcing regular entry doors using additional bolts on sides and along the top and bottom, and by replacing or reinforcing garage doors using stiffeners and reinforcing brackets to prevent door failure due to excessive deflection, bending or failure of the tracks that support the door. Window openings can be mitigated by installing impact-resistant shutters or screens to protect windows or strengthening window glass using tempered glass, wire-reinforced glass or window film. The cost to protect exterior openings will vary based on the age, type, level of code compliance and condition of the existing structure and openings. The cost-effectiveness of protecting exterior openings will vary based on project cost and the level of wind risk. Protecting exterior openings is technically feasible and highly effective for most buildings, however, it is most effective when combined with other measures such as strengthening building framing connections and protecting exterior sheathing. The environmental impacts of protecting exterior openings are typically negligible.
- Anchor or Secure Utilities: Utility damage to buildings or facilities is typically caused by wind pressures and/or debris impact forces, which can snap antenna poles, sever transmission lines, and damage heavy equipment. Mitigation techniques for utilities include anchoring heavy equipment such as rooftop Heating Ventilation and Cooling (HVAC) compressors, securing tanks used for storage of fuel or water with metal straps or tie-down anchors, and strengthening antenna poles using stronger materials or cable ties to prevent collapse. Another effective but expensive option is to relocate rooftop utilities inside the building or underground to eliminate damages from all future wind events. The cost to anchor or secure utilities will vary based on the age, location and condition of the existing equipment. The cost-effectiveness of anchoring or securing utilities will vary based on project cost and the level of wind risk. Anchoring or securing utilities is technically feasible and highly effective for most facilities, however, it is most effective when combined with minimizing potential windborne debris. The environmental impacts of anchoring or securing utilities are typically negligible.
- Construct a Shelter: Construction of a large, secure shelter space is recommended to protect individuals in high-occupancy buildings from high or extreme wind events where structures are unlikely to escape destruction. Shelters located in the floodplain must be constructed above the 100-year flood level. Additional information on constructing large-scale community shelters is available from *Design and Construction Guidance for Community*

Shelters, (FEMA Publication 361, July 2000). The cost to construct a shelter will vary based on the size and wind design requirements of the shelter. The cost-effectiveness of constructing a shelter will vary based on project cost and the level of wind risk. Constructing a shelter is technically feasible and highly effective at protecting human lives. However, it does not protect against storm surge or reduce damages to the surrounding building or facility, and is only effective for high or extreme wind events. The environmental impacts of constructing a shelter will vary based on the environmental conditions of the shelter site.

Continuous Load Path: In layman's term, this is tying home or offices together from the roof to the foundation. A continuous load path is the series of building members and connections that resist loads that act downward (gravity loads), as well as laterally and upward (wind, flood, or seismic loads). The connections between the members are typically the point of failure (and thus most critical) in continuous load path found in residential structures. It is a method of construction that uses a system of wood, metal connectors, fasteners (like nails and screws), and shear walls to connect the structural frame of the house together. A continuous load path is like a chain that ties the house together from the roof to the foundation and is essential during a major wind storm because it helps hold the house together when ground forces or high winds try to pull the building apart. A building is more likely to withstand a high wind event and stay intact when all parts of the house – roof, walls, floors and foundation – are connected together. Suggested reading is: *Wind Storm Mitigation Manual for Light Frame Construction (http://www.safehomeillinois.org/resources/building/windstorm_miti_lightframe.pdf)* by Illinois emergency Management Agency and funded by FEMA, plus *Companion Manual to the Wind Storm Mitigation Manual for Light Frame Construction*; *Bracing For the Future: Construction Techniques to Protect Against Wind Damage in Ladysmith* developed by FEMA.

Hurricane Proof Building: Not widely known to the public and the building industry, reinforced and other innovatively engineered concrete buildings offer high wind protection than even high modified conventional "stick=built" buildings. For example, Structural Insulated Panel (SIP) Construction is Miami-Dade rated at 200 mph. SIP uses concrete panels sandwiched with a layer of foam insulation between erected structures using a steel wind frame. Insulated Concrete Form (ICF) structures can be rated for over 250 mph. The only building surviving on the beach of Pass Christian during Hurricane Katrina was an ICF. The ultimate is one piece, cast in place, thin-shell concrete monolithic dome. It can be designed to withstand pressures up to 2,000 plus pounds per square foot (PSF). This can also be compared to the fastest tornado, a F5, at 300 mph, which generates 1/5 the amount, or 404 PSF.

A dome would be an ideal EOC, school building, etc. According to FEMA standards, domes provide near absolute protection. Furthermore, domes cannot be damaged by wildfire, hurricanes, flooding, earthquakes, etc. To date, no domes have ever been destroyed by any natural event.

Recommended Practices for Mitigation – High Wind (Hurricane)

Based on the overview and evaluation of possible hurricane wind mitigation actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of hurricane winds to State-owned buildings and critical facilities in Louisiana. A structural engineer should be consulted to identify whether selected structural mitigation actions are appropriate for a given building or facility.

- Construct Safe Rooms
- Increased Code Adoption and Compliance
- Fortified Construction
- Minimize Potential Windborne Debris
- Strengthen Building Framing Connection
- Protect Exterior Sheathing
- Protect Exterior Openings

- Anchor or Secure Utilities:
- Continuous Load Path
- Hurricane proof building

Appendix H.5:
High Wind (Tornado)

Identification and Evaluation of Possible Mitigation Actions

Tornadoes are a localized and violently destructive windstorms occurring over land characterized by a funnel-shaped cloud extending toward the ground. Wind speed can vary from 40 mph to over 300 mph and represents the most extreme and violent type of wind produced by nature. At 300 mph, tornadoes can generate forces of 404 pounds per square foot.

Virtually no buildings are designed typically for the above conditions, but local building codes require new structures to be able to withstand wind speeds typically in the range of 70 to 110 mph, depending on the parish.

The following mitigation actions are possible to reduce the impacts of tornado winds to State-owned buildings and critical facilities in Louisiana, and generally across the State. For additional information, refer to the FEMA How-To Series, *Protecting Your Property from Wind*s and *Protecting Your Business from Disasters* (http://www.fema.gov/fima/).

Note: "Safe Rooms" are the only mitigation measure relevant to a direct hit from a tornado, although mitigation measures intended for other high-wind events can be effective when tornadoes pass close to a structure.

- Construct Safe Rooms. A small windowless room, such as a closet or bathroom, readily accessible from all parts of the house, can be designed to provide occupant protection during a tornado. Such a shelter becomes the "in-residence shelter." The concept is applicable to both existing residences and newly constructed ones, and is economically practical, whereas constructing the entire house to provide occupant protection is cost prohibitive. The accessibility of a shelter within the house makes the in-residence shelter highly advantageous over an outdoor cellar or community shelter because it eliminates the extreme danger of being struck by flying debris while attempting to reach a cellar or community shelter. Unlike the cellar, the in-residence shelter has a daily functional use - bathroom, closet, utility room, etc. It permits a family to continue regular living patterns during a weather watch with the peace of mind of knowing that a place of safety from extreme winds is only a few seconds away. Properly reinforced basements with concrete roofs offer safe and readily accessible shelters from storms, but in many areas of the country they are not commonly provided in residences. The cost of an in-residence shelter is substantially less than that of a basement. In-residence shelters require the following: rapid accessibility, resistance to wind forces up to 250 mph, adequate fasteners, adequate coverage, and resistance to wind-borne missile perforation up to 100 mph. Ventilation should be provided if the shelter is also intended to provide protection from hurricanes. Construction using reinforced concrete masonry or layered plywood and steel on wood studs are both viable. (Information from the Texas Tech Wind Science and Engineering Center). For more information, download *Taking Shelter from the Storm, Building a Safe Room Inside Your House* (FEMA 320) from the FEMA Information Resource Library at www.fema.gov. In areas of extremely high tornado risk and to provide for the safety of residents without the means to construct a safe room, construction of Community Shelters may also be appropriate. See "Construct a Shelter," below.

- Code Adoption and Improved Code Compliance: Adoption of current building codes and improved compliance with existing codes for new and existing buildings will reduce wind damages from future tornados. Techniques for code adoption include development and passing of local legislation to enact the current version of building codes such as the IBC and associated standards. Techniques for improved code compliance include increased inspections and contractor education and outreach activities to help increase understanding of construction methods to meet and exceed current code requirements. The cost of code adoption and improved code compliance can be difficult to estimate due to the level of effort and cooperation required on the part of community officials, building inspectors and private contractors. The cost-effectiveness of code adoption and improved code compliance will vary based on the cost of implementing these activities in relation to the wind

hazard risk level, although, in general, code adoption and compliance are standard functions of local governments, are funded through their general budgets, and the costs are exceeded by the long-term potential damage to buildings and infrastructure from wind-related hazards. . Code adoption and improved code compliance is technically feasible and can improve the quality of building construction, but, overall effectiveness can be difficult to measure, and increased education and inspections are needed to maintain effectiveness over time. The environmental impacts of code adoption and improved code compliance are typically negligible. Fortified Construction: This is a disaster-resistant new home construction initiative of the Institute for Business & Home Safety (IBHS), a national organization, headquartered in Tampa, FL. The pilot program features affordable construction options designed to safeguard homes and families against high winds, flooding, and wildfires. Fortification includes the following methods:

- Non-combustible roof materials that also better withstand high winds
- Windows and patio doors made of impact-resistant glass or protected by shutters
- Connections that securely tie the house together from roof to foundation
- Securely anchored exterior structures such as carports and porches
- Reinforced, impact-resistant entry and garage doors
- Building site and landscaping techniques that reduce wildfire and flooding vulnerability

Fortified buildings' insurance premiums are significantly lower than unfortified structure rates. In many areas of the greater New Orleans area, for example, where insurance rates have increased 2 to 4 times the pre-Katrina rates, fortification offers cost relief. Following are comparative quotes:

	Fortified	Fortified	110 mph code	110 mph code
Coverage>	$ 100,000.00	$ 150,000.00	$ 100,000.00	$ 150,000.00
Jefferson Parish	$ 794.85	$ 1,117.20	$ 1,589.70	$ 2,234.40
St Bernard	$ 994.35	$ 1,408.05	$ 1,988.70	$ 2,816.10
Orleans	$ 896.70	$ 1,264.20	$ 1,793.40	$ 2,528.40

- Minimize Potential Windborne Debris: Many buildings, utilities and other facilities are damaged in high wind events when tree limbs or other debris are picked up by the wind and impact structures. Minimizing the potential for windborne debris can help reduce damages from high or extreme wind events. Mitigation techniques include removing dead and dying trees near structures and along utility lines, and anchoring storage sheds to their foundations or replacing them with more durable reinforced concrete structures, and anchoring rooftop utility equipment. The cost of minimizing potential windborne debris will vary based on the amount of debris around the site. The cost-effectiveness of minimizing potential windborne debris will vary based on the level of wind risk. Minimizing potential windborne debris is technically feasible and highly effective for most buildings and facilities. For minimizing potential windborne debris, cutting or trimming certain trees and vegetation may be restricted by environmental considerations.
- Strengthen Building Framing Connections: Buildings in high wind events are often damaged when wind pressures on framing connections lead to uplift failure and collapse of roofs, walls, or the entire structure. Strengthening building framing connections can help reduce the risk of damages during high wind events. Mitigation techniques for framing connections include bracing roof framing between roof trusses and at gable ends, installing straps between the roof framing and the walls, anchoring structures to their foundations using anchor bolts or tie-down straps, using adhesive to bond roof underlayment to rafters, and overlapping exterior sheathing in sufficient number and strength to resist wind uplift (suction) pressures. The cost to strengthen building framing connections will vary based on the age, type, level of code compliance and condition of the existing structure and connections. The cost-effectiveness of strengthening building framing connections will vary based on project cost and the level of wind risk. Strengthening building framing connections is technically feasible and highly effective for most buildings, however, it is most effective when combined with other measures such as protecting exterior sheathing and exterior openings. The environmental impacts of strengthening building framing connections are typically negligible.
- Protect Exterior Sheathing: The building envelope of a structure consists of the exterior sheathing (roof materials and exterior walls). Protection of the exterior sheathing is essential to prevent increased internal wind pressures, damage to the interior, and possible structural damage or collapse. Mitigation of exterior sheathing can be accomplished by securing roof underlayment materials to rafters with adhesives, securing wood shingle, built-up and single-ply roofing materials with additional fasteners, securing metal siding and roofs with fasteners and brackets at the edges and corners to reduce the risk of 'blow off' in high wind events and eliminating gravel ballast roof systems. The cost to protect exterior sheathing will vary based on the age, type, level of code compliance and condition of the existing structure and sheathing. The cost-effectiveness of protecting exterior sheathing will vary based on project cost and the level of wind risk. Protecting exterior sheathing is technically feasible and highly effective for most buildings, however, it is most effective when combined with other measures such as strengthening building framing connections and protecting exterior openings. The environmental impacts of protecting exterior sheathing are typically negligible.
- Protect Exterior Openings: The exterior openings (exterior doors and windows) form part of the building envelope. As with exterior sheathing, protection of the exterior openings is essential to prevent increased internal wind pressures, interior damage, and possible structural damage or collapse. Exterior doors can be mitigated by reinforcing regular entry doors using additional bolts on sides and along the top and bottom, and by replacing or reinforcing garage doors using stiffeners and reinforcing brackets to prevent door failure due to excessive deflection, bending or failure of the tracks that support the door. Window openings can be mitigated by installing impact-resistant shutters or screens to protect windows or strengthening window glass using tempered glass, wire-reinforced glass or window film. The cost to protect exterior openings will vary based on the age, type, level of code compliance and condition of the existing structure and openings. The cost-effectiveness of protecting exterior openings will vary based on project cost and the level of wind risk. Protecting exterior openings is technically feasible and highly effective for most buildings, however, it is most effective when combined with other measures such as strengthening building framing connections and protecting exterior sheathing. The environmental impacts of protecting exterior openings are typically negligible.

- Anchor or Secure Utilities: Utility damage to buildings or facilities is typically caused by wind pressures and/or debris impact forces, which can snap antenna poles, sever transmission lines, and damage heavy equipment. Mitigation techniques for utilities include anchoring heavy equipment such as rooftop HVAC compressors, securing tanks used for storage of fuel or water with metal straps or tie-down anchors, and strengthening antenna poles using stronger materials or cable ties to prevent collapse. Another effective but expensive option is to relocate rooftop utilities inside the building or underground to eliminate damages from all future wind events. The cost to anchor or secure utilities will vary based on the age, location and condition of the existing equipment. The cost-effectiveness of anchoring or securing utilities will vary based on project cost and the level of wind risk. Anchoring or securing utilities is technically feasible and highly effective for most facilities, however, it is most effective when combined with minimizing potential windborne debris. The environmental impacts of anchoring or securing utilities are typically negligible.
- Construct a Shelter: Construction of a large, secure shelter space is recommended to protect individuals in high-occupancy buildings from high or extreme wind events where structures are unlikely to escape destruction. Shelters located in the floodplain must be constructed above the 100-year flood level. Additional information on constructing large-scale community shelters is available from *Design and Construction Guidance for Community Shelters (*FEMA Publication 361, July 2000). The cost to construct a shelter will vary based on the size and wind design requirements of the shelter. The cost-effectiveness of constructing a shelter will vary based on project cost and the level of wind risk. Constructing a shelter is technically feasible and highly effective at protecting human lives. However, it does not protect against storm surge or reduce damages to the surrounding building or facility, and is only effective for high or extreme wind events. The environmental impacts of constructing a shelter will vary based on the environmental conditions of the shelter site.
- Continuous Load Path: In layman's term, this is tying home or offices together from the roof to the foundation. A continuous load path is the series of building members and connections that resist loads that act downward (gravity loads), as well as laterally and upward (wind, flood, or seismic loads). The connections between the members are typically the point of failure (and thus most critical) in continuous load path found in residential structures. It's a method of construction that uses a system of wood, metal connectors, fasteners (like nails and screws) and shear walls to connect the structural frame of the house together. A continuous load path is like a chain that ties the house together from the roof to the foundation and is essential during a major wind storm because it helps hold the house together when ground forces or high winds try to pull the building apart. A building is more likely to withstand a high wind event and stay intact when all parts of the house – roof, walls, floors and foundation – are connected together. Suggested reading is: *Wind Storm Mitigation Manual for Light Frame Construction (http://www.safehomeillinois.org/resources/building/windstorm_miti_lightframe.pdf)* by Illinois emergency Management Agency and funded by FEMA plus *Companion Manual to the Wind Storm Mitigation Manual for Light Frame Construction*; *Bracing For the Future: Construction Techniques to Protect Against Wind Damage in Ladysmith* developed by FEMA.
- Tornado Proof Building: Not widely known to the public and the building industry, concrete buildings offer higher wind protection than even high modified conventional "stick-built" buildings. For example, Structural Insulated Panel (SIP) Construction is Miami-Dade rated at 200 mph. SIP uses concrete panels sandwiched with a layer of foam insulation in between and erected using a steel wind frame. Insulated Concrete Form (ICF) structures are another tornado proof building option and can be rated to over 250 mph. The only building surviving on the beach of Pass Christian during Katrina was an ICF. The ultimate is one piece, cast in place, thin-shell concrete monolithic dome. Domes can be designed to withstand pressures up to 2,000 plus pounds per square foot (PSF). Compared to the fastest tornado, an F5 at 300 mph only generates 1/5 the wind load, or 404 PSF.

Recommended Practices for Mitigation – High Wind (Tornado)

Based on the overview and evaluation of possible tornado wind mitigation actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of tornado winds to State-owned buildings and critical facilities in Louisiana. A structural engineer should be consulted to identify whether selected structural mitigation actions are appropriate for a given building or facility.

- Construct Safe Rooms
- Increased Code Adoption and Compliance
- Fortified construction
- Minimize Potential Windborne Debris
- Strengthen Building Framing Connection
- Protect Exterior Sheathing
- Protect Exterior Openings
- Anchor or Secure Utilities:
- Continuous Load Path
- Tornado Proof Building

Appendix H.6: Ice Storm

Identification and Evaluation of Possible Mitigation Actions

The following mitigation actions are possible to reduce the impacts of ice storms to State-owned buildings and critical facilities in Louisiana, and generally across the State. For additional information, refer to the FEMA website for mitigation (http://www.fema.gov/fima/).

- Maintenance of Power Line Corridors and Right-of-Ways (ROWs): Many roads, buildings, and utility systems are damaged in ice storm events when tree limbs weighed down by ice snap and strike the structure or utility line. Minimizing the potential for debris can help reduce damages from ice storm events. Mitigation techniques include removing dead and dying trees near structures and along roadsides and utility lines. The cost of minimizing potential debris is typically low. The cost-effectiveness of minimizing potential debris will vary based on project cost and the level of ice storm risk. Minimizing potential debris is technically feasible and highly effective for most buildings and facilities, however, it may not eliminate ice storm damage to structures or utility lines. For minimizing potential debris, the cutting and trimming of certain trees and vegetation may be restricted by environmental considerations.
- Robust Components and Features: Damage to utility systems is also caused by the weight of ice collected on overhead utilities and by wind oscillation ("galloping") that can snap utility poles, sever overhead transmission lines, and harm heavy equipment. Mitigation techniques for protecting utility systems include anchoring heavy equipment such as electrical transformers mounted on poles using additional straps and braces, reducing camber in overhead transmission lines, and providing cover for exposed utilities.
- Utility Line Relocation: Another effective but expensive option is to relocate overhead utilities underground (i.e. burying them) to eliminate damages from all future ice-storm events. Burial usually costs 2 to 5 times more than overhead lines. Burying transmission lines in troublesome corridors is usually cost effective.
- High Performance Equipment: Often implemented by large for-profit energy companies like Entergy, using both high performance power transmission equipment and material is an effective mitigation measure. Some of the activities conducted are:
    - Replace old style copper conductor with aluminum conductor for short span, or aluminum conductor steel reinforced (ACSR) for long span. ACSR is very strong and seldom breaks, even under high wind load.
    - Replace standard southern yellow pine poles with spun concrete. Almost no spun concrete pole failed during Hurricanes Charley, Frances, Ivan and Jeanne. Spun concrete cost 2-3 times as much, but is 3-4 times stronger.
    - Replace wooden cross arms with line post-polymeric insulators, which seldom break and do not have high-wind profile of cross arm.
    - Add more guide wire support for poles.
    - Add Aeolian Dampeners, commonly called dog bones, to high voltage line in order to stop oscillation (galloping) which can tear lines and poles. Line overburdened by ice accretion may snap from oscillation.
    - Irregularly space new or replacement poles (e.g. first span might be 300 feet, the next 294 feet, the next 310 feet, etc..). Irregular span spacing prevents standing harmonic waves that may destroy line from galloping.

- Make sure electrical coop is rebuilt with top static line and with adequate grounding. This line is used to intercept lightning strikes. Some small coops may omit this important item.
- Dual Transmission Conductors: Another effective measure is the use of T-2 style Power Line Conductors. Instead of one high-voltage transmission line conductor, two line conductors are twisted together. Sizing is based on impedance and load capacity of the wire. Since two lines move in different direction, each line will easily resist ice acervation (ice forming), and will easily break any ice forming. Two conductors are stronger than single conductors, so lines resist high-wind loads, resisting galloping/oscillation (two lines dampen each other out) and handle increase ice load. FEMA has funded many such Hazard Mitigation Grant Program (HMGP) projects in ice-storm prone areas.
- Increased Electrical Resistance: Another new method is to increase the electrical resistance in cables. This is counter intuitive, and exactly opposite of what electrical engineers avoid to dissipate energy and heat in power lines. In this method, a device is attached to the end of a power line, which switches power between the wires (usually wired in parallel) to a series circuit. When not activated, the power line performs like any other standard conductor. However, when the switch is activated to the series, the resistance goes up and the conductor generates sufficient heat to melt the ice coating. The process takes from 30 seconds to 3 minutes, and consumes less than 1 percent of the power being conducted. Power can be switched from a remote control station as well. This is cost effective as the costs are greatly outweighed by the damages that usually result from ice storms.

  Note: An older method is to reduce the voltage between stations, as this also increases the heating of the power line.

- Minimize Potential Debris: Many roads, buildings and utility systems are damaged in ice storm events when tree limbs weighed down by ice snap and strike the structure or utility line. Minimizing the potential for debris can help reduce damages from ice storm events. Mitigation techniques include removing dead and dying trees near structures and along roadsides and utility lines. The cost of minimizing potential debris is typically low. The cost-effectiveness of minimizing potential debris will vary based on project cost and the level of ice storm risk. Minimizing potential debris is technically feasible and highly effective for most buildings and facilities, however, it may not eliminate ice storm damage to structures or utility lines. For minimizing potential debris, the cutting and trimming of certain trees and vegetation may be restricted by environmental considerations.
- Anchor or Secure Utility Systems: Damage to utility systems is also caused by the weight of ice collected on overhead utilities that can snap utility poles, sever overhead transmission lines, and harm heavy equipment. Mitigation techniques for protecting utility systems include anchoring heavy equipment such as electrical transformers mounted on poles using additional straps and braces, reducing camber in overhead transmission lines, and providing cover for exposed utilities. Another effective but expensive option is to relocate overhead utilities underground to eliminate damages from all future ice storm events. The cost to anchor or secure utility systems will vary based on the age, location and condition of the existing equipment. The cost-effectiveness of anchoring or securing utility systems will vary based on project cost and the level of ice storm risk. Anchoring or securing utility systems is technically feasible and highly effective for most facilities, however, it is most effective when combined with minimizing potential debris. The environmental impacts of anchoring or securing utility systems are typically negligible.
- Preventing Damages to Buildings: Mitigation measures include adding attic ventilation and ceiling insulation, plugging roof leaks, and adding protective coverings for gutters. Ice damages can be reduced with high performance roofing material that stops leaks from ice damming. These materials are normally self adhering and can be used for all standard type of roofing, such as metal, shingles, and tile. In effect, it will waterproof the roof. Interestingly, if the roofing is lost from a wind storm, the roof remains waterproof and will not need tarp

covering. Generally, it is rubberized asphalt which seals around nails and protects where standard underlayment cannot.

Most buildings in Louisiana have little to no insulation, with limited to no attic ventilation. Ice damages buildings according to the following "ice dam" scenario: Snow accumulates on the roof, and the building's heating system responds to the winter cold by heating the building interior. Some of the heat (in excess) passes through the un-insulated ceiling, and into the attic. With already poor venting from the attic to the outdoors, the heat is trapped in the attic and warms the roof. As the roof warms, the snow on top of it begins to melt, starting near the ridge of the roof. As the water runs down the roof, it turns to ice along the eaves, as this section of the roof remains colder than the ridge. The ice gradually builds up into a ridge, commonly called an "ice dam." Over time, water forms a pool against the ice dam and runs up under the shingles, finds a leak path (roofing is not a consistent barrier to this type of water flow), and flows inside the building. The moisture drips onto the insulation in the attic near the outside wall, wetting the plaster or dry wall of the ceiling or outside wall. This creates a large amount of damage and is a potential health hazard resulting from mold growth. In addition, the gutter, already filled with ice and previously filled with leaves and other blown debris, creates a makeshift dam of water that freezes into ice, creating a dam in the gutter.

Recommended Practices for Mitigation – Ice Storms

Based on the overview and evaluation of possible ice storm mitigation actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of ice storms to State-owned buildings and critical facilities in Louisiana. A structural engineer should be consulted to identify whether selected structural mitigation actions are appropriate for a given building or facility.

- Maintenance of Power Line Corridors and Right-of-Ways (ROW's
- Robust Components and Features
- Utility Line Relocation
- High Performance Equipment
- Dual Transmission Conductors
- Increased Electrical Resistance
- Minimize Potential Debris Anchoring or Securing Utility Systems
- Preventing Damages to Buildings

Appendix H.7: Storm Surge

Identification and Evaluation of Possible Mitigation Actions

The following mitigation actions are possible options for reducing the impacts of storm surge to State-owned buildings and critical facilities in Louisiana, and generally across the State. For additional information, refer to the *Flood Hazard Mitigation Handbook for Public Facilities* (FEMA, 2002), *Coastal Construction Manual* (FEMA 55, 3rd Edition, 2000) and *Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings* (FEMA 259, 2nd Edition, 2001).

- Structural Elevation: Storm surge damages to buildings and other facilities in Louisiana occur during hurricanes or other coastal storm events that create areas of low pressure accompanied by wave action. Elevation is one of the most effective mitigation techniques available for reducing or eliminating damages caused by storm surge and waves. Buildings and other structures may be elevated on piers, piles or other deeply embedded foundation elements to above a specified design flood elevation (usually the 100-year flood elevation, including storm surge). The cost of structural elevation will vary depending on the type of deep foundation, age, condition and design flood elevation of the existing structure. The cost-effectiveness of structural elevations will vary based on project cost and the level of storm surge risk. Structural elevations are technically feasible and highly effective for most buildings at reducing storm surge impacts as well as flood damage, however, careful evaluation of the site and the existing structure is necessary prior to starting the work. The environmental impacts of structural elevation projects are typically minimal, provided the footprint of the elevated structure does not change. For some structures located in areas with high property values, an alternative elevation technique, known as "demolish and rebuild" is available. The "demolish and rebuild" process involves demolition of the existing structure and construction of a new elevated structure to current codes and NFIP standards on the existing footprint. However, the eligibility for funding of demolish and rebuild projects under various FEMA hazard mitigation programs is currently under review.
- Acquisition: Some existing buildings and facilities in Louisiana are located in coastal areas prone to frequent, significant storm surge events. Acquisition of storm surge-prone structures can eliminate future damages and improve the community at large. Acquisition involves buying the property and the structure from the owner and demolishing the existing structure. The original site of the acquired structure can then be converted to undeveloped open space, parkland or public beaches. The cost of acquisition will vary depending on market value of the property (structure and land). The cost-effectiveness of acquisition will vary based on project cost and the level of storm surge risk. Acquisitions are technically feasible and fully effective for all buildings. However, acquisition of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located in the coastal floodplain and/or has a high market value. The environmental impacts of acquisition projects will vary based on the age of the structure and the materials present in the structure to be demolished (i.e., asbestos, lead-based paint, etc.)
- Relocation: Relocation of structures subject to frequent, significant storm surge events can eliminate future damages and improve the community at large. Relocation involves buying the property from the owner and moving the existing structure to a new site outside the floodplain subject to storm surge. The original site of the relocated structure can then be converted to undeveloped open space, parkland or public beaches. The cost of relocation will vary depending on the market value of the property (structure and land) and the type of foundation, age and condition of the existing structure. The cost-effectiveness of relocation will vary based on project cost and the level of storm surge risk. Relocations are technically feasible and fully effective for most buildings, however, careful evaluation of the sites and the existing structure is necessary prior to starting the work on a relocation project. In addition, relocation of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located in the coastal floodplain and/or has a

high market value. The environmental impacts of relocation projects will vary based on the environmental condition of the relocation site.

- Wet Flood Proofing: Some existing buildings and facilities in Louisiana are located in areas prone to frequent, but low-level storm surge events. Wet flood proofing techniques can help mitigate damages against damages from shallow, short duration, low-velocity storm surge events with adequate warning time. Wet flood proofing allows storm surge waters to inundate selected portions of the building but minimizes the damage by using water-resistant construction materials and protecting vulnerable systems, such as electrical equipment, by elevating or shielding. The cost of wet flood proofing will vary depending on the type of foundation, wall construction, utility systems, and surge depth of the existing structure. The cost-effectiveness of wet flood proofing projects will vary based on project cost and the level of storm surge risk. Wet flood proofing can be technically feasible and somewhat effective for protecting buildings with high-value contents. However, wet flood proofing relies on human intervention to be effective (active mitigation), and some storm surge damages and clean-up costs will remain. The environmental impacts of wet flood proofing are typically negligible, provided the storm surge flooding of a facility does not spread toxic or hazardous materials.
- Shoreline Protection Structures: Storm surge and waves can lead to dramatic shoreline changes that can severely impact coastal buildings and facilities. Shoreline protection structures such as revetments or submerged breakwaters can help limit or control most short-term and some long-term erosion effects on coastal buildings and facilities Revetments are offshore structures constructed of rip-rap or concrete blocks placed parallel to the shoreline that protect against storm surge and wave impacts. Submerged breakwaters provide effective mitigation against storm surges by dissipating wave setup effects before they reach the coastline. The cost of shoreline protection structures will vary depending on the size, materials and difficulty of construction. Since the cost of shoreline protection structures is usually high, the cost-effectiveness of shoreline protective structures will vary based on the level of storm surge risk. Shoreline protection structures are technically feasible and very effective for protecting coastal facilities against storm surge, but maintenance is required to retain their effectiveness over time and against repeated storm events. Also, shoreline protection structures can increase erosion and scour at adjacent locations. The environmental impacts of shoreline protection structures need to be carefully reviewed and approved by the USACE and other agencies prior to construction.
  - Mitigation Reconstruction: Also known as “demolish and rebuild,” mitigation reconstruction involves the demolition of a substantially damaged structure and its replacement, on the same site, with a mitigation structure. Under FEMA's Pilot Reconstruction Program, eligible applicants may receive HMGP funds to demolish an existing structure and construct an improved, elevated structure on the same site. This may include pre-existing structures that were substantially damaged or destroyed because of the declared event. The grant is only available to property owners who owned the property at the time of the event for which funding is authorized. Mitigation reconstruction projects are not eligible if located in floodways as identified on the effective FIRMs. Alternative mitigation actions must be considered, and elevation determined to be the most cost effective and beneficial action.
  - Restoration of Coastal Barrier Islands: There is no federal or state agency legislated with sole responsibility for Coastal Restoration projects. It is a shared effort among federal and state entities that recognize the critical need for coastal restoration and possess, at different times, the means to assist with the effort. While funding for such projects is available from sources such as the Coastal Impact Assistance Program (CIAP) and the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), those sources cannot on their own provide enough funding to successfully carry the burden of protecting the whole of Louisiana’s coast.

    The Isles Dernieres barrier island chain, which includes Whiskey Island off the southern end of Terrebonne Parish, is considered one of the most rapidly deteriorating barrier shorelines in the United States. Measured retreat rates in the island chain during the last 100 years are on the order of 36.4 ft/yr on the Gulf side and 2 ft/yr on the Bay side. The Gulf side retreat has been about 15 times greater than the Bay side.

Consequently, the islands are converging and narrowing while migrating. The islands are not rolling over and preserving land area as would be predicted by conventional coastal engineering theory. Higher retreats and loss rates are observed in the middle of the island chain including Whiskey and Trinity Islands, as compared to the ends of the chain system which include Raccoon and East Islands. This would indicate that the two interior islands are acting as feeders for the two exterior islands in this chain. Chain breakup has resulted from major storm actions and the loss of nourishing sediment from the natural system. Whiskey Island has lost an average of 24 acres per year from 1978 to 1996. The Isles Dernieres barrier island chain is losing its structural integrity and the capability to perform its function within the coastal and estuarine ecosystems. Chief among these is the chain's storm buffering capacity (which includes storm surges) and the protection it provides to human population centers, oil and gas infrastructure, inland bays, estuaries, and wetlands.

To address the potential loss of Whiskey Island the Ship Shoal-Whiskey Island West Flank Restoration Project (TE-47), was authorized for federal and state funding by the Coastal Wetlands Planning, Protection, and Restoration Act (Public Law 101 – 646, Title III) (CWPPRA). However, this project has not yet received funding.

The name Isle Derniere means "last island" in French and was given to the chain in the 1800s to describe a single large island, which at the time was not separated by tidal inlets. The island was created by the dispersion of sediments from the adjacent delta as it gradually submerged 600 to 800 years ago. Today, the plural form of the original name "Isles Dernieres" is used to account for the multiple islands and inlets that that have formed through island breaching and tidal inlet development. The remaining islands contain regressive beach ridges, wash over deposits, primary dunes and back barrier marshes. Several restoration projects involving this chain were recently constructed: East Island, Trinity Island, Raccoon Island, Whiskey Island East Flank, and East Timbalier Island.

This project (Ship Shoal-Whiskey Island West Flank Restoration Project) is located on the West Flank of Whiskey Island 17.5 miles southwest from Cocodrie, Louisiana in Terrebonne Parish. The overall project objectives are:

- Restoring the integrity of the West Flank of Whiskey Island to retain its structural function
- Adding new offshore sediment to the West Flank of Whiskey Island from Ship Shoal to increase sediment supply and strengthen island formation
- Rebuilding the natural structural framework within the coastal ecosystem to provide for separation of the gulf and the estuary
- Creating a continuous protective barrier for back bays and inland marshes
- Reducing wave energies thereby helping to reduce land loss
- Strengthening the long shore transport system of sediment for continuous island building
- Providing a unique and sustainable barrier island habitat for numerous indigenous biological species, some of which are threatened or endangered.
- Restoring roughly 500 acres of barrier island habitat into the island's West Flank
- Demonstrating the feasibility and long term efficacy of moving Ship Shoal sands to the Isles Dernieres and other barrier islands for future restoration projects

The estuarine marsh inland of the island as well as the inland communities will reap the protective benefits of the project. It has been estimated that every kilometer (km) of barrier island shoreline protects 30 square km (12 square miles or 7680 ac) of wetland-estuarine habitat. In conjunction with other Isle Dernieres restoration projects, Whiskey Island is estimated to protect 80,000 acres of estuarine habitat including inland infrastructure. By bolstering the natural physical barrier provided by Whiskey Island, the project will provide

storm surge protection to Terrebonne Parish. Reducing the storm surge at the coastline prevents the flood waters being propagated through the marshland to residential areas.

It should be noted that FEMA has not funded projects of this nature since the 1990's. Funding is available from other federal agencies (Alternative Funding). Coastal Restoration should consider using this publication to seek out funding options, other than FEMA. For example, EPA funded restoration of East Whiskey Island.

- Restoration of Salt Marshes: An estuary is a partially enclosed body of water formed where freshwater from rivers and streams flows into the ocean, mixing with the salty sea water. Estuaries and the lands surrounding them are places of transition from land to sea and from fresh to salt water. Although influenced by the tides, estuaries are protected from the full force of ocean waves, winds, and storms by the reefs, barrier islands, or fingers of land, mud, or sand that define an estuary's seaward boundary.

  Salt Marshes are one typical habitat type occurring commonly in estuaries. Salt marshes are particularly important because they are among the most productive habitats on earth and are home to a wealth of plant and wildlife species. Technically, salt marshes are wetlands, but are included here because they are a dominant component of many estuaries. Salt marshes also provide flooding protection like other types of wetlands. One of the major reasons New Orleans suffered so extensively was the loss of 1,900 square miles of wetlands.

  Salt Marsh restoration is estimated at approximately $20,000 per acre, according to *The Costs of Environmental Restoration Projects* by Rhode Island Habitat Restoration, and includes hydrologic restoration. Reestablishment of tidal hydrodynamics is a critical first step in the restoration process. Tidal restriction due to dikes, levees, and poorly designed water-control structures leads to a substantial reduction in pore water salinity (the salinity level of the water in the soil), lowering of the water table, and a relative drop in marsh surface elevation.
- Protective Dune Systems: Protective dune systems in front of property will reduce structure vulnerability to storm surge and ocean over-wash. This should be coupled with other mitigation measures, such as elevating structures above updated Base Flood Elevations (BFE) or Advisory Base Flood Elevations (ABFE). This combined approach is critical to the very limited survival of traditional building designs during a category 4 or 5 hurricane. However, for a category 1 or 2 storm, this combined method is able to significantly mitigate storm surge.
- Levee and Floodgates: These structures allow open and free passage of tidal waters during non-hazard conditions, but are closed when shore land is under a storm surge threat. These have been successfully implemented in the Netherlands, although achieving levels of protection seen in the Netherlands' floodgate infrastructure will require massive capital investment most likely exceeding the funding levels in existing mitigation grant programs. That said, targeted smaller-scale floodgates can enhance storm surge mitigation efforts in Louisiana's Coastal High Hazard Areas.

Recommended Practices for Mitigation – Storm Surge

Based on the overview and evaluation of possible storm surge mitigation actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of storm surge to State-owned buildings and critical facilities in Louisiana. A coastal engineer should be consulted to identify whether selected structural mitigation actions are appropriate for a given building or facility.

- Structural Elevation

- Acquisition
- Mitigation construction
- Wet Flood Proofing
- Restoration of Coastal Barrier Islands
- Protective Dune Systems
- Dams and Floodgates

Appendix H.8: Subsidence

Identification and Evaluation of Possible Mitigation Actions

Subsidence is the downward motion of the Earth's surface relative to a reference point (i.e. datum point), such as the level of the sea. Many areas in Southern Louisiana experience losses up to 0.34 inches per year, or about 1.48 feet in 50 years.

A review of the hazard profiles indicates that subsidence is an ongoing problem statewide, and the combined impacts of land subsidence and sea-level rise are particularly significant in the Mississippi River delta and coastal areas of Louisiana. Although the subsidence hazard cannot be completely mitigated statewide, the following mitigation actions are possible to reduce the impacts of subsidence to State-owned buildings and critical facilities in Louisiana, and generally across the State. For additional land subsidence information, refer to the U.S. Geologic Survey(USGS) website (http://water.usgs.gov/ogw/subsidence.html).

- Structural Elevation: Subsidence damages to buildings and other facilities in Louisiana occur more frequently in coastal areas that experience subsidence combined with sea-level rise and an increased risk of flooding. Elevation is one of the few effective mitigation techniques available for reducing or eliminating damages caused by subsidence and sea-level rise. Buildings and other structures must be elevated on piers, piles or other deeply embedded foundation elements above the specified design elevation (usually the 100-year flood elevation, but with allowances for long-term subsidence and sea-level rise effects). The cost of structural elevation will vary depending on the type of deep foundation, age, condition and design elevation of the existing structure. The cost-effectiveness of structural elevations will vary based on project cost and the level of flood and subsidence risk. Structural elevations are technically feasible and very effective for most buildings at reducing subsidence and sea-level rise impacts as well as flood damage, however, careful evaluation of the site and the existing structure is necessary prior to starting the work. The environmental impacts of structural elevation project are typically minimal, provided the footprint of the elevated structure does not change. For some structures located in areas with high property values, two alternative elevation techniques are available. The first technique, known as “demolish and rebuild”, involves demolition of the existing structure and construction of a new elevated structure to current codes and NFIP standards on the existing footprint. The second technique, known as “second-story conversion”, involves retrofit of a single-story structure into an elevated structure. The conversion process involves removing the walls and occupied areas of the first floor, enhancing the structural design of the remaining structure, and constructing the new NFIP and code-compliant building on top of the remaining elevated frame. Both of these alternative elevation techniques, particularly second-story conversion, have become increasingly attractive in Louisiana where most existing buildings are difficult to elevate and acquisition options are limited. However, although alternative elevation techniques are becoming increasingly popular in Louisiana, the eligibility for funding of demolish and rebuild and second-story conversion projects under various FEMA hazard mitigation programs is currently under review.
- Acquisition: Some existing buildings and facilities in the Mississippi Delta and coastal areas of Louisiana are particularly prone to damage from long-term, significant land subsidence and sea-level rise. Acquisition of subsidence-prone structures can eliminate future damages and improve the community at large. Acquisition involves buying the property and the structure from the owner and demolishing the existing structure. The original site of the acquired structure can then be converted to undeveloped open space or parkland. The cost of acquisition will vary depending on market value of the property (structure and land). The cost-effectiveness of acquisition will vary based on project cost and the level of subsidence risk. Acquisitions are technically feasible and fully effective for all buildings. However, acquisition of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located in a high subsidence risk area and/or has a high market value. The environmental impacts of acquisition projects will vary based on the age of the structure and the materials present in the structure to be demolished (i.e., asbestos, lead-based paint, etc.)

- Relocation: Relocation of structures subject to long-term, significant subsidence events can eliminate future damages and improve the community at large. Relocation involves buying the property from the owner and moving the existing structure to a new site outside the subsidence hazard area. The original site of the relocated structure can then be converted to undeveloped open space, parkland or public beaches. The cost of relocation will vary depending on the market value of the property (structure and land) and the type of foundation, age and condition of the existing structure. The cost-effectiveness of relocation will vary based on project cost and the level of subsidence risk. Relocations are technically feasible and highly effective for most buildings, however, careful evaluation of the sites and the existing structure is necessary prior to starting the work on a relocation project. In addition, relocation of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located in high subsidence risk area and/or has a high market value. The environmental impacts of relocation projects will vary based on the environmental condition of the relocation site.
- Underpinning: In areas of major subsidence due to soil compaction, such as New Orleans, underpinning may be used to strengthen and stabilize the foundation of an existing building or other structure. There are a number of firms that specialize in extending the foundation in depth and/or with, so the weight of the building is distributed over a large area, and able to rest on a more supportive soil layer. This may involve the use of hydraulically driven steel piers or use of helical (screw) piers, to transfer weight into increased load bearing soil.

Recommended Practices for Mitigation – Subsidence

Based on the overview and evaluation of possible subsidence mitigation actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of subsidence to State-owned buildings and critical facilities in Louisiana. A geotechnical and/or structural engineer should be consulted to identify whether selected mitigation actions are appropriate for a given building or facility site.

- Structural Elevation
- Acquisition
- Underpinning

Appendix H.9: Wildfire

Identification and Evaluation of Possible Mitigation Actions

The following mitigation actions are possible options for reducing the impacts of wildfires to State-owned buildings and critical facilities in Louisiana, and generally across the state. For additional information, refer to the FEMA website for mitigation (http://www.fema.gov/fima/).

- Public Education and Outreach - The Louisiana Department of Agriculture and Forestry (DAF) is undertaking a public education program to raise awareness of the wildfire potential in Wildland-Urban Interface areas. The department is working with the Firewise Communities program (www.firewise.org) to develop a recognition program for neighborhoods that incorporate fire-safe landscaping and construction materials. The focus of the program is public education, and the program has created the following two brochures:

  1. "*Fire Safe Homes in the Louisiana Wildland/Urban Interface*" which discusses homebuilding and landscaping techniques that will enable homes to survive a wildland fire;
  2. "*Prevention: A Home's Best Defense from Wildfire*" developed to educate Louisiana homeowners about wildfire risk and clearly describe how to create and maintain defensible space around a residence.

  Future plans include Firewise information and education trailers to disseminate the Firewise message throughout the State. The costs for public education and outreach will vary based on the extent of the programs. The cost-effectiveness of public education and outreach will vary based on project cost and the level of wildfire risk. Public education and outreach is technically feasible and highly effective for all buildings and facilities, however, effective wildfire mitigation relies on proactive human intervention and utilization of program information (active mitigation). There are no environmental impacts associated with public education and outreach.

- Remove Vegetation and Combustible Materials - Many buildings and facilities are damaged in wildfires when vegetation or other combustible materials surrounding the structure are ignited by a wildfire and enable the flames to reach the structure. Removal of vegetation and combustible materials can help reduce damages from wildfire events. Mitigation techniques include removing trees, vegetation, debris and combustible materials within a radius of 50 feet or more from buildings or facilities to create a 'defensible space' around the structure. The cost to remove vegetation and combustible materials will vary based on the size and amount of vegetation surrounding the structure. The cost-effectiveness of removing vegetation and combustible materials will vary based on project cost and the level of wildfire risk. Removing vegetation and combustible materials is technically feasible and highly effective for most buildings and facilities, however, periodic maintenance is required to maintain mitigation effectiveness. For removing vegetation and minimizing combustible materials, the cutting and trimming of certain trees and vegetation may be restricted by environmental considerations.
- Replace Roofing with Fire-Resistant Materials – Some roofing materials, such as asphalt shingles and wood shakes, are less fire-resistant than others. Replacing these roofing materials with slate, tile or metal roofing materials can make buildings and facilities more resistant to damage from wildfires. The cost to replace roofing with fire-resistant materials will vary based on the size of the roof and the replacement roof materials selected for the structure. The cost-effectiveness of replacing roofing with fire-resistant materials will vary based on project cost and the level of wildfire risk. Replacing roofing with fire-resistant materials is technically feasible and highly effective for most buildings and facilities, however, it is most effective when combined with removing vegetation and minimizing combustible materials. The environmental impacts of replacing roofing with fire-resistant materials are typically negligible, but may be restricted by historic-preservation considerations.

- Improve Fire Suppression Capabilities – Most fires start as small fires that quickly grow into larger building fires or wildfires. Improved fire suppression capabilities can reduce the risk of wildfire damages by putting out fires before they spread over a larger area. Mitigation techniques include additional training and equipment for firefighters, increased water supply available for fighting fires, and improved water supply access through public and private hydrants. The cost to improve fire suppression capabilities will vary based on the extent of the improvements. The cost-effectiveness of improving fire suppression capabilities will vary based on project cost and the level of wildfire risk. Improving fire suppression capabilities is technically feasible and highly effective for most buildings and facilities, however, effective mitigation relies on proactive human intervention and utilization of these resources (active mitigation). The environmental impacts of improving fire suppression capabilities may vary based on the placement of new fire facilities and hydrants.

- Use of Fire-Resistant Coating: For many years, technology has been available to make almost any building cost effectively and fireproof through the use of readily available, non-toxic, intumescent coating/paint. An intumescent paint is a fire-retardant coating that when heated, forms a protective barrier. Intumescent paint can meet Code driven requirements for hourly fire resistant construction materials and assemblies. This includes gypsum wall board, wood structural members, lath and plaster, concrete, electrical cables, light gauge metal, form insulation, and advanced materials such as plastics and carbon fiber. Applications include residential, commercial, and industrial building types.

  Use of intumescent paint is easy and can be sprayed or brushed on. Typically, coverage is 100 to 200 square feet per gallon of paint. Intumescent paint can be used as an additive by being mixed to existing latex paint. Retrofitting/fire-proofing buildings on historic registers can be achieved by use of this coating (historic structures are typically not allowed to be retrofitted with fire sprinklers). In many cases, fire insurance is greatly lowered as a result. Coating typically will expand 30 times its thickness, and protect against 2,000 degree heat for one hour or more. It is also a cheaper, more efficient way to meet Code requirements.

  Use of intumescent paint is also an effective solution to the widespread use of highly flammable foam/insulation. Use of intumescent paint will prevent fires from igniting, thus limiting the release of toxic gas. It can also improve the fire rating of new foam panels as well as meet the UBC 26-3 room corner test.

  Finally, intumescent paint is toxic free and approved by the California Fire Marshall.

  Adopting the International Wildland-Urban Interface Code: The IWUIC safeguards buildings by mitigating wildfires through model Code regulations. IWUIC enforcement, however, is what ultimately protects the public's health and safety in all participating communities. The Code establishes minimum regulations for land use and the built environment in designated Wildland-Urban Interface areas using prescriptive and performance related provisions. It is founded on data collected from tests and fire incidents, technical reports and mitigation strategies from around the world. The Code is fully compatible with all ICC codes, including the International Building Code. IWUIC can be easily *adopted by reference* in accordance with proceedings establishing the local jurisdiction's laws.

  More and more of the northern half of Louisiana is fast becoming a Wildland-Urban Interface, as more people construct or purchase rural homes. This area, where development meets wildland, is fast becoming the most hazardous of both wildland and structural firefighting. Areas that have been traditionally viewed as having a Wildland-urban Interface, such as Southern California, have recognized the need for a modern, up-to-date Code addressing the mitigation of fire in this interface and have begun to adopt International Code Council's (ICC) 2009 International Wildland-Urban Interface Code (IWUIC). The need for such a Code is poignantly represented by the Southern California Wildfire Disaster of 2003, during which approximately 775,000 acres burned, 2,232 buildings destroyed, and 15 people killed. For purposes of comparison, in the City of Rancho Cucamonga, CA which adopted and enforced the IWUIC, few homes were destroyed, whereas in neighboring San Bernardino, CA which did not adopt the Code, over 1,100 homes were destroyed. Simi Valley, CA also adopted the Code and no homes were destroyed.

- Fire-Resistant/Fire-Proof Designed Buildings: As buildings in wildfire risk locations are replaced over time, fire-resistant or fire proof facilities, such as an EOC, could be constructed. Many fire resistant/proof buildings use concrete as their primary structural element. Among buildings that are fire-resistant are those that built from Structural Insulated Panels (SIP) and Insulated Concrete Forms (ICF). Concrete domes are generally completely fire proof as well, as they have a concrete shell and the coverings are fire proof. SIP construction can be modified to be completely fire proof with a few changes in finishing and interior structures. ICF construction is covered by fire proof foam. As an added bonus, SIP and ICF can be rated at 200+ mph for wind hazard, while a concrete dome provides absolute protection (they will completely survive the strongest tornadoes, earthquakes, floods, etc. with little to no damages).

Recommended Practices for Mitigation – Wildfires

Based on the overview and evaluation of possible wildfire mitigation actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of wildfires to State-owned buildings and critical facilities in Louisiana. A fire protection expert should be consulted to identify whether selected mitigation actions are appropriate for a given building or facility.

- Public Education and Outreach
- Remove Vegetation and Combustible Materials
- Use of Fire-Resistance Coating
- Improve Fire Suppression Capabilities
- Adopting International Wildland-Urban Interface Code
- Fire-Resistant/Fire-Proof Designed Buildings

Appendix H.10: Dam Failure

Identification and Evaluation of Possible Mitigation Actions

In terms of the dams themselves, the owners/operators are responsible for maintenance, repair and mitigation. If a problem is found, inspectors can be dispatched to recommend corrective measures. While the State dam safety program is there to inspect the dams, the owner is still primarily responsible.

Failures fall into three general categories: overtopping failure, seepage failures, and structural failures. Since only visual/superficial inspections are possible by the owner/operators, it is essential that they are aware of these warning signs.

- Overtopping: Results from erosive water action on the surface embankment, and is usually caused by uncontrolled/poorly control water over, around and next to the dam. Except for designed spillways, dams are not designed for overtopping. The majority of the dams are earthen. Once overtopping starts, it is virtually impossible to stop erosion of dam surfaces as this result in complete dam breaching/failures within hours.
- Seepage: All dams have seepage from water that permeates its interior, winding through it and the foundation. It is paramount in importance that seepage is controlled for both velocity and quantity. Otherwise, progressive escalation would lead to erosion of dam/foundation material and then to dam failure.
- Structural Failures: Can be caused by embankment or appurtenances failure. Further, structural failure of a spillway, lake drain or other appurtenance may also lead to embankment failure. Usually, cracking, settlement and slides are indicative/visual signs of embankment failure. Large cracks in an appurtenance or embankment, major settlement or major slides demands quick measures to ensure safety, especially if this appears suddenly.

Although dam failures cannot be completely mitigated statewide, the following planning and mitigation actions are possible to improve response and/or reduce the impacts of potential dam failures to State-owned buildings and critical facilities in Louisiana, and are generally applicable across the State. Subsequently, inspections, maintenance, and educational seminars should be instituted as part of an annual statewide program to identify and mitigate potential long term issues with dam failure. For additional information, refer to the *Flood Hazard Mitigation Handbook for Public Facilities* (FEMA, 2002) and *Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings* (FEMA 259, 2nd Edition, 2001).

- Emergency Action Plans: According to the Director of Public Works & Water Resources Program for LDOTD, 86 percent of the "high hazard" dams have emergency action plans as of September 2010 (refer to Figure D-21). Communities located near high hazard dams should be aware of these emergency action plans. An emergency action plan includes a summary of the dam, identifies the area below the dam that would be flooded from a failure, establishes lines of communication for the dam owner and emergency response personnel, and provides for warnings and evacuations to be conducted by police, fire, and rescue teams. The cost of emergency action plans can be difficult to estimate due to the level of effort and cooperation required on the part of community officials, but public awareness campaigns and periodic plan updates are needed to maintain their effectiveness over time. The environmental impacts of emergency action plans are typically negligible.
- Warning Systems: Inundation zones are areas located near high hazard dams where failure of the dam is likely to cause significant flooding and loss of life. Communities located within inundation zones need to establish warning systems to provide residents with time to evacuate in the event of an imminent dam failure. Warning systems typically consist of monitoring equipment located at the dam that detects a dam or levee breach and relays a warning signal to residents within the inundation zone. The cost of warning systems will vary based on the size of the dam, the number of residents in the inundation zone, and the amount of warning time provided.

The cost-effectiveness of warning systems will vary based on system cost, the size and number of dams, and the hazard risk level. Warning systems are technically feasible and very effective for reducing casualties within the inundation zone from dam failures, but the systems do not prevent damage to buildings and infrastructure. Also, public awareness campaigns and periodic plan updates are needed to maintain their effectiveness over time. The environmental impacts of warning systems are typically negligible.

- Acquisition: Some existing buildings and facilities located in inundation zones are prone to heavy damage, collapse or high casualties in the event of a dam failure. Acquisition of inundation-prone structures can eliminate the risk of future damages and improve the community at large. Acquisition involves buying the property and the structure from the owner and demolishing the existing structure. The original site of the acquired structure can then be converted to undeveloped open space or parkland. The cost of acquisition will vary depending on market value of the property (structure and land). The cost-effectiveness of acquisition will vary based on project cost and the level of inundation risk. Acquisitions are technically feasible and fully effective for all buildings. However, acquisition of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located within an inundation zone and/or has a high market value. The environmental impacts of acquisition projects will vary based on the age of the structure and the materials present in the structure to be demolished (i.e., asbestos, lead-based paint, etc.)
- Relocation: Relocation of structures located in dam failure inundation zones can eliminate future damages and improve the community at large. Relocation involves buying the property from the owner and moving the existing structure to a new site outside the dam inundation zone and outside the floodplain. The original site of the relocated structure can then be converted to undeveloped open space or parkland. The cost of relocation will vary depending on the market value of the property (structure and land) and the type of foundation, age and condition of the existing structure. The cost-effectiveness of relocation will vary based on project cost and the level of inundation risk. Relocations are technically feasible and fully effective for most buildings, however, careful evaluation of the sites and the existing structure is necessary prior to starting the work on a relocation project. In addition, relocation of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located within an inundation zone and/or has a high market value. The environmental impacts of relocation projects will vary based on the environmental condition of the relocation site.

Recommended Practices for Mitigation – Dam Failure

Based on the overview and evaluation of possible dam failure mitigation actions, the following "best practices" for mitigation planning are recommended for consideration to reduce the impacts of dam failures to State-owned buildings and critical facilities in Louisiana. A civil engineer or hydrologist should be consulted to identify whether selected mitigation planning actions are appropriate for a given building or facility.

- Emergency Action Plans
- Warning Systems
- Relocation

Appendix H.11: Levee Failure

Identification and Evaluation of Possible Mitigation Actions

There are a number of different ways that man-made levees can fail. The most common and dangerous way is a breach in the levee. This is occurs when a portion of the levee wall breaks away, leaving an opening for the flood waters to penetrate and floods land protected by the levee. Breaching can be gradual or sudden. Often this is caused by surface erosion or by failure of the subsurface. Breaching may occur due to levee boils or sand boils, which happen when the upward pressure of the water flowing through the sand pores beneath the levee surface (underseepage) exceeds the pressure resulting from the weight of the soil above the seepage. The underseepage quickly surfaces on the landward as a spewing cone of sand. Boils can be a red flag that the instability of the levee may result in erosion of the levee toe or foundation, or even the subsidence of the levee in the foundation that has liquefied. Complete, catastrophic failure (complete breeching) could soon follow.

Sometimes overtopping will cause levee failure. Overtopping may be the result of very high flood waters or high winds. This is generally associated with hurricanes and other wind events. Since the levees are not normally designed for overtopping, massive scour and erosion soon follow, and perhaps complete breeching.

While the US Army Corps of Engineers (USACE) is the agency responsible for the design and construction of federal levees, locals can take responsibility to prevent levee breaching (see below). Although levee and flood wall failures cannot be completely mitigated statewide, the following planning and mitigation actions are possible to improve response and/or reduce the impacts of potential levee and flood wall failures to State-owned buildings and critical facilities in Louisiana, and are generally applicable across the State. Subsequently, inspections, maintenance, and educational seminars should be instituted as part of an annual statewide program to identify and mitigate potential long term issues with levee and flood wall failure. For additional information, refer to the *Flood Hazard Mitigation Handbook for Public Facilities* (FEMA, 2002) and *Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings* (FEMA 259, 2nd Edition, 2001).

- Emergency Action Plans: Emergency action plans include a detailed summary of levees and flood walls within the community, inundation zones in the event of levee failures, evacuation routes, and specific actions to be taken in response to various incidents. The cost of emergency action plans can be difficult to estimate due to the level of effort and cooperation required on the part of community officials, the USACE, and the general public. The cost-effectiveness of emergency action plans will vary based on the cost of developing the plan, the size and number of levees, and the hazard risk level. Emergency action plans are technically feasible and effective for improving response to levee failures, but public awareness campaigns and periodic plan updates are needed to maintain their effectiveness over time. The environmental impacts of emergency action plans are typically negligible.
- Warning Systems: Inundation zones are areas located large levees where failure of the levee is likely to cause significant flooding and loss of life. Communities located within inundation zones need to establish warning systems to provide residents with time to evacuate in the event of a levee failure. Warning systems typically consist of monitoring equipment located at the levee that detects a levee breach and relays a warning signal to residents within the inundation zone . The cost of warning systems will vary based on the size of the levee, the number of residents in the inundation zone, and the amount of warning time provided. The cost-effectiveness of warning systems will vary based on system cost, the size and number of levees, and the hazard risk level. Warning systems are technically feasible and very effective for reducing casualties within the inundation zone from levee failures, but the systems do not prevent damage to buildings and infrastructure. Also, public awareness campaigns and periodic plan updates are needed to maintain their effectiveness over time. The environmental impacts of warning systems are typically negligible.

- Structural Elevation: Damages to buildings and other facilities in Louisiana can occur as the result of levee failures. Elevation is one of the most effective mitigation techniques available for reducing or eliminating damages caused by levee failures.(Note that this recommendation is applied in areas protected by levees and, therefore, structures in these areas may not be targeted for elevation under NFIP or other programs). Buildings and other structures may be elevated on piers, piles or other deeply embedded foundation elements to above a specified design flood elevation (usually the 100-year flood elevation, including storm surge). The cost of structural elevation will vary depending on the type of deep foundation, age, condition and design flood elevation of the existing structure. The cost-effectiveness of structural elevations will vary based on project cost and the level of storm surge risk. Structural elevations are technically feasible and highly effective for most buildings at reducing storm surge impacts as well as flood damage, however, careful evaluation of the site and the existing structure is necessary prior to starting the work. The environmental impacts of structural elevation projects are typically minimal, provided the footprint of the elevated structure does not change.
- Mitigation Reconstruction: Also known as "demolish and rebuild," mitigation reconstruction involves the demolition of a substantially damaged structure and its replacement, on the same site, with a mitigation structure. Under FEMA's Pilot Reconstruction Program, eligible applicants may receive HMGP funds to demolish an existing structure and construct an improved, elevated structure on the same site. This may include pre-existing structures that were substantially damaged or destroyed because of the declared event. The grant is only available to property owners who owned the property at the time of the event for which funding is authorized. Mitigation reconstruction projects are not eligible if located in floodways as identified on the effective FIRMs. Alternative mitigation actions must be considered, and elevation determined to be the most cost effective and beneficial action.
- Wet Flood proofing: Many existing buildings and facilities in Louisiana are located in areas prone to frequent, but low-level, flood events. Wet flood proofing techniques can help mitigate damages resulting from shallow, short duration, low-velocity flood events with adequate warning time. Wet flood proofing allows floodwaters to inundate selected portions of the building, but minimizes the damage by using water-resistant construction materials and protecting vulnerable systems such as electrical equipment through equipment elevation and/or shielding. The cost of wet flood proofing will vary depending on the type of foundation, wall construction, utility systems, and flood depth of the existing structure. The cost-effectiveness of wet flood proofing projects will vary based on project cost and the level of flood risk. Wet flood proofing can be technically feasible and somewhat effective for protecting buildings with high-value contents; however, some flood damages and clean-up costs will remain. The environmental impacts of wet flood proofing are typically negligible, provided the flooding of a facility does not spread toxic or hazardous materials.
- Dry Flood proofing: Dry flood proofing techniques can help mitigate damages from shallow, short duration, low-velocity flood events with adequate warning time. Dry flood proofing prevents floodwaters from entering the building by sealing the building with waterproof materials and using shields to protect openings. However, flood depths should be limited to 2 feet or less, and structural capacity and buoyancy checks are needed. The cost of dry flood proofing will vary depending on the site soils, type of foundation, wall construction, condition, and flood depth of the existing structure. The cost-effectiveness of dry flood proofing projects will vary based on project cost and the level of flood risk. Dry flood proofing can be technically feasible and very effective for protecting buildings and facilities, flood proofing although it may increase flood damages and clean-up costs if the flood depth exceeds the flood proofing design depth. The environmental impacts of dry flood proofing are typically negligible.
- Acquisition: Some existing buildings and facilities located in inundation zones are prone to heavy damage, collapse or high casualties in the event of a levee failure. Acquisition of inundation-prone structures can eliminate the risk of future damages and improve the community at large. Acquisition involves buying the property and the structure from the owner and demolishing the existing structure. The original site of the acquired structure can then be converted to undeveloped open space or parkland. The cost of acquisition will vary depending on market value of the property (structure and land). The cost-effectiveness of acquisition will

vary based on project cost and the level of inundation risk. Acquisitions are technically feasible and fully effective for all buildings. However, acquisition of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located within an inundation zone and/or has a high market value. The environmental impacts of acquisition projects will vary based on the age of the structure and the materials present in the structure to be demolished (i.e., asbestos, lead-based paint, etc.)

- Relocation: Relocation of structures located in inundation zones subject to heavy damage, collapse or high casualties in the event of a levee failure can eliminate future damages and improve the community at large. Relocation involves buying the property from the owner and moving the existing structure to a new site outside the levee inundation zone and outside the floodplain. The original site of the relocated structure can then be converted to undeveloped open space or parkland. The cost of relocation will vary depending on the market value of the property (structure and land) and the type of foundation, age and condition of the existing structure. The cost-effectiveness of relocation will vary based on project cost and the level of inundation risk. Relocations are technically feasible and fully effective for most buildings, however, careful evaluation of the sites and the existing structure is necessary prior to starting the work on a relocation project. In addition, relocation of State-owned buildings serving the community may not be feasible in some parishes where nearly all of the available land is located within an inundation zone and/or has a high market value. The environmental impacts of relocation projects will vary based on the environmental condition of the relocation site.

Recommended Practices for Mitigation –Levee Failure

Based on the overview and evaluation of possible levee and flood wall failure mitigation actions, the following "best practices" for mitigation planning are recommended for consideration to reduce the impacts of levee and flood wall failures to State-owned buildings and critical facilities in Louisiana. A civil engineer or hydrologist should be consulted to identify whether selected mitigation planning actions are appropriate for a given building or facility.

- Emergency Action Plans
- Warning Systems
- Structural Elevation
- Acquisition
- Mitigation Reconstruction
- Wet Flood Proofing
- Dry Flood Proofing
- Relocation

Appendix H.12: Drought

Identifying and Evaluating Possible Mitigation Actions

Drought is a repetitive feature of the climate. Globally, it occurs everywhere, but with varying degrees. Defining it is difficult. According to the *Glossary of Meteorology*, a drought is a "period of abnormally dry weather sufficiently prolonged for the lack of water to cause a serious hydrologic imbalance in the affected area." The timing and impact of drought can vary between regions of the United States. A classic example is the extended 5-year drought experienced by the entire western United States from 1999-2004.

Generally, a drought is a lack of water over a large area for a significant amount of time. It typically takes several months of below normal rainfall to move into long-term drought, and many months of above normal rainfall to recover from hydrologic drought. A drought can be divided into four different categories, according to its impacts.

- Meteorological - occurs when there is a significant departure of precipitation below normal values.
- Agricultural - occurs when the soil moisture is not adequate for vegetation (crops) or livestock.
- Hydrological - occurs when surface (lakes, rivers, reservoirs) and subsurface water (groundwater) levels are significantly below normal.
- Socioeconomic - occurs when the physical water shortage begins to have an effect on daily life

Drought conditions are assessed using precipitation amounts, stream flows, lake and reservoir levels, and soil moisture. In the 1960's, Wayne Palmer developed the Palmer Drought Severity Index (PDSI) based on temperature and rainfall. It is most effective over a period of several months, enabling it to measure meteorological and hydrological drought. Palmer also developed the Crop Moisture Index (CMI) for use from week to week, instead of months. It is more efficient at measuring short term dryness or wetness, which will more easily influence agriculture.

In recent years, a new tool has been developed by the National Drought Mitigation Center, located at the University of Nebraska. Tracking drought blends science and art. No single definition of drought works for all circumstances, so people rely on drought indices to detect and measure droughts. But, no single index works under all circumstances. For this reason, the Drought Monitor was developed as a synthesis of multiple indices, outlooks and news accounts. The Drought Monitor is supported by a consensus of federal and academic scientists, although the product will be refined over time in order to capture new methods, data, and the needs of decision-makers and others who use the information.

Drought causes many problems. Loss of crops is one of the more costly effects of drought. Inadequate rainfall and the inability to irrigate crops directly affect the farmer and indirectly affect the consumer. Drought is also often accompanied by increased temperatures. Due to the lack of moisture, the sun's energy is used to heat the atmosphere instead of evaporating water. Wildfire is another series consequence of drought as a spark of lightning can easily trigger an uncontrollable forest fire. Severe droughts also have an impact on the daily routine for people as water conservation guidelines prevent water usage. One landscape-scale impact of drought is forced changes in natural plant community after drought-induced die out. Plant community impacts also accelerate erosion and diminish water quality and quantity. Rural and metropolitan communities document demographic shifts after periods of drought.

The average annual precipitation over the state ranges from a low of 40 inches in the far northern portion of the state to 59 inches near the Gulf Coast. Generally, the heaviest rainfall occurs in the late spring, with the mid-summer months being the driest. The drier air and hot summers in the north result in higher rates of evaporation than the south. Average annual net reservoir evaporation rates range from a low of 8 inches per year to 32.5 inches per year.

High evaporation and reduced rainfall and runoff can lead to drought conditions. Since 1900 several droughts have occurred. Even with the recent drought periods, the droughts of the 1950s and 1960s still appear to be the most severe of meteorological record.

While the state does not have the technological solution to prevent drought, there are mitigation actions that can be implemented. Following are mitigation actions that can be performed to reduce damages from drought:

- Reducing Drought Impact through Education - County Extension agents educate farmers, homeowners, 4-H'ers, community leaders and businesses through workshops, activities and projects.
- Water Restriction – The central problem is how to deal with a continuous drought which may leave homeowners and agriculture industry professionals perplexed as to how to keep landscape plants alive with little or no water. What is needed are techniques and principles for coping with the drought landscape as related to homeowners and landscapers through media outlets during next drought. This effort should include a series of statewide radio spots to reach a large audience through the state to inform them on the latest methods of conserving moisture in the landscape. State horticulturists need to develop a Best Management Practices manual for landscapers covering water conservation and quality.
- Drought Contingency Plan – Each municipality conserves the available water supply and protects the integrity of water supply facilities, with particular regard for domestic water use, sanitation and fire protection. The intent is also to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other emergency water supply conditions. The plan specifies how each municipality will respond to and manage the water system during system capacity and distribution limitations. In addition, the plan specifies how the municipality will respond to and manage the water system during a severe drought.
- Interaction of Water and Growth Regulators - Water and plant growth regulators, like mepiquat chloride, can be applied to change cotton growth habits, but both are costly. Additional water encourages rank growth, while heavy mepiquat chloride application inhibits growth. A combination of controlled irrigation and less mepiquat chloride application can potentially decrease both water and chemical application, save money, and decrease the environmental impact of plant growth regulator sprays. Concurrently, decreasing irrigation and mepiquat chloride application resulted in similar plant heights at the highest rates of irrigation and mepiquat chloride application.
- Meat Producer Need Survival Program - Since water is a valuable natural resource needed to sustain livestock and forage production, producers will have to find ways to manage with less during drought. Producers will be faced with reducing their beef herd size, improving their pastures and hay fields, and looking for ways to conserve water. Agricultural Extension agents can conduct educational programs on topics related to the drought. These included a series of programs on pasture improvement and beef cattle management in addition to holding annual forage field days. The focus is to provide producers with management tools that would allow them to better manage their operations in times of drought. Forage quality can be increased and livestock producers can feed and produce higher quality forage. Emergency funding programs can be established to dig wells and clean out farm ponds with a 50 percent cost share to producers. This will enable producers to provide water to livestock during these drier periods of the year. All these efforts have helped producers in the past, and will have the added benefit of protecting the producer from a dramatic rise in production costs.
- Crop Insurance Education Program – Farmers need to have a thorough understanding of Federal Crop Insurance compliance as it relates to acceptable farming practices and (drought) preventative planting before the next drought condition occurs. This requires a cooperative program between the Federal Crop Insurance Program and local extension agents, which can design programs on farming recommendations as related to insurance regulations, as well as information on planting deadline options, herbicide use and expectations in drought conditions and reasonable approaches to least cost planting in drought conditions.

- Drought Plan – In 1980, only 3 states had official drought plans. Today most states have one or are in the process of developing a plan. Louisiana needs to develop one, due to the tremendous cost (economic, social, and environmental) associated with drought impacts. The National Drought Mitigation Center at the University of Nebraska at Lincoln has the capability to assist the state with developing the plan at no cost, using their 10-step Drought Planning Process. The 10-step planning process, developed in 1991 and revised in 2000 and 2004, provides guidelines for creating a drought plan and a process to adapt the plan to any level of government or geographical setting.
- Comprehensive Water Management Plan – Louisiana is generally considered an "absolute ownership" state, though state law is not clear on its implications, and not much has been done by the legislature or the courts to clarify its intent. Under absolute ownership laws, the landowner has the right to capture all the water he wants and use it for whatever purpose he chooses as long as he does not "waste" the water. No legal responsibility exists for harming neighbors' water access by drawing water away from their wells. Article 490 of the Louisiana Civil Code seems to be consistent with the absolute ownership law by stating that a landowner owns everything on, above or below his land. However, with respect to groundwater, the courts have interpreted this article to mean that a landowner does not have absolute ownership, but only owns the water after he has captured it. Article 667 says that although a landowner may do with his estate whatever he pleases, he still cannot harm his neighbor. This Article appears to restrict absolute ownership, but it is questionable as to whether or not this Article can be applied to the use of groundwater. Along with these Articles, the Mineral Code also addresses the ownership of groundwater. The Mineral Code treats groundwater as a mineral and goes along with the court's interpretation of Article 490 saying that a landowner does not actually own the water below his land but only owns it once he has pumped it out of the ground. As such, there is a pressing need for Louisiana to develop a comprehensive water management plan in order to clarify water rights for the users of this state as well as protect this valuable resource for future users.

  Note on surface water: Louisiana's usual abundant supply of water has resulted in limited development of regulatory authority regarding surface water rights. In different watersheds, authority may be created to conserve, store, control, preserve, and distribute water within that basin.

Recommended Practices for Mitigation – Drought

Based on the overview and evaluation of possible drought actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of drought in Louisiana. A drought expert should be consulted to identify whether selected mitigation actions are appropriate for protecting the state.

- Reducing impact of Drought through education
- Water restriction
- Drought Contingency Plan
- Interaction of Water and Growth Regulators
- Meat producer need survival program
- Drought Plan
- comprehensive water management plan

Appendix H.13: Lightning

Identifying and Evaluating Possible Mitigation Actions

Lightning is the transient passage of electrical current between a cloud and another cloud, or with the surface of the earth.

Transient voltage surges (TVSs) are high-energy voltage spikes that are usually associated with lightning strikes or poor power quality. Even if lightning does not directly hit a power or phone line, the current can reach 300,000 amperes from nearby strikes; a lightning strike three miles away can cause interruptions on power/phone lines. The effects are degraded system performance, increased down-time, or even physical equipment damage.

Lightning is a major cause of storm related deaths in the U.S., out pacing hurricanes and tornados in most years.

It is also the cause of tremendous damages to electrical/electronic circuits and equipment, especially with new equipment that has more advanced integrated circuits. Electrical circuits are ordinarily designed to operate in well controlled electrical environment. Also, lightning is more likely to strike elevated elements, such as a radio tower or water tower. However, the burying of cables does not lessen their vulnerability, as they still attract lightning. Lightning current can travel for long distances on overhead power lines, or in underground pipes and cables, so that a user who experiences upset or damage may not recognize that it coincided with a lightning strike some distance from the user. Computers which are subject to transient current from lightning, either directly fail, or have noticeable decrease in life expectancy. Crucial for Louisiana is the vulnerability of critical facilities, especially police departments, fire departments, EOC's, hospitals, etc.

Following are mitigation actions that can be performed to reduce damages from transient and lightning strikes:

- Transient Protection – Short of a direct hit, a facility should suffer no damages from lightning strikes, if equipped with adequate grounding and the proper use of a rated surge suppressor (meeting UL 1449 third edition standard). Individual devices can be installed for each piece of equipment. Whole building protections can also be provided at the electrical service entrance. Each electrical phase should be protected by one device, properly grounded.

Lightning/transient protection is far less expensive than the large repair or replacement cost of damaged equipment. However, transient protection is more than simply using an AC surge protector, as this is usually not sufficient and may create additional problems. In addition to affecting AC power lines, transients can also attack incoming telephone lines and data communication lines. Therefore, a more comprehensive method of protection should be utilized. Even routing cable correctly does not prevent electromagnetic energy from getting into data lines. However, transient voltage surge suppressors (TVSS) with battery-backed power should still be used to assure disaster avoidance.

There are several different types of TVSS's on the market. What is important is that the device at least meets UL 1449 3rd Edition standards, and for enhanced protection, the device fully meets Institute of Electrical and Electronics Engineers (IEEE) C62.41 standards, which replaces the earlier IEEE 587 -1980 standard for Class A, B, C (aka C62.41-1980). Devices that do not meet these standards provide no predictable or measurable lightening mitigation benefits. Many cheap transient protections have Radio Frequency Interference (RFI) filters, to filter out noise from common items like vacuum cleaners. Unfortunately, most resonate with the frequency associated with lightning

strikes and actually amplify the wave by thousands of folds, thus creating more damages than by not using the device at all.

It should be emphasized that the majority of surge protector products on the retail market do not meet IEEE standards.

- Ensure proper grounding of facility – Install of all necessary measure to ensure adequate grounding (providing a good path for the return of electrons) is achieved. It should be noted that annual or semi-annual maintenance is necessary. Connection to ground must be checked to insure connection is clean and adequate. Proper grounding is needed to reduce lightening damage through, e.g., additional ground rods, chemically treating soil using saline solution saturation around ground rods or other means, bonding neutral and ground to well casing or city mains, and connecting dedicated ground conductors to equipment, etc. In order to establish the appropriate grounding methods and/or the conditions of existing grounding, ground potential measurement (Grounding Testing) should be performed, using any standard technique, such as 3-stake falling potential, 4-stake potential measurement, or other standards from EOS/ESD. This is to insure grounding has not deteriorated over time and there are no grounding system inadequacies. Correct any bonding problem (bonding is what you do to connect system components to the grounding system).
- Install static lines/lightning arrestors on power lines – Install static lines on all overhead power lines (i.e. feeders, distribution, transmission) coupled with appropriate lightning arrestors for each segment. Many rural cooperatives often do not consider the use of static lines for their power lines. Static lines are the highest overhead wires, which are installed directly over the phase wires and are grounded at intervals. They basically function as continuous lightning rods, attracting lightning bolts and conveying them around the current-carrying wires, to the earth. Wire running down the pole, often sheathed in wood or some other insulator for the bottom ten feet or so, provides the ground connection. This is connected to ground rods. Lightning arrestors are devices that are connected directly between the phase wires and ground. They are normally operated like an open circuit, but respond rapidly to voltages across them that exceed their design threshold. When the voltage comes back to a predetermined level, the device becomes an open circuit again. This method prevents transient voltage from traveling down the line, going into a home or business and causing major damages.

Historically, rural cooperates have been reluctant to using static lines/lightning arrestors for a number of reasons, including cost and lack of outspoken customer demand. Most municipal cooperatives have long since installed these features.

Recommended Practices for Mitigation – Lightning

Based on the overview and evaluation of possible lightning mitigation actions, the following "best practices" for mitigation are recommended for consideration to reduce the impacts of lightning in Louisiana. An expert in transients protection should be consulted to identify whether selected mitigation actions are appropriate for protecting a given building or facility.

- Transition Protection
- Ensure proper grounding of facility
- Install static lines/lightning arrestors on power lines

Appendix H.14: Hazardous Materials Incident

Identification and Evaluation of Possible Mitigation Actions

According to FEMA, chemicals may be found everywhere. They are used to purify drinking water, increase crop production, and for simple household chores. But chemicals also can be hazardous to humans or the environment if used or released improperly. Hazards can occur during production, storage, transportation, use, or disposal. A community may be at risk if a chemical is used unsafely or released in harmful amounts into the environment.

Hazardous materials (HAZMAT) in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Many products containing hazardous chemicals are used and stored in homes routinely. These products are also shipped daily on the nation's highways, railroads, waterways, and pipelines.

Chemical manufacturers are one source of hazardous materials, but there are many others, including service stations, hospitals, and hazardous materials waste sites.

Varying quantities of hazardous materials are manufactured, used, or stored at an estimated 4.5 million facilities in the United States--from major industrial plants to local dry cleaning establishments or gardening supply stores.

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These substances are most often released as a result of transportation accidents or because of chemical accidents in plants.

Since most hazardous materials are controlled by privately-owned entities, there are few mitigation options available to completely mitigate against hazardous materials incidents that might impact State-owned buildings and critical facilities in Louisiana, and generally across the state.

However, chemical spills and fires at education institutions continue to be a problem for state government. Major problems often occur in laboratories, including those at educational institutions. HAZMAT mitigation is seldom practiced in labs. Universities and other state agencies need to prepare responses to such occurrences in their own plans.

Oil company pipelines are major potential sources of haz mat in the state. The Southern portion of the state has a large network of offshore petroleum pipelines coming out of the Gulf of Mexico. Many of these lines were constructed as early as 1946, at which time engineers did not take hurricanes into account. Potential damages include pipe movement, destabilization and breakage, leading to spills and expensive recovery and repair efforts. They are subject to storm generated wave surge velocity, especially near the surface, where the pipelines are the most vulnerable. Any break in pipe would cause large-scale environmental effects/impacts to both coastal waters and land (such as the oil spill following the Deepwater Horizon drilling rig explosion). Costs could include monumental environmental clean-up and restoration (historically ordered by the state of Louisiana for each incident).

There are more than 130 pipeline companies in Louisiana operating about 68,000 miles of pipelines. Roughly 70 of the pipelines carry natural gas and 60 carry hazardous liquids such as gasoline and jet fuel. Louisiana is a principal provider of the oil and natural gas produced in the nation, rating first in crude oil production, and 2nd in natural gas. Nearly 34 percent of the Nation's natural gas supply and over 29 percent of the Nation's crude oil supply, moves through the state and is connected to nearly 50 percent of U.S. refining capacity. The Louisiana Offshore Oil Port, or

LOOP, is located off the Louisiana coast near the town of Port Fourchon. LOOP is the United States' only port capable of accommodating deep draft tankers, and the network of pipelines connects to about 50 percent of the nation's refining capacity. Also located in the Gulf of Mexico near Erath, Louisiana is the Henry Hub. The national price of natural gas is established at this site. The Gulf Gateway Deepwater Port/Energy Bridge, located south of Cameron parish, is the only offshore liquefied natural gas terminal in the United States.

The natural coastal land that provides protection to the pipelines is being reduced by large and small events, such as hurricanes. Maintenance of coastal land and barrier islands is essential to protection of the pipelines. Funding has been difficult, increase the vulnerability even more.

Incident Command System (ICS) is a set of personnel, policies, procedures, facilities, and equipment, integrated into a common organizational structure designed to improve emergency response operations of all types and complexities. It was developed by forest fire fighters as a method to better manage fire response for major event. ICS is based upon a flexible, scalable response organization providing a common framework within which people can work together effectively. It does not matter which agency they are from or their rank or title. These people may be drawn from multiple agencies that do not routinely work together, and ICS is designed to give standard response and operation procedures to reduce the problems and potential for miscommunication on such incidents. ICS has been summarized as a "first-on-scene" structure, where the first responder of a scene has charge of the scene until the incident has been declared resolved, a superior-ranking responder arrives on scene and seizes command, or the Incident Commander appoints another individual Incident Commander. ICS has now weathered 30 years of emergency and non emergency application.

Since hazardous materials are controlled by privately-owned entities, there are few mitigation options available to completely mitigate against hazardous materials incidents at State-owned buildings and critical facilities in Louisiana, and generally across the State. However, the following planning and mitigation actions are possible options for improving response and/or reduce the impacts of hazardous materials incidents to State-owned buildings and critical facilities in Louisiana. For additional hazardous materials incident information, refer to *Risk Management Series Reference Manual to Mitigate Potential Terrorist Attacks against Buildings*, (FEMA Publication 426, Chapter 5, December 2003).

- Emergency Response Plans: A review of the hazard profiles indicates that hazardous materials incidents generally involve privately-owned, fixed-site facilities or major transportation routes. Communities located near hazardous materials facilities or routes need to prepare emergency response plans to address hazardous materials incidents and other emergencies. Emergency response plans include a detailed summary of fixed-site facilities and major transportation routes for hazardous materials within the community, criteria for establishing hazardous materials incidents, and specific actions, including evacuation routes, to be taken in response to various incidents. The cost of emergency response plans can be difficult to estimate due to the level of effort and cooperation required on the part of community officials, the private sector, and the general public. The cost-effectiveness of emergency response plans will vary based on the cost to develop the plan and the hazardous materials incident risk level. Emergency response plans are technically feasible and very effective for improving response to hazardous materials incidents, but public awareness campaigns and periodic plan updates are needed to maintain their effectiveness over time. The environmental impacts of emergency response plans are typically negligible.
- Shelter-in-Place: For buildings or facilities where the hazardous materials incident risk level is high and immediate evacuation is not feasible, sheltering occupants in place is one of three mitigation actions to protect individuals from serious injury or death. Sheltering-in-place involves use or construction of a temporary shelter space within the existing building or facility that is protected from external airborne hazardous materials. Additional information on sheltering-in-place is available in *Risk Management Series Reference Manual to Mitigate Potential Terrorist Attacks against Buildings*, (FEMA Publication 426, Section 5.2, December 2003).

Shelter spaces located in the floodplain must be constructed above the 100-year flood level. The cost to use or construct a shelter will vary based on the size and design requirements of the shelter (as applicable). The cost-effectiveness of constructing a shelter will vary based on project cost and the hazardous materials incident risk level. Sheltering-in-place is technically feasible and effective at protecting human lives, however, the level of protection will vary based on several factors including the building's air exchange rate and the duration of occupancy. The environmental impacts of sheltering in place will vary based on the environmental conditions of the shelter site.

- Personal Protective Equipment: The second mitigation option for protecting building occupants from hazardous materials incidents where immediate evacuation is not feasible is to use Personal Protective Equipment (PPE). PPE includes respirators, protective hoods, protective suits and other equipment that can protect individual occupants from the effects of various hazardous materials incidents. Additional information on PPE is in *Risk Management Series Reference Manual to Mitigate Potential Terrorist Attacks against Buildings*, (FEMA Publication 426, Section 5.3, December 2003). The cost of PPE will vary based on the number, protective capacity and shelf life of the equipment. The cost-effectiveness of PPE will vary based on project cost and the hazardous materials incident risk level. The use of PPE is technically feasible and effective at protecting human lives, however, the level of protection will vary based on several factors including the type of equipment used and the type of hazardous materials involved. The environmental impacts of personal protective equipment are typically negligible.
- Air Filtration: The third mitigation option for protecting building occupants from hazardous materials incidents where *immediate evacuation is not feasible* is air filtration. Air filtration involves using filtering, and/or cleaning the air, to remove hazardous materials before discharging it inside the building or facility. The two basic methods of air filtration are external filtration, which draws air to be filtered/cleaned from outside the building, and internal filtration, which draws air to be filtered/cleaned from inside the building. In general, external filtration provides a higher level of protection than internal filtration, but at a much higher cost. Additional information on air filtration and pressurization is available in *Risk Management Series Reference Manual to Mitigate Potential Terrorist Attacks against Buildings*, (FEMA Publication 426, Section 5.4 dated December 2003). The cost of air filtration will vary based on the method of air filtration selected, the type of equipment used, and the size of the building or facility to be mitigated. The cost-effectiveness of air filtration will vary based on project cost and the hazardous materials incident risk level. Air filtration is technically feasible and highly effective at protecting human lives, however, the level of protection will vary based on several factors including the method of filtration, the type and size of the filters, and maintenance requirements. The environmental impacts of air filtration are typically negligible.
- Use of Fire-Resistant Coating: For many years, technology has been available to make almost any building cost effectively and completely fireproof through the use of readily available, non-toxic, intumescent coating/paint. An intumescent paint is a fire-retardant coating that when heated, forms a protective barrier. Intumescent paint can meet Code driven requirements for hourly fire resistant construction materials and assemblies. This includes gypsum wall board, wood structural members, lath and plaster, concrete, electrical cables, light gauge metal, form insulation, and advanced materials such as plastics and carbon fiber. Applications include residential, commercial, and industrial building types.

  Use of intumescent paint is easy and can be sprayed or brushed on. Typically, coverage is 100 to 200 square feet per gallon of paint. Intumescent paint can be used as an additive by being mixed to existing latex paint. Retrofitting/fire-proofing buildings on historic registers can be achieved by use of this coating (historic structures are typically not allowed to be retrofitted with fire sprinklers). In many cases, fire insurance is greatly lowered as a result. Coating typically will expand 30 times its thickness, and protect against 2,000 degree heat for one hour or more. It is also a cheaper, more efficient way to meet Code requirements.

Use of intumescent paint is also an effective solution to the widespread use of highly flammable foam/insulation. Use of intumescent paint will prevent fires from igniting, thus limiting the release of toxic gas. It can also improve the fire rating of new foam panels as well as meet the UBC 26-3 room corner test.

Finally, intumescent paint is toxic free and approved by the California Fire Marshall.

- Fire-Resistant/Fire-Proof Designed Buildings: As buildings are replaced over time, fire-resistant or fire proof facilities, such as an EOC, could be constructed in wildfire risk locations. Many fire resistant/proof buildings use concrete as their primary structural element, and are essentially fire-resistant or fire-proof. Among buildings that are fire-resistant are those that contain Structural Insulated Panels (SIP) and Insulated Concrete Forms (ICF). Concrete domes are generally completely fire proof as well, as they have a concrete shell and the coverings are fire proof. SIP construction can be modified to be completely fire proof with a few changes in finishing and interior structures. ICF construction is covered by fire proof foam. As an added bonus, SIP and ICF can be rated at 200+ mph for wind hazard, while a concrete dome provides absolute protection (they will completely survive the strongest tornadoes, earthquakes, floods, etc. with little to no damages).

- Concrete Dome for Major Tank Storage: Steel tanks frequently rupture and release their content, especially gasoline storage. During the Loma Prieta Earthquakes, they accounted for 10% of HAZMAT events. Concrete Dome storage units can minimize HAZMAT issues in many scenarios due to their durability.

- Increase First Responder ICS Training: There is no watch dog active in the state to ensure that first responders receive this essential training. As such, mitigation of HAZMAT should emphasize state of the art training for HAZMAT response among local and state level first responders, such as fire fighters, EMS, and police. As such, mitigation must emphasize efforts to increase funding for expanded and improved training programs.

- Educate public agencies on using ICS more frequently – Historically, ICS has been a model tool for command, control, and coordination of a response to a critical incident. However, if public agencies only utilize the ICS during critical incidents, they are less likely to retain the knowledge gained during their initial training.

- Educate Schools on HAZMAT: Most universities/colleges offer little or no training on HAZMAT. However, many universities/colleges handle such materials in places such as classroom laboratories, placing themselves at risk for failing to meet federal and state hazardous waste laws. Many schools have been ordered to pay large monetary penalties to the EPA and other related agencies.

- Increase funding of first responder training, equipment – HAZMAT training and equipment tend to be low in the priority list, resulting in it often being underfunded; this issue is particularly problematic given recent economic and budget challenges.

- Identify Funding and Relocate Schools – Many schools, etc, are located near major HM sources, such as tank farms. For example, if a building is damaged by a flood event, funding sources should be identified and used to relocate the school structure.

- Provide incentive for private industry to do HAZMAT planning and training – Incentivizing HAZMAT planning and training for private industry can increase their compliance with HAZMAT regulations and also make them more prepared in the event of a HAZMAT-related emergency.

- Educate/help fund local units of government on homeland security – Funding is often delayed from DHS for first responder funding to local units of government. Further, state provided additional bureaucratic delays, with

additional requirement on top of federal requirements for funding. Effort must be made to streamline funding. Effort is need to educate the local on needs for and importance of homeland security, especially in light of HM problems.

Recommended Practices for Mitigation – Hazardous Materials Incident

Based on the overview and evaluation of possible hazardous materials incident mitigation actions, the following "best practices" for planning and mitigation are recommended for consideration to improve response and/or reduce the impacts of hazardous materials incidents to State-owned buildings and critical facilities in Louisiana. A civil engineer should be consulted to identify whether selected planning and mitigation actions are appropriate for a given building or facility.

- Emergency Response Plans
- Sheltering-in-Place
- Use of Fire Resistant Coating
- Fire Resistant/Fire-Proof Building Design
- Concrete Dome for Major Tank Storage
- Restoration of Coastal Barrier Islands
- Increase ICS Training and Funding for First Responders
- Educate police dept to run daily ICS, not just for emergency
- Educate Schools on HM
- Increase funding of first responder training, equipment
- Relocate Schools
- Provide incentive for private industry to do HM planning and training
- Educate/help fund local units of government on homeland security

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Appendix I:
Disaster Mitigation Act of 2000

The following 26 pages are excerpted from Public Law 106-390, dated October 30, 2004.

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PUBLIC LAW 106–390—OCT. 30, 2000

DISASTER MITIGATION ACT OF 2000

Public Law 106–390
106th Congress

An Act

Oct. 30, 2000
[H.R. 707]

To amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act to authorize a program for predisaster mitigation, to streamline the administration of disaster relief, to control the Federal costs of disaster assistance, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Disaster Mitigation Act of 2000.

42 USC 5121 note.

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Disaster Mitigation Act of 2000".

(b) TABLE OF CONTENTS.—The table of contents of this Act is as follows:

Sec. 1. Short title; table of contents.

TITLE I—PREDISASTER HAZARD MITIGATION

Sec. 101. Findings and purpose.
Sec. 102. Predisaster hazard mitigation.
Sec. 103. Interagency task force.
Sec. 104. Mitigation planning; minimum standards for public and private structures.

TITLE II—STREAMLINING AND COST REDUCTION

Sec. 201. Technical amendments.
Sec. 202. Management costs.
Sec. 203. Public notice, comment, and consultation requirements.
Sec. 204. State administration of hazard mitigation grant program.
Sec. 205. Assistance to repair, restore, reconstruct, or replace damaged facilities.
Sec. 206. Federal assistance to individuals and households.
Sec. 207. Community disaster loans.
Sec. 208. Report on State management of small disasters initiative.
Sec. 209. Study regarding cost reduction.

TITLE III—MISCELLANEOUS

Sec. 301. Technical correction of short title.
Sec. 302. Definitions.
Sec. 303. Fire management assistance.
Sec. 304. Disaster grant closeout procedures.
Sec. 305. Public safety officer benefits for certain Federal and State employees.
Sec. 306. Buy American.
Sec. 307. Treatment of certain real property.
Sec. 308. Study of participation by Indian tribes in emergency management.

TITLE I—PREDISASTER HAZARD MITIGATION

42 USC 5133 note.

SEC. 101. FINDINGS AND PURPOSE.

(a) FINDINGS.—Congress finds that—

(1) natural disasters, including earthquakes, tsunamis, tornadoes, hurricanes, flooding, and wildfires, pose great danger to human life and to property throughout the United States;

(2) greater emphasis needs to be placed on—

(A) identifying and assessing the risks to States and local governments (including Indian tribes) from natural disasters;

(B) implementing adequate measures to reduce losses from natural disasters; and

(C) ensuring that the critical services and facilities of communities will continue to function after a natural disaster;

(3) expenditures for postdisaster assistance are increasing without commensurate reductions in the likelihood of future losses from natural disasters;

(4) in the expenditure of Federal funds under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.), high priority should be given to mitigation of hazards at the local level; and

(5) with a unified effort of economic incentives, awareness and education, technical assistance, and demonstrated Federal support, States and local governments (including Indian tribes) will be able to—

(A) form effective community-based partnerships for hazard mitigation purposes;

(B) implement effective hazard mitigation measures that reduce the potential damage from natural disasters;

(C) ensure continued functionality of critical services;

(D) leverage additional non-Federal resources in meeting natural disaster resistance goals; and

(E) make commitments to long-term hazard mitigation efforts to be applied to new and existing structures.

(b) PURPOSE.—The purpose of this title is to establish a national disaster hazard mitigation program—

(1) to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters; and

(2) to provide a source of predisaster hazard mitigation funding that will assist States and local governments (including Indian tribes) in implementing effective hazard mitigation measures that are designed to ensure the continued functionality of critical services and facilities after a natural disaster.

SEC. 102. PREDISASTER HAZARD MITIGATION.

(a) IN GENERAL.—Title II of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5131 et seq.) is amended by adding at the end the following:

"SEC. 203. PREDISASTER HAZARD MITIGATION.

President.
42 USC 5133.

"(a) DEFINITION OF SMALL IMPOVERISHED COMMUNITY.—In this section, the term 'small impoverished community' means a community of 3,000 or fewer individuals that is economically disadvantaged, as determined by the State in which the community is located and based on criteria established by the President.

"(b) ESTABLISHMENT OF PROGRAM.—The President may establish a program to provide technical and financial assistance to States and local governments to assist in the implementation of

predisaster hazard mitigation measures that are cost-effective and are designed to reduce injuries, loss of life, and damage and destruction of property, including damage to critical services and facilities under the jurisdiction of the States or local governments.

"(c) APPROVAL BY PRESIDENT.—If the President determines that a State or local government has identified natural disaster hazards in areas under its jurisdiction and has demonstrated the ability to form effective public-private natural disaster hazard mitigation partnerships, the President, using amounts in the National Predisaster Mitigation Fund established under subsection (i) (referred to in this section as the 'Fund'), may provide technical and financial assistance to the State or local government to be used in accordance with subsection (e).

"(d) STATE RECOMMENDATIONS.—

"(1) IN GENERAL.—

"(A) RECOMMENDATIONS.—The Governor of each State may recommend to the President not fewer than five local governments to receive assistance under this section.

"(B) DEADLINE FOR SUBMISSION.—The recommendations under subparagraph (A) shall be submitted to the President not later than October 1, 2001, and each October 1st thereafter or such later date in the year as the President may establish.

"(C) CRITERIA.—In making recommendations under subparagraph (A), a Governor shall consider the criteria specified in subsection (g).

"(2) USE.—

President.

"(A) IN GENERAL.—Except as provided in subparagraph (B), in providing assistance to local governments under this section, the President shall select from local governments recommended by the Governors under this subsection.

"(B) EXTRAORDINARY CIRCUMSTANCES.—In providing assistance to local governments under this section, the President may select a local government that has not been recommended by a Governor under this subsection if the President determines that extraordinary circumstances justify the selection and that making the selection will further the purpose of this section.

"(3) EFFECT OF FAILURE TO NOMINATE.—If a Governor of a State fails to submit recommendations under this subsection in a timely manner, the President may select, subject to the criteria specified in subsection (g), any local governments of the State to receive assistance under this section.

"(e) USES OF TECHNICAL AND FINANCIAL ASSISTANCE.—

"(1) IN GENERAL.—Technical and financial assistance provided under this section—

"(A) shall be used by States and local governments principally to implement predisaster hazard mitigation measures that are cost-effective and are described in proposals approved by the President under this section; and

"(B) may be used—

"(i) to support effective public-private natural disaster hazard mitigation partnerships;

"(ii) to improve the assessment of a community's vulnerability to natural hazards; or

"(iii) to establish hazard mitigation priorities, and an appropriate hazard mitigation plan, for a community.

"(2) DISSEMINATION.—A State or local government may use not more than 10 percent of the financial assistance received by the State or local government under this section for a fiscal year to fund activities to disseminate information regarding cost-effective mitigation technologies.

"(f) ALLOCATION OF FUNDS.—The amount of financial assistance made available to a State (including amounts made available to local governments of the State) under this section for a fiscal year—

"(1) shall be not less than the lesser of—

"(A) $500,000; or

"(B) the amount that is equal to 1.0 percent of the total funds appropriated to carry out this section for the fiscal year;

"(2) shall not exceed 15 percent of the total funds described in paragraph (1)(B); and

"(3) shall be subject to the criteria specified in subsection (g).

"(g) CRITERIA FOR ASSISTANCE AWARDS.—In determining whether to provide technical and financial assistance to a State or local government under this section, the President shall take into account—

"(1) the extent and nature of the hazards to be mitigated;

"(2) the degree of commitment of the State or local government to reduce damages from future natural disasters;

"(3) the degree of commitment by the State or local government to support ongoing non-Federal support for the hazard mitigation measures to be carried out using the technical and financial assistance;

"(4) the extent to which the hazard mitigation measures to be carried out using the technical and financial assistance contribute to the mitigation goals and priorities established by the State;

"(5) the extent to which the technical and financial assistance is consistent with other assistance provided under this Act;

"(6) the extent to which prioritized, cost-effective mitigation activities that produce meaningful and definable outcomes are clearly identified;

"(7) if the State or local government has submitted a mitigation plan under section 322, the extent to which the activities identified under paragraph (6) are consistent with the mitigation plan;

"(8) the opportunity to fund activities that maximize net benefits to society;

"(9) the extent to which assistance will fund mitigation activities in small impoverished communities; and

"(10) such other criteria as the President establishes in consultation with State and local governments. President.

"(h) FEDERAL SHARE.—

"(1) IN GENERAL.—Financial assistance provided under this section may contribute up to 75 percent of the total cost of mitigation activities approved by the President.

"(2) SMALL IMPOVERISHED COMMUNITIES.—Notwithstanding paragraph (1), the President may contribute up to 90 percent of the total cost of a mitigation activity carried out in a small impoverished community.

"(i) NATIONAL PREDISASTER MITIGATION FUND.—

"(1) ESTABLISHMENT.—The President may establish in the Treasury of the United States a fund to be known as the 'National Predisaster Mitigation Fund', to be used in carrying out this section.

"(2) TRANSFERS TO FUND.—There shall be deposited in the Fund—

"(A) amounts appropriated to carry out this section, which shall remain available until expended; and

"(B) sums available from gifts, bequests, or donations of services or property received by the President for the purpose of predisaster hazard mitigation.

"(3) EXPENDITURES FROM FUND.—Upon request by the President, the Secretary of the Treasury shall transfer from the Fund to the President such amounts as the President determines are necessary to provide technical and financial assistance under this section.

"(4) INVESTMENT OF AMOUNTS.—

"(A) IN GENERAL.—The Secretary of the Treasury shall invest such portion of the Fund as is not, in the judgment of the Secretary of the Treasury, required to meet current withdrawals. Investments may be made only in interest-bearing obligations of the United States.

"(B) ACQUISITION OF OBLIGATIONS.—For the purpose of investments under subparagraph (A), obligations may be acquired—

"(i) on original issue at the issue price; or

"(ii) by purchase of outstanding obligations at the market price.

"(C) SALE OF OBLIGATIONS.—Any obligation acquired by the Fund may be sold by the Secretary of the Treasury at the market price.

"(D) CREDITS TO FUND.—The interest on, and the proceeds from the sale or redemption of, any obligations held in the Fund shall be credited to and form a part of the Fund.

"(E) TRANSFERS OF AMOUNTS.—

"(i) IN GENERAL.—The amounts required to be transferred to the Fund under this subsection shall be transferred at least monthly from the general fund of the Treasury to the Fund on the basis of estimates made by the Secretary of the Treasury.

"(ii) ADJUSTMENTS.—Proper adjustment shall be made in amounts subsequently transferred to the extent prior estimates were in excess of or less than the amounts required to be transferred.

"(j) LIMITATION ON TOTAL AMOUNT OF FINANCIAL ASSISTANCE.—The President shall not provide financial assistance under this section in an amount greater than the amount available in the Fund.

"(k) MULTIHAZARD ADVISORY MAPS.—

"(1) DEFINITION OF MULTIHAZARD ADVISORY MAP.—In this subsection, the term 'multihazard advisory map' means a map

on which hazard data concerning each type of natural disaster is identified simultaneously for the purpose of showing areas of hazard overlap.

"(2) DEVELOPMENT OF MAPS.—In consultation with States, local governments, and appropriate Federal agencies, the President shall develop multihazard advisory maps for areas, in not fewer than five States, that are subject to commonly recurring natural hazards (including flooding, hurricanes and severe winds, and seismic events). President.

"(3) USE OF TECHNOLOGY.—In developing multihazard advisory maps under this subsection, the President shall use, to the maximum extent practicable, the most cost-effective and efficient technology available.

"(4) USE OF MAPS.—

"(A) ADVISORY NATURE.—The multihazard advisory maps shall be considered to be advisory and shall not require the development of any new policy by, or impose any new policy on, any government or private entity.

"(B) AVAILABILITY OF MAPS.—The multihazard advisory maps shall be made available to the appropriate State and local governments for the purposes of—

"(i) informing the general public about the risks of natural hazards in the areas described in paragraph (2);

"(ii) supporting the activities described in subsection (e); and

"(iii) other public uses.

"(l) REPORT ON FEDERAL AND STATE ADMINISTRATION.—Not later than 18 months after the date of the enactment of this section, the President, in consultation with State and local governments, shall submit to Congress a report evaluating efforts to implement this section and recommending a process for transferring greater authority and responsibility for administering the assistance program established under this section to capable States. Deadline.

"(m) TERMINATION OF AUTHORITY.—The authority provided by this section terminates December 31, 2003.".

(b) CONFORMING AMENDMENT.—Title II of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5131 et seq.) is amended by striking the title heading and inserting the following:

"TITLE II—DISASTER PREPAREDNESS AND MITIGATION ASSISTANCE".

SEC. 103. INTERAGENCY TASK FORCE.

Title II of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5131 et seq.) (as amended by section 102(a)) is amended by adding at the end the following:

"SEC. 204. INTERAGENCY TASK FORCE. 42 USC 5134.

"(a) IN GENERAL.—The President shall establish a Federal interagency task force for the purpose of coordinating the implementation of predisaster hazard mitigation programs administered by the Federal Government.

"(b) CHAIRPERSON.—The Director of the Federal Emergency Management Agency shall serve as the chairperson of the task force.

"(c) MEMBERSHIP.—The membership of the task force shall include representatives of—

"(1) relevant Federal agencies;

"(2) State and local government organizations (including Indian tribes); and

"(3) the American Red Cross.".

SEC. 104. MITIGATION PLANNING; MINIMUM STANDARDS FOR PUBLIC AND PRIVATE STRUCTURES.

(a) IN GENERAL.—Title III of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5141 et seq.) is amended by adding at the end the following:

42 USC 5165.

"SEC. 322. MITIGATION PLANNING.

"(a) REQUIREMENT OF MITIGATION PLAN.—As a condition of receipt of an increased Federal share for hazard mitigation measures under subsection (e), a State, local, or tribal government shall develop and submit for approval to the President a mitigation plan that outlines processes for identifying the natural hazards, risks, and vulnerabilities of the area under the jurisdiction of the government.

"(b) LOCAL AND TRIBAL PLANS.—Each mitigation plan developed by a local or tribal government shall—

"(1) describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan; and

"(2) establish a strategy to implement those actions.

"(c) STATE PLANS.—The State process of development of a mitigation plan under this section shall—

"(1) identify the natural hazards, risks, and vulnerabilities of areas in the State;

"(2) support development of local mitigation plans;

"(3) provide for technical assistance to local and tribal governments for mitigation planning; and

"(4) identify and prioritize mitigation actions that the State will support, as resources become available.

"(d) FUNDING.—

"(1) IN GENERAL.—Federal contributions under section 404 may be used to fund the development and updating of mitigation plans under this section.

"(2) MAXIMUM FEDERAL CONTRIBUTION.—With respect to any mitigation plan, a State, local, or tribal government may use an amount of Federal contributions under section 404 not to exceed 7 percent of the amount of such contributions available to the government as of a date determined by the government.

"(e) INCREASED FEDERAL SHARE FOR HAZARD MITIGATION MEASURES.—

"(1) IN GENERAL.—If, at the time of the declaration of a major disaster, a State has in effect an approved mitigation plan under this section, the President may increase to 20 percent, with respect to the major disaster, the maximum percentage specified in the last sentence of section 404(a).

President.

"(2) FACTORS FOR CONSIDERATION.—In determining whether to increase the maximum percentage under paragraph (1), the President shall consider whether the State has established—

"(A) eligibility criteria for property acquisition and other types of mitigation measures;

"(B) requirements for cost effectiveness that are related to the eligibility criteria;

"(C) a system of priorities that is related to the eligibility criteria; and

"(D) a process by which an assessment of the effectiveness of a mitigation action may be carried out after the mitigation action is complete.

"SEC. 323. MINIMUM STANDARDS FOR PUBLIC AND PRIVATE STRUCTURES. 42 USC 5165a.

"(a) IN GENERAL.—As a condition of receipt of a disaster loan or grant under this Act—

"(1) the recipient shall carry out any repair or construction to be financed with the loan or grant in accordance with applicable standards of safety, decency, and sanitation and in conformity with applicable codes, specifications, and standards; and

"(2) the President may require safe land use and construction practices, after adequate consultation with appropriate State and local government officials.

"(b) EVIDENCE OF COMPLIANCE.—A recipient of a disaster loan or grant under this Act shall provide such evidence of compliance with this section as the President may require by regulation.".

(b) LOSSES FROM STRAIGHT LINE WINDS.—The President shall increase the maximum percentage specified in the last sentence of section 404(a) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5170c(a)) from 15 percent to 20 percent with respect to any major disaster that is in the State of Minnesota and for which assistance is being provided as of the date of the enactment of this Act, except that additional assistance provided under this subsection shall not exceed $6,000,000. The mitigation measures assisted under this subsection shall be related to losses in the State of Minnesota from straight line winds. President.

(c) CONFORMING AMENDMENTS.—

(1) Section 404(a) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5170c(a)) is amended—

(A) in the second sentence, by striking "section 409" and inserting "section 322"; and

(B) in the third sentence, by striking "The total" and inserting "Subject to section 322, the total".

(2) Section 409 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5176) is repealed.

TITLE II—STREAMLINING AND COST REDUCTION

SEC. 201. TECHNICAL AMENDMENTS.

Section 311 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5154) is amended in subsections (a)(1), (b), and (c) by striking "section 803 of the Public Works and Economic Development Act of 1965" each place it appears

and inserting "section 209(c)(2) of the Public Works and Economic Development Act of 1965 (42 U.S.C. 3149(c)(2))".

SEC. 202. MANAGEMENT COSTS.

(a) IN GENERAL.—Title III of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5141 et seq.) (as amended by section 104(a)) is amended by adding at the end the following:

42 USC 5165b.

"SEC. 324. MANAGEMENT COSTS.

"(a) DEFINITION OF MANAGEMENT COST.—In this section, the term 'management cost' includes any indirect cost, any administrative expense, and any other expense not directly chargeable to a specific project under a major disaster, emergency, or disaster preparedness or mitigation activity or measure.

Regulations.

"(b) ESTABLISHMENT OF MANAGEMENT COST RATES.—Notwithstanding any other provision of law (including any administrative rule or guidance), the President shall by regulation establish management cost rates, for grantees and subgrantees, that shall be used to determine contributions under this Act for management costs.

Deadline.

"(c) REVIEW.—The President shall review the management cost rates established under subsection (b) not later than 3 years after the date of establishment of the rates and periodically thereafter.".

42 USC 5165b note.

(b) APPLICABILITY.—

(1) IN GENERAL.—Subject to paragraph (2), subsections (a) and (b) of section 324 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (as added by subsection (a)) shall apply to major disasters declared under that Act on or after the date of the enactment of this Act.

(2) INTERIM AUTHORITY.—Until the date on which the President establishes the management cost rates under section 324 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (as added by subsection (a)), section 406(f) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5172(f)) (as in effect on the day before the date of the enactment of this Act) shall be used to establish management cost rates.

SEC. 203. PUBLIC NOTICE, COMMENT, AND CONSULTATION REQUIREMENTS.

Title III of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5141 et seq.) (as amended by section 202(a)) is amended by adding at the end the following:

42 USC 5165c.

"SEC. 325. PUBLIC NOTICE, COMMENT, AND CONSULTATION REQUIREMENTS.

"(a) PUBLIC NOTICE AND COMMENT CONCERNING NEW OR MODIFIED POLICIES.—

President.

"(1) IN GENERAL.—The President shall provide for public notice and opportunity for comment before adopting any new or modified policy that—

"(A) governs implementation of the public assistance program administered by the Federal Emergency Management Agency under this Act; and

"(B) could result in a significant reduction of assistance under the program.

"(2) APPLICATION.—Any policy adopted under paragraph (1) shall apply only to a major disaster or emergency declared on or after the date on which the policy is adopted.

"(b) CONSULTATION CONCERNING INTERIM POLICIES.—

"(1) IN GENERAL.—Before adopting any interim policy under the public assistance program to address specific conditions that relate to a major disaster or emergency that has been declared under this Act, the President, to the maximum extent practicable, shall solicit the views and recommendations of grantees and subgrantees with respect to the major disaster or emergency concerning the potential interim policy, if the interim policy is likely—

"(A) to result in a significant reduction of assistance to applicants for the assistance with respect to the major disaster or emergency; or

"(B) to change the terms of a written agreement to which the Federal Government is a party concerning the declaration of the major disaster or emergency.

"(2) NO LEGAL RIGHT OF ACTION.—Nothing in this subsection confers a legal right of action on any party.

"(c) PUBLIC ACCESS.—The President shall promote public access to policies governing the implementation of the public assistance program.". President.

SEC. 204. STATE ADMINISTRATION OF HAZARD MITIGATION GRANT PROGRAM.

Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5170c) is amended by adding at the end the following:

"(c) PROGRAM ADMINISTRATION BY STATES.—

"(1) IN GENERAL.—A State desiring to administer the hazard mitigation grant program established by this section with respect to hazard mitigation assistance in the State may submit to the President an application for the delegation of the authority to administer the program.

"(2) CRITERIA.—The President, in consultation and coordination with States and local governments, shall establish criteria for the approval of applications submitted under paragraph (1). The criteria shall include, at a minimum—

"(A) the demonstrated ability of the State to manage the grant program under this section;

"(B) there being in effect an approved mitigation plan under section 322; and

"(C) a demonstrated commitment to mitigation activities.

"(3) APPROVAL.—The President shall approve an application submitted under paragraph (1) that meets the criteria established under paragraph (2). President.

"(4) WITHDRAWAL OF APPROVAL.—If, after approving an application of a State submitted under paragraph (1), the President determines that the State is not administering the hazard mitigation grant program established by this section in a manner satisfactory to the President, the President shall withdraw the approval.

"(5) AUDITS.—The President shall provide for periodic audits of the hazard mitigation grant programs administered by States under this subsection.". President.

SEC. 205. ASSISTANCE TO REPAIR, RESTORE, RECONSTRUCT, OR REPLACE DAMAGED FACILITIES.

(a) CONTRIBUTIONS.—Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5172) is amended by striking subsection (a) and inserting the following:

"(a) CONTRIBUTIONS.—

"(1) IN GENERAL.—The President may make contributions—

"(A) to a State or local government for the repair, restoration, reconstruction, or replacement of a public facility damaged or destroyed by a major disaster and for associated expenses incurred by the government; and

"(B) subject to paragraph (3), to a person that owns or operates a private nonprofit facility damaged or destroyed by a major disaster for the repair, restoration, reconstruction, or replacement of the facility and for associated expenses incurred by the person.

"(2) ASSOCIATED EXPENSES.—For the purposes of this section, associated expenses shall include—

"(A) the costs of mobilizing and employing the National Guard for performance of eligible work;

"(B) the costs of using prison labor to perform eligible work, including wages actually paid, transportation to a worksite, and extraordinary costs of guards, food, and lodging; and

"(C) base and overtime wages for the employees and extra hires of a State, local government, or person described in paragraph (1) that perform eligible work, plus fringe benefits on such wages to the extent that such benefits were being paid before the major disaster.

"(3) CONDITIONS FOR ASSISTANCE TO PRIVATE NONPROFIT FACILITIES.—

"(A) IN GENERAL.—The President may make contributions to a private nonprofit facility under paragraph (1)(B) only if—

"(i) the facility provides critical services (as defined by the President) in the event of a major disaster; or

"(ii) the owner or operator of the facility—

"(I) has applied for a disaster loan under section 7(b) of the Small Business Act (15 U.S.C. 636(b)); and

"(II)(aa) has been determined to be ineligible for such a loan; or

"(bb) has obtained such a loan in the maximum amount for which the Small Business Administration determines the facility is eligible.

"(B) DEFINITION OF CRITICAL SERVICES.—In this paragraph, the term 'critical services' includes power, water (including water provided by an irrigation organization or facility), sewer, wastewater treatment, communications, and emergency medical care.

"(4) NOTIFICATION TO CONGRESS.—Before making any contribution under this section in an amount greater than $20,000,000, the President shall notify—

"(A) the Committee on Environment and Public Works of the Senate;

"(B) the Committee on Transportation and Infrastructure of the House of Representatives;

"(C) the Committee on Appropriations of the Senate; and

"(D) the Committee on Appropriations of the House of Representatives.".

(b) FEDERAL SHARE.—Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5172) is amended by striking subsection (b) and inserting the following:

"(b) FEDERAL SHARE.—

"(1) MINIMUM FEDERAL SHARE.—Except as provided in paragraph (2), the Federal share of assistance under this section shall be not less than 75 percent of the eligible cost of repair, restoration, reconstruction, or replacement carried out under this section.

"(2) REDUCED FEDERAL SHARE.—The President shall promulgate regulations to reduce the Federal share of assistance under this section to not less than 25 percent in the case of the repair, restoration, reconstruction, or replacement of any eligible public facility or private nonprofit facility following an event associated with a major disaster— President. Regulations.

"(A) that has been damaged, on more than one occasion within the preceding 10-year period, by the same type of event; and

"(B) the owner of which has failed to implement appropriate mitigation measures to address the hazard that caused the damage to the facility.".

(c) LARGE IN-LIEU CONTRIBUTIONS.—Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5172) is amended by striking subsection (c) and inserting the following:

"(c) LARGE IN-LIEU CONTRIBUTIONS.—

"(1) FOR PUBLIC FACILITIES.—

"(A) IN GENERAL.—In any case in which a State or local government determines that the public welfare would not best be served by repairing, restoring, reconstructing, or replacing any public facility owned or controlled by the State or local government, the State or local government may elect to receive, in lieu of a contribution under subsection (a)(1)(A), a contribution in an amount equal to 75 percent of the Federal share of the Federal estimate of the cost of repairing, restoring, reconstructing, or replacing the facility and of management expenses.

"(B) AREAS WITH UNSTABLE SOIL.—In any case in which a State or local government determines that the public welfare would not best be served by repairing, restoring, reconstructing, or replacing any public facility owned or controlled by the State or local government because soil instability in the disaster area makes repair, restoration, reconstruction, or replacement infeasible, the State or local government may elect to receive, in lieu of a contribution under subsection (a)(1)(A), a contribution in an amount equal to 90 percent of the Federal share of the Federal estimate of the cost of repairing, restoring, reconstructing, or replacing the facility and of management expenses.

"(C) USE OF FUNDS.—Funds contributed to a State or local government under this paragraph may be used—

"(i) to repair, restore, or expand other selected public facilities;

"(ii) to construct new facilities; or

"(iii) to fund hazard mitigation measures that the State or local government determines to be necessary to meet a need for governmental services and functions in the area affected by the major disaster.

"(D) LIMITATIONS.—Funds made available to a State or local government under this paragraph may not be used for—

"(i) any public facility located in a regulatory floodway (as defined in section 59.1 of title 44, Code of Federal Regulations (or a successor regulation)); or

"(ii) any uninsured public facility located in a special flood hazard area identified by the Director of the Federal Emergency Management Agency under the National Flood Insurance Act of 1968 (42 U.S.C. 4001 et seq.).

"(2) FOR PRIVATE NONPROFIT FACILITIES.—

"(A) IN GENERAL.—In any case in which a person that owns or operates a private nonprofit facility determines that the public welfare would not best be served by repairing, restoring, reconstructing, or replacing the facility, the person may elect to receive, in lieu of a contribution under subsection (a)(1)(B), a contribution in an amount equal to 75 percent of the Federal share of the Federal estimate of the cost of repairing, restoring, reconstructing, or replacing the facility and of management expenses.

"(B) USE OF FUNDS.—Funds contributed to a person under this paragraph may be used—

"(i) to repair, restore, or expand other selected private nonprofit facilities owned or operated by the person;

"(ii) to construct new private nonprofit facilities to be owned or operated by the person; or

"(iii) to fund hazard mitigation measures that the person determines to be necessary to meet a need for the person's services and functions in the area affected by the major disaster.

"(C) LIMITATIONS.—Funds made available to a person under this paragraph may not be used for—

"(i) any private nonprofit facility located in a regulatory floodway (as defined in section 59.1 of title 44, Code of Federal Regulations (or a successor regulation)); or

"(ii) any uninsured private nonprofit facility located in a special flood hazard area identified by the Director of the Federal Emergency Management Agency under the National Flood Insurance Act of 1968 (42 U.S.C. 4001 et seq.).".

(d) ELIGIBLE COST.—

(1) IN GENERAL.—Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5172) is amended by striking subsection (e) and inserting the following:

"(e) ELIGIBLE COST.—

"(1) DETERMINATION.—

"(A) IN GENERAL.—For the purposes of this section, the President shall estimate the eligible cost of repairing, restoring, reconstructing, or replacing a public facility or private nonprofit facility—

"(i) on the basis of the design of the facility as the facility existed immediately before the major disaster; and

"(ii) in conformity with codes, specifications, and standards (including floodplain management and hazard mitigation criteria required by the President or under the Coastal Barrier Resources Act (16 U.S.C. 3501 et seq.)) applicable at the time at which the disaster occurred.

"(B) COST ESTIMATION PROCEDURES.—

"(i) IN GENERAL.—Subject to paragraph (2), the President shall use the cost estimation procedures established under paragraph (3) to determine the eligible cost under this subsection.

"(ii) APPLICABILITY.—The procedures specified in this paragraph and paragraph (2) shall apply only to projects the eligible cost of which is equal to or greater than the amount specified in section 422.

"(2) MODIFICATION OF ELIGIBLE COST.—

"(A) ACTUAL COST GREATER THAN CEILING PERCENTAGE OF ESTIMATED COST.—In any case in which the actual cost of repairing, restoring, reconstructing, or replacing a facility under this section is greater than the ceiling percentage established under paragraph (3) of the cost estimated under paragraph (1), the President may determine that the eligible cost includes a portion of the actual cost of the repair, restoration, reconstruction, or replacement that exceeds the cost estimated under paragraph (1).

"(B) ACTUAL COST LESS THAN ESTIMATED COST.—

"(i) GREATER THAN OR EQUAL TO FLOOR PERCENTAGE OF ESTIMATED COST.—In any case in which the actual cost of repairing, restoring, reconstructing, or replacing a facility under this section is less than 100 percent of the cost estimated under paragraph (1), but is greater than or equal to the floor percentage established under paragraph (3) of the cost estimated under paragraph (1), the State or local government or person receiving funds under this section shall use the excess funds to carry out cost-effective activities that reduce the risk of future damage, hardship, or suffering from a major disaster.

"(ii) LESS THAN FLOOR PERCENTAGE OF ESTIMATED COST.—In any case in which the actual cost of repairing, restoring, reconstructing, or replacing a facility under this section is less than the floor percentage established under paragraph (3) of the cost estimated under paragraph (1), the State or local government or person receiving assistance under this section shall reimburse the President in the amount of the difference.

"(C) NO EFFECT ON APPEALS PROCESS.—Nothing in this paragraph affects any right of appeal under section 423.

"(3) EXPERT PANEL.—

"(A) ESTABLISHMENT.—Not later than 18 months after the date of the enactment of this paragraph, the President, acting through the Director of the Federal Emergency Management Agency, shall establish an expert panel, which shall include representatives from the construction industry and State and local government.

"(B) DUTIES.—The expert panel shall develop recommendations concerning—

"(i) procedures for estimating the cost of repairing, restoring, reconstructing, or replacing a facility consistent with industry practices; and

"(ii) the ceiling and floor percentages referred to in paragraph (2).

President.

"(C) REGULATIONS.—Taking into account the recommendations of the expert panel under subparagraph (B), the President shall promulgate regulations that establish—

"(i) cost estimation procedures described in subparagraph (B)(i); and

"(ii) the ceiling and floor percentages referred to in paragraph (2).

Deadline.

"(D) REVIEW BY PRESIDENT.—Not later than 2 years after the date of promulgation of regulations under subparagraph (C) and periodically thereafter, the President shall review the cost estimation procedures and the ceiling and floor percentages established under this paragraph.

Deadline.

"(E) REPORT TO CONGRESS.—Not later than 1 year after the date of promulgation of regulations under subparagraph (C), 3 years after that date, and at the end of each 2-year period thereafter, the expert panel shall submit to Congress a report on the appropriateness of the cost estimation procedures.

"(4) SPECIAL RULE.—In any case in which the facility being repaired, restored, reconstructed, or replaced under this section was under construction on the date of the major disaster, the cost of repairing, restoring, reconstructing, or replacing the facility shall include, for the purposes of this section, only those costs that, under the contract for the construction, are the owner's responsibility and not the contractor's responsibility.".

42 USC 5172 note.

(2) EFFECTIVE DATE.—The amendment made by paragraph (1) takes effect on the date of the enactment of this Act and applies to funds appropriated after the date of the enactment of this Act, except that paragraph (1) of section 406(e) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (as amended by paragraph (1)) takes effect on the date on which the cost estimation procedures established under paragraph (3) of that section take effect.

(e) CONFORMING AMENDMENT.—Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5172) is amended by striking subsection (f).

SEC. 206. FEDERAL ASSISTANCE TO INDIVIDUALS AND HOUSEHOLDS.

(a) IN GENERAL.—Section 408 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5174) is amended to read as follows:

"SEC. 408. FEDERAL ASSISTANCE TO INDIVIDUALS AND HOUSEHOLDS.

"(a) IN GENERAL.—

"(1) PROVISION OF ASSISTANCE.—In accordance with this section, the President, in consultation with the Governor of a State, may provide financial assistance, and, if necessary, direct services, to individuals and households in the State who, as a direct result of a major disaster, have necessary expenses and serious needs in cases in which the individuals and households are unable to meet such expenses or needs through other means.

"(2) RELATIONSHIP TO OTHER ASSISTANCE.—Under paragraph (1), an individual or household shall not be denied assistance under paragraph (1), (3), or (4) of subsection (c) solely on the basis that the individual or household has not applied for or received any loan or other financial assistance from the Small Business Administration or any other Federal agency.

"(b) HOUSING ASSISTANCE.—

"(1) ELIGIBILITY.—The President may provide financial or other assistance under this section to individuals and households to respond to the disaster-related housing needs of individuals and households who are displaced from their predisaster primary residences or whose predisaster primary residences are rendered uninhabitable as a result of damage caused by a major disaster.

"(2) DETERMINATION OF APPROPRIATE TYPES OF ASSISTANCE.—

"(A) IN GENERAL.—The President shall determine appropriate types of housing assistance to be provided under this section to individuals and households described in subsection (a)(1) based on considerations of cost effectiveness, convenience to the individuals and households, and such other factors as the President may consider appropriate. President.

"(B) MULTIPLE TYPES OF ASSISTANCE.—One or more types of housing assistance may be made available under this section, based on the suitability and availability of the types of assistance, to meet the needs of individuals and households in the particular disaster situation.

"(c) TYPES OF HOUSING ASSISTANCE.—

"(1) TEMPORARY HOUSING.—

"(A) FINANCIAL ASSISTANCE.—

"(i) IN GENERAL.—The President may provide financial assistance to individuals or households to rent alternate housing accommodations, existing rental units, manufactured housing, recreational vehicles, or other readily fabricated dwellings.

"(ii) AMOUNT.—The amount of assistance under clause (i) shall be based on the fair market rent for the accommodation provided plus the cost of any transportation, utility hookups, or unit installation not provided directly by the President.

"(B) DIRECT ASSISTANCE.—

"(i) IN GENERAL.—The President may provide temporary housing units, acquired by purchase or lease, directly to individuals or households who, because of a lack of available housing resources, would be unable

to make use of the assistance provided under subparagraph (A).

"(ii) PERIOD OF ASSISTANCE.—The President may not provide direct assistance under clause (i) with respect to a major disaster after the end of the 18-month period beginning on the date of the declaration of the major disaster by the President, except that the President may extend that period if the President determines that due to extraordinary circumstances an extension would be in the public interest.

"(iii) COLLECTION OF RENTAL CHARGES.—After the end of the 18-month period referred to in clause (ii), the President may charge fair market rent for each temporary housing unit provided.

"(2) REPAIRS.—

"(A) IN GENERAL.—The President may provide financial assistance for—

"(i) the repair of owner-occupied private residences, utilities, and residential infrastructure (such as a private access route) damaged by a major disaster to a safe and sanitary living or functioning condition; and

"(ii) eligible hazard mitigation measures that reduce the likelihood of future damage to such residences, utilities, or infrastructure.

"(B) RELATIONSHIP TO OTHER ASSISTANCE.—A recipient of assistance provided under this paragraph shall not be required to show that the assistance can be met through other means, except insurance proceeds.

"(C) MAXIMUM AMOUNT OF ASSISTANCE.—The amount of assistance provided to a household under this paragraph shall not exceed $5,000, as adjusted annually to reflect changes in the Consumer Price Index for All Urban Consumers published by the Department of Labor.

"(3) REPLACEMENT.—

"(A) IN GENERAL.—The President may provide financial assistance for the replacement of owner-occupied private residences damaged by a major disaster.

"(B) MAXIMUM AMOUNT OF ASSISTANCE.—The amount of assistance provided to a household under this paragraph shall not exceed $10,000, as adjusted annually to reflect changes in the Consumer Price Index for All Urban Consumers published by the Department of Labor.

"(C) APPLICABILITY OF FLOOD INSURANCE REQUIREMENT.—With respect to assistance provided under this paragraph, the President may not waive any provision of Federal law requiring the purchase of flood insurance as a condition of the receipt of Federal disaster assistance.

"(4) PERMANENT HOUSING CONSTRUCTION.—The President may provide financial assistance or direct assistance to individuals or households to construct permanent housing in insular areas outside the continental United States and in other remote locations in cases in which—

"(A) no alternative housing resources are available; and

"(B) the types of temporary housing assistance described in paragraph (1) are unavailable, infeasible, or not cost-effective.

"(d) TERMS AND CONDITIONS RELATING TO HOUSING ASSISTANCE.—

"(1) SITES.—

"(A) IN GENERAL.—Any readily fabricated dwelling provided under this section shall, whenever practicable, be located on a site that—

"(i) is complete with utilities; and

"(ii) is provided by the State or local government, by the owner of the site, or by the occupant who was displaced by the major disaster.

"(B) SITES PROVIDED BY THE PRESIDENT.—A readily fabricated dwelling may be located on a site provided by the President if the President determines that such a site would be more economical or accessible.

"(2) DISPOSAL OF UNITS.—

"(A) SALE TO OCCUPANTS.—

"(i) IN GENERAL.—Notwithstanding any other provision of law, a temporary housing unit purchased under this section by the President for the purpose of housing disaster victims may be sold directly to the individual or household who is occupying the unit if the individual or household lacks permanent housing.

"(ii) SALE PRICE.—A sale of a temporary housing unit under clause (i) shall be at a price that is fair and equitable.

"(iii) DEPOSIT OF PROCEEDS.—Notwithstanding any other provision of law, the proceeds of a sale under clause (i) shall be deposited in the appropriate Disaster Relief Fund account.

"(iv) HAZARD AND FLOOD INSURANCE.—A sale of a temporary housing unit under clause (i) shall be made on the condition that the individual or household purchasing the housing unit agrees to obtain and maintain hazard and flood insurance on the housing unit.

"(v) USE OF GSA SERVICES.—The President may use the services of the General Services Administration to accomplish a sale under clause (i).

"(B) OTHER METHODS OF DISPOSAL.—If not disposed of under subparagraph (A), a temporary housing unit purchased under this section by the President for the purpose of housing disaster victims—

"(i) may be sold to any person; or

"(ii) may be sold, transferred, donated, or otherwise made available directly to a State or other governmental entity or to a voluntary organization for the sole purpose of providing temporary housing to disaster victims in major disasters and emergencies if, as a condition of the sale, transfer, or donation, the State, other governmental agency, or voluntary organization agrees—

"(I) to comply with the nondiscrimination provisions of section 308; and

"(II) to obtain and maintain hazard and flood insurance on the housing unit.

"(e) FINANCIAL ASSISTANCE TO ADDRESS OTHER NEEDS.—

"(1) MEDICAL, DENTAL, AND FUNERAL EXPENSES.—The President, in consultation with the Governor of a State, may provide financial assistance under this section to an individual or household in the State who is adversely affected by a major disaster to meet disaster-related medical, dental, and funeral expenses.

"(2) PERSONAL PROPERTY, TRANSPORTATION, AND OTHER EXPENSES.—The President, in consultation with the Governor of a State, may provide financial assistance under this section to an individual or household described in paragraph (1) to address personal property, transportation, and other necessary expenses or serious needs resulting from the major disaster.

"(f) STATE ROLE.—

"(1) FINANCIAL ASSISTANCE TO ADDRESS OTHER NEEDS.—

"(A) GRANT TO STATE.—Subject to subsection (g), a Governor may request a grant from the President to provide financial assistance to individuals and households in the State under subsection (e).

"(B) ADMINISTRATIVE COSTS.—A State that receives a grant under subparagraph (A) may expend not more than 5 percent of the amount of the grant for the administrative costs of providing financial assistance to individuals and households in the State under subsection (e).

"(2) ACCESS TO RECORDS.—In providing assistance to individuals and households under this section, the President shall provide for the substantial and ongoing involvement of the States in which the individuals and households are located, including by providing to the States access to the electronic records of individuals and households receiving assistance under this section in order for the States to make available any additional State and local assistance to the individuals and households.

"(g) COST SHARING.—

"(1) FEDERAL SHARE.—Except as provided in paragraph (2), the Federal share of the costs eligible to be paid using assistance provided under this section shall be 100 percent.

"(2) FINANCIAL ASSISTANCE TO ADDRESS OTHER NEEDS.—In the case of financial assistance provided under subsection (e)—

"(A) the Federal share shall be 75 percent; and

"(B) the non-Federal share shall be paid from funds made available by the State.

"(h) MAXIMUM AMOUNT OF ASSISTANCE.—

"(1) IN GENERAL.—No individual or household shall receive financial assistance greater than $25,000 under this section with respect to a single major disaster.

"(2) ADJUSTMENT OF LIMIT.—The limit established under paragraph (1) shall be adjusted annually to reflect changes in the Consumer Price Index for All Urban Consumers published by the Department of Labor.

President.

"(i) RULES AND REGULATIONS.—The President shall prescribe rules and regulations to carry out this section, including criteria, standards, and procedures for determining eligibility for assistance.".

(b) CONFORMING AMENDMENT.—Section 502(a)(6) of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5192(a)(6)) is amended by striking "temporary housing".

(c) ELIMINATION OF INDIVIDUAL AND FAMILY GRANT PROGRAMS.—Section 411 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5178) is repealed.

(d) EFFECTIVE DATE.—The amendments made by this section take effect 18 months after the date of the enactment of this Act. 42 USC 5174 note.

SEC. 207. COMMUNITY DISASTER LOANS.

Section 417 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5184) is amended—

(1) by striking "(a) The President" and inserting the following:
"(a) IN GENERAL.—The President";

(2) by striking "The amount" and inserting the following:
"(b) AMOUNT.—The amount";

(3) by striking "Repayment" and inserting the following:
"(c) REPAYMENT.—
"(1) CANCELLATION.—Repayment";

(4) by striking "(b) Any loans" and inserting the following:
"(d) EFFECT ON OTHER ASSISTANCE.—Any loans";

(5) in subsection (b) (as designated by paragraph (2))—
(A) by striking "and shall" and inserting "shall"; and
(B) by inserting before the period at the end the following: ", and shall not exceed $5,000,000"; and

(6) in subsection (c) (as designated by paragraph (3)), by adding at the end the following:
"(2) CONDITION ON CONTINUING ELIGIBILITY.—A local government shall not be eligible for further assistance under this section during any period in which the local government is in arrears with respect to a required repayment of a loan under this section.".

SEC. 208. REPORT ON STATE MANAGEMENT OF SMALL DISASTERS INITIATIVE. 42 USC 5121 note.

Not later than 3 years after the date of the enactment of this Act, the President shall submit to Congress a report describing the results of the State Management of Small Disasters Initiative, including— Deadline.

(1) identification of any administrative or financial benefits of the initiative; and

(2) recommendations concerning the conditions, if any, under which States should be allowed the option to administer parts of the assistance program under section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5172).

SEC. 209. STUDY REGARDING COST REDUCTION. 42 USC 5121 note.

Not later than 3 years after the date of the enactment of this Act, the Director of the Congressional Budget Office shall complete a study estimating the reduction in Federal disaster assistance that has resulted and is likely to result from the enactment of this Act. Deadline.

TITLE III—MISCELLANEOUS

SEC. 301. TECHNICAL CORRECTION OF SHORT TITLE.

The first section of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 note) is amended to read as follows:

"SECTION 1. SHORT TITLE.

"This Act may be cited as the 'Robert T. Stafford Disaster Relief and Emergency Assistance Act'.".

SEC. 302. DEFINITIONS.

Section 102 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5122) is amended—

(1) in each of paragraphs (3) and (4), by striking "the Northern" and all that follows through "Pacific Islands" and inserting "and the Commonwealth of the Northern Mariana Islands";

(2) by striking paragraph (6) and inserting the following:

"(6) LOCAL GOVERNMENT.—The term 'local government' means—

"(A) a county, municipality, city, town, township, local public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government;

"(B) an Indian tribe or authorized tribal organization, or Alaska Native village or organization; and

"(C) a rural community, unincorporated town or village, or other public entity, for which an application for assistance is made by a State or political subdivision of a State."; and

(3) in paragraph (9), by inserting "irrigation," after "utility,".

SEC. 303. FIRE MANAGEMENT ASSISTANCE.

(a) IN GENERAL.—Section 420 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5187) is amended to read as follows:

"SEC. 420. FIRE MANAGEMENT ASSISTANCE.

"(a) IN GENERAL.—The President is authorized to provide assistance, including grants, equipment, supplies, and personnel, to any State or local government for the mitigation, management, and control of any fire on public or private forest land or grassland that threatens such destruction as would constitute a major disaster.

President.

"(b) COORDINATION WITH STATE AND TRIBAL DEPARTMENTS OF FORESTRY.—In providing assistance under this section, the President shall coordinate with State and tribal departments of forestry.

"(c) ESSENTIAL ASSISTANCE.—In providing assistance under this section, the President may use the authority provided under section 403.

"(d) RULES AND REGULATIONS.—The President shall prescribe such rules and regulations as are necessary to carry out this section.". President.

(b) EFFECTIVE DATE.—The amendment made by subsection (a) takes effect 1 year after the date of the enactment of this Act. 42 USC 5187 note.

SEC. 304. DISASTER GRANT CLOSEOUT PROCEDURES. 42 USC 5205.

Title VII of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5101 et seq.) is amended by adding at the end the following:

"SEC. 705. DISASTER GRANT CLOSEOUT PROCEDURES.

"(a) STATUTE OF LIMITATIONS.—

"(1) IN GENERAL.—Except as provided in paragraph (2), no administrative action to recover any payment made to a State or local government for disaster or emergency assistance under this Act shall be initiated in any forum after the date that is 3 years after the date of transmission of the final expenditure report for the disaster or emergency.

"(2) FRAUD EXCEPTION.—The limitation under paragraph (1) shall apply unless there is evidence of civil or criminal fraud.

"(b) REBUTTAL OF PRESUMPTION OF RECORD MAINTENANCE.—

"(1) IN GENERAL.—In any dispute arising under this section after the date that is 3 years after the date of transmission of the final expenditure report for the disaster or emergency, there shall be a presumption that accounting records were maintained that adequately identify the source and application of funds provided for financially assisted activities.

"(2) AFFIRMATIVE EVIDENCE.—The presumption described in paragraph (1) may be rebutted only on production of affirmative evidence that the State or local government did not maintain documentation described in that paragraph.

"(3) INABILITY TO PRODUCE DOCUMENTATION.—The inability of the Federal, State, or local government to produce source documentation supporting expenditure reports later than 3 years after the date of transmission of the final expenditure report shall not constitute evidence to rebut the presumption described in paragraph (1).

"(4) RIGHT OF ACCESS.—The period during which the Federal, State, or local government has the right to access source documentation shall not be limited to the required 3-year retention period referred to in paragraph (3), but shall last as long as the records are maintained.

"(c) BINDING NATURE OF GRANT REQUIREMENTS.—A State or local government shall not be liable for reimbursement or any other penalty for any payment made under this Act if—

"(1) the payment was authorized by an approved agreement specifying the costs;

"(2) the costs were reasonable; and

"(3) the purpose of the grant was accomplished.".

SEC. 305. PUBLIC SAFETY OFFICER BENEFITS FOR CERTAIN FEDERAL AND STATE EMPLOYEES.

(a) IN GENERAL.—Section 1204 of the Omnibus Crime Control and Safe Streets Act of 1968 (42 U.S.C. 3796b) is amended by striking paragraph (7) and inserting the following:

"(7) 'public safety officer' means—

"(A) an individual serving a public agency in an official capacity, with or without compensation, as a law enforcement officer, as a firefighter, or as a member of a rescue squad or ambulance crew;

"(B) an employee of the Federal Emergency Management Agency who is performing official duties of the Agency in an area, if those official duties—

"(i) are related to a major disaster or emergency that has been, or is later, declared to exist with respect to the area under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.); and

"(ii) are determined by the Director of the Federal Emergency Management Agency to be hazardous duties; or

"(C) an employee of a State, local, or tribal emergency management or civil defense agency who is performing official duties in cooperation with the Federal Emergency Management Agency in an area, if those official duties—

"(i) are related to a major disaster or emergency that has been, or is later, declared to exist with respect to the area under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.); and

"(ii) are determined by the head of the agency to be hazardous duties.".

42 USC 3796b note.

(b) EFFECTIVE DATE.—The amendment made by subsection (a) applies only to employees described in subparagraphs (B) and (C) of section 1204(7) of the Omnibus Crime Control and Safe Streets Act of 1968 (as amended by subsection (a)) who are injured or who die in the line of duty on or after the date of the enactment of this Act.

42 USC 5206.

SEC. 306. BUY AMERICAN.

(a) COMPLIANCE WITH BUY AMERICAN ACT.—No funds authorized to be appropriated under this Act or any amendment made by this Act may be expended by an entity unless the entity, in expending the funds, complies with the Buy American Act (41 U.S.C. 10a et seq.).

(b) DEBARMENT OF PERSONS CONVICTED OF FRAUDULENT USE OF "MADE IN AMERICA" LABELS.—

Deadline.

(1) IN GENERAL.—If the Director of the Federal Emergency Management Agency determines that a person has been convicted of intentionally affixing a label bearing a "Made in America" inscription to any product sold in or shipped to the United States that is not made in America, the Director shall determine, not later than 90 days after determining that the person has been so convicted, whether the person should be debarred from contracting under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 et seq.).

(2) DEFINITION OF DEBAR.—In this subsection, the term "debar" has the meaning given the term in section 2393(c) of title 10, United States Code.

SEC. 307. TREATMENT OF CERTAIN REAL PROPERTY.

(a) IN GENERAL.—Notwithstanding the National Flood Insurance Act of 1968 (42 U.S.C. 4001 et seq.), the Flood Disaster

Protection Act of 1973 (42 U.S.C. 4002 et seq.), or any other provision of law, or any flood risk zone identified, delineated, or established under any such law (by flood insurance rate map or otherwise), the real property described in subsection (b) shall not be considered to be, or to have been, located in any area having special flood hazards (including any floodway or floodplain).

(b) REAL PROPERTY.—The real property described in this subsection is all land and improvements on the land located in the Maple Terrace Subdivisions in the City of Sycamore, DeKalb County, Illinois, including—

(1) Maple Terrace Phase I;
(2) Maple Terrace Phase II;
(3) Maple Terrace Phase III Unit 1;
(4) Maple Terrace Phase III Unit 2;
(5) Maple Terrace Phase III Unit 3;
(6) Maple Terrace Phase IV Unit 1;
(7) Maple Terrace Phase IV Unit 2; and
(8) Maple Terrace Phase IV Unit 3.

(c) REVISION OF FLOOD INSURANCE RATE LOT MAPS.—As soon as practicable after the date of the enactment of this Act, the Director of the Federal Emergency Management Agency shall revise the appropriate flood insurance rate lot maps of the agency to reflect the treatment under subsection (a) of the real property described in subsection (b).

SEC. 308. STUDY OF PARTICIPATION BY INDIAN TRIBES IN EMERGENCY MANAGEMENT. 42 USC 5121 note.

(a) DEFINITION OF INDIAN TRIBE.—In this section, the term "Indian tribe" has the meaning given the term in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b).

(b) STUDY.—

(1) IN GENERAL.—The Director of the Federal Emergency Management Agency shall conduct a study of participation by Indian tribes in emergency management.

(2) REQUIRED ELEMENTS.—The study shall—

(A) survey participation by Indian tribes in training, predisaster and postdisaster mitigation, disaster preparedness, and disaster recovery programs at the Federal and State levels; and

(B) review and assess the capacity of Indian tribes to participate in cost-shared emergency management programs and to participate in the management of the programs.

(3) CONSULTATION.—In conducting the study, the Director shall consult with Indian tribes.

(c) REPORT.—Not later than 1 year after the date of the enactment of this Act, the Director shall submit a report on the study under subsection (b) to— Deadline.

(1) the Committee on Environment and Public Works of the Senate;

(2) the Committee on Transportation and Infrastructure of the House of Representatives;

(3) the Committee on Appropriations of the Senate; and

(4) the Committee on Appropriations of the House of Representatives.

Approved October 30, 2000.

LEGISLATIVE HISTORY—H.R. 707 (S. 1691):

HOUSE REPORTS: No. 106–40 (Comm. on Transportation and Infrastructure).
SENATE REPORTS: No. 106–295 accompanying S. 1691 (Comm. on Environment and Public Works).
CONGRESSIONAL RECORD:
Vol. 145 (1999): Mar. 4, considered and passed House.
Vol. 146 (2000): July 19, considered and passed Senate, amended.
Oct. 3, House concurred in Senate amendment with an amendment.
Oct. 5, Senate concurred in House amendment with an amendment.
Oct. 10, House concurred in Senate amendment.

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Appendix J:
Interim Final Rule

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Appendix J.1:
Interim Final Rule – February 26, 2002

The following 13 pages are the Federal Register, dated February 26, 2002.

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Federal Register

Tuesday,
February 26, 2002

Part III

Federal Emergency Management Agency

44 CFR Parts 201 and 206

Hazard Mitigation Planning and Hazard Mitigation Grant Program; Interim Final Rule

8844 **Federal Register** / Vol. 67, No. 38 / Tuesday, February 26, 2002 / Rules and Regulations

FEDERAL EMERGENCY MANAGEMENT AGENCY

44 CFR Parts 201 and 206

RIN 3067–AD22

Hazard Mitigation Planning and Hazard Mitigation Grant Program

AGENCY: Federal Emergency Management Agency.

ACTION: Interim final rule.

SUMMARY: This rule addresses State mitigation planning, identifies new local mitigation planning requirements, authorizes Hazard Mitigation Grant Program (HMGP) funds for planning activities, and increases the amount of HMGP funds available to States that develop a comprehensive, enhanced mitigation plan. This rule also requires that repairs or construction funded by a disaster loan or grant must be carried out in accordance with applicable standards and says that FEMA may require safe land use and construction practices as a condition of grantees receiving disaster assistance under the Stafford Act.

DATES: *Effective Date:* February 26, 2002.

Comment Date: We will accept written comments through April 29, 2002.

ADDRESSES: Please send written comments to the Rules Docket Clerk, Office of the General Counsel, Federal Emergency Management Agency, 500 C Street, SW., room 840, Washington, DC 20472, (facsimile) 202–646–4536, or (email) *rules@fema.gov.*

FOR FURTHER INFORMATION CONTACT: Margaret E. Lawless, Federal Insurance and Mitigation Administration, Federal Emergency Management Agency, 500 C Street, SW., Washington, DC, 20472, 202–646–3027, (facsimile) 202–646–3104, or (email) *margaret.lawless@fema.gov.*

SUPPLEMENTARY INFORMATION:

Introduction

Throughout the preamble and the rule the terms "we", "our" and "us" refer to FEMA.

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under § 104 the Disaster Mitigation Act of 2000, (DMA 2000) P.L. 106–390, provides new and revitalized approaches to mitigation planning. This section: (1) Continues the requirement for a Standard State Mitigation plan as a condition of disaster assistance; (2) provides for States to receive an increased percentage of HMGP funds (from 15 to 20 percent of the total estimated eligible Federal assistance) if, at the time of the declaration of a major disaster, they have in effect a FEMA-approved Enhanced State Mitigation Plan that meets the factors listed in this rule; (3) establishes a new requirement for local mitigation plans; and (4) authorizes up to 7 percent of the HMGP funds available to a State to be used for development of State, tribal, and local mitigation plans. We will give Indian tribal governments the opportunity to fulfill the requirements of § 322 either as a grantee or a subgrantee. An Indian tribal government may choose to apply for HMGP funding directly to us and would then serve as a grantee, meeting the State level responsibilities, or it may apply through the State, meeting the local government or subgrantee responsibilities.

Section 322, in concert with other sections of the Act, provides a significant opportunity to reduce the Nation's disaster losses through mitigation planning. In addition, implementation of planned, pre-identified, cost-effective mitigation measures will streamline the disaster recovery process. The Act provides a framework for linking pre- and post-disaster mitigation planning and initiatives with public and private interests to ensure an integrated, comprehensive approach to disaster loss reduction. The language in the Act, taken as a whole, emphasizes the importance of strong State and local planning processes and comprehensive program management at the State level. The new planning criteria also support State administration of the HMGP, and contemplate a significant State commitment to mitigation activities, comprehensive State mitigation planning, and strong program management.

The planning process also provides a link between State and local mitigation programs. Both State level and local plans should address strategies for incorporating post-disaster early mitigation implementation strategies and sustainable recovery actions. We also recognize that governments are involved in a range of planning activities and that mitigation plans may be linked to or reference hazardous materials and other non-natural hazard plans. Improved mitigation planning will result in a better understanding of risks and vulnerabilities, as well as to expedite implementation of measures and activities to reduce those risks, both pre- and post-disaster.

Section 409 of the Stafford Act, 42 U.S.C. 5176, which required mitigation plans and the use of minimum codes and standards, was repealed by the DMA 2000. These issues are now addressed in two separate sections of the law: mitigation planning is in section 322 of the Act, and minimum codes and standards are in section 323 of the Act. We previously implemented section 409 through 44 CFR Part 206, Subpart M. Since current law now distinguishes the planning from the codes and standards in separate sections, we will address them in different sections of the CFR. We address the new planning regulations in Part 201 to reflect the broader relevance of planning to all FEMA mitigation programs, while the minimum standards remain in Part 206, Federal Disaster Assistance, Subpart M. The regulations implementing the Hazard Mitigation Grant Program are in Part 206, Subpart N. This rule also contains changes to Subpart N, to reflect the new planning criteria identified in section 322 of the Act.

The administration is considering changes to FEMA's mitigation programs in the President's Budget for FY 2003. However, States and localities still would be required to have plans in effect, which meet the minimum requirements under this rule, as a condition of receiving mitigation assistance after November 1, 2003.

Implementation Strategy. States must have an approved hazard mitigation plan in order to receive Stafford Act assistance, excluding assistance provided pursuant to emergency provisions. These regulations provide criteria for the new two-tiered State mitigation plan process: Standard State Mitigation Plans, which allow a State to receive HMGP funding based on 15 percent of the total estimated eligible Stafford Act disaster assistance, and Enhanced State Mitigation Plans, which allow a State to receive HMGP funds based on 20 percent of the total estimated eligible Stafford Act disaster assistance. Enhanced State Mitigation Plans must demonstrate that the State has developed a comprehensive mitigation program, that it effectively uses available mitigation funding, and that it is capable of managing the increased funding. All State Mitigations Plans must be reviewed, revised, and re-approved by FEMA every three years. An important requirement of the legislation is that we must approve a completed enhanced plan *before* a disaster declaration, in order for the State to be eligible for the increased funding.

We will no longer require States to revise their mitigation plan after every disaster declaration, as under former

section 409 of the Act, 42 U.S.C. 5176. We recommend, however, that States consider revising their plan if a disaster or other circumstances significantly affect its mitigation priorities. States with existing mitigation plans, approved under former section 409, will continue to be eligible for the 15 percent HMGP funding until November 1, 2003, when all State mitigation plans must meet the requirements of these regulations. If State plans are not revised and approved to meet the Standard State Mitigation Plan requirements by that time, they will be ineligible for Stafford Act assistance, excluding emergency assistance.

Indian tribal governments may choose to apply directly to us for HMGP funding, and would therefore be responsible for having an approved State level mitigation plan, and would act as the grantee. If an Indian tribal government chooses to apply for HMGP grants through the State, they would be responsible for having an approved local level mitigation plan, and would serve as a subgrantee accountable to the State as grantee.

This rule also establishes local planning criteria so that these jurisdictions can actively begin the hazard mitigation planning process. This requirement is to encourage the development of comprehensive mitigation plans before disaster events. Section 322 requires local governments to have an approved local mitigation plan to be eligible to receive an HMGP project grant; however, this requirement will not fully take effect until November 1, 2003. FEMA Regional Directors may grant an exception to this requirement in extenuating circumstances. Until November 1, 2003, local governments will be able to receive HMGP project grant funds and may prepare a mitigation plan concurrently with implementation of their project grant. We anticipate that the Predisaster Mitigation program authorized by section 203 of the Act, 42 U.S.C. 5133, will also support this local mitigation planning by making funds available for the development of comprehensive local mitigation plans. Managing States that we approve under new criteria established under section 404 of the Act, 42 U.S.C. 5170c(c), as amended by section 204 of DMA 2000 will have approval authority for local mitigation plans. This provision does not apply to States that we approved under the Managing State program in effect before enactment of DMA 2000.

Our goal is for State and local governments to develop comprehensive and integrated plans that are coordinated through appropriate State, local, and regional agencies, as well as non-governmental interest groups. To the extent feasible and practicable, we would also like to consolidate the planning requirements for different FEMA mitigation programs. This will ensure that one local plan will meet the minimum requirements for all of the different FEMA mitigation programs, such as the Flood Mitigation Assistance Program (authorized by sections 553 and 554 of the National Flood Insurance Reform Act of 1994, 42 U.S.C. 4104c and 42 U.S.C. 4104d), the Community Rating System (authorized by section 541 of the National Flood Insurance Reform Act of 1994, 42 U.S.C. 4022), the Pre-Disaster Mitigation Program (authorized by section 203 of the Stafford Act), the Hazard Mitigation Grant Program (authorized by section 404 of the Stafford Act), and the mitigation activities that are based upon the provisions of section 323 and subsections 406(b) and (e) of the Stafford Act. The mitigation plans may also serve to integrate documents and plans produced under other emergency management programs. State level plans should identify overall goals and priorities, incorporating the more specific local risk assessments, when available, and including projects identified through the local planning process.

Under section 322(d), up to 7 percent of the available HMGP funds may now be used for planning, and we encourage States to use these funds for local plan development. In a memorandum to FEMA Regional Directors dated December 21, 2000, we announced that this provision of section 322 was effective for disasters declared on or after October 30, 2000, the date on which the Disaster Mitigation Act of 2000 became law. Regional Directors are encouraging States to make these funds immediately available to local and Indian tribal governments, although the funds can be used for plan development and review at the State level as well.

As discussed earlier in this Supplementary Information, subsection 323(a) of the Stafford Act, 42 U.S.C. 5166(a), requires as a precondition to receiving disaster assistance under the Act that State and local governments, as well as eligible private nonprofit entities, must agree to carry out repair and reconstruction activities "in accordance with applicable standards of safety, decency, and sanitation and in conformity with applicable codes, specifications, and standards." In addition, that subsection authorizes the President (FEMA, by virtue of Executive Order 12148, as amended) to "require safe land use and construction practices, after adequate consultation with appropriate State and local officials" in the course of the use of Federal disaster assistance by eligible applicants to repair and restore disaster-damaged facilities.

At the same time that we implement the planning mandates of section 322 of the Stafford Act, we are also implementing the Minimum Standards for Public and Private Structures provision of section 323 of the Act. This rule appears at Subpart M of Part 206 of Title 44 of the Code of Federal Regulations. As mentioned earlier, the section 322 planning regulations are in Part 201, while Part 206, Subpart M includes only the minimum codes and standards regulations mandated in § 323. The rule to implement § 323 of the Act reinforces the link between pre-disaster planning, building and construction standards, and post-disaster reconstruction efforts.

We encourage comments on this interim final rule, and we will make every effort to involve all interested parties prior to the development of the Final Rule.

Justification for Interim Final Rule

In general, FEMA publishes a rule for public comment before issuing a final rule, under the Administrative Procedure Act, 5 U.S.C. 533 and 44 CFR 1.12. The Administrative Procedure Act, however, provides an exception from that general rule where the agency for good cause finds the procedures for comment and response contrary to public interest. Section 322 of the Stafford Act allows States to receive increased post-disaster grant funding for projects designed to reduce future disaster losses. States will only be eligible for these increased funds if they have a FEMA-approved Enhanced State Mitigation Plan.

This interim final rule provides the criteria for development and approval of these plans, as well as criteria for local mitigation plans required by this legislation. In order for State and local governments to be positioned to receive these mitigation funds as soon as possible, these regulations must be in effect. The public benefit of this rule will be to assist States and communities assess their risks and identify activities to strengthen the larger community and the built environment in order to become less susceptible to disasters. Planning serves as the vital foundation to saving lives and protecting properties, having integrated plans in place can serve to both streamline recovery efforts and lessen potential future damages. Therefore, we believe it is contrary to the public interest to delay

the benefits of this rule. In accordance with the Administrative Procedure Act, 5 U.S.C. 553(d)(3), we find that there is good cause for the interim final rule to take effect immediately upon publication in the **Federal Register** in order to meet the needs of States and communities by identifying criteria for mitigation plans in order to reduce risks nationwide, establish criteria for minimum codes and standards in post-disaster reconstruction, and to allow States to adjust their mitigation plans to receive the increase in mitigation funding.

In addition, we believe that, under the circumstances, delaying the effective date of this rule until after the comment period would not further the public interest. Prior to this rulemaking, FEMA hosted a meeting where interested parties provided comments and suggestions on how we could implement these planning requirements. Participants in this meeting included representatives from the National Emergency Management Association, the Association of State Floodplain Managers, the National Governors' Association, the International Association of Emergency Managers, the National Association of Development Organizations, the American Public Works Association, the National League of Cities, the National Association of Counties, the National Conference of State Legislatures, the International City/County Management Association, and the Bureau of Indian Affairs. We took comments and suggestions provided at this meeting into account in developing this interim final rule. Therefore, we find that prior notice and comment on this rule would not further the public interest. We actively encourage and solicit comments on this interim final rule from interested parties, and we will consider them in preparing the final rule. For these reasons, we believe we have good cause to publish an interim final rule.

National Environmental Policy Act

44 CFR 10.8(d)(2)(ii) excludes this rule from the preparation of an environmental assessment or environmental impact statement, where the rule relates to actions that qualify for categorical exclusion under 44 CFR 10.8(d)(2)(iii), such as the development of plans under this section.

Executive Order 12866, Regulatory Planning and Review

We have prepared and reviewed this rule under the provisions of E.O. 12866, Regulatory Planning and Review. Under Executive Order 12866, 58 FR 51735, October 4, 1993, a significant regulatory action is subject to OMB review and the requirements of the Executive Order. The Executive Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The purpose of this rule is to implement section 322 of the Stafford Act which addresses mitigation planning at the State, tribal, and local levels, identifies new local planning requirements, allows Hazard Mitigation Grant Program (HMGP) funds for planning activities, and increases the amount of HMGP funds available to States that develop a comprehensive, enhanced mitigation plan. The rule identifies local mitigation planning requirements before approval of project grants, and requires our approval of an Enhanced State Mitigation plan as a condition for increased mitigation funding. The rule also implements section 323 of the Stafford Act, which requires that repairs or construction funded by disaster loans or grants must comply with applicable standards and safe land use and construction practices. As such the rule itself will not have an effect on the economy of more than $100,000,000.

Therefore, this rule is a significant regulatory action and is not an economically significant rule under Executive Order 12866. The Office of Management and Budget (OMB) has reviewed this rule under Executive Order 12866.

Executive Order 12898, Environmental Justice

Under Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, February 16, 1994, we incorporate environmental justice into our policies and programs. The Executive Order requires each Federal agency to conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that those programs, policies, and activities do not have the effect of excluding persons from participation in our programs, denying persons the benefits of our programs, or subjecting persons to discrimination because of their race, color, or national origin.

No action that we can anticipate under the final rule will have a disproportionately high or adverse human health and environmental effect on any segment of the population. Section 322 focuses specifically on mitigation planning to: Identify the natural hazards, risks, and vulnerabilities of areas in States, localities, and tribal areas; support development of local mitigation plans; provide for technical assistance to local and tribal governments for mitigation planning; and identify and prioritize mitigation actions that the State will support, as resources become available. Section 323 requires compliance with applicable codes and standards in repair and construction, and use of safe land use and construction standards. Accordingly, the requirements of Executive Order 12898 do not apply to this interim final rule.

Paperwork Reduction Act of 1995

As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) and concurrent with the publication of this interim final rule, we have submitted a request for review and approval of a new collection of information, which is contained in this interim final rule. Under the Paperwork Reduction Act of 1995, a person may not be penalized for failing to comply with an information collection that does not display a currently valid Office of Management and Budget (OMB) control number. The request was submitted to OMB for approval under the emergency processing procedures in OMB regulation 5 CFR 1320.1. OMB has approved this collection of information for use through August 31, 2002, under OMB Number 3067–0297.

We expect to follow this emergency request with a request for OMB approval to continue the use of the collection of information for a term of three years. The request will be processed under OMB's normal clearance procedures in accordance with provisions of OMB regulation 5 CFR 1320.10. To help us with the timely processing of the emergency and normal clearance submissions to OMB, we invite the general public to comment on the collection of information. This notice and request for comments complies with the provisions of the Paperwork

Reduction Act of 1995 (44 U.S.C. 3506(c)(2)(A)).

Collection of Information

Title: State/Local/Tribal Hazard Mitigation Plans under Section 322 of the Disaster Mitigation Act of 2000.

Abstract: Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistant Act, as amended by Section 104 of the Disaster Mitigation Act of 2000, provides new and revitalized approaches to mitigation planning. To obtain Federal assistance, new planning provisions require that each state, local, and tribal government prepare a hazard mitigation plan to include sections that describe the planning process, an assessment of the risks, a mitigation strategy, and identification of the plan maintenance and updating process. The Act provides a framework for linking pre- and post-disaster mitigation planning and initiatives with public and private interests to ensure an integrated, comprehensive approach to disaster loss reduction. Under Section 322 there is a two-tiered State mitigation plan process. State mitigation plans must be reviewed, revised, and submitted to us every 3 years.

(1) A *Standard State Mitigation Plan* must be approved by us in order for States to be eligible to receive Hazard Mitigation Grant Program (HGMP) funding based on 15 percent of the total estimated eligible Federal disaster assistance. This plan demonstrates the State's goals, priorities, and commitment to reduce risks from natural hazards and serves as a guide for State and local decision makers as they commit resources to reducing the effects of natural hazards.

(2) An *Enhanced State Mitigation Plan* must be approved by us for a State to be eligible to receive HMGP funds based on 20 percent of the total estimated eligible Federal disaster assistance. This plan must be approved by us within the 3 years prior to the current major disaster declaration. It must demonstrate that a State has developed a comprehensive mitigation program, is effectively using available mitigation funding, and is capable of managing the increased funding.

To be eligible to receive HMGP project grants, *local governments* must develop Local Mitigation Plans that include a risk assessment and mitigation strategy to reduce potential losses and target resources. Plans must be reviewed, revised, and submitted to us for approval every 5 years.

To receive HMGP project grants, *tribal governments* may apply as a grantee or subgrantee, and will be required to meet the planning requirements of a State or local government.

Estimated Total Annual Burden:

Type of collection/forms	No. of respondents	Hours per response	Annual burden hours
Update state or tribal mitigation plans (standard state mitigation plans)	18	320	5,760
State review of local plans	500 local plans	8	4,000
States develop Enhanced State Mitigation Plans	7	100	700
Local or tribal governments develop mitigation plans	500 local plans	300	150,000
Total burden			160,460

Comments: We are soliciting written comments to: (a) Evaluate whether the proposed data collection is necessary for the proper performance of the agency, including whether the information shall have practical utility; (b) evaluate the accuracy of the agency's estimate of the burden of the proposed collection of information; (c) obtain recommendations to enhance the quality, utility, and clarity of the information to be collected; and (d) evaluate the extent to which automated, electronic, mechanical, or other technological collection techniques may further reduce the respondents' burden. FEMA will accept comments through April 29, 2002.

Addressee: Interested persons should submit written comments to Muriel B. Anderson, Chief, Records Management Section, Program Services and Systems Branch, Facilities Management and Services Division, Administration and Resource Planning Directorate, Federal Emergency Management Agency, 500 C Street, Street, SW., Washington, DC 20472.

FOR FURTHER INFORMATION CONTACT: You may obtain copies of the OMB paperwork clearance package by contacting Ms. Anderson at (202) 646–2625 (voice), (202) 646–3347 (facsimile), or by e-mail at *muriel.anderson@fema.gov.*

Executive Order 13132, Federalism

Executive Order 13132, Federalism, dated August 4, 1999, sets forth principles and criteria that agencies must adhere to in formulating and implementing policies that have federalism implications, that is, regulations that have substantial direct effects on the States, or on the distribution of power and responsibilities among the various levels of government. Federal agencies must closely examine the statutory authority supporting any action that would limit the policymaking discretion of the States, and to the extent practicable, must consult with State and local officials before implementing any such action.

We have reviewed this rule under E.O.13132 and have concluded that the rule does not have federalism implications as defined by the Executive Order. We have determined that the rule does not significantly affect the rights, roles, and responsibilities of States, and involves no preemption of State law nor does it limit State policymaking discretion.

However, we have consulted with State and local officials. In order to assist us in the development of this rule, we hosted a meeting to allow interested parties an opportunity to provide their perspectives on the legislation and options for implementation of § 322. Stakeholders who attended the meeting included representatives from the National Emergency Management Association, the Association of State Floodplain Managers, the National Governors' Association, the International Association of Emergency Managers, the National Association of Development Organizations, the American Public Works Association, the National League of Cities, the National Association of Counties, the National Conference of State Legislatures, the International City/County Management Association, and the Bureau of Indian Affairs. We received valuable input from all parties at the meeting, which we took into account in the development of this rule. Additionally, we actively encourage and solicit comments on this interim final rule from interested parties, and we will

consider them in preparing the final rule.

Executive Order 13175, Consultation and Coordination With Indian Tribal Governments

We have reviewed this interim final rule under Executive Order 13175, which became effective on February 6, 2001. Under the Hazard Mitigation Grant Program (HMGP), Indian tribal governments will have the option to apply for grants directly to us and to serve as "grantee", carrying out "State" roles. If they choose this option, tribal governments may submit either a State-level Standard Mitigation Plan for the 15 percent HMGP funding or a State-level Enhanced Mitigation Plan for 20 percent HMGP funding. In either case, Indian tribal governments would be able to spend up to 7 percent of those funds on planning. Before developing this rule, we met with representatives from State and local governments and the Bureau of Indian Affairs, to discuss the new planning opportunities and requirements of § 322 of the Stafford Act. We received valuable input from all parties, which helped us to develop this interim final rule.

In reviewing the interim final rule, we find that it does not have "tribal implications" as defined in Executive Order 13175 because it will not have a substantial direct effect on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes. Moreover, the interim final rule does not impose substantial direct compliance costs on tribal governments, nor does it preempt tribal law, impair treaty rights or limit the self-governing powers of tribal governments.

Congressional Review of Agency Rulemaking

We have sent this interim final rule to the Congress and to the General Accounting Office under the Congressional Review of Agency Rulemaking Act, Public Law 104–121. The rule is a not "major rule" within the meaning of that Act. It is an administrative action in support of normal day-to-day mitigation planning activities required by section 322 and compliance under section 323 of the Stafford Act, as enacted in DMA 2000.

The rule will not result in a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. It will not have "significant adverse effects" on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises. This final rule is subject to the information collection requirements of the Paperwork Reduction Act, and OMB has assigned Control No. 3067–0297. The rule is not an unfunded Federal mandate within the meaning of the Unfunded Mandates Reform Act of 1995, Public Law 104–4, and any enforceable duties that we impose are a condition of Federal assistance or a duty arising from participation in a voluntary Federal program.

List of Subjects in 44 CFR Part 201 and Part 206

Administrative practice and procedure, Disaster assistance, Grant programs, Mitigation planning, Reporting and recordkeeping requirements.

Accordingly, Amend 44 CFR, Subchapter D—Disaster Assistance, as follows:

1. Add Part 201 to read as follows:

PART 201—MITIGATION PLANNING

Sec.
201.1 Purpose.
201.2 Definitions.
201.3 Responsibilities.
201.4 Standard State Mitigation Plans.
201.5 Enhanced State Mitigation Plans.
201.6 Local Mitigation Plans.

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121–5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; and E.O. 12673, 54 FR 12571, 3 CFR, 1989 Comp., p. 214.

§ 201.1 Purpose.

(a) The purpose of this part is to provide information on the polices and procedures for mitigation planning as required by the provisions of section 322 of the Stafford Act, 42 U.S.C. 5165.

(b) The purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

§ 201.2 Definitions.

Grantee means the government to which a grant is awarded, which is accountable for the use of the funds provided. The grantee is the entire legal entity even if only a particular component of the entity is designated in the grant award document. Generally, the State is the grantee. However, after a declaration, an Indian tribal government may choose to be a grantee, or may act as a subgrantee under the State. An Indian tribal government acting as grantee will assume the responsibilities of a "state", as described in this part, for the purposes of administering the grant.

Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Hazard Mitigation Grant Program means the program authorized under section 404 of the Stafford Act, 42 U.S.C 5170c and implemented at 44 CFR Part 206, Subpart N, which authorizes funding for certain mitigation measures identified through the evaluation of natural hazards conducted under section 322 of the Stafford Act 42 U.S.C 5165.

Indian tribal government means any Federally recognized governing body of an Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of Interior acknowledges to exist as an Indian tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Local government is any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Managing State means a State to which FEMA has delegated the authority to administer and manage the HMGP under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c). FEMA may also delegate authority to tribal governments to administer and manage the HMGP as a Managing State.

Regional Director is a director of a regional office of FEMA, or his/her designated representative.

Small and impoverished communities means a community of 3,000 or fewer individuals that is identified by the State as a rural community, and is not a remote area within the corporate boundaries of a larger city; is economically disadvantaged, by having an average per capita annual income of residents not exceeding 80 percent of national, per capita income, based on

best available data; the local unemployment rate exceeds by one percentage point or more, the most recently reported, average yearly national unemployment rate; and any other factors identified in the State Plan in which the community is located.

The Stafford Act refers to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93–288, as amended (42 U.S.C. 5121–5206).

State is any State of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

State Hazard Mitigation Officer is the official representative of State government who is the primary point of contact with FEMA, other Federal agencies, and local governments in mitigation planning and implementation of mitigation programs and activities required under the Stafford Act.

Subgrantee means the government or other legal entity to which a subgrant is awarded and which is accountable to the grantee for the use of the funds provided. Subgrantees can be a State agency, local government, private non-profit organizations, or Indian tribal government. Indian tribal governments acting as a subgrantee are accountable to the State grantee.

§ 201.3 Responsibilities.

(a) *General.* This section identifies the key responsibilities of FEMA, States, and local/tribal governments in carrying out section 322 of the Stafford Act, 42 U.S.C. 5165.

(b) *FEMA.* The key responsibilities of the Regional Director are to:

(1) Oversee all FEMA related pre- and post-disaster hazard mitigation programs and activities;

(2) Provide technical assistance and training to State, local, and Indian tribal governments regarding the mitigation planning process;

(3) Review and approve all Standard and Enhanced State Mitigation Plans;

(4) Review and approve all local mitigation plans, unless that authority has been delegated to the State in accordance with § 201.6(d);

(5) Conduct reviews, at least once every three years, of State mitigation activities, plans, and programs to ensure that mitigation commitments are fulfilled, and when necessary, take action, including recovery of funds or denial of future funds, if mitigation commitments are not fulfilled.

(c) *State.* The key responsibilities of the State are to coordinate all State and local activities relating to hazard evaluation and mitigation and to:

(1) Prepare and submit to FEMA a Standard State Mitigation Plan following the criteria established in § 201.4 as a condition of receiving Stafford Act assistance (except emergency assistance).

(2) In order to be considered for the 20 percent HMGP funding, prepare and submit an Enhanced State Mitigation Plan in accordance with § 201.5, which must be reviewed and updated, if necessary, every three years from the date of the approval of the previous plan.

(3) At a minimum, review and, if necessary, update the Standard State Mitigation Plan by November 1, 2003 and every three years from the date of the approval of the previous plan in order to continue program eligibility.

(4) Make available the use of up to the 7 percent of HMGP funding for planning in accordance with § 206.434.

(5) Provide technical assistance and training to local governments to assist them in applying for HMGP planning grants, and in developing local mitigation plans.

(6) For Managing States that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c), review and approve local mitigation plans in accordance with § 201.6(d).

(d) *Local governments.* The key responsibilities of local governments are to:

(1) Prepare and adopt a jurisdiction-wide natural hazard mitigation plan as a condition of receiving project grant funds under the HMGP, in accordance with § 201.6.

(2) At a minimum, review and, if necessary, update the local mitigation plan every five years from date of plan approval to continue program eligibility.

(e) *Indian tribal governments.* Indian tribal governments will be given the option of applying directly to us for Hazard Mitigation Grant Program funding, or they may choose to apply through the State. If they apply directly to us, they will assume the responsibilities of the State, or grantee, and if they apply through the State, they will assume the responsibilities of the local government, or subgrantee.

§ 201.4 Standard State Mitigation Plans.

(a) *Plan requirement.* By November 1, 2003, States must have an approved Standard State Mitigation plan meeting the requirements of this section, in order to receive assistance under the Stafford Act, although assistance authorized under disasters declared prior to November 1, 2003 will continue to be made available. In any case, emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. The mitigation plan is the demonstration of the State's commitment to reduce risks from natural hazards and serves as a guide for State decision makers as they commit resources to reducing the effects of natural hazards. States may choose to include the requirements of the HMGP Administrative Plan in their mitigation plan.

(b) *Planning process.* An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other State agencies, appropriate Federal agencies, interested groups, and be integrated to the extent possible with other ongoing State planning efforts as well as other FEMA mitigation programs and initiatives.

(c) *Plan content.* To be effective the plan must include the following elements:

(1) Description of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how other agencies participated.

(2) *Risk assessments* that provide the factual basis for activities proposed in the strategy portion of the mitigation plan. Statewide risk assessments must characterize and analyze natural hazards and risks to provide a statewide overview. This overview will allow the State to compare potential losses throughout the State and to determine their priorities for implementing mitigation measures under the strategy, and to prioritize jurisdictions for receiving technical and financial support in developing more detailed local risk and vulnerability assessments. The risk assessment shall include the following:

(i) An overview of the type and location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate;

(ii) An overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the State risk assessment. The State shall describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events. State owned critical or operated facilities located in the

identified hazard areas shall also be addressed;

(iii) An overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment. The State shall estimate the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.

(3) A *Mitigation Strategy* that provides the State's blueprint for reducing the losses identified in the risk assessment. This section shall include:

(i) A description of State goals to guide the selection of activities to mitigate and reduce potential losses.

(ii) A discussion of the State's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: an evaluation of State laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; a discussion of State funding capabilities for hazard mitigation projects; and a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

(iii) An identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section should be linked to local plans, where specific local actions and projects are identified.

(iv) Identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities.

(4) A section on the *Coordination of Local Mitigation Planning* that includes the following:

(i) A description of the State process to support, through funding and technical assistance, the development of local mitigation plans.

(ii) A description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.

(iii) Criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures. Further, that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.

(5) A *Plan Maintenance Process* that includes:

(i) An established method and schedule for monitoring, evaluating, and updating the plan.

(ii) A system for monitoring implementation of mitigation measures and project closeouts.

(iii) A system for reviewing progress on achieving goals as well as activities and projects identified in the Mitigation Strategy.

(6) A *Plan Adoption Process.* The plan must be formally adopted by the State prior to submittal to us for final review and approval.

(7) *Assurances.* The plan must include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The State will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).

(d) *Review and updates.* Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities and resubmitted for approval to the appropriate Regional Director every three years. The Regional review will be completed within 45 days after receipt from the State, whenever possible. We also encourage a State to review its plan in the post-disaster timeframe to reflect changing priorities, but it is not required.

§ 201.5 Enhanced State Mitigation Plans.

(a) A State with a FEMA approved Enhanced State Mitigation Plan at the time of a disaster declaration is eligible to receive increased funds under the HMGP, based on twenty percent of the total estimated eligible Stafford Act disaster assistance. The Enhanced State Mitigation Plan must demonstrate that a State has developed a comprehensive mitigation program, that the State effectively uses available mitigation funding, and that it is capable of managing the increased funding. In order for the State to be eligible for the 20 percent HMGP funding, FEMA must have approved the plan within three years prior to the disaster declaration.

(b) Enhanced State Mitigation Plans must include all elements of the Standard State Mitigation Plan identified in § 201.4, as well as document the following:

(1) Demonstration that the plan is integrated to the extent practicable with other State and/or regional planning initiatives (comprehensive, growth management, economic development, capital improvement, land development, and/or emergency management plans) and FEMA mitigation programs and initiatives that provide guidance to State and regional agencies.

(2) Documentation of the State's project implementation capability, identifying and demonstrating the ability to implement the plan, including:

(i) Established eligibility criteria for multi-hazard mitigation measures.

(ii) A system to determine the cost effectiveness of mitigation measures, consistent with OMB Circular A–94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, and to rank the measures according to the State's eligibility criteria.

(iii) Demonstration that the State has the capability to effectively manage the HMGP as well as other mitigation grant programs, including a record of the following:

(A) Meeting HMGP and other mitigation grant application timeframes and submitting complete, technically feasible, and eligible project applications with appropriate supporting documentation;

(B) Preparing and submitting accurate environmental reviews and benefit-cost analyses;

(C) Submitting complete and accurate quarterly progress and financial reports on time; and

(D) Completing HMGP and other mitigation grant projects within established performance periods, including financial reconciliation.

(iv) A system and strategy by which the State will conduct an assessment of the completed mitigation actions and include a record of the effectiveness (actual cost avoidance) of each mitigation action.

(3) Demonstration that the State effectively uses existing mitigation programs to achieve its mitigation goals.

(4) Demonstration that the State is committed to a comprehensive state mitigation program, which might include any of the following:

(i) A commitment to support local mitigation planning by providing workshops and training, State planning grants, or coordinated capability development of local officials, including Emergency Management and Floodplain Management certifications.

(ii) A statewide program of hazard mitigation through the development of legislative initiatives, mitigation councils, formation of public/private

partnerships, and/or other executive actions that promote hazard mitigation.

(iii) The State provides a portion of the non-Federal match for HMGP and/or other mitigation projects.

(iv) To the extent allowed by State law, the State requires or encourages local governments to use a current version of a nationally applicable model building code or standard that addresses natural hazards as a basis for design and construction of State sponsored mitigation projects.

(v) A comprehensive, multi-year plan to mitigate the risks posed to existing buildings that have been identified as necessary for post-disaster response and recovery operations.

(vi) A comprehensive description of how the State integrates mitigation into its post-disaster recovery operations.

(c) *Review and updates.* (1) A State must review and revise its plan to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities, and resubmit it for approval to the appropriate Regional Director every three years. The Regional review will be completed within 45 days after receipt from the State, whenever possible.

(2) In order for a State to be eligible for the 20 percent HMGP funding, the Enhanced State Mitigation plan must be approved by FEMA within the three years prior to the current major disaster declaration.

§ 201.6 Local Mitigation Plans.

The local mitigation plan is the representation of the jurisdiction's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Local plans will also serve as the basis for the State to provide technical assistance and to prioritize project funding.

(a) *Plan requirement.* (1) For disasters declared after November 1, 2003, a local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants. Until November 1, 2003, local mitigation plans may be developed concurrent with the implementation of the project grant.

(2) Regional Directors may grant an exception to the plan requirement in extraordinary circumstances, such as in a small and impoverished community, when justification is provided. In these cases, a plan will be completed within 12 months of the award of the project grant. If a plan is not provided within this timeframe, the project grant will be terminated, and any costs incurred after notice of grant's termination will not be reimbursed by FEMA.

(3) Multi-jurisdictional plans (e.g. watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan. State-wide plans will not be accepted as multi-jurisdictional plans.

(b) *Planning process.* An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

(c) *Plan content.* The plan shall include the following:

(1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

(2) A *risk assessment* that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:

(i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

(ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of:

(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

(B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate;

(C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

(iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

(3) *A mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:

(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

(iii) An action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

(iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

(4) A *plan maintenance process* that includes:

(i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

(ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

(iii) Discussion on how the community will continue public participation in the plan maintenance process.

(5) *Documentation* that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

(d) *Plan review.* (1) Plans must be submitted to the State Hazard Mitigation Officer for initial review and coordination. The State will then send the plan to the appropriate FEMA Regional Office for formal review and approval.

(2) The Regional review will be completed within 45 days after receipt from the State, whenever possible.

(3) Plans must be reviewed, revised if appropriate, and resubmitted for approval within five years in order to continue to be eligible for HMGP project grant funding.

(4) Managing States that have been approved under the criteria established by FEMA pursuant to 42 U.S.C. 5170c(c) will be delegated approval authority for local mitigation plans, and the review will be based on the criteria in this part. Managing States will review the plans within 45 days of receipt of the plans, whenever possible, and provide a copy of the approved plans to the Regional Office.

PART 206—FEDERAL DISASTER ASSISTANCE FOR DISASTERS DECLARED ON OR AFTER NOVEMBER 23, 1988

2. The authority citation for part 206 is revised to read as follows:

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121–5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; and E.O. 12673, 54 FR 12571, 3 CFR, 1989 Comp., p. 214.

2a. Revise Part 206, Subpart M to read as follows:

Subpart M—Minimum Standards

Sec.
206.400 General.
206.401 Local standards.
206.402 Compliance.

§ 206.400 General.

(a) As a condition of the receipt of any disaster assistance under the Stafford Act, the applicant shall carry out any repair or construction to be financed with the disaster assistance in accordance with applicable standards of safety, decency, and sanitation and in conformity with applicable codes, specifications and standards.

(b) Applicable codes, specifications, and standards shall include any disaster resistant building code that meets the minimum requirements of the National Flood Insurance Program (NFIP) as well as being substantially equivalent to the recommended provisions of the National Earthquake Hazards Reduction Program (NEHRP). In addition, the applicant shall comply with any requirements necessary in regards to Executive Order 11988, Floodplain Management, Executive Order 12699, Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction, and any other applicable Executive orders.

(c) In situations where there are no locally applicable standards of safety, decency and sanitation, or where there are no applicable local codes, specifications and standards governing repair or construction activities, or where the Regional Director determines that otherwise applicable codes, specifications, and standards are inadequate, then the Regional Director may, after consultation with appropriate State and local officials, require the use of nationally applicable codes, specifications, and standards, as well as safe land use and construction practices in the course of repair or construction activities.

(d) The mitigation planning process that is mandated by section 322 of the Stafford Act and 44 CFR part 201 can assist State and local governments in determining where codes, specifications, and standards are inadequate, and may need to be upgraded.

§ 206.401 Local standards.

The cost of repairing or constructing a facility in conformity with minimum codes, specifications and standards may be eligible for reimbursement under section 406 of the Stafford Act, as long as such codes, specifications and standards meet the criteria that are listed at 44 CFR 206.226(b).

§ 206.402 Compliance.

A recipient of disaster assistance under the Stafford Act must document for the Regional Director its compliance with this subpart following the completion of any repair or construction activities.

Subpart N—Hazard Mitigation Grant Program

3. Revise § 206.431 to read as follows:

§ 206.431 Definitions.

Activity means any mitigation measure, project, or action proposed to reduce risk of future damage, hardship, loss or suffering from disasters.

Applicant means a State agency, local government, Indian tribal government, or eligible private nonprofit organization, submitting an application to the grantee for assistance under the HMGP.

Enhanced State Mitigation Plan is the hazard mitigation plan approved under 44 CFR part 201 as a condition of receiving increased funding under the HMGP.

Grant application means the request to FEMA for HMGP funding, as outlined in § 206.436, by a State or tribal government that will act as grantee.

Grant award means total of Federal and non-Federal contributions to complete the approved scope of work.

Grantee means the government to which a grant is awarded and which is accountable for the use of the funds provided. The grantee is the entire legal entity even if only a particular component of the entity is designated in the grant award document. Generally, the State is the grantee. However, an Indian tribal government may choose to be a grantee, or it may act as a subgrantee under the State. An Indian tribal government acting as a grantee will assume the responsibilities of a "state", under this subpart, for the purposes of administering the grant.

Indian tribal government means any Federally recognized governing body of an Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of Interior acknowledges to exist as an Indian tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.

Local Mitigation Plan is the hazard mitigation plan required of a local or Indian tribal government acting as a subgrantee as a condition of receiving a project subgrant under the HMGP as outlined in 44 CFR 201.6.

Standard State Mitigation Plan is the hazard mitigation plan approved under 44 CFR part 201, as a condition of receiving Stafford Act assistance as outlined in § 201.4.

State Administrative Plan for the Hazard Mitigation Grant Program means the plan developed by the State to describe the procedures for administration of the HMGP.

Subgrant means an award of financial assistance under a grant by a grantee to an eligible subgrantee.

Subgrant application means the request to the grantee for HMGP funding by the eligible subgrantee, as outlined in § 206.436.

Subgrantee means the government or other legal entity to which a subgrant is awarded and which is accountable to the grantee for the use of the funds provided. Subgrantees can be a State agency, local government, private non-profit organizations, or Indian tribal government as outlined in § 206.433.

Indian tribal governments acting as a subgrantee are accountable to the State grantee.

4. Revise § 206.432(b) to read as follows:

§ 206.432 Federal grant assistance.

* * * * *

(b) *Amounts of assistance.* The total of Federal assistance under this subpart shall not exceed either 15 or 20 percent of the total estimated Federal assistance (excluding administrative costs) provided for a major disaster under 42 U.S.C. 5170b, 5172, 5173, 5174, 5177, 5178, 5183, and 5201 as follows:

(1) *Fifteen (15) percent.* Effective November 1, 2003, a State with an approved Standard State Mitigation Plan, which meets the requirements outlined in 44 CFR 201.4, shall be eligible for assistance under the HMGP not to exceed 15 percent of the total estimated Federal assistance described in this paragraph. Until that date, existing, approved State Mitigation Plans will be accepted.

(2) *Twenty (20) percent.* A State with an approved Enhanced State Mitigation Plan, in effect prior to the disaster declaration, which meets the requirements outlined in 44 CFR 201.5 shall be eligible for assistance under the HMGP not to exceed 20 percent of the total estimated Federal assistance described in this paragraph.

(3) The estimates of Federal assistance under this paragraph (b) shall be based on the Regional Director's estimate of all eligible costs, actual grants, and appropriate mission assignments.

* * * * *

5. Section 206.434 is amended by redesignating paragraphs (b) through (g) as paragraphs (c) through (h), respectively; adding a new paragraph (b); revising redesignated paragraphs (c) introductory text and (c)(1); and revising redesignated paragraph (d) to read as follows:

§ 206.434 Eligibility.

* * * * *

(b) *Plan requirement.* (1) For all disasters declared on or after November 1, 2003, local and tribal government applicants for subgrants, must have an approved local mitigation plan in accordance with 44 CFR 201.6 prior to receipt of HMGP subgrant funding. Until November 1, 2003, local mitigation plans may be developed concurrent with the implementation of subgrants.

(2) Regional Directors may grant an exception to this requirement in extraordinary circumstances, such as in a small and impoverished community when justification is provided. In these cases, a plan will be completed within 12 months of the award of the project grant. If a plan is not provided within this timeframe, the project grant will be terminated, and any costs incurred after notice of grant's termination will not be reimbursed by FEMA.

(c) *Minimum project criteria.* To be eligible for the Hazard Mitigation Grant Program, a project must:

(1) Be in conformance with the State Mitigation Plan and Local Mitigation Plan approved under 44 CFR part 201;

* * * * *

(d) *Eligible activities.* (1) *Planning.* Up to 7% of the State's HMGP grant may be used to develop State, tribal and/or local mitigation plans to meet the planning criteria outlined in 44 CFR part 201.

(2) *Types of projects.* Projects may be of any nature that will result in protection to public or private property. Eligible projects include, but are not limited to:

(i) Structural hazard control or protection projects;

(ii) Construction activities that will result in protection from hazards;

(iii) Retrofitting of facilities;

(iv) Property acquisition or relocation, as defined in paragraph (e) of this section;

(v) Development of State or local mitigation standards;

(vi) Development of comprehensive mitigation programs with implementation as an essential component;

(vii) Development or improvement of warning systems.

* * * * *

6. Revise § 206.435(a) to read as follows:

§ 206.435 Project identificaiton and selection criteria.

(a) *Identification.* It is the State's responsibility to identify and select eligible hazard mitigation projects. All funded projects must be consistent with the State Mitigation Plan. Hazard Mitigation projects shall be identified and prioritized through the State, Indian tribal, and local planning process.

* * * * *

7. Revise § 206.436 to read as follows:

§ 206.436 Application procedures.

(a) *General.* This section describes the procedures to be used by the grantee in submitting an application for HMGP funding. Under the HMGP, the State or Indian tribal government is the grantee and is responsible for processing subgrants to applicants in accordance with 44 CFR part 13 and this part 206. Subgrantees are accountable to the grantee.

(b) *Governor's Authorized Representative.* The Governor's Authorized Representative serves as the grant administrator for all funds provided under the Hazard Mitigation Grant Program. The Governor's Authorized Representative's responsibilities as they pertain to procedures outlined in this section include providing technical advice and assistance to eligible subgrantees, and ensuring that all potential applicants are aware of assistance available and submission of those documents necessary for grant award.

(c) *Hazard mitigation application.* Upon identification of mitigation measures, the State (Governor's Authorized Representative) will submit its Hazard Mitigation Grant Program application to the FEMA Regional Director. The application will identify one or more mitigation measures for which funding is requested. The application must include a Standard Form (SF) 424, Application for Federal Assistance, SF 424D, Assurances for Construction Programs, if appropriate, and an narrative statement. The narrative statement will contain any pertinent project management information not included in the State's administrative plan for Hazard Mitigation. The narrative statement will also serve to identify the specific mitigation measures for which funding is requested. Information required for each mitigation measure shall include the following:

(1) Name of the subgrantee, if any;

(2) State or local contact for the measure;

(3) Location of the project;

(4) Description of the measure;

(5) Cost estimate for the measure;

(6) Analysis of the measure's cost-effectiveness and substantial risk reduction, consistent with § 206.434(c);

(7) Work schedule;

(8) Justification for selection;

(9) Alternatives considered;

(10) Environmental information consistent with 44 CFR part 9, Floodplain Management and Protection of Wetlands, and 44 CFR part 10, Environmental Considerations.

(d) *Application submission time limit.* The State's application may be amended as the State identifies and selects local project applications to be funded. The State must submit all local HMGP applications and funding requests for the purpose of identifying new projects to the Regional Director within 12 months of the date of disaster declaration.

(e) *Extensions.* The State may request the Regional Director to extend the application time limit by 30 to 90 day

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increments, not to exceed a total of 180 days. The grantee must include a justification in its request.

(f) *FEMA approval.* The application and supplement(s) will be submitted to the FEMA Regional Director for approval. FEMA has final approval authority for funding of all projects.

(g) *Indian tribal grantees.* Indian tribal governments may submit a SF 424 directly to the Regional Director.

Subpart H—Public Assistance Eligibility

* * * * *

8. Revise § 206.220 to read as follows:

§ 206.220 General.

This subpart provides policies and procedures for determinations of eligibility of applicants for public assistance, eligibility of work, and eligibility of costs for assistance under sections 402, 403, 406, 407, 418, 419, 421(d), 502, and 503 of the Stafford Act. Assistance under this subpart must also conform to requirements of 44 CFR part 201, Mitigation Planning, and 44 CFR part 206, subparts G—Public Assistance Project Administration, I—Public Assistance Insurance Requirements, J—Coastal Barrier Resources Act, and M—Minimum Standards. Regulations under 44 CFR part 9—Floodplain Management and 44 CFR part 10—Environmental Considerations, also apply to this assistance.

9. Section 206.226 is amended by redesignating paragraphs

(b) through (j) as paragraphs (c) through (k), respectively; adding a new paragraph (b); and revising redesignated paragraph (g)(5) to read as follows:

§ 206.226 Restoration of damaged facilities.

* * * * *

(b) *Mitigation planning.* In order to receive assistance under this section, as of November 1, 2003, the State must have in place a FEMA approved State Mitigation Plan in accordance with 44 CFR part 201.

* * * * *

(g) * * *

(5) If relocation of a facility is not feasible or cost effective, the Regional Director shall disapprove Federal funding for the original location when he/she determines in accordance with 44 CFR parts 9, 10, 201, or subpart M of this part 206, that restoration in the original location is not allowed. In such cases, an alternative project may be applied for.

* * * * *

Dated: February 19, 2002.

Michael D. Brown,

General Counsel.

[FR Doc. 02–4321 Filed 2–25–02; 8:45 am]

BILLING CODE 6718–05–P

Appendix J.2:
Interim Final Rule – October 1, 2002

The following 4 pages are the Federal Register, dated October 1, 2002.

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CFR 773.23(a)(1) through (a)(6) for a notice of suspension or rescission, showing that the person requesting review is entitled to administrative relief;

* * * * *

24. In § 4.1374, revise paragraph (a) to read as follows:

§ 4.1374 Burdens of proof.

(a) OSM shall have the burden of going forward to present a prima facie case of the validity of the notice of proposed suspension or rescission or the notice of suspension or rescission.

* * * * *

25. In § 4.1376, revise the section heading and paragraph (a) to read as follows:

§ 4.1376 Petition for temporary relief from notice of proposed suspension or rescission or notice of suspension or rescission; appeals from decisions granting or denying temporary relief.

(a) Any party may file a petition for temporary relief from the notice of proposed suspension or rescission or the notice of suspension or rescission in conjunction with the filing of the request for review or at any time before an initial decision is issued by the administrative law judge.

* * * * *

26. Revise the heading for 43 CFR 4.1380–4.1387 to read as follows:

Review of Office of Surface Mining Written Decisions Concerning Ownership or Control Challenges

27. Revise § 4.1380 to read as follows:

§ 4.1380 Scope.

Sections 4.1380 through 4.1387 govern the procedures for review of a written decision issued by OSM under 30 CFR 773.28 on a challenge to a listing or finding of ownership or control.

28. In § 4.1381, revise paragraph (a) to read as follows:

§ 4.1381 Who may file; when to file; where to file.

(a) Any person who receives a written decision issued by OSM under 30 CFR 773.28 on a challenge to an ownership or control listing or finding may file a request for review with the Hearings Division, Office of Hearings and Appeals, U.S. Department of the Interior, 801 N. Quincy Street, Suite 300, Arlington, Virginia 22203 (telephone 703–235–3800) within 30 days of service of the decision.

* * * * *

29. Revise § 4.1390 to read as follows:

§ 4.1390 Scope.

Sections 4.1391 through 4.1394 set forth the procedures for obtaining review of an OSM determination under 30 CFR 761.16 that a person does or does not have valid existing rights.

30. In § 4.1391, revise paragraphs (a) and (b) to read as follows:

§ 4.1391 Who may file; where to file; when to file; filing of administrative record.

(a) The person who requested a determination under 30 CFR 761.16 or any person with an interest that is or may be adversely affected by a determination that a person does or does not have valid existing rights may file a request for review of the determination with the office of the OSM official whose determination is being reviewed and at the same time shall send a copy of the request to the Interior Board of Land Appeals, U.S. Department of the Interior, 801 N. Quincy Street, Suite 300, Arlington, VA 22203 (telephone 703–235–3750). OSM shall file the complete administrative record of the determination under review with the Board as soon as practicable.

(b) OSM must provide notice of the valid existing rights determination to the person who requested that determination by certified mail, or by overnight delivery service if the person has agreed to bear the expense of this service.

(1) When the determination is made independently of a decision on an application for a permit or for a permit boundary revision, a request for review shall be filed within 30 days of receipt of the determination by a person who has received a copy of it by certified mail or overnight delivery service. The request for review shall be filed within 30 days of the date of publication of the determination in a newspaper of general circulation or in the **Federal Register**, whichever is later, by any person who has not received a copy of it by certified mail or overnight delivery service.

(2) When the determination is made in conjunction with a decision on an application for a permit or for a permit boundary revision, the request for review must be filed in accordance with § 4.1362.

* * * * *

31. Revise § 4.1394 to read as follows:

§ 4.1394 Burden of proof.

(a) If the person who requested the determination is seeking review, OSM shall have the burden of going forward to establish a prima facie case and the person who requested the determination shall have the ultimate burden of persuasion.

(b) If any other person is seeking review, that person shall have the burden of going forward to establish a prima facie case and the ultimate burden of persuasion that the person who requested the determination does or does not have valid existing rights.

[FR Doc. 02–24417 Filed 9–30–02; 8:45 am]

BILLING CODE 4310–79–P

FEDERAL EMERGENCY MANAGEMENT AGENCY

44 CFR Parts 201 and 206

RIN 3067–AD22

Hazard Mitigation Planning and Hazard Mitigation Grant Program

AGENCY: Federal Emergency Management Agency.

ACTION: Interim final rule.

SUMMARY: This rule extends the date by which State and local governments must develop mitigation plans as a condition of grant assistance in compliance with 44 CFR Part 201. The regulations in Part 201 outline the requirements for State and local mitigation plans, which must be completed by November 1, 2003 in order to continue to receive FEMA grant assistance. This interim final rule extends that date to November 1, 2004.

DATES: *Effective Date:* October 1, 2002.

Comment Date: We will accept written comments through December 2, 2002.

ADDRESSES: Please send written comments to the Rules Docket Clerk, Office of the General Counsel, Federal Emergency Management Agency, 500 C Street, SW., room 840, Washington, DC 20472, (facsimile) 202–646–4536, or (e-mail) *rules@fema.gov*.

FOR FURTHER INFORMATION CONTACT: Terry Baker, Federal Insurance and Mitigation Administration, Federal Emergency Management Agency, 500 C Street, SW., Washington, DC, 20472, 202–646–4648, (facsimile) 202–646–3104, or (e-mail) *terry.baker@fema.gov*.

SUPPLEMENTARY INFORMATION:

Introduction

Throughout the preamble and the rule the terms "we", "our" and "us" refer to FEMA.

On February 26, 2002, FEMA published an interim final rule implementing Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under § 104 of the Disaster Mitigation Act of 2000, (DMA 2000) Pub. L. 106–390. This identified the requirements for State and local mitigation plans necessary for FEMA assistance. The critical portion of the current interim

final rule being published extends the date that the planning requirements take effect. The date is being modified from November 1, 2003 to November 1, 2004 for all programs except the Pre-Disaster Mitigation (PDM) program.

The date that local mitigation plans will be required for the PDM program as a condition of "brick and mortar" project grant funding will continue to be November 1, 2003. Our objective is to encourage the use of the PDM program to develop State and local mitigation plans that will meet the criteria for all of our mitigation programs. The initial implementation of the PDM program allows States to prioritize the funding towards the development of mitigation plans in their most high-risk communities, positioning them to be eligible for project grant funding when it becomes available. The PDM program will benefit from the experiences in the Flood Mitigation Assistance (FMA) program, which has had a planning requirement for many years. States often prioritize FMA planning funds to a community in one year, with the implementation of the project occurring after the appropriate planning has been completed.

We received many thoughtful comments on much of the rule, and we intend to address them all prior to finalizing the rule. However, the overwhelming number of comments regarding the effective date for the new planning requirements on both the State and local governments indicated to us a need to extend that date. This new interim final rule will address this issue, and clarify the planning requirement for the recently published Fire Management Assistance Grant Program final rule.

Since publication of the interim final rule, it became clear to us that, in some cases, there was a need to extend the effective date of the planning requirement to allow more time for plan development. An additional year will allow State, tribal, and local governments time to identify necessary resources, establish support for the planning process, and develop meaningful mitigation plans. Legislative sessions, which in some cases may be once every two years, may be necessary to obtain funding for plan development and/or adoption of the plan prior to submittal to FEMA. Many State and local fiscal years run from July through June, and budget requests must be made months prior to the beginning of the fiscal year. This has made it difficult for many jurisdictions to begin the planning process. Our intention in extending the date is to allow for more thoughtful and comprehensive development of plans and implementation of this regulation.

Nearly all of those commenting on the rule recognize the importance of planning. The generally accepted model is that good mitigation happens when good mitigation plans are the basis for the actions taken.

Even though we are extending the date for meeting the planning requirements, we encourage States and localities to continue to work on getting plans developed and approved as soon as feasible, and not to wait until the deadline to begin the process. It is important to note that although there is no deadline for approval of Enhanced State Mitigation Plans in order to qualify for the 20 percent HMPG funding, it will only be available to States if the plan is approved prior to a disaster declaration.

Although many comments addressed the need to extend the deadline, only a few provided specific alternative dates. We received several comments requesting a phased approach to the deadline for communities based on general risk levels or the priorities identified in a State plan. At this point, FEMA is not considering any option for a phased approach to the timeline since we believe that it would make this requirement too difficult to administer, for both States and FEMA. We believe that the one-year extension for the HMGP will address most of the concerns regarding the effective date of the planning requirements.

We have also received some questions regarding the relationship of the planning requirements of the Fire Management Assistance Grant Program to the plans developed under 44 CFR part 201. A Standard or Enhanced State Mitigation plan, which includes an evaluation of wildfire risk and mitigation, as identified in 44 CFR part 201 will meet the planning requirement of the Fire Management Assistance Grant Program. Until States develop and have either of those plans approved by FEMA, States must comply with the fire management planning requirement as stated in 44 CFR part 204 by ensuring that there is a fire component to the existing State Mitigation Plan or a separate wildfire mitigation plan.

Finally, we would like to clarify that for grants awarded under any hazard mitigation program prior to October 30, 2000 for the purpose of developing or updating a hazard mitigation plan, we will not provide an increase in funding or extensions for changes in the scope of work for purposes of meeting the enhanced state plan criteria, since the enhanced plan concept did not exist prior to the Disaster Mitigation Act of 2000, enacted on that date.

We encourage comments on this interim final rule, and we will make every effort to involve all interested parties, including those who commented on the original interim final planning rule, prior to the development of the Final Rule.

Justification for Interim Final Rule

In general, FEMA publishes a rule for public comment before issuing a final rule, under the Administrative Procedure Act, 5 U.S.C. 533 and 44 CFR 1.12. The Administrative Procedure Act, however, provides an exception from that general rule where the agency for good cause finds the procedures for comment and response contrary to public interest.

This interim final rule extends the date that State, tribal, and local governments have to develop mitigation plans required as a condition of FEMA grant assistance. State, tribal, and local governments are currently under the assumption that plans are required by November 1, 2003, whereas this interim final rule extends that date to November 1, 2004 for the HMGP. It does not affect the date for compliance for other programs, such as the Pre-disaster Mitigation (PDM) program. In order for State, local and tribal resources to be appropriately identified and used, it is essential that the date extension be made effective as soon as possible. We believe it is contrary to the public interest to delay the benefits of this rule. In accordance with the Administrative Procedure Act, 5 U.S.C. 553(d)(3), we find that there is good cause for the interim final rule to take effect immediately upon publication in the **Federal Register** in order to meet the needs of States and communities by identifying the new effective date for planning requirement under 44 CFR part 201. Therefore, we find that prior notice and comment on this rule would not further the public interest. We actively encourage and solicit comments on this interim final rule from interested parties, and we will consider them as well as those submitted on the original interim final planning rule in preparing the final rule. For these reasons, we believe we have good cause to publish an interim final rule.

National Environmental Policy Act

44 CFR 10.8(d)(2)(ii) excludes this rule from the preparation of an environmental assessment or environmental impact statement, where the rule relates to actions that qualify for categorical exclusion under 44 CFR 10.8(d)(2)(iii), such as the development of plans under this section.

Executive Order 12866, Regulatory Planning and Review

We have prepared and reviewed this rule under the provisions of E.O. 12866, Regulatory Planning and Review. Under Executive Order 12866, 58 FR 51735, October 4, 1993, a significant regulatory action is subject to review by The Office of Management and Budget (OMB) and the requirements of the Executive Order. The Executive Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The purpose of this rule is to extend the date by which State and local governments have to prepare or update their plans to meet the criteria identified in 44 CFR part 201. The original date, November 1, 2003, was determined to be difficult to meet. This interim final rule extends that date to November 1, 2004 for the post disaster Hazard Mitigation Grant Program. The date of November 1, 2003 will still apply to project grants under the Pre-disaster Mitigation program. As such, the rule itself will not have an effect on the economy of more than $100,000,000.

Therefore, this rule is not a significant regulatory action and is not an economically significant rule under Executive Order 12866. OMB has not reviewed this rule under Executive Order 12866.

Executive Order 12898, Environmental Justice

Under Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, February 16, 1994, we incorporate environmental justice into our policies and programs. The Executive Order requires each Federal agency to conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that those programs, policies, and activities do not have the effect of excluding persons from participation in our programs, denying persons the benefits of our programs, or subjecting persons to discrimination because of their race, color, or national origin.

No action that we can anticipate under the final rule will have a disproportionately high or adverse human health and environmental effect on any segment of the population. This rule extends the date for development or update of State and local mitigation plans in compliance with 44 CFR part 201. Accordingly, the requirements of Executive Order 12898 do not apply to this interim final rule.

Paperwork Reduction Act of 1995

As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) we submitted a request for review and approval of a new collection of information when the initial interim final rule was published on February 26, 2002. OMB approved this collection of information for use through August 31, 2002, under the emergency processing procedures in OMB regulation 5 CFR 1320.1, OMB Number 3067–0297. There have been no changes to the collection of information, and we have submitted a request for OMB approval to continue the use of the collection of information for a term of three years. The request is being processed under OMB's normal clearance procedures in accordance with provisions of OMB regulation 5 CFR 1320.11.

This new interim final rule simply extends the date by which States and communities have to comply with the planning requirements, and clarifies which FEMA programs are affected by these requirements. The changes do not affect the collection of information; therefore, no change to the request for the collection of information is necessary. In summary, this interim final rule complies with the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. 3506(c)(2)(A)).

FOR FURTHER INFORMATION CONTACT: You may obtain copies of the OMB paperwork clearance package by contacting Ms. Muriel Anderson at (202) 646–2625 (voice), (202) 646–3347 (facsimile), or by e-mail at *informationcollectios@fema.gov*.

Executive Order 13132, Federalism

Executive Order 13132, Federalism, dated August 4, 1999, sets forth principles and criteria that agencies must adhere to in formulating and implementing policies that have federalism implications, that is, regulations that have substantial direct effects on the States, or on the distribution of power and responsibilities among the various levels of government. Federal agencies must closely examine the statutory authority supporting any action that would limit the policymaking discretion of the States, and to the extent practicable, must consult with State and local officials before implementing any such action.

We have reviewed this rule under E.O. 13132 and have concluded that the rule does not have federalism implications as defined by the Executive Order. We have determined that the rule does not significantly affect the rights, roles, and responsibilities of States, and involves no preemption of State law nor does it limit State policymaking discretion.

We will continue to evaluate the planning requirements and will work with interested parties as we implement the planning requirements of 44 CFR part 201. In addition, we actively encourage and solicit comments on this interim final rule from interested parties, and we will consider them in preparing the final rule.

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments

We have reviewed this interim final rule under Executive Order 13175, which became effective on February 6, 2001. In reviewing the interim final rule, we find that it does not have "tribal implications" as defined in Executive Order 13175 because it will not have a substantial direct effect on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes. Moreover, the interim final rule does not impose substantial direct compliance costs on tribal governments, nor does it preempt tribal law, impair treaty rights or limit the self-governing powers of tribal governments.

Congressional Review of Agency Rulemaking

We have sent this interim final rule to the Congress and to the General Accounting Office under the Congressional Review of Agency Rulemaking Act, Public Law 104–121. The rule is a not "major rule" within the meaning of that Act. It is an administrative action to extend the time State and local governments have to prepare mitigation plans required by section 322 of the Stafford Act, as enacted in DMA 2000.

The rule will not result in a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. It will not have "significant adverse effects" on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises. This final rule is subject to the information collection requirements of the Paperwork Reduction Act, and OMB has assigned Control No. 3067–0297. The rule is not an unfunded Federal mandate within the meaning of the Unfunded Mandates Reform Act of 1995, Public Law 104–4, and any enforceable duties that we impose are a condition of Federal assistance or a duty arising from participation in a voluntary Federal program.

List of Subjects in 44 CFR Parts 201 and Part 206

Administrative practice and procedure, Disaster assistance, Grant programs, Mitigation planning, Reporting and record keeping requirements.

Accordingly, amend 44 CFR, chapter I, as follows:

PART 201—MITIGATION PLANNING

1. The authority for Part 201 continues to read as follows:

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121–5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; and E.O. 12673, 54 FR 12571, 3 CFR, 1989 Comp., p. 214.

2. Revise § 201.3(c)(3) to read as follows:

§ 201.3 Responsibilities.

* * * * *

(c) * * *

(3) At a minimum, review and, if necessary, update the Standard State Mitigation Plan by November 1, 2004 and every three years from the date of the approval of the previous plan in order to continue program eligibility.

* * * * *

3. Revise § 201.4(a) to read as follows:

§ 201.1 Standard State Mitigation Plans.

(a) *Plan requirement.* By November 1, 2004, States must have an approved Standard State Mitigation plan meeting the requirements of this section in order to receive assistance under the Stafford Act, although assistance authorized under disasters declared prior to November 1, 2004 will continue to be made available. Until that date, existing, FEMA approved State Mitigation Plans will be accepted. In any case, emergency assistance provided under 42 U.S.C 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. The mitigation plan is the demonstration of the State's commitment to reduce risks from natural hazards and serves as a guide for State decision makers as they commit resources to reducing the effects of natural hazards. States may choose to include the requirements of the HMGP Administrative Plan in their mitigation plan, but must comply with the updates, amendments or revisions requirement listed under 44 CFR 206.437.

* * * * *

4. Revise § 201.6(a) to read as follows:

§ 201.6 Local Mitigation Plans.

* * * * *

(a) *Plan requirements.*

(1) For disasters declared after November 1, 2004, a local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants. Until November 1, 2004, local mitigation plans may be developed concurrent with the implementation of the HMGP project grant.

(2) By November 1, 2003, local governments must have a mitigation plan approved pursuant to this section in order to receive a project grant through the Pre-Disaster Mitigation (PDM) program, authorized under § 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5133. PDM planning grants will continue to be made available to all local governments after this time to enable them to meet the requirements of this section.

(3) Regional Directors may grant an exception to the plan requirement in extraordinary circumstances, such as in a small and impoverished community, when justification is provided. In these cases, a plan will be completed within 12 months of the award of the project grant. If a plan is not provided within this timeframe, the project grant will be terminated, and any costs incurred after notice of grant's termination will not be reimbursed by FEMA.

(4) Multi-jurisdictional plans (*e.g.* watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan. State-wide plans will not be accepted as multi-jurisdictional plans.

* * * * *

PART 206—FEDERAL DISASTER ASSISTANCE FOR DISASTERS DECLARED ON OR AFTER NOVEMBER 23, 1988

4. The authority for Part 206 continues to read as follows:

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121–5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; and E.O. 12673, 54 FR 12571, 3 CFR, 1989 Comp., p. 214.

5. Revise § 206.432(b)(1) to read as follows:

§ 206.432 Federal grant assistance.

* * * * *

(b) * * *

(1) *Fifteen (15) Percent.* Effective November 1, 2004, a State with an approved Standard State Mitigation Plan, which meets the requirements outlined in 44 CFR 201.4, shall be eligible for assistance under the HMGP not to exceed 15 percent of the total estimated Federal assistance described in this paragraph. Until that date, existing, FEMA approved State Mitigation Plans will be accepted.

* * * * *

6. Revise § 206.434(b)(1) to read as follows:

§ 206.434 Eligibility.

* * * * *

(b) * * *

(1) For all disasters declared on or after November 1, 2004, local and tribal government applicants for subgrants must have an approved local mitigation plan in accordance with 44 CFR 201.6 prior to receipt of HMGP subgrant funding. Until November 1, 2004, local mitigation plans may be developed concurrent with the implementation of subgrants.

* * * * *

Dated: September 26, 2002.

Joe M. Allbaugh,

Director.

[FR Doc. 02–24998 Filed 9–30–02; 8:45 am]

BILLING CODE 6718–05–P

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 73

[DA 02–2315, MB Docket No. 02–130, RM–10438]

Digital Television Broadcast Service; Des Moines, IA

AGENCY: Federal Communications Commission.

Appendix J.3:
Interim Final Rule – September 13, 2004

The following 4 pages are the Federal Register, dated September 13, 2004.

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55094 Federal Register / Vol. 69, No. 176 / Monday, September 13, 2004 / Rules and Regulations

PART 292—NATIONAL RECREATION AREAS

Subpart C—Sawtooth National Recreation Area—Private Lands

■ 1. The authority citation for subpart C continues to read as follows:

Authority: Sec. 4(a), Act of Aug. 22, 1972 (86 Stat. 613).

■ 2. Amend § 292.16 by revising paragraph (e)(2)(ii) to read as follows:

§ 292.16 Standards.

* * * * *

(e) * * *

(2) * * *

(ii) Not more than two outbuildings with each residence. Aggregate square foot area of outbuildings not to exceed 850 square feet and to be limited to one story not more than 22 feet in height.

* * * * *

Dated: September 7, 2004.

David P. Tenny,

Deputy Under Secretary, Natural Resources and Environment.

[FR Doc. 04–20592 Filed 9–10–04; 8:45 am]

BILLING CODE 3410–11–P

DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

44 CFR Parts 201 and 206

RIN 1660–AA17

Hazard Mitigation Planning and Hazard Mitigation Grant Program

AGENCY: Federal Emergency Management Agency (FEMA), Emergency Preparedness and Response Directorate, Department of Homeland Security.

ACTION: Interim rule.

SUMMARY: This rule provides State and Indian tribal governments with a mechanism to request an extension to the date by which they must develop State Mitigation Plans as a condition of grant assistance. FEMA regulations outline the requirements for State Mitigation Plans, which must be completed by November 1, 2004 in order to receive FEMA grant assistance. This interim rule allows FEMA to grant justifiable extensions, in extraordinary circumstances, for State and Indian tribal governments of up to six months, or no later than May 1, 2005. In addition, this interim rule allows mitigation planning grants provided through the Pre-Disaster Mitigation (PDM) program to continue to be available to State, Indian tribal, and local governments after November 1, 2004.

DATES: *Effective Date:* September 13, 2004.

Comment Date: We will accept written comments through November 12, 2004.

ADDRESSES: Please send written comments to the Rules Docket Clerk, Office of the General Counsel, Federal Emergency Management Agency, 500 C Street, SW., room 840,Washington DC 20472, (facsimile) 202–646–4536, or (e-mail) *FEMA-RULES@dhs.gov.*

FOR FURTHER INFORMATION CONTACT: Karen Helbrecht, Risk Reduction Branch, Mitigation Division, Federal Emergency Management Agency, 500 C Street, SW., Washington DC 20472, (phone) 202–646–3358, (facsimile) 202–646–3104, or (e-mail) *karen.helbrecht@dhs.gov.*

SUPPLEMENTARY INFORMATION:

Introduction

On February 26, 2002, FEMA published an interim rule at 67 FR 8844 implementing Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000), Public Law 106–390. This identified the requirements for State, tribal, and local mitigation plans. On October 1, 2002, FEMA published a change to that rule at 67 FR 61512, extending the date that the planning requirements take effect. The October 1, 2002 interim rule stated that by November 1, 2004, FEMA approved State Mitigation Plans were required in order to receive non-emergency Stafford Act assistance, and local mitigation plans were required in order to receive mitigation project grants. The critical portion of this interim rule provides a mechanism for Governors or Indian tribal leaders to request an extension to the date that the planning requirements take effect for State level mitigation plans. This interim rule allows extensions up to May 1, 2005 to States or Indian tribal governments who submit the necessary justification.

While all States and many Indian tribal governments have been working on the required State Mitigation Plans, and many have been very successful, a few have encountered extraordinary difficulties in meeting the November 1, 2004 deadline. Due to the significant implications of not having an approved plan, FEMA has decided to provide an option for States and Indian tribal governments that may not be able to meet the deadline, in order to allow all States to develop effective Mitigation plans. The option allows the Governor or Indian tribal leader to ask FEMA for an extension. A Governor or Indian tribal leader would be required to submit a written request to FEMA for the extension. The written request would include the justification for the extension; the reasons the plan has not been completed; the amount of additional time needed to complete the plan; and a strategy for completing the plan. FEMA would review each request, and could grant up to a six-month extension. However, the deadline would not be later than May 1, 2005. Governors or Indian tribal leaders could request this extension at any time after publication of this interim rule.

In addition, the current rule requirement states that States, or Indian tribal governments who choose to apply directly to FEMA, must have an approved mitigation plan by November 1, 2004 to be eligible for planning or project grant funding under the Pre-Disaster Mitigation (PDM) program. This rule change allows PDM planning grants to continue to be available to States and Indian tribal governments who do not have a FEMA approved mitigation plan. Local governments, and Indian tribal governments acting as subgrantees, continue to be eligible for PDM planning grants under the current requirement. Mitigation planning is the foundation to saving lives, protecting properties, and developing disaster resistant communities. The PDM program is the primary mechanism that provides grant assistance for mitigation planning. State and Indian tribal governments will be able to apply for a PDM planning grant in order to develop or update their mitigation plan which, when approved by FEMA, will maintain their eligibility for non-emergency Stafford Act assistance.

Finally, this interim rule makes technical and conforming amendments to other sections of FEMA regulations affected by the provision of Part 201 Mitigation planning, and adjusts the general major disaster allocation for the Hazard Mitigation Grant Program (HMGP) from 15 percent to 7½ percent to be consistent with a recent statutory amendment.

FEMA encourages comments on this interim rule.

Administrative Procedure Act Statement

In general, FEMA publishes a rule for public comment before issuing a final rule, under the Administrative Procedure Act, 5 U.S.C. 533 and 44 CFR 1.12. The Administrative Procedure Act,

however, provides an exception from that general rule where the agency for good cause finds that the procedures for prior comment and response are impracticable, unnecessary, or contrary to public interest.

This interim rule provides an option for States and Indian tribal governments to request an extension to the date by which they have to develop State Mitigation Plans required as a condition of receiving non-emergency Stafford Act grant assistance. State and Indian tribal governments are currently under the assumption, consistent with the current requirements, that plans are required by November 1, 2004, whereas this interim rule provides a mechanism to extend that date up to May 1, 2005, in certain cases. It does not affect the date that local plans will be required for other programs, such as the PDM program. In order for State and Indian tribal government resources to be appropriately identified and available to complete the required plans, it is essential that the date extension be made effective as soon as possible. If the rule were delayed beyond the November 1, 2004 deadline, and a State or Indian tribal government did not have a FEMA approved mitigation plan, all entities within that State or Indian tribe would be ineligible for grants to restore damaged public facilities, Fire Management Assistance grants, and HMGP funding. The benefits of this rule will only be realized if the rule is immediately effective and available to State and Indian tribal governments prior to the existing November 1, 2004 deadline. As a practical matter, since FEMA anticipates opening the application period for the FY2004/2005 PDM program in September, this rule is necessary to ensure that FEMA can provide timely guidance to States and Indian tribal governments of their eligibility for PDM planning funds, so they do not miss the opportunity to submit the necessary applications. FEMA believes that it is contrary to the public interest to delay the benefits of this rule. In accordance with the Administrative Procedure Act, 5 U.S.C. 553(d)(3), FEMA finds that there is good cause for the interim rule to take effect immediately upon publication in the **Federal Register** in order to meet the needs of States and communities by identifying the new effective date for planning requirement under 44 CFR Part 201.

The rule also allows PDM planning grants to continue to be available to States and Indian tribal governments who do not have a FEMA approved mitigation plan. The existing deadline for States to have a FEMA approved mitigation plan is November 1, 2004, and since the next round of competition for PDM funding will occur after that deadline, it is essential that the change in the planning requirement be made effective as soon as possible. This will allow State and Indian tribal governments to apply and compete for planning grants during the next PDM competitive cycle.

Therefore, FEMA finds that prior notice and comment on this rule would not further the public interest. We actively encourage and solicit comments on this interim rule from interested parties, and we will consider them as well as those submitted on the original interim planning rule in preparing the final rule. For these reasons, FEMA believes that we have good cause to publish an interim rule.

National Environmental Policy Act

44 CFR 10.8(d)(2)(ii) excludes this rule from the preparation of an environmental assessment or environmental impact statement, where the rule relates to actions that qualify for categorical exclusion under 44 CFR 10.8(d)(2)(iii), such as the development of plans under this section.

Executive Order 12866, Regulatory Planning and Review

FEMA has prepared and reviewed this rule under the provisions of Executive Order 12866, Regulatory Planning and Review. Under Executive Order 12866, 58 FR 51735, October 4, 1993, a significant regulatory action is subject to OMB review and the requirements of the Executive Order. The Executive Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The purpose of this rule is to extend the date by which State and Indian tribal governments have to prepare or update their mitigation plans to meet the criteria identified in 44 CFR Part 201. This interim rule provides a mechanism for States and Indian tribal governments to request an extension of the November 1, 2004 deadline for State Mitigation Plans, and allows State and Indian tribal governments that do not have an approved plan to compete for PDM planning funds after the deadline. As such, the rule itself will not have an effect on the economy of more than $100,000,000, nor otherwise constitute a significant regulatory action.

The Office of Management and Budget has concluded that this rule is not significant for purposes of Executive Order 12866.

Executive Order 12898, Environmental Justice

Under Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, February 16, 1994, FEMA incorporates environmental justice into our policies and programs. The Executive Order requires each Federal agency to conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that those programs, policies, and activities do not have the effect of excluding persons from participation in our programs, denying persons the benefits of our programs, or subjecting persons to discrimination because of their race, color, or national origin.

No action that we can anticipate under the interim rule will have a disproportionately high or adverse human health and environmental effect on any segment of the population. This rule extends the date for development or update of State and Indian tribal mitigation plans in compliance with 44 CFR 201.4. Accordingly, the requirements of Executive Order 12898 do not apply to this interim rule.

Paperwork Reduction Act of 1995

This new interim rule simply provides an option to extend the date by which States have to comply with the planning requirements, and clarifies the planning requirements for the PDM program. The changes do not affect the collection of information; therefore, no change to the request for the collection of information is necessary. In summary, this interim rule complies with the provisions of the Paperwork Reduction Act of 1995, 44 U.S.C. 3506(c)(2)(A).

Executive Order 13132, Federalism

Executive Order 13132, Federalism, dated August 4, 1999, sets forth principles and criteria that agencies must adhere to in formulating and

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implementing policies that have federalism implications, that is, regulations that have substantial direct effects on the States, or on the distribution of power and responsibilities among the various levels of government. Federal agencies must closely examine the statutory authority supporting any action that would limit the policymaking discretion of the States, and to the extent practicable, must consult with State and local officials before implementing any such action.

We have reviewed this rule under Executive Order 13132 and have concluded that the rule does not have federalism implications as defined by the Executive Order. We have determined that the rule does not significantly affect the rights, roles, and responsibilities of States, and involves no preemption of State law nor does it limit State policymaking discretion.

We will continue to evaluate the planning requirements and will work with interested parties as we implement the planning requirements of 44 CFR Part 201. In addition, we actively encourage and solicit comments on this interim rule from interested parties, and we will consider them in preparing the final rule.

Executive Order 13175, Consultation and Coordination With Indian Tribal Governments

FEMA has reviewed this interim rule under Executive Order 13175, which became effective on February 6, 2001. In reviewing the interim rule, we find that it does not have "tribal implications" as defined in Executive Order 13175 because it will not have a substantial direct effect on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes. Moreover, the interim rule does not impose substantial direct compliance costs on Indian tribal governments, nor does it preempt tribal law, impair treaty rights nor limit the self-governing powers of Indian tribal governments. In fact, this interim rule relieves a burden on Indian tribal governments by allowing them to apply for PDM planning grants after the November 1, 2004 deadline.

Congressional Review of Agency Rulemaking

FEMA has sent this interim rule to the Congress and to the General Accounting Office under the Congressional Review of Agency Rulemaking Act, Public Law 104–121. This interim rule is a not "major rule" within the meaning of that Act. It is an administrative action to extend the time State and local governments have to prepare mitigation plans required by Section 322 of the Stafford Act, as enacted in DMA 2000.

The interim rule will not result in a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. It will not have "significant adverse effects" on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises. The rule is not an unfunded Federal mandate within the meaning of the Unfunded Mandates Reform Act of 1995, Public Law 104–4, and any enforceable duties that we impose are a condition of Federal assistance or a duty arising from participation in a voluntary Federal program.

List of Subjects in 44 CFR Parts 201 and 206

Administrative practice and procedure, Disaster assistance, Grant programs, Mitigation planning, Reporting and recordkeeping requirements.

■ Accordingly, FEMA amends 44 CFR, Parts 201 and 206 as follows:

PART 201—MITIGATION PLANNING

■ 1. The authority citation for part 201 continues to read as follows:

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121–5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; and E.O. 12673, 54 FR 12571, 3 CFR, 1989 Comp., p. 214.

■ 2. In § 201.3 add paragraph (c)(7) to read as follows:

§ 201.3 Responsibilities.

* * * * *

(c) * * *

(7) If necessary, submit a request from the Governor to the Director of FEMA, requesting an extension to the plan deadline in accordance with § 201.4(a)(2).

* * * * *

■ 3. Revise § 201.4(a) to read as follows:

§ 201.4 Standard State Mitigation Plans.

(a) *Plan requirement.* (1) By November 1, 2004, States must have an approved Standard State Mitigation Plan meeting the requirements of this section in order to receive assistance under the Stafford Act, although assistance authorized under disasters declared prior to November 1, 2004 will continue to be made available. Until that date, existing, FEMA approved State Mitigation Plans will be accepted. In any case, emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. Mitigation planning grants provided through the Pre-Disaster Mitigation (PDM) program, authorized under Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5133, will also continue to be available. The mitigation plan is the demonstration of the State's commitment to reduce risks from natural hazards and serves as a guide for State decision makers as they commit resources to reducing the effects of natural hazards. States may choose to include the requirements of the HMGP Administrative Plan in their mitigation plan, but must comply with the requirement for updates, amendments, or revisions listed under 44 CFR 206.437.

(2) A Governor, or Indian tribal leader, may request an extension to the plan approval deadline by submitting a request in writing to the Director of FEMA, through the Regional Director. At a minimum, this must be signed by the Governor or the Indian tribal leader, and must include justification for the extension, identification of the reasons the plan has not been completed, identification of the amount of additional time required to complete the plan, and a strategy for finalizing the plan. The Director of FEMA will review each request and may grant a plan approval extension of up to six months. However, any extended plan approval deadline will be no later than May 1, 2005.

* * * * *

■ 4. Revise § 201.6(a)(1) to read as follows:

§ 201.6 Local Mitigation Plans.

* * * * *

(a) * * *

(1) For disasters declared on or after November 1, 2004, a local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants.

* * * * *

PART 206—FEDERAL DISASTER ASSISTANCE FOR DISASTERS DECLARED ON OR AFTER NOVEMBER 23, 1988

■ 5. The authority citation for part 206 continues to read as follows:

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42

U.S.C. 5121–5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; and E.O. 12673, 54 FR 12571, 3 CFR, 1989 Comp., p. 214.

■ 6. Revise § 206.226(b) to read as follows:

§ 206.226 Restoration of damaged facilities.

* * * * *

(b) *Mitigation planning.* In order to receive assistance under this section, as of November 1, 2004 (subject to 44 CFR 201.4(a)(2)), the State must have in place a FEMA approved State Mitigation Plan in accordance with 44 CFR part 201.

* * * * *

■ 7. In § 206.432, revise paragraphs (b) introductory text and (b)(1) to read as follows:

§ 206.432 Federal grant assistance.

* * * * *

(b) *Amounts of assistance.* The total of Federal assistance under this subpart shall not exceed either 7½ or 20 percent of the total estimated Federal assistance (excluding administrative costs) provided for a major disaster under 42 U.S.C. 5170b, 5172, 5173, 5174, 5177, 5178, 5183, and 5201 as follows:

(1) *Seven and one-half (7½) percent.* Effective November 1, 2004, a State with an approved Standard State Mitigation Plan, which meets the requirements outlined in 44 CFR 201.4, shall be eligible for assistance under the HMGP not to exceed 7½ percent of the total estimated Federal assistance described in this paragraph. Until that date, existing FEMA approved State Mitigation Plans will be accepted. States may request an extension to the deadline of up to six months to the Director of FEMA by providing written justification in accordance with 44 CFR 201.4(a)(2).

* * * * *

■ 8. Revise § 206.434(b)(1) to read as follows:

§ 206.434 Eligibility.

* * * * *

(b) * * *

(1) For all disasters declared on or after November 1, 2004, local and Indian tribal government applicants for project subgrants must have an approved local mitigation plan in accordance with 44 CFR 201.6 prior to receipt of HMGP subgrant funding for projects. Until November 1, 2004, local mitigation plans may be developed concurrent with the implementation of subgrants.

* * * * *

Michael D. Brown,

Under Secretary, Emergency Preparedness and Response, Department of Homeland Security.

[FR Doc. 04–20609 Filed 9–10–04; 8:45 am]

BILLING CODE 9110–41–P

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 0, 1, and 54

[CC Docket No. 02–6; FCC 04–190]

Schools and Libraries Universal Service Support Mechanism

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: In this document, the Commission adopts measures to protect against waste, fraud, and abuse in the administration of the schools and libraries universal service support mechanism (also known as the E-rate program). In particular, the Commission resolves a number of issues that have arisen from audit activities conducted as part of ongoing oversight over the administration of the universal service fund, and we address programmatic concerns raised by our Office of Inspector General.

DATES: Effective October 13, 2004 except for §§ 1.8003, 54.504(b)(2), 54.504(c)(1), 54.504(f), 54.508, and 54.516 which contain information collection requirements that are not effective until approved by the Office of Management and Budget. The FCC will publish a document in the **Federal Register** announcing the effective date for those sections.

FOR FURTHER INFORMATION CONTACT: Jennifer Schneider, Attorney, Wireline Competition Bureau, Telecommunications Access Policy Division, (202) 418–7400.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's Fifth Report and Order, and Order in CC Docket No. 02–6 released on August 13, 2004. The full text of this document is available for public inspection during regular business hours in the FCC Reference Center, Room CY–A257, 445 Twelfth Street, SW., Washington, DC, 20554.

I. Introduction

1. In this order, we adopt measures to protect against waste, fraud, and abuse in the administration of the schools and libraries universal service support mechanism (also known as the E-rate program). In particular, we resolve a number of issues that have arisen from audit activities conducted as part of ongoing oversight over the administration of the universal service fund, and we address programmatic concerns raised by our Office of Inspector General (OIG). First, we set forth a framework regarding what amounts should be recovered by the Universal Service Administrative Company (USAC or Administrator) and the Commission when funds have been disbursed in violation of specific statutory provisions and Commission rules. Second, we announce our policy regarding the timeframe in which USAC and the Commission will conduct audits or other investigations relating to use of E-rate funds. Third, we eliminate the current option to offset amounts disbursed in violation of the statute or a rule against other funding commitments. Fourth, we extend our red light rule previously adopted pursuant to the Debt Collection Improvement Act (DCIA) to bar beneficiaries or service providers from receiving additional benefits under the schools and libraries program if they have failed to satisfy any outstanding obligation to repay monies into the fund. Fifth, we adopt a strengthened document retention requirement to enhance our ability to conduct all necessary oversight and provide a stronger enforcement tool for detecting statutory and rule violations. Sixth, we modify our current requirements regarding the timing, content and approval of technology plans. Seventh, we amend our beneficiary certification requirements to enhance our oversight and enforcement activities. Eighth, we direct USAC to submit a plan for timely audit resolution, and we delegate authority to the Chief of the Wireline Competition Bureau to resolve audit findings. Finally, we direct USAC to submit on an annual basis a list of all USAC administrative procedures to the Wireline Competition Bureau (Bureau) for review and further action, if necessary, to ensure that such procedures effectively serve our objective of preventing waste, fraud and abuse.

II. Fifth Report and Order

2. Since the inception of the schools and libraries support mechanism, schools and libraries have been subject to audits to determine compliance with the program rules and requirements. Audits are a tool for the Commission and USAC, as directed by the

Appendix J.4:
Interim Final Rule – October 31, 2007

The following 32 pages are the Federal Register, dated October 31, 2007.

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Federal Register

Wednesday,
October 31, 2007

Part II

Department of Homeland Security

Federal Emergency Management Agency

44 CFR Parts 59, 61, 78, et al.
Flood Mitigation Grants and Hazard Mitigation Planning; Interim Rule

61720 Federal Register / Vol. 72, No. 210 / Wednesday, October 31, 2007 / Rules and Regulations

DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

44 CFR Parts 59, 61, 78, 79, 80, 201, and 206

[Docket ID FEMA–2006–0010]

RIN 1660–AA36

Flood Mitigation Grants and Hazard Mitigation Planning

AGENCY: Federal Emergency Management Agency, DHS.

ACTION: Interim rule.

SUMMARY: This interim rule implements certain provisions of the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 to provide new incentives for States and communities to mitigate the effects of flood damage to severe repetitive loss properties by creating the Severe Repetitive Loss program (SRL), and through reduced cost-share requirements in the existing Flood Mitigation Assistance program (FMA). In addition, the rule ensures that the FMA planning requirements are consistent with other applicable regulations, and streamlines the planning requirements for Indian tribal governments. It also describes requirements for the acquisition of property for open space with mitigation funds, including under SRL and FMA. Finally, this interim rule makes technical changes to clarify current practices and implements conforming amendments to reflect current authorities, including the recent change to the standard amount of authorized Hazard Mitigation Grant Program assistance.

DATES: *Effective Date:* December 3, 2007.

Comment Date: Comments on the rule including the new Paperwork Reduction Act collections are due on or before December 31, 2007.

Applicability Date: Part 78 will continue to apply to the administration of funds awarded for which the application period opened prior to December 3, 2007. Parts 79 and 80 will apply to the administration of funds awarded for which the application period opens on or after December 3, 2007, except that § 80.19 will apply as of December 3, 2007 regardless of the original project date.

ADDRESSES: You may submit comments, identified by Docket ID FEMA–2006–0010, by one of the following methods:

Federal eRulemaking Portal: *http://www.regulations.gov.* Follow the instructions for submitting comments.

E-mail: *FEMA-RULES@dhs.gov.* Include Docket ID FEMA–2006–0010 in the subject line of the message.

Fax: 866–466–5370.

Mail/Hand Delivery/Courier: Rules Docket Clerk, Office of Chief Counsel, Federal Emergency Management Agency, Room 835, 500 C Street, SW., Washington, DC 20472.

FOR FURTHER INFORMATION CONTACT: Cecelia Rosenberg, Mitigation Directorate, Federal Emergency Management Agency, 500 C Street, SW., Washington DC 20472, (phone) 202–646–3321, (facsimile) 202–646–2719, or (e-mail) *cecelia.rosenberg@dhs.gov.*

SUPPLEMENTARY INFORMATION:

Request for Comments

FEMA encourages public participation in this rulemaking. Comments will be most helpful if they state a particular section (or sections) of the rule, and offer specific proposals for change, as needed. All submissions received must include the agency name and docket ID (FEMA–2006–0010). Regardless of the method used for submitting comments or material, all submissions will be posted, without change, to the Federal eRulemaking Portal at *http://www.regulations.gov,* and will include any personal information you provide. Therefore, submitting this information makes it public. You may wish to read the Privacy Act notice that is available on the Privacy and Use Notice link on the Administration Navigation Bar of *www.regulations.gov.*

All comments received, as well as this document are available on the public docket for this rulemaking. For access to the docket, go to the Federal eRulemaking Portal at *http://www.regulations.gov.* Submitted comments may also be inspected at FEMA, Office of Chief Counsel, Room 835, 500 C Street, SW., Washington, DC 20472.

At this time, FEMA does not anticipate it will hold a public meeting for this rulemaking project.

Table of Abbreviations

BC—Benefit Cost
BCA—Benefit Cost Analysis
CAP–SSE—Community Assistance Program–State Support Services Element
CRS—Community Rating System
DHS—Department of Homeland Security
FEMA—Federal Emergency Management Agency
FIRM—Flood Insurance Rate Map
FIS—Flood Insurance Study
FMA—Flood Mitigation Assistance
HMGP—Hazard Mitigation Grant Program
ICC—Increased Cost of Compliance
NEPA—National Environmental Policy Act of 1969
NFIA—National Flood Insurance Act of 1968
NFIF—National Flood Insurance Fund
NFIP—National Flood Insurance Program
OMB—Office of Management and Budget
PDM—Pre-disaster Mitigation
POC—Point of Contact
PRA—Paperwork Reduction Act of 1995
RFC—Repetitive Flood Claims
SHMO—State Hazard Mitigation Officer
SQA Net—Simple and Quick Access Net
SRL—Severe Repetitive Loss
USACE—United States Army Corps of Engineers

I. Background

This rule implements provisions of the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (the Act), Public Law 108–264, 118 Stat. 714, found at 42 U.S.C. 4102a. The Act amends the National Flood Insurance Act of 1968 to provide new programs and incentives for States and communities to mitigate flood damage to severe repetitive loss properties. Severe repetitive loss properties are residential properties covered under a contract for flood insurance that have incurred flood-related damage (i) for which 4 or more separate claims payments have been made under flood insurance coverage, with the amount of each such claim exceeding $5,000, and with the cumulative amount exceeding $20,000; or (ii) for which at least 2 separate claims payments have been made under such coverage, with the cumulative amount exceeding the value of the property. Pursuant to the Act, this interim rule implements the new Severe Repetitive Loss (SRL) program, which is authorized by the Act until September 30, 2009, and amends the existing Flood Mitigation Assistance (FMA) program to meet the requirements of the Act. In addition, FEMA is modifying the mitigation planning regulations to minimize the burden on State, local, and Indian tribal governments, to streamline the planning process, and to ensure consistency in the local planning requirements that apply to all FEMA mitigation programs, including the SRL and FMA programs.

Also, effective October 4, 2006, section 684 of the Post-Katrina Emergency Management Reform Act of 2006, Public Law 109–295, amended the amount of Hazard Mitigation Grant Program (HMGP) assistance authorized for States with an approved Standard State Mitigation Plan from 7.5 percent to 15 percent of the total estimated Federal assistance (excluding administrative costs) provided for a major disaster under FEMA Public and Individual Assistance programs for amounts spent up to $2 billion, and established a sliding scale for HMGP assistance, based on the amount of the total estimated

Federal assistance. This interim rule amends FEMA's regulations to reflect this statutory change.

II. Discussion of Interim Rule

The SRL grant program was created pursuant to Section 1361A of the National Flood Insurance Act of 1968 (NFIA, or "the Act"), 42 U.S.C. 4030, as amended by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, Public Law 108–264, with the goal of reducing flood damages to SRL properties. The long-term goal of the SRL program is to reduce or eliminate claims under the NFIP through project activities that will result in the greatest savings to the NFIF in the shortest period of time.

The new program, the SRL program, is authorized through September 30, 2009 and is designed to provide mitigation assistance to address properties that have experienced repetitive flood losses and that are insured under the NFIP. The SRL program focuses on a subset of all repetitive flood loss properties: Those residential properties with a high frequency of losses or a high value of claims. The mitigation of losses sustained by these properties, through projects such as buyouts, elevation, relocation, or floodproofing, will produce savings for policyholders under the NFIP and for Federal taxpayers through reduced flood insurance losses and reduced Federal disaster assistance. The program relies on a strategy of making mitigation offers to these severe repetitive loss property owners and shifting more of the burden of recovery costs to those property owners who decline the offer of mitigation assistance, and choose to remain vulnerable to repetitive flood damage, by incrementally increasing their rates for flood insurance. As established by Congress, the sale of flood insurance under the NFIP is subject to the rules and regulations of FEMA. FEMA has elected to have State-licensed insurance companies' agents and brokers sell flood insurance to consumers. Those whose rates are increased will be eligible to appeal this increase via an independent third party from a list based on professional qualifications impartially developed by FEMA's Alternative Dispute Resolution (ADR) office. To reduce costs, the property owner may request that the Administrator substitute a reviewer from FEMA's ADR office for the independent third party.

With respect to grant programs, FEMA has actively engaged in flood mitigation through its HMGP, FMA, PDM and Repetitive Flood Claims (RFC) programs. Each of these programs was created under different legislative authorities, and as a result, have varied impacts on reducing the nation's inventory of the most floodprone structures. What has not existed is a program that specifically addresses and provides funds for the elimination of, or reduction of risk to, the subset of those properties that create the largest impact on claims paid from the NFIF. Most of these properties existed before the inception of the NFIP and its associated floodplain management standards, and are thus eligible for discounted insurance rates. Furthermore, none of these other programs feature a formal mitigation offer process whereby insurance rates may be increased if the property owner declines the offer.

FEMA intends to focus the SRL program in communities and on property owners who choose to participate in the program. This will maximize the benefits of the program, while minimizing adverse impacts on communities and property owners. The program will provide an opportunity for many property owners to address recurring flooding problems, and reduce the impact of these events.

The legislation also provides an incentive to mitigate damage to severe repetitive loss properties through reduced non-Federal cost-share requirements for the SRL and FMA programs (from 25 percent to 10 percent) for projects in States with approved State Mitigation Plans that meet the additional repetitive loss requirements. The reduced cost share would be available only for projects that address severe repetitive loss properties.

While the SRL and FMA programs will be implemented as separate programs, with different funding accounts, they are similar in their goals and purpose. FEMA has included both of these programs in one implementing regulation to ensure as much consistency as reasonable between the programs and to limit the confusion around program implementation, since both programs will likely be managed by the same State agency staff.

The final rule implementing the FMA program is published elsewhere in today's **Federal Register**. (It follows an interim rule published March 20, 1997 at 62 FR 13346.) *See* 44 CFR part 78. This part will continue to be used to implement the FMA program for all grants awarded for which the application period opened prior to December 3, 2007.

This new interim rule creates a new part (part 79, with details specific to acquisition projects at a new part 80), that restates the requirements for the existing FMA program in a format more consistent with the approach to all of FEMA's mitigation grant programs. Part 79 will implement the FMA program for all grants awarded for which the application period opens on or after December 3, 2007.

Part 79 also implements a change to the cost share available to States under the FMA program if their approved mitigation plan meets certain criteria, described herein in § 201.4. States would be eligible for a reduced cost share if their mitigation plan addresses actions related to reducing the risk to repetitive loss properties that they have already taken, and those actions that they intend to take.

The requirements for the new SRL program are incorporated into this rule. In addition, this interim rule brings the FMA program regulations into conformance with current policies, and ensures better conformance to existing grants management requirements. In authorizing the SRL program in section 102 of the Act, and amending the FMA program in section 103 of the Act, Congress directed FEMA to "provide assistance for properties in the order that will result in the greatest amount of savings to the National Flood Insurance Fund in the shortest period of time" and to provide assistance for activities that are "in the best interest of the National Flood Insurance Fund." FEMA has concluded that Congress' stated goals for the two programs are similar. Therefore, there is no substantial difference in how FEMA will determine the funding priority for the two programs.

As an additional aspect of implementing these programs, this rule includes a new part (part 80) which describes the requirements and procedures for open space property acquisition which applies to the SRL and FMA programs, as well as all FEMA hazard mitigation assistance programs. In light of the Act's requirements regarding property acquisition, FEMA determined that a central reference point for all mitigation grant program property acquisitions would make the programs more consistent overall and easier to implement.

Elsewhere in today's **Federal Register**, FEMA published a final rule implementing section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165. (It follows an interim rule published February 26, 2002 at 67 FR 8844.) The final rule identified the requirements for State, Tribal, and local mitigation plans. This new interim rule streamlines the mitigation planning requirements contained in that rule by making the

FMA planning requirements, currently implemented in a separate part of the regulation at § 78.5, consistent with the mitigation planning requirements outlined in part 201. This will ensure that local governments can comply with one set of mitigation planning requirements in order to be eligible to apply for all FEMA mitigation project grant funding, including the FMA and SRL programs.

In addition, this interim rule streamlines the roles and responsibilities of Indian tribal governments in mitigation planning. In the preexisting regulations, Indian tribal governments were given the option of preparing either a State-level Mitigation Plan, or a Local-level Mitigation Plan, depending on whether or not they intended to apply directly to FEMA as a grantee or whether they would apply through the State as a subgrantee. FEMA has found, however, that neither of these options has sufficiently met the needs of the Indian tribal governments.

To address this problem, this interim rule establishes a specific planning requirement for Indian tribal governments that recognizes some of the unique aspects of these governments. The rule establishes Tribal Mitigation Plans for plans prepared and approved after December 3, 2007. The rule provides that plans prepared and approved under the preexisting rule, under either the State or local requirements, would also be recognized as Tribal Mitigation Plans. These older plans, however, would be required to meet the revised criteria when the original approval expires. Most Indian tribal governments fit the local planning model, in that they do not have sub-jurisdictions as States do; however, if they are grantees, the rule would require that they provide the capability assessment and identification of funding options that are listed in the State plan requirements. This rule combines the appropriate aspects of these planning requirements into one section, with a single plan required for Indian tribal governments.

This rule also implements section 106 of the Act, which modifies the insurance rates for property leased from the Federal government "located on the river-facing side of any dike, levee, or other riverine flood control structure, or seaward of any seawall or other coastal flood control structure." These properties will be charged the full actuarial insurance premium rates.

Finally, this rule makes conforming amendments, as well as technical corrections to clarify current authorities and practices. This rule thus makes revisions to the amount of assistance available to States under the Hazard Mitigation Grant Program in § 79.4 as a result of changes made to the Stafford Act in the Post-Katrina Emergency Management Reform Act passed in October 2006.

III. Solicitation of Public Comments

Section 102 of the Act required FEMA, within 90 days of the Act, to consult with State and local officials in carrying out the development of procedures for the distribution of funds to States and communities to carry out eligible mitigation activities. To meet this requirement, FEMA published a **Federal Register** notice on September 15, 2004, at 69 FR 55642, to initiate consultation with State and local officials, as well as members of the public. In the notice, FEMA solicited responses to the following questions: What key factors FEMA should consider in developing the SRL program; the parameters that FEMA should use to define severe repetitive loss for multifamily structures; the process FEMA should use to notify property owners that their property is considered a severe repetitive loss property by virtue of the legislative definition; the criteria FEMA should use to allocate funds to States, including whether or not there should be caps on the funding as is the case under the FMA program; the criteria that should be used to approve State mitigation plans to take advantage of the increased Federal cost share; the criteria FEMA should use to determine projects that will result in the greatest amount of savings to the National Flood Insurance Fund (NFIF); and, what types of assistance should FEMA provide to States and communities when making offers to owners of SRL properties. Interested parties initially had until November 30, 2004, to submit written comments in response to these questions. FEMA extended the deadline for comments until December 7, 2004. FEMA received 26 written comments. Eight of those comments were received from States, ten from communities and eight were from associations. On November 17, 2004, as part of the consultation process, FEMA held a meeting in Washington DC with representative officials of State and local governments, organizations representing emergency management, floodplain management, and insurance professions, and other interested parties.

FEMA reviewed and considered all oral and written responses as FEMA developed the SRL grant program and this interim rule. FEMA's questions, the public comments, and FEMA's responses to the public comments are listed below.

Question 1: What key factors should FEMA consider in developing the Pilot Program for Severe Repetitive Loss Properties under section 1361A?

Multiple commenters stated that the program should be administered by the States, similar to existing FEMA mitigation grant programs, including FMA and Pre-Disaster Mitigation (PDM). However, once commenter wrote that the existing programs take too long to implement.

Multiple commenters stated that funding allocations should be disbursed based on the location of SRL properties (those with the greatest drain, greatest losses, most number of SRL properties, *etc.*), rather than disbursing funds evenly among States. Multiple comments indicated that the ranking of properties should ensure that those properties with the most loss claims should be addressed first. Multiple commenters stated that allocations should also consider the State and/or community capability, defined as having plans in place, past performance shown to mitigate repetitive loss properties, projects lined-up, and/or matching funds available. Multiple comments also indicated that funds should be prioritized to those communities with experience managing FEMA funds and/or with matching funds and projects lined-up. Multiple commenters indicated that reallocations should occur quickly to move funds to communities that need them.

A considerable number of commenters stated that the data used for determining those properties that meet the SRL property definition was not accurate and needed to be updated/corrected, and that real-time claim reporting was needed.

Multiple commenters stated that the parameters for demolition rebuild projects need to be clarified. Multiple commenters stated that property owners, communities, and States must be able to determine the most appropriate mitigation measures.

Multiple commenters stated that there needs to be clear definitions for "notices" and "offers," and that both need to include clear details of the appeals process and insurance implications. Further, multiple commenters stated that there needs to be a clear description of the property value in an offer.

Multiple commenters stated that FEMA would need additional staff with National Flood Insurance Program (NFIP) expertise to manage the program.

Multiple commenters stated that the Increased Cost of Compliance (ICC) should be made available for match, or indicated that many communities would not be able to provide the cost share.

Multiple commenters indicated that the program should focus on cost effectiveness, and Benefit/Cost analysis in particular.

Multiple commenters indicated that the planning requirement should be clearly defined, and multiple commenters suggested a plan be required to prioritize funding.

Multiple commenters requested that a streamlined, simple, or tailored application and grants management process be implemented; and that guidance needs to be clear regarding the roles and responsibilities of FEMA, States and communities.

Multiple commenters stated that mitigation funds should be directed to only those covered under an NFIP policy. Multiple respondents indicated that insurance policy writers needed education and awareness/outreach, both to understand the program and the ICC benefits.

FEMA's Response

In response to comments regarding administration of the program by the States, the new Part 79 added in this rulemaking deals with the States' program administration responsibilities, which are being designed similar to the way FEMA's other mitigation grant programs operate. In response to comments regarding the accuracy of data used to identify SRL properties, insurance and claims information for properties validated as meeting the legislative characteristics of SRL are now available to States on a web-based site (SQA Net), which is updated monthly. Furthermore, regulations and program procedures clearly describe the notice, offer, and appeals processes. Program procedures have been developed to define the parameters and limitations imposed for the demolition/rebuild activity type. State, local and tribal mitigation plans will be required and are described in this interim rule; allocation of funds will be based on the number of SRL properties within each State, in accordance with the authorizing legislation; it is also described in this interim rule. Awards shall be prioritized in order of the greatest savings to the National Flood Insurance Fund, by virtue of the Benefit Cost Ratio.

With respect to concerns over the accuracy of claims data, FEMA has continually worked to update the claims information data to increase accuracy, including field verification of property information when necessary. Furthermore, property owners can discuss errors in their claim history with NFIP representatives. As described under the response to Question 3, a property owner is given a toll-free number to call if they have questions about their designation as an SRL property.

With respect to concerns regarding the details of receiving a mitigation offer, particularly for an acquisition, FEMA has developed an offer letter that will contain information regarding the mitigation project type; the amount of the purchase offer, including the basis and methodology for calculating the purchase offer, and the final offer amount that reflects applicable deductions; notification that participation in the SRL program is voluntary; the amount of time the property owner has to accept or reject the offer; the right of the property owner to appeal the increase in flood insurance rates if they refuse the offer; a summary of the consultation process, and other pertinent information.

In response to the comment that funds should only be directed to those covered under a NFIP policy, the definition of a SRL property includes the requirement that the property is covered by a NFIP policy.

ICC coverage under the Standard Flood Insurance Policy (SFIP) provides for the payment of a claim to help pay for the cost to comply with State or community floodplain management laws or ordinances from a flood event in which a building has been declared substantially damaged or repetitively damaged. When an insured building is damaged by a flood and the State or community declares the building to be substantially or repetitively damaged, ICC coverage will help pay for the cost to elevate, floodproof, demolish, or relocate the building up to a maximum benefit of $30,000. This coverage is in addition to the building coverage for the repair of actual physical damages from flood under the SFIP. ICC claims payments from previous flood events may be used to meet the non-Federal cost share requirements, as long as the period for making such a claim remains open.

Question 2: What parameters should FEMA use to define severe repetitive loss for multifamily structures consisting of 5 or more residences?

Multiple commenters stated that the multifamily properties definition should be the same as the single-family properties definition. However, several alternative options to define multifamily properties were suggested including:

- The ratio of cumulative loss versus replacement cost;
- The determination of substantial damage for a structure;
- A proportionate definition based on the number of units; or
- Five or more residences covered under a single contract for flood insurance that have had 4 or more claims, each exceeding 6.25 percent of the replacement value of the structure, with cumulative payments exceeding 25 percent of the replacement value. Parameters to consider included total damages, number of losses, dollar loss per claim, and low-rise versus high-rise structures.

Multiple commenters agreed that at least 2 claims payments that cumulatively exceed the replacement value of the structure (as stated in Section 1361A(b)(2) of the Act) should apply to single family as well as multifamily properties.

Multiple commenters indicated that multifamily properties should follow single-family properties as the priority for mitigation funding.

Multiple commenters indicated that Benefit Cost Analysis data applied to multifamily projects consider more than building damages, but also content damages, in order to make multifamily projects cost-effective.

FEMA's Response

FEMA evaluated two options in selecting the definition of "multifamily property" for the purposes of this interim final rule. The first option was keeping the same claims thresholds as defined in the Act for single family properties. The second option FEMA evaluated was defining "multifamily property" as reflecting the increased property values and number of units typically associated with multifamily properties. FEMA analyzed claim information for multifamily properties and determined that a claim history including four separate claims of $25,000 with the cumulative amount of such payments exceeding $100,000 or having at least two separate claims payments with the cumulative amount of such claims exceeding the value of the property would be reasonable criteria to select for the meaning of the term "severe repetitive loss" for multifamilty properties.

Based on evaluating options, FEMA determined that selecting the first option allowed properties for which a relatively inexpensive mitigation solution may be available (such as elevating HVAC equipment or eliminating finished enclosures below

elevated floors) to be eligible for SRL program funds. These minimal mitigation steps may also lead to a diminished need for disaster housing as well. This definition was chosen because it allows for the maximum number of multifamily residences to be eligible for funding consideration under the SRL program by virtue of meeting the definition of an SRL property.

Thus, "multifamily property" is defined in part 79 as "a property consisting of five or more residences". Furthermore, the definition of "Severe Repetitive Loss" as defined in part 79 of this interim rule uses the same parameters for multifamily properties as for single family.

Question 3: What process should FEMA use to notify property owners that their property is considered a severe repetitive loss property as defined by the statute?

A considerable number of commenters stated that notices to property owners needed to be coordinated with, sent concurrently to, or shared with State, Tribal and local communities. A considerable number of respondents stated that FEMA should be responsible for notifying property owners, and multiple commenters indicated that this notice should be in writing, either through certified or registered mail.

A considerable number of respondents stated that the notice needed to include clear, non-legal, plain English language that described the notice, the program, the determination, the process, appeals, *etc.* Multiple commenters suggested a standard form or one-page document explaining the program. Furthermore, multiple responses wrote that the notice be provided with the property owner's insurance policy renewal to link the program to insurance coverage. Multiple commenters stated that disclosure in property records, and real estate transactions needed to be enforced.

FEMA's Response

FEMA's Special Direct Facility (SDF) is operated by the NFIP's Servicing Agent. It has been in existence since 2000, when FEMA determined it needed to manage more closely the loss adjustments to the subset of repetitive loss properties that had the highest number of losses. For the same reasons, property owners whose claims history meets the SRL criteria have been receiving letters approximately 150 days before their policy is renewed that identify their properties as SRL properties. In addition to managing loss adjustments, the SDF will manage the increase in premiums should the property owner decline an offer of mitigation. The letters also explain that their flood insurance policy will be transferred to FEMA's Special Direct Facility (if the policy is not already being serviced there). These letters are also sent to the property owner's flood insurance agent, and to their mortgage lender. This letter provides a toll-free number that the property owner can call if they have questions about their designation as an SRL property, or any other questions about the transfer of their policy.

Question 4: What criteria should FEMA consider when allocating funds to States and/or communities under the Pilot Program? Should FEMA consider base allocations for States with higher numbers of severe repetitive loss properties?

Multiple commenters stated that funds should target those properties with the most losses to the NFIF, therefore targeting the most egregious properties regardless of location. A considerable number of commenters indicated that allocations should be based on the total number of SRL properties per State. Finally, multiple commenters indicated that base allocations for those States with high numbers of SRL properties should be considered.

Multiple commenters stated that any allocation should provide enough to cover the cost of at least 1 project or some acceptable number of properties, and multiple responses stated that allocations should consider variations in costs to mitigate.

Commenters wrote that additional considerations for allocation included capability factors, such as project readiness, leveraged local investment, past mitigation grant performance, NFIP compliance, and Community Rating System (CRS) ratings. Multiple commenters suggested FEMA base allocations on approved mitigation plans.

Commenters suggested several alternative bases for allocations, including: Insured values or market values, or values based on value of future losses.

FEMA's Response

Subpart 79.4 of this interim rule provides for allocations to be based upon the percentage of the total number of SRL properties located within each State, as per the authorizing legislation, Flood Insurance Reform Act of 2004, Public Law 108–264. States with little or no allocation will be able to apply for 10 percent of the total funds appropriated in any fiscal year, provided that the State or Tribal applicant has at least 1 SRL property. State allocations will be large enough to permit the implementation of at least 1 project.

FEMA considered several options in evaluating how to administer allocations based on the percentage of the total number of SRL properties located within each State, as per the authorizing legislation, Flood Insurance Reform Act of 2004, Public Law 108–264. States with little or no funding allocation will be able to apply for 10 percent of the total funds made available under SRL in any fiscal year, provided that the State or Tribal applicant has at least one SRL property. The options evaluated and not accepted included small allocations to all States; larger allocations to a limited number of States with numerous SRL properties; and a variety of allocation scenarios for States with a limited number of SRL properties.

Ultimately FEMA decided on an allocation that could be adjusted annually based on the number of SRL properties in a particular State. FEMA would evaluate the point at which it is more beneficial for a State to compete for the 10 percent set-aside than to receive an allocation that was insufficient. This allocation approach provided the necessary funds to accomplish mitigation projects. The average flood mitigation project funded under FEMA's mitigation programs is approximately $70,000–$100,000.

The legislation also required a 10 percent set-aside of the grant funds for States receiving little or no allocation. FEMA determined that "little or no allocation" meant the point at which it was more beneficial for a State to compete for appropriate funds to accomplish mitigation activities than to receive a small allocation, or one which is below the $70,000-$100,000 average mitigation project cost. The allocation option that FEMA selected is a reasonable approach to both allocations and the 10 percent set-aside.

Question 5: Should there be caps on Pilot Program funding for States and communities similar to Flood Mitigation Assistance program funds? If so, how would the cap amounts be determined?

The overwhelming response was there should be no caps on funding.

Multiple commenters requested FEMA remove the caps on funding currently implemented under the FMA program as well.

FEMA's Response

At the commenters' request, FEMA has not imposed any funding caps within the SRL program. FMA caps are not changed by this rule, since they are statutorily based.

Question 6: What criteria should FEMA use to review and approve State mitigation plans consistent with 44 CFR part 201 to ensure that they contain recommended actions to mitigate severe repetitive loss properties?

Multiple commenters indicated that FEMA should be as flexible as possible in the criteria used to review and approve plans, including simple goals and strategies that acknowledge properties at risk.

Multiple commenters indicated that mitigation is local, and therefore States should not be held accountable for local strategies. Multiple commenters suggested that existing State or local plans should be accepted, particularly given the limited timeframe of authority for the Pilot program.

Suggestions, if a plan is required, included providing for amendments to existing plans and approving projects while the amendments are being reviewed. Multiple commenters suggested that criteria to be reviewed focus on capability factors such as plan implementation, past performance and effort, not the number of severe repetitive loss properties mitigated. Multiple commenters were concerned that the lack of accuracy in the repetitive loss database may affect their ability to meet the planning requirements related to severe repetitive loss property mitigation. Discrepancies in claims information and property values as shown in the repetitive loss database may result in not showing certain properties as being SRL properties, yet those properties may in fact have been mitigated, "counting" towards a SRL property mitigated. Similarly, database discrepancies may show a property as being SRL, when in fact it may not be. Therefore, if the property has not been mitigated, it may count "against" the state's efforts to indicate mitigation of SRL properties in their state plan.

Several commenters stated that disclosure of offer and insurance information needed to be a part of the property's permanent record, and information needs to be conveyed to the existing and new homeowners regarding the mitigation offer. Finally, multiple commenters indicated that there were too many "lists" between repetitive loss and severe repetitive loss.

FEMA's Response

In this interim rule, FEMA requires states to have an approved State Mitigation Plan meeting the requirements of §§ 201.4 or 201.5 to qualify for the reduced non-federal cost share. The plan must satisfy all standard requirements but also identify specific actions the state has taken to reduce the number of repetitive loss properties; specify how the state intends to reduce the number of such properties; and describe the state's strategy to ensure that local jurisdictions with SRL properties take actions to reduce the number of these properties, including the development of local mitigation plans. Amendments to currently approved State plans will be acceptable. However, at the time of the next required plan update, the amendment must be incorporated into the plan and adopted as part of the plan. Until such time as the amendment is approved by FEMA, grants could be awarded; but the lower non-Federal cost share would not be available until the amendment is approved. While State and local plans must contain different types of data, the two types of planning efforts must be linked via common mitigation goals and objectives.

With respect to the number of repetitive loss lists, FEMA has made available a separate list of SRL properties on SQA Net, which is available to State NFIP Coordinators and State Hazard Mitigation Officers via FEMA Regional Offices. SQA Net is a secure web portal that enables access of data from the NFIP flood insurance database. Data is updated monthly. In pursuing a repetitive loss strategy, FEMA developed a definition of repetitive loss structures, and maintained a list of those structures. A target repetitive loss list was also developed, which consisted of a subset of the list of repetitive loss properties that had the highest number of losses. FEMA does not consider these lists to be excessive, and finds that each serves a valuable purpose.

Question 7: What criteria should FEMA use to make the determination that a State has taken actions to reduce the number of severe repetitive loss properties in its communities?

Commenters characterized criteria in terms of qualitative and quantitative criteria, as well as procedures for developing and reviewing plans.

Qualitative factors suggested include the effort (that is, the number of offers made or the most egregious properties approached, but not necessarily accepted or mitigated); documentation that any actions were taken; partnerships with other programs and funding sources; level of outreach; and strength of the Community Assistance Program-State Support Services Element (CAP–SSSE). This program provides funding to States to provide technical assistance to communities in the National Flood Insurance Program (NFIP) and to evaluate community performance in implementing NFIP floodplain management activities. Quantitative factors proposed include number of properties mitigated, higher regulatory standards, number of Community Rating System (CRS) communities, number of repetitive loss properties, other programs in place, a plan in place, prioritization of properties, leveraging of matching funds, and others.

Multiple commenters stated that States with approved mitigation plans in place should not have to submit new plans or "prove" that actions have been taken. Conversely, multiple commenters suggested that States submit a report or other documentation each year to show actions taken.

FEMA's Response

Section § 201.5(c)(3)(v) of this interim rule addresses the State mitigation planning requirements for meeting this provision. The regulation requires documentation of actions already taken that specifically focused on SRL properties. Because the mitigation measures for each State and community could vary widely depending on the factual circumstances of each state and community, FEMA opted not to set fixed criteria.

With respect to submitting plans and updates, since most States already have approved mitigation plans, they may only need to make limited revisions or clarifications to the plan that focus on this subset of properties. The entire plan will not need to be resubmitted, only the amendment that pertains to the SRL mitigation actions. Finally, at a minimum, states are required to review and update their mitigation plans every 3 years. Although they may opt to submit revisions annually, showing the mitigation actions taken, FEMA believed an annual requirement to be overly burdensome.

Question 8: What criteria should FEMA use to determine projects that will result in the greatest amount of savings to the National Flood Insurance Fund? How should the criteria relate to current FEMA procedures for determining cost effectiveness?

A considerable number of commenters stated that Benefit Cost

Analysis (BCA) should be used to determine the greatest amount of savings to the NFIF. Multiple commenters indicated that the benefit cost analysis should be waived for all SRL properties or for those with 2 or more claims that cumulatively exceed the property value. Additional suggestions for the use of benefit cost methodologies included providing clear guidance, a request that it be simple to use, and that it allow FEMA and applicants to consider all factors, not just damages. Commenters provided alternative criteria for ranking properties such as: claims paid; claims relative to property values; greatest cost savings to insured properties mitigated; or cost effectiveness based on insurance premium costs.

Multiple commenters expressed that the term "property value" needed to be defined clearly, whether based on appraisal value, replacements value, insured value, or fair market value.

FEMA's Response

All projects for which FEMA provides funding must be cost effective. For the purpose of determining the amount of savings to the NFIF as a result of the project, FEMA agreed with the commenters and used a Benefit Cost Ratio. In this rule, FEMA determines an SRL property by the cumulative amount of claims when 4 or more claims have been made, or by the market value of the property in relation to the cumulative amount of two or more claims when that cumulative amount exceeds the market value (§ 79.2(g)).

Instead of using the term "property value", FEMA used the term "market value" and defined it in § 79.2. FEMA defined market value as the amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the valuation, after a reasonable exposure time on the open market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the valuation.

Question 9: What types of assistance do States and communities want from FEMA when making offers to owners of severe repetitive loss properties?

Multiple commenters asked for funding for States and communities to assist with administrative costs, technical assistance needs, staff, and application development as part of making offers to owners of SRL properties. State and community commenters also stated that legal assistance prior to initiating offers and negotiating with owners would assist them.

A considerable number of commenters stated that the data supporting the SRL properties list needed to be updated for accuracy, including validating the data for addresses, names, claims history, and property values. In addition, commenters requested access to the database, SQA Net, flexibility to add structures or validate data, and verifying premiums. Commenters also suggested FEMA maintain a single national database for projects, and provide information on the true actuarial rate in case of refusal at the time of the offer.

Multiple commenters stated that adequate number of FEMA staff needed to be available to manage the program, and that the staff needs to be trained in NFIP and FEMA mitigation programs.

Multiple commenters stated that assistance was needed to notify property owners of the consequences of not accepting offers. The commenters also stated that a simple FEMA handout or document explaining the insurance repercussions and the appeals process would be extremely helpful. Multiple commenters also requested FEMA describe the tax implications of accepting mitigation funds.

Multiple commenters requested training be made available or improved for the program, and specifically identified insurance agents as a target for training.

FEMA's Response

As with our other grant programs, administrative costs are available to applicants and subapplicants as a percentage of the grant award, once the grant is awarded. Furthermore, applicants and subapplicants may be reimbursed for pre-award costs for activities directly related to the development of the project proposal. These costs can only have been incurred during the open application period. These criteria are detailed in § 79.8 of this interim rule.

Certain legal expenses may be considered eligible applicant and/or subapplicant management cost activities when associated with: solicitation, review and processing of the SRL subapplications and subgrant awards, obtaining pre-award consultation agreements from SRL property owners, and staff salary costs directly related to performing the activities above. All management cost activities must be in conformance with 44 CFR part 13, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments and applicable program guidance.

Applicant management costs are limited to up to 10 percent of the grant award and subapplicant management costs are limited to up to 5 percent of the grant award. Eligible management costs incurred prior to the grant award, but after the SRL application period has opened are identified as pre-award management costs. Costs incurred with respect to pre-award activities associated with project implementation are not eligible.

Data on SRL properties is available on the SQA Net to State NFIP Coordinators and State Hazard Mitigation Officers. This data is being validated and updated continuously. Over one third of the properties identified as having a data anomaly have been validated. New information is published each month on SQA Net. Information on the insurance premium rate increases for property owners refusing the mitigation offer will be provided during the consultation. Project-related data for the SRL program will be housed within the same database that is maintained for all other Pre-Disaster Mitigation (PDM) grant programs.

Only FEMA Regional and disaster related staff as well as State personnel, have been granted access to the repetitive loss and SRL data available to SQA Net. Several new features have been added to SQA Net recently including the ability to submit requested updates to repetitive loss records electronically over the Internet. The ability to search for claims records and to view former and active policy records via SQA Net is expected to be in place by Spring 2008. With respect to allowing local government access to SQA Net, there are concerns regarding potential security issues and the increased possibility of the unintentional inappropriate release of the data at the local level resulting in a Privacy Act violation. Although they do not have access to the SQA Net system, local communities continue to be approved users of the repetitive loss data under the Privacy Act.

Program implementation information will contain information on premium rate increases, if a property owner refuses the mitigation offer. This program information also contains checklists of the types of information that the State or community would need to compile and make available as part of the consultations. The program information will be augmented further with mitigation consultation tools and resources for States and communities to aid in the consultation and offer process.

Tax implications of accepting mitigation offers must be answered by the property owner's tax advisor or other State or locally sponsored tax advisory service. FEMA does not have the authority to provide information on this issue.

Section 207 of the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 calls for the establishment of minimum training and education requirements for insurance agents who sell flood insurance policies. FEMA is working with state insurance commissioners on training requirements for agents that sell flood insurance policies.

Question 10: What role should states and communities have in the appeals process for severe repetitive loss property owners who decline mitigation offers under the Pilot Program? What rules and procedures should be contained in the Appeals Process?

Of the comments received, 19 entities offered comments on question 10. A general synopsis of these comments is as follows:

General comments on appeals process	States/ territories	Local communities	Associations/ organizations
Advocate information sharing between FEMA and States	1	3	4
Advocate State and/or community involvement in Appeals Process	5	4	1
Advocate that only FEMA be involved in Appeals Process		1	
State participants still discussing the issue with other State agencies	1		

The following are the comments on the appeals requirement of the Pilot Program presented by State and local officials and representative organizations during the consultation:

- Clarity in the details, especially the Appeals Process and the insurance consequences.
- States and communities are also sensitive to any possibility of liability which may preclude much participation in the Appeals Process. However, States and communities may be willing to participate in an administrative capacity in collecting data for appeals and ensuring that applications are completed.
- Property owners should make an appeal in writing, along with supporting documentation. The jurisdiction can also file documentation either in support or against the property owner's reason for the appeal.
- The decision to accept or deny the appeal must come from FEMA, thereby removing the States and communities from the threat of legal action. FEMA should send written notice of its findings to the state, community and property owner.
- Appeals rule requirements should not be written in a way that allows the property owners to easily avoid mitigation activities or higher flood insurance premiums.
- States and communities should be an informational role; again, concern to keep the States and communities from the potential legal liabilities.
- The local communities and the State officials should just assist people with the appeals. FEMA should make all your final decisions and handle all the paperwork. We also feel that there should be some formal recommendation from your parishes or local communities or State.
- The appeal process should start with the community. If the owner of a property rejects an offer but can easily show that in purchasing, that he relied on a FIRM [Flood Insurance Rate Map] map that indicated the property was not on the mapped flood hazard area, this should not have to go to FEMA.
- The appeal should go through the local government. They are the ones with claims on the property; they could validate it. Should come through the state as the administrator of the program. We could validate it; just like with an appeal from the local government, you concur, you may not concur, no comment, but that provides the additional insight.

FEMA's Response

As established in § 78.7(d) of this rule, an appeal on increased insurance rates is made in writing by the property owner to the FEMA Regional Administrator within 90 days of the date of the notice of insurance increase. The Regional Administrator may request the Grantee, and Sub-grantee (State and community) if applicable, to assist in the collection of data to support the property owner's appeal. The Regional Administrator will review the information provided by the property owner and may participate in discussions with the property owner, and if applicable, with the Grantee and Sub-grantee to resolve the appeal prior to sending it to an Independent Third Party or a reviewer from FEMA's Alternative Dispute Resolution office (at the property owner's discretion).

IV. Regulatory Requirements

A. Administrative Procedure Act Statement

In general, FEMA publishes a rule for public comment before issuing a final rule, under the Administrative Procedure Act, 5 U.S.C. 533 and 44 CFR 1.12. The Administrative Procedure Act, however, provides an exception from that general rule where the agency for good cause finds that the procedures for prior comment and response are impracticable, unnecessary, or contrary to public interest.

This interim rule implements provisions of the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968. The key component of this rule includes implementation of the new SRL program as well as amending provisions of the existing FMA program. The rule also streamlines the planning process, and clarifies the planning requirements to address existing, unanticipated inconsistencies.

Authorization for the SRL program expires on September 30, 2009. Funding for the new SRL program was made available as of fiscal year 2006, thus it is important to allow States, tribes, communities, and property owners to access these funds so that they may have the opportunity to reduce their flood losses to these high risk properties as soon as possible. It is also in the public interest to mitigate these SRL properties as soon as possible to minimize further costs resulting from upcoming seasonal flooding. These properties often pose the highest costs to the Nation in terms of discounted Federal flood insurance rates, as well as Federal disaster assistance payments.

Prior comment on this rule is not in the public interest where the implementation of the new SRL program, as well as the modified FMA program, will assist States recovering from flood disasters nationwide, including Hurricanes Katrina and Rita, by providing additional grant resources

and increasing the Federal cost share for projects mitigating SRL properties. In particular, States and communities are at a critical stage for identifying properties to be mitigated in the post-Katrina recovery efforts, and these funds are essential for targeting the most costly properties in the area. To be most effective, the funds need to be made available to the Gulf Coast States and communities affected by Katrina and Rita as soon as possible. At the end of August 2007, there were just under 8,100 properties identified as meeting the definition of severe repetitive loss properties; approximately 58 percent, or 4,685 properties, lie within the 5 States most affected by Hurricanes Katrina and Rita. Mitigating these SRL properties will provide States the opportunity to reduce future losses to these SRL properties, which represent the largest drain on the NFIF and also will reduce future disaster costs to the local, State, and Federal government.

States, tribes, and communities also have a strong interest in accessing, as soon as possible, information in the rule that outlines how the States can revise their mitigation plans to receive the reduced cost share under the FMA and SRL programs. This cost-share reduction is an important incentive and, in some cases, necessary to allow communities, which otherwise would not be able to meet the match requirement, to mitigate SRL properties. It is essential that the availability of this information not be delayed, particularly where in many cases the revisions to mitigation plans will themselves, require time-consuming coordination across multiple agencies.

In accordance with the Administrative Procedure Act, 5 U.S.C. 553 (b), FEMA believes that prior notice and comment would be contrary to the public interest, as it would serve only to delay the benefits of this rule to States, tribes, and communities, and would continue imposing the costs of these at-risk properties on the general public.

FEMA nevertheless recognizes the importance of public input in the regulatory process. To that end, FEMA involved the public in a consultation process prior to the publication of this interim rule. To initiate the consultation process, FEMA published a **Federal Register** notice on September 15, 2004, 69 FR 55642. The comment period was supposed to close on November 30, 2004, but FEMA extended the deadline for comments until December 7, 2004, and received 26 written comments from States, communities, and associations. Also, as part of the consultation, FEMA invited representative officials of State and local governments, organizations representing emergency management, floodplain management, and insurance professions, to provide oral presentations on the requirements and issues raised in the **Federal Register** notice. Comments received were given careful consideration in the preparation of this interim rule.

Finally, FEMA actively encourages and solicits comments on this interim rule from interested parties. These comments will be given careful consideration, and could result in changes to these regulations.

B. National Environmental Policy Act

FEMA has considered this rule in accordance with its implementing regulations for complying with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321–4370f), which are found at 44 CFR part 10. This rule addresses applicant planning requirements, as well as eligibility, funding increases, and cost sharing/funding incentives relating to certain disaster mitigation programs and does not change the type or nature of mitigation actions that may be funded. This rulemaking would neither individually nor cumulatively have a significant effect on the human environment and, therefore, neither an environmental assessment nor an environmental impact statement is required. This rulemaking is among the category of actions included in the Categorical Exclusions listed at 44 CFR 10.8(d)(2)(ii), which excludes the preparation, revision and adoption of regulations from the preparation of an environmental assessment or environmental impact statement, where the rule relates to actions that qualify for categorical exclusions. The related actions of the development of plans and administrative activities that are included in this rule are also categorically excluded under 44 CFR 10.8(d)(2)(iii) and 44 CFR 10.8(d)(2)(i).

C. Executive Order 11988, Floodplain Management

FEMA has prepared and reviewed this rule under the provisions of Executive Order 11988, Floodplain Management. Part 9 sets forth FEMA's policy, procedures, and responsibilities in implementing this Executive Order. In summary, these are, to the greatest possible degree: To avoid long and short term adverse impacts associated with the occupancy and modification of floodplains; avoid direct and indirect support of floodplain development whenever there is a practical alternative; reduce the risk of flood loss; promote the use of nonstructural flood protection methods to reduce the risk of flood loss; minimize the impacts of floods on human health, safety and welfare; restore and preserve the natural and beneficial values served by floodplains; and adhere to the objectives of the Unified National Program for Floodplain Management. As stated in the rule, the purpose of the SRL and FMA programs is to mitigate insured property losses from floods, thereby minimizing impacts to the NFIF, which is consistent with the intent of the Executive Order. In addition, for project activities funded through the SRL and FMA programs, each project will go through the environmental review process, which will include compliance with Executive Order 11988.

D. Executive Order 12866, Regulatory Planning and Review

FEMA has prepared and reviewed this rule under the provisions of Executive Order 12866, Regulatory Planning and Review. Under Executive Order 12866, a significant regulatory action is subject to the Office of Management and Budget (OMB) review and the requirements of the Executive Order. The Executive Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Regulatory Alternatives

In determining how to move forward with this rule, two alternatives were considered. The first alternative was to issue an interim rule for the SRL program, and to modify the existing separate FMA rule to incorporate changes made by the Act. This would result in two sections of the CFR addressing mitigation grant programs funded through the NFIP which could result in disjointed implementation of the two similar programs.

The second alternative (and the one adopted by FEMA) was to establish and proceed with the implementation of the SRL and FMA programs as described in

this interim rule. This will allow FEMA to ensure a more consistent approach to implementation and management of these programs. FEMA has been working to implement all of the mitigation grant programs in a consistent manner, and this regulatory change furthers that attempt. These changes are also expected to limit confusion around program implementation since both programs will likely be managed by the same state agency staff.

Congressional Appropriations

The regulations implementing the FMA program were originally issued on March 20, 1997. Historically, the program has provided $20 million in grants on an annual basis to States and communities to reduce flood losses to properties insured under the NFIP. In fiscal year 2007, $31 million was made available for the FMA program to fund activities that help reduce repetitive flood insurance claims, thereby reducing the drain on the NFIP from these properties. This program provides an opportunity for every State to fund planning and project activities but, since it is a small program, it is unable to assist all those who could benefit from it. The Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 provides for additional program funding for the FMA program, as well as makes it easier for some to participate in the program, by providing the ability for States to reduce the cost share for those properties that meet the definition of a severe repetitive loss property.

The primary purpose of this rule is to implement the new SRL program, which will provide grants to property owners to mitigate their risk from flooding, with incremental increases in the insurance premiums imposed if they decline to accept the offers of mitigation. In fiscal year 2007, $40 million was made available by Congress for the SRL program. Therefore, in fiscal year 2007, a total of $71 million was allocated for these programs ($31 million for FMA and $40 million for SRL).

Impact From Increase in Insurance Premiums

Most severe repetitive loss properties were built prior to December 31, 1974, and the insurance premiums for these properties are supported financially by other NFIP policyholders. Repetitive loss properties only account for approximately 1 percent of the current NFIP policies, yet these properties historically account for over 30 percent of the amount paid in claims. Under the SRL program, owners of severe repetitive loss properties will receive mitigation offers. Refusals of these offers will result in increased premiums for owners of these properties. Thus, in either case, this rule should help shift the disproportionate burden away from the majority of NFIP policyholders who do not own SRL properties.

Within the NFIP, the average discounted premium paid by owners of property built before December 31, 1974 is $800 per year. However, if those properties were rated on an actuarial basis, taking into account their actual flood risk, the annual premiums they should be paying would average between $1,700 and $1,900 per year. Severe repetitive loss properties as a subset of the pre-1974 properties have higher flood risks than most properties with discounted premiums insured under the NFIP, and their actuarial rates could be much higher. For purposes of estimating the annual economic impact of this interim rule, FEMA used an average actuarial premium rate of $5,000 for these severe repetitive loss properties. This average actuarial rate does not reflect the discount premium rate; rather it more closely represents the flood risk to the property.

Of the $40 million available each year for the SRL program, FEMA assumes that $37 million will be awarded as project grants, and that the average grant per property is $75,000. Therefore, offers will be made to approximately 500 property owners in the first year. It is assumed that up to 3 percent of those property owners might decline the offer of mitigation assistance, and that these 15 properties would be subject to the increased insurance premiums. This 3 percent figure is based on the fact that although NFIP engages in litigation for less than 1 percent of its claims in an average claims year, there have been 3 times the normal number of claims as a result of Hurricanes Katrina, Rita, and Wilma. Also, after the wildfires of Cerro Grande, FEMA instituted a similar grant program whereby homeowners received funds for repair, with an appeals provision. Approximately 3 percent of those homeowners appealed their grant amount.

This increased cost of insurance for these 15 properties would result in an average discounted premium increase of approximately $400 per property owner (50% of the $800 average discounted premium), for a total increase in insurance premiums of $6,000 the first year. This premium rate can increase over time, until the actuarial rate (averaged, for the purpose of this rule to $5,000) is reached. At no time, however, would the premium paid for the affected property exceed the actuarial rate. If, over the remaining 1 year of the pilot SRL program, one expects the number of property owners declining the offer of assistance to remain the same, then the total number of affected properties will be 30. Within 10 to 20 years, when all 30 of the affected properties whose owners declined the mitigation offer will each pay actuarial premium rates described above as averaging $5,000 per year, the maximum annual impact of the program would be $150,000 ($5000 × 30).

Changes to HMGP

The rulemaking makes a technical change to reflect existing HMGP post-disaster allocation amounts already in effect as a result of amendments to Section 404 of the Stafford Act (42 U.S.C. 5170c, as amended by Pub. L. 109–295, § 684). The change set non-discretionary standard allocation amounts for the program.

Open Space

As part of implementing the SRL and FMA, this rule also includes a new part (part 80) which describes the requirements and procedures for open space acquisition which will apply to these programs, as well as all FEMA mitigation grant programs. The Act requires certain special acquisition procedures for SRL, however open space acquisitions funded under all FEMA mitigation grant programs otherwise subject to the same requirements to ensure mitigation objectives are met. Prior to this rule, acquisition requirements for each mitigation grant program were addressed in the respective mitigation grant program regulations or guidance, such as at § 78.12 for FMA and § 206.434 for HMGP, including associated program guidance. A central reference point for all mitigation grant program property acquisitions is intended to make the programs easier to implement. There will be no additional cost from this change.

Increase in Federal Share

The rule also implements the changes to the FMA program by allowing for a 90 percent Federal share for the mitigation of severe repetitive loss properties, amending the method by which State funding allocations are calculated, and making the FMA planning requirements and other program aspects consistent with other FEMA mitigation planning and program requirements. Though there is no net change in the funding allocated for FMA with this new cost share provision, the distribution of the funding will shift to the Federal "side". In FY 2007, $31

million was made available for the FMA program. Since the change in Federal share will be from 75 percent to 90 percent, the change in Federal outlay will be $4.65 million. This figure includes two very conservative assumptions: That all properties mitigated under FMA will be SRL properties; and that all States will seek this new cost share by virtue of revising their State mitigation plans.

Intangible Benefit

As of the end of August 2007, just under 8,100 properties were identified as meeting the definition of severe repetitive loss. Of those, approximately 58 percent are in the 5 States most affected by hurricanes Katrina and Rita. Alabama has 223 properties, Louisiana has 2,567 properties, Mississippi has 148 properties, Texas has 1,275 properties, and Florida has 472 properties. Implementation of the new SRL program, as well as the modified FMA program, will assist these States in recovering from these disasters by providing additional grant resources and the ability to increase the Federal cost share for projects mitigating SRL properties.

The economic impact of this rule is approximately $76 million. This rulemaking has been determined to be a nonsignificant regulatory action under section 3(f) of Executive Order 12866 by OMB. This rule adheres to the principles of regulation of the Executive Order.

E. Executive Order 12898, Environmental Justice

Under Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629, February 16, 1994, FEMA incorporates environmental justice into our policies and programs. The Executive Order requires each Federal agency to conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that those programs, policies, and activities do not have the effect of excluding persons from participation in our programs, denying persons the benefits of our programs, or subjecting persons to discrimination because of their race, color, or national origin.

No action that FEMA can anticipate under the interim rule will have a disproportionately high or adverse human health and environmental effect on any segment of the population. This rule implements the SRL program, providing mitigation grants to severe repetitive loss properties, and modifies aspects of the FMA program and the mitigation planning requirements. With respect to Indian tribal governments, the rule streamlines and simplifies the planning requirements. Finally, this interim rule amends § 206.432 to reflect statutory and technical changes to HMGP. Accordingly, the requirements of Executive Order 12898 do not apply to this interim rule.

F. Paperwork Reduction Act of 1995

This interim rule includes provisions constituting collections of information under the Paperwork Reduction Act (PRA) of 1995 (44 U.S.C. 3501 *et seq.*). Under section 3507(d) of the PRA, The Federal Emergency Management Agency (FEMA) will submit a copy of this rulemaking action to the Office of Management and Budget (OMB) for review. FEMA is submitting a request for review and approval of collections of information under OMB's emergency processing procedures. Through publication of this interim rule, FEMA is requesting a 6-month approval for these information collections. FEMA plans to follow this emergency approval request with a 3-year approval request. The 3-year request will be processed under OMB's normal clearance procedures in accordance with the provisions of OMB regulation at 5 CFR 1320.10. This interim rule also serves as the 60 day notice required by 5 CFR 1320.8. FEMA invites the public to comment on the proposed collections of information during this 60 day comment period.

Several collections of information referenced in this interim rule have existing OMB approvals under the PRA. The rule in §§ 79.3(b), 79.3(c), 79.3(d), 79.5(a)(2), 79.5(b), 79.6(b), 79.7(b), 79.9(a), 201.3, 201.6, and 201.7 contains collections of information under the PRA for which FEMA requests approval of amendments to existing collections by OMB. In addition, FEMA is requesting approval of two new collections of information for the interim rule contained under the new §§ 79.7(d), 80.13(a), 80.13(b), 80.17(e), 80.19(b), 80.19(d), 80.19(e), 80.21, and 206.434.

1. Collection of Information

Part 201 under OMB Number 1660–0062, State/Local/Tribal Hazard Mitigation Plans—under section 322 of Stafford Act clarifies the State, Tribal, and local mitigation planning requirements. Before this interim rule goes into effect, applicants for FMA funds are required to develop a plan that specifically addresses flood mitigation planning requirements under part 78. This plan is collected under OMB collection number 1660–0075; Flood Mitigation Assistance—Flood Mitigation Plan. Applicants for all other types of mitigation grant funding are required to develop a plan that addresses all hazards for which the applicant seeks funds under part 201, which may also include floods. This plan is collected under OMB collection number 1660–0062; State/Local/Tribal Hazard Mitigation Plans—under section 322 of Stafford Act. With the revisions established by this interim rule, the all hazards plan developed under part 201 will meet the requirements for all mitigation grants including FMA, which means that applicants will no longer be required to submit the flood specific plans under part 78. Because of this change FEMA is discontinuing OMB collection number 1660–0075, and revising OMB collection number 1660–0062.

Due to this change in the mitigation grant process, there are outstanding flood mitigation grants that have been issued with the requirement that the grantee submit a flood mitigation plan pursuant to the requirements of part 78. Although FEMA will no longer require the submission of flood mitigation plans for those funds awarded during application periods that open on or after the effective date of this rule, FEMA will continue to accept flood mitigation plans until the end of a grantee's current period of performance to include any extensions granted pursuant to § 78.9 and FEMA's Financial and Acquisition Management Division's Extension Policy.

Title: State/Local/Tribal Hazard Mitigation Plans-Section 322 of the Disaster Mitigation Act of 2000.

OMB Number: 1660–0062.

Abstract: The purpose of the State/Local/Tribal Hazard Mitigation Plan requirements is to outline the strategy by which State, tribal and local governments use to demonstrate the goals, priorities, and commitment to reduce risks from natural hazards and serves as a guide for State and local decision makers as they commit resources to reducing the effects of natural hazards.

Affected Public: State, Local or Tribal Government.

Number of Respondents: 56.

Estimated Time per Respondent: 2,408.

Estimated Total Annual Burden Hours: 768,320.

Frequency of Response: On Occasion.

The authorized SRL grant program will be implemented under the new part 79. However, the administration of FMA funds for which application period opens prior to publication of this rule will be subject to part 78, while the new

part 79 is used to administer new FMA grants.

2. Collection of Information

The SRL grant program was authorized by Congress in 2004 and expires on September 30, 2009. The SRL grant program focuses on a subset of all repetitive flood loss properties, residential properties with a high frequency of losses or a high value of claims, defined as severe repetitive loss properties. This is a non-disaster grant program that is authorized annually and not as a result of a Presidential Disaster Declaration. The information collection activity under the approved OMB information collection 1660–0025, FEMA Grant Administrative Forms is a paper-based collection used by States and local government to obtain grant information and is being amended to include the following burden hours for the SRL grant program.

Title: FEMA Grant Administration Forms.

OMB Number: 1660–0025.

Abstract: This collection of information focuses on the standardization and consistent use of standard and FEMA forms associated with grantees request for disaster and non-disaster federal assistance, submission of financial and administrative reporting and recordkeeping. The use of the forms will minimize burden on the respondents and enable FEMA to continue to improve in its grants administration practices.

Affected Public: State, Local or Tribal Government.

Estimated Total Annual Burden Hours:

DISASTER PROGRAMS

Data collections activity/instruments	Number of respondents (A)	Frequency of responses (B)	Hour burden per response (C)	Annual responses (D) = (A × B)	Total annual burden hours (C × D)
PA:					
SF 424	56	1	45 minutes	56	42 hours.
FF 20–20	56	1	9.7 hours	56	543 hours.
FF 20–16, A, B, C	56	1	1.7 hours	56	95 hours.
FF 20–10	56	4	1 hour	224	224 hours.
SF–LLL	56	1	10 minutes	56	9 hours.
Subtotal	56		13.3 hours	392	57 Disaster Declarations × 913 hours = 52,041.
SCC:					
SF 424	17	1	45 minutes	17	13 hours.
SF 20–20	17	1	9.7 hours	17	165 hours.
FF 20–16, A, B, C	17	1	1.7 hours	17	29 hours.
FF 20–10 (SF 269)	17	4	1 hour	68	68 hours.
SF–LLL	17	1	10 minutes	17	3 hours.
Subtotal	17		13.3 hours	119	57 Disaster Declarations × 278 hours = 15,846.
ONA:					
SF 424	40	1	45 minutes	40	30 hours.
FF 20–20	40	1	9.7 hours	40	388 hours.
FF 20–16, A, B, C	40	1	1.7 hours	40	68 hours.
FF 20–10	40	4	1 hour	160	160 hours.
SF–LLL	40	1	10 minutes	40	7 hours.
Subtotal	40		13.3 hours	320	57 Disaster Declarations × 653 hours = 37,221.
HMGP:					
SF 424	52	1	45 minutes	52	39 hours.
FF 20–20	52	15	9.7 hours	780	7,566. hours.
FF 20–16, A, B, C	52	1	1.7 hours	52	88 hours.
FF 20–10	52	4	1 hour	208	208 hours.
FF 20–17	52	15	17.2 hours	780	13,416 hours.
FF 20–18	52	6	4.2 hours	312	1,310 hours.
FF 20–19	52	6	5 minutes	312	25 hours.
SF–LLL	52	1	10 minutes	52	9 hours.
Subtotal	52		35 hours	2,548	57 Disaster Declarations × 22,661 hours = 1,291,677.
FMAGP:					
SF 424	12	4	45 minutes	48	36 hours.
FF 20–20	36	4	9.7 hours	144	1,397 hours.
FF 20–16, A, B, C	36	4	1.7 hours	144	245 hours.

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DISASTER PROGRAMS—Continued

Data collections activity/instruments	Number of respondents (A)	Frequency of responses (B)	Hour burden per response (C)	Annual responses (D) = (A × B)	Total annual burden hours (C × D)
FF 20–15	36	4	17.2 hours	144	2,477 hours.
FF 20–10	12	4	1 hour	48	48 hours.
FF 20–18	36	4	4.2 hours	144	605 hours.
FF 20–19	36	4	5 minutes	144	12 hours.
SF–LLL	36	4	10 minutes	144	24 hours.
Subtotal	36		35 hours	960	94 Disaster Declarations × 4,844 hours = 455,336.
Disaster Grants Total	56		110 hours	3,800	1,852,121 hours.

NON-DISASTER PROGRAMS

Data collection activity/instruments	Number of respondents (A)	Frequency of responses (B)	Hour burden per response (C)	Annual responses (D) = (A × B)	Total burden hours (C × D)
US&R:					
SF 424	28	1	45 minutes	28	21 hours.
FF 20–20	28	1	9.7 hours	28	272 hours.
FF 20–16, A, B, C	28	1	1.7 hours	28	48 hours.
FF 76–10A	28	1	1.2 hours	28	34 hours.
FF 20–10	28	2	1 hour	56	56 hours.
SF 270	28	1	1 hour	28	28 hours.
SF LLL	28	1	10 minutes	28	5 hours.
Subtotal	28		16 hours	224	498 hours.
CAP-SSSE:					
SF 424	56	1	45 minutes	56	42 hours.
FF 20–20	56	1	9.7 hours	56	543 hours.
FF 20–15	56	1	17.2 hours	56	963 hours.
FF 20–16, A, B, C	56	1	1.7 hours	56	95 hours.
FF 76–10A	56	1	1.2 hours	56	67 hours.
FF 20–10	56	2	1 hour	112	112 hours.
FF 20–18	56	1	4.2 hours	56	235 hours.
FF 20–19	56	1	5 minutes	56	4 hours.
SF LLL	56	1	10 minutes	56	9 hours.
Subtotal	56		36 hours	560	2,070 hours.
CSEPP:					
SF 424	10	1	45 minutes	10	8.0 hours.
FF 20–20	10	1	9.7 hours	10	97.0 hours.
FF 20–10	10	4	1 hour	40	40.0 hours.
FF 20–16, A, B, C	10	1	1.7 hour	10	17.0 hours.
FF 76–10A	10	1	1.2 hour	10	12.0 hours.
FF 20–18	10	1	4.2 hours	10	42.0 hours.
FF 20–19	10	1	5 minutes	10	1.0 hours.
SF LLL	10	1	10 minutes	10	2.0 hours.
Subtotal	10		19 hours	120	219 hours.
NDSP:					
SF 424	51	1	45 minutes	51	38.0 hours.
FF 20–20	51	1	9.7 hours	51	495.0 hours.
FF 20–16, A, B, C	51	1	1.7 hours	51	87.0 hours.
FF 76–10A	51	1	1.2 hours	51	61.0 hours.
FF 20–10	51	4	1 hour	204	204.0 hours.
SF 270	51	1	1 hour	51	51.0 hours.
SF LLL	51	1	10 minutes	51	8.0 hours.
Subtotal	51		16 hours	510	944 hours.
ICE:					
FF 20–10	17	4	1 hour	68	68.0 hours.
Subtotal	17		1 hour	17	68 hours.

NON-DISASTER PROGRAMS—Continued

Data collection activity/instruments	Number of respondents (A)	Frequency of responses (B)	Hour burden per response (C)	Annual responses (D) = (A × B)	Total burden hours (C × D)
EqC:					
FF 20–10	3	2	1 hour	6	6 hours.
Subtotal	3		1 hour	6	6 hours.
AIDMATRIX:					
SF 424	1	1	45 minutes	1	.75 minutes.
FF 20–20	1	1	9.7 hours	1	9.7 hours.
FF 20–10	1	4	1 hour	4	4.0 hours.
FF 20–16 A, B, C	1	1	1.7 hours	1	1.7 hours.
SF LLL	1	1	10 minutes	1	.16 minutes.
Subtotal	1		13 hours	8	16 hours.
AHPP:					
SF 424	4	1	45 minutes	4	3.0 hours.
FF 20–20	4	1	9.7 hours	4	39.0 hours.
FF 20–10	4	4	1 hour	16	16.0 hours.
FF 20–16, A, B, C	4	1	1.7 hours	4	6.8 hours.
SF LLL	4	1	10 minutes	4	.66 hours.
Subtotal	4		13 hours	32	65 hours.
CTP:					
SF 424	20	1	45 minutes	20	15.0 hours.
FF 20–20	20	1	9.7 hours	20	194.0 hours.
FF 20–15	20	1	17.2 hours	20	344.0 hours.
FF 20–16, A, B, C	20	1	1.7 hours	20	34.0 hours.
FF 20–10	20	4	1 hour	80	80.0 hours.
SF LLL	20	1	10 minutes	20	3.3 hours.
Subtotal	20		31 hours	180	670.3 hours.
MMMS:					
SF 424	20	1	45 minutes	20	15.0 hours.
FF 20–20	20	1	9.7 hours	20	194.0 hours.
FF 20–15	20	1	17.2 hours	20	344.0 hours.
FF 20–16, A, B, C	20	1	1.7 hours	20	34.0 hours.
FF 20–10	20	2	1 hour	40	40.0 hours.
SF LLL	20	1	10 minutes	20	3.0 hours.
Subtotal	20		31 hours	120	630 hours.
RFC:					
SF 424	56	1	45 minutes	56	42.0 hours.
FF 20–20	56	1	9.7 hours	56	543.0 hours.
FF 76–10A	56	1	1.2 hours	56	67.0 hours.
FF 20–16, A, B, C	56	1	1.7 hours	56	95.0 hours.
FF 20–10	56	4	1 hour	224	224.0 hours.
FF 20–18	56	1	4.2 hours	56	235.0 hours.
FF–20–19	56	1	5 minutes	56	5.0 hours.
SF LLL	56	1	10 minutes	56	9.0 hours.
Subtotal	56		19 hours	616	1,220 hours.
SRL:					
FF 424	56	1	45 minutes	56	42.0 hours.
FF 20–20	56	1	9.7 hours	56	543.0 hours.
FF 76–10A	56	1	1.2 hours	56	67.0 hours.
FF 20–16, A, B, C	56	1	1.7 hours	56	95.0 hours.
FF 20–10	56	4	1 hour	224	224.0 hours.
FF 20–18	56	1	4.2 hours	56	235.0 hours.
FF 20–19	56	1	5 minutes	56	5 hours.
SF LLL	56	1	10 minutes	56	9.0 hours.
Subtotal	56		19 hours	616	1,220 hours.
FMA:					
SF 424	56	3	45 minutes	168	126.0 hours.
FF 20–20	56	3	9.7 hours	168	1630.0 hours.
FF 20–16, A, B, C	56	1	1.7 hours	56	95.0 hours.
FF 76–10A	56	3	1.2 hours	168	202.0 hours.
FF 20–10	56	4	1 hour	224	224.0 hours.
FF 20–18	56	1	4.2 hours	56	235.0 hours.
FF 20–19	56	1	5 minutes	56	4.0 hours.
SF LLL	56	1	10 minutes	56	9.0 hours.
Subtotal	56		19 hours	952	2,525 hours.

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NON-DISASTER PROGRAMS

Data collection activity/instruments	Number of respondents (A)	Frequency of responses (B)	Hour burden per response (C)	Annual responses (D) = (A × B)	Total burden hours (C × D)
PDM:					
SF 424	56	2	45 minutes	112	84 hours.
FF 20–15	56	1	17.2 hours	56	963.2 hours.
FF 20–20	56	2	9.7 hours	112	1,086.4 hours.
FF 76–10A	56	2	1.2 hours	112	134.4 hours.
FF 20–16, A, B, C	56	2	1.7 hours	112	190.4 hours.
FF 20–10	56	8	1 hour	448	448 hours.
FF 20–17	56	20	17.2 hours	1,120	19,264 hours.
FF 20–18	56	2	4.2 hours	112	470.4 hours.
FF 20–19	56	2	5 minutes	112	9.3 hours.
SF LLL	56	2	10 minutes	112	18.6 hours.
Subtotal	56		53 hours	2,408	22,668.7 hours.
AFG*:					
SF 424	4,246	1	45 minutes	4,246	3,185.0 hours.
FF 20–20	4,246	2	9.7 hours	8,492	82,372.0 hours.
FF 76–10A	4,246	2	1.2 hours	8,492	10,190.0 hours.
FF 20–16, A, B, C	4,246	1	1.7 hours	4,246	7,218.0 hours.
FF 20–10	4,246	2	1 hour	8,492	8,492.0 hours.
FF 20–17	4,246	1	17.2 hour	4,246	73,031.0 hours.
FF 20–18	4,246	1	4.2 hours	4,246	17,833.0 hours.
FF 20–19	4,246	1	5 minutes	4,246	340.0 hours.
SF LLL	4,246	1	10 minutes	4,246	705.0 hours.
Subtotal	4,246		36 hours	50,952	203,366 hours.
SAFER*:					
SF 424	243	1	45 minutes	243	182.0 hours.
FF 20–20	243	2	9.7 hours	486	4,714.0 hours.
FF 76–10A	243	2	1.2 hours	486	583.0 hours.
FF 20–16, A, B, C	243	1	1.7 hours	243	413.1 hours.
FF 20–10	243	4	1 hour	972	972 hours.
FF 20–17	243	1	17.2 hours	243	4,179.6 hours.
FF 20–18	243	1	4.2 hours	243	1,020.6 hours.
FF 20–19	243	1	5 minutes	243	20.2 hours.
SF LLL	243	1	10 minutes	243	40.5 hours.
Subtotal	243		36 hours	3,402	12,125.7 hours.
Non-Disaster Grants Total			359	55,378	248,312.
Grand Total			469	59,178	2,100,433.

* AFG and SAFER grants are awarded directly to individual Fire departments.

3. Collection of Information

The information collection activity under the approved OMB information collection 1660–0072, Mitigation Grant Program/e-Grants (previous named Flood Mitigation Assistance (e-Grants)) and Grant Supplemental Information is an electronic system used to meet the intent of the eGovernment initiative. This collection does not supersede the paper-based collection for Grants (OMB No. 1660–0025). Applicants may apply using the e-Grants (1660–0072) application accessible on the Internet at *https://portal.fema.gov*. The OMB approved collection 1660–0072 have been combined with OMB No. 1660–0071, Pre-Disaster Mitigation (PDM) Grant Program/e-Grants to streamline and simplify documentation of the same information collected for all mitigation e-Grants program. Because of this change OMB No. 1660–0071 has been discontinued as a separate collection. This collection also includes the authorized SRL program.

Title: Mitigation Grant Program/e-Grants.

OMB Number: 1660–0072.

Abstract: The States will utilize the Mitigation Grant Program/e-Grants, automated application to report to FEMA on a quarterly basis, certify how funding is being used and to report on the progress of mitigation activities funded under grant awards, made to grantees by FEMA who will use the system to review the grantees quarterly reports to ensure that mitigation grant activities are progressing on schedule and to track the expenditures of funds.

Affected Public: State, Local or Tribal Government.

Estimated Total Annual Burden Hours:

Project/activity (survey, forms(s), focus group, etc.)	Number of respondents	Frequency of responses	Burden hours per respondent	Annual responses	Total annual burden hours
FMA:					
Benefit-Cost Determination	56	2	5	112	560

Project/activity (survey, forms(s), focus group, etc.)	Number of respondents	Frequency of responses	Burden hours per respondent	Annual responses	Total annual burden hours
Environmental Review	56	2	7.5	112	840
Project Narrative—Sub-grant Application	56	4	12	224	2,688
Subtotal FMA	56		24.5	448	4,088
RFC:					
Benefit-Cost Determination	56	1	5	56	280
Environmental Review	56	1	7.5	56	420
Project Narrative—Sub-grant Application	56	2	12	112	1,344
Subtotal RFC	56		24.5	224	2,084
PDM:					
Benefit-Cost Determination	56	20	5	1,120	5,600
Environmental Review	56	20	7.5	1,120	8,400
Project Narrative—Sub-grant Application (including PDM Evaluation Information Questions [5])	56	20	12	1,120	13,440
Subtotal PDM	56		24.5	3,360	27,440
SRL:					
Benefit-Cost Determination	56	7	5	392	1,960
Environment Review	56	7	7.5	392	2,940
Project Narrative—Sub-grant Application	56	8	12	448	5,376
Subtotal SRL	56		24.5	1,232	10,276
Total	56		98	5264	43,888

4. Collection of Information

The Property Acquisition and Relocation for Open Space (part 80) will govern property acquisitions for the creation of open space under all of FEMA mitigation grant programs authorized under both the Stafford Act and the National Flood Insurance Act of 1968, as amended. Acquisition and relocation of property for open space use is one of the most common mitigation activities, and is an eligible activity type authorized for Federal grant funds under all of FEMA mitigation grant programs. FEMA mitigation grant programs require all properties acquired with FEMA funds to be deed restricted and maintained as open space in perpetuity. This ensures that no future risks from hazards occur to life or structures on that property, and no future disaster assistance or insurance payments are made as a result of damages to that property. This new collection of information is necessary to establish uniform requirements for State and local implementation of acquisition activities, and to enforce open space maintenance and monitoring requirements for properties acquired with FEMA mitigation grant funds. This interim rule includes a conforming amendment to the HMGP to refer to the new part 80 for acquisition and relocation activities, and deletes § 206.434(f).

Title: Property Acquisition and Relocation for Open Space.

Type of Information Collection: New Collection.

OMB Number: 1660–New23.

Form Numbers: None.

Abstract: FEMA and State and local recipients of FEMA mitigation grant programs will use the information collected under the Property Acquisition requirements to implement acquisition activities under the terms of grant agreements for acquisition and relocation activities. FEMA and State/local grant recipients will also use the information to monitor and enforce the open space requirements for all properties acquired with FEMA mitigation grants.

Affected Public: State, local, or Indian tribal government and individuals or households.

Estimated Total Annual Burden Hours:

Data collection activity	Number of respondents	Frequency of responses	Number of responses	Hour burden per response	Total burden hours
Voluntary Participation Statement	56	40	1	2240	2440
Deed Restriction Requirements	56	40	4	2240	8960
Monitoring and Reporting Requirements	56	1	4	56	224
Transfer Certification					
Enforcement Notices					
Total	56		9	4,536	11,424

5. Collection of Information

The appeals process in § 79.7(d) outlines the process by which any owner of a severe repetitive loss property may appeal the decision of FEMA to increase the chargeable insurance premium rate on property. The legislation that created the SRL program provides that any owner of a severe repetitive loss property who refuses an offer of mitigation may appeal the decision of FEMA to increase the chargeable insurance premium rate on that property. The process requires the owner to submit a written appeal, including any supporting documentation for their appeal to FEMA within 90 days of the notice of the insurance rate increase. This new collection of information is necessary to ensure that the property owner is given

opportunity to provide additional documentation that support one of the six allowable bases for appeal, outlined in the authorizing legislation, and implemented at § 79.7(d).

Title: Severe Repetitive Loss (SRL) Appeals Process.

Type of Information Collection: New Collection.

OMB Number: 1660–New36.

Form Numbers: None.

Abstract: The SRL program provides property owners with the ability to appeal an increase in their flood insurance premium rate if they refuse an offer of mitigation under this program. The property owner must submit information to FEMA to support their appeal.

Affected Public: Federal Government, and individuals or households.

Estimated Total Annual Burden Hours:

Data collection activity	Number of respondents	Frequency of responses	Number of responses	Hour burden per response	Total burden hours
Appeal written request and supporting documentation	10	1	10	10	100
Total	10		10	10	100

Comments: Written comments are solicited to (a) evaluate whether the proposed data collection is necessary for the proper performance of the agency, including whether the information shall have practical utility; (b) evaluate the accuracy of the agency's estimate of the burden of the proposed information collection, including the validity of the methodology and assumptions used; (c) enhance the quality, utility, and clarity of the information to be collected; and (d) minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technology, *e.g.*, permitting electronic submission of responses. FEMA will continue to accept comments from interested persons through December 31, 2007. Submit comments by one of the methods provided in the **ADDRESSES** section at the beginning of this rule.

Requests for additional information regarding FEMA's Paperwork Reduction Act requirements or copies of the information collection should be made to Chief, Records Management and Privacy, FEMA, 500 C Street, SW., Room 609, Washington, DC 20472, facsimile number (202) 646–3347, or e-mail address *FEMA-Information-Collections@dhs.gov.*

G. Executive Order 13132, Federalism

Executive Order 13132, Federalism, dated August 4, 1999, sets forth principles and criteria that agencies must adhere to in formulating and implementing policies that have federalism implications, that is, regulations that have substantial direct effects on the States, or on the distribution of power and responsibilities among the various levels of government. Federal agencies must closely examine the statutory authority supporting any action that would limit the policymaking discretion of the States, and to the extent practicable, must consult with State and local officials before implementing any such action.

FEMA published a **Federal Register** notice on September 15, 2004, 69 FR 55642, to initiate consultation with State and local officials, as well as members of the public in the formulation of this rule. Interested parties initially had until November 30, 2004, to submit written comments in response to the notice. FEMA extended the deadline for comments until December 7, 2004, and received 23 written comments from States, communities, and associations.

On November 17, 2004, as part of the consultation process, FEMA held a meeting in Washington DC with representative officials of State and local governments; organizations representing emergency management, floodplain management, and insurance professions; and other interested parties.

Both the written comments received and the oral comments presented at the meeting addressed aspects of the SRL program, including the circumstances affecting severe repetitive loss property owners, the mitigation offer process, the effects of insurance premium increases on individuals who refuse mitigation offers, and the appeals process. In the context of preparing this rule, FEMA reviewed and addressed all of the comments received in response to the **Federal Register** notice including the oral presentations made on November 17, 2004.

FEMA has reviewed this rule under Executive Order 13132 and has concluded that the rule, which implements statutory requirements for a new SRL program as well as a potential increase in the Federal share for the FMA program, simplifies the planning requirements, and reflects a statutorily mandated change to the HMGP allocation, does not have federalism implications as defined by the Executive Order. FEMA has determined that the rule does not significantly affect the rights, roles, and responsibilities of States, and involves no preemption of State law nor does it limit State policymaking discretion.

FEMA will continue to evaluate the new SRL and FMA programs, as well as the planning requirements, and will work with interested parties as FEMA implements the requirements of 44 CFR parts 59, 61, 78, 79, 80, 201, and 206. In addition, FEMA actively encourages and solicits comments on this interim rule from interested parties, and FEMA will consider those comments in preparing the final rule.

H. Executive Order 13175, Consultation and Coordination With Indian Tribal Governments

FEMA has reviewed this interim rule under Executive Order 13175. In reviewing the portion of the interim rule which streamlines the mitigation planning requirements affecting Indian tribal governments, FEMA finds that, while it does have "tribal implications" as defined in Executive Order 13175, it will not have a substantial direct effect on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.

FEMA has worked with Indian tribal governments while implementing its programs, and has modified its procedures to accommodate some of the issues relating to the tribal governments. This rule clarifies those procedures and streamlines the roles and responsibilities of Indian tribal governments in mitigation planning. In the February 26, 2002 interim rule, Indian tribal governments were given the option of preparing either a State-level Mitigation Plan, or a Local-level Mitigation Plan depending on whether or not they intended to apply directly to FEMA as a grantee, or whether they

would apply through the State as a subgrantee. Neither of these options has sufficiently met the needs of the Indian tribal governments. The new interim rule establishes a specific planning requirement for Indian tribal governments that recognizes some of the unique aspects of these governments. The rule establishes requirements for Tribal Mitigation Plans for plans prepared and approved after December 3, 2007. The rule provides that plans prepared and approved under the preexisting rule, either under the State or local requirements, would also be recognized as Tribal Mitigation Plans. These older plans, however, would be required to meet the revised criteria when the original plan approval expires. This rule combines the appropriate aspects of State and local planning requirements into one section for Indian tribal governments. Prior to the preparation of this rule, FEMA discussed the planning requirements with many of the Indian tribal governments as they were developing their own plans, or while attending tribal training courses, and heard the concerns regarding the planning requirements.

In conclusion, the interim rule does not impose substantial direct compliance costs on Indian tribal governments, nor does it preempt tribal law, impair treaty rights nor limit the self-governing powers of Indian tribal governments.

I. Congressional Review of Agency Rulemaking

FEMA has sent this interim rule to the Congress and to the General Accountability Office under the Congressional Review of Agency Rulemaking Act, (Congressional Review Act), Public Law 104–121. This interim rule is not a "major rule" within the meaning of the Congressional Review Act. It implements statutory requirements creating the SRL program and statutory amendments providing for an increased Federal share for FMA projects affecting severe repetitive loss properties; streamlines and makes consistent the planning requirements for FMA and Indian tribal governments; and makes a technical update to reflect a statutory change in the HMGP allocation.

The interim rule will not result in a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. It will not have "significant adverse effects" on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises. The rule is not an unfunded Federal mandate within the meaning of the Unfunded Mandates Reform Act of 1995, Public Law 104–4, and any enforceable duties that FEMA imposes are a condition of Federal assistance or a duty arising from participation in a voluntary Federal program.

J. Regulatory Flexibility Act

The Regulatory Flexibility Act ("RFA") mandates that an agency conduct a RFA analysis when an agency is "required by section 553 * * * to publish general notice of proposed rulemaking for any proposed rule * * * 5 U.S.C. 603(a). Accordingly, RFA analysis is not required when a rule is exempt from notice and comment rulemaking under 5 U.S.C. 553(b). DHS has determined that good cause exists under 5 U.S.C. 553(b)(B) to exempt this rule from the notice and comment requirements of 5 U.S.C. 553(b). Therefore no RFA analysis under 5 U.S.C. 603 is required for this rule.

K. Executive Order 12630, Taking of Private Property

This rule will not affect a taking of private property or otherwise have taking implications under Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights. In fact, § 80.5(a) states that

> [e]ligible acquisition projects are those where the property owner participates voluntarily, and the grantee/subgrantee will not use its eminent domain authority to acquire the property for the open space purposes should negotiations fail.

L. Executive Order 12988, Civil Justice Reform

This rule meets applicable standards in sections 3(a) and 3(b)(2) of Executive Order 12988, Civil Justice Reform, to minimize litigation, eliminate ambiguity, and reduce burden.

List of Subjects

44 CFR Part 59

Flood insurance, Reporting and recordkeeping requirements.

44 CFR Part 61

Flood insurance, Reporting and recordkeeping requirements.

44 CFR Parts 78 and 79

Flood insurance, Grant programs.

44 CFR Part 80

Acquisition and relocation for open space.

44 CFR Part 201

Administrative practice and procedure, Disaster assistance, Grant programs, Reporting and recordkeeping requirements.

44 CFR Part 206

Administrative practice and procedure, Coastal zone, Community facilities, Disaster assistance, Fire prevention, Grant programs—housing and community development, Housing, Insurance, Intergovernmental relations, Loan programs—housing and community development, Natural resources, Penalties, Reporting and recordkeeping requirements.

■ For the reasons set forth in the preamble, the Federal Emergency Management Agency amends 44 CFR chapter I as set forth below:

PART 59—GENERAL PROVISIONS

■ 1. The authority citation for part 59 continues to read as follows:

Authority: 42 U.S.C. 4001 *et seq.*; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127 of Mar. 31, 1979, 44 FR 19367, 3 CFR, 1979 Comp., p. 376.

■ 2. Section 59.1 is amended by revising the definition of *State* as follows:

§ 59.1 Definitions.

* * * * *

State means any State of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

* * * * *

PART 61—INSURANCE COVERAGE AND RATES

■ 3. The authority citation for part 61 continues to read as follows:

Authority: 42 U.S.C. 4001 *et seq.*; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127 of Mar. 31, 1979, 44 FR 19367, 3 CFR, 1979 Comp., p. 376.

■ 4. In § 61.9 add paragraphs (d) and (e) as follows:

§ 61.9 Establishment of chargeable rates.

* * * * *

(d) Properties that meet the definition of Severe Repetitive Loss properties as defined in § 79.2(g) of this subchapter, and who refuse an offer of mitigation pursuant to § 79.7 of this subchapter are not eligible for the rates identified in paragraphs (a) through (c) of this section.

(e) Properties leased from the Federal Government and located either on the

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river-facing side of a dike, levee, or other riverine flood control structure, or seaward of any seawall or other coastal flood control structure are not eligible for the rates identified in paragraphs (a) through (c) of this section.

PART 78—FLOOD MITIGATION ASSISTANCE

■ 5. The authority citation for part 78 is revised to read as follows:

Authority: 6 U.S.C. 101; 42 U.S.C. 4001 *et seq.*; 42 U.S.C. 4104c, 4104d; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; E.O. 13286, 68 FR 10619, 3 CFR, 2003 Comp., p. 166.

■ 6. Revise § 78.1(a) to read as follows:

§ 78.1 Purpose.

(a) The purpose of this part is to prescribe actions, procedures, and requirements for administration of the Flood Mitigation Assistance (FMA) program, authorized by Sections 1366 and 1367 of the National Flood Insurance Act of 1968, 42 U.S.C. 4104c and 4104d. The rules in this part apply to the administration of funds awarded under the FMA program for which the application period opened prior to December 3, 2007. On or after that date, the administration of funds awarded under FMA program shall be subject to the rules in part 79 of this subchapter.

* * * * *

■ 7. Remove the undesignated center heading FEDERAL CRIME INSURANCE PROGRAM which precedes RESERVED PARTS 80–149.

■ 8. Add part 79 to read as follows:

PART 79—FLOOD MITIGATION GRANTS

Sec.
79.1 Purpose.
79.2 Definitions.
79.3 Responsibilities.
79.4 Availability of funding.
79.5 Application process.
79.6 Eligibility.
79.7 Offers and appeals under the SRL program.
79.8 Allowable costs.
79.9 Grant administration.

Authority: 6 U.S.C. 101; 42 U.S.C. 4001 *et seq.*; 42 U.S.C. 4104c, 4104d; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; E.O. 13286, 68 FR 10619, 3 CFR, 2003 Comp., p. 166.

§ 79.1 Purpose.

(a) The purpose of this part is to prescribe actions, procedures, and requirements for administration of the hazard mitigation grant programs made available under the National Flood Insurance Act of 1968, as amended, and the Flood Disaster Protection Act of 1973, as amended, 42 U.S.C. 4001 *et seq.* The Severe Repetitive Loss (SRL) and Flood Mitigation Assistance (FMA) grant programs mitigate losses from floods, minimizing impacts to the National Flood Insurance Fund (NFIF). The rules in this part apply to the administration of funds under the SRL and FMA programs for which the application period opens on or after December 3, 2007. Prior to this date, the administration of funds under the FMA program shall be subject to the rules in part 78 of this subchapter.

(b) The purpose of the SRL program is to:

(1) Assist State and local governments in funding actions that reduce or eliminate the risk of flood damage to residential properties insured under the National Flood Insurance Program (NFIP) that meet the definition of severe repetitive loss property;

(2) Reduce the need to increase flood insurance premiums of NFIP policyholders that would otherwise be required to pay for potential future repetitive claims associated with severe repetitive loss properties; and

(3) Reduce loss of life, property damage, outlays for the NFIF, and Federal disaster assistance by reducing or eliminating the risk of flood damage to those insured properties that have historically experienced the most severe flood losses.

(c) The purpose of the FMA program is to assist State and local governments in funding cost-effective actions that reduce or eliminate the risk of flood damage to buildings, manufactured homes, and other structures insured under the NFIP.

§ 79.2 Definitions.

(a) Except as otherwise provided in this part, the definitions set forth in section 59.1 of this subchapter are applicable to this part.

(b) *Applicant* is the State or Indian tribal government applying to FEMA for a grant, and which will be accountable for the use of the funds.

(c) *Community* means:

(1) A political subdivision, including any Indian tribe, authorized tribal organization, Alaskan native village or authorized native organization, that has zoning and building code jurisdiction over a particular area having special flood hazards, and is participating in the NFIP; or

(2) A political subdivision of a State, or other authority that is designated by a political subdivision to develop and administer a mitigation plan.

(d) *Grantee* means the State or Indian tribal government to which FEMA awards a grant and which is accountable for the use of the funds provided. The grantee is the entire legal entity, even if only a particular component of the entity is designated in the grant award document.

(e) *Market Value* is generally defined as the amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the valuation, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the valuation.

(f) *Multifamily Property* means a property consisting of 5 or more residences.

(g) *Severe Repetitive Loss Properties* are defined as single or multifamily residential properties that are covered under an NFIP flood insurance policy and:

(1) That have incurred flood-related damage for which 4 or more separate claims payments have been made, with the amount of each claim (including building and contents payments) exceeding $5,000, and with the cumulative amount of such claims payments exceeding $20,000; or

(2) For which at least 2 separate claims payments (building payments only) have been made under such coverage, with cumulative amount of such claims exceeding the market value of the building.

(3) In both instances, at least 2 of the claims must be within 10 years of each other, and claims made within 10 days of each other will be counted as 1 claim.

(h) *Subapplicant* means a State agency, community, or Indian tribal government submitting an application for planning or project activity to the applicant for assistance under the FMA or SRL programs. Upon grant award, the subapplicant is referred to as the subgrantee.

(i) *Subgrant* means an award of financial assistance made under a grantee to an eligible subgrantee.

(j) *Subgrantee* means the State agency, community, or Indian tribal government or other legal entity to which a subgrant is awarded and which is accountable to the grantee for the use of the funds provided.

(k) *Administrator* means the head of the Federal Emergency Management

Agency, or his/her designated representative, appointed under section 503 of the Post-Katrina Emergency Management Reform Act of 2006 (Pub. L. 109–295). The term also refers to the Director as discussed in part 2 of this chapter.

(l) *Regional Administrator* means the head of a Federal Emergency Management Agency regional office, or his/her designated representative, appointed under section 507 of the Post-Katrina Emergency Management Reform Act of 2006 (Pub. L. 109–295). The term also refers to Regional Directors as discussed in part 2 of this chapter.

§ 79.3 Responsibilities.

(a) *Federal Emergency Management Agency (FEMA).* Administer and provide oversight to all FEMA-related hazard mitigation programs and grants, including:

(1) Issue program implementation procedures, as necessary, which will include information on availability of funding;

(2) Allocate funds to States for the FMA and for the SRL programs;

(3) Award all grants to the grantee after evaluating subgrant applications for eligibility and ensuring compliance with applicable Federal laws, giving priority to such properties, or to the subset of such properties, as the Administrator may determine are in the best interest of the NFIF;

(4) Provide technical assistance and training to State, local and Indian tribal governments regarding the mitigation and grants management process;

(5) Review and approve State, Indian tribal, and local mitigation plans in accordance with part 201 of this chapter;

(6) Comply with applicable Federal statutory, regulatory, and Executive Order requirements related to environmental and historic preservation compliance, including reviewing and supplementing, if necessary, the environmental analyses conducted by the State and subgrantee in accordance with part 10 of this chapter;

(7) Establish and maintain an updated list of SRL properties and make such information available to States and communities; and

(8) Notify owners of SRL properties that their properties meet the definition of a severe repetitive loss property and provide a summary of the opportunities and implications of being identified as such.

(b) *State.* The State will serve as the applicant and grantee through a single Point of Contact (POC) for the FMA and SRL programs. The POC is a State agency that must have working knowledge of NFIP goals, requirements, and processes and ensure that the programs are coordinated with other mitigation activities at the State level. States will:

(1) Have a FEMA approved Mitigation Plan in accordance with part 201 of this chapter;

(2) Review and submit local mitigation plans to the FEMA Regional Administrator for final review and approval;

(3) Provide technical assistance and training to communities on mitigation planning, mitigation project activities, developing subgrant applications, and implementing approved subgrants;

(4) Prioritize and recommend subgrant applications to be approved by FEMA, based on the State Mitigation Plan, other State evaluation criteria and the eligibility criteria described in § 79.6;

(5) Award FEMA-approved subgrants; and

(6) Comply with program requirements under this part, grant management requirements identified under part 13 of this chapter, the grant agreement articles, and other applicable Federal, State, tribal and local laws and regulations.

(c) *Indian tribal governments.* The Indian tribal government will coordinate all tribal activities relating to hazard evaluation and mitigation including:

(1) Have a FEMA approved Tribal Mitigation Plan in accordance with § 201.7 of this chapter;

(2) A Federally Recognized Indian tribal government as defined by the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a, applying directly to FEMA for mitigation grant funding will assume the responsibilities of the "State" as the term is used in this part, as applicant or grantee, described in paragraphs (b)(3) through (6) of this section; and

(3) A Federally Recognized Indian tribal government as defined by the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a, applying through the State, will assume the responsibilities of the community (as the subapplicant or subgrantee) described in paragraphs (d)(2) through (4) of this section.

(d) *Community.* The community (referred to as both subapplicant and subgrantee) will:

(1) Prepare and submit a FEMA-approved Local Mitigation Plan, consistent with the requirements of part 201 of this chapter;

(2) Complete and submit subgrant applications to the State POC for FMA planning, project and management cost subgrants, and for SRL project and management cost subgrants;

(3) Implement all approved subgrants; notifying each holder of a recorded interest in severe repetitive loss properties when an offer of mitigation assistance has been made under the SRL program, and when such offer has been refused; and

(4) Comply with program requirements under this part, grant management requirements identified under part 13 of this chapter, the grant agreement articles, and other applicable Federal, State, tribal and local laws and regulations.

§ 79.4 Availability of funding.

(a) *Allocation.* (1) For the amount made available for the SRL program, the Administrator will allocate the available funds to States each fiscal year based upon the percentage of the total number of severe repetitive loss properties located within that State. Ten percent of the total funds made available in any fiscal year will be made available to States and Indian tribal applicants that have at least 1 SRL property and that receive little or no allocation.

(2) For the amount made available for the FMA program, the Administrator will allocate the available funds each fiscal year. Funds will be distributed based upon the number of NFIP policies, repetitive loss structures, and any other such criteria as the Administrator may determine are in the best interests of the NFIF.

(i) A maximum of 7.5 percent of the amount made available in any fiscal year may be allocated for FMA planning grants nationally. A planning grant will not be awarded to a State or community more than once every 5 years, and an individual planning grant will not exceed $150,000 to any State agency applicant, or $50,000 to any community subapplicant. The total planning grant made in any fiscal year to any State, including all communities located in the State, will not exceed $300,000.

(ii) The total amount of FMA project grant funds provided during any 5-year period will not exceed $10,000,000 to any State agency(s) or $3,300,000 to any community. The total amount of project grant funds provided to any State, including all communities located in the State will not exceed $20,000,000 during any 5-year period. The Administrator may waive the limits of this subsection for any 5-year period when a major disaster or emergency is declared pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act for flood conditions.

(b) *Redistribution.* Funds allocated to States who choose not to participate in

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either the FMA or SRL program in any given year will be reallocated to participating States and Indian tribal applicants. Any funds allocated to a State, and the communities within the State, which have not been obligated within the timeframes established by the Administrator, shall be redistributed by the Administrator to other States and communities to carry out eligible activities in accordance with this part.

(c) *Cost share.* All mitigation activities approved under the State's grant will be subject to the following cost-share provisions:

(1) FEMA may contribute up to 75 percent of the eligible cost of activities for grants approved for funding; or

(2) FEMA may contribute up to 90 percent of the cost of the eligible activities for each severe repetitive loss property for which grant amounts are provided if the State has an approved State Mitigation Plan meeting the repetitive loss requirements identified in § 201.4(c)(3)(v) of this chapter at the time the project application is submitted;

(3) For the FMA program only, of the non-Federal contribution, not more than one half will be provided from in-kind contributions.

§ 79.5 Application process.

(a) *Applicant or grantee.* (1) States will be notified of the amount allocated to them for the SRL and FMA programs each fiscal year, along with the application timeframes.

(2) The State will be responsible for soliciting applications from eligible communities, or subapplicants, and for reviewing and prioritizing applications prior to forwarding them to FEMA for review and award.

(3) Participation in these flood mitigation grant programs is voluntary, and States may elect not to participate in either the SRL or FMA program in any fiscal year without compromising their eligibility in future years.

(4) Indian tribal governments interested in applying directly to FEMA for either the FMA or SRL program grants should contact the appropriate FEMA Regional Administrator for application information.

(b) *Subapplicant or subgrantee.* Participation in the SRL and the FMA program is voluntary, and communities may elect not to apply. Communities or other subapplicants who choose to apply must develop applications within the timeframes and requirements established by FEMA and must submit applications to the State.

§ 79.6 Eligibility.

(a) *Eligible applicants and subapplicants.* (1) States, Indian tribal governments, and communities participating in the NFIP may apply for FMA planning and project grants and associated management costs.

(2) States, Indian tribal governments, and communities participating in the NFIP may apply for SRL project grants and associated management costs.

(3) Communities withdrawn, suspended, or not participating under part 60 of this subchapter of the NFIP are not eligible for either the FMA or SRL programs.

(b) *Plan requirement.* (1) States must have an approved State Mitigation Plan meeting the requirements of §§ 201.4 or 201.5 of this chapter in order to apply for grants through the FMA or SRL programs. Indian tribal governments must have an approved plan meeting the requirements of part 201 of this chapter at the time of application.

(2) In order to be eligible for FMA and SRL project grants, subapplicants must have an approved mitigation plan at the time of application in accordance with part 201 of this chapter that, at a minimum, addresses flood hazards.

(c) *Eligible activities.* (1) *Planning.* FMA planning grants may be used to develop or update State, Indian tribal and/or local mitigation plans which meet the planning criteria outlined in part 201 of this chapter. FMA planning grants are limited to those activities necessary to develop or update the flood portion of any mitigation plan. Planning grants are not eligible for funding under the SRL program.

(2) *Projects.* Projects funded under the SRL program are limited to those activities that specifically reduce or eliminate flood damages to severe repetitive loss properties. Projects funded under the FMA program are limited to activities that reduce flood damages to properties insured under the NFIP. For either program, applications involving any activities for which implementation has already been initiated or completed are not eligible for funding, and will not be considered. Eligible activities are:

(i) Acquisition of real property from property owners, and demolition or relocation of buildings to convert the property to open space use in perpetuity, in accordance with part 80 of this subchapter;

(ii) Demolition or relocation of structures to areas outside of the floodplain;

(iii) Elevation of existing structures to at least base flood levels or higher, if required by FEMA or if required by any State or local ordinance, and in accordance with criteria established by the Administrator;

(iv) Floodproofing of existing non-residential structures in accordance with the requirements of the NFIP or higher standards if required by FEMA or if required by any State or local ordinance, and in accordance with criteria established by the Administrator;

(v) Floodproofing of historic structures as defined in § 59.1 of this subchapter;

(vi) For SRL only, demolition and rebuilding of properties to at least base flood levels or higher, if required by FEMA or if required by any State or local ordinance, and in accordance with criteria established by the Administrator; and

(vii) Minor physical localized flood reduction measures that lessen the frequency or severity of flooding and decrease predicted flood damages, and that do not duplicate the flood prevention activities of other Federal agencies. Major flood control projects such as dikes, levees, floodwalls, seawalls, groins, jetties, dams and large-scale waterway channelization projects are not eligible.

(d) *Minimum project criteria.* In addition to being an eligible project type, mitigation grant projects must also:

(1) Be in conformance with mitigation plans approved under part 201 of this chapter for the State and community where the project is located;

(2) Be in conformance with part 9 of this chapter, Floodplain management and protection of wetlands, part 10 of this chapter, Environmental considerations, § 60.3 of this subchapter, Flood plain management criteria for flood-prone areas, and other applicable Federal, State, tribal, and local laws and regulations;

(3) Be technically feasible;

(4) Solve a problem independently, or constitute a functional portion of a long-term solution where there is assurance that the project as a whole will be completed. This assurance will include documentation identifying the remaining funds necessary to complete the project, and the timeframe for completing the project;

(5) Be cost-effective and reduce the risk of future flood damage;

(6) Consider long-term changes to the areas and entities it protects, and have manageable future maintenance and modification requirements. The subgrantee is responsible for the continued maintenance needed to preserve the hazard mitigation benefits of these measures; and

(7) Not duplicate benefits available from another source for the same purpose or assistance that another Federal agency or program has more primary authority to provide.

§ 79.7 Offers and appeals under the SRL program.

(a) *Consultation.* States and communities shall consult, to the extent practicable, and in accordance with criteria determined by the Administrator, with owners of the severe repetitive loss properties to select the most appropriate eligible mitigation activity. These consultations shall be initiated in the early stages of the project development, and shall continue throughout the process. After FEMA awards the project grant, the subgrantee shall continue to consult with the property owners to determine the specific conditions of the offer.

(b) *Mitigation offer.* After FEMA awards the grant and the subgrantee completes final consultations with the property owners, the subgrantee shall develop and present official offers to the property owners participating in the mitigation activities.

(1) The offer shall include all pertinent information regarding the mitigation activity, including a detailed description of the activity (*e.g.* property acquisition, elevation), the responsibilities of and benefits to the property owner, a summary of the consultation process, timeframes, and the consequences of refusing such offer. For open space acquisitions, it will also include the market value of the property, the basis for the purchase offer, and the final offer amount. The offer will also clearly state that the property owner's participation in the SRL program is voluntary.

(2) The subgrantee will send the written offer to the property owner's current mailing address as a certified letter, along with a copy to the appropriate FEMA Regional Administrator. In addition, the subgrantee will notify each holder of a recorded interest on the property when such offer is extended, along with the identification of the mitigation assistance being offered.

(3) The property owner will have 45 days from the date of the letter to accept or refuse the offer of mitigation assistance in writing. Failure to respond in writing within this time period will be deemed a refusal of the offer.

(c) *Insurance increases due to refusal of offer.* In any case in which the property owner refuses an offer of mitigation assistance made through the SRL program, the Administrator shall provide written notice that the chargeable insurance rates with respect to the property will increase effective on the next renewal of the policy.

(1) The chargeable insurance premium rate shall be increased to the amount equal to 150 percent of the chargeable rate for the property at the time that the offer was made, as adjusted by any other premium adjustments otherwise applicable to the property. Each time there is another claim payment in excess of $1,500, the chargeable premium rate for that property shall be the amount equal to 150 percent over the chargeable rate at the time of every such claim, as adjusted by any other premium adjustments otherwise applicable to the property. The increases shall end when the actuarial rate is reached.

(2) Upon each renewal or modification of the flood insurance coverage, the property owner will be able to accept the original mitigation offer, if the community, through the State, forwards the request to FEMA, and if sufficient funds are available.

(d) *Appeals of insurance rate increases.* Any owner of a severe repetitive loss property may appeal the decision to increase the chargeable insurance premium rate as described in paragraph (c) of this section by submitting a written appeal, including supporting documentation that is postmarked or delivered to the appropriate FEMA Regional Administrator within 90 days of the date of the notice of the insurance increase. The increase in the amount of chargeable premium rate for flood insurance coverage for the property will be suspended pending the outcome of the appeal.

(1) Appeals must be based upon one or more of the following grounds. The property owner must include documentation to support each ground serving as a basis for the appeal:

(i) The offered mitigation activity is an acquisition and the property owner would be unable to purchase a replacement of the primary residence that is of comparable value and that is functionally equivalent. The property owner must document the actions taken to locate such replacement dwelling and demonstrate that no such dwelling is available.

(ii)(A) The amount of Federal funds offered for a mitigation activity, when combined with funds from the required non-Federal sources, would not cover the actual eligible costs of the mitigation activity contained in the mitigation offer, based on independent information. In the case of an acquisition, the purchase offer is not an accurate estimation of the market value of the property, based on independent information.

(B) For a mitigation activity other than acquisition, the property owner must submit independent estimates from professional engineers or registered architects to support this claim. For an acquisition, the property owner must submit an appraisal from a qualified appraiser to support this claim, and valuations will be considered by a review appraiser.

(iii) The offered mitigation activity would diminish the integrity of a historic district, site, building, or object's significant historic characteristics to the extent where the historic resource would lose its status as listed or eligible for inclusion on the National Register of Historic Places. The property owner must submit appropriate documentation from the State Historic Preservation Officer/ Tribal Historic Preservation Officer to support this claim.

(iv) For a multifamily property: Each of the flood insurance claims payments that served as the basis for its designation as a severe repetitive loss property must have resulted directly from the actions of a third party in violation of Federal, State, or local law, ordinance, or regulation. The property owner(s) must submit appropriate evidence, documentation, or data to support this claim.

(v) The property owner relied upon FEMA Flood Insurance Rate Maps (FIRMs) that were current at the time the property was purchased, and the effective FIRM and associated Flood Insurance Study (FIS) did not indicate that the property was located in an area having special flood hazards. The property owner must produce the dated FIRM and FIS in effect at the time the property was purchased to support this claim.

(vi) An alternative mitigation activity would be at least as cost effective as the offered mitigation activity. The property owner must submit documentation of the costs for a technically feasible and eligible alternative mitigation activity based on estimates from qualified appraisers, professional engineers, or registered architects, and information and documentation demonstrating the cost effectiveness using a FEMA approved methodology to support this claim.

(2) The FEMA Regional Administrator will conduct an initial review of each appeal that is filed on a timely basis to determine if the appeal complies with this section and includes sufficient documentation to be evaluated. The Regional Administrator may reject an appeal on initial review if it is made on

a basis other than those listed in paragraph (d)(1) of this section; if the property owner does not provide sufficient documentation, including, if applicable, supplemental information requested by the Regional Administrator by the deadline established by the Regional Administrator, which shall not exceed the timeframe described in paragraph (d) of this section; or if the appeal otherwise fails to comply with this section.

(3) If, upon initial review, the Regional Administrator determines that the basis for the offered mitigation activity was erroneous on its face and the appeal can be resolved in favor of the property owner, the appeal will be closed and no insurance increase will apply to the property. All other cases will be referred to the Administrator for assignment to an independent third party for review. The independent third party shall make a final determination on each appeal within 90 days of the date on which FEMA receives the appeal. As a low cost option, the property owner may request that the Administrator substitute a reviewer from FEMA's Alternative Dispute Resolution Office for the independent third party.

(4) A property owner who brings an appeal will be responsible for paying his/her attorneys' fees and costs to gather the necessary documentation and data to demonstrate the ground(s) for the appeal. Attorneys' fees and costs cannot be awarded by the independent third party.

(5) If the property owner prevails on appeal, the independent third party shall require the Administrator to charge the risk premium rate for flood insurance coverage of the property at the amount paid prior to the mitigation offer, as adjusted by any other premium adjustments otherwise applicable to the property. If the independent third party hearing the appeal is compensated for such service, the NFIF shall bear the costs of such compensation.

(6) If the property owner loses the appeal, the Administrator shall promptly increase the chargeable risk premium rate for flood insurance coverage of the property to the amount established pursuant to paragraph (c) of this section, and shall collect from the property owner the amount necessary to cover the stay of the applicability of such increased rates while the appeal was pending. If FEMA does not receive the additional premium by the date it is due, the amount of coverage will be reduced to match the amount of premium payment received. If the independent third party hearing the appeal is compensated for such service, the property owner shall bear the costs of such compensation.

§ 79.8 Allowable costs.

(a) *General.* General policies for determining allowable costs are addressed in §§ 13.4, 13.6, and 13.22 of this chapter. Allowable costs are explained in this paragraph.

(1) *Eligible Management Costs*—(i) Grantee. States are eligible to receive management costs consisting of a maximum of 10 percent of the planning and project activities awarded to the State, each fiscal year under FMA and SRL, respectively. These costs must be included in the application to FEMA. An Indian tribal government applying directly to FEMA is eligible for management costs consisting of a maximum of 10 percent of grants awarded for planning and project activities under the SRL and FMA programs respectively.

(ii) Subgrantee. Subapplicants may include a maximum of 5 percent of the total funds requested for their subapplication for management costs to support the implementation of their planning or project activity. These costs must be included in the subapplication to the State.

(2) *Indirect costs.* Indirect costs of administering the FMA and SRL programs are eligible as part of the 10 percent management costs for the grantee or the 5 percent management costs of the subgrantee, but in no case do they make the recipient eligible for additional management costs that exceed the caps identified in paragraph (a)(1) of this section. In addition, all costs must be in accordance with the provisions of part 13 of this chapter and Office of Management and Budget Circular A–87.

(b) *Pre-award costs.* FEMA may fund eligible pre-award planning or project costs at its discretion and as funds are available. Grantees and subgrantees may be reimbursed for eligible pre-award costs for activities directly related to the development of the project or planning proposal. These costs can only be incurred during the open application period of the respective grant program. Costs associated with implementation of the activity but incurred prior to grant award are not eligible. Therefore, activities where implementation is initiated or completed prior to award are not eligible and will not be reimbursed.

(c) *Duplication of benefits.* Grant funds may not duplicate benefits received by or available to applicants, subapplicants and project participants from insurance, other assistance programs, legal awards, or any other source to address the same purpose. Such individual or entity must notify the grantee and FEMA of all benefits that it receives or anticipates from other sources for the same purpose. FEMA will reduce the subgrant award by the amounts available for the same purpose from another source.

(d) *Negligence or other tortious conduct.* FEMA grant funds are not available where an applicant, subapplicant, other project participant, or third party's negligence or intentional actions contributed to the conditions to be mitigated. If the applicant, subapplicant, or project participant suspects negligence or other tortious conduct by a third party for causing such condition, they are responsible for taking all reasonable steps to recover all costs attributable to the tortious conduct of the third party. FEMA generally considers such amounts to be duplicated benefits available for the same purpose, and will treat them consistent with paragraph (c) of this section.

(e) FEMA grant funds are not available to satisfy or reimburse for legal obligations, such as those imposed by a legal settlement, court order, or State law.

§ 79.9 Grant administration.

(a) The Grantee must follow FEMA grant requirements, including submission of performance and financial status reports, and shall follow adequate competitive procurement procedures. In addition, grantees are responsible for ensuring that all subgrantees are aware of and follow the requirements contained in part 13 of this chapter.

(b) During the implementation of an approved grant, the State POC may find that actual costs are exceeding the approved award amount. While there is no guarantee of additional funding, FEMA will only consider requests made by the State POC to pay for such overruns if:

(1) Funds are available to meet the requested increase in funding;

(2) The amended grant award meets the cost-share requirements identified in this section; and

(3) The total amount obligated to the State does not exceed the maximum funding amounts set in § 79.4(a)(2).

(c) Grantees may use cost underruns from ongoing subgrants to offset overruns incurred by another subgrant(s) awarded under the same grant. All costs for which funding is requested must have been included in the original application's cost estimate.

(d) For all cost overruns that exceed the amount approved under the grant,

and which require additional Federal funds, the State POC shall submit a written request with a recommendation, including a justification for the additional funding to the Regional Administrator for a determination. If approved, the Regional Administrator shall increase the grant through an amendment to the original award document.

(e) At the time of closeout, FEMA will recapture any funds provided to a State or a community under these programs if the applicant has not provided the appropriate matching funds, the approved project has not been completed within the timeframes specified in the grant agreement, or the completed project does not meet the criteria specified in this part.

■ 9. Add part 80 to read as follows:

PART 80—PROPERTY ACQUISITION AND RELOCATION FOR OPEN SPACE

Subpart A—General

Sec.
80.1 Purpose and scope.
80.3 Definitions.
80.5 Roles and responsibilities.

Subpart B—Requirements Prior to Award

80.7 General.
80.9 Eligible and ineligible costs.
80.11 Project eligibility.
80.13 Application information.

Subpart C—Post-Award Requirements

80.15 General.
80.17 Project implementation.
80.19 Land use and oversight.

Subpart D—After the Grant Requirements

80.21 Closeout requirements.

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 through 5206; the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4001 *et seq.*; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; Homeland Security Act of 2002, 6 U.S.C. 101; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; E.O. 13286, 68 FR 10619, 3 CFR, 2003 Comp., p. 166.

Subpart A—General

§ 80.1 Purpose and scope.

This part provides guidance on the administration of FEMA mitigation assistance for projects to acquire property for open space purposes under all FEMA hazard mitigation assistance programs. It provides information on the eligibility and procedures for implementing projects for acquisition and relocation of at-risk properties from the hazard area to maintain the property for open space purposes. This part applies to property acquisition for open space project awards made under any FEMA hazard mitigation assistance program. This part supplements general program requirements of the funding grant program and must be read in conjunction with the relevant program regulations and guidance available at *http://www.fema.gov*. This part, with the exception of § 80.19 Land use and oversight, applies to projects for which the funding program application period opens or for which funding is made available pursuant to a major disaster declared on or after December 3, 2007. Prior to that date, applicable program regulations and guidance in effect for the funding program (available at *http://www.fema.gov*) shall apply. Section 80.19 Land use and oversight apply as of December 3, 2007 to all FEMA funded acquisitions for the purpose of open space.

§ 80.3 Definitions.

(a) Except as noted in this part, the definitions applicable to the funding program apply to implementation of this part. In addition, for purposes of this part:

(b) *Applicant* is the State or Indian tribal government applying to FEMA for a grant, and which will be accountable for the use of the funds.

(c) *Grantee* means the State or Indian tribal government to which FEMA awards a grant and which is accountable for the use of the funds provided. The grantee is the entire legal entity, even if only a particular component of the entity is designated in the grant award document.

(d) *Market Value* is generally defined as the amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of the valuation, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property at the time of the valuation.

(e) *National of the United States* means a person within the meaning of the term as defined in the Immigration and Nationality Act, 8 U.S.C. section 1101(a)(22).

(f) *Purchase offer* is the initial value assigned to the property, which is later adjusted by applicable additions and deductions, resulting in a final offer amount to a property owner.

(g) *Qualified alien* means a person within the meaning of the term as defined at 8 U.S.C. 1641.

(h) "Qualified conservation organization" means a qualified organization with a conservation purpose pursuant to 26 CFR 1.170A–14 and applicable implementing regulations, that is such an organization at the time it acquires the property interest and that was such an organization at the time of the major disaster declaration, or for at least 2 years prior to the opening of the grant application period.

(i) *Subapplicant* means the entity that submits an application for FEMA mitigation assistance to the State or Indian tribal applicant/grantee. With respect to open space acquisition projects under the Hazard Mitigation Grant Program (HMGP), this term has the same meaning as given to the term "applicant" in part 206, subpart N of this chapter. Upon grant award, the subapplicant is referred to as the subgrantee.

(j) *Subgrant* means an award of financial assistance made under a grantee to an eligible subgrantee.

(k) *Subgrantee* means the State agency, community, or Indian tribal government or other legal entity to which a subgrant is awarded and which is accountable to the grantee for the use of the funds provided.

(l) *Administrator* means the head of the Federal Emergency Management Agency, or his/her designated representative, appointed under section 503 of the Post-Katrina Emergency Management Reform Act of 2006 (Pub. L. 109–295). The term also refers to the Director as discussed in part 2 of this chapter.

(m) *Regional Administrator* means the head of a Federal Emergency Management Agency regional office, or his/her designated representative, appointed under section 507 of the Post-Katrina Emergency Management Reform Act of 2006 (Pub. L. 109–295). The term also refers to Regional Directors as discussed in part 2 of this chapter.

§ 80.5 Roles and responsibilities.

The roles and responsibilities of FEMA, the State, the subapplicant/subgrantee, and participating property owners in the particular context of mitigation projects for the purpose of creating open space include the activities in this section. These are in addition to grants management roles and responsibilities identified in regulations and guidance of the program funding the project (available at *http://www.fema.gov*) and other responsibilities specified in this part.

(a) *Federal roles and responsibilities.* Oversee property acquisition activities undertaken under FEMA mitigation grant programs, including:

(1) Providing technical assistance to the applicant/grantee to assist in implementing project activities in compliance with this part;

(2) Reviewing applications for eligibility and compliance with this part;

(3) Reviewing proposals for subsequent transfer of a property interest and approving appropriate transferees;

(4) Making determinations on the compatibility of proposed uses with the open space purpose, in accordance with § 80.19;

(5) Complying with applicable Federal statutory, regulatory, and Executive Order requirements related to environmental and historic preservation compliance, including reviewing and supplementing, if necessary, environmental analyses conducted by the State and subgrantee in accordance with part 10 of this chapter;

(6) Providing no Federal disaster assistance, flood insurance claims payments, or other FEMA assistance with respect to the property or any open-space related improvements, after the property interest transfers; and

(7) Enforcing the requirements of this part and the deed restrictions to ensure that the property remains in open space use in perpetuity.

(b) *State (applicant/grantee) roles and responsibilities.* Serve as the point of contact for all property acquisition activities by coordinating with the subapplicant/subgrantee and with FEMA to ensure that the project is implemented in compliance with this part, including:

(1) Providing technical assistance to the subapplicant/subgrantee to assist in implementing project activities in compliance with this part;

(2) Ensuring that applications are not framed in a manner that has the effect of circumventing any requirements of this part;

(3) Reviewing the application to ensure that the proposed activity complies with this part, including ensuring that the property acquisition activities remain voluntary in nature, and that the subgrantee and property owners are made aware of such;

(4) Submitting to FEMA subapplications for proposed projects in accordance with the respective program schedule and programmatic requirements, and including all the requisite information to enable FEMA to determine the eligibility, technical feasibility, cost effectiveness, and environmental and historic preservation compliance of the proposed projects;

(5) Reviewing proposals for subsequent transfer of property interest and obtaining FEMA approval of such transfers; and ensuring that all uses proposed for the property are compatible with open space project purposes;

(6) Making no application for, nor providing, Federal disaster assistance or other FEMA assistance for the property or any open-space related improvements, after the property interest transfers;

(7) Enforcing the terms of this part and the deed restrictions to ensure that the property remains in open space use in perpetuity; and

(8) Reporting on property compliance with the open space requirements after the grant is awarded.

(c) *Subapplicant/Subgrantee roles and responsibilities.* Coordinate with the applicant/grantee and with the property owners to ensure that the project is implemented in compliance with this part, including:

(1) Submitting all applications for proposed projects in accordance with the respective program schedule and programmatic requirements, and including all the requisite information to enable the applicant/grantee and FEMA to determine the eligibility, technical feasibility, cost effectiveness, and environmental and historic preservation compliance of the proposed projects;

(2) Ensuring that applications are not framed in a manner that has the effect of circumventing any requirements of this part;

(3) Coordinating with the property owners to ensure they understand the benefits and responsibilities of participating in the project, including that participation in the project is voluntary, and that the property owner(s) are made aware of such;

(4) Developing the application and implementing property acquisition activities in compliance with this part, and ensuring that all terms of the deed restrictions and grant award are enforced;

(5) Ensuring fair procedures and processes are in place to compensate property owners and tenants affected by the purchase of property; such as determining property values and/or the amount of the mitigation offer, and reviewing property owner disputes regarding such offers;

(6) Making no application for Federal disaster assistance, flood insurance, or other FEMA benefits for the property or any open-space related improvements, after the property interest transfers;

(7) Taking and retaining full property interest, consistent with this part; or if transferring such interest, obtaining approval of the grantee and FEMA;

(8) Submitting to the grantee and FEMA proposed uses on the property for open space compatibility determinations; and

(9) Monitoring and reporting on property compliance after the grant is awarded.

(d) *Participating property owner roles and responsibilities.* Notify the subapplicant/subgrantee of its interest to participate, provide information to the subapplicant/subgrantee, and take all required actions necessary for the completion of the grant application and the implementation of property acquisition activities in accordance with this part.

Subpart B—Requirements Prior to Award

§ 80.7 General.

A project involving property acquisition or the relocation of structures for open space is eligible for hazard mitigation assistance only if the subapplicant meets the pre-award requirements set forth in this subpart. A project may not be framed in a manner that has the effect of circumventing the requirements of this subpart.

§ 80.9 Eligible and ineligible costs.

(a) *Allowable costs.* Eligible project costs may include compensation for the value of structures, for their relocation or demolition, for associated land, and associated costs. For land that is already held by an eligible entity, compensation for the land is not an allowable cost, but compensation for development rights may be allowable.

(b) *Pre-award costs.* FEMA may fund eligible pre-award project costs at its discretion and as funds are available. Grantees and subgrantees may be reimbursed for eligible pre-award costs for activities directly related to the development of the project proposal. These costs can only be incurred during the open application period of the respective grant program. Costs associated with implementation of the project but incurred prior to grant award are not eligible. Therefore, activities where implementation is initiated or completed prior to award are not eligible and will not be reimbursed.

(c) *Duplication of benefits.* Grant funds may not duplicate benefits received by or available to applicants, subapplicants and other project participants from insurance, other assistance programs, legal awards, or any other source to address the same purpose. Such individual or entity must notify the subapplicant and FEMA of all benefits that it receives, anticipates, or has available from other sources for the

same purpose. FEMA will reduce the subgrant award by the amounts available for the same purpose from another source.

(d) *Negligence or other tortious conduct.* FEMA acquisition funds are not available where an applicant, subapplicant, other project participant, or third party's negligence or intentional actions contributed to the conditions to be mitigated. If the applicant, subapplicant, or project participant suspects negligence or other tortious conduct by a third party for causing such condition, they are responsible for taking all reasonable steps to recover all costs attributable to the tortious conduct of the third party. FEMA generally considers such amounts to be duplicated benefits available for the same purpose, and will treat them consistent with paragraph (c) of this section.

(e) FEMA mitigation grant funds are not available to satisfy or reimburse for legal obligations, such as those imposed by a legal settlement, court order, or State law.

§ 80.11 Project eligibility.

(a) *Voluntary participation.* Eligible acquisition projects are those where the property owner participates voluntarily, and the grantee/subgrantee will not use its eminent domain authority to acquire the property for the open space purposes should negotiations fail.

(b) *Acquisition of improved properties.* Eligible properties are those with at-risk structures on the property, including those that are damaged or destroyed due to an event. In some cases, undeveloped, at-risk land adjacent to an eligible property with existing structures may be eligible.

(c) *Subdivision restrictions.* The land may not be subdivided prior to acquisition except for portions outside the identified hazard area, such as the Special Flood Hazard Area or any risk zone identified by FEMA.

(d) *Subapplicant property interest.* To be eligible, the subapplicant must acquire or retain fee title (full property interest) as part of the project implementation. A pass through of funds from an eligible entity to an ineligible entity must not occur.

(e) *Hazardous materials.* Eligible properties include only those that are not contaminated with hazardous materials, except for incidental demolition and household hazardous waste.

(f) *Open space restrictions.* Property acquired or from which a structure is removed must be dedicated to and maintained as open space in perpetuity consistent with this part.

§ 80.13 Application information.

(a) An application for acquisition of property for the purpose of open space must include:

(1) A photograph that represents the appearance of each property site at the time of application;

(2) Assurances that the subapplicant will implement the project grant award in compliance with subparts C and D of this part;

(3) The deed restriction language, which shall be consistent with the FEMA model deed restriction that the local government will record with the property deeds. Any variation from the model deed restriction language can only be made with prior approval from FEMA's Office of General Counsel;

(4) The documentation of voluntary interest signed by each property owner, which must include that the subapplicant has informed them in writing that it will not use its eminent domain authority for the open space purpose; and

(5) Assurance that the subject property is not part of an intended, planned, or designated project area for which the land is to be acquired by a certain date, and that local and State governments have no intention to use the property for any public or private facility in the future inconsistent with this part;

(6) If the applicant is offering pre-event value: certification that the property owner is a National of the United States or qualified alien; and

(7) Other information as determined by the Administrator.

(b) *Consultation regarding other ongoing Federal activities.* (1) The subapplicant must demonstrate that it has consulted with the United States Army Corps of Engineers (USACE) regarding the subject land's potential future use for the construction of a levee system. The subapplicant must also demonstrate that it has, and will, reject any future consideration of such use if it accepts FEMA assistance to convert the property to permanent open space.

(2) The subapplicant must demonstrate that it has coordinated with its State Department of Transportation to ensure that no future, planned modifications, improvements, or enhancements to Federal aid systems are under consideration that will affect the subject property.

(c) *Restriction on alternate properties.* Changes to the properties in an approved mitigation project will be considered by FEMA but not approved automatically. The subapplicant must identify the alternate properties in the project application and each alternate property must meet eligibility requirements in order to be considered.

Subpart C—Post-Award Requirements

§ 80.15 General.

A project involving property acquisition or the relocation of structures for open space must be implemented consistent with the requirements set forth in this subpart.

§ 80.17 Project implementation.

(a) *Hazardous materials.* The subgrantee shall take steps to ensure it does not acquire or include in the project properties contaminated with hazardous materials by seeking information from property owners and from other sources on the use and presence of contaminants affecting the property from owners of properties that are or were industrial or commercial, or adjacent to such. A contaminated property must be certified clean prior to participation. This excludes permitted disposal of incidental demolition and household hazardous wastes. FEMA mitigation grant funds may not be used for clean up or remediation of contaminated properties.

(b) *Clear title.* The subgrantee will obtain a title insurance policy demonstrating that fee title conveys to the subgrantee for each property to ensure that it acquires only a property with clear title. The property interest generally must transfer by a general warranty deed. Any incompatible easements or other encumbrances to the property must be extinguished before acquisition.

(c) *Purchase offer and supplemental payments.* (1) The amount of purchase offer is the current market value of the property or the market value of the property immediately before the relevant event affecting the property ("pre-event").

(i) The relevant event for Robert T. Stafford Disaster Relief and Emergency Assistance Act assistance under HMGP is the major disaster under which funds are available; for assistance under the Pre-disaster Mitigation program (PDM) (42 U.S.C. 5133), it is the most recent major disaster. Where multiple disasters have affected the same property, the grantee and subgrantee shall determine which is the relevant event.

(ii) The relevant event for assistance under the National Flood Insurance Act is the most recent event resulting in a National Flood Insurance Program (NFIP) claim of at least $5000.

(2) For acquisition of properties under the Severe Repetitive Loss program under part 79 of this subchapter, the purchase offer is not less than the

greatest of the amount in paragraph (c)(1) of this section; the original purchase price paid by the participating property owner holding the flood insurance policy; or the outstanding amount of any loan to the participating property owner, which is secured by a recorded interest in the property at the time of the purchase offer.

(3) The grantee should coordinate with the subgrantee in their determination of whether the valuation should be based on pre-event or current market value. Generally, the same method to determine market value should be used for all participants in the project.

(4) A property owner who did not own the property at the time of the relevant event, or who is not a National of the United States or qualified alien, is not eligible for a purchase offer based on pre-event market value of the property. Subgrantees will ask each participating property owner to certify that they are either a National of the United States or qualified alien before offering pre-event market value for the property.

(5) Certain tenants who must relocate as a result of the project are entitled to relocation benefits under the Uniform Relocation Assistance and Real Property Acquisition Policies Act (such as moving expenses, replacement housing rental payments, and relocation assistance advisory services) in accordance with 49 CFR part 24.

(6) If a purchase offer for a residential property is less than the cost of the homeowner-occupant to purchase a comparable replacement dwelling outside the hazard-prone area in the same community, the subgrantee for funding under the Severe Repetitive Loss program implemented at part 79 of this subchapter shall make available a supplemental payment to the homeowner-occupant to apply to the difference. Subgrantees for other mitigation grant programs may make such a payment available in accordance with criteria determined by the Administrator.

(7) The subgrantee must inform each property owner, in writing, of what it considers to be the market value of the property, the method of valuation and basis for the purchase offer, and the final offer amount. The offer will also clearly state that the property owner's participation in the project is voluntary.

(d) *Removal of Existing Buildings.* Existing incompatible facilities must be removed by demolition or by relocation outside of the hazard area within 90 days of settlement of the property transaction. The FEMA Regional Administrator may grant an exception to this deadline only for a particular property based upon written justification if extenuating circumstances exist, but shall specify a final date for removal.

(e) *Deed Restriction.* The subgrantee, upon settlement of the property transaction, shall record with the deed of the subject property notice of applicable land use restrictions and related procedures described in this part, consistent with FEMA model deed restriction language.

§ 80.19 Land use and oversight.

This section applies to acquisitions for open space projects to address flood hazards. If the Administrator determines to mitigate in other circumstances, he/she will adapt the provisions of this section as appropriate.

(a) *Open space requirements.* The property shall be dedicated and maintained in perpetuity as open space for the conservation of natural floodplain functions.

(1) These uses may include: Parks for outdoor recreational activities; wetlands management; nature reserves; cultivation; grazing; camping (except where adequate warning time is not available to allow evacuation); unimproved, unpaved parking lots; buffer zones; and other uses FEMA determines compatible with this part.

(i) Allowable uses generally do not include: Walled buildings, levees, dikes, or floodwalls, paved roads, highways, bridges, cemeteries, landfills, storage of any hazardous or toxic materials, above or below ground pumping and switching stations, above or below ground storage tanks, paved parking, off-site fill or other uses that obstruct the natural and beneficial functions of the floodplain.

(ii) In the rare circumstances where the Administrator has determined competing Federal interests were unavoidable and has analyzed floodplain impacts for compliance with § 60.3 of this subchapter or higher standards, the Administrator may find only USACE projects recognized by FEMA in 2000 and improvements to pre-existing Federal-aid transportation systems to be allowable uses.

(2) No new structures or improvements will be built on the property except as indicated below:

(i) A public facility that is open on all sides and functionally related to a designated open space or recreational use;

(ii) A public restroom; or

(iii) A structure that is compatible with open space and conserves the natural function of the floodplain, which the Administrator approves in writing before the construction of the structure begins.

(3) Any improvements on the property shall be in accordance with proper floodplain management policies and practices. Structures built on the property according to paragraph (a)(2) of this section shall be floodproofed or elevated to at least the base flood level plus 1 foot of freeboard, or greater, if required by FEMA, or if required by any State or local ordinance, and in accordance with criteria established by the Administrator.

(4) After the date of property settlement, no Federal entity or source may provide disaster assistance for any purpose with respect to the property, nor may any application for such assistance be made to any Federal entity or source.

(5) The property is not eligible for coverage under the NFIP for damage to structures on the property occurring after the date of the property settlement, except for pre-existing structures being relocated off the property as a result of the project.

(b) *Subsequent transfer.* After acquiring the property interest, the subgrantee, including successors in interest, shall convey any interest in the property only if the Regional Administrator, through the State, gives prior written approval of the transferee in accordance with this paragraph.

(1) The request by the subgrantee, through the State, to the Regional Administrator must include a signed statement from the proposed transferee that it acknowledges and agrees to be bound by the terms of this section, and documentation of its status as a qualified conservation organization if applicable.

(2) The subgrantee may convey a property interest only to a public entity or to a qualified conservation organization. However, the subgrantee may convey an easement or lease to a private individual or entity for purposes compatible with the uses described in paragraph (a), of this section, with the prior approval of the Regional Administrator, and so long as the conveyance does not include authority to control and enforce the terms and conditions of this section.

(3) If title to the property is transferred to a public entity other than one with a conservation mission, it must be conveyed subject to a conservation easement that shall be recorded with the deed and shall incorporate all terms and conditions set forth in this section, including the easement holder's responsibility to enforce the easement. This shall be accomplished by one of the following means:

(i) The subgrantee shall convey, in accordance with this paragraph, a conservation easement to an entity other than the title holder, which shall be recorded with the deed, or

(ii) At the time of title transfer, the subgrantee shall retain such conservation easement, and record it with the deed.

(4) Conveyance of any property interest must reference and incorporate the original deed restrictions providing notice of the conditions in this section and must incorporate a provision for the property interest to revert to the subgrantee or grantee in the event that the transferee ceases to exist or loses its eligible status under this section.

(c) *Inspection.* FEMA, its representatives and assigns, including the grantee shall have the right to enter upon the property, at reasonable times and with reasonable notice, for the purpose of inspecting the property to ensure compliance with the terms of this part, the property conveyance and of the grant award.

(d) *Monitoring and reporting.* Every 3 years the subgrantee (in coordination with any current successor in interest) through the grantee, shall submit to the FEMA Regional Administrator a report certifying that the subgrantee has inspected the property within the month preceding the report, and that the property continues to be maintained consistent with the provisions of this part, the property conveyance and the grant award.

(e) *Enforcement.* The subgrantee, grantee, FEMA, and their respective representatives, successors and assigns, are responsible for taking measures to bring the property back into compliance if the property is not maintained according to the terms of this part, the conveyance, and the grant award. The relative rights and responsibilities of FEMA, the grantee, the subgrantee, and subsequent holders of the property interest at the time of enforcement, shall include the following:

(1) The grantee will notify the subgrantee and any current holder of the property interest in writing and advise them that they have 60 days to correct the violation.

(i) If the subgrantee or any current holder of the property interest fails to demonstrate a good faith effort to come into compliance with the terms of the grant within the 60-day period, the grantee shall enforce the terms of the grant by taking any measures it deems appropriate, including but not limited to bringing an action at law or in equity in a court of competent jurisdiction.

(ii) FEMA, its representatives, and assignees may enforce the terms of the grant by taking any measures it deems appropriate, including but not limited to 1 or more of the following:

(A) Withholding FEMA mitigation awards or assistance from the State and subgrantee; and current holder of the property interest.

(B) Requiring transfer of title. The subgrantee or the current holder of the property interest shall bear the costs of bringing the property back into compliance with the terms of the grant; or

(C) Bringing an action at law or in equity in a court of competent jurisdiction against any or all of the following parties: the grantee, the subgrantee, and their respective successors.

Subpart D—After the Grant Requirements

§ 80.21 Closeout requirements.

Upon closeout of the grant, the subgrantee, through the grantee, shall provide FEMA, with the following:

(a) A copy of the deed recorded for each property, demonstrating that each property approved in the original application was mitigated and that the deed restrictions recorded are consistent with the FEMA model deed restriction language to meet the requirements of this part;

(b) A photo of each property site after project completion;

(c) The latitude-longitude coordinates of each property site;

(d) Identification of each property as a repetitive loss property, if applicable; and

(e) Other information as determined by the Administrator.

PART 201—MITIGATION PLANNING

■ 10. The authority citation for part 201 is revised to read as follows:

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 through 5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; Homeland Security Act of 2002, 6 U.S.C. 101; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; E.O. 13286, 68 FR 10619, 3 CFR, 2003 Comp., p. 166.

■ 11. Section 201.2 is amended by revising the definition of "Hazard Mitigation Grant Program" and by adding the following definitions to the alphabetical list of definitions:

§ 201.2 Definitions.

Administrator means the head of the Federal Emergency Management Agency, or his/her designated representative, appointed under section 503 of the Post-Katrina Emergency Management Reform Act of 2006 (Pub. L. 109–295). The term also refers to the Director as discussed in part 2 of this chapter.

Flood Mitigation Assistance (FMA) means the program authorized by section 1366 of the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4104c, and implemented at parts 78 and 79.

* * * * *

Hazard Mitigation Grant Program (HMGP) means the program authorized under section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5170c, and implemented at part 206, subpart N of this chapter.

* * * * *

Pre-Disaster Mitigation Program (PDM) means the program authorized under section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5133.

* * * * *

Repetitive Flood Claims (RFC) program means the program authorized under section 1323 of the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4011, which provides funding to reduce flood damages to individual properties for which 1 or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Program (NFIP) in the shortest period of time.

Severe Repetitive Loss (SRL) program means the program authorized under section 1361(a) of the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4102a, and implemented at part 79 of this chapter.

Severe Repetitive Loss properties are defined as single or multifamily residential properties that are covered under an NFIP flood insurance policy and:

(1) That have incurred flood-related damage for which 4 or more separate claims payments have been made, with the amount of each claim (including building and contents payments) exceeding $5,000, and with the cumulative amount of such claims payments exceeding $20,000; or

(2) For which at least 2 separate claims payments (building payments only) have been made under such coverage, with cumulative amount of such claims exceeding the market value of the property.

(3) In both instances, at least 2 of the claims must be within 10 years of each

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other, and claims made within 10 days of each other will be counted as 1 claim.

* * * * *

■ 12. Revise paragraphs (c)(1), (c)(3), (d)(2) and (e) of § 201.3 to read as follows:

§ 201.3 Responsibilities.

* * * * *

(c) * * *

(1) Prepare and submit to FEMA a Standard State Mitigation Plan following the criteria established in § 201.4 as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. In addition, a State may choose to address severe repetitive loss properties in their plan as identified in § 201.4(c)(3)(v) to receive the reduced cost share for the Flood Mitigation Assistance (FMA) and Severe Repetitive Loss (SRL) programs, pursuant to § 79.4(c)(2) of this chapter.

* * * * *

(3) At a minimum, review and update the Standard State Mitigation Plan every 3 years from the date of the approval of the previous plan in order to continue program eligibility.

* * * * *

(d) * * *

(2) At a minimum, review and update the local mitigation plan every 5 years from date of plan approval of the previous plan in order to continue program eligibility.

(e) *Indian tribal governments.* The key responsibilities of the Indian tribal government are to coordinate all tribal activities relating to hazard evaluation and mitigation and to:

(1) Prepare and submit to FEMA a Tribal Mitigation Plan following the criteria established in § 201.7 as a condition of receiving non-emergency Stafford Act assistance as a grantee. This plan will also allow Indian tribal governments to apply through the State, as a subgrantee, for any FEMA mitigation project grant. Indian tribal governments with a plan approved by FEMA on or before October 1, 2008 under § 201.4 or § 201.6 will also meet this planning requirement. All Tribal Mitigation Plans approved after that date must follow the criteria identified in § 201.7. In addition, an Indian tribal government may choose to address severe repetitive loss properties as identified in § 201.4(c)(3)(v) as a condition of receiving the reduced cost share for the FMA and SRL programs, pursuant to § 79.4(c)(2) of this chapter.

(2) Review and update the Tribal Mitigation Plan at least every 5 years from the date of approval of the previous plan in order to continue program eligibility.

(3) In order to be considered for the increased HMGP funding, the Tribal Mitigation Plan must meet the Enhanced State Mitigation Plan criteria identified in § 201.5. The plan must be reviewed and updated at least every 3 years from the date of approval of the previous plan.

■ 13. Revise paragraphs (a) and (c)(7) and add paragraph (c)(3)(v) of § 201.4 to read as follows:

§ 201.4 Standard State Mitigation Plans.

(a) *Plan requirement.* States must have an approved Standard State Mitigation Plans meeting the requirements of this section as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. Emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. Mitigation planning grants provided through the Pre-disaster Mitigation (PDM) program, authorized under section 203 of the Stafford Act, 42 U.S.C. 5133, will also continue to be available. The mitigation plan is the demonstration of the State's commitment to reduce risks from natural hazards and serves as a guide for State decision makers as they commit resources to reducing the effects of natural hazards.

* * * * *

(c) * * *

(3) * * *

(v) A State may request the reduced cost share authorized under § 79.4(c)(2) of this chapter for the FMA and SRL programs, if it has an approved State Mitigation Plan meeting the requirements of this section that also identifies specific actions the State has taken to reduce the number of repetitive loss properties (which must include severe repetitive loss properties), and specifies how the State intends to reduce the number of such repetitive loss properties. In addition, the plan must describe the strategy the State has to ensure that local jurisdictions with severe repetitive loss properties take actions to reduce the number of these properties, including the development of local mitigation plans.

* * * * *

(7) *Assurances.* The plan must include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c) of this chapter. The State will amend its plan whenever necessary to reflect changes in State or Federal statutes and regulations as required in 44 CFR 13.11(d) of this chapter.

* * * * *

■ 14. Revise paragraphs (a)(1), (a)(2), (c)(2)(ii) introductory text, (d)(1), and (d)(3) and add a sentence to the end of paragraph (c)(3)(ii) of § 201.6 to read as follows:

§ 201.6 Local Mitigation Plans.

* * * * *

(a) * * *

(1) A local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants. The Administrator may, at his discretion, require a local mitigation plan for the Repetitive Flood Claims Program. A local government must have a mitigation plan approved pursuant to this section in order to apply for and receive mitigation project grants under all other mitigation grant programs.

(2) Plans prepared for the FMA program, described at part 79 of this chapter, need only address these requirements as they relate to flood hazards in order to be eligible for FMA project grants. However, these plans must be clearly identified as being flood mitigation plans, and they will not meet the eligibility criteria for other mitigation grant programs, unless flooding is the only natural hazard the jurisdiction faces.

* * * * *

(c) * * *

(2) * * *

(ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

* * * * *

(3) * * *

(ii) * * * All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

* * * * *

(d) * * *

(1) Plans must be submitted to the State Hazard Mitigation Officer (SHMO) for initial review and coordination. The State will then send the plan to the appropriate FEMA Regional Office for formal review and approval. Where the State point of contact for the FMA program is different from the SHMO, the SHMO will be responsible for

coordinating the local plan reviews between the FMA point of contact and FEMA.

* * * * *

(3) A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

* * * * *

■ 15. Add § 201.7 to read as follows:

§ 201.7 Tribal Mitigation Plans.

The Indian Tribal Mitigation Plan is the representation of the Indian tribal government's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards.

(a) *Plan requirement.* (1) Indian tribal governments applying to FEMA as a grantee must have an approved Tribal Mitigation Plan meeting the requirements of this section as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants. Emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected. Mitigation planning grants provided through the PDM program, authorized under section 203 of the Stafford Act, 42 U.S.C. 5133, will also continue to be available.

(2) An Indian tribal government may choose to address severe repetitive loss properties in their plan, as identified in § 201.4(c)(3)(v), to receive the reduced cost share for the FMA and SRL programs.

(3) Indian tribal governments applying through the State as a subgrantee must have an approved Tribal Mitigation Plan meeting the requirements of this section in order to receive HMGP project grants. The Administrator, at his discretion may require a local mitigation plan for the Repetitive Flood Claims Program. A tribe must have an approved Tribal Mitigation Plan in order to apply for and receive FEMA mitigation project grants, under all other mitigation grant programs.

(4) Multi-jurisdictional plans (*e.g.* county-wide or watershed plans) may be accepted, as appropriate, as long as the Indian tribal government has participated in the process and has officially adopted the plan. Indian tribal governments must address all the elements identified in this section to ensure eligibility as a grantee or as a subgrantee.

(b) An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other tribal agencies, appropriate Federal agencies, adjacent jurisdictions, interested groups, and be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA mitigation programs and initiatives.

(c) *Plan content.* The plan shall include the following:

(1) Documentation of the *planning process* used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. This shall include:

(i) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval, including a description of how the Indian tribal government defined "public;"

(ii) As appropriate, an opportunity for neighboring communities, tribal and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process;

(iii) Review and incorporation, if appropriate, of existing plans, studies, and reports; and

(iv) Be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA programs and initiatives.

(2) A *risk assessment* that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Tribal risk assessments must provide sufficient information to enable the Indian tribal government to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:

(i) A description of the type, location, and extent of all natural hazards that can affect the tribal planning area. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

(ii) A description of the Indian tribal government's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the tribe. The plan should describe vulnerability in terms of:

(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

(B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate;

(C) A general description of land uses and development trends within the tribal planning area so that mitigation options can be considered in future land use decisions; and

(D) Cultural and sacred sites that are significant, even if they cannot be valued in monetary terms.

(3) A *mitigation strategy* that provides the Indian tribal government's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:

(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

(iii) An action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the Indian tribal government.

(iv) A discussion of the Indian tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: An evaluation of tribal laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; and a discussion of tribal funding capabilities for hazard mitigation projects.

(v) Identification of current and potential sources of Federal, tribal, or private funding to implement mitigation activities.

(vi) An Indian tribal government may request the reduced cost share authorized under § 79.4(c)(2) of this chapter of the FMA and SRL programs if they have an approved Tribal Mitigation Plan meeting the requirements of this section that also identify actions the Indian tribal government has taken to reduce the number of repetitive loss properties (which must include severe repetitive loss properties), and specifies how the Indian tribal government intends to

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reduce the number of such repetitive loss properties.

(4) A *plan maintenance process* that includes:

(i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan.

(ii) A system for monitoring implementation of mitigation measures and project closeouts.

(iii) A process by which the Indian tribal government incorporates the requirements of the mitigation plan into other planning mechanisms such as reservation master plans or capital improvement plans, when appropriate.

(iv) Discussion on how the Indian tribal government will continue public participation in the plan maintenance process.

(v) A system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy.

(5) *Plan Adoption Process.* The plan must be formally adopted by the governing body of the Indian tribal government prior to submittal to FEMA for final review and approval.

(6) *Assurances.* The plan must include assurances that the Indian tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with § 13.11(c) of this chapter. The Indian tribal government will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in § 13.11(d) of this chapter.

(d) *Plan review and updates.* (1) Plans must be submitted to the appropriate FEMA Regional Office for formal review and approval. Indian tribal governments who would like the option of being a subgrantee under the State must also submit their plan to the State Hazard Mitigation Officer for review and coordination.

(2) The Regional review will be completed within 45 days after receipt from the Indian tribal government, whenever possible.

(3) Indian tribal governments must review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for non-emergency Stafford Act assistance and FEMA mitigation grant funding, with the exception of the Repetitive Flood Claims program.

PART 206—FEDERAL DISASTER ASSISTANCE

■ 16. The authority citation for part 206 continues to read as follows:

Authority: Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 through 5206; Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; Homeland Security Act of 2002, 6 U.S.C. 101; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376; E.O. 12148, 44 FR 43239, 3 CFR, 1979 Comp., p. 412; E.O. 13286, 68 FR 10619, 3 CFR, 2003 Comp., p. 166.

■ 17. Section 206.432 is amended by revising paragraphs (b) introductory text and (b)(1) to read as follows:

§ 206.432 Federal grant assistance.

* * * * *

(b) *Amounts of Assistance.* The total Federal contribution of funds is based on the estimated aggregate grant amount to be made under 42 U.S.C. 5170b, 5172, 5173, 5174, 5177, 5178, and 5183 of the Stafford Act for the major disaster (less associated administrative costs), and shall be as follows:

(1) *Standard percentages.* Not to exceed 15 percent for the first $2,000,000,000 or less of such amounts; not to exceed 10 percent of the portion of such amounts over $2,000,000,000 and not more than $10,000,000,000; and not to exceed 7.5 percent of the portion of such amounts over $10,000,000,000 and not more than $35,333,000,000.

* * * * *

■ 18. Section 206.433 is amended by revising paragraph (c) to read as follows:

§ 206.433 State responsibilities.

* * * * *

(c) *Hazard Mitigation Officer.* The State must appoint a Hazard Mitigation Officer who serves as the responsible individual for all matters related to the Hazard Mitigation Grant Program.

* * * * *

■ 19. Revise paragraphs (a)(2), (c)(5)(ii), (e) introductory text; add a sentence after the first sentence of (d)(2); remove paragraph (f); and redesignate current paragraphs (g) and (h) as (f) and (g) of § 206.434 to read as follows:

§ 206.434 Eligibility.

(a) * * *

(2) Private nonprofit organizations that own or operate a private nonprofit facility as defined in § 206.221(e). A qualified conservation organization as defined at § 80.3(h) of this chapter is the only private nonprofit organization eligible to apply for acquisition or relocation for open space projects;

* * * * *

(c) * * *

(5) * * *

(ii) Will not cost more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future disasters were to occur,

* * * * *

(d) * * *

(2) * * * Activities for which implementation has already been initiated or completed are not eligible for funding. * * *

* * * * *

(e) *Property acquisitions and relocation requirements.* Property acquisitions and relocation projects for open space proposed for funding pursuant to a major disaster declared on or after December 3, 2007 must be implemented in accordance with part 80 of this chapter. For major disasters declared prior to December 3, 2007, a project involving property acquisition or the relocation of structures and individuals is eligible for assistance only if the applicant enters into an agreement with the FEMA Regional Director that provides assurances that:

* * * * *

■ 20. Add new paragraph (c) to §206.439 to read as follows:

§ 206.439 Allowable costs.

* * * * *

(c) *Pre-award costs.* FEMA may fund eligible pre-award planning or project costs at its discretion and as funds are available. Grantees and subgrantees may be reimbursed for eligible pre-award costs for activities directly related to the development of the project or planning proposal. These costs can only be incurred during the open application period of the grant program. Costs associated with implementation of the activity but incurred prior to grant award are not eligible. Therefore, activities where implementation is initiated or completed prior to award are not eligible and will not be reimbursed.

Dated: October 24, 2007.

Harvey E. Johnson, Jr.,

Deputy Administrator/Chief Operating Officer, Federal Emergency Management Agency.

[FR Doc. E7–21265 Filed 10–30–07; 8:45 am]

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Appendix K
Planning Pilot Grant Program

Contents of this Section

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Appendix K.1:
Planning Pilot Grant Program Application Guidance

The following 6 pages contain the original guidance provided to potential applicants by the Governor's Office of Homeland Security on September 8, 2006.

Guidance for Preparing
PROJECT MILESTONE DESCRIPTIONS on the
HAZARD MITIGATION GRANT PROGRAM (HMGP) APPLICATION for the
PLANNING PILOT GRANT PROGRAM

What needs to be provided to apply for the Planning Pilot Grant Program?

The following sections of the Hazard Mitigation Grant Program (HMGP) Project Application, provided by the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), must be completed:

- Applicant, Project Location, Project Title and Estimated Project Cost information on page 1 of 23
- Applicant Information in Section B. on page 2 of 23
- Planning Requirement information in Section I. on page 3 of 23
- Project Description / Protection Provided information in Section III.A. on page 4 of 23
- Hazards to be Mitigated information in Section III.B.1 on page 4 of 23
- Scope of Work / Budget information regarding Labor and Funding Sources in Sections V.B and V.D on page 7 of 23
- Scope of Work / Budget information regarding Project Milestones in Section V.E. on page 8 of 23

The following information must be included under **Planning Requirement** (Section I on page 3) for all Plan Update applications. The applicant must provide a:

- listing of all jurisdictions, school districts, and quasi-governments that will participate in the plan;
- statement that the updated plan will meet or exceed the requirements of the Interim Final Rule for Local Mitigation Plan found in 44CFR Part 201.6;
- statement that the hazards assessed during the plan update, at a minimum, will be coordinated with the State of Louisiana Hazard Mitigation Plan including comparing local and state information for statewide risk assessments, critical facility listings and recommendations for mitigation best practices; and
- statement that the FEMA plan review crosswalk (September 2006 – Version 1.0) with the "cover page" and "location in the plan" sections completed will be submitted to the State and FEMA for review and approval through the State Hazard Mitigation Officer at GOHSEP for each required deliverable. A copy of the crosswalk is attached to this guidance document.

The following information must be provided under **Project Milestones** (Section V.E. on page 8) for the Planning Pilot Grant Program:

- Detailed **Scope of Work** (SOW) description. The level of detail for the SOW must be similar to Parts 1, 2 and 3 of this guidance document (see descriptions starting on page 2) regarding: Plan Updates, Project/Mitigation Scoping and Plan Amendments respectively.
- Proposed **Time Schedule** for completion of the SOW. The time schedule shall include specific deliverables as identified in Parts 1, 2 and 3 of this guidance document and indicate completion of all work tasks within a twelve (12) month period of performance. **Note**: You still must submit quarterly reports corresponding to 90 day milestones. However, the proposed deliverable schedule does not have to be based on these 90 day intervals.

All other parts of the HMGP Project Application can be indicated as "N/A"; not applicable.

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How do you use this guidance to describe the proposed Project Milestones?

The following outline describes components of a SOW for each type of planning project included in the Planning Pilot Grant Program. Find your planning project type in the two choices listed below and then read the referenced parts of the guidance. Incorporate the relevant portions of these descriptions in your SOW, including specified deliverables..

- **Plan Update and Project Scoping**: If you are proposing to update your hazard mitigation plan and then scope project(s), parts 1 and 2 of the following outline will assist you in describing the SOW.
- **Mitigation Scoping and Plan Amendment**: If you are proposing to scope project(s) and only amend your plan, parts 2 and 3 will assist you in describing the SOW.

Note: If you are not sure if your project type should include a "Plan Update" or a "Plan Amendment", consider the following distinctions:

A **Plan Update** is appropriate when your jurisdiction has experienced an extreme hazard occurrence that provides additional hazard information (e.g., the issuance of FEMA-generated ABFEs) or indicates unforeseen problems that would change the previously completed risk assessment. The revision of the risk assessment would logically lead to substantive revisions in the mitigation goals, strategy and priorities. An updated plan must be submitted for review and approval by GOHSEP and FEMA.

A **Plan Amendment** is the right choice when you only need to add more detail to existing actions in the mitigation strategy or add a new action that is consistent with the existing risk assessment and goals. The added details will be one of the products of your Project Scoping activities and will allow you to provide more specific information about the location, scope and extent of proposed mitigation activities. An amended plan does not need to be approved by GOHSEP and FEMA but a record copy of the amended plan is required for both agencies at the end of the pilot project.

If you still are unclear about which is the correct option for your community, contact GOHSEP for assistance.

Who can I contact if I have questions?

If you have any questions regarding this guidance document or the application process while you are preparing your application, please contact:

Margaret Sanz, Plans Manager
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1. **PLAN UPDATE -** The following steps contain examples of tasks to be performed in updating your previously approved hazard mitigation plan. Types of tasks are not limited to these examples, but they provide guidance for the level of detail needed for the application.

   A. **Planning Process** – will identify:
      - reasons for the plan update;
      - changes to the Hazard Mitigation Planning Committee;
      - new analysis methods and procedures for the planning process;
      - the Committee meeting schedule;
      - the roles and responsibilities of each committee member and how they contributed to the process; and
      - opportunities for public participation.

   B. **Hazard Identification and Profiles** – will include:
      - verification of past and current hazard risks; and
      - description of (recent) hazard events, including event impact / loss data, event location.

   C. **Risk Assessment** – will include:
      - description/comparison of new hazard risk and/or changes in risk from existing hazards;
      - changes in hazard frequency of occurrences;
      - changes in the potential impact of a hazard;
      - comparison of past damage estimates to actual damage sustained;
      - description of (damage) lessons learned;
      - description of loss estimate models (past and current);
      - future damage projections based on best available data and damage models; and
      - risk reduction resulting from implemented mitigation projects.

   D. **Mitigation Strategy** – will include:
      - comparing current mitigation goals, action plan, and projects to updated Risk Assessment efforts;
      - adjusting action items and projects to reflect changes in risk;
      - assessing local capabilities to plan for and implement hazard mitigation related actions;
      - comparing mitigation action items and projects to identified risks and current local capabilities; and
      - incorporating detailed descriptions of "Scoped" Projects.

   E. **Plan Maintenance** – will include:
      - changes in committee membership;
      - adjusting criteria and methodologies to be used in future plan monitoring and evaluations; and
      - refining procedures to be used in future plan updates.

   In addition, your application should include a statement regarding any "**Recommended Revisions**" per the Plan Review Crosswalk comments related to your current approved hazard mitigation plan. The statement must indicate which recommendations you are or are not including in this update process and provide an explanation for those not included.

   Deliverables – Part 1: The application must identify at least three (3) deliverables for the Plan Update portion of the planning pilot project: Preliminary, Draft and Final Plan Updates. **Note**: All three deliverables must be accompanied by a Plan Review Crosswalk (September 2006 – Version 1.0) with only the cover page and "location in the plan" sections completed.

   The **Preliminary Plan Update** deliverable will be reviewed by GOHSEP and FEMA Region VI and will include:
   - Letter of Transmittal;
   - Two (2) hard copies, in three ring binders, including at a minimum the updated hazard identification, risk assessment and mitigation strategy sections of the plan. **Note**: Project(s) to be scoped in subsequent work tasks under the pilot program will be confirmed as part of GOHSEP and FEMA review of this deliverable.

The **Draft Plan Update** deliverable will be reviewed by GOHSEP and FEMA Region VI and will include:

- Letter of Transmittal;
- Two (2) hard copies, in three ring binders, including an entire updated hazard mitigation plan. This deliverable will incorporate review comments from the Preliminary Plan deliverable and will conform to all requirements of 44CFR Part 201.6 with the exception of resolution(s) of adoption.

The **Final Plan Update** deliverable will include the following:

- Letter of Transmittal;
- Two (2) hard copies, in three ring binders, including an entire updated, adopted and approved hazard mitigation plan; and
- Two (2) CD's containing digital files of the updated plan that are identical to the hard copies.

Note: In developing the time schedule for completion of the Plan Update (see the last bullet on page 1), you should allow a total of five (5) weeks for GOHSEP and FEMA reviews. This includes two (2) weeks for the Preliminary and Draft Plan Update deliverables; and one (1) week for processing of Final Plan deliverables. In addition, if desired, GOHSEP will review the risk assessment portion of the plan update as a separate submittal. However, you should allow an additional two (2) weeks for reviews of the risk assessment.

2. **PROJECT/MITIGATION SCOPING –** The application must indicate what type of project will be scoped, if known. This project type must be eligible under HMGP eligibility requirements (which can be found in the HMGP Desk Reference). If the project type cannot be identified with certainty until after the Plan Update is completed or substantially complete, the application must indicate that the Project Scoping portion of the work shall not proceed until approval of the type of project to be scoped is received in writing from GOHSEP and FEMA. The Preliminary Plan Update deliverable identified under Part 1 will include this information (see deliverable description above).

   In addition, the application shall indicate that "Scoping" mitigation projects will include the following activities:

   A. Identify mitigation project(s) that reflect local needs and capabilities as described and prioritized in the plan update or the existing hazard mitigation plan.

   B. As appropriate, perform the following analyses for the identified project(s):

      (i) **Feasibility Analysis –** an analysis of the project's technical complexity and technical merits; regulatory obstacles and advantages; political / social obstacles and advantages; financial incentives and disincentives. This analysis should include consideration of alternative actions;

      (ii) **Design and Engineering –** development of design and engineering documents sufficient to develop cost estimates and losses avoided for use in the Cost-Benefit Analysis (see 2.B.v);

      (iii) **Cost Estimating –** including labor, materials and equipment per FEMA HMGP and Planning Pilot Grant Program eligible cost limitations for use in the Cost-Benefit Analysis (see 2.B.v);

      (iv) **Environmental/Cultural Resource Considerations –** including determinations of compliance with FEMA HMGP requirements regarding environmental and cultural resources sufficient to complete an HMGP application for the scoped project(s);

      (v) **Cost-Benefit Analysis –** an analysis of the cost to perform all work associated with a completed project compared to the project's projected benefit or its reduction in all future hazards related costs Projected benefits must be calculated using the FEMA-approved BCA Toolkit; and

      (vi) **HMGP Application –** preparation of a complete HMGP application for the scoped project(s).

Deliverables – Part 2: The application must identify that at a minimum, two (2) deliverable(s) will be provided for the Project/Mitigation Scoping portion of the planning project: Draft and Final HMGP Applications.

The **Draft HMGP Application** deliverable will include:

- Letter of Transmittal; and
- Two (2) hard copies of completed HMGP application(s) for the project or projects that were scoped during the Planning Pilot process.

The **Final HMGP Application** deliverable will incorporate all review comments from the Draft HMGP Application and will include:

- Letter of Transmittal; and
- Two (2) hard copies of completed HMGP application(s) for the project or projects that were scoped during the Planning Pilot process.

Note: Neither of these submittals will be processed and funded, but rather serve as one of the components of the end product of this process. In addition, you can request technical assistance throughout the process of scoping the projects from GOHSEP. For example, if you experience problems with meeting or documenting HMGP program or application requirements, you should contact GOHSEP to assist in the resolution of the problem.

3. **PLAN AMENDMENT** – The application must include a specific step identifying that the plan's Mitigation Strategy will be edited to include the more detailed description of any project(s) that have been scoped under this pilot project. This description shall be based on the results of the Project Scoping/Mitigation Activities.

Deliverables – Part 3: This type of pilot planning project does not include a formal plan update and therefore will not be submitted to FEMA for formal approval. However, the application must indicate that a deliverable for the Plan Amendment portion of the work will be provided which will include:

- Letter of Transmittal identifying changes made to the hazard mitigation plan; and
- Two (2) hard copies of the **amended** hazard mitigation plan with highlighted text to indicate text passages, paragraphs or sections that have been altered.

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SUMMARY OF DELIVERABLES

The following deliverables will be required at various stages throughout the period of performance for each project type:

Plan Update and Project Scoping

- Letters of Transmittal for each deliverable;
- Two (2) hard copies in three ring binders of the **Preliminary Plan Update** including updated hazard identification, risk assessment and mitigation strategy sections of the plan and Plan Review Crosswalk with cover page and "location in the plan" sections completed;
- Two (2) hard copies in three ring binders of the **Draft Plan Update** including the entire updated hazard mitigation plan and Plan Review Crosswalk with cover page and "location in the plan" sections completed. This deliverable will incorporate review comments from the Preliminary Plan deliverable and will conform to all requirements of 44CFR Part 201.6 with the exception of resolution of adoption;
- Two (2) hard copies in three ring binders of the **Final Plan Update** plan and completed FEMA plan review crosswalk;
- Two (2) CD's containing digital files of the **Final Plan Update** that are identical to the hard copies;
- Two (2) hard copies of completed **Draft HMGP Application(s)** for the project or projects that were scoped during the Planning Pilot process; and
- Two (2) hard copies of completed **Final HMGP Application(s)**.

Mitigation Scoping and Plan Amendment

- Letters of Transmittal for each deliverable, including an indication of amendments made to the hazard mitigation plan;
- Two (2) hard copies of completed **Draft HMGP Application(s)** for the project or projects that were scoped during the Planning Pilot process;
- Two (2) hard copies of completed **Final HMGP Application(s)**; and
- Two (2) hard copies of the **amended** hazard mitigation plan with highlighted text to indicate text passages, paragraphs or sections that have been altered.

REFERENCE TOOLS FOR PREPARING PILOT APPLICATIONS

FEMA/State Mitigation Plan Review Crosswalk – The Crosswalk was prepared as part of the hazard mitigation plan review process. It contains detailed comments regarding each component/section of the plan, including "Recommended Revisions" for improving the satisfactory elements of the plan. The applicant should use the Crosswalk to identify issues to be addressed in any plan update. The current version of the crosswalk (September, 2006 – Version 1.0) is attached to this guidance.

Mitigation Go-Kit - Materials provided in hard copy and on CD during visits to parishes by GOHSEP staff during the months of July, August and September 2006 including:

- HMGP Application Forms and Templates for the Planning Pilot Grant Program. The templates can be used to prepare the cost estimates that can provide the detailed information needed for the Scope of Work / Budget information regarding Labor and Funding Sources in parts V.B and V.D on page 7 of 23 of the HMGP Application.

Technical Assistance - You can request technical assistance throughout the process of updating your plan and scoping the projects from GOHSEP. For example, if you experience problems with meeting or documenting HMGP program or application requirements as part of the project scoping, you should contact GOHSEP to assist in the resolution of the problem.

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Appendix K.2:

Typical Scope of Work – Plan Update and Project Scoping

The following 3 pages contain a typical example of Planning Pilot Grant Program Plan Update and Project Scoping projects.

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The following scope of work description is typical of Planning Pilot Grant Program Plan Update and Project Scoping projects:

TASK 1 Planning Process—including documenting the following at a minimum:

a. Project Kick-Off Meeting

b. Revisions of the plan per all three "Reviewer's Comments" in the original approved FEMA Local Hazard Mitigation Plan Review Crosswalk.

c. All special-purpose districts in existence during development of the original HMP were represented in the original Committee and will again be represented. Also, the parish is in the process of revising certain special-purpose districts. If revisions are completed during or before this project, then the newly-revised districts will all have representation in the Committee. The documentation will include the roles and responsibilities of each committee member and how they contributed to the process. Committee meeting documentation will include schedules, agendas, minutes of meeting and sign-up attendance sheets.

d. Opportunities for public participation via open-to-the-public meetings during the draft phase that will be advertised through paid-for ads in the local newspapers, parish website postings, and other news media announcements. Also, during the plan update process, selected Hazard Mitigation Committee members will give presentations to at least four civic groups regarding the HMP update process.

e. New analysis methods and procedures for the planning process that incorporate information from existing plans including, but not limited to, the Louisiana ESF-14 plan and local approved FMA plans.

f. In addition to the kick-off meeting referenced above, no less than four more meetings will be held with at least two occurring during the planning phase and one to be held for review of the Draft Plan Update deliverable.

TASK 2 Risk Assessment-- including the following at a minimum:

a. Verification of current and past hazard risks including how these hazards relate to all participating jurisdictions.

b. Update hazard profiles (including location, extent, previous occurrences and probability of future events) based on hazard events since the approval of the current hazard mitigation plan including Advisory Base Flood Elevations per Hurricanes Katrina and Rita including impact/loss data and event location and risk reduction resulting from implemented mitigation projects.

c. Update potential impact of and vulnerability of existing structures and future development to hurricanes and flooding.

d. Update loss estimates to include actual damage sustained from hurricanes and flooding.

The documentation for the risk assessment will include a description of loss estimate models (past and current), which will incorporate new data including, but not limited to, HAZUS, ABFE's, LIDAR, levee elevations/conditions, Hurricane Rita flood elevations, and GIS overlays. The update of the Risk Assessment will specifically incorporate the data and methodologies found in the following table:

HAZARD	DATA		METHODOLOGY	
	Current	Proposed Addition	Current	Proposed Addition
	•	•		

1

TASK 3 Mitigation Strategy--The update process will include the following:

a. Description of lessons learned in aftermath of Katrina/Rita

b. Comparing current mitigation goals to updated Risk Assessment efforts and updating as appropriate.

c. Re-assessing local capabilities to plan for and implement new hazard-mitigation-related actions.

d. Adjusting and updating action items and projects to reflect lessons learned, revisions in hurricane and flood risks, and updated goals and capabilities.

e. For at least four mitigation projects, perform preliminary cost, feasibility, and engineering evaluations of proposed mitigation projects using the STAPLEE method and Limited Data Module Benefit-Cost Analysis to determine probability of projects' success. Priorities will then be established by considering the projects' ease of implementation, time, available funding, and preliminary scoping results.

f. Develop implementation strategy for updated and prioritized mitigation actions, per IFR requirements, by identifying parties, defining responsibilities, confirming partners, identifying resources, and determining a time frame for implementation.

g. Identify mitigation projects to be scoped for review and approval by GOHSEP and FEMA. No projects will be scoped without prior written GOHSEP and FEMA approval.

TASK 4 Plan Maintenance--The update process will include the following:

a. Institutionalizing committee membership in accordance with agency member or staff replacements.

b. Adjusting criteria and methodologies to be used in future plan monitoring and evaluations.

c. Refining procedures to be used in future plan updates, if required.

Plan Update Deliverables will include the following:

- Preliminary Draft Plan Update: Letter of transmittal and two hard copies in three-ring binders.
- Final Draft Plan Update: Letter of transmittal and two hard copies in three-ring binders.
- Final Plan Update: Letter of transmittal, two hard copies in three-ring binders, and two CD's each containing a single digital file containing the entire updated plan, identical to the hard copies. The Final Draft will include detailed descriptions of "Scoped" Projects per the Final Project Scoping Summary Report(s) (see "Project Scoping Statement of Work" below).

PROJECT SCOPING STATEMENT OF WORK:

No later than the conclusion of the Plan Update process, the Parish shall indicate a list of projects to scope. Mitigation projects considered for possible scoping will include mitigation projects previously identified in the [parish / municipality] Hazard Mitigation Plan that have not yet been scoped and any new mitigation projects that may be identified in the Plan Update process. No work shall be undertaken to scope any of these projects without prior written approval from GOHSEP and FEMA.

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As appropriate, the following analysis for the identified projects will be provided as funding permits:

- Feasibility Analysis: Analysis of the project's technical complexity and merit, regulatory obstacles and advantages, political/social obstacles and advantages, financial incentives and disincentives, and alternative actions.
- Environmental & Cultural Resource Consideration: Determination of compliance with FEMA HMGP requirements regarding environmental and cultural resources sufficient to complete the "Environmental/Cultural Resource Checklist" for each scoped project.
- Design and Engineering: Development of design and engineering documents sufficient to develop cost estimates and losses avoided for use in the Benefit-Cost Analysis.
- Cost Estimating: Including labor, materials, and equipment per FEMA HMGP and Planning Pilot grant program eligible cost limitation for use in the Benefit-Cost Analysis.
- Benefit-Cost Analysis: Analysis of the cost to perform all work associated with a completed project compared to the project's projected benefit or its reduction in all future hazards related costs, calculated using the FEMA-approved BCA Toolkit.

Project Scoping Deliverables:

- Draft Project Scoping Summary Report for each scoped project: Letter of transmittal and two hard copies in three-ring binders.
- Final Project Scoping Summary Report for each scoped project: Letter of transmittal and two hard copies in three-ring binders.

Appendix K.3:

Typical Scope of Work – Project Scoping and Plan Amendment

The following 2 pages contain a typical example of Planning Pilot Grant Program Project Scoping and Plan Amendment projects.

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The following scope of work description is typical of Planning Pilot Grant Program Project Scoping and Plan Amendment projects:

TASK 1 Feasibility Study: This initial task in the project scoping for the [parish / municipality] will include the following steps:

a. The Consultant will compile a list of potential mitigation projects within the [parish / municipality], including properties and areas that have been identified as having flooding problems in the [parish / municipality] Hazard Mitigation Plan or other existing plans, and reports including all repetitive loss (RL) and severely repetitive loss (SRL) properties within the [parish / municipality] corporate limits. A full range of options will be objectively explored for these properties including acquisition, elevation and mitigation reconstruction. This list will also include project types other than flooding and drainage such as hardening of critical facilities.

b. The Consultant will work with the [parish / municipality] Hazard Mitigation Planning Committee to review and evaluate the compiled list. The Committee will use the following criteria at a minimum for this initial screening:

   1. Eligibility for federal mitigation projects
   2. Engineering feasibility
   3. Cost effectiveness, including using the FEMA Benefit-Cost Analysis Limited Data Module;
   4. A general assessment of each project on the environmental impact on cultural, wetlands, endangered species, archeological, historical, air, water and others as appropriate.
   5. Relative significance of project for the purpose of establishing priority

Note: GOHSEP and FEMA will be provided a two-week advance notice of the date(s) of these meetings with the Hazard Mitigation Planning Committee and any materials sent to the Committee in advance of the meeting. In addition, the [parish / municipality] will provide a copy of the compiled list to appropriate representatives of the [participating municipalities] prior to the meetings and extend an invitation to those communities to provide any comments or questions regarding the compiled project list and/or attend the meetings of the Hazard Mitigation Planning Committee.

c. The Consultant will work with the Committee to identify the highest ranked projects and determine the number of projects that can be scoped within the budget allocated for the remaining project activities. This list will include a variety of project types and scales to provide the greatest flexibility for future funding.

d. The Consultant will develop a detailed work plan and cost estimate for the identified projects.

e. The [parish / municipality] will submit the proposed list of projects along with the detailed work plan and cost estimate to GOHSEP and FEMA for review and approval. The [parish / municipality] will work with the Consultant to clarify or revise the list based on GOHSEP and FEMA review comments. No work on the remaining scoping activities will proceed without written authorization from GOHSEP and FEMA.

TASK 2 Project Scoping: As appropriate, the following analysis for the identified projects will be provided as funding permits:

- Feasibility Analysis: Analysis of the project's technical complexity and merit, regulatory obstacles and advantages, political/social obstacles and advantages, financial incentives and disincentives, and alternative actions.
- Environmental and Cultural Resources Consideration: Determination of compliance with FEMA HMGP requirements regarding environmental and cultural resources sufficient to completed "Environmental/Cultural Resource Checklist" for each scoped project.

1

- Design and Engineering: Development of design and engineering documents sufficient to develop cost estimates and losses avoided for use in the Benefit-Cost Analysis.
- Cost Estimating: Include labor, materials, and equipment per FEMA HMGP and Planning Pilot grant program eligible cost limitation for use in the Benefit-Cost Analysis.
- Benefit-Cost Analysis: Analysis of the cost to perform all work associated with a completed project compared to the project's projected benefit or its reduction in all future hazard related costs, calculated using the FEMA-approved BCA Toolkit.

Project Scoping Deliverables:

- Draft Project Scoping Summary Report for each scoped Project: Letter of transmittal and two hard copies in three-ring binders
- Final Project Scoping Summary Report for each scoped project: Letter of transmittal and two hard copies in three-ring binders.

TASK 3 Plan Amendment:

The [parish / municipality] Hazard Mitigation Plan's Mitigation Strategy and Actions section will be edited to include a summary description of all projects that have been scoped under this pilot project. These descriptions shall be based on the results of the Project Scoping Activities and will summarize the rationale/purpose of the project, scoping activities outcomes, and a description of the anticipated construction-related work to be performed in the future to be funded through the HMGP, PDM, or FMA project grant sources.

Plan Amendment Deliverables – This type of pilot planning does not include a formal plan update and therefore will not be submitted to FEMA for approval. However, a Plan Amendment of the [parish / municipality] Hazard Mitigation Plan will be provided including:

- A Letter of Transmittal identifying changes made to the hazard mitigation plan; and
- Two (2) hard copies of the amended hazard mitigation plan with highlighted text to indicate text passages, paragraphs or sections that have been altered.

Appendix K.4:
PPGP Reporting Forms

The following 14 pages contain forms developed by GOHSEP for use in documenting projects scoped under the Planning Pilot Grant Program.

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Louisiana Planning Pilot Grant Program
Project Scoping Summary Report **1607 - __ __ __ - __ __ __ __ - __ __**

1.0 Project Overview

1.1	Report Submittal Type	☐ Draft ☐ Final
1.2	Report Submittal Date	_____
1.3	Jurisdiction Name:	_____
1.4	Jurisdiction Type:	☐ Parish ☐ Incorporated Municipality ☐ Private Non-Profit
1.5	Project Title:	_____
1.6	Project Type:	☐ Acquisition, Elevation or Mitigation Reconstruction ☐ Retrofit of Existing Building ☐ Flood Control or Drainage Improvements ☐ Other: _____
1.7	Hazard(s) mitigated by project:	☐ Flood ☐ High Wind ☐ Other (list) _____ ☐ Other (list) _____
1.8	Description of protection provided by the project: Note: Where appropriate, include relevant standards or codes that the project will comply with. For example, "10 residential structures will be elevated above the BFE in accordance with NFIP requirements and protected from the 100-year recurrence interval flood." or "The Parish EOC will be retrofitted to provide protection from high winds according to standards in FEMA Publication 361 and the International Building Code (current edition)." Use only the space provided in this table.	_____
1.9	Estimated Total Project Cost (Attachment D)	$ _____
1.10	Benefit-Cost Ratio (Attachment F)	_____

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Louisiana Planning Pilot Grant Program
Project Scoping Summary Report

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2.0 Consistency with Hazard Mitigation Plan

2.1	Date of FEMA approval for Hazard Mitigation Plan:	_____
2.2	Section and page in Hazard Mitigation Plan where project is identified:	Section: _____ Page _____
2.3	Describe how project is consistent with the risk assessment, goals and actions in plan. Use only the space provided in this table.	_____

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Louisiana Planning Pilot Grant Program
Project Scoping Summary Report

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3.0 Project Location (Attachment A)

3.1	Description of the physical location for projects protecting a single structure or discrete location: Note: If project involves multiple structures or large areas, see 3.2.	Street address: _____ City, state, zipcode: _____ Latitude: _____ Longitude: _____ ☐ Not applicable, multiple structures or large areas are involved (see 3.2)
3.2	Mapping showing physical location for projects protecting multiple structures or large areas. Note: At least one (1) legible map must be provided.	☐ City or Parish Map with structures and project area(s) clearly marked ☐ USGS 1:24,000 Quad Map(s) with structures and project area(s) clearly marked ☐ Other: _____ ☐ For **acquisition, elevation or reconstruction** projects including multiple properties, local tax assessment map showing individual parcels with each property in the project clearly marked on the map with a unique identification number.
3.3	Flood Insurance Rate Map (FIRM) Note: At least one (1) of the identified options must be provided.	☐ Panel(s) from the FIRM (along with the appropriate flood profile and discharge tables from the community FIS) with the project site and structures clearly marked on the map ☐ (FIRM for project area is not published) Flood Hazard Boundary Map (FHBM) for project area, with the project site and structures clearly marked on the map
3.4	Flood Zone per FIRM Note: At least one (1) box must be checked.	☐ Not applicable, the project area(s) are not located within any mapped flood zone ☐ VE or V 1-30 ☐ AE or A 1-30 ☐ AO or AH ☐ A (no base flood elevation given) ☐ B or X (shaded) ☐ C or X (unshaded) ☐ Floodway ☐ Coastal Barrier Resource Act (CBRA) Zone (Federal regulations strictly limit federal funding for projects in this zone; please coordinate with your state agency before submitting an application for a CBRA Zone project)

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Louisiana Planning Pilot Grant Program
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4.0 Feasibility Analysis (Attachment B)

4.1 Feasibility Analysis	☐ Summary Report – Feasibility Analysis ☐ Not applicable, no feasibility analysis required (see 4.2)
4.2 Consideration of Feasible Alternative Actions Note: At a minimum, Attachment B must contain documentation for the consideration of reasonable alternative actions.	☐ Summary Report - Consideration of Reasonable Alternative Actions including: ▪ No Action Alternative ▪ Other Reasonable Alternative(s) including project description, project location, cost estimates and potential impacts of alternative(s)

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Louisiana Planning Pilot Grant Program
Project Scoping Summary Report

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5.0 Design and Engineering (Attachment C)

5.1 Design and Engineering – required submittals	☐ Summary Report – Design and Engineering
5.2 Design and Engineering – supporting documentation submittals	☐ Plans or drawings, including: ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____

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6.0 Cost Estimates / Project Schedule (Attachment D)

6.1	Cost Estimates / Project Schedule – required submittals Summary cost estimates including lump sum costs for major stages of the project and Project Schedule showing start, duration and end for tasks and subtasks.	☐ Summary Report – Cost Estimates ☐ Project Schedule
6.2	Cost Estimates – supporting documentation submittals	☐ Supporting documentation, including: ☐ Detailed cost estimates indicating labor, materials and equipment for all aspects of the proposed project consistent with HMGP eligibility requirements ☐ _____ ☐ _____ ☐ _____

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Louisiana Planning Pilot Grant Program
Project Scoping Summary Report

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7.0 Environmental/Cultural Resource Considerations (Attachment E)

7.1	Environmental / Cultural Resource Considerations – required submittals	☐ Summary Report – Environmental / Cultural Resource Considerations
7.2	Environmental / Cultural Resource Considerations – supporting documentation submittals Supporting documentation consistent with Planning Pilot Grant Program – Environmental / Cultural Resources Compliance Checklist	☐ Supporting documentation, including: ☐ Planning Pilot Grant Program – Environmental / Cultural Resources Compliance Checklist ☐ _____ ☐ _____ ☐ _____

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8.0 Benefit-Cost Analysis (Attachment F)

8.1 Benefit-Cost Analysis	☐ Summary Report – BCA Analysis
8.2 Benefit-Cost Analysis – supporting documentation submittals Supporting documentation consistent with FEMA Mitigation BCA Toolkit (current version) Data Documentation Templates and Checklists.	☐ Supporting documentation, including: ☐ _____ ☐ _____ ☐ _____ ☐ _____

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Attachment E: Environmental / Cultural Resources Checklist

Report Submittal Type	☐ Draft ☐ Final
Report Submittal Date	_____
Jurisdiction Name:	_____
Project Title:	_____

A. National Environmental Policy Act (NEPA)

1. The following studies will be required for this project[1]:

Environmental Assessment	☐ Yes	☐ No
Supplemental Environmental Assessment	☐ Yes	☐ No
Environmental Impact Statement	☐ Yes	☐ No

Explanation for the answer for all three studies (including attached supporting documentation):

If "Yes" to any of these three studies, the following allowances have been made in the cost estimates and/or project schedule: _____

B. National Historic Preservation Act - Historic Buildings and Structures

1. Does the project have the potential to affect or is it in close proximity to any buildings or structures that are over 50 years of age (or will be over 50 years at the time of implementation) or those of historical significance?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

C. National Historic Preservation Act - Archeological Resources

1. Does the project involve disturbance of ground in an area that was not previously disturbed and/or that has the potential for the presence of archeological resources?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

[1] Throughout this document, when the phrase "*will be required for this project*" is used, it is referring to circumstances related to if and when an application for federal funding is formally submitted for this project.

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Louisiana Planning Pilot Grant Program
Project Scoping Summary Report

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Attachment E: Environmental / Cultural Resources Checklist

D. Endangered Species Act and Fish & Wildlife Coordination Act

1. Does the project require the permanent removal of vegetation?

   ☐ Yes ☐ No

2. Is the project in or within 200 feet of any type of waterway or body of water?

   ☐ Yes ☐ No

3. Is the project proposed for areas outside existing structures, or has the potential to cause changes to the natural environment?

   ☐ Yes ☐ No

4. Are there threatened or endangered species or their critical habitat present in the project area or within the ***[parish/city]*** the project is located within?

   ☐ Yes ☐ No

Explanation for the answer for all four questions (including attached supporting documentation): _____

If "Yes" to any of these four questions, the following coordination efforts and/or documentation will be required for this project: _____

If "Yes" to any of these four questions, the following allowances have been made in the cost estimates and/or project schedule: _____

E. Coastal Barrier Resources Act

1. Is the project in or connected to a CBRA Unit or Otherwise Protected Area?

   ☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

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Louisiana Planning Pilot Grant Program
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Attachment E: Environmental / Cultural Resources Checklist

F. Coastal Zone Management Act

1. Is the project in the State's designated coastal zone area and/or affects the coastal zone?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

G. Clean Water Act, Rivers and Harbors Act and Executive Order 11990 (Protection of Wetlands)

1. Will the project involve work near or in a waterway, dredging or disposal of dredged material, excavation, adding fill material and/or result in any modification to water bodies and/or wetlands designated as "waters" of the U.S." as identified by the US Army Corps of Engineers and/or on the National Wetland Inventory?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

H. Executive Order 11988 – Floodplain Management

1. Is the project located in a FEMA identified 100 or 500 year floodplain, in a FEMA identified floodway, or identified as a floodplain through any other source?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

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Louisiana Planning Pilot Grant Program **1607 - _ _ _ - _ _ _ _ - _ _**
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Attachment E: Environmental / Cultural Resources Checklist

I. Clean Air Act

1. Will the project result in permanent air emissions or located in an attainment area?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

J. Farmland Protection Policy Act

1. Will the project convert "prime" or "unique" farmland as defined by the Farmland Protection Policy Act outside community limits to any other use?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

K. Migratory Bird Treaty Act

1. Is the project located within identified migratory flyways or has the potential to affect migratory birds?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

L. Magnuson-Stevens Fishery Conservation and Management Act

1. Is the project located within or near or has the potential to affect Essential Fish Habitat?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

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Attachment E: Environmental / Cultural Resources Checklist

M. Wild and Scenic Rivers Act

1. Is the project located along or has the potential to adversely affect a designated Wild or Scenic River (WSR)?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

O. Executive Order 12898 - Environmental Justice for Low Income and Minority Populations

1. Is the project located in an area of low income or minority population?

☐ Yes ☐ No

2. Will the project cause any changes that may affect nearby low income or minority populations resulting in adverse effects, or change availability of services?

☐ Yes ☐ No

Explanation for the answer for these two questions (including attached supporting documentation): _____

If "Yes" to either of these two questions, the following coordination efforts and/or documentation will be required for this project: _____

If "Yes" to either of these two questions, the following allowances have been made in the cost estimates and/or project schedule: _____

P. Hazardous and Toxic Materials

1. Is there any reason to suspect there are contaminants from a current or past use on the property associated with the proposed project?

☐ Yes ☐ No

Explanation for the answer (including attached supporting documentation): _____

If "Yes", the following coordination efforts and/or documentation will be required for this project: _____

If "Yes", the following allowances have been made in the cost estimates and/or project schedule: _____

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Louisiana Planning Pilot Grant Program **1607 - _ _ _ - _ _ _ _ - _ _**
Project Scoping Summary Report

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Q. Other Relevant Laws and Environmental Regulations or Environmental Issues

1. Identify relevant law or regulations, resolution and any consultation/references that you are aware of: _____

2. Identify other potential environmental concerns not clearly falling under a law or executive order and that possibly specifically applies to your action. _____

3. Identify any controversial issues associated with this project: _____

4. Identify any public meetings or public input or comments on your specific proposed mitigation activities: _____

R. Extraordinary Circumstances 44CFR 10.8 (3)

Based on the review of compliance with other environmental laws and Executive Orders, and in consideration of other environmental factors, review the project for extraordinary circumstances.

* A "Yes" under any circumstance may require an Environmental Assessment (EA) with the exception of (ii) which should be applied in conjunction with controversy on an environmental issue. If the circumstance can be mitigated, please explain in comments. If no, leave blank.

Yes

- ☐ (i) Greater scope or size than normally experienced for a particular category of action
- ☐ (ii) Actions with a high level of public controversy
- ☐ (iii) Potential for degradation, even though slight, of already existing poor environmental conditions;
- ☐ (iv) Employment of unproven technology with potential adverse effects or actions involving unique or unknown environmental risks;
- ☐ (v) Presence of endangered or threatened species or their critical habitat, or archaeological, cultural, historical or other protected resources;
- ☐ (vi) Presence of hazardous or toxic substances at levels which exceed Federal, state or local regulations or standards requiring action or attention;
- ☐ (vii) Actions with the potential to affect special status areas adversely or other critical resources such as wetlands, coastal zones, wildlife refuge and wilderness areas, wild and scenic rivers, sole or principal drinking water aquifers;
- ☐ (viii) Potential for adverse effects on health or safety; and
- ☐ (ix) Potential to violate a federal, state, local or tribal law or requirement imposed for the protection of the environment.
- ☐ (x) Potential for significant cumulative impact when the proposed action is combined with other past, present and reasonably foreseeable future actions, even though the impacts of the proposed action may not be significant by themselves.

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Appendix K.5:
Status of Planning Pilot Grant Program Applications

The following 5 pages contain mapping and tabulations regarding the most recent status of applications under the Planning Pilot Grant Program.

Planning Pilot Grant Program

The Expanded Mitigation Strategies Planning Grant Pilot Guidance was released by FEMA in March 2006. The Pilot was offered to the five states that were affected by Hurricanes Katrina, Rita and Wilma. These states were Louisiana, Florida, Alabama, Mississippi and Texas. In an effort to help the Gulf Coast with recovery following the extreme hazards that these states suffered, the Pilot would provide a great opportunity to identify and scope projects along with amending or updating the current approved Hazard Mitigation Plan.

The Pilot, which quickly became known as the Planning Pilot Grant Program (PPGP), was designed to demonstrate the connection between developing mitigation strategies in the plan and implementation of actual projects during disaster recovery. This relationship of the planning process and actual projects is often difficult for the applicant to understand. The PPGP was a great way to show how important the mitigation strategies are for the development of projects.

Scoping a project is developing enough information in the categories of feasibility, engineering, environmental and cost effectiveness to complete an application. One of the problems, when funds become available, is that applicants do not have the funds to scope projects. This activity is not usually covered under a grant and is done at the expense of the applicant. The PPGP provided the funding needed to scope projects and have them ready for when funding became available.

To be an eligible applicant for the PPGP the applicant must have been located in a declared disaster area eligible for hazard mitigation assistance as a result of Hurricanes Katrina, Rita and Wilma. The applicant must also have been in the process of developing a Hazard Mitigation Plan or have an approved Hazard Mitigation Plan.

There were three types of possible activities offered in the PPGP. They are explained below:

1. Hazard Mitigation Plan Update and Project Scoping
   This was the appropriate activity for the applicant that had a FEMA approved Hazard Mitigation Plan and had experienced an extreme hazard event or if there had been a change in State and/or Local regulations, such as Advisory Base Flood Elevations (ABFE's) which would change the previously completed risk assessment, mitigation goals, strategies and mitigation priorities. It would also provide the opportunity for project scoping.

2. Project Scoping and Hazard Mitigation Plan Amendment
   For the applicant that had a FEMA approved Hazard Mitigation Plan but did not experience an event that would change the risk assessment, mitigation goals, strategies and mitigation priorities. This activity provided the opportunity for projects to be scoped and the current plan amended to include the new projects.

3. Adjustments to the Plan under Development and Project Scoping
   This applied to the applicant that was in the process of developing a Hazard Mitigation Plan and had progressed past the Identification of Hazards in the plan, and then experienced an extreme hazard event or there was a change in the State and/or Local regulations, such as Advisory Base Flood Elevations (ABFE's). It would be opportune and beneficial to capture this new information into the mitigation strategies and actions. It also provided the opportunity to scope projects for future funding.

The State of Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) recognized that this program could present a great benefit to the people trying to recover from Hurricanes Katrina and Rita. The PPGP was made available to any parish, city or entity with an approved Hazard Mitigation Plan. It was determined by the GOHSEP that the funding available would be $150,000 per approved application. The Hurricane Rita (DR-1607) planning funds would be used for the PPGP. The word of the available grant was spread throughout the State by letters, phone calls, presentations and meetings.

The parishes and cities responded favorably. There were 30 parishes, 3 cities and 1 university that opted for the Project Scoping and Plan Amendment. There were 15 parishes and 5 cities that qualified for the Plan Update and Project Scoping. The State did not have any applicants that fell into the Plan Adjustment and Project Scoping category.

Project Scoping and Plan Amendment Subgrantees

Acadia Parish	Madison Parish
Allen Parish	Morehouse Parish
Avoyelles Parish	Natchitoches Parish
Bienville Parish	Orleans Parish
Caddo Parish	Rapides Parish

Caldwell Parish
Catahoula Parish
Concordia Parish
East Baton Rouge Parish
East Feliciana Parish
Evangeline Parish
Franklin Parish
Iberville Parish
Jefferson Davis Parish
Lincoln Parish
Livingston Parish
Richland Parish
St. James Parish
Tensas Parish
Union Parish
West Baton Rouge Parish
West Feliciana Parish
Winn Parish
City of Covington
City of Monroe
City of West Monroe
University of New Orleans

Plan Update and Project Scoping Subgrantees

Ascension Parish
Beauregard Parish
Calcasieu Parish
Iberia Parish
Jefferson Parish
Lafourche Parish
Plaquemines Parish
Pointe Coupee Parish
St. Martin Parish
City of Thibodaux
St. Mary Parish
St. Tammany Parish
Tangipahoa Parish
Terrebonne Parish
Washington Parish
Vermilion Parish
City of Harahan
City of Lake Charles
City of Slidell

Louisiana was the only state that succeeded in making the PPGP a successful program. The true success was realized when the parishes that scoped projects were able to submit applications for funding of the projects.

The State of Louisiana released a second round of funding for Hurricane Katrina (DR-1603) and this allowed the opportunity for participants in the PPGP to submit scoped projects for funding. It also provided an opportunity for 5 more participants to join the PPGP; East Carroll Parish, Red River Parish, St. Bernard Parish, St. Charles Parish and Vernon Parish. Of the original 53 participants in the PPGP, 23 of them had progressed in the PPGP far enough to submit projects for funding.

In September 2008, the State of Louisiana was hit by Hurricane Gustav (DR-1786). The mitigation funds that became available for this declared disaster allowed 13 more participants to submit scoped projects for funding.

1607 Plan Update & Project Scoping Planning Pilot Grant Subgrantee	# of Projects Scoped in PPGP	# of Projects Submitted DR-1603	# of Projects Submitted DR-1786
Ascension Parish	9	7	0
Beauregard Parish	10	9	1
Calcasieu Parish	13	0	3
Iberia Parish	3	0	0
Jefferson Parish	5	0	0
Lafourche Parish	6	0	1
Plaquemines Parish	6	0	1
Pointe Coupee Parish	7	0	0
St. Martin Parish	6	0	1
St. Mary Parish	10	0	10
St. Tammany Parish	18	0	0
Tangipahoa Parish	5	0	1

Terrebonne Parish	6	0	6
Vermilion Parish	4	0	6
Washington Parish	15	8	0
City of Harahan	6	0	0
City of Lake Charles	7	1	0
City of Mandeville	6	0	0
City of Slidell	7	7	0
City of Thibodaux	6	0	0
TOTALS	155	32	26
Percentage of projects scoped		21%	17%

1607 Project Scoping & Plan Amendment Planning Pilot Grant Subgrantee	# of Projects Scoped	# of Projects Submitted 1603	# of Projects Submitted 1786
Acadia Parish	11	10	0
Allen Parish	15	7	0
Avoyelles Parish	8	3	0
Bienville Parish	2	2	0
Caddo Parish	10	0	0
Caldwell Parish	7	6	0
Catahoula Parish	11	4	0
Concordia Parish	14	2	1
East Baton Rouge Parish	10	0	0
East Feliciana Parish	11	10	0
Evangeline Parish	13	0	3
Franklin Parish	8	6	0
Iberville Parish	8	7	0
Jefferson Davis Parish	18	17	0
Lincoln Parish	7	2	0
Livingston Parish	12	0	10
Madison Parish	10	0	0
Morehouse Parish	7	4	0
Natchitoches Parish	8	0	0
Rapides Parish	8	0	0
Richland Parish	11	4	0
St. James Parish	5	2	0
St. Landry Parish	28	0	28
Tensas Parish	14	0	0
Union Parish	25	0	1

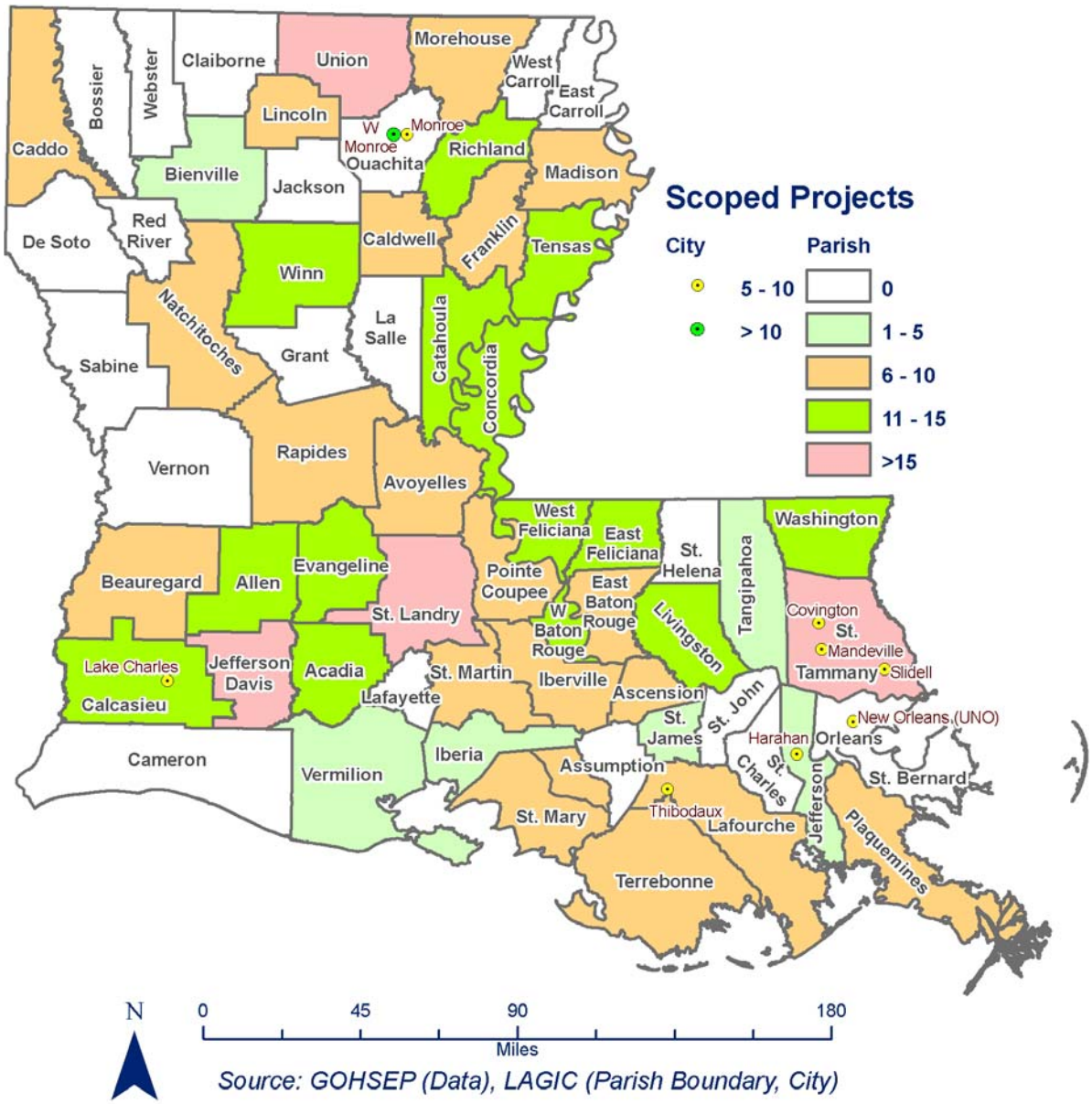
West Baton Rouge Parish	11	11	0
West Feliciana Parish	15	5	0
Winn Parish	12	11	0
City of Covington	9	8	0
City of Monroe	10	0	0
City of West Monroe	15	0	0
University of New Orleans	6	0	0
TOTALS	359	121	43
Percentage of projects scoped		34%	12%

During these two rounds of funding the participants of the Plan Update and Project Scoping submitted applications for funding for 38% of the total projects scoped. The participants of the Project Scoping and Plan Amendment submitted 46%. The projects that were not submitted for funding now can remain "on the shelf" for the next time funds become available.

The 53 participants scoped a total of 514 projects. The hazards that these projects were mitigating were primarily flood, wind from hurricanes and wind from tornados. Since Louisiana has the most repetitive loss properties in the nation, the table below shows a subcategory of repetitive loss under flooding. The table below demonstrates that 32% of the projects that were scoped focused on mitigating floods. The 9% of the projects for repetitive loss properties includes only direct elevation, acquisition or pilot reconstruction of these properties. There are many flood projects that also address repetitive loss properties as a neighborhood or group. The mitigation of hurricane wind and tornado wind was divided by the location of the parish. In general, and for the purposes of the table below, the southern parishes experience more hurricane wind and the northern parishes more tornado wind.

Hazards	Projects Scoped	Percentage of Projects Scoped by Hazard	Projects Submitted for Funding	Percentage of Projects Scoped and Submitted
Flood	167	32%	58	35%
Repetitive Loss Property	46	9%	9	19%
Wind / Hurricane	113	22%	67	59%
Wind / Tornado	188	37%	88	47%

Overall, the Planning Pilot Grant Program was a successful program, which helped the people of the State of Louisiana in the recovery from the devastating effects of Hurricanes Katrina and Rita. The purpose of the pilot was realized by participants in the knowledge that the Hazard Mitigation Plan that is required for Hazard Mitigation Grant Programs does serve as a helpful tool in creating mitigation projects. The updated and amended plans that resulted from the pilot will serve the parishes and cities in their future mitigation efforts.



Source: GOHSEP (Data), LAGIC (Parish Boundary, City)

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Appendix L
Plan Evaluation and Progress

Contents of this Appendix

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L.3	Progress Tracking Database Goal 3	L-3
L.4	Progress Tracking Database Goal 4	L-3

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Appendix L.1:
Progress Tracking Database

Table L.1-1 documents the Goals and Actions identified in the April 2008 Plan and captures associated efforts and accomplishments for Goal 1.

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
Objective 1.1: - Increase awareness of risks and understanding of the advantages of mitigation by the general public and local government officials. - Provide information to municipalities and parishes regarding best practices for hazard mitigation project identification and implementation. - Increase local government official awareness about funding opportunities for mitigation.	1.1.A **Statewide Education and Outreach**: Support start-up and implementation of the CEO program and institutionalize practices for after the completion of CEO.	GOHSEP/ SHMO	Ongoing Effort	Get a Game Plan Website, PSAs and workshops educating the public about the need for family and business evacuation planning.	The CEO Program is a $25 million effort that has been initiated to distribute information to state agencies, municipalities and parishes about the benefits of mitigation, grant opportunities and best practices. The program has resulted in the development of print and radio public service announcement regarding the benefits of mitigation and the development of a workshop and supporting informational materials and imagery that are utilized in the workshops. A series of 5 workshops are planned throughout the state targeting local elected officials and staff, state agencies and other eligible sub-applicants. Two workshops have been held with 81 individuals registering for the 1st and 66 individuals registered for the second workshop. The workshop focuses on increasing awareness of HMG funds, available assistance from GOHSEP and best practices which are documented in a workbook provided to registrants. Institutionalization of practices developed through the CEO program will be pursued through making training and educational materials available into the future through print and online, public service announcements that can be utilized into the future, the workshop that has educated government and agency staff and the development of training videos based on the workshop materials.

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	A.i. Define audience				
	- Define the audience and its needs regarding increased awareness and the definition of preferred methodologies for risk assessment and mitigation planning.	GOHSEP	Complete		
	- Facilitate a connection between local land use/community planning offices, parish and local OHS/EP directors and other Stakeholders	OCD	Program Initiated	OCD Grant program has been initiated to foster collaboration between land use planning and emergency management	
	- Include Office of State Planning staff in CEO efforts to ensure that mitigation planning is incorporated into program.		No Progress		Not initiated & no plan to
	A.ii. Staffing plan				
	- Staff would need to be increased to meet time commitments for an increased public education and outreach effort.	GOHSEP	Assigned as prioritized		GOHSEP staff participating in CEO workshops as well as other education and outreach efforts associated with Hazard Mitigation Program and Technical Assistance

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	A.iii. Identify existing resources/programs. Ongoing programs include:		Ongoing Effort		
	- Louisiana Floodplain Management Desk Reference.	GOHSEP/ LFMA	Ongoing Effort		Information available through LFMA website.
	- LouisianaFloods.org hosted by LSU AgCenter	GOHSEP/ LSU AgCenter	Ongoing Effort		Working with LSU Ag Center, sharing info and coordinating efforts, floodplain maps, mitigation measures and recovery information is available online at the LSU AgCenter website.
	- DNR and allied efforts to develop public awareness regarding coastal issues. Programs include America's Wetlands campaign, CWPPRA, Louisiana State Grant Program, and DNR's Coastal Management Division and USAC Ecosystem Restoration Study.	DNR/GOHSEP	Ongoing Effort		Public awareness materials published in print and online, status of program and documentation of efforts available on agency and program websites. CEO program, GOHSEP website, meetings and other coordination efforts have been implemented to facilitate this action. CPRA and OCPR now play key roles.

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	A.iv. Create tools to use in education and outreach including:				
	- State websites, toll free hotline information services, PSA's, speaker series, demonstration events, insurance and real estate disclosures and training.	GOHSEP	Ongoing Effort		- Get a Game Plan website, PSAs, workshops for public and officials. - GOHSEP HM staff participation in series of 4 seminar/disaster fairs held throughout the state in 2009 targeting state agencies, parish and local government and other eligible sub-applicants to educate about HM program and available GOHSEP assistance. - Let's Mitigate Louisiana print materials. - 211 program - CEO program materials and best practices. - CEO program, GOHSEP website, meetings and other coordination efforts have been implemented to facilitate this action.
	- Presentation at regularly schedules events such as EMA conference, LA AFM	GOHSEP	Ongoing effort		
	- Video teleconferences to provide updates and training to broad audiences	GOHSEP	Ongoing Effort		
	- Identifying mitigation options for flood insurance policyholders as part of notification requirements under the FIRA of 2004.	GOHSEP	Ongoing Effort	LSU AgCenter and LAFM outreach through websites.	CEO program, GOHSEP website, meetings and other coordination efforts have been implemented to facilitate this action.

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Facilitate the connection between OHS/Eps both between and within parishes and other Stakeholders to foster sharing of information.	GOHSEP	Ongoing Effort		Website is a key component of this, and the CEO program facilitates this.
	A.v. Identify / solicit support				
	- Solicit support and participation by other state agencies and parties that may have an interest in public education and outreach efforts for selected hazards and/or an established method for communicating information to address gaps in the program. Louisiana Association of Planning and Development Districts, Police Jury Association, Louisiana Municipal Association	GOHSEP	Ongoing Effort	- SHMP Update - OCD grant program - Get a Game Plan Program - Workshops - Conference Participation	Currently working with Ag Center, DNR, Universities, LFMA, and Dept of Insurance, workshops will facilitate others. CEO program, GOHSEP website, meetings and other coordination efforts have been implemented to facilitate this action.
	A.vi. Work with PIO's				

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Work with PIOs within GOHSEP and other state and local agencies to develop and distribute a common message to accompany public education and outreach efforts related to hazard mitigation.	GOHSEP	Limited Progress		Only working with GOHSEP PIO, little or no coordination with other state agencies
	- Identify common resources and methods to address hazards, provide contacts for further information.		Limited Progress	- CEO program - GOHSEP assistance	Only working with GOHSEP PIO, little or no coordination with other state agencies
	A.vii. Develop / distribute materials				
	- Distribute materials to partner agencies and interested parties to support delivery of the message including website postings, presentations, brochures, posters, etc.	GOHSEP	Ongoing Effort	- GOHSEP website updates - Get a Game Plan website, PSAs and print materials - CEO program print materials and PSAs, emailing workshop invitations - LFMA website - LSU AgCenter Website - GOHSEP participation in workshops and conferences	CEO program, GOHSEP website, meetings and other coordination efforts have been implemented to facilitate this action.

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	A.viii. Feedback				
	- Seek feedback periodically to determine needs for additional information and alternative methods to reach additional audiences.	GOHSEP	Ongoing Effort		Following training and workshops, questionnaires are often utilized to solicit feedback. Website provide opportunity for comments.

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
Objective 1.2: - Increase the awareness of risks and understanding of the advantages by mitigation of state agency heads.	1.2.B Education and Outreach for State Agencies: Develop and implement an "internal state agency mitigation education and outreach program.	GOHSEP/SHMO	Ongoing Effort	- State agencies invited to participate in CEO program workshop - Training and outreach provided through HM staff as requested , 9 state agencies have received mitigation funds and associated assistance from GOHSEP. - State agencies participating in SHMP update efforts - Information provided through print and online resources. - GOHSEP outreach through website and mail to participate and solicit mitigation projects.	GOHSEP HM and contract staff have participated in more than 3200 meetings, site visits, conference calls and training sessions with state agencies, parishes, municipalities and other eligible groups from 2007-2010, in support of hazard mitigation program activities, education and outreach, and technical assistance. From July 2007-October 2009 over 2000 HMGP technical assistance were made state wide and another 454 planning assistance visits.
	B.i. Staffing plan				
	- Part of staffing plan should include ongoing training to increase staff capabilities, training should also be available to SHMPC	GOHSEP	Staffed under CEO program	CEO program workshops have focused on broad participation.	- GOHSEP training and technical assistance provided to state agencies as needed/requested

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	B.ii. Follow-up interviews				
	- Determine interest and specific needs for continuing educations and outreach efforts.	GOHSEP	Ongoing Effort		Online training regarding mitigation targeted at parish, municipal and state agency staff has been proposed. Mitigation awareness training for state critical facility managers has been identified.
	B.iii. Identify / solicit support				
	- Secure participation by state agencies that are not already member agencies on the SHMT or represented on the SHMPC (especially those with critical facilities), including establishing points-of contact and communications preferences.	Mitigation Planning Team	Ongoing Effort	- Mitigation Planning Team has participated in Disaster Fairs (4 across state) to reach out to state agencies and other stakeholders. - Outreach via mail and website to solicit agency mitigation project development.	Mitigation Planning Team Responsibility CEO program, GOHSEP website, meetings and other coordination efforts have been implemented to facilitate this action.
	B.iv. Data management mechanism				
	- Provide results of Risk Assessment for State Owned Assets in a "real-time" format to reflect continuing data updates.	GOHSEP	No Progress		May grow out of critical facility work in GOHSEP GIS office or ULL/NIMSAT GIS tasks

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	B.v. Develop / conduct training				
	- Conduct training for state facility managers regarding recommended procedures for "ground-truthing" information. Support with "job aids" to include reference materials, assessment criteria, and checklists for buildings and state owned assets.	GOHSEP	No Progress		Proposed online mitigation training will facilitate this.
	B.vi. Plan integration efforts				
	- Work with state agencies to identify existing plans and planning efforts that could be enhanced through integration with the SHMP updates.	GOHSEP	No progress		State agencies will be encouraged to consider the SHMP in their own planning efforts

Goal 1: The State of Louisiana will improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	B.vii. Infrastructure Protection Branch				
	- Develop internal training program within GOHSEP for the Infrastructure Protection Branch to facilitate integration of hazard mitigation into existing technical assistance offered by that Branch to owners and operations of identified critical infrastructure and key resources.	GOHSEP Planning or Preparedness	No Progress		Proposed online mitigation training will facilitate this.

Appendix L.2:
Progress Tracking Database

Table L.2-1 documents the Goals and Actions identified in the April 2008 Plan and captures associated efforts and accomplishments for Goal 2.

Goal 2: The State of Louisiana will improve data collection, use and sharing to reduce the impacts of hazards.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
Objective 2.1: - Improve data available to parishes and communities for use in future planning efforts. - Provide parish and municipal officials and local practitioners with educational opportunities and information regarding available tools to effectively use risk and related data. - Improve integration of parish and local mitigation plans into the State of Louisiana Hazard Mitigation Plans part of periodic monitoring, evaluating and updating of the Plan.	2.1.C Statewide Data Related Efforts: Define and implement appropriate institutional arrangements for collection, use and sharing data for parishes and municipalities.	GOHSEP/SHMO	Ongoing Effort	- ULL/NIMSAT task order to make hazard data available online. ($825K - in progress) Future efforts will focus on allowing data to be accessible across other state platforms. - Statewide Alert and Warning System 5% project to provide emergency alert portals and receivers to parishes, universities, GOHSEP and state police. ($5.2 M - 30% complete) - 7% program, GOHSEP Statewide Spatial Data Imagery Development Project. ($9.5 M - 5% complete. - State wide data coordination efforts (Virtual LA, LOSCO, LAGIC)	
	C.i. Staffing plan				
	- In addition determine and refine funding needs to address specific data deficiencies.	GOHSEP	Not completely staffed		
	C.ii. Definitions and methodologies				

Goal 2: The State of Louisiana will improve data collection, use and sharing to reduce the impacts of hazards.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- For use by stakeholders regarding hazards, assets, risk assessments, loss estimations, goals and objectives and project types. (incorporate into training)	GOHSEP	Ongoing Effort	- ULL/NIMSAT task order - Workshops with stakeholders	CEO program workshops incorporate best practices.
	- Revisit assumptions made that underpin risk assessment methodologies. Subsidence assumptions, relative risk vs absolute risk assessments for parishes for surge or levee failure hazards, i.e. parish with less exposure (property value) may have higher risk but rank lower on priority due to lower losses.	GOHSEP/ULL	Ongoing Effort	- Methodologies utilized in SHMP Update will inform this.	ULL will facilitate this as part of their task order.
	C.iii. Identify available data				
	- Make sure all parties understand what data exists or will be available and what can and cannot be done with certain data sets, i.e. SRL property owners info is confidential under the Privacy Act. Release can impact funding.	GOHSEP/ULL	Ongoing Effort	- Platforms are in development, usage guidance will be developed as programs are implemented.	ULL will facilitate this as part of their task order, GOHSEP will provide input as their project develops.
	C.iv. Validate Plan Update results				

Goal 2: The State of Louisiana will improve data collection, use and sharing to reduce the impacts of hazards.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Validate and improve where possible on the study methodology.	GOHSEP/ULL	Ongoing Effort	- Validation and improvements will be performed as programs are implemented.	ULL will facilitate this as part of their task order, GOHSEP will provide input as their project develops.
	- Disseminate and collect information from municipal governments and other state agencies.	GOHSEP	Ongoing Effort	- Efforts will increase as programs progress.	ULL will facilitate this as part of their task order, GOHSEP will provide input as their project develops.
	- Support process of identifying appropriate eligible mitigation projects at the parish level and within state agencies.	GOHSEP	Ongoing Effort	- Efforts will increase as data programs progress. - GOHSEP staff provides assistance as requested and participate in parish HMP development process.	
	- Review/verification should include check to determine if critical facilities in HAZUS database still exist, addition of recently constructed facilities, accurate geo-referenced locations, and necessary supporting data.	GOHSEP	Ongoing Effort	- Critical facility update for SHMP can be compared to HAZUS data.	GIS group at Independence has developed and updated critical facility database. GOHSEP (Virtual LA) info loaded, has not been validated
	C.v. Develop / conduct training				
	- Coordinate data management training.	GOHSEP	Ongoing Efforts		State GIS user groups provide guidance and training opportunities to members.
	C.vi. Integrate data w/ 2011 Plan Update	GOHSP	Ongoing Effort		
	C.vii. Continue data gathering				

Goal 2: The State of Louisiana will improve data collection, use and sharing to reduce the impacts of hazards.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Validated database of historical disasters - Statewide Risk Index - Web portal access to public and businesses - Secure web portal access for government - Ongoing communications, data management, training and web support.	GOHSEP	Ongoing Effort	- SHMP update - NIMSAT task order - GOHSEP data development project. - Other state data portals.	
Objective 2.2: - Improve data available to state agencies for use in future planning efforts. - Improve communication of updated data and information from state agencies to GOHSEP and the SHMPC.	2.2.D Objective for data related efforts for State Agencies: Support implementation of a coordinated approach to data collection, use and sharing for State agencies to validate and disseminate result of the Risk Assessment for State-owned Buildings, Critical Facilities and Infrastructure.	GOHSEP/SHMO	Ongoing Effort	Coordination with other state data programs	
	D.i. Staffing plan				
	D.ii. Contact agency heads / managers				
	- Encourage data ground-truthing, better data will improve the process.	GOHSEP	Some Progress		
	D.iii. Centralized data repository				

Goal 2: The State of Louisiana will improve data collection, use and sharing to reduce the impacts of hazards.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Long term goal is for state agencies and facility managers to maintain their own information and plans.	GOHSEP	Some Progress	- 7% program, GOHSEP Statewide Spatial Data Imagery Development Project. ($9.5 M - 5% complete.	Repository in development but state agencies/ facility managers not involved at this time.

Appendix L.3:
Progress Tracking Database

Table L.3-1 documents the Goals and Actions identified in the April 2008 Plan and captures associated efforts and accomplishments for Goal 3.

Goal 3: The State of Louisiana will improve capabilities and coordination at the municipal, parish, regional and state level to plan and implement hazard mitigation projects.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
Objective 3.1: - Support hazard mitigation planning and project implementation at the municipal, parish and multi-parish level. - Support increased NFIP/CRS participation. - Support full and effective UCC enforcement. - Support increased integration of local/parish floodplain management and Coastal Zone Management with effective municipal/parish zoning regulation, subdivision regulation, and comprehensive planning.	3.1.E Technical Support for Parish and Municipal Hazard Mitigation Planning: Provide technical support to municipalities, parishes, or groups of parishes for on-going and continuing municipal hazard mitigation planning efforts.	GOHSEP/SHMO Mitigation Planning Section	Ongoing Effort	State NFIP coordinator	Through the FEMA Planning Pilot Grant Program, GOHSEP assisted 58 parishes, cities and universities to update HMPs and scope mitigation projects. Efforts included meeting facilitation, plan guidance and review, and technical assistance in mitigation project scoping. - GOHSEP HM and contract staff have participated in more than 3200 meetings, site visits, conference calls and training sessions with state agencies, parishes, municipalities and other eligible groups from 2007-2010, in support of hazard mitigation program activities, education and outreach, and technical assistance. From July 2007-October 2009 over 2000 HMGP technical assistance site visits were made state wide and another 454 planning assistance visits.
	E.i. Staffing plan		Ongoing Effort		
	E.ii. Support parish plan maintenance		Ongoing Effort		

Goal 3: The State of Louisiana will improve capabilities and coordination at the municipal, parish, regional and state level to plan and implement hazard mitigation projects.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Pursue municipal plan updates on a rotating basis	GOHSEP	Ongoing Effort	CEO program promoting participation in HMP.	- GOHSEP tracks status of HMP development and updates - General Mitigation Assistance offered by GOHSEP - Planning Pilot Program resulted in 58 HM plans / updates and project scoping. - 9 new HMP have been written, 48 HMP updates and 1 regional effort is underway.
	- Provide technical assistance to any jurisdiction that could be an eligible subgrantee, but the state should only support funding application for planning support at the parish level or above.	GOHSEP	Ongoing Effort	CEO program promoting participation in HMP.	- All 64 parishes, 9 state agencies, 1 university, and 1 tribe received HM grants and associates application assistance from GOHSEP for a total of over $1 billion in projects.
	E.iii. Support NFIP participation				
	- Identify parishes at relatively high risk to floods that are either non-participants in CRS or have low CRS rankings.	GOHSEP	Ongoing Effort	State NFIP Coordinator outreach.	- Efforts are supported through GOHSEP HM Planning staff participation in parish and municipal HMP development/update.
	E.iv. Support repetitive loss mitigation	GOHSEP	Ongoing Effort	State NFIP Coordinator outreach.	Part of planning and technical assistance efforts.
	E.v. Support plan integration	GOHSEP	Ongoing Effort		

Goal 3: The State of Louisiana will improve capabilities and coordination at the municipal, parish, regional and state level to plan and implement hazard mitigation projects.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Encourage parishes to expand hazard mitigation planning and implementation efforts to include all relevant local parties.	GOHSEP	Ongoing Effort	- Efforts are supported through GOHSEP HM Planning staff participation in parish and municipal HMP development/update.	
	E.vi. Support NFIP substantial damage permitting preparations	GOHSEP, NFIP Coordinator	Ongoing Effort		
	- Eligible activities could include research of construction costs and market values, initial set-up of estimating software, site inspections of damages, notifications to property owners about permitting requirements	GOHSEP	Ongoing Effort	State NFIP Coordinator outreach.	Planning and technical mitigation assistance offered by GOHSEP

Goal 3: The State of Louisiana will improve capabilities and coordination at the municipal, parish, regional and state level to plan and implement hazard mitigation projects.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
Objective 3.2: - Provide information regarding techniques for State agencies to undertake detailed vulnerability and risk assessments for their own planning efforts and prioritization of funding for project implementation.	3.2.F Technical Support for State Agencies Hazard Mitigation Planning: Provide technical support to state agencies for on-going and continuing mitigation planning.	GOHSEP/SHMO	Ongoing Effort	CEO program workshops.	- General Mitigation Assistance offered by GOHSEP as requested - 5% program Develop Statewide Alert and Warning System: Purchasing Emergency receivers for state distribution of broadcasting messages (1 FM portal for each of the 64 Parish EOCs and Sherriff Offices, 1 portal for each of 8 State Universities, 1 alert FM portal for State Police and 1 for GOHSEP will transmit. Portable receivers for GOHSEP and state police as well as receivers for 64 universities and 8 parishes. In process $5.2 million. - SHMP Update work on state critical facilities will provide a resource to identify vulnerabilities.
	F.i. Training and technical support				
	- Help state agencies prepare HMGP and PDM planning grant applications.	GOHSEP	Ongoing Effort		- Over $597 million in HMGP and PDM grant funds have be awarded to state agencies with the assistance of GOHSEP in developing grant applications.
	- Sharing existing data and methodologies	GOHSEP	Ongoing Effort		- Data and methodologies are provided and shared during coordination and assistance efforts performed by GOHESP HM staff.

Goal 3: The State of Louisiana will improve capabilities and coordination at the municipal, parish, regional and state level to plan and implement hazard mitigation projects.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Provide plan reviews at key milestones in the process	GOHSEP	Ongoing Effort		- All grant applications undergo reviews by GOHSEP staff at key milestones.
	F.ii. Reserve Fund - Pursue the designation of 5% Initiative funds as part of the Implementation Strategies for post disaster HMGP funding to be used to establish a list of funding needs.	GOHSEP	Ongoing Effort		- 5% program Develop Statewide Alert and Warning System - 5% program, GOHSEP Generator project ($30 M) purchase portable generators for local communities statewide. 60% complete. - 5% program, DHH Generator Project ($32 M) purchase generators for Hospitals and nursing homes to provide backup power for HV systems. 30% complete. - 5% program, DPS project to provide technical assistance, training, staffing, office and equipment funding to promote local code enforcement of statewide ICC building code.
Objective 3.3:- Evaluate all plans included in the *State of Louisiana Hazard Mitigation Strategy* to ensure consistency between risk assessments, policies and recommendations.	3.3.G Implementation of Mitigation Plans of Action:Conduct follow-up activities to engage members of the SHMPC and the SHMPAB in a review of planning and implementation activities under their jurisdictions and responsibility.	GOHSEP/SHMO	Ongoing Effort		
	G. Plan Integration				

Goal 3: The State of Louisiana will improve capabilities and coordination at the municipal, parish, regional and state level to plan and implement hazard mitigation projects.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Conduct follow-up activities to engage members of the SHMPC and the SHMPAB in a review of planning and implementation activities under their jurisdictions and responsibilities, interviews, focus group meetings, conference calls to confirm consistency in methodologies and recommendations.	GOHSEP	Ongoing Effort	- Education and Outreach efforts - Data collection efforts	

Appendix L.4:
Progress Tracking Database

Table L.4-1 documents the Goals and Actions identified in the April 2008 Plan and captures associated efforts and accomplishments for Goal 4.

Goal 4: The State of Louisiana will continue to pursue opportunities to reduce impacts to the State's manmade and natural environment through mitigation of repetitive and sever repetitive loss properties and other appropriate construction project and related activities.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
Objective 4.1: - Facilitate development and administration of project applications that will meet State and federal guidelines for funding for repetitive and severe repetitive loss properties and other appropriate construction projects. - Establish mitigation project priorities on a regional, hazard specific basis.	4.1.H Identifying Cost Effective Projects with Parishes and Municipalities: Work with municipalities, parishes and State agencies to identify, fund and implement cost effective projects to mitigate repetitive and severe repetitive loss properties and other appropriate risks, and to prioritize (or rank) them according to cost effectiveness.	GOHSEP/SHMO	Ongoing Effort	- All 64 parishes, 9 state agencies, 1 university, and 1 tribe received HM grants and associates application assistance from GOHSEP for a total of over $1 billion in projects. - GOHSEP provides guidance/input on mitigation priorities.	- GOHSEP HM and contract staff have participated in more than 3200 meetings, site visits, conference calls and training sessions with state agencies, parishes, municipalities and other eligible groups from 2007-2010, in support of hazard mitigation program activities, education and outreach, and technical assistance. From July 2007-October 2009 over 2000 HMGP technical assistance site visits were made state wide and another 454 planning assistance visits.
	H.i. Preferred regional project types				

Goal 4: The State of Louisiana will continue to pursue opportunities to reduce impacts to the State's manmade and natural environment through mitigation of repetitive and sever repetitive loss properties and other appropriate construction project and related activities.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Current top priorities include: RL and SRL, limiting forced drainage solutions to areas where levees or floodwalls are already in place and supporting planning and non-structural solutions in areas where engineered systems have been relied on in the past, hardening of critical facilities.	GOHSEP	Ongoing Effort	State NFIP Coordinator outreach.	GOHSEP planning and technical assistance
	H.ii. Project application training, "best practices"	GOHSEP	Ongoing Effort	CEO program, Workshops in process, printed materials developed.	- GOHSEP HM and contract staff have participated in more than 3200 meetings, site visits, conference calls and training sessions with state agencies, parishes, municipalities and other eligible groups from 2007-2010, in support of hazard mitigation program activities, education and outreach, and technical assistance. From July 2007-October 2009 over 2000 HMGP technical assistance site visits were made state wide and another 454 planning assistance visits.
	- How to prepare HMGP and PDM-C grant applications	GOHSEP	Ongoing Effort	CEO program workshops and materials, GOHSEP HMP planning and technical assistance.	- All 64 parishes, 9 state agencies, 1 university, and 1 tribe received HM grants and associates application assistance from GOHSEP for a total of over $1 billion in projects.
	- How to determine a B/C ratio consistent with FEMA guidance	GOHSEP	Ongoing Effort	CEO program workshops and materials, GOHSEP HMP planning and technical assistance.	Assistance provided by GOHSEP as requested.

Goal 4: The State of Louisiana will continue to pursue opportunities to reduce impacts to the State's manmade and natural environment through mitigation of repetitive and sever repetitive loss properties and other appropriate construction project and related activities.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Establishing education and outreach on improved cost-estimation data and methodologies.	GOHSEP	Ongoing Effort	CEO program Best Practices.	Assistance provided by GOHSEP as requested.
	- Online training, funding availability, project eligibility and application procedures; building code enforcement, etc.	GOHSEP	Ongoing Effort	CEO program Best Practices.	GOHSEP outreach through mail, website and technical assistance.
	- Direct technical support and outreach to improve coordination of emergency management and regulatory officials.	GOHSEP	Ongoing Effort	OCD grant program.	
Objective 4.2:- Harden and retrofit infrastructure and critical facilities with highest vulnerability rankings.	4.2.I Identifying Cost Effective Projects with State Agencies:Support efforts by State agencies to identify and pursue hazard mitigation projects for at-risk State-owned assets and critical infrastructure, and prioritize (or rank) them according to cost-effectiveness.	GOHSEP/SHMO	Ongoing Effort	SHMP efforts to update state critical facility database and rank priorities based on recovery.	CEO program workshops provide outreach to state agencies
	I. Technical support				
	- Using UNO results combined with State building data per the Facilities Management database to determine where State buildings occur within clusters of repetitive loss properties.	GOHSEP	No Progress		Insufficient resources, will be pursued in conjunction with future efforts.

Goal 4: The State of Louisiana will continue to pursue opportunities to reduce impacts to the State's manmade and natural environment through mitigation of repetitive and sever repetitive loss properties and other appropriate construction project and related activities.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Pursue wind-load hardening and retrofitting of critical facilities south of I-10 as highest priority.	GOHSEP	Ongoing Effort		
	- Continue work to coordinate the Plan update's recommendations with future EM Accreditation Program updates	GOHSEP	Ongoing Effort		
	- Pursue cross-training arrangements and MOU with other agencies and/or state to provide assistance in the wake of disasters.	GOHSEP	Ongoing Effort	- Proposed HM online training will facilitate this action.	State EOP operational plans incorporate support from other state agencies.
	- Use best possible cost-estimation data and methodologies.	GOHSEP	Ongoing Effort	- CEO program distributing best practices. - GOHSEP technical assistance.	
	- Gather data from facility managers of top ten facilities as identified in section six.	GOHSEP	No Progress		Insufficient resources.
	- Help state agencies prepare HMGP and PDM planning grant applications.	GOHSEP	Ongoing Effort		Over $597 million in HMGP and PDM grant funds have be awarded to state agencies with the assistance of GOHSEP in developing grant applications.

Goal 4: The State of Louisiana will continue to pursue opportunities to reduce impacts to the State's manmade and natural environment through mitigation of repetitive and sever repetitive loss properties and other appropriate construction project and related activities.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
Objective 4.3:- Maintain and enhance local regulatory standards.- Elicit and support efforts by federal and State legislatures to address shortcomings in existing laws and programs related to hazard mitigation.	4.3.J Legislative and Regulatory Enhancements:Support and pursue legislative agendas at all levels of government.	GOHSEP/SHMO	Ongoing Effort		Support provided as requested.
	J.i Support adoption, implementation and enforcement of higher regulatory standards at the municipal and parish level by developing and delivering technical assistance.				
	- Promote adoption and enforcement of comprehensive planning, zoning, sensitive area protection ordinances, and floodplain ordinances as required elements.	DPS	Ongoing Effort		- 5% project, Public Safety Code Enforcement Project $14 million to provide technical assistance to local code enforcement of ICC code statewide, provides for staffing offices, training and equipment.
	- Establish local requirements for development permitting-review processes for wetlands.	DOA	Ongoing Effort		State and Federal requirements.
	- Establish local freeboard requirements for construction in areas with significant subsidence rates.	DOTD	No Progress	NFIP	Insufficient resources to coordinate efforts.
	J.ii State legislative agenda items:				

Goal 4: The State of Louisiana will continue to pursue opportunities to reduce impacts to the State's manmade and natural environment through mitigation of repetitive and sever repetitive loss properties and other appropriate construction project and related activities.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	- Provide funding for non-federal share of projects.	DOA	No Progress		Insufficient State funding resources.
	- Establish incentives for participation by State facility managers in risk assessment and hazard mitigation planning and project implementation in the form of rebates on insurance premiums for the Office of Risk Management.	DOI/ORM	No Progress	NFIP coordination	Insufficient resources to staff efforts. May be pursued in future data management and training programs.
	- Address the need for refinements or corrections to the UCC legislation (Act 12) including: -Regulation of additions and improvement to existing structures; - Regulation of appurtenances not in the original footprint associated with mobile homes; - Refining the definition of "recreational structure" to exclude habitable year-round dwellings; - Refining the definition of "work area" such that extensive alterations, renovations, and repairs are covered, even if less than 50% of the total area is involved in the projects; - Resolving confusion in working that implies that commercial properties under the NFIP are not covered by the UCC.	DOTD/DPS	Ongoing Effort	NFIP	

Goal 4: The State of Louisiana will continue to pursue opportunities to reduce impacts to the State's manmade and natural environment through mitigation of repetitive and sever repetitive loss properties and other appropriate construction project and related activities.					
Objective	Action	Responsible Dept/Contacts	Status	Other Efforts Supporting Objective	Notes
	J.iii Support federal legislative agenda items: - Enforce flood insurance rate increases for property owners that refuse mitigation funding. - Develop and enforce actuarial based flood insurance rates for non-primary residential structures.	DOTD	Ongoing Effort	NFIP	

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