TANGIPAHOA

PARISH HAZARD MITIGATION UPDATE - 2015

TANGIPAHOA PARISH GOVERNMENT

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TANGIPAHOA HAZARD MITIGATION PLAN UPDATE

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Tangipahoa Parish

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Tangipahoa Parish
City of Hammond
City of Ponchatoula
City of Amite
Town of Kentwood
Town of Independence
Town of Roseland
Village of Tangipahoa
Village of Tickfaw

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Contents

1 Introduction

This plan will identify cost effective and environmentally sound mitigation strategies that will reduce or eliminate long-term risk to human life and property from natural hazards. Implementation of this plan can reduce the enormous cost of disasters to property owners and all levels of government. Mitigation strategies often include protecting critical community facilities, reducing exposure to liability and minimizing community disruption. Land development planning, adoption of building codes, elevation of homes, and acquisition and relocation of homes away from floodplains are just a few examples of mitigation strategies.

In the past, federal legislation has provided funding for disaster relief, recovery, and some hazard mitigation planning. The Disaster Mitigation Act of 2000 improved this planning process and became effective on October 10, 2000, when the President signed the Act (Public Law 106-390). The new legislation reinforced the importance of mitigation planning and emphasized planning for disasters before they occur. The Act established a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program. The Act increased the amount of funds available to states and local communities that have developed a comprehensive, enhanced mitigation plan prior to a disaster.

This hazard mitigation plan is a comprehensive plan for disaster resiliency in Tangipahoa Parish. As required by federal regulations under the Act of 2000, the hazard profiles contained in this plan provide information on the natural and man-caused hazards that could affect the municipalities and rural areas of Tangipahoa Parish. Tangipahoa Parish prepared this Hazard Mitigation Plan to be better equipped for disasters before they occur. It is our hope that, with proper planning, our citizens can be more knowledgeable of things they can do to protect their property and their lives from the devastation caused by hazards like floods and hurricanes. In addition, it is our desire to objectively evaluate the hazards that occur in our Parish and, as government officials, prioritize the actions that we need to take to provide a safe place to live.

The Parish's first Hazard Mitigation Plan was funded in September 2002 by a Planning Grant from the Federal Emergency Management Agency (FEMA) and administered by the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and was finalized in March 2006. In August 2005, one of the worst hurricanes to hit Louisiana in recent history came ashore. Hurricane Katrina caused significant flooding in south Louisiana and continued her path of destruction northward. Next, Hurricane Rita struck Louisiana approximately one month later. The entire State of Louisiana was named as part of a presidentially declared disaster for both Hurricanes Katrina and Rita. Once again, Tangipahoa Parish faced the cleanup after the storm. Subsequently, the Tangipahoa Parish Council was made aware of a Planning Grant that would assist in updating the existing hazard mitigation plan using funds made available through FEMA from the Hazard Mitigation Grant Program (HMGP) fund created after Hurricanes Katrina and Rita. The Parish applied for a Planning Grant and was awarded the grant in May 2007. This additional funding was made available through FEMA's Expanded Mitigation Strategies Planning Grant Pilot which is administered by the State of Louisiana and provides funds to update existing hazard mitigation plans and/or identify and document feasible mitigation projects. These funds assisted Tangipahoa Parish in updating the hazard mitigation plan to reflect new information such as

the Advisory Base Flood Elevations (ABFEs) and identifying cost effective specific mitigation projects, focusing on those particular types of projects that may be eligible for HMGP funding. The parish once again faced a powerful hurricane in August of 2012 when Hurricane Isaac brought heavy rainfall leading to severe inland flooding, peaking at 23.22 inches in Hammond, LA[1]. For the 2015 plan update, the State of Louisiana again assisted Tangipahoa Parish by allocating funds from HMGP to support the plan update.

Location and Hazard Risk

Tangipahoa Parish is located in southeast Louisiana, north of New Orleans and east of Baton Rouge. It is strategically situated to serve New Orleans, Baton Rouge and Mississippi. St. Tammany and Washington parishes are located to the east of Tangipahoa. St. Helena and Livingston parishes are located to the west of Tangipahoa Parish. The state of Mississippi is located to the north of the Parish. St. John the Baptist and Jefferson parishes are located to the south of the Parish meeting in Lake Pontchartrain. Tangipahoa Parish consists of an area of 790.3 square miles, or 505,790 acres. Tangipahoa Parish contains eight incorporated communities: Hammond, Ponchatoula, Amite, Kentwood, Independence, Roseland, Tangipahoa, and Tickfaw. Tangipahoa Parish is located in Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) Region 9.

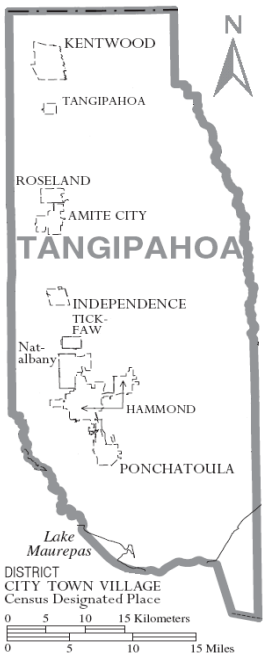

Figure 1-1 - Map of Tangipahoa and Jurisdictions
(Source: http://upload.wikimedia.org)

The 2000 census reports the Tangipahoa Parish population at 100,588 people with 40,792 households. Tangipahoa's population from the 1990 census report was listed as 85,709 people, a population change of 17.4%. The 2006 census reports show a total population of 113,137 and a housing stock in the Parish of 44,190 units. This change in the rural areas of Tangipahoa Parish can be attributed to the 6.6% increase in the year following Hurricane Katrina. The City of Hammond's population fluctuates with an additional 17,000 people due to Southeastern Louisiana University's enrollment. In 2010, the census reports the population of the Parish at 121,101, up 7,964 from 2006[2].

[1] Wikipedia – The Effects of Hurricane Isaac in Louisiana
[2] US Census

Table 1-1 - Tangipahoa Parish Population

Tangipahoa Parish Population					
Name	**Total 2010 Population**	**Total 2006 Population**	**Total 2000 Population**	**Total 1990 Population**	**Total 1980 Population**
Tangipahoa Parish	121,101	113,137	100,588	85,709	80,698
Hammond, City of	20,019	19,134	17,639	15,871	15,043
Ponchatoula, City of	6,559	6,156	5,180	5,425	5,459
Amite, City of		4,287	4,110	4,236	4,301
Kentwood, Town of		2,309	2,205	2,468	2,637
Independence, Town of		1,828	1,724	1,632	1,684
Roseland, Town of		1,306	1,162	1,093	---
Tangipahoa, Village of		784	747	569	---
Tickfaw, Village of		683	617	565	---

This plan will discuss twelve hazards affecting Tangipahoa Parish, five of which will be profiled and have proposed mitigation actions identified. The identified hazards of Tangipahoa Parish include; Flooding, tropical cyclones, thunderstorms with lighting and high winds, tornadoes, severe winter/hailstorms, extreme heat, drought, wildfires, coastal erosion, saltwater intrusion. Hazard Profiles (see Section Two) are included for these hazards and contain information on the likelihood of occurrence, possible magnitude or intensity, areas of the parish that could be affected and conditions that could influence the manifestation of the hazard.

Transportation

The main transportation arteries through Tangipahoa Parish are Interstate Highway 12 and U.S. Highways 51 and 190. The State Highways are 10, 16, 22, 38, 40, 442, 443, 445, 1054, 1058, and 1062. Interstate 12 runs east/west through the southern portion of the Parish. Interstate 55 runs north/south through the Parish. Some of these roadways are significant evacuation routes for Tangipahoa Parish, as well as surrounding Parishes during states of emergency.

Tangipahoa Parish is served by Illinois Central Gulf Railroad. The railroad runs north/south through the Parish, parallel to Interstate 55. Rail rates in Louisiana for many commodities tend to be lower than those in the other states because of the competition from barge carriers. All lines handle a significant volume of containers, trailers on flat cars, and carload traffic between New Orleans and other parts of America. Baton Rouge Metropolitan Airport serves Tangipahoa Parish 56 miles to the west in Baton Rouge and is served by five commercial carriers, including Continental Airlines, American Airlines, Delta Airlines, Northwest Airlines, with 70 flights daily on three runways. The local airport is the Hammond Municipal Airport with two runways.

The closest international waterway port is located 56 miles to the west in Baton Rouge at the Port of Baton Rouge, with a channel depth of 45 feet. The nearest port facilities are located 24 miles to the south at the Port of Manchac with an eight foot channel depth and two barge terminals.

History

Tangipahoa Parish is part of the area known as the Florida Parishes. It was established on March 6, 1869, the last of the Florida Parishes. It was cut from several surrounding parishes as a right-away for a railroad from New Orleans to Natchez. The Parish seat is in Amite.

The largest municipality in the Parish was named after Peter Hammond, a Swedish adventurer who first settled the area. The economic story of Hammond began in 1860 when C.E. Cate bought land and constructed a home as well as a shoe factory, tannery and a sawmill. The railroad came through Hammond soon after, and Hammond became a key center for the Confederacy during the Civil War.

Soon after the Civil War, Peter Hammond laid out the town and merchandising businesses quickly made Hammond a commercial center for the area. In 1893, Colonel Henry Robinson built the first of three magnificent hotels on a site facing the railroad tracks near the middle of town. The town became a popular stop for northern visitors who would come south for the winter months and for New
Orleans residents who wanted to escape the Yellow Fever season during the summer months.

By the early twentieth century, Hammond was known as the Strawberry Capital of America. Boxcar loads of the produce were shipped north from the city until competition from California and other states decreased the market share. Hammond is probably the smallest city at an intersection of two major interstate highways, but the diversity of commerce and industry in the city is a welcome contrast to its size. The town of Independence was originally known as Uncle Sam when it was settled in the 1830's. Italian families began to arrive in the early 1880s and began working in the sugar cane fields. Because of its heritage, the town became known as Little Italy. The Italian families began to establish strawberry and truck farms in Uncle Sam, which was ideally located along the railroad between Amite and Hammond. As these hard working immigrants grew in numbers, they began to leave the fields and establish a retail industry to support employees at the nearby Southern Car Works. They eventually renamed the town Independence and it remained a significant cultural force in the Parish.

Kentwood was named after Amos Kent, an early settler who established a sawmill and a brickyard, which eventually became the largest in the south. The lumber industry thrived in the area until about 1920 when the virgin timber began to diminish. Kentwood had been the largest town in the Parish, but much of the population left when the timber trade declined.

The people remaining in the town turned to the dairy industry and began to prosper again, using cooperative breeding and marketing techniques. Today, it remains a principal industry in the northern reaches of the Parish.

The first railroad was chartered in 1852 by New Orleans, Jackson and Great Northern Railroad (later Illinois Central). That event drew the first land developers to a site 68 miles from New Orleans that had been selected as a station stop, later to become known as Amite. The city of Amite has been the Parish seat since the creation of the Parish in 1869. The word Amite is derived from a French word describing the amiable Indians that the early explorers found in the area.
Amite was the site of one of the principal Louisiana Confederate induction centers and training camps during the Civil War, at nearby Camp Moore which was named for Governor Thomas Overton Moore. Over 400 soldiers are buried in the camp cemetery.

Ponchatoula is a Choctaw name meaning falling or flowing hair, which was the Indian description of the fungus called Spanish moss. When the railroad was commissioned, Ponchatoula began to grow as the work crews needed a base camp. Eventually sawmills were built to harvest the abundant pine and cypress forests nearby. Strawberry and truck farms provide another basic industry to the area.

The original Ponchatoula railroad depot was built by the New Orleans, Jackson & Great Northern Railroad. The depot burned when Union forces captured the town in March 1863. It was then rebuilt in 1865. The present day depot was built in 1894 and then remodeled in the late 1920s.

Topography

The topography of the Parish extends from low flat land in the south to rolling hills in the north. It is the center of the strawberry industry in the South. The true heartland of piney woods in Tangipahoa Parish is characterized by gently rolling hill country dotted with farmsteads and small towns separated by a rich growth of pine forests and occasional hardwoods. The Parish is approximately 51 miles long and 18 miles wide.

The terrain of the Parish consists of gently rolling hills with elevations that range from 370 feet along the northern state boundary to 0 feet in the wetlands along Lakes Maurepas and Pontchartrain.

Approximately 45% of the total land area of Tangipahoa Parish is located within FEMA's 100-year floodplain. The majority of the floodplain is found along the Tangipahoa River, Natalbany River, Lake Maurepas and Lake Pontchartrain shorelines, and the Tchefuncte River.

Climate

Tangipahoa Parish has a semitropical climate. Variations in daily temperature are determined by distance from the Gulf of Mexico and, to a lesser degree, by differences in elevation. The average annual temperature for the state as a whole is 68ºF. January is the coldest month averaging 55ºF, and July the warmest, averaging 81ºF. Winter months are usually mild with cold spells of short duration. Snowfall is less than 1" per year. The summer months are quite warm. Average annual precipitation for the area is 68 inches. Tangipahoa Parish has an average of 300 days of sun per year. Prevailing winds are from the north and northeast in the winter and fall and from the southeast in the spring and summer.

Economy

The economic base of Tangipahoa Parish consists of companies in the lumber and wood products industries, food products industries, healthcare, educational institutions, agriculture and agricultural related industries. Its hard-working labor force, excellent transportation network, abundant raw materials, and land for commercial and industrial development make Tangipahoa Parish an ideal prospect for business investment. Tangipahoa Parish is ranked 12th out of 64 Parishes in per capita retail sales.

Table 1-2 - Tangipahoa Parish Employer Sectors

Description of Sectors	Paid employees for pay period	First Q payroll	Annual Payroll	Total Establishments
Agriculture, Forestry, Fishing and Hunting	-	273,000	818,000	10
Mining, QUARRYING, Oil and Gas Extraction	96	1,452,000	5,843,00	14
Utilities	-	-	-	12
Construction	998	8,464,000	39,245,000	170
Manufacturing	2,429	20,055,000	83,333,000	81

Wholesale trade	1,769	16,440,000	69,771,000	103
Retail trade	6,435	36,079,00	147,549,000	439
Transportation and Warehousing	1,485	13,455,00	56,306,000	70
Information	440	4,547,000	17,201,000	25
Finance and Insurance	2,336	29,972,000	141,927,000	187
Real Estate and Rental/leasing	507	4,051,000	16,859,000	94
Professional, Scientific, and technical Services	856	7,838,000	33,504,000	207
Management of Companies	-	1,167,000	3,615,000	6
Educational Services	415	2,583,000	10,898,000	28
Healthcare and social assistance	8,569	74,808,000	295,418,000	303
Arts, Entertainment, Recreation	251	753,000	3,291,000	33
Accommodations and Food Services	4,037	12,077,000	51,753,000	213
Other services (except public administration)	1,507	7,945,000	33,220,00	238
Industries not classified	-	-	-	3
Totals	**33,980**	**255,157,000**	**1,063,794,000**	**2,292**

Source: censtats.census.gov

Table 1-3 - Tangipahoa Parish Major Employers
(Source: TEDF, Inc)

Major employers in Tangipahoa as of June 2014:		
North Oaks Medical Center	Medical	2,700
Tangipahoa Parish School System	Education	2,670
Southeastern Louisiana University	Education	1,600
North Lake Support & Services Center	Medical	1,100
Wal-Mart Distribution Center	Distribution	800
Inner Parish Security Corp	Security	800
CARE, Inc	Medical	650
Sanderson Farms, Inc.	Food Processing	600
Wal-Mart Stores - Hammond	Retail	400
Tangipahoa Parish Government	Government	360
C&S Distribution	Distribution	330
Smitty Supply	Manufacturing & Distribution	325
Wal-Mart Stores - Amite	Retail	300
Wal-Mart Stores - Ponchatoula	Retail	300
City of Hammond	Government	300

Elmer's Candy Corp	Manufacturing & Distribution	300
Options Inc.	Education – Disabilities	280
Neill Corp	Beauty/Retail	250
First Guaranty Bank	Banking	240
Entergy	Utilities	230
Bradken	Foundry	175
J&M Industries	Manufacturing & Distribution	145
LSU Regional Medical Center	Medical	125

The Tangipahoa Economic Development Foundation (TEDF) continues to identify opportunities and lead efforts to attract new jobs and investment, enhance the climate for retention and expansion of existing business, address education and workforce development needs, and provide advocacy for economic development public policy on behalf of all Tangipahoa Parish citizens. The TEDF Master Plan focuses on five strategic goals to create an environment conducive to increasing business investment and job creation within the parish, these five goals focus on: marketing, business development, workforce development, infrastructure development and resource development.

Hazard Mitigation

To fully understand hazard mitigation efforts in Tangipahoa Parish and throughout Louisiana, it is first crucial 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. The four phases are as follows:

- **Hazard Mitigation**—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. Besides significantly aiding in the obviously desirous goal of saving human lives, mitigation 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, helping communities return to usual daily living in the aftermath of disaster. Examples of mitigation involve a range of activities and actions including the following: land-use planning, adoption and enforcement of building codes, and construction projects (e.g., flood proofing 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.

Illustrated on the following page is the basic relationship between these phases of emergency management. While hazard mitigation may occur both before and after a disaster event, it is significantly more effective when implemented before an event occurs. This is one of the key elements of this Plan and its overall strategy*:* reduce risk before disaster strikes in order to minimize the need for post-disaster response and recovery.

Figure 1-2: The four phases of emergency management and their relation to future hazard mitigation (source: Louisiana State Hazard Mitigation Plan 2014).

As Figure 1 demonstrates, mitigation relies on updating in the wake of disaster. This can give the appearance that mitigation is only reactive rather than proactive. In reality, however, post-disaster revision is a vital component of improving mitigation. Each hazardous event affords an opportunity to reduce the consequences of future occurrences.

Unfortunately, this cycle can be painful for a community. For instance, the risks of disasters that could create catastrophic incidents in Louisiana were thought to be relatively well-understood prior to 2005. However, the impact of the 2005 hurricane season on the Gulf Coast region of the United States prompted a new level of planning and engagement related to disaster response, recovery, and hazard mitigation. Hurricanes Katrina and Rita hit three weeks apart and together caused astonishing damage to human life and to property. The two storms highlighted a hurricane season that spawned 28 storms—unparalleled in American history. The 2005 hurricane season confirmed Louisiana's extreme exposure to natural disasters and both the positive effects and the concerns resulting from engineered flood-protection solutions.

The catastrophic events of 2005 had profound impacts on emergency management and hazard mitigation throughout Louisiana. The storms also raised awareness of the importance of hazard mitigation among decision-makers and the general population, which has been particularly important since natural hazards will likely be increasing in frequency, magnitude, and impact in the coming years due to climate change.

General Strategy

During the last update the Louisiana State Hazard Mitigation Plan, the State Hazard Mitigation Team (SHMT) began a long-term effort to better integrate key components of all plans with hazard mitigation implications in Louisiana to ensure that the programs, policies, recommendations, and implementation strategies are internally consistent. As each of these documents has been adopted by various agencies within the state, the SHMT has worked to incorporate this information into the decision process.

Part of the ongoing integration process is that GOHSEP requires the parishes and the local municipalities with independent hazard mitigation plans to utilize the same plan format and methodologies as the State Hazard Mitigation Plan in order to create continuity of information from local to state mitigation plans and programs.

The 2015 Tangipahoa Parish Hazard Mitigation Plan (HMP) maintains some of the information from the 2006 and 2010 plan versions, but it now reflects the order and methodologies of the Louisiana State Hazard Mitigation Plan. The sections in the 2010 Tangipahoa HMP were as follows:

- Section One Introduction
- Section Two Parish Profile
- Section Three Planning Process
- Section Four Risk Assessment
- Section Five Mitigation Strategy
- Section Six Plan Maintenance Procedures
- Section Seven Action Plan
- Tables
- Maps
- Appendices

This plan update now also coheres with the Plain Writing Act of 2010, which requires federal agencies to use clear communication that is accessible, consistent, understandable, and useful to the public. While the State of Louisiana and its political subdivisions are not required to meet such standards, the Act aligns with best practices in hazard mitigation. Since successful hazard mitigation relies on full implementation and cooperation at all levels of government and community, a successful hazard mitigation plan must also be easily used at all of these levels. Nevertheless, the Tangipahoa Parish Hazard Mitigation Steering Committee was not ignorant or dismissive of the successful analysis and mitigation planning executed in previous plan updates. This plan update remains coherent with those documents, retaining language and content when needed, deleting it when appropriate, and augmenting it when constructive.

2015 Plan Update

This 2015 plan update proceeds with the three previous goals of the Tangipahoa Parish hazard mitigation plan. The current goals are as follows:

Goal 1: Identify and pursue preventative measures that will reduce future damages from hazards

Goal 2: Reduce repetitive flood losses in the Parish and municipalities

Goal 3: Regulate sound development in the Parish and municipalities so as to reduce or eliminate the potential impact of hazards

This plan update makes a number of textual changes throughout. But the most obvious changes are data related and structural. First, the Spatial Hazard Events and Losses Database for the United States (SHELDUS) was used as a data source for hazard identification because it incorporates all storm event data from the National Climatic Data Center (NCDC) Storm Events Database used in previous plans, as well as storm event data from other sources including the NOAA Storm Prediction Center, National Hurricane Center, and U.S. Fire Administration. Furthermore, all of the sections were updated to reflect the most current information

and the most current vision of the plan update. Second, instead of seven sections, separate sections for numerous tables, maps and appendices, the present plan update has four sections and five appendices. The most significant changes are the newly developed hazard profiles and risk assessments, the removal of much repetition between sections from the previous plan updates. The 2015 plan update is organized generally as follows:

- Section One Introduction
- Section Two Hazard Identification and Parish-wide Risk Assessment
- Section Three Capability Assessment
- Section Four Mitigation Strategies
- Appendix A Planning Process
- Appendix B Plan Maintenance
- Appendix C Mapping Methodology
- Appendix D Plan Adoption
- Appendix E State Required Worksheets

Section two of the old plan (Parish Profile) has been moved to Section 1 (Introduction) in the update.

The Hazard Identification and Profile was moved from Section Four to Section Two in the present Update. It was also synthesized with the Risk Assessments for parish-wide and parish- and municipally-owned assets for each hazard. Additionally, Saltwater Intrusion and Sea Level Rise were added under the Coastal Erosion category, while other hazards were moved. Lightning, Hail, and High Wind were all profiled under Severe Thunderstorm, and Hurricanes and Tropical Storms are now classified as Tropical Cyclones. Furthermore, Storm Surge was profiled as a subcategory of Tropical Cyclones.

The Risk Assessment (previously comprising Section Four) and the Risk Assessment for Parish- and local-Owned Assets (previously comprising Section Four) were consolidated within Section Two of the present Update. In addition, this update changes the methodology used in the Risk Assessment for parish-and local-Owned Assets to reflect current data on damage.

The Capability Assessment (section 3 of update) has been added as a new section.

The Planning Process (previously section 3) has been moved to an appendix in this document.

Section Five Mitigation Strategies was moved to Section Four of the present update. The three identified goals from the previous plan remain in the current plan. The Mitigation Action section has been revised to reflect the process used in this plan update, as well as the results from the Tangipahoa Parish evaluation and ranking of hazards. New actions were added.

Lastly, Section Six (Plan Maintenance) was moved to an appendix in this document.

Table 1-4: Plan Change Crosswalk

2010 Plan	Revised Plan (2015)
Section 1: Prerequisites	Section 1: Introduction
Section 2: Parish Profile	Section 1: Introduction
Section 3: The Planning Process	Appendix A: Planning Process
Section 4: Risk Assessment	Section 2: Hazard Identification and Parish-wide Risk Assessment Section 3: Capability Assessment
Section 5: Hazard Mitigation Strategies	Section 4: Mitigation Strategies
Section 6: Plain Maintenance Procedures	Appendix B: Plan Maintenance
Section 7: Action Plan	Section 4: Mitigation Strategy
Attachments	Appendix C Mapping Methodology Appendix D Plan Adoption Appendix F State Required Worksheets

Despite numerous changes in this plan update, the plan remains consistent in its emphasis on the few types of hazards that pose the most risk to loss of life, injury, and property in Tangipahoa Parish and its municipalities. The extent of this risk is dictated primarily by its geographic location. Most significantly, the Tangipahoa Parish remains at high risk of water inundation from various sources, including backwater flooding; failure of dams/levees and forced drainage systems, tornadoes and tropical cyclone activity. All the parish is also at high risk of damages from high winds and wind-borne debris—caused by various meteorological phenomena. Other hazards threaten the parish and/or its municipalities although not to such great degrees and not in such widespread ways. In all cases, the relative social vulnerability of areas threatened and affected plays a significant role in how governmental agencies and their partners (local, parish, state and federal) prepare for and respond to disasters.

Mitigation efforts related to particular hazards are highly individualized by jurisdiction. Flexibility in response and planning is essential. Indeed, although funding for relief from major disasters has been available and ample, funds are not always directed effectively to the appropriate areas due to relatively poor communication between federal, state, parish and local authorities. The most important step forward to improve hazard management capability is to improve coordination and information sharing between the various levels of government regarding hazards.

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2 Hazard Identification and Parish wide Risk Assessment

This section assesses the various hazard risks Tangipahoa Parish faces in order to identify a strategy for mitigation. Having identified the categories of hazards, emergencies, disasters, and catastrophes, this section details the major climatological and natural/human-influenced hazards by (1) defining them, (2) explaining how they are measured, (3) describing their geographic extent, (4) surveying their previous occurrences, and (5) evaluating their future likelihood of occurrences.

The table below provided an overview of the hazards that had been previously profiled in the Tangipahoa Parish Hazard Mitigation plan published in 2009, as well as the hazards that were identified in the State's 2014 Hazard Mitigation Plan that were considered to be of high or medium risk for the parish by the State. Those hazards identified as high or medium risk by the state or previously identified as a risk by the parish, have been determined to provide a risk to the parish and will be profiled in this section.

Table 2-1: Hazard Profile Summary.

Hazard	Profiled in Last Plan	Considered Medium or High Risk in the State's HM Plan	Profiled in the 2015 Update
Coastal Land Loss	X		X
Dams			
Drought	X		X
Earthquakes			
Expansive Soils	X		X
Extreme Heat	X		
Fog			
Floods	X		X
Levee Failure			
Sinkhole			
Subsidence	X		X
Termites			
Thunderstorms (Hail, Lightning & Wind)	X		X
Tornado	X		X
Tropical Cyclones	X		X
Wildfires	X		X
Winter Storm	X		X

Prevalent Hazards to the Community

While many of the hazards identified in Table 2-1 occur in the parish, their occurrence was not merited for further study by the planning committee. The determination was made to focus attention and resources on the most prevalent hazards which include the hazards previously profiled. The following hazards have been selected to be included in this risk assessment:

a) **Coastal Land Loss**
b) **Drought**

c) Expansive Soils
d) Flooding (backwater, storm surge, riverine, localized storm water event)
e) Subsidence (now Included with Coastal Land Loss)
f) Thunderstorms
g) Tornadoes
h) Tropical Cyclones (flooding and high winds)
i) Wildfires
j) Winter Storms

For analysis purposes, the impact of the critical and prevalent hazards is summarized as follows:

- Flooding from rivers and waterways, rain storms, tropical storms, and hurricanes in the following forms:
  a) Riverine
  b) Storm water
  c) Surge
  d) Back water flooding (as the result of river flooding and surge)
- High wind damage most commonly resulting from hurricanes, thunderstorms and tornadoes
- Coastal land loss as a result of land subsiding and coastal erosion which have been combined into a single hazard since they both result in increased potential for flooding.
- Land Change resulting from Drought and Expansive Soils.

The potential destructive power of Tropical Cyclones was determined to be the most prevalent and the most frequent hazard to the parish. Eleven of the nineteen presidential declarations Tangipahoa Parish has received resulted from tropical cyclones which validates this as the most significant hazard. Therefore, the issue of hurricanes will serve as the main focus during the mitigation planning process. Hurricanes present risks from the potential for flooding, primarily resulting from storm surge, and high wind speeds. While storm surge is considered the hazard with the most potential destructive potential, the risk assessment will also asses non-storm surge flooding as well. Since 1965, Tangipahoa Parish has received 5 Presidential Declarations as a result of flooding.

Hurricanes, tropical storms, and heavy storms are fairly common occurrences and resultant wind damage is of utmost concern. Damage from high winds can include roof damage, destruction of homes and commercial buildings, downed trees and power lines, and damage and disruption to services caused by heavy debris. A wind map for Tangipahoa Parish is included as Figure 2-38.

Because Tangipahoa Parish is a parish with a significant coastline along Lake Pontchartrain and Lake Maurepas it is also susceptible to land loss through coastal erosion and land subsidence. The coastal wetlands serve as an important natural barrier to potential storm surge from tropical cyclones and their loss through erosion and subsidence has the potential to significantly increase the risk to Tangipahoa Parish.

Tangipahoa Parish also has zero dams located within the parish boundaries that are considered to be significant potential hazard dams by the USACE. However, the parish does have 14 low risk dams as well. Tangipahoa also considers drought, heat, severe winter weather, and wildfires as part of the overall risk assessment.

Tangipahoa Parish identified many hazards that affected the community in the past, and may possibly affect the Parish and municipalities in the future. These hazards are addressed individually through a widespread process that included input from the Steering Committee members (comprised of representatives from Parish/State departments and agencies, Parish and State Emergency Preparedness Offices, local businesses and local residents), public involvement, researching archived articles published or documented within the Parish pertaining to those disasters, past disaster declarations in the Parish, and a review of current FIRMs and Flood Insurance Studies.

FEMA has tracked and compiled a list of all the federally declared disasters for the State of Louisiana. Therefore, we know since 1965 this data is a complete and accurate list of all the federally declared disaster events in Tangipahoa Parish. Tangipahoa Parish has been a presidential declared major disaster area on nineteen (19) different occasions since 1965. Table 2-2 contains a detailed account of the federally declared disaster history of Tangipahoa Parish.

Table 2-2 summarizes the hazards the Steering Committee identified as impacting the Parish. The hazards were prioritized based on a number of factors including, frequency, severity, life and death consequences, potential impact, and ultimately ranked based on what the Steering Committee determined. This table also explains how the hazards were identified and why they were identified.

Table 2-2: Hazards that have an impact on Tangipahoa Parish.

Hazard Identification Table			
Hazard	**How Identified**	**Why Identified**	**Priority**
Floods	Input from local residents and businesses	Major floods occurred in 1969 and 1983	High
	Input from Parish and State Emergency Preparedness Officials	Effects from hurricanes which caused tremendous devastations in the parish	
	Review of past disaster declarations	Numerous repetitive loss properties are located in the Parish	
	Review of DFIRMs and Flood Insurance Studies	Federally declared disasters	
	Identification of NFIP repetitive loss properties in the Parish	The I-55 exit ramp frequently floods	
		Major concern is that 20,000 to 100,000 people would be trapped on the high rise if were inoperable	
Hurricanes	Input from local residents and businesses	Caused debris and wind damage	High
	Input from Parish and State Emergency Preparedness Officials	Power outages throughout the Parish	

Hazard Identification Table			
Hazard	**How Identified**	**Why Identified**	**Priority**
	Review of past disaster declarations	Federally Declared disasters	
Thunderstorms, Lightning, High Winds and Hail	Input from local residents and businesses	Numerous thunderstorms and lightning events	High
	Input from Parish and State Emergency Preparedness Officials	Can be damaging to homes and businesses	
	Input from Parish Utilities Department		
Tornadoes	Input from industry	Potential for loss of residential and commercial structures	High
	Input from Parish and State Emergency Preparedness Officials	Potential for loss of life and bodily injury	
	Input from the Department of Public Works	Several tornadoes have caused damages in the parish	
	Input from the Parish Planning Commission		
	Input from the Sheriff's Office		
Wildfires	Input from local residents and businesses	Large part of the Parish is forested or agriculture	High
	Input from Parish and State Emergency Preparedness Officials	Drought can lead to fires	
	Input from Parish Fire Department	Fixed facilities are at risk for fires	
Winter Storms	Input from Parish and State Emergency Preparedness Officials	The Parish encountered a snow and ice storm in 1989	Medium
Drought	Input from local residents and businesses	There has been at least one local declaration for drought	Medium
	Input from Parish Emergency Preparedness Office	That Parish has been in a drought for nearly six years from 2002 – 2008	
Extreme Heat	Input from local residents and businesses	The Parish is in an area subject to heat index values in excess of 115 degrees F for the 5-percent-annual chance event	Medium
	Input from Parish and State Emergency Preparedness Officials		

Hazard Identification Table			
Hazard	**How Identified**	**Why Identified**	**Priority**
	Input from Parish Utilities Department		
Coastal Land Loss (Includes salt water intrusion and subsidence)	Input from industry	Impacts the timber industry	Medium
	Input from Parish Planning Commission	Several aquifers in the Parish and drinkable	
	Input from the Department of Public Works	Erosion of soils are an ongoing problem that has occurred for years	
	Input from the Parish Water District	Variation of soils across the parish	
		Coastal area classified within the Parish	
Expansive Soils	Input from local residents and local businesses	Damages to homes foundations, ceilings, floors, and walls	Medium
	Input from Department of Transportation and Development	Damages seen on highways and roads	

Natural hazards, the largest single contributor to catastrophic or repetitive damage to communities nationwide, evolve from atmospheric, geologic, hydrologic, and seismic events. They pose threats in all areas of the United States. The impacts of natural hazards can be local or widespread, predictable or unpredictable. Resulting property and infrastructure damage can range from minor to major, depending on whether hazard events affect major or minor population centers. When the damage to life and property becomes real, not just potential, the event is commonly called a natural disaster.

Risk assessments provides the foundation for the rest of the mitigation planning process. It focuses attention on areas most in need by evaluating which populations and facilities are most vulnerable to natural hazards and to what extent injuries and damages may occur. It provides:

- The hazards to which the community is susceptible;
- What these hazards can do to physical, social and economic assets'
- Which areas are most vulnerable to damage from these hazards; and
- The resulting cost of damages or costs avoided through future mitigation projects.

In addition to the description of each hazard, the detailed hazard profiles will discuss:

- How likely it is that a hazard will impact the area (probability); often supported by previous occurrences, with the dates, frequency, extent and damage. When past events have not occurred, or data is missing or incomplete, probability potential is based on conditions that may cause the hazard event, i.e. dam failure, earthquake, storm surge, etc.
- How severe the hazard will be (magnitude);
- Where the hazards will affect the community (geographic extent or location); and
- Conditions in the community that may increase or reduce the effects of the hazard.

Based on the overall impact of the above considerations, the five hazards for which this plan will develop mitigation actions are floods, hurricanes, thunderstorms with lightning and high winds, tornadoes, and wildfires. The remaining hazards were profiled, but it was determined they do not to pose a significant risk to the planning area within Tangipahoa Parish.

Previous Occurrences

Table 2-3 summarizes federal disaster declarations for Tangipahoa Parish in the last fifty years. Information includes names, dates and types of disaster.

Table 2-3: Tangipahoa Parish Major Disaster Declarations.

Disaster Declaration Number	Date	Type of Disaster	Description
208	9/10/1965	Tropical Cyclone (Hurricane Betsy)	• Winds measured up to 115 miles per hour in Hammond • Part of Interstate-10 broke off and floated away, making traffic movement impossible • Rising flood waters completely blocked the Illinois Central right of way • Many trains were stopped at Hammond on their southbound journey to New Orleans Between $25,000 – $30,000 worth of cattle were lost • Crops suffered severe damage • Estimated 250,000 eggs were lost • A gas line burst in the 900 block of South Magnolia, spewing gas in the area • Shingles were ripped off and the roofs of many business and residential structures were blown away or collapsed • Buildings were smashed and windows shattered • Uprooted and fallen trees created heavy damage to homes, businesses and snapped power lines • Hammond was blacked out for a period of time • Over 14,000 people took refuge to shelters • Several people were injured due to effects from storm • Estimated damage for Hammond was one million dollars
374	4/27/1973	Severe Storm, Flood	• Major damage to crops throughout the Parish • Several bridges collapsed from overflow of water • Backwaters and overflow created problems in the Parish • Tangipahoa River was 16 feet above normal • Flood water levels were 8 inches short of record
3031	2/22/1977	Drought and Freezing	• Power companies suffered damage to many distribution lines • Parish roads were closed • Drought kept production of hay low hurting the dairy farmers and cattle ranchers

Disaster Declaration Number	Date	Type of Disaster	Description
534	5/2/1977	Severe Storm, Flood	• Recorded rainfall of 13.44 inches in 48 hours • Roads closed throughout the Parish • Estimated damages neared three million dollars • Firemen sent boats to rescue people trapped by waters • Some areas reported six to seven feet of water
679	4/20/1983	Severe Storm, Flood	• Water damage in homes were recorded above two feet • Heavy rains besieged the areas throughout the Parish • Several bridge sides were washed out due to overflow of waters • Several incidents of illegal poaching • Wildlife had to flee from rising waters • Estimated 453 families affected
752	11/1/1985	Tropical Cyclone – Hurricane Juan	• Hurricane Juan spawned rain for five days straight • Backed up water in rivers throughout the Parish caused flooding • 3.5 feet of water in buildings at peak • Estimated one million dollars in damages for three Parishes • 53 homes had water inside • 16 businesses had water from damage • 95% of camps along Tangipahoa River had water
833	6/16/1989	Hurricane, Rain/Storm, Tornado	• Eight inches of rain fell • Electrical and phone service was knocked out Parish-wide • Many roads were covered by water
956	8/25/1992	Tropical Cyclone – Hurricane Andrew	• Winds were estimated to have reached 75 miles per hour • Amite reported moderate damage from the strong gusts and rain • All schools in the Parish were closed • Fallen trees, power lines and high water • blocked many streets and roads throughout the Parish • Virtually every road in the area contained debris • Parts of State and Federal highways were impassable • About 28,000 customers were without electricity throughout the Parish
978	2/2/1993	Severe Storm, Flood	• Tides averaged two to three feet above normal • Flooding was generally confined to inundation of low lying roads and nearby bayous • Numerous customers were without power
1049	5/8/1995	Rainstorm, Flood	• Received twelve inches of water in two days • Several culverts washed out and roads underwater throughout the Parish • Tangipahoa River flowed over its banks causing flooding in subdivisions • Roads closed throughout the Parish

Disaster Declaration Number	Date	Type of Disaster	Description
1246	9/30/1998	Tropical Cyclone – Hurricane Georges	• Hurricane Georges winds hit at 30-40 miles per hour • Schools were closed throughout the Parish • Reported wind damage to homes and power lines • Downed trees and widespread power outages were the main problems in the Parish • Residents in the extreme south end of the Parish were forced to evacuate
1380	6/5/2001	Tropical Cyclone – TS Allison	• Estimated rainfall received was more than 20 inches • Heavy rains dumped 4.3 inches of rain in Hammond, 4.2 inches in Ponchatoula and 1.75 inches in Amite • Parish disbursed over 3,000 sandbags • Reports of over a dozen weather related accidents • Parish received extensive street flooding
1435	9/27/2002	Tropical Cyclone – TS Isadore	• Storm surge of four to five feet above normal • Four to eight inches of rainfall occurred within six hours • Drainage systems were overwhelmed • Streets, homes and automobiles were flooded • Sustained winds of 35 to 45 mph, with gusts of 50 mph in squalls
1437	10/3/2002	Tropical Cyclone – Hurricane Lili	• More than 40 roads were closed due to high water • Downed trees and power lines were widespread throughout the Parish • About 10,700 customers were without power in the Parish
1548	9/15/2001	Tropical Cyclone – Hurricane Ivan	• Total damage in Louisiana was $7.9 million • Sustained winds of 83 mph, with gusts of 100 mph • At least 55, 000 customers experienced power outages • Around Lake Pontchartrain and west of the Mississippi River, storm surge was 2 to 4 feet above normal
1603	8/29/2005	Tropical Cyclone – Hurricane Katrina	• Hurricane eye passed through the Parish approximately 35 miles east of Amite, LA • Hurricane-force winds exceeded 90 mph and lasted over 12 hours • Thousands of downed trees, a shortage of potable water, and the loss of electricity and essential communication • Extensive obstruction of all roadways, rail crossings, bridges, and drainage systems due to fallen trees • Power outage of 100% for three days, some rural areas for up to two weeks • Schools closed for 2.5 weeks • Flood damage occurred only in the low lying areas of the Parish; observed precipitation over 10 inches • 89 homes were destroyed • Damage to critical infrastructure was over $8.4 million • Dairy industry suffered economic loss of $1.2 million • More than 75% of the timber in Tangipahoa, St. Tammany, and Washington parishes was damaged

Disaster Declaration Number	Date	Type of Disaster	Description
1607	9/24/2005	Tropical Cyclone – Hurricane Rita	• Maximum sustained winds of 120 mph • Flooding occurred in areas adjacent to Lake Pontchartrain • Damage in southwest Louisiana is estimated near $4 billion
1786	9/2/2008	Tropical Cyclone – Hurricane Gustav	• Hammond received 4.65 inches of precipitation while Amite received 6 inches • Most damages was isolated in the Southern part of the parish near Manchac where severe flooding was observed
4080	8/29/2012	Tropical Cyclone – Hurricane Isaac	• The Tangipahoa River reached major flood stage and all residents within a half mile of the river were ordered to evacuate. • Areas in the southern portion of the parish were ordered to evacuate including the Manchac area, the Akers community, Lee's Landing and all areas south of Wadesboro Road and Weinberger Road.

Probability of Future Hazard Events

The probability of a hazard event occurring in Tangipahoa Parish is estimated below. The percent chance of an event happening during any given year was calculated by posting past events and dividing by the time period. Unless otherwise indicated the time period used to access probability followed the method used in the State of Louisiana's most current Hazard Mitigation Plan. The primary source for historical data used throughout the plan is the Spatial Hazards Events and Losses Database (SHELDUS) which provides historical hazard data from 1960 to 2014. In staying consistent with the state plan, the SHELDUS database was evaluated for the last twenty five years (1989 – 2014) in order to determine future probability of a hazard occurring. While the twenty five year record used by the State was adopted for the purpose of determining the overall probability, to assist with determining estimated losses, unless otherwise stated the full 54 year record was used when HAZUS-HM wasn't available to determine losses. This full record was used to provide a more extensive record to determine losses. All assessed damages were adjusted to inflation to reflect the equivalent amount of damages with the value of the U.S. dollar today. In addition, the National Climatic Data Center (NCDC) was also used to help identify hazard data specific to the municipalities as it contains specific data for cities, whereas SHELDUS is limited to parishes.

The following tables shows the annual probability for each hazard occurring across the parish and in separate jurisdictions.

Table 2-4: Probability of Future Hazard Reoccurrence.

Hazard	Probability				
	Tangipahoa Parish (unincorporated)	Amite	Hammond	Independence	Kentwood
Coastal Land Loss	100%	0%	0%	0%	0%
Dam Failure	0.01%	0%	0.01%	0%	0%
Drought	4%	4%	4%	4%	4%
Expansive Soils	100%	0%	0%	0%	0%
Floods	28%	4%	16%	4%	4%
Thunderstorm - Hail	28%	28%	28%	28%	28%
Thunderstorm -Lightning	60%	60%	60%	60%	60%
Thunderstorm - Winds	100%	100%	100%	100%	100%
Tornado	60%	60%	60%	60%	60%
Tropical Cyclones	84%	84%	84%	84%	84%
Wildfires	1%	1%	1%	1%	1%
Winter Storms	12%	12%	12%	12%	12%

Table 2-5: Probability of Future Hazard Reoccurrence.

Hazard	Probability			
	Ponchatoula	Roseland	Tangipahoa	Tickfaw
Coastal Land Loss	0%	0%	0%	0%
Dam Failure	0%	0%	0%	0%
Drought	4%	4%	4%	4%
Expansive Soils	0%	0%	0%	0%
Floods	4%	4%	4%	4%
Thunderstorm - Hail	28%	28%	28%	28%
Thunderstorm -Lightning	60%	60%	60%	60%
Thunderstorm - Winds	100%	100%	100%	100%
Tornado	60%	60%	60%	60%
Tropical Cyclones	84%	84%	84%	84%
Wildfires	1%	1%	1%	1%
Winter Storms	12%	12%	12%	12%

As shown in *Table 2-4* & *Table 2-5*, high winds from thunderstorms (100%) and tropical cyclones (84%) are the most prevalent hazards within the parish and its jurisdictions. This is followed by tornadoes (60%) and lightning from thunderstorms (60%). Flooding in the unincorporated part of the parish has an annual

probability of 28% as does the chance of a hailstorm (28%). Flooding within Hammond is calculated at an annual probability of 16%, followed by winter storms. The remaining probabilities are considered extremely low with the chance of drought and flood within the remaining jurisdictions calculated at 4%. The least likely event to occur is a dam failure which is calculated at annual probability of 0.01% and only has a potential impact on the unincorporated area of the parish.

Inventory of Assets for the Entire Parish

As part of the Risk Assessment, the planning team identified essential facilities throughout the parish. Several methods were used to assist in identifying all essential facilities including field data collected by the Louisiana Governor's Office of Homeland Security and Emergency Preparedness on critical infrastructure from a previous hazard mitigation project.

Within the entire planning area there are an estimated value of $9,555,337,000 in structures throughout the parish. The table below provides the total estimated value for each structure by occupancy and were determined based on data collected from the latest version of HAZUS-MH released in 2015.

Table 2-6: Estimated total of potential losses throughout Tangipahoa Parish.

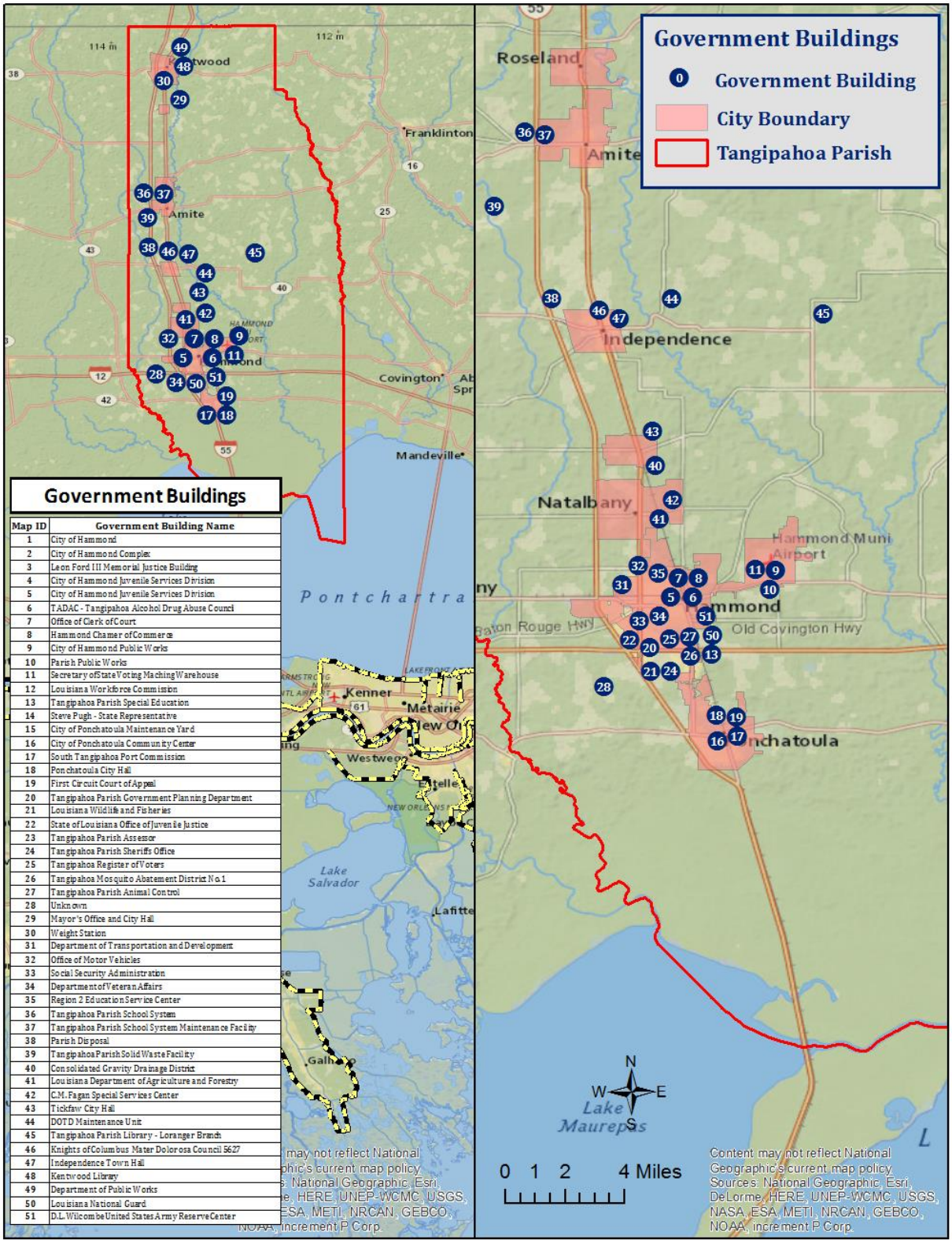
Occupancy	Tangipahoa Parish	Unincorporated Tangipahoa	Amite	Independence	Hammond
Agricultural	$28,599,000	$26,456,000	$490,000	$0	$1,188,000
Commercial	$996,547,000	$583,100,000	$42,024,000	$14,388,000	$268,084,000
Government	$39,139,000	$21,537,000	$3,763,000	$983,000	$4,048,000
Industrial	$199,124,000	$134,018,000	$13,768,000	$3,887,000	$30,399,000
Religion	$206,348,000	$124,751,000	$14,225,000	$1,924,000	$44,338,000
Residential	$7,980,251,000	$5,648,869,000	$237,051,000	$76,024,000	$1,346,954,000
Education	$105,329,000	$70,109,000	$747,000	$3,177,000	$29,235,000
Total	$9,555,337,000	$6,608,840,000	$312,068,000	$100,383,000	$1,724,246,000

Table 2-7: Estimated total of potential losses throughout Tangipahoa Parish.

Occupancy	Kentwood	Ponchatoula	Roseland	Tangipahoa	Tickfaw
Agricultural	$465,000	$0	$0	$0	$0
Commercial	$31,448,000	$50,783,000	$4,671,000	$524,000	$1,525,000
Government	$1,335,000	$5,885,000	$1,506,000	$82,000	$0
Industrial	$6,683,000	$10,171,000	$0	$0	$198,000
Religion	$4,667,000	$9,694,000	$5,540,000	$775,000	$434,000
Residential	$99,185,000	$451,332,000	$59,795,000	$27,830,000	$33,211,000
Education	$319,000	$1,408,000	$334,000	$0	$0
Total	$144,102,000	$529,273,000	$71,846,000	$29,211,000	$35,368,000

Essential Facilities of the Parish.

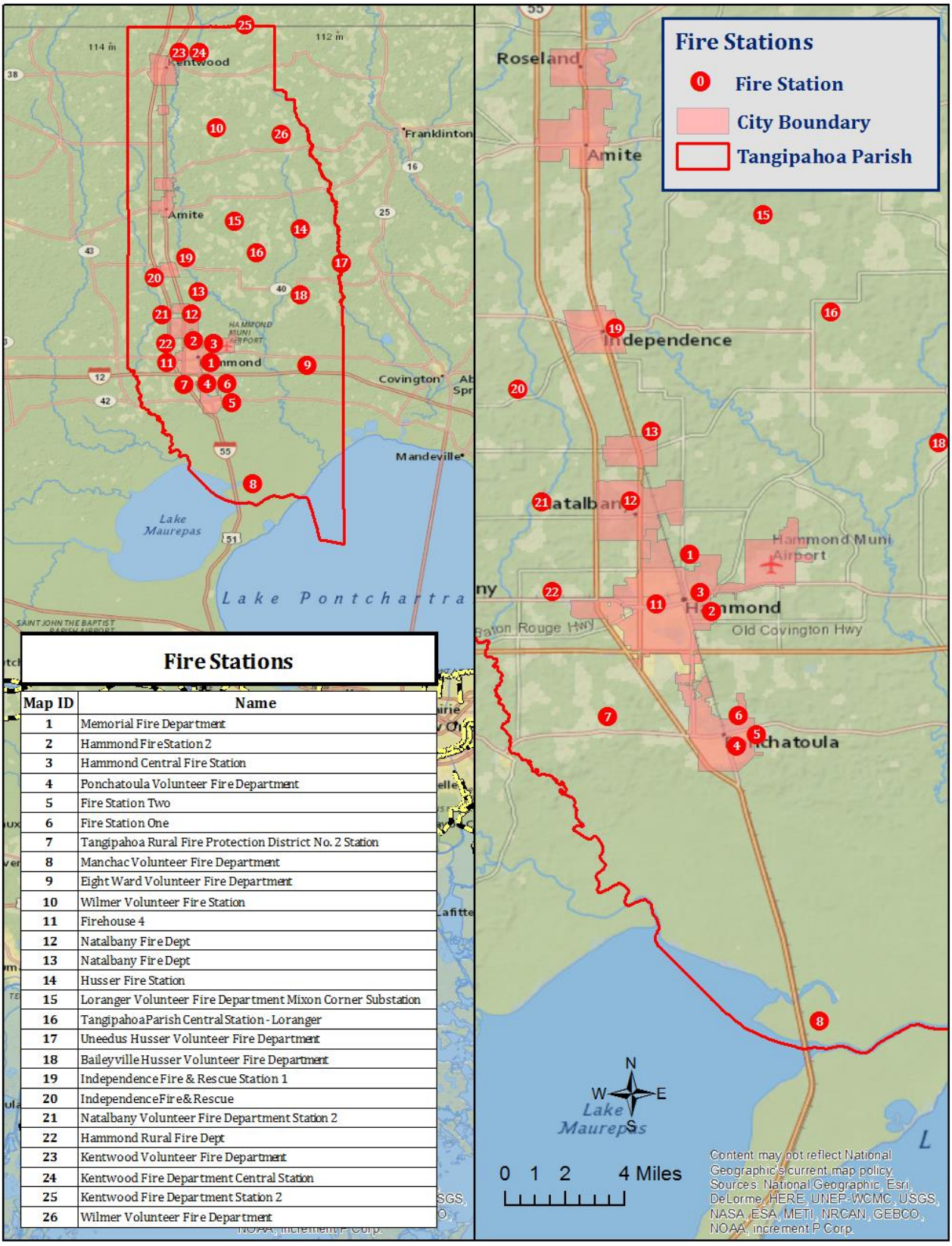
Below are the locations and names of the essential facilities within the parish.



Government Buildings

Map ID	Government Building Name
1	City of Hammond
2	City of Hammond Complex
3	Leon Ford III Memorial Justice Building
4	City of Hammond Juvenile Services Division
5	City of Hammond Juvenile Services Division
6	TADAC - Tangipahoa Alcohol Drug Abuse Council
7	Office of Clerk of Court
8	Hammond Chamer of Commerce
9	City of Hammond Public Works
10	Parish Public Works
11	Secretary of State Voting Maching Warehouse
12	Louisiana Workforce Commission
13	Tangipahoa Parish Special Education
14	Steve Pugh - State Representative
15	City of Ponchatoula Maintenance Yard
16	City of Ponchatoula Community Center
17	South Tangipahoa Port Commission
18	Ponchatoula City Hall
19	First Circuit Court of Appeal
20	Tangipahoa Parish Government Planning Department
21	Louisiana Wildlife and Fisheries
22	State of Louisiana Office of Juvenile Justice
23	Tangipahoa Parish Assessor
24	Tangipahoa Parish Sheriffs Office
25	Tangipahoa Register of Voters
26	Tangipahoa Mosquito Abatement District No.1
27	Tangipahoa Parish Animal Control
28	Unknown
29	Mayor's Office and City Hall
30	Weight Station
31	Department of Transportation and Development
32	Office of Motor Vehicles
33	Social Security Administration
34	Department of Veteran Affairs
35	Region 2 Education Service Center
36	Tangipahoa Parish School System
37	Tangipahoa Parish School System Maintenance Facility
38	Parish Disposal
39	Tangipahoa Parish Solid Waste Facility
40	Consolidated Gravity Drainage District
41	Louisiana Department of Agriculture and Forestry
42	C.M. Fagan Special Services Center
43	Tickfaw City Hall
44	DOTD Maintenance Unit
45	Tangipahoa Parish Library - Loranger Branch
46	Knights of Columbus Mater Dolorosa Council 5627
47	Independence Town Hall
48	Kentwood Library
49	Department of Public Works
50	Louisiana National Guard
51	D.L. Wilcombe United States Army Reserve Center

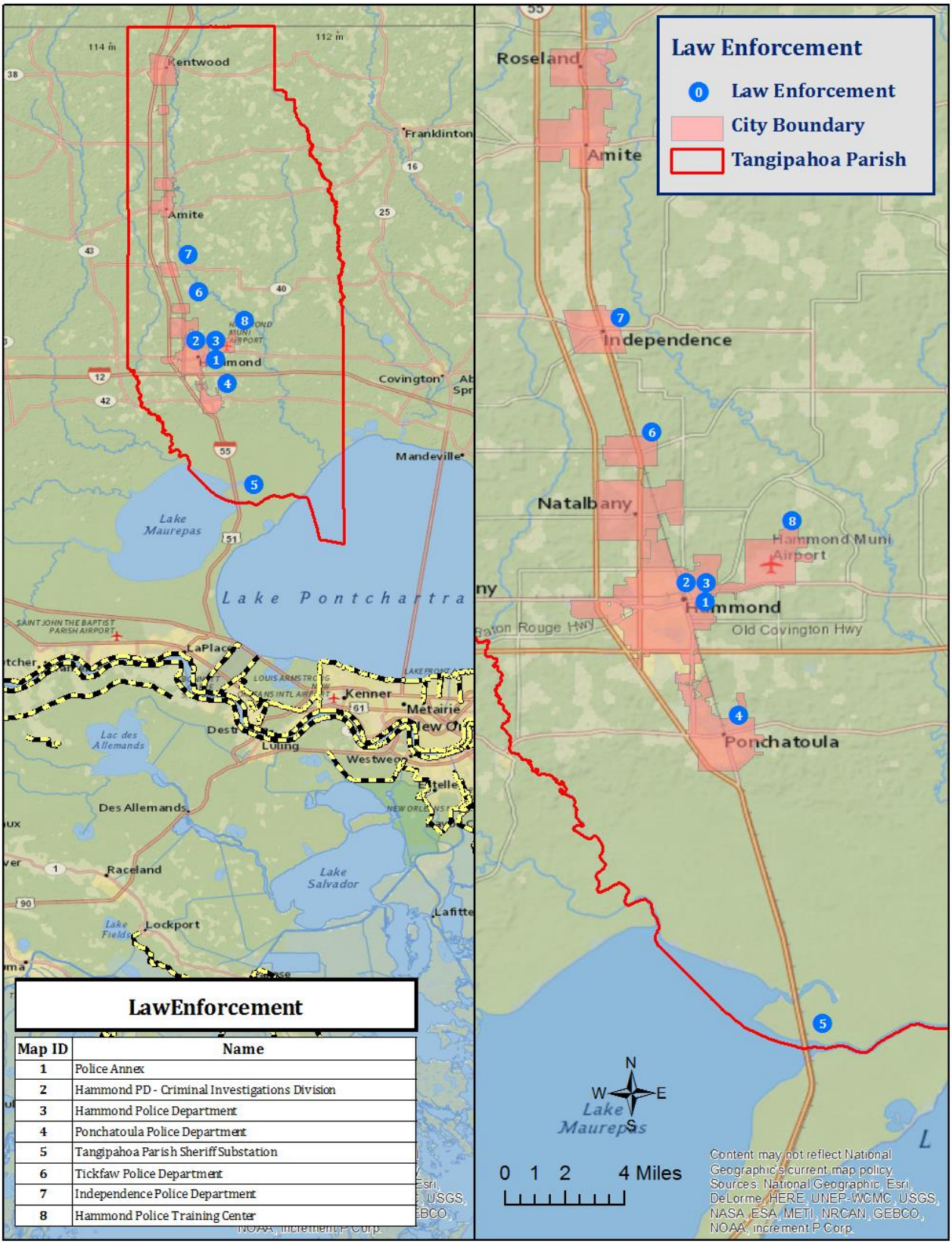
Figure 2-1: Government Buildings throughout eastern Tangipahoa Parish.



Fire Stations

Map ID	Name
1	Memorial Fire Department
2	Hammond Fire Station 2
3	Hammond Central Fire Station
4	Ponchatoula Volunteer Fire Department
5	Fire Station Two
6	Fire Station One
7	Tangipahoa Rural Fire Protection District No. 2 Station
8	Manchac Volunteer Fire Department
9	Eight Ward Volunteer Fire Department
10	Wilmer Volunteer Fire Station
11	Firehouse 4
12	Natalbany Fire Dept
13	Natalbany Fire Dept
14	Husser Fire Station
15	Loranger Volunteer Fire Department Mixon Corner Substation
16	Tangipahoa Parish Central Station - Loranger
17	Uneedus Husser Volunteer Fire Department
18	Baileyville Husser Volunteer Fire Department
19	Independence Fire & Rescue Station 1
20	Independence Fire & Rescue
21	Natalbany Volunteer Fire Department Station 2
22	Hammond Rural Fire Dept
23	Kentwood Volunteer Fire Department
24	Kentwood Fire Department Central Station
25	Kentwood Fire Department Station 2
26	Wilmer Volunteer Fire Department

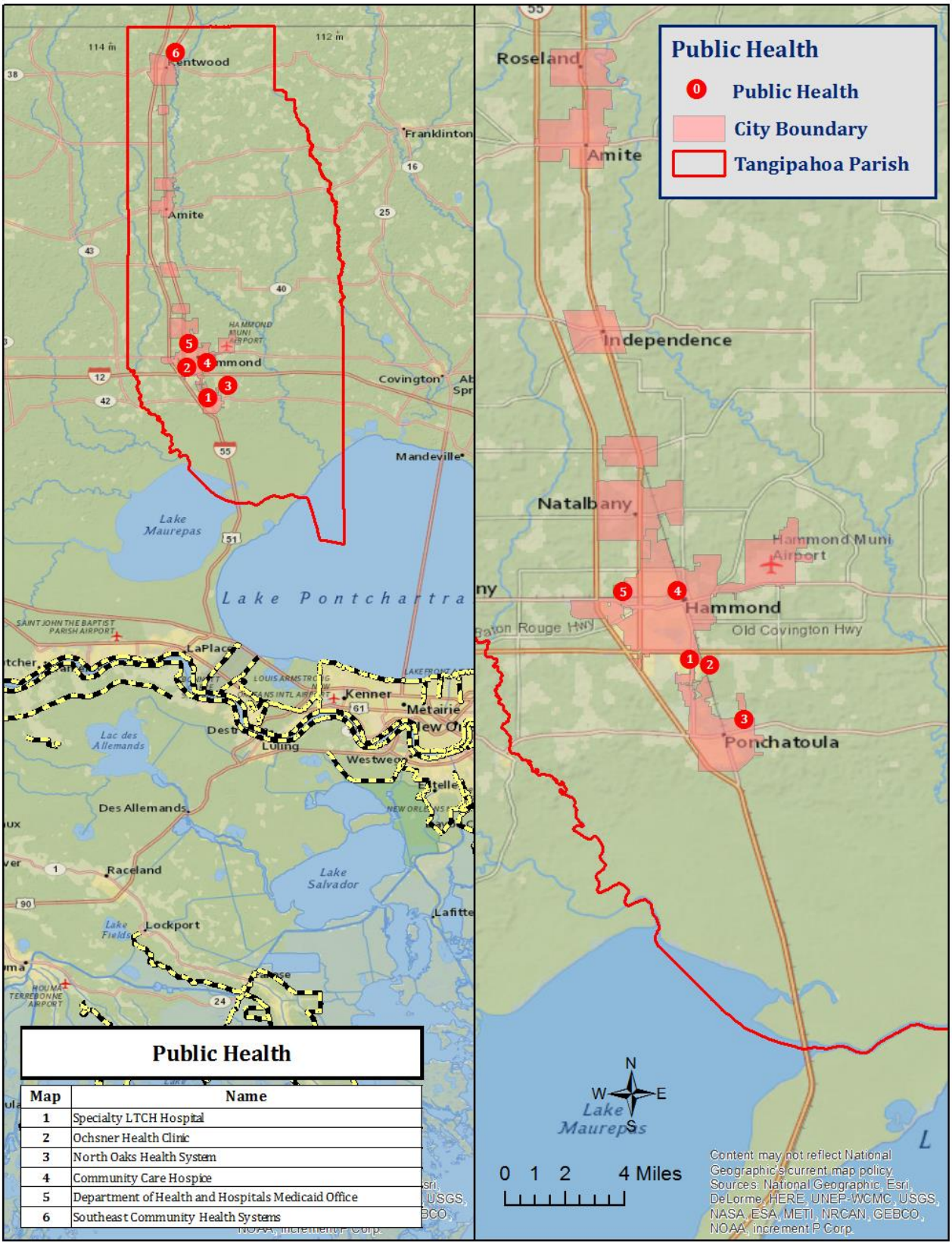
Figure 2-2: Fire Station locations throughout Tangipahoa Parish.



LawEnforcement

Map ID	Name
1	Police Annex
2	Hammond PD - Criminal Investigations Division
3	Hammond Police Department
4	Ponchatoula Police Department
5	Tangipahoa Parish Sheriff Substation
6	Tickfaw Police Department
7	Independence Police Department
8	Hammond Police Training Center

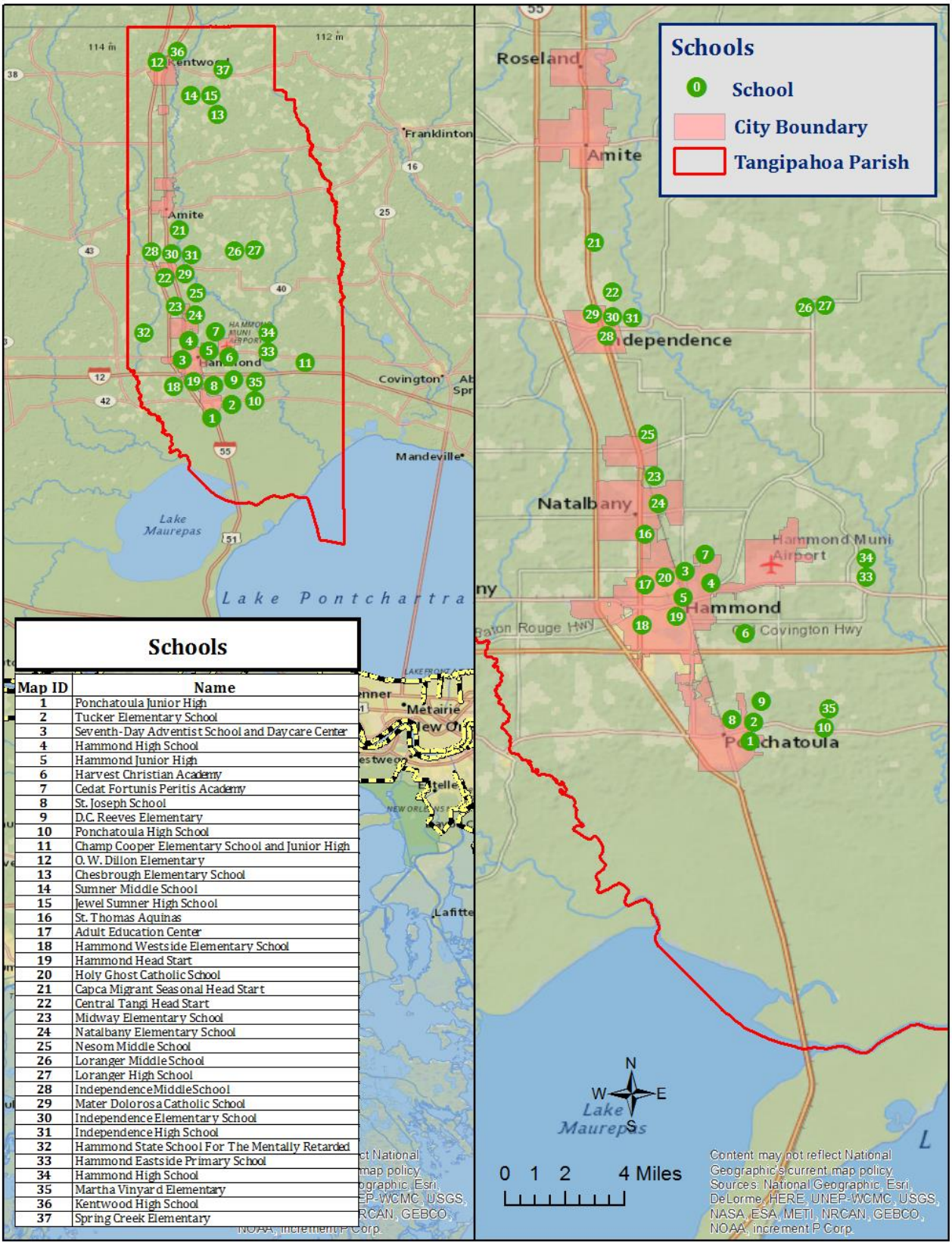
Figure 2-3: Law Enforcement facilities in Tangipahoa Parish.



Public Health

Map	Name
1	Specialty LTCH Hospital
2	Ochsner Health Clinic
3	North Oaks Health System
4	Community Care Hospice
5	Department of Health and Hospitals Medicaid Office
6	Southeast Community Health Systems

Figure 2-4: Public Health facilities in Tangipahoa Parish



Schools

Map ID	Name
1	Ponchatoula Junior High
2	Tucker Elementary School
3	Seventh-Day Adventist School and Daycare Center
4	Hammond High School
5	Hammond Junior High
6	Harvest Christian Academy
7	Cedat Fortunis Peritis Academy
8	St. Joseph School
9	D.C. Reeves Elementary
10	Ponchatoula High School
11	Champ Cooper Elementary School and Junior High
12	O. W. Dillon Elementary
13	Chesbrough Elementary School
14	Sumner Middle School
15	Jewel Sumner High School
16	St. Thomas Aquinas
17	Adult Education Center
18	Hammond Westside Elementary School
19	Hammond Head Start
20	Holy Ghost Catholic School
21	Capca Migrant Seasonal Head Start
22	Central Tangi Head Start
23	Midway Elementary School
24	Natalbany Elementary School
25	Nesom Middle School
26	Loranger Middle School
27	Loranger High School
28	Independence Middle School
29	Mater Dolorosa Catholic School
30	Independence Elementary School
31	Independence High School
32	Hammond State School For The Mentally Retarded
33	Hammond Eastside Primary School
34	Hammond High School
35	Martha Vinyard Elementary
36	Kentwood High School
37	Spring Creek Elementary

Figure 2-5: Educational Facilities in eastern Tangipahoa Parish.

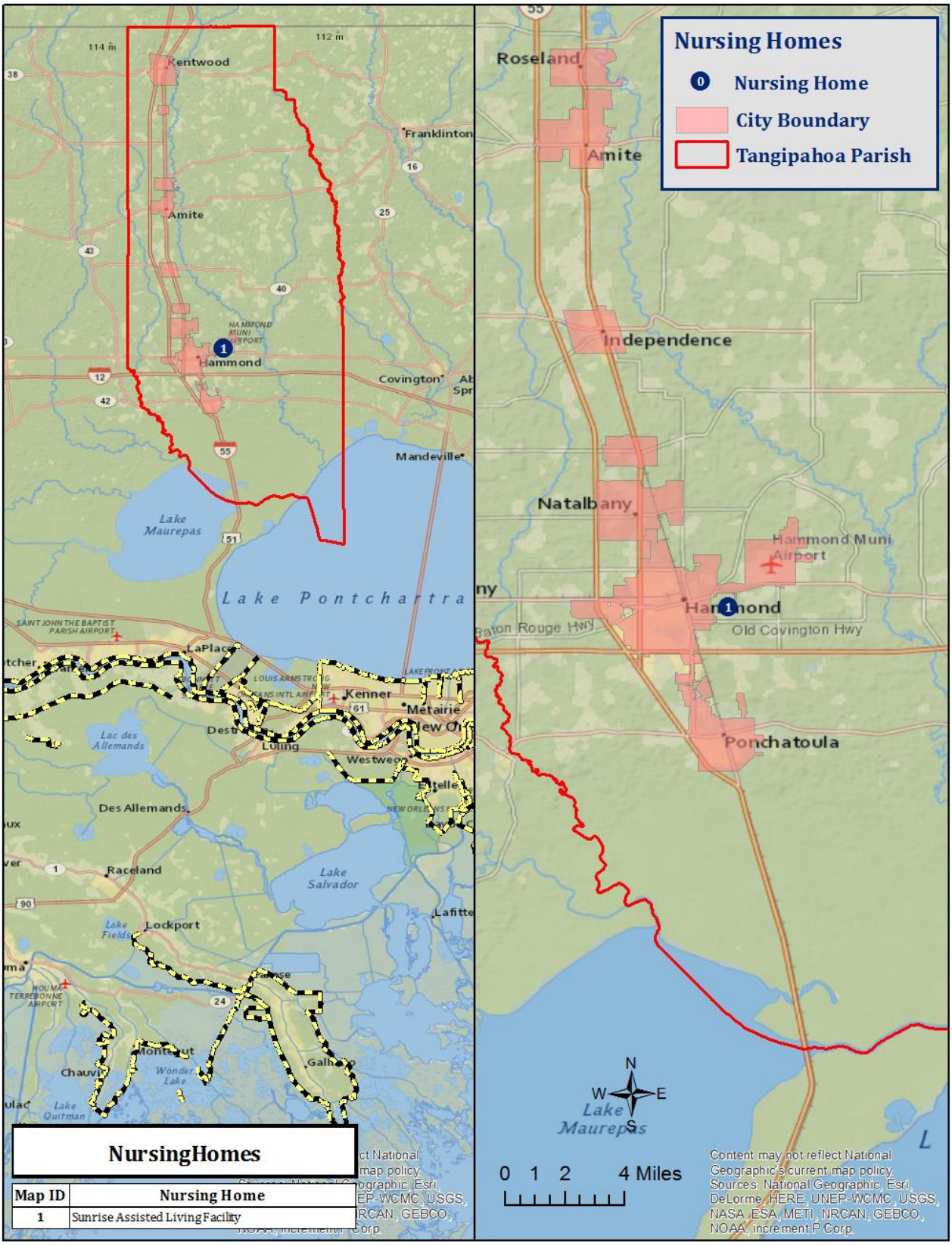


Figure 2-6: Nursing Home facilities in Tangipahoa Parish.

Future Development Trends

The majority of Parish growth is expected to take place in the southern portion of the Parish, near Hammond and Ponchatoula, but is also expected to grow in a northward direction. There has been slow steady growth over the last three years in Tickfaw and Independence in terms of overall growth rate. In addition, as seen on Table 2-7 and Table 2-8, Tangipahoa Parish's population has increased significantly since 1980. Tangipahoa Parish's population grew by 58% between 1980 and 2000, from 80,698 to 100,826 persons, which was an average growth rate of 1% annually. The parish continued to grow at an accelerated rate the following ten year period with a 2010 population of 121,563 and annual growth rate of 1.7%. Hurricane Katrina redistributed New Orleans' population across the southern U.S. The City of Hammond received over 10,000 residents nearly doubling its size during the aftermath of Katrina. The Parish population increased by 6.6% from September 2005 to February 2007, exceeding its population growth for the preceding 10-year period. Estimates are that 7,000 new residents remain in the Parish from the sudden influx. Since the 2010 census, the 2013 population for Tangipahoa Parish is estimated to be at 125,412 people. While not maintaining the same level of growth as the previous decades, Tangipahoa still continued to grow at a modest rate of 1% annually. There has been a total change of 44,714 people since the 1980 census, including all of the towns as well as the unincorporated areas of the Parish. The Parish has a Comprehensive Plan which was adopted in 2008 is intended to provide the Parish with a sound basis for making choices that will affect its future growth and development. The future population and number of buildings can be estimated using U.S. Census Bureau housing and population data. The tables below show population and housing unit estimates from 2000 to 2013.

Table 2-8: Population Growth Rate for Tangipahoa Parish.

Total Population	Amite	Hammond	Independence	Kentwood	Ponchatoula
1-Apr-00	4,110	17,639	1,724	2,205	5,180
1-Apr-10	4,141	20,019	1,665	2,198	6,559
1-Jul-13	4,209	20,107	2,111	1,987	6,671
Population Growth between 2000 – 2010	0.75%	13.49%	-3.42%	-0.32%	26.62%
Average Annual Growth Rate between 2000 – 2010	0.08%	1.35%	-0.34%	-0.03%	2.66%
Population Growth between 2010 – 2013	1.64%	0.44%	26.79%	-9.60%	1.71%
Average Annual Growth Rate between 2010 – 2013	0.5%	0.1%	8.9%	-3.2%	0.6%

Table 2-9: Population Growth Rate for Tangipahoa Parish.

Total Population	Roseland	Tangipahoa	Tickfaw	Tangipahoa Unincorporated	Tangipahoa Parish
1-Apr-00	1,162	747	617	67,204	100,588
1-Apr-10	1,123	748	694	83,950	121,097
1-Jul-13	1,168	661	830	84,921	122,665
Population Growth between 2000 – 2010	-3.36%	0.13%	12.48%	24.92%	20.39%
Average Annual Growth Rate between 2000 – 2010	-0.34%	0.01%	1.25%	2.49%	2.04%
Population Growth between 2010 – 2013	4.01%	-11.63%	19.60%	1.16%	1.29%
Average Annual Growth Rate between 2010 – 2013	1.3%	-3.9%	6.5%	0.4%	0.4%

Table 2-10: Housing Growth Rate for Tangipahoa Parish.

Total Housing Units	Amite	Hammond	Independence	Kentwood	Ponchatoula
1-Apr-00	1,450	7,014	735	979	2,175
1-Apr-10	1,502	8,059	708	967	2,852
1-Jul-13	1,338	8,331	779	939	3,161
Housing Growth between 2000 – 2010	3.59%	14.90%	-3.67%	-1.23%	31.13%
Average Annual Growth Rate between 2000 – 2010	0.36%	1.49%	-0.37%	-0.12%	3.11%
Housing Growth between 2010 – 2013	-10.92%	3.38%	10.03%	-2.90%	10.83%
Average Annual Growth Rate between 2010 – 2013	-4%	1%	3%	-1%	4%

Table 2-11: Housing Growth Rate for Tangipahoa Parish.

Total Housing Units	Roseland	Tangipahoa	Tickfaw	Tangipahoa Unincorporated	Tangipahoa Parish
1-Apr-00	477	266	261	27,437	40,794
1-Apr-10	471	259	277	34,978	50,073
1-Jul-13	456	292	290	35,089	50,675
Housing Growth between 2000 – 2010	-1.26%	-2.63%	6.13%	27.48%	22.75%
Average Annual Growth Rate between 2000 – 2010	-0.13%	-0.26%	0.61%	2.75%	2.27%
Housing Growth between 2010 – 2013	-3.18%	12.74%	4.69%	0.32%	1.20%
Average Annual Growth Rate between 2010 – 2013	-1.1%	4.2%	1.6%	0.1%	0.4%

As shown in the *Tables 2-8 – Table 2-11*, Tangipahoa Parish population and housing has grown over the last 13 years. Population rates grew at 2.04% between 2000 – 2010 and slowed significantly in the last three years with a 0.4% in population between 2010 – 2013. Housing grew at a slightly faster rate at 2.27% from 2000 – 2010, and also slowed down in the last three years while keeping up with the population growth rate of 0.4%. The largest growth areas have taken place in the town of Independence (8.9% annually over the last three years) and the village of Tickfaw (6.5% annually over the last three years). Growth everywhere else in the parish has remained stagnant with annual growth rates from 0.1% to 1.3% annually. During the same three year period, the Town of Kentwood and the Village of Tangipahoa actually experience annual declines exceeding 3%.

Future Hazard Impacts

Hazard impacts were estimated for five years and ten years in the future (2019 and 2024). Yearly population and housing growth rates were applied to parish inventory assets for composite flood, tropical cyclones, and levee failures. Commercial structures were estimated to increase by 21 structures a year which has been a consistent average of growth over the past three years. Average growth rates were estimated at 448 new structures for housing and 0.6% for population based on recent growth rates in the parish, which have been trending down. A summary of estimated future impacts is shown in the table below. Dollar values assume are expressed in future costs and assume an annual rate of inflation of 1.02%.

Table 2-12: Estimated Future Hazard Impacts, 2019-2024.
(Source: HAZUS, US Census Bureau)

Hazard / Impact	Total in Parish (2014)	Hazard Area (2014)	Hazard Area (2019)	Hazard Area (2024)
Flood Damage				
Structures	53,890	43,112	44,421	45,770
Value of Structures	$9,555,337,000	$7,644,269,600	$9,233,452,139	$11,005,307,487
# of People	122,665	98,132	101,112	104,181
Tropical Cyclone				
Structures	53,890	53,890	56,276	58,768
Values of Structures	$9,555,337,000	$9,555,337,000	$11,541,815,174	$13,756,634,358
# of People	122,665	122,665	126,389	130,227

Zoning and Land Use

The Parish has no zoning regulations and few mechanisms to determine what type of development can go where in the Parish. The Parish and the incorporated areas adopted a Comprehensive Plan which includes current planning efforts in 2008. The Comprehensive Plan will help identify new proposed buildings, infrastructure, and critical facilities and determine what regulations and infrastructure are needed for the growth in the Parish. As part of the Comprehensive Plan, a current land use map was developed which can be seen in *Figure 2-7* as well as a future land use map, *Figure 2-8*, that provides a path for future growth.

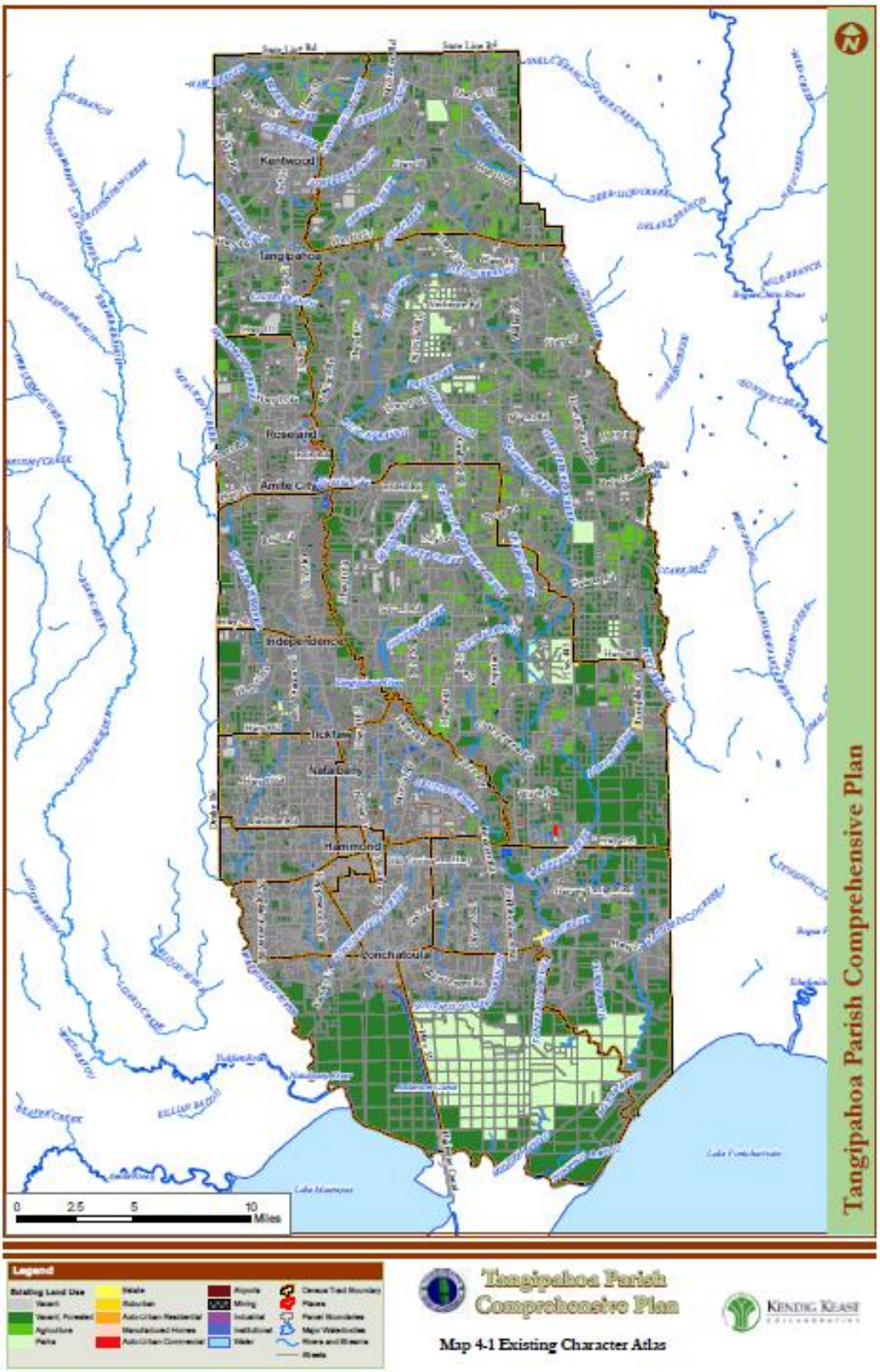


Figure 2-7: Tangipahoa Parish Land Use Map as of 2008.
(Source: Tangipahoa Comprehensive Plan 2008)

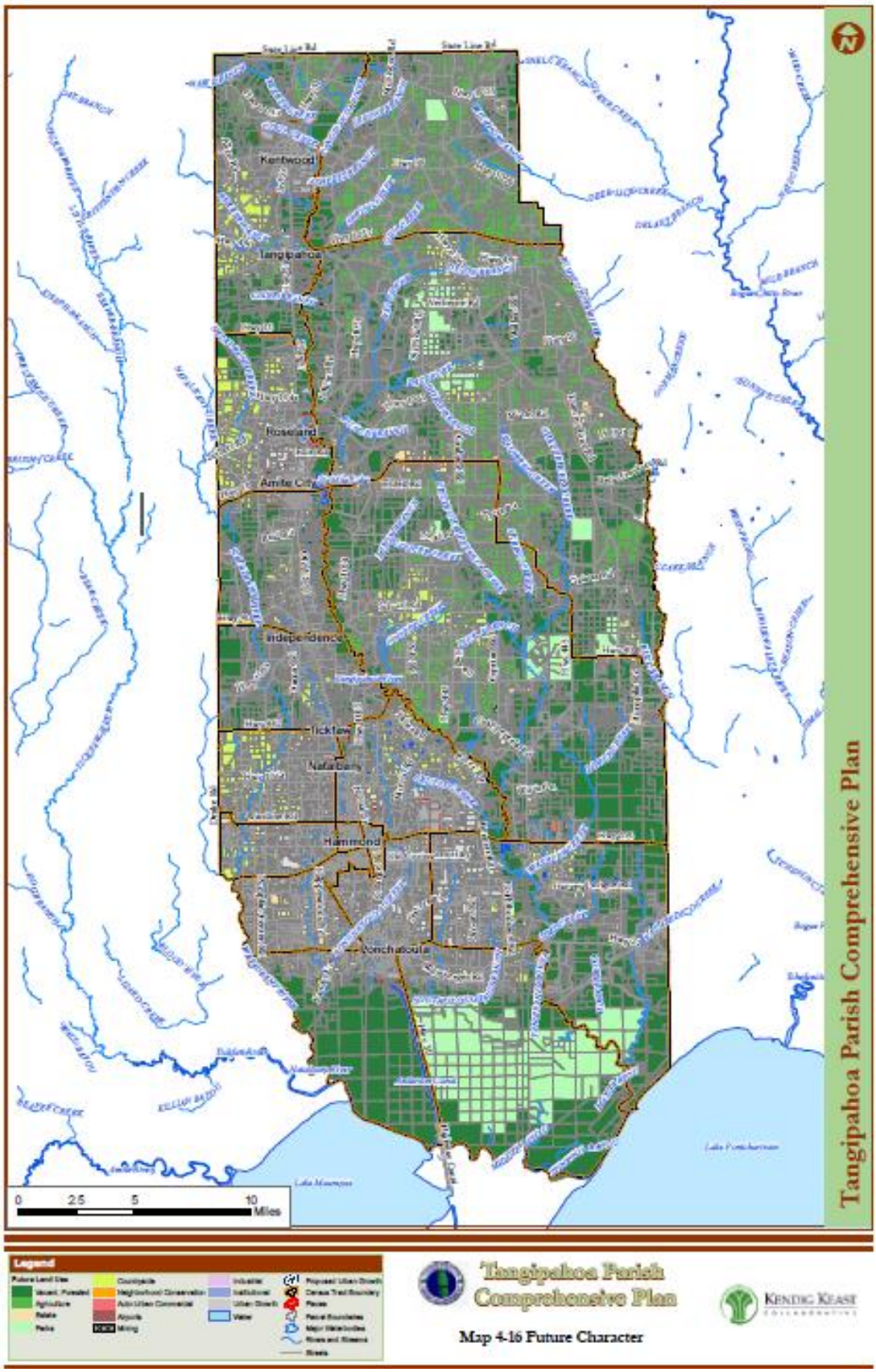


Figure 2-8: Tangipahoa Parish Future Land Use Map.
(Source: Tangipahoa Comprehensive Plan 2008)

The Tangipahoa Parish Land Use table is provided below, residential, commercial and industrial areas account for only 10% of the parish's land use. Forestlands are the largest category with over 199,000 acres (38%), followed by wetlands (32%), agriculture (16%), and water (4%).

Table 2-13: Tangipahoa Parish Land Use.
(Source: USGS Land Use Map)

Land Use	Acres	Percentage
Agricultural Land, Cropland, and Pasture	86,828	16%
Wetlands	167,215	32%
Forest land (not including forested wetlands)	199,411	38%
Urban/Development	51,304	10%
Water	22,122	4%

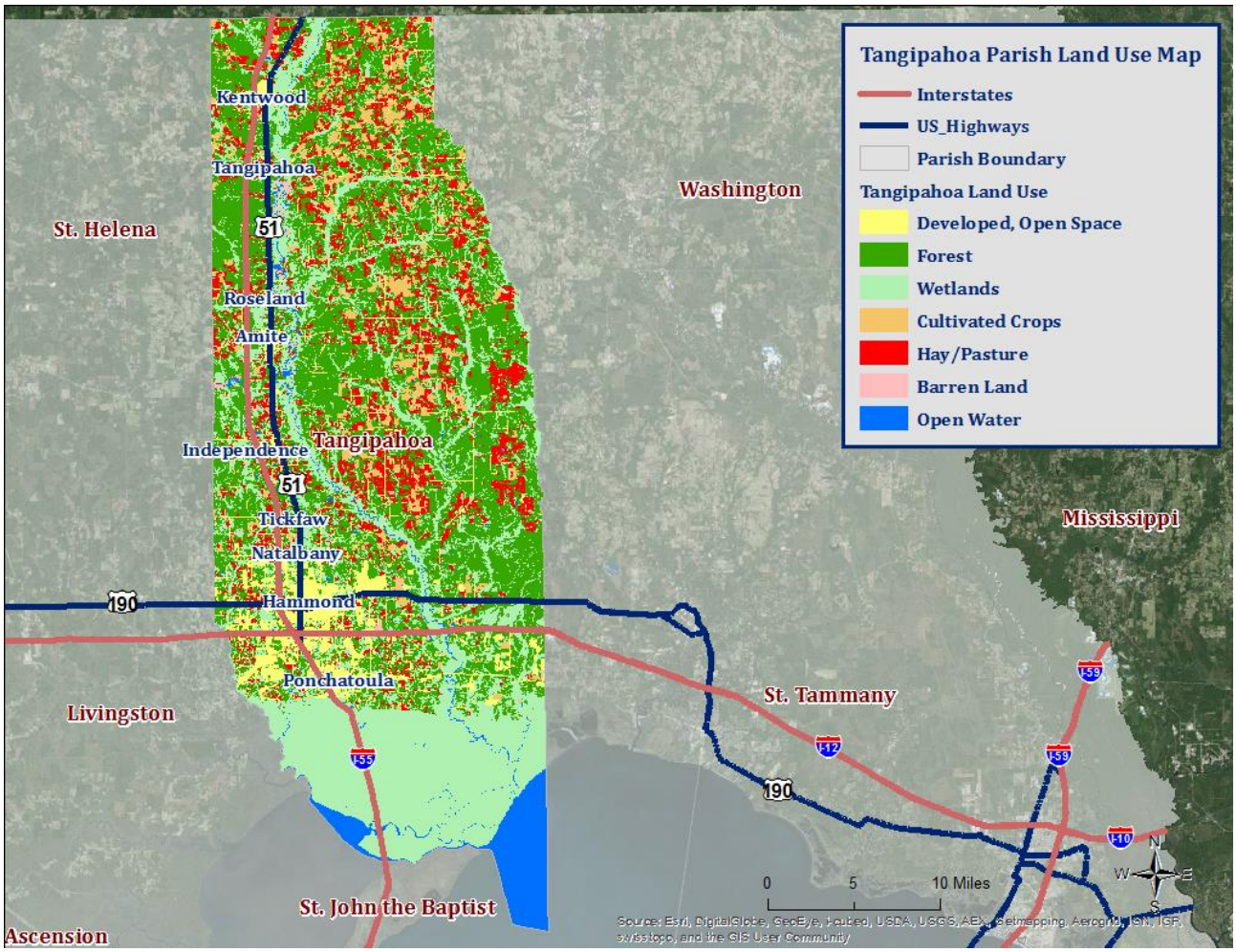


Figure 2-9: Tangipahoa Parish Land Use Map.
(Source: USGS Land Use Map)

Hazard Identification

Coastal Land Loss

Coastal land loss is the loss of land (especially beach, shoreline, or dune material) by natural and/or human influences. Coastal land loss occurs through various means, including erosion, subsidence (the sinking of land over time as a result of natural and/or human-caused actions), saltwater intrusion, coastal storms, littoral drift, changing currents, manmade canals, rates of accretion, and sea level rise. The effects of these processes are difficult to differentiate because of their complexity and because they often occur simultaneously, with one influencing each of the others.

Some of the worst recent contributors to coastal land loss in the state are the tropical cyclones of the past decade. Two storms that stand out in this regard are Hurricanes Katrina and Rita. These powerful cyclones completely covered large tracts of land in a very brief period, permanently altering the landscape. The disastrous legacy of these storms concentrated already ongoing efforts to combat coastal land loss. Consistent with the 2014 State Hazard Mitigation Plan Update, coastal land loss is considered in terms of two of the most dominant factors: sea level rise and subsidence.

Sea level rise and subsidence impact Louisiana in a similar manner—again making it difficult to separate impacts. Together, rising sea level and subsidence—known together as relative sea level rise—can accelerate coastal erosion and wetland loss, exacerbate flooding, and increase the extent and frequency of storm impacts. According to NOAA, global sea level rise refers to the upward trend currently observed in the average global sea level. Local sea level rise is the level that the sea rises relative to a specific location (or, benchmark) at the coastline. The most prominent causes of sea level rise are thermal expansion, tectonic actions (such as sea floor spreading), and the melting of the Earth's glacial ice caps.

The current U.S. Environmental Protection Agency (EPA) estimate of global sea level rise is 10–12 in. per century, while future sea level rise could be within the range of 1–4 ft. by 2100. According to the U.S. 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.

Subsidence results from a number of factors including:

- Compaction/consolidation of shallow strata caused by the weight of sediment deposits, soil oxidation, and aquifer draw-down (shallow component)
- Gas/oil/resource extraction (shallow & intermediate component)
- Consolidation of deeper strata (intermediate components)
- Tectonic effects (deep component)

For the most part, subsidence is a slow-acting process with effects that are not as evident as hazards associated with discrete events. Although the impacts of subsidence can be readily seen in coastal parishes over the course of decades, subsidence is a "creeping" hazard. The highest rate of subsidence is occurring at the Mississippi River Delta (estimated at greater than 3.5 ft./century). Subsidence rates tend to decrease inland, and they also vary across the coast.

Overall, 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, subsidence may make structures more vulnerable to flooding.

- By destabilizing elevations, 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.

Location

Historic areas of coastal land loss and gain (*Figure 2-10*) and subsidence rates (*Figure 2-11*) have been quantified for Tangipahoa Parish using data from the U.S. Geologic Survey and Louisiana Coastal Protection and Restoration Authority (CPRA). Since 1932, the average annual land loss in Louisiana is 35 mi^2, while the average annual land gain has been 3 mi^2 for a net loss of 32 mi^2 per year. Minimal land loss is primarily currently occurring on the north shore of Lake Pontchartrain in unincorporated Tangipahoa Parish (*Figure 2-10).* Subsidence is occurring in southeast Tangipahoa Parish, outside of incorporated jurisdictions (*Figure 2-11*).

Previous Occurrences / Extent

Coastal land loss is an ongoing process, including discrete (hurricanes) and continuous (subsidence, sea level rise) processes. While historic flood loss data undoubtedly include the effects of coastal land loss, specific previous occurrences have not been identified as a source of direct disaster damage in Louisiana. Rather, the effects of the underlying flood or hurricane storm surge hazard are recorded. Land loss is a significant hazard, however, and assessment of the added flood impacts caused by land loss is quantified in the following sections.

Frequency / Probability

Subsidence, sea level rise, and coastal land loss are ongoing hazards. Based on historical subsidence rates and land loss/gain trends, the probability of future land loss in Louisiana is 100% certain, but actual rates of subsidence and land loss/gain vary along the coast based on various meteorological, geological, and human-influenced dynamics (e.g., water/resource extraction, canal dredging, saltwater intrusion, marsh restoration projects, etc.).

Table 2-14: Annual probability of coastal land loss in Tangipahoa Parish.

Coastal Land Loss Probability Tangipahoa Parish								
Unincorporated Tangipahoa Parish	Amite	Hammond	Independence	Kentwood	Ponchatoula	Roseland	Tangipahoa	Tickfaw
100%	0%	0%	0%	0%	0%	0%	0%	0%

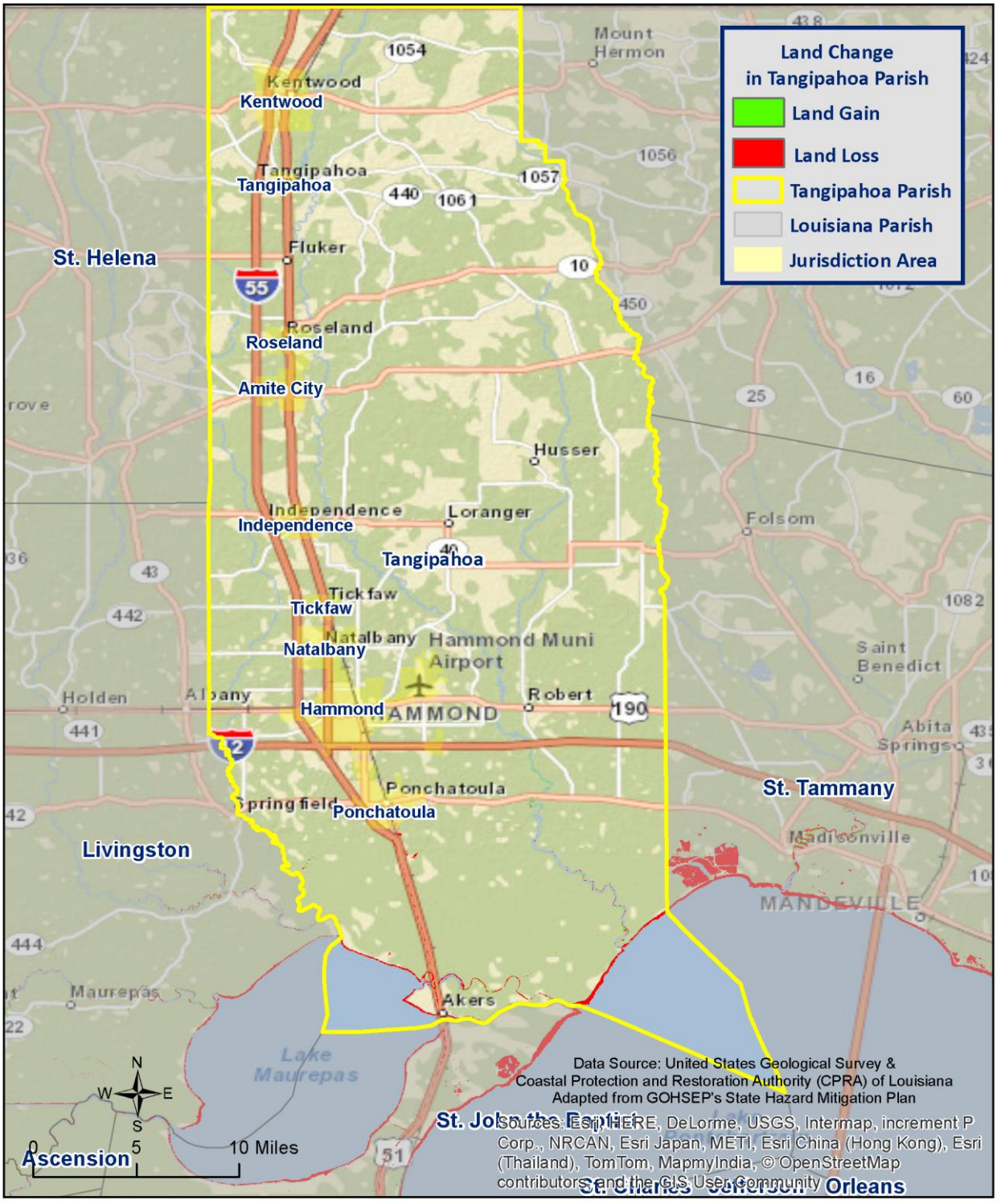


Figure 2-10: Historical areas of land loss and gain between 1932 and 2010
(Source: State of Louisiana Hazard Mitigation Plan)

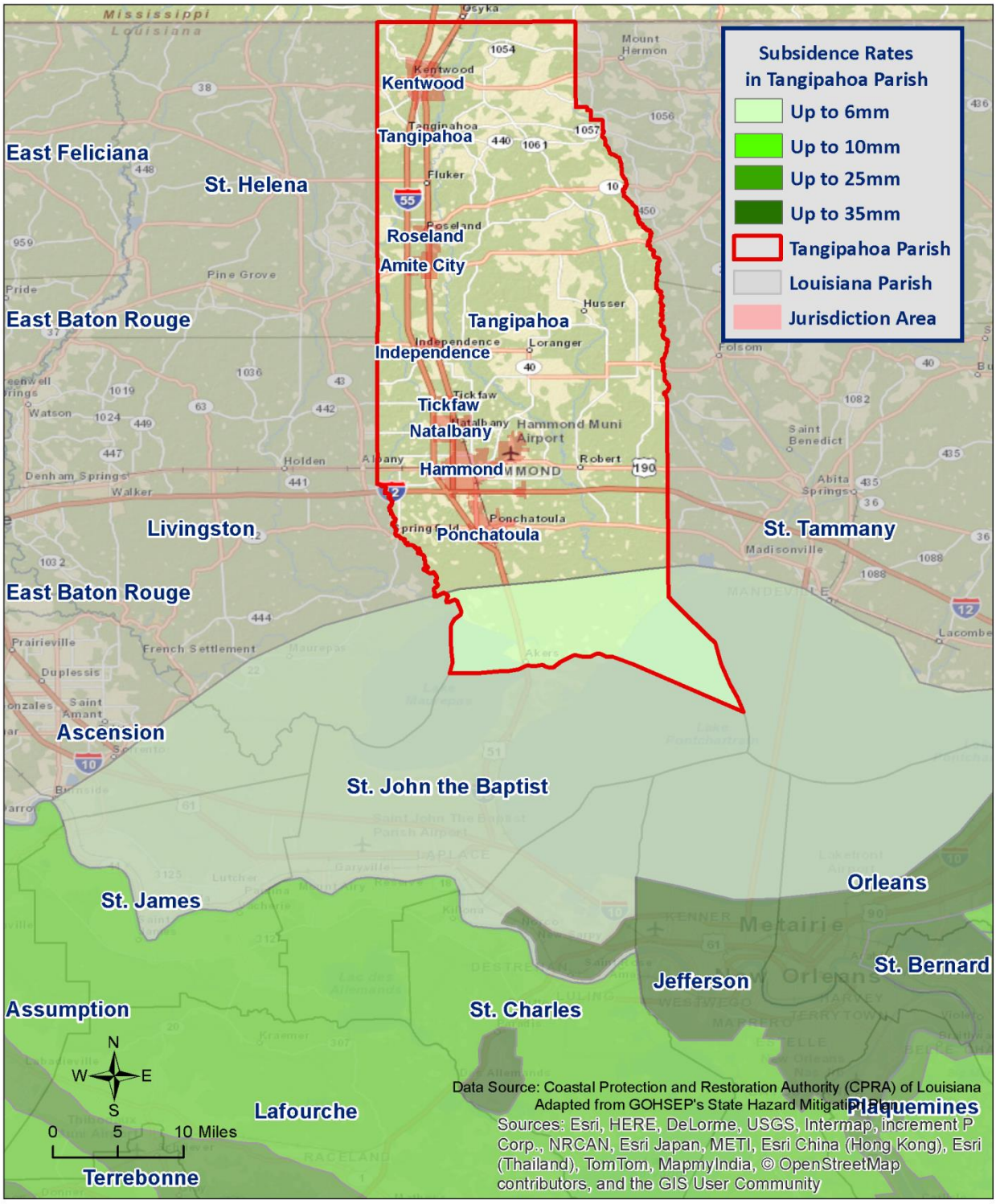


Figure 2-11: Maximum annual subsidence rates based on subsidence zones in coastal Louisiana. (Source: State of Louisiana Hazard Mitigation Plan)

Estimated Potential Losses

To determine the estimated potential losses, the methodology implemented in the 2014 Louisiana State Plan Update was used. In the state plan, two parameters were considered to estimate the projected increase in coastal flood losses from storm surge scenarios – global sea level rise and subsidence. A timeframe of 10 years was used for evaluation of future effects of sea level rise and subsidence for comparison with current conditions. The NOAA Sea, Lake and Overland Surges from Hurricanes (SLOSH) model was used to estimate the maximum of maximum (MOM) storm surge elevations for a Category 1 hurricane at mean tide along the coast of Louisiana. The MOM scenario is not designed to describe the storm surge that would result from a particular event, but rather evaluates the impacts of multiple hurricane scenarios with varying forward speeds and storm track trajectories to create the maximum storm surge elevation surface that would occur given the simultaneous occurrence of all hurricane events for a given category.

There are many global sea level rise scenarios from which to select; however, within a 10-year timeframe, methods that predict accelerating sea level rise rates do not deviate significantly from straight line methods. Therefore, a linear sea level rise projection for the sea level rise occurring in 10 years (SLR2024) using a linear global sea level rise rate of 3.1 mm/year was used (IPCC, 2007), which is also in accordance with the CPRA Coastal Master Plan. This resulted in an increase of 0. 1 feet, which was applied to the NOAA MOM storm surge elevation results over the model output domain.

$$SLR_{2024} = 0.0031 \frac{m}{year} x\ 10\ years$$

$$SLR_{2024} = 0.031\ meters = 0.10\ ft\ in\ 2024$$

To estimate the effects of subsidence, the elevation profile for southern Louisiana was separated into sections based on subsidence zones. The 20th percentile values for subsidence were used, in accordance with the CPRA Master Plan, and subtracted from the digital elevation model (DEM) for each zone and re-joined to create a final subsided ground elevation layer.

To perform the economic loss assessment, depth grids were created for current conditions (SLOSH MOM Results – Current Land Elevation) and for projected 2024 conditions ([SLOSH MOM Results + 0.1 ft sea level rise] – [Current Land Elevation – Subsidence]). HAZUS-MH was used to calculate economic loss for the current and future depth grids.

Figure 2-12 shows the projected increase in total flood loss resulting from a SLOSH Category 1 MOM in the year 2014, with many areas, primarily in unincorporated Tangipahoa Parish, expecting increase in losses. Some areas that would be currently unaffected by a SLOSH Category 1 MOM would be impacted in ten years based on subsidence and sea level rise projections (*Figure 2-13*).

To determine annual potential loss estimates for coastal land loss, increased exposure estimates over the next 10 years calculated using HAZUS-MH were annualized at the parish level (Figure 2-14). To provide an annual estimated potential loss per jurisdiction, the total loss for the census block groups within each jurisdiction were calculated. Based on hazard exposure, *Table 2-14* provides an estimate of annual potential losses for Tangipahoa Parish.

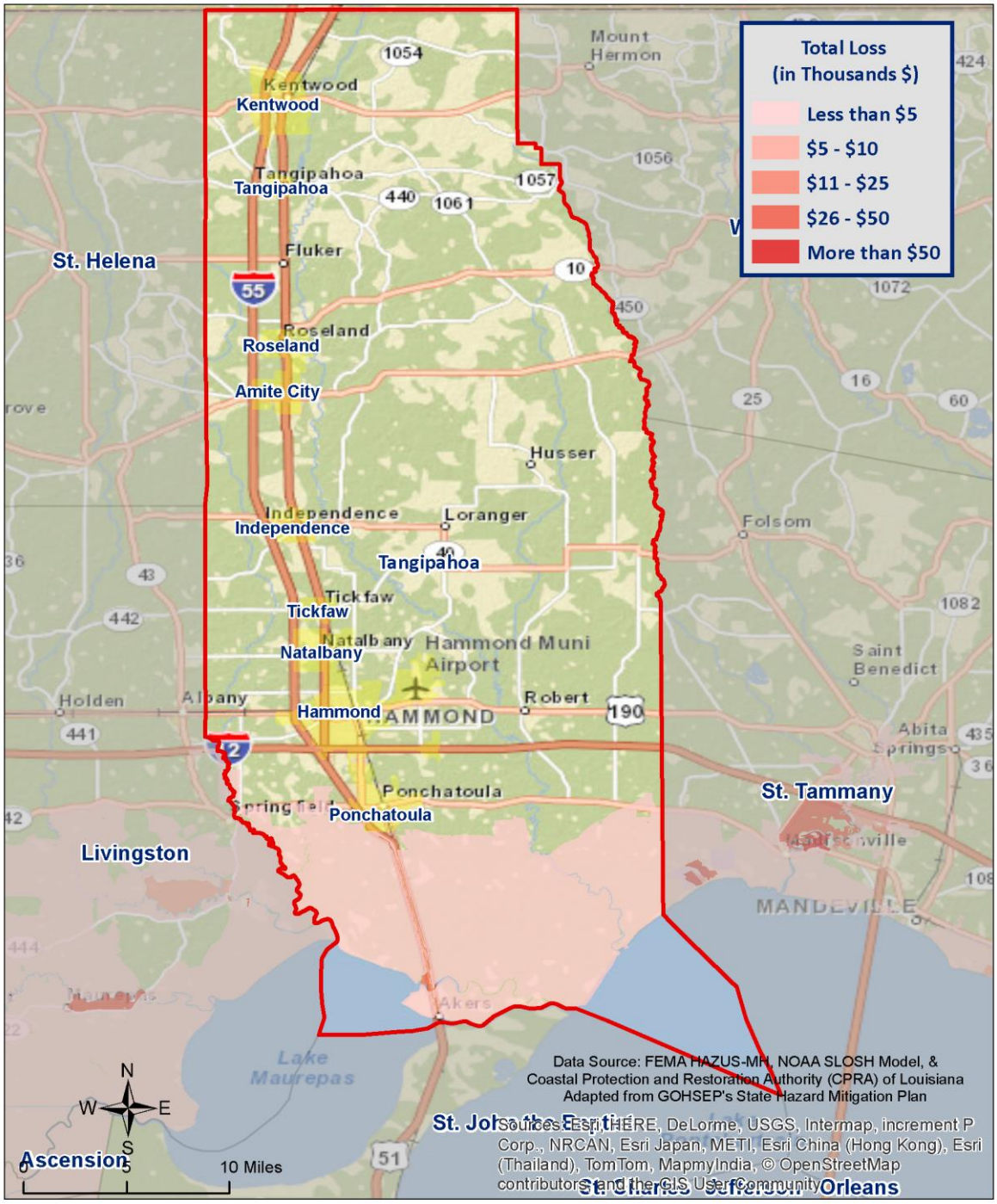


Figure 2-12: Increase in total loss estimates in 2024 by census block group based on the HAZUS-MH flood model and NOAA SLOSH model.
(Source: State of Louisiana Hazard Mitigation Plan)

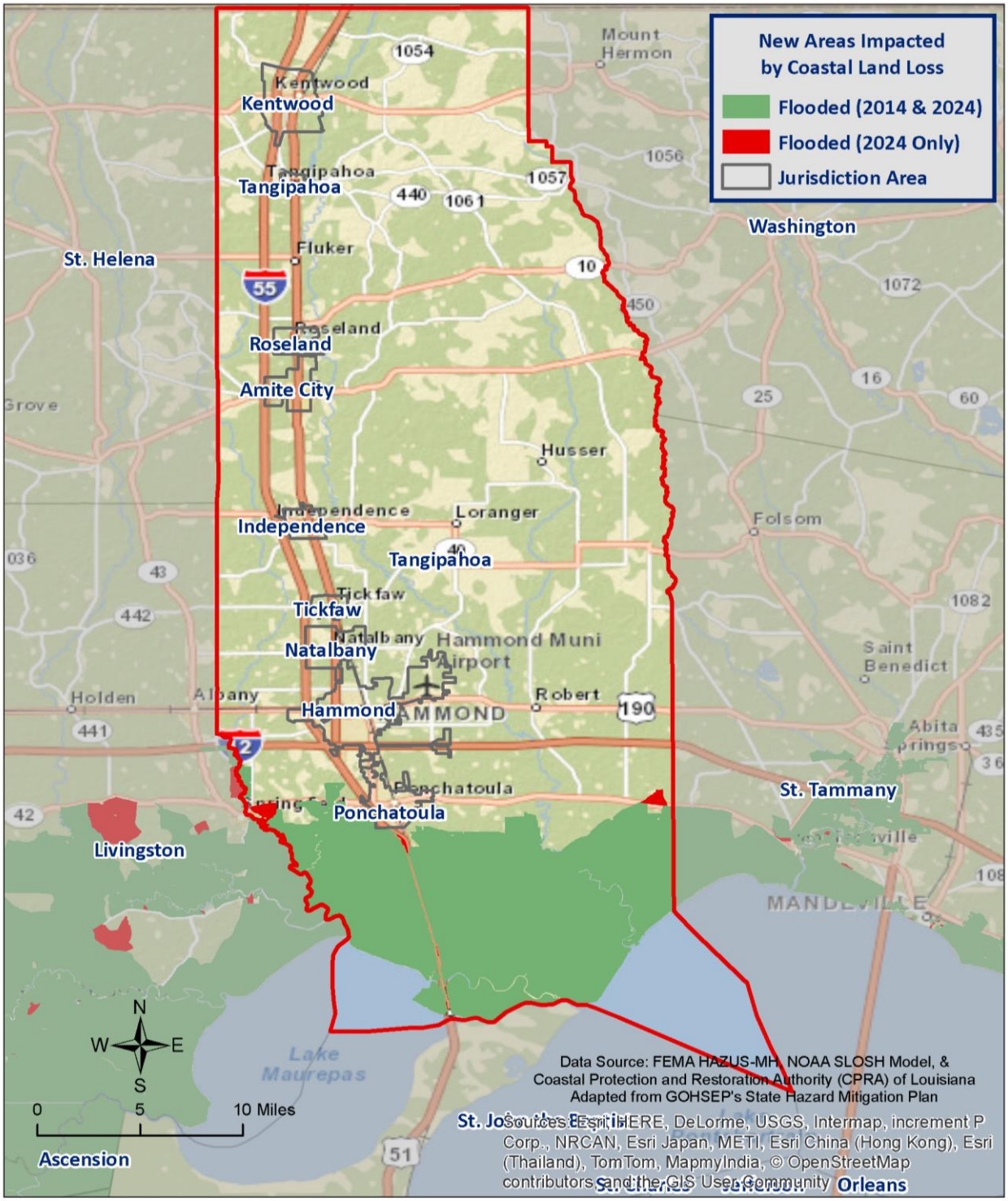


Figure 2-13: Census block groups not currently impacted by Category 1 hurricane storm surge but expected to be impacted in 2024 are shown in red.
(Source: State of Louisiana Hazard Mitigation Plan)

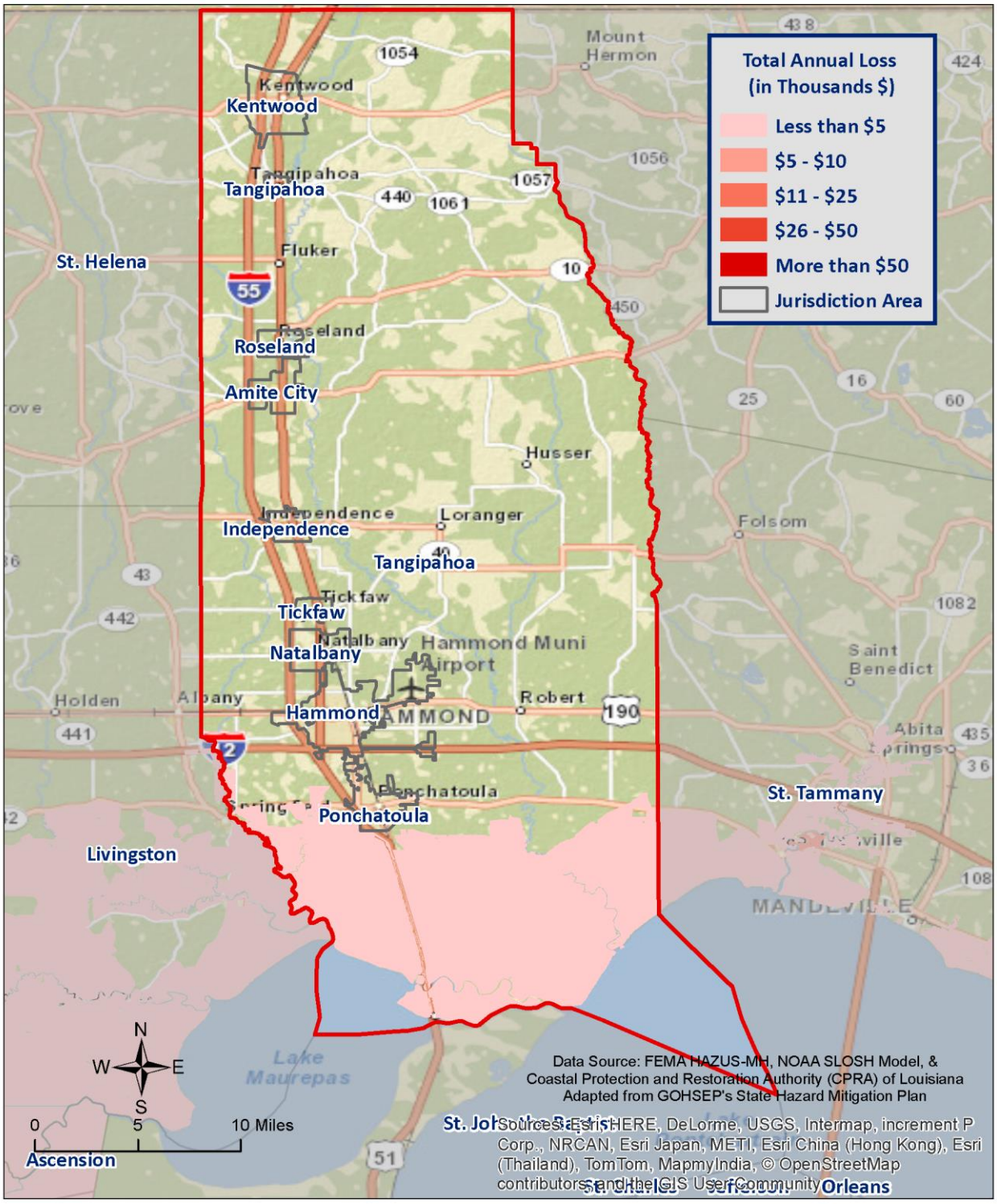


Figure 2-14: Estimated annual losses for coastal land loss by census block group.

Table 2-15: Estimated annual losses for coastal land loss in Tangipahoa Parish. (Source: HAZUS-MH)

Coastal Land Loss Estimated Annual Potential Loses for Tangipahoa Parish								
Unincorporated Tangipahoa Parish	Amite	Hammond	Independence	Kentwood	Ponchatoula	Roseland	Tangipahoa	Tickfaw
$2,000	$0	$0	$0	$0	$0	$0	$0	$0

Table 2-15 shows the current and future exposure potential based on the HAZUS-MH 2.2 inventory database.

Threat to People

Coastal land loss can impact all demographics and age groups. Buildings located within highly vulnerable coastal land loss areas could be eventually permanently shut down and forced to re-locate. Long-term sheltering and permanent relocation could be a concern for communities that are at the highest risk for future coastal land loss. The total population within the parish that is susceptible to the effects of coastal land loss is shown in *Table 2-16*.

Table 2-16: Number of people susceptible to coastal land loss in Tangipahoa Parish. (Source: Census 2010)

Number of People Exposed to Coastal Land Loss			
Location	**# in Community**	**# in Hazard Area**	**% in Hazard Area**
Tangipahoa Parish (Unincorporated)	**83,950**	**7,500**	**8.9%**
Amite	**4,141**	**0**	**0%**
Hammond	**20,019**	**0**	**0%**
Independence	**1,665**	**0**	**0%**
Kentwood	**2,198**	**0**	**0%**
Ponchatoula	**6,559**	**33**	**0.5%**
Roseland	**1,123**	**0**	**0%**
Tangipahoa	**748**	**0**	**0%**
Tickfaw	**694**	**0**	**0%**

The HAZUS-MH hurricane model was used to identify populations vulnerable to coastal land loss throughout the jurisdictions in the tables below:

Table 2-17: Population vulnerable to coastal land loss in unincorporated Tangipahoa Parish. (Source: HAZUS-MH)

Tangipahoa Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	7,500	100%
Persons Under 5 years	551	7.4%
Persons Under 18 years	1,936	25.8%
Persons 65 Years and Over	826	11%
White	5,546	73.9%
Minority	1,954	26.1%

Table 2-18: Population vulnerable to coastal land loss in Ponchatoula. (Source: HAZUS-MH)

Ponchatoula		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	33	100%
Persons Under 5 years	2	6.1%
Persons Under 18 years	9	27.3%
Persons 65 Years and Over	4	12.1%
White	21	63.6%
Minority	12	36.4%

Based on historical data, coastal land loss is determined not to pose a significant risk to the planning area within Tangipahoa Parish.

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 few 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 provide the opportunity to identify possible deficiencies in their early stages and can prevent a possible catastrophic failure event.

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.

Dam/reservoir 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.

The USACE National Inventory of Dams classifies dams as 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 other impacts. 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.

In Louisiana there are 513 dams included in the Army Corps of Engineers National Inventory of Dams. Of these, 41 are considered high hazard, 63 are significant hazard and 409 are low hazard potential dams.

Location

According to the National Inventory of Dams, Tangipahoa Parish has 14 low hazard potential dams. All of the low hazard dams are located in unincorporated Tangipahoa Parish except the Oxidation Pond No. 1 Dam located in Hammond. All dams in Tangipahoa Parish are privately owned. The following is a summary of the low hazard dam data contained within the National Inventory of Dams by location.

Table 2-19: Low hazard dams located in Tangipahoa Parish.
(Source: National Inventory of Dams)

Inventory of Low Hazard Dams in Tangipahoa Parish						
Dam Name	Year Completed	Structural Height (Ft.)	Hydraulic Height (Ft.)	Surface Area (Acres)	Normal Storage (Acre-Ft)	Drainage Area (Sq. Miles)
Unincorporated Tangipahoa Parish						
Capdeboscq Pond No. 2	1950	-	-	14	-	-
Chappepeela Lake	1938	12	9	47	256	1
Dogwood Lake	1938	16	12	16	125	1
Global Wildlife Foundation Dam	1974	7	5	21.1	105.5	2
Henson Pond Dam	1984	10	8	15.1	121	2
Lake Forest	1968	10	7	25	240	0.06
Lewis Pond	1948	16	13	5	54	1
Littles Pond	1948	12	9	2	51	1
Mirror Lake	1938	9	7	14	75	4
Spring Creek Lake Dam	1938	18	14	51	128	8
Tung Oil Lake No. 1	1951	15	8	5	50	1
Tung Oil Lake No. 2	1951	10	6	-	50	-
Whispering Pines	1973	15	10	23	200	1
Hammond						
Oxidation Pond No. 1	-	8	6	-	188	-

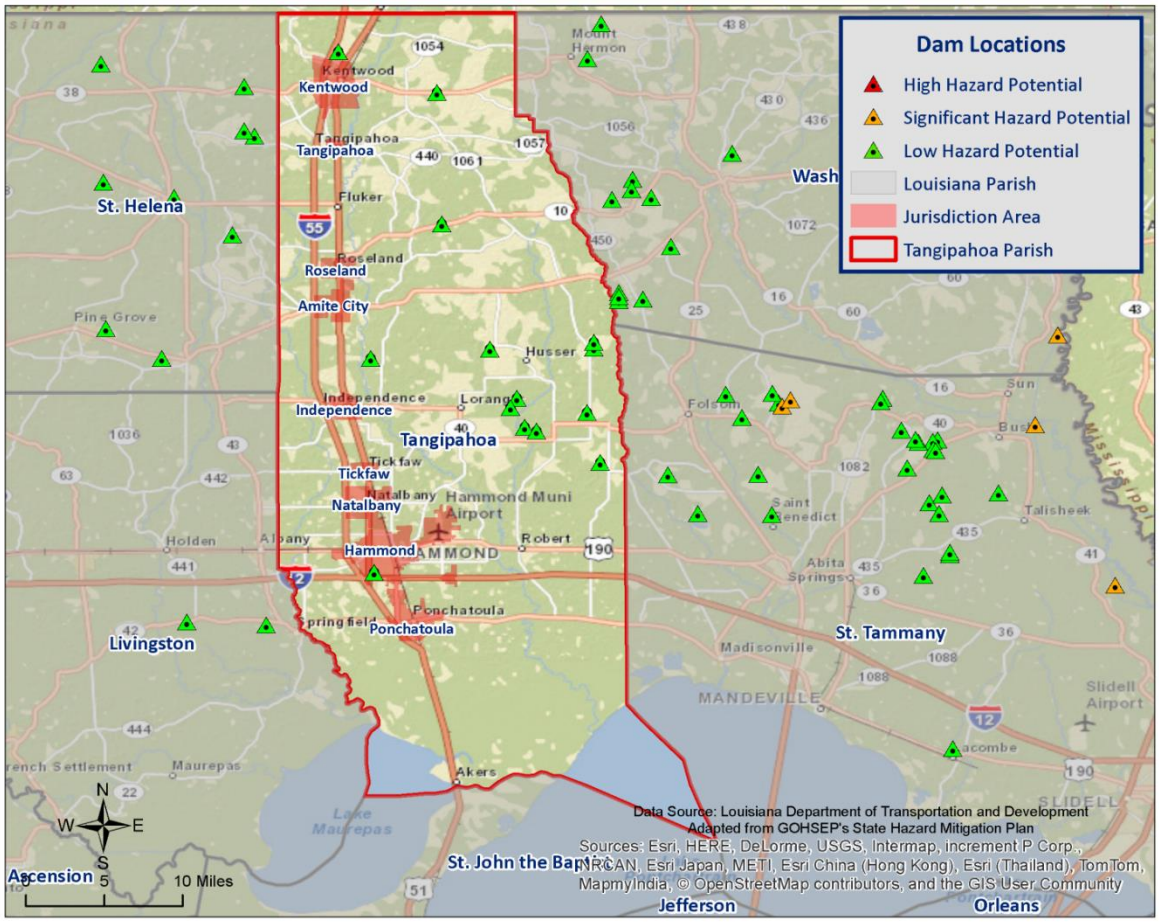


Figure 2-15: Dam locations in Tangipahoa Parish with respect to hazard potential (Source: National Inventory of Dams)

Previous Occurrences / Extent

The National Performance of Dams Program (NPDP), a database of dam incidents maintained by Stanford University, lists one dam incident in Louisiana, which occurred at the Kisatchie Lake Dam in Grant Parish in 1991. After heavy rains, the 25' high earthen dam was breached at the concrete spillway structure. There are no other reports of dam incidents in Louisiana reported by NPDP.

Frequency / Probability

Guidance from the Bureau of Reclamation, among others, suggests an average probability of failure for dams to be 10^{-4}, or 0.1% annual probability, to be appropriate. The probability of a dam failure in unincorporated Tangipahoa Parish and Hammond is therefore assessed at 0.1%.

Estimated Potential Losses

Because the dams located in and near Tangipahoa Parish are low hazard dams, dam failure is not carried forward into risk assessment.

Drought

A drought is a deficiency in water availability over an extended period of time, caused by precipitation totals and soil water storages that do not satisfy the environmental demand for water either by evaporation or transpiration through plant leaves. It is important to note that the lack of precipitation alone does not constitute drought; the season during which the precipitation is lacking has a major impact on whether drought occurs. For example, a week of no precipitation in July, when the solar energy to evaporate water and vegetation's need for water to carry on photosynthesis are both high, may trigger a drought, while a week of no precipitation in January may not initiate a drought.

Drought is a unique and insidious hazard. Unlike other natural hazards, no specific threshold of "dryness" exists for declaring a drought. In addition, the definition of drought depends on stakeholder needs. For instance, the onset (and demise) of agricultural drought is quick, as crops need water every few days; once they get rainfall, they improve. But hydrologic drought sets in (and is alleviated) only over longer time periods. A few dry days will not drain a reservoir, but a few rain showers cannot replenish it, either. Moreover, different geographical regions define drought differently based on the deviation from local, normal precipitation. And drought can occur anywhere, triggered by changes in the local-to-regional-scale atmospheric circulation over an area or by broader-scale circulation variations such as the expansion of semi-permanent oceanic high-pressure systems or the stalling of an upper-level atmospheric ridge in place over a region. The severity of a drought depends upon the degree and duration of moisture deficiency, as well as the size of the affected area. Periods of drought tend to be associated with other hazards such as wildfires and/or heat waves as well. Lastly, drought is a slow onset event, causing less direct—but tremendous indirect—damage. Depletion of aquifers, crop loss, and livestock and wildlife mortality rates are examples of direct impacts. Since the groundwater found in aquifers is the source of about 38% of all county and city water supplied to households (and comprises 97% of the water for all rural populations that are not already supplied by cities and counties), droughts can potentially have direct, disastrous effects on human populations. The indirect consequences of drought such as unemployment, reduced tax revenues, increased food prices, reduced outdoor recreation opportunities, higher energy costs as water levels in reservoirs decrease and consumption increases, and water rationing are not often fully known. This complex web of impacts causes drought to affect people and economies well beyond the area physically experiencing the drought.

This hazard is often measured using the Palmer Drought Severity Index (PDSI, also known operationally as the Palmer Drought Index). The PDSI, first developed by Wayne Palmer in a 1965 paper for the U.S. Weather Bureau, measures drought through recent precipitation and temperature data with regard to a basic supply-and-demand model of soil moisture. It is most effective in long-term calculations. Three other indices used to measure drought are the Palmer Hydrologic Drought Index (PHDI); the Crop Moisture Index (CMI), which is derived from the PDSI; and the Keetch-Byram Drought Index (KBDI), created by John Keetch and George Byram in 1968 for the U.S. Forest Service. The KBDI is used mainly for predicting likelihood of wildfire outbreaks. As a compromise, the PDSI is used most often for droughts since it is a medium-response drought indicator. Due to the varying types and severities of drought that rely on different indicators, great caution should be exercised in interpreting and inferring from the results of the PDSI maps shown here.

Results from the PDSI indicate that the drought risk across Tangipahoa Parish increased, although not significantly from a statistical perspective, between 1958 and 2007. The PDSI best measures the duration and intensity of drought-inducing circulation patterns at a somewhat long-term time scale, although not as long term as the PHDI. Long-term drought is cumulative, so the intensity of drought during the current month is dependent on the current weather patterns plus the effects of cumulative patterns of previous months—or longer. Although weather patterns can change almost literally overnight from a long-term drought pattern to a long-term wet pattern, as a medium-response indicator, the PDSI responds relatively rapidly.

The current drought severity index published by the National Drought Mitigation Center indicates that Tangipahoa Parish is currently at abnormally dry conditions, but is not experiencing any drought events (*Figure 2-16*).

The experimental "Long-Term Blend" approximates drought-related impacts (such as reservoir stores, irrigated agriculture, groundwater levels, and well water depth) that respond to precipitation on time scales ranging from several months to a few years by blending data from those time scales. As of March 7, 2015 conditions in Tangipahoa Parish are normal.

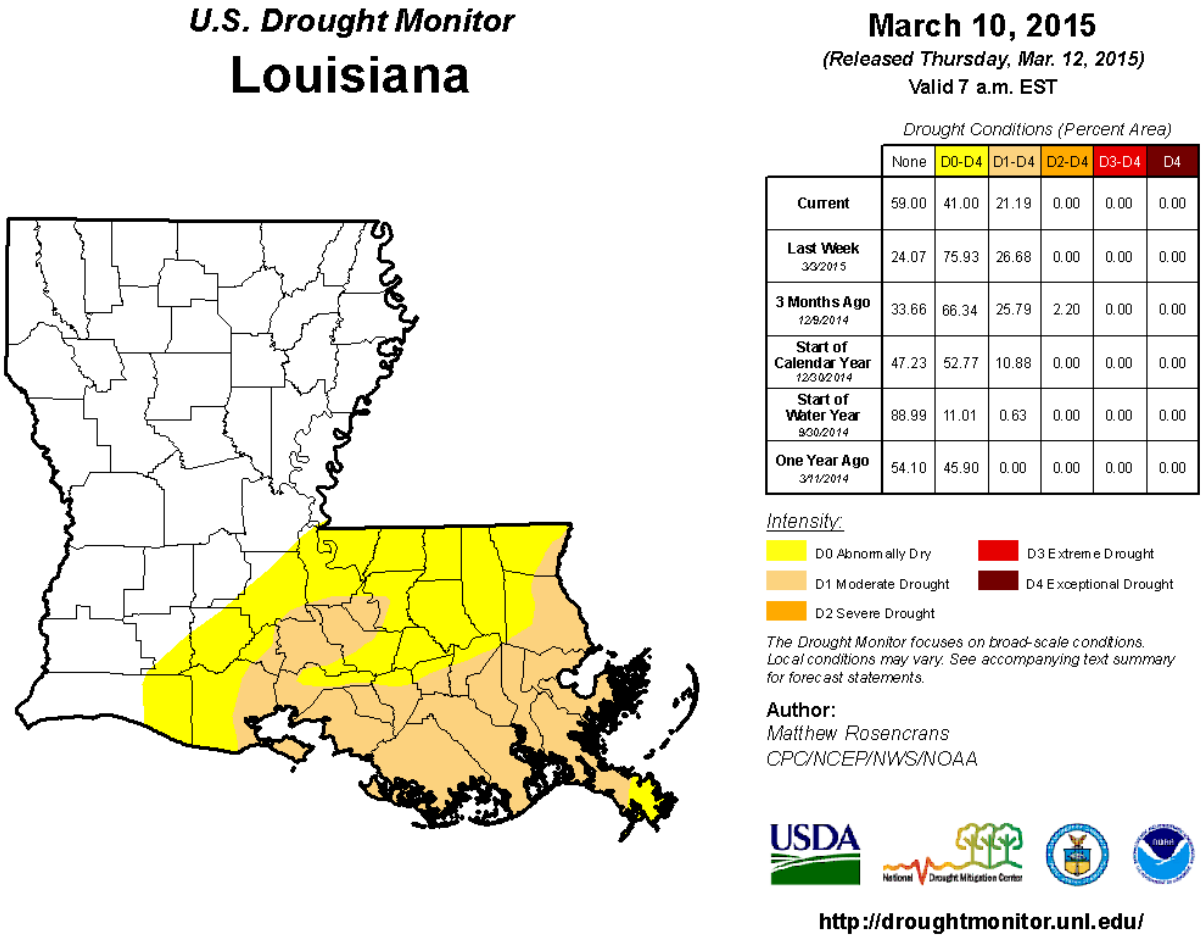


Figure 2-16: Drought monitor for the State of Louisiana

Location

Drought typically impacts a region and not one specific parish or jurisdiction. Because drought is a climatological based hazard and has the same probability of occurring in Tangipahoa parish as all of the adjacent parishes, the entire planning area for Tangipahoa Parish is equally at risk for drought. However, the major impact of drought in Tangipahoa Parish is on the agricultural community.

Previous Occurrences / Extent

The SHELDUS database reports only two drought events occurring within the boundaries of Tangipahoa Parish from the years 1960 -2014. *Table 2-20* identifies the date of occurrence and estimated crop damage for the droughts that have occurred in Tangipahoa Parish.

Table 2-20: Drought events with crop damage totals for Tangipahoa Parish. (Source: SHELDUS)

Date	Crop Damage
August 1998	$5,034,625
December 2000	$6,072,695

Frequency / Probability

One significant drought events has occurred within the boundaries of Tangipahoa since 1989. The annual chance of occurrence is calculated at 4% based on the records for the past 25 years (1989 – 2014).

Estimated Potential Losses

According to the SHELDUS database, there have been 2 droughts that have caused some level of crop damage. The total agricultural damage from these events is $11,107,320 with an average cost of $5,553,660 per drought event. When annualizing the total cost over the 54 year record, total annual loses based on drought is estimated to be $205,691. *Table 2-21* presents an analysis of agricultural exposure that are susceptible to droughts by type for Tangipahoa Parish.

Table 2-21: Agricultural exposure by Type for Droughts in Tanipahoa Parish (Source: LSU Ag Center 2013 Parish Totals)

Agricultural Exposure by Crop Type for Drought			
Blueberry	Strawberry	Figs	Tomatoes
$222,750	$10,162,873	$8,318	$345,800

There have been no reported injuries or deaths as a direct result to drought in Tangipahoa Parish.

Based on historical data, drought is determined not to pose a significant risk to the planning area within Tangipahoa Parish.

Expansive Soils

Soils and soft rock that tend to swell or shrink due to changes in moisture content are commonly known as expansive soils. Changes in soil volume present a hazard primarily to structures built on top of expansive soils. The most extensive damage occurs to highways and streets.

“Clay” is defined as a natural, earthy, fine-grained material that develops plasticity when mixed with a limited amount of water. Swelling clay is clay that is capable of absorbing large quantities of water, thus increasing greatly in volume.

Variations in moisture content and volume changes are greatest in clays found in regions of moderate to high precipitation, where prolonged periods of drought are followed by long periods of rainfall. It is in these regions, which include many of the Southern, Central, and Western States, that swelling of clays resulting from climatic fluctuations cause the most severe engineering problems

Location

The availability of data on expansive soils varies greatly. In or near metropolitan centers and at dam sites, abundant information on the amount of clay generally is available. However, for large areas of the United States, little information is reported other than field observations of the physical characteristics of clay of a particular stratigraphic unit. Therefore, fixed criteria for determining the swelling potential have not been devised. However, one method that was devised in 1989 was based mostly on numerous published descriptions of the physical and mineralogical properties of clays. Using this classification system, one sees that the southeastern portion of Louisiana, primarily along the Mississippi River from about East Baton Rouge Parish to the mouth of the Mississippi River, is abundant with high swelling potential clays.

Clays in the Quaternary alluvium of the lower Mississippi River valley in Louisiana are reported to be of the "montmorillonite type”. Clayey soils of the alluvial valley have high "shrink-swell capacity," and foundation problems in the area are associated with changing water levels and the instability of clayey soils. Foundation failures in alluvial deposits of the Mississippi River valley are common. Figure 2-17 shows the primary locations of swelling clays in Louisiana.

Areas within the planning area that are at risk to expansive soils are shown in *Figure 2-18*.

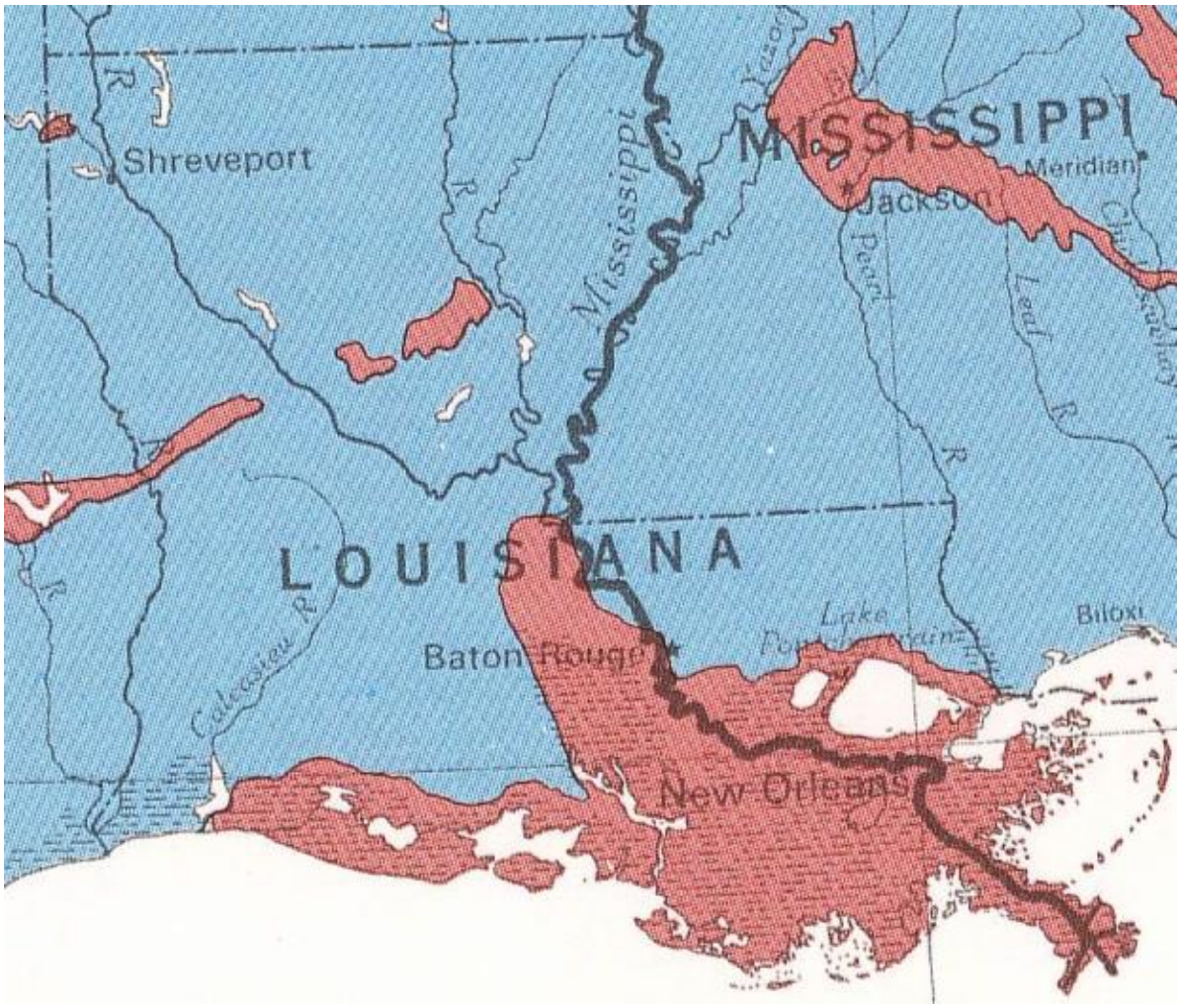


Figure 2-17: Location of swelling clays in Louisiana
(Source: "Swelling Clays Map Of The Conterminous United States," W.W. Olive, A.F. Chleborad, C.W. Frahme, Julius Schlocker, R.R. Schneider, and R.L Shuster; 1989)

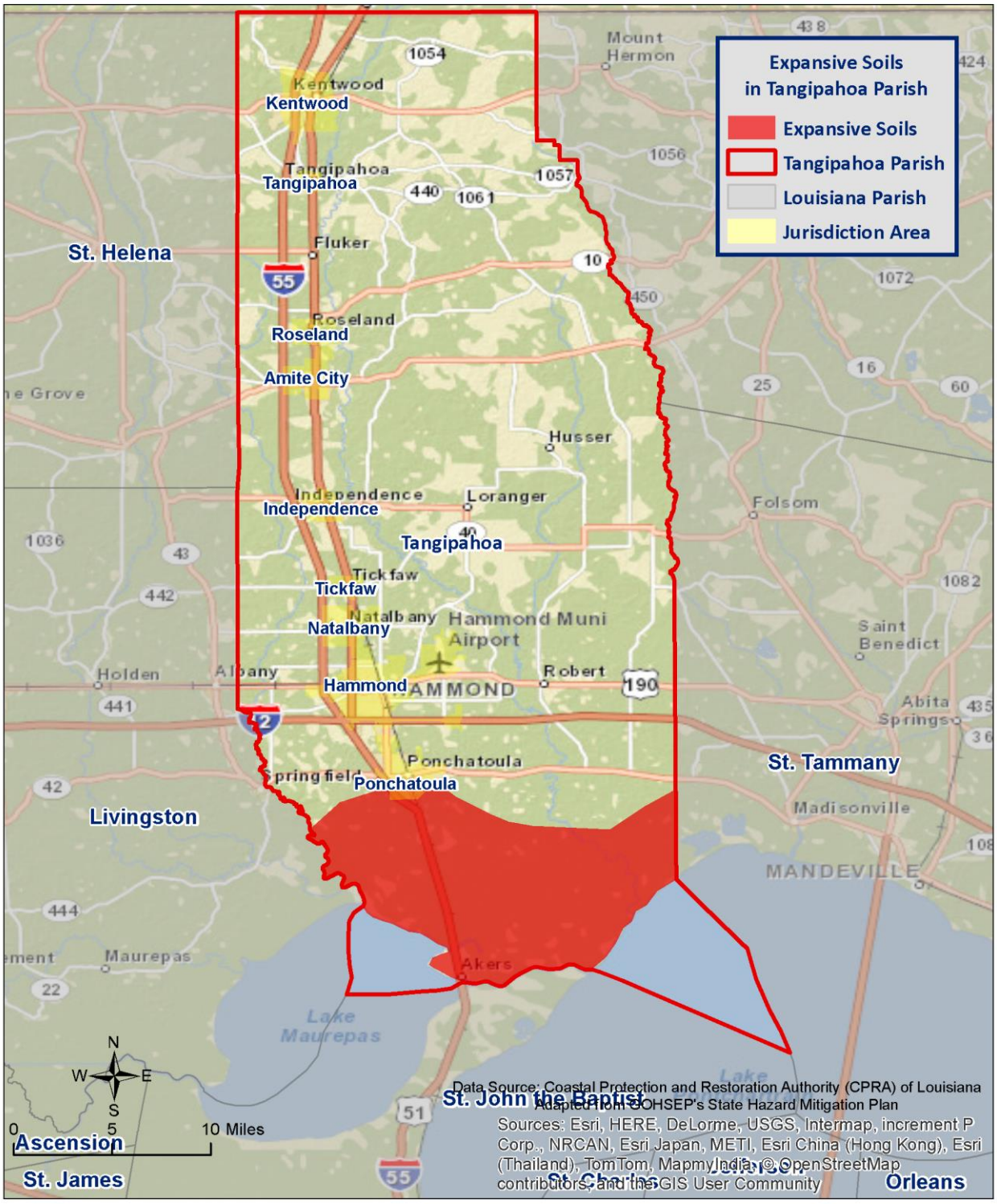


Figure 2-18: Location of swelling clays in Tangipahoa Parish
(Source: "Swelling Clays Map Of The Conterminous United States," W.W. Olive, A.F. Chleborad, C.W. Frahme, Julius Schlocker, R.R. Schneider, and R.L Shuster; 1989)

Based on the map the map in *Figure 2-18*, the primary risk of expansive soils is in the southern portion of unincorporated Tangipahoa Parish and southern Ponchatoula in primarily uninhabited marsh areas.

Previous Occurrences / Extent

Since the last plan update, no new information has been found regarding previous occurrences in the planning area.

Frequency / Probability

The probability of expansive soils in the areas designated in Figure 2-18 is 100%. However, because of the low population in the affected areas, expansive soil is considered a low impact hazard in the planning area.

Estimated Potential Losses

Because of the low impact of expansive soils in the planning area, expansive soils does not need to be addressed and is not carried forward into risk assessment.

Extreme Heat

There is no operational definition for defining heat or a heat wave. Heat waves are the consequence of the same weather pattern as drought and therefore both hazards often occur concurrently. A heat wave is an extended period of oppressive and above normal temperatures over a given period of time. The World Meteorological Organization recommends the declaration of a heat wave when the daily maximum temperature exceeds the average maximum temperatures by 9 F° and lasts for a period of at least five days.

However, temperature alone is insufficient to describe the stress placed on humans (as well as flora and fauna) in hot weather. It is crucial to consider the effect of relative humidity since it is essential to the body's ability to perspire and cool. Once air temperature reaches 95° F, perspiration becomes a very significant biophysical mechanism to ensure heat loss. Perspiration is ineffective as a cooling mechanism if the water cannot evaporate (i.e., sweating in high relative humidity is reduced as compared to during dry conditions). To communicate this relationship between temperature and humidity, the National Weather Service (NWS) developed the Heat Index (HI), which provides a warning system based on a combination of air temperature and relative humidity. The HI is presented in Figure 2-19 The NWS devised the index for shady, light wind conditions, and thus advises that the HI value can be increased by as much as 15 F° if a person is in direct sunlight, and that strong winds of hot, dry air can be extremely hazardous.

Most heat disorders (e.g., sunburn, heat cramps, heat exhaustion, and heat stroke) occur because the victim has been overexposed to heat or has over-exercised considering age and physical condition. Other circumstances that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Seniors and children are most at risk from adverse heat effects. Extreme heat can also damage roads, bridges, pipelines, utilities, and railroads. High temperatures can be partially responsible for deflection of rails and related railroad accidents.

According to NOAA, extreme heat is the leading weather-related cause of deaths in the United States. And while heat-related deaths in Louisiana are not common, due in part to the consistency and predictability of high seasonal temperatures, they do occur, and are still very intense and dangerous. Such deaths happen in a variety of circumstances, often in ways that are not easily categorized because they are unexpected. For instance, although exposure to heat is higher at the beach than usual, NOAA does not track heat-related deaths there because such deaths happen infrequently.

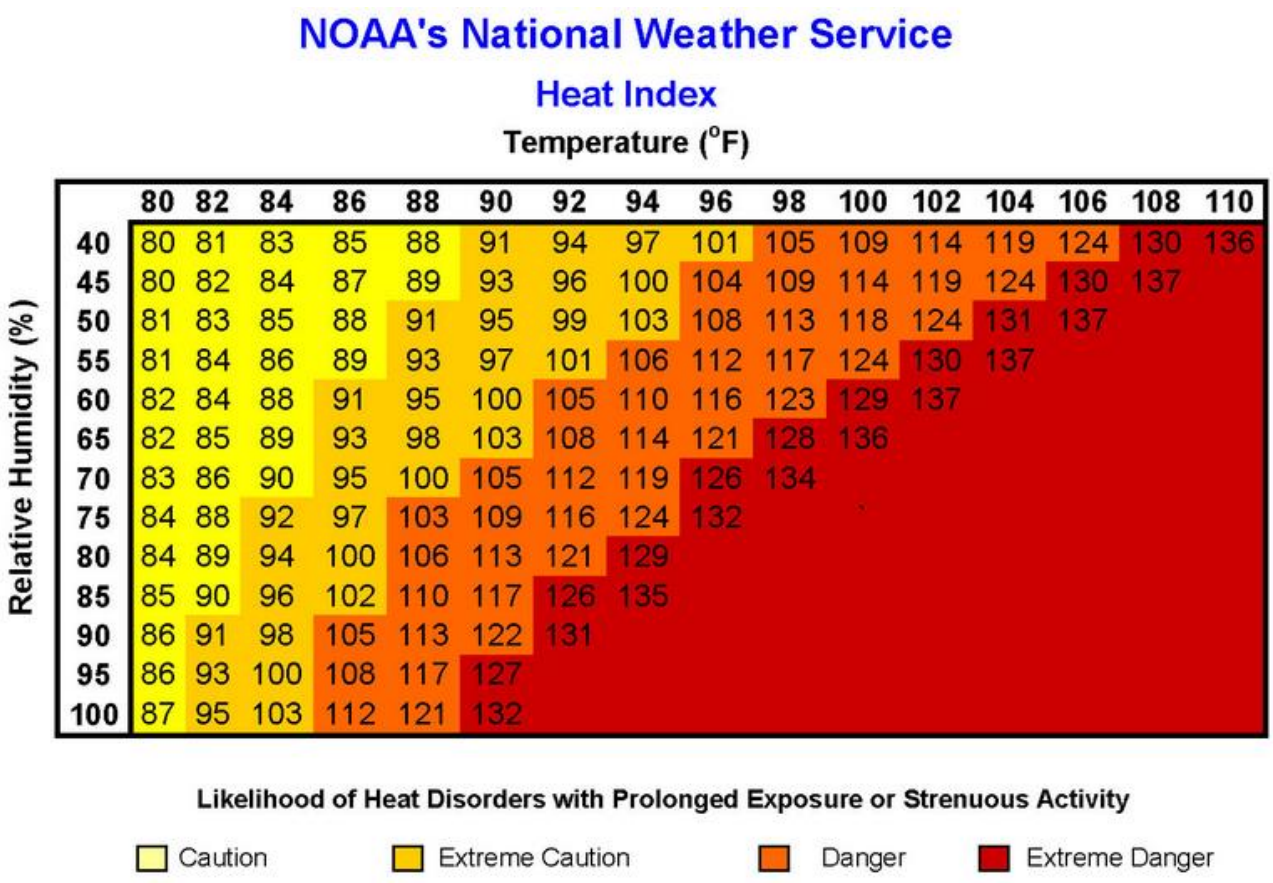


Figure 2-19: Heat Index advisory based on air temperature (F) and relative humidity. (Source: National Weather Service)

Location

Extreme heat typically impacts a region and not one specific parish or jurisdiction. Because extreme heat is a climatological based hazard and has the same probability of occurring in Tangipahoa Parish as all of the adjacent parishes, the entire planning area for Tangipahoa Parish is equally at risk for extreme heat.

Previous Occurrences / Extent

The SHELDUS database reports a total of 2 significant extreme heat events occurring within the boundaries of Tangipahoa Parish between the years of 1960 - 2014. *Table 2-22* provides an overview of extreme heat events that have impacted the Tangipahoa Parish planning area since 1960.

Table 2-22: Previous occurrences of extreme heat in Tangipahoa Parish (Source: SHELDUS)

Date	Crop Damage
May 1963	$5,894,763
July 1980	$22,087

Frequency / Probability

The State of Louisiana Hazard mitigation plan estimated the probability of occurrence of extreme heat at 100%. The probability was determined based on the geographical location of the state of Louisiana and Tangipahoa Parish.

Estimated Potential Losses

According to the SHELDUS database, crop damage due to extreme heat in Tangipahoa Parish have totaled approximately $616,850 since 1960. A list of the crop damages by event can be found in Table 2-22. To estimate the potential loses of an extreme heat event on an annual basis, the total damages recorded for extreme event was divided by the total number of years of available extreme heat data in SHELDUS (1960 – 2014). This provides an annual estimated potential loss of $11,423. To access potential losses proportionally across the jurisdictions, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. Based on the 2010 Census data, the following table provides an estimate of potential crop losses for Tangipahoa Parish:

Table 2-23: Estimated annual crop losses in Tangipahoa Parish from extreme heat.

Estimated Annual Potential Loses from Hailstorms for Tangipahoa Parish								
Unincorporated Tangipahoa Parish (69.3% of Population)	Amite (3.4% of Population)	Hammond (16.5% of Population)	Independence (1.4% of Population)	Kentwood (1.8% of Population)	Ponchatoula (5.4% of Population)	Roseland (0.9% of Population)	Tangipahoa (0.6% of Population)	Tickfaw (0.6% of Population)
$7,919	$391	$1,888	$157	$207	$619	$106	$71	$65

The Parish has suffered no deaths or injuries due to extreme heat from 1960 – 2014.

Based on historical data, extreme heat is determined not to pose a significant risk to the planning area within Tangipahoa Parish.

Flooding

A flood is the overflow of water onto land that is usually not inundated. The National Flood Insurance Program defines a flood as:

> A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from overflow of inland or tidal waves, unusual and rapid accumulation or runoff of surface waters from any source, mudflow, or collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Factors influencing the type and severity of flooding include natural variables such as precipitation, topography, vegetation, soil texture, and seasonality, as well as anthropogenic factors such as urbanization (extent of impervious surfaces), land use (e.g., agricultural and forestry tend to remove native vegetation and accelerate soil erosion), and the presence of flood-control structures such as levees and dams.

Excess precipitation, produced from thunderstorms or hurricanes, is often the major initiating condition for flooding, and Louisiana can have high rainfall totals at any time of day or year. During the cooler months, slow-moving frontal weather systems produce heavy rainfalls, while the summer and autumn seasons produce major precipitation in isolated thunderstorm events (often on warm afternoons) that may lead to localized flooding. During these warmer seasons, floods are overwhelmingly of the flash flood variety, as opposed to the slower-developing river floods caused by heavy stream flow during the cooler months.

In cooler months, particularly in the spring, Louisiana is in peak season for severe thunderstorms. The fronts that cause these thunderstorms often stall while passing over the state, occasionally producing rainfall totals exceeding 10 in. within a period of a few days. Since soil tends to be nearly saturated at this time (due to relatively low overall evaporation rates), spring typically becomes the period of maximum stream flow across the state. Together, these characteristics increase the potential for high water, and low-lying, poorly drained areas are particularly prone to flooding during these months.

In Louisiana, six specific types of floods are of main concern: riverine, flash, ponding, backwater, urban, and coastal.

- **Riverine flooding** occurs along a river or smaller stream. It is the result of runoff from heavy rainfall or intensive snow or ice melt. The speed with which riverine flood levels rise and fall depends not only on the amount of rainfall, but even more on the capacity of the river itself and the shape and land cover of its drainage basin. The smaller the river, the faster water levels rise and fall. Thus, the Mississippi River levels rise and fall slowly due to its large capacity. Generally, elongated and intensely-developed drainage basins will reach faster peak discharges and faster falls than circular-shaped and forested basins of the same area.
- **Flash flooding** occurs when locally intense precipitation inundates an area in a short amount of time, resulting in local stream flow and drainage capacity being overwhelmed.
- **Ponding** occurs when concave areas (e.g., parking lots, roads, and clay-lined natural low areas) collect water and are unable to drain.
- **Backwater flooding** occurs when water slowly rises from a normally unexpected direction where protection has not been provided. A model example is the flooding that occurred in LaPlace during Hurricane Isaac in 2012. Although the town was protected by a levee on the side facing the Mississippi, floodwaters from Lake Maurepas and Lake Pontchartrain crept into the community on the side of town opposite the Mississippi River.

- **Urban flooding** is similar to flash flooding but is specific to urbanized areas. It takes place when storm water drainage systems cannot keep pace with heavy precipitation, and water accumulates on the surface. Most urban flooding is caused by slow-moving thunderstorms or torrential rainfall.
- **Coastal flooding** can appear similar to any of the other flood types, depending on its cause. It occurs when normally dry coastal land is flooded by seawater, but may be caused by direct inundation (when the sea level exceeds the elevation of the land), overtopping of a natural or artificial barrier, or the breaching of a natural or artificial barrier (i.e., when the barrier is broken down by the sea water). Coastal flooding is typically caused by storm surge, tsunami, and gradual sea level rise.

In Tangipahoa parish, all six types of flooding have historically been observed. For purposes of this assessment, ponding, flash flood and urban flooding are considered to be flooding as a result of storm water from heavy precipitation thunderstorms

Based on stream gauge levels and precipitation forecasts, the National Weather Service (NWS) posts flood statements watches and warnings. The NWS issues the following weather statements with regard to floods:

- **Flood Categories**
  - Minor Flooding: Minimal or no property damage, but possibly some public threat.
  - Moderate Flooding: Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations.
  - Major Flooding: Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
  - Record Flooding: Flooding which equals or exceeds the highest stage or discharge at a given site during the period of record keeping.

- **Flood Warning**
  - Issued along larger streams when there is a serious threat to life or property.

- **Flood Watch**
  - Issued when current and developing hydrometeorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.

Floods are measured mainly by probability of occurrence. A 10-yr flood event, for example, is an event of small magnitude (in terms of stream flow or precipitation) but with a relatively high annual probability of recurrence (10%). A 100-yr flood event is larger in magnitude, but it has a smaller chance of recurrence (1%). A 500-yr flood is significantly larger than both a 100-yr event and a 10-yr event, but it has a lower probability than both to occur in any given year (0.2%). It is important to understand that an x-yr flood event does not mean an event of that magnitude occurs only once in x years. Instead, it just means that on average, we can expect a flood event of that magnitude to occur once every x years. Given that such statistical probability terms are inherently difficult for the lay population to understand, the Association of State Floodplain Managers (ASFPM) promotes the use of more tangible expressions of flood probability. As such, the ASFPM also expresses the 100-yr flood event has having a 25% chance of occurring over the life of a 30-yr mortgage.

It is essential to understand that the magnitude of an x-yr flood event for a particular area depends on the source of flooding and the area's location. The size of a specific flood event is defined through historic data of precipitation, flow, and discharge rates. Consequently, different 100-yr flood events can have very different impacts. The 100-yr flood events in two separate locations have the same likelihood to occur, but they do not necessarily have the same magnitude. For example, a 100-yr event for the Mississippi River

means something completely different in terms of discharge values (ft^3/s) than, for example, for the Amite River. Not only are the magnitudes of 100-yr events different between rivers, they can be different along any given river. A 100-yr event upstream is different from one downstream since river characteristics (volume, discharge, and topography) change. As a result, the definition of what constitutes a 100-yr flood event is specific to each location, river, and time, since floodplain and river characteristics change over time. Finally, it is important to note that each flood event is unique. Two hypothetical events at the same location, given the same magnitude of stream flow, may still produce substantially different impacts, if there were different antecedent moisture characteristics, different times of day of occurrence (which indicates the population's probable activities at the flood's onset), or other characteristic differences.

The 100-yr event is of particular significance since it is the regulatory standard that determines the obligation or lack thereof to purchase flood insurance. Flood insurance premiums are set depending on the flood zone as modeled by National Flood Insurance (NFIP) Rate Maps. The NFIP and FEMA suggest insurance rates based on special flood hazard areas (SFHAs), as diagrammed in *Figure 2-20*.

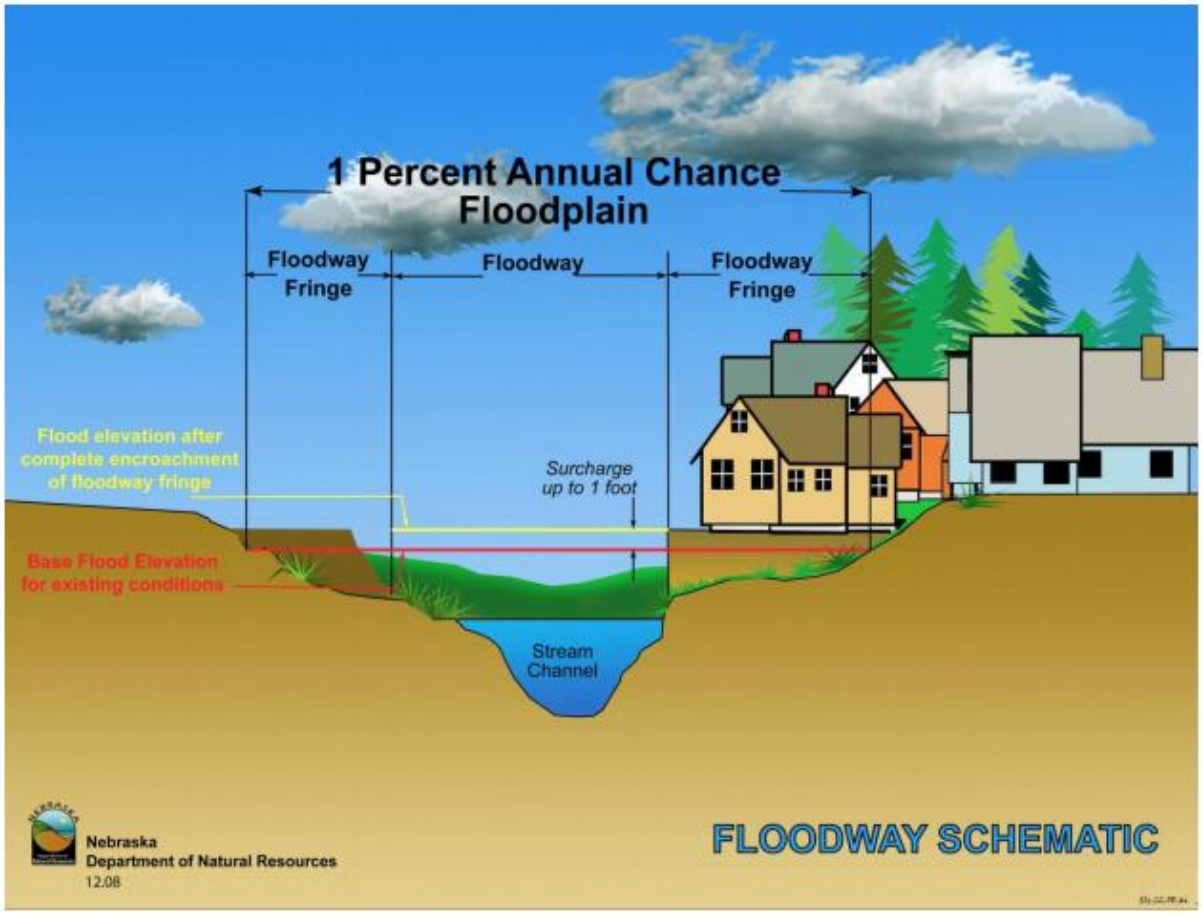


Figure 2-20: Schematic of 100-yr floodplain. The special hazard area (SFHA) extends to the end of the floodway fringe.
(Source: Nebraska Department of Natural Resources Desk Reference).

A SFHA is the land area covered by the floodwaters of the base flood (red line in *Figure 2-20*), where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

Property Damage

The depth and velocity of flood waters are the major variables in determining property damage. Flood velocity is important because the faster water moves, the more pressure it puts on a structure and the more it will erode stream banks and scour the earth around a building's foundation. In a few situations, deep and fast moving waters will push a building off its foundation. Structural damage can also be caused by the weight of standing water (hydrostatic pressure).

Another threat to property from a flood is called soaking. When soaked, many materials change their composition or shape. Wet wood will swell, and if dried to quickly, will crack, split, or warp. Plywood can come apart and gypsum wallboard has the potential to fall apart if it is bumped before it has time to completely dry. The longer these materials are saturated, the more moisture, sediment, and pollutants they absorb.

Soaking can also cause extensive damage to household goods. Wooden furniture may become warped, making it unusable while other furnishings such as books, carpeting, mattresses, and upholstery usually are not salvageable. Electrical appliances and gasoline engines will flood, making them worthless until they are professionally dried and cleaned.

Many buildings that have succumbed to flood waters may look sound and unharmed after a flood, but water has the potential to cause severe property damage. Any structure that experiences a flood should be stripped, cleaned and allowed to dry before being reconstructed. This is an extremely expensive and time consuming effort.

Repetitive Loss Properties

Repetitive loss structures are structures covered by a contract for flood insurance made available under the NFIP that:

a. Has incurred flood-related damage on 2 occasions, in which the cost of the repair, on the average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event; and
b. At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

Severe repetitive loss (SRL) is defined by the Flood Insurance Reform Act of 2004 and updated in the Biggert-Waters Flood Insurance Reform Act of 2012. For a property to be designated SRL, the following criteria must be met:

a. Is covered under a contract for flood insurance made available under the NFIP; and
b. Has incurred flood related damage –
    1) For which 4 or more separate claims payments have been made under flood insurance coverage with the amount of each claim 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 have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

Repetitive loss properties for Tangipahoa Parish are provided below:

Table 2-24: Repetitive Loss Structures for Tangipahoa Parish.

Jurisdiction	Number of Structures	Residential	Commercial	Government	Total Claims	Total Claims Paid	Average Claim Paid
Tangipahoa Parish (Not Incorporated)	131	124	7	0	384	$10,391,670	$27,061
Amite, Town of	0	0	0	0	0	$0	$0
Hammond, City of	19	19	0	0	50	$638,548	$12,771
Independence, Town of	0	0	0	0	0	$0	$0
Kentwood, Town of	0	0	0	0	0	$0	$0
Ponchatoula, City of	2	2	0	0	6	$75,888	$12,648
Roseland, Town of	0	0	0	0	0	$0	$0
Tangipahoa, Village of	2	2	0	0	5	$85,060	$17,012
Tickfaw, Village of	1	1	0	0	2	$33,953	$16,976
Tangipahoa Parish Total	155	148	7	0	447	$11,225,119	$25,112

Of the 154 repetitive loss structures, 143 were able to be geocoded to provide an overview of where the repetitive loss structures are located throughout the parish. *Figure 2-21* shows the approximate location of the 143 structures, while *Figure 2-22* shows where the highest concentration of repetitive loss structures are located. Through the density map, it is clear that the primary concentrated area of repetitive loss structures are focused around the southern portion of the parish with Hammond and its immediate area serving as a focal point for these structures in Tangipahoa.

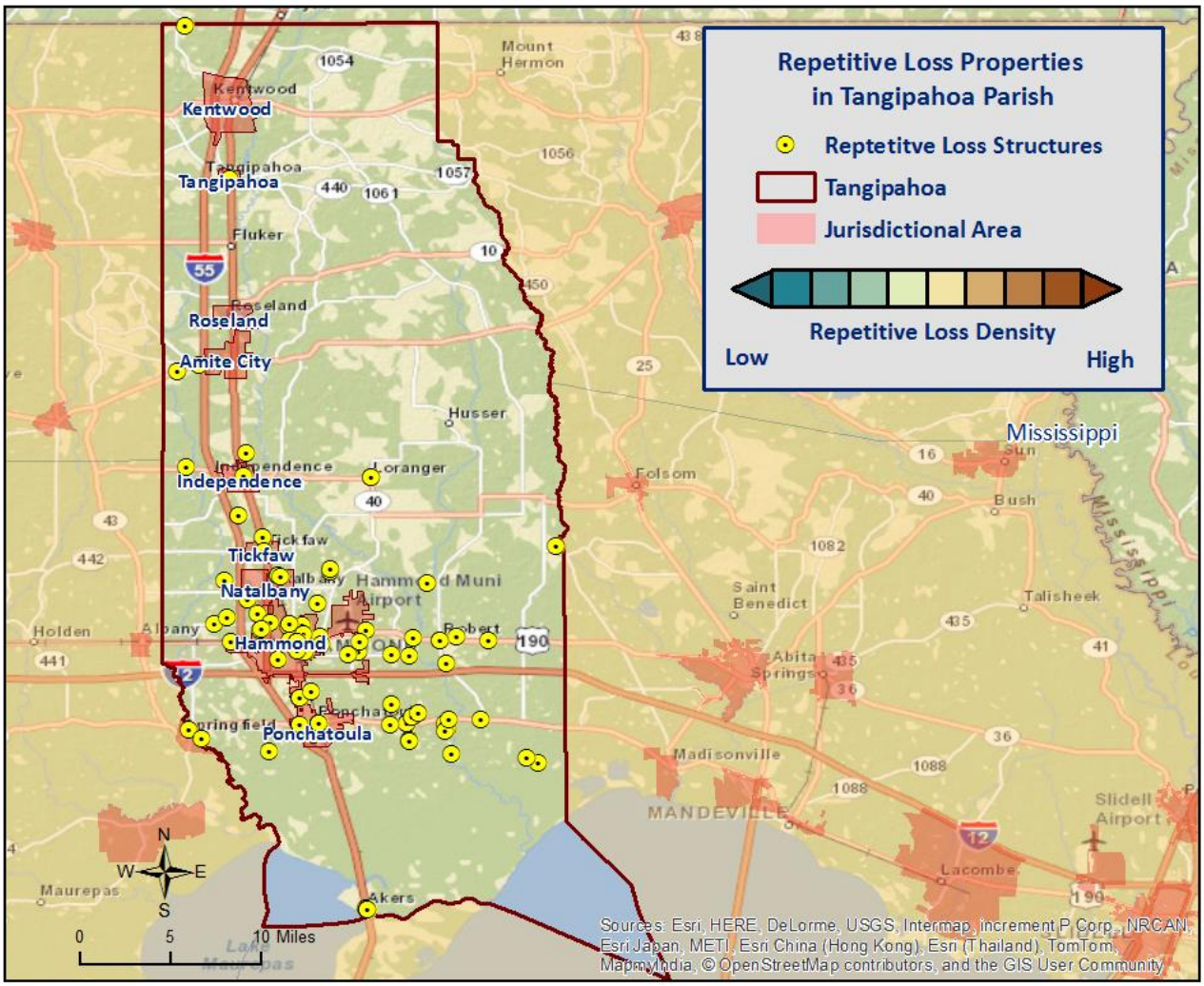


Figure 2-21: Repetitive Loss Properties in Tangipahoa Parish.

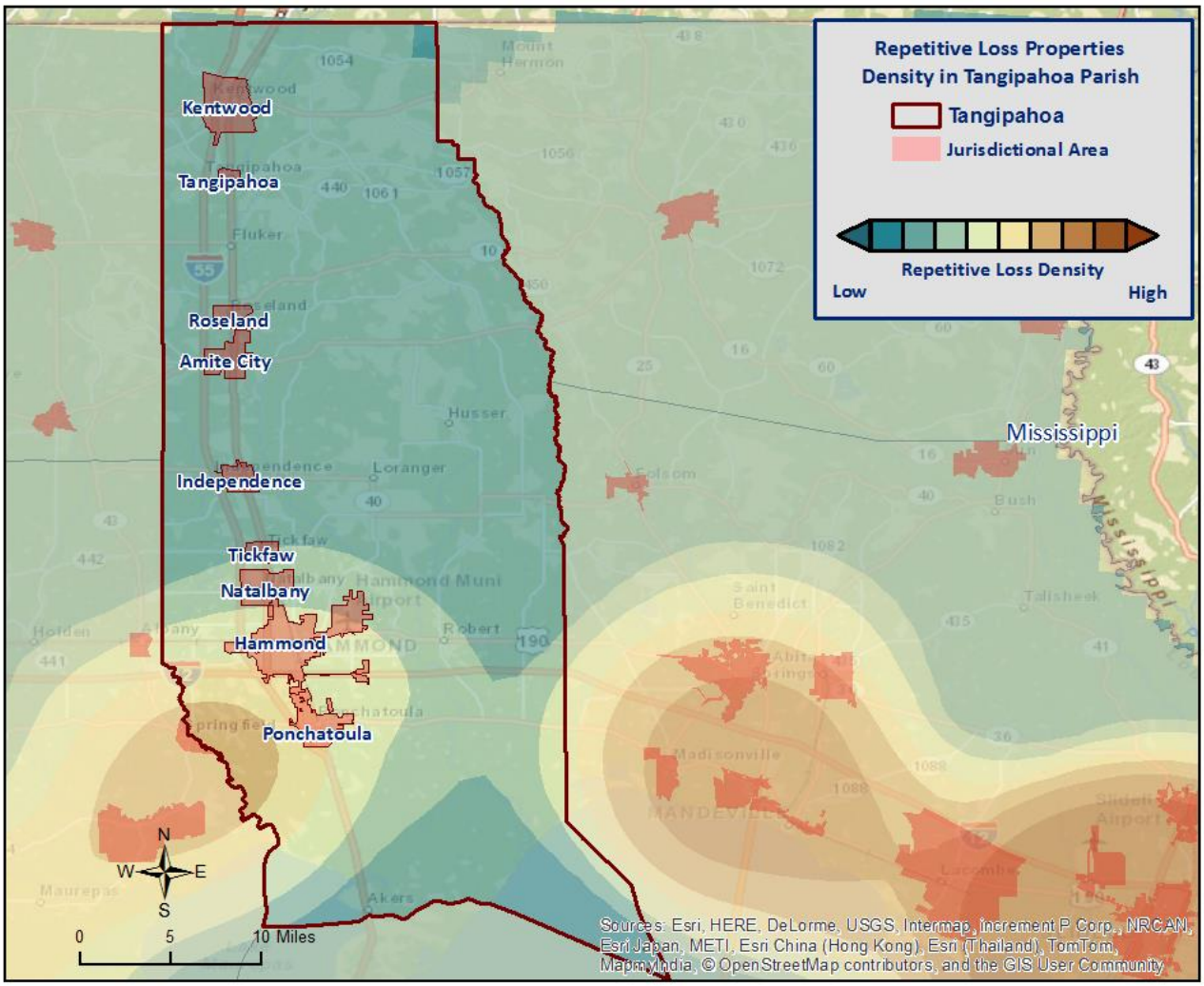


Figure 2-22: Repetitive Loss Property Densities in Tangipahoa Parish.

National Flood Insurance Program

Flood insurance statistics indicate that Tangipahoa Parish has over 6,500 flood insurance policies with the NFIP with total annual premiums in excess of $3.8 million. Tangipahoa Parish, Amite, Hammond, Independence, Kentwood, Ponchatoula, Roseland, the Village of Tangipahoa and Tickfaw are all participants in the NFIP. Flood insurance statistics and additional NFIP participation details for the unincorporated part of Tangipahoa Parish and incorporated municipalities are provided in the tables to follow.

Table 2-25: Summary of NFIP Policies for Tangipahoa Parish.

Location	No. of Insured Structures	Total Insurance Coverage Value	Annual Premiums Paid	No. of Insurance Claims Filed	Total Loss Payments
Tangipahoa Parish (Not	4,682	$1,104,823,800	$2,508,565	1,138	$19,880,570
Amite, Town of	27	$7,376,000	$16,166	8	$184,562
Hammond, City of	1,313	$291,357,100	$1,107,062	244	$1,905,557

Location	No. of Insured Structures	Total Insurance Coverage Value	Annual Premiums Paid	No. of Insurance Claims Filed	Total Loss Payments
Independence, Town of	89	$19,100,900	$66,719	4	$10,839
Kentwood, Town of	27	$6,603,900	$19,635	1	$100,055
Ponchatoula, City of	352	$93,981,100	$161,467	36	$1,193,067
Roseland, Town of	0	$0	$0	2	$0
Tangipahoa, Village of	4	$246,800	$1,904	14	$30,086
Ticfaw, Village of	58	$10,817,800	$38,811	9	$95,949
Total	6,552	$1,534,307,400	$3,920,329	1,456	$23,400,685

Table 2-26: Summary of Community Flood Maps for Tangipahoa Parish.

CID	Community Name	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Date Joined the NFIP	Tribal
220206	Tangipahoa Parish (Not Incorporated)	1/17/1975	2/2/1983	7/22/2010	2/2/1983	No
220207	Amite, Town of	12/7/1973	7/22/2010	7/22/2010	6/30/1976	No
220208	Hammond, City of	3/8/1974	12/15/1981	7/22/2010	12/15/1981	No
220209	Independence, Town of	5/17/1974	7/5/1977	7/22/2010 (M)	7/5/1977	No
220210	Kentwood, Town of	11/2/1973	4/15/1980	7/22/2010	4/15/1980	No
220211	Ponchatoula, City of	4/12/1974	4/17/1979	7/22/2010	4/17/1979	No
220212	Roseland, Town of	10/26/1973	9/1/1987	7/22/2010 (L)	9/1/1987	No
220213	Tangipahoa, Village of	8/30/1974	9/28/1979	7/22/2010	9/28/1979	No
220214	Tickfaw, Village of	8/30/1974	6/28/1977	7/22/2010	6/28/1977	No

According to the Community Rating System (CRS) list of eligible communities dated June 1, 2014, Tangipahoa Parish is the only jurisdiction with the parish that is a participant in the Community Rating System (CRS). *Table 2-27* provides details regarding CRS Participation for Tangipahoa Parish.

Table 2-27: Summary of the Community Rating System (CRS) Participation for Tangipahoa Parish.

Community Number	Name	CRS Entry Date	Current Effective Date	Current Class	% Discount for SFHA	% Discount for Non-SFHA	Status
225206	Tangipahoa Parish	10/1/1996	10/1/1996	9	5%	5%	C

Threat to People

Just as with property damage, depth and velocity are major factors in determining the threat posed to people by flooding. It takes very little depth or velocity for flood waters to become dangerous. A car will float in less than two feet of moving water and can be swept downstream into deeper waters, trapping the passengers within the vehicle. Victims of floods have often put themselves in perilous situations by entering flood waters they believe are safe or by ignoring travel advisories.

Major health concerns are also associated with floods. Floodwaters can transport materials such as dirt, oil, animal waste, and chemicals (e.g., farm, lawn and industrial), that may cause illnesses of various degrees when coming in contact with humans. Floodwaters can also infiltrate sewer lines and inundate wastewater treatment plants, causing sewage to backup and creating a breeding ground for dangerous bacteria. This infiltration may also cause water supplies to become contaminated and undrinkable.

Flooding in Tangipahoa Parish

Tangipahoa Parish is located in southeastern Louisiana, north of Lake Pontchartrain, and is one of the Florida Parishes. Tangipahoa Parish is a predominantly rural Parish whose economic base is comprised of truck, dairy, fish farms, and the timber industry. The Parish is approximately 51 miles long by 18 miles wide. The terrain of the Parish consists of gently rolling hills with elevations that range from 370 feet along the northern state boundary to 0 feet in the wetlands along Lakes Maurepas and Pontchartrain.

The Tangipahoa River, with a drainage area of 771 square miles at Lake Pontchartrain, flows from the northwestern to the southeastern part of the Parish. The Natalbany River, with a drainage area of 218 square miles at its mouth, flows through the Parish in a southern direction near the western border of the Parish. The mean annual temperature of the area is 67ºF. The mean monthly annual temperature ranges from a high of 83ºF in July to a low of 41ºF in January. The average rainfall is 62 inches.

Principal Flood Problems

Most flooding within the Parish occurs during the winter and spring months, however flooding can occur anytime during the year. During the late summer and fall, very heavy rainfall associated with hurricanes can cause floods. Flooding along Lake Pontchartrain and Lake Maurepas can occur as a result of either headwater floods, wind-driven wave action from hurricanes or from a combination of both.

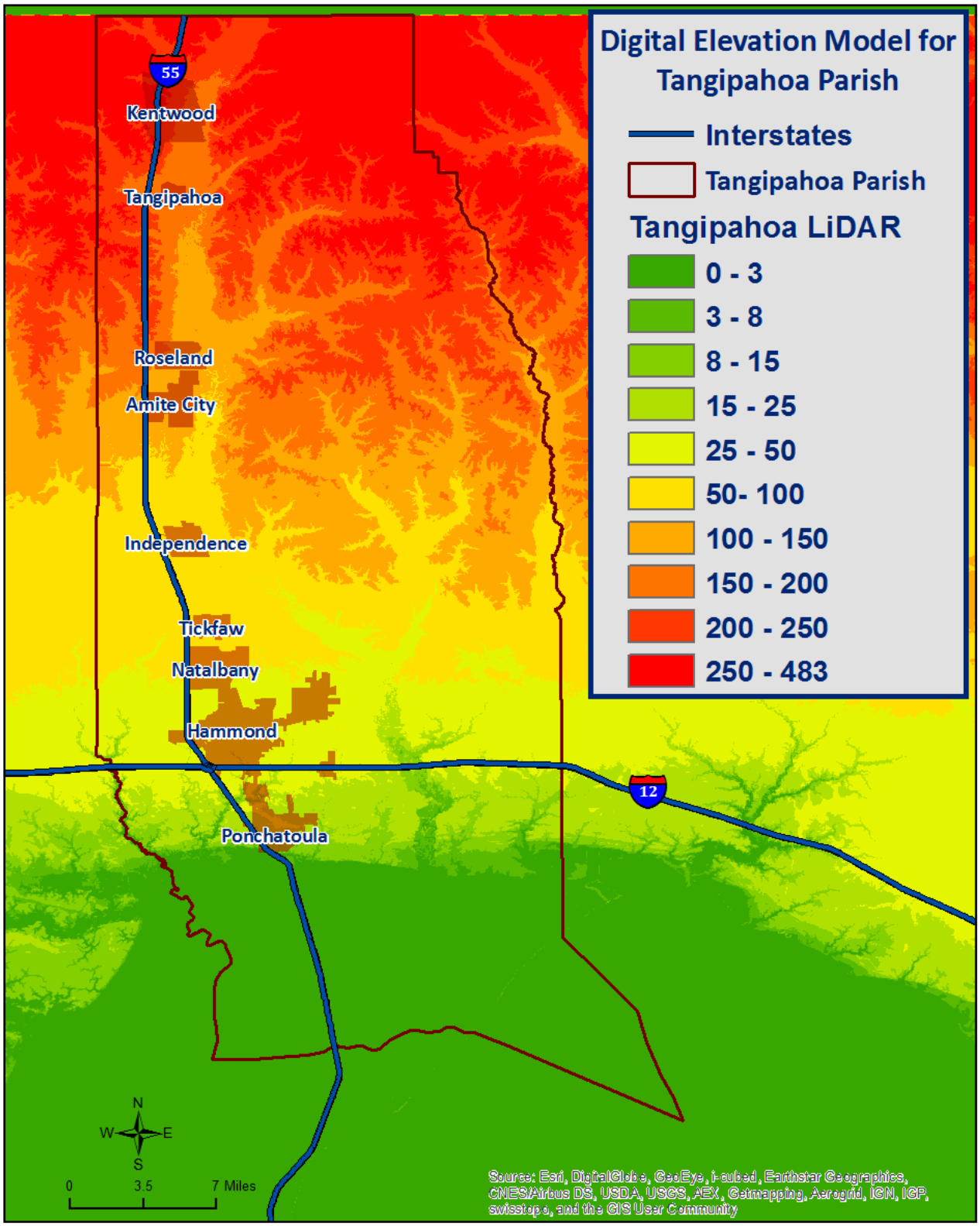


Figure 2-23: Elevation throughout Tangipahoa Parish.

Looking at the digital elevation model (DEM) in *Figure 2-23* for Tangipahoa Parish is instructive in visualizing where the low lying and risk areas are for the parish. The southern portion of the parish, primarily below Ponchatoula consists of wet lands and are bordered by Lake Maurepas and Lake Pontchartrain, which makes this area susceptible to storm surge. While the vast majority of the parish's elevation is above 25 feet, it is still susceptible to flooding due to its proximities to major water ways, particularly the Tangipahoa, River which runs parallel to most of the villages, towns and cities located within Tangipahoa Parish.

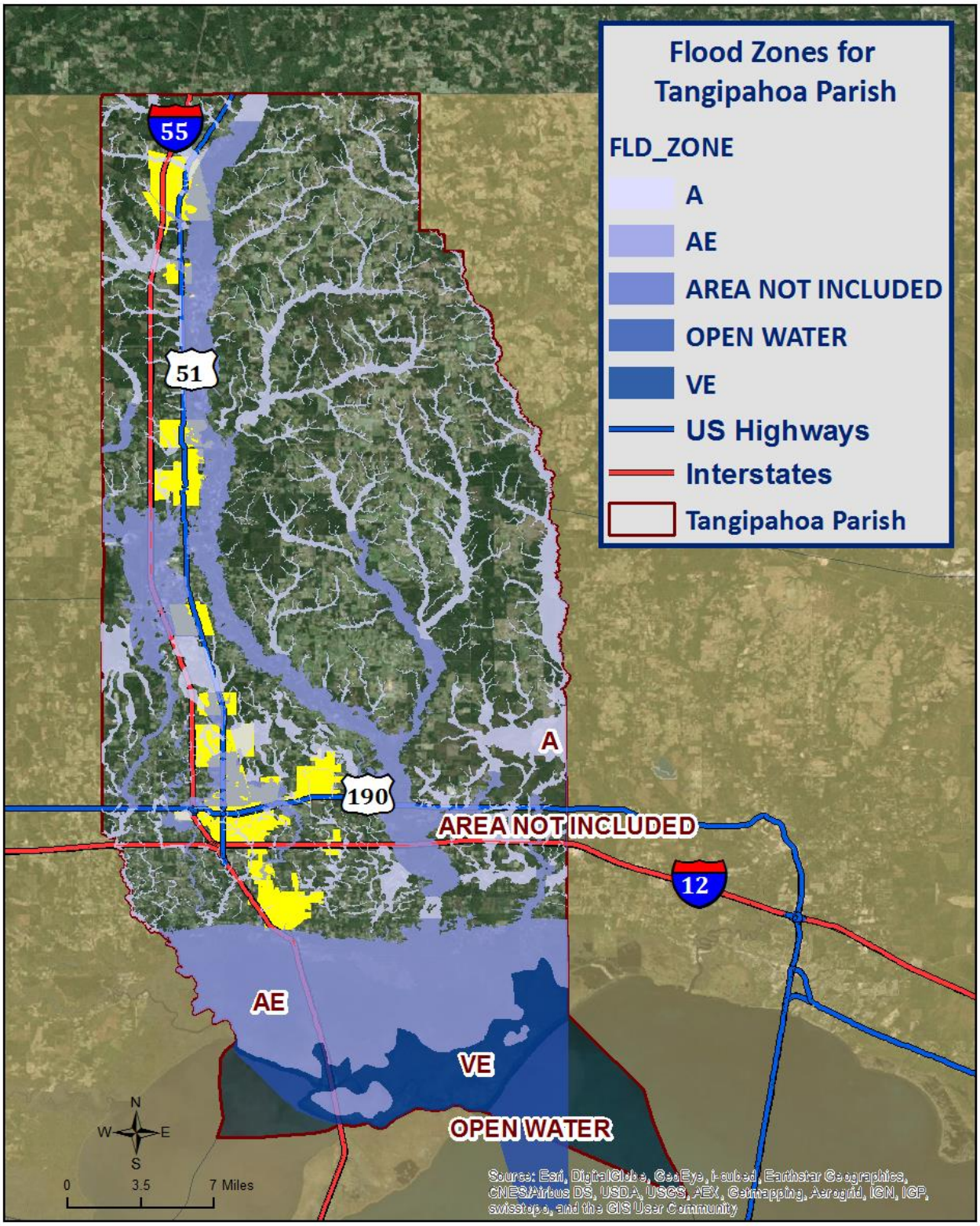


Figure 2-24: The 100 Year Floodplain for Tangipahoa Parish with Levee Systems.

Location

Tangipahoa parish has experienced significant flooding in its history and can expect more in the future. Approximately 11 percent of the Parish's total land area contains frequently flooded soils or floodplains. These areas generally run along with the Tangipahoa, Natalbany, Tchefuncte, and other creeks and rivers and are often flooded for long periods of time, usually between December and May. One-third of the Parish is either wetland or subject to flooding. These soils are swamps or other wetlands which have water depths of up to one food most of the year. This area is located in the lower section of the Parish, the wetland and floodplain of Lake Pontchartrain, and accounts for approximately 14 percent of the Parish.

The following are areas that have been impacted in Tangipahoa Parish during flood events:

- Flooding along the drainage ways adjacent to the Natalbany and
- Tangipahoa Rivers and Ponchatoula Creek
- Flooding at major drainage laterals along Highway 51 that connects
- the majority of incorporated areas
- Flooding in low-lying areas in Manchac
- Flooding at the 62 repetitive loss structure locations.

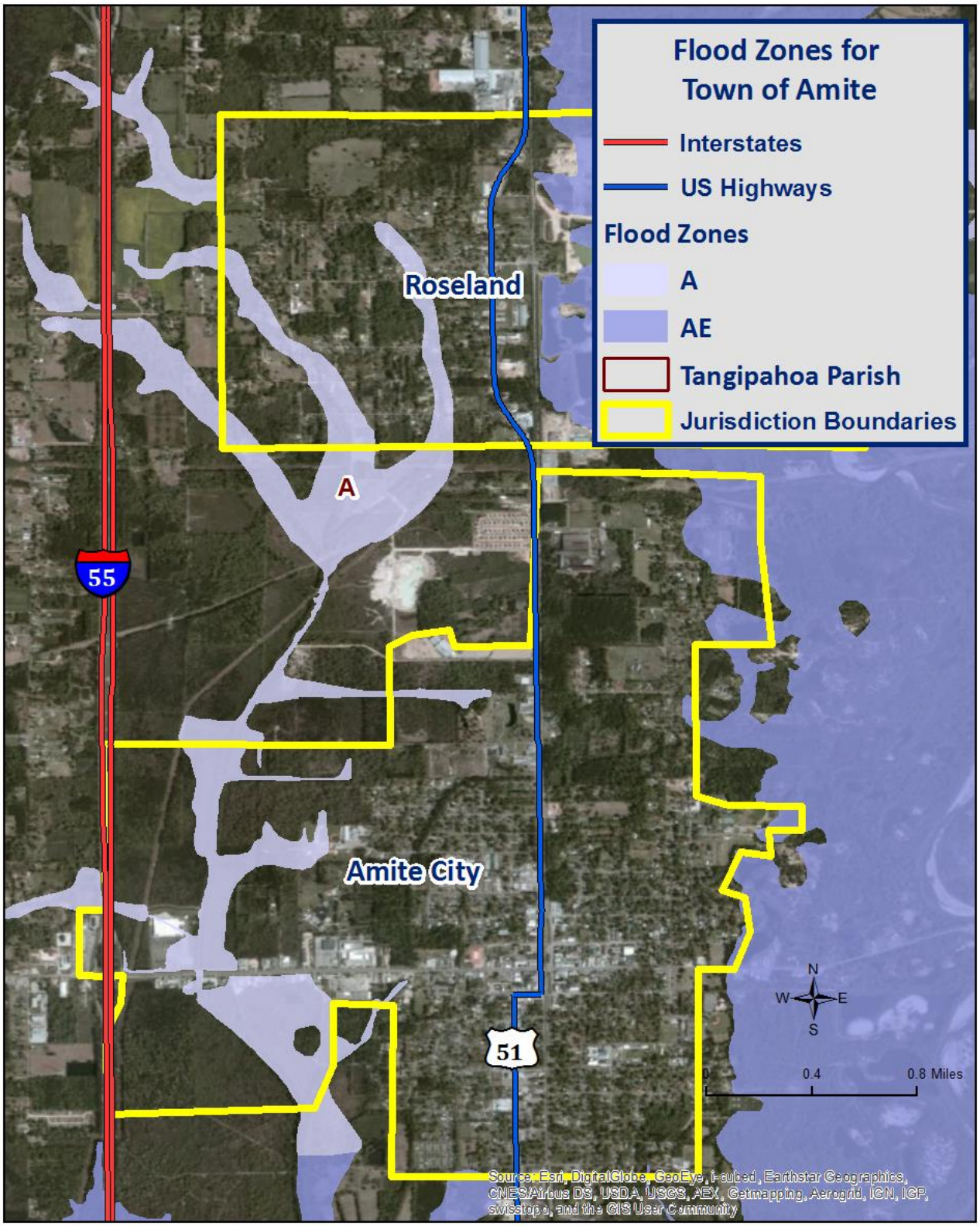


Figure 2-25: Town of Amite areas within the Flood Zones.

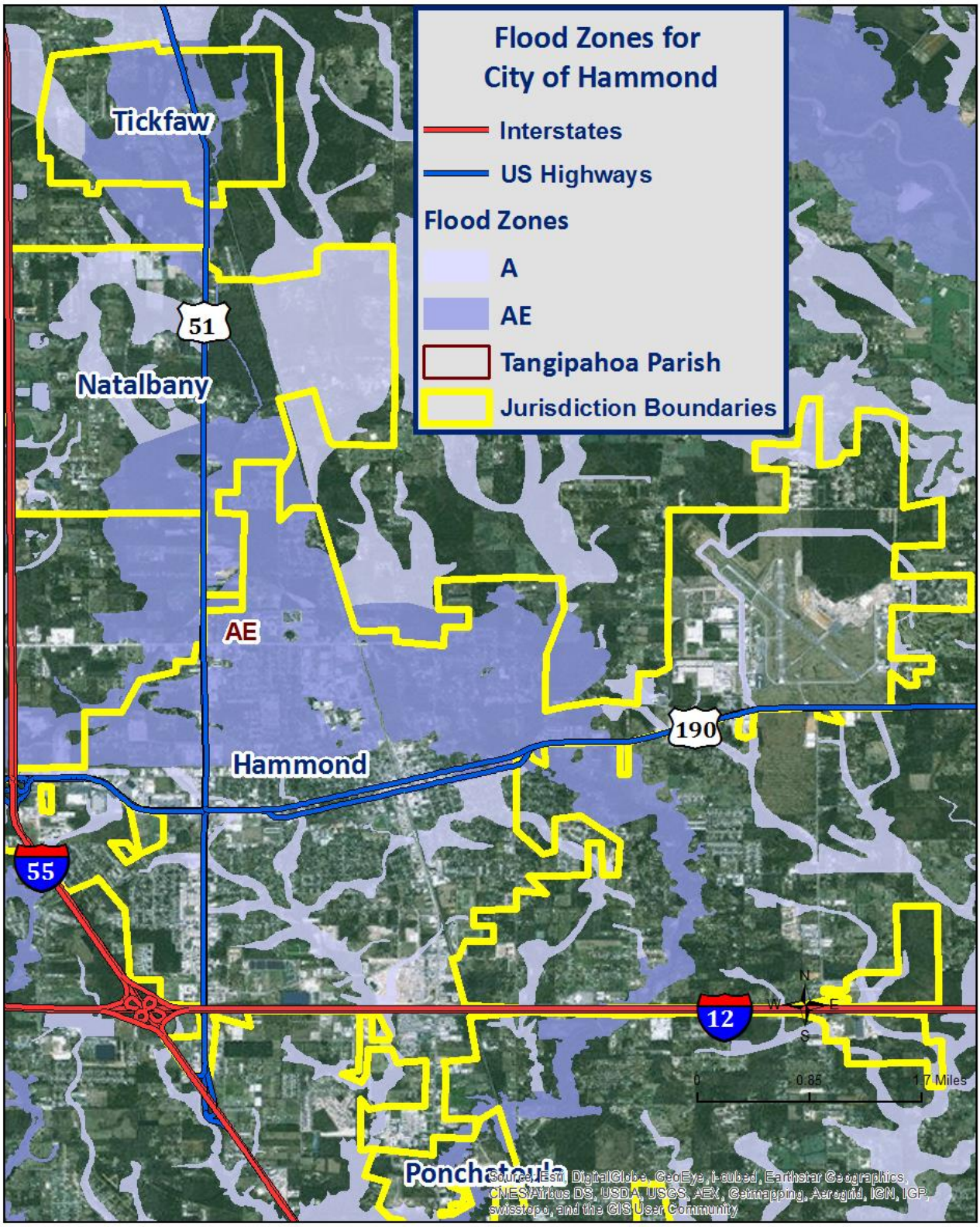


Figure 2-26: City of Hammond areas within the Flood Zones.

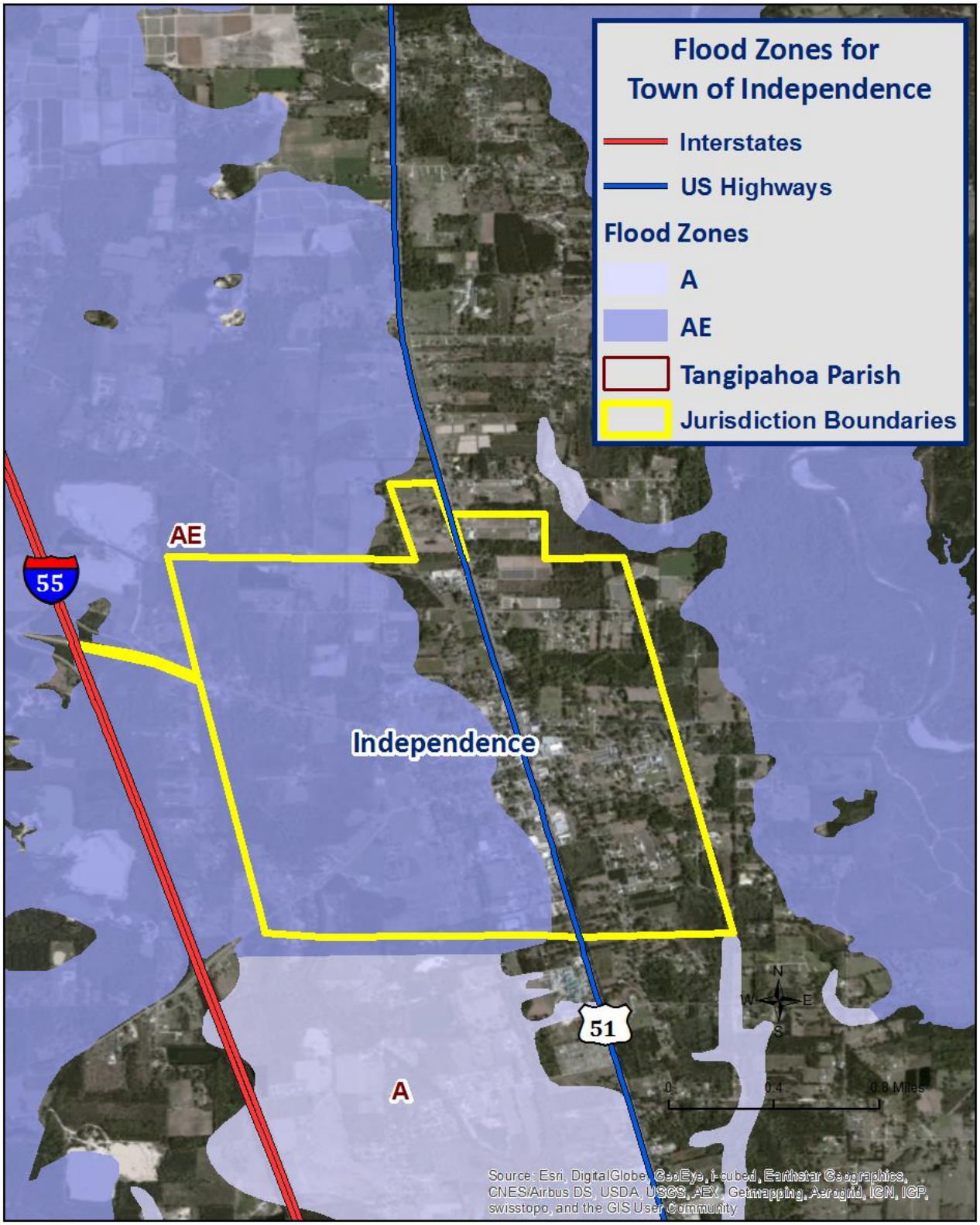


Figure 2-27: Town of Independence areas within the Flood Zones.

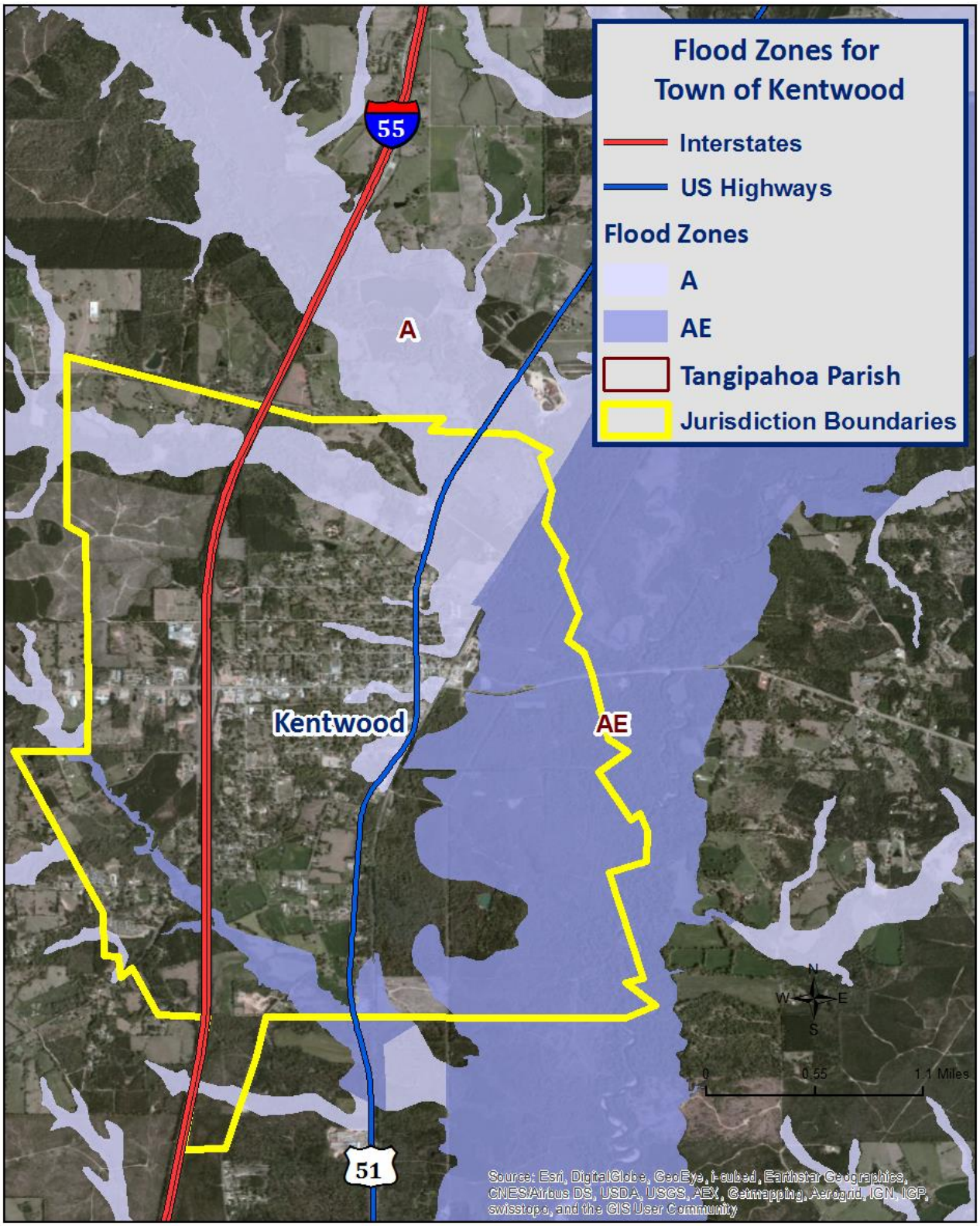


Figure 2-28: Town of Kentwood areas within the Flood Zones.

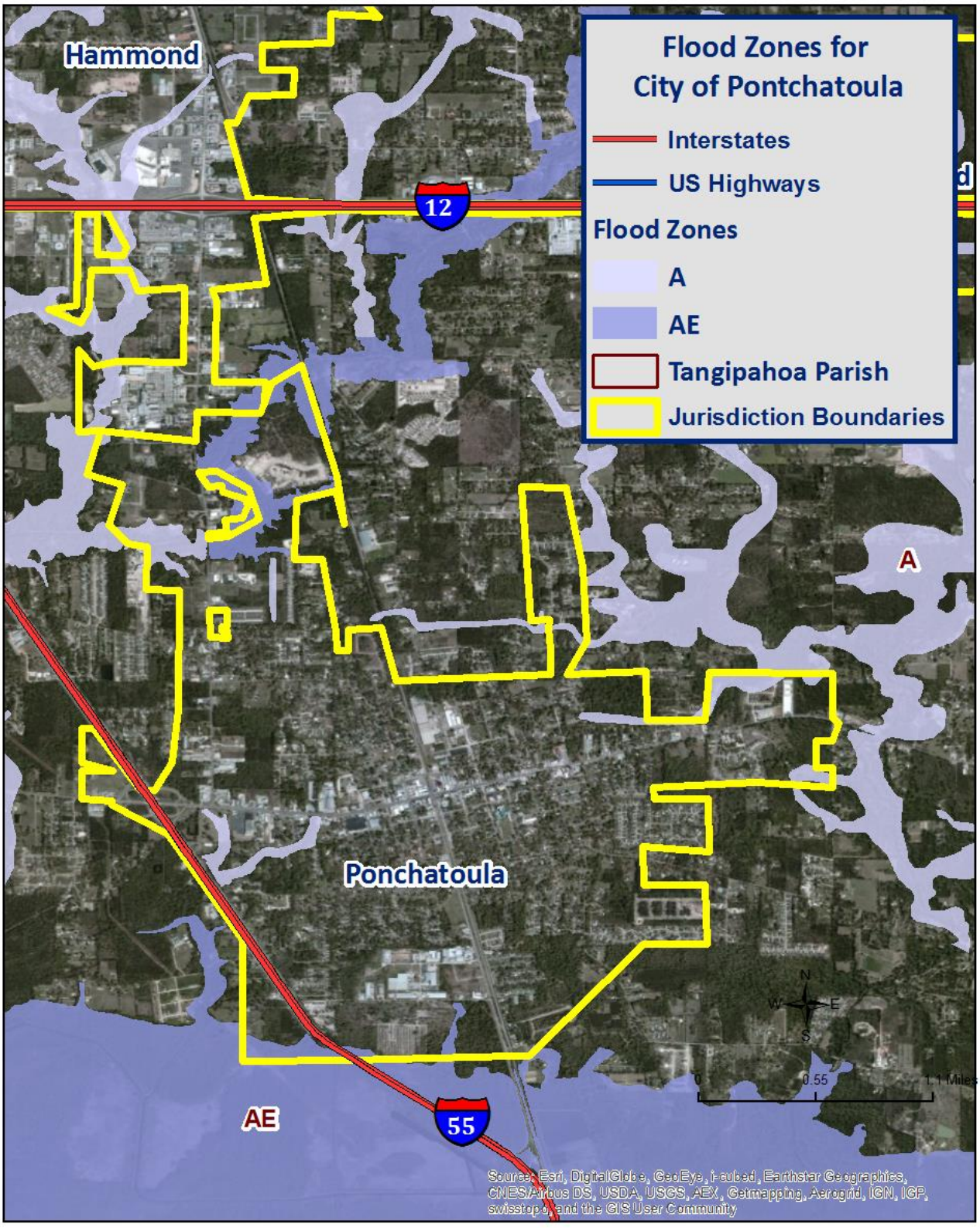


Figure 2-29: City of Ponchatoula areas within the Flood Zones.

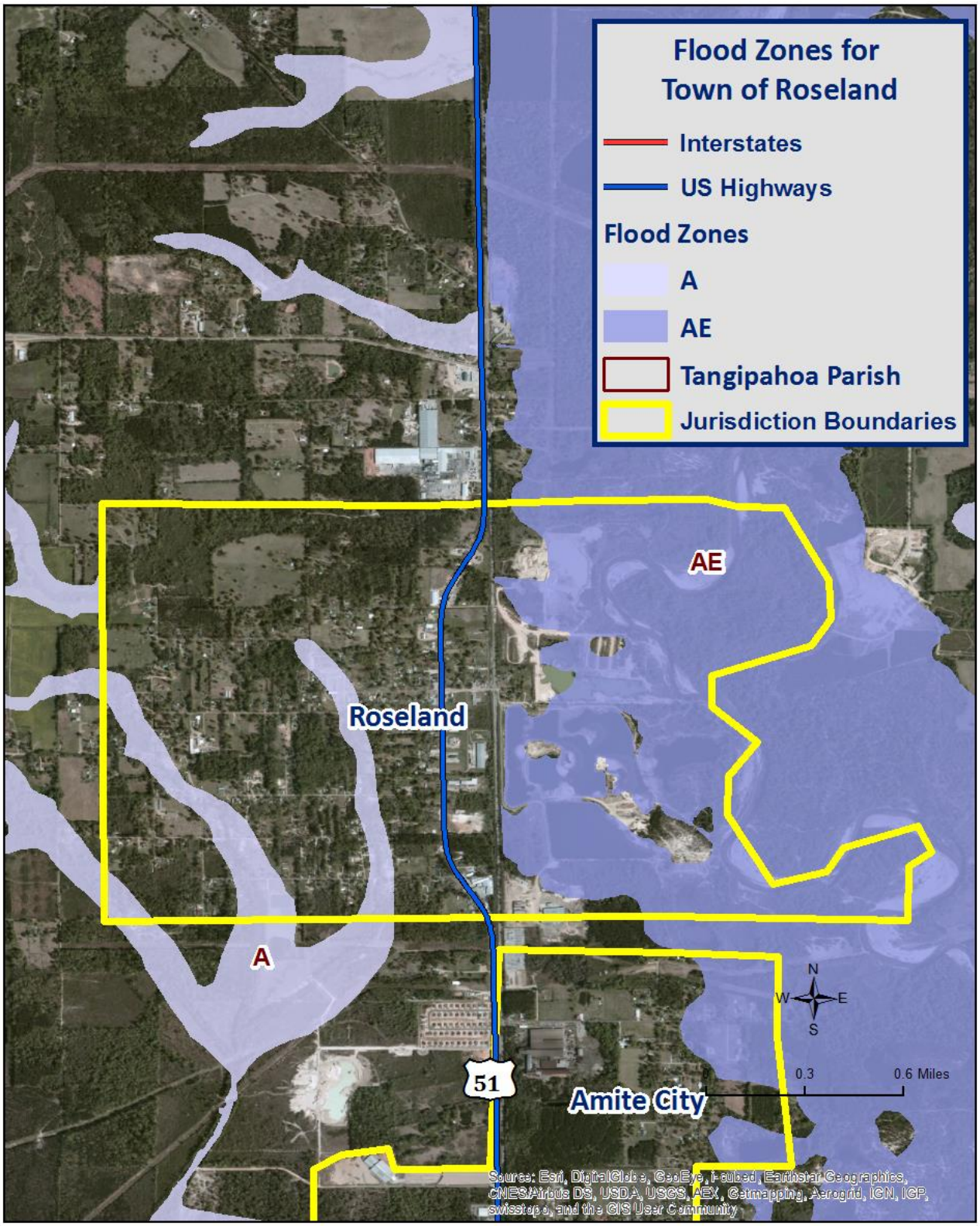


Figure 2-30: Town of Roseland areas within the Flood Zones.

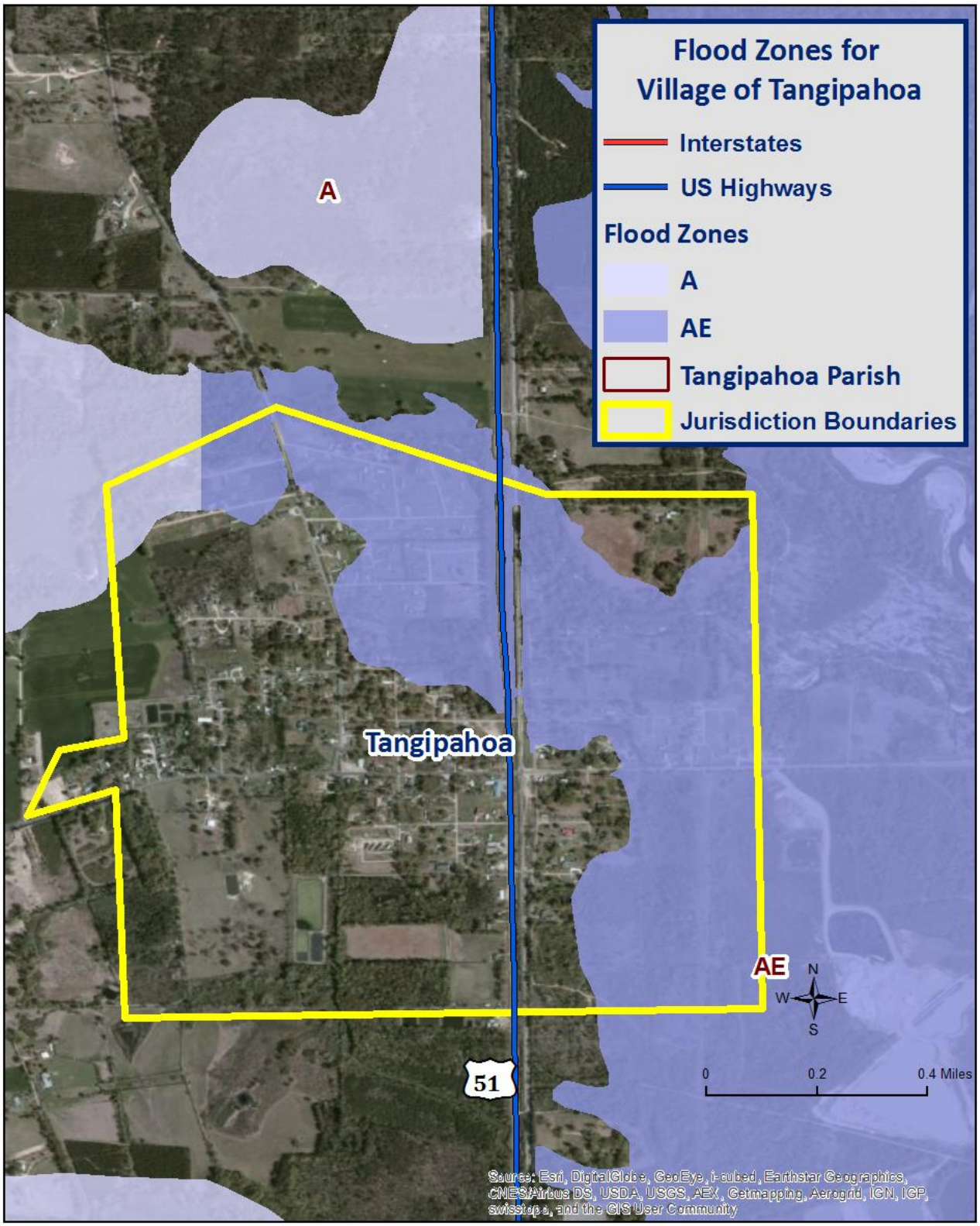


Figure 2-31: Village of Tangipahoa areas within the Flood Zones.

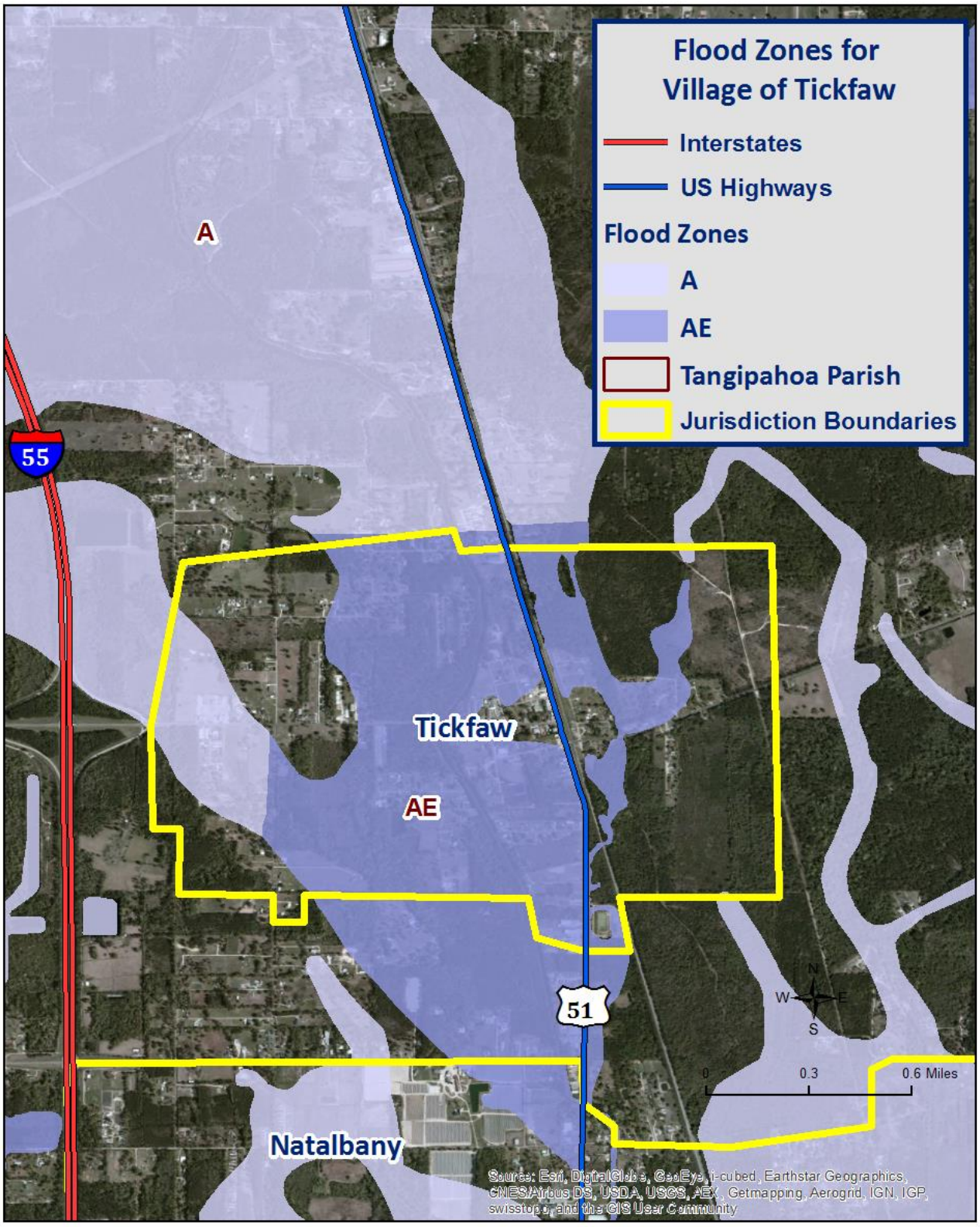


Figure 2-32: Village of Tickfaw areas within the Flood Zones.

Previous Occurrences and Extents

Historically, there have been 17 flood events that have created significant flooding in Tangipahoa parish between 1989 – 2014. Below is a brief synopsis of the 17 flooding events over the last 25 years, including each flooding event that has occurred since the parish's last planning update. Municipalities of the Tangipahoa Planning areas largest threat to flooding are in areas that are adjacent the Tangipahoa River. Areas immediately adjacent can expect to see 5 to 7 feet of flooding. Areas outside the immediate area can expect to see 1 to 3 feet of flooding from heavy rains and backwater flooding from the Tangipahoa River and other primary waterways throughout the parish.

Table 2-28: Historical floods in Tangipahoa Parish with locations from 1989 - 2014.

Date	Extents	Type of Flooding	Estimated Damages	Location
2/25/1997	Approximately 25 miles of roads, around rivers and low lying areas near rivers, were flooded after heavy rain.	Flood	$0	Tangipahoa (Unincorporated)
1/5/1998	Heavy rain of three to five inches occurred over portions of extreme southeast Louisiana. The heavy rain occurred within a few hours' time and overwhelmed drainage pumping capacity resulting in widespread street flooding.	Flood	$0	Hammond
1/22/1998	Heavy rain of 2.5 inches caused extensive street flooding.	Flood	$0	Ponchatoula
6/6/2001 (Federal Declaration)	Estimated rainfall was over 20 inches. The parish distributed over 3,000 sandbags. Approximately 30 roadways were flooded along with several houses.	Flash Flood	$100,000	Tangipahoa (Unincorporated)
4/7/2003	Three to four inches of rain fell in just a few hours causing flash flooding in areas of poor drainage. Several buildings and houses were flooded. A 12 year old boy playing in, or trying to cross a flooded creek with several other boys, was swept away and drowned.	Flash Flood	$0	Tangipahoa (Unincorporated)
6/30/2003	N/A	Flash Flood	$0	Tangipahoa (Unincorporated)
5/2/2008	Louisiana Highway 40 and a number of other roads were closed due to flooding from 6 to 10 inches of rain. A woman had to be rescued from a vehicle stranded in high water in the Loranger area.	Flash Flood	$0	Independence

Date	Extents	Type of Flooding	Estimated Damages	Location
5/14/2008	Several inches of rain flooded numerous streets and a number of homes in the Hammond area. Fourteen people had to be rescued from the high water.	Flash Flood	$0	Hammond
8/13/2010	Five inches of rain from the remnants of Tropical Depression Five flooded yards and approached homes near Hammond High School east of Hammond.	Flash Flood	$0	Hammond
8/19/2010	Several inches of rain from thunderstorms produced street flooding in several areas of Hammond and surrounding portions of Tangipahoa Parish.	Flash Flood	$0	Hammond
3/4/2011	A few roads in eastern portions of Hammond, including Old Covington Highway and Highway 190 East had 2 to 8 inches of water across them. Several roads were flooded between the Hammond area and Ponchatoula. A few other roads were closed due to high water.	Flash Flood	$0	Tangipahoa (Unincorporated)
3/8/2011	Moderate to major flooding developed on the lower portion of the Bogue Falaya and Tchefuncte Rivers in Tangipahoa Parish. The flooding was the result of heavy rain caused by TS Bill. Most rivers crested late on July 1st. River flooding damaged some man-made structures and flooded and damaged some roadways	Flash Flood	$100,000	Tangipahoa (Unincorporated)
3/8/2011	Many roads were reported under water in Kentwood with 3 to 4 feet of flooding in some areas.	Flash Flood	$0	Kentwood
3/8/2011	The Kentwood Police Department reported 6 water rescues as a result of 3 to 4 feet of flooding along a creek in the village of Tangipahoa.	Flood	$30,000	Village of Tangipahoa
9/2/2011	Flooding occurred in low lying areas and roadways south of Ponchatoula as a result of Tropical Storm Lee	Storm Surge/Tide	$35,000	Tangipahoa (Unincorporated)
5/2/2012	Extensive and deep street flooding was reported in Amite. Water was reported up to two feet deep on some roads.	Flash Flood	$0	Amite Roseland
8/28/2012	Localized flooding resulting from Hurricane Isaac. The Tangipahoa	Storm Surge/Tide	$26,800,000	Tangipahoa (Unincorporated)

Date	Extents	Type of Flooding	Estimated Damages	Location
	River reached flood stage at 22.87 feet, causing some backflow flooding.			

There have not been any significant flooding events within the Village of Tickfaw since the last plan update in 2010.

Frequency / Probability

While other parts of this plan, along with the State's Hazard Mitigation Plan have relied on the SHELDUS database to provides the annual probability, due to Tangipahoa parish having multiple jurisdictions, it was necessary to assess the historical data found in the National Climatic Data Center's for Tangipahoa parish and its jurisdictions to properly determine probability for future flood events. The table below shows the probability and return frequency for each jurisdiction.

Table 2-29: Flood annual probabilities for Tangipahoa Parish

Jurisdiction	Annual Probability	Return Frequency
Tangipahoa Parish	68%	1 – 2 Years
Tangipahoa Parish (Unincorporated)	28%	3 - 4 Years
Amite	4%	25 Years
Hammond	16%	6 Years
Independence	4%	25 Years
Kentwood	4%	25 Years
Ponchatoula	4%	25 Years
Roseland	4%	25 Years
Tangipahoa	4%	25 Years
Tickfaw	4%	25 Years

Based on the State's Hazard Mitigation Plan, the overall probability for the entire Tangipahoa Parish Planning area is 68% with 17 events taking place over a 25 year period. Based on the amount of significant flood events that have taken place throughout the parish, the Tangipahoa Parish Planning area can anticipate having a significant flood event every 1 to 2 years. While Tickfaw has not experienced a significant flood event in the last 25 years, its overall annual probability is assessed at 4% due to previous flooding before the last 25 years that were assessed for this plan.

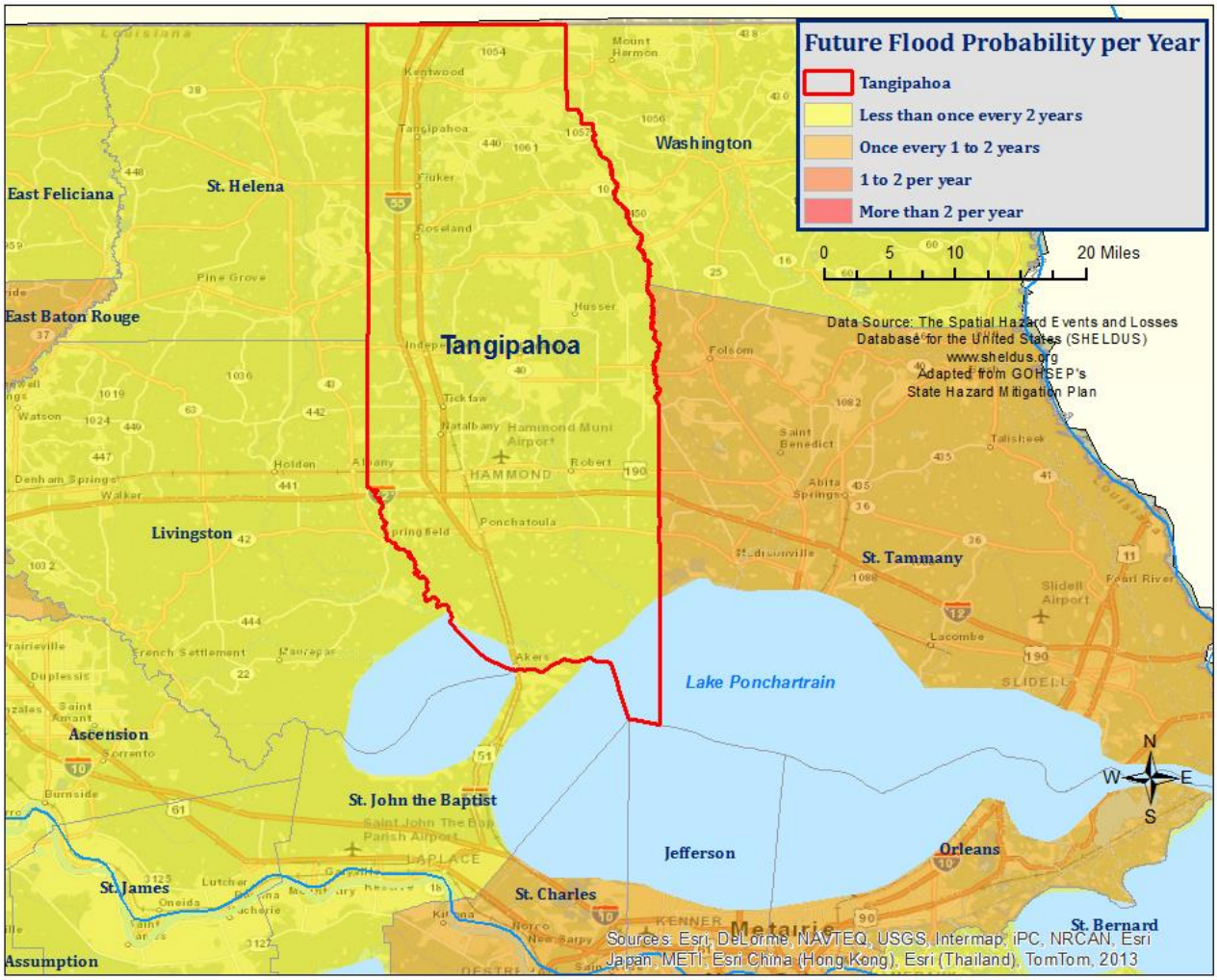


Figure 2-33: Flood Probability for Tangipahoa Parish

Estimated Potential Losses

Using HAZUS-MH Flood Model the 100 year flood scenario, along with the Parish DFIRM, was analyzed to determine losses from this worst-case scenario. *Table 2-30* shows the total economic losses that would result from this occurrence.

Table 2-30: Estimated losses in Tangipahoa Parish from a 100 year flood event.

Jurisdiction	Estimated total Losses from 100 Year Flood Event
Tangipahoa Parish (Unincorporated)	$1,334,525,000
Amite	$13,279,000
Hammond	$871,989,000
Independence	$48,343,000
Kentwood	$18,033,000
Ponchatoula	$8,112,000
Roseland	$8,053,000
Tangipahoa	$10,299,000
Tickfaw	$21,774,000
Total for the Parish	$2,334,407,000

The HAZUS-MH Flood model also provides a breakdown by jurisdiction for seven primary sectors (HAZUS-MH occupancy) throughout the parish. The losses for each jurisdiction by sector are listed in the tables below.

Table 2-31: Estimated 100 year flood losses for unincorporated Tangipahoa Parish by sector. (Source: HAZUS-MH)

Tangipahoa Parish (Unincorporated Areas)	Estimated total Losses from 100 Year Flood Event
Agricultural	$1,539,000
Commercial	$156,539,000
Government	$8,725,000
Industrial	$41,937,000
Religious / Non-Profit	$56,723,000
Residential	$1,034,895,000
Schools	$34,167,000
Totals	$1,334,525,000

Table 2-32: Estimated 100 year flood losses for Amite by sector. (Source: HAZUS-MH)

Amite	Estimated total Losses from 100 Year Flood Event
Agricultural	$95,000
Commercial	$5,680,000
Government	$84,000
Industrial	$586,000
Religious / Non-Profit	$793,000
Residential	$5,112,000
Schools	$929,000
Totals	$13,279,000

Table 2-33: Estimated 100 year flood losses for Hammond by sector. (Source: HAZUS-MH)

Hammond	Estimated total Losses from 100 Year Flood Event
Agricultural	$392,000
Commercial	$117,793,000
Government	$5,669,000
Industrial	$11,920,000
Religious / Non-Profit	$42,664,000
Residential	$660,449,000
Schools	$33,102,000
Totals	$871,989,000

Table 2-34: Estimated 100 year flood losses for Independence by sector. (Source: HAZUS-MH)

Independence	Estimated total Losses from 100 Year Flood Event
Agricultural	$0
Commercial	$6,976,000
Government	$1,092,000
Industrial	$502,000
Religious / Non-Profit	$1,338,000
Residential	$34,036,000
Schools	$4,399,000
Totals	$48,343,000

Table 2-35: Estimated 100 year flood losses for Kentwood by sector. (Source: HAZUS-MH)

Kentwood	Estimated total Losses from 100 Year Flood Event
Agricultural	$220,000
Commercial	$6,429,000
Government	$600,000
Industrial	$1,439,000
Religious / Non-Profit	$604,000
Residential	$8,541,000
Schools	$200,000
Totals	$18,033,000

Table 2-36: Estimated 100 year flood losses for Ponchatoula by sector. (Source: HAZUS-MH)

Ponchatoula	Estimated total Losses from 100 Year Flood Event
Agricultural	$2,000
Commercial	$1,027,000
Government	$0
Industrial	$52,000
Religious / Non-Profit	$236,000
Residential	$6,795,000
Schools	$0
Totals	$8,112,000

Table 2-37: Estimated 100 year flood losses for Roseland by sector. (Source: HAZUS-MH)

Roseland	Estimated total Losses from 100 Year Flood Event
Agricultural	$0
Commercial	$130,000
Government	$0
Industrial	$0
Religious / Non-Profit	$1,675,000
Residential	$6,248,000
Schools	$0
Totals	$8,053,000

Table 2-38: Estimated 100 year flood losses for Tangipahoa by sector. (Source: HAZUS-MH)

Tangipahoa	Estimated total Losses from 100 Year Flood Event
Agricultural	$0
Commercial	$104,000
Government	$130,000
Industrial	$0
Religious / Non-Profit	$952,000
Residential	$9,113,000
Schools	$0
Totals	$10,299,000

Table 2-39: Estimated 100 year flood losses for Tickfaw by sector. (Source: HAZUS-MH)

Tickfaw	Estimated total Losses from 100 Year Flood Event
Agricultural	$0
Commercial	$1,769,000
Government	$0
Industrial	$284,000
Religious / Non-Profit	$580,000
Residential	$19,141,000
Schools	$0
Totals	$21,774,000

Threat to People

The total population within the parish that is susceptible to a flood hazard are shown in the table below.

Table 2-40: Number of people potentially exposed to a 100 year flood event. (Source: HAZUS-MH)

Number of People Exposed to Hurricane Hazards			
Location	# in Community	# in Hazard Area	% in Hazard Area
Parish (Unincorporated)	83,950	75,452	90%
Amite	4,141	1216	29%
Hammond	20,019	14,813	74%
Independence	1665	1106	66%
Kentwood	2198	1125	51%
Ponchatoula	6,559	1,542	24%
Roseland	1,123	877	78%
Tangipahoa	748	509	68%
Tickfaw	694	671	97%
Total	121,097	97,311	80%

The HAZUS-MH flood model was also extrapolated to provide an overview of vulnerable populations throughout the jurisdictions in the tables below:

Table 2-41: Vulnerable populations susceptible to a 100 year flood event in unincorporated Tangipahoa. (Source: HAZUS-MH)

Tangipahoa Parish (Unincorporated)		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	75,452	90%
Persons Under 5 years	5,583	7.40%
Persons Under 18 years	19,467	25.80%
Persons 65 Years and Over	8,300	11%
White	55,759	73.90%
Minority	19,693	26.10%

Table 2-42: Vulnerable populations susceptible to a 100 year flood event in Amite. (Source: HAZUS-MH)

Amite		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	1,216	29%
Persons Under 5 years	64	5.30%
Persons Under 18 years	270	22.20%
Persons 65 Years and Over	154	12.70%
White	530	43.60%
Minority	686	56.40%

Table 2-43: Vulnerable populations susceptible to a 100 year flood event in Hammond. (Source: HAZUS-MH)

Hammond		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	14,813	74%
Persons Under 5 years	1,007	6.80%
Persons Under 18 years	3,155	21.30%
Persons 65 Years and Over	1,718	11.60%
White	7,199	48.60%
Minority	7,614	51.40%

Table 2-44: Vulnerable populations susceptible to a 100 year flood event in Independence. (Source: HAZUS-MH)

Independence		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	1,106	66%
Persons Under 5 years	91	8.20%
Persons Under 18 years	299	27%
Persons 65 Years and Over	169	15.30%
White	604	54.60%
Minority	502	45.40%

Table 2-45: Vulnerable populations susceptible to a 100 year flood event in Kentwood. (Source: HAZUS-MH)

Kentwood		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	1,125	51%
Persons Under 5 years	74	6.60%
Persons Under 18 years	302	26.80%
Persons 65 Years and Over	152	13.50%
White	304	27%
Minority	821	73%

Table 2-46: Vulnerable populations susceptible to a 100 year flood event in Ponchatoula (Source: HAZUS-MH)

Ponchatoula		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	1,542	24%
Persons Under 5 years	116	7.50%
Persons Under 18 years	415	26.90%
Persons 65 Years and Over	205	13.30%
White	976	63.30%
Minority	566	36.70%

Table 2-47: Vulnerable populations susceptible to a 100 year flood event in Roseland. (Source: HAZUS-MH)

Roseland		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	877	78%
Persons Under 5 years	61	6.90%
Persons Under 18 years	242	27.60%
Persons 65 Years and Over	109	12.40%
White	281	32.00%
Minority	596	68.00%

Table 2-48: Vulnerable populations susceptible to a 100 year flood event in Tangipahoa. (Source: HAZUS-MH)

Tangipahoa		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	509	68%
Persons Under 5 years	50	9.80%
Persons Under 18 years	187	36.80%
Persons 65 Years and Over	34	6.70%
White	40	7.80%
Minority	469	92.20%

Table 2-49: Vulnerable populations susceptible to a 100 year flood event in Tickfaw. (Source: HAZUS-MH)

Tickfaw		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	671	97%
Persons Under 5 years	39	5.80%
Persons Under 18 years	164	24.40%
Persons 65 Years and Over	91	13.50%
White	505	75.20%
Minority	166	24.80%

Vulnerability

See Appendix C for parish and municipality buildings that are susceptible to flooding due to proximity within the 100 year flood plain.

Thunderstorms

The term "thunderstorm" is usually used as a catch-all term for several kinds of storms. Here "thunderstorm" is defined to include any precipitation event in which thunder is heard or lightning is seen. Thunderstorms are often accompanied by heavy rain and strong winds and, depending on conditions, occasionally by hail or snow. Thunderstorms form when humid air masses are heated, which causes them to become convectively unstable and therefore rise. Upon rising, the air masses' water vapor condenses into liquid water and/or deposits directly into ice when they rise sufficiently to cool to the dew-point temperature.

Thunderstorms are classified into four main types (single-cell, multicell, squall line, and supercell), depending on the degree of atmospheric instability, the change in wind speed with height (called wind shear), and the degree to which the storm's internal dynamics are coordinated with those of adjacent storms. There is no such interaction for single-cell thunderstorms, but there is significant interaction with clusters of adjacent thunderstorms in multicell thunderstorms and with a linear "chain" of adjacent storms in squall line thunderstorms. Though supercell storms have no significant interactions with other storms, they have very well-organized and self-sustaining internal dynamics, which allows them to be the longest-lived and most severe of all thunderstorms.

The life of a thunderstorm proceeds through three stages: the developing (or cumulus) stage, the mature stage, and the dissipation stage. During the developing stage, the unstable air mass is lifted as an updraft into the atmosphere. This sudden lift rapidly cools the moisture in the air mass, releasing latent heat as condensation and/or deposition occurs, and warming the surrounding environment, thus making it less dense than the surrounding air. This process intensifies the updraft and creates a localized lateral rush of air from all directions into the area beneath the thunderstorm to feed continued updrafts. At the mature stage, the rising air is accompanied by downdrafts caused by the shear of falling rain (if melted completely), or hail, freezing rain, sleet, or snow (if not melted completely). The dissipation stage is characterized by the dominating presence of the downdraft as the hot surface that gave the updrafts their buoyancy is cooled by precipitation. During the dissipation stage, the moisture in the air mass largely empties out.

The Storm Prediction Center in conjunction with the National Weather Service (NWS) have the ability to issue advisory messages based on forecasts and observations. The following are the advisory messages that may be issued with definitions of each:

- *Severe Thunderstorm Watch*: Issued to alert people to the possibility of a severe thunderstorm developing in the area. Expected time frame for these storms is three to six hours.

- *Severe Thunderstorm Warning*: Issued when severe thunderstorms are imminent. This warning is highly localized and covers parts of one to several counties (parishes).

A variety of hazards might be produced by thunderstorms, including lightning, hail, tornadoes or waterspouts, flash floods, and high-speed winds called downbursts. Nevertheless, given all of these criteria,

the National Oceanic and Atmospheric Administration (NOAA) characterizes a thunderstorm as severe when it produces one or more of the following:

- Hail of 1 inch in diameter or larger
- Wind gusts to 58 mph or greater
- One or more tornadoes

Tornadoes and flooding hazards have been profiled within this report; therefore, for the purpose of thunderstorms, the sub hazards of hail, high winds, and lightning will be profiled.

Thunderstorms occur throughout Louisiana at all times of the year, although the types and severity of those storms vary greatly, depending on a wide variety of atmospheric conditions. Thunderstorms generally occur more frequently during the late spring and early summer when extreme variations exist between ground surface temperatures and upper atmospheric temperatures.

Hazard Description

Hailstorms

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 grow through deposition of water vapor onto their surface, fall partially to a level in the cloud where the temperature exceeds the freezing point, melt partially, get caught in another updraft whereupon re-freezing and deposition grows another concentric layer of ice, and fall after developing enough weight, sometimes after several trips up and down the cloud. The size of hailstones varies depending on the severity and size of the thunderstorm. Higher surface temperatures generally mean stronger updrafts, which allows more massive hailstones to be supported by updrafts, leaving them suspended longer. This longer time means larger hailstone sizes. The tables on the following page display the TORRO Hailstorm Intensity Scale along with a spectrum of hailstone diameters and their everyday equivalents.

Table 2-50: TORRO Hailstorm Intensity Scale.

Intensity Category		Hail Diameter (mm)	Probable Kinetic Energy	Typical Damage Impacts
H0	Hard Hail	5	0 - 20	No damage
H1	Potentially Damaging	5 - 15	>20	Slight general damage to plant, crops
H2	Significant	10 - 20	>100	Significant damage to fruit, crops, vegetation
H3	Severe	20 - 30	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25 - 40	>500	Widespread glass damage, vehicle body work
H5	Destructive	30 - 50	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40 - 60		Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50 - 75		Severe roof damage, risk of serious injuries
H8	Destructive	60 - 90		Severe damage to aircraftbodywork
H9	Super Hailstorms	75 - 100		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Table 2-51: Spectrum of hailstone diameters and their everyday description.
(Source: National Weather Service)

Spectrum of Hailstone Diameters	
Hail Diameter Size	**Description**
1/4”	Pea
1/2”	Plain M&M
3/4”	Penny
7/8”	Nickle
1” (severe)	Quarter
1 1/4”	Half Dollar
1 1/2”	Ping Pong Ball / Walnut
1 3/4”	Golf Ball
2”	Hen Egg / Lime
2 1/2"	Tennis Ball
2 3/4"	Baseball
3”	Teacup / Large Apple
4”	Softball
4 1/2"	Grapefruit
4 3/4” – 5”	Computer CD-DVD

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 cost to communities, especially across large metropolitan areas, can be quite significant. Hailstorms can also be devastating to crops. Thus, the severity of hailstorms depends on the size of the hailstones, the length of time the storm lasts, and where it occurs.

Hail rarely causes loss of life, although large hailstones can cause bodily injury.

High Winds

In general, high winds can occur in a number of different ways, within and without thunderstorms. The Federal Emergency Management Agency (FEMA) distinguishes these as shown in *Table 2-51.*

Table 2-52: High winds categorized by source, frequency, and duration.
(Source: Making Critical Facilities Safe from High Wind, FEMA)

High Winds Categories			
High Wind Type	**Description**	**Relative Frequency in Louisiana**	**Relative Maximum Duration in Louisiana**
Straight-line Winds	Wind blowing in straight line; usually associated with intense low-pressure area	High	Few-minutes – 1 day
Downslope Winds	Wind blowing down the slope of a mountain; associated with temperature and pressure gradients	N/A	N/A
Thunderstorm Winds	Wind blowing due to thunderstorms, and thus associated with temperature and pressure gradients	High (especially in the spring and summer	~Few minutes – several hours
Downbursts	Sudden wind blowing down due to downdraft in a thunderstorm; spreads out horizontally at the ground, possibly forming horizontal vortex rings around the downdraft	Medium-to-High(~5% of all thunderstorms)	~15 – 20 minutes
Northeaster (nor'easter) Winds	Wind blowing due to cyclonic storm off the east coast of North America; associated with temperature and pressure gradients between the Atlantic and land	N/A	N/A
Hurricane Winds	Wind blowing in spirals, converging with increasing speed toward eye; associated with temperature and pressure gradients between the Atlantic and Gulf and land	Low-to-Medium	Several days
Tornado Winds	Violently rotating column of air from base of a thunderstorm to the ground with rapidly decreasing winds at greater distances from center; associated with extreme temperature gradient	Low-to-Medium	Few minutes – few hours

The only high winds of present concern are thunderstorm winds and downbursts. Straight-line winds are common but are a relatively insignificant hazard (on land) compared to other high winds. Downslope winds are common but relatively insignificant in the mountainous areas of Louisiana where they occur. Nor'easters are cyclonic events that have at most a peripheral effect on Louisiana, and none associated with high winds. Winds associated with hurricanes and tornadoes will be considered in their respective sections.

Table 2-56 presents the Beaufort Wind Scale, first developed in 1805 by Sir Francis Beaufort, which aids in determining relative force and wind speed based on the appearance of wind effects.

Table 2-53: Beaufort Wind Scale.
(Source: NOAA's SPC)

Beaufort Wind Scale			
Force	**Wind (MPH)**	**WMO Classification**	**Appearance of Wind Effects on Land**
			Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-17	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	18-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-30	Strong Breeze	Larger tree branches moving, whistling in wires
7	31-38	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	Gale	Twigs breaking off trees, generally impedes progress
9	47-54	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	54-73	Violent Storm	
12	74+	Hurricane	

Major damage directly caused by thunderstorm winds is relatively rare, while minor damage is common and pervasive, and most noticeable when it contributes to power outages. These power outages can have major negative impacts such as increased tendency for traffic accidents, loss of revenue for businesses, increased vulnerability to fire, food spoilage, and other losses that might be sustained by a loss of power.

Power outages may pose a health risk for those requiring electric medical equipment and/or air conditioning

Lightning

Lightning is a natural electrical discharge in the atmosphere that is a by-product of thunderstorms. Every thunderstorm produces lightning. There are three primary types of lightning: intra-cloud, cloud-to-ground, and cloud-to-cloud. Cloud-to-ground lightning has the potential to cause the most damage to property and crops, while also posing as a health risk to the populace in the area of the strike.

Damage caused by lightning is usually to homes or businesses. These strikes have the ability to damage electrical equipment inside the home or business and can also ignite a fire that could destroy homes or crops.

Lightning continues to be one of the top three storm-related killers in the United States per FEMA, but it also has the ability to cause negative long-term health effects to the individual that is struck. The following table outlines the lightning activity level that is a measurement of lightning activity.

Table 2-54: Lightning Activity Level (LAL) Grids.

LAL	Cloud and Storm Development	Lightning Strikes/15 Min
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent.	>25
6	Similar to LAL 3 except thunderstorms are dry	

Hazard Profile

Hailstorms

Location

Because hailstorms is a climatological based hazard and has the same probability of occurring in Tangipahoa parish as all of its jurisdictions, the entire planning area for Tangipahoa Parish is equally at risk for hailstorms.

Previous Occurrences / Extents

The SHELDUS database reports a total of 4 significant hailstorms occurring within the boundaries of Tangipahoa Parish between the years of 1989-2014. The hailstorm diameters experienced in Tangipahoa Parish have ranged from 0.75 inches to 1.75 inches according to the National Climatic Data Center over the 25 year period. The most frequently recorded hail size has been 1 inch diameters. Figure 2-34 displays the density of hailstorms in Tangipahoa parish and adjacent parishes. Table 2-53 provides an overview of hail storms that have impacted the Tangipahoa Parish Planning area since 2009. Of these 17 events, only one event on September 28, 2011 in the city of Hammond resulted in property damage and no events resulted in injuries or fatalities. The event that occurred on September 28, 2011 resulted in approximately $5,000 in damage when golf ball size hail broke several car windows in the city of Hammond. There have not be any recorded hail events that have impacted the town of Roseland or the village of Tangipahoa since the last

plan update. It is expected that the Tangipahoa Parish planning area will continue to experience hail storms with the most prevalent size of hail being 1.00". However, as a worse case, Tangipahoa Parish can potentially experience hail up to 2" in diameter.

Table 2-55: Previous Occurrences of Hailstorms in Tangipahoa Parish. (Source: NCDC)

Date	Recorded Hail Size	Location
May 11, 2009	0.75 in	Wilmer (Unincorporated Tangipahoa Parish)
May 16, 2009	1.00 in	Husser (Unincorporated Tangipahoa Parish)
January 20, 2010	1.75 in	Independence
January 20, 2010	1.75 in	Loranger (Unincorporated Tangipahoa Parish)
April 24, 2010	1.00 in	Tickfaw
April 24, 2010	1.75 in	Tickfaw
March 29, 2011	1.75 in	Amite
March 29,2011	1.00 in	Amite
April 15, 2011	1.00 in	Kentwood
April 15, 2011	1.00 in	Kentwood
June 6, 2011	1.00 in	Ponchatoula
September 28, 2011	1.75 in	Hammond
April 3, 2012	1.00 in	Ponchatoula
April 5, 2012	1.00 in	Tickfaw
April 11, 2012	1.00 in	Robert (Unincorporated Tangipahoa Parish)
May 31, 2012	1.00 in	Hammond
April 8,2014	1.00 in	Ponchatoula

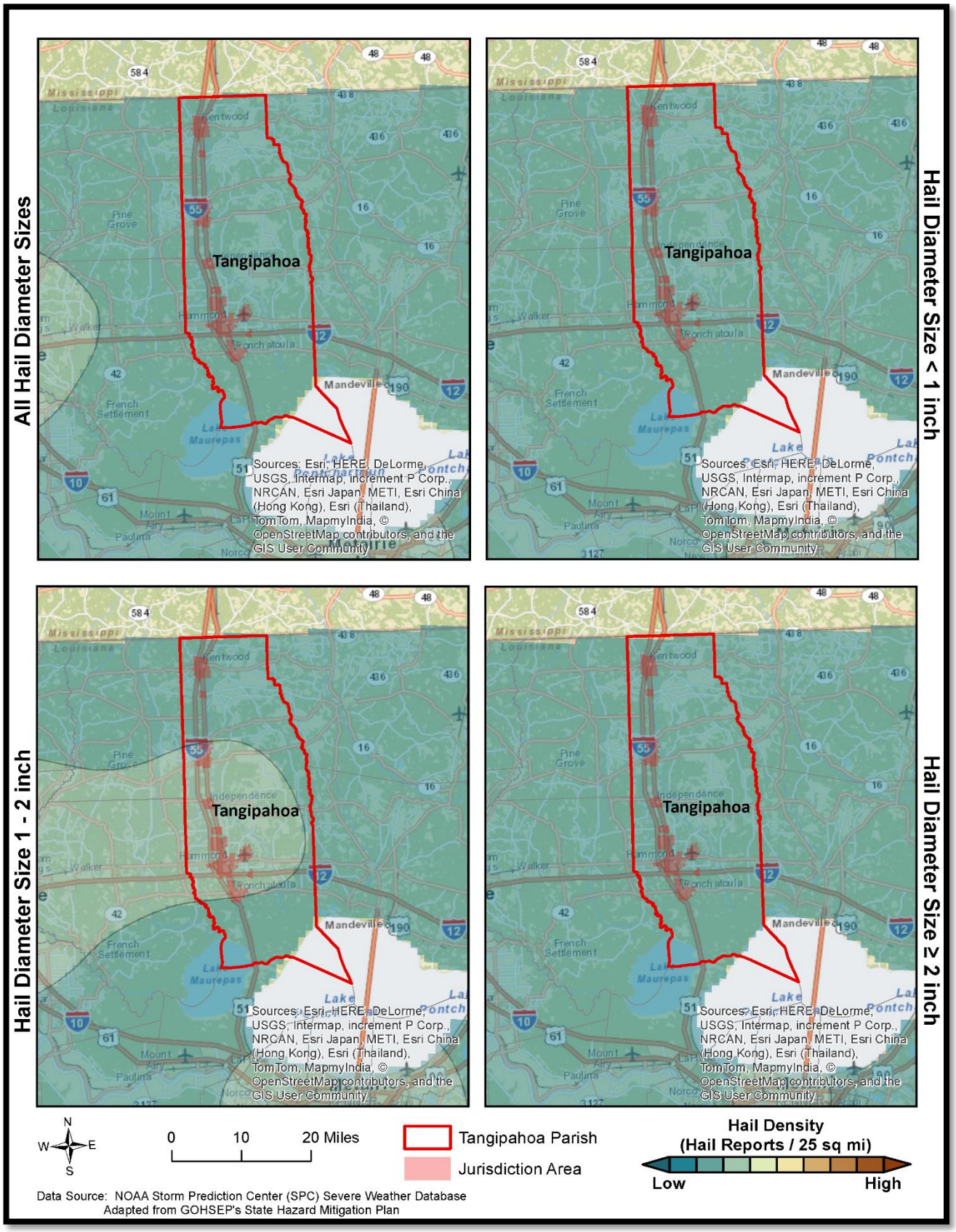


Figure 2-34: Density of hailstorms by by diameter from 1950-1964

Frequency

The State of Louisiana Hazard Mitigation plan estimated the probability of occurrence at approximately 28%, with a return frequency of more than once every 2 years. The probability was determined based on a review of significant hail data that has caused damages in the last twenty five years, in which Tangipahoa parish has had seven recorded events (*Figure 2-35*).

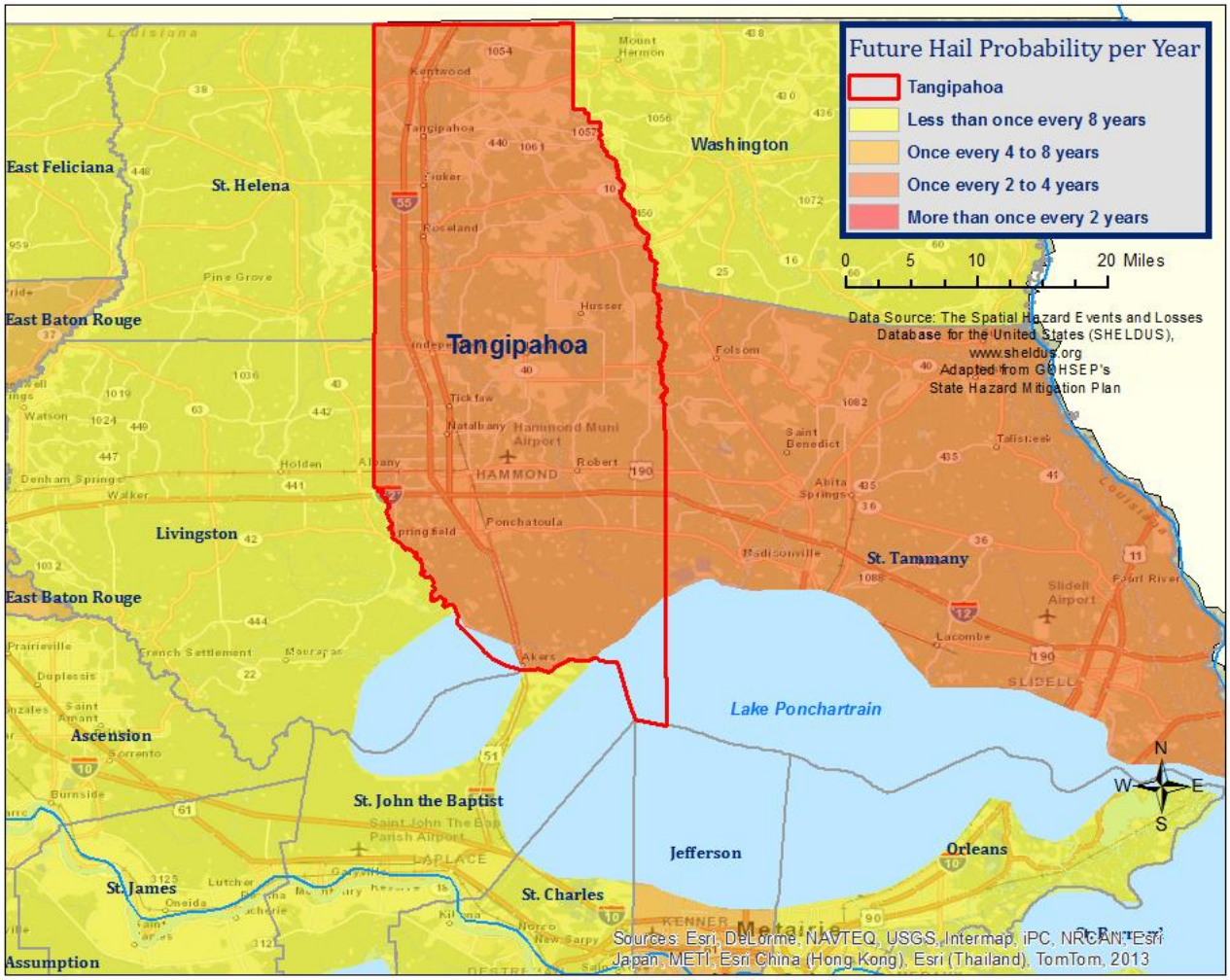


Figure 2-35: Probability of hailstorm events in Tangipahoa Parish from 1987-2012. (Source: State of Louisiana Hazard Mitigation Plan 2014)

Estimated Potential Losses

According to the SHELDUS database, property damage due to hailstorms in Tangipahoa Parish have totaled approximately $434,441 since 1960. A list of total damages by event can be found in Table 2-54. To estimate the potential loses of a severe weather event on an annual basis, the total damages recorded for hailstorms was divided by the total number of years of available hailstorm data in SHELDUS (1960 – 2014). This provides an annual estimated potential loss of $8,045. To access potential losses to the participating jurisdictions, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. Based on the 2010 Census data, the following table provides an estimate of potential property losses for Tangipahoa Parish:

Table 2-56: Property damage caused by hailstorms in Tangipahoa Parish. (Source: SHELDUS)

Date	Property Damage
April 1960	$39,350
April 1962	$3,013
July 1963	$1,982
April 1964	$202,545
June 1967	$1,816
July 1967	$1,362
May 1968	$17
March 1971	$11,234
March 1972	$142,824
November 1972	$1,088
May 1974	$315
May 1975	$11,276
May 1976	$6,823
May 1985	$1,546
February 1993	$268
March 1993	$2,686
May 1999	$1,118
September 2011	$5,178

Table 2-57: Estimated annual property losses in Tangipahoa Parish from hailstorms.

Estimated Annual Potential Loses from Hailstorms for Tangipahoa Parish								
Unincorporated Tangipahoa Parish (69.3% of Population)	Amite (3.4% of Population)	Hammond (16.5% of Population)	Independence (1.4% of Population)	Kentwood (1.8% of Population)	Ponchatoula (5.4% of Population)	Roseland (0.9% of Population)	Tangipahoa (0.6% of Population)	Tickfaw (0.6% of Population)
$5,577	$275	$1,330	$111	$146	$436	$75	$50	$46

The Parish has suffered no deaths or injuries due to hailstorms from 1960 – 2014.

Vulnerability

See Appendix C for parish and municipality buildings that are susceptible to hailstorms.

High Winds

Location

Because high winds are a climatological based hazard and have the same probability of occurring in Tangipahoa parish as all of its jurisdictions, the entire planning area for Tangipahoa Parish is equally at risk for high winds.

Previous Occurrences / Extents

The SHELDUS database reports a total of 117 thunderstorm wind events occurring within the boundaries of Tangipahoa Parish between the years of 1989-2014. The significant thunderstorm wind events experienced in Tangipahoa Parish have ranged from a wind speed of 58 mph to 70 mph. Since the hazard mitigation plan was last updated there have not been any observed significant thunderstorm winds in the town of Roseland, village of Tangipahoa, and village of Tickfaw. It is expected that the Tangipahoa Parish planning area will continue to experience wind speeds at the 70 mph level and below.

Table 2-58: Previous Occurrences for Thunderstorm High Wind Events.

Location	Date	Recorded Wind Speeds	Property Damage	Crop Damage
Loranger	March 26, 2009	58 mph	$200	$0
Independence	January 20, 2010	60 mph	$5,000	$0
Hammond	August 4, 2010	69 mph	$10,000	$0
Kentwood	February 1, 2011	69 mph	$2,000	$0
Amite	April 4, 2011	69 mph	$5,000	$0
Hammond	April 4, 2011	69 mph	$5,000	$0
Kentwood	April 15, 2011	69 mph	$3,000	$0
Kentwood	April 15, 2011	69 mph	$5,000	$0
Ponchatoula	April 26, 2011	59 mph	$1,000	$0
Hammond	September 28, 2011	67 mph	$0	$0
Independence	December 22, 2011	60 mph	$3,000	$0
Ponchatoula	February 18, 2012	60 mph	$5,000	$0
Robert	February 18, 2012	60 mph	$5,000	$0
Ponchatoula	December 20, 2012	69 mph	$0	$0
Ponchatoula	December 20, 2012	70 mph	$2,000	$0
Ponchatoula	February 18, 2013	69 mph	$15,000	$0
Wilmer	April 6, 2014	63 mph	$1,000	$0
Netalbany	April 7, 2014	70 mph	$0	$0
Kentwood	June 24, 2014	60 mph	$20,000	$0

Frequency

High winds are a fairly common occurrence within Tangipahoa Parish with an annual chance of occurrence calculated at 100%. According to the State Hazard Mitigation Plan, Tangipahoa parish has a future probability of experiencing more than 4 wind events annually as seen in *Figure 2-36*.

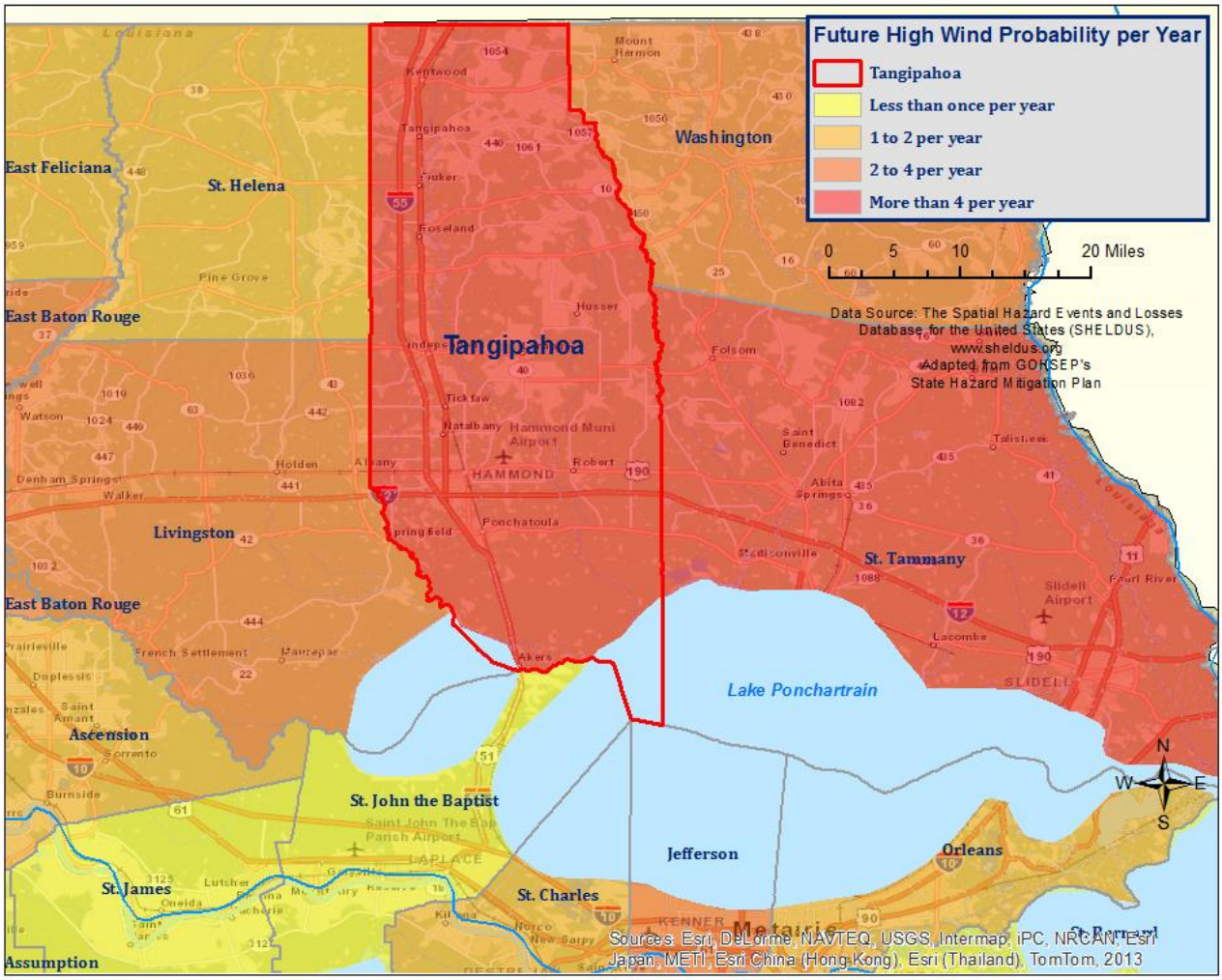


Figure 2-36: Probability of high wind events in Tangipahoa and adjacent parishes. (Source: State of Louisiana 2014 Hazard Mitigation Plan)

Estimated Potential Losses

Since 1960, there have been 167 significant wind events that have resulted in property damages according to the SHELDUS database. The total property damages associated with those storms have totaled $1,759,282. To estimate the potential loses of a wind event on an annual basis, the total damages recorded for wind events was divided by the total number of years of available wind data in SHELDUS (1960 – 2014). This provides an annual estimated potential loss of $32,579. To access potential losses to the participating jurisdictions, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. Based on the 2010 Census data, the table on the following page provides an estimate of potential property losses for Tangipahoa Parish.

Table 2-59: Estimated annual property losses in Tangipahoa parish resulting from wind damage.

Estimated Annual Potential Loses from Thunderstorm Winds for Tangipahoa Parish								
Unincorporated Tangipahoa Parish (69.3% of Population)	Amite (3.4% of Population)	Hammond (16.5% of Population)	Independence (1.4% of Population)	Kentwood (1.8% of Population)	Ponchatoula (5.4% of Population)	Roseland (0.9% of Population)	Tangipahoa (0.6% of Population)	Tickfaw (0.6% of Population)
$22,585	$1,114	$5,386	$448	$591	$1,765	$302	$201	$187

There has been 1 reported injury and 0 fatalities as a result of a wind event over the 54 year record.

Vulnerability

See Appendix C for parish and municipality buildings that are susceptible to high winds.

Lightning

Location

Like hail and high winds, lightning is a climatological based hazard and has the same probability of occurring throughout the entire planning area for Tangipahoa Parish, making all jurisdictions equally at risk for lightning.

Previous Occurrences / Extent

The SHELDUS database reports a total of 40 lightning events occurring within the boundaries of Tangipahoa Parish between the years of 1960-2014. The SHELDUS database only records lightning events that cause death, injuries, crop damage, and/or property damage, so these numbers do not accurately reflect the number of lightning events in Tangipahoa Parish which occur on a nearly monthly basis. The table below provides an overview of significant lightning strikes over the last five years.

Table 2-60: Previous occurrences of significant lightning strikes in Tangipahoa Parish from 2009 – 2014. (Source: NCDC & SHELDUS)

Location	Date	Summary	Property Damage
Hammond	August 16, 2010	Lightning downed several trees and triggered power outages in Hammond and in areas in between Tickfaw and Independence	$10,683
Wadesboro	April 11, 2012	Two fisherman fatality lost their lives when a small tin structure they were sheltering in along the Natalbany River was struck by lightning.	$0
Loranger	February 22, 2013	A lightning strike damaged one home in the area.	$5,000

Frequency

Lightning can strike anywhere and is produced by every thunderstorm, so the chance of lightning occurring in Tangipahoa Parish is high. However, lightning that meets the definition that is used by SHELDUS and the NCDC that actually results in damages to property and injury or death to people is a less likely event. The probability of a significant lightning strike in Tangipahoa parish is 60%. According to the State Hazard Mitigation Plan, a significant lightning strike in Tangipahoa parish is likely to occur once every one to four years as depicted in *Figure 2-37*.

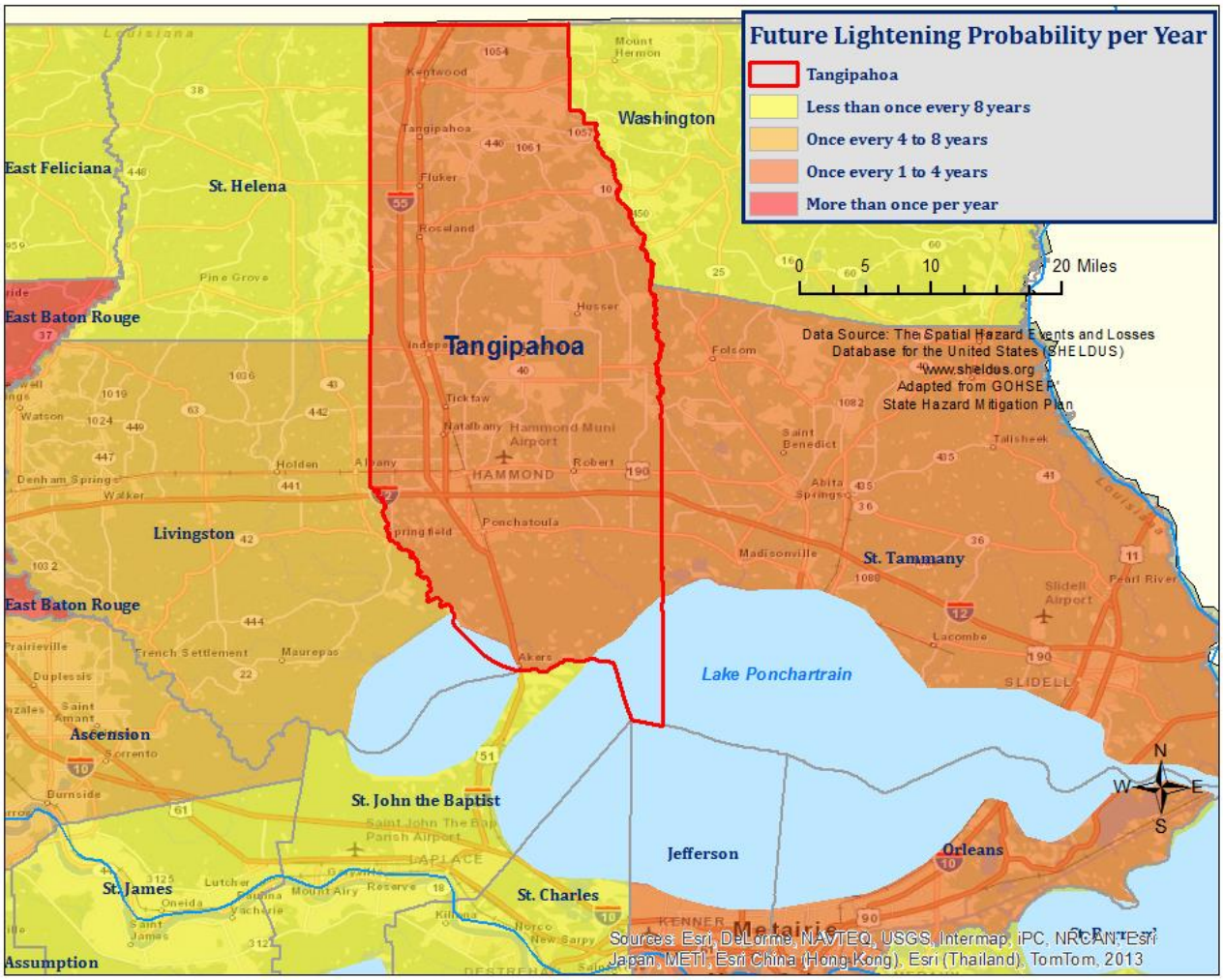


Figure 2-37: Probability of lightning events in Tangipahoa and adjacent parishes. (Source: State of Louisiana Hazard Mitigation Plan)

Estimated Potential Losses

Since 1960, there have been 40 significant lightning strikes with 32 of those strikes resulting in property damages according to the SHELDUS database. The total property damages associated with those events have totaled $1,921,106. To estimate the potential loses of a lightning event on an annual basis, the total damages recorded for lightning events was divided by the total number of years of available major lightning strike data in SHELDUS (1960 – 2014). This provides an annual estimated potential loss of $35,576. To access potential losses to the participating jurisdictions, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. Based on the 2010 Census data, the table on the following page provides an estimate of potential property losses for Tangipahoa Parish.

Table 2-61: Estimated annual property losses in Tangipahoa Parish from lightning.

Estimated Annual Potential Losses resulting from Lightning Strikes for Tangipahoa Parish								
Unincorporated Tangipahoa Parish (69.3% of Population)	Amite (3.4% of Population)	Hammond (16.5% of Population)	Independence (1.4% of Population)	Kentwood (1.8% of Population)	Ponchatoula (5.4% of Population)	Roseland (0.9% of Population)	Tangipahoa (0.6% of Population)	Tickfaw (0.6% of Population)
$24,663	$1,217	$5,881	$489	$646	$1,927	$330	$220	$204

There have been 7 reported injuries and 7 fatalities as a result of a lightning strikes over the 54 year record.

Vulnerability

See Appendix C for parish and municipality building exposure to lightning hazards.

Tornadoes

Tornadoes (also called twisters and cyclones) are rapidly rotating funnels of wind extending between storm clouds and the ground. For their size, tornadoes are the most severe storms, and 70% of the world's reported tornadoes occur within the continental United States, making them one of the most significant hazards Americans face. Tornadoes and waterspouts form 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, which usually occurs in a counterclockwise direction in the northern hemisphere. The updraft of air in tornadoes always rotates because of wind shear (differing speeds of moving air at various heights), and it can rotate in either a clockwise or counterclockwise direction; clockwise rotations (in the northern hemisphere) will sustain the system, at least until other forces cause it to die seconds to minutes later.

Since February 1, 2007, the Enhanced Fujita (EF) Scale has been used to classify tornado intensity. The EF Scale classifies tornadoes based on their damage pattern rather than wind speed; wind speed is then derived and estimated. This contrasts with the Saffir-Simpson scale used for hurricane classification, which is based on measured wind speed. *Table 2-62* shows the EF scale in comparison with the old Fujita (F) Scale, which was used prior to February 1, 2007. When discussing past tornadoes, the scale used at the time of the hazard is used. Damage and adjustment between scales can be made using the following tables.

Table 2-62: Comparison of the Enhanced Fujita (EF) Scale to the Fujita (F) Scale.

Wind speed (mph)	**Enhanced Fujita Scale**					
	EF0	**EF1**	**EF2**	**EF3**	**EF4**	**EF5**
	65-85	86-110	111-135	136-165	166-200	>200
	Fujita Scale					
	F0	**F1**	**F2**	**F3**	**F4**	**F5**
	<73	73-112	113-157	158-206	207-260	>261

Table 2-63: Fujita and Enhanced Fujita Tornado Damage Scale.

Scale	Typical Damage
F0/EF0	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1/EF1	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2/EF2	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; light-object missiles generated; cars lifted off ground.
F3/EF3	Severe damage. Roofs and some walls torn of well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4/EF4	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.

Scale	Typical Damage
F5/EF5	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

The National Weather Service (NWS) has the ability to issue advisory messages based on forecasts and observations. The following are the advisory messages that may be issued with definitions of each:

- *Tornado Watch*: Issued to alert people to the possibility of a tornado developing in the area. A tornado has not been spotted but the conditions are favorable for tornadoes to occur.
- *Tornado Warning*: Issued when a tornado has been spotted or when Doppler radar identifies a distinctive "hook-shaped" area within a thunderstorm line.

Structures within the direct path of a tornado vortex are often reduced to rubble. Structures adjacent to the tornado's path are often severely damaged by high winds flowing into the tornado vortex, known as inflow winds. It is here, adjacent to the tornado's path, that the building type and construction techniques are critical to the structure's survival. Although tornadoes strike at random, making all buildings vulnerable, mobile homes, homes on crawlspaces, and buildings with large spans are more likely to suffer damage.

The major health hazard from tornadoes is physical injury from flying debris or being in a collapsed building or mobile home. Within a building, flying debris or missiles are generally stopped by interior walls. However, if a building has no partitions, any glass, brick, or other debris blown into the interior is life threatening. Following a tornado, damaged buildings are a potential health hazard due to instability, electrical system damage, and gas leaks. Sewage and water lines may also be damaged.

Peak tornado activity in Louisiana occurs during the spring, as it does in the rest of the United States. Nearly one-third of observed tornadoes in the United States occur during April. About half of those in Louisiana, including many of the strongest, occur between March and June. Fall and winter tornadoes are less frequent, but the distribution of tornadoes throughout the year is more uniform in Louisiana than in locations farther north.

Location

While there is a significant tornado record in Tangipahoa parish with actual locations, tornadoes in general are a climatological based hazard and have the same approximate probability of occurring in Tangipahoa parish as all of its jurisdictions. Because a tornado has a similar probability of striking anywhere within the planning area for Tangipahoa parish, all jurisdictions are equally at risk for tornadoes.

Previous Occurrences / Extent

Tangipahoa Parish has not experienced any federally declared disasters due to a tornado alone. SHELDUS reports a total of 15 tornadoes or waterspouts occurring within the boundaries of Tangipahoa Parish between the years of 1989-2014. The tornadoes experienced in Tangipahoa Parish have been EF1s on the EF scale and ranged from F0 to F3 on the F scale.

The tornado that caused the most damage to property and resulted in the most injuries was a F2 that occurred on February 15, 1992. The tornado touched down near Woodhaven Road 4 miles northwest of Natalbany causing $2,490,630 in property damage and 10 injuries. Based on previous occurrences, Tangipahoa Parish is most likely to experience a tornado of the EF1 magnitude; however, as a worse-case scenario, Tangipahoa parish should prepare for a tornado of the EF3 magnitude.

Table 2-64: Historical tornadoes in Tangipahoa Parish with locations from 1989-2014.

Date	Impacts	Property Damage	Location	Magnitude
June 8, 1989	2.5 mile path with a width of 40 yards.	$93,934	Unincorporated Area of Parish	F1
February 15, 1992	0.8 mile path with a width of 527 yards. Destroyed 8 single-family homes and 7 mobile homes. Severe damage to 9 homes and minor damage to 26 homes. 10 people injured.	$2,490,630	Natalbany	F2
August 26, 1992	7 mile path with a width of 20 yards. Spawned from Hurricane Andrew.	$83,021	Tickfaw and Loranger	F1
March 9, 1994	0.3 mile path with a width of 30 yards.	$7,859	Loranger	F1
March 7, 1995	0.5 mile path with a width of 20 yards. One mobile home destroyed and a roof blown off home.	$45,857	Independence	F1
November 10, 1998	0.5 mile path with a width of 50 yards. Destroyed one house and downed several trees.	$71,459	Kentwood	F1
January 29, 2001	0.2 mile path with a width of 25 yards. Damaged a wall of a	$23,677	Amite	F0

Date	Impacts	Property Damage	Location	Magnitude
	movie theatre and canopy of a gas station.			
March 12, 2001	0.3 mile path with a width of 20 yards. Knocked down several trees and power lines. Damaged the roofs of several homes.	$39,461	Kentwood	F0
April 6, 2005	0.2 mile path with a width of 20 yards. Destroyed 5 sheds, minor damage to a home, and uprooted 3 trees.	$2,385	Kentwood	F0
October 27, 2006	2.47 mile path with a width of 75 yards. Several buildings had roofs damaged. Downed several trees and power lines.	$231,108	Tangipahoa	F1
November 15, 2006	2.66 mile path with a width of 75 yards. 2 homes destroyed and 4 structures sustained heavy damage.	$288,885	Arcola	F1
February 12, 2008	0.77 mile path with a width of 20 yards. Overturned a mobile home and broke several car windows. 1 fatality occurred when a 51 year old woman was thrown into a vehicle.	$27,266	Independence	EF1
February 17, 2008	2.04 mile path with a width of 15 yards. The roof of a home damaged and a camper trailer overturned.	$16,013	Roseland	EF1
March 26, 2009	0.75 mile path with a width of 50 yards. 7 homes damaged and 1 mobile home destroyed with another taking heavy damage.	$65,151	Independence	EF1

Date	Impacts	Property Damage	Location	Magnitude
January 20, 2010	1.66 mile path with a width of 150 yards. 1 home damaged, 1 barn destroyed, and an outbuilding damaged.	$106,833	Holton	EF1

Since 2009, the year the last update to this hazard mitigation plan was written, Tangipahoa parish has had 1 tornado touch downs. The following is a brief synopsis of these events:

January 20, 2010 – EF1 Tornado in Holton

> Isolated severe thunderstorms developed ahead of a cold front that moved through the area. A tornado touched down in the Holton area approximately 2 miles north of Loranger toppling 10 to 15 trees, destroying one barn, and severely damaging an out building and a house. The estimated wind speed with this tornado was approximately 60 mph.

Frequency / Probability

Tornadoes are a sporadic occurrence within Tangipahoa Parish with an annual chance of occurrence calculated at 60% based on the records for the past 25 years (1989-2014). Figure 2-38 displays the density of tornado touchdowns in Tangipahoa Parish and neighboring parishes. Based on the State Hazard Mitigation Plan, the overall probability of a tornado touching down in Tangipahoa Parish is once every 1 to 2 years.

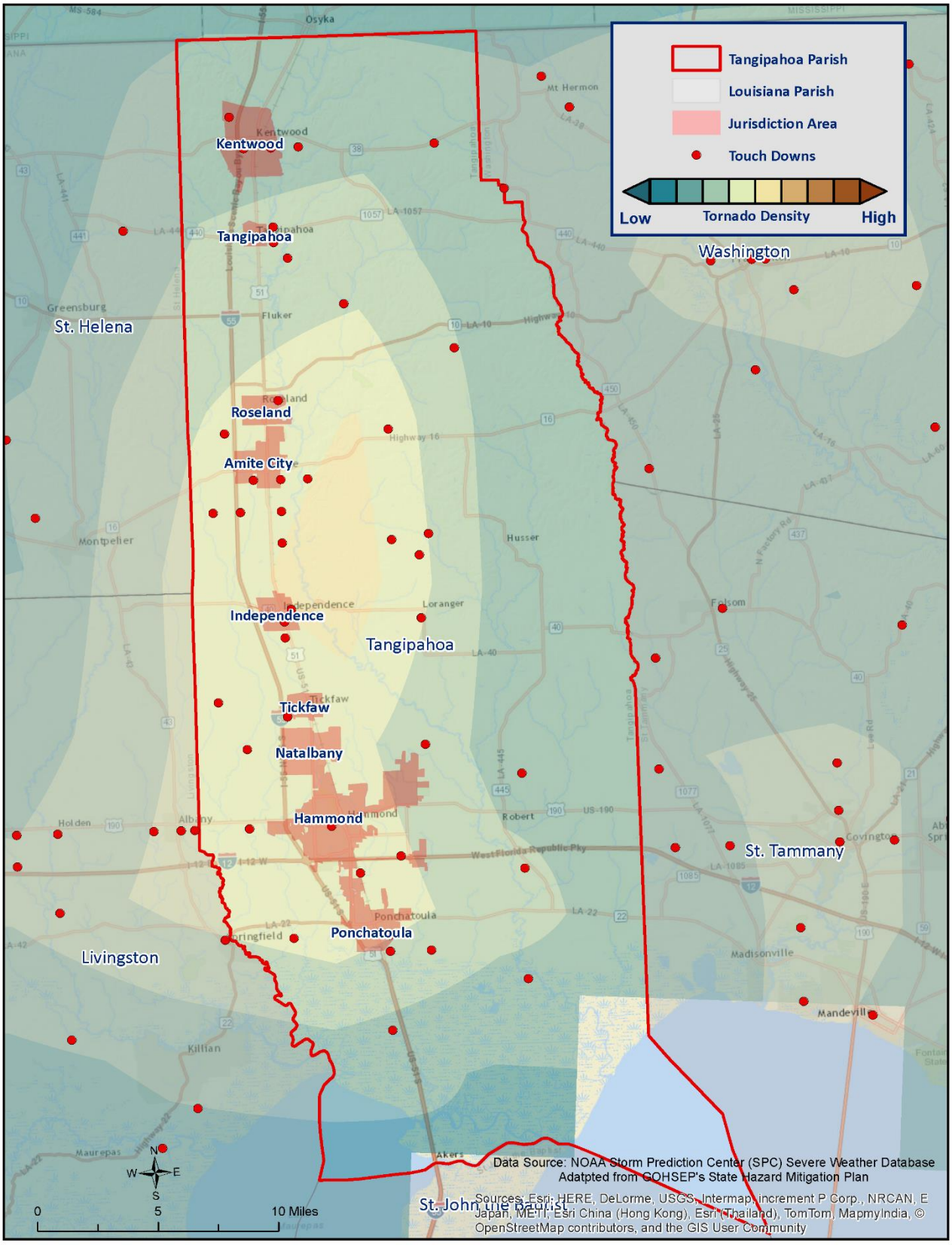


Figure 2-38: Location and density of tornadoes to touchdown in Tangipahoa Parish. (Source: NOAA/SPC Severe Weather Database)

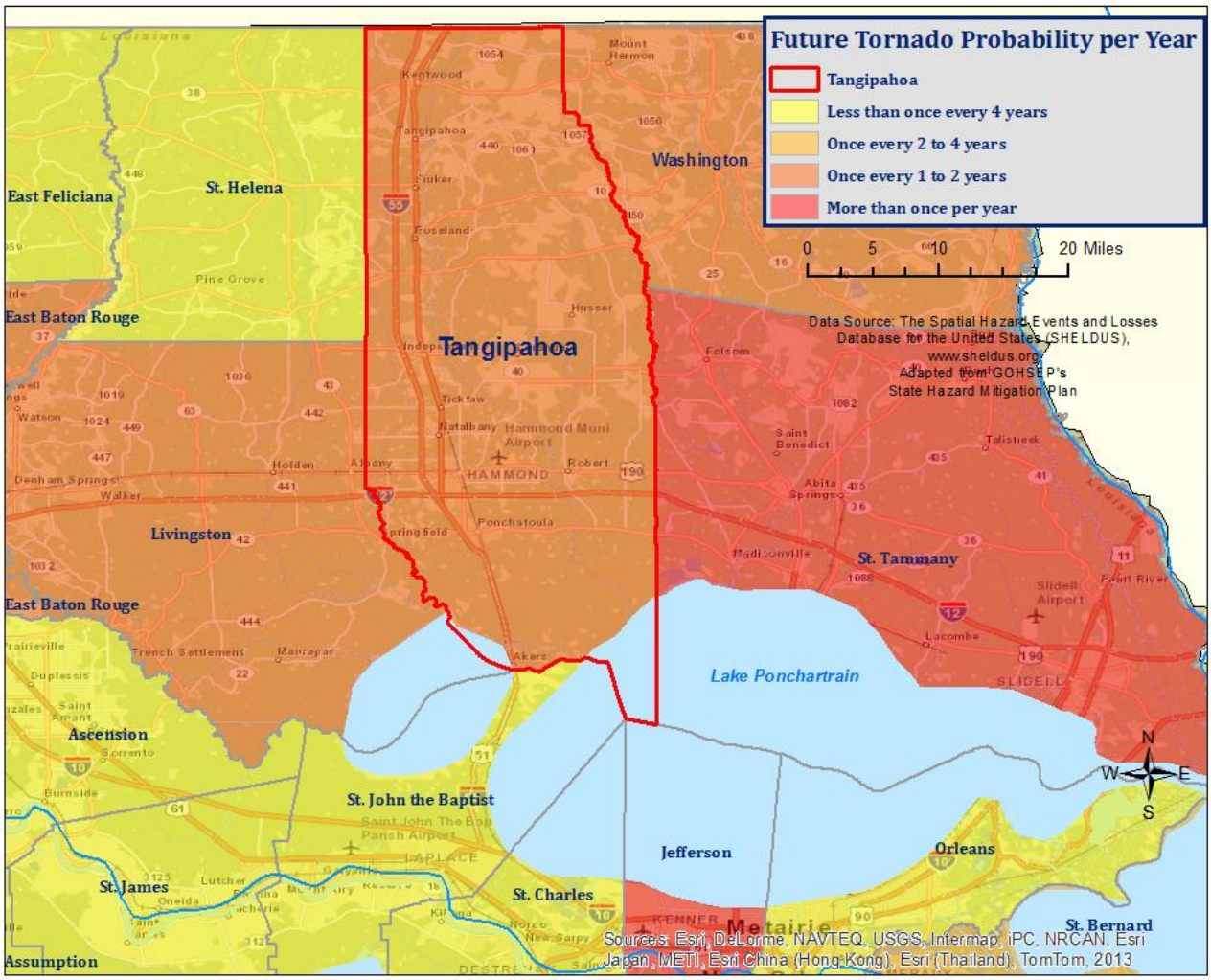


Figure 2-39: Probability of tornado events in Tangipahoa and adjacent parishes based on data from 1987-2012.
(Source: State of Louisiana Hazard Mitigation Plan)

Estimated Potential Losses

According to the SHELDUS database, there have been 15 tornadoes that have caused some level of property damage. The total damage from the actual claims for property is $3,593,539 with an average cost of $239,569 per tornado strike. When annualizing the total cost over the 25 year record, total annual loses based on tornadoes are estimated to be $143,742. To provide an estimated annual estimated potential loss per jurisdiction, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. Based on the 2010 Census data, Table 2-37 provides an annual estimate of potential losses for Tangipahoa parish.

Table 2-65: Estimated annual losses for tornadoes in Tangipahoa Parish.

Estimated Annual Potential Loses from Tornadoes for Tangipahoa Parish								
Unincorporated Tangipahoa Parish (69.3% of Population)	Amite (3.4% of Population)	Hammond (16.5% of Population)	Independence (1.4% of Population)	Kentwood (1.8% of Population)	Ponchatoula (5.4% of Population)	Roseland (0.9% of Population)	Tangipahoa (0.6% of Population)	Tickfaw (0.6% of Population)
$99,649	$4,915	$23,763	$1,976	$2,609	$7,786	$1,333	$888	$824

Table 2-63 presents an analysis of building exposure that are susceptible to tornadoes by general occupancy type for Tangipahoa Parish along with the percentage of building stock that are mobile homes.

Table 2-66: Building exposure by General Occupancy Type for Tornadoes in Tangipahoa Parish. (Source: FEMA's HAZUS-MH 2.2)

Building Exposure by General Occupancy Type for Tornadoes **Exposure Types ($1,000)**							
Residential	Commercial	Industrial	Agricultural	Religion	Government	Education	Mobile Homes (%)
7,980,251	996,547	199,124	28,599	206,348	39,139	105,329	25%

The Parish has suffered through a total of 5 days in which tornadoes or waterspouts have accounted for 14 injuries and 1 fatality during this 25 year period (*Table 2-64*). The average injury per event for Tangipahoa parish is 0.93 per tornado with an average of 0.56 per year for the 25 year period. The average fatality per event for Tangipahoa is 0.06 per tornado with an average of 0.04 per year for the 25 year period.

Table 2-67: Tornadoes in Tangipahoa Parish by magnitude that caused injuries or deaths.

Date	Magnitude	Deaths	Injuries
June 8, 1989	F1	0	1
February 15, 1992	F2	0	10
November 10, 1998	F1	0	1
November 15, 2006	F1	0	2
February 12, 2008	EF1	1	0

In accessing the overall risk to population, the most vulnerable population throughout the parish are those residing in manufacturing housing. Approximately 25% of all housing in Tangipahoa parish consists of manufactured housing. Based on location data collected in a previous hazard mitigation project, there are 41 known locations where manufactured housing is concentrated. Those 41 locations have an overall number of manufactured houses ranging from 4 to 89. The location and density of manufactured houses can be seen in *Figure 2-40*.

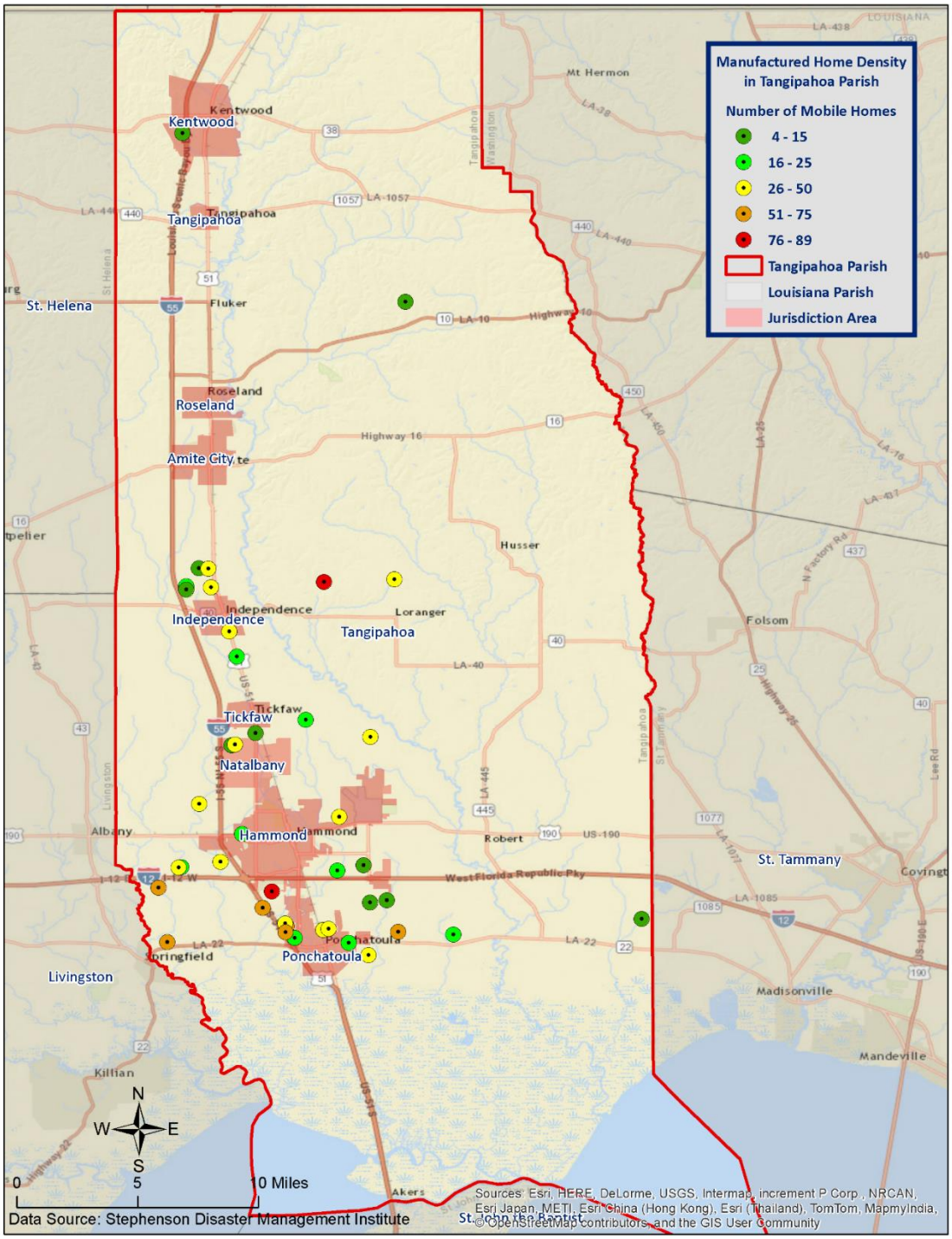


Figure 2-40: Location and approximate number of units in manufactured housing locations throughout Tangipahoa Parish.

Vulnerability

See Appendix C for parish and municipality building exposure to tornado hazards.

Tropical Cyclones

Tropical cyclones are among the worst hazards Louisiana faces. These spinning, low-pressure air masses draw surface air into their centers and attain strength ranging from weak tropical waves to the most intense hurricanes. Usually, these storms begin as clusters of oceanic thunderstorms off the western coast of Africa, moving westward in the trade wind flow. The spinning of these thunderstorm clusters begins because of the formation of low pressure in a perturbation in the westerly motion of the storms associated with differential impacts of the Earth's rotation. The west-moving, counterclockwise-spinning collection of storms-now called a tropical disturbance-may then gather strength as it draws humid air toward its low-pressure center, forming a tropical depression (defined when the maximum sustained surface wind speed is 38 mph or less), then a tropical storm (when the maximum sustained surface wind ranges from 39 mph to 73 mph), and finally a hurricane (when the maximum sustained surface wind speeds exceed 73 mph). *Table 2-65* presents the Saffir-Simpson Hurricane Wind Scale, which categorizes tropical cyclones based on sustained winds.

Table 2-68: Saffir-Simpson Hurricane Wind Scale.

SAFFIR-SIMPSON HURRICANE WIND SCALE			
Category	**Sustained Winds**	**Pressure**	**Types of Damage Due to Winds**
Tropical Depression	<39 mph	N/A	
Tropical Storm	39-73 mph	N/A	
1	74-95 mph	>14.2 psi	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallow-rooted trees may be toppled, especially after the soil becomes waterlogged. Extensive damage to power lines and poles likely will result in power outages that could last several days.
2	96-110 mph	14-14.2 psi	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallow-rooted trees will be snapped or uprooted, especially after the soil becomes waterlogged, and block numerous roads. Near total power loss is expected with outages that could last from several days to weeks.
3	111-129 mph	13.7 -14 psi	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, especially after the soil becomes waterlogged, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130-156 mph	13.3-13.7 psi	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted especially after the soil becomes waterlogged, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly

			months. Most of the area will be uninhabitable for weeks or months.
5	157 mph or higher	<13.7 psi	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks to months.

Many associated hazards can occur during a hurricane, including heavy rain, flooding, high winds, and tornadoes. A general rule of thumb in coastal Louisiana is that the number of inches of rainfall to be expected from a tropical cyclone is approximately 100 divided by the forward velocity of the storm in mph; so a fast-moving storm (20 mph) might be expected to drop 5 inches of rain while a slow-moving (5 mph) storm could produce totals of around 20 inches. However, no two storms are alike, and such generalizations have limited utility for planning purposes. Hurricane Beulah, which struck Texas in 1967, spawned 115 confirmed tornadoes. In recent years, extensive coastal development as increased the storm surge resulting from these storms so much that this has become the greatest natural hazard threat to property and loss of life in the state. Storm surge is a temporary rise in sea level generally caused by reduced air pressure and strong onshore winds associated with a storm system near the coast. Although storm surge can technically occur at any time of the year in Louisiana, surges caused by hurricanes can be particularly deadly and destructive. Such storm surge events are often accompanied by large, destructive waves exceeding 10 m in some places that can inflict high numbers of fatalities and economic losses. In 2005, Hurricane Katrina clearly demonstrated the destructive potential of this hazard, as it produced the highest modern-day storm surge levels in the state of Louisiana, reaching up to 18.7 feet in St. Bernard Paris, near Alluvial City.

Property can be damaged by the various forces that accompany a tropical storm. High winds can directly impact structures in three ways: wind forces, flying debris and pressure. By itself, the force of the wind can knock over trees, break tree limbs and destroy loose items, such as television antennas and power lines. Many things can be moved by high winds. As winds increase, so does the pressure against stationary objects. Pressure against a wall rises with the square of the wind speed. For some structures, this force is enough to cause failure. The potential for damage to structures is increased when debris breaks the building "envelope" and allows the wind pressures to impact all surfaces (the building envelope includes all surfaces that make up the barrier between the indoors and the outdoors, such as the walls, foundation, doors, windows, and roof). Buildings needing maintenance and mobile homes are most subject to wind damage. High winds mean bigger waves. Extended pounding by waves can demolish any structure not properly designed. The waves also erode sand beaches, roads, and foundations. When foundations are undermined, the building will collapse.

Nine out of ten deaths during hurricanes are caused by storm surge flooding. Falling tree limbs and flying debris caused by high winds have the ability to cause injury or death. Downed trees and damaged buildings are a potential health hazard due to instability, electrical system damage, broken pipelines, chemical releases, and gas leaks. Sewage and water lines may also be damaged. Salt water and fresh water intrusions from storm surge send animals, such as snakes, into areas occupied by humans.

Location

Hurricanes are the single biggest threat to all of south Louisiana. With any single hurricane having the potential to devastate multiple parishes during a single event, the risk of a tropical cyclone has the probability of impacting anywhere within the planning area for Tangipahoa parish. As such, all jurisdictions are equally at risk for tropical cyclones.

Previous Occurrences / Extent

The central Gulf of Mexico coastline is among the most hurricane-prone locations in the United States, and hurricanes can affect every part of the state. The SHELDUS database reports a total of 14 tropical cyclone events occurring that have impacted Tangipahoa Parish between the years 1989-2014 (*Table 2-66*). The tropical cyclone events experienced in Tangipahoa Parish include depressions, storms, and hurricanes. Hurricanes that have had a major impact on Tangipahoa Parish are profiled after *Table 2-66*.

Table 2-69: Historical tropical cyclone events in Tangipahoa Parish from 1989- 2014. (Source: SHELDUS)

Date	Name	Storm Type While Impacting Tangipahoa Parish
October 15, 1989	Jerry	Tropical Storm
August 26, 1992	Andrew	Tropical Storm
October 4, 1995	Opal	Tropical Storm
September 28, 1998	Georges	Tropical Storm
August 8, 2002	Bertha	Tropical Storm
September 27, 2002	Isidore	Tropical Storm
October 3, 2002	Lili	Hurricane – Cat 1
June 30, 2003	Bill	Tropical Storm
September 15, 2004	Jeanne	Tropical Depression
September 15, 2004	Ivan	Tropical Storm
October 9, 2004	Matthew	Tropical Storm
July 6, 2005	Cindy	Tropical Storm
August 29, 2005	Katrina	Hurricane – Cat 1
September 23, 2005	Rita	Tropical Storm
August 24, 2008	Fay	Tropical Depression
September 1, 2008	Gustav	Hurricane – Cat 2
September 12, 2008	Ike	Tropical Storm
September 9, 2009	Ida	Tropical Storm
September 2, 2011	Lee	Tropical Storm
August 29, 2012	Isaac	Tropical Storm

Hurricane Betsy (1965)

Hurricane Betsy made landfall in September 1965 as a Category 3 hurricane and caused extensive damage in Tangipahoa Parish. Winds were measured at up to 92 mph, and an estimated $7,812,500 dollars of damage occurred. Injuries in Tangipahoa Parish alone totaled 273 people and while there were no deaths in the parish, Hurricane Betsy claimed 74 lives statewide.

Tropical Storm Allison (2001)

In June 2001, Tropical Storm Allison made landfall in the state of Texas and moved across Louisiana causing extensive flood damage. Up to 30 inches of rain fell in some areas of the state. The Tangipahoa River crested at 17.3 feet causing low lying areas around Highway 22 and U.S. 190 to become inundated. Ponchatoula reported approximately 20.03 inches of precipitation during Tropical Storm Allison.

Tropical Storm Isidore (2002)

Tropical Storm Isidore made landfall in Grand Isle, Louisiana on September 27, 2002. Tropical Storm Isidore had a large circulation with high force winds extending several hundreds of miles from its center. This caused significant storm surge over a large area specifically on Lake Pontchartrain where storm surges of 4 to 5 feet above normal were measured. Low lying areas, roadways, and some non-elevated structures on the lake were flooded.

Tropical Storm Isidore caused minor power outages and damage in Tangipahoa Parish. Approximately 2,750 residents in Hammond and 1,800 residents in Amite experienced power outages due to Tropical Storm Isidore. Amite recorded 4.8 inches of precipitation, Hammond 4.6 inches, and Ponchatoula 4.8 inches which resulted in localized flooding and some road closures. In Amite, most of the damage was contained to the downtown area along Oak Street. Richou Road, Trano Road, and Fletcher Loop Road in Ponchatoula and Dummy Line Road Number 2 in Tickfaw were closed due to flood waters.

Hurricane Katrina (2005)

Hurricane Katrina was one of the strongest and most destructive hurricanes on record to impact the coast of the United States. The National Hurricane Center ranked Katrina as the costliest storm (both before and after adjusting for inflation) and the third deadliest in the U.S. since 1851. The hurricane made landfall in Plaquemines Parish on August 29, 2005, as a Category 3 storm and continued on a north northeast track with a second landfall occurring near the Louisiana and Mississippi border.

The eye of Hurricane Katrina passed through Tangipahoa Parish approximately 35 miles east of Amite. Tangipahoa Parish experienced hurricane force winds in excess of 90 mph for over 12 hours which downed thousands of trees and power lines resulting in a parish wide power outage for 3 days and extensive obstruction of all roadways. Hurricane Katrina caused extensive damage to the Tangipahoa Parish's critical facilities infrastructure directly impacting LSU Medical Facility, North Oaks Medical Clinic, and Southeastern University.

Hurricane Rita (2005)

While Hurricane Katrina and resulting levee failures captured headlines worldwide, lesser known but just as destructive Hurricane Rita wreaked havoc on southwestern Louisiana less than a month later. The storm made landfall as a Category 3 hurricane but impacted Tangipahoa Parish as a tropical storm. Across southeast Louisiana, the main affect from Hurricane Rita was the substantial storm surge flooding that occurred in low lying communities across coastal areas of southern Terrebonne, southern Lafourche, and southern Jefferson Parishes where numerous homes and businesses were flooded. Some of the most substantial damage occurred in southern Terrebonne Parish where storm surge of 5 to 7 feet above normal overtopped or breached local drainage levees inundating many small communities. Newspaper accounts indicated approximately 10,000 structures were flooded in Terrebonne Parish. Lafitte and other communities in lower Jefferson Parish also suffered extensive storm surge flooding. Storm surge flooding also occurred in areas adjacent to Lake Pontchartrain and Lake Maurepas with some homes and businesses flooded in the Manchac area of Tangipahoa Parish. Approximately 1500 structures were reported flooded in Livingston Parish near Lake Maurepas. Repaired levees damaged by Hurricane Katrina in late August were overtopped or breached along the Industrial Canal in New Orleans resulting in renewed flooding in adjacent

portions of New Orleans and St. Bernard Parish, although the flooding was much more limited in areal coverage than during Hurricane Katrina.

Hurricane Gustav (2008)

Hurricane Gustav emerged into the southeast Gulf of Mexico as a major category 3 hurricane on August 31st after developing in the Caribbean Sea and moving across western Cuba. Gustav tracked northwestward across the Gulf toward Louisiana and made landfall as a category 2 hurricane near Cocodrie, Louisiana during the morning of September 1st. Gustav continued to move northwest across south Louisiana and weakened to a Category 1 storm over south central Louisiana later that day. The storm diminished to a tropical depression over northwestern Louisiana on September 2nd.

The highest wind gust recorded was 102 knots or 117 mph at a USGS site at the Houma Navigational Canal and at the Pilot Station East C-MAN at near the Southwest Pass of the Mississippi River. The highest sustained wind of 91 mph was recorded at the Pilot's Station East C-MAN site. However, due to the failure of equipment at some observation sites during the storm higher winds may have occurred. The minimum sea level pressure measured was 951.6 millibars at a USGS site at Caillou Lake southwest of Dulac and 954.5 millibars at the LUMCON facility near Dulac. Rainfall varied considerably across southeast Louisiana ranging from around 4 inches to just over 11 inches.

Gustav produced widespread wind damage across southeast Louisiana, especially in the area from Houma and Thibodaux through the greater Baton Rouge area including Tangipahoa Parish. Hurricane force wind gusts occurred across the inland areas through the Baton Rouge area and surrounding parishes. A peak wind gust of 91 mph was recorded at the Baton Rouge (Ryan Field) Airport at 112 PM CST. This was only one mph less than the highest wind gust recorded during Hurricane Betsy in 1965. The electric utility serving most of southeast Louisiana reported 75 to 100 percent of utility customers were without power after the storm from Lafourche and Terrebonne Parishes northwest through the Baton Rouge area to southwest Mississippi and central Louisiana. Considerable damage occurred to many houses and structures as large tree limbs and trees were toppled by the hurricane force winds. Preliminary estimates from the American Red Cross indicated that around 13,000 single family dwellings were damaged by the hurricane in southeast Louisiana, and several thousand more apartments and mobile homes. Early estimates from Louisiana Economic Development indicated that Gustav caused at least $4.5 billion in property damage in Louisiana, including insured and uninsured losses.

Rain fall from Hurricane Gustav resulted in localized flood throughout the Tangipahoa Parish. Hammond recorded 4.65 inches of precipitation and Amite 6 inches. Areas south of Highway 22 in the extreme southern portion of the parish received the blunt of damage especially in the Manchac area which experienced severe flooding.

Tropical Storm Lee (2011)

Tropical Storm Lee initially developed as Tropical Depression Thirteen in the middle of the Gulf of Mexico on Thursday evening September 1st, 2011. The depression moved slowly north and gradually strengthened, eventually reaching tropical storm strength just south of the Louisiana coast on Friday afternoon September 2nd, 2011. Tropical Storm Lee made only slow and haltingly northward progress over the next 24 hours, eventually moving onshore the Louisiana coast Saturday night, September 3rd, 2011, with a maximum sustained wind estimated around 60 mph. Lee moved slowly inland to the north of Baton Rouge late Sunday September 4th, 2011, and eventually weakened to a tropical depression Sunday evening.

Tropical Depression Lee then moved steadily northeast throughout Monday, September 5th, 2011, taking on extra-tropical characteristics over the next 24 hours as it interacted with an upper level disturbance moving through the region. The maximum wind observed in Louisiana was a southerly wind of 40 kts (46 mph) sustained, 50 kts (58 mph) gust at New Orleans Lakefront Airport on September 4th, 2012 at 0528CST. The lowest minimum central pressure was 993.2 mb at Baton Rouge Ryan Field at Sept 4, 2012 at 0959CST. As Tropical Depression Lee was moving northeast and taking on mid-latitude characteristics, strong northerly winds were experienced across the region, occasionally gusting to higher levels than experienced when Lee was characterized as a tropical storm. No fatalities or injuries were associated with any Tropical Storm Lee hazards.

The main impacts associated with Tropical Storm Lee were associated with storm surge and rainfall. Both of these impacts were related to its slow forward speed as it crossed the region, which allowed the circulation to linger over the area for several days. Storm surge associated with Lee caused storm tides 3 to 5 feet above normal, causing lowland flooding. Additional detailed information about Tropical Storm Lee's storm surge is contained in the separate storm surge report. Four day total rainfall ranged between 7 and 15 inches across the area. A maximum of 15.48 inches was recorded near Holden in Livingston Parish. Due to dry antecedent conditions, river flooding was minimal for the amount of rainfall that occurred. Wind impacts were generally minimal due to only tropical storm strength winds being recorded, resulting in tree limbs being blown down, and weak trees toppling, causing power outages.

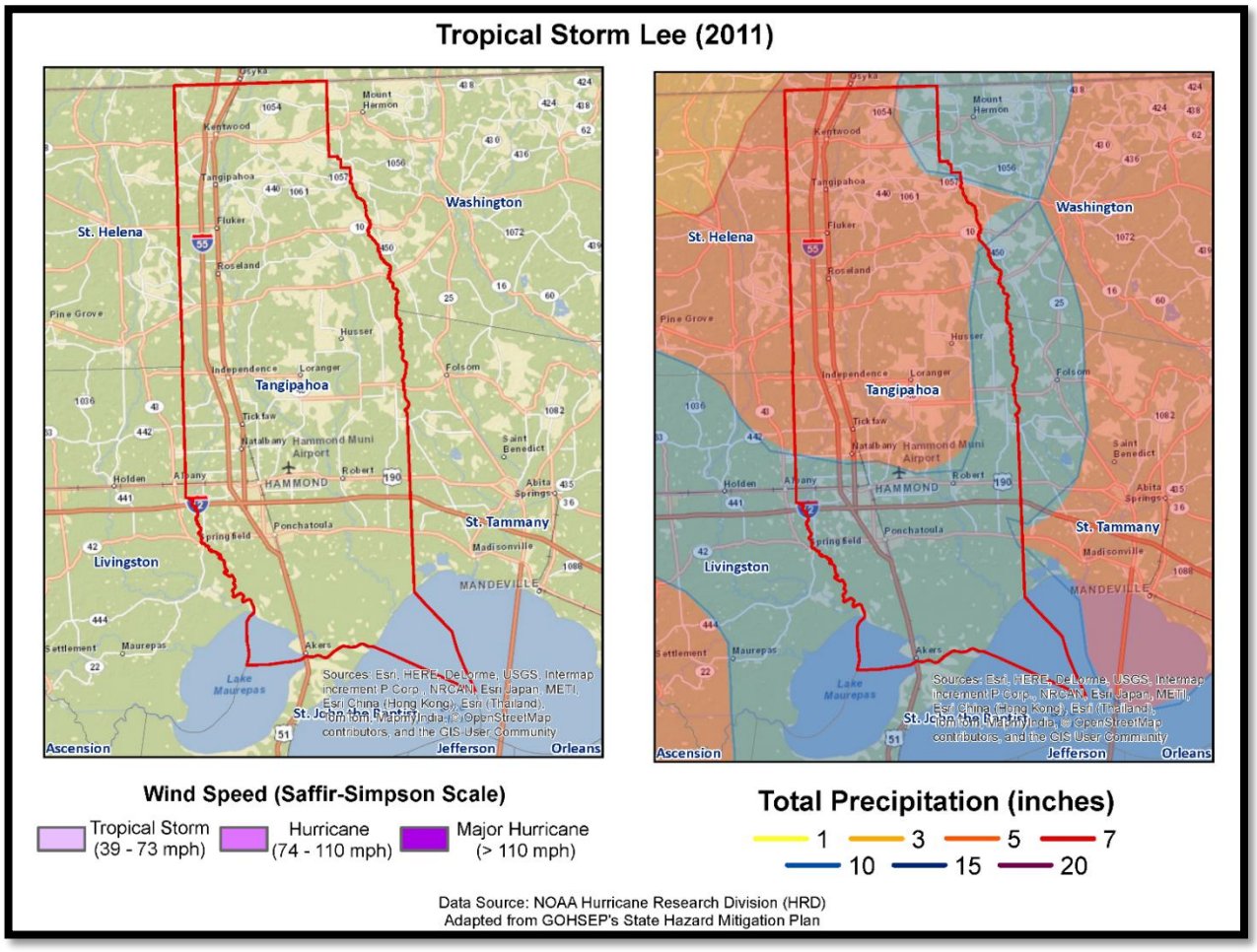


Figure 2-41: Wind and Precipitation fields affecting Tangipahoa Parish from Tropical Storm Lee.

Effects from the landfall of Tropical Storm Lee were felt in different areas throughout Tangipahoa Parish and its incorporated jurisdictions. According to the National Weather Service, the following statistics were recorded in association with Tropical Storm Lee:

- **Rainfall totals**: Ponchatoula – 13.24 inches, Robert – 11.8 inches, Kentwood – 8.77 inches,
- **Overall synopsis**: Zero deaths or injuries; several recreational camps flooded along with roadways near Lake Maurepas due to tidal flooding.

- Source: National Weather Service Post Tropical Cyclone Report

Hurricane Isaac (2012)

Isaac entered the Gulf of Mexico as a tropical storm on August 26, moving northwest after crossing Haiti, Cuba and the Florida Straits. Isaac strengthened into a hurricane on the morning of the 28th when it was 75 miles south-southeast of the mouth of the Mississippi River. Isaac made landfall in Plaquemines Parish as a Category 1 Hurricane near Southwest Pass of the Mississippi River on the evening of the 28th. A second landfall occurred near Port Fourchon the following morning. The storm weakened to a tropical storm on the

afternoon of the 29th about 50 miles west southwest of New Orleans, and weakened further to a tropical depression on the afternoon of the 30th near Monroe, Louisiana.

The highest wind gust recorded on land in Louisiana was 75 knots, or 86 mph, measured by a portable weather station (Texas Tech University) near Buras on the evening at August 28. The maximum sustained wind in Louisiana was 65 knots, or 75 mph, at the same portable weather station near Buras on the evening of August 28. There were several marine observations near the coast that had slightly higher wind readings, but their observation heights were generally 80 ft or higher.

Due to Isaac's very large size, and slow forward speed, tropical storm force winds lasted in excess of 48 hours in many areas of coastal southeast Louisiana. Occasional hurricane gusts of 70 to 85 mph were recorded across southeast Louisiana during the night of the Aug 28th and early on the 29th, especially south of Lake Pontchartrain. Interior areas of southeast Louisiana such as around Baton Rouge and northward experienced tropical storm force winds. Widespread power outages occurred across the area. Local utility companies reported over 700,000 customers were without power at the peak of the storm in southeast Louisiana. Generally, most of the wind damage was limited to downed trees and power lines, and roof damage caused by wind and falling trees and tree limbs.

Significant impact also occurred around Lakes Pontchartrain and Maurepas with a storm tide of 5 to 9 feet. Five to 10 thousand homes were flooded in low lying areas of that border these lakes of the following parishes: Tangipahoa, Livingston, Ascension, St James and St John the Baptist. Laplace in St. John the Baptist was especially hard hit with over 5,000 homes flooded by storm surge. An additional storm surge fatality occurred in Tangipahoa Parish on the morning of the 30th when a 75 year old man drove his car into a storm surge filled ditch. Storm surge flooding also affected areas south and southwest of New Orleans with a storm tide of 4 to 7 feet. Roadways and low lying property were flooded. Local levees around Lafitte and Myrtle Grove were overtopped and/or breached resulting flooding of numerous houses and property in this area.

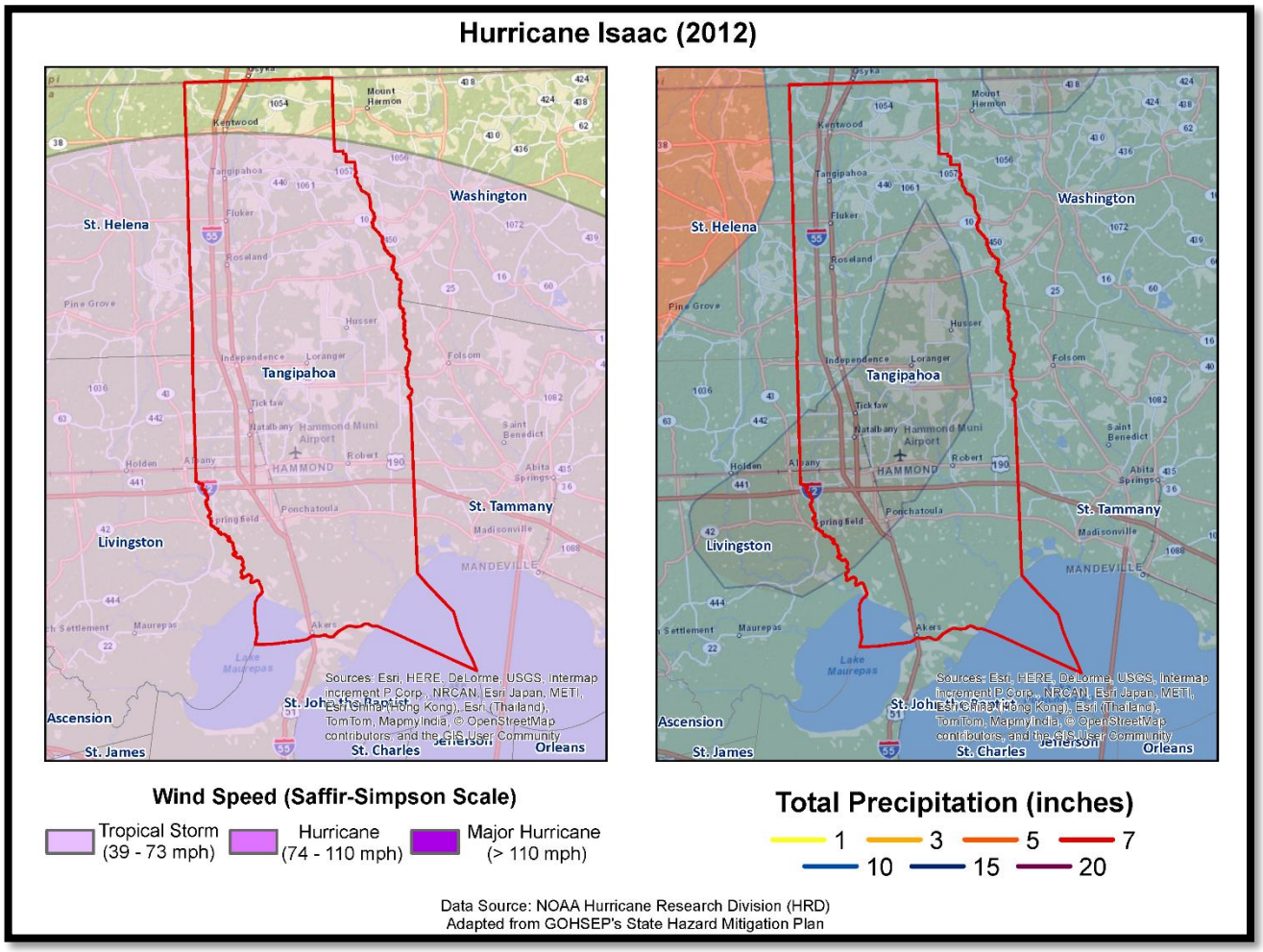


Figure 2-42: Wind and Precipitation fields affecting Tangipahoa Parish from Hurricane Isaac.

Many areas of southeast Louisiana received 8 to 12 inches of rain with a few locations having 15 inches of rain or more. Maximum storm total rainfall was 20.66 inches at the New Orleans Carrollton gauge on the Mississippi River. Rainfall run-off produced moderate to major flooding on the Tangipahoa, Tchefuncte, Tickfaw, Amite, Pearl, Bogue Chitto and Bogue Falaya Rivers. Storm surge and high tides restricted outflow of the rivers near the coast and lakes exacerbating flooding in those areas.

Overall impacts of Isaac resulted in at least $600 million in damages in southeast Louisiana, 3 direct fatalities, and 2 indirect fatalities. Storm surge flooding accounted for the bulk of damage, estimated around $500 million and the three direct storm surge fatalities in Louisiana. Winds accounted for a much lesser amount of slightly more than a $100 million.

In Tangipahoa Parish, Isaac caused significant building damage and power outages throughout the parish. Approximately 4,584 homes located in Tangipahoa Parish were damaged by Hurricane Isaac and approximately 43% of the parish experienced power outages. Hammond, Robert, Amite, Kentwood, and Ponchatoula experienced localized flooding. Notable road closures include Interstate 55 south of the Mississippi border, US 51 from Manchac to Ponchatoula, Louisiana 445 between US 190 and Interstate 12, Louisiana 440 westbound at the Tangipahoa River, US 190 east of Louisiana 445, and US 190 between Old Covington Highway and Louisiana 445.

Several mandatory evacuations were ordered in Tangipahoa Parish due to Hurricane Isaac. Residents located within a half mile of the Tangipahoa River were ordered to evacuate due to the river reaching major flood stage. An earthen dam located in Percy Quin State Park located along the banks of the 700-acre Lake Tangipahoa on the Mississippi/Louisiana border was severely damaged resulting in mandatory evacuations of small towns and rural areas in Tangipahoa Parish. In advance of the storm, the extreme southern portions of Tangipahoa Parish were ordered to evacuate. This included the Manchac area, the Akers community, Lee's Landing, and all areas south of Wadesboro Road and Weinberger Road.

Figure 2-43 displays the wind zones that affect Tangipahoa Parish in relation to critical facilities throughout the Parish and *Figures 2-44* and *2-45* show the amount of precipitation and wind the parish received from four major tropical cyclones that struck the Louisiana coast.

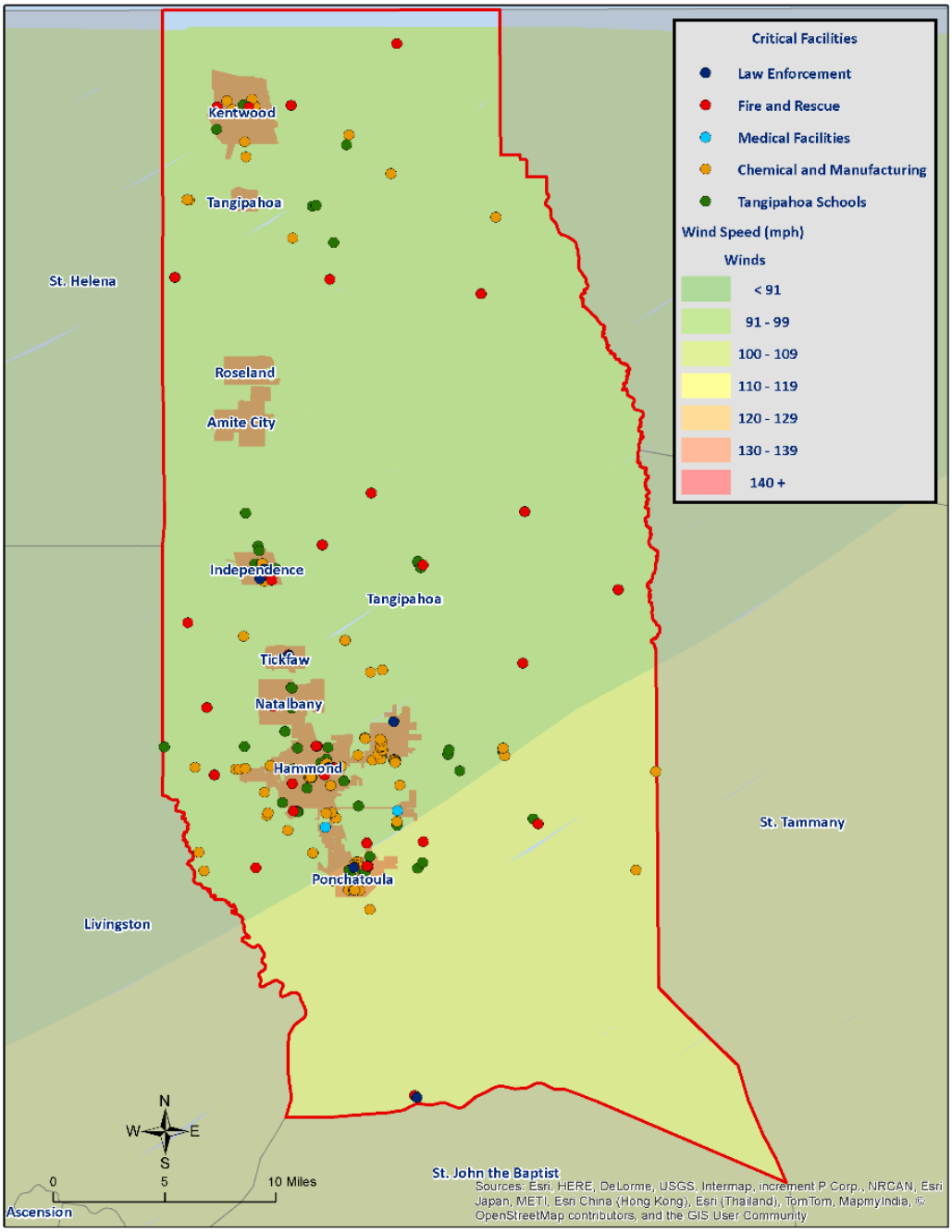


Figure 2-43: Winds zones for Tangipahoa Parish in relation to critical facilities.

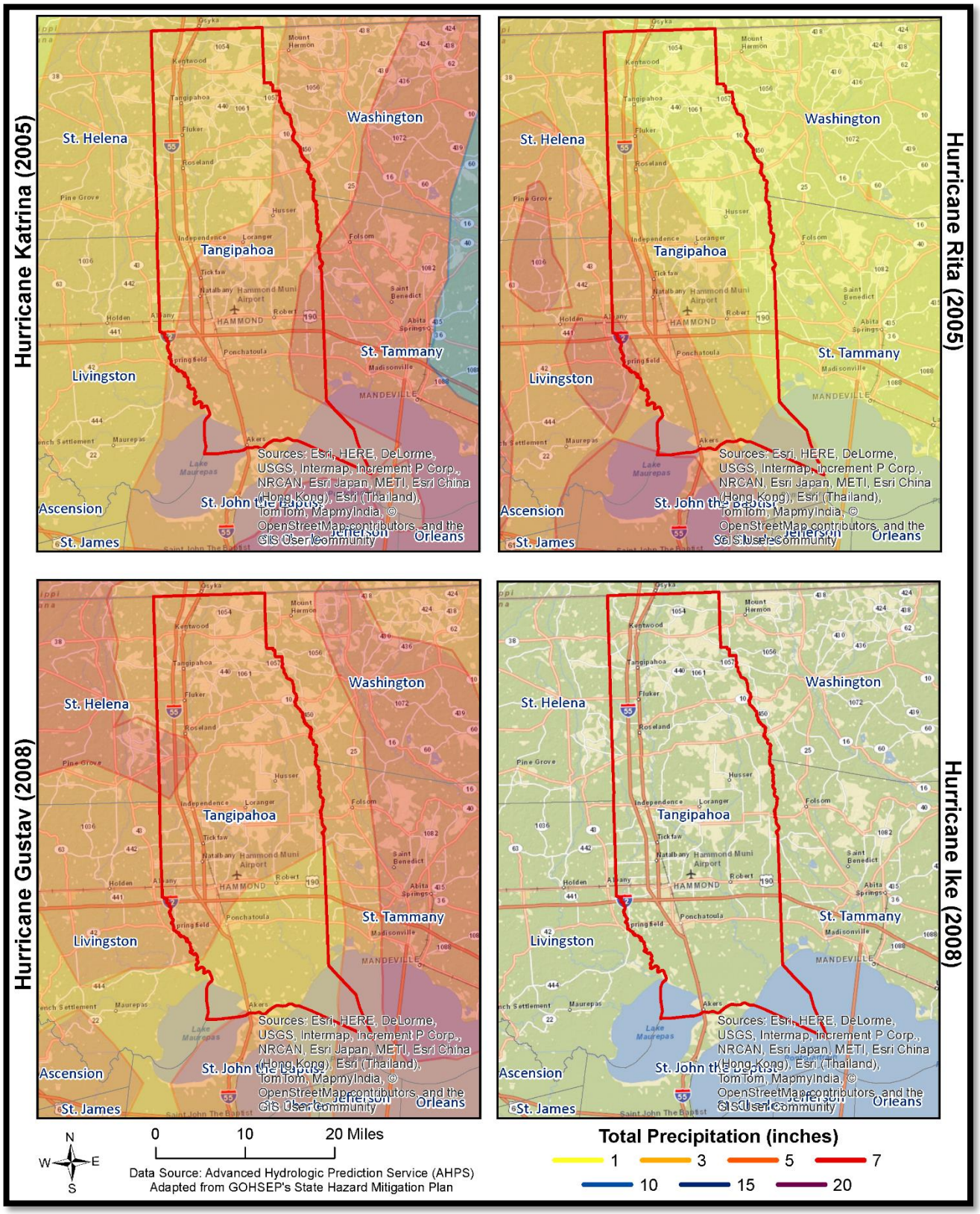


Figure 2-44: Precipitation totals from Hurricane Katrina, Hurricane Rita, Hurricane Gustav, and Hurricane Ike for Tangipahoa Parish.
(Source: State of Louisiana Hazard Mitigation Plan)

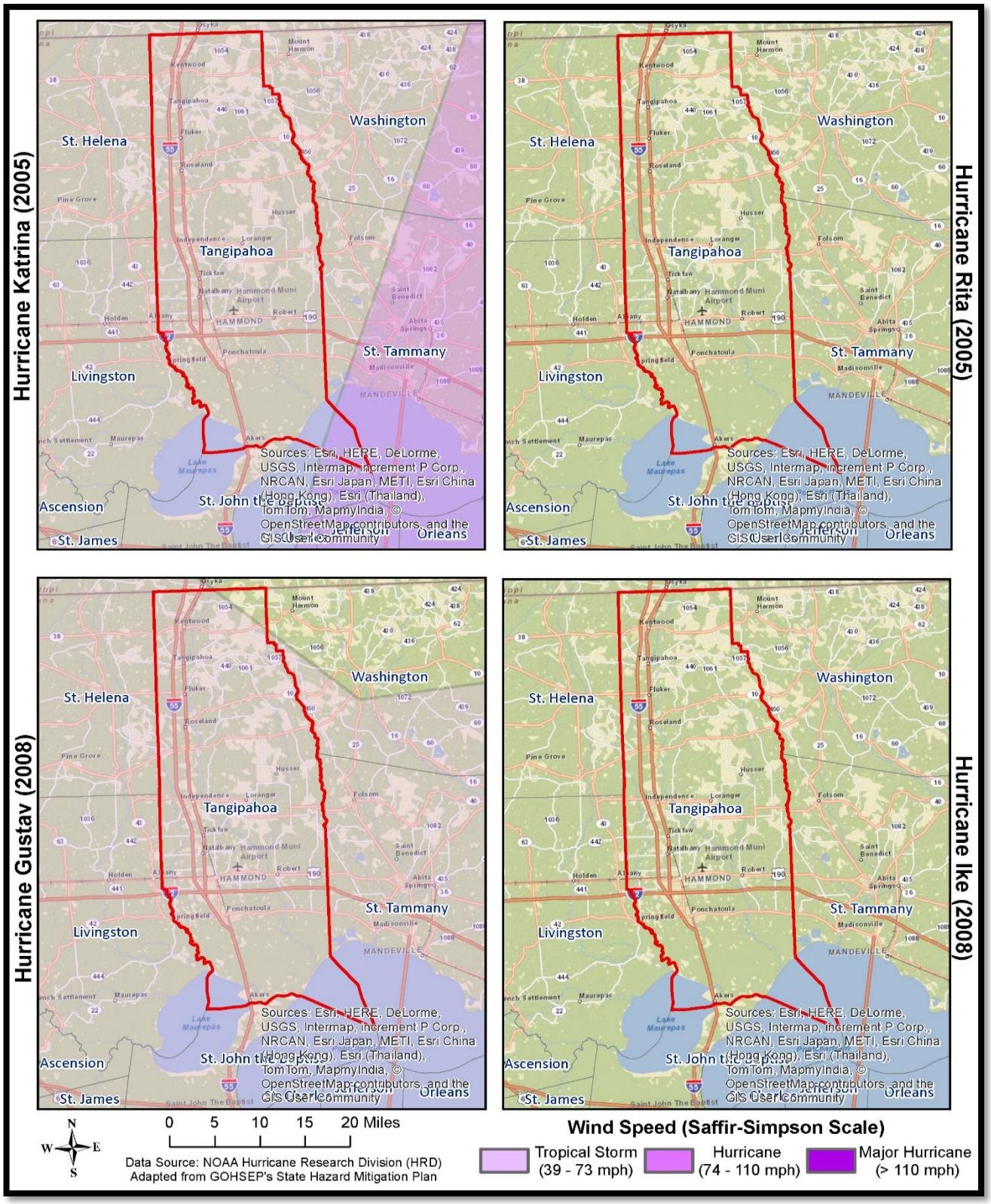


Figure 2-45: Maximum sustained winds from Hurricane Katrina, Hurricane Rita, Hurricane Gustav, and Hurricane Ike.
(Source: State of Louisiana Hazard Mitigation Plan)

Frequency / Probability

Tropical cyclones are large natural hazard events that occur regularly within Tangipahoa Parish. The annual chance of occurrence for a tropical cyclone occurrence is estimated at 84% for Tangipahoa parish and its municipalities.

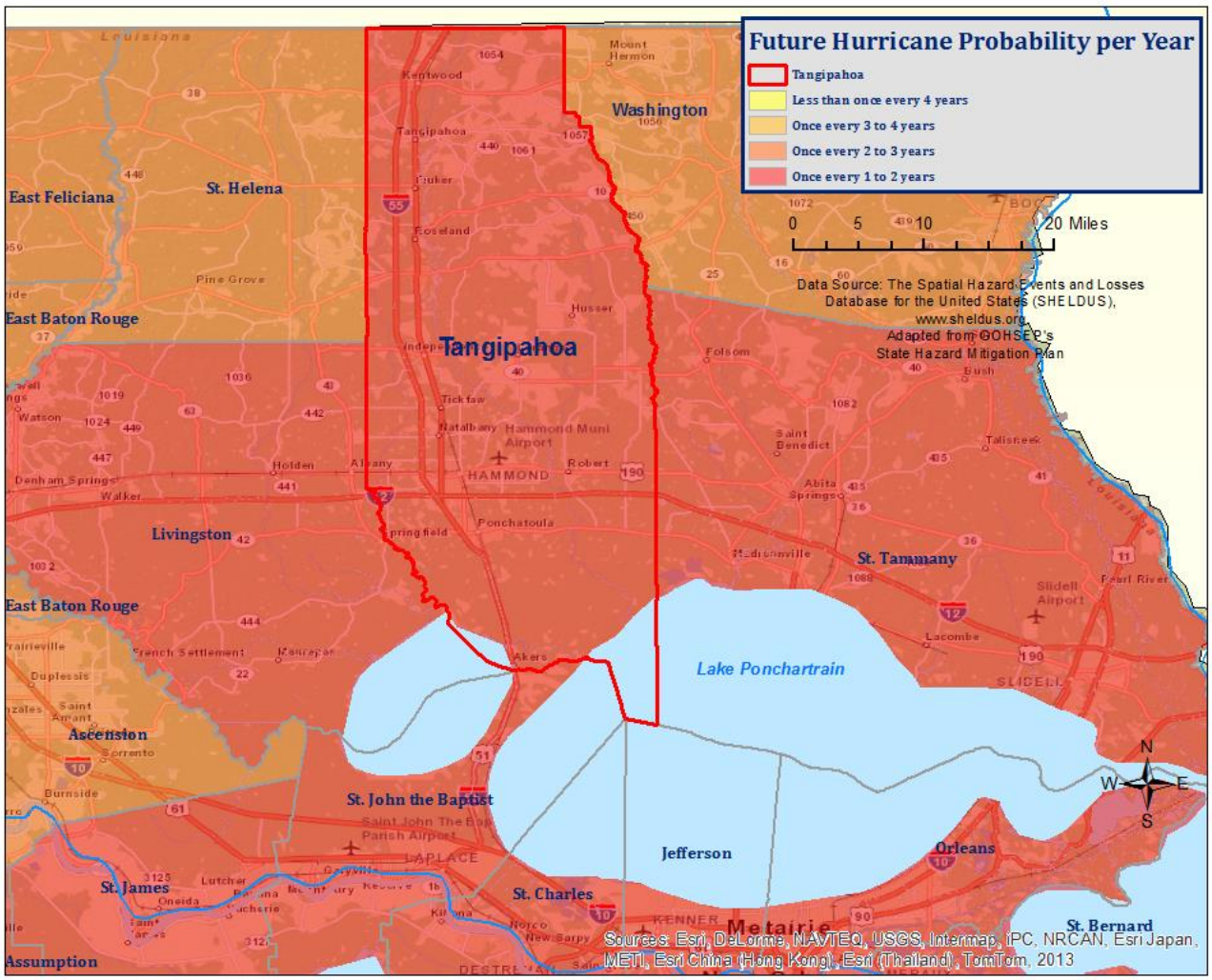


Figure 2-46: Probability of Tropical Cyclones impacting Tangipahoa Parish. (Source: State of Louisiana Hazard Mitigation Plan)

The tropical cyclone season for the Atlantic Basin is from June 1st through November 30th with most of the major hurricanes (Saffir-Sipson Categories 3,4,5) occurring between the months of August and October. Based on geographical location alone, Tangipahoa Parish is highly vulnerable to tropical cyclones. This area has experienced several tropical cyclone events in the past and can expect more in the future. Based on historical record, illustrated in *Figure 2-46*, the probability of future occurrence of tropical cyclones in Tangipahoa Parish is approximately one event every 1 to 2 years.

Estimated Potential Loses

Using HAZUS-MH 100 year hurricane model, the 100 year hurricane scenario was analyzed to determine losses from this worst-case scenario. *Table 2-70* shows the total economic losses that would result from this occurrence.

Table 2-70: Total estimated losses for a 100 Year Hurricane Event. (Source: HAZUS-MH)

Jurisdiction	
Tangipahoa Parish (Unincorporated)	$100,795,363
Amite	$4,971,931
Hammond	$24,036,002
Independence	$1,999,098
Kentwood	$2,639,050
Ponchatoula	$7,875,125
Roseland	$1,348,341
Tangipahoa	$898,093
Tickfaw	$833,258
Total	$145,396,260

The HAZUS-MH hurricane model also provides a breakdown by jurisdiction for seven primary sectors (HAZUS occupancy) throughout the parish. The losses for each jurisdiction by sector are listed in the tables below.

Table 2-71: Estimated losses in unincorporated Tangipahoa Parish for a 100 year hurricane event. (Source: HAZUS-MH)

Tangipahoa Parish (Unincorporated Areas)	Estimated total Losses from 100 Year Hurricane Event
Agricultural	$199,761
Commercial	$4,820,083
Government	$114,437
Industrial	$579,006
Religious / Non-Profit	$599,282
Residential	$94,083,273
Schools	$399,521
Totals	$100,795,363

Table 2-72: Estimated losses in Amite for a 100 year hurricane event. (Source: HAZUS-MH)

Amite	Estimated total Losses from 100 Year Hurricane Event
Agricultural	$9,854
Commercial	$237,760
Government	$5,645
Industrial	$28,561
Religious / Non-Profit	$29,561
Residential	$4,640,844
Schools	$19,707
Totals	$4,971,931

Table 2-73: Estimated losses in Hammond for a 100 year hurricane event. (Source: HAZUS-MH)

Hammond	Estimated total Losses from 100 Year Hurricane Event
Agricultural	$47,636
Commercial	$1,149,413
Government	$27,289
Industrial	$138,072
Religious / Non-Profit	$142,907
Residential	$22,435,414
Schools	$95,271
Totals	$24,036,002

Table 2-74: Estimated losses for Independence for a 100 year hurricane event. (Source: HAZUS-MH)

Independence	Estimated total Losses from 100 Year Hurricane Event
Agricultural	$3,962
Commercial	$95,598
Government	$2,270
Industrial	$11,484
Religious / Non-Profit	$11,886
Residential	$1,865,976
Schools	$7,924
Totals	$1,999,098

Table 2-75: Estimated losses for Kentwood for a 100 year hurricane event. (Source: HAZUS-MH)

Kentwood	Estimated total Losses from 100 Year Hurricane Event
Agricultural	$5,230
Commercial	$126,201
Government	$2,996
Industrial	$15,160
Religious / Non-Profit	$15,691
Residential	$2,463,312
Schools	$10,460
Totals	$2,639,050

Table 2-76: Estimated losses for Ponchatoula for a 100 year hurricane event. (Source: HAZUS-MH)

Ponchatoula	Estimated total Losses from 100 Year Hurricane Event
Agricultural	$15,607
Commercial	$376,592
Government	$8,941
Industrial	$45,238
Religious / Non-Profit	$46,822
Residential	$7,350,711
Schools	$31,215
Totals	$7,875,125

Table 2-77: Estimated losses for Roseland for a 100 year hurricane event. (Source: HAZUS-MH)

Roseland	Estimated total Losses from 100 Year Hurricane Event
Agricultural	$2,672
Commercial	$64,478
Government	$1,531
Industrial	$7,745
Religious / Non-Profit	$8,017
Residential	$1,258,553
Schools	$5,344
Totals	$1,348,341

Table 2-78: Estimated losses for Tangipahoa for a 100 year hurricane event. (Source: HAZUS-MH)

Tangipahoa	Estimated total Losses from 100 Year Hurricane Event
Agricultural	$1,780
Commercial	$42,947
Government	$1,020
Industrial	$5,159
Religious / Non-Profit	$5,340
Residential	$838,288
Schools	$3,560
Totals	$898,093

Table 2-79: Estimated losses for Tickfaw for a 100 year hurricane event. (Source: HAZUS-MH)

Tickfaw	Estimated total Losses from 100 Year Hurricane Event
Agricultural	$1,651
Commercial	$39,847
Government	$946
Industrial	$4,787
Religious / Non-Profit	$4,954
Residential	$777,770
Schools	$3,303
Totals	$833,258

Threat to People

The total population within the parish that is susceptible to a hurricane hazard are shown in the table below.

Table 2-80: Number of people susceptible to a 100 year hurricane event in Tangipahoa Parish. (Source: HAZUS-MH)

Number of People Exposed to Hurricane Hazards			
Location	**# in Community**	**# in Hazard Area**	**% in Hazard Area**
Parish (Unincorporated)	83,950	83,950	100%
Amite	4,141	4,141	100%
Hammond	20,019	20,019	100%
Independence	1,665	1,665	100%
Kentwood	2,198	2,198	100%
Ponchatoula	6,559	6,559	100%
Roseland	1,123	1,123	100%
Tangipahoa	748	748	100%
Tickfaw	694	694	100%

The HAZUS-MH hurricane model was also extrapolated to provide an overview of vulnerable populations throughout the jurisdictions in the tables on the following pages.

Table 2-81: Vulnerable populations in unincorporated Tangipahoa Parish for a 100 year hurricane. (Source: HAZUS-MH)

Tangipahoa Parish (Unincorporated)		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	83,950	100%
Persons Under 5 years	6,167	7.4%
Persons Under 18 years	21,669	25.8%
Persons 65 Years and Over	9,243	11%
White	62,081	73.9%
Minority	21,869	26.1%

Table 2-82: Vulnerable populations in Amite for a 100 year hurricane. (Source: HAZUS-MH)

Amite		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	4,141	100%
Persons Under 5 years	220	5.3%
Persons Under 18 years	920	22.2%
Persons 65 Years and Over	526	12.7%
White	1,805	43.6%
Minority	2,336	56.4%

Table 2-83: Vulnerable populations in Hammond for a 100 year hurricane. (Source: HAZUS-MH)

Hammond		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	20,019	100%
Persons Under 5 years	1,365	6.8%
Persons Under 18 years	4,273	21.3%
Persons 65 Years and Over	2,330	11.6%
White	9,724	48.6%
Minority	10,295	51.4%

Table 2-84: Vulnerable populations in Independence for a 100 year hurricane. (Source: HAZUS-MH)

Independence		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	1,665	100%
Persons Under 5 years	136	8.2%
Persons Under 18 years	450	27%
Persons 65 Years and Over	255	15.3%
White	909	54.6%
Minority	756	45.4%

Table 2-85: Vulnerable populations in Kentwood for a 100 year hurricane. (Source: HAZUS-MH)

Kentwood		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	2,198	100%
Persons Under 5 years	145	6.6%
Persons Under 18 years	590	26.8%
Persons 65 Years and Over	296	13.5%
White	593	27%
Minority	1,605	73%

Table 2-86: Vulnerable populations in Ponchatoula for a 100 year hurricane. (Source: HAZUS-MH)

Ponchatoula		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	6,559	100%
Persons Under 5 years	489	7.5%
Persons Under 18 years	1,764	26.9%
Persons 65 Years and Over	870	13.3%
White	4,155	63.3%
Minority	2,404	36.7%

Table 2-87: Vulnerable populations in Roseland for a 100 year hurricane. (Source: HAZUS-MH)

Roseland		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	1,123	100%
Persons Under 5 years	77	6.9%
Persons Under 18 years	310	27.6%
Persons 65 Years and Over	139	12.4%
White	359	32%
Minority	764	68%

Table 2-88: Vulnerable populations in Tangipahoa for a 100 year hurricane. (Source: HAZUS-MH)

Tangipahoa		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	748	100%
Persons Under 5 years	73	9.8%
Persons Under 18 years	275	36.8%
Persons 65 Years and Over	50	6.7%
White	58	7.8%
Minority	690	92.2%

Table 2-89: Vulnerable populations in Tickfaw for a 100 year hurricane. (Source: HAZUS-MH)

Tickfaw		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	694	100%
Persons Under 5 years	40	5.8%
Persons Under 18 years	169	24.4%
Persons 65 Years and Over	94	13.5%
White	522	75.2%
Minority	172	24.8%

Vulnerability

See Appendix C for parish and municipality buildings that are susceptible to hurricanes.

Wildfire

A wildfire is combustion in a natural setting, marked by flames or intense heat. Most frequently wildfires are ignited by lightning or unintentionally by humans. Fires set purposefully (but lawfully) are referred to as controlled fires or burns. There are three different types of wildfires. (1) **Ground fires** burn primarily in the thick layers of organic matter directly on the forest floor and even within the soil. Ground fires destroy root networks, peat, and compact litter. These fires spread extremely slowly and can smolder for months. (2) **Surface fires** burn litter and vegetative matter in the underbrush of a forest. (3) **Crown fires** spread rapidly by wind and move quickly by jumping along the tops of trees. There are two types of crown fires—(a) *passive (or dependent)* crown fires rely on heat transfer from surface fire, whereas (b) *active (or independent)* crown fires do not require any heat transfer from below. Active crown fires tend to occur with greater tree density and drier conditions. A firestorm is a mass, crown fire (also called a running crown fire, area fire, or conflagration). They are large, continuous, intense fires that lead to violent convection. They are characterized by destructively violent surface in-drafts near and beyond their perimeter. Crown fires are the most damaging and most difficult to contain. The intensity of crown fires enables the fire to produce its own wind gusts. These so-called *fire whirls* can move embers ahead of the fire front and ignite new fires. Fire whirls are spinning vortex columns of ascending hot air and gases rising from the fire. Large fire whirls have the intensity of a small tornado.

The conditions conducive to the occurrence of wildfires are not distributed equally across the United States. Wildfires have a much greater likelihood of occurring in the western part of the country. Although less frequent than in other areas, wildfires do occur in Louisiana. Wildfire danger can vary greatly season to season and is exacerbated by dry weather conditions. Factors that increase susceptibility to wildfires are the availability of fuel (e.g., litter and debris), topography (i.e., slope and elevation affect various factors like precipitation, fuel amount, and wind exposure), and specific meteorological conditions (e.g., low rainfall, high temperatures, low relative humidity, and winds). The potential for wildfire is often measured by the Keetch–Byram Drought Index (KBDI), which represents the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in the soil. The KBDI tries to measure the amount of precipitation needed to return soil to its full field capacity, with KBDI values ranging from 0 (moist soil) to 800 (severe drought).

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, exacerbated by human confrontation with nature. The wildland–urban interface is the area in which development meets wildland vegetation, where both vegetation and the built environment provide fuel for fires. As development near wildland settings continues, more people and property are exposed to wildfire danger. *Figure 2-48* displays the areas of wildland-urban interaction in Tangipahoa Parish.

The Southern Group of State Foresters developed the Southern Wildfire Risk Assessment Portal to create awareness among the public and government sectors about the threat of wildfires in their areas. The Southern Wildfire Assessment Portal allows users to identify areas that are most prone to wildfires. The table below summarizes the intensity levels assigned to areas in the Southern Wildfire Assessment Portal.

Table 2-90: Southern Group of State Foresters Wildfire Risk Assessment Fire Intensity Scale. (Source: Southern Wildfire Assessment Portal)

Fire Intensity Scale	
Level	**Definition**
1	Lowest Intensity: Minimal direst wildfire impacts. Location has a minimal chance of being directly impacted by a wildfire.
2	Low Intensity: Small flames usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress.
3	Moderate Intensity: Flames up to eight feet in length; short-range spotting is possible.
4	High Intensity: Large flames up to 30 feet in length; short-range spotting common; medium range spotting possible.
5	Highest Intensity: Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire induced winds.

Location

Wildfires impact areas that are populated with forests and grasslands. Because every jurisdictional area in Tangipahoa Parish has some form of wildland-urban interface or wildland-urban intermix, the entire planning area is equally at risk for wildfires.

Previous Occurrences / Extents

Both the SHELDUS and National Climatic Data Center report no wildfire events occurring within the boundaries of Tangipahoa Parish between the years of 1960 – 2014. The United States Fire Service's Active Fire Mapping Program estimates 158 wildfire events have occurred within the boundaries of Tangipahoa Parish between the years 2001 – 2014. This discrepancy between the different databases is attributed to SHELDUS and NCDC only recording events that cause damage to crops and property, or injuries and deaths.

Frequency / Probability

Because there has been no reported event that has caused damage to property, crops, or life, the State Hazard Mitigation Plan accesses the overall probability of a significant wildfire event occurring within Tangipahoa Parish as less than once every 100 years.

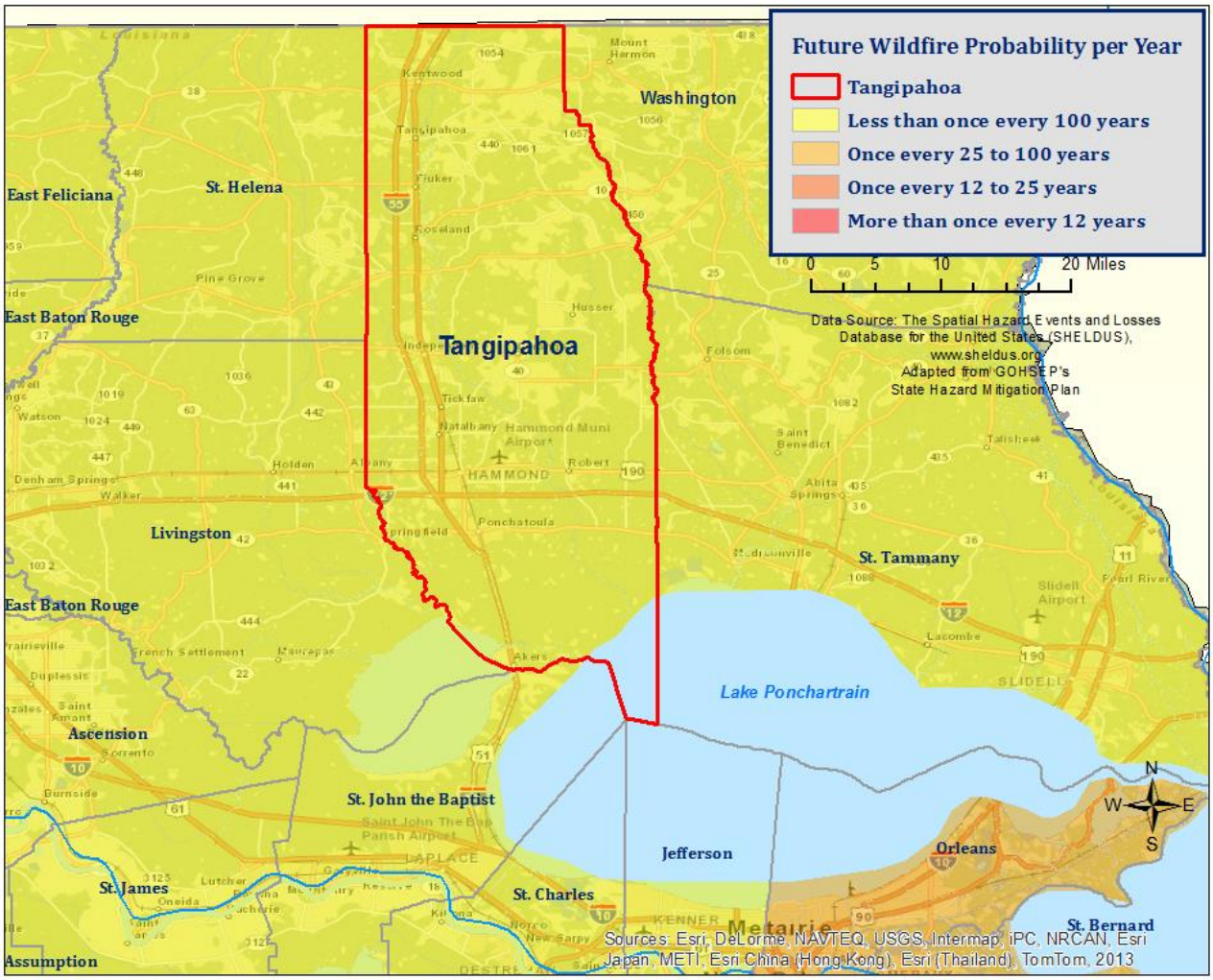


Figure 2-47: Probability of wildfire events in Tangipahoa and adjacent parishes based on data from 1987-2012.

(Source: State of Louisiana Hazard Mitigation Plan)

Estimated Potential Loses

According to the SHELDUS database, there have been no wildfire events that have caused property damage, crop damage, injuries, or fatalities in Tangipahoa Parish. In accessing the overall risk to population, the most vulnerable population throughout the parish consists of those residing in areas of wildland-urban interaction. *Figure 2-48* displays the areas of wildland-urban interaction in Tangipahoa Parish.

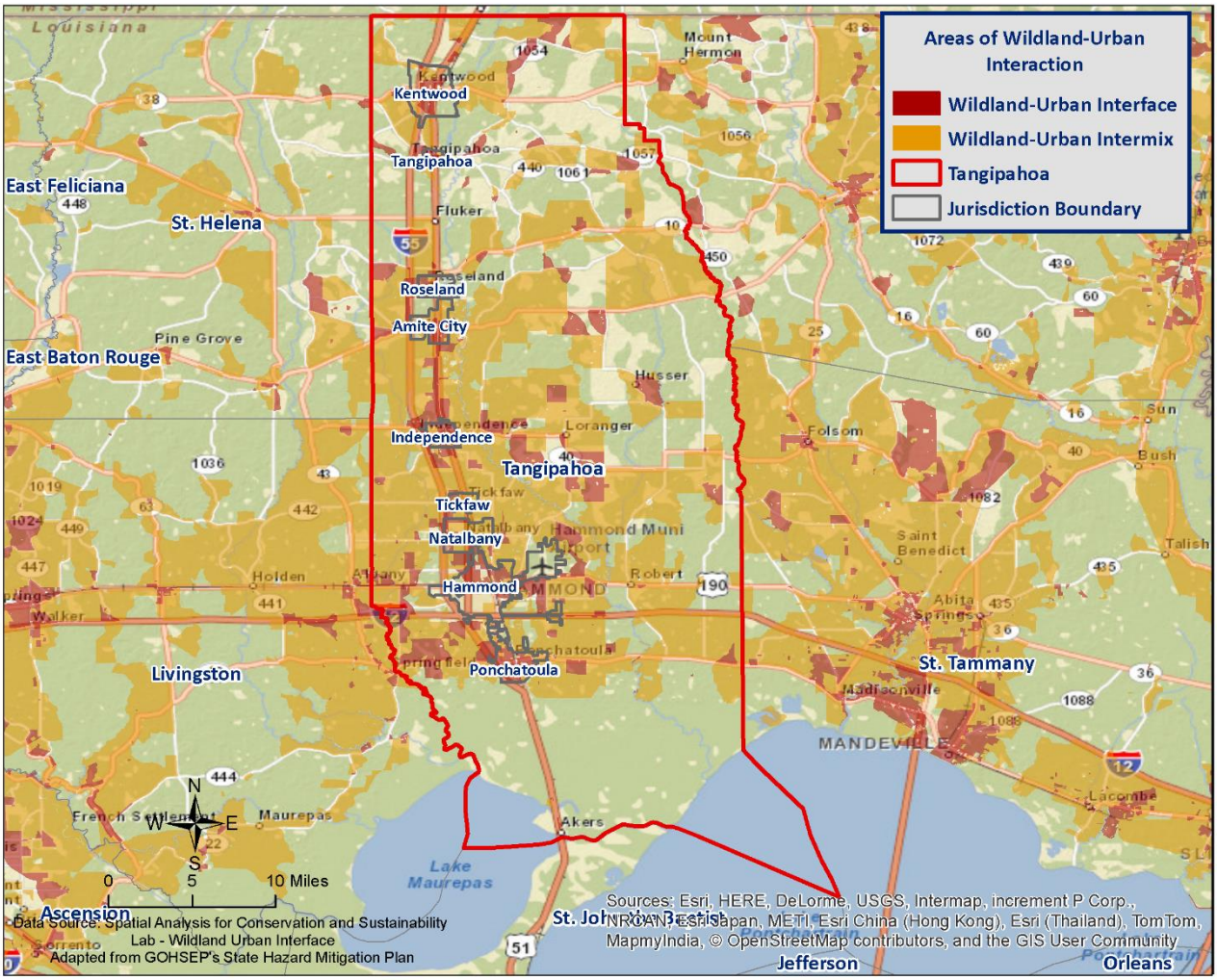


Figure 2-48: Wildland-Urban Interaction in Tangipahoa Parish

Table 2-91 presents an analysis of building exposure that are susceptible to wildfires based on location within the wildland-urban interface and intermix.

Table 2-91: Total building exposure to wildfires based on wildland-urban interface and intermix. (Source: HAZUS-MH)

Jurisdiction	Exposure
Tangipahoa Parish (Unincorporated)	$4,793,172,000
Amite	$431,329,000
Hammond	$1,914,744,000
Independence	$144,384,000
Kentwood	$168,215,000
Ponchatoula	$743,175,000
Roseland	$78,336,000
Tangipahoa	$35,120,000
Tickfaw	$83,746,000
Total	$8,728,090,000

Vulnerability

See Appendix C for parish and municipality facilities that could potentially be exposed to a wildfire hazard. Buildings were determined based on whether or not they fill within the wildfire-urban interface and/or intermix.

Winter Weather

For Louisiana and other parts of the southeastern United States, a severe winter storm occurs when humid air from the Gulf of Mexico meets a cold air mass from the north. As the temperature falls once the cold air mass crosses Louisiana, precipitation may fall in the form of snow or sleet. If the ground temperature is cold enough but air temperature is above freezing, rain can freeze instantly on contact with the surface, causing massive ice storms.

The winter weather events that affect the state of Louisiana are ice storms, freezes, and snow events. Each event can affect any part of Tangipahoa parish. Of the winter weather types listed above, ice storms are the most dangerous. Ice storms occur during a precipitation event when warm air aloft exceeds 32°F while the surface remains below the freezing point. Ice will form on all surfaces when precipitation originating as rain or drizzle contacts physical structures. These ice storms are usually accompanied by freezing temperatures and occasionally snow.

Winter storms can be accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. These types of conditions are very rare in Louisiana – even north Louisiana- but ice storms are more common. The climatic line between snow and rain often stalls over north Louisiana creating ideal conditions for ice accumulation.

Location

Winter weather typically impacts a region and not one specific parish or jurisdiction. Because winter weather is a climatological based hazard and has the same probability of occurring in Tangipahoa Parish as all of the adjacent parishes, the entire planning area for Tangipahoa Parish is equally at risk for winter weather.

Previous Occurrences / Extent

The SHELDUS database reports a total of 21 winter weather events occurring within the boundaries of Tangipahoa Parish between the years of 1960 - 2014. Table 2-83 provides an overview of winter weather events that have impacted the Tangipahoa Parish planning area from 1989 - 2014.

Table 2-92: Previous occurrences of winter weather in Tangipahoa Parish from 1989 - 2014. (Source: SHELDUS)

Date	Property Damage
December 1989	$14,677
March 1993	$0
February 1996	$0

Frequency / Probability

Winter weather is a rare occurrence within Tangipahoa Parish with an annual chance of occurrence calculated at 12% based on the records for the past 25 years (1989 – 2014). Based on the State Hazard Mitigation Plan, the overall probability of a winter weather event in Tangipahoa Parish is less than once every 8 years.

Estimated Potential Loses

According to the SHELDUS database, property damage due to winter weather in Tangipahoa Parish have totaled approximately $6,620,495 since 1960. A list of the property damages by event can be found in Table 2-89. To estimate the potential loses of a winter weather event on an annual basis, the total damages recorded for extreme event was divided by the total number of years of available winter weather data in SHELDUS (1960 – 2014). This provides an annual estimated potential loss of $122,601. To access potential losses proportionally across the jurisdictions, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. Based on the 2010 Census data, the following table provides an estimate of potential property damage for Tangipahoa Parish:

Table 2-93: Estimated annual property damage in Tangipahoa Parish from winter weather.

Estimated Annual Potential Loses from Winter Weather for Tangipahoa Parish								
Unincorporated Tangipahoa Parish (69.3% of Population)	Amite (3.4% of Population)	Hammond (16.5% of Population)	Independence (1.4% of Population)	Kentwood (1.8% of Population)	Ponchatoula (5.4% of Population)	Roseland (0.9% of Population)	Tangipahoa (0.6% of Population)	Tickfaw (0.6% of Population)
$84,993	$4,192	$20,268	$1,686	$2,225	$6,640	$1,137	$757	$703

The Parish has suffered no deaths or injuries due to winter weather from 1960 – 2014.

Based on historical data, winter weather is determined not to pose a significant risk to the planning area within Tangipahoa Parish.

Vulnerability

See Appendix C for parish and municipality exposure to winter weather hazards.

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3 Capability Assessment

This section summarizes the results of Tangipahoa Parish, its jurisdictions and other agency efforts to develop policies, programs, and activities that directly or indirectly support hazard mitigation. It also provides information on resources and gaps in the parish and participating jurisdictions infrastructures, as well as relevant changes in its law since the last Plan Update, in order to suggest a mitigation strategy.

Through this assessment, Tangipahoa Parish and the participating jurisdictions are able to identify strengths that could be used to reduce losses and reduce risk throughout the community. It also identifies areas where mitigation actions might be used to supplement current capabilities and create a more resilient community before, during and after a hazard event.

Policies, Plans and Programs

Tangipahoa Parish capabilities are unique to the parish, including planning, regulatory, administrative, technical, financial, and education and outreach resources. There are a number of mitigation-specific acts, plans, executive orders, and policies that lay out specific goals, objectives, and policy statements which already support or could support pre- and post-disaster hazard mitigation. Many of the ongoing plans and policies hold significant promise for hazard mitigation, and take an integrated and strategic look holistically at hazard mitigation in Tangipahoa Parish to continually propose ways to improve it. These tools are valuable instruments in pre and post disaster mitigation as they facilitate the implementation of mitigation activities through the current legal and regulatory framework. Examples of existing documents in Tangipahoa Parish and its jurisdictions include the following:

Planning and Regulatory	Tangipahoa Parish	Hammond	Ponchatoula	Amite	Kentwood	Roseland	Independence	Tickfaw	Village of Tangipahoa	Com
Plans	Yes / No									
Comprehensive / Master Plan	Y	Y	N	N	N	N	N	N	N	
Capital Improvements Plan	Y	Y	N	N	N	N	N	N	N	
Economic Development Plan	Y	Y	N	N	N	N	N	N	N	
Local Emergency Operations Plan	Y	Y	N	Y	N	N	N	N	N	
Continuity of Operations Plan	Y	Y	N	N	N	N	N	N	N	
Transportation Plan	Y	Y	N	N	N	N	N	N	N	
Stormwater Management Plan	Y	Y	Y	N	N	N	N	N	N	
Community Wildfire Protection Plan	N	N	N	N	N	N	N	N	N	
Other plans (redevelopment, recovery, coastal zone management)	N	N	N	N	N	N	N	N	N	
Building Code, Permitting and Inspections	Yes / No									
Building Code	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	N	N	N	N	N	N	N	N	
Fire Department ISO/PIAL rating	Y	2	N	N	4	7	5	6	6	
Site plan review requirements	Y	Y	N	N	Y	N	N	Y	N	
Land Use Planning and Ordinances	Yes / No									
Zoning Ordinance	Y	Y	Y	Y	Y	N	Y	Y	N	
Subdivision Ordinance	Y	Y	Y	Y	Y	N	N	Y	N	
Floodplain Ordinance	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Y	Y	Y	N	N	N	N	N	N	
Flood Insurance Rate Maps	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Acquisition of land for open space and public recreation uses	Y	Y	Y	Y	Y	N	N	N	N	
Other										

Building Codes, Permitting, Land Use Planning and Ordinances

As of the 2015 Update Tangipahoa Parish and its jurisdictions ensures that all building codes adopted are enforced and in compliance relating to the construction of any within the boundaries of the parish. The Parish Planning Department, created in 2008, directly addresses land use and subdivision regulations to verify compliance with subdivision regulations and the Comprehensive Land Use Plan. The Tangipahoa Parish Government Planning Department and Permit Office outline the administration and enforcement of any construction which occurs, or will occur, within the parish. Permitting and inspections capabilities are in place within the Parish and its incorporated jurisdictions. Permit offices are located at two locations within the parish in the jurisdictions of Hammond and Roseland. Some examples of leveraging these capabilities within the parish are seen above in table 1.

While local capabilities for mitigation can vary from community to community, Tangipahoa Parish as a whole has a system in place to coordinate and share these capabilities through the OHSEP and through this Parish Hazard Mitigation Plan.

Some programs and policies, such as the above described, might use complementary tools to achieve a common end, but fail to coordinate with or support each other. Thus, coordination among local mitigation policies and programs is essential to hazard mitigation.

Administration, Technical, and Financial

As a community, Tangipahoa Parish has administrative and technical capabilities in place that may be utilized in reducing hazard impacts or implementing hazard mitigation activities. Such capabilities include staff, skillset, and tools available in the community that may be accessed to implement mitigation activities and to effectively coordinate resources. The ability to access and coordinate these resources is also important. The following are examples of resources in place in Tangipahoa Parish and its jurisdictions:

Administration and Technical	Tangipahoa Parish	Hammond	Ponchatoula	Amite	Kentwood	Roseland	Independence	Tickfaw	Village of Tangipahoa	Com
Administration	Yes / No									
Planning Commission	Y	Y	Y	Y	Y	N	Y	Y	N	
Mitigation Planning Committee	Y	N	Y	N	N	N	N	N	N	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Y	Y	Y	Y	Y	N	N	N	N	
Staff	Yes / No; FT/PT; % Hazard Mitigation									
Chief Building Official	Y/FT/25%	Y	Y	N	Y	N	N	N	N	
Floodplain Administrator	Y/FT/25%	Y	Y	Y	Y	Y	Y	Y	Y	
Emergency Manager	Y/FT/25%	Y	Y	N	Y	N	N	N	N	
Community Planner	Y/FT/25%	Y	Y	Y	N	N	N	N	N	
Civil Engineer	Y/FT/25%	N	Y	N	Y	N	N	N	N	
GIS Coordinator	Y/FT/25%	Y	N	N	N	N	N	N	N	
Grant Writer	Y/FT/75%	Y	Y	N	N	N	N	N	N	
Other	N	N	N	N	N	N	N	N	N	
Technical	Yes / No									
Warning Systems / Service (Reverse 911, outdoor warning signals)	Y	N	Y	N	Y	N	N	Y	N	
Hazard Data & Information	Y	N	N	N	N	N	N	N	N	
Grant Writing	Y	Y	Y	N	N	N	N	N	N	
Hazus Analysis	Y	N	N	N	N	N	N	N	N	
Other	N	N	N	N	N	N	N	N	N	

Financial capabilities are the resources that Tangipahoa Parish and its incorporated jurisdictions have access to or are eligible to use in order to fund mitigation actions. Costs associated with implementing the actions identified by the jurisdictions may vary from little to no cost actions, such as outreach efforts, or substantial action costs such acquisition of flood prone properties.

The follow resources are available to fund mitigation actions in Tangipahoa Parish and its jurisdictions:

Financial										
	Tangipahoa Parish	Hammond	Ponchatoula	Amite	Kentwood	Roseland	Independence	Tickfaw	Village of Tangipahoa	Comm
Funding Resource	Yes / No									
Capital Improvements project funding	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Authority to levy taxes for specific purposes	Y	Y	N	Y	Y	Y	Y	Y	Y	
Fees for water, sewer, gas, or electric services	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Impact fees for new development	N	Y	Y	N	N	N	N	N	N	
Stormwater Utility Fee	N	N	N	N	N	N	N	N	N	
Community Development Block Grant (CDBG)	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Other Funding Programs	N	N	N	N	Y	N	N	N	N	

Education and Outreach

A key element in hazard mitigation is promoting a safer, more disaster resilient community through Education and Outreach activities and/or programs. Successful outreach programs provide data and information that improves overall quality and accuracy of important information for citizens to feel better prepared and educated with mitigation activities. These programs enable the individual jurisdictions and Parish as a whole to maximize opportunities for implementation of activities through greater acceptance and consensus of the community.

Tangipahoa Parish and its jurisdictions have existing education and outreach programs to implement mitigation activities as well as communicate risk and hazard related information to its communities. Specifically focusing on advising repetitive loss property owners of ways they can reduce their exposure to damage by repetitive flooding remains a priority for the entire parish. The existing programs are as follows:

Education and Outreach										
	Tangipahoa Parish	Hammond	Ponchatoula	Amite	Kentwood	Roseland	Independence	Tickfaw	Village of Tangipahoa	Comm
Program / Organization	Yes / No									
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Y	N	N	N	N	N	N	N	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Y	Y	N	N	N	N	N	N	N	
Natural Disaster or safety related school program	N	N	N	N	N	N	N	N	N	
Storm Ready certification	N	N	N	N	N	N	N	N	N	
Firewise Communities certification	N	Y	N	N	N	N	N	N	N	
Public/Private partnership initiatives addressing disaster-related issues	N	N	N	N	N	N	N	N	N	
Other										

In some cases, the jurisdictions rely on Tangipahoa Parish OHSEP and/or Tangipahoa Parish Government Agencies for the above listed planning and regulatory, Administrative and Technical, Financial, and Education and Outreach Capabilities. Comments regarding the jurisdictions utilization or intentions to utilize and

leverage the capabilities of the parish government can be found in Appendix E in the jurisdictional specific worksheets.

As reflected with above existing regulatory mechanisms, programs and resources within each jurisdiction, Tangipahoa Parish and the jurisdictions remain committed to expanding and improving on the existing capabilities within the parish. Each participating jurisdiction will work toward increased participation in funding opportunities and available mitigation programs. Should funding become available, the hiring of additional personnel to dedicate to Hazard Mitigation initiatives and programs, as well as increasing ordinances within the jurisdictions will all enhance and expand risk reduction measures within the parish.

With the sharing of these capabilities, the following municipalities and entities are recognized by the Parish of Tangipahoa under the Hazard Mitigation Plan allowing them to apply for available hazard mitigation funding for as long as these municipalities and entities notify the Parish of their intentions and the Parish concurs.

- Tangipahoa Parish
- City of Hammond
- City of Ponchatoula
- City of Amite
- Town of Kentwood
- Town of Independence
- Town of Roseland
- Village of Tangipahoa
- Village of Tickfaw

Flood Insurance and Community Rating System

Tangipahoa Parish is a participant in the Community Rating System (CRS). Maintaining and improving the CRS rating for the Parish is recognized as a high priority by the Hazard Mitigation Steering Committee. Participation in the CRS strengthens local capabilities by lowering flood insurance premiums for jurisdictions that exceed NFIP minimum requirements.

The Federal Emergency Management Agency's National Flood Insurance Program (NFIP) administers the Community Rating System (CRS). Under the CRS, flood insurance premiums for properties in participating communities are reduced to reflect the flood protection activities that are being implemented. This program can have a major influence on the design and implementation of flood mitigation activities, so a brief summary is provided here.

A community receives a CRS classification based upon the credit points it receives for its activities. It can undertake any mix of activities that reduce flood losses through better mapping, regulations, public information, flood damage reduction and/or flood warning and preparedness programs.

There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction (see Table). A community that does not apply for the CRS or that does not obtain the minimum number of credit points is a class 10 community.

CLASS	DISCOUNT	CLASS	DISCOUNT
1	45%	6	20%
2	40%	7	15%
3	35%	8	10%
4	30%	9	5%
5	25%	10	–

SFHA (Zones A, AE, A1–A30, V, V1–V30, AO, and AH): Discount varies depending on class.

SFHA (Zones A99, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO): 10% discount for Classes 1–6; 5% discount for Classes 7–9.*

Non-SFHA (Zones B, C, X, D): 10% discount for Classes 1–6; 5% discount for Classes 7–9.

* In determining CRS Premium Discounts, all AR and A99 Zones are treated as non-SFHAs.

Figure 3-1 - CRS Discounts by Class (Source: FEMA)

Tangipahoa Parish entered CRS in October of 1996 and has a current class rating of 9. As of the 2015 update, Jefferson Parish, East Baton Rouge and Terrebone all lead the state with best classifications, Class 6.

As of May 2012, 310 communities in the State of Louisiana participate in the Federal Emergency Management Agency's National Flood Insurance Program (NFIP). Of these communities, 41 (or 13%) participate in the Community Rating System (CRS). Of the top 50 Louisiana communities, in terms of total Flood Insurance policies held by residents, 27 participate in the CRS. The remaining 23 communities present an outreach opportunity for encouraging participation in the CRS.

The CRS provides an incentive not just to start new mitigation programs, but to keep them going. There are two requirements that "encourage" a community to implement flood mitigation activities.

First, the Parish will receive CRS credit for this Plan when it is adopted. To retain that credit, though, the Parish must submit an evaluation report on progress toward implementing this Plan to FEMA by October 1 of each year. That report must be made available to the media and the public.

Second, the Parish must annually recertify to FEMA that it is continuing to implement its CRS credited activities. Failure to maintain the same level of involvement in flood protection can result in a loss of CRS credit points and a resulting increase in flood insurance rates to residents.

In 2011[3], the National Flood Insurance Program (NFIP) completed a comprehensive review of the Community Rating System (CRS) that will result in the release of a new CRS Coordinator's Manual.

The changes to the 2013 CRS Coordinator's Manual are the result of a multi-year program evaluation that included input from a broad group of contributors to evaluate the CRS and refine the program to meet its stated goals.

The upcoming changes will drive new achievements in the following six core flood loss reduction areas important to the NFIP: (1) reduce liabilities to the NFIP Fund; (2) improve disaster resiliency and sustainability of communities; (3) integrate a Whole Community approach to addressing emergency management; (4) promote natural and beneficial functions of floodplains; (5) increase understanding of risk, and; (6) strengthen adoption and enforcement of disaster-resistant building codes.

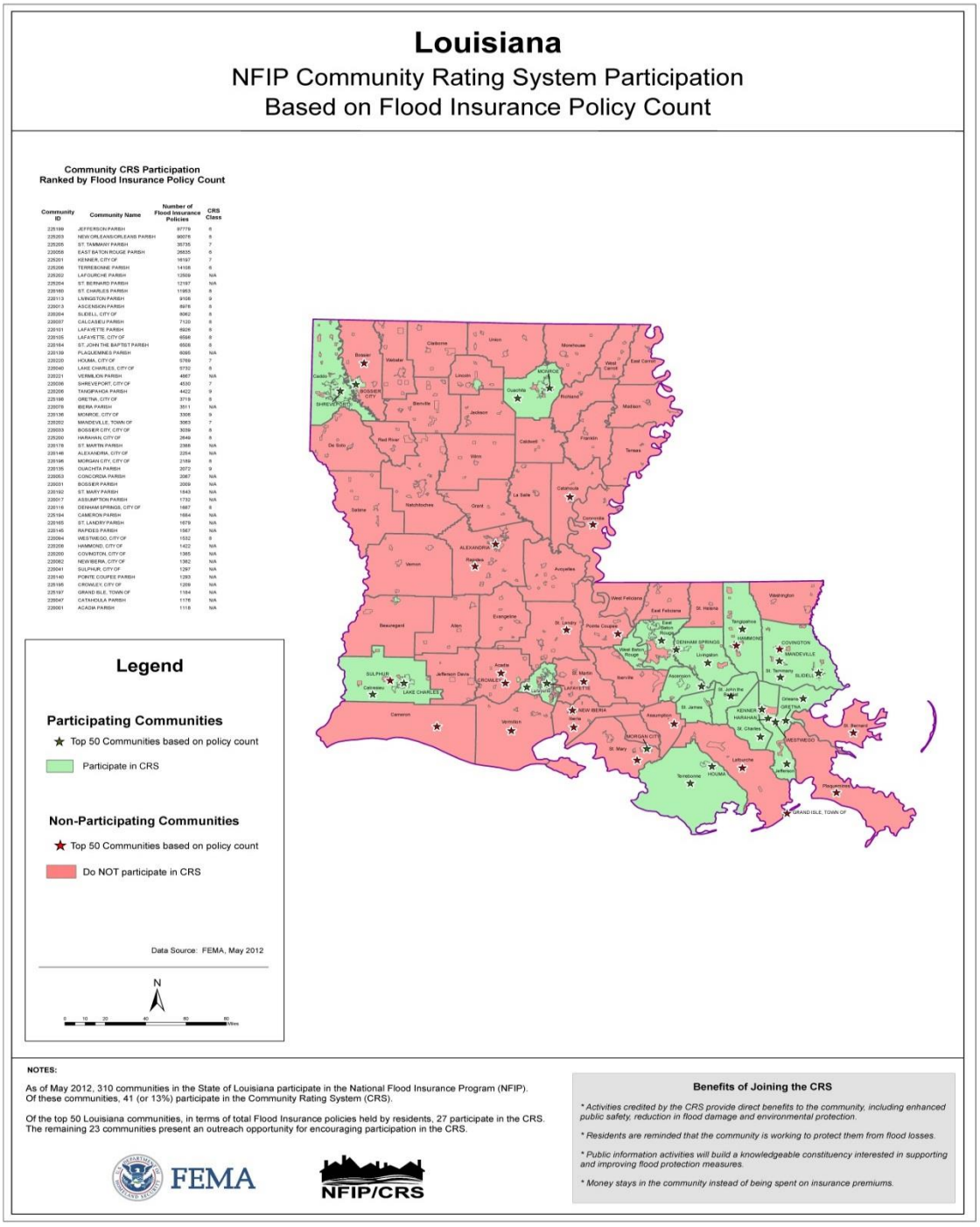
The 2013 CRS Coordinator's Manual changes will impact each CRS community differently. Some communities will see an increase in the points they receive since points for certain activities have increased (e.g., Activity 420 Open Space Preservation). Other communities will receive fewer points for certain

[3] https://www.fema.gov/national-flood-insurance-program-community-rating-system

activities (e.g., Activity 320 Map Information Service). It is likely that some communities with marginal CRS Class 9 programs will have to identify new CRS credits in order to remain in the CRS.

Typically, CRS communities do not request credit for all the activities they are currently implementing unless it would earn enough credit to advance the community to a higher CRS Class. A community that finds itself losing CRS credit with the 2013 Manual could likely identify activities deserving credit they had not previously received.

Due to the changes in both activities and CRS points, community CRS coordinators should speak with their ISO/CRS Specialist to understand how the 2013 Manual will impact their community and when.



4

In addition to the direct financial reward for participating in the Community Rating System, there are many other reasons to participate in the CRS. As FEMA staff often say, "if you are only interested in saving premium dollars, you're in the CRS for the wrong reason." The other benefits that are more difficult to measure in dollars include:

[4] http://www.fema.gov/media-library-data/20130726-2128-31471-9581/ks_ky_la_crs_may_2012_508.zip

1. The activities credited by the CRS provide direct benefits to residents, including:
– Enhanced public safety;
– A reduction in damage to property and public infrastructure;
– Avoidance of economic disruption and losses;
– Reduction of human suffering; and
– Protection of the environment.

2. A community's flood programs will be better organized and more formal. Ad hoc activities, such as responding to drainage complaints rather than an inspection program, will be conducted on a sounder, more equitable basis.

3. A community can evaluate the effectiveness of its flood program against a nationally recognized benchmark.

4. Technical assistance in designing and implementing a number of activities is available at no charge from the Insurance Services Office.

5. The public information activities will build a knowledgeable constituency interested in supporting and improving flood protection measures.

6. A community would have an added incentive to maintain its flood programs over the years. The fact that its CRS status could be affected by the elimination of a flood related activity or a weakening of the regulatory requirements for new developments would be taken into account by the governing board when considering such actions.

7. Every time residents pay their insurance premiums, they are reminded that the community is working to protect them from flood losses, even during dry years.

**More information on the Community Rating System can be found at www.fema.gov/nfip/crs.shtm

NFIP Worksheets

Parish and Participating Jurisdiction NFIP worksheets can be found in Appendix E: State Required Worksheets.

4 Mitigation Strategy

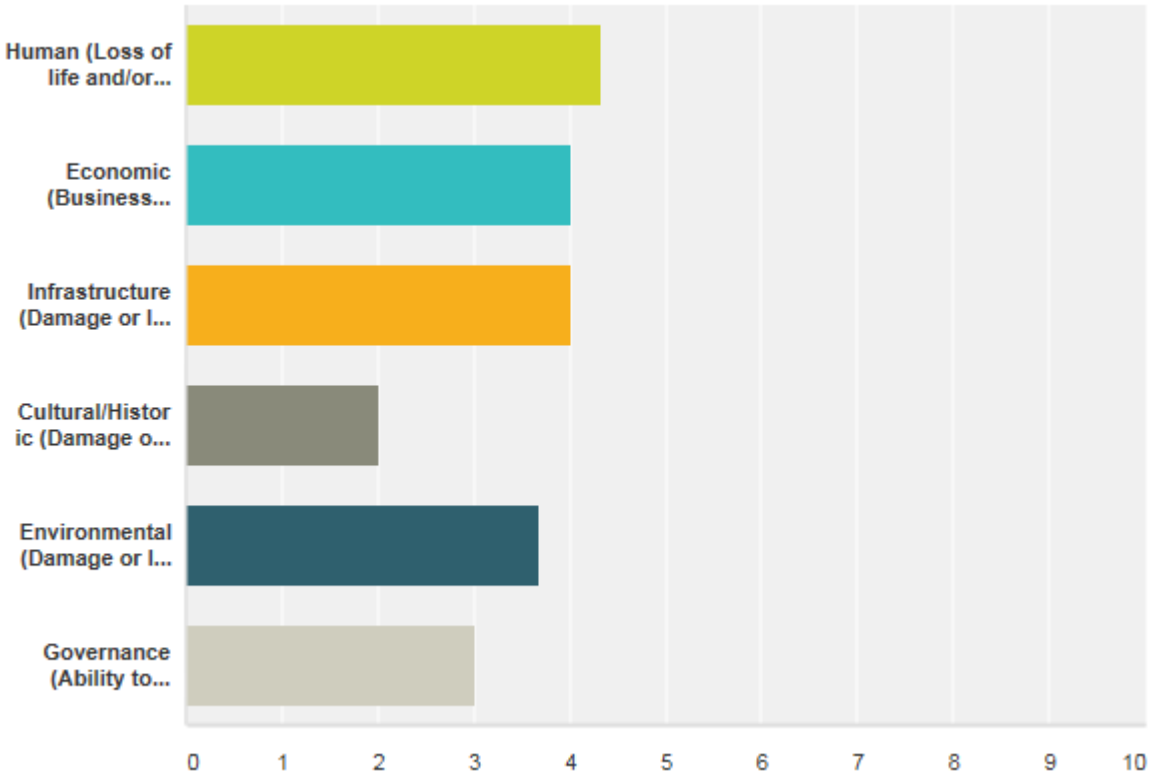
The Tangipahoa Parish Hazard Mitigation Strategy validates the parish and jurisdictions commitment to reduce risks from hazards, and serves as a guide for parish and local decision makers as they commit resources to reducing the effects of the hazards identified during the risk assessment phase of this project.

An online public opinion survey was conducted of Tangipahoa Parish residents between August and December 2014. The 25 question survey was completed by parish residents over the age of 18.

The survey was designed to capture public perceptions and opinions regarding natural hazards in Tangipahoa Parish and its jurisdictions. In addition, the survey collected information regarding the methods and techniques preferred by the respondents for reducing the risks and losses associated with local hazards.

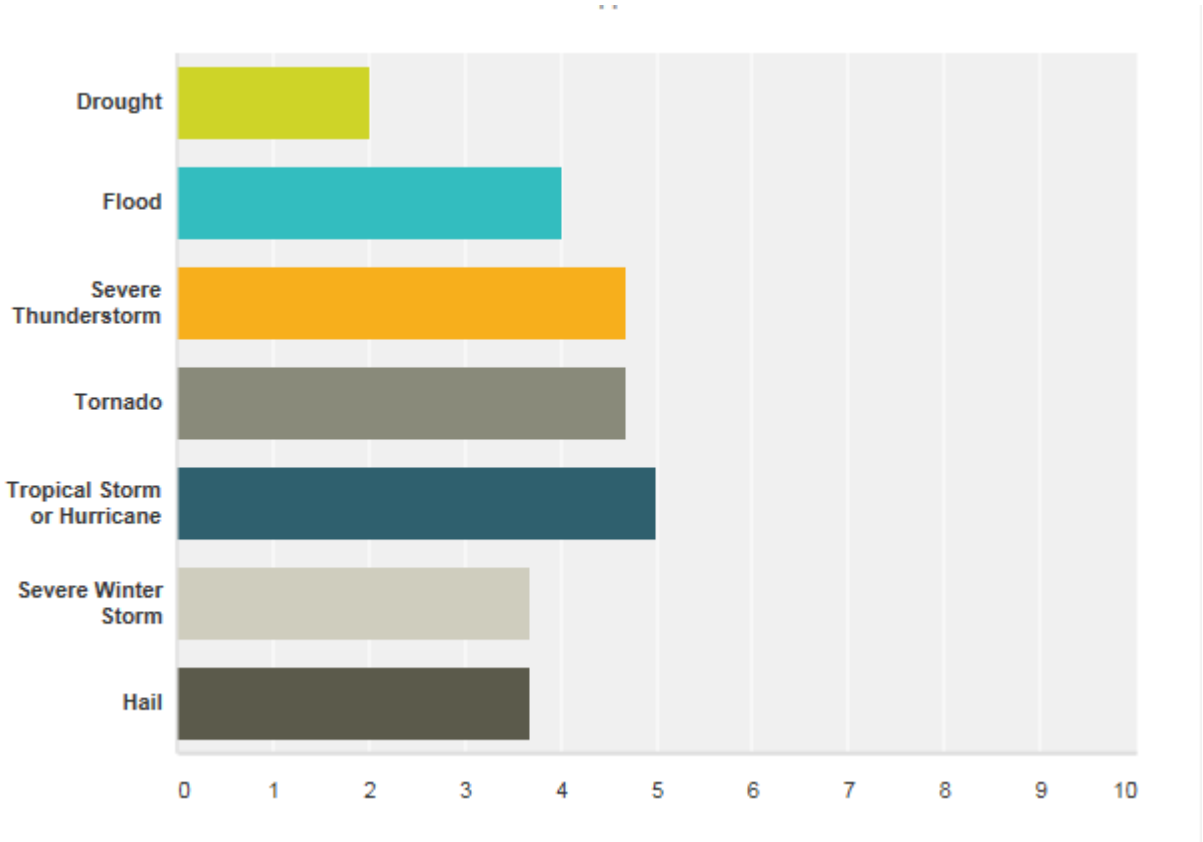
When asked to gage from a list which categories were more susceptible to impacts caused by natural hazards, the top three categories selected were:

1. Human (Loss of life and/or injuries)
2. Economic (Business closures and/or job losses)
3. Infrastructure (Damage or loss of bridges, utilities, schools, etc.)



The survey results also indicated which natural disasters citizens were *most concerned* with being affected by in Tangipahoa Parish and its jurisdictions. The top three natural disasters selected were:

1. Tropical Storm or Hurricane
2. Severe Thunderstorm
3. Tornado



Tangipahoa Parish and the participating jurisdictions revised the goals and actions over the period of the hazard mitigation plan update process. The mitigation actions in this 2015 HMP update are a product of analysis and review of the Tangipahoa Parish Hazard Mitigation Plan Steering Committee and jurisdictions under the coordination of the Tangipahoa Parish Office of Homeland Security and Emergency Preparedness. The Committee was presented a list of projects and actions, new and from the 2009 plan, for review From September 2014 - December 2014.

During the meeting the committee and participating jurisdictions provided a status of the projects from 2009 and the proposed projects for the 2015 update.

Committee members and jurisdictions then submitted jurisdiction specific projects based on feasibility for funding, ease of completion and other community specific factors. The actions were later prioritized for the parish and jurisdiction specific projects.

This activity confirms that the goals and action items developed by the Tangipahoa Hazard Mitigation Plan Steering Committee and jurisdictions are representative of the outlook of the community at large. Full survey results can be found here:

https://www.surveymonkey.com/r/tangipahoaparish

The goals are to represent the guidelines the parish and its jurisdictions want to achieve with this plan update. To help implement the strategy and adhere to the mission of the Hazard Mitigation Plan, the Section 2 of the plan update was focused on identifying and quantifying the risks faced by the residents and property owners in Tangipahoa Parish and its jurisdictions from natural hazards. By articulating goals and objectives based on the risk assessment results, and intending to address those results, this section sets the stage for identifying, evaluating, and prioritizing feasible, cost effective, and environmentally sound actions to be promoted at the parish and jurisdictions. By doing so, Tangipahoa Parish and its communities can make progress toward reducing identified risks. The actions and projects are specific steps the parish will take to reduce the risk of hazards. Based off of the new risk assessment, progress on previous mitigation actions and experiencing significant events throughout the parish following the last update, the parish was able to reflect a change in priorities with new mitigation actions and a process by which they were prioritized.

For the purposes of this Plan Update, goal and action items are defined as follows:

- ***Goals*** are general guidelines that explain what the parish wants to achieve. Goals are expressed as broad policy statements representing desired long-term results.
- ***Actions Items*** are the specific steps (projects, policies, and programs) that advance a given Goal. They are highly focused, specific and measurable.

Goals

Tangipahoa Parish and each participating jurisdiction reviewed the existing mitigation goals and opted to keep all goals the same. These goals represent a long-term commitment of the parish and its jurisdictions to improve its disaster resiliency. The Hazard Mitigation Steering Committee met in October 2014 to analyze the results of the risk assessment. The new parish-wide risk assessment consisted of identifying the hazards that affect the parish and each jurisdiction and the critical facilities and populations that are vulnerable to the hazards. Based on the risk assessment, the Steering Committee agreed to keep the goals established in the original HMP because the goals were consistent with the most common hazards identified in the Parish, as well as in the municipalities. The goals are related to the risk assessment in that they address ways to reduce the impact of the identified hazards on the identified critical facilities. The three goals listed were determined to be those that would have the greatest benefit in hazard reduction to the Parish and each jurisdiction considering the predominate hazards profiled in Section two.

The goals are as follows:

Goal 1: Identify and pursue preventative measures that will reduce future damages from hazards

Goal 2: Reduce repetitive flood losses in the Parish and municipalities

Goal 3: Regulate sound development in the Parish and municipalities so as to reduce or eliminate the potential impact of hazards.

Many of the action items hinge on funding becoming available; therefore, these activities will be accomplished with outside funding. Most of them cannot be completed without outside funds. The details of the Action Plan serve to deal with changing priorities, administration transitions, and unpredictable funding and still allow for adoption of the plan by Parish and local governments.

2015 Mitigation Actions and Update on Previous Plan Actions

The Tangipahoa Parish Hazard Mitigation Plan Steering Committee and participating jurisdictions identified mitigation actions that would reduce and/or prevent future damage. In that effort, the group focused collectively on a comprehensive range of specific mitigation actions and projects. These actions and projects were identified in thorough fashion by the steering committee and the individual jurisdictions by way of frequent and open communications and meetings held throughout the planning process taking into consideration the changing priorities of the parish.

Tangipahoa Parish and the participating jurisdictions continue their efforts to better understand the exposure risk to flooding, specifically due to recent flooding events that had a measurable impact on people and property within the parish. These events have helped the parish and its communities identify additional mitigation actions to further protect lives and property in the parish. Other efforts to help understand exposure risk to flooding include ongoing work to develop flood risk maps of the entire parish. These maps will be continuously updated with current information and made available to local officials, residents and other jurisdictions to refine the planning process and mitigate potential damage. Along with these internal efforts, Tangipahoa Parish and the participating parishes identified mitigation actions and projects.

As outlined in the Local Mitigation Planning Handbook the following are eligible types of Mitigation Actions:

- **Local Plans and Regulations –** These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- **Structure and Infrastructure Projects –** These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area, and also includes projects to construct manmade structures to reduce the impact of hazards.
- **Natural System Protection –** These actions minimize the damage and losses and also preserve or restore the functions of natural systems.
- **Education and Awareness Programs –** These actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.

Action items relative to each goal mentioned above were filtered to only include those of the highest local priority. The status of mitigation actions from the original hazard mitigation plan are also included in this update. The established and agreed upon mitigation actions relative to the established goals are as follows:

Unincorporated Tangipahoa Mitigation Actions

Mitigation Actions for Unincorporated Tangipahoa							
Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
1.1 Public Building wind hardening	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HMGP and Parish or City funding (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish	Severe Thunderstorm, Tropical Cyclone, Tornado	1	New
1.2 Drainage - flood relief projects	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Initially identified projects include Ash Street area in Ponchatoula, Chapapeela Road in 2 locations, Wardline Road near I-55, and other potential sites. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HMGP and Parish funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish	Flooding, Severe Thunderstorm, Tropical Cyclone	1,2,3	New
1.3 Residential elevations and acquisitions for repetitive loss properties	Elevation or acquisition-demolition of approximately 40 properties in Tangipahoa Parish. Benefits: Relieves property owners of the continual flooding problems. Saves flood relief and damage repayment for each property.	HMGP and homeowners being impacted (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish	Flooding	1,2,3	New

Lees Landing and/or Traino Landing Boat Launch retrofit-repair	The 2 public boat launches owned by the Parish government are in need of retrofit. Lee's Landing launch is a priority. Benefits: Relieves Parish of damage concerns and loss of function when most needed before and after major storm events. Assists emergency responders with safe place to provide lifesaving rescue missions, delivery of supplies.	HMGP and Parish or HUD funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish	Flooding, severe thunderstorm, tropical cyclone, tornado	1	New
1.4 Public sewerage infrastructure retrofits	The sewerage retrofit projects include the systems owned and operated by the City of Hammond, City of Ponchatoula, the Town of Amite, and the Town of Independence. Benefits: The project proposed will relieve the communities and property owners with sewage back-up into their buildings, strengthen existing treatment site levees, and provide pump station retrofits to keep the systems operating during high water flow.	HMGP and Parish or HUD funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish	Flooding, severe thunderstorm, tropical cyclone	1	New
1.5 Radios for Interoperable Communications	700mhz radios to allow for interoperable communications between Parish and local agencies during events that may compromise communication systems.	HMGP and Parish	February 2016-December 2018	Tangipahoa Parish	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1	New
1.6 Safe Room Projects	Construction of a safe room for first responders located in Hammond. Other locations will be identified based on funding availability.	HMGP and Parish	April 2015 - December 2018	Tangipahoa Parish	Tornado	1	New

4.1 Mitigation Public Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for flooding, tropical cyclone, severe thunderstorms, tornadoes and wildfire hazards, as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HMPG and Parish	January 2016 through December, 2018	Tangipahoa Parish	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1,2,3	New
1	Improve drainage ways, along the Natalbany River and the Tangipahoa River, by enlarging any inferior culverts along the major drainage laterals. Benefits: to ensure water flows freely within the drainage system, which will protect the surrounding area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish is continuing its search for grant funds for drainage improvements and continues maintenance of existing systems. The completion of this initiative will be dependent upon available funding and resources.
2	Improve drainage ways along Ponchatoula Creek, by enlarging any inferior culverts along the major drainage laterals. Benefits: To ensure water flows freely within the drainage system, which will protect the surrounding areas from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish is continuing its search for grant funds for drainage improvements and continues maintenance of existing systems. The completion of this initiative will be dependent upon available funding and resources.
3	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best methods of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at final outfall.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has applied for drainage related grants and continues to support the Consolidated Drainage District to maintain and increase drainage capacity along the major drainage laterals.

4	Expand the drainage districts to cover the entire parish. Currently, the parish has 3 drainage districts in the southern part of the parish, but only has one staff. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures and therefore, suffer less mental and physical anguish, displacement days, and flood damage. In addition the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish continues its efforts to expand the drainage district throughout the parish.
5	Harden/retrofit the Amite High School gym. Benefits: To strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope. Safe rooms provide a place for occupants to take refuge from wind or wind-borne debris and will prevent interruption of services in times of emergencies.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete
6	Harden the Hammond Westside school gym. Benefits: To strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete
7	Harden the Ponchatoula Community Center. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	N/A	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has applied for funding for this project and at this time there is no available funding.

8	Harden the Hammond Criminal Justice Center. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete
9	Harden the Hammond City Fire Administration Office. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete
10	Harden the Hammond City Fire Department (central). Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete
11	Harden the Hammond City Fire Department Stations #2-5. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	Tangipahoa Parish	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has been approved for funding for this project expected completion for 2015.
12	Harden the Michael J. Kenney Center. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	N/A	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has applied for funding for this project and at this time there is no available funding.
13	Add a safe room at the Office of Emergency Preparedness. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	TBD	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has submitted for funding for this project through GOHSEP and is presently being reviewed.

14	Add a safe room at the Amite City Police Department. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	N/A	Ongoing	Tangipahoa Parish	High Winds	N/A	This action has been combined with HMP 13.
15	Add securely attached and elevated, backup power supply/ generator at Amite High School gym. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Tangipahoa Parish has modified this item and has acquired portable generators for this location.
16	Add securely attached and elevated, backup power supply/ generator at Hammond Westside School. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Tangipahoa Parish has modified this item and has acquired portable generators for this location.
17	Add securely attached and elevated, backup power supply/ generator at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	District Authority	High Winds/Thunderstorms	N/A	Complete
18	Add securely attached and elevated, backup power supply/ generator at Amite City Hall. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	City Government	High Winds/Thunderstorms	N/A	Complete
19	Install quick connection fittings on all water connections in the boiler room at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Complete

20	Pursued drainage improvement project to alleviate poor drainage on the roadway along Hwy 190 West in the City of Hammond limits along the Town and Country Shopping Center. Benefits: Improved drainage in the known area of flooding will reduce future damages in the area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
21	Investigate and implement a localized interior drainage project along Hwy 51 and in each repetitive loss area to reduce its flood potential. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures and therefore, suffer less mental and physical anguish, displacement days, and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
22	Pursue elevation/ acquisition/flood proofing projects and structural solutions to flooding by pursuing funding opportunities for the 34 repetitive loss structures. Benefits: By removing structures from the floodplain, homeowners suffer less mental and physical anguish displacement days and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
23	Pursue working with State and Federal governments on the redesignation of Tangipahoa River as a scenic river. Benefits: By removing the river as a scenic river, flooding issues would be	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing

	reduced, allowing maintenance of the river to take place.						
24	Review the existing floodplain ordinance and evaluate ways to improve the Parish's "Community Rating System (CRS)" rating to reduce the flood insurance premium. Choose from the variety of methods and projects available that can be implemented to improve CRS rating. Benefits: Reduce flood insurance premiums and thereby encourage more people to purchase flood insurance which would potentially result in lower cost and a more timely recovery.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish adopted a new flood damage prevention ordinance in 2010. The permit office continues to implement existing activities as well as new activities toward a lower CRS rating.
25	Adopt additional commercial building regulations which include stricter building standards and incorporate dry floodproofing techniques. Benefits: Results in additional techniques to harden structures and thereby withstand the impacts of hazards.	N/A	No progress at this time	Tangipahoa Parish	High Winds/Tornadoes/Hurricanes	N/A	Louisiana State law does not allow modifications of the building code through local agencies. This action item is under review for the 2014 HMP.

26	Develop additional subdivision guidelines that would help reduce flooding, such as requiring proper drainage with adequate sloping; stormwater retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages. Benefits: reduce the localized flooding problems that would occur with new development. Reduce potential power outages.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	The Tangipahoa Parish Planning Office continues to review and suggest modifications to the subdivision guidelines to help reduce flooding. Tangipahoa Parish's stormwater plan has been approved through LDEQ and full implementation in phases is expected from 2014-2019.
27	Incorporate the draft Comprehensive Plan, flood maps, and building codes into long-term planning. Continually update the development of floodplain maps. Benefits: Results in a comprehensive effort to develop a Parish Wide approach to disaster damage reduction and preparation.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	These items have been combined and Tangipahoa Parish is continuing to implement its parish wide disaster preparation plan.
28	Re-evaluate codes for water line sizing and proper placement of flushing devices. Adopt building regulations to acquire adequately sized water distribution lines and fire hydrants in areas to improve water supply for combating fires. Expand the water district. Benefits: Reduce the risk of wildfire damage to structures and property.	N/A	Ongoing	Tangipahoa Parish	Flooding/Wildfire	N/A	Tangipahoa Parish has researched funding sources for this project and at this time there is no available funding.

Town of Amite Mitigation Actions

Mitigation Actions for Town of Amite							
Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
1.1 Public Building wind hardening	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HMGP and Parish or City funding (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/City of Amite	Severe Thunderstorm, Tropical Cyclone, Tornado	1	New
1.2 Drainage - flood relief projects	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Initially identified projects include Ash Street area in Ponchatoula, Chapapeela Road in 2 locations, Wardline Road near I-55, and other potential sites. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HMGP and Parish funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/City of Amite	Flooding, Severe Thunderstorm, Tropical Cyclone	1,2,3	New
1.3 Residential elevations and acquisitions for repetitive loss properties	Elevation or acquisition-demolition of approximately 40 properties in Tangipahoa Parish. Benefits: Relieves property owners of the continual flooding problems.	HMGP and homeowners being impacted (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/ City of Amite	Flooding	1,2,3	New

1.4 Public sewerage infrastructure retrofits	Project includes the systems owned and operated by the City of Hammond, City of Ponchatoula, the Town of Amite, and the Town of Independence. Benefits: The project proposed will relieve the communities and property owners with sewage back-up into their buildings, strengthen existing treatment site levees, and provide pump station retrofits to keep the systems operating during high water flow.	HMGP and Parish or HUD funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/ City of Amite	Flooding, severe thunderstorm, tropical cyclone	1	New
1.5 Radios for Interoperable Communications	700mhz radios to allow for interoperable communications between Parish and local agencies during events that may compromise communication systems.	HMGP and Parish	February 2016-December 2018	Tangipahoa Parish/ City of Amite	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1	New
1.6 Safe Room Projects	Construction of a safe room for first responders located in Hammond. Other locations will be identified based on funding availability.	HMGP and Parish	April 2015 - December 2018	Tangipahoa Parish/ City of Amite	Tornado	1	New
4.1 Mitigation Public Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for flooding, tropical cyclone, severe thunderstorms, tornadoes and wildfire hazards, as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HMPG and Parish	January 2016 through December, 2018	Tangipahoa Parish/ City of Amite	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1,2,3	New

1	Improve drainage ways, along the Natalbany River and the Tangipahoa River, by enlarging any inferior culverts along the major drainage laterals. Benefits: to ensure water flows freely within the drainage system, which will protect the surrounding area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.
2	Improve drainage ways along Ponchatoula Creek, by enlarging any inferior culverts along the major drainage laterals. Benefits: To ensure water flows freely within the drainage system, which will protect the surrounding areas from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.
3	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best methods of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at final outfall.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has applied for drainage related grants and continues to support the Consolidated Drainage District to maintain and increase drainage capacity along the major drainage laterals.
4	Expand the drainage districts to cover the entire parish. Currently, the parish has 3 drainage districts in the southern part of the parish, but only has one staff. Benefits: By improving drainage in the flood prone areas. In addition the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish continues its efforts to expand the drainage district throughout the parish.

5	Harden/retrofit the Amite High School gym. Benefits: To strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete
13	Add a safe room at the Office of Emergency Preparedness. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	TBD	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has submitted for funding for this project through GOHSEP and is presently being reviewed.
14	Add a safe room at the Amite City Police Department. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	N/A	Ongoing	Tangipahoa Parish	High Winds	N/A	This action has been combined with HMP 13.
15	Add securely attached and elevated, backup power supply/ generator at Amite High School gym. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Tangipahoa Parish has modified this item and has acquired portable generators for this location.
17	Add securely attached and elevated, backup power supply/ generator at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	District Authority	High Winds/Thunderstorms	N/A	Complete

18	Add securely attached and elevated, backup power supply/ generator at Amite City Hall. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	City Government	High Winds/Thunderstorms	N/A	Complete
19	Install quick connection fittings on all water connections in the boiler room at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Complete
21	Investigate and implement a localized interior drainage project along Hwy 51 and in each repetitive loss area to reduce its flood potential. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
22	Pursue elevation/ acquisition/floodproofing projects and structural solutions to flooding by pursuing funding opportunities for the 34 repetitive loss structures. Benefits: By removing structures from the floodplain, homeowners suffer less displacement days and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing

23	Pursue working with State and Federal governments on the redesignation of Tangipahoa River as a scenic river. Benefits: By removing the river as a scenic river, flooding issues would be reduced, allowing maintenance of the river to take place.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
24	Review the existing floodplain ordinance and evaluate ways to improve the Parish's "Community Rating System (CRS)" rating to reduce the flood insurance premium. Choose from the variety of methods and projects available that can be implemented to improve CRS rating. Benefits: Reduce flood insurance premiums and thereby encourage more people to purchase flood insurance which would potentially result in lower cost and a more timely recovery.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish adopted a new flood damage prevention ordinance in 2010. The permit office continues to implement existing activities as well as new activities toward a lower CRS rating.
25	Adopt additional commercial building regulations which include stricter building standards and incorporate dry floodproofing techniques. Benefits: Results in additional techniques to harden structures and thereby withstand the impacts of hazards.	N/A	No progress at this time	Tangipahoa Parish	High Winds/Tornadoes/Hurricanes	N/A	Louisiana State law does not allow modifications of the building code through local agencies. This action item is under review for the 2014 HMP.

26	Develop additional subdivision guidelines that would help reduce flooding, such as requiring proper drainage with adequate sloping; stormwater retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages. Benefits: reduce the localized flooding problems that would occur with new development. Reduce potential power outages.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	The Tangipahoa Parish Planning Office continues to review and suggest modifications to the subdivision guidelines to help reduce flooding. Tangipahoa Parish's stormwater plan has been approved through LDEQ and full implementation in phases is expected from 2014-2019.
27	Incorporate the draft Comprehensive Plan, flood maps, and building codes into long-term planning. Continually update the development of floodplain maps. Benefits: Results in a comprehensive effort to develop a Parish Wide approach to disaster damage reduction and preparation.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	These items have been combined and Tangipahoa Parish is continuing to implement its parish wide disaster preparation plan.

28	Re-evaluate codes for water line sizing and proper placement of flushing devices. Adopt building regulations to acquire adequately sized water distribution lines and fire hydrants in areas to improve water supply for combating fires. Expand the water district. Benefits: Reduce the risk of wildfire damage to structures and property.	N/A	Ongoing	Tangipahoa Parish	Flooding/Wildfire	N/A	Tangipahoa Parish has researched funding sources for this project and at this time there is no available funding.

City of Hammond Mitigation Actions

Mitigation Actions for City of Hammond							
Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
1.3 Residential elevations and acquisitions for repetitive loss properties	Elevation or acquisition-demolition of approximately 40 properties in Tangipahoa Parish. Benefits: Relieves property owners of the continual flooding problems.	HMGP and homeowners being impacted (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/ City of Hammond	Flooding	1,2,3	New
1.7 Hardening of Critical Facilities	Hardening of Hammond Police Station at 120 S Oak Street. Impact resistant window coverings, doors and roof straps will ensure its continued use as a staging area.	City of Hammond HMPG	March 2015 through December, 2018	City of Hammond	Tropical Cyclone, Severe Thunderstorm, Tornado	1,2	New
1.8 Hardening of Critical Facilities	Hardening of Hammond City Fire Stations #3 and #4. Serves as staging area. Hardening will also ensure continued operations of the building to protect the lives and citizens of the City of Hammond and within the parish.	City of Hammond HMPG	March 2015 through December, 2018	City of Hammond	Tropical Cyclone, Severe Thunderstorm, Tornado	1,2	New
1.9 Hardening of Critical Facilities	Hardening of Michael J Kennedy Center. Serves as shelter for first responders and stages New Orleans Police Department. Hardening will strengthen building components to withstand the forces of high winds and minimize damage	City of Hammond HMPG	March 2015 through December, 2018	City of Hammond	Tropical Cyclone, Severe Thunderstorm, Tornado	1,2	Carried Over

1.10 Backup generators for critical facilities (sewer lift stations)	Installation of natural gas generators and automatic transfer switches at six critical sewer lift stations. These stations must have back up source of power to continue essential operation and to prevent sewer backflow.	City of Hammond HMPG	March 2015 through December, 2018	City of Hammond	Tropical Cyclone, Severe Thunderstorm, Tornado	1,2	New
1.11 Backup generators for critical facilities (Michael J Kennedy Center)	Installation of backup generator and transfer switch for Michael J Kennedy Center which serves as staging area for first responders.	City of Hammond HMPG	March 2015 through December, 2018	City of Hammond	Tropical Cyclone, Severe Thunderstorm, Tornado	1,2	New
1.12 Backup generator for critical facilities (Police Training Center)	Installation of natural gas generator, automatic transfer switch and connections within the police training facility so essential operations can continue.	City of Hammond HMPG	March 2015 through December, 2018	City of Hammond	Tropical Cyclone, Severe Thunderstorm, Tornado	1,2	New
1.2 Drainage - flood relief projects	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Initially identified projects include Ash Street area in Ponchatoula, Chapapeela Road in 2 locations, Wardline Road near I-55, and other potential sites. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HMGP and Parish funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/City of Hammond	Flooding, Severe Thunderstorm, Tropical Cyclone	1,2,3	New

1.4 Public sewerage infrastructure retrofits	Project includes the systems owned and operated by the City of Hammond, City of Ponchatoula, the Town of Amite, and the Town of Independence. Benefits: The project proposed will relieve the communities and property owners with sewage back-up into their buildings, strengthen existing treatment site levees, and provide pump station retrofits to keep the systems operating during high water flow.	HMGP and Parish or HUD funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/ City of Hammond	Flooding, severe thunderstorm, tropical cyclone	1	New
1.5 Radios for Interoperable Communications	700mhz radios to allow for interoperable communications between Parish and local agencies during events that may compromise communication systems.	HMGP and Parish	February 2016-December 2018	Tangipahoa Parish/ City of Hammond	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1	New
1.6 Safe Room Projects	Construction of a safe room for first responders located in Hammond. Other locations will be identified based on funding availability.	HMGP and Parish	April 2015 - December 2018	Tangipahoa Parish/ City of Hammond	Tornado	1	New

4.1 Mitigation Public Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for flooding, tropical cyclone, severe thunderstorms, tornadoes and wildfire hazards, as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HMPG and Parish	January 2016 through December, 2018	Tangipahoa Parish/ City of Hammond	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1,2,3	New
1	Improve drainage ways, along the Natalbany River and the Tangipahoa River, by enlarging any inferior culverts along the major drainage laterals. Benefits: to ensure water flows freely within the drainage system, which will protect the surrounding area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.
3	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best methods of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at final outfall.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has applied for drainage related grants and continues to support the Consolidated Drainage District to maintain and increase drainage capacity along the major drainage laterals.

4	Expand the drainage districts to cover the entire parish. Currently, the parish has 3 drainage districts in the southern part of the parish, but only has one staff. Benefits: By improving drainage in the flood prone areas. In addition the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish continues its efforts to expand the drainage district throughout the parish.
6	Harden the Hammond Westside school gym. Benefits: To strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete
8	Harden the Hammond Criminal Justice Center. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete
9	Harden the Hammond City Fire Administration Office. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete
10	Harden the Hammond City Fire Department (central). Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	HMGP	Complete	Tangipahoa Parish	High Winds	N/A	Complete

11	Harden the Hammond City Fire Department Stations #2-5. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	Tangipahoa Parish	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has been approved for funding for this project expected completion for 2015.
12	Harden the Michael J. Kenney Center. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	N/A	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has applied for funding for this project and at this time there is no available funding.
13	Add a safe room at the Office of Emergency Preparedness. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	TBD	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has submitted for funding for this project through GOHSEP and is presently being reviewed.
16	Add securely attached and elevated, back up power supply/ generator at Hammond Westside School. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Tangipahoa Parish has modified this item and has acquired portable generators for this location.

17	Add securely attached and elevated, backup power supply/ generator at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	District Authority	High Winds/Thunderstorms	N/A	Complete
18	Add securely attached and elevated, backup power supply/ generator at Amite City Hall. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	City Government	High Winds/Thunderstorms	N/A	Complete
19	Install quick connection fittings on all water connections in the boiler room at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Complete
20	Pursue drainage improvement project to alleviate poor drainage on the roadway along Hwy 190 West in the City of Hammond limits along the Town and Country Shopping Center. Benefits: Improved drainage in the known area of flooding will reduce future damages in the area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.

21	Investigate and implement a localized interior drainage project along Hwy 51 and in each repetitive loss area to reduce its flood potential. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
22	Pursue elevation/ acquisition/flood proofing projects and structural solutions to flooding by pursuing funding opportunities for the 34 repetitive loss structures. Benefits: By removing structures from the floodplain, homeowners suffer less displacement days and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
23	Pursue working with State and Federal governments on the redesignation of Tangipahoa River as a scenic river. Benefits: By removing the river as a scenic river, flooding issues would be reduced, allowing maintenance of the river to take place.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing

24	Review the existing floodplain ordinance and evaluate ways to improve the Parish's "Community Rating System (CRS)" rating to reduce the flood insurance premium. Choose from the variety of methods and projects available that can be implemented to improve CRS rating. Benefits: Reduce flood insurance premiums and thereby encourage more people to purchase flood insurance which would potentially result in lower cost and a more timely recovery.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish adopted a new flood damage prevention ordinance in 2010. The permit office continues to implement existing activities as well as new activities toward a lower CRS rating.
25	Adopt additional commercial building regulations which include stricter building standards and incorporate dry flood proofing techniques. Benefits: Results in additional techniques to harden structures and thereby withstand the impacts of hazards.	N/A	No progress at this time	Tangipahoa Parish	High Winds/Tornadoes/Hurricanes	N/A	Louisiana State law does not allow modifications of the building code through local agencies. This action item is under review for the 2014 HMP.

26	Develop additional subdivision guidelines that would help reduce flooding, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages. Benefits: reduce the localized flooding problems that would occur with new development. Reduce potential power outages.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	The Tangipahoa Parish Planning Office continues to review and suggest modifications to the subdivision guidelines to help reduce flooding. Tangipahoa Parish's storm water plan has been approved through LDEQ and full implementation in phases is expected from 2014-2019.
27	Incorporate the draft Comprehensive Plan, flood maps, and building codes into long-term planning. Continually update the development of floodplain maps. Benefits: Results in a comprehensive effort to develop a Parish Wide approach to disaster damage reduction and preparation.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	These items have been combined and Tangipahoa Parish is continuing to implement its parish wide disaster preparation plan.

28	Re-evaluate codes for water line sizing and proper placement of flushing devices. Adopt building regulations to acquire adequately sized water distribution lines and fire hydrants in areas to improve water supply for combating fires. Expand the water district. Benefits: Reduce the risk of wildfire damage to structures and property.	N/A	Ongoing	Tangipahoa Parish	Flooding/Wildfire	N/A	Tangipahoa Parish has researched funding sources for this project and at this time there is no available funding.

City of Ponchatoula Mitigation Actions

Mitigation Actions for City of Ponchatoula							
Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
1.1 Public Building wind hardening	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HMGP and Parish or City funding (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/City of Ponchatoula	Severe Thunderstorm, Tropical Cyclone, Tornado	1	New
1.2 Drainage - flood relief projects	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Initially identified projects include Ash Street area in Ponchatoula, Chapapeela Road in 2 locations, Wardline Road near I-55, and other potential sites. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HMGP and Parish funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/City of Ponchatoula	Flooding, Severe Thunderstorm, Tropical Cyclone	1,2,3	New
1.3 Residential elevations and acquisitions for repetitive loss properties	Elevation or acquisition-demolition of approximately 40 properties in Tangipahoa Parish. Benefits: Relieves property owners of the continual flooding problems.	HMGP and homeowners being impacted (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/City of Ponchatoula	Flooding	1,2,3	New

1.4 Public sewerage infrastructure retrofits	Project includes the systems owned and operated by the City of Hammond, City of Ponchatoula, the Town of Amite, and the Town of Independence. Benefits: will relieve the communities and property owners with sewage back-up into their buildings, strengthen existing treatment site levees, and provide pump station retrofits to keep the systems operating during high water flow.	HMGP and Parish or HUD funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/ City of Ponchatoula	Flooding, severe thunderstorm, tropical cyclone	1	New
1.5 Radios for Interoperable Communications	700mhz radios to allow for interoperable communications between Parish and local agencies during events that may compromise communication systems.	HMGP and Parish	February 2016-December 2018	Tangipahoa Parish/ City of Ponchatoula	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1	New
1.6 Safe Room Projects	Construction of a safe room for first responders located in Hammond. Other locations will be identified based on funding availability.	HMGP and Parish	April 2015 - December 2018	Tangipahoa Parish/ City of Ponchatoula	Tornado	1	New
4.1 Mitigation Public Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for flooding, tropical cyclone, severe thunderstorms, tornadoes and wildfire hazards, as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HMPG and Parish	January 2016 through December, 2018	Tangipahoa Parish/ City of Ponchatoula	Flooding, Severe thunderstorm, Tropical Cyclone, tornados, wildfire	1,2,3	New
1	Improve drainage ways, along the Natalbany River and the Tangipahoa River, by enlarging any inferior culverts along the major drainage laterals. Benefits: to ensure water flows freely within the drainage system, which will	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.

	protect the surrounding area from flooding.						
2	Improve drainage ways along Ponchatoula Creek, by enlarging any inferior culverts along the major drainage laterals. Benefits: To ensure water flows freely within the drainage system, which will protect the surrounding areas from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.
3	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best methods of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at final outfall.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has applied for drainage related grants and continues to support the Consolidated Drainage District to maintain and increase drainage capacity along the major drainage laterals.
4	Expand the drainage districts to cover the entire parish. Currently, the parish has 3 drainage districts in the southern part of the parish, but only has one staff. Benefits: By improving drainage in the flood prone areas. In addition the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish continues its efforts to expand the drainage district throughout the parish.
7	Harden the Ponchatoula Community Center. Benefits: to strengthen the building components to withstand the forces of high winds and minimize damage and avoid building failure by envelope.	N/A	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has applied for funding for this project and at this time there is no available funding.

13	Add a safe room at the Office of Emergency Preparedness. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	TBD	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has submitted for funding for this project through GOHSEP and is presently being reviewed.
17	Add securely attached and elevated, backup power supply/ generator at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	District Authority	High Winds/Thunderstorms	N/A	Complete
19	Install quick connection fittings on all water connections in the boiler room at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Complete
21	Investigate and implement a localized interior drainage project along Hwy 51 and in each repetitive loss area to reduce its flood potential. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
22	Pursue elevation/ acquisition/flood proofing projects and structural solutions to flooding by pursuing funding opportunities for the 34 repetitive loss structures. Benefits: By removing structures from the floodplain, homeowners suffer less displacement days and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing

23	Pursue working with State and Federal governments on the re-designation of Tangipahoa River as a scenic river. Benefits: By removing the river as a scenic river, flooding issues would be reduced, allowing maintenance of the river to take place.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
24	Review the existing floodplain ordinance and evaluate ways to improve the Parish's "Community Rating System (CRS)" rating to reduce the flood insurance premium. Choose from the variety of methods and projects available that can be implemented to improve CRS rating. Benefits: Reduce flood insurance premiums and thereby encourage more people to purchase flood insurance which would potentially result in lower cost and a more timely recovery.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish adopted a new flood damage prevention ordinance in 2010. The permit office continues to implement existing activities as well as new activities toward a lower CRS rating.
25	Adopt additional commercial building regulations which include stricter building standards and incorporate dry flood proofing techniques. Benefits: Results in additional techniques to harden structures and thereby withstand the impacts of hazards.	N/A	No progress at this time	Tangipahoa Parish	High Winds/Tornadoes/Hurricanes	N/A	Louisiana State law does not allow modifications of the building code through local agencies. This action item is under review for the 2014 HMP.

26	Develop additional subdivision guidelines that would help reduce flooding, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages. Benefits: reduce the localized flooding problems that would occur with new development. Reduce potential power outages.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	The Tangipahoa Parish Planning Office continues to review and suggest modifications to the subdivision guidelines to help reduce flooding. Tangipahoa Parish's storm water plan has been approved through LDEQ and full implementation in phases is expected from 2014-2019.
27	Incorporate the draft Comprehensive Plan, flood maps, and building codes into long-term planning. Continually update the development of floodplain maps. Benefits: Results in a comprehensive effort to develop a Parish Wide approach to disaster damage reduction and preparation.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	These items have been combined and Tangipahoa Parish is continuing to implement its parish wide disaster preparation plan.
28	Re-evaluate codes for water line sizing and proper placement of flushing devices. Adopt building regulations to acquire adequately sized water distribution lines and fire hydrants in areas to improve water supply for combating fires. Expand the water district. Benefits: Reduce the risk of wildfire damage to structures and property.	N/A	Ongoing	Tangipahoa Parish	Flooding/Wildfire	N/A	Tangipahoa Parish has researched funding sources for this project and at this time there is no available funding.

Town of Kentwood Mitigation Actions

Mitigation Actions for Town of Kentwood							
Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
1.1 Public Building wind hardening	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HMGP and Parish or City funding (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/Town of Kentwood	Severe Thunderstorm, Tropical Cyclone, Tornado	1	New
1.2 Drainage - flood relief projects	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Initially identified projects include Ash Street area in Ponchatoula, Chapapeela Road in 2 locations, Wardline Road near I-55, and other potential sites. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HMGP and Parish funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/Town of Kentwood	Flooding, Severe Thunderstorm, Tropical Cyclone	1,2,3	New
1.3 Residential elevations and acquisitions for repetitive loss properties	Elevation or acquisition-demolition of approximately 40 properties in Tangipahoa Parish. Benefits: Relieves property owners of the continual flooding problems.	HMGP and homeowners being impacted (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/ Town of Kentwood	Flooding	1,2,3	New

1.5 Radios for Interoperable Communications	700mhz radios to allow for interoperable communications between Parish and local agencies during events that may compromise communication systems.	HMGP and Parish	February 2016-December 2018	Tangipahoa Parish/ Town of Kentwood	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1	New
1.6 Safe Room Projects	Construction of a safe room for first responders located in Hammond. Other locations will be identified based on funding availability.	HMGP and Parish	April 2015 - December 2018	Tangipahoa Parish/ Town of Kentwood	Tornado	1	New
4.1 Mitigation Public Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for flooding, tropical cyclone, severe thunderstorms, tornadoes and wildfire hazards, as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HMPG and Parish	January 2016 through December, 2018	Tangipahoa Parish/ Town of Kentwood	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1,2,3	New
1	Improve drainage ways, along the Natalbany River and the Tangipahoa River, by enlarging any inferior culverts along the major drainage laterals. Benefits: to ensure water flows freely within the drainage system, which will protect the surrounding area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.
3	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best methods of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at final outfall.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has applied for drainage related grants and continues to support the Consolidated Drainage District to maintain and increase drainage capacity along the major drainage laterals.

4	Expand the drainage districts to cover the entire parish. Currently, the parish has 3 drainage districts in the southern part of the parish, but only has one staff. Benefits: By improving drainage in the flood prone areas. In addition the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish continues its efforts to expand the drainage district throughout the parish.
13	Add a safe room at the Office of Emergency Preparedness. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	TBD	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has submitted for funding for this project through GOHSEP and is presently being reviewed.
17	Add securely attached and elevated, backup power supply/ generator at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	District Authority	High Winds/Thunderstorms	N/A	Complete
19	Install quick connection fittings on all water connections in the boiler room at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Complete
21	Investigate and implement a localized interior drainage project along Hwy 51 and in each repetitive loss area to reduce its flood potential. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.

22	Pursue elevation/ acquisition/flood proofing projects and structural solutions to flooding by pursuing funding opportunities for the 34 repetitive loss structures. Benefits: By removing structures from the floodplain, homeowners suffer less displacement days and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
23	Pursue working with State and Federal governments on the re-designation of Tangipahoa River as a scenic river. Benefits: By removing the river as a scenic river, flooding issues would be reduced, allowing maintenance of the river to take place.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
24	Review the existing floodplain ordinance and evaluate ways to improve the Parish's "Community Rating System (CRS)" rating to reduce the flood insurance premium. Choose from the variety of methods and projects available that can be implemented to improve CRS rating. Benefits: Reduce flood insurance premiums and thereby encourage more people to purchase flood insurance which would potentially result in lower cost and a more timely recovery.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish adopted a new flood damage prevention ordinance in 2010. The permit office continues to implement existing activities as well as new activities toward a lower CRS rating.
25	Adopt additional commercial building regulations which include stricter building standards and incorporate dry flood proofing techniques. Benefits: Results in additional techniques to harden structures and thereby withstand the impacts of hazards.	N/A	No progress at this time	Tangipahoa Parish	High Winds/Tornadoes/ Hurricanes	N/A	Louisiana State law does not allow modifications of the building code through local agencies. This action item is under review for the 2014 HMP.

26	Develop additional subdivision guidelines that would help reduce flooding, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages. Benefits: reduce the localized flooding problems that would occur with new development. Reduce potential power outages.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	The Tangipahoa Parish Planning Office continues to review and suggest modifications to the subdivision guidelines to help reduce flooding. Tangipahoa Parish's storm water plan has been approved through LDEQ and full implementation in phases is expected from 2014-2019.
27	Incorporate the draft Comprehensive Plan, flood maps, and building codes into long-term planning. Continually update the development of floodplain maps. Benefits: Results in a comprehensive effort to develop a Parish Wide approach to disaster damage reduction and preparation.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	These items have been combined and Tangipahoa Parish is continuing to implement its parish wide disaster preparation plan.
28	Re-evaluate codes for water line sizing and proper placement of flushing devices. Adopt building regulations to acquire adequately sized water distribution lines and fire hydrants in areas to improve water supply for combating fires. Expand the water district. Benefits: Reduce the risk of wildfire damage to structures and property.	N/A	Ongoing	Tangipahoa Parish	Flooding/Wildfire	N/A	Tangipahoa Parish has researched funding sources for this project and at this time there is no available funding.

Town of Independence Mitigation Actions

Mitigation Actions for Town of Independence							
Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
1.1 Public Building wind hardening	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HMGP and Parish or City funding (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/Town of Independence	Severe Thunderstorm, Tropical Cyclone, Tornado	1	New
1.2 Drainage - flood relief projects	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Initially identified projects include Ash Street area in Ponchatoula, Chapapeela Road in 2 locations, Wardline Road near I-55, and other potential sites. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HMGP and Parish funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/Town of Independence	Flooding, Severe thunderstorm, Tropical Cyclone	1,2,3	New
1.3 Residential elevations and acquisitions for repetitive loss properties	Elevation or acquisition-demolition of approximately 40 properties in Tangipahoa Parish. Benefits: Relieves property owners of the continual flooding problems.	HMGP and homeowners being impacted (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/ Town of Independence	Flooding	1,2,3	New

1.4 Public sewerage infrastructure retrofits	Project includes the systems owned and operated by the City of Hammond, City of Ponchatoula, the Town of Amite, and the Town of Independence. Benefits: The project proposed will relieve the communities and property owners with sewage back-up into their buildings, strengthen existing treatment site levees, and provide pump station retrofits to keep the systems operating during high water flow.	HMGP and Parish or HUD funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/ Town of Independence	Flooding, severe thunderstorm, tropical cyclone	1	New
1.5 Radios for Interoperable Communications	700mhz radios to allow for interoperable communications between Parish and local agencies during events that may compromise communication systems.	HMGP and Parish	February 2016-December 2018	Tangipahoa Parish/ Town of Independence	Flooding, Severe thunderstorm, Tropical Cyclone, tornados, wildfire	1	New
1.6 Safe Room Projects	Construction of a safe room for first responders located in Hammond. Other locations will be identified based on funding availability.	HMGP and Parish	April 2015 - December 2018	Tangipahoa Parish/ Town of Independence	Tornado	1	New
4.1 Mitigation Public Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for flooding, tropical cyclone, severe thunderstorms, tornadoes and wildfire hazards, as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HMPG and Parish	January 2016 through December, 2018	Tangipahoa Parish/ Town of Independence	Flooding, Severe thunderstorm, Tropical Cyclone, tornados, wildfire	1,2,3	New

1	Improve drainage ways, along the Natalbany River and the Tangipahoa River, by enlarging any inferior culverts along the major drainage laterals. Benefits: to ensure water flows freely within the drainage system, which will protect the surrounding area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.
3	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best methods of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at final outfall.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has applied for drainage related grants and continues to support the Consolidated Drainage District to maintain and increase drainage capacity along the major drainage laterals.
4	Expand the drainage districts to cover the entire parish. Currently, the parish has 3 drainage districts in the southern part of the parish, but only has one staff. Benefits: By improving drainage in the flood prone areas. In addition the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish continues its efforts to expand the drainage district throughout the parish.
13	Add a safe room at the Office of Emergency Preparedness. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	TBD	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has submitted for funding for this project through GOHSEP and is presently being reviewed.
17	Add securely attached and elevated, backup power supply/ generator at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	District Authority	High Winds/Thunderstorms	N/A	Complete

19	Install quick connection fittings on all water connections in the boiler room at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Complete
21	Investigate and implement a localized interior drainage project along Hwy 51 and in each repetitive loss area to reduce its flood potential. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
22	Pursue elevation/ acquisition/flood proofing projects and structural solutions to flooding by pursuing funding opportunities for the 34 repetitive loss structures. Benefits: By removing structures from the floodplain, homeowners suffer less displacement days and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
23	Pursue working with State and Federal governments on the re-designation of Tangipahoa River as a scenic river. Benefits: By removing the river as a scenic river, flooding issues would be reduced, allowing maintenance of the river to take place.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing

24	Review the existing floodplain ordinance and evaluate ways to improve the Parish's "Community Rating System (CRS)" rating to reduce the flood insurance premium. Choose from the variety of methods and projects available that can be implemented to improve CRS rating. Benefits: Reduce flood insurance premiums and thereby encourage more people to purchase flood insurance which would potentially result in lower cost and a more timely recovery.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish adopted a new flood damage prevention ordinance in 2010. The permit office continues to implement existing activities as well as new activities toward a lower CRS rating.
25	Adopt additional commercial building regulations which include stricter building standards and incorporate dry flood proofing techniques. Benefits: Results in additional techniques to harden structures and thereby withstand the impacts of hazards.	N/A	No progress at this time	Tangipahoa Parish	High Winds/Tornadoes/ Hurricanes	N/A	Louisiana State law does not allow modifications of the building code through local agencies. This action item is under review for the 2014 HMP.
26	Develop additional subdivision guidelines that would help reduce flooding, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages. Benefits: reduce the localized flooding problems that would occur with new development. Reduce potential power outages.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	The Tangipahoa Parish Planning Office continues to review and suggest modifications to the subdivision guidelines to help reduce flooding. Tangipahoa Parish's storm water plan has been approved through LDEQ and full implementation in phases is expected from 2014-2019.

27	Incorporate the draft Comprehensive Plan, flood maps, and building codes into long-term planning. Continually update the development of floodplain maps. Benefits: Results in a comprehensive effort to develop a Parish Wide approach to disaster damage reduction and preparation.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	These items have been combined and Tangipahoa Parish is continuing to implement its parish wide disaster preparation plan.
28	Re-evaluate codes for water line sizing and proper placement of flushing devices. Adopt building regulations to acquire adequately sized water distribution lines and fire hydrants in areas to improve water supply for combating fires. Expand the water district. Benefits: Reduce the risk of wildfire damage to structures and property.	N/A	Ongoing	Tangipahoa Parish	Flooding/Wildfire	N/A	Tangipahoa Parish has researched funding sources for this project and at this time there is no available funding.

Town of Roseland Mitigation Actions

Mitigation Actions for Town of Roseland							
Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
1.1 Public Building wind hardening	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HMGP and Parish or City funding (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/Town of Roseland	Severe Thunderstorm, Tropical Cyclone, Tornado	1	New
1.2 Drainage - flood relief projects	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Initially identified projects include Ash Street area in Ponchatoula, Chapapeela Road in 2 locations, Wardline Road near I-55, and other potential sites. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HMGP and Parish funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/Town of Roseland	Flooding, Severe Thunderstorm, Tropical Cyclone	1,2,3	New

1.3 Residential elevations and acquisitions for repetitive loss properties	Elevation or acquisition-demolition of approximately 40 properties in Tangipahoa Parish. Benefits: Relieves property owners of the continual flooding problems.	HMGP and homeowners being impacted (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/ Town of Roseland	Flooding	1,2,3	New
1.4 Public sewerage infrastructure retrofits	Project includes the systems owned and operated by the City of Hammond, City of Ponchatoula, the Town of Amite, and the Town of Independence. Benefits: The project proposed will relieve the communities and property owners with sewage back-up into their buildings, strengthen existing treatment site levees, and provide pump station retrofits to keep the systems operating during high water flow.	HMGP and Parish or HUD funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/ Town of Roseland	Flooding, severe thunderstorm, tropical cyclone	1	New
1.5 Radios for Interoperable Communications	700mhz radios to allow for interoperable communications between Parish and local agencies during events that may compromise communication systems.	HMGP and Parish	February 2016-December 2018	Tangipahoa Parish/ Town of Roseland	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1	New
1.6 Safe Room Projects	Construction of a safe room for first responders located in Hammond. Other locations will be identified based on funding availability.	HMGP and Parish	April 2015 - December 2018	Tangipahoa Parish/ Town of Roseland	Tornado	1	New

4.1 Mitigation Public Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for flooding, tropical cyclone, severe thunderstorms, tornadoes and wildfire hazards, as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HMPG and Parish	January 2016 through December, 2018	Tangipahoa Parish/ Town of Roseland	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1,2,3	New
1	Improve drainage ways, along the Natalbany River and the Tangipahoa River, by enlarging any inferior culverts along the major drainage laterals. Benefits: to ensure water flows freely within the drainage system, which will protect the surrounding area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.
3	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best methods of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at final outfall.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has applied for drainage related grants and continues to support the Consolidated Drainage District to maintain and increase drainage capacity along the major drainage laterals.

4	Expand the drainage districts to cover the entire parish. Currently, the parish has 3 drainage districts in the southern part of the parish, but only has one staff. Benefits: By improving drainage in the flood prone areas. In addition the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish continues its efforts to expand the drainage district throughout the parish.
13	Add a safe room at the Office of Emergency Preparedness. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	TBD	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has submitted for funding for this project through GOHSEP and is presently being reviewed.
17	Add securely attached and elevated, backup power supply/ generator at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	District Authority	High Winds/Thunderstorms	N/A	Complete
19	Install quick connection fittings on all water connections in the boiler room at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Complete

21	Investigate and implement a localized interior drainage project along Hwy 51 and in each repetitive loss area to reduce its flood potential. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
22	Pursue elevation/ acquisition/flood proofing projects and structural solutions to flooding by pursuing funding opportunities for the 34 repetitive loss structures. Benefits: By removing structures from the floodplain, homeowners suffer less displacement days and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
23	Pursue working with State and Federal governments on the re-designation of Tangipahoa River as a scenic river. Benefits: By removing the river as a scenic river, flooding issues would be reduced, allowing maintenance of the river to take place.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing

24	Review the existing floodplain ordinance and evaluate ways to improve the Parish's "Community Rating System (CRS)" rating to reduce the flood insurance premium. Choose from the variety of methods and projects available that can be implemented to improve CRS rating. Benefits: Reduce flood insurance premiums and thereby encourage more people to purchase flood insurance which would potentially result in lower cost and a more timely recovery.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish adopted a new flood damage prevention ordinance in 2010. The permit office continues to implement existing activities as well as new activities toward a lower CRS rating.
25	Adopt additional commercial building regulations which include stricter building standards and incorporate dry flood proofing techniques. Benefits: Results in additional techniques to harden structures and thereby withstand the impacts of hazards.	N/A	No progress at this time	Tangipahoa Parish	High Winds/Tornadoes/Hurricanes	N/A	Louisiana State law does not allow modifications of the building code through local agencies. This action item is under review for the 2014 HMP.

26	Develop additional subdivision guidelines that would help reduce flooding, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages. Benefits: reduce the localized flooding problems that would occur with new development. Reduce potential power outages.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	The Tangipahoa Parish Planning Office continues to review and suggest modifications to the subdivision guidelines to help reduce flooding. Tangipahoa Parish's storm water plan has been approved through LDEQ and full implementation in phases is expected from 2014-2019.
27	Incorporate the draft Comprehensive Plan, flood maps, and building codes into long-term planning. Continually update the development of floodplain maps. Benefits: Results in a comprehensive effort to develop a Parish Wide approach to disaster damage reduction and preparation.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	These items have been combined and Tangipahoa Parish is continuing to implement its parish wide disaster preparation plan.

28	Re-evaluate codes for water line sizing and proper placement of flushing devices. Adopt building regulations to acquire adequately sized water distribution lines and fire hydrants in areas to improve water supply for combating fires. Expand the water district. Benefits: Reduce the risk of wildfire damage to structures and property.	N/A	Ongoing	Tangipahoa Parish	Flooding/Wildfire	N/A	Tangipahoa Parish has researched funding sources for this project and at this time there is no available funding.

Village of Tickfaw Mitigation Actions

Mitigation Actions for Village of Tickfaw							
Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
1.1 Public Building wind hardening	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HMGP and Parish or City funding (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/Village of Tickfaw	Severe Thunderstorm, Tropical Cyclone, Tornado	1	New
1.2 Drainage - flood relief projects	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Initially identified projects include Ash Street area in Ponchatoula, Chapapeela Road in 2 locations, Wardline Road near I-55, and other potential sites. Benefits: Relieves Parish or local government and property-owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HMGP and Parish funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/Village of Tickfaw	Flooding, Severe Thunderstorm, Tropical Cyclone	1,2,3	New

1.3 Residential elevations and acquisitions for repetitive loss properties	Elevation or acquisition-demolition of approximately 40 properties in Tangipahoa Parish. Benefits: Relieves property-owners of the continual flooding problems.	HMGP and homeowners being impacted (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/ Village of Tickfaw	Flooding	1,2,3	New
1.4 Public sewerage infrastructure retrofits	Project includes the systems owned and operated by the City of Hammond, City of Ponchatoula, the Town of Amite, and the Town of Independence. Benefits: The project proposed will relieve the communities and property-owners with sewage back-up into their buildings, strengthen existing treatment site levees, and provide pump station retrofits to keep the systems operating during high water flow.	HMGP and Parish or HUD funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/ Village of Tickfaw	Flooding, severe thunderstorm, tropical cyclone	1	New
1.5 Radios for Interoperable Communications	700mhz radios to allow for interoperable communications between Parish and local agencies during events that may compromise communication systems.	HMGP and Parish	February 2016-December 2018	Tangipahoa Parish/ Village of Tickfaw	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1	New
1.6 Safe Room Projects	Construction of a safe room for first responders located in Hammond. Other locations will be identified based on funding availability.	HMGP and Parish	April 2015 - December 2018	Tangipahoa Parish/ Village of Tickfaw	Tornado	1	New

4.1 Mitigation Public Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for flooding, tropical cyclone, severe thunderstorms, tornadoes and wildfire hazards, as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HMPG and Parish	January 2016 through December, 2018	Tangipahoa Parish/ Village of Tickfaw	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1,2,3	New
1	Improve drainage ways, along the Natalbany River and the Tangipahoa River, by enlarging any inferior culverts along the major drainage laterals. Benefits: to ensure water flows freely within the drainage system, which will protect the surrounding area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.
3	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best methods of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at final outfall.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has applied for drainage related grants and continues to support the Consolidated Drainage District to maintain and increase drainage capacity along the major drainage laterals.

4	Expand the drainage districts to cover the entire parish. Currently, the parish has 3 drainage districts in the southern part of the parish, but only has one staff. Benefits: By improving drainage in the flood prone areas. In addition the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish continues its efforts to expand the drainage district throughout the parish.
13	Add a safe room at the Office of Emergency Preparedness. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	TBD	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has submitted for funding for this project through GOHSEP and is presently being reviewed.
17	Add securely attached and elevated, backup power supply/ generator at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	District Authority	High Winds/Thunderstorms	N/A	Complete
19	Install quick connection fittings on all water connections in the boiler room at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Complete

20	Pursue drainage improvement project to alleviate poor drainage on the roadway along Hwy 190 West in the City of Hammond limits along the Town and Country Shopping Center. Benefits: Improved drainage in the known area of flooding will reduce future damages in the area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
21	Investigate and implement a localized interior drainage project along Hwy 51 and in each repetitive loss area to reduce its flood potential. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
22	Pursue elevation/ acquisition/flood proofing projects and structural solutions to flooding by pursuing funding opportunities for the 34 repetitive loss structures. Benefits: By removing structures from the floodplain, homeowners suffer less displacement days and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing

23	Pursue working with State and Federal governments on the redesignation of Tangipahoa River as a scenic river. Benefits: By removing the river as a scenic river, flooding issues would be reduced, allowing maintenance of the river to take place.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
24	Review the existing floodplain ordinance and evaluate ways to improve the Parish's "Community Rating System (CRS)" rating to reduce the flood insurance premium. Choose from the variety of methods and projects available that can be implemented to improve CRS rating. Benefits: Reduce flood insurance premiums and thereby encourage more people to purchase flood insurance which would potentially result in lower cost and a more timely recovery.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish adopted a new flood damage prevention ordinance in 2010. The permit office continues to implement existing activities as well as new activities toward a lower CRS rating.
25	Adopt additional commercial building regulations which include stricter building standards and incorporate dry flood proofing techniques. Benefits: Results in additional techniques to harden structures and thereby withstand the impacts of hazards.	N/A	No progress at this time	Tangipahoa Parish	High Winds/Tornadoes/Hurricanes	N/A	Louisiana State law does not allow modifications of the building code through local agencies. This action item is under review for the 2014 HMP.

26	Develop additional subdivision guidelines that would help reduce flooding, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages. Benefits: reduce the localized flooding problems that would occur with new development. Reduce potential power outages.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	The Tangipahoa Parish Planning Office continues to review and suggest modifications to the subdivision guidelines to help reduce flooding. Tangipahoa Parish's storm water plan has been approved through LDEQ and full implementation in phases is expected from 2014-2019.
27	Incorporate the draft Comprehensive Plan, flood maps, and building codes into long-term planning. Continually update the development of floodplain maps. Benefits: Results in a comprehensive effort to develop a Parish Wide approach to disaster damage reduction and preparation.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	These items have been combined and Tangipahoa Parish is continuing to implement its parish wide disaster preparation plan.

28	Re-evaluate codes for water line sizing and proper placement of flushing devices. Adopt building regulations to acquire adequately sized water distribution lines and fire hydrants in areas to improve water supply for combating fires. Expand the water district. Benefits: Reduce the risk of wildfire damage to structures and property.	N/A	Ongoing	Tangipahoa Parish	Flooding/Wildfire	N/A	Tangipahoa Parish has researched funding sources for this project and at this time there is no available funding.

Village of Tangipahoa Mitigation Actions

Mitigation Actions for Village of Tangipahoa							
Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Goal**	**Status**
1.1 Public Building wind hardening	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HMGP and Parish or City funding (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/Village of Tangipahoa	Severe Thunderstorm, Tropical Cyclone, Tornado	1	New
1.2 Drainage - flood relief projects	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Initially identified projects include Ash Street area in Ponchatoula, Chapapeela Road in 2 locations, Wardline Road near I-55, and other potential sites. Benefits: Relieves Parish or local government and property-owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HMGP and Parish funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/Village of Tangipahoa	Flooding, Severe Thunderstorm, Tropical Cyclone	1,2,3	New

1.3 Residential elevations and acquisitions for repetitive loss properties	Elevation or acquisition-demolition of approximately 40 properties in Tangipahoa Parish. Benefits: Relieves property-owners of the continual flooding problems.	HMGP and homeowners being impacted (75%-25% grants)	January 2015 through December, 2018	Tangipahoa Parish/ Village of Tangipahoa	Flooding	1,2,3	New
1.4 Public sewerage infrastructure retrofits	Project includes the systems owned and operated by the City of Hammond, City of Ponchatoula, the Town of Amite, and the Town of Independence. Benefits: The project proposed will relieve the communities and property-owners with sewage back-up into their buildings, strengthen existing treatment site levees, and provide pump station retrofits to keep the systems operating during high water flow.	HMGP and Parish or HUD funding (75%-25% matching grants)	January 2015 through December, 2018	Tangipahoa Parish/ Village of Tangipahoa	Flooding, severe thunderstorm, tropical cyclone	1	New
1.5 Radios for Interoperable Communications	700mhz radios to allow for interoperable communications between Parish and local agencies during events that may compromise communication systems.	HMGP and Parish	February 2016-December 2018	Tangipahoa Parish/ Village of Tangipahoa	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1	New
1.6 Safe Room Projects	Construction of a safe room for first responders located in Hammond. Other locations will be identified based on funding availability.	HMGP and Parish	April 2015 - December 2018	Tangipahoa Parish/ Village of Tangipahoa	Tornado	1	New

4.1 Mitigation Public Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for flooding, tropical cyclone, severe thunderstorms, tornadoes and wildfire hazards, as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HMPG and Parish	January 2016 through December, 2018	Tangipahoa Parish/ Village of Tangipahoa	Flooding, Severe Thunderstorm, Tropical Cyclone, tornados, wildfire	1,2,3	New
1	Improve drainage ways, along the Natalbany River and the Tangipahoa River, by enlarging any inferior culverts along the major drainage laterals. Benefits: to ensure water flows freely within the drainage system, which will protect the surrounding area from flooding.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Completion of this initiative will be dependent upon available funding and resources.
3	Develop a master drainage plan which will evaluate drainage projects at major drainage laterals to determine best methods of increasing drainage capacity. Implement recommended projects resulting from drainage plan. Benefits: Reduces the number of flooded structures by increasing the volume of water the pumps can handle at final outfall.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has applied for drainage related grants and continues to support the Consolidated Drainage District to maintain and increase drainage capacity along the major drainage laterals.

4	Expand the drainage districts to cover the entire parish. Currently, the parish has 3 drainage districts in the southern part of the parish, but only has one staff. Benefits: By improving drainage in the flood prone areas. In addition the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish continues its efforts to expand the drainage district throughout the parish.
13	Add a safe room at the Office of Emergency Preparedness. Benefits: Safe rooms provide a place for occupants to take refuge from wind or wind borne debris and will prevent interruption of services in times of emergencies.	TBD	Ongoing	Tangipahoa Parish	High Winds	N/A	Tangipahoa Parish has submitted for funding for this project through GOHSEP and is presently being reviewed.
17	Add securely attached and elevated, backup power supply/ generator at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	District Authority	High Winds/Thunderstorms	N/A	Complete
19	Install quick connection fittings on all water connections in the boiler room at Hood Memorial Hospital. Benefits: Provide a source of power during power outages to continue essential operation.	N/A	Complete	Tangipahoa Parish	High Winds/Thunderstorms	N/A	Complete

21	Investigate and implement a localized interior drainage project along Hwy 51 and in each repetitive loss area to reduce its flood potential. Benefits: By improving drainage in the flood prone areas, homeowners will suffer less flooded structures. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish has searched for funding for this project and at this time there is no available funding.
22	Pursue elevation/ acquisition/flood proofing projects and structural solutions to flooding by pursuing funding opportunities for the 34 repetitive loss structures. Benefits: By removing structures from the floodplain, homeowners suffer less displacement days and flood damage. In addition, the drain on the NFIP is reduced by a decrease in flood claims.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing
23	Pursue working with State and Federal governments on the re-designation of Tangipahoa River as a scenic river. Benefits: By removing the river as a scenic river, flooding issues would be reduced, allowing maintenance of the river to take place.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Ongoing

24	Review the existing floodplain ordinance and evaluate ways to improve the Parish's "Community Rating System (CRS)" rating to reduce the flood insurance premium. Choose from the variety of methods and projects available that can be implemented to improve CRS rating. Benefits: Reduce flood insurance premiums and thereby encourage more people to purchase flood insurance which would potentially result in lower cost and a more timely recovery.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	Tangipahoa Parish adopted a new flood damage prevention ordinance in 2010. The permit office continues to implement existing activities as well as new activities toward a lower CRS rating.
25	Adopt additional commercial building regulations which include stricter building standards and incorporate dry flood proofing techniques. Benefits: Results in additional techniques to harden structures and thereby withstand the impacts of hazards.	N/A	No progress at this time	Tangipahoa Parish	High Winds/Tornadoes/Hurricanes	N/A	Louisiana State law does not allow modifications of the building code through local agencies. This action item is under review for the 2014 HMP.

26	Develop additional subdivision guidelines that would help reduce flooding, such as requiring proper drainage with adequate sloping; storm water retention ponds; dikes; levees and floodwalls if appropriate, and requiring freeboard above the Base Flood Elevation (BFE) in flood prone areas. Encourage new subdivision developments to install underground utilities, which would help reduce the chances of power outages. Benefits: reduce the localized flooding problems that would occur with new development. Reduce potential power outages.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	The Tangipahoa Parish Planning Office continues to review and suggest modifications to the subdivision guidelines to help reduce flooding. Tangipahoa Parish's storm water plan has been approved through LDEQ and full implementation in phases is expected from 2014-2019.
27	Incorporate the draft Comprehensive Plan, flood maps, and building codes into long-term planning. Continually update the development of floodplain maps. Benefits: Results in a comprehensive effort to develop a Parish Wide approach to disaster damage reduction and preparation.	N/A	Ongoing	Tangipahoa Parish	Flooding	N/A	These items have been combined and Tangipahoa Parish is continuing to implement its parish wide disaster preparation plan.

28	Re-evaluate codes for water line sizing and proper placement of flushing devices. Adopt building regulations to acquire adequately sized water distribution lines and fire hydrants in areas to improve water supply for combating fires. Expand the water district. Benefits: Reduce the risk of wildfire damage to structures and property.	N/A	Ongoing	Tangipahoa Parish	Flooding/Wildfire	N/A	Tangipahoa Parish has researched funding sources for this project and at this time there is no available funding.

Mitigation Action Prioritization Process

During the prioritization process, each Jurisdiction and the Steering Committee considered the costs and relative benefits of each new action. Costs can usually be listed in terms of dollars, although at times it involves staff time rather than the purchase of equipment or services that can be readily measured in dollars. In most cases, benefits, such as lives saved or future damage prevented, are hard to measure in dollars, many projects were prioritized with these factors in mind.

In all cases, the jurisdictions concluded that the benefits (in terms of reduced property damage, lives saved, health problems averted and/or economic harm prevented) outweighed the costs for the recommended action items.

The jurisdictions prioritized the possible activities that could be pursued by determining a numerical order for each mitigation action listed in this section. Jurisdictions and the steering committee members consulted appropriate agencies in order to assist with the prioritizations. The result were items that address the major hazards, are appropriate for those hazards, are cost-effective, and are affordable. The steering committee met at the Mitigation Action meeting to review and approve each jurisdictions and unincorporated Tangipahoa mitigation actions.

The Tangipahoa Parish Council governs the entire Parish and has the final decision on what projects are worked on and how and when they will be accomplished. The action items in the Tangipahoa Unincorporated and Jurisdiction Action Plans fall under their jurisdiction and they will delegate the tasks of the action items. Therefore, the Council will coordinate with the Tangipahoa Parish Planner and Lead Manager of each mitigation item to accomplish the goals and action items. The Lead Manager will follow any current procedures the Parish has while completing the action items. The Annual Progress Report will be submitted to the Parish Council, which will reflect progress on each item and on the Hazard Mitigation Plan.

The action items found in this section will be implemented through the defined political process of the Parish and local jurisdiction's governments. The annual budget, as required by law, is the driving factor in determining what projects are accomplished. Often, a certified public accountant generates the annual budget for the local governments. The lead manager for each action item will submit the corresponding project for consideration to the Council members. Then each Council member submits projects for consideration in the annual budget. They will use this HMP as a guide to help them determine what projects will be submitted into the annual budget for completion. Outlined within each budget are projects that the Parish would like to complete. The Council then will hold budget hearings to determine what projects in the budget will and can be funded. All other projects are then removed and must be resubmitted during the following year's budget hearing.

Appendix A: Planning Process

Purpose

The hazard mitigation plan update process prompts local jurisdictions to keep their hazard mitigation plan current and moving toward a more resilient community. The plan update builds on the research and planning efforts of previous plans while reviewing recent trends. The Steering Committee and jurisdictions followed FEMA's hazard mitigation planning process per the FEMA Local Mitigation Planning Handbook. This planning process assured public involvement and the participation of interested agencies and private organizations. Documentation of the planning process for the updated plan is addressed in this section.

The Tangipahoa Parish Hazard Mitigation Plan Update

The Tangipahoa Parish Hazard Mitigation Plan Update process began in August 2014 with a series of meetings and collaborations between the contractor (SDMI) and the participating jurisdictions. Update activities were intended to give each jurisdiction the opportunity to shape the plan to best fit their community's goals. Community stakeholders and the general public were invited to attend and contribute information to the planning process during specific time periods or meetings.

Date	Meeting or Outreach	Location	Public Invited	Purpose
8/18/14	Coordination Conference Call	Telephone	No	Discuss with Parish HM coordinator and any steering committee members expectations and requirements of the project.
9/09/14	Kick-Off Meeting	Hammond, Parish Government Building	No	Discuss with the plan steering committee expectations and requirements of the project. Assign plan worksheets to jurisdictions.
10/21/14	Risk Assessment Meeting	Hammond Parish Government Building	No	Discuss and review the risk assessment with the steering committee, discuss and review expectations for public meeting.
11/19/14	Public Meeting	Hammond, Parish Government Building	Yes	The public meeting allowed the public and community stakeholders to participate and provide input into the hazard mitigation planning process. Maps of the Tangipahoa parish communities were provide for the meeting attendees to identify specific areas where localized hazards occur.
12/10/14	Mitigation Strategy Meeting	Hammond Parish Government Building	No	Discussed, reviewed and prioritized mitigation actions with the steering committee.
ongoing	Public Survey Tool	Online	Yes	This survey asked participants about public perceptions and opinions regarding natural hazards in Tangipahoa Parish. In addition, we asked about the methods and techniques preferred for reducing the risks and losses associated with these hazards. Survey

				Results: https://www.surveymonkey.com/s/tangipahoaparish
2 week period	Public Plan Review (Digital)	Online	Yes	Parish Website
2 week period	Public Plan Review (Hardcopy)	Hammond, LA	Yes	Parish Government Building, Hammond, LA.

Planning

The plan update process consisted of several phases

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8
Plan revision								
Data collection								
Risk assessment								
Public input								
Mitigation strategy and actions								
Plan review by GOHSEP and FEMA								
Plan adoption								
Plan approval								

Coordination

The Tangipahoa Parish Office of Homeland Security and Emergency Preparedness (OHSEP) and participating jurisdictions oversaw the coordination of the 2015 Hazard Mitigation Plan Update Steering Committee during the update process. The Parish Planning Director was responsible for identifying and working directly with members for the committee selected by each jurisdiction.

The Parish Planning Director was responsible for inviting the steering committee, jurisdictions and key stakeholders to planned meetings and activities. SDMI assisted the Parish Planning Director with press releases and social media statements for notification to the media and general public for public meetings and public outreach activities. SDMI was also was responsible for facilitating meetings and outreach efforts during the update process.

Neighboring Community, Local and Regional Planning Process Involvement

From the outset of the planning process, the Hazard Mitigation Team encouraged participation from a broad range of jurisdictional entities. The involvement of representatives from the City, state, and regional agencies provided diverse perspectives and mitigation ideas.

Formal participation in this plan includes but is not limited to the following activities:

- Participation in Hazard Mitigation Team meetings at the local and parish level
- Sharing local data and information
- Local action item development
- Plan document draft review
- Formal adoption of the Hazard Mitigation Plan document by each jurisdiction following Provisional approval by The State of Louisiana and FEMA

The 2015 Hazard Mitigation Plan Update Steering Committee consisted of representatives from the following parish, municipal or community stakeholders:

- Tangipahoa Parish Government
- City of Hammond
- City of Ponchatoula
- City of Amite
- Town of Kentwood
- Town of Independence
- Town of Roseland
- Village of Tangipahoa
- Village of Tickfaw

The neighboring Parish of St Tammany was invited to participate in planning meetings and the public meeting as well in an effort to collaborate with neighboring communities. Tangipahoa and St Tammany Parish border each other and share a major state highways which serves as an evacuation routes for citizens of both parishes. Jurisdictions also discussed previous mitigation actions involving hardening of shelters which house citizens from St Charles Parish during disasters. Tangipahoa and St Charles parish have agreements in place to assist each other with shelter space. By hardening and retrofitting these buildings, Tangipahoa is able to provide a safe shelter for a neighboring parish and community.

As part of the coordination and planning process, each jurisdiction was provided the State Required Hazard Mitigation Plan Update Worksheet. Jurisdictions with the capability to complete and return these worksheets returned them to assist with the 2015 update. The completed worksheets can be found in Appendix E – State Required Plan Update Worksheets

Below is a detailed list of the 2015 HMPU Steering Committee:

Member/Title	Jurisdiction/Entity
Priss Gallager, Administrative Assistant	City of Amite
Lacy Landrum, Director of Administration	City of Hammond
John Thomas, Fire Chief	City of Hammond
Robert Morgan, Public Works Director	City of Hammond
Bobby Zabbia, Mayor	City of Ponchatoula
Russell Hoover, North Oaks Hospital	North Oaks Hospital
Dawson Primes, Director	Tangipahoa OHSEP
Gordon Burgess, Parish President	Tangipahoa Parish Government
Nic Leblanc, Parish Floodplain Manager	Tangipahoa Parish Government
Bill Moorman, Parish GIS	Tangipahoa Parish Government
Andy Currier, Parish Building Official	Tangipahoa Parish Government
Alyson Lapuma, Planning Director	Tangipahoa Parish Government
Nace Garafola, Public Works Director	Tangipahoa Parish Government
John Dardis, Grants	Tangipahoa Parish Government
Gary Clark, Water District Manager	Tangipahoa Parish Water Dist. #1
Maurice Jordan, Parish Engineer	Tangipahoa Parish Government
Stacey Neal, Economic Development Director	Tangipahoa Parish Government
Missy Cowart, Grants	Tangipahoa Parish Government
Michael Ragusa, Mayor	Town of Independence
Harold Smith, Mayor	Town of Kentwood
Wanda McCoy, Mayor	Town of Roseland
Brenda Nevels, Mayor	Village of Tangipahoa
Anthony LaMonte, Mayor	Village of Tickfaw

Program integration

Local governments are required to describe how their mitigation planning process is integrated with other ongoing local and area planning efforts. This subsection describes Tangipahoa Parish programs and planning.

A measure of integration and coordination is achieved through the HMPU participation of steering committee members and community stakeholders who administer programs such as: floodplain management under the National Flood Insurance Program (NFIP), parish planning and zoning and building code enforcement, comprehensive plans, and Emergency Planning.

Opportunities to integrate the requirements of this Hazard Mitigation Plan into other local planning mechanisms will continue to be identified through future meetings of the Parish and Jurisdictions and through the five-year review process described in the Plan Maintenance Section. The primary means for integrating mitigation strategies into other local planning mechanisms will be through the revision, update and implementation of each jurisdiction's individual city/town plans that require specific planning and administrative tasks (e.g. risk assessment, plan amendments, ordinance revisions, capital improvement projects, etc.).

The members of the Tangipahoa Parish Hazard Mitigation steering committee will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their jurisdictions or agencies are consistent with the goals and actions of the Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in Parish. Existing plans, studies, and technical information were

incorporated in the planning process. Examples include flood data from FEMA, the U. S. Army Corps of Engineers (USACE or Corps), and the U. S. Geological Survey. Much of this data was incorporated into the risk assessment component of the plan relative to plotting historical events and the magnitude of damages that occurred. The parish's 2005 Hazard Mitigation Plan was also used in the planning process. Other existing data and plans used in the planning process include those listed below.

- Tangipahoa Economic Development Master Plan
- Parish and Local Emergency Operations Plans
- Continuity of Operations Plans (City and Parish)
- State of Louisiana Hazard Mitigation Plan
- Storm water Management Plan (City and Parish)
- Capital Improvement Plan (City)
- Comprehensive Master Plan (City and Parish)

Further information on the plans can be found in the Capabilities Assessment, Section 3.

Documentation (Meetings and Public Outreach)

The following pages contain documentation of the agendas, attendees, and presentations, as well as any other related documents, for the meetings and public outreach activities conducted during this hazard mitigation plan update for Tangipahoa parish and participating jurisdictions.

Meeting #1: Coordination Conference Call

Date: August 18, 2014
Location: Teleconference
Purpose: Discuss with the hazard mitigation lead for the parish (OHSEP director) the expectations and requirements of the hazard mitigation plan update process and to establish and initial project timeline.
Public Initiation: No
Invitees included:

- Dawson Primes, Tangipahoa OHSEP
- Alyson Lapuma, Parish Planning
- Brant Mitchell, SDMI
- Lauren Stevens, SDMI
- GOHSEP

Agenda:

Agenda

Tangipahoa Parish Hazard Mitigation Plan Update Parish Director Meeting #1

Aug 18, 2014, 9:00 a.m.

- Welcome - SDMI
- Parish Introductions
- SDMI Introductions
- Overview of Plan Update Process and Con Call Objectives
    - Objectives
        - Overview of Plan Update Process
        - Parish Expectations for Update Process
        - Discuss tentative dates for First Planning Meeting

- Plan Update Process will consist of the below main action items:
    1) Planning Team Meeting
    2) Worksheet Completion/Data Collection
    3) Plan Update Begins
    4) Public Meeting
    5) Public Draft Review
    6) Plan Update Final Draft to Parish and GOHSEP

    - Planning Team Meeting
        - Select Date and Location (parish can help secure location or provide suggestions for SDMI to coordinate)
        - Parish should identifying stakeholders, provide SDMI with a list of these stakeholders to coordinate invitations
        - Worksheets will be provided at this meeting for data collection
    - Worksheets
        - Parishes/Stakeholders to have 2 weeks to complete the worksheets
        - Will return completed worksheets to SDMI
    - Plan Update begins – Approximately 30 days
        - SDMI will review data submitted in worksheets and update the HM plan based off of information received by parish and stakeholders. This will include:
            - Mitigation Strategy
            - Previous Occurrences
            - Mapping
            - Risk Assessment
    - Public Meeting – Mitigation Plan DRAFT for public review/changes
        - Date/location
    - Pubic Draft Review - Think about a location for this
    - Plan Update from Draft to Final – Approximately 30 days
        - Submission of final plan to GOHSEP HM Officer

- Closing Remarks

Attendees

- Parish of Tangipahoa
    - Dawson Primes
    - Alyson Lapuma
- GOHSEP
    - Not represented
- Contractor-LSU-SDMI
    - Lauren Stevens

Meeting #2: Hazard Mitigation Plan Update Kick-Off

Date: September 9, 2014

Location: Hammond, Louisiana

Purpose: Discuss the expectations and requirements of the hazard mitigation plan update process and to establish and initial project timeline with the Parish's Hazard Mitigation Plan Steering Committee. Assign each individual jurisdiction and the parish data collection for the plan update.

Public Initiation: No

Member/Title	Jurisdiction/Entity
Buddy Bell, Mayor	City of Amite
Lacy Landrum, Director of Administration	City of Hammond
John Thomas, Fire Chief	City of Hammond
Robert Morgan, Public Works Director	City of Hammond
Bobby Zabbia, Mayor	City of Ponchatoula
Russell Hoover, North Oaks Hospital	North Oaks Hospital
Dawson Primes, Director	Tangipahoa OHSEP
Gordon Burgess, Parish President	Tangipahoa Parish Government
Nic Leblanc, Parish Floodplain Manager	Tangipahoa Parish Government
Bill Moorman, Parish GIS	Tangipahoa Parish Government
Andy Currier, Parish Building Official	Tangipahoa Parish Government
Alyson Lapuma, Planning Director	Tangipahoa Parish Government
Nace Garafola, Public Works Director	Tangipahoa Parish Government
James Harper, Sewer District Manager	Tangipahoa Parish Government
Gary Clark, Sewer District Manager	Tangipahoa Parish Government
Maurice Jordan, Parish Engineer	Tangipahoa Parish Government
Stacey Neal, Economic Development Director	Tangipahoa Parish Government
Mark Kolwe, Parish School Superintendent	Tangipahoa Parish Government
Michael Ragusa, Mayor	Town of Independence
Harold Smith, Mayor	Town of Kentwood
Wanda McCoy, Mayor	Town of Roseland
Brenda Nevels, Mayor	Village of Tangipahoa
Anthony LaMonte, Mayor	Village of Tickfaw

Agenda-Meeting #2

Tangipahoa Parish Hazard Mitigation Plan Update

Mitigation Coordination Committee Kick-off Meeting
September 9, 2014

INTRODUCTIONS AND BACKGROUND

- Officials
- Mitigation Coordination Committee
- SDMI Team
- Governor's Office of Homeland Security

HAZARD MITIGATION PLANNING PROCESS

- Multi-jurisdictional Approach
- Federal Requirements
- Expectations
- Timeline

OUTREACH STRATEGY

COMMUNITY CAPABILITIES

RISK ASSESSMENT

- Hazard Identification
- Community Assets
- Risk Analysis
- Vulnerabilities

MITIGATION STRATEGY

PLAN APPROVAL PROCESS

PLAN ADOPTION BY JURISDICTIONS

FINAL PRODUCT

ASSIGNMENT: WORKSHEETS FOR EACH JURISDICTION

ADJORN

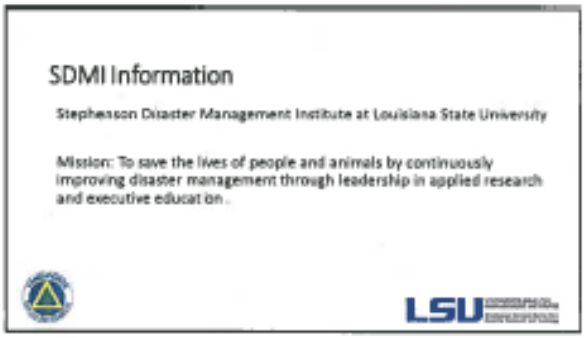
Roster-Meeting #2

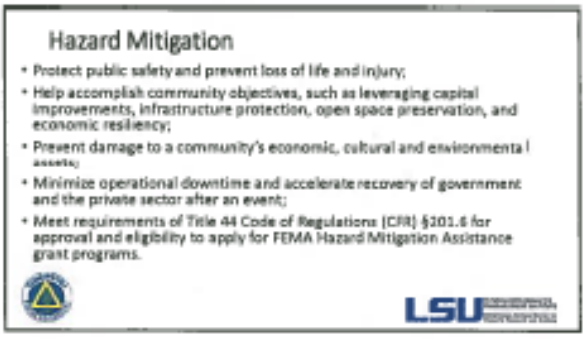
TANGIPAHOA PARISH HAZARD MITIGATION PLAN UPDATE KICK-OFF MEETING
September 9, 2014

Name	Organization	Email	Phone	Comments
Dawson Primes	Tang. Parish OHSEP	dprimes@tangipahoa.org		
Leike Andrews	SDMI, LSU	aandrews1@lsu.edu	578-7034	
ROBERT MORGAN	City of HAMMOND	morgan-rm@hammond.org	9859691636	
RUSSELL HOOVER	NORTH OAKS	RHOOVER@NORTHOAKS.ORG	985-351-7803	
LACY LANDRUM	CITY OF HAMMOND	Landrum_L@hammond.org	985-277-5653	
John Thomas	Hammond Fire	thomas_jw@hammond.org	985-277-5600	
GORDON BURGESS	TANGI. Gov.		985-748-3211	
Missy Cowart	TPG	missycowart@tangipahoa.org	985 748 3211	
MAURICE JORDAN	TPG	TPGROAD@TANGIPAHOA.ORG	985-748-3211	
Nici English	GOHSEP	nicolette.english@la.gov	225-267-2607	
Tom Fagan	DHH/OPH	Thomas.Fagan@la.gov	985-543-4175 x242	
Wendy Montalbano	Tangi Water	wendy@tangiwater.com	985-969-6391	
Clyde Martin	CGDD#1	clyde@tangipahoadrainage.org	985-542-4292	
Bob Zabbia	Ponchatoula	mayor@cityofponchatoula.com	985-386-0741	
Lauren Stevens	SDMI, LSU	lstevens@lsu.edu	578-0500	

Stephenson Disaster Management Institute
Stephenson National Center for Security Research and Training

Presentation-Meeting #2






Hazard Mitigation Plan Update Requirements
• The plan must be updated every five (5) years;
• Re-assess hazard identification and risk assessment
• Consider any changes since the last plan update, and address events that have occurred since the last plan;
• Incorporate local planning efforts;
• Report mitigation strategy (projects) progress and discuss adjustments;
• Address any weaknesses identified in the previous plan review.
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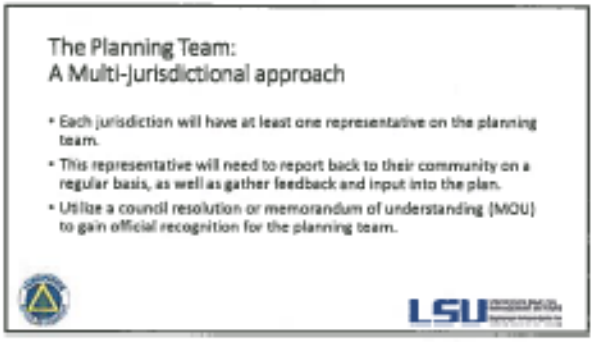
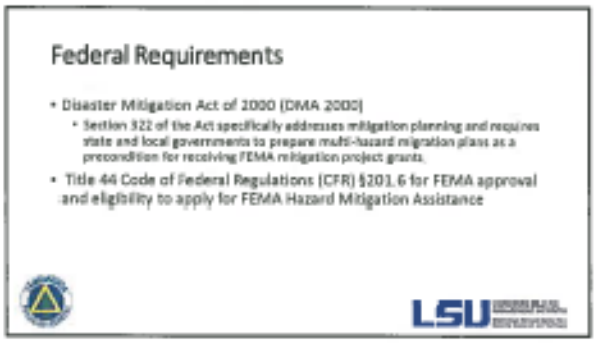
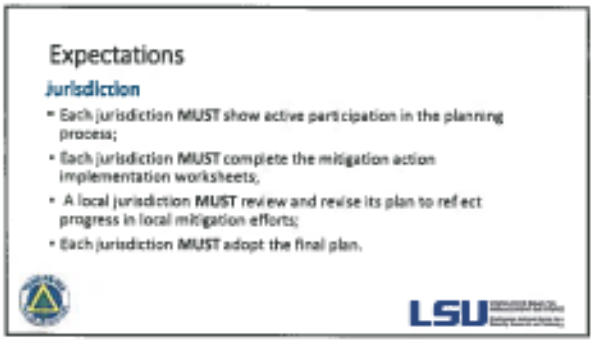

The Planning Team:
A Multi-Jurisdictional approach
• Each jurisdiction will have at least one representative on the planning team.
• This representative will need to report back to their community on a regular basis, as well as gather feedback and input into the plan.
• Utilize a council resolution or memorandum of understanding (MOU) to gain official recognition for the planning team.
LSU


Federal Requirements
• Disaster Mitigation Act of 2000 (DMA 2000)
• Section 322 of the Act specifically addresses mitigation planning and requires state and local governments to prepare multi-hazard mitigation plans as a precondition for receiving FEMA mitigation project grants.
• Title 44 Code of Federal Regulations (CFR) §201.6 for FEMA approval and eligibility to apply for FEMA Hazard Mitigation Assistance
LSU


Expectations
Jurisdiction
• Each jurisdiction MUST show active participation in the planning process;
• Each jurisdiction MUST complete the mitigation action implementation worksheets;
• A local jurisdiction MUST review and revise its plan to reflect progress in local mitigation efforts;
• Each jurisdiction MUST adopt the final plan.
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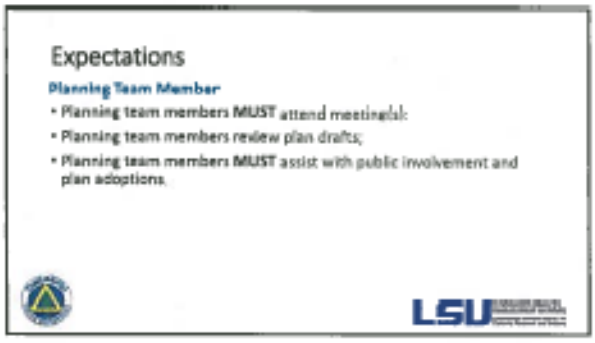
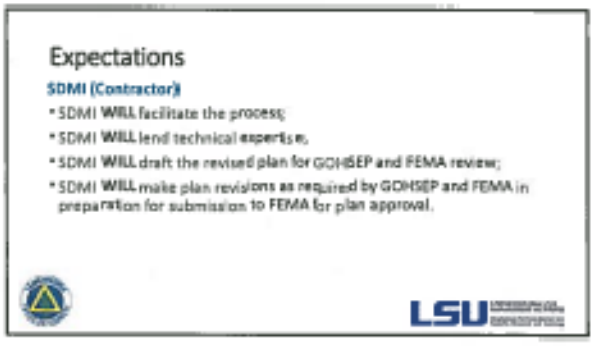

Expectations
Planning Team Member
• Planning team members MUST attend meetings/all;
• Planning team members review plan drafts;
• Planning team members MUST assist with public involvement and plan adoptions.
LSU


Expectations
SDMI (Contractor)
• SDMI WILL facilitate the process;
• SDMI WILL lend technical expertise;
• SDMI WILL draft the revised plan for GOHSEP and FEMA review;
• SDMI WILL make plan revisions as required by GOHSEP and FEMA in preparation for submission to FEMA for plan approval.
LSU


Timeline*


Outreach Strategy
Planning Team
Community Stakeholders
General Public


Community Capabilities
Primary types of capabilities for reducing long-term vulnerability through mitigation planning are:
• Planning and regulatory
• Administrative and technical
• Financial
• Educational and outreach
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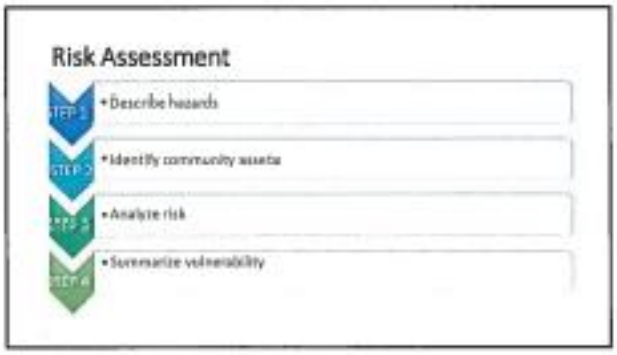
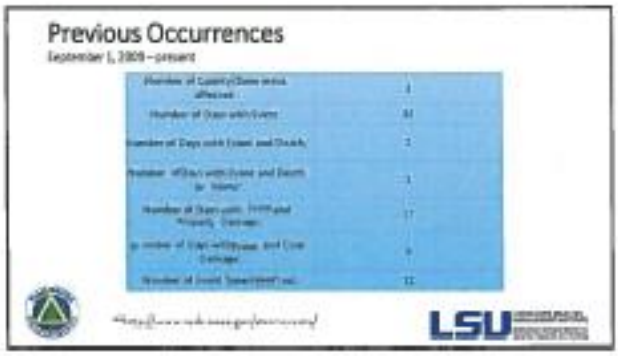

Risk Assessment
STEP 1
• Describe hazards
STEP 2
• Identify community assets
• Analyze risk
• Summarize vulnerability


Previous Occurrences
September 1, 2009 – present
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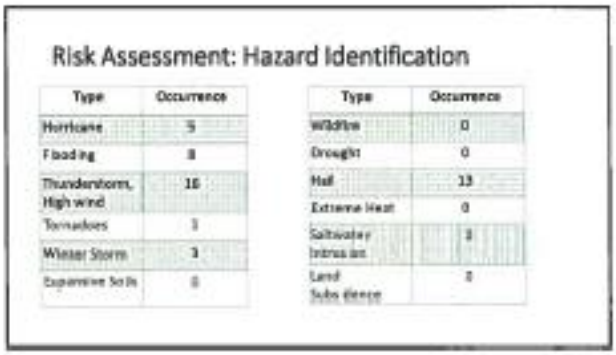
Risk Assessment: Hazard Identification
Type
Occurrence
Hurricane
5
Flooding
8
Thunderstorm, High wind
16
Tornadoes
1
Winter Storm
3
Expansive Soils
0
Type
Occurrence
Wildfire
0
Drought
0
Hail
13
Extreme Heat
0
Saltwater Intrusion
1
Land Subsidence
1

Risk Assessment- Community Assets

- ***People***
  - Population concentration
  - Special needs (functional needs) and demographics
  - Project population growth
- ***Economy***
  - Major employers
  - Dependencies between economic sectors and infrastructure
- ***Built Environment***
  - Building types and age
  - Infrastructure and critical facilities
  - Future development
  - Historic and cultural significance
- ***Natural Environment***
  - Areas that protect and mitigate hazards
  - Critical habitat and important environmental features

Mitigation Strategy

Mitigation Strategy

- The plan should be updated with the status current mitigation strategies
- Progress on the mitigation action items will be monitored and evaluated by the Tangipahoa Parish Planner. The Lead Manager for each action item will complete an annual Progress Report and submit them to the Tangipahoa Parish Planner for review.
- The coordinating committee should identify any new strategies for their jurisdictions and work together to prioritize the updated list.

Previous Goals

1) Identify and pursue preventive measures that will reduce future damages from hazards.

2) Pursue elevation/ acquisition/ flood proofing projects and structural solutions to flooding (acquisitions, elevations, and flood proofing)

3) Regulate sound development in the Town to reduce or eliminate the potential impact of hazards

Plan Approval Process

Adopt the Plan

Each jurisdiction MUST adopt the final plan.

- As a planning team member be aware of the policies for your jurisdiction
  - Know the process for putting this plan on the docket for adoption
  - Make sure you make the required deadlines

The Final Product

- FEMA approved Hazard Mitigation Plan
  - Meets requirements of Title 44 Code of Regulations (CFR) §201.6 for approval and eligibility to apply for FEMA Hazard Mitigation Assistance grant programs
  - A hazard mitigation project strategy for each jurisdiction
  - A comprehensive list of jurisdiction owned properties
  - Assessment of natural disaster-related risks and vulnerabilities

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Reminder-Timeline*

Kick off meeting		Today
Parish/local meetings	Jurisdictions should hold 2-3 internal meetings to assess prioritized goals and actions, review strategies in implementing the action plan, and adjust actions as necessary while refining the mitigation strategy.	Sep 9 - September 23rd
Jurisdiction specific submission	Jurisdictions start to complete updated information for plan update.	Due by October 1st
Public meeting	The general public and community stakeholders are invited to participate in the planning process. The public will be invited to participate in an online mitigation survey. They are helps to identify possible mitigation strategies	October (3rd - 10th)
Plan development	SDMI will work to incorporate updates into existing plan.	October - November
Public plan review	The plan will be available to the public for review and comment for a two-week period.	November (1-14)
Plan review GOHSEP	GOHSEP reviews and provides input for revisions. SDMI with jurisdictions will make edits.	Nov - Dec (15th - 1st)
Plan review FEMA	FEMA reviews and provides input for revisions. SDMI with jurisdictions will make edits.	December - January
Jurisdiction adoption of plan	Each jurisdiction will adopt the plan	January - February
FEMA plan approval	The plan with crisis level adoptions will be submitted to FEMA for approval.	By March 13, 2013

Plan Update Worksheet

TABS INCLUDE

- Planning Team
- Capability Assessment
- NFIP Worksheet
- Hazard Identification
- Critical Facilities/Vulnerable Populations

Plan Update Worksheet – Planning Team

Plan Update Worksheet – Capability Assessment

Plan Update Worksheet – NFIP

Plan Update Worksheet –
Hazard Summary

Plan Update Worksheet –
Building Inventory

Plan Update Worksheet –
Critical Facilities and Vulnerable Population

Hazards Worksheet

Hazards Worksheet – Example Iberia Parish

Mitigation Action Evaluation Worksheet


Mitigation Action Implementation Worksheet
Mitigation Action Implementation Worksheet


Contact Us
Brant Mitchell, SDMI Director of Research & Operations
(225) 578-5819
Lauren Stevens, HM Project Lead
lstevens@lsu.edu
(225) 578-0502
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Meeting #3 Risk Assessment Meeting

Date: October 21, 2014

Location: Hammond, LA, Louisiana

Purpose: Members of the HMPU Steering Committee were presented the results of the most recent risk assessment during this meeting. The assessment was conducted based on hazards identified during previous plans. The steering committee also reviewed hazard mitigation goals and agreed on proposed mitigation actions.

Public Initiation: No

Invitees Included:

Member/Title	Jurisdiction/Entity
Buddy Bell, Mayor	City of Amite
Lacy Landrum, Director of Administration	City of Hammond
John Thomas, Fire Chief	City of Hammond
Robert Morgan, Public Works Director	City of Hammond
Bobby Zabbia, Mayor	City of Ponchatoula
Russell Hoover, North Oaks Hospital	North Oaks Hospital
Dawson Primes, Director	Tangipahoa OHSEP
Gordon Burgess, Parish President	Tangipahoa Parish Government
Nic Leblanc, Parish Floodplain Manager	Tangipahoa Parish Government
Bill Moorman, Parish GIS	Tangipahoa Parish Government
Andy Currier, Parish Building Official	Tangipahoa Parish Government
Alyson Lapuma, Planning Director	Tangipahoa Parish Government
Nace Garafola, Public Works Director	Tangipahoa Parish Government
James Harper, Sewer District Manager	Tangipahoa Parish Government
Gary Clark, Sewer District Manager	Tangipahoa Parish Government
Maurice Jordan, Parish Engineer	Tangipahoa Parish Government
Stacey Neal, Economic Development Director	Tangipahoa Parish Government
Mark Kolwe, Parish School Superintendent	Tangipahoa Parish Government
Michael Ragusa, Mayor	Town of Independence
Harold Smith, Mayor	Town of Kentwood
Wanda McCoy, Mayor	Town of Roseland
Brenda Nevels, Mayor	Village of Tangipahoa
Anthony LaMonte, Mayor	Village of Tickfaw

Agenda-Meeting #3

Agenda

Tangipahoa Parish Hazard Mitigation Plan Update
Steering Committee Risk Assessment Meeting
October 21, 2014
10:00 a.m. to 11:00 a.m.

RISK ASSESSMENT

- Overview of Risk Assessment for Tangipahoa

MITIGATION STRATEGY

- Review of Current Goals
- Proposed Mitigation Projects

ADJORN

Roster-Meeting #3

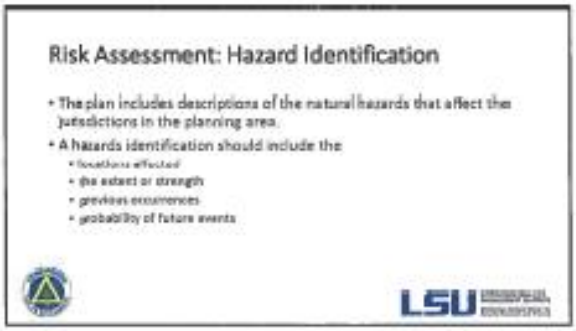
TANGIPAHOA PARISH HAZARD MITIGATION PLAN UPDATE RISK ASSESSMENT MEETING
October 21, 2014

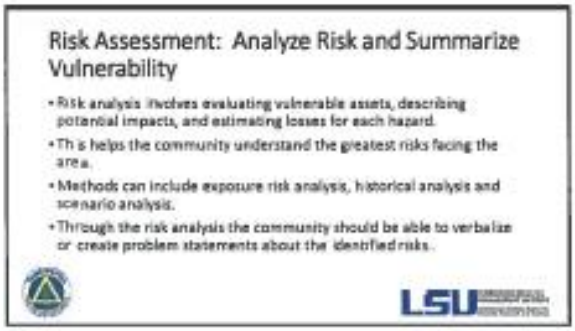
Name	Organization	Email	Phone	Comments
Harold Smith	Town of Kentwood	mayor@kentwood.org	985-229-3451	
Lauren Stevens	LSU	lstevens@lsu.edu	225-578-0002	
Brant Mitchell	LSU	bmitch9@lsu.edu	225-578-0502	
Bruce Cutrer	T.P.F.D. #1	tp1chief@bellsouth.Net	985-748-5161	
Gordon Burgess	Tangi. Psh. Gov.		985-748-3211	
Nic LeBlanc	Tangi Parish Gov't	nleblanc@tangipahoa.org	985-542-2117	
Gary Clark	Tangi Water	gary@tangiwater.com	985-345-6457	
Wendy Montalbano	Tangi. Water	wendy@tangiwater.com	345-6457	
[illegible]	Village of Tickfaw	[illegible]	542-9249	
Anthony [illegible]	" "	" "	" "	
Andy Currier	Tangi Parish Gov't	acurrier@tangipahoa.org	542-2117	
Bob Zabbia	Ponchatoula	city of ponchatoula.com	386-0741	
Lacy Landrum	Hammond	Landrum_L@hammond.org	277-5853	
Mayson Foster	Hammond	Mayor@hammond.org	277-5605	
Robert Morgan	Hammond	morgan_rm@hammond.org	277 5957	
John Dardis	Parish			

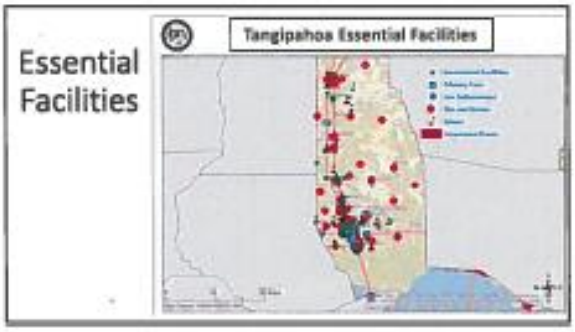
TANGIPAHOA PARISH HAZARD MITIGATION PLAN UPDATE RISK ASSESSMENT MEETING
October 21, 2014

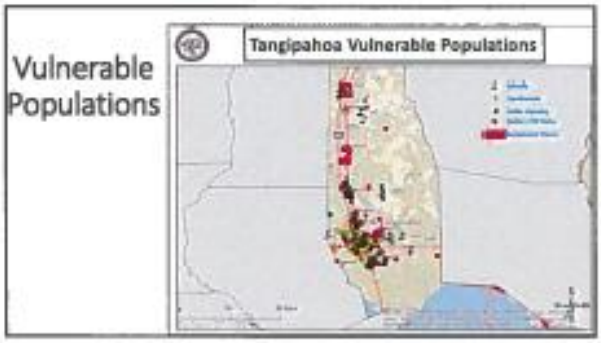
Name	Organization	Email	Phone	Comments
Maurice Jordan	T. P. G	TPCROAD@TANGIPAHOA.ORG	985-748-3211	

Presentation-Meeting #3








Vulnerable Populations
Tangipahoa Vulnerable Populations


Flooding
• A flood is the overflow of water onto land that is usually not inundated
• The National Flood Insurance Program defines a flood as a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from overflow of inland or tidal waves, unusual and rapid accumulation or runoff of surface waters from any source, mudflow, or collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above
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Flooding
Types of flooding may include the following:
• Riverine
• Flash
• Ponding
• Backwater
• Urban
• Coastal
LSU


Repetitive Flooding
• Some areas flood more often than other properties, even more than those in the mapped 100-year floodplain
• FEMA defines a "repetitive loss "property as one which has received two flood insurance claim payments for at least $1,000 over any 10-year period since 1978.
• These properties are important to the National Flood Insurance Program and the Community Rating System because even though they comprise 1% of the policy base, they account for 30% of the country's flood insurance claim payments .
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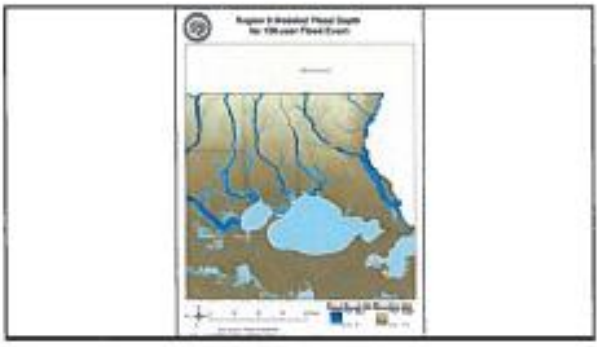
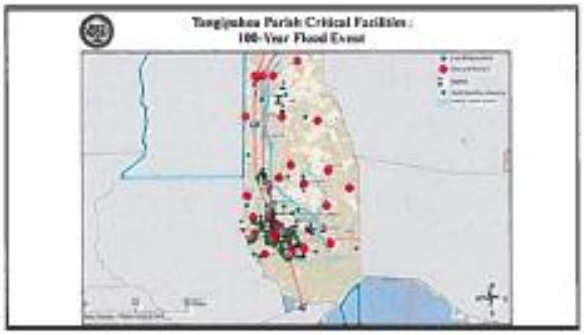
GOHSEP Region 9 Vulnerability:
Flooding Probability





100 Year Flood Consequences

Total Building Exposure	$5,311,687,000
Total Economic Loss	$193,966,000
Total Damaged Buildings	1,172
Building Loss	$103,451,000
Short Term Shelter Needs	5,115
Essential Facilities Damaged (Fire & Police Stations ; Schools)	1

Tropical Cyclones (Hurricanes)

- Tropical cyclones are defined spinning, low-pressure air masses that draw surface air into their centers and attain strength ranging from weak tropical waves to the most intense hurricanes

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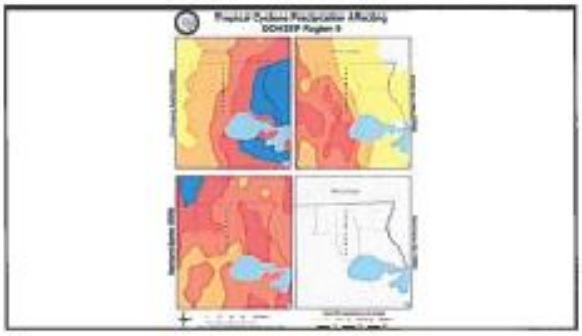
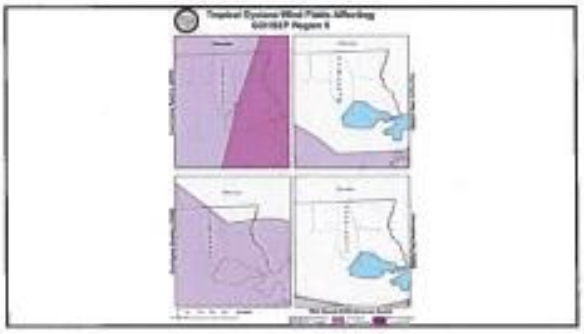
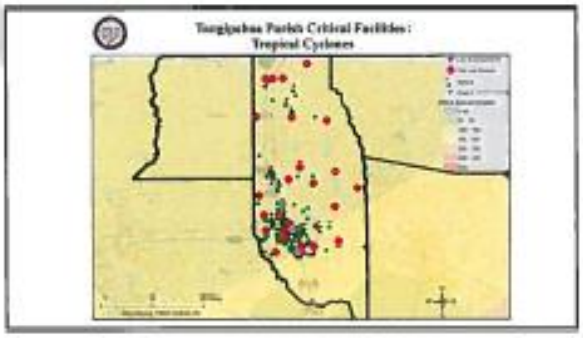
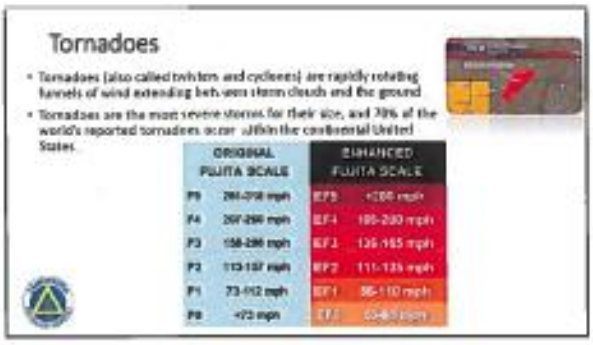







GOHSEP Region 9 Vulnerability,
Hurricane Probability

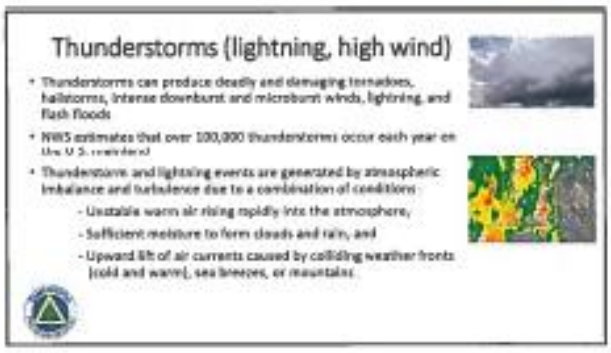

Wind Zone Map for Tangipahoa Parish


Tornadoes
• Tornadoes (also called twisters and cyclones) are rapidly rotating funnels of wind extending between storm clouds and the ground
• Tornadoes are the most severe storms for their size, and 70% of the world's reported tornadoes occur within the continental United States.
ORIGINAL FUJITA SCALE
ENHANCED FUJITA SCALE


High Risk Areas for Tornadoes in Louisiana

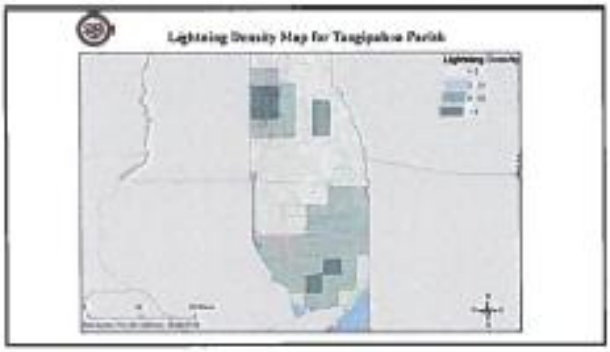

GOHSEP Region 9 Vulnerability
Tornado Probability


GOHSEP Region 9
Tornado Density

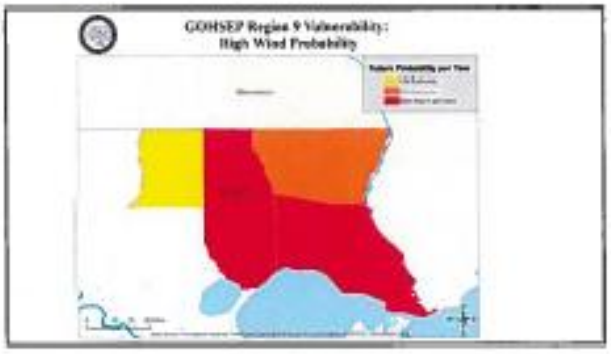

Thunderstorms (lightning, high wind)
• Thunderstorms can produce deadly and damaging tornadoes, hailstorms, intense downburst and microburst winds, lightning, and flash floods
• NWS estimates that over 100,000 thunderstorms occur each year on
• Thunderstorm and lightning events are generated by atmospheric imbalance and turbulence due to a combination of conditions:
- Unstable warm air rising rapidly into the atmosphere,
- Sufficient moisture to form clouds and rain, and
- Upward lift of air currents caused by colliding weather fronts (cold and warm), sea breezes, or mountains


Louisiana Average Annual Precipitation
(1981-2010)

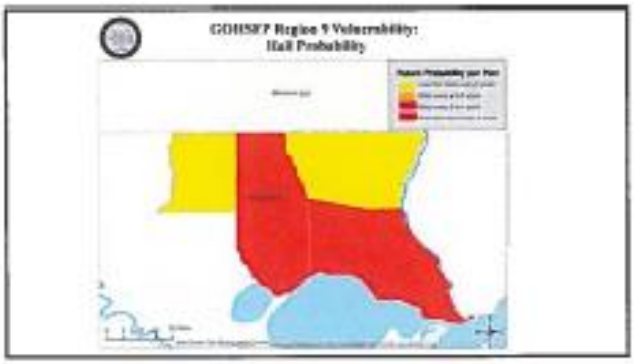

High Risk Areas for Thunderstorms
in Louisiana


Lightning Density Map for Tangipahoa Parish

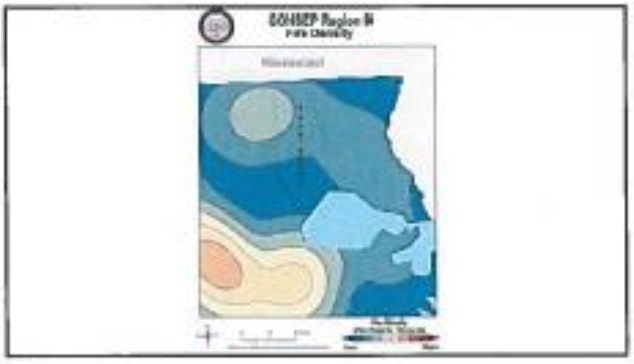

GOHSEP Region 9 Vulnerability:
Lightning Probability


GOHSEP Region 9 Vulnerability:
High Wind Probability


Hail Density in Louisiana
and Tangipahoa Parish


GOHSEP Region 9 Vulnerability:
Hail Probability


Wildfires
• Wildfires are fueled by naturally occurring or non native species of trees, brush, and grasses
• Topography, fuel, and weather are the three principal factors that impact wildfire hazards and behavior
• There are four categories of wildfires, wildland fires, interface or intermixed fires, firestorms, and prescribed natural fires


GOHSEP Region 9
Pole Density


Hazard Summary Since 1960 for Tangipahoa Parish
LSU


Mitigation Strategy
LSU

Previous Goals

- Identify and pursue preventative measures that will reduce future damages from hazards
- Reduce repetitive flood losses in the Parish and municipalities
- Regulate sound development in the Parish and municipalities so as to reduce or eliminate the potential impact of hazards

Proposed Mitigation Projects for Plan Update

Contact Us

Brent Mitchell, SDMI Director of Research & Operations
[redacted]
(225) 578-5999

Lauren Stevens, HM Project Lead
lstevens@lsu.edu
(225) 578-0503

Stephenson Disaster Management Institute
www.sdmi.lsu.edu

WHERE RESEARCH SDMI MEETS PRACTICE LSU
STEPHENSON DISASTER MANAGEMENT INSTITUTE

Meeting #4: Public Meeting

Date: November 19, 2014

Location: Hammond, Louisiana

Purpose: The public meeting allowed the public and community stakeholders to participate and provide input into the hazard mitigation planning process. Maps of the Tangipahoa parish communities were provide for the meeting attendees to identify specific areas where localized hazards occur.

Public Initiation: Yes

Invitees Included:

Member/Title	Jurisdiction/Entity
Buddy Bell, Mayor	City of Amite
Lacy Landrum, Director of Administration	City of Hammond
John Thomas, Fire Chief	City of Hammond
Robert Morgan, Public Works Director	City of Hammond
Bobby Zabbia, Mayor	City of Ponchatoula
Russell Hoover, North Oaks Hospital	North Oaks Hospital
Dawson Primes, Director	Tangipahoa OHSEP
Gordon Burgess, Parish President	Tangipahoa Parish Government
Nic Leblanc, Parish Floodplain Manager	Tangipahoa Parish Government
Bill Moorman, Parish GIS	Tangipahoa Parish Government
Andy Currier, Parish Building Official	Tangipahoa Parish Government
Alyson Lapuma, Planning Director	Tangipahoa Parish Government
Nace Garafola, Public Works Director	Tangipahoa Parish Government
James Harper, Sewer District Manager	Tangipahoa Parish Government
Gary Clark, Sewer District Manager	Tangipahoa Parish Government
Maurice Jordan, Parish Engineer	Tangipahoa Parish Government
Stacey Neal, Economic Development Director	Tangipahoa Parish Government
Mark Kolwe, Parish School Superintendent	Tangipahoa Parish Government
Michael Ragusa, Mayor	Town of Independence
Harold Smith, Mayor	Town of Kentwood
Wanda McCoy, Mayor	Town of Roseland
Brenda Nevels, Mayor	Village of Tangipahoa
Anthony LaMonte, Mayor	Village of Tickfaw
Dexter Accardo, Director	St Tammany OHSEP

Agenda-Meeting #4

Agenda

Tangipahoa Parish Hazard Mitigation Plan Update
Steering Committee Public Meeting –Hammond, LA
November 19, 2014
10:00a.m.-12:00 p.m.

INTRODUCTIONS AND BACKGROUND

- Officials
- Planning Steering Committee
- SDMI Team
- Governor's Office of Homeland Security

HAZARD MITIGATION PLANNING PROCESS– SDMI Staff

- What is Hazard Mitigation?
- Federal Requirements
- Multi –Jurisdictional Approach and Timeline

RISK ASSESSMENT – SDMI Staff

- Hazard Identification – Currently Identified Tangipahoa Hazards
- Risk Analysis
- Vulnerabilities

UPDATE ON PREVIOUS/CURRENT MITIGATION PROJECTS

- Current Goals/Strategies
- Update on project status

PUBLIC FORUM – SDMI Staff/Tangipahoa Parish

- Risk Analysis (Activity)
  - Hazard occurrences
- Identification of problems (Jurisdiction and Parish Maps)
- Completion of public survey
  - Electronic: https://www.surveymonkey.com/s/tangipahoaparish
  - Paper copy

ADJORN

Meeting notices-Meeting #4

FOR IMMEDIATE RELEASE
November 14, 2014

Tangipahoa Parish to hold Public Meeting for Hazard Mitigation Plan Update

Baton Rouge, LA – Tangipahoa Hazard Mitigation Plan Update public meeting will be held on Wednesday November 19th, at 10:00am at the Tangipahoa Parish Government Building 15485 West Club Deluxe Road, Hammond, LA.

Natural hazards have the potential to cause property loss, loss of life, economic hardship, and threats to public health and safety. While an important aspect of emergency management deals with disaster recovery (the actions that a community takes to repair damages), an equally important aspect of emergency management involves hazard mitigation - sustained actions taken to reduce long-term risk to life and property. They are things we do today to be more protected in the future. For example, elevating buildings in flood hazard areas, installing hurricane clips and storm shutters, relocating critical facilities out of hazard areas, using fire-resistant construction materials in wildfire hazard areas, etc. Hazard mitigation actions are essential to breaking the typical disaster cycle of damage, reconstruction, and repeated damage. With careful selection, they can be long-term, cost-effective means of reducing risk and helping to create a more sustainable and disaster-resilient community.

A hazard mitigation plan describes an area's vulnerability to the various natural hazards that are typically present, along with an array of actions and projects for reducing key risks. While natural disasters cannot be prevented from occurring, the continued implementation of mitigation strategies identified in the plan will gradually, but steadily, make our communities more sustainable and disaster-resilient.

The Disaster Mitigation Act of 2000 (DMA 2000) requires all states and local governments to have a hazard mitigation plan in order to be eligible to apply for certain types of federal hazard mitigation project grants. Hazard mitigation plans must be: (a) implemented on an ongoing basis, and (b) updated every five years to ensure that they remain applicable representations of local risk and locally-preferred risk reduction strategies.

Tangipahoa Parish, in collaboration with Amite, Independence, Hammond, Kentwood, Ponchatoula, Village of Tangipahoa, Roseland, and Tickfaw, is in the beginning stages of updating its hazard mitigation plan. The Public Meeting will be held on Wednesday November 19th, at 10:00am at the Tangipahoa Parish Government Building 15485 West Club Deluxe Road, Hammond, LA. for all citizens interested in learning about and participating in discussions concerning the Tangipahoa Parish Hazard Mitigation Plan.

Residents of Tangipahoa Parish are asked to participate in a survey about public perceptions and opinions regarding natural hazards in the parish. The survey results will be used in the development of the plan. This short web-based survey can be found at https://www.surveymonkey.com/s/tangipahoaparish

For more information, please contact: Alyson Lapuma, Tangipahoa Parish Planning Director (985)-340-9028 or Lauren Stevens, Project Manager, (225) 578-0502

From: work <alapuma@tangipahoa.org>
Sent: Friday, November 14, 2014 9:46 AM
To: 'Andy Currier'; 'Bruce Cutrer'; 'Clyde Martin '; 'Dawson Primes'; 'Dennis Darouse'; 'Gary Clark'; 'Gordon Burgess'; 'John Dardis '; 'John Thomas'; 'Josh Taylor '; 'Lacy Landrum'; Lauren C Stevens; 'Maurice Jordan '; 'Mayors'; 'Missy Cowart '; 'Nic LeBlanc '; 'Priss Gallager '; 'Robert Morgan'; 'Russell Hoover '; 'Sherry Collura'; 'Stacey Neal '; 'Tom Fagan '; 'Vicki Travis '
Subject: Public Hearing
Attachments: Tangipahoa Parish Press Release_Draft.doc

I am sending out the press release for the public hearing for the HMP. It will be Wednesday, November 19th at 10:00 here at the Meeting Room (New Building behind Health Unit-15485 West Club Deluxe Rd) See you all then!

Roster-Meeting #4

TANGIPAHOA PARISH HAZARD MITIGATION PLAN PUBLIC MEETING
November 19, 2014

Name	Organization	Email	Phone	Comments
Lauren Stevens	SDMI	lstevens@lsu.edu	578-0502	—
Brant Mitchell	SDMI	bmitch9@lsu.edu	578-0502	—
Margaret Pierce	SDMI	mpierce@lsu.edu		
Shauit Nolan	SDMI	snolan@lsu.edu		
Josh Gardes	Tangi	dardisjat@bellsouth.net		
Bob Zabbia	Ponchatoula	mayor@cityofponchatoula.com	985-386-0741	
Allyson Segrom	TPG			
Robert Morgan	City of Hammond	morgan-rm@hammond.org	985 969 1636	
Maurice Jordan	Tangi. Par. Gov.	TPC Road@tangipahoa.org	985-748-3211	
Nic. English	GOHSEP	nicolette.english@la.gov	225-267-2607	—

Presentation-Meeting #4

Plan Update Timeline

Activity	Detail	When
Kick-off Meeting	Steering committee	September 2014
Risk Assessment Meeting	Steering committee	October 2014
Jurisdictional Meetings	Steering committee and jurisdictions	September - December
Public Meeting	Steering committee and Public	Today
Mitigation Strategies Meeting	Steering committee	December 2014
Plan development	Contractor (GCAP)	October - December 2014
Public plan review	Public	December 2014
Plan review GOHSEP	GOHSEP	January 2015
Plan review FEMA	FEMA	January - February 2015
Jurisdiction adoption of plan	Jurisdictions	February - March 2015
FEMA plan approval	FEMA	By 30 March 2015

*Timeline subject to change

Risk Assessment: Hazard Identification

- The plan includes descriptions of the natural hazards that affect the jurisdictions in the planning area.
- A hazards identification should include the
  - locations affected
  - the extent or strength
  - previous occurrences
  - probability of future events

Risk Assessment: Analyze Risk and Summarize Vulnerability

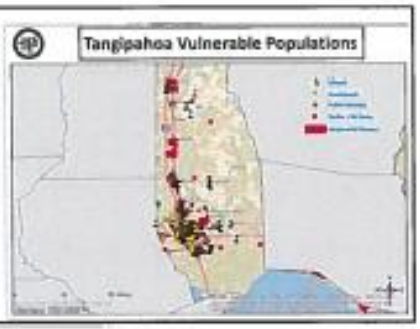
- Risk analysis involves evaluating vulnerable assets, describing potential impacts, and estimating losses for each hazard.
- This helps the community understand the greatest risks facing the area.
- Methods can include exposure risk analysis, historical analysis and scenario analysis.
- Through the risk analysis the community should be able to verbalize or create problem statements about the identified risks.

Risk Assessment: Hazards Identified

- Twelve hazards identified, only five hazards will be profiled,
- These natural hazards were selected based on an assessment of the overall impact (geographic extent, magnitude, probability, and exacerbating or mitigating conditions) affecting Tangipahoa Parish.
- The hazards that pose the greatest potential for a negative impact are:
  - Floods, hurricanes, thunderstorms with lighting and high winds, tornadoes, and wildfires.

Essential Facilities

Vulnerable Populations



Flooding

- A flood is the overflow of water onto land that is usually not inundated.
- The National Flood Insurance Program defines a flood as a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from overflow of inland or tidal waves, unusual and rapid accumulation or runoff of surface waters from any source, mudflow, or collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Flooding

Types of flooding may include the following:

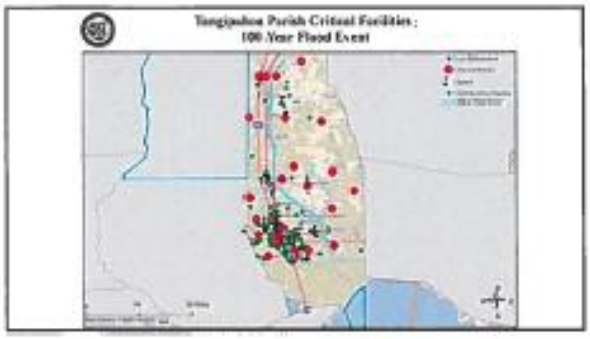
- Riverine
- Flash
- Ponding
- Backwater
- Urban
- Coastal

Repetitive Flooding

- Some areas flood more often than other properties, even more than those in the mapped 100-year floodplain.
- FEMA defines a "repetitive loss" property as one which has received two flood insurance claim payments for at least $1,000 over any 10-year period since 1978.
- These properties are important to the National Flood Insurance Program and the Community Rating System because even though they comprise 1%of the policy base, they account for 30% of the country's flood insurance claim payments.

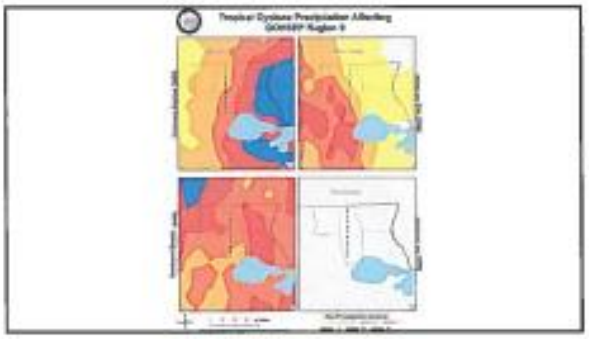
Repetitive Flooding

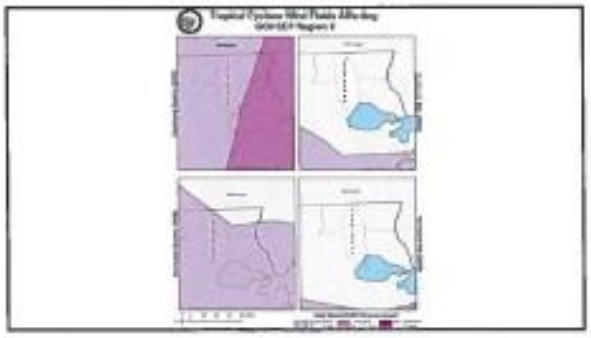
- Tangipahoa Repetitive Loss Facts
  - 214 Repetitive loss structures
  - 447 Payouts
  - Total Payments: $11,259,874
  - Average Payment: $25,178



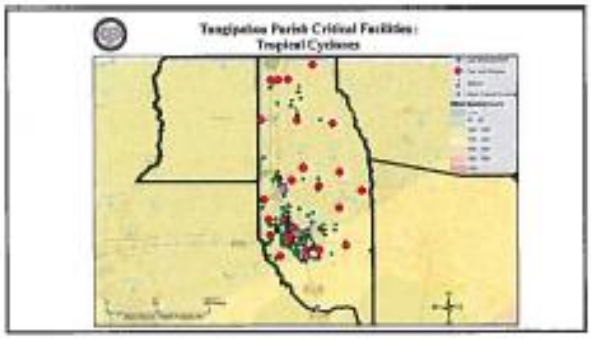
100 Year Flood Consequences

Total Building Exposure	$8,311,687,000
Total Economic Loss	$193,968,000
Total Damaged Buildings	1,172
Building Loss	$103,431,000
Short Term Shelter Needs	5,115
Essential Facilities Damaged (Fire & Police Stations, Schools)	1

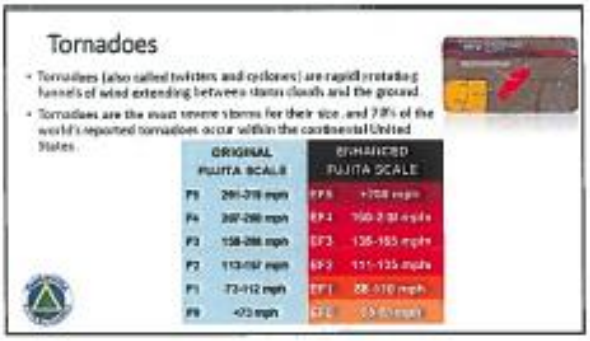





Wind Zone Map for Tangipahoa Parish


Tangipahoa Parish Critical Facilities:
Tropical Cyclones

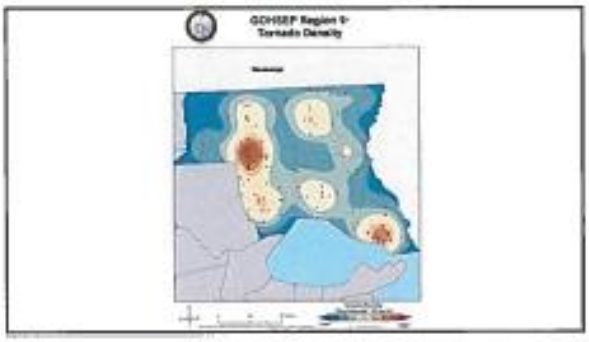

GOHSEP Region 9 Vulnerability:
Hurricane Probability

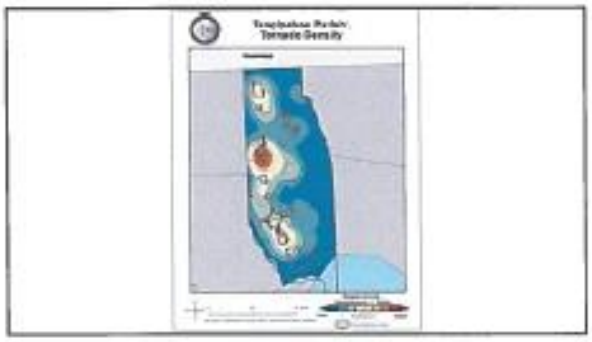

Tornadoes
• Tornadoes (also called twisters and cyclones) are rapid rotating funnels of wind extending between storm clouds and the ground
• Tornadoes are the most severe storms for their size, and 70% of the world's reported tornadoes occur within the continental United States
ORIGINAL FUJITA SCALE
ENHANCED FUJITA SCALE


High Risk Areas for Tornadoes
in Louisiana


GOHSEP Region 9 Vulnerability:
Tornado Probability


GOHSEP Region 9
Tornado Density


GOHSEP Region 9
Tornado Density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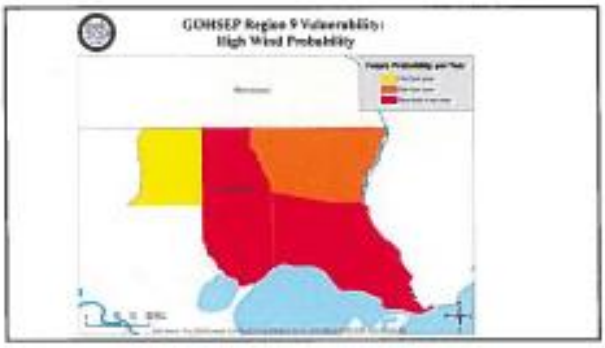
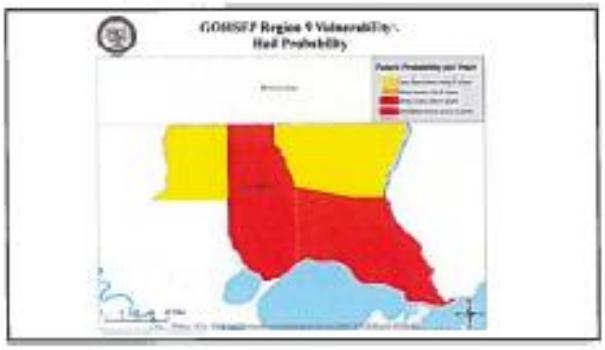
Louisiana Average Annual Precipitation
(1981-2010)


High Risk Areas for Thunderstorms


Lightning Density Map for Tangipahoa Parish


GOHSEP Region 9 Vulnerability:
Lightning Probability


GOHSEP Region 9 Vulnerability:
High Wind Probability


GOHSEP Region 9 Vulnerability:
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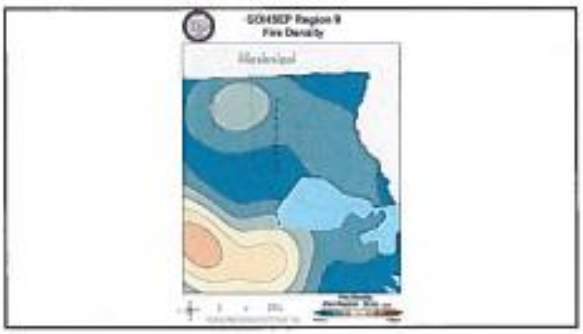
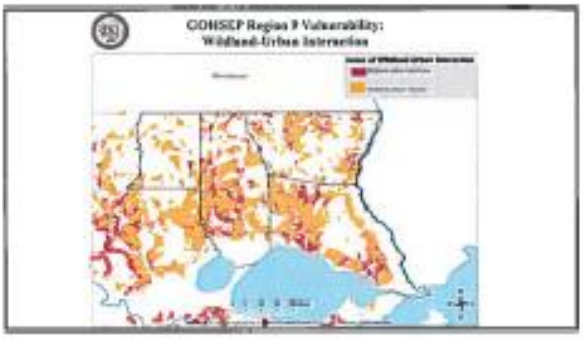

GOHSEP Region 9
Fire Density


GOHSEP Region 9 Vulnerability:
Wildland-Urban Interface


Hazard Summary Since 1960 for Tangipahoa Parish
LSU


Mitigation Strategy
LSU


2015 Hazard Mitigation Plan Goals
• Identify and pursue preventative measures that will reduce future damages from hazards
• Reduce repetitive flood losses in the Parish and municipalities
• Regulate sound development in the Parish and municipalities so as to reduce or eliminate the potential impact of hazards
LSU


2009-2014 Parish HM Project Status
• 11 out of 28 are completed
LSU

2009-2014 Parish Completed Projects

- Amite School Gym Retrofit
- Hardening of Hammond Westside School Gymnasium
- Hardening of Hammond Criminal Justice Center
- Hardening of Hammond City Fire Administrative Office
- Hardening of Hammond City Fire Department
- Backup power supply/generator @ Amite High School (portable generators as well)
- Backup power supply/generator @ Hammond Westside School (portable generators as well)
- Backup power supply/generator @ Flood Memorial Hospital (standby backup generator installed)
- Backup power supply/generator @ Amite City Hall
- Installation of quick connection fittings at Hood Memorial

Proposed HM Projects

- Drainage projects include Wardline Rd., Chapanella Rd., and Ash St. in Ponchatoula
- Building hardening projects for public buildings include: Ponchatoula City Hall, Hammond Fire Stations #2 and #5, Hammond Public Works Building - Highway 190 East; Tangipahoa Parish Animal Shelter, Tangipahoa Parish Sheriff's Office in Amite, and several public school gymnasiums
- Home elevations and 3 home acquisitions/demolitions of repetitive loss properties
- Lee's Landing Boat Launch renovation
- Two new safe room buildings- next to the Parish Courthouse Annex in Amite, and the Parish Road Maintenance shop on West Pleasant Ridge Road in Hammond.

Public Forum Activities

- Jurisdictional Representatives/Project Specialists
- Risk Analysis Activity (Hazard Occurrences)
- Problem Area Identification (Jurisdiction and Parish Maps)
- Survey

Contact Us

Brant Mitchell, SDMI Director of Research & Operations
bmitch9@lsu.edu
(225) 578-0109

Lauren Stevens, HM Project Lead
lstevens@lsu.edu
(225) 578-0502

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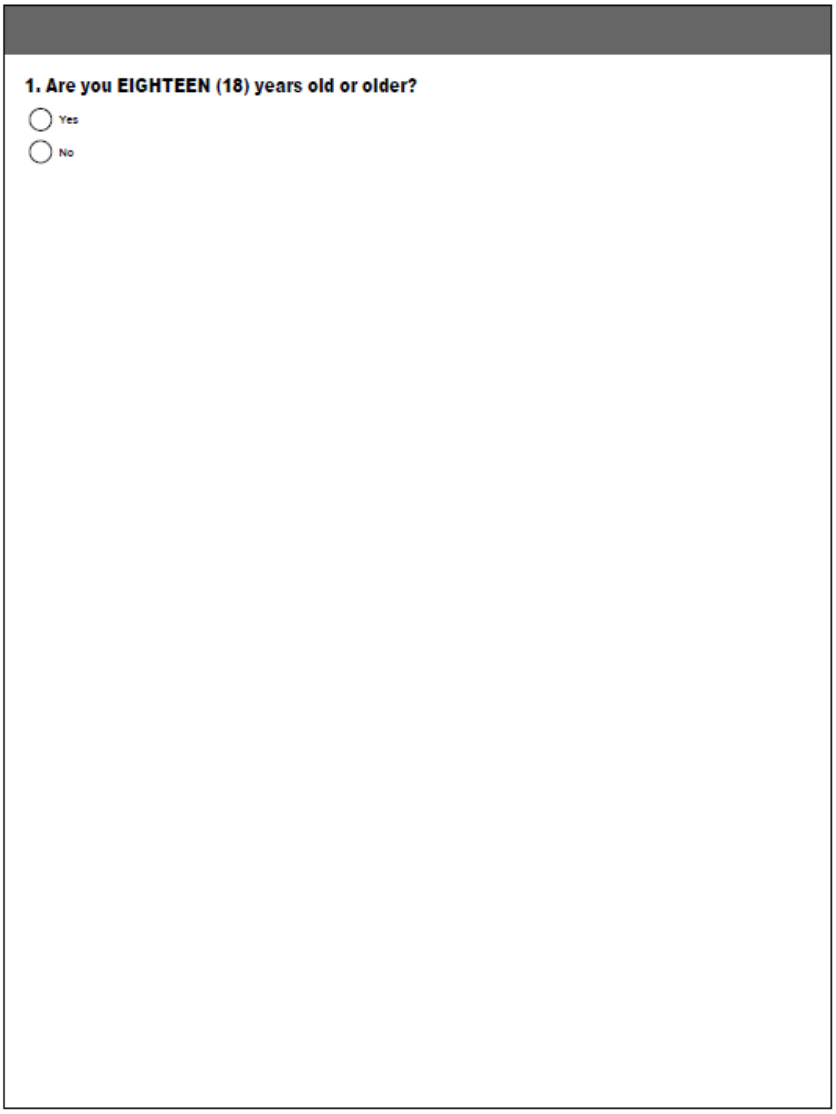
www.sdmi.lsu.edu

STEPHENSON DISASTER MANAGEMENT INSTITUTE
WHERE RESEARCH
SDMI
MEETS PRACTICE
LSU

Outreach Activity #1: Public Opinion Survey

Date: Ongoing throughout planning process
Location: Web survey
Public Initiation: Yes



2. Do you live in Tangipahoa Parish?

- ◯ Yes
- ◯ No

NATURAL HAZARD INFORMATION

First we would like to know about your experiences involving natural hazards and your exposure to preparedness information.

3. During the past five years in the parish you currently reside in, have you or someone in your household directly experienced a natural disaster such as a severe windstorm, flood, tropical storm or other type of natural disaster?

- ◯ Yes
- ◯ No

4. Which of these natural disasters have you or someone in your household experienced in the past five years? (Check all that apply)

- ☐ Drought
- ☐ Flood
- ☐ Severe Thunderstorm
- ☐ Tornado
- ☐ Tropical Storm or Hurricane
- ☐ Severe Winter Storm
- ☐ Hail

Other (please specify)

5. How concerned are you about the following natural disasters affecting your parish? (Check the corresponding box for each hazard.)

	Not Concerned	Not Very Concerned	Neutral	Somewhat Concerned	Very Concerned
Drought	◯	◯	◯	◯	◯
Flood	◯	◯	◯	◯	◯
Severe Thunderstorm	◯	◯	◯	◯	◯
Tornado	◯	◯	◯	◯	◯
Tropical Storm or Hurricane	◯	◯	◯	◯	◯
Severe Winter Storm	◯	◯	◯	◯	◯
Hail	◯	◯	◯	◯	◯

Other (please specify)

6. Have you ever received information about how to make members of your household and your home safer from natural disasters?

- ◯ Yes
- ◯ No

7. How recently?

- ◯ Within the last 6 months
- ◯ Between 6 and 12 months
- ◯ Between 1 and 2 years
- ◯ Between 2 and 5 years
- ◯ 5 years or more

8. From whom did you LAST receive information about how to make members of your household and your home safer from natural disasters? (Check only one)

- ◯ News media
- ◯ Government agency
- ◯ Insurance company
- ◯ Utility company
- ◯ University or research institution
- ◯ Neighbor/friend/family
- ◯ Elected official
- ◯ American Red Cross
- ◯ Church or civic association
- ◯ Other non-profit organization
- ◯ Social media (Facebook, etc.)
- ◯ Not sure

Other (please specify)

9. Whom would you MOST TRUST to provide you with information about how to make your household and home safer from natural disasters? (Check up to three answers)

- ☐ News media
- ☐ Government agency
- ☐ Insurance company
- ☐ Utility company
- ☐ University or research institution
- ☐ Neighbor/friend/family
- ☐ Elected official
- ☐ American Red Cross
- ☐ Church or civic association
- ☐ Other non-profit organization
- ☐ Social media (Facebook, etc.)
- ☐ Not sure

Other (please specify)

10. What is the MOST EFFECTIVE way for you to receive information about how to make your household and home safer from natural disasters? (Check up to three answers)

- ☐ Newspaper stories
- ☐ Newspaper ads
- ☐ TV news
- ☐ TV ads
- ☐ Radio news
- ☐ Radio ads
- ☐ Email newsletters
- ☐ Online news outlets
- ☐ Social media (Facebook, etc.)
- ☐ Schools
- ☐ Billboards
- ☐ Books
- ☐ Mail
- ☐ Fire department
- ☐ Fact sheet/brochure
- ☐ Chamber of Commerce
- ☐ Library
- ☐ Public workshops/meetings
- ☐ Displays in public places (mall, grocery, etc.)
- ☐ University or research institution

Other (please specify)

11. Prior to taking this survey, were you aware of your parish's Hazard Mitigation Plan (HMP)?

- ◯ Yes
- ◯ No

12. Prior to taking this survey, were you aware that the Federal Emergency Management Agency (FEMA) requires your parish to update the hazard mitigation plan every five years in order for your parish to be eligible for federal pre- and post-disaster hazard mitigation funds?

- ◯ Yes
- ◯ No

COMMUNITY VULNERABILITIES AND HAZARD MITIGATION STRATEGIES

In order to assess community risk, we need to understand which community assets may be vulnerable to natural hazards in the region. Vulnerable assets are those community features, characteristics, or resources that may be impacted by natural hazards (e.g. populations with functional or special needs, economic components, environmental resources, etc.). The next set of questions focuses on vulnerable assets in your community and your preferred strategies to mitigate risk to those assets.

13. Community assets are features, characteristics, or resources that either make a community unique or allow the community to function. In your opinion, which of the following CATEGORIES are most susceptible to the impacts caused by natural hazards in your parish?

(Rank the community assets in order of vulnerability, 1 being most vulnerable and 6 being least vulnerable

☐	Human (Loss of life and/or injuries)
☐	Economic (Business closures and/or job losses)
☐	Infrastructure (Damage or loss of bridges, utilities, schools, etc.)
☐	Cultural/Historic (Damage or loss of libraries, museums, historic sites)
☐	Environmental (Damage or loss of forests, pastureland, waterways, etc.)
☐	Governance (Ability to maintain order and/or provide public amenities and services)

14. Next we would like to know what specific types of COMMUNITY ASSETS are most important to you.

(Check the corresponding box for each asset)

	Not Important	Not Very Important	Neutral	Somewhat Important	Very Important
Nursing homes/Assisted-living facilities	◯	◯	◯	◯	◯
Schools (K-12)	◯	◯	◯	◯	◯
Hospitals	◯	◯	◯	◯	◯
Major bridges	◯	◯	◯	◯	◯
Fire/Police stations	◯	◯	◯	◯	◯
Museums/Historic buildings	◯	◯	◯	◯	◯
Major employers	◯	◯	◯	◯	◯
Small businesses	◯	◯	◯	◯	◯
College/Universities	◯	◯	◯	◯	◯
Parish or City Buildings (City Hall, Courthouse, etc.)	◯	◯	◯	◯	◯

Other (please specify) _____

15. A number of activities can reduce your community's risk from natural hazards. These activities can be both regulatory and non-regulatory.

(Check the box that best represents your opinion of the following COMMUNITY-WIDE STRATEGIES to reduce the risk and loss associated with natural disasters)

	Not sure	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I support a regulatory approach to reducing risk	◯	◯	◯	◯	◯	◯
I support a non-regulatory approach to reducing risk	◯	◯	◯	◯	◯	◯
I support a mix of both regulatory and non-regulatory approaches to reducing risk	◯	◯	◯	◯	◯	◯
I support policies to prohibit development in areas subject to natural hazards	◯	◯	◯	◯	◯	◯
I support the use of local tax dollars to reduce risks and losses from natural disasters	◯	◯	◯	◯	◯	◯
I support protecting historical and cultural structures	◯	◯	◯	◯	◯	◯
I would be willing to make my home more disaster-resistant	◯	◯	◯	◯	◯	◯
I support steps to safeguard the local economy following a disaster event	◯	◯	◯	◯	◯	◯
I support improving the disaster preparedness of local schools	◯	◯	◯	◯	◯	◯
I support a local inventory of at-risk buildings and infrastructure	◯	◯	◯	◯	◯	◯
I support the disclosure of natural hazard risks during real estate transactions	◯	◯	◯	◯	◯	◯

16. Natural hazards can have a significant impact on a community, but planning for these events can help lessen the impacts. The following statements will help determine citizen priorities regarding planning for natural disasters in your parish.

(Tell us how important each on is to you.)

	Not Important	Not Very Important	Neutral	Somewhat Important	Very Important
Protecting private property	◯	◯	◯	◯	◯
Protecting critical facilities (transportation networks, hospitals, fire stations)	◯	◯	◯	◯	◯
Preventing development in hazard areas	◯	◯	◯	◯	◯
Enhancing the function of natural features (bayous, rivers and wetlands)	◯	◯	◯	◯	◯
Protecting historical and cultural landmarks	◯	◯	◯	◯	◯
Protecting and reducing damage to utilities	◯	◯	◯	◯	◯
Strengthening emergency services (police, fire, EMS)	◯	◯	◯	◯	◯
Disclosing natural hazard risks during real estate transactions	◯	◯	◯	◯	◯
Promoting cooperation among public agencies, citizens, non-profits and businesses	◯	◯	◯	◯	◯

MITIGATION AND PREPAREDNESS ACTIVITIES IN YOUR HOUSEHOLD

Households can mitigate and prepare for natural hazards in order to prevent damage to property, injuries, and loss of life. The precautions you take and training you receive can make a big difference in your ability to recover from a natural disaster or emergency. Access to basic services, such as electricity, gas, water, telephones and emergency care can be cut off temporarily, or you may have to evacuate at a moment's notice. The following questions focus on your household's preparedness for disaster events.

17. In the following list, please check those activities that you HAVE DONE in your household, PLAN TO DO in the near future, HAVE NOT DONE, or are UNABLE TO DO.

(Check one answer for each preparedness activity)

	Have Done	Plan to Do	Not Done	Unable to Do
Attended meetings or received written information on natural disasters or emergency preparedness?	◯	◯	◯	◯
Talked with members in your household about what to do in case of a natural disaster or emergency?	◯	◯	◯	◯
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	◯	◯	◯	◯
Prepared a "Disaster Supply Kit" (stored extra food, water, batteries or other emergency supplies)?	◯	◯	◯	◯
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?	◯	◯	◯	◯
Discussed or created a utility shutoff procedure in the event of a natural disaster?	◯	◯	◯	◯

GENERAL HOUSEHOLD INFORMATION

Finally, we would appreciate any information you are willing to share with us about you and your household. This information will remain confidential and is for survey comparison purposes only.

18. Gender

- ◯ Female
- ◯ Male

Other (please specify)

19. How much total combined money did all members of your HOUSEHOLD earn last year?

- ◯ $0 to $9,999
- ◯ $10,000 to $24,999
- ◯ $25,000 to $49,999
- ◯ $50,000 to $74,999
- ◯ $75,000 to $99,999
- ◯ $100,000 to $124,999
- ◯ $125,000 to $149,999
- ◯ $150,000 to $174,999
- ◯ $175,000 to $199,999
- ◯ $200,000 and up
- ◯ Prefer not to answer

20. In what ZIP code is your home located? (enter 5-digit ZIP code; for example, 00544 or 94305)

21. Do you rent or own the place where you live?

- ◯ Own
- ◯ Rent
- ◯ Neither (please specify)

22. Which category below includes your age?

- ○ 17 or younger
- ○ 18-20
- ○ 21-29
- ○ 30-39
- ○ 40-49
- ○ 50-59
- ○ 60 or older

23. Does anyone in your household own a business or a farm?

- ○ Yes
- ○ No

24. Which race/ethnicity best describes you? (Please choose only one.)

- ○ American Indian or Alaskan Native
- ○ Asian / Pacific Islander
- ○ Black or African American
- ○ Hispanic American
- ○ White / Caucasian
- ○ Multiple ethnicity / Other (please specify)

25. Please feel free to provide any additional comments in the space provided:

Outreach Activity #2: Incident Questionnaire

Date: Public Meeting Activity

Location: Public Meeting

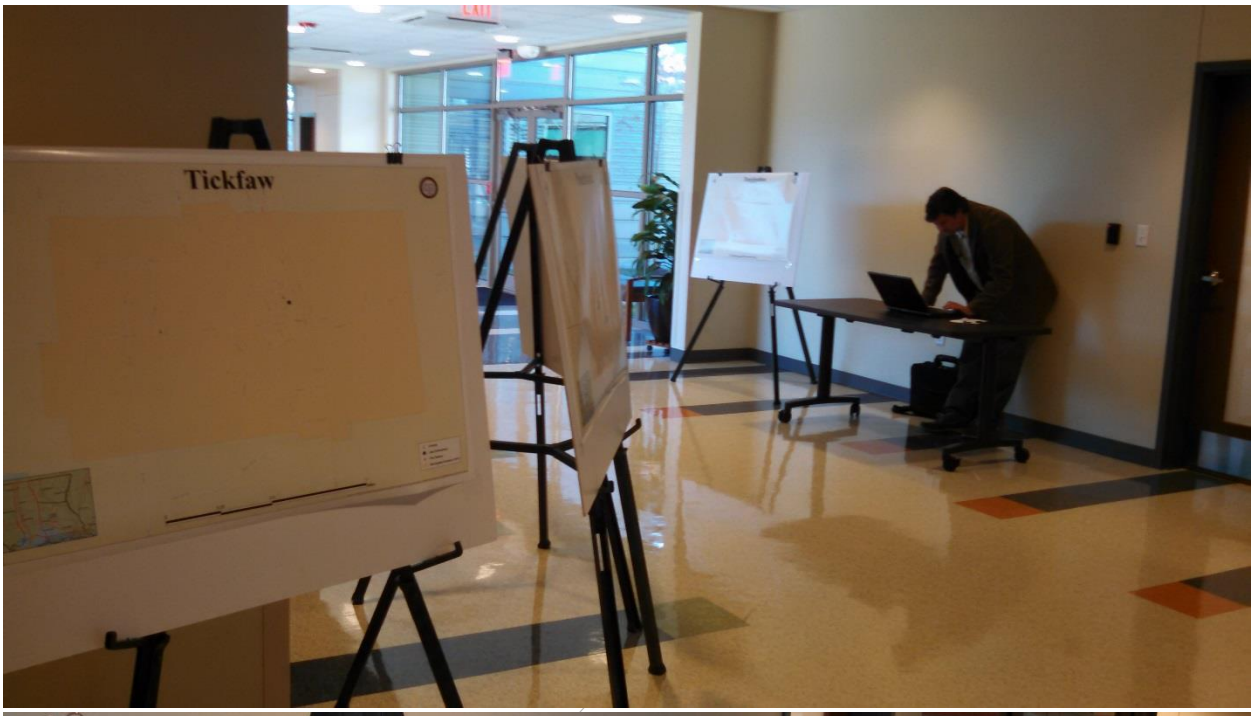
Public Initiation: Yes

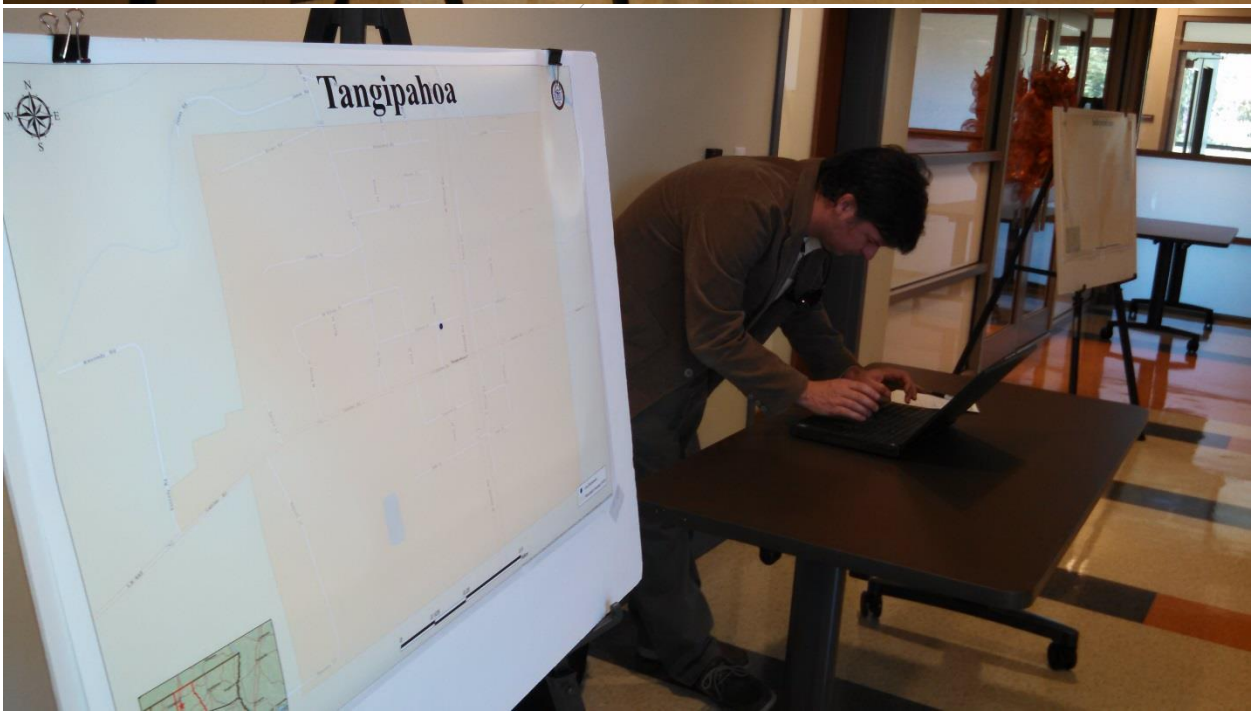
Public Meeting
Incident/Issue Questionnaire

1. Hazard Type(s):
    a. Flooding
        i. Riverine
        ii. Storm Surge
        iii. Street
        iv. Other (describe):
    b. High winds (not tropical)
    c. Coastal
        i. Saltwater Intrusion
        ii. Erosion
        iii. Other (describe):
    d. Tropical Systems
    e. Winter Weather
    f. Other: _____
2. Describe incident or issue:
    _____
    _____
    _____
    _____
    _____
3. Location:
    a. City:_____
    b. Address or Area: _____
    c. Localized or dispersed: _____
4. Intensity:
    a. Depth (flooding) or Size (hail, etc.) _____
    b. Wind strength
5. Re-occurring or one-time
    a. If re-occurring, how often? _____
6. What type of interruptions does/did the incident or issue cause? (business closure, damage, evacuation,
    etc.)_____
    _____
7. How long was the interruption (hours, days, weeks, etc.)?_____
8. How could this problem or impact be prevented, fixed or alleviated?
    _____
    _____
    _____
9. Can we contact you if we have further questions about this incident? Yes/No
10. Contact Information (optional)
    a. Name:_____
    b. City: _____
    c. Phone: (_____)_____
    d. Email: _____

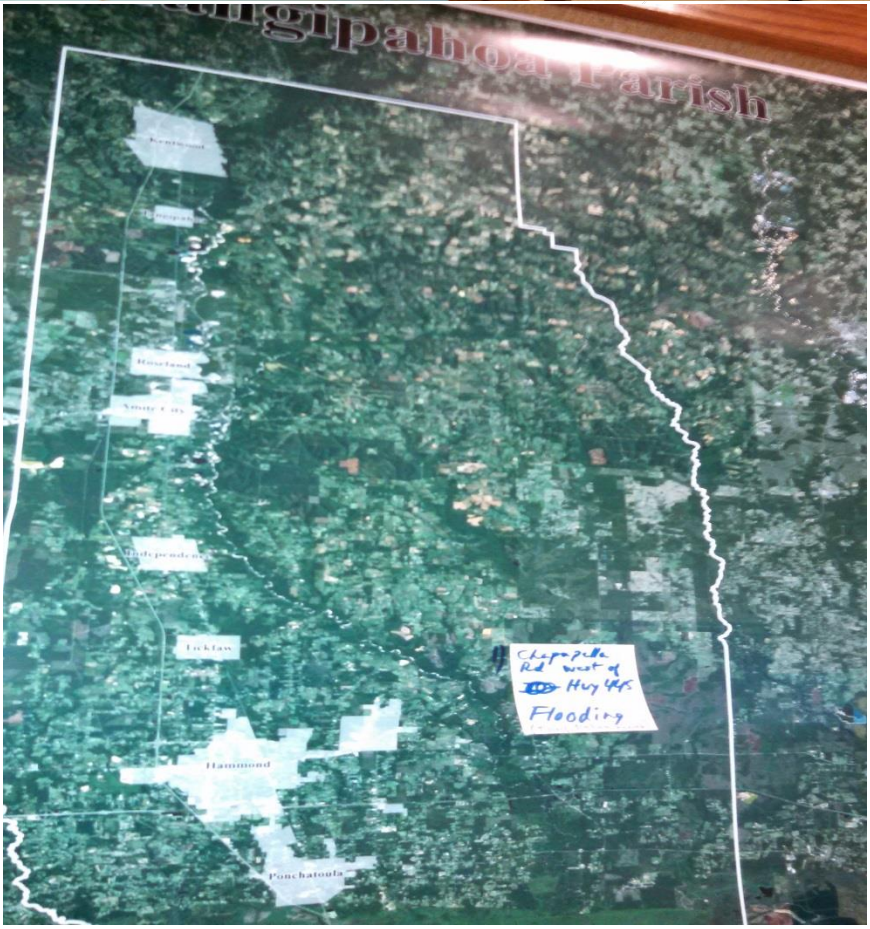
Outreach Activity #3 Mapping Activities

Public meeting attendees were asked to identify areas on jurisdictional maps provided that were "problem areas". They were also asked to indicate any areas of new development. This activity gave the public an opportunity to interact with SDMI's GIS Mapping section to as well as provide valuable input on areas that may flood repeatedly during rain events that may not get reported to local emergency managers as significant events.






Kentwood
Hammond


Tangipahoa Parish
Kentwood
Hammond
Ponchatoula
Flooding

Meeting #5 Mitigation Strategies/Action Meeting

Date: December 10, 2014

Location: Hammond, LA, Louisiana

Purpose: Members of the HMPU Steering Committee were presented the compiled list of parish wide and jurisdiction specific projects. The committee determined collectively agreed on the priority of each mitigation action for Tangipahoa Parish.

Public Initiation: No

Invitees Included:

Member/Title	Jurisdiction/Entity
Buddy Bell, Mayor	City of Amite
Lacy Landrum, Director of Administration	City of Hammond
John Thomas, Fire Chief	City of Hammond
Robert Morgan, Public Works Director	City of Hammond
Bobby Zabbia, Mayor	City of Ponchatoula
Russell Hoover, North Oaks Hospital	North Oaks Hospital
Dawson Primes, Director	Tangipahoa OHSEP
Gordon Burgess, Parish President	Tangipahoa Parish Government
Nic Leblanc, Parish Floodplain Manager	Tangipahoa Parish Government
Bill Moorman, Parish GIS	Tangipahoa Parish Government
Andy Currier, Parish Building Official	Tangipahoa Parish Government
Alyson Lapuma, Planning Director	Tangipahoa Parish Government
Nace Garafola, Public Works Director	Tangipahoa Parish Government
James Harper, Sewer District Manager	Tangipahoa Parish Government
Gary Clark, Sewer District Manager	Tangipahoa Parish Government
Maurice Jordan, Parish Engineer	Tangipahoa Parish Government
Stacey Neal, Economic Development Director	Tangipahoa Parish Government
Mark Kolwe, Parish School Superintendent	Tangipahoa Parish Government
Michael Ragusa, Mayor	Town of Independence
Harold Smith, Mayor	Town of Kentwood
Wanda McCoy, Mayor	Town of Roseland
Brenda Nevels, Mayor	Village of Tangipahoa
Anthony LaMonte, Mayor	Village of Tickfaw

Roster for Meeting #5

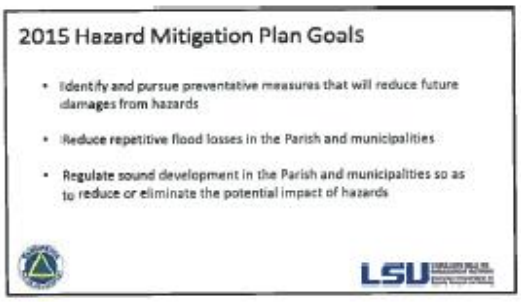
TANGIPAHOA PARISH HAZARD MITIGATION PLAN UPDATE MITIGATION ACTION MEETING
December 10, 2014

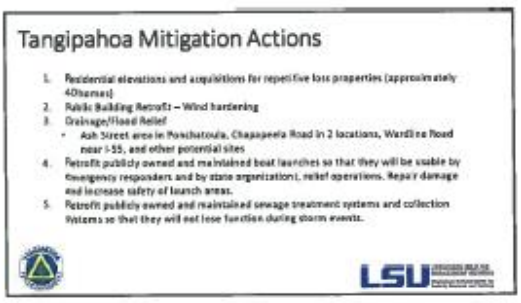
Name	Organization	Email	Phone	Comments
Lauren Stevens	LSU SDMI	lstevens@lsu.edu	578-0502	—
John Thomas	Hammond Fire	john@hammond.org	985-277-5800	
Lacy Landrum	City of Hammond	landrum_L@hammond.org	985.277.5653	—
Alyson Tupper	TPG			
Missy Cowart	TPG	Missy@tangipahoa.org	985-748-3211	—
Maurice Jordan	TPG	TPCROAD@TANGIPAHOA.ORG	985-748-3441	—

TANGIPAHOA PARISH GOVERNMENT

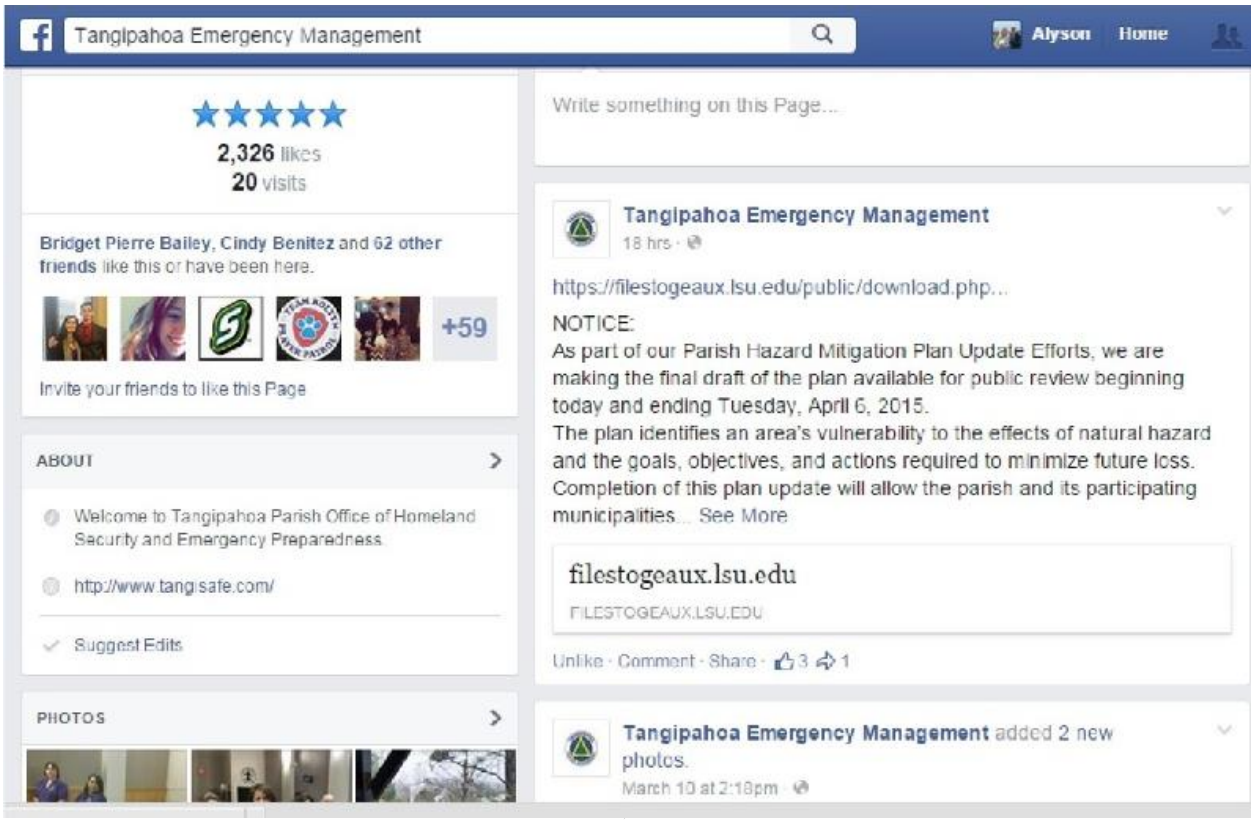
LSU STEPHENSON DISASTER MANAGEMENT INSTITUTE
Stephenson National Center for Security Research and Training

Presentation Meeting #5





Public Plan Review



Appendix B: Plan Maintenance

Purpose

The section of the Code of Federal Regulations (CFR) pertaining to Local Mitigation Plans lists five required components for each plan: a description of the planning process; risk assessments; mitigation strategies; a method and system for plan maintenance; and documentation of plan adoption. This section details the method and system for plan maintenance, following the CFR's guidelines that the Plan Update must include (1) "a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle," (2) "a process by which local governments incorporated the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans" and (3) "discussion on how the community will continue public participation in the plan maintenance process."

Monitoring, Evaluating, and Updating the Plan

By law, the Plan must be updated every five years prior to re-submittal to the Federal Emergency Management Agency (FEMA) for re-approval. The first part of this subsection describes the whole update process, including the responsible parties, methods to be used, evaluation criteria to be applied, and, scheduling for monitoring and evaluating the plan. These descriptions are followed by an explanation of how and when the plan will be periodically updated. The Plan must be updated every five years prior to re-submittal to the Federal Emergency Management Agency (FEMA) for re-approval. The first part of this subsection describes the whole update process, including sections on the following:

- 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.

Responsible Parties

The Tangipahoa Parish Office of Homeland Security and Emergency Preparedness (OHSEP) is the parish department directly responsible for the plan. The Tangipahoa Parish Planner, in coordination with the Tangipahoa Hazard Mitigation Steering Committee is responsible for assuring that plan monitoring, evaluating and updates are done in accordance with the procedures outlined in this section. Designee's from each of the jurisdictions, along with representatives from local businesses and private citizens will work as part of the steering committee and be involved in the process of monitoring, evaluating and updating the plan. The following jurisdictions are represented on the steering committee:

- Town of Amite
- City of Hammond
- Town of Independence
- Town of Kentwood
- City of Ponchatoula
- Town of Roseland

- Village of Tangipahoa
- Village of Tickfaw

The following basic schedule will be undertaken for monitoring, evaluating and updating the plan:

- At a minimum, monitoring activities by the Parish Planner should be done every six months;
- Best practice is that the update should start a year and a half prior to plan expiration date, taking into consideration one year of development and six months to receive plan approval. Notices regarding annual evaluations should be sent by the Parish Planner to the Parish Hazard Mitigation Steering Committee;
- The timetable for evaluations for the first four years is expected to last up to four months (March - June), and approximately one year for the update in the fifth year for re-submittal to FEMA.

Methods for Monitoring and Evaluating the Plan

On an semi-annual basis (and as warranted by circumstances such as a major disaster declaration), the Tangipahoa Parish Planner will review the plan in order to assess the degree to which assumptions and underlying information contained in the plan may have changed. For example, the Tangipahoa Parish Planner will look for the following:

- Changes in the information available to perform vulnerability assessments and loss estimates. For example: as the parish and municipal risk assessments and plans are integrated into this Plan Update, the Parish Planner will solicit feedback from parish and municipal officials about any changes in their real or perceived risks.
- Changes in laws, policies and regulations. Changes in parish or jurisdictional departments and/or their procedures, including the Tangipahoa OHSEP and the administration of grant programs

Progress on the mitigation action items will be monitored and evaluated by the Tangipahoa Parish Planner. The lead agency/manager for each action item will complete an annual progress report and submit them to the Tangipahoa Parish Planner for review. This progress report is designed to monitor the state of the projects and evaluate success of each mitigation item.

Using the compiled results of ongoing monitoring efforts, the plan will be evaluated annually, generally by March 31st, (unless circumstances indicate otherwise). The Parish Planner will initiate the evaluations by contacting parish and municipal departments identified as responsible parties in the Mitigation Action Plan, as well as other departments and organizations that have been involved in developing the plan. By March 31st each year, the Parish Planner will draft an annual evaluation report on progress toward implementing the Update's action items for the Mitigation Steering Committee. The report will cover the following points:

- A description of how the evaluation report was prepared and how it is submitted to the governing body, released to the media, and made available to the public.
- How the reader can obtain a copy of the original Plan and Update;
- A review of action item, including a statement on how much was accomplished during the previous year;
- A discussion of why any objectives were not reached or why implementation is behind schedule;
- Recommendations for new projects or revised recommendations.

The initial contacts will be made no later than January 1st of each year for the first four years and in March in the fifth 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.

The Tangipahoa Parish Planner also has the authority to evaluate 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 and in conjunction with the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP); or (3) When significant new information regarding risks or vulnerabilities is identified. If during this process of reviewing the annual progress report, the Tangipahoa Parish Planner determines that the Steering Committee should be reconvened for discussion, the parish planner may call a Steering Committee meeting.

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 Steering Committee. The factors that will be taken into consideration during these periodic evaluations of the plan include the following:

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 parish/jurisdiction is considering) should be modified.
2. Changes in laws, policies, ordinances, or regulations. The evaluation will include an assessment of the impact of changes in relevant laws, policies, ordinances, and regulations pertaining to elements of the plan.
3. Changes in parish/jurisdiction departments or their procedures 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 parish/jurisdiction is considering.

Updating the Plan

Updates will follow the original planning process outlined in the Planning Process Section (Appendix A). The update process will entail a detailed and structured re-examination of all aspects of the plan, followed by recommended updates. The update process will be undertaken by the Tangipahoa Parish Planner in coordination with the Steering Committee. The Steering Committee will work together as a team, which each member sharing the jurisdiction specific responsibilities for completing the updates. Each member of the steering committee is an equal member of the process. It will be the responsibility of the representative from each jurisdictions to ensure their sections of the plan are updated to meet the required deadline.

At a minimum, the plan will be updated and re-submitted to FEMA for re-approval every five years, as required by the Disaster Mitigation Act 2000. The five-year update for FEMA re-approval requires that all the original steps outlined in Appendix A 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 amendments 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.

The next two paragraphs describe the procedures for amendments and five-year updates, respectively.

The nature of Plan amendments will be determined by the evaluation process described above. In general, the Tangipahoa Parish Planner will notify the Steering Committee that the parish is initiating an amendment, and describe the circumstances that created the need for the amendment (per the list in the Plan Evaluation Criteria section above). The Tangipahoa Parish Planner will determine if the Steering Committee should be consulted regarding potential changes. If it is determined that the Steering Committee should be involved, the nature of the involvement will be at the discretion of the Tangipahoa Parish Planner. When involved in any amendments, the jurisdictional representatives on the Steering Committee will forward information on any proposed change(s) to all interested parties including, but not limited to, all affected parish and municipal departments, residents and businesses. When a proposed amendment may directly affect particular private individuals or properties, jurisdictions will follow existing local, state or federal notification requirements, which may include published public notices as well as direct mailings. When amendments are completed absent the involvement of the Steering Committee, the Tangipahoa Parish Planner will advise all committee members via email that the plan has been amended, and describe the nature of the update. In addition, the Tangipahoa Parish Planner will provide GOHSEP with a copy (although there is no requirement to have the plan re-approved by FEMA for amendments).

As required by the DMA 2000, the plan will be updated every five 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 Steering Committee will be required and that the parish and each jurisdiction will formally re-approve the plan prior to its submission to FEMA.

Based on the five-year renewal requirements for Plan Updates, the Tangipahoa OHSEP anticipates that the submission date for the required update will be March 2020. Prior to that time, the Tangipahoa Parish Planner will contact the committee members and other appropriate agencies/organizations to confirm a schedule for the Plan Update.

2015 Plan Version Plan Method and Schedule Evaluation

For the current plan update, the previously approved plan's method and schedule were evaluated to determine if the elements and processes involved in the required 2015 update.

Incorporation into Existing Planning Programs

The project requirements from the Hazard Mitigation Plan shall be incorporated into other planning mechanisms, as applicable, during the routine re-evaluation and update of the Parish and jurisdictional plans. Any changes or updates to the floodplain ordinances, Emergency Operations Plan, FIRMs, Comprehensive Plan, or any other applicable plans will be reflected in this HMP during its updates. During the 2009 update, the Parish was also engaged in the preparation of the Comprehensive Plan. Both the Parish Planner and a Contract Parish Planner who were managing the Comprehensive Plan's development were active Steering Committee members for the HMP Update. They were able to share information from the Comprehensive Plan meetings with the HMP Steering Committee and make sure that the goals of the Steering Committee were shared with the Comprehensive Plan developers. For example, as a result of discussions regarding floodplain managements, the Comprehensive Plan contained recommendations to require a two-foot freeboard to further protect properties from flooding. The Comprehensive Plan also included other items that resulted from HMP Steering Committee discussions such as addressing fill in the floodplain. This coordination continues both in the parish and jurisdictions as of this most recent update.

The Parish as well as Amite, Hammond, Independence, Kentwood, Ponchatoula, Roseland, Tangipahoa and Tickfaw are members of the NFIP and have Floodplain Management Ordinances. When the cities or Parish update their Floodplain Ordinances, the requirements from this HMP will be included in the newly revised Floodplain Ordinance. This HMP plan will be made available to each committee leader responsible for revising their Floodplain Ordinance.

The Parish and the municipalities follow the Uniform Construction Code guidelines. The Uniform Construction Code was developed by the International Code Council and was adopted by the cities and Parish. If the Parish or cities decide to amend any of the codes, within the process of amending them, they will take into account the requirements from this HMP.

The Parish OHSEP has jurisdiction over the incorporated areas during disaster events; therefore, the incorporated areas follow the recommended guidelines in the Parish Emergency Operations Plan.

The Steering Committee members representing each participating jurisdiction for this HMP Update will remain charged with the responsibility to ensure that the requirements of the Tangipahoa HMP are incorporated into applicable parish local planning mechanisms when they are due for revisions or updates. Integration and coordination is achieved through the HMP Update participation of steering committee members and community stakeholders who administer programs such as: floodplain management under the National Flood Insurance Program (NFIP), parish planning and zoning and building code enforcement, comprehensive plans, and Emergency Planning.

Opportunities to integrate the requirements of this Hazard Mitigation Plan into other local planning mechanisms will continue to be identified through future meetings of the Parish and Jurisdictions and through the five-year review process described in the Plan Maintenance Section. The primary means for integrating mitigation strategies into other local planning mechanisms will be through the revision, update and implementation of each jurisdiction's individual city/town plans that require specific planning and administrative tasks.

The timeline and process for these updates to local plans, ordinance revisions, mutual aid agreements, and other planning programs within each jurisdiction will vary based off of their planning cycles. Steering committee members, jurisdiction representatives, and parish and local planning commissions will stay engaged throughout each of these updates to ensure incorporation of any hazard mitigation plan requirements. They will do this through continued communication and participation in their jurisdictions.

The members of the Tangipahoa Parish Hazard Mitigation steering committee will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their jurisdictions or agencies are consistent with the goals and actions of the Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in Parish.

The following parish and local plans incorporate requirements of this HMP Update as follows through steering committee member and jurisdiction representation throughout the planning processes as described above:

Tangipahoa Unincorporated
Comprehensive Master Plan/Updated as needed/Parish Planning Department
Capital Improvement Plan/Updated Annually/Parish Planning Department
Economic Development Plan/Updated every 5 years/Tangipahoa Economic Development Foundation
Local Emergency Operations Plan/Updated every 5 years/Parish OHSEP
Continuity of Operations Plan/Updated Annually/Parish OHSEP
Transportation Plan/Updated as needed/Parish OHSEP
Stormwater Management Plan/Updated As needed/Parish Department of Public Works

City of Hammond
Comprehensive Master Plan/Updated Every 10 Years/Comprehensive Plan Steering Committee
Capital Improvement Plan/Updated Annually/City of Hammond Planning Department
Economic Development Plan/Updated every 5 Years/City of Hammond Planning Department
Continuity of Operations Plan/Updated Annually/City of Hammond Planning Department
Local Emergency Operations Plan/Updated Annually/City of Hammond Planning Department
Transportation Plan/Updated every 4 years/City of Hammond Planning Department
Stormwater Management Plan/Updated as needed/City of Hammond Planning Department

City of Ponchatoula
Stormwater Management Plan/Updated as needed/City of Ponchatoula Government.

Town of Amite
Local Emergency Operations Plan/Updated Every Four Years/Town of Amite Government.

Town of Kentwood
There are no applicable plans within the jurisdiction of Kentwood for the Hazard Mitigation Plan to be integrated.

Town of Roseland
There are no applicable plans within the jurisdiction of Roseland for the Hazard Mitigation Plan to be integrated.

Town of Independence
There are no applicable plans within the jurisdiction of Independence for the Hazard Mitigation Plan to be integrated.

Village of Tangipahoa
There are no applicable plans within the jurisdiction of Tangipahoa for the Hazard Mitigation Plan to be integrated.

Village of Tickfaw
There are no applicable plans within the jurisdiction of Tickfaw for the Hazard Mitigation Plan to be integrated.

Continued Public Participation

Public participation is an integral component of the mitigation planning process and will continue to be essential as this Plan evolves over time. Significant changes or amendments to the Plan require a public hearing prior to any adoption procedures. Other efforts to involve the public in the maintenance, evaluation, and revision process will be made as necessary.

Tangipahoa Parish and its jurisdictions are dedicated to involving the public directly in the reshaping and updating of the Hazard Mitigation Plan. The Steering Committee members and jurisdictions are involved in the process of the review and update of the plan, which is to be conducted every five years. Although they represent the public to some extent, the public will be able to directly comment on and provide feedback about the plan and its updates. Before the Steering Committee is reconvened for any meeting, a public notice will be issued for anyone in the general population who would like to participate in the process of HMP review and update. This would include all jurisdictions. A public notice will be displayed in prominent locations within the main governmental buildings in Tangipahoa Parish and in the City Halls and government buildings of all participating municipalities. Those who opt to participate in this process will have an opportunity to express their concerns, opinions, or ideas about the plan.

Copies of the plan will be catalogued and kept on hand at the Tangipahoa Parish Permit Office located in Hammond. The existence and location of these copies will be publicized in “Hammond Daily Star”. The Parish OHSEP will be responsible for keeping track of public comments on the plan. All public comments will be reviewed and incorporated in the HMP at the five year update if appropriate. If an annual meeting of the Steering Committee is held, than the public comments will be reviewed and incorporated at this time, if appropriate.

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Appendix C: Essential Facilities

Tangipahoa Unincorporated

Tangipahoa Unincorporated Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
Fire and Rescue	Baileyville Husser Volunteer Fire Department					X	X	X	X	X		X
	Eight Ward Volunteer Fire Department					X	X	X	X	X		X
	Hammond Rural Fire Dept					X	X	X	X	X		X
	Husser Fire Station					X	X	X	X	X		X
	Independence Fire & Rescue				X	X	X	X	X	X		X
	Kentwood Fire Department Central Station					X	X	X	X	X		X
	Kentwood Fire Department Station 2					X	X	X	X	X		X
	Loranger Volunteer Fire Department Mixon Corner Substation					X	X	X	X	X		X
	Manchac Volunteer Fire Department	X		X	X	X	X	X	X	X		X
	Natalbany Volunteer Fire Department Station 2				X	X	X	X	X	X		X
	Tangipahoa Parish Central Station - Loranger					X	X	X	X	X		X
	Tangipahoa Rural Fire Protection District No. 2 Station					X	X	X	X	X		X
	Uneedus Husser Volunteer Fire Department					X	X	X	X	X		X
	Wilmer Volunteer Fire Department					X	X	X	X	X		X

Tangipahoa Unincorporated Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
	Wilmer Volunteer Fire Station					X	X	X	X	X		X
Government	City of Hammond Public Works					X	X	X	X	X		X
	C.M. Fagan Special Services Center					X	X	X	X	X		X
	Consolidated Gravity Drainage District					X	X	X	X	X		X
	DOTD Maintenance Unit					X	X	X	X	X		X
	Louisiana Department of Agriculture and Forestry					X	X	X	X	X		X
	Louisiana National Guard					X	X	X	X	X		X
	Louisiana Wildlife and Fisheries					X	X	X	X	X		X
	Parish Disposal				X	X	X	X	X	X		X
	Parish Public Works					X	X	X	X	X		X
	Tangipahoa Mosquito Abatement District No. 1					X	X	X	X	X		X
	Tangipahoa Parish Animal Control					X	X	X	X	X		X
	Tangipahoa Parish Assessor					X	X	X	X	X		X
	Tangipahoa Parish Library - Loranger Branch					X	X	X	X	X		X
	Tangipahoa Parish School System					X	X	X	X	X		X
	Tangipahoa Parish School System Maintenance Facility					X	X	X	X	X		X
	Tangipahoa Parish Sheriff's Office					X	X	X	X	X		X
	Tangipahoa Parish Solid Waste Facility					X	X	X	X	X		X

Tangipahoa Unincorporated Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
	Tangipahoa Register of Voters					X	X	X	X	X		X
	Weight Station					X	X	X	X	X		X
Law Enforcement	Hammond Police Training Center					X	X	X	X	X		X
	Tangipahoa Parish Sheriff Substation	X		X	X	X	X	X	X	X		X
Public Health	Specialty LTCH Hospital					X	X	X	X	X		X
Schools	Capca Migrant Seasonal Head Start					X	X	X	X	X		X
	Champ Cooper Elementary School and Junior High					X	X	X	X	X		X
	Chesbrough Elementary School					X	X	X	X	X		X
	Hammond Eastside Primary School					X	X	X	X	X		X
	Hammond High School					X	X	X	X	X		X
	Hammond State School For The Mentally Retarded					X	X	X	X	X		X
	Harvest Christian Academy					X	X	X	X	X		X
	Jewel Sumner High School					X	X	X	X	X		X
	Loranger High School					X	X	X	X	X		X
	Loranger Middle School					X	X	X	X	X		X
	Martha Vinyard Elementary					X	X	X	X	X		X
	Midway Elementary School					X	X	X	X	X		X
	Natalbany Elementary School				X	X	X	X	X	X		X
	Ponchatoula High School					X	X	X	X	X		X
	Spring Creek Elementary					X	X	X	X	X		X

Tangipahoa Unincorporated Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
	St. Thomas Aquinas				X	X	X	X	X	X		X
	Sumner Middle School					X	X	X	X	X		X

City of Hammond

Hammond Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
Fire and Rescue	Firehouse 4					X	X	X	X	X		X
	Hammond Central Fire Station					X	X	X	X	X		X
	Hammond Fire Station 2					X	X	X	X	X		X
	Memorial Fire Department				X	X	X	X	X	X		X
Government	City of Hammond					X	X	X	X	X		X
	City of Hammond Complex					X	X	X	X	X		X
	City of Hammond Juvenile Services Division					X	X	X	X	X		X
	City of Hammond Juvenile Services Division					X	X	X	X	X		X
	D.L. Wilcombe United States Army Reserve Center					X	X	X	X	X		X
	Department of Transportation and Development				X	X	X	X	X	X		X
	Department of Veteran Affairs					X	X	X	X	X		X
	Hammond Chamer of Commerce					X	X	X	X	X		X
	Leon Ford III Memorial Justice Building					X	X	X	X	X		X
	Louisiana Department of Agriculture and Forestry					X	X	X	X	X		X
	Louisiana Workforce Commission					X	X	X	X	X		X
	Office of Clerk of Court					X	X	X	X	X		X
	Office of Motor Vehicles				X	X	X	X	X	X		X

Hammond Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
	Region 2 Education Service Center				X	X	X	X	X	X		X
	Secretary of State Voting Maching Warehouse					X	X	X	X	X		X
	Social Security Administration					X	X	X	X	X		X
	State of Louisiana Office of Juvenile Justice					X	X	X	X	X		X
	TADAC - Tangipahoa Alcohol Drug Abuse Council					X	X	X	X	X		X
	Tangipahoa Parish Government Planning Department					X	X	X	X	X		X
	Tangipahoa Parish Special Education					X	X	X	X	X		X
Law Enforcement	Hammond PD - Criminal Investigations Division					X	X	X	X	X		X
	Hammond Police Department					X	X	X	X	X		X
	Police Annex					X	X	X	X	X		X
Public Health	Community Care Hospice					X	X	X	X	X		X
	Department of Health and Hospitals Medicaid Office					X	X	X	X	X		X
						X	X	X	X	X		X
Schools	Adult Education Center					X	X	X	X	X		X
	Cedat Fortunis Peritis Academy				X	X	X	X	X	X		X
	Hammond Head Start					X	X	X	X	X		X
	Hammond High School					X	X	X	X	X		X
	Hammond Junior High					X	X	X	X	X		X

Hammond Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
	Hammond Westside Elementary School					X	X	X	X	X		X
	Holy Ghost Catholic School				X	X	X	X	X	X		X
	Seventh-Day Adventist School and Daycare Center				X	X	X	X	X	X		X
Nursing Homes	Sunrise Assisted Living Facility					X	X	X	X	X		X

Town of Independence

Independence Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
Fire & Rescue	Independence Fire & Rescue Station 1				X	X	X	X	X	X		X
Government	Independence Town Hall					X	X	X	X	X		X
Law Enforcement	Independence Police Department					X	X	X	X	X		X
Schools	Central Tangi Head Start					X	X	X	X	X		X
	Independence Elementary School					X	X	X	X	X		X
	Independence High School					X	X	X	X	X		X
	Independence Middle School				X	X	X	X	X	X		X
	Mater Dolorosa Catholic School				X	X	X	X	X	X		X

City of Ponchatoula

Ponchatoula Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
Government	City of Ponchatoula Community Center					X	X	X	X	X		X
	City of Ponchatoula Maintenance Yard					X	X	X	X	X		X
	First Circuit Court of Appeal					X	X	X	X	X		X
	Ponchatoula City Hall					X	X	X	X	X		X
	South Tangipahoa Port Commission					X	X	X	X	X		X
	Steve Pugh - State Representative					X	X	X	X	X		X
Law Enforcement	Ponchatoula Police Department					X	X	X	X	X		X
Public Health	North Oaks Health System					X	X	X	X	X		X
	Ochsner Health Clinic					X	X	X	X	X		X
Schools	D.C. Reeves Elementary					X	X	X	X	X		X
	Ponchatoula Junior High					X	X	X	X	X		X
	St. Joseph School					X	X	X	X	X		X
	Tucker Elementary School					X	X	X	X	X		X

Town of Kentwood

Kentwood Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
Fire & Rescue	Kentwood Volunteer Fire Department				X							
Government	Department of Public Works					X	X	X	X	X		X
	Kentwood Library					X	X	X	X	X		X
Schools	Kentwood High School					X	X	X	X	X		X
	O. W. Dillon Elementary					X	X	X	X	X		X
Public Health	Southeast Community Health Systems					X	X	X	X	X		X

Village of Tangipahoa

Village of Tangipahoa Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
Government	Mayor's Office and City Hall					X	X	X	X	X		X

Village of Tickfaw

Tickfaw Essential Facilities												
Type	Name	Coastal Land Loss	Dam Failure	Expansive Soils	Flood	Hail	Heavy Winds	Lightning	Tornado	Tropical Cyclones	Wildfires	Winter Storms
Government	Tickfaw City Hall					X	X	X	X	X		X
Law Enforcement	Tickfaw Police Department					X	X	X	X	X		X
Schools	Nesom Middle School					X	X	X	X	X		X

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Appendix D: Plan Adoption

T.P. Resolution No. R15-34

TANGIPAHOA PARISH

LOUISIANA

A RESOLUTION OF THE TANGIPAHOA PARISH COUNCIL

TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015

WHEREAS the Tangipahoa Parish Council- President Government recognizes the threat that natural hazards pose to people and property within Tangipahoa Parish; and

WHEREAS the Tangipahoa Parish has prepared a multi-hazard mitigation plan, hereby known as TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Tangipahoa Parish from the impacts of future hazards and disasters; and

WHEREAS adoption by the Tangipahoa Parish Council- President Government demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

NOW THEREFORE, BE IT RESOLVED, that this Resolution shall be effective immediately upon signature of the Parish President.

On motion by Mr. Varnado and seconded by Mr. Joseph, the foregoing resolution was hereby declared adopted on this the 27th Day of July, 2015 by the following roll-call vote:

YEAS: 9 (Forrest, Varnado, Joseph, Bruno, Muscarello, Bankston, Vial, Lavine, Cortez)

NAYS: 0

ABSENT: 1 (Wells)

NOT VOTING: 0

ATTEST:

David P. Vial, Chairman
Tangipahoa Parish Council

Kristen Pecoraro, Clerk
Tangipahoa Parish Council

Gordon A. Burgess, President
Tangipahoa Parish

RESOLUTION NO. 8 - 2015

TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015

WHEREAS the Town of Amite City recognizes the threat that natural hazards pose to people and property within the Town of Amite City; and

WHEREAS the Town of Amite City has prepared a multi-hazard mitigation plan, hereby known as TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Town of Amite City from the impacts of future hazards and disasters; and

WHEREAS adoption by the Board of Aldermen of the Town of Amite City demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

NOW THEREFORE, BE IT RESOLVED BY THE TOWN OF AMITE CITY, LOUISIANA, THAT THE BOARD OF ALDERMEN OF THE TOWN OF AMITE CITY ADOPTS THE TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 on this 4th day of August 2015.

On a motion by Mr. Currier, seconded by Mrs. Sumrall, Resolution No. 8 - 2015 was hereby approved by the following vote of the Board of Aldermen of the Town of Amite City:

YEA: Mr. Leonard, Mr. Foster, Mr. Zanders, Mr. Currier, Mrs. Sumrall.

NAY: None.

ABSENT/ABSTAIN: None.

ATTEST:

Milton "Buddy" Bel, Mayor

Mary Lou Lee, City Clerk

TOWN OF KENTWOOD

LOUISIANA

RESOLUTION NO. JULY 24, 2015

A RESOLUTION OF THE TOWN OF KENTWOOD

TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015

WHEREAS the TOWN OF KENTWOOD recognizes the threat that natural hazards pose to people and property within KENTWOOD; and

WHEREAS the TOWN OF KENTWOOD has prepared a multi-hazard mitigation plan, hereby known as TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the TOWN OF KENTWOOD from the impacts of future hazards and disasters; and

WHEREAS adoption by the TOWN OF KENTWOOD demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

NOW THEREFORE, BE IT RESOLVED BY THE TOWN OF KENTWOOD, LOUISIANA, THAT:

In accordance with the LAWRASON ACT, THE TOWN OF KENTWOOD adopts the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

ADOPTED by a vote of 5 in favor and 0 against, and 0 abstaining, this 24th day of July, 2015.

By: Michelle Anthony

MICHELLE ANTHONY, TOWN CLERK

ATTEST:

By: Michelle Anthony

MICHELLE ANTHONY, TOWN CLERK

APPROVED AS TO FORM:

By: Michelle Anthony

MICHELLE ANTHONY, TOWN CLERK

Pete Panepinto
Mayor

RESOLUTION No. 15-0721-10

Be it resolved:

That the Hammond City Council has approved **a resolution to adopt the Tangipahoa Parish Hazard Mitigation Plan 2015 that identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property.**

Extract of the minutes of 07-21-2015

A resolution to adopt the Tangipahoa Parish Hazard Mitigation Plan 2015 that identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property.

Lacy Landrum, Director of Administration, informed council this is updated every 5 yrs. to new buildings such as Hammond police department. This plan identifies goals an actions that harden buildings, strengthen windows and roll up doors. She stated this will allow the city to be eligible for grant funds and there are currently 3 ongoing projects. **There was a motion by Janice Carter Beard and Seconded by Lemar Marshall to adopt the Tangipahoa Parish Hazard Mitigation Plan 2015 that identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property.**

VOTE: Johnny Blount (Y) Jason Hood (Y) Janice Carter Beard (Y) Lemar Marshall (Y) Mike Williams (Y)

5-0 Motion Approved

This resolution is approved and adopted this **21st, day of July, 2015.**

I, the undersigned Clerk of Council, hereby certify that the foregoing Resolution was duly adopted by the Hammond City Council after the following roll call

Vote: Yeas: **5** Nays: **0** Absent: **0**

Tonia Banks
Hammond City Council Clerk

Mike Williams
Hammond City Council President

Village of Tangipahoa

Post Office Box 156 12616 Jackson Street
Tangipahoa, Louisiana 70465

Mayor
Brenda V. Nevels

Chief of Police
Darrell D. Martin

Clerk
Fredrika M. Ruffin

Alderwomen
Shelia Martin
Mayor Pro-Tem
Larinda Mearidy
Vanessa Williams

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(985) 229-8300
(985) 229-8303

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Email
votpd@bellsouth.net

Website
tangipahoala.org

THE VILLAGE OF TANGIPAHOA

LOUISIANA

RESOLUTION NO. 2015-0812

A RESOLUTION OF THE VILLAGE OF TANIGPAHOA

TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015

WHEREAS the Village of Tangipahoa recognizes the threat that natural hazards pose to the people and property within the Village of Tangipahoa community; and

WHEREAS the Village of Tangipahoa community has prepared a multi-hazard mitigation plan, hereby knowns as TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Village of Tangipahoa from the impacts of future hazards and disasters; and

WHEREAS adoption by the Village of Tangipahoa demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

NOW THEREFORE, BE IT RESOLVED BY THE VILLAGE OF TANGIPAHOA, LOUISIANA, THAT:

THE VILLAGE OF TANGIPAHOA adopts the TANGIPAHOA PARISH MITIGATION PLAN 2015.

ADOPTED by a vote of 3 in favor and 0 against, and 0 abstained on August 12, 2015.

By: Brenda V. Nevels

ATTEST:
By: Fredrika M. Ruffin

RESOLUTION

A RESOLUTION ADOPTING THE TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015

WHEREAS, the Ponchatoula Mayor and City Council recognize the threat that natural hazards pose to people and property within Ponchatoula; and

WHEREAS, Tangipahoa Parish Government has prepared a multi-hazard mitigation plan, hereby known as Tangipahoa Parish Hazard Mitigation Plan 2015 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Tangipahoa Parish Hazard Mitigation Plan 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Ponchatoula from the impacts of future hazards and disasters; and

WHEREAS adoption by the Ponchatoula City Council demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the Tangipahoa Parish Hazard Mitigation Plan 2015.

NOW THEREFORE, BE IT RESOLVED that the Ponchatoula City Council hereby adopts the Tangipahoa Parish Hazard Mitigation Plan 2015.

The above resolution having been submitted to the City Council and discussed at a public meeting on August 10, 2015; after a motion by Mr. Sandifer and second by Mr. LeBlanc, and having been submitted for a vote, the vote was as follows:

YEAS:	LeBlanc, Hills, Toomer, Sandifer
NAYS:	None
ABSTAIN:	None
ABSENT:	Pierson

Robert F. Zabbia, Mayor

CERTIFICATE

I, Tomlyn Poche', City Clerk of the City of Ponchatoula, do hereby certify that the foregoing resolution is a true and exact copy adopted by the Ponchatoula City Council at a meeting thereof legally held on the 10th day of August, 2015.

Tomlyn Poche, City Clerk

Village of Tickfaw

5008t Hwy. 51
P.O. Box 249
Tickfaw, Louisiana 70466

RESOLUTION

A RESOLUTION OF THE Village of Tickfaw, Louisiana
TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015

WHEREAS the Village of Tickfaw Council recognizes the threat that natural hazards pose to people and property within Village of Tickfaw, Louisiana; and

WHEREAS the Village of Tickfaw has prepared a multi-hazard mitigation plan, hereby known as TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Village of Tickfaw, Louisiana from the impacts of future hazards and disasters; and

WHEREAS adoption by the Village of Tickfaw Council demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

NOW THEREFORE, BE IT RESOLVED , that the Village of Tickfaw Council hereby resolve and agree that the Village of Tickfaw adopt the goals outlines in the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

Introduced by Councilman Fedele, *and seconded by* Councilman Rifando *Passed by a vote of* 2 *yeas and* 0 *nays with* 0 *Abstaining, this* 11th *day of August, 2015 at a monthly meeting of the Tickfaw Council.*

Anthony S. Lamnte, Mayor

Absent
Steve Galofaro, Councilman

Michael Fedele, Councilman

Guy Rifando, Councilman

Attest By:

Ruby LeYard, Municipal Clerk

INTRODUCED BY Larry Cardarella
SECONDED BY Mike Muscarello

INTRODUCTION _____
HEARING _____
ADOPTION August 25, 2015

TOWN OF INDEPENDENCE

PARISH OF TANGIPAHOA, STATE OF LOUISIANA

Resolution 15-00

A RESOLUTION OF THE TOWN OF INDEPENDENCE ADOPTING THE TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015

WHEREAS the Board of Alderman for the *Town of Independence* recognizes the threat that natural hazards pose to people and property within Town of Independence; and

WHEREAS the Town of Independence has prepared a multi-hazard mitigation plan, hereby known as TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Town of Independence from the impacts of future hazards and disasters; and

WHEREAS adoption by the Board of Alderman for the *Town of Independence* demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

NOW THEREFORE, BE IT RESOLVED BY THE *TOWN OF INDEPENDENCE*, LOUISIANA, THAT:

In accordance with Louisiana Law and Code of Ordinances of the *Town of Independence*, the Board of Alderman for the *Town of Independence* adopts the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

ADOPTED by a vote of 4 in favor and _____ against, and _____ abstaining, this 25th day of August, 2015.

MICHAEL RAGUSA, MAYOR

ATTEST:
Carla Dawsey
CARLA DAWSEY, TOWN CLERK

TOWN OF ROSELAND

LOUISIANA

RESOLUTION NO. 2015-1012

A RESOLUTION OF THE TOWN OF ROSELAND

TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015

WHEREAS the TOWN OF ROSELAND recognizes the threat that natural hazards pose to people and property within; and

WHEREAS the ROSELAND has prepared a multi-hazard mitigation plan, hereby known as TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the TOWN OF ROSELAND from the impacts of future hazards and disasters; and

WHEREAS adoption by the TOWN OF ROSELAND demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

NOW THEREFORE, BE IT RESOLVED BY THE TOWN OF ROSELAND LOUISIANA, THAT:

In accordance with , THE TOWN OF ROSELAND adopts the TANGIPAHOA PARISH HAZARD MITIGATION PLAN 2015.

ADOPTED by a vote of 5 in favor and 0 against, and 0 abstaining, this 12th day of November, 20 15.

By: _____

Mayor Wanda F. McCoy

ATTEST:

By: Sharlet K. Jackson

Sharlet K. Jackson, Clerk

APPROVED AS TO FORM:

By: Wanda F. McCoy

Mayor Wanda F. McCoy

Appendix E: State Required Worksheets

During the planning process (Appendix A) the Hazard Mitigation Plan Update Steering Committee was provided state-required plan update process worksheets to be filled out by each jurisdiction. The worksheets were presented at the Kickoff Meeting by the contractor as tools for assisting in the update of the Hazard Mitigation Plan. The plan update worksheets allowed for collection of information such as planning team members, community capabilities, critical infrastructure and vulnerable populations and NFIP information. The following pages contain documentation of the worksheets.

Capability Assessment

Unincorporated Tangipahoa

Worksheet 4.1

Capability Assessment Worksheet - Unincorporated Tangipahoa

Planning and Regulatory

Plans	Yes / No	How often is the plan updated?
Comprehensive / Master Plan	Y	
Capital Improvements Plan	Y	
Economic Development Plan	Y	
Local Emergency Operations Plan	Y	
Continuity of Operations Plan	Y	
Transportation Plan	Y	
Stormwater Management Plan	Y	
Community Wildfire Protection Plan	N	
Other plans (redevelopment, recovery, coastal zone	N	
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	Y	
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	
Fire Department ISO rating	Y	
Site plan review requirements	Y	
Land Use Planning and Ordinances	**Yes / No**	**Is the ordinance adequately administered and enforced?**
Zoning Ordinance	Y	
Subdivision Ordinance	Y	
Floodplain Ordinance	Y	
Natural Hazard Specific Ordinance (stormwater, steep slope,	Y	
Flood Insurance Rate Maps	Y	
Acquisition of land for open space and public recreation uses	Y	
Other		

Administration and Technical

Administration	Yes / No	Comments
Planning Commission	Y	
Mitigation Planning Committee	Y	
Maintenance programs to reduce risk (tree trimming,	Y	
Mutual Aid Agreements	Y	
Staff	**Yes / No**	**Percentage of time spent on hazard mitigation**
Chief Building Official	Y/FT/25%	
Floodplain Administrator	Y/FT/25%	
Emergency Manager	Y/FT/25%	
Community Planner	Y/FT/25%	
Civil Engineer	Y/FT/25%	
GIS Coordinator	Y/FT/25%	
Grant Writer	Y/FT/75%	
Other	N/A	
Technical	**Yes / No**	**Describe capability**
Warning Systems / Service	Y	
Hazard Data & Information	Y	
Grant Writing	Y	
Hazus Analysis	Y	
Other	N	

Financial

Funding Resource	Yes / No	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	N	
Stormwater Utility Fee	N	
Community Development Block Grant (CDBG)	Y	
Other Funding Programs	N	

Education and Outreach

Program / Organization	Yes / No	Comments
Local citizen groups or non-profit organizations focused on	Y	
Ongoing public education or information program	Y	
Natural Disaster or safety related school program	N	
Storm Ready certification	N	
Firewise Communities certification	N	
Public/Private partnership initiatives addressing disaster-	N	
Other	N	

How can these capabilities be expanded and improved to reduce risk?

Increased paritcpation in funding opportunities and mitigation programs will enhance and expand risk rediction measures. Progress on identified mitigation actions will also increase capabilities and reduce risk.

City of Hammond

Worksheet 4.1

Capability Assessment Worksheet - City of Hammond

Planning and Regulatory

Plans	Yes / No	How often is the plan updated?
Comprehensive / Master Plan	Yes	Adopted June 1, 2011. Updated every 10 years.
Capital Improvements Plan	Yes	Adopted with each budget. Updated annually.
Economic Development Plan	Yes	Adopted December 6, 2011. Updated every 5 years.
Local Emergency Operations Plan	Yes	Updated annually.
Continuity of Operations Plan	Yes	Updated annually.
Transportation Plan	Yes	Part of South Tangipahoa TIP (updated every 4 years) and MTP (updated every 20 years)
Stormwater Management Plan	Yes	Completed drainage study in 2012.
Community Wildfire Protection Plan	N	n/a
Other plans (redevelopment, recovery, coastal zone	N	n/a
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	Yes	Adopted Unified Development Code (UDC) March 1, 2014.
Building Code Effectiveness Grading Schedule (BCEGS) Score	n/a	Score
Fire Department ISO rating	Yes	Rating 2 (for PIAL?)
Site plan review requirements	Yes	
Land Use Planning and Ordinances	**Yes / No**	**Is the ordinance adequately administered and enforced?**
Zoning Ordinance	Yes	Included in UDC
Subdivision Ordinance	Yes	Included in UDC
Floodplain Ordinance	Yes	Included in UDC
Natural Hazard Specific Ordinance (stormwater, steep slope,	Yes	Stormwater - Included in UDC
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	Yes	
Other	n/a	

Administration and Technical

Administration	Yes / No	Comments
Planning Commission	Yes	n/a
Mitigation Planning Committee	No	n/a
Maintenance programs to reduce risk (tree trimming,	Yes	n/a
Mutual Aid Agreements	Yes	n/a
Staff	**Yes / No**	**Percentage of time spent on hazard mitigation**
Chief Building Official	Yes	n/a
Floodplain Administrator	Yes	n/a
Emergency Manager	Yes	n/a
Community Planner	Yes	n/a
Civil Engineer	No	Contracted
GIS Coordinator	Yes	n/a
Grant Writer	Yes	n/a
Other		n/a
Technical	**Yes / No**	**Describe capability**
Warning Systems / Service	n/a	n/a
Hazard Data & Information	n/a	n/a
Grant Writing	Yes	n/a
Hazus Analysis	n/a	n/a
Other	n/a	n/a

Financial

Funding Resource	Yes / No	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	Yes	Yes
Authority to levy taxes for specific purposes	Yes	Yes
Fees for water, sewer, gas, or electric services	Yes	Yes
Impact fees for new development	Yes	No
Stormwater Utility Fee	No	No
Community Development Block Grant (CDBG)	Yes	No
Other Funding Programs	Yes	Yes

Education and Outreach

Program / Organization	Yes / No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access	Yes	Keep Hammond Beautiful, Reconnect Student Group, BRACES, Options, Tangipahoa Voluntary Council on Aging
Ongoing public education or information program (responsible water use, fire safety, household preparedness,	Yes	Hammond Fire Department, Hammond Stormwater Committee, Keep Hammond Beautiful
Natural Disaster or safety related school program	No	Operated by Tangipahoa Parish School Systems
Storm Ready certification	No	n/a
Firewise Communities certification	Yes	Delivered by Hammond Fire Department, Fire Prevention
Public/Private partnership initiatives addressing disaster-	No	
Other	No	

How can these capabilities be expanded and improved to reduce risk?

Increased paritcpation in funding opportunities and mitigation programs will enhance and expand risk rediction measures. Progress on identified mitigation actions will also increase capabilities and reduce risk.

City of Ponchatoula

Worksheet 4.1

Capability Assessment Worksheet -
City of Ponchatoula

Planning and Regulatory

Plans	Yes / No	How often is the plan updated?
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	Yes	MS4 Stormwater Plan Permit
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone	No	
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	Yes	Updated when State updates new laws
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO rating	No	
Site plan review requirements	No	
Land Use Planning and Ordinances	**Yes / No**	**Is the ordinance adequately administered and enforced?**
Zoning Ordinance	Yes	Yes
Subdivision Ordinance	Yes	Yes
Floodplain Ordinance	Yes	Yes
Natural Hazard Specific Ordinance (stormwater, steep slope,	Yes	Yes
Flood Insurance Rate Maps	Yes	Yes
Acquisition of land for open space and public recreation uses	Yes	Yes
Other	No	

Administration and Technical

Administration	Yes / No	Comments
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk (tree trimming,	Yes	
Mutual Aid Agreements	Yes	
Staff	**Yes / No**	**Percentage of time spent on hazard mitigation**
Chief Building Official	Yes	
Floodplain Administrator	Yes	
Emergency Manager	Yes	
Community Planner	Yes	
Civil Engineer	Yes	
GIS Coordinator	No	
Grant Writer	Yes	
Other	No	
Technical	**Yes / No**	**Describe capability**
Warning Systems / Service	Yes	Fire Whistle
Hazard Data & Information	No	
Grant Writing	Yes	
Hazus Analysis	no	
Other	No	

Financial		
Funding Resource	Yes / No	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	Yes	N/A
Authority to levy taxes for specific purposes	no	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	
Stormwater Utility Fee	No	Yes
Community Development Block Grant (CDBG)	Yes	N/A
Other Funding Programs	No	

Education and Outreach		
Program / Organization	Yes / No	Comments
Local citizen groups or non-profit organizations focused on	No	N/A
Ongoing public education or information program	No	N/A
Natural Disaster or safety related school program	No	N/A
Storm Ready certification	No	N/A
Firewise Communities certification	No	N/A
Public/Private partnership initiatives addressing disaster-	No	N/A
Other	No	N/A

How can these capabilities be expanded and improved to reduce risk?
Increased paritcpation in funding opportunities and mitigation programs will enhance and expand risk rediction measures. Progress on identified mitigation actions will also increase capabilities and reduce risk.

Town of Amite

Worksheet 4.1

Capability Assessment Worksheet - Town of Amite

Planning and Regulatory		
Plans	Yes / No	How often is the plan updated?
Comprehensive / Master Plan	No	n/a
Capital Improvements Plan	No	n/a
Economic Development Plan	No	n/a
Local Emergency Operations Plan	Yes	n/a
Continuity of Operations Plan	No	n/a
Transportation Plan	No	n/a
Stormwater Management Plan	No	n/a
Community Wildfire Protection Plan	No	n/a
Other plans (redevelopment, recovery, coastal zone	Np	n/a
Building Code, Permitting and Inspections	Yes / No	
Building Code	Yes	n/a
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	n/a
Fire Department ISO rating	No	n/a
Site plan review requirements	No	n/a
Land Use Planning and Ordinances	Yes / No	Is the ordinance adequately administered and enforced?
Zoning Ordinance	Yes	n/a
Subdivision Ordinance	Yes	n/a
Floodplain Ordinance	Yes	n/a
Natural Hazard Specific Ordinance (stormwater, steep slope,	No	n/a
Flood Insurance Rate Maps	Yes	n/a
Acquisition of land for open space and public recreation uses	Yes	n/a
Other	No	n/a

Administration and Technical

Administration	Yes / No	Comments
Planning Commission	Yes	n/a
Mitigation Planning Committee	No	n/a
Maintenance programs to reduce risk (tree trimming,	Yes	n/a
Mutual Aid Agreements	Yes	n/a
Staff	**Yes / No**	**Percentage of time spent on hazard mitigation**
Chief Building Official	No	n/a
Floodplain Administrator	Yes	n/a
Emergency Manager	No	n/a
Community Planner	Yes	n/a
Civil Engineer	No	n/a
GIS Coordinator	No	n/a
Grant Writer	No	n/a
Other	No	n/a
Technical	**Yes / No**	**Describe capability**
Warning Systems / Service	No	n/a
Hazard Data & Information	No	n/a
Grant Writing	No	n/a
Hazus Analysis	No	n/a
Other	No	n/a

Financial

Funding Resource	Yes / No	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	Yes	n/a
Authority to levy taxes for specific purposes	Yes	n/a
Fees for water, sewer, gas, or electric services	Yes	n/a
Impact fees for new development	No	n/a
Stormwater Utility Fee	No	n/a
Community Development Block Grant (CDBG)	Yes	n/a
Other Funding Programs	No	n/a

Education and Outreach

Program / Organization	Yes / No	Comments
Local citizen groups or non-profit organizations focused on	No	n/a
Ongoing public education or information program	No	n/a
Natural Disaster or safety related school program	No	n/a
Storm Ready certification	No	n/a
Firewise Communities certification	No	n/a
Public/Private partnership initiatives addressing disaster-	No	n/a
Other	No	n/a

How can these capabilities be expanded and improved to reduce risk?

Increased pariticpation in funding opportunities and mitigation programs will enhance and expand risk rediction measures. Progress on identified mitigation actions will also increase capabilities and reduce risk.

Town of Kentwood

Worksheet 4.1

Capability Assessment Worksheet-
Town of Kentwood

Planning and Regulatory

Plans	Yes / No	How often is the plan updated?
Comprehensive / Master Plan	NO	
Capital Improvements Plan	NO	
Economic Development Plan	NO	
Local Emergency Operations Plan	NO	
Continuity of Operations Plan	NO	
Transportation Plan	NO	
Stormwater Management Plan	NO	
Community Wildfire Protection Plan	NO	
Other plans (redevelopment, recovery, coastal zone	NO	
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	YES	
Building Code Effectiveness Grading Schedule (BCEGS) Score	NO	
Fire Department ISO rating	4	PIAL RATING IS 4 INSIDED CITY LIMITS AND 5 OUTSIDE
Site plan review requirements	YES	
Land Use Planning and Ordinances	**Yes / No**	**Is the ordinance adequately administered and enforced?**
Zoning Ordinance	YES	
Subdivision Ordinance	YES	
Floodplain Ordinance	YES	
Natural Hazard Specific Ordinance (stormwater, steep slope,	NO	
Flood Insurance Rate Maps	YES	
Acquisition of land for open space and public recreation uses	YES	
Other		

Administration and Technical

Administration	Yes / No	Comments
Planning Commission	YES	
Mitigation Planning Committee	NO	
Maintenance programs to reduce risk (tree trimming,	YES	
Mutual Aid Agreements	YES	
Staff	**Yes / No**	**Percentage of time spent on hazard mitigation**
Chief Building Official	YES	
Floodplain Administrator	YES	
Emergency Manager	YES	
Community Planner	NO	
Civil Engineer	YES	
GIS Coordinator	NO	
Grant Writer	NO	Town Clerk is currently writing
Other		
Technical	**Yes / No**	**Describe capability**
Warning Systems / Service	YES	
Hazard Data & Information	NO	
Grant Writing	NO	
Hazus Analysis	NO	
Other		

Financial

Funding Resource	Yes / No	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	NO	
Authority to levy taxes for specific purposes	NO	
Fees for water, sewer, gas, or electric services	NO	
Impact fees for new development	NO	
Stormwater Utility Fee	NO	
Community Development Block Grant (CDBG)	YES	
Other Funding Programs	NO	

How can these capabilities be expanded and improved to reduce risk?

Education and Outreach

Program / Organization	Yes / No	Comments
Local citizen groups or non-profit organizations focused on	NO	N/A
Ongoing public education or information program	NO	N/A
Natural Disaster or safety related school program	NO	N/A
Storm Ready certification	NO	N/A
Firewise Communities certification	NO	N/A
Public/Private partnership initiatives addressing disaster-	NO	N/A
Other	NO	N/A

How can these capabilities be expanded and improved to reduce risk?

Increased paritcpation in funding opportunities and mitigation programs will enhance and expand risk rediction measures. Progress on identified mitigation actions will also increase capabilities and reduce risk.

Town of Roseland

Worksheet 4.1

Capability Assessment Worksheet - Town of Roseland

Planning and Regulatory

Plans	Yes / No	How often is the plan updated?
Comprehensive / Master Plan	no	
Capital Improvements Plan	no	
Economic Development Plan	no	
Local Emergency Operations Plan	no	
Continuity of Operations Plan	no	
Transportation Plan	no	
Stormwater Management Plan	no	
Community Wildfire Protection Plan	no	
Other plans (redevelopment, recovery, coastal zone	no	
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	yes	implemented by parish building department
Building Code Effectiveness Grading Schedule (BCEGS) Score	no	
Fire Department ISO rating	7	
Site plan review requirements	no	
Land Use Planning and Ordinances	**Yes / No**	**Is the ordinance adequately administered and enforced?**
Zoning Ordinance	no	
Subdivision Ordinance	no	
Floodplain Ordinance	yes	
Natural Hazard Specific Ordinance (stormwater, steep slope,	no	
Flood Insurance Rate Maps	yes	
Acquisition of land for open space and public recreation uses	no	
Other	no	

Administration and Technical

Administration	Yes / No	Comments
Planning Commission	no	
Mitigation Planning Committee	no	
Maintenance programs to reduce risk (tree trimming,	no	
Mutual Aid Agreements	no	
Staff	**Yes / No**	**Percentage of time spent on hazard mitigation**
Chief Building Official	no	
Floodplain Administrator	yes	permit clerk
Emergency Manager	no	
Community Planner	no	
Civil Engineer	no	
GIS Coordinator	no	
Grant Writer	no	
Other		
Technical	**Yes / No**	**Describe capability**
Warning Systems / Service	no	
Hazard Data & Information	no	
Grant Writing	no	
Hazus Analysis	no	
Other	no	

Financial		
Funding Resource	Yes / No	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	yes	capital outlay
Authority to levy taxes for specific purposes	yes	
Fees for water, sewer, gas, or electric services	yes	
Impact fees for new development	no	
Stormwater Utility Fee	no	
Community Development Block Grant (CDBG)	yes	yes
Other Funding Programs	no	

Education and Outreach		
Program / Organization	Yes / No	Comments
Local citizen groups or non-profit organizations focused on	no	N/A
Ongoing public education or information program	no	N/A
Natural Disaster or safety related school program	no	N/A
Storm Ready certification	no	N/A
Firewise Communities certification	no	N/A
Public/Private partnership initiatives addressing disaster-	no	N/A
Other	no	N/A
How can these capabilities be expanded and improved to reduce risk?		
Increased pariticpation in funding opportunities and mitigation programs will enhance and expand risk rediction measures. Progress on identified mitigation actions will also increase capabilities and reduce risk.		

Town of Independence

Worksheet 4.1

Capability Assessment Worksheet -
Town of Independence

Planning and Regulatory		
Plans	Yes / No	How often is the plan updated?
Comprehensive / Master Plan	no	
Capital Improvements Plan	no	
Economic Development Plan	no	
Local Emergency Operations Plan	no	
Continuity of Operations Plan	no	
Transportation Plan	no	
Stormwater Management Plan	no	
Community Wildfire Protection Plan	no	
Other plans (redevelopment, recovery, coastal zone	no	
Building Code, Permitting and Inspections	Yes / No	
Building Code	yes	parish building department
Building Code Effectiveness Grading Schedule (BCEGS) Score	no	
Fire Department ISO rating	5	
Site plan review requirements	no	
Land Use Planning and Ordinances	Yes / No	Is the ordinance adequately administered and enforced?
Zoning Ordinance	yes	
Subdivision Ordinance	no	
Floodplain Ordinance	yes	
Natural Hazard Specific Ordinance (stormwater, steep slope,	no	
Flood Insurance Rate Maps	yes	
Acquisition of land for open space and public recreation uses	no	
Other	no	

Administration and Technical

Administration	Yes / No	Comments
Planning Commission	yes	
Mitigation Planning Committee	no	
Maintenance programs to reduce risk (tree trimming,	no	
Mutual Aid Agreements	no	
Staff	**Yes / No**	**Percentage of time spent on hazard mitigation**
Chief Building Official	no	
Floodplain Administrator	yes	permit clerk
Emergency Manager	no	
Community Planner	no	
Civil Engineer	no	
GIS Coordinator	no	
Grant Writer	no	
Other		
Technical	**Yes / No**	**Describe capability**
Warning Systems / Service	no	
Hazard Data & Information	no	
Grant Writing	no	
Hazus Analysis	no	

Financial

Funding Resource	Yes / No	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	yes	
Authority to levy taxes for specific purposes	yes	
Fees for water, sewer, gas, or electric services	yes	
Impact fees for new development	no	
Stormwater Utility Fee	no	
Community Development Block Grant (CDBG)	yes	
Other Funding Programs	no	

Education and Outreach

Program / Organization	Yes / No	Comments
Local citizen groups or non-profit organizations focused on	no	N/A
Ongoing public education or information program	no	N/A
Natural Disaster or safety related school program	no	N/A
Storm Ready certification	no	N/A
Firewise Communities certification	no	N/A
Public/Private partnership initiatives addressing disaster-	no	N/A
Other	no	N/A

How can these capabilities be expanded and improved to reduce risk?

Increased pariticpation in funding opportunities and mitigation programs will enhance and expand risk rediction measures. Progress on identified mitigation actions will also increase capabilities and reduce risk.

Village of Tickfaw

Worksheet 4.1

Capability Assessment Worksheet - Village of Tickfaw

Planning and Regulatory

Plans	Yes / No	How often is the plan updated?
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone		
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	yes	Tangipahoa Parish Government enforcement
Building Code Effectiveness Grading Schedule (BCEGS) Score	no	
Fire Department ISO rating	6	
Site plan review requirements	yes	
Land Use Planning and Ordinances	**Yes / No**	**Is the ordinance adequately administered and enforced?**
Zoning Ordinance	yes	yes
Subdivision Ordinance	yes	yes
Floodplain Ordinance	yes	yes
Natural Hazard Specific Ordinance (stormwater, steep slope,	no	
Flood Insurance Rate Maps	yes	
Acquisition of land for open space and public recreation uses	no	

Administration and Technical

Administration	Yes / No	Comments
Planning Commission	yes	
Mitigation Planning Committee	no	
Maintenance programs to reduce risk (tree trimming,	no	
Mutual Aid Agreements	no	
Staff	**Yes / No**	**Percentage of time spent on hazard mitigation**
Chief Building Official	no	administered through the parish
Floodplain Administrator	yes	permit clerk
Emergency Manager	no	
Community Planner	no	
Civil Engineer	no	
GIS Coordinator	no	
Grant Writer	no	
Other		
Technical	**Yes / No**	**Describe capability**
Warning Systems / Service	yes	fire dept siren alarm
Hazard Data & Information	no	
Grant Writing	no	
Hazus Analysis	no	

Financial

Funding Resource	Yes / No	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	yes	Capital Outlay programs
Authority to levy taxes for specific purposes	yes	
Fees for water, sewer, gas, or electric services	yes	
Impact fees for new development	no	
Stormwater Utility Fee	no	
Community Development Block Grant (CDBG)	yes	
Other Funding Programs		

Education and Outreach

Program / Organization	Yes / No	Comments
Local citizen groups or non-profit organizations focused on	no	N/A
Ongoing public education or information program	no	N/A
Natural Disaster or safety related school program	no	N/A
Storm Ready certification	no	N/A
Firewise Communities certification	no	N/A
Public/Private partnership initiatives addressing disaster-	no	N/A
Other	no	N/A

How can these capabilities be expanded and improved to reduce risk?

Increased pariticpation in funding opportunities and mitigation programs will enhance and expand risk rediction measures. Progress on identified mitigation actions will also increase capabilities and reduce risk.

Village of Tangipahoa

Worksheet 4.1

Capability Assessment Worksheet - Village of Tangipahoa

Planning and Regulatory

Plans	Yes / No	How often is the plan updated?
Comprehensive / Master Plan	no	
Capital Improvements Plan	no	
Economic Development Plan	no	
Local Emergency Operations Plan	no	
Continuity of Operations Plan	no	
Transportation Plan	no	
Stormwater Management Plan	no	
Community Wildfire Protection Plan	no	
Other plans (redevelopment, recovery, coastal zone		
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	yes	parish building dept.
Building Code Effectiveness Grading Schedule (BCEGS) Score	no	
Fire Department ISO rating	6	
Site plan review requirements	no	
Land Use Planning and Ordinances	**Yes / No**	**Is the ordinance adequately administered and enforced?**
Zoning Ordinance	no	
Subdivision Ordinance	no	
Floodplain Ordinance	yes	
Natural Hazard Specific Ordinance (stormwater, steep slope,	no	
Flood Insurance Rate Maps	yes	
Acquisition of land for open space and public recreation uses	no	

Administration and Technical

Administration	Yes / No	Comments
Planning Commission	no	
Mitigation Planning Committee	no	
Maintenance programs to reduce risk (tree trimming,	no	
Mutual Aid Agreements	no	
Staff	**Yes / No**	**Percentage of time spent on hazard mitigation**
Chief Building Official	no	
Floodplain Administrator	yes	permit clerk
Emergency Manager	no	
Community Planner	no	
Civil Engineer	no	
GIS Coordinator	no	
Grant Writer	no	
Other		
Technical	**Yes / No**	**Describe capability**
Warning Systems / Service	no	
Hazard Data & Information	no	
Grant Writing	no	
Hazus Analysis	no	

Financial

Funding Resource	Yes / No	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	yes	
Authority to levy taxes for specific purposes	yes	
Fees for water, sewer, gas, or electric services	yes	
Impact fees for new development	no	
Stormwater Utility Fee	no	
Community Development Block Grant (CDBG)	yes	
Other Funding Programs	no	

Education and Outreach

Program / Organization	Yes / No	Comments
Local citizen groups or non-profit organizations focused on	no	N/A
Ongoing public education or information program	no	N/A
Natural Disaster or safety related school program	no	N/A
Storm Ready certification	no	N/A
Firewise Communities certification	no	N/A
Public/Private partnership initiatives addressing disaster-	no	N/A
Other	no	N/A

How can these capabilities be expanded and improved to reduce risk?

Increased pariticpation in funding opportunities and mitigation programs will enhance and expand risk rediction measures. Progress on identified mitigation actions will also increase capabilities and reduce risk.

Building Inventory

PLACEHOLDER FOR TABLES

Critical Facilities and Vulnerable Populations

PLACEHOLDER FOR TABLES

National Flood Insurance Program (NFIP)

Work Sheet 4.3 National Flood Insurance Program (NFIP) - Town of Kentwood

NFIP Topic	Source of	Comments
Insurance Summary		
How many NFIP polices are in the community? What is the total premium and coverage?	27-TP $19,635 .00 / $6,603,900.00	
How many claims have been paid in the community? What is	1 - $10,055.00	
How many structures are exposed to flood risk with in the		
Describe any areas of flood risk with limited NFIP policy		
Staff Resources		
Is the Community FPA or NFIP Coordinator certified?	NO	
Is flood plain management an auxiliary function?	Call	
Provide an explanation of NFIP administration services (e.g.,		
What are the barriers to running an effective NFIP program in		
Compliance History		
Is the community in good standing with the NFIP?	YES	
Are there any outstanding compliance issues(i.e., current		
When was the most recent Community Assistance Visit (CAV) or	2004	
Is a CAV or CAC scheduled or needed? If so when?	NO	
Regulation		
When did the community enter the NFIP?	4/15/1980	
Are the FIRMs digital or paper?	digital	
Do floodplain development regulations meet or exceed FEMA or		
Community Rating System (CRS)		
Does the community participate in CRS?		
What is the community's CRS Class Ranking?		
Does the plan include CRS planning requirements?		

Tangipahoa Parish

Work Sheet 4.3

National Flood Insurance Program (NFIP)

NFIP Topic	
Insurance Summary	
How many NFIP polices are in the community? What is the total premium and coverage?	Policies: 4,682 ; Premium: $2,508,565. ; Coverage: $1,104,823,300.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	Claims pd: 856 ; Total amount pd: $19,105,510 ; SD: 143
How many structures are exposed to flood risk with in the community?	
Describe any areas of flood risk with limited NFIP policy coverage.	
Staff Resources	
Is the Community FPA or NFIP Coordinator certified?	
Is flood plain management an auxiliary function?	
Provide an explanation of NFIP administration services (e.g., permit	
What are the barriers to running an effective NFIP program in the	
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or	CAV=4-24-14; CAC=10-16-12
Is a CAV or CAC scheduled or needed? If so when?	No
Regulation	
When did the community enter the NFIP?	E.P.=4/18/75; R.P.=2/2/83 *
Are the FIRMs digital or paper?	
Do floodplain development regulations meet or exceed FEMA or	Exceeds
Community Rating System (CRS)	
Does the community participate in CRS?	Yes
What is the community's CRS Class Ranking?	9
Does the plan include CRS planning requirements?	?

* E.P. = Emergency Phase
R.P. = Regular Phase

Amite City

Work Sheet 4.3

National Flood Insurance Program (NFIP)

NFIP Topic	
Insurance Summary	
How many NFIP polices are in the community? What is the total premium and coverage?	27 policies; premiums: $16,166.; Coverage: $7,376,000.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	1 3 claims pd. totalling $ 184,562.
How many structures are exposed to flood risk with in the community?	
Describe any areas of flood risk with limited NFIP policy coverage.	
Staff Resources	
Is the Community FPA or NFIP Coordinator certified?	
Is flood plain management an auxiliary function?	
Provide an explanation of NFIP administration services (e.g., permit	
What are the barriers to running an effective NFIP program in the	
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or	CAC=2/17/12; CAV=1/9/09
Is a CAV or CAC scheduled or needed? If so when?	No
Regulation	
When did the community enter the NFIP?	6-30-76 (Regular Phase)
Are the FIRMs digital or paper?	
Do floodplain development regulations meet or exceed FEMA or	Meets
Community Rating System (CRS)	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	10
Does the plan include CRS planning requirements?	??

Hammond

Work Sheet 4.3

National Flood Insurance Program (NFIP)

NFIP Topic	
Insurance Summary	
How many NFIP polices are in the community? What is the total premium and coverage?	Policies: 1,313; Premiums: $1,107,062.; Coverage: $291,357,100.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	Claims pd: 144; Total amount pd: $1,905,557; SD = 9
How many structures are exposed to flood risk with in the community?	
Describe any areas of flood risk with limited NFIP policy coverage.	
Staff Resources	
Is the Community FPA or NFIP Coordinator certified?	
Is flood plain management an auxiliary function?	
Provide an explanation of NFIP administration services (e.g., permit	
What are the barriers to running an effective NFIP program in the	
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or	CAC: 8/14/13; CAV: 11/16/11
Is a CAV or CAC scheduled or needed? If so when?	No
Regulation	
When did the community enter the NFIP?	Emergency Phase: 4/14/75; Regular Phase: 12/15/81
Are the FIRMs digital or paper?	
Do floodplain development regulations meet or exceed FEMA or	Meet
Community Rating System (CRS)	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	10
Does the plan include CRS planning requirements?	??

Ponchatoula

Work Sheet 4.3

National Flood Insurance Program (NFIP)

NFIP Topic	
Insurance Summary	
How many NFIP polices are in the community? What is the total premium and coverage?	PIF: 352; Premiums: $161,467.; Coverage: $93,981,100.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	Claims pd.: 26; Total pd.: $1,103,067.; SD: 3
How many structures are exposed to flood risk with in the community?	
Describe any areas of flood risk with limited NFIP policy coverage.	
Staff Resources	
Is the Community FPA or NFIP Coordinator certified?	
Is flood plain management an auxiliary function?	
Provide an explanation of NFIP administration services (e.g., permit	
What are the barriers to running an effective NFIP program in the	
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or	CAC: 10/17/02; CAV: 8/23/11
Is a CAV or CAC scheduled or needed? If so when?	No
Regulation	
When did the community enter the NFIP?	E.P.: 6/5/75; R.P.: 4/17/79 *
Are the FIRMs digital or paper?	
Do floodplain development regulations meet or exceed FEMA or	Meet
Community Rating System (CRS)	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	10
Does the plan include CRS planning requirements?	

* E.P. = Emergency Phase

R.P. = Regular Phase

Roseland

Work Sheet 4.3

National Flood Insurance Program (NFIP)

NFIP Topic	
Insurance Summary	
How many NFIP polices are in the community? What is the total premium and coverage?	PIF: 2 ; Premiums: $521. ; Coverage: $175,000.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	-0- claims pd.
How many structures are exposed to flood risk with in the community?	
Describe any areas of flood risk with limited NFIP policy coverage.	
Staff Resources	
Is the Community FPA or NFIP Coordinator certified?	
Is flood plain management an auxiliary function?	
Provide an explanation of NFIP administration services (e.g., permit	
What are the barriers to running an effective NFIP program in the	
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or	CAC: 10/17/12 ; CAV: 5/30/06
Is a CAV or CAC scheduled or needed? If so when?	No
Regulation	
When did the community enter the NFIP?	E.P. = 3/23/77 ; R.P. = 9/1/87 *
Are the FIRMs digital or paper?	
Do floodplain development regulations meet or exceed FEMA or	Meet
Community Rating System (CRS)	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	10
Does the plan include CRS planning requirements?	

* E.P. = Emergency Phase
R.P. = Regular Phase

Independence

Work Sheet 4.3

National Flood Insurance Program (NFIP)

NFIP Topic	
Insurance Summary	
How many NFIP polices are in the community? What is the total premium and coverage?	PIF: 89; Premiums: $66,719.; Coverage: $19,100,900.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	Claims pd: 3; Total pd: $10,839.; SD: -0-
How many structures are exposed to flood risk with in the community?	
Describe any areas of flood risk with limited NFIP policy coverage.	
Staff Resources	
Is the Community FPA or NFIP Coordinator certified?	
Is flood plain management an auxiliary function?	
Provide an explanation of NFIP administration services (e.g., permit	
What are the barriers to running an effective NFIP program in the	
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or	CAC: 10/17/12; CAV: 10/21/04
Is a CAV or CAC scheduled or needed? If so when?	No
Regulation	
When did the community enter the NFIP?	E.P. = 7/25/75; R.P. = 7/5/77 *
Are the FIRMs digital or paper?	
Do floodplain development regulations meet or exceed FEMA or	Meet
Community Rating System (CRS)	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	10
Does the plan include CRS planning requirements?	

* E.P. = Emergency Phase
R.P. = Regular Phase

Tangipahoa (Village)

Work Sheet 4.3

National Flood Insurance Program (NFIP)

NFIP Topic
Insurance Summary
How many NFIP polices are in the community? What is the total premium and coverage? PIF: 4; Premiums: $1,904.; Coverage: $246,800.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage? Claims pd.: 6; Total pd.: $30,087.; SD: 1
How many structures are exposed to flood risk with in the community?
Describe any areas of flood risk with limited NFIP policy coverage.
Staff Resources
Is the Community FPA or NFIP Coordinator certified?
Is flood plain management an auxiliary function?
Provide an explanation of NFIP administration services (e.g., permit
What are the barriers to running an effective NFIP program in the
Compliance History
Is the community in good standing with the NFIP? Yes
Are there any outstanding compliance issues(i.e., current violations)? No
When was the most recent Community Assistance Visit (CAV) or CAC: 6/16/10; CAV: 3/4/07
Is a CAV or CAC scheduled or needed? If so when? No
Regulation
When did the community enter the NFIP? E.P. = 3/31/75; R.P. = 9/28/79 *
Are the FIRMs digital or paper?
Do floodplain development regulations meet or exceed FEMA or Meet
Community Rating System (CRS)
Does the community participate in CRS? No
What is the community's CRS Class Ranking? 10
Does the plan include CRS planning requirements?

* E.P. = Emergency Phase

R.P. = Regular Phase

Tickfaw

Work Sheet 4.3

National Flood Insurance Program (NFIP)

NFIP Topic	
Insurance Summary	
How many NFIP polices are in the community? What is the total premium and coverage?	PIF: 58 ; Premiums: $38,811. ; Coverage: $19,817,800.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	Claims pd.: 5 ; Total pd.: $95,949. ; SD: 1.
How many structures are exposed to flood risk with in the community?	
Describe any areas of flood risk with limited NFIP policy coverage.	
Staff Resources	
Is the Community FPA or NFIP Coordinator certified?	
Is flood plain management an auxiliary function?	
Provide an explanation of NFIP administration services (e.g., permit	
What are the barriers to running an effective NFIP program in the	
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or	CAC: 10/17/12 ; CAV: 8/23/11
Is a CAV or CAC scheduled or needed? If so when?	No
Regulation	
When did the community enter the NFIP?	E.P. = 7/30/75 ; R.P. = 4/28/77 *
Are the FIRMs digital or paper?	
Do floodplain development regulations meet or exceed FEMA or	Meet
Community Rating System (CRS)	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	10
Does the plan include CRS planning requirements?	

E.P. = Emergency Phase

R.P. = Regular Phase