CONCORDIA

PARISH HAZARD MITIGATION UPDATE – 2016

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CONCORDIA PARISH

HAZARD MITIGATION PLAN UPDATE

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Concordia Parish

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ACKNOWLEDGMENTS

This 2016 Concordia Parish Hazard Mitigation Plan Update was coordinated by the Concordia Parish Hazard Mitigation Plan Update Steering Committee, in collaboration with the participating jurisdictions as well as community stakeholders and the general public. The participating jurisdictions are made up of the following communities:

Unincorporated Concordia Parish
Town of Clayton
Town of Ferriday
Town of Ridgecrest
City of Vidalia

Special thanks is directed to all of those who assisted in contributing feedback and expertise on this document, especially the Concordia Parish Office of Homeland Security and Emergency Management. These combined efforts have made this project possible. The Concordia Parish Steering Committee consists of the following individuals, who are credited in the creation of this document:

Payne Scott	OHSEP Director	Concordia Parish Police Jury
Buz Craft	Mayor	City of Vidalia
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Sherrie Jacobs	Mayor	Town of Ferriday
Bobby Sheppard SR.	Mayor	Town of Ridgecrest
Kevin Friloux	Secretary/Treasurer	Concordia Parish Police Jury

The 2016 Concordia Parish Hazard Mitigation Plan Update was written by the Stephenson Disaster Management Institute, Louisiana State University. Further comments should be directed to the Concordia Parish Office of Homeland Security and Emergency Preparedness: 4001 Carter Street, Vidalia, LA, 71373.

Contents

1. Introduction

Hazard Mitigation is defined as sustained actions taken to reduce or eliminate long-term risk from hazards and their effects. Hazard Mitigation Planning is the process through which natural hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies that would lessen the impacts are determined, prioritized, and implemented.

In that regard, this plan (a) documents the Concordia Parish Hazard Mitigation Plan Update process; (b) identifies natural hazards and risks within the parish; and (c) identifies the parish's hazard mitigation strategy to make Concordia Parish less vulnerable and more disaster resistant. It also includes mitigation project scoping to further identify the extent of work, estimated costs, and implementation timing requirements of proposed selected mitigation projects. Information in the plan will be used to help guide and coordinate mitigation activities and local policy decisions affecting future land use.

The Concordia Parish Hazard Mitigation Plan is a multi-jurisdictional plan that includes the following jurisdictions which participated in the planning process:

- Unincorporated Concordia Parish
- Town of Clayton
- Town of Ferriday
- Town of Ridgecrest
- City of Vidalia

The Federal Emergency Management Agency (FEMA), now under the Department of Homeland Security, has made reducing losses from natural disasters one of its primary goals. The Hazard Mitigation Plan (HMP) and subsequent implementation of recommended projects, measures, and policies is the primary means to achieving these goals. Mitigation planning and project implementation has become even more significant in a post-Katrina and Rita environment in south Louisiana.

This Hazard Mitigation Plan is a comprehensive plan for disaster resiliency in Concordia Parish. The parish is subject to natural hazards that threaten life and health and have caused extensive property damage. To better understand these hazards and their impacts on people and property, and to identify ways to reduce those impacts, the parish's Office of Homeland Security and Emergency Preparedness undertook this Natural Hazards Mitigation Plan.

"Hazard mitigation" does not mean that all hazards are stopped or prevented. It does not suggest complete elimination of the damage or disruption caused by such incidents. Natural forces are powerful and most natural hazards are well beyond our ability to control. Mitigation does not mean quick fixes. It is a long term approach to reduce hazard vulnerability. As defined by FEMA, "hazard mitigation" means any sustained action taken to reduce or eliminate the long-term risk to life and property from a hazard event.

Why this plan? Every community faces different hazards and every community has different resources and interests to bring to bear on its problems. Because there are many ways to deal with natural hazards and many agencies that can help, there is no one solution or cookbook for managing or mitigating their effects.

Planning is one of the best ways to correct these shortcomings and produce a program of activities that will best mitigate the impact of local hazards and meet other local needs. A well-prepared plan will ensure that all possible activities are reviewed and implemented so that the problem is addressed by the most

appropriate and efficient solutions. It can also ensure that activities are coordinated with each other and with other goals and programs, preventing conflicts and reducing the costs of implementing each individual activity.

Mitigation activities need funding. Under the Disaster Mitigation Act of 2000 (42 USC 5165), a mitigation plan is a requirement for federal mitigation funds. Therefore, a mitigation plan will both guide the best use of mitigation funding and meet the prerequisite for obtaining such funds from FEMA. FEMA also recognizes plans through its Community Rating System, a program that reduces flood insurance premiums in participating communities. This program is described at the end of this chapter.

This plan identifies activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage caused by natural hazards. It fulfills the federal mitigation planning requirements, qualifies for Community Rating System credit, and provides the parish and its municipalities with a blueprint for reducing the impacts of these natural hazards on people and property.

Location, Demography, and Economy

Location

Concordia Parish is located northeast of Alexandria in East Central Louisiana. The parish is surrounded by Tensas Parish to the north; Catahoula Parish and Avoyelles Parish to the west; Pointe Coupee Parish and West Feliciana Parish to the south; and Adams and Wilkinson Counties, Mississippi to the east. The Mississippi River forms the parish boundary to the east, and the Tensas River forms the parish boundary to the west. The Red River Wildlife Management Area and Three Rivers Wildlife Management Area are located in the southern part of the parish. The Red and Black Rivers form the parish boundaries to the southwest and south. Bayou Cocodrie National Wildlife Refuge is located in the northern part of the parish. Concordia Parish has a land area of 696 square miles.

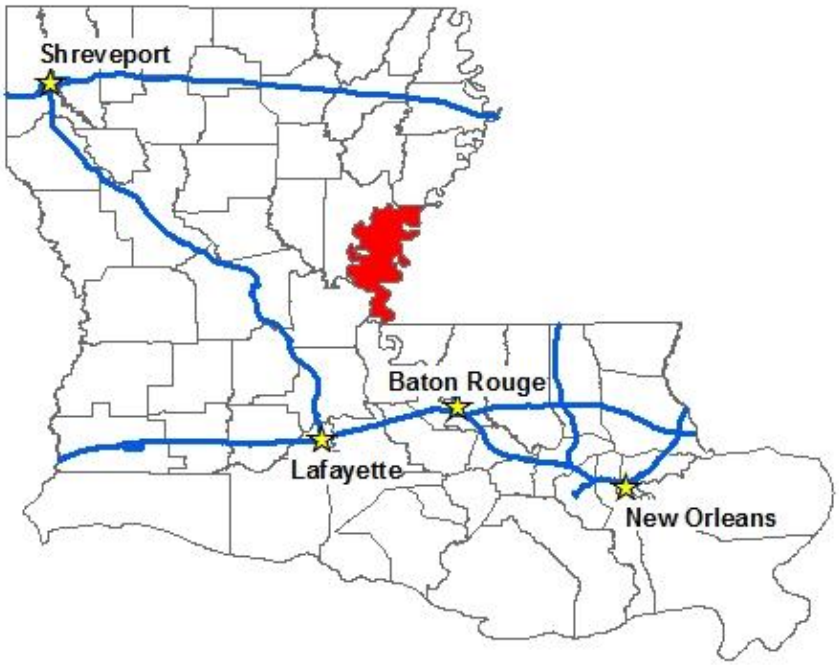


Figure 1-1: Location of Concordia Parish within the State of Louisiana

The geography of Concordia Parish is largely determined by the rivers which border it. The Mississippi River forms its eastern boundary; the Tensas River courses along its northwestern boundary; The Black River touches its western boundary in the central portion of the parish; and the Red River forms its southwestern boundary shared with Avoyelles Parish. Much of the land area of Concordia Parish is comprised of alluvial plains, including natural levees along the Mississippi, Tensas, and Red Rivers. Elevation averages approximately 65 feet above sea level.

Concordia Parish is located in Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) Region 6.

As noted above, Concordia Parish is located in the east-central region of Louisiana.

Figure 1-2: Louisiana Homeland Security Regions

Table 1-1: Concordia Parish Population
(Source: U.S. Census Bureau)

	2010 Census	2013 Census	(Current Yr) Estimate	Percent Change 2010 -2013	Percent Change 2010 -(Current Year)
Total Population	20,822	20,475	20,466	-1.70%	-1.70%
Population Density (Pop/Sq. Mi.)	29.9	___	___	___	___
Total Households	7,642	7,642	___	___	___

Economy

The economy in Concordia Parish is primarily driven by retail and wholesale trade, as well as healthcare and social services. However, with a Fruit of the Loom distribution center located in Vidalia, Concordia Parish is unique in that it does have a major employer from the manufacturing sector within its boundary.

Agricultural production also serves as an industry of major economic importance in Concordia Parish. Row crop production of soybeans, corn, cotton, rice, wheat, and grain sorghum accounted for 96% of the $116 million gross farm value produced in the parish in 2012. Land use is mainly for agriculture and woodland. About 63 percent of the land is cultivated cropland or pasture land; about 32 percent is in woodland.

Table 1-2: Business Patterns in Concordia Parish
(Source: http://censtats.census.gov/cgi-bin/cbpnaic/cbpsect.pl)

Business Description	Number of Employees	Number of Establishments	Annual Payroll ($1,000)
Retail Trade	886	77	21,680
Manufacturing	100-249	10	___
Health Care and Social Assistance	1,028	41	27,408
Mining, Quarrying, Oil and Gas Extraction	226	10	10,346
Transportation and Warehousing	250-499	14	14,467
Construction	93	17	3,505
Administration and Support and Waste Management and Remediation Services	100-249	10	___
Real Estate and Rental and Leasing	20-99	14	___
Wholesale Trade	286	77	21,680
Other Services (except Public Administration)	151	48	2,644
Accommodation and Food Services	382	27	4,561
Financial and Insurance	100-249	31	7,788
Professional, Scientific, and Technical Services	207	28	8,299
Information	20-99	4	___
Educational Services	0-19	1	___
Arts, Entertainment, and Recreation	20-99	6	509
Management of Companies and Enterprises	0-19	2	___
Agriculture, Forestry, Fishing and Hunting	0-19	5	321
Utilities	20-99	4	___

While nature has presented the parish with a variety of hazards, the parish has the human resources that can face those hazards and manage the impact they have on people and property. This plan will discuss hazards affecting Concordia Parish. Hazard Profiles (see Section Two) contain detailed 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.

Hazard Mitigation

To fully understand hazard mitigation efforts in Concordia 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 before 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.

Figure 1-3 illustrates 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.

As *Figure 1-3* 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.

Figure 1-3: The Four Phases of Emergency Management and their Relation to Future Hazard Mitigation
(Source: Louisiana State Hazard Mitigation Plan 2014)

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. As detailed later in this document, significant funding has been made available to the State of Louisiana and its parishes for the purpose of hazard mitigation planning. The storms also raised awareness of the importance of hazard mitigation among decision-makers and the general population, 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 to 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 encourages 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 2016 Concordia Parish Hazard Mitigation Plan maintains much of the information from the 2006 and 2011 plan versions, but it now reflects the order and methodologies of the 2011 Louisiana State Hazard Mitigation Plan. The sections in the 2011 Concordia Hazard Mitigation Plan were as follows:

- Section One Table of Contents
- Section Two Executive Summary
- Section Three Context
- Section Four Adoption and Approval
- Section Five Planning Process
- Section Six Hazard Identification, Profiling and Ranking
- Section Seven Risk Assessment
- Section Eight Capability Assessment
- Section Nine Mitigation Action Plan
- Section Ten Plan Monitoring and Maintenance
- 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 Concordia 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.

2016 Plan Update

This 2016 plan update proceeds with the previous goals of the Concordia Parish Hazard Mitigation Plan. The current goals are as follows:

- Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact
- Improve data collection, use, and sharing to reduce the impact of hazards
- Improve capabilities, coordination, and opportunities at municipal and parish levels to plan and implement hazard mitigation projects, programs, and activities
- Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities

This plan update makes a number of textual changes throughout, but the most obvious changes are data related and structural edits. 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 eleven, 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, as well as the removal of repetition between sections from the previous plan updates. The 2016 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 Strategy
- Appendix A Planning Process
- Appendix B Plan Maintenance
- Appendix C Essential Facilities
- Appendix D Plan Adoption
- Appendix E State Required Worksheets

Table 1-4: Plan Crosswalk

2011 Plan	Revised Plan (2016)
Section 1: Table of Contents	Section 1: Introduction
Section 2: Executive Summary	Section 1: Introduction
Section 3: Context	Section 1: Introduction
Section 4: Adoption and Approval	Appendix D: Plan Adoption
Section 5: Planning Process	Appendix A: Planning Process
Section 6: Hazard Identification, Profiling and Ranking	Section 2: Risk Assessment
Section 7: Risk Assessment	Section 2: Risk Assessment
Section 8: Capability Assessment	Section 3: Capability Assessment
Section 9: Mitigation Action Plan	Section 4: Mitigation Strategy
Section 10: Plan Monitoring and Maintenance	Appendix B: Plan Maintenance
Appendices	Appendices

Despite 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 Concordia Parish and its municipalities. The extent of this risk is dictated primarily by its geographic location. Most significantly, Concordia Parish remains at high risk of water inundation from various sources, including flooding, tornadoes, and tropical cyclone activity. All of 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. 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.

2. Hazard Identification and Parish-Wide Risk Assessment

This section assesses the various hazard risks that Concordia 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 provides an overview of the hazards that had been previously profiled in the Concordia Parish Hazard Mitigation Plan published in 2011, 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 2016 Update
Subsidence/Coastal Land Loss			
Drought	X		X
Earthquakes	X		*
Expansive Soils			
Fog			
Flooding	X	X	X
Extreme Heat	X		X
Sinkholes			
Thunderstorms (Hail, Lightning, & Wind)	X	X	X
Tornadoes	X	X	X
Tropical Cyclones	X	X	X
Tsunamis			
Wildfires	X		X
Winter Storms	X		X
Dam Failure	X		+
Levee Failure	X		+

* Hazard was profiled but discounted

+ Data deficiency

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 hazard of earthquakes was discounted due to it having no impact on the parish, while dam and levee failure declared a data deficiency.

The following hazards have been selected to be included in this risk assessment:

a) Drought
b) Earthquakes
c) Extreme Heat
d) Flooding (backwater, riverine, localized stormwater event)
e) Thunderstorms (hail, lightning, wind)
f) Tornadoes
g) Tropical Cyclones (flooding and high winds)
h) Wildfires
i) Winter Storms
j) Dam Failure
k) Levee Failure

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

- Flooding from rivers and waterways, rain storms, tropical cyclones, and hurricanes in the following forms:
  a) Riverine
  b) Stormwater
  c) Surge
  d) Backwater flooding (as the result of river flooding and surge)
- High wind damage most commonly resulting from hurricanes, thunderstorms, and tornadoes
- Property and crop damage resulting from drought, extreme heat, and wildfires

The potential destructive power of tropical cyclones and flooding were determined to be the most prevalent hazards to the parish. All fourteen Presidential Declarations Concordia Parish has received resulted from either tropical cyclones (6 declarations) or flooding (8 declarations), which validates these as the most significant hazards. Therefore, the issues of hurricanes and floods will both 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 destructive potential, the risk assessment will also asses non-storm surge flooding as well. Flooding can also occur from non-hurricane events, as flash floods are a common occurrence due to heavy rainfall.

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 Concordia Parish is included in the hurricane risk assessment.

Concordia Parish is also susceptible to tornadoes. Tornadoes can spawn from tropical cyclones or severe weather systems that pass through Concordia Parish. High winds produced by tornadoes have the potential to destroy residential and commercial buildings, as well as create wind-borne objects from the debris produced by the destruction of the natural and human environment, such as building materials and trees.

Previous Occurrences

Table 2-2 summarizes federal disaster declarations for Concordia Parish since 1965. Information includes names, dates, and types of disaster.

Table 2-2: Concordia Parish Major Disaster Declarations

Disaster Declaration Number	Date	Type of Disaster
374	4/27/1973	Severe Storms and Flooding
418	2/23/1974	Flooding
3011	4/12/1975	Heavy Rains and Flooding
470	6/6/1975	Heavy Rains, Tornadoes, and Flooding
904	5/3/1991	Severe Storms, Tornadoes, and Flooding
1548	9/15/2004	Tropical Cyclone – Hurricane Ivan
1603	8/29/2005	Tropical Cyclone – Hurricane Katrina
1607	9/24/2005	Tropical Cyclone – Hurricane Rita
1786	9/2/2008	Tropical Cyclone- Hurricane Gustav
1792	9/13/2008	Tropical Cyclone – Hurricane Ike
3322	5/6/2011	Flooding
4015	8/18/2011	Flooding
4080	8/29/2012	Tropical Cyclone – Hurricane Isaac
4102	2/22/2013	Severe Storms and Flooding

Probability of Future Hazard Events

The probability of a hazard event occurring in Concordia Parish is estimated in the table on the following page. 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 (1990 – 2015) in order to determine future probability of a hazard occurring. While the 25-year record used by the State was adopted for the purpose of determining the overall probability, in order to assist with determining estimated losses, unless otherwise stated, the full 54-year record was used when Hazus-Multi-Hazard (MH) 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 for inflation in order 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. This was used due to it containing specific data for cities, whereas the data within SHELDUS is limited to parishes.

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

Table 2-3: Probability of Future Hazard Reoccurrence

Hazard	Probability				
	Concordia Parish (Unincorporated)	Clayton	Ferriday	Ridgecrest	Vidalia
Drought	28%	28%	28%	28%	28%
Earthquakes	<1%	<1%	<1%	<1%	<1%
Extreme Heat	60%	60%	60%	60%	60%
Flooding	52%	68%	60%	48%	64%
Thunderstorms (Hail)	64%	64%	64%	64%	64%
Thunderstorms (Lightning)	8%	8%	8%	8%	8%
Thunderstorms (Wind)	100%	100%	100%	100%	100%
Tornadoes	72%	72%	72%	72%	72%
Tropical Cyclones	16%	16%	16%	16%	16%
Wildfires	<1%	<1%	<1%	<1%	<1%
Winter Storms	20%	20%	20%	20%	20%
Dam Failure	<1%	<1%	<1%	<1%	<1%
Levee Failure	<1%	<1%	<1%	<1%	<1%

As shown in *Table 2-3* thunderstorm winds for the entire planning area have the highest annual chance of occurrence in the parish (100%). Tornadoes have a 72% annual chance of reoccurrence, followed by flooding for the incorporated area of Clayton at 68%. Flooding for the unincorporated areas of the parish and the incorporated areas of Ferriday, Ridgecrest, and Vidalia have a slightly lower annual chance of occurrence. Thunderstorm hail has a 64% annual chance of occurrence, followed by extreme heat at 60%, and drought and winter storms at 28%. Tropical cyclones (16%), thunderstorm lightning (8%), and wildfires (<1%) have the lowest annual chance of occurrence in Concordia Parish. Earthquakes were discounted since the annual chance of occurrence was calculated at less than 1% and they have no impact on the parish, while dam and levee failure claim a data deficiency.

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 (GOHSEP) on critical infrastructure from a previous hazard mitigation project.

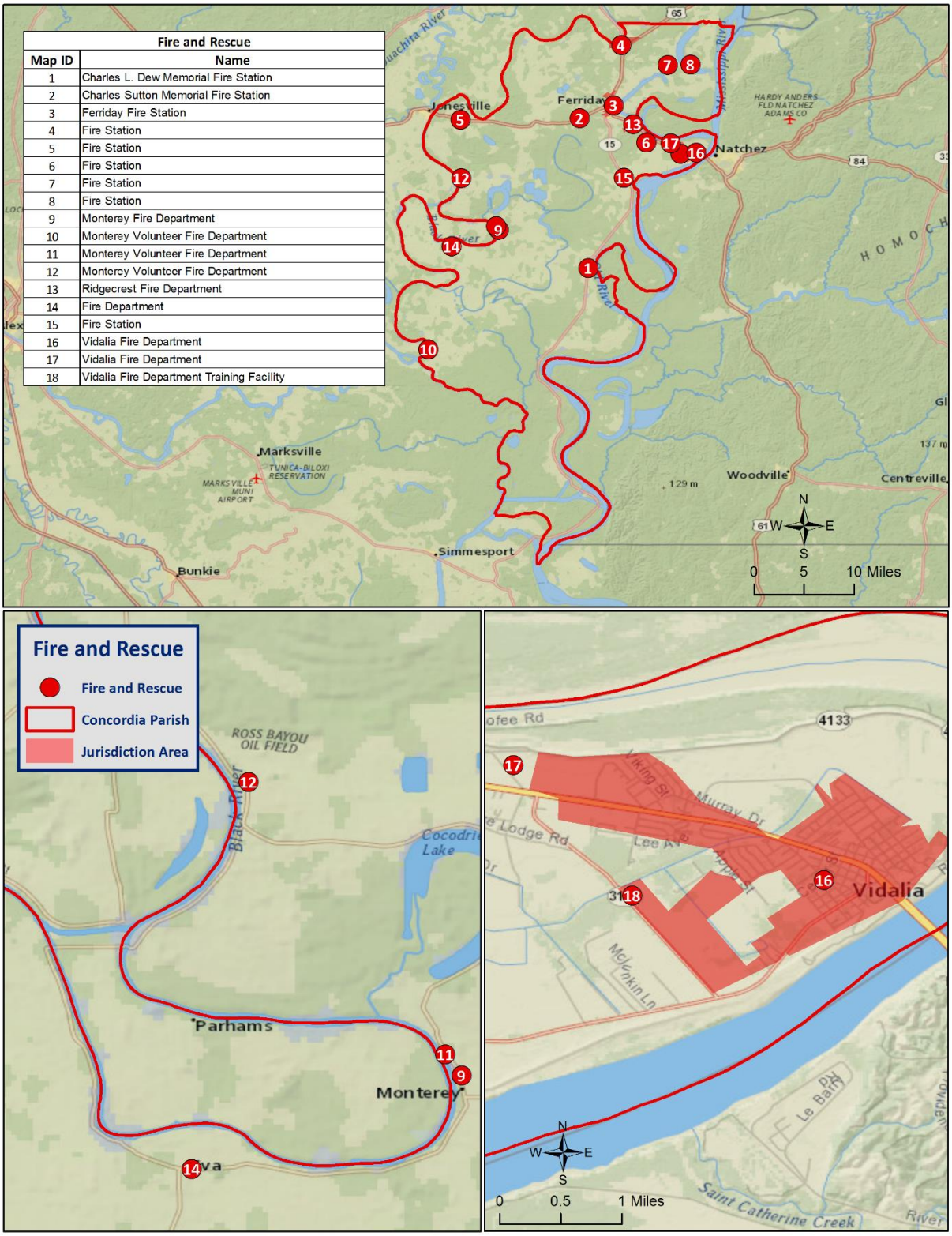
Within the entire planning area, there is an estimated value of $2,900,925,000 in structures throughout the parish. The table below provide the total estimated value for each type of structure by occupancy.

Table 2-4: Estimated Total of Potential Losses throughout Concordia Parish

Occupancy	Concordia Parish	Unincorporated Concordia Parish	Clayton	Ferriday	Ridgecrest	Vidalia
Agricultural	$24,566,000	$18,230,000	$2,520,000	$1,960,000	$0	$1,856,000
Commercial	$554,885,000	$353,027,000	$28,894,000	$64,968,000	$8,136,000	$99,860,000
Government	$29,438,000	$8,089,000	$4,636,000	$3,575,000	$220,000	$12,918,000
Industrial	$53,766,000	$35,516,000	$935,000	$9,804,000	$498,000	$7,013,000
Religion	$105,818,000	$48,330,000	$5,280,000	$27,084,000	$1,516,000	$23,608,000
Residential	$2,085,744,000	$1,270,698,000	$4,983,000	$253,191,000	$71,387,000	$485,485,000
Education	$46,708,000	$14,078,000	$7,710,000	$12,734,000	$2,620,000	$9,566,000
Total	$2,900,925,000	$1,747,968,000	$54,958,000	$373,316,000	$84,377,000	$640,306,000

Essential Facilities of the Parish

The following figures show the locations and names of the essential facilities within the parish:



Fire and Rescue	
Map ID	Name
1	Charles L. Dew Memorial Fire Station
2	Charles Sutton Memorial Fire Station
3	Ferriday Fire Station
4	Fire Station
5	Fire Station
6	Fire Station
7	Fire Station
8	Fire Station
9	Monterey Fire Department
10	Monterey Volunteer Fire Department
11	Monterey Volunteer Fire Department
12	Monterey Volunteer Fire Department
13	Ridgecrest Fire Department
14	Fire Department
15	Fire Station
16	Vidalia Fire Department
17	Vidalia Fire Department
18	Vidalia Fire Department Training Facility

Figure 2-1: Fire and Rescue Buildings in Concordia Parish

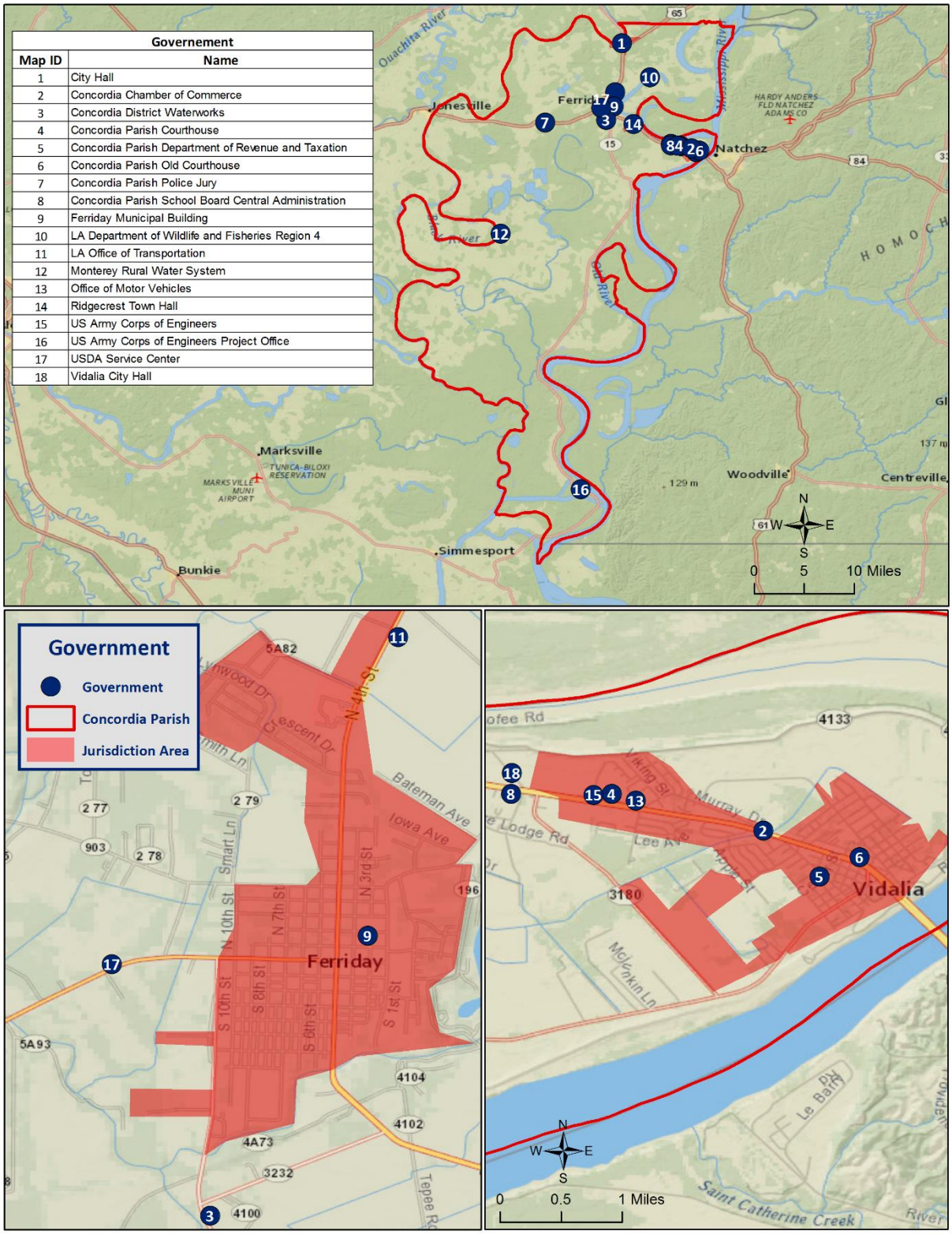


Figure 2-2: Government Buildings in Concordia Parish

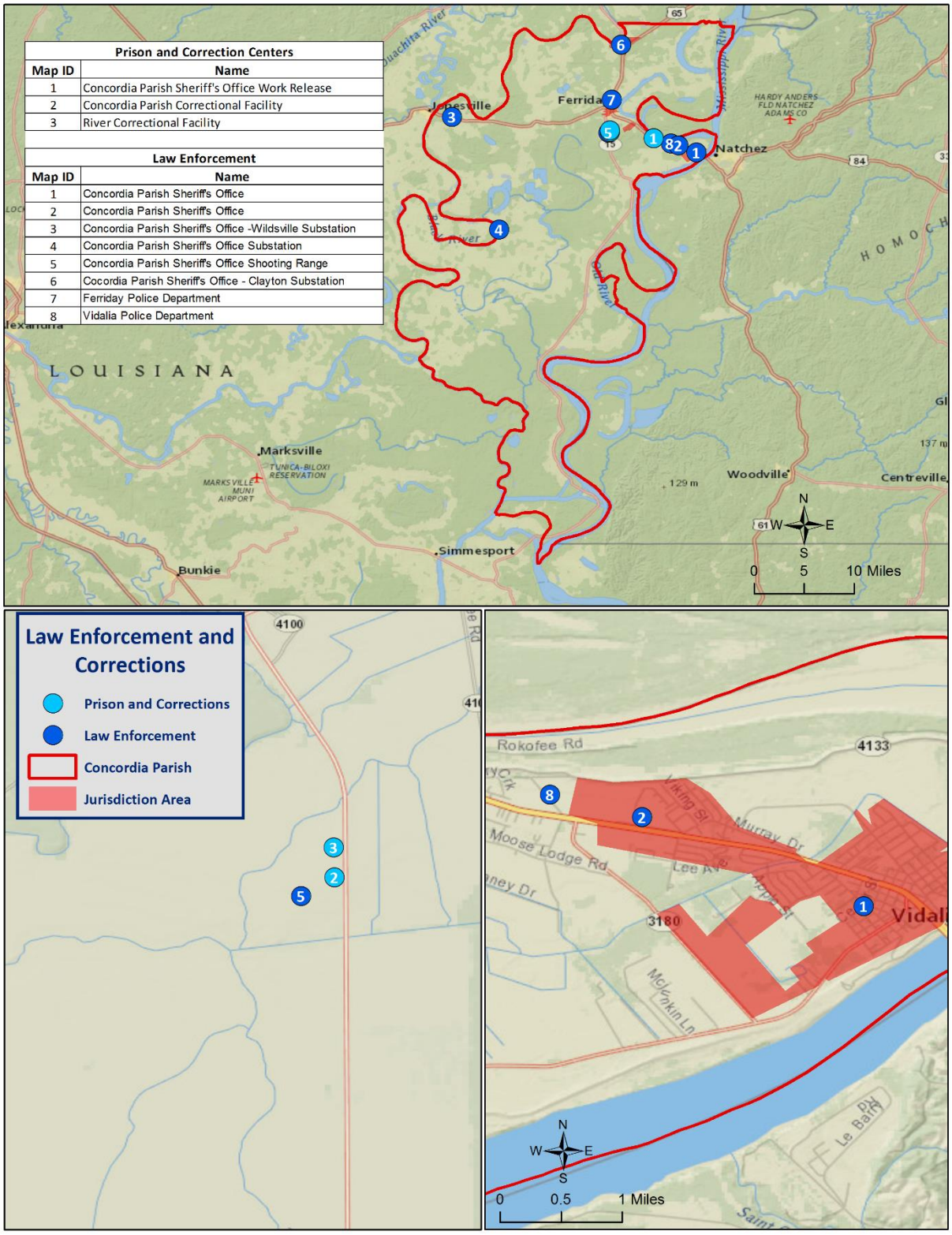


Figure 2-3: Law Enforcement and Corrections in Concordia Parish

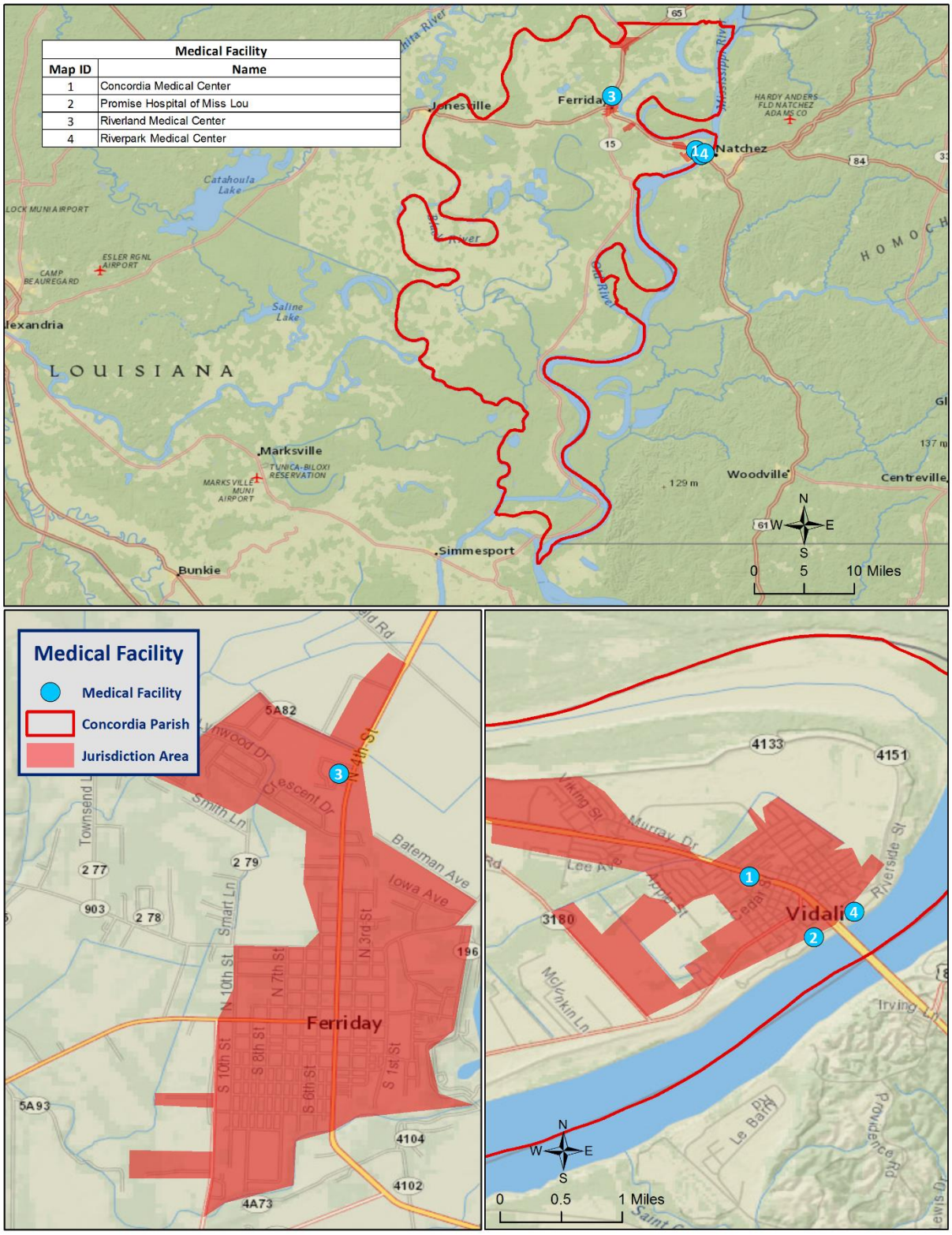


Figure 2-4: Medical Facilities in Concordia Parish

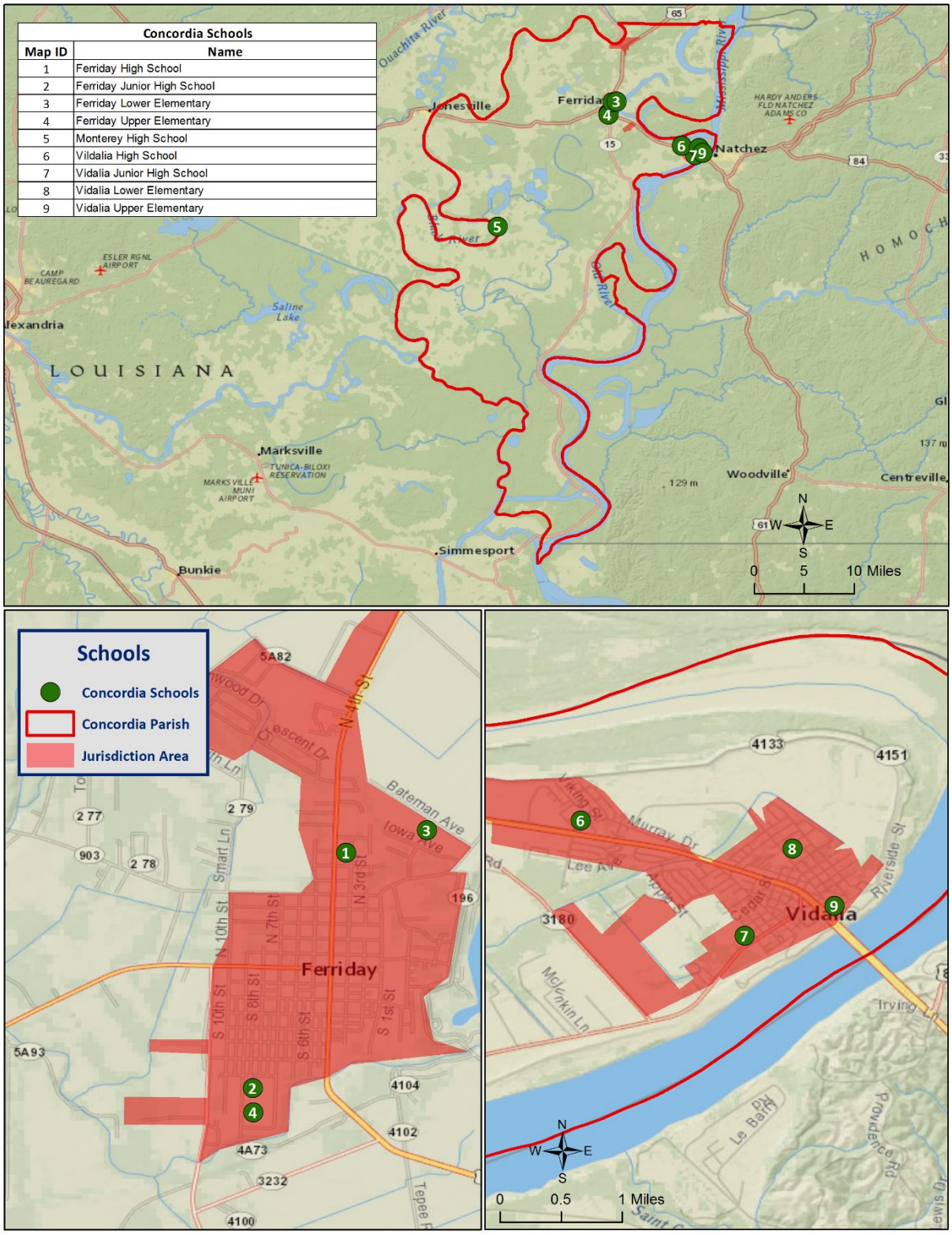


Figure 2-5: School Buildings in Concordia Parish

Future Development Trends

Concordia Parish experienced a small growth in population and housing between the years of 2000 and 2014, growing from a population of 20,225 with 9,148 housing units in 2000 to a population of 20,466 with 9,402 housing units in 2014. This growth was largely in the unincorporated areas of Concordia Parish from the years 2000 to 2010. From 2000 to 2013, the incorporated areas of Clayton, Ferriday, Ridgecrest, and Vidalia, and the unincorporated areas of the parish all experienced a decline in population from the years of 2010 to 2014. The future population and number of buildings can be estimated using U.S. Census Bureau housing and population data. The following tables show population and housing unit estimates from 2000 to 2014:

Table 2-5: Population Growth Rate for Concordia Parish

Total Population	Concordia Parish	Concordia (Unincorporated)	Clayton	Ferriday	Ridgecrest	Vidalia
1-Apr-00	20,225	10,272	880	3,758	762	4,553
1-Apr-10	20,806	11,599	710	3,508	693	4,296
1-Jul-14	20,466	11,458	697	3,440	678	4,193
Population Growth between 2000 – 2010	2.9%	12.9%	-19.3%	-6.7%	-9.1%	-5.6%
Average Annual Growth Rate between 2000 – 2010	0.3%	1.3%	-1.9%	-0.7%	-0.9%	-0.6%
Population Growth between 2010 – 2014	-1.6%	-1.2%	-1.8%	-1.9%	-2.2%	-2.4%
Average Annual Growth Rate between 2010 – 2014	-0.41%	-0.30%	-0.46%	-0.48%	-0.54%	-0.60%

Table 2-6: Housing Growth Rate for Concordia Parish

Total Housing Units	Concordia Parish	Concordia (Unincorporated)	Clayton	Ferriday	Ridgecrest	Vidalia
1-Apr-00	9,148	5,073	361	1,498	306	1,910
1-Apr-10	9,383	5,392	320	1,497	300	1,874
1-Jul-14	9,402	5,347	346	1,425	328	1,956
Housing Growth between 2000 – 2010	2.6%	6.3%	-11.4%	-0.1%	-2.0%	-1.9%
Average Annual Growth Rate between 2000 – 2010	0.3%	0.6%	-1.1%	0.0%	-0.2%	-0.2%
Housing Growth between 2010 – 2014	0.2%	-0.8%	8.1%	-4.8%	9.3%	4.4%
Average Annual Growth Rate between 2010 – 2014	0.1%	-0.2%	2.0%	-1.2%	2.3%	1.1%

As shown in previous tables, Concordia Parish has experienced slight growth in both population and housing units from 2000 to 2014. Housing growth rates grew at 0.3% annually from 2000 to 2010, and at 0.1% annually from 2010 to 2014. Population growth rates for the parish were slightly lower at 0.3% annually from 2000 to 2010, and -0.41% annually from 2010 to 2014. From 2000 to 2010, the unincorporated area of Concordia Parish had the largest increase in population rate at 12.9%. The incorporated area of Clayton had the largest decrease in population during this time period at -19.3%. From 2010 to 2014, all incorporated areas in Concordia Parish and the unincorporated areas of the parish experienced a decline in population.

The unincorporated area of Concordia Parish experienced the largest increase in housing units from 2000 to 2010 at 6.3%. All incorporated areas of the parish experienced a decline in housing units during this time period. From 2010 to 2014, Ridgecrest experienced the largest increase in housing units at 9.3%, followed by Clayton at 8.1%. The incorporated area of Ferriday and the unincorporated areas experienced a decline in housing units during this time.

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 and tropical cyclones. Based on a review of available information, it is assumed that population and housing units will grow slightly within Concordia Parish from the present until 2024. A summary of estimated future impacts is shown in the table below. Dollar values are expressed in future costs and assume an annual rate of inflation of 1.02%. No changes in development have impacted the community's vulnerability since the plans last update.

Table 2-7: Estimated Future 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	9,402	3,655	3,664	3,673
Value of Structures	$2,900,925,000	$1,127,657,619	$1,189,359,309	$1,254,437,110
# of People	20,466	7,956	8,361	8,788
Tropical Cyclones				
Structures	9,402	9,402	9,426	9,450
Value of Structures	$2,900,925,000	$2,900,925,000	$3,059,654,007	$3,227,068,139
# of People	20,466	20,466	21,510	22,607

Land Use

The Concordia Parish Land Use table is provided on the next page. Residential, commercial, and industrial areas account for only 4% of the parish's land use. Agricultural land is the largest category at 236,827 acres, accounting for 50% of parish land. At 172,597 acres, wetlands account for 36% of parish lands, while 33,634 acres of water account for 7% of parish lands. The parish also consists of 11,901 acres of forest land areas, accounting for 3% of all parish lands.

Table 2-8: Concordia Parish Land Use
(Source: USGS Land Use Map)

Land Use	Acres	Percentage
Agricultural Land, Cropland, and Pasture	236,827	50%
Wetlands	172,597	36%
Forest Land (not including forested wetlands)	11,901	3%
Urban/Development	19,823	4%
Water	33,634	7%

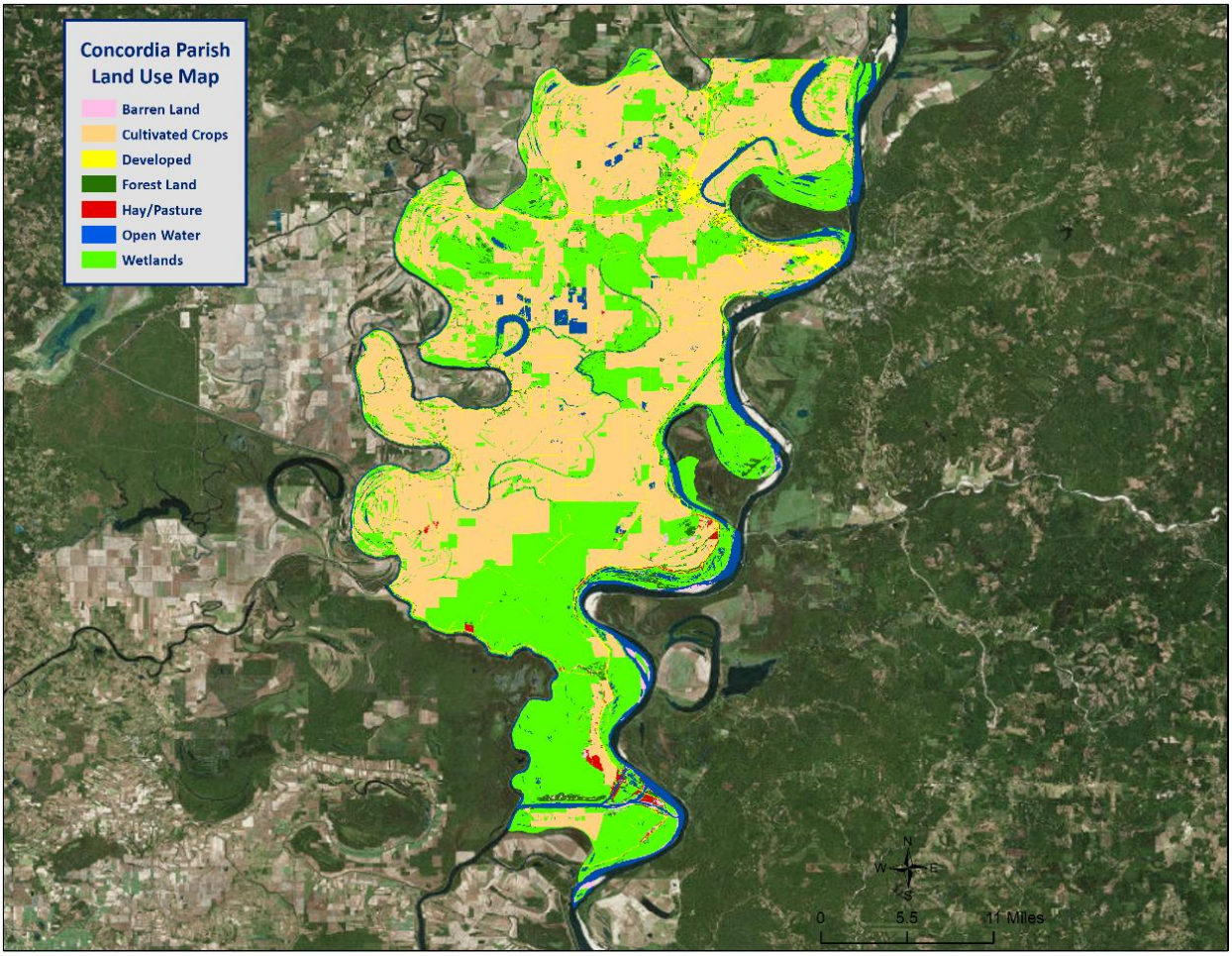


Figure 2-6: Concordia Parish Land Use Map
(Source: USGS Land Use Map)

Hazard Identification

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. 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 also tend to be associated with other hazards, such as wildfires and/or heat waves. 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 the likelihood of wildfire outbreaks. As a compromise, the PDSI is used most often for droughts since it is a medium-response drought indicator. The objective of the PDSI is to provide measurements of moisture conditions that are standardized so that comparisons using the index can be made between locations and between months. On the next page, *Table 2-9* displays the range and Palmer classifications of the PDSI index. *Figure 2-7* displays the current drought monitor for the state of Louisiana and its parishes.

Table 2-9: Palmer Drought Severity Index Classification and Range

Range	Palmer Classifications
4.0 or more	Extremely Wet
3.0 to 3.9	Very Wet
2.0 to 2.9	Moderately Wet
1.0 to 1.99	Slightly Wet
0.5 to 0.99	Incipient Wet Spell
0.49 to -0.49	Near Normal
-0.5 to -0.99	Incipient Dry Spell
-1.0 to -1.99	Mild Drought
-2.0 to -2.99	Moderate Drought
-3.0 to -3.99	Severe Drought
-4.0 or less	Extreme Drought

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 in addition to the effects of cumulative patterns of previous months. Although weather patterns can change almost overnight from a long-term drought pattern to a long-term wet pattern, as a medium-response indicator, the PDSI responds relatively rapidly. Data compiled by the National Drought Mitigation Center indicates normal conditions exist in Concordia Parish at the time this plan went to publication (*Figure 2-7*).

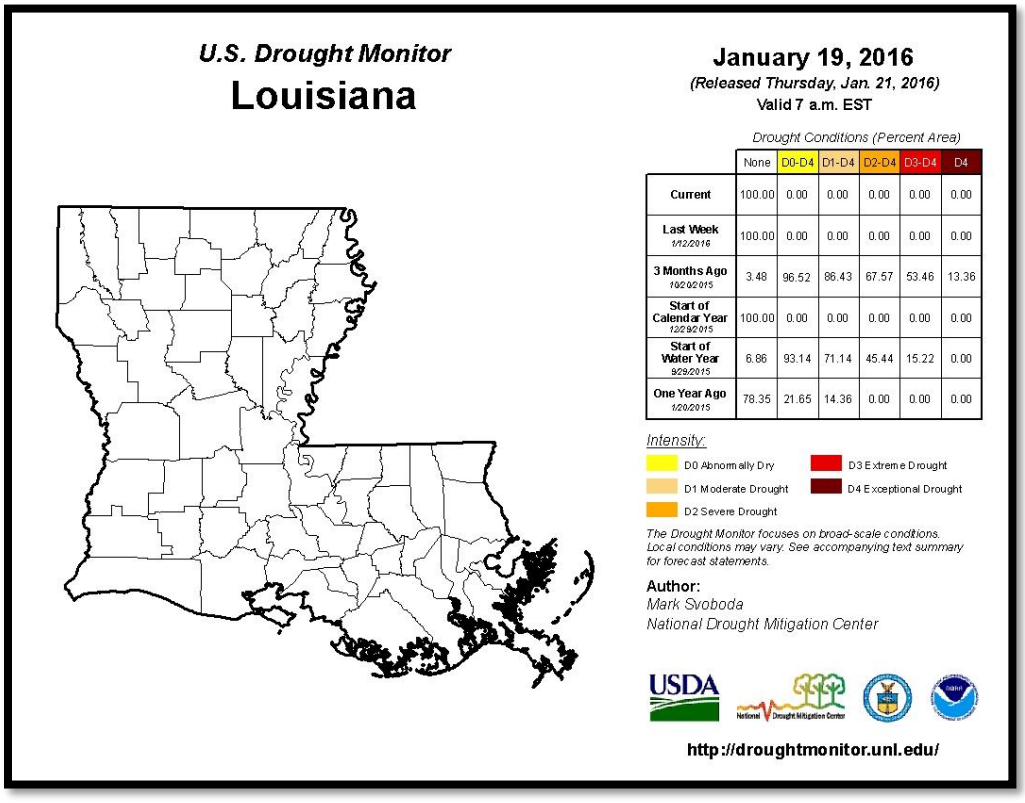


Figure 2-7: United States Drought Monitor for the State of Louisiana and its Parishes (Source: The National Drought Mitigation Center)

Location

Drought typically impacts a region and not one specific parish or jurisdiction. While the entire planning area can experience drought, the major impact of a drought event in Concordia Parish is on the agricultural community.

Previous Occurrences / Extents

The SHELDUS database reports a total of seven drought events occurring within the boundaries of Concordia Parish between the years of 1990 to 2015. *Table 2-10* identifies the date of occurrence, estimated crop damage, and severity of the events that have occurred in Concordia Parish. Based on previous occurrences, and in accordance with the Palmer Drought Index, the worst case scenario for drought in Concordia Parish would be a severe drought event.

Table 2-10: Drought Events with Crop Damage Totals for Concordia Parish (Source: SHELDUS)

Date	Crop Damage	Palmer Classification
October 2004	$246,646	Moderate Drought
October 2006	$950,111	Severe Drought
June 2010	$106,834	Moderate Drought
July 2010	$534,168	Severe Drought
August 2010	$534,168	Severe Drought
September 2010	$534,168	Severe Drought
October 2010	$534,168	Severe Drought

Frequency / Probability

Based on previous occurrences of seven drought events in 25 years, the probability of drought occurrence in the planning area in any given year is 28%.

Estimated Potential Losses

According to the SHELDUS database, there have been seven drought events that have caused some level of crop damage. The total agricultural damage from these events is $3,440,262, with an average cost of $491,466 per drought event. When annualizing the total cost over the 25-year record, total annual losses based on drought is estimated to be $137,610. *Table 2-11* presents an analysis of agricultural exposure that is susceptible to drought by major crop type for Concordia Parish.

Table 2-11: Agricultural Exposure by Crop Type for Droughts in Concordia Parish (Source: LSU Ag Center 2014 Parish Totals)

Agricultural Exposure by Type for Drought						
Cotton	Forestry	Corn	Sorghum	Rice	Soybeans	Total
$13,656,059	$4,174,470	$10,163,084	$3,937,711	$10,944,199	$73,016,013	$115,891,536

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

Earthquakes

An earthquake is a sudden motion or trembling of the Earth caused by an abrupt release of stored energy in the rocks beneath the Earth's surface. The energy released results in vibrations which are known as seismic waves. Ground motion from seismic waves is expressed as peak ground acceleration (PGA), the fastest measured change in speed for a particle at ground level that is moving because of an earthquake. PGA is commonly measured as a percentage of acceleration due to Earth's gravity (%g). This measurement is relied upon to determine seismic load engineering design and construction requirements. Earthquakes are typically described in terms of magnitude and intensity. Magnitude is the measure of the amplitude of the seismic wave and is often expressed by the Richter scale, and intensity is a measure of how strong the shock was felt at a particular location, indexed by the Modified Mercalli Intensity (MMI) scale. The Richter scale is a logarithmic measurement whereby an increase in the scale by one whole number represents a tenfold increase in measured ground motion of the earthquake (and an increase in energy released of more than 30 times). An increase by two whole numbers represents a 102 (or 100-fold) increase in ground motion, and thus more than 302 (or 900) times the energy released. *Table 2-12* shows the rough correlation between the Richter scale, PGA, and the MMI. The relationship between these is approximate and depends upon such specifics as the depth of the focus (the location of the actual rock movement) and distance from the epicenter (the location on the Earth's surface above the earthquake focus) of the earthquake.

Table 2-12: Comparison of Earthquake Magnitudes for PGA, Richter, and MMI
(Source: USGS Earthquake Hazards Program)

Comparison of Earthquake Metrics			
PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
<0.17	1.0 - 3.0	I	**I**. Not felt except by a very few under especially favorable conditions.
0.17 - 1.4	3.0 - 3.9	II - III	**II**. Felt only by a few persons at rest, especially on upper floors of buildings. **III**. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
1.4 - 9.2	4.0 - 4.9	IV - V	**IV**. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rock noticeably. **V**. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
9.2 - 34	5.0 - 5.9	VI - VII	**VI**. Felt by all. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. **VII**. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

Comparison of Earthquake Metrics			
PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
34 - 124	6.0 - 6.9	VII - IX	**VIII**. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. **IX**. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
>124	7.0 and higher	**VIII** or higher	**X**. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. **XI**. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. **XII**. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

The system of subsidence faults in southern Louisiana developed due to accelerated land subsidence and rapid sediment deposition from the Mississippi River. The system stretches across the southern portion of the state from Beauregard Parish in the west to West Baton Rouge Parish in the east and it includes every parish south of this line. This system is thought to be responsible for many of the recorded earthquakes from 1843 to the present. All of the earthquakes that occurred over this period of time were of low magnitude, resulting mostly in limited property damage (such as broken windows, damaged chimneys, and cracked plaster). While faults throughout the northwestern parishes are thought to be inactive, the New Madrid seismic zone lies just to the north of Louisiana and originates in the region of New Madrid, Missouri. The magnitude of historic earthquakes originating in the New Madrid seismic zone is far greater than that generated by the subsidence fault system in coastal Louisiana. A significant seismic event from the New Madrid seismic zone is more likely to have a greater impact on Louisiana than a seismic event from the subsidence fault system.

Location

An earthquake event is a geological hazard that occurs along fault lines. Concordia Parish has no fault lines located within the boundaries of the parish or near the parish (*Figure 2-8*).

Previous Occurrences / Extents

Both the SHELDUS and National Climatic Data Center report no earthquake events occurring within the boundaries of Concordia Parish between the years of 1990 – 2015. The National Oceanic and Atmospheric Administration's National Geophysical Data Center report no earthquake events occurring within the boundaries of Concordia Parish between the years 1811 – 2014. *Figure 2-8* displays the location and intensity of each earthquake event in relation to Concordia Parish and surrounding parishes. Based on previous earthquake events surrounding the parish, an earthquake with an intensity level of MMI 1 could occur near the planning area. If one were to occur, it would have no impact on the planning area.

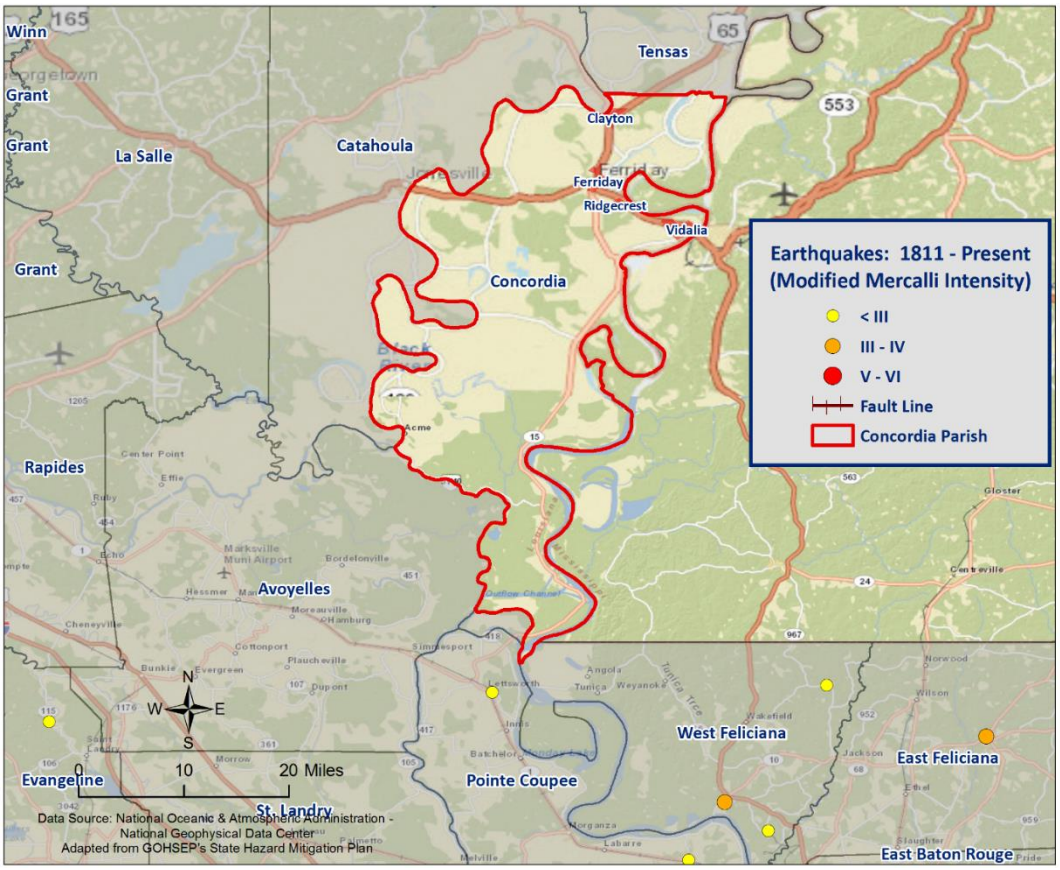


Figure 2-8: Location and Intensity (MMI) of Earthquakes in Concordia Parish

Frequency / Probability

Earthquakes are an extremely rare occurrence in the State of Louisiana and Concordia Parish, with no occurrences of an earthquake event within the boundaries of the parish from the years 1811 – 2014. Based on the available data, it is determined that there will be no impact on Concordia Parish or any of its jurisdictions, and is therefore discounted. As a result, earthquakes are 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 *Table 2-13* and Table 2-14 summarizes the HI risk levels and protective measures. 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 with strong, hot winds present.

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 in relation to their 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, utilities, and railroads. Extreme heat can cause pavement to soften, creating the buckling of roads and highways, which can result in potholes and rutting. These damaged roads can create hazardous conditions, causing motorists to find alternate transportation routes. Old water and sewer lines can deteriorate, increasing the likelihood of line ruptures during extreme heat. The demands on water supplies can result in water rationing, shortages, and restrictions. Extreme heat can also cause strain on several power grids, causing people to minimize the consumption of power during the hottest parts of the day due to overheating. The overwhelming demand of excess electrical power usage can also cause a strain on power capacities, resulting in blackout and /or brown outs. vehicles can overheat, and tires will deteriorate. High temperatures can be partially responsible for the expansion, buckling, or deflection of rails requiring track repairs or speed restrictions to avoid derailments.

Extreme heat can also be detrimental to the agricultural community. Extreme heat stress can reduce plant photosynthetic and transpiration efficiencies and negatively impact plant root development, which collectively can negatively impact yield. Heat injury in plants includes scalding and scorching of leaves and stems, sunburn on fruits and stems, leaf drop, rapid leaf death, and reduction in growth and yield. Extreme heat is particularly impactful when extreme heat is accompanied by drought conditions. The reduced moisture in the soil further exacerbates the effects of extreme temperatures.

The agrarian issues associated with extreme heat are relevant throughout the state, but are particularly significant in rural and agricultural parishes. A reduction of crop yield will diminish the incomes of farmers and producers in the area. If the reduced crop yield lasts over an extended period of time, the resulting reduction in disposable income could have a negative impact on businesses in the affected communities. People wouldn't have any extra money to spend at local establishments, and businesses would be forced to close for good.

Table 2-13: Heat Index Advisor based on Air Temperature (°F) and Relative Humidity (Source: National Weather Service)

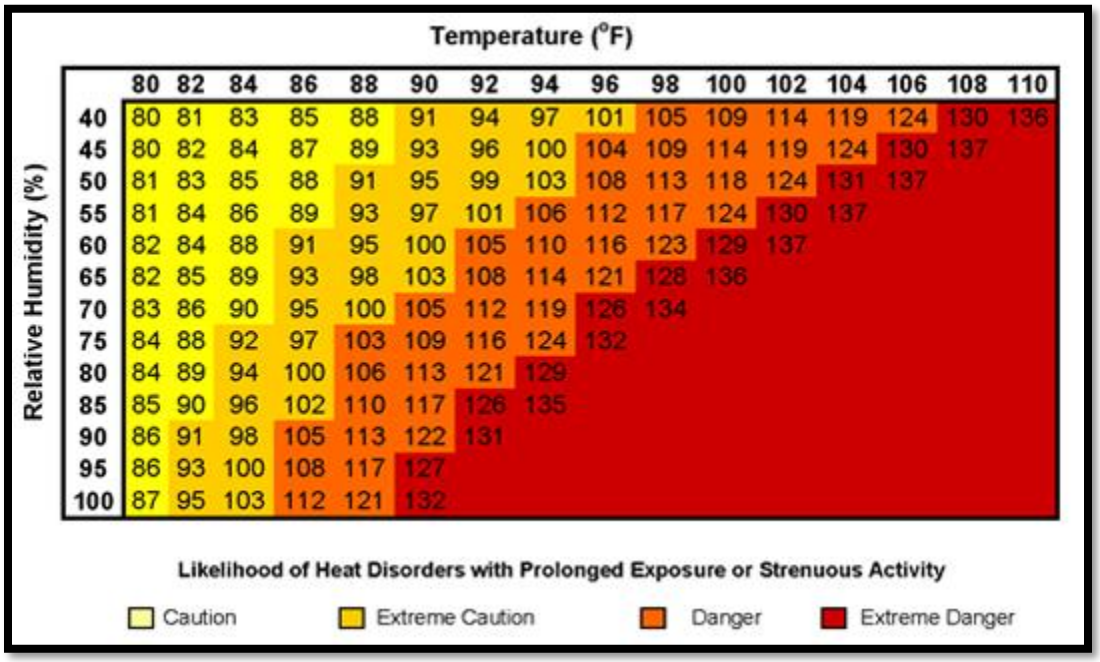


Table 2-14: Summary of Heat Index Risk Levels with Protective Measures (Source: National Weather Service)

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning.
91°F to 103°F	Moderate	Implement precautions and heighten awareness.
103°F to 115°F	High	Additional precautions to protect workers.
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures.

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 Concordia Parish as all of the adjacent parishes, the entire planning area for Concordia Parish is equally at risk for extreme heat.

Previous Occurrences / Extents

NOAA reports a total of 15 significant extreme heat events occurring within the boundaries of Concordia Parish between the years of 1990 to 2015. On the next page, *Table 2-15* provides an overview of extreme heat events that have impacted the Concordia Parish planning area since 2010. Based on historical data, the worst case scenario for Concordia Parish involving extreme heat would be a high risk level event on the HI scale with temperatures ranging from 103 °F to 115 °F.

Table 2-15: Previous Occurrences of Extreme Heat in Concordia Parish (Source: NOAA)

Date	Temperature (°F)
August 3, 2010	104
August 7, 2010	103

Frequency / Probability

Based on the geographical location of the State of Louisiana, and Concordia Parish in particular, extreme heat events occur frequently. Based on a review of significant extreme heat events that have been in excess of 103°F, in which Concordia Parish has had 15 recorded events, the probability of occurrence is estimated at 60%.

Estimated Potential Losses

According to the SHELDUS database, crop damage due to extreme heat in Concordia Parish has totaled approximately $966,627 since 1990. To estimate the potential losses of an extreme heat event on an annual basis, the total damages recorded for an extreme event is divided by the total number of years of available extreme heat data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of $38,665. The following table, based on the 2010 Land Use Land Classification data, provides an estimate of potential crop losses for Concordia Parish:

Table 2-16: Estimated Annual Crop Losses in Concordia Parish for Extreme Heat

Estimated Annual Potential Losses from Extreme Heat for Concordia Parish				
Unincorporated Concordia Parish (99.2% of Land)	Clayton (0.1% of Land)	Ferriday (0.2% of Land)	Ridgecrest (0.1% of Land)	Vidalia (0.4% of Land)
$38,356	$39	$77	$39	$155

There have been no reported injuries or deaths as a direct result of extreme heat in Concordia Parish during the 25-year record.

Vulnerability

See Appendix C for parish and municipality agricultural exposure to extreme heat hazards.

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 (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 ten inches 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, with low-lying, poorly drained areas being particularly susceptible to flooding during these months.

In Louisiana, six specific types of flooding 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, as well as the shape and land cover of its drainage basin. The smaller the river, the faster that 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 River, 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, tsunamis, or gradual sea level rise.

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 flooding:

- **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-year 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-year flood event is larger in magnitude, but it has a smaller chance of recurrence (1%). A 500-year flood is significantly larger than both a 100-year event and a 10-year 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-year flood event does not mean an event of that magnitude occurs only once in X years. Instead, it 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 general 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-year flood event as having a 25% chance of occurring over the life of a 30-year mortgage.

It is essential to understand that the magnitude of an X-year 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-year flood events can have very different impacts. The 100-year flood event in two separate locations have the same likelihood to occur, but they do not necessarily have the same magnitude. For example, a 100-year event for the Mississippi River means something completely different in terms of discharge values (ft^3/s) than for the Amite River. Not only are the magnitudes of 100-year events different between rivers, they can be different along any given river. A 100-year event upstream is different from one downstream due to the variation of river characteristics (volume, discharge, and topography). As a result, the definition of what constitutes a 100-year flood event is specific to each location, river, and time, since floodplain and river characteristics temporally fluctuate. 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-year flood 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 Program Rate Maps. The NFIP and FEMA suggest insurance rates based on Special Flood Hazard Areas (SFHAs), as diagrammed in *Figure 2-9*.

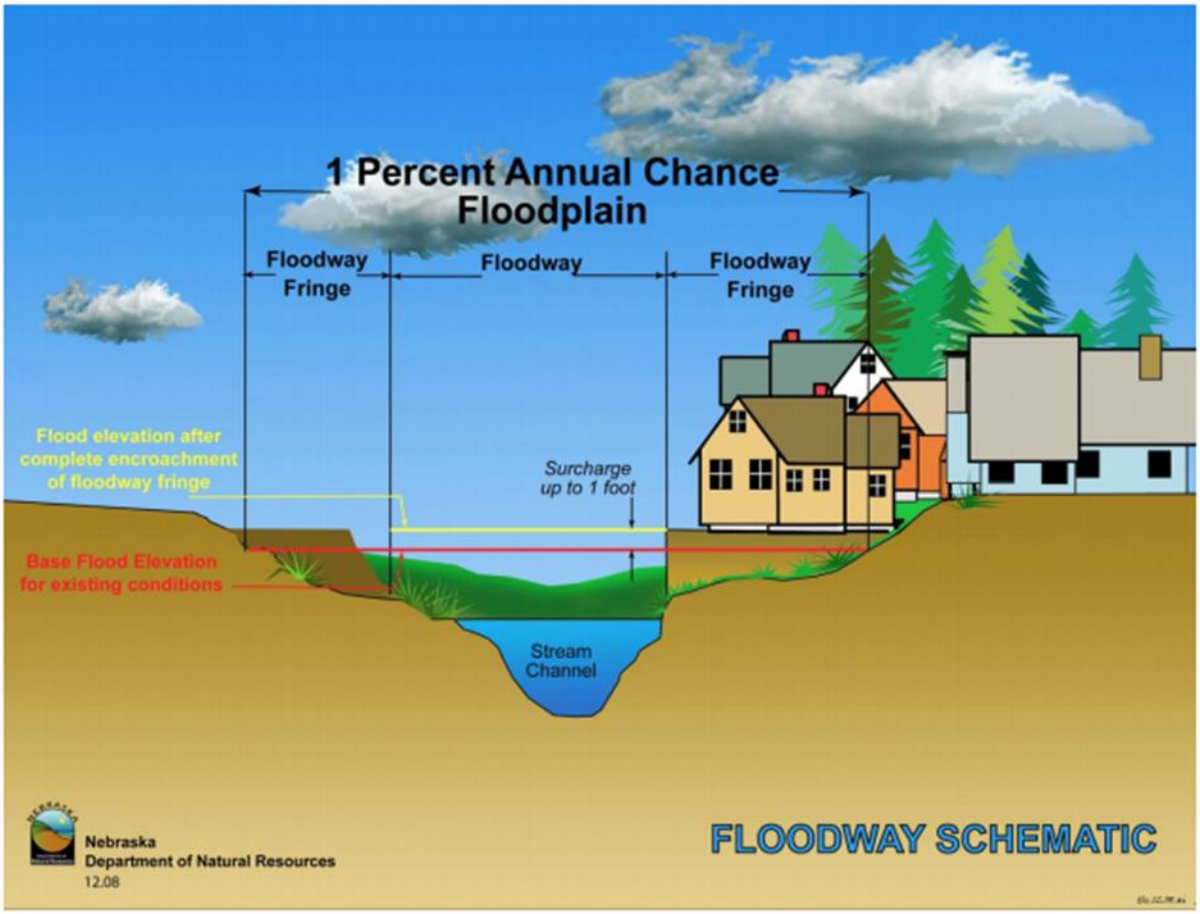


Figure 2-9: Schematic of 100-Year Floodplain. The Special Flood Hazard Area (SFHA) extends to the end of the floodway fringe.
(Source: Nebraska Department of Natural Resources)

A SFHA is the land area covered by the floodwaters of the base flood (red line in *Figure 2-9*), 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 some situations, deep and fast moving waters can 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 too quickly, will crack, split, or warp. Plywood can come apart and gypsum wallboard can deteriorate 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 are usually 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 can be 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. Have incurred flood-related damage on two occasions, in which the cost of the repair, on 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. It is covered under a contract for flood insurance made available under the NFIP; and
b. It has incurred flood related damage –
    1) For which four 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 two separate claims payments have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

Figures regarding repetitive loss structures for Concordia Parish are provided in the table below:

Table 2-17: Repetitive Loss Structures for Concordia Parish

Jurisdiction	Number of Structures	Residential	Commercial	Government	Total Claims	Total Claims Paid	Average Claim Paid
Concordia Parish (Unincorporated)	186	177	9	0	795	8,856,391	$11,140
Clayton	0	0	0	0	0	$0	$0
Ferriday	1	0	1	0	2	$84,309	$42,155
Ridgecrest	1	1	0	0	4	$105,132	$26,283
Vidalia	4	3	1	0	9	$153,051	$17,006
Total	192	181	11	0	810	$9,198,883	$11,357

Of the 192 repetitive loss structures, 171 were able to be geocoded in order to provide an overview of where the repetitive loss structures were located throughout the parish. *Figure 2-10* shows the approximate location of the 171 structures, while *Figure 2-11* shows where the highest concentration of repetitive loss structures are located. Through the repetitive loss map, it is clear that the primary concentrated area of repetitive loss structures is focused in and around the incorporated areas of Ridgecrest and Vidalia.

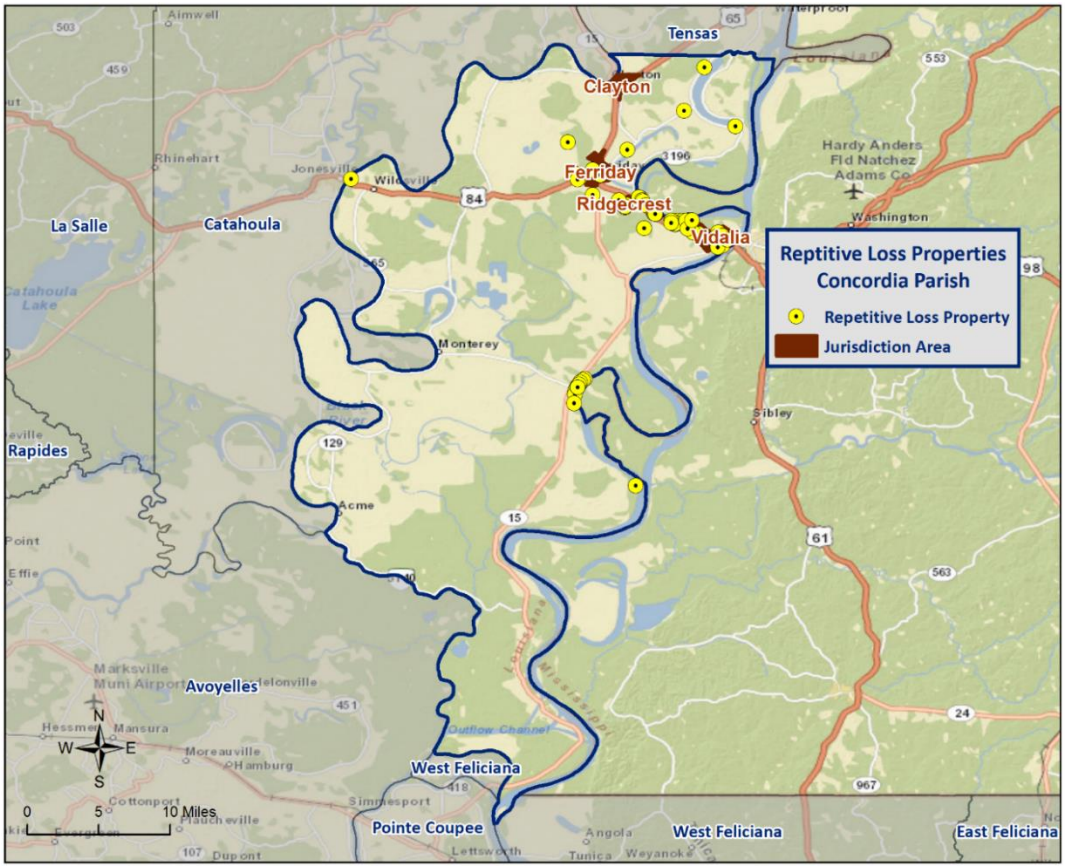


Figure 2-10: Repetitive Loss Properties in Concordia Parish

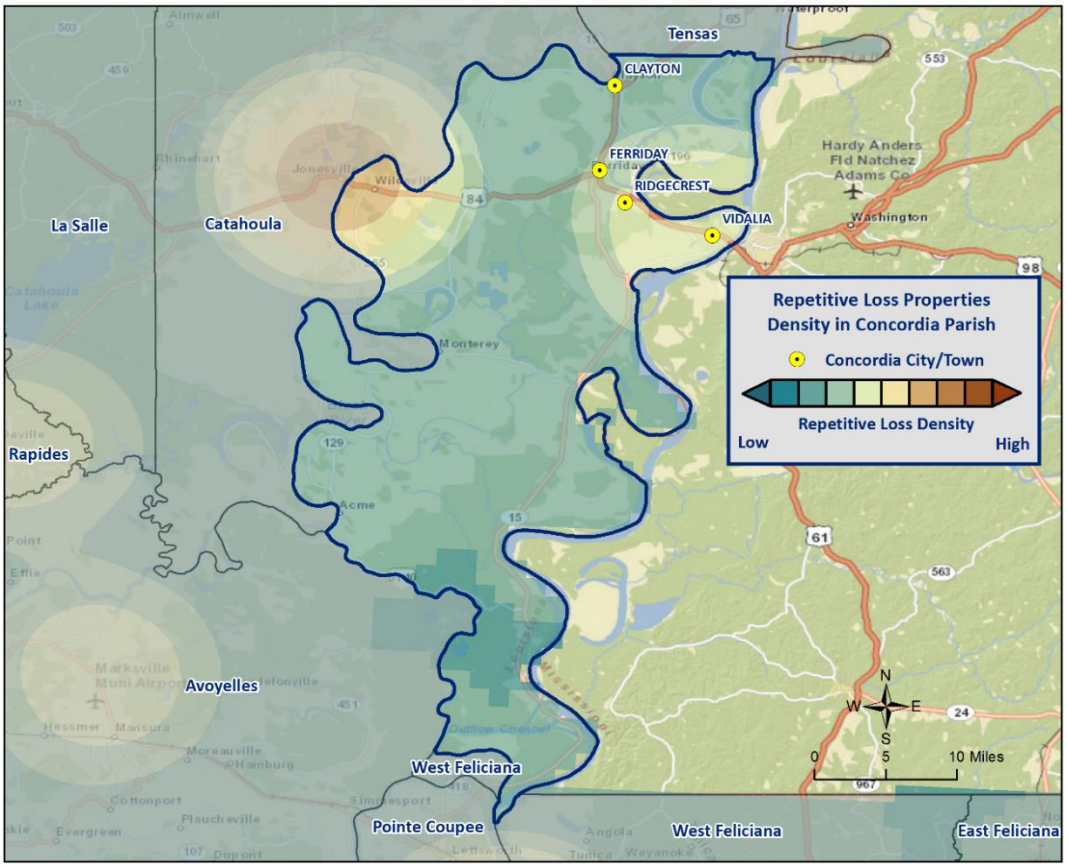


Figure 2-11: Repetitive Loss Property Densities in Concordia Parish

National Flood Insurance Program

Flood insurance statistics indicate that Concordia Parish has 1,243 flood insurance policies with the NFIP, with total annual premiums of $610,253. Concordia Parish and the incorporated areas of Clayton, Ferriday, Ridgecrest, and Vidalia are all participants in the NFIP. Concordia Parish and each of the incorporated jurisdictions will continue to adopt and enforce floodplain management requirements, including regulating new construction Special Flood Hazard Areas, and will continue to monitor activities including local requests for new map updates. Flood insurance statistics and additional NFIP participation details for Concordia Parish are provided in the tables to follow.

Concordia Parish and the communities listed above will continue their active participation in the NFIP through various education and outreach activities. These activities will include community outreach on the availability of flood insurance within the parish and incorporated municipalities, as well as flood safe building initiatives throughout the parish. The Parish Floodplain Manager will continue to work in coordination with each community to ensure floodplain management regulations are adopted and enforced. The Parish Floodplain Manager will also continue to seek and attend floodplain management and NFIP continuing education.

Table 2-18: Summary of NFIP Policies for Concordia Parish

Location	No. of Insured Structures	Total Insurance Coverage Value	Annual Premiums Paid	No. of Insurance Claims Filed Since 1978	Total Loss Payments
Concordia Parish (Unincorporated)	805	$197,632,700	$386,230	1,522	$13,070,861
Clayton	16	$2,339,300	$7,396	23	$144,700
Ferriday	54	$13,848,300	$29,348	15	$147,812
Ridgecrest	25	$4,385,000	$8,641	6	$257,641
Vidalia	343	$81,749,200	$178,638	86	$504,817
Total	1,243	$299,954,500	$610,253	1,652	$14,125,831

Table 2-19: Summary of Community Flood Maps for Concordia Parish

CID	Community Name	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Date Joined the NFIP	Tribal
220053#	Concordia Parish	-	4/3/1978	6/2/1994	4/3/1978	No
220054#	Clayton	-	8/1/1978	(NSFHA)	8/1/1978	No
220055#	Ferriday	12/28/1973	12/15/1977	12/15/1977	12/15/1977	No
220056#	Ridgecrest	5/24/1974	4/3/1978	4/3/1978	4/3/1978	No
220057#	Vidalia	1/4/1974	6/15/1978	1/5/1982	6/15/1978	No

According to the Community Rating System (CRS) list of eligible communities, Concordia Parish and the incorporated areas of Clayton, Ferriday, Ridgecrest, and Vidalia do not participate in the CRS.

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 passengers within the vehicle. Victims of flooding have often put themselves in perilous situations by entering flood waters that they believe to be safe, or by ignoring travel advisories.

Major health concerns are also associated with floods. Flood waters 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. Flood waters 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 Concordia Parish

By definition, flooding is caused when an area receives more water than the drainage system can convey. The following is a synopsis of the types of flooding that Concordia Parish experiences.

Flash Flooding: Flash flooding is characterized by a rapid rise in water level, high velocity, and large amounts of debris. It is capable of uprooting trees, undermining buildings and bridges, and scouring new channels. Major factors in flash flooding are the high intensity and short duration of rainfall, as well as the steepness of watershed and stream gradients.

Local Drainage or High Groundwater Levels: Locally heavy precipitation may produce flooding in areas other than delineated floodplains or along recognizable drainage channels. If local conditions cannot accommodate intense precipitation through a combination of infiltration and surface runoff, water may accumulate and cause flooding problems.

Backwater Flooding: Backwater flooding is normally associated with riverine flooding and connotes minimal velocity. All low lying areas are at risk. A heavy rainfall event coupled with a swollen river, canal, bayou, or marsh hinders drainage outflow, causing backwater flooding to the same areas susceptible to storm surge.

Riverine Flooding: Riverine flooding is, by definition, river-based. Most of the riverine flooding problems occur when the Mississippi River crests at flood stage levels, causing extensive flooding in low-lying areas.

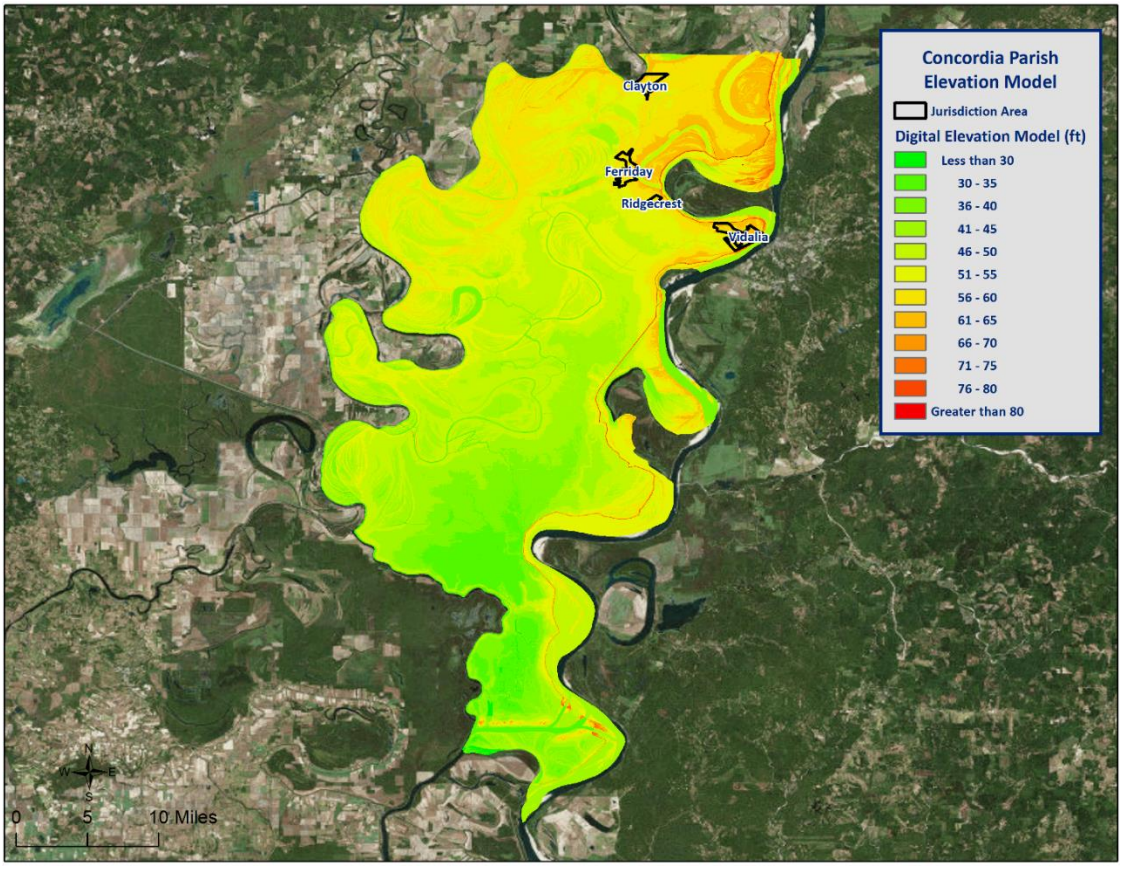


Figure 2-12: Elevation throughout Concordia Parish

Looking at the digital elevation model (DEM) for Concordia Parish on the previous page is instructive in visualizing where the low lying and high risk areas are for the parish. Elevations in the parish range from less than 30 feet to approximately 80 feet. The highest elevations in the parish are approximately 80 feet, located in the unincorporated area of the parish. These higher elevations are sporadic throughout the parish and are not common for the majority of the area. The incorporated areas range in elevation from 52 to 65 feet, with Ferriday and Ridgecrest averaging 52 feet, Clayton averaging 56 feet, and Vidalia averaging 65 feet.

Location

Concordia Parish has experienced significant flooding in its history and can expect more in the future. Many parts of the parish are located in the 100-year floodplain and its' proximity to the Mississippi River causes additional flooding concerns.

The following are enlarged maps of the incorporated areas showing the areas within each jurisdiction that are at risk of flooding:

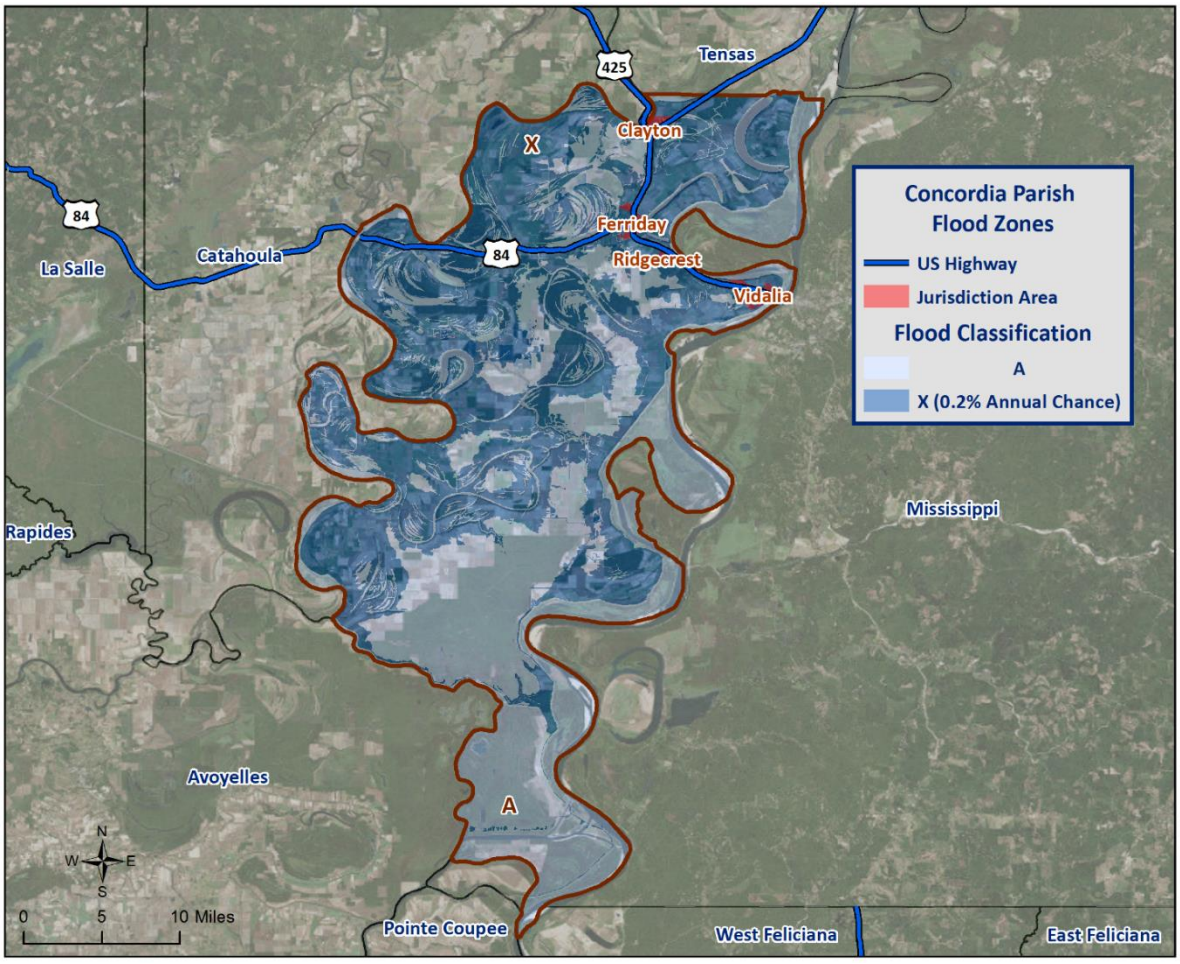


Figure 2-13: Concordia Parish Areas within the Flood Zones

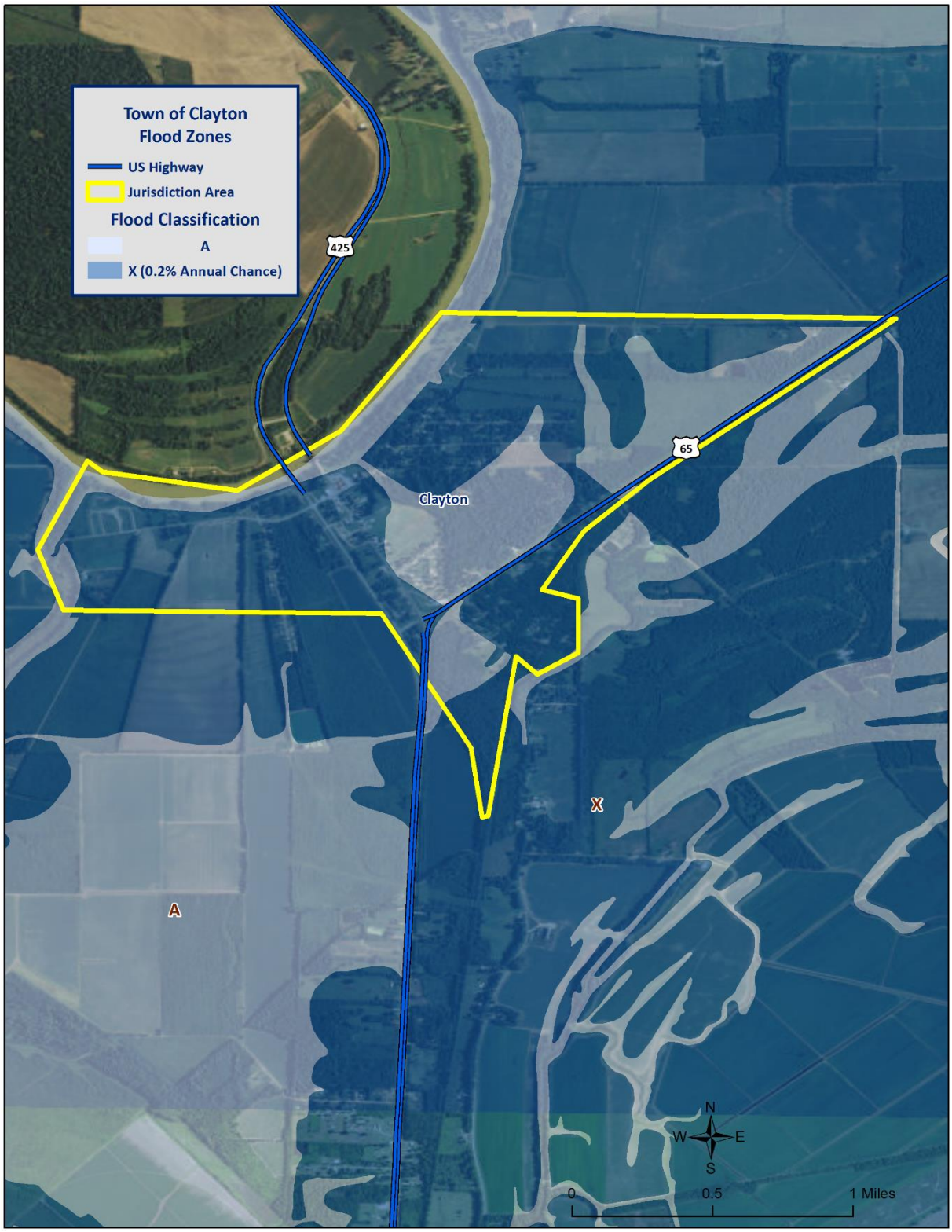


Figure 2-14: Town of Clayton Areas within the Flood Zones

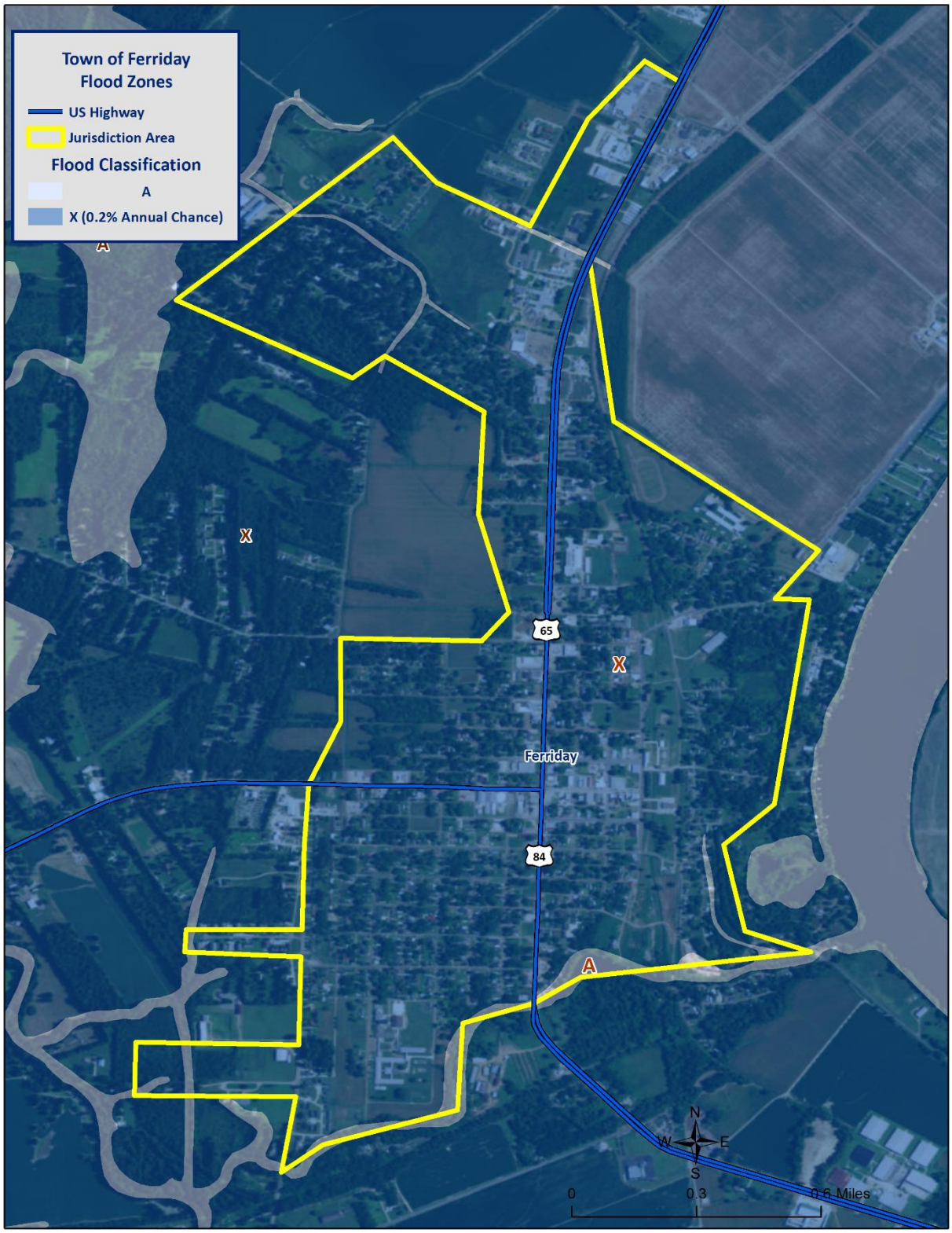


Figure 2-15: Town of Ferriday Areas within the Flood Zones

Figure 2-16: Town of Ridgecrest Areas within the Flood Zones

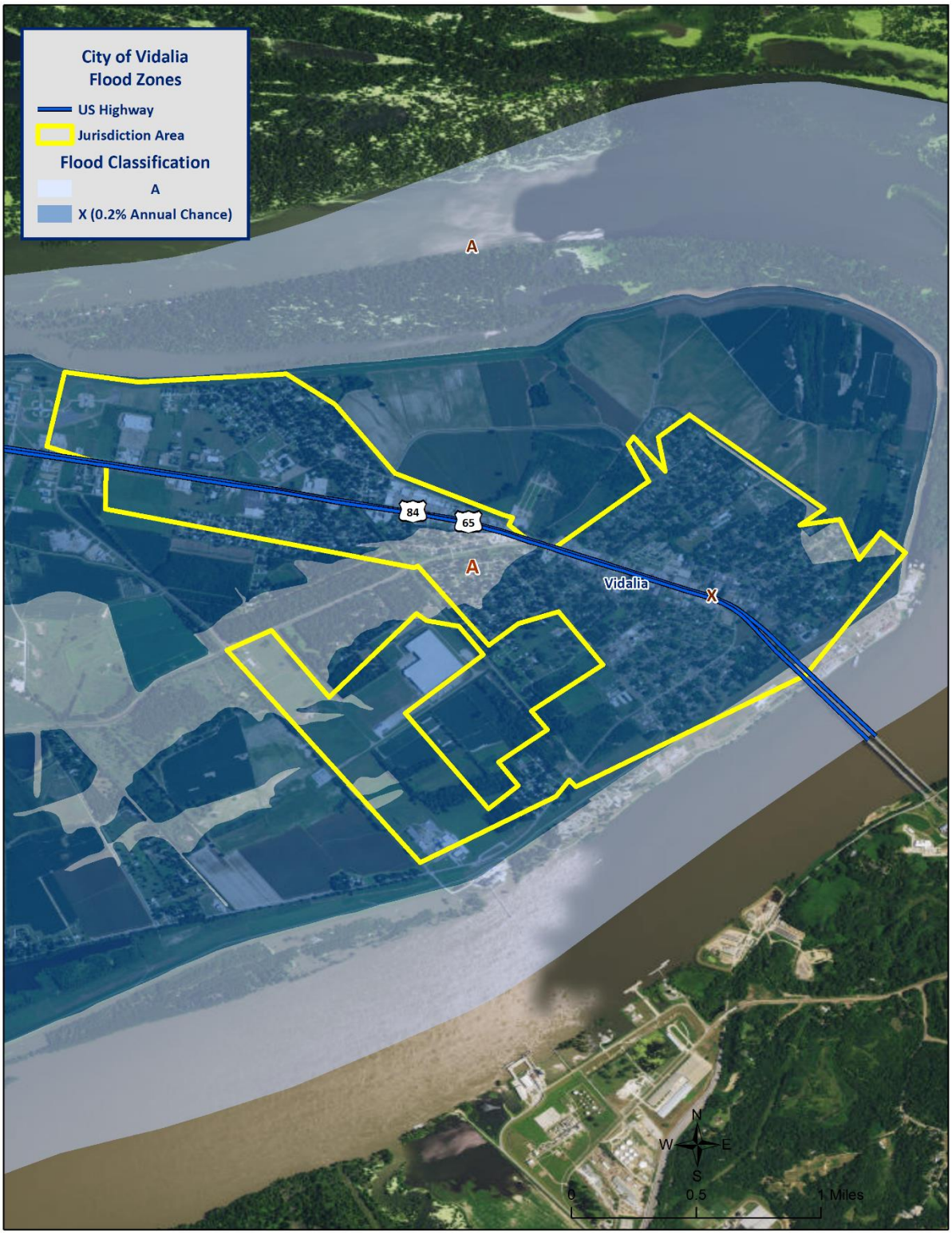


Figure 2-17: City of Vidalia Areas within the Flood Zones

Previous Occurrences / Extents

Historically, there have been 25 flooding events that have created significant flooding in Concordia Parish between 1990 and 2015. Below is a brief synopsis of the seven flooding events that have occurred since 2010, including flooding events that have occurred since the parish's last planning update.

Table 2-20: Historical Floods in Concordia Parish with Locations from 2010 - 2015

Date	Extents	Type of Flooding	Estimated Damages	Location
August 18, 2010	The remnants of Tropical Depression 5 caused extensive flooding in the parish. Water surrounded several homes in the Ridgecrest area.	Flash Flood	$251,000	UNINCORPORATED AREA, FERRIDAY, AND RIDGECREST
March 9, 2011	Scattered thunderstorms Clayton area caused localized flooding. A parking lot in the Clayton area was completely underwater.	Flood	$0	CLAYTON
May 9, 2011	Flooding along the Mississippi River caused extensive flooding of low lying farmland around the river. All of the flood waters were within the mainline levee. Flooding along the Concordia riverfront was extensive.	Flood	$5,000,000	UNINCORPORATED AREA
June 1, 2011	Flooding along the Mississippi River caused extensive flooding of low lying areas. Significant flooding ended on June 17th.	Flood	$200,000	UNINCORPORATED AREA
February 3, 2012	Widespread rain caused several roads to flood in Concordia Park. Several homes were also surrounded by flood waters.	Flash Flood	$10,000	UNINCORPORATED AREA
January 10, 2013	Several thunderstorms caused flash flooding to occur in the Clayton area. Watered entered several homes.	Flash Flood	$100,000	CLAYTON
July 5, 2015	Heavy rain caused flooding across Concordia Avenue Extension in Vidalia.	Flash Flood	$2,000	VIDALIA

The worst-case scenarios are based on several different types of flooding events. Storm water excesses and riverine flooding primarily affect the low-lying areas of the parish, and flood depths of up to six feet can be expected in the unincorporated areas of the parish. The incorporated areas of Ridgecrest, can expect flood depths from two to four feet, while the incorporated areas of Vidalia, Clayton, and Ferriday can expect flooding levels of approximately one to two feet.

Frequency / Probability

While other parts of this plan, along with the State's Hazard Mitigation Plan, have relied on the SHELDUS database to provide the annual probability, due to Concordia Parish having multiple jurisdictions, it was necessary to assess the historical data found in the National Climatic Data Center for Concordia 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 2-21: Annual Flood Probabilities for Concordia Parish

Jurisdiction	Annual Probability	Return Frequency
Concordia Parish (Unincorporated)	52%	1 – 2 years
Clayton	68%	1 – 2 years
Ferriday	60%	1 – 2 years
Ridgecrest	48%	2 – 3 years
Vidalia	64%	1 – 2 years

Based on historical record, the overall flooding probability for the entire Concordia Parish planning area is 100%, with 25 events occurring over a 25-year period.

Estimated Potential Losses

Using the Hazus 2.2 Flood Model, along with the Parish DFIRM, the 100-year flood scenario was analyzed to determine losses from this worst-case scenario. Below, *Table 2-22* shows the total economic losses that would result from this occurrence.

Table 2-22: Estimated Losses in Concordia Parish from a 100-Year Flood Event (Source: Hazus 2.2)

Jurisdiction	Estimated Total Losses from 100-Year Flood Event
Concordia Parish (Unincorporated)	$7,466,000
Clayton	$41,000
Ferriday	$12,000
Ridgecrest	$23,000
Vidalia	$21,000
Total	$7,563,000

The Hazus 2.2 Flood 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 following tables. These sectors are comprised of privately owned structures/facilities, as well as locally, state, and federally owned structures/facilities.

Table 2-23: Estimated 100-Year Flood Losses for Unincorporated Concordia Parish by Sector (Source: Hazus 2.2)

Concordia Parish (Unincorporated)	Estimated Total Losses from 100-Year Flood Event
Agricultural	$408,000
Commercial	$1,065,000
Government	$185,000
Industrial	$1,043,000
Religious / Non-Profit	$113,000
Residential	$4,638,000
Schools	$14,000
Total	$7,466,000

Table 2-24: Estimated 100-Year Flood Losses for Clayton by Sector (Source: Hazus 2.2)

Clayton	Estimated Total Losses from 100-Year Flood Event
Agricultural	$0
Commercial	$0
Government	$0
Industrial	$0
Religious / Non-Profit	$0
Residential	$41,000
Schools	$0
Total	$41,000

Table 2-25: Estimated 100-Year Flood Losses for Ferriday by Sector (Source: Hazus 2.2)

Ferriday	Estimated Total Losses from 100-Year Flood Event
Agricultural	$0
Commercial	$0
Government	$0
Industrial	$0
Religious / Non-Profit	$0
Residential	$12,000
Schools	$0
Total	$12,000

Table 2-26: Estimated 100-Year Flood Losses for Ridgecrest by Sector
(Source: Hazus 2.2)

Ridgecrest	Estimated Total Losses from 100-Year Flood Event
Agricultural	$0
Commercial	$0
Government	$2,000
Industrial	$0
Religious / Non-Profit	$0
Residential	$21,000
Schools	$0
Total	$23,000

Table 2-27: Estimated 100-Year Flood Losses for Vidalia by Sector
(Source: Hazus 2.2)

Vidalia	Estimated Total Losses from 100-Year Flood Event
Agricultural	$0
Commercial	$0
Government	$3,000
Industrial	$0
Religious / Non-Profit	$0
Residential	$18,000
Schools	$0
Total	$21,000

Threat to People

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

Table 2-28: Vulnerable Populations Susceptible to a 100-Year Flood Event
(Source: Hazus 2.2)

Number of People Exposed to Flood Hazards			
Location	**# in Community**	**# in Hazard Area**	**% in Hazard Area**
Concordia Parish (Unincorporated)	**11,607**	**8,016**	**68.8%**
Clayton	**711**	**11**	**1.5%**
Ferriday	**3,511**	**7**	**0.2%**
Ridgecrest	**694**	**78**	**11.2%**
Vidalia	**4,299**	**15**	**0.3%**
Total	**20,822**	**8,094**	**38.9%**

The Hazus 2.2 Flood Model was also extrapolated to provide an overview of vulnerable populations throughout the jurisdictions in the following tables:

Table 2-29: Vulnerable Populations Susceptible to a 100-Year Flood Event in Unincorporated Concordia Parish
(Source: Hazus 2.2)

Concordia Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	7,983	68.8%
Persons Under 5 Years	549	6.9%
Persons Under 18 Years	2,006	25.1%
Persons 65 Years and Over	1,160	14.5%
White	4,585	57.4%
Minority	3,398	42.6%

Table 2-30: Vulnerable Populations Susceptible to a 100-Year Flood Event in Clayton
(Source: Hazus 2.2)

Clayton		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	11	1.5%
Persons Under 5 Years	1	8.6%
Persons Under 18 Years	3	30.5%
Persons 65 Years and Over	2	14.8%
White	3	30.2%
Minority	8	69.8%

Table 2-31: Vulnerable Populations Susceptible to a 100-Year Flood Event in Ferriday
(Source: Hazus 2.2)

Ferriday		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	7	0.2%
Persons Under 5 Years	1	9.3%
Persons Under 18 Years	2	31.7%
Persons 65 Years and Over	1	12.5%
White	1	15.4%
Minority	6	84.6%

Table 2-32: Vulnerable Populations Susceptible to a 100-Year Flood Event in Ridgecrest (Source: Hazus 2.2)

Ridgecrest		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	78	11.2%
Persons Under 5 Years	7	8.4%
Persons Under 18 Years	22	27.7%
Persons 65 Years and Over	12	15.3%
White	54	69.0%
Minority	24	31.0%

Table 2-33: Vulnerable Populations Susceptible to a 100-Year Flood Event in Vidalia (Source: Hazus 2.2)

Vidalia		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	15	0.3%
Persons Under 5 Years	1	6.6%
Persons Under 18 Years	4	25.9%
Persons 65 Years and Over	2	16.6%
White	11	72.0%
Minority	4	28.0%

Vulnerability

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

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. Consequently, the air masses 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, multi-cell, 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 multi-cell 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, which warms 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, has the ability to issue advisory messages based on forecasts and observations. The following are the advisory messages that may be issued, along 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 parishes (counties).

A variety of hazards might be produced by thunderstorms, including lightning, hail, tornadoes or waterspouts, flash flooding, and high-speed winds called downbursts. Nevertheless, given the criteria, the National Oceanic and Atmospheric Administration characterizes a thunderstorm as severe when it produces one or more of the following:

- Hail of one 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 initially develops in the upper atmosphere as ice crystals that are bounced about by high-velocity updraft winds. The ice crystals grow through deposition of water vapor onto their surface. They then fall partially to a level in the cloud where the temperature exceeds the freezing point, melt partially, and then get caught in another updraft whereupon re-freezing and deposition grows another concentric layer of ice. After several trips up and down the cloud, they develop enough weight to fall. The size of hailstones varies depending on the severity and size of the thunderstorm. Higher surface temperatures generally mean stronger updrafts, which allow more massive hailstones to be supported by updrafts, leaving them suspended longer. This longer suspension time results in larger hailstone sizes. The tables on the next page display the TORRO Hailstorm Intensity Scale, as well as a spectrum of hailstone diameters and their everyday equivalents.

Table 2-34: 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 aircraft bodywork
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 2-35: 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 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 distinguishes these as shown in the following table.

Table 2-36: 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 hilly 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.

The following table 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 2-37: 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	N/A
12	74+	Hurricane	N/A

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 table below outlines the lightning activity level that is a measurement of lightning activity.

Table 2-38: 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 are a climatological based hazard, the entire planning area for Concordia Parish is equally at risk for hailstorms.

Previous Occurrences / Extents

The SHELDUS database reports 16 significant hailstorm events occurring within the boundaries of Concordia Parish between the years of 1990-2015. According to the National Climatic Data Center, hailstorm diameters experienced in Concordia Parish have ranged from 0.75 inches to 4.50 inches since 1989. The most frequently recorded hail size has been 1.00 inch diameters. *Figure 2-18* displays the density of hailstorms in Concordia Parish and adjacent parishes. Based on the National Climatic Data Center dataset, *Table 2-39* provides an overview of hailstorms that have impacted the Concordia Parish planning area since 2010. Concordia Parish can expect to experience hail up to 4.50 inches in diameter for future events. Since 2010, there have been no significant hailstorm events in the incorporated areas of Ferriday and Ridgecrest.

Table 2-39: Previous Occurrences of Hailstorms in Concordia Parish (Source: NCDC)

Date	Recorded Hail Size (inches)	Location
February 21, 2010	0.88	CLAYTON
February 21, 2010	1	SLOCUM
February 21, 2010	0.88	CROSBY
May 18, 2010	1	EVA
October 12, 2010	1	BLACK HAWK
May 23, 2013	1.75	MONTEREY
December 23, 2014	1	VIDALIA
December 23, 2014	2.75	LISMORE

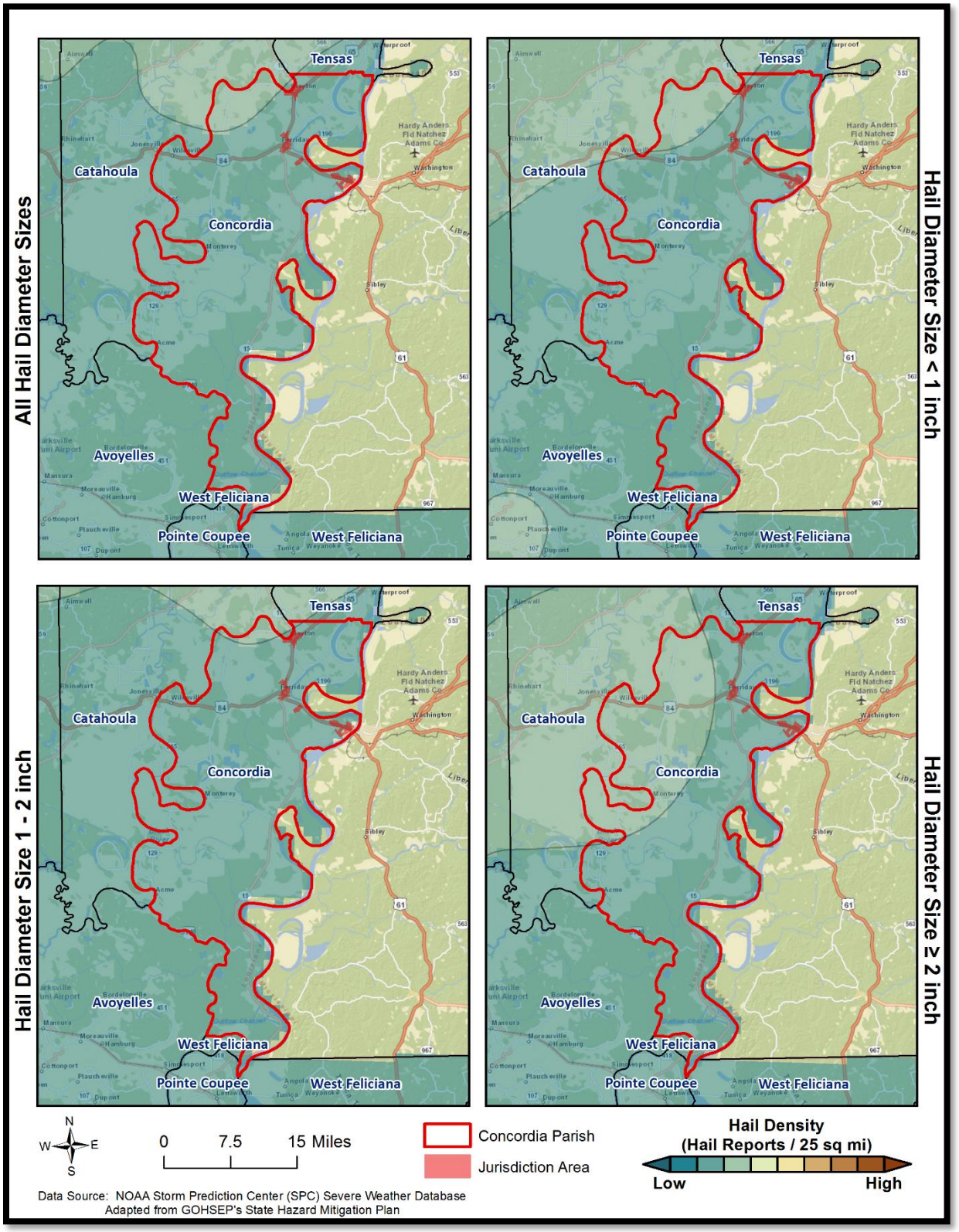


Figure 2-18: Density of Hailstorms by Diameter from 1950-2012
(Source: State of Louisiana Hazard Mitigation Plan 2014)

Frequency

Based on historical data from SHELDUS for the past 25 years, it is estimated the probability of occurrence for a significant hailstorm event is approximately 64%. The probability was determined based on a review of significant hail data that has caused damages in the last 25 years, in which Concordia Parish has had 16 recorded events.

Estimated Potential Losses

According to the SHELDUS database, property damage due to hailstorms in Concordia Parish have totaled approximately $294,034 since 1990. A list of total damages by event can be found in *Table 2-40*. To estimate the potential losses of a hail 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 (1990 – 2015). This provides an annual estimated potential loss of $11,761. *Table 2-41* provides an estimate of potential property losses for Concordia Parish.

Table 2-40: Property Damage Caused by Hailstorms in Concordia Parish (Source: SHELDUS)

Date	Property Damage
March 1999	$76,907
May 2001 (6 storms)	$138,117
March 2003 (4 storms)	$18,991
April 2003	$1,266
May 2003	$1,266
July 2003	$1,266
May 2006	$46,222
May 2013	$10,000

Table 2-41: Estimated Annual Property Losses in Concordia Parish from Hailstorms

Estimated Annual Potential Losses from Hailstorms for Concordia Parish				
Unincorporated Concordia Parish (55.7% of Population)	Clayton (3.4% of Population)	Ferriday (16.9% of Population)	Ridgecrest (3.3% of Population)	Vidalia (20.6% of Population)
$6,556	$402	$1,983	$392	$2,428

There have been no deaths or injuries due to hailstorms from 1990 – 2015 in Concordia Parish.

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, the entire planning area for Concordia Parish is equally at risk for high winds.

Previous Occurrences / Extents

The SHELDUS database reports a total of 165 thunderstorm wind events occurring within the boundaries of Concordia Parish between the years of 1990 to 2015. The significant thunderstorm wind events experienced in Concordia Parish have ranged in wind speed from 45 mph to 81 mph. Concordia Parish can expect to receive thunderstorm winds up to 81 mph for future high wind events. The table below provides an overview of significant high wind events over the last five years:

Table 2-42: Previous Occurrences for Thunderstorm High Wind Events

Location	Date	Recorded Wind Speeds (mph)	Property Damage	Crop Damage
BLACK HAWK	May 17, 2010	69	$19,565	$0
MONTEREY	July 26, 2010	58	$10,870	$0
RED GUM	November 29, 2010	60	$0	$0
CONCORDIA JCT	February 1, 2011	58	$5,435	$0
MINORCA	April 26, 2011	58	$81,522	$0
MONTEREY	June 2, 2011	58	$130,345	$0
CONCORIDA JCT	June 3, 2011	58	$43,478	$0
VIDALIA	June 3, 2011	58	$43,478	$0
CLAYTON	June 3, 2011	58	$54,348	$0
DEER PARK	September 28, 2011	56	$543	$0
MONTEREY	February 3, 2012	58	$2,065	$0
CLAYTON	May 21, 2012	58	$10,323	$0
CONCORDIA JCT	May 31, 2012	63	$20,647	$0
WILDSVILLE	August 9, 2012	63	$5,162	$0
CLAYTON	December 20, 2012	58	$10,323	$0
CONCORDIA JCT	February 10, 2013	58	$0	$0
FROGMORE	March 31, 2013	58	$0	$0
CONCORDIA JCT	March 28, 2014	69	$60,071	$0
VIDALIA	March 28, 2014	63	$35,042	$0
CONCORDIA JCT	May 17, 2015	58	$3,000	$0
MONTEREY	May 25, 2015	58	$8,000	$0
MAITLAND	June 24, 2015	45	$1,000	$0
MINORCA	July 25, 2015	63	$10,000	$0

Since 2010, there have been no significant thunderstorm wind events in the incorporated areas of Ferriday and Ridgecrest.

Frequency

High winds are a fairly common occurrence within Concordia Parish, with an annual chance of occurrence calculated at 100%.

Estimated Potential Losses

Since 1990, there have been 165 significant wind events that have resulted in property damages according to the SHELDUS database. The total property damages associated with those storms have totaled $969,353. To estimate the potential losses 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 (1990 – 2015). This provides an annual estimated potential loss of $38,774. The following table provides an estimate of potential property losses for Concordia Parish:

Table 2-43: Estimated Annual Property Losses in Concordia Parish Resulting from High Winds

Estimated Annual Potential Losses from Thunderstorm Winds for Concordia Parish				
Unincorporated Concordia Parish (55.7% of Population)	Clayton (3.4% of Population)	Ferriday (16.9% of Population)	Ridgecrest (3.3% of Population)	Vidalia (20.6% of Population)
$21,614	$1,324	$6,538	$1,292	$8,005

There have been no reported injuries or fatalities as a result of a thunderstorm wind event over the 25-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 Concordia Parish.

Previous Occurrences / Extents

The SHELDUS database reports a total of two lightning events occurring within the boundaries of Concordia Parish between the years of 1990-2015. 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 Concordia Parish, which occur on a nearly monthly basis. The planning area can expect to have a lightning density of 11-12 flashes per sq. mile per year. The table below provides an overview of significant lightning strikes over the last five years.

Table 2-44: Previous Occurrences of Significant Lightning Strikes in Concordia Parish from 1990 – 2015 (Source: NCDC and SHELDUS)

Location	Date	Summary	Property Damage
MONTEREY	February 23, 2005	Lightning killed 11 cows as they stood around a hay ring.	$0
VIDALIA	June 3, 2011	Two houses were struck by lightning in Vidalia. Nobody was injured.	$20,713

Since 2010, there have been no lightning events that have caused property damage or loss of life in the unincorporated areas and the incorporated areas of Clayton, Ferriday, and Ridgecrest.

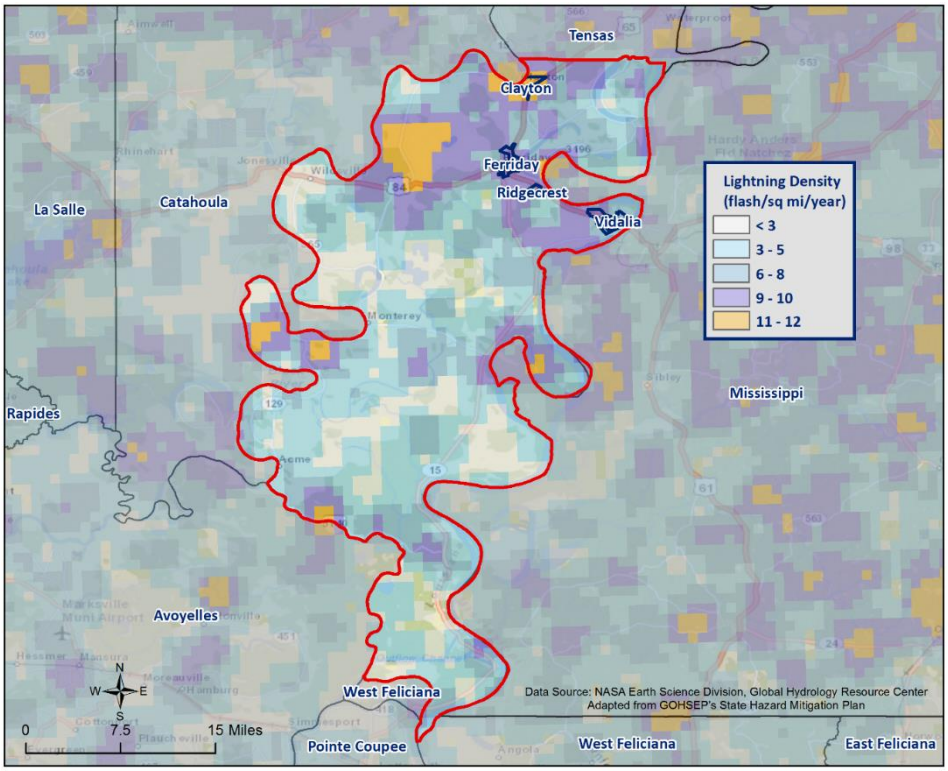


Figure 2-19: Lightning Density Reports for Concordia Parish

Frequency

Lightning can strike anywhere and is produced by every thunderstorm, so the chance of lightning occurring in Concordia 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 is a less likely event. According to SHELDUS, there have been two lightning events that have caused property damages or injuries over the last 25 years, establishing an annual probability of 8%.

Estimated Potential Losses

Since 1990, there have been two significant lightning events that have resulted in property damages according to the SHELDUS database. The total property damages associated with lightning events totaled $20,713. To estimate the potential losses 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 (1990 – 2015). This provides an annual estimated potential loss of $829. The following table provides an estimate of potential property losses for Concordia Parish:

Table 2-45: Estimated Annual Property Losses in Concordia Parish from Lightning

Estimated Annual Potential Losses from Thunderstorm Lightning for Concordia Parish				
Unincorporated Concordia Parish (55.7% of Population)	Clayton (3.4% of Population)	Ferriday (16.9% of Population)	Ridgecrest (3.3% of Population)	Vidalia (20.6% of Population)
$462	$28	$140	$28	$171

There have been no reported injuries or human fatalities in Concordia Parish as a result of a lightning strikes over the 25-year record.

Vulnerability

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

Tornadoes

Tornadoes (also called twisters or 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. This usually results in a counterclockwise rotation 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 2-46* 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 2-46: Comparison of the Enhanced Fujita (EF) Scale to the Fujita (F) Scale

	Enhanced Fujita Scale					
	EF0	**EF1**	**EF2**	**EF3**	**EF4**	**EF5**
Wind Speed (mph)	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 2-47: 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.
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 has the ability to issue advisory messages based on forecasts and observations. The following are the advisory messages that may be issued, along 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 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 with 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 projectiles 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 Concordia Parish with actual locations, tornadoes in general are a climatological based hazard and have the same approximate probability of occurring in Concordia Parish as all of its jurisdictions. Because a tornado has a similar probability of striking anywhere within the planning area for Concordia Parish, all jurisdictions are equally at risk for tornadoes.

Previous Occurrences / Extents

SHELDUS reports a total of 18 tornadoes or waterspouts occurring within the boundaries of Concordia Parish between the years of 1990-2015. The tornadoes experienced in Concordia Parish have from ranged EF1 to EF2 on the EF scale, and ranged from F0 to F3 on the F scale. The worst case scenario Concordia Parish can expect in the future is an EF3 tornado.

The tornadoes that caused the most damage to property occurred on February 2007. The first tornado crossed the wooded land just northwest of the Wildsville Community along a path that was mostly inaccessible by vehicle. The tornado intensified as it downed or snapped numerous trees. The second tornado mangled, snapped, and uprooted hundreds of trees and numerous power lines. Near Dunbarton, two mobile homes were destroyed as the tornado continued toward Clayton. This tornado also remained over rural areas with much of the path not accessible by vehicle.

Table 2-48: Historical Tornadoes in Concordia Parish with Locations from 1990-2015

Date	Impacts	Property Damage	Location	Magnitude
September 9, 1990	0.3 mile path with a width of 30 yards. A weak tornado snapped off the crown of several pine trees which blocked Highway 129	$89	UNINCORPORATED AREA	F1
May 29, 1991	1 mile path with a width of 23 yards. A tornado damaged the roof of Ferriday High School.	$171,040	UNINCORPORATED AREA	F1
March 5, 1992	10 mile path with a width of 50 yards. A tornado destroyed three storage sheds at the Kunkle Storage Company and damaged two planes and a storage shed at the Dixie Aero Crop Spraying Company.	$166,042	UNINCORPORATED AREA	F1
November 21, 1992	3 mile path with a width of 100 yards. A tornado injured 6 people, destroyed 2 homes and a mobile home, and took off the roof of a barn.	$83,021	UNINCORPORATED AREA	F3
December 15, 1992	0.1 mile path with a width of 23 yards. A tornado destroyed two concrete block storage buildings and heavily damaged the roof of a nearby home.	$8,302	UNINCORPORATED AREA	F1
April 30, 1994	0.3 mile path with a width of 10 yards. The tornado overturned a mobile home in Eva, resulting in two injuries. It also destroyed two utility barns and damaged the roof of a house.	$7,860	MAYNA	F1
March 7, 1995	1 mile path with a width of 30 yards. Five people received minor injuries when their mobile home was severely damaged. Six additional mobile homes were destroyed and ten damaged.	$229,288	VIDALIA	F1
March 18, 2003	1.5 mile path with a width of 100 yards. A tornado touched down near Lismore and snapped numerous trees.	$12,661	LISMORE	F0
March 26, 2005	1 mile path with a width of 75 yards. A Coast Guard ship saw the tornado as it crossed the Mississippi River. Several trees were blown down or snapped.	$5,964	SPOKANE	F0

Date	Impacts	Property Damage	Location	Magnitude
September 24, 2005	2 mile path with a width of 75 yards. Some awning was torn from a house and one tree was uprooted. The tornado moved across Highway 129 where it damaged a shed in an open field and blew the skirting out from a mobile home.	$83,497	MONTEREY	F0
September 24, 2005	1 mile path with a width of 75 yards. The weak tornado tore off some limbs from trees and uprooted six trees.	$0	CLAYTON	F0
September 24, 2005	3 mile path with a width of 50 yards. The tornado uprooted a few trees with one landing on a mobile home causing one injury. The tornado then traveled into Tensas Parish.	$59,641	CLAYTON	F0
January 13, 2006	2 mile path with a width of 100 yards. The tornado tore a portion of the roof off two buildings and peeled shingles off many more homes and buildings.	$519,993	CLAYTON	F1
May 10, 2006	5 mile path with a width of 100 yards. The tornado moved through a corn field destroying a path of corn nearly 50 yards wide.	$0	FROGMORE	F1
February 24, 2007	3.33 mile path with a width of 300 yards. The tornado crossed the Tensas River several times and affected an area mostly inaccessible by vehicle.	$449,416	WILDSVILLE	EF2
February 24, 2007	10 mile path with a width of 500 yards. Two mobile homes were destroyed as the tornado affected an area mostly inaccessible by vehicle.	$337,062	DUNBARTON	EF2
September 3, 2008	1.8 mile path with a width of 50 yards. A tornado spawned by Hurricane Gustav damaged a mobile home by blowing out the windows and shifting the home off the blocks.	$7,574	NEW ERA	EF1
February 21, 2013	2.95 mile path with a width of 75 yards. The tornado tore a roof off a mobile home and overturned the trailer of an 18-wheeler. It also damaged a second roof, destroyed one shed, and flipped another.	$75,000	CLAYTON	EF1

The unincorporated area of the parish and the incorporated areas of Ferriday, Ridgecrest, and Vidalia have not experienced a tornado event from 2010 to the present. Since 2010, the year in which the last update to this hazard mitigation plan was written, Concordia Parish has had one tornadoes touch down in Clayton. The following is a brief synopsis of this event:

February 21, 2013 – EF1 Tornado in Clayton

The tornado touched down near Highway 65 where a roof was torn off a mobile home and the trailer of an 18-wheeler was turned over. The tornado continued east and caused roof damage to a brick house. The tornado continued to Traxler Road where roof damage occurred to a second house, a shed was destroyed and another shed was flipped. The tornado dissipated just east of Traxler Road near the Summerell Airport. Maximum wind speeds were estimated at 90 mph.

Frequency / Probability

Tornadoes are a sporadic occurrence within Concordia Parish, with an annual chance of occurrence calculated at 72% based on the records for the past 25 years (1990-2015). The figure below displays the density of tornado touch downs in Concordia Parish and neighboring parishes.

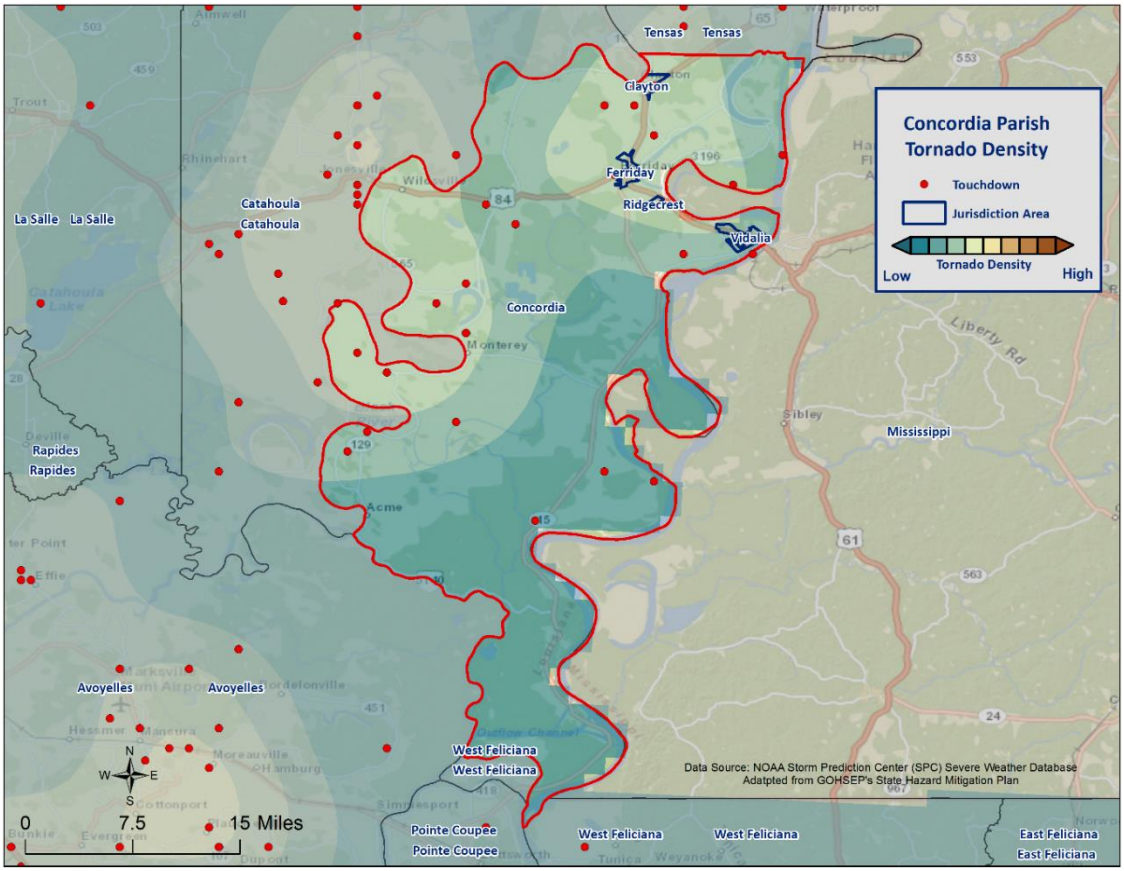


Figure 2-20: Location and Density of Tornadoes to Touch Down in Concordia Parish (Source: NOAA/SPC Severe Weather Database)

Estimated Potential Losses

According to the SHELDUS database, there have been 18 tornadoes that have caused some level of property damage. The total damage from the actual claims for property is $2,216,451, with an average cost of $123,136 per tornado strike. When annualizing the total cost over the 25-year record, total annual loses based on tornadoes are estimated to be $88,658. 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, the following table provides an annual estimate of potential losses for Concordia Parish.

Table 2-49: Estimated Annual Losses from Tornadoes in Concordia Parish

Estimated Annual Potential Losses from Tornadoes for Concordia Parish				
Unincorporated Concordia Parish (55.7% of Population)	Clayton (3.4% of Population)	Ferriday (16.9% of Population)	Ridgecrest (3.3% of Population)	Vidalia (20.6% of Population)
$49,421	$3,027	$14,949	$2,955	$18,305

Table 2-50 presents an analysis of building exposure that is susceptible to tornadoes by general occupancy type for Concordia Parish, along with the percentage of building stock that are mobile homes.

Table 2-50: Building Exposure by General Occupancy Type for Tornadoes in Concordia Parish (Source: FEMA's Hazus 2.2)

Building Exposure by General Occupancy Type for Tornadoes Exposure Types ($1,000)							
Residential	Commercial	Industrial	Agricultural	Religion	Government	Education	Mobile Homes (%)
2,085,744	554,885	53,766	24,566	105,818	29,438	46,708	22.8%

The parish has suffered through a total of four days in which tornadoes or waterspouts have accounted for 14 injuries and no fatalities during this 25-year period (*Table 2-51*). The average number of injuries per event for Concordia Parish is 0.88 per tornado, with an average of 0.56 per year for the 25-year period.

Table 2-51: Tornadoes in Concordia Parish by Magnitude that Caused Injuries or Deaths

Date	Magnitude	Deaths	Injuries
November 21, 1992	F3	0	6
April 30, 1994	F1	0	2
March 7, 1995	F1	0	5
January 13, 2006	F1	0	1

In assessing the overall risk to population, the most vulnerable population throughout the parish are those residing in manufacturing housing. Approximately 22.8% of all housing in Concordia Parish consists of manufactured housing. Based on location data collected in a previous hazard mitigation project, there are 16 known locations where manufactured housing is concentrated. Each of those 16 locations have an overall number of manufactured houses ranging from one to 100. The location and density of manufactured houses can be seen in *Figure 2-21*.

Manufactured housing is more likely to sustain damage from a tornado than any other residential structure. The highest concentration of manufactured home parks is located in the unincorporated area of Concordia Parish (*Table 2-52*). However, this does not influence the risk associated with a tornado event since they strike at random, making all structures and population within the planning area equally vulnerable.

Table 2-52: Manufactured Home Distribution throughout Concordia Parish

Location	Number of Manufactured Home Parks	% of Manufactured Home Parks
Unincorporated Area	11	68.8%
Clayton	0	0.0%
Ferriday	0	0.0%
Ridgecrest	2	12.5%
Vidalia	3	18.8%

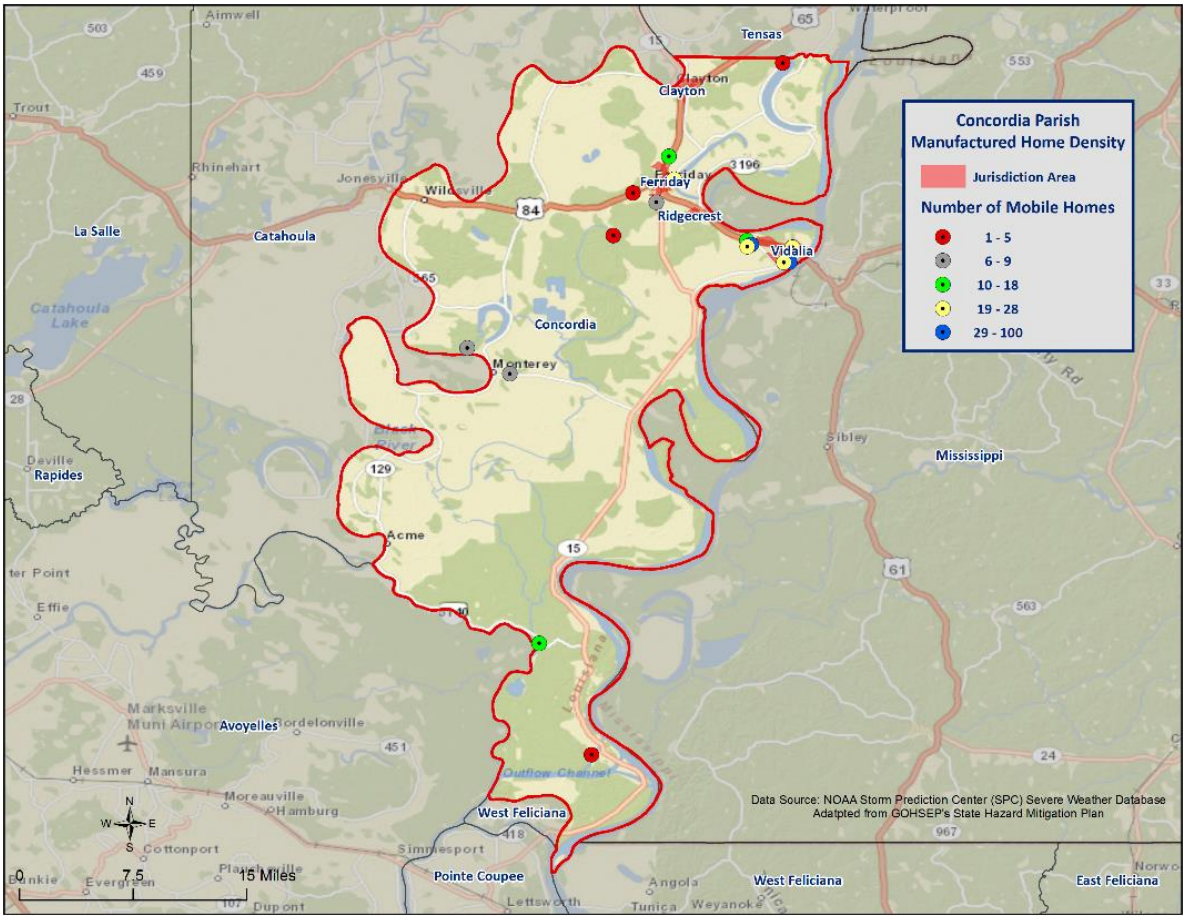


Figure 2-21: Location and Approximate Number of Units in Manufactured Housing Locations throughout Concordia Parish

Vulnerability

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

Tropical Cyclones

Tropical cyclones are among the worst hazards that 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. This results in the formation of a tropical depression (defined when the maximum sustained surface wind speed is 38 mph or less), then a Tropical Cyclone (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). On the next page, *Table 2-53* presents the Saffir-Simpson Hurricane Wind Scale, which categorizes tropical cyclones based on sustained winds.

Table 2-53: 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	N/A
Tropical Cyclone	39-73 mph	N/A	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 will likely 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 may 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 rains, 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 five 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 has 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 ten meters in some places) that can inflict a high number 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 near Alluvial City in St. Bernard Parish.

Property can be damaged by the various forces that accompany a tropical cyclone. 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 pressure 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). Mobile homes and buildings in need of maintenance are most subject to wind damage. High winds mean bigger waves. Extended pounding by waves can demolish any poorly or improperly designed structures. The waves also erode sand beaches, roads, and foundations. When foundations are compromised, 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 Louisiana. With any single hurricane having the potential to devastate multiple parishes at once, the risk of a tropical cyclone has the probability of impacting anywhere within the planning area for Concordia Parish. As such, all jurisdictions are equally at risk for tropical cyclones.

Previous Occurrences / Extents

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 four tropical cyclone events occurring within the boundaries of Concordia Parish between the years 2002 and 2014 (*Table 2-54*). The tropical cyclone events experienced in Concordia Parish include depressions, storms, and hurricanes. As a worst case scenario, Concordia Parish can expect to experience hurricanes at the category 1 level in the future.

Table 2-54: Historical Tropical Cyclone Events in Concordia Parish from 2002- 2015 (Source: SHELDUS)

Date	Name	Storm Type At Time of Impact
August 29, 2005	Katrina	Hurricane – Category 1
September 24, 2005	Rita	Hurricane – Category 1
September 1, 2008	Gustav	Tropical Storm
August 29, 2012	Isaac	Tropical Storm

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 initially 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- Mississippi border. Hurricane Katrina caused widespread devastation along the central Gulf Coast states. Following the passage of Katrina, the flooding of New Orleans was catastrophic, resulting in the displacement of more than 250,000 people.

The most significant impact of Hurricane Katrina on Concordia Parish was the large number of evacuees leaving New Orleans and surrounding areas in southeastern Louisiana. Many evacuees headed north to protect themselves from the damaging winds that ravaged the Louisiana coastline. The evacuees placed an immediate strain on the infrastructure in Concordia Parish and nearby Natchez, MS, but these effects were mitigated by a sharp increase in the local economy due to the displaced residents.

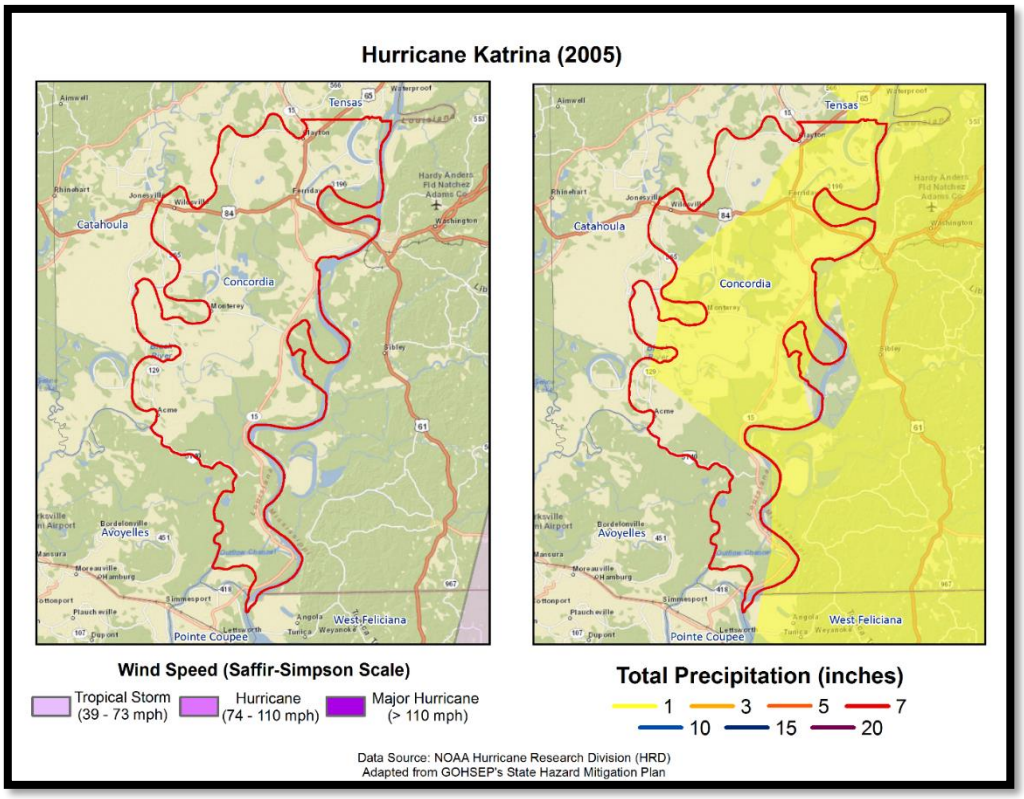


Figure 2-22: Wind Speed and Precipitation Totals in Concordia Parish for Hurricane Katrina

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 in Cameron Parish. Across southeast Louisiana, the main effect 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 five to seven feet above normal overtopped or breached local drainage levees, inundating many small communities. Newspaper accounts indicated that 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, affecting homes and businesses from Slidell to Mandeville and Madisonville. Approximately 1,500 structures were reported as 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. However, the flooding was much more limited in scope than during Hurricane Katrina.

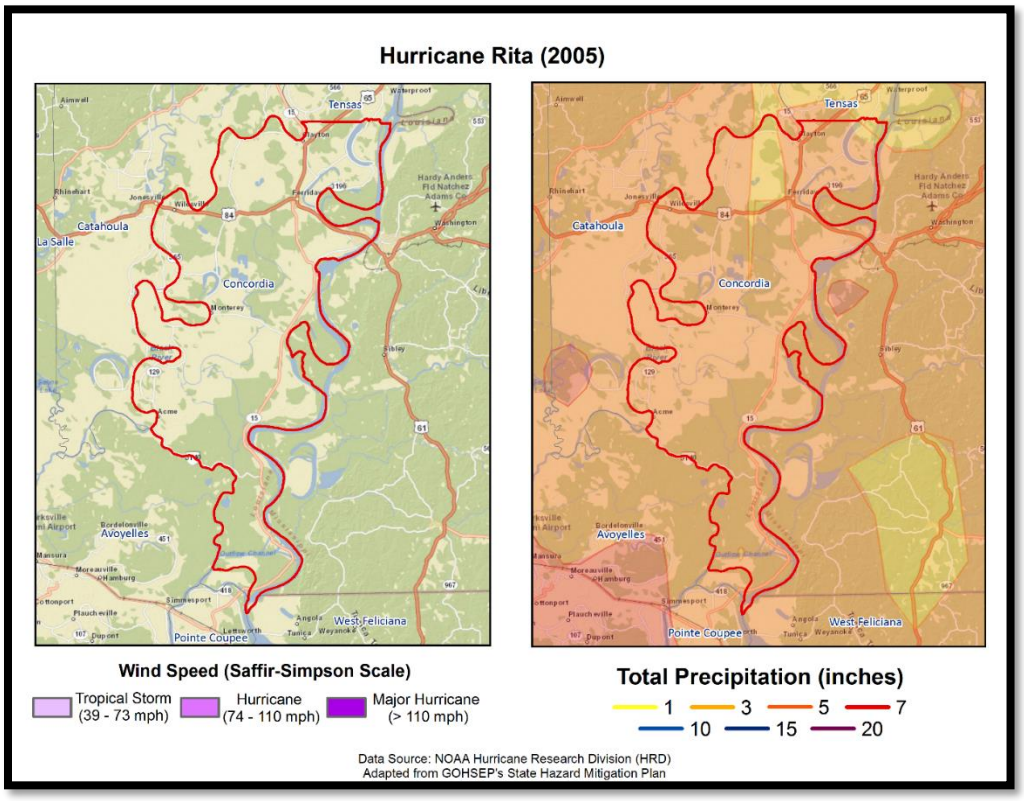


Figure 2-23: Wind Speed and Precipitation Totals in Concordia Parish for Hurricane Rita

Hurricane Rita was the most powerful hurricane to impact southwestern Louisiana since Hurricane Audrey in 1957. Estimated damages in southwest Louisiana totaled near $4 billion, with the majority of those losses occurring in Cameron and Calcasieu Parishes. Entire towns were destroyed in Cameron Parish, including downtown Cameron, Creole, Holly Beach, and Grand Chenier. An estimated 90 to 95 percent of the homes in the parish were severely damaged or destroyed. Storm surge values were estimated around 15 feet in parts of Cameron Parish.

In Concordia Parish, the most prominent effect of Hurricane Rita was the rainfall. No stations in Concordia Parish recorded wind speed or rainfall, so data was obtained from stations in nearby Natchez, MS. Rainfall totals upwards of five inches were reported in the Natchez area. Sustained wind speeds of 25-35 mph were experienced while gusts occasionally reached tropical storm force. The tornado outbreak that followed Hurricane Rita was the largest ever experienced in the Ark-La-Miss region, and three of these tornadoes impacted Concordia Parish.

Hurricane Gustav (2008)

Hurricane Gustav entered the southeast Gulf of Mexico as a major Category 3 hurricane on August 31, 2008, 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 117 mph (102 kts) at a USGS site at the Houma Navigational Canal and at the Pilot Station East C-MAN 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 four inches to just over 11 inches.

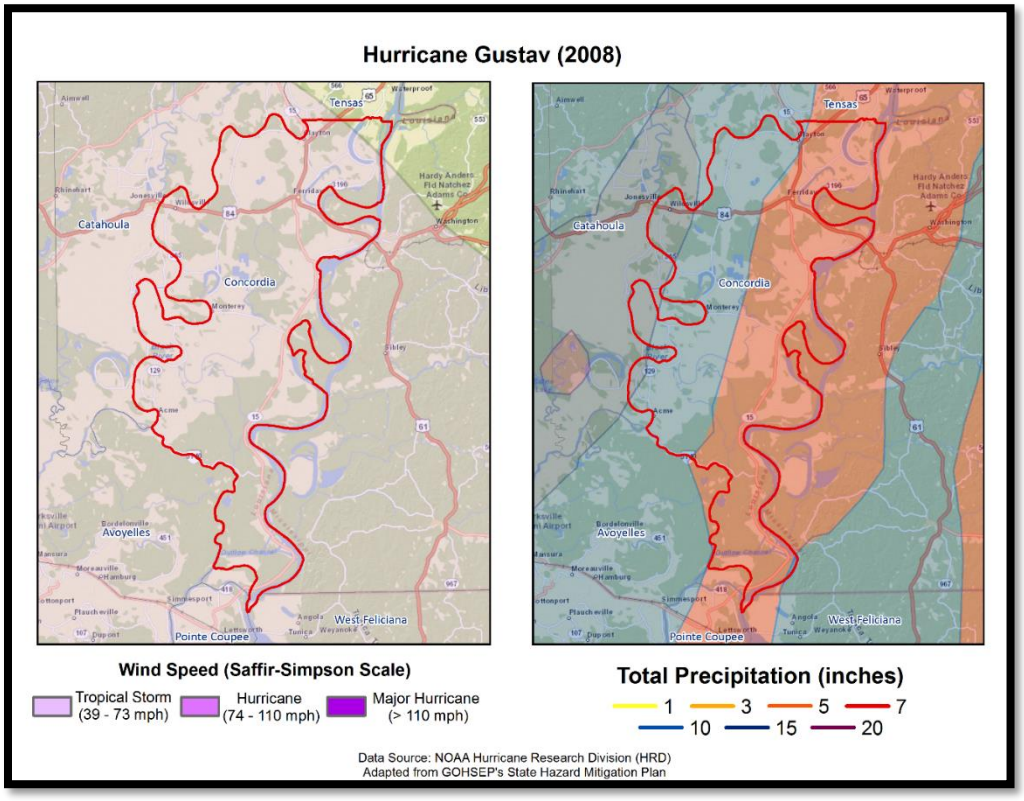


Figure 2-24: Wind Speed and Precipitation Totals in Concordia Parish for Hurricane Gustav

Gustav produced widespread wind damage across southeast Louisiana, especially in the area from Houma and Thibodaux through the greater Baton Rouge area. Hurricane force wind gusts occurred also across the inland areas, including the Baton Rouge area and surrounding parishes. A peak wind gust of 91 mph was recorded at the Baton Rouge (Ryan Field) Airport at 1:12 PM CST. This was only one mph less than the highest wind gust recorded during Hurricane Betsy in 1965. After the storm, the electric utility serving most of southeast Louisiana reported 75 to 100 percent of utility customers were without power, in areas ranging from Lafourche and Terrebonne Parishes northwest through the Baton Rouge area to central Louisiana and southwest Mississippi. 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 were also damaged. 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.

Tropical storm force winds occurred across Concordia Parish as the outer edges of Hurricane Gustav moved across southern and central Louisiana. Numerous trees and power lines were blown down. Many homes sustained minor roof damage with less than 10 percent of the shingles peeled off. Homes and buildings with tin roofs also sustained damage as some tin was torn off. All damage was widespread across the parish as wind gusts peaked between 50 and 70 mph for several hours. Many roads were blocked by downed trees and the power outages were extensive and lasted for several days. Sustained winds were around 40 mph.

Hurricane Isaac (2012)

Tropical Depression Nine formed in the Atlantic, east of the Lesser Antilles, on the morning of August 21, 2012. Twelve hours later, Tropical Depression Nine had strengthened into Tropical Storm Isaac. Isaac continued to track through the eastern Caribbean Sea and Florida Straits while maintaining high end tropical storm strength. Just before noon central time on the 28th, Isaac was located about 75 miles south-southeast of the mouth of the Mississippi River (or about 160 miles southeast of New Orleans) and was found to have reached hurricane strength with winds of 75 mph. An outer rain band from Isaac brought some showers to portions of the Ark-La-Miss during the afternoon of the 28th, while the center of Isaac was still churning in the Gulf of Mexico. At 6:45pm on August 28th, Hurricane Isaac made a brief landfall along the coast of Southeast Louisiana in Plaquemines Parish. Maximum sustained winds were 80mph at this landfall. Isaac did not remain over land for long as he was back over water again by 9:00pm that same evening. Isaac made his second landfall along the coast of southeast Louisiana, just to the west of Port Fourchon, around 2:15am August 29th, again with maximum sustained winds of 80 mph.

Isaac moved very slowly to the north and northwest over the course of August 29th, which made for prolonged impacts. Forward motion of about 5 mph lead to tremendous flooding issues for both Louisiana and portions of Mississippi south of I-20. Around noon on August 29th, Isaac was downgraded to a Tropical Storm, but this was not much relief to the many residents who were being inundated with rain and wind. Tropical storm force wind gusts were noted as far north as Bolivar County, with the Golden Triangle region not seeing winds reach more than tropical depression strength. The worst of the wind was felt generally along and south of an axis from Marion County to Adams County. Numerous trees were down in Adams County, leaving many without power for several days. Eighty percent of the roads were blocked in Franklin County due to downed trees.

With all of the rain that fell, some of the area rivers filled quickly. Minor flooding was recorded on the lower Pearl River at Rockport and Monticello, as well as on Bouie Creek at Hattiesburg and Tallahala Creek at Laurel.

The biggest river impact in the Jackson Hydrologic Service Area was on Black Creek at Brooklyn. Black Creek entered moderate flooding and finally crested at 26.71 feet on August 31st at 5pm. This will go down as the second highest crest in history for this particular river and forecast point. This river flooding caused damage to 15 homes both upstream and downstream of the river gage.

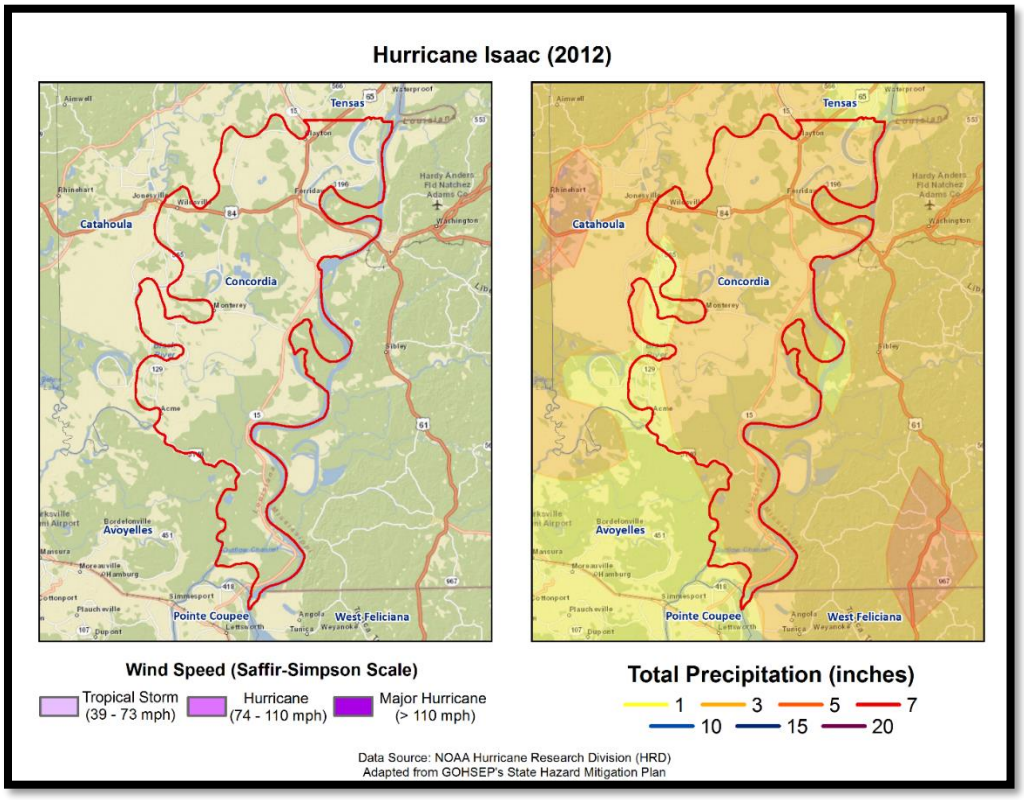


Figure 2-25: Wind Speed and Precipitation Totals in Concordia Parish for Hurricane Isaac

In Concordia Parish, damage was mostly confined to downed trees and power lines. Strong winds downed multiple trees all across the parish starting on the afternoon of August 29th and continuing into the midday on August 30th. Rainfall totals were generally low with few stations reporting more than three inches of rain.

The following figure displays the wind zones that affect Concordia Parish in relation to critical facilities throughout the parish.

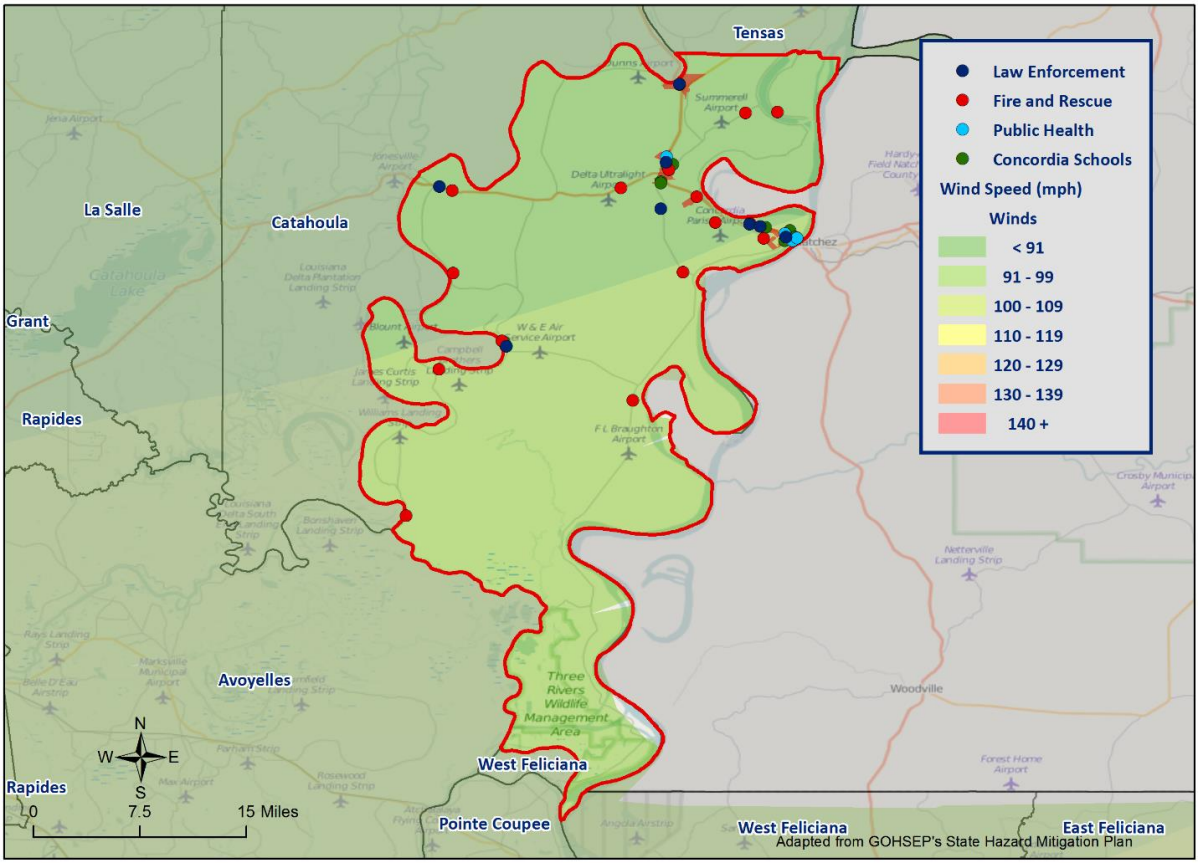


Figure 2-26: Winds Zones for Concordia Parish in Relation to Critical Facilities

Frequency / Probability

Tropical cyclones are large natural hazard events that regularly impact Concordia Parish. The annual chance of occurrence for a tropical cyclone is estimated at 16% for Concordia Parish and its municipalities, with four events occurring within 25 years. The tropical cyclone season for the Atlantic Basin is from June 1st through November 30th, with most of the major hurricanes (Saffir-Simpson Categories 3, 4, & 5) occurring between the months of August and October. Based on geographical location alone, Concordia 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.

Estimated Potential Losses

Using Hazus 2.2 100-Year Hurricane Model, the 100-year hurricane scenario was analyzed to determine losses from this worst-case scenario. The table on the next page shows the total economic losses that would result from this occurrence.

Table 2-55: Total Estimated Losses for a 100-Year Hurricane Event
(Source: Hazus 2.2)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event
Concordia Parish (Unincorporated)	$2,801,102
Clayton	$171,585
Ferriday	$847,305
Ridgecrest	$167,482
Vidalia	$1,037,472
Total	$5,024,945

Total losses from a 100-year hurricane event for each jurisdiction were compared with the total value of assets to determine the ratio of potential damage to total inventory in the table below.

Table 2-56: Ratio of Total Losses to Total Estimated Value of Assets for each Jurisdiction in Concordia Parish
(Source: Hazus 2.2)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event	Total Estimated Value of Assets	Ratio of Estimated Losses to Total Value
Unincorporated	$2,801,102	$1,747,968,000	0.2%
Clayton	$171,585	$54,958,000	0.3%
Ferriday	$847,305	$373,316,000	0.2%
Ridgecrest	$167,482	$84,377,000	0.2%
Vidalia	$1,037,472	$640,306,000	0.2%

Based on the Hazus 2.2 Hurricane Model, estimated total losses range from 0.2% to 0.3% of the total estimated value of all assets for the unincorporated area of Concordia Parish, and the incorporated areas of Clayton, Ferriday, Ridgecrest, and Vidalia.

The Hazus 2.2 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 following tables. These sectors are comprised of privately owned structures/facilities, as well as locally, state, and federally owned structures/facilities.

Table 2-57: Estimated Losses in Unincorporated Concordia Parish for a 100-Year Hurricane Event
(Source: Hazus 2.2)

Concordia Parish (Unincorporated)	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$4,159
Commercial	$44,101
Government	$1,769
Industrial	$3,750
Religious / Non-Profit	$9,598
Residential	$3,771,869
Schools	$3,328
Total	$2,801,102

Table 2-58: Estimated Losses in Clayton for a 100-Year Hurricane Event (Source: Hazus 2.2)

Clayton	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$186
Commercial	$1,971
Government	$79
Industrial	$168
Religious / Non-Profit	$429
Residential	$168,603
Schools	$149
Total	$171,585

Table 2-59: *Estimated Losses in Ferriday for a 100-Year Hurricane Event (Source: Hazus 2.2)*

Ferriday	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$918
Commercial	$9,735
Government	$391
Industrial	$828
Religious / Non-Profit	$2,119
Residential	$832,581
Schools	$735
Total	$847,305

Table 2-60: Estimated Losses in Ridgecrest for a 100-Year Hurricane Event (Source: Hazus 2.2)

Ridgecrest	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$181
Commercial	$1,924
Government	$77
Industrial	$164
Religious / Non-Profit	$419
Residential	$164,572
Schools	$145
Total	$167,482

Table 2-61: Estimated Losses in Vidalia for a 100-Year Hurricane Event
(Source: Hazus 2.2)

Vidalia	Estimated Total Losses from 100-Year Hurricane Event
Agricultural	$1,124
Commercial	$11,919
Government	$478
Industrial	$1,014
Religious / Non-Profit	$2,594
Residential	$1,019,443
Schools	$900
Total	$1,037,472

Threat to People

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

Table 2-62: Number of People Susceptible to a 100-Year Hurricane Event in Concordia Parish
(Source: Hazus 2.2)

Number of People Exposed to Hurricane Hazards			
Location	**# in Community**	**# in Hazard Area**	**% in Hazard Area**
Parish (Unincorporated)	**11,607**	**11,607**	**100.0%**
Clayton	**711**	**711**	**100.0%**
Ferriday	**3,511**	**3,511**	**100.0%**
Ridgecrest	**694**	**694**	**100.0%**
Vidalia	**4,299**	**4,299**	**100.0%**
Total	**20,822**	**20,822**	**100.0%**

The HAZUS-MH Hurricane Model was also extrapolated to provide an overview of vulnerable populations throughout the jurisdictions. These populations are illustrated in the following tables:

Table 2-63: Vulnerable Populations in Unincorporated Concordia Parish for a 100-Year Hurricane Event
(Source: Hazus 2.2)

Concordia Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	11,607	100.0%
Persons Under 5 Years	799	6.9%
Persons Under 18 Years	2,917	25.1%
Persons 65 Years and Over	1,686	14.5%
White	6,666	57.4%
Minority	4,941	42.6%

Table 2-64: Vulnerable Populations in Clayton for a 100-Year Hurricane Event (Source: Hazus 2.2)

Clayton		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	711	100.0%
Persons Under 5 Years	61	8.6%
Persons Under 18 Years	217	30.5%
Persons 65 Years and Over	105	14.8%
White	215	30.2%
Minority	496	69.8%

Table 2-65: Vulnerable Populations in Ferriday for a 100-Year Hurricane Event (Source: Hazus 2.2)

Ferriday		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	3,511	100.0%
Persons Under 5 Years	326	9.3%
Persons Under 18 Years	1,114	31.7%
Persons 65 Years and Over	438	12.5%
White	541	15.4%
Minority	2,970	84.6%

Table 2-66: Vulnerable Populations in Ridgecrest for a 100-Year Hurricane Event (Source: Hazus 2.2)

Ridgecrest		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	694	100.0%
Persons Under 5 Years	58	8.4%
Persons Under 18 Years	192	27.7%
Persons 65 Years and Over	106	15.3%
White	479	69.0%
Minority	215	31.0%

Table 2-67: Vulnerable Populations in Vidalia for a 100-Year Hurricane Event (Source: Hazus 2.2)

Vidalia		
Category	**Total Numbers**	**Percentage of People in Hazard Area**
Number in Hazard Area	4,299	100.0%
Persons Under 5 Years	284	6.6%
Persons Under 18 Years	1,111	25.9%
Persons 65 Years and Over	713	16.6%
White	3,096	72.0%
Minority	1,203	28.0%

Vulnerability

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

Wildfires

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 2-27 displays the areas of wildland-urban interaction in Concordia 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 on the next page summarizes the intensity levels assigned to areas in the Southern Wildfire Assessment Portal.

Table 2-68: 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 direct 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. The following figure displays the areas of wildland-urban interface and intermix in Concordia Parish and its jurisdictions.

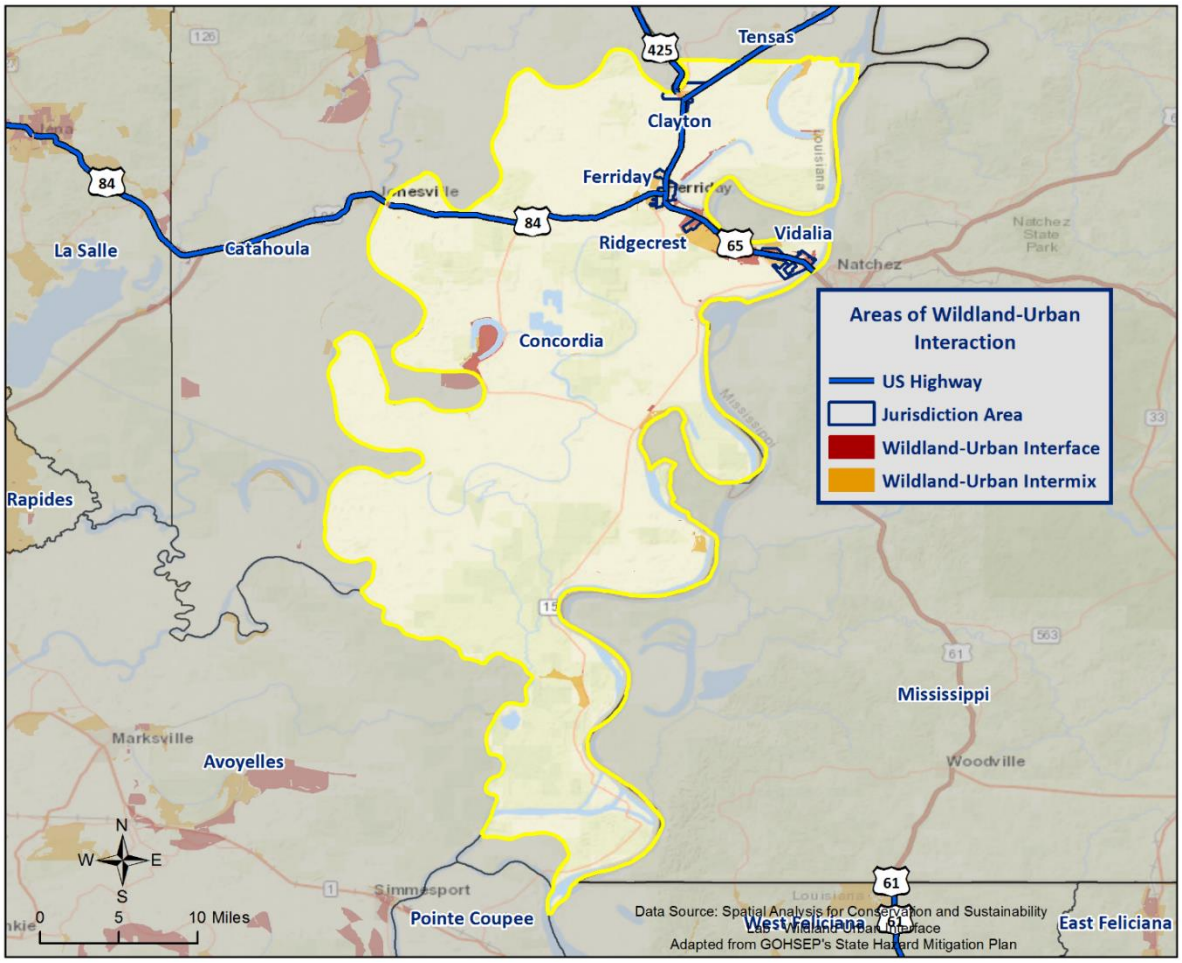


Figure 2-27: Wildland-Urban Interaction in Concordia Parish

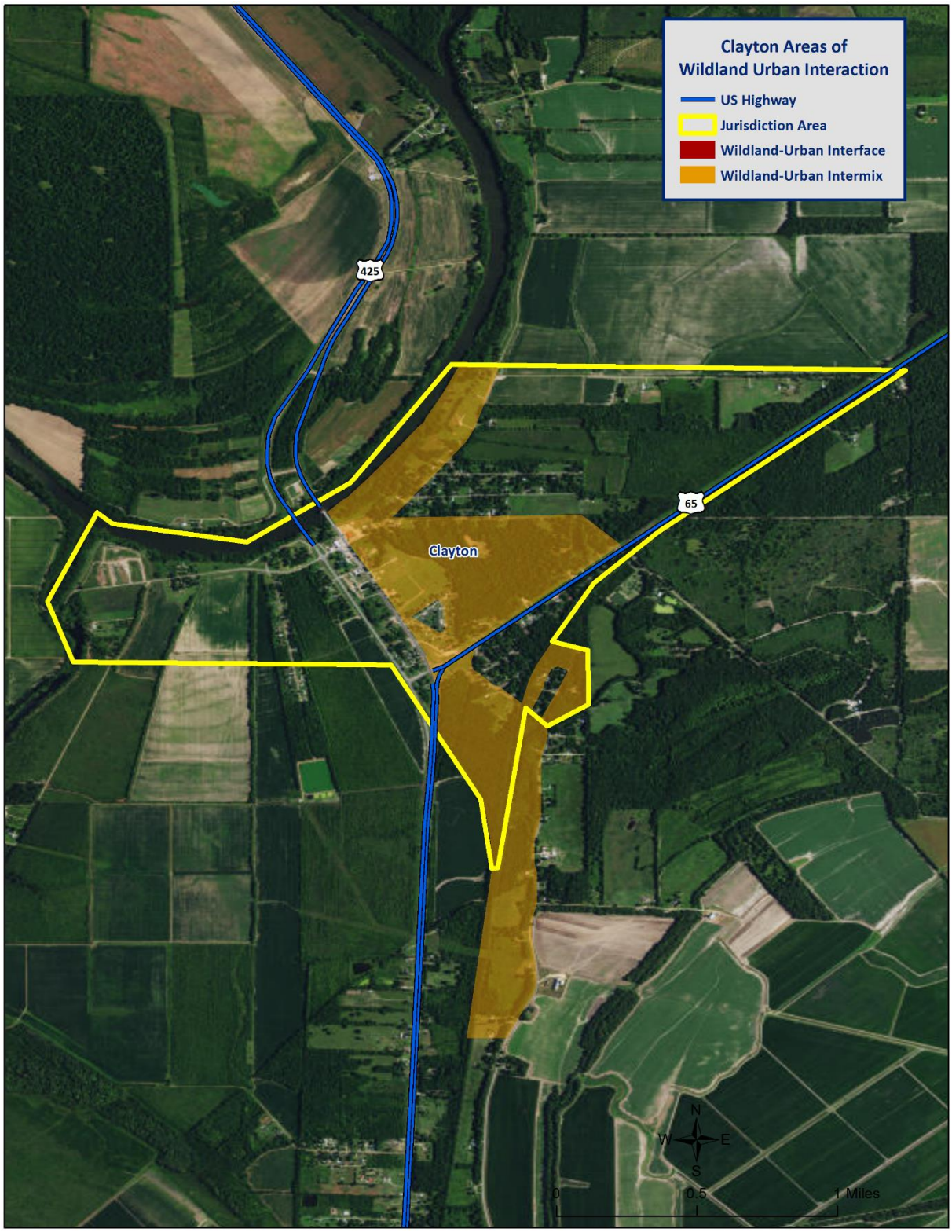


Figure 2-28: Wildland-Urban Interaction in Clayton

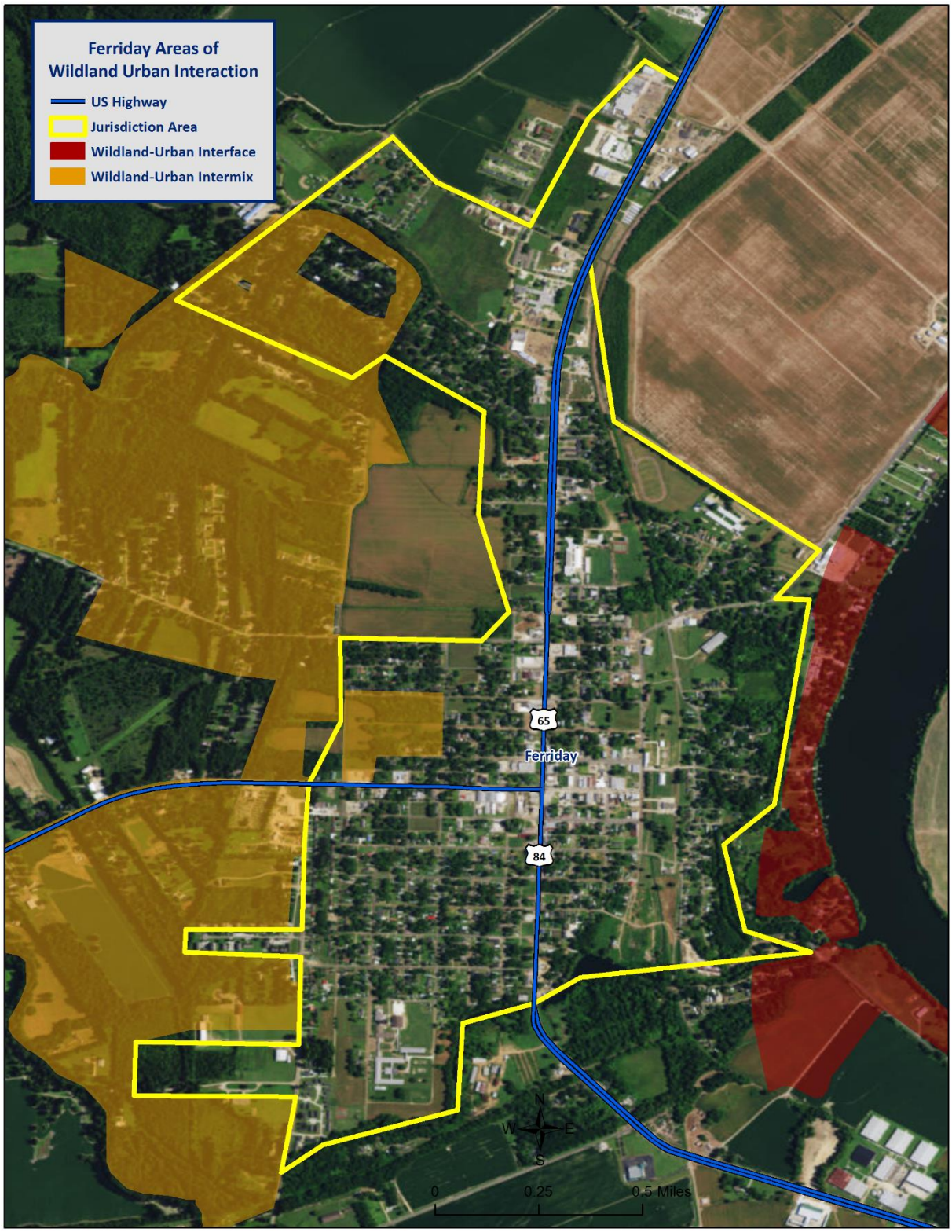


Figure 2-29: Wildland-Urban Interaction in Ferriday

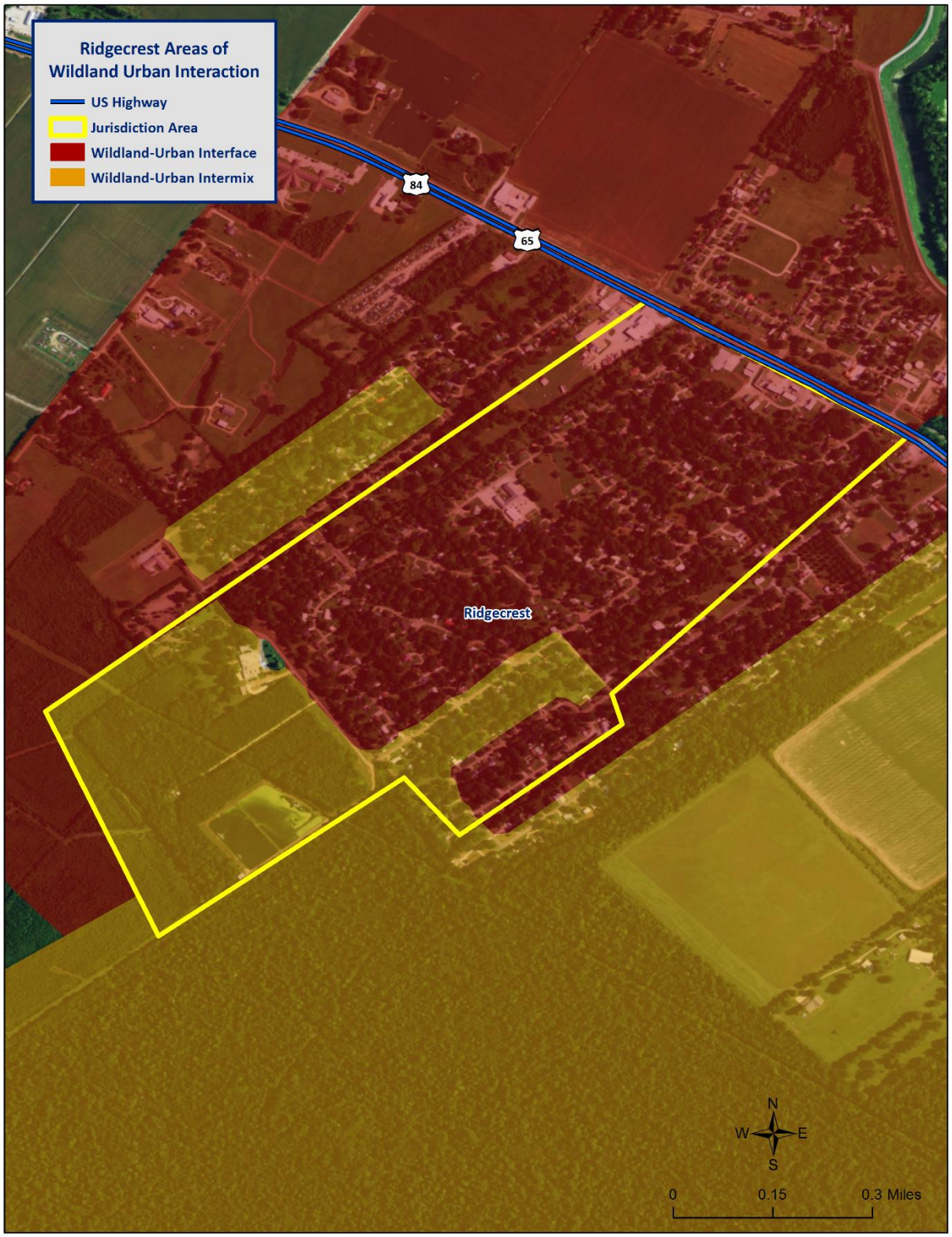


Figure 2-30: Wildland-Urban Interaction in Ridgecrest

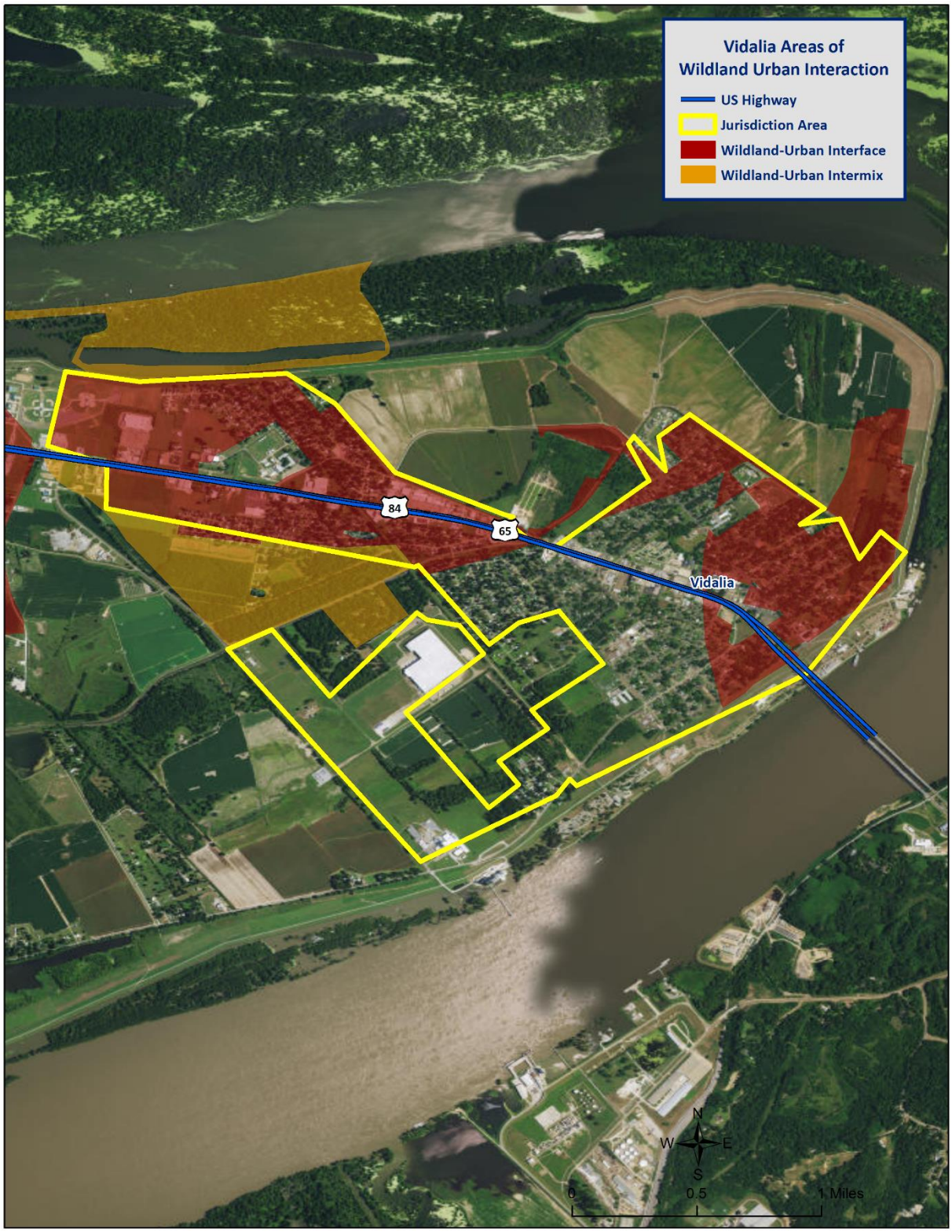


Figure 2-31: Wildland-Urban Interaction in Vidalia

Previous Occurrences / Extents

There have been no reported wildfire events that have occurred within the boundaries of Concordia Parish between the years of 1990 and 2015. Since 2010, there have been no reported wildfire events in the incorporated areas of Clayton, Ferriday, Ridgecrest, and Vidalia and the unincorporated areas of Concordia Parish.

Based on the Southern Group of State Foresters Risk Assessment Portal, the following table outlines the intensity that each jurisdictional area within Concordia Parish could potential experience due to a wildfire event.

Table 2-69: Potential Wildfire Intensity Levels for Concordia Parish
(Source: Southern Wildfire Assessment Portal)

Potential Wildfire Intensity	
Concordia Parish (Unincorporated)	Highest Intensity Level 5
Clayton	Moderate Intensity Level 3
Ferriday	Moderate Intensity Level 3
Ridgecrest	Moderate to High Intensity Level 3.5
Vidalia	Low Intensity Level 2

Frequency / Probability

With no recorded events in 25 years, wildfire events within the boundaries of Concordia Parish have an annual chance of occurrence calculated at less than 1% based on the SHELDUS dataset.

Estimated Potential Losses

There have been no wildfire events that have caused property damage, crop damage, injuries, or fatalities in Concordia Parish. In assessing the overall risk to population, the most vulnerable population throughout the parish consists of those residing in areas of wildland-urban interaction. Figure 2-27 displays the areas of wildland-urban interaction in Concordia Parish.

Using Hazus 2.2, along with wildland-urban interaction areas, the following table presents an analysis of total building exposure that is located within the wildland-urban interaction areas.

Table 2-70: Total Building Exposure by Wildland-Urban Interaction Areas
(Source: Hazus 2.2)

Jurisdiction	Estimated Total Building Exposure
Concordia Parish (Unincorporated)	$1,184,218,000
Clayton	$72,308,000
Ferriday	$89,718,000
Ridgecrest	$84,377,000
Vidalia	$502,539,000
Total	$1,933,160,000

Hazus 2.2 also provides a breakdown by jurisdiction for seven primary sectors (Hazus occupancy) throughout the parish. Utilizing this information with the wildland-urban interaction areas allows for identifying the total exposure by jurisdiction. The total exposure for each jurisdiction by sector is listed in the following tables. These sectors are comprised of privately owned structures/facilities, as well as locally, state, and federally owned structures/facilities.

Table 2-71: Estimated Exposure for Unincorporated Concordia Parish by Sector (Source: Hazus 2.2)

Concordia Parish (Unincorporated)	Estimated Total Building Exposure by Sector
Agricultural	$10,346,000
Commercial	$241,272,000
Government	$5,305,000
Industrial	$30,918,000
Religious / Non-Profit	$34,548,000
Residential	$852,921,000
Schools	$8,908,000
Total	$1,184,218,000

Table 2-72: Estimated Exposure for Clayton by Sector (Source: Hazus 2.2)

Clayton	Estimated Total Building Exposure by Sector
Agricultural	$2,060,000
Commercial	$22,114,000
Government	$2,824,000
Industrial	$703,000
Religious / Non-Profit	$2,608,000
Residential	$37,981,000
Schools	$4,018,000
Total	$72,308,000

Table 2-73: Estimated Exposure for Ferriday by Sector (Source: Hazus 2.2)

Ferriday	Estimated Total Building Exposure by Sector
Agricultural	$988,000
Commercial	$9,409,000
Government	$0
Industrial	$1,113,000
Religious / Non-Profit	$2,042,000
Residential	$73,702,000
Schools	$2,464,000
Total	$89,718,000

Table 2-74: Estimated Exposure for Ridgecrest by Sector
(Source: Hazus 2.2)

Ridgecrest	Estimated Total Building Exposure by Sector
Agricultural	$0
Commercial	$8,136,000
Government	$220,000
Industrial	$498,000
Religious / Non-Profit	$1,516,000
Residential	$71,387,000
Schools	$2,620,000
Total	$84,377,000

Table 2-75: Estimated Exposure for Vidalia by Sector
(Source: Hazus 2.2)

Vidalia	Estimated Total Building Exposure by Sector
Agricultural	$1,856,000
Commercial	$84,096,000
Government	$12,918,000
Industrial	$5,760,000
Religious / Non-Profit	$20,758,000
Residential	$368,051,000
Schools	$9,100,000
Total	$502,539,000

Threat to People

The total population within the parish that is located within a wildland-urban interaction area is shown in the table below:

Table 2-76: Populations Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)

Number of People Located in Wildland-Urban Interaction Areas.			
Location	**# in Community**	**# in Area**	**% in Area**
Concordia (Unincorporated)	**11,607**	**7,885**	**67.9%**
Clayton	**711**	**521**	**73.3%**
Ferriday	**3,511**	**892**	**25.4%**
Ridgecrest	**694**	**604**	**87.0%**
Vidalia	**4,299**	**2,982**	**69.4%**
Total	**20,822**	**12,884**	**61.9%**

The 2010 U.S. Census data was also extrapolated to provide an overview of populations located within wildland-urban interaction areas throughout the jurisdictions. That data is illustrated in the tables on the following pages.

Table 2-77: Population in Unincorporated Concordia Parish Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)

Concordia Parish (Unincorporated)		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	7,885	67.9%
Persons Under 5 Years	542	6.9%
Persons Under 18 Years	1,982	25.1%
Persons 65 Years and Over	1,146	14.5%
White	4,528	57.4%
Minority	3,357	42.6%

Table 2-78: Population in Clayton Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)

Clayton		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	521	73.3%
Persons Under 5 Years	45	8.6%
Persons Under 18 Years	159	30.5%
Persons 65 Years and Over	77	14.8%
White	158	30.2%
Minority	363	69.8%

Table 2-79: Population in Ferriday Located within a Wildland-Urban Interaction Area
(Source: 2010 U.S. Census Data)

Ferriday		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	892	25.4%
Persons Under 5 Years	83	9.3%
Persons Under 18 Years	283	31.7%
Persons 65 Years and Over	111	12.5%
White	137	15.4%
Minority	755	84.6%

Table 2-80: Population in Ridgecrest Located within a Wildland-Urban Interaction Area (Source: 2010 U.S. Census Data)

Ridgecrest		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	604	87.0%
Persons Under 5 Years	50	8.4%
Persons Under 18 Years	167	27.7%
Persons 65 Years and Over	92	15.3%
White	417	69.0%
Minority	187	31.0%

Table 2-81: Population in Vidalia Located within a Wildland-Urban Interaction Area (Source: 2010 U.S. Census Data)

Vidalia		
Category	**Total Numbers**	**Percentage of People in Wildland-Urban Interaction Area**
Number in Hazard Area	2,982	69.4%
Persons Under 5 Years	197	6.6%
Persons Under 18 Years	771	25.9%
Persons 65 Years and Over	495	16.6%
White	2,148	72.0%
Minority	834	28.0%

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 fall within the wildfire-urban interface and/or intermix.

Winter Storms

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. Once the cold air mass crosses Louisiana, and the temperature drops, 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 storm events that affect the state of Louisiana are ice storms, freezes, and snow events. Of the winter storm 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 in 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.

In a typical winter storm event, homes and buildings are damaged by ice accumulation, either directly by the weight of the ice on the roofs or by trees and/or limbs falling on buildings. While it is not very prevalent, this type of damage can occur in Louisiana, particularly in north Louisiana. Effects of winter weather more likely to occur in Louisiana, especially southern Louisiana, include extreme temperatures which can cause waterlines to freeze and sewer lines to rupture. This is especially true with elevated or mobile homes, since cold air is able to access more of the building's infrastructure. Winter storms can also have a devastating effect on agriculture, particularly on crops (like citrus) that are dependent on warm weather. Long exposures to low temperatures can kill many kinds of crops, and ice storms can weigh down branches and fruit.

Winter storms are not only a direct threat to human health through conditions like frostbite and hypothermia, but they are also an indirect threat to human health due to vehicle accidents and loss of power and heat, which can be disrupted for days. However, these impacts are rarely seen in Louisiana. As people use space heaters and fireplaces to stay warm, the risk of household fires and carbon monoxide poisoning increases.

Winter storm events occur throughout Louisiana usually during the colder calendar months of December, January, and February. Severe weather events do not occur with the same frequency across all parts of Louisiana. The northern quarter of Louisiana has historically experienced the most severe winter events between 1987 and 2012. The central, and to an even greater extent the southern parts of the state, such as Ascension Parish, have experienced the fewest severe winter events. The table on the following page shows the Sperry-Piltz Ice Accumulation Index which is utilized to predict the potential damage to overhead utility systems from freezing rain and ice storms.

Table 2-82: Sperry-Piltz Ice Accumulation Index

Ice Damage Index	Damage and Impact Descriptions
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged and widespread utility interruptions with extensive damage to main distribution feeder lines and some high voltage transmission lines/structure. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

Location

Because a winter storm is a climatological based hazard and has the same probability of occurring in Concordia Parish as all of the adjacent parishes, the entire planning area for Concordia Parish is equally at risk for winter storms.

Previous Occurrences / Extents

According to SHELDUS, there have been seven reported winter storm events that have occurred within the boundaries of Concordia Parish between the years of 1990 and 2015. The following table provides a brief synopsis of each event. Based on historic data, Concordia Parish can expect an ice damage index of 2 on the Sperry-Piltz Ice Accumulation Index.

Table 2-83: Previous Occurrences for Winter Storm Events

Date	Synopsis	Property Damage	Crop Damage
March 14, 1993	A widespread, damaging freeze occurred as temperatures fell into the upper teens and 20s. Due to the relatively mild winter, many crops were in early bloom. Severe damage occurred to the strawberry, peach, blueberry, citrus, tomato, and ryegrass crops.	$0	$224,191
February 1, 1996	Freezing rain fell across several parishes. Widespread damage was done to trees and power lines. Accumulations of up to one inch were common over the area. Most roads and bridges were impassable. Many thousand customers were without power over these parishes.	$148,475	$0

Date	Synopsis	Property Damage	Crop Damage
January 1, 2010	A prolonged cold snap, caused by a couple of strong arctic air masses, affected the Ark-La-Miss region during the first two weeks of January. The first ten days of 2010 were the coldest first ten days of any year on record. Due to the duration of the cold, a great deal of damage occurred to the water line infrastructure around the region. A few rural homes around the parish country side reported some water line issues due to the cold weather.	$80,125	$0
February 11, 2010	Heavy snow affected large regions across central and southern Mississippi. Due to the heavy wet nature of the snow, many large branches and some trees took down power lines across the region. Power outages were common after the event and widespread. Four to six inches of snow was reported across Concordia Parish. There were reports of automobile accidents.	$427,334	$0
February 3, 2011	An ice storm developed across the area. While the icing event was not devastating, the impact to travel was a major issue across the region. Thousands of accidents occurred from slick roads. A quarter to four tenths of ice and sleet accumulated across the parish. Bridges and overpasses were iced over and roadways were slick.	$310,694	$0
January 23, 2014	Two to three inches of snow fell across the far southwestern portion of Concordia Parish.	$0	$0
January 28, 2014	Two to three inches of snow mixed with some sleet fell across Concordia Parish.	$0	$0

Based on previous winter storm events, the worst-case scenario for the unincorporated area of Concordia Parish and the incorporated areas of Clayton, Ferriday, Ridgecrest, and Vidalia is approximately four to six inches of snow accumulation and approximately one quarter to four tenths inch of ice accumulation

Frequency / Probability

With five recorded events in 25 years, winter storm events within the boundaries of Concordia Parish have an annual chance of occurrence calculated at 20% based on the SHELDUS dataset.

Estimated Potential Losses

Since 1990, there have been seven reported winter weather events that have resulted in property and/or crop damages according to the SHELDUS database. The total property damages associated with these storms have totaled $966,628. To estimate the potential losses of a winter weather event on an annual basis, the total damage recorded for winter weather events was divided by the total number of years of available winter weather data in SHELDUS (1990 – 2015). This provides an annual estimated potential loss of $38,665. To assess potential losses to the participating jurisdictions, the 2010 Census population was used to assign the estimated potential losses proportionally across the jurisdictions. The table on the next page provides an estimate of potential property losses for Concordia Parish based on the 2010 Census data.

Table 2-84: Estimated Annual Losses for Winter Weather Events in Concordia Parish

Estimated Annual Potential Losses from Winter Weather for Concordia Parish				
Unincorporated Concordia Parish (55.7% of Population)	Clayton (3.4% of Population)	Ferriday (16.9% of Population)	Ridgecrest (3.3% of Population)	Vidalia (20.6% of Population)
$21,553	$1,320	$6,520	$1,290	$7,983

From 1990 - 2015, there have been no injuries or fatalities as a result of winter weather in Concordia Parish.

Vulnerability

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

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.

Location

Concordia Parish is awaiting a response from the U.S. Army Corps of Engineers on dam locations within the Concordia Parish Planning area. Currently, a data deficiency exists for dam failure in Concordia Parish.

Previous Occurrences / Extents

There have been no reported dam failures in Concordia Parish from 1990 to 2015. Dam information including the extent of dam failures has been requested from the USACE. Concordia Parish is awaiting a response from the USACE, and will continue to work to update this information as new data is received.

Frequency / Probability

Based on the 25-year record, it is determined that a dam failure has less than a 1% annual chance of occurrence in the Concordia Parish planning area. Concordia Parish is awaiting a response from the USACE, and will continue to work to update this information as new data is received.

Levee Failure

Levees and floodwalls are flood control barriers constructed of earth, concrete, or other materials. For the purposes of this plan, levees are distinguished from smaller flood barriers (such as berms) by their size and extent. Berms are barriers that only protect a small number of structures, or at times only a single structure. Levees and floodwalls are barriers that protect significant areas of residential, commercial, or industrial development; at a minimum, they protect a neighborhood or small community. Levee failure involves the overtopping, breach, or collapse of the levee. Levee failure is especially destructive to nearby development during flood and hurricane events.

The northern half of Louisiana is protected by levees on the Ouachita River, under the authority of the Vicksburg District of the United States Army Corp of Engineers (USACE). The Vicksburg District encompasses 68,000 mi^2 in the states of Arkansas, Mississippi and Louisiana. They manage seven drainage basins, including the Yazoo, Pearl, Big Black, Red, Ouachita, and Mississippi Rivers; 12 locks and dams on the Pearl, Red, and Ouachita Rivers; 1,808 miles of levees, including 468 miles along the Mississippi River; and multiple lakes with 1,709 miles of shoreline.

Coastal and southern Louisiana are protected by an extensive levee system under the authority of the New Orleans District of the USACE. This system includes 30,000 mi^2 of Louisiana south of Alexandria, including 961 miles of river levees in the Mississippi River and Tributaries Project, 449 miles of river levees in the Atchafalaya Basin, and 340 miles of hurricane-protection levees. Other levees have been built along stretches of rivers throughout Louisiana by local levee districts and private citizens. The data regarding these non-federal levees are managed by the individual entity responsible for construction and subsequent maintenance and are not kept in a consistent format for comprehensive hazard analysis.

The effects of a levee failure on property is similar to that of a flood, as discussed in the flooding section. One major difference is that the velocity of the water is increased in the area of the breach, so the potential for property damage is higher in these areas.

A levee failure occurs during high water events, so the populace is normally alerted to the potential danger. Levees are normally monitored during these events and the population in danger is alerted to a possible levee failure. However, if people consider themselves safe once a levee has been breached and do not evacuate, the results could be deadly.

Location

Concordia Parish is awaiting a response from the U.S. Army Corps of Engineers on levee locations within the Concordia Parish Planning area. Currently, a data deficiency exists for levee failure in Concordia Parish.

Previous Occurrences / Extents

There have been no reported levee failures in Concordia Parish from 1990 to 2015. Levee information including the extent of a levee failure has been requested from the U.S. Army Corps of Engineers. Concordia Parish is awaiting a response from the USACE, and will continue to update this information as new data is received.

Frequency / Probability

Based on the 25-year record, it is determined that a levee failure has less than a 1% annual chance of occurrence in the Concordia Parish planning area. Concordia Parish is awaiting a response from the USACE, and will continue to work to update this information as new data is received.

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3. Capability Assessment

This section summarizes the results of the Concordia Parish 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's infrastructure, as well as relevant changes in its law since the last plan update, in order to suggest a mitigation strategy.

Through this assessment, Concordia 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

Concordia 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. They take an integrated and strategic look holistically at hazard mitigation in Concordia Parish to propose ways to continually 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 Concordia Parish and its jurisdictions are shown in the table on the following page.

Table 3-1: Concordia Parish Planning and Regulatory Capabilities

Planning and Regulatory						
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.						
	Concordia Parish	Clayton	Ferriday	Ridgecrest	Vidalia	
Plans	Yes / No					
Comprehensive / Master Plan	No	No	No	No	Yes	
Capital Improvements Plan	No	No	Yes	No	Yes	
Economic Development Plan	Yes	No	No	Yes	Yes	
Local Emergency Operations Plan	Yes	No	Yes	No	Yes	
Continuity of Operations Plan	No	No	No	No	Yes	
Transportation Plan	No	No	No	No	Yes	
Stormwater Management Plan	No	No	No	No	Yes	
Community Wildfire Protection Plan	No	No	No	No	No	
Other plans (redevelopment, recovery, coastal zone management)	No	No	No	No	No	
Building Code, Permitting and Inspections	Yes / No					
Building Code	Yes	No	Yes	Yes	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	No	Yes	No	Yes	
Fire Department ISO/PIAL rating	Yes	No	Yes	Yes	Yes	
Site plan review requirements	Yes	No	Yes	Yes	Yes	
Land Use Planning and Ordinances	Yes / No					
Zoning Ordinance	No	Yes	Yes	No	Yes	
Subdivision Ordinance	Yes	Yes	Yes	No	Yes	
Floodplain Ordinance	Yes	Yes	Yes	Yes	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	No	No	Yes	Yes	
Flood Insurance Rate Maps	Yes	Yes	Yes	Yes	Yes	
Acquisition of land for open space and public recreation uses	Yes	No	Yes	Yes	Yes	

Building Codes, Permitting, Land Use Planning and Ordinances

The Concordia Parish Police Jury provides oversight for building permits and codes, and all parish ordinances.

As of the 2016 update, Concordia Parish and its jurisdictions ensure that all adopted building codes are enforced and in compliance relating to the construction of any structure within the boundaries of the parish. Building permits are required prior to beginning any type of construction or renovation projects, installation of electrical wiring, plumbing or gas piping, moving manufactured/modular or portable buildings, and reroofing or demolitions.

The Concordia Parish Police Jury is also responsible for enforcing the Parish Ordinances relating to health and safety, property maintenance standards, and condemnation of unsafe structures.

The Concordia Parish Police Jury meets regularly to consider any proposed ordinance changes, and to take final actions on proposed changes.

While local capabilities for mitigation can vary from community to community, Concordia Parish as a whole has a system in place to coordinate and share these capabilities through Concordia Parish Government 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, Concordia 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 table below shows examples of resources in place in Concordia Parish and its jurisdictions.

Table 3-2: Concordia Parish Administrative and Technical Capabilities

Administration and Technical						
Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without lo						
are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.						
	Concordia Parish	Clayton	Ferriday	Ridgecrest	Vidalia	
Administration	Yes / No					
Planning Commission	Yes	No	No	No	Yes	
Mitigation Planning Committee	Yes	No	No	No	Yes	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	No	Yes	Yes	Yes	
Mutual Aid Agreements						
Staff	Yes / No; FT/PT; % Hazard Mitigation					
Chief Building Official	Yes/FT/20%	No	Yes/FT/20%	Yes/FT/20%	Yes/FT/20%	
Floodplain Administrator	Yes/PT/20%	No	No	No	No	
Emergency Manager	Yes/PT/10%	No	Yes/PT/10%	Yes/PT/10%	Yes/PT/10%	
Community Planner	Yes/PT/10%	No	Yes	No	No	
Civil Engineer	Yes/PT	Yes	Yes	Yes	Yes	
GIS Coordinator	Yes/PT	No	No	No	Yes	
Grant Writer	No	Yes	Yes	No	Yes	
Technical	Yes / No					
Warning Systems / Service (Reverse 911, outdoor warning signals)	No	No	No	No	No	
Hazard Data & Information	No	No	No	No	No	
Grant Writing	No	No	Yes	No	Yes	
Hazus Analysis	N/A	No	No	No	No	

Financial capabilities are the resources that Concordia 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/no cost actions, such as outreach efforts, to substantial action costs such acquisition of flood prone properties.

The following resources are available to fund mitigation actions in Concordia Parish and its jurisdictions:

Table 3-3: Concordia Parish Financial Capabilities

Financial						
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.						
	Concordia Parish	Clayton	Ferriday	Ridgecrest	Vidalia	
Funding Resource	Yes / No					
Capital Improvements project funding	Yes	No	Yes	No	Yes	
Authority to levy taxes for specific purposes	Yes	No	Yes	No	Yes	
Fees for water, sewer, gas, or electric services	Yes	No	Yes	No	Yes	
Impact fees for new development	No	No	No	No	No	
Stormwater Utility Fee	No	No	No	No	No	
Community Development Block Grant (CDBG)	Yes	No	Yes	Yes	Yes	
Other Funding Programs	Yes	No	Yes	Yes	N/A	

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.

Concordia Parish and its jurisdictions have existing education and outreach programs to implement mitigation activities, as well as to communicate risk and hazard related information to its communities. The existing programs are as follows:

Table 3-4: Concordia Parish Education and Outreach Capabilities

Education and Outreach						
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities a hazard-related information.						
	Concordia Parish	Clayton	Ferriday	Ridgecrest	Vidalia	
Program / Organization	Yes / No					
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	No	No	Yes	Yes	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	No	No	Yes	Yes	
Natural Disaster or safety related school program	Yes	No	No	Yes	No	
Storm Ready certification	No	No	No	No	No	
Firewise Communities certification	No	No	No	No	No	
Public/Private partnership initiatives addressing disaster-related issues	No	No	No	No	No	
Other	No	No	No	Yes	No	

In some cases, the jurisdictions rely on Concordia Parish OHSEP and/or Concordia 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 in the aforementioned existing regulatory mechanisms, programs, and resources within each jurisdiction, Concordia Parish and its jurisdiction remains committed to expanding and improving on the existing capabilities within the parish. All participating jurisdictions 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 help to 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 Concordia 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:

- Town of Clayton
- Town of Ferriday
- Town of Ridgecrest
- City of Vidalia

Flood Insurance and Community Rating System

Concordia Parish is not a participant in the Community Rating System (CRS), nor are any of its jurisdictions. Obtaining the CRS rating for the parish and participating jurisdictions is recognized as an eventual goal 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.

Under the Federal Emergency Management Agency (FEMA), the National Flood Insurance Program (NFIP) administers the Community Rating System. 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 *Figure 3-1*). 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.

During the last update, 38 Louisiana communities participated. Mandeville, Shreveport, and Jefferson and East Baton Rouge Parishes had the best classifications in the state, class 7. As of the 2016 update, Jefferson, East Baton Rouge, and Terrebonne Parishes all lead the state with best classifications, class 6.

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)

As of May 2012, 310 communities in the State of Louisiana participate in the Federal Emergency Management Agency's NFIP. Of these communities, 41 (or 13%) participate in the Community Rating System (CRS). Of the top fifty 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 1st 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[1], the National Flood Insurance Program (NFIP) completed a comprehensive review of the Community Rating System 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 in order 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 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.

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

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 and when the 2013 manual will impact their community.

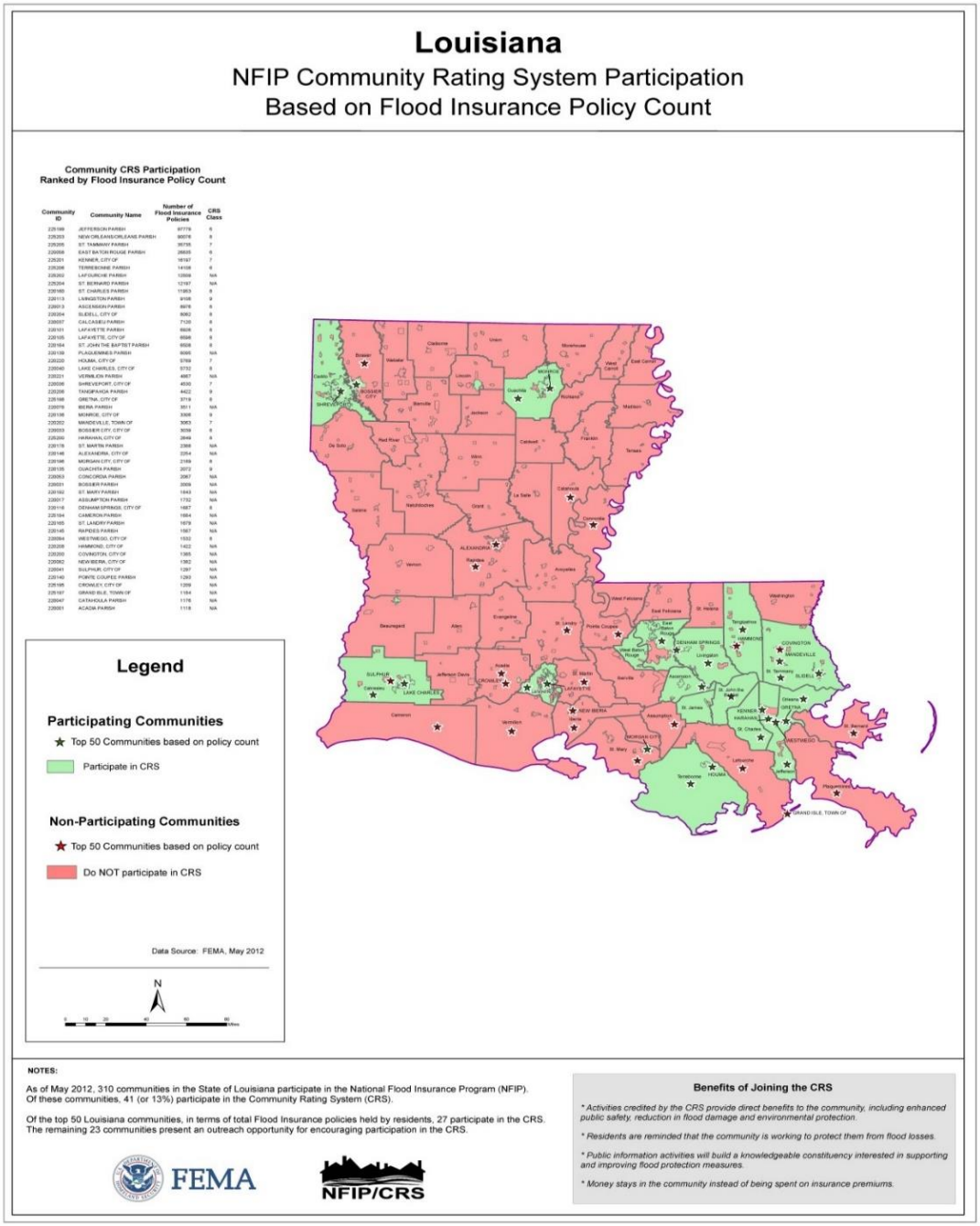

Figure 3-2: Louisiana CRS NFIP Participation
(Source: FEMA[2])

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

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:

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
   – 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 programs 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

Introduction

Concordia Parish's Hazard Mitigation Strategy has a common guiding principle and is the demonstration of the parish's and participating jurisdictions' commitment to reduce risks from hazards. The strategy also serves as a guide for parish and local decision makers as they commit resources to reducing the effects of hazards.

Concordia Parish confirmed the goals, objectives, actions, and projects over the period of the Hazard Mitigation Plan Update process. The mitigation actions and projects in this 2016 update are a product of analysis and review of the Concordia Parish Hazard Mitigation Plan Steering Committee, under the coordination of the Concordia Parish Office of Homeland Security and Emergency Preparedness. The committee was presented a list of projects and actions, new and from the 2011 plan, for review from December 2015 – June 2016.

An online public opinion survey was conducted of Concordia Parish residents between January and June 2016. The survey was designed to capture public perceptions and opinions regarding natural hazards in Concordia Parish. In addition, the survey sought to collect information regarding the methods and techniques preferred by the respondents for reducing the risks and losses associated with local hazards.

This activity was created in an effort to confirm that the goals and action items developed by the Concordia Parish Hazard Mitigation Plan Steering Committee are representative of the outlook of the community at large. However, because there were no responses to the survey, this public feedback could not be incorporated into the plan. The full Concordia Parish survey can be found at the following link:

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

During the public meeting in April, the committee provided a status of the projects from 2011 and the proposed actions for the 2016 update. Committee members then agreed on the submission of each project based on feasibility for funding, ease of completion and other community specific factors. The actions were later prioritized.

Goals

The goals represent the guidelines that the parish and its communities want to achieve with this plan update. To help implement the strategy and adhere to the mission of the Hazard Mitigation Plan, the preceding section of the plan update was focused on identifying and quantifying the risks faced by the residents and property owners in Concordia Parish from natural and manmade hazards. By articulating goals and objectives based on the previous plans, 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 municipal level – and to be undertaken by the state for its own property and assets. By doing so, Concordia Parish and its jurisdictions can make progress toward reducing identified risks.

For the purposes of this plan update, goals 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.
- **Action Items** are the specific steps (projects, policies, and programs) that advance a given goal. They are highly focused, specific, and measurable.

The current goals of the Concordia Parish Hazard Mitigation Plan Update Steering Committee represent long-term commitments by the parish and its jurisdictions. After assessing these goals, the committee decided that the current four goals remain valid.

The goals are as follows:

- Improve education and outreach efforts regarding potential impacts of hazards and the identification of specific measures that can be taken to reduce their impact
- Improve data collection, use, and sharing to reduce the impact of hazards
- Improve capabilities, coordination, and opportunities at municipal and parish levels to plan and implement hazard mitigation projects, programs, and activities
- Pursue opportunities to mitigate repetitive and severe repetitive loss properties and other appropriate hazard mitigation projects, programs, and activities

The Mitigation Action Plan focuses on actions to be taken by Concordia Parish and its jurisdictions. All of the activities in the Mitigation Action Plan will be focused on helping the parish and its municipalities in developing and funding projects that are not only cost effective, but also meet the other DMA 2000 criteria of environmental compatibility and technical feasibility.

The Hazard Mitigation Plan Steering Committee and each jurisdiction reviewed and evaluated the potential action and project lists in which consideration was given to a variety of factors. Such factors include determining a project's eligibility for federal mitigation grants, as well as its ability to be funded. This process required evaluation of each project's engineering feasibility, cost effectiveness, and environmental and cultural factors.

2016 Mitigation Actions and Update on Previous Plan Actions

The Concordia Parish Hazard Mitigation Plan Steering Committee and participating jurisdictions each identified actions that would reduce and/or prevent future damage within Concordia Parish and their respective communities. In that effort, each jurisdiction focused on a comprehensive range of specific mitigation actions. These actions were identified in thorough fashion by the consultant team, the committee, and the individual jurisdictions by way of frequent and open communications and meetings held throughout the planning process.

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.

The established and agreed upon parish and jurisdiction actions relative to the parish-wide goals are below. Additionally, action updates from the previous plan updates can be found in the first table below.

Concordia Parish and Jurisdictions 2011 Hazard Mitigation Action Update

Concordia Parish and Jurisdictions - Action Update			
Jurisdiction-Specific Action	**Action Description**	**Responsible Party, Agency, or Department**	**Status**
C1: Underground Utility Lines	Switch to underground utility lines for the following public buildings: i) Clayton City Hall; ii) Clayton Mayors Office; iii) Ferriday City Hall; iv) Ferriday Mayors Office; v) Ridgecrest City Hall; vi) Ridgecrest Mayors Office; vii) Vidalia City Hall; viii) Vidalia Mayors Office; ix) Parish Courthouse	Concordia Parish OHSEP Director	Delete
C2: Flood Relief Programs	Implement flood relief programs for the structures identified in the feasible study using the following structural techniques: flood-proofing, elevation of structure, relocation of structure outside of the floodplain, and acquisition.	Concordia Parish OHSEP Director	Delete
C3: Community Rating System	Participate in the Community Rating System (CRS) program.	Concordia Parish OHSEP Director	Carried Over
C4: Mosquito Abatement	Implement mosquito abatement programs.	Concordia Parish OHSEP Director	Delete
C5: Head Start	Work with Head Start to change the location of their bus boarding.	Concordia Parish OHSEP Director	Delete
C6: Drinking Water Scarcity	Conduct a study to identify water supply projects to alleviate the drinking water scarcity during drought years. The projects will include drilling of additional water wells, laying of water lines, and building of water reservoirs.	Concordia Parish OHSEP Director	In Progress
C7: Radio Communication System	Research the radio communication system upgrades for the first responders including Concordia Parish Sheriff's Office, Police Departments, Fire Departments, and Concordia Parish Emergency Operations Center.	Concordia Parish OHSEP Director	Delete
C8: School Zone Deputies	Work with the Parish and State to request deputies in the school zone during loading and unloading hours.	Concordia Parish OHSEP Director	Delete

Concordia Parish and Jurisdictions - Action Update			
Jurisdiction-Specific Action	**Action Description**	**Responsible Party, Agency, or Department**	**Status**
C9: Farmer Wildfire Education	Develop a public education program tailored to educating farmers on the prevention of wildfires. Public education program will include dissemination of Louisiana Department of Agriculture and Forestry guidelines.	Concordia Parish OHSEP Director	Delete
C10: Emergency Notification System	Publicize the Code Red emergency notification system to members of the community.	Concordia Parish OHSEP Director	Delete
C11: State of Louisiana Wellhead Protection Program	Participate in the "State of Louisiana Wellhead Protection Program". Arrange a meeting with the water districts for parish-wide participation in the "State of Louisiana Wellhead Protection Program".	Concordia Parish OHSEP Director	Carried Over
C12: Wildfire Training for Firefighters	Provide training to firefighters regarding extinguishing structure fires in elevated properties.	Concordia Parish OHSEP Director	Delete
C13: PA Coverage Training for Officials	Training for local officials in PA coverage and documentation.	Concordia Parish OHSEP Director	Carried Over
C14: Feasibility Study	Conduct a feasibility study to determine best mitigation option for each repetitive loss property. Study would include interviewing repetitive loss property owners in an effort to document willingness and preference to participate in structural elevation, flood-proofing, or acquisition.	Concordia Parish OHSEP Director	Delete
C15: Floodplain Management Ordinance Evaluation	Evaluate the performance of parish and municipal floodplain management ordinances.	Concordia Parish OHSEP Director	Delete
C16: Engineering Assessment	Conduct an engineering assessment to determine the vulnerability of the 425/84 bridge to barge collision and implement recommendations.	Concordia Parish OHSEP Director	Delete
C17: Tracking System	Develop a tracking system for hazard related losses and damages to maintain adequate data for BCAs.	Concordia Parish OHSEP Director	Delete
C18: Hydraulic Modeling	Conduct hydraulic modeling of levee failure scenarios.	Concordia Parish OHSEP Director	Delete
C19: Damage Tracking	Begin tracking damages from localized flooding.	Concordia Parish OHSEP Director	Delete
C20: Backup Generator Relocation	Elevate or relocate the backup generators at the Concordia Parish Courthouse Building and Riverland Medical Center to protect from flooding. Provide an enclosure to the backup generator at the Concordia Parish Courthouse from rain, high wind, hailstorm, and winter storms.	Concordia Parish OHSEP Director	Delete
C21: Emergency Generators	Install emergency generators for the priority critical facilities.	Concordia Parish OHSEP Director	Delete
C22: Traffic Re-Routing Plan	Create a plan to re-route traffic around the town in an emergency.	Concordia Parish OHSEP Director	Completed

Concordia Parish and Jurisdictions - Action Update			
Jurisdiction-Specific Action	**Action Description**	**Responsible Party, Agency, or Department**	**Status**
C23: Portable Generator	Purchase portable generator to assist people on life support and/or oxygen machine.	Concordia Parish OHSEP Director	Delete
C24: Water System Generator	Generator for the water system.	Concordia Parish OHSEP Director	Delete
C25: City Hall Generator	Purchase generator for city hall.	Concordia Parish OHSEP Director	Delete
C26: Mounted Generators	Install a permanent mounted generator for the City Hall and Fire Station.	Concordia Parish OHSEP Director	Delete
C27: Amend Ordinances	Amend i) Clayton Flood Damage Prevention Ordinance; ii) Clayton Zoning Ordinance; iii) Ridgecrest Flood Damage Prevention Ordinance; iv) Ridgecrest Buildings and Building Regulations; v) Zoning Ordinance for the City of Vidalia.	Concordia Parish OHSEP Director	Delete
C28: Water Usage	Promulgate an ordinance in the Concordia Parish Police Jury meeting and the town council meetings to restrict outdoor water usage during drought advisories. Prohibit and enforce against the unauthorized use of water.	Concordia Parish OHSEP Director	Delete
C29: Burn Notification	Introduce a resolution in the Concordia Parish Police Jury meeting to adopt an ordinance requiring notification of the fire department prior to any burn activities by nonagricultural entities in the parish.	Concordia Parish OHSEP Director	Carry Over
C30: Uniform Construction Code	Adopt the Louisiana State Uniform Construction Code (ICode) consisting of the following codes as the building codes in the parish. i) The 2000 edition of the International Building Code.	Concordia Parish OHSEP Director	Delete
C31: Floodplain Manager	Hire a full-time floodplain manager.	Concordia Parish OHSEP Director	Delete
C32: Floodplain Performance Evaluation	Evaluate the performance of parish and municipal floodplain management ordinances.	Concordia Parish OHSEP Director	Delete
C33: Future Development Plan	Create a future development plan that considers natural hazards in development.	Concordia Parish OHSEP Director	Delete
C34: Shady Lane Passing	Eliminate passing on Shady Lane.	Concordia Parish OHSEP Director	Delete
C35: Drainage Project Study	Conduct a study with Concordia Parish Public Works Department to identify drainage projects to reduce the flood potential in repetitive loss areas and other flood prone areas. The study would address the specific flooding.	Concordia Parish OHSEP Director	In Progress
C36: Maintenance Study	Conduct a study with the Concordia Parish Public Works Department and the cities' Public Works Department to enhance the program for the maintenance of drainage channels and culverts in the flood-prone areas.	Concordia Parish OHSEP Director	Delete
C37: Ditches	Work with the Parish to ensure that ditches outside the city limits are not clogged.	Concordia Parish OHSEP Director	Delete

Concordia Parish and Jurisdictions - Action Update			
Jurisdiction-Specific Action	**Action Description**	**Responsible Party, Agency, or Department**	**Status**
C38: Replacing Open Ditches	Replace existing open ditches with closed culverts and storm drains.	Concordia Parish OHSEP Director	Delete
C39: Re-Open Culverts	Re-open culverts by the old railroad in the Woodland Area.	Concordia Parish OHSEP Director	Delete
C40: Pump Repair	Repair existing pumps and create a maintenance schedule.	Concordia Parish OHSEP Director	In Progress
C41: Enlarge Culverts and Ditches	Enlarge undersized culverts and ditches.	Concordia Parish OHSEP Director	Delete
C42: Flood Mitigation Priority System	Identify structures impacted by Repetitive Flooding. Establish a property flood mitigation priority system that identifies and ranks repetitive loss structures in order of priority for mitigation activity.	Concordia Parish OHSEP Director	Delete
C43: Reduce Old River Flooding	Reduce/Eliminate flooding in the structure located near the Old River.	Concordia Parish OHSEP Director	Delete
C44: Concordia Park Flooding	Reduce/Eliminate flooding in the Concordia Park area.	Concordia Parish OHSEP Director	In Progress
C45: Sewage Backflow	Sewage backflow prevention.	Concordia Parish OHSEP Director	Carried Over
C46: Tornado Shelter Areas	Identify and designate tornado shelter areas in schools and public buildings in association with the Concordia Parish Public Works Department, municipalities' public works departments, and Concordia Parish School Board.	Concordia Parish OHSEP Director	Carried Over
C47: Public Building Engineering Study	Conduct an engineering study on the condition of the existing public buildings for lightning control and ability to withstand high wind forces from hurricanes and thunderstorms.	Concordia Parish OHSEP Director	Delete
C48: Public Brochures	Obtain brochures from FEMA, LOHSEP, and LSU Ag. Center and make them available to public in the parish courthouse and the public buildings in the incorporated communities.	Concordia Parish OHSEP Director	Delete
C49: Public Building Roofing Study	Conduct a study with the Concordia Parish Public Works Department to evaluate the condition of the roofing of the existing public buildings to withstand damage from hailstones.	Concordia Parish OHSEP Director	Delete
C50: Roof and Window Hardening	Harden the roof and windows on the Parish Courthouse.	Concordia Parish OHSEP Director	Delete
C51: Tree Trimming	Trim trees away from power lines and homes to prevent damages.	Concordia Parish OHSEP Director	Delete
C52: School Safe Rooms	Install safe rooms in schools.	Concordia Parish OHSEP Director	Delete
C53: Red Cross Safe Rooms	Safe rooms at the Red Cross Evacuation Center.	Concordia Parish OHSEP Director	Delete
C54: City Hall Safe Room	Harden city hall to include a safe room.	Concordia Parish OHSEP Director	Delete

Concordia Parish and Jurisdictions - Action Update			
Jurisdiction-Specific Action	**Action Description**	**Responsible Party, Agency, or Department**	**Status**
C55: Fasten School A/C Unit	Ensure proper fastening of A/C unit on top of school.	Concordia Parish OHSEP Director	Delete
C56: Fire Station Bay Doors	Install wind rated bay doors at the Fire Station.	Concordia Parish OHSEP Director	Delete
C57: Wildfire Mitigation Study	Conduct a wildfire mitigation study around school, create interface barriers as necessary.	Concordia Parish OHSEP Director	Delete
C58: Incorporate FEMA Building Codes	Incorporate the "Terrorism and Technological Hazard Mitigation Actions" from FEMA's "State and Local Mitigation Planning how-to guide: Integrating Manmade Hazards Into Mitigation Planning" into building codes.	Concordia Parish OHSEP Director	Delete
C59: Harden City Hall Security	Harden the City Hall against security risks.	Concordia Parish OHSEP Director	Delete

Unincorporated Concordia New Mitigation Actions

Concordia Unincorporated - New Mitigation Actions						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C1: Building Retrofits	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.	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
C2: Drainage Improvement	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. 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.	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
C3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
C4: Safe Room Projects	Construction of a safe room for first responders located in Concordia Parish. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones	New

Concordia Unincorporated - New Mitigation Actions						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Dam Failure, Levee Failure, Drought, and Winter Storm 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.	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New
C6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Extreme Heat	New
C7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Lightning	New
C8: Warning Systems	Update/upgrade public warning system components throughout Concordia Parish as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Winter storm, Wildfires, Tornadoes, Tropical Cyclones	New
C9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New

Concordia Unincorporated - New Mitigation Actions						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Tropical Cyclones, Flooding	New
C11: Retaining Wall for River Front	Procurement and construction of retaining wall for riverfront along the Mississippi. This retaining wall will protect homes and parish essential facilities along the river from future flooding events.	FEMA HMGP, Local	1-10 years	Concordia Parish OHSEP	Tropical Cyclones, Flooding, Dam and Levee Failure	New
C12: Dam and Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam and levee failure.	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
C13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of Drought.	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Drought	New
C14: Wildfires Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	Concordia Parish OHSEP	Wildfires	New

Town of Clayton - New Mitigation Actions

Town of Clayton						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C1: Building Retrofits	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.	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
C2: Drainage Improvement	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. 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.	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
C3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
C4: Safe Room Projects	Construction of a safe room for first responders located in Clayton. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones	New

Town of Clayton						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Dam Failure, Levee Failure, Drought, and Winter Storm 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.	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New
C6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail) , Extreme Heat	New
C7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Lightning	New
C8: Warning Systems	Update/upgrade public warning system components throughout Clayton as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones	New
C9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New

Town of Clayton						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
C10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Tropical Cyclones, Flooding	New
C11: Dam and Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam and levee failure.	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
C12: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of Drought.	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Drought	New
C13: Wildfires Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	Town of Clayton/ Concordia Parish OHSEP	Wildfires	New

Town of Ferriday – New Mitigation Actions

Town of Ferriday						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
F1: Building Retrofits	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.	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
F2: Drainage Improvement	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. 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.	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
F3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
F4: Safe Room Projects	Construction of a safe room for first responders located in Ferriday. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones	New

Town of Ferriday						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
F5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Dam Failure, Levee Failure, Drought, and Winter Storm 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.	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New
F6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail) , Extreme Heat	New
F7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	Lightning	New
F8: Warning Systems	Update/upgrade public warning system components throughout Ferriday as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	Winter Storms, Wildfires, Tornadoes, Tropical Cyclones	New
F9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New

Town of Ferriday						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
F10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Town of Ferriday/ Concordia Parish OHSEP	Tropical Cyclones, Flooding	New
F11: Dam and Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam and levee failure.	FEMA HMGP, Local	1-5 years	Town of Ferriday / Concordia Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
F12: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of Drought.	FEMA HMGP, Local	1-5 years	Town of Ferriday / Concordia Parish OHSEP	Drought	New
F13: Wildfires Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	Town of Ferriday / Concordia Parish OHSEP	Wildfires	New

Town of Ridgecrest – New Mitigation Actions

Town of Ridgecrest						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
R1: Building Retrofits	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.	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
R2: Drainage Improvements	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. 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.	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
R3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
R4: Safe Room Projects	Construction of a safe room for first responders located in Ridgecrest. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones	New

Town of Ridgecrest						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
R5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Dam Failure, Levee Failure, Drought, and Winter Storm 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.	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New
R6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail) , Extreme Heat	New
R7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Lightning	New
R8: Warning Systems	Update/upgrade public warning system components throughout Ridgecrest as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Winter storm, Wildfires, Tornadoes, Tropical Cyclones	New

Town of Ridgecrest						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
R9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
R10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Tropical Cyclones, Flooding	New
R11: Dam and Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam and levee failure.	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
R12: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of Drought.	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Drought	New
R13: Wildfires Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	Town of Ridgecrest/ Concordia Parish OHSEP	Wildfires	New

City of Vidalia – New Mitigation Actions

City of Vidalia						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
V1: Building Retrofits	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.	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	High Wind, Hail, Tropical Cyclones, Tornadoes	New
V2: Drainage Improvements	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. 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.	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
V3: Mitigation of repetitive loss and severe repetitive loss properties and other hazard prone structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Flooding, Tropical Cyclones	New
V4: Safe Room Projects	Construction of a safe room for first responders located in Vidalia. Other locations will be identified based on funding availability.	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Tornadoes, High Wind, Tropical Cyclones	New

City of Vidalia						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
V5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Dam Failure, Levee Failure, Drought, and Winter Storm 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.	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Flooding, Tropical Cyclones, Tornadoes, Wildfires, Extreme Heat, Thunderstorms (lightning, high wind, hail), Winter Storms, Drought, Dam Failure, Levee Failure	New
V6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Tornadoes, Winter Storms, Tropical Cyclones, Thunderstorms (lightning, high wind, hail) , Extreme Heat	New
V7: Lightning Mitigation	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Lightning	New
V8: Warning Systems	Update/upgrade public warning system components throughout Vidalia as necessary. Install audible and/or reverse 911 warning system(s)	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Winter storm, Wildfires, Tornadoes, Tropical Cyclones	New

City of Vidalia						
Jurisdiction-Specific Action	**Action Description**	**Funding Source**	**Target Completion Date**	**Responsible Party, Agency, or Department**	**Hazard**	**Status**
V9: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Tropical Cyclones, Thunderstorms (lightning, high wind, hail), Tornadoes	New
V10: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Tropical Cyclones, Flooding	New
V11: Retaining Wall for River Front	Procurement and construction of retaining wall for riverfront along the Mississippi. This retaining wall will protect homes and parish and city of Vidalia essential facilities along the river from future flooding events.	FEMA HMGP, Local	1-10 years	City of Vidalia/Concordia Parish OHSEP	Tropical Cyclones, Flooding	New
V12: Dam and Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam and levee failure.	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Tropical Cyclones, Flooding, Dam Failure, Levee Failure	New
V13: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of Drought.	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Drought	New
V14: Wildfires Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	FEMA HMGP, Local	1-5 years	City of Vidalia/Concordia Parish OHSEP	Wildfires	New

Action Prioritization

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 steering committee met internally for mitigation action meetings to review and approve Concordia Parish and the jurisdiction's mitigation actions. On-going actions, as well as actions which can be undertaken by existing parish or local staff without need for additional funding, were given high priority. The actions with high benefit and low cost, political support, and public support but require additional funding from parish or external sources were given medium priority. The actions that require substantial funding from external sources with relatively longer completion time were given low priority. There have been no changes in financial, legal, and political priorities within the past 5 years, with the methodology and prioritization process remaining the same.

Concordia Parish and the participating jurisdictions will implement and administer the identified actions based off of the proposed timeframes and priorities for each reflected in the portions of this section where actions are summarized. The inclusion of any specific action item in this document does not commit the parish to implementation. Each action item will be subject to availability of staff and funding. Certain items may require regulatory changes or other decisions that must be implemented through standard processes, such as changing regulations. This plan is intended to offer priorities based on an examination of hazards.

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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 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 Concordia Parish Hazard Mitigation Plan Update

The Concordia Parish Hazard Mitigation Plan Update process began in October 2015 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.

Concordia Parish includes the unincorporated areas of the parish, as well as four incorporated municipalities that participated in the plan update process – the Town of Clayton, Town of Ferriday, Town of Ridgecrest, and City of Vidalia. Concordia Parish Office of Homeland Security and Emergency Preparedness (OHSEP) invited communities' representatives to meetings, where they supplied critical infrastructure data and reviewed work-in-progress for the plan update.

Similar to the development of the original Hazard Mitigation Plan, the role of the steering committee members during the plan update was to attend the planning meetings and provide valuable information on the parish, develop parts of the plan update, and review the results of research conducted by SDMI. Tasks completed by the steering committee include:

- Reviewing and revising the list of potential hazards included in the plan update
- Assembling a list of critical facilities, such as hospitals, police stations, and shelters
- Updating mitigation goals and objectives
- Determining prudent mitigation measures
- Prioritization of identified mitigation measures

The table below details the meeting schedule and purpose for the planning process:

Date	Meeting or Outreach	Location	Public Invited	Purpose
10/2/2015	Initial Coordination	Telephone/ Email	No	Discuss with Parish HM coordinator and any Steering Committee members expectations and requirements of the project.
12/17/2015	Kick-Off Meeting	Concordia Parish, LA	No	Discuss with the plan steering committee expectations and requirements of the project. Assign plan worksheets to jurisdictions.
4/27/2016	Risk Assessment Overview	Concordia Parish, LA	No	Discuss and review the risk assessment with the steering committee discuss and review expectations for public meeting.
4/27/2016	Public Meeting	Concordia Parish, LA	Yes	The public meeting allowed the public and community stakeholders to participate and provide input into the hazard mitigation planning process. Maps of the Concordia Parish communities were provide for the meeting attendees to identify specific areas where localized hazards occur.
Ongoing	Public Survey Tool	Online	Yes	This survey asked participants about public perceptions and opinions regarding natural hazards in Concordia 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/r/ConcordiaParish
2 Week Period	Public Plan Review (Digital)		Yes	Parish Website and Concordia Parish OHSEP

Planning

The plan update process consisted of several phases

Phase	Month 1-2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Plan Revision								
Data Collection								
Risk Assessment								
Public Input								
Mitigation Strategy and Actions								
Plan Review by GOHSEP and FEMA								
Plan Adoption								
Plan Approval								

Coordination

The Concordia Parish OHSEP oversaw the coordination of the 2016 Hazard Mitigation Plan Update Steering Committee during the update process. The Concordia Parish OHSEP and participating jurisdictions were responsible for identifying members for the committee.

The Parish Director and SDMI were jointly responsible for inviting the Steering Committees and key stakeholders to planned meetings and activities by email invitations and calendar invites. SDMI assisted the Parish Director with meeting notices, website and social media statements for notification to the media and general public for public meetings and public outreach activities.

SDMI 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 2016 Hazard Mitigation Plan Update Steering Committee consisted of representatives from the following parish, municipal or community stakeholders:

- Concordia Parish Police Jury
- Concordia Office of Homeland Security and Emergency Preparedness
- Town of Clayton
- Town of Ferriday
- Town of Ridgecrest
- City of Vidalia

The Tensas Parish OHSEP Director was invited by the Concordia Parish OHSEP via email invitations to participate in all meetings and activities as well in an effort to collaborate with neighboring communities. In addition, the participation of the GOHSEP Region 6 Coordinator during the process also contributed to neighboring community representation.

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 2016 update. The completed worksheets can be found in Appendix E – State Required Plan Update Worksheets.

Below is a detailed list of the 2016 Hazard Mitigation Plan Update Steering Committee:

Name	Title	Agency	Address	Phone
Payne Scott	OHSEP Director	Concordia Parish Police Jury	4001 Carter Street Vidalia, LA	(318) 336-7151
Buz Craft	Mayor	City of Vidalia	200 Vernon Stevens Blvd Vidalia, LA	(318) 336-5206
Josephien Taylor Washington	Mayor	Town of Clayton	101 Shady Ln Clayton, LA	(318) 757-8540
Sherrie Jacobs	Mayor	Town of Ferriday	1116 2nd Street Ferriday, LA	(318) 757-8635
Bobby Sheppard Sr.	Mayor	Town of Ridgecrest	116 Foster Drive Ferriday, LA	(318) 757-4497
Kevin Friloux	Secretary/Treasurer	Concordia Parish Police Jury	4001 Carter Street Vidalia, LA	(318) 336-7151
Teresa Basco	Regional Coordinator	GOHSEP	7667 Independence Blvd Baton Rouge, LA	(225) 925-7500
Rick Foster	OHSEP Director	Tensas Parish OHSEP	203 Hancock Street St Joseph, LA	(318) 766-3992

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 Concordia Parish programs and planning.

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

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 Concordia 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 the 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 parish and jurisdiction data and plans reviewed and/or incorporated into the planning process include those listed below:

- Emergency Operations Plan
- State of Louisiana's Hazard Mitigation Plan
- Flood Insurance Rate Maps

Further information on other plans and capabilities reviewed can be found in the Capabilities Assessment, Section 3.

Meeting Documentation and Public Outreach Activities

The following pages contain information from the meetings and public outreach activities conducted during this Hazard Mitigation Plan Update for Assumption Parish.

Meeting #1: Coordination Discussion

Date: October 2, 2015

Location: Email

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: Concordia Parish OHSEP, SDMI Staff

Meeting #2: Hazard Mitigation Plan Update Kick-Off

Date: December 17, 2015

Location: Vidalia, LA

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

Invitees Included:

Name	Title	Agency
Payne Scott	OHSEP Director	Concordia Parish Police Jury
Buz Craft	Mayor	City of Vidalia
Josephien Taylor Washington	Mayor	Town of Clayton
Sherrie Jacobs	Mayor	Town of Ferriday
Bobby Sheppard Sr.	Mayor	Town of Ridgecrest
Kevin Friloux	Secretary/Treasurer	Concordia Parish Police Jury
Teresa Basco	Regional Coordinator	GOHSEP
Rick Foster	OHSEP Director	Tensas Parish OHSEP

Meeting #3: Risk Assessment Overview

Date: April 27, 2016

Location: Vidalia, LA

Purpose: Members of the Hazard Mitigation Plan Update Steering Committee were invited and were presented the results of the most recent risk assessment and an overview of the public meeting presentation during this overview. The assessment was conducted based on hazards identified during previous plans.

Public Initiation: No

Invitees Included:

Name	Title	Agency
Payne Scott	OHSEP Director	Concordia Parish Police Jury
Buz Craft	Mayor	City of Vidalia
Josephien Taylor Washington	Mayor	Town of Clayton
Sherrie Jacobs	Mayor	Town of Ferriday
Bobby Sheppard Sr.	Mayor	Town of Ridgecrest
Kevin Friloux	Secretary/Treasurer	Concordia Parish Police Jury
Teresa Basco	Regional Coordinator	GOHSEP
Rick Foster	OHSEP Director	Tensas Parish OHSEP

Meeting #4: Public Meeting

Date: April 27, 2016

Location: Vidalia, LA

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

Public Initiation: Yes

Invitees Included:

Name	Title	Agency
Payne Scott	OHSEP Director	Concordia Parish Police Jury
Buz Craft	Mayor	City of Vidalia
Josephien Taylor Washington	Mayor	Town of Clayton
Sherrie Jacobs	Mayor	Town of Ferriday
Bobby Sheppard Sr.	Mayor	Town of Ridgecrest
Kevin Friloux	Secretary/Treasurer	Concordia Parish Police Jury
Teresa Basco	Regional Coordinator	GOHSEP
Rick Foster	OHSEP Director	Tensas Parish OHSEP

****Subject Matter Experts from parish government were present to answer specific questions about proposed projects from any citizens. ****

Meeting Public Notice

LSU STEPHENSON DISASTER MANAGEMENT INSTITUTE

CONCORDIA PARISH OFFICE OF HOMELAND SECURITY & EMERGENCY PREPAREDNESS

MEETING NOTICE – April 27, 2016

Concordia Parish to hold Public Meetings for Hazard Mitigation Plan Update

Vidalia, LA – Concordia Parish Office of Homeland Security & Emergency Preparedness is in the process of updating the Concordia Parish Hazard Mitigation Plan and are required to hold public meetings on the plan update. The Public meeting will be held on April 27th, in the Concordia Parish Police Jury Meeting Room located at 4001 Carter Street, from 10:30AM to 11:30AM.

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.

Concordia Parish is in the stages of updating its hazard mitigation plan. Public meeting will be held on April 27th for all citizens interested in learning about and participating in discussions concerning the Concordia Parish Hazard Mitigation Plan.

Residents of Concordia 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/r/ConcordiaParish

For more information, please contact: Concordia OHSEP Office 318-336-5953

Stephenson Disaster Management Institute
Louisiana State University • 3000 Business Education Complex • Baton Rouge, Louisiana 70803

Outreach Activity #1: Public Opinion Survey

Date: Ongoing throughout planning process
Location: Web Survey
Public Initiation: Yes
No comments were collected through this activity.

Outreach Activity #2: Incident Questionnaire

Date: Public Meeting Activity
Location: Public Meeting
Public Initiation: Yes

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, 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. However, because no members of the public attended, no comments were collected.

Public Plan Review Documentation

The Concordia Parish Hazard Mitigation Draft Plan was placed on the Concordia Parish website to collect comments and feedback from the public. This outreach provided the public an opportunity to comment on the plan during the drafting stage and prior to plan approval. No feedback was received at this time.

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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

The Concordia Parish Planning Committee will be responsible for monitoring, evaluating, and documenting the plan's progress throughout the year. Part of the plan maintenance process should include a system by which local governing bodies incorporate the HMP into the parish's comprehensive or capital improvement plans. This process provides for continued public participation through the diverse resources of the parish to help in achieving the goals and objectives of the plan. Public participation will be achieved through availability of copies of HMP in parish public library and parish website. This section describes the whole update process which includes the following:

- Responsible parties
- Methods to be used
- Evaluation criteria to be applied
- Scheduling for monitoring and evaluating the plan

Responsible Parties

Concordia Parish has developed a method to ensure that a regular review and update of the Hazard Mitigation Plan occurs. This will be the responsibility of the steering committee, which consists of representatives from governmental organizations, local businesses, and private citizens, who will be involved in the process of monitoring, evaluating and updating the plan. All committee members in this plan will remain active in the steering committee.

Although the people filling the positions may change from year to year, the parish and its stakeholders will have representatives on the Steering Committee. The future Steering Committee will continue to be comprised of the same job functions as currently evident in the Steering Committee. However, the decision of specific job duties will be left to the Parish OHSEP Director to be assigned as deemed appropriate.

Methods for Monitoring and Evaluating the Plan and Plan Evaluation Criteria

Concordia Parish has developed a method to ensure monitoring, evaluating, and updating of the HMP occurs during the five-year cycle of the plan. The planning committee will become a permanent body and will be responsible for monitoring, evaluating, and updating of the plan. The planning committee meeting will be held annually in order to monitor, evaluate, and update the plan. The Concordia Parish OHSEP Director will be responsible for conducting the annual planning committee meetings.

The lead person of the agency responsible for the implementation of a specific mitigation action will submit a progress report to the Director at least thirty days prior to the planning committee meeting. The progress report will provide project status monitoring to include the following: whether the project has started; if not started, reason for not starting; if started, status of the project; if the project is completed, whether it has eliminated the problem; and any changes recommended to improve the implementation of the project etc. In addition, the progress report will provide status monitoring on the plan evaluation, changes to the hazard profile, changes to the risk assessment, and public input on the Hazard Mitigation Plan updates and reviews.

Progress on the mitigation action items and projects will be reviewed during the annual planning committee meeting. The criteria that would be utilized in the project review will include the following:

1) Whether the action was implemented and reasons, if the action was not implemented

2) What were the results of the implemented action

3) Were the outcomes as expected, and reasons if the outcomes were not as expected

4) Did the results achieve the stated goals and objectives

5) Was the action cost-effective

6) What were the losses avoided after completion of the project

7) In case of a structural project, did it change the hazard profile

In addition to monitoring and evaluating the progress of the mitigation plan actions and projects, the mitigation plan is required to be maintained and monitored annually, and updated every five years. The annual maintenance, monitoring and evaluation of the plan will be conducted in the annual planning committee meeting. The planning committee will review each goal and objective to determine their relevance to changing situations in the parish, as well as changes to state or federal policy, and to ensure that they are addressing current and expected conditions. The planning committee will evaluate if any change in hazard profile and risk in the parish occurred during the past year. In addition, the evaluation will include the following criteria in respect of plan implementation:

1) Any local staffing changes that would warrant inviting different members to the planning committee

2) Any new organizations that would be valuable in the planning process or project implementation need to be included in the planning committee

3) Are there any procedures that can be done more efficiently

4) Are there more ways to gain more diverse and widespread cooperation

5) Are there any different or additional funding sources available for mitigation planning and implementation

The HMP will be updated every five years to remain eligible for continued HMGP funding. The planning committee will be responsible for updating the HMP. The OHSEP Director will be the lead person for the HMP update. The HMP update process will commence at least one year prior to the expiration of the plan. The HMP will be updated after a major disaster if an annual evaluation of the plan indicate a substantial change in hazard profile and risk assessment in the parish.

Additionally, the public will be canvassed to solicit public input to continue Concordia Parish's dedication to involving the public directly in review and updates of the Hazard Mitigation Plan. Meetings will be scheduled as needed by the plan administrator to provide a forum for which the public can express their concerns, opinions, and/or ideas about the plan. The plan administrator will be responsible for using parish resources to publicize the annual public meetings and maintain public involvement through the newspapers, radio, and public access television channels. Copies of the plan will be catalogued and kept at all appropriate agencies in the city government, as well as at the Public Library.

The review by the steering committee and input from the public will determine whether a plan update is needed prior to the required five-year update.

2016 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 2016 update. Based on this analysis, the method and schedule were deemed to be acceptable, and nothing was changed for this update.

Incorporation into Existing Planning Programs

It is and has been the responsibility of the Concordia Parish Hazard Mitigation Plan Steering Committee and participating jurisdictions to determine additional implementation procedures when appropriate. This may include integrating the requirements of the Concordia Parish Hazard Mitigation Plan into each jurisdiction's planning documents, processes, or mechanisms as follows:

- Ordinances, Resolutions, Regulations
- Floodplain Ordinances
- Comprehensive Master Plan
- Capital Improvements Plan
- Economic Development Plan
- Emergency Operations Plan
- Continuity of Operations Plan
- Transportation Plan
- Stormwater Management Plan
- Community Wildfire Protection Plan

Opportunities to integrate the requirements of this plan into other local planning mechanisms will continue to be identified through future meetings of the Concordia Parish Hazard Mitigation Steering Committee and through the five-year review process described herein. 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 plans that require specific planning and administrative tasks (e.g. risk assessment, plan amendments, ordinance revisions, capital improvement projects, etc.). The members of the steering committee will meet with Department Heads to discuss what should be included in the changes that are necessary before the changes are introduced to the city council or police jury meetings. Steering committee members 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 Concordia Parish Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability within the parish.

During the planning process for new and updated local planning documents at the parish and jurisdiction level, such as a risk assessment, comprehensive plan, capital improvements plan, or emergency operations plan, the jurisdictions will provide a copy of the Parish Hazard Mitigation Plan to the appropriate parties and recommend that all goals and strategies of new and updated local planning documents are consistent with and support the goals of the Parish Hazard Mitigation Plan and will not contribute to increased hazards.

Although it is recognized that there are many possible benefits to integrating components of this plan into other parish and jurisdiction planning mechanisms, the development and maintenance of this stand-alone Hazard Mitigation Plan is deemed by the steering committee to be the most effective and appropriate method to ensure implementation of parish and local hazard mitigation actions.

On behalf of the jurisdictions of the Town of Clayton, Town of Ferriday, Town of Ridgecrest, and Town of Ferriday, Concordia Parish has the authority to incorporate the contents of the Hazard Mitigation Plan into the parish's existing regulatory mechanisms. Agreements are currently in place with jurisdictions to allow for the parish incorporation mechanisms to take place.

The following parish and local plans incorporate requirements of this HMP Update as follows through steering committee member and jurisdiction representation throughout the planning process as described above:

Concordia Unincorporated
Economic Development Plan/Updated as needed/Concordia Parish Police Jury
Local Emergency Operations Plan/Updated as needed/Concordia Parish OHSEP

Town of Clayton
There are no additional plans within this jurisdiction for the Hazard Mitigation Plan to be integrated.

Town of Ferriday
Capital Improvements Plan/ Updated as needed/Concordia Parish Police Jury and Mayor of Ferriday
Emergency Operations Plan/Updated as needed/Concordia Parish OHSEP and Mayor of Ferriday

Town of Ridgecrest
Economic Development Plan/Updated as needed/Concordia Parish Police Jury and Mayor of Ridgecrest

City of Vidalia
Comprehensive Master Plan/Updated as needed/Concordia Parish Police Jury and Mayor of Vidalia
Capital Improvements Plan/ Updated as needed/Concordia Parish Police Jury and Mayor of Vidalia
Economic Development Plan/Updated as needed/Concordia Parish Police Jury and Mayor of Vidalia
Emergency Operations Plan/Updated as needed/Concordia Parish OHSEP and Mayor of Vidalia
Continuity of Operations Plan/Updated as needed/Concordia Parish OHSEP and Mayor of Vidalia
Transportation Plan/Concordia Parish Police Jury and Mayor of Vidalia
Stormwater Management Plan/Concordia Parish Police Jury and Mayor of Vidalia

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. These efforts will include at least one of the following:

- Advertising meetings of the Mitigation Committee in the local newspaper, public bulletin boards, and/or city and county office buildings
- Designating willing and voluntary citizens and private sector representatives as official members of the Mitigation Committee
- Utilizing local media to update the public of any maintenance and/or periodic review activities taking place
- Utilizing city and parish web sites to advertise any maintenance and/or periodic review activities taking place
- Keeping copies of the plan in appropriate public locations

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Appendix C: Essential Facilities

Concordia Parish Essential Facilities – All Jurisdictions

Unincorporated Concordia Essential Facilities													
Type	**Name**	**Drought***	**Extreme Heat***	**Flood**	**Hail**	**Wind**	**Lightning**	**Tornado**	**Tropical Cyclones**	**Wildfire**	**Winter Storm***	**Dam Failure+**	**Levee Failure+**
Fire and Rescue	Charles L. Dew Memorial Fire Station			X	X	X	X	X	X	X			
	Charles Sutton Memorial Fire Station			X	X	X	X	X	X	X			
	Fire Station			X	X	X	X	X	X	X			
	Fire Station			X	X	X	X	X	X	X			
	Fire Station			X	X	X	X	X	X	X			
	Fire Station			X	X	X	X	X	X	X			
	Monterey Fire Department			X	X	X	X	X	X				
	Monterey Volunteer Fire Department			X	X	X	X	X	X	X			
	Monterey Volunteer Fire Department			X	X	X	X	X	X				
	Monterey Volunteer Fire Department			X	X	X	X	X	X	X			
	Fire Department			X	X	X	X	X	X				
	Fire Station			X	X	X	X	X	X	X			
	Vidalia Fire Department			X	X	X	X	X	X				

Unincorporated Concordia Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flood	Hail	Wind	Lightning	Tornado	Tropical Cyclones	Wildfire	Winter Storm*	Dam Failure+	Levee Failure+
Government	Concordia Parish Courthouse				X	X	X	X	X	X			
	Concordia District Waterworks			X	X	X	X	X	X	X			
	Concordia Parish Police Jury			X	X	X	X	X	X	X			
	School Board Central Administration			X	X	X	X	X	X				
	Monterey Rural Water System			X	X	X	X	X	X	X			
Law Enforcement	Concordia Parish Sheriff's Office - Wildsville Substation			X	X	X	X	X	X				
	Concordia Parish Sheriff's Office Substation			X	X	X	X	X	X	X			
	Concordia Parish Sheriff's Shooting Range			X	X	X	X	X	X	X			
	Vidalia Police Department			X	X	X	X	X	X	X			

Unincorporated Concordia Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flood	Hail	Wind	Lightning	Tornado	Tropical Cyclones	Wildfire	Winter Storm*	Dam Failure+	Levee Failure+
Prison and Corrections	Concordia Parish Correctional Facility			X	X	X	X	X	X	X			
	Concordia Parish Sheriff's Office Work Release			X	X	X	X	X	X	X			
Schools	Monterey High School			X	X	X	X	X	X				

Clayton Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flood	Hail	Wind	Lightning	Tornado	Tropical Cyclones	Wildfire	Winter Storm	Dam Failure+	Levee Failure+
Fire and Rescue	Fire Station				X	X	X	X	X	X			
Government	City Hall				X	X	X	X	X	X			
Law Enforcement	Concordia Parish Sherriff's Office - Clayton Sub				X	X	X	X	X	X			

Ferriday Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flood	Hail	Wind	Lightning	Tornado	Tropical Cyclones	Wildfire	Winter Storm	Dam Failure+	Levee Failure+
Fire and Rescue	Ferriday Fire Station				X	X	X	X	X	X			
Government	Ferriday Municipal Building				X	X	X	X	X				
Law Enforcement	Ferriday Police Department				X	X	X	X	X	X			
Schools	Ferriday Junior High School				X	X	X	X	X	X			
	Ferriday Upper Elementary				X	X	X	X	X	X			
	Ferriday High School				X	X	X	X	X	X			
	Ferriday Lower Elementary				X	X	X	X	X	X			

Ridgecrest Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flood	Hail	Wind	Lightning	Tornado	Tropical Cyclones	Wildfire	Winter Storm	Dam Failure+	Levee Failure+
Fire and Rescue	Ridgecrest Fire Department				X	X	X	X	X	X			
Government	Ridgecrest Town Hall			X	X	X	X	X	X	X			

Vidalia Essential Facilities													
Type	Name	Drought*	Extreme Heat*	Flood	Hail	Wind	Lightning	Tornado	Tropical Cyclones	Wildfire	Winter Storm	Dam Failure +	Levee Failure+
Fire and Rescue	Vidalia Fire Department				X	X	X	X	X	X			
	Vidalia Fire Department Training Facility				X	X	X	X	X	X			
Government	Concordia Parish Old Courthouse				X	X	X	X	X	X			
	Vidalia City Hall			X	X	X	X	X	X	X			
Law Enforcement	Concordia Parish Sheriff's Office				X	X	X	X	X	X			
	Concordia Parish Sheriff's Office				X	X	X	X	X	X			
Schools	Vidalia Junior High School				X	X	X	X	X	X			
	Vidalia High School				X	X	X	X	X	X			
	Vidalia Lower Elementary				X	X	X	X	X	X			
	Vidalia Upper Elementary				X	X	X	X	X	X			

* There are no critical facilities vulnerable to the hazard

+Data Deficiency

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Appendix D: Plan Adoption

UNITED STATES OF AMERICA

STATE OF LOUISIANA

PARISH OF CONCORDIA

A RESOLUTION OF THE PARISH OF CONCORDIA ADOPTING

THE CONCORDIA PARISH HAZARD MITIGATION PLAN – 2017

WHEREAS the Parish of Concordia recognizes the threat that natural hazards pose to people and property within Concordia Parish; and

WHEREAS the Parish of Concordia has prepared a multi-hazard mitigation plan, hereby known as THE CONCORDIA PARISH HAZARD MITIGATION PLAN – 2017 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS THE CONCORDIA PARISH HAZARD MITIGATION PLAN – 2017 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Concordia Parish from the impacts of future hazards and disasters; and

WHEREAS adoption by the Concordia Parish Police Jury demonstrates their commitment to the hazard mitigation and achieving the goals outlined in THE CONCORDIA PARISH HAZARD MITIGATION PLAN – 2017.

NO THEREFORE, BE IT RESOLVED BY THE CONCORDIA PARISH POLICE JURY THAT:

The Concordia Parish Police Jury adopts THE CONCORDIA PARISH HAZARD MITIGATION PLAN – 2017.

I hereby certify that I am the duly acting and qualified Secretary of the Concordia Parish Police Jury and that the above and foregoing constitutes a true and correct copy of the Resolution duly adopted at a meeting of the Jury held on September 25, 2017, at which meeting a quorum was present and voted in favor of said Resolution, and Resolution never having been modified or rescinded and is still in full force and effect.

Secretary, Concordia Parish Police Jury Sandra Bradley

Date: 9/25/17

United States of America

State of Louisiana

VILLAGE OF CLAYTON, PARISH OF CONCORDIA

RESOLUTION NO. _____

A RESOLUTION ADOPTING THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017

WHEREAS, the VILLAGE OF CLAYTON MAYOR AND COUNCIL recognize the threat that natural hazards pose to people and property within CLAYTON; and

WHEREAS, the CONCORIDA PARISH GOVERNMENT has prepared a multi-hazard mitigation plan, hereby known as THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in CLAYTON from the impacts of future hazards and disasters; and

WHEREAS adoption by the VILLAGE OF CLAYTON COUNCIL demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the CONCORDIA PARISH HAZARD MITIGATION PLAN 2017.

NOW THEREFORE, BE IT RESOLVED that the VILLAGE OF CLAYTON hereby adopts the CONCORDIA PARISH HAZARD MITIGATION PLAN 2017.

The above resolution having been submitted to the Council and discussed at a public meeting on October, 3, 2017; after a motion by Irene Jefferson and a second by Shannon Madison, and having been submitted for a vote, the vote was as follows:

YEAS: 4 NAYS: 0 ABSTAIN: 0 ABSENT: 1

Josephine Washington, Mayor

CERTIFICATE

I, Sally B. Lewis, Office Clerk of the VILLAGE OF CLAYTON, do hereby certify that the foregoing resolution is a true and exact copy adopted by the VILLAGE OF CLAYTON COUNCIL at a meeting thereof legally held on the 3 day of October, 2017.

Sally B. Lewis

Office Clerk

United States of America

State of Louisiana

TOWN OF FERRIDAY, PARISH OF CONCORDIA

RESOLUTION NO. _____

A RESOLUTION ADOPTING THE CONCORDIA PARISH HAZARD IVIITIGATION PLAN 2017

WHAREAS, the TOWN OF FERRIDAY MAYOR AND CITY COUNCIL recognize the threat that natural hazards pose to people and property within FERRIDAY; and

WHEREAS, the CONCORIDA PARISIH GOVERNMENT has prepared a multi hazard mitigation plan, hereby known as THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017 identifies mitigation *goals* and actions to reduce or eliminate long term risk to people and property in FERRIDAY from the impacts of future hazards and disasters; and

WHEREAS adoption by the TOWN OF FERRIDAY COUNCIL demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the CONCORDIA PARISH HAZARD MITIGATION PLAN 2017.

NOW THEREFORE, BE IT RESOLVED that the TOWN OF FERRIDAY hereby adopts the CONCORDIA PARISH HAZARD MITIGATION PLAN 2017.

The above resolution having been submitted to the City Council and discussed at a public meeting Oct 10, 2017; after a motion by Alderwoman Lloyd and a second by Alderman Keys, and having been submitted for a vote, the vote was as follows.

YEAS: 3 NAYS: 0 ABSTAIN: 0 ABSENT: 2

Sherrie Jacobs, Mayor

CERTIFICATE

Lola Jordan, City Clerk of the Town of Ferriday, do hereby certify that the foregoing resolution is a true and ~~exact~~ copy adopted by the Town of Ferriday Council at a meeting thereof legally held on the 10 day of Oct 2017

Town Clerk

United States of America

State of Louisiana

VILLAGE OF RIDGECREST, PARISH OF CONCORDIA

RESOLUTION NO: 10

A RESOLUTION ADOPTING THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017

WHEREAS, the VILLAGE OF RIDGECREST MAYOR AND COUNCIL recognize the threat that natural hazards pose to people an property with RIDGECREST; and

WHEREAS, the CONCORDIA PARISH GOVERNMENT has prepared a multi-hazard mitigation plan, hereby known as THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in RIDGECREST from the impacts of future hazards and disasters; and

WHEREAS, adoption by THE VILLAGE OF RIDGECREST COUNCIL demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the CONCORDIA PARISH HAZARD MITIGATION PLAN 2017.

NOW THEREFORE, BE IT RESOLVED that the VILLAGE OF RIDGECREST hereby adopts the CONCORDIA PARISH HAZARD MITIGATION PLAN 2017.

The above resolution having been submitted to the Council and discussed at a public meeting on October 10, 2017; after a motion by Alderwoman Bolyer and a second by Alderman Lawrence, and having been submitted for a vote, the vote was as follows:

YEAS 4 NAYS 0 ABSTAIN 0 ABSENT 1

Bobby R. Sheppard, Sr., Mayor

CERTIFICATE

I, Dorothy Evans, Clerk of the VILLAGE OF RIDGECREST, do hereby certify that the foregoing resolution is a true an exact copy adopted by the VILLAGE OF RIDGECREST COUNCIL at a meeting thereof legally held on the 10th day of October, 2017.

Dorothy Evans

Village Clerk

United States of America

State of Louisiana

CITY OF VIDALIA, PARISH OF CONCORDIA

RESOLUTION NO. _____

A RESOLUTION ADOPTING THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017

WHEREAS, the CITY OF VIDALIA MAYOR AND COUNCIL recognize the threat that natural hazards pose to people and property within VIDALIA; and

WHEREAS, the CONCORIDA PARISH GOVERNMENT has prepared a multi-hazard mitigation plan, hereby known as THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017 in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, THE CONCORDIA PARISH HAZARD MITIGATION PLAN 2017 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in VIDALIA from the impacts of future hazards and disasters; and

WHEREAS adoption by the CITY OF VIDALIA COUNCIL demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the CONCORDIA PARISH HAZARD MITIGATION PLAN 2017.

NOW THEREFORE, BE IT RESOLVED that the CITY OF VIDALIA hereby adopts the CONCORDIA PARISH HAZARD MITIGATION PLAN 2017.

The above resolution having been submitted to the Council and discussed at a public meeting on Tuesday, October, 10, 2017; after a motion by Jon Betts and a second by Tommy Probst, and having been submitted for a vote, the vote was as follows:

YEAS: 4 NAYS: 0 ABSTAIN: 0 ABSENT: 1

Buz Craft, Mayor

CERTIFICATE

I, Vicki Byrnes, City Clerk of the CITY OF VIDALIA, do hereby certify that the foregoing resolution is a true and exact copy adopted by the CITY OF VIDALIA COUNCIL at a meeting thereof legally held on the 10th day of October, 2017.

Vicki Byrnes

City Clerk

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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.

Mitigation Planning Team

Name	Title	Agency	Address	Phone
Payne Scott	OHSEP Director	Concordia Parish Police Jury	4001 Carter Street Vidalia, LA	(318) 336-7151
Buz Craft	Mayor	City of Vidalia	200 Vernon Stevens Blvd Vidalia, LA	(318) 336-5206
Josephien Taylor Washington	Mayor	Town of Clayton	101 Shady Ln Clayton, LA	(318) 757-8540
Sherrie Jacobs	Mayor	Town of Ferriday	1116 2nd Street Ferriday, LA	(318) 757-8635
Bobby Sheppard SR.	Mayor	Town of Ridgecrest	116 Foster Drive Ferriday, LA	(318) 757-4497
Kevin Friloux	Secretary/Treasurer	Concordia Parish Police Jury	4001 Carter Street Vidalia, LA	(318) 336-7151
Teresa Basco	Regional Coordinator	GOHSEP	7667 Independence Blvd Baton Rouge, LA	(225) 925-7500
Rick Foster	OHSEP Director	Tensas Parish OHSEP	203 Hancock Street St Joseph, LA	(318) 766-3992

Capability Assessment

Concordia Unincorporated

Worksheet 4.1: Capability Assessment
Worksheet - Concordia Parish - Unincorporated

Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.

Plans	Yes / No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	No	
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	Yes	Go by state req.
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	Yes	Vanesby district
Site plan review requirements	Yes	Contracted out
Land Use Planning and Ordinances	**Yes / No**	
Zoning Ordinance	No	
Subdivision Ordinance	Yes	
Floodplain Ordinance	Yes	

Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	Yes	Varies by district

Administration and Technical

Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes / No	
Planning Commission	Yes	Contacted out
Mitigation Planning Committee	Yes	LAPC
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
Staff	**Yes / No; FT/PT; % Hazard Mitigation**	
Chief Building Official	Yes/FT/20%	
Floodplain Administrator	Yes/PT/20%	
Emergency Manager	Yes/PT/10%	
Community Planner	Yes/PT/10%	
Civil Engineer	Yes/PT	
GIS Coordinator	Yes/PT	
Grant Writer	No	
Technical	**Yes / No**	
Warning Systems / Service (Reverse 911, outdoor warning signals)	No	
Hazard Data & Information	No	
Grant Writing	No	
Hazus Analysis	No	
Other	No	

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes / No	
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	Yes	State C.O., LGAP

Education and Outreach

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes / No	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	Through fire departments & WL fisheries
Natural Disaster or safety related school program	Yes	Schools
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other	No	

Town of Clayton

Worksheet 4.1: Capability Assessment Worksheet - Clayton

Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.

Plans	Yes / No	Comments
Comprehensive / Master Plan	No	Parish
Capital Improvements Plan	No	Parish
Economic Development Plan	No	Parish
Local Emergency Operations Plan	No	Parish
Continuity of Operations Plan	No	Parish
Transportation Plan	No	Parish
Stormwater Management Plan	No	Parish
Community Wildfire Protection Plan	No	Parish
Other plans (redevelopment, recovery, coastal zone management)	No	Parish
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	No	Parish
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	Parish
Fire Department ISO/PIAL rating	No	Parish (Concordia Recreation)
Site plan review requirements	No	
Land Use Planning and Ordinances	**Yes / No**	
Zoning Ordinance	Yes	Clayton
Subdivision Ordinance	Yes	Clayton
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	Parish
Flood Insurance Rate Maps	Yes	

Acquisition of land for open space and public recreation uses	No	Parish
Other	No	

Administration and Technical

Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes / No	
Planning Commission	No	Parish
Mitigation Planning Committee	No	Parish
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	No	Parish
Staff	**Yes / No; FT/PT; % Hazard Mitigation**	
Chief Building Official	No	Parish
Floodplain Administrator	No	Parish
Emergency Manager	No	Parish
Community Planner	No	Parish
Civil Engineer	Yes	Brian Hammet & Associates
GIS Coordinator	No	Parish
Grant Writer	Yes	Richard Madison
Other	Yes	Oliver Schulz
Technical	**Yes / No**	
Warning Systems / Service (Reverse 911, outdoor warning signals)	No	Parish
Hazard Data & Information	No	Parish
Grant Writing	No	Parish
Hazus Analysis	No	Parish
Other	N/A	

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes / No	
Capital Improvements project funding	No	Parish
Authority to levy taxes for specific purposes	No	Parish
Fees for water, sewer, gas, or electric services	No	Parish
Impact fees for new development	No	Parish
Stormwater Utility Fee	No	Parish
Community Development Block Grant (CDBG)	No	State
Other Funding Programs	No	State

Education and Outreach

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes / No	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	Parish
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	No	Parish
Natural Disaster or safety related school program	No	Parish
Storm Ready certification	No	Parish
Firewise Communities certification	No	Parish
Public/Private partnership initiatives addressing disaster-related issues	No	Parish

Town of Ferriday

Worksheet 4.1: Capability Assessment Worksheet - Ferriday

Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.

Plans	Yes / No	Comments
Comprehensive / Master Plan	No	Parish Plan
Capital Improvements Plan	Yes	
Economic Development Plan	No	Parish
Local Emergency Operations Plan	Yes	Fire Department
Continuity of Operations Plan	No	Parish
Transportation Plan	No	
Stormwater Management Plan	No	Parish
Community Wildfire Protection Plan	No	Parish
Other plans (redevelopment, recovery, coastal zone management)	No	
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	Yes	Fire Department
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	Fire Department
Fire Department ISO/PIAL rating	Yes	Fire Department
Site plan review requirements	Yes	Fire Department
Land Use Planning and Ordinances	**Yes / No**	
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Floodplain Ordinance	Yes	

Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	Parish
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	Yes	
Other	No	

Administration and Technical

Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes / No	
Planning Commission	No	Parish
Mitigation Planning Committee	No	Parish
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
Staff	Yes / No; FT/PT; % Hazard Mitigation	
Chief Building Official	Yes/FT/20%	
Floodplain Administrator	No	Parish
Emergency Manager	Yes/PT/10%	
Community Planner	Yes	
Civil Engineer	Yes	Bryant Hammett
GIS Coordinator	No	Parish
Grant Writer	Yes	
Other	no	
Technical	Yes / No	
Warning Systems / Service (Reverse 911, outdoor warning signals)	No	Parish
Hazard Data & Information	No	Parish

Grant Writing	Yes	Parish and Local
Hazus Analysis	No	Parish
Other	No	

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes / No	
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	Yes	

Education and Outreach

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes / No	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	Parish
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	
Natural Disaster or safety related school program	No	Parish
Storm Ready certification	No	Parish
Firewise Communities certification	No	Parish
Public/Private partnership initiatives addressing disaster-related issues	No	Parish
Other	No	

Town of Ridgecrest

Worksheet 4.1: Capability Assessment Worksheet - Ridgecrest

Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.

Plans	Yes / No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	Yes	
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 management)	No	
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	Yes	
Site plan review requirements	Yes	
Land Use Planning and Ordinances	**Yes / No**	
Zoning Ordinance	No	
Subdivision Ordinance	No	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	

Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	Yes	

Administration and Technical

Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes / No	
Planning Commission	No	
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
Staff	Yes / No; FT/PT; % Hazard Mitigation	
Chief Building Official	Yes/FT/20%	
Floodplain Administrator	No	Parish
Emergency Manager	Yes/PT/10%	
Community Planner	No	
Civil Engineer	Yes	Contractor
GIS Coordinator	No	
Grant Writer	No	
Other	No	
Technical	**Yes / No**	
Warning Systems / Service (Reverse 911, outdoor warning signals)	No	
Hazard Data & Information	No	
Grant Writing	No	
Hazus Analysis	No	
Other	No	

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes / No	
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	Yes	

Education and Outreach

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes / No	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	No	
Natural Disaster or safety related school program	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other	No	

City of Vidalia

Worksheet 4.1: Capability Assessment Worksheet - Vidalia

Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.

Plans	Yes / No	Comments
Comprehensive / Master Plan	Yes	
Capital Improvements Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	Yes	
Transportation Plan	Yes	
Stormwater Management Plan	Yes	
Community Wildfire Protection Plan	no	
Other plans (redevelopment, recovery, coastal zone management)	no	
Building Code, Permitting and Inspections	**Yes / No**	
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	
Fire Department ISO/PIAL rating	Yes	
Site plan review requirements	Yes	
Land Use Planning and Ordinances	**Yes / No**	
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Floodplain Ordinance	yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	
Flood Insurance Rate Maps	Yes	

Acquisition of land for open space and public recreation uses	Yes	
Other	no	

Administration and Technical

Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.

Administration	Yes / No	
Planning Commission	Yes	
Mitigation Planning Committee	Yes	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
Staff	Yes / No; FT/PT; % Hazard Mitigation	
Chief Building Official	Yes/FT/20%	
Floodplain Administrator	No	Parish
Emergency Manager	Yes/PT/10%	
Community Planner	No	
Civil Engineer	Yes	
GIS Coordinator	Yes	
Grant Writer	Yes	
Other	no	
Technical	Yes / No	
Warning Systems / Service (Reverse 911, outdoor warning signals)	No	
Hazard Data & Information	No	
Grant Writing	Yes	
Hazus Analysis	No	
Other	no	

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Yes / No	
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

Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.

Program / Organization	Yes / No	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	
Natural Disaster or safety related school program	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other	No	

Building Inventory

Critical Facility (If Yes, Mark X)	Name of Building	Purpose of Building	Address	City	Lat	Long	Assessed Value	Date Built	Const. Type
Concordia									
	Charles L. Dew Memorial Fire Station	Fire Search and Rescue	18325 LA Hwy 15	Deer Park	31.39845533	-91.58884638	$8,925.00	1990	Metal
	Monterey Volunteer Fire Department	Fire Search and Rescue	LA-565	Lismore	31.52812407	-91.77239565	$20,550.00	1990	Concrete
	Monterey High School	Education	LA Hwy 129	Monterey	31.45786851	-91.7203129	$789,075.00	1990	Concrete
	Concordia Parish Sheriff's Office Substation	Law Enforcement	6098 LA Hwy 129	Monterey	31.4534293	-91.71820401	$75,000	2010	Concrete
	Concordia Parish Sheriff's Office - Wildsville Substation	Law Enforcement	Nearby: U.S. 84	Wildsville	31.61650676	-91.78638919	$4,575.00	1990	Concrete
	Concordia Sewer Dist. No. 1						$129,000	2010	Concrete
	Concordia Recreation Dist. No. 1						$249,000	2013	Concrete
	Ferriday Library	Education	1609 N 3rd St.	Ferriday			$2,200,000	1988	Concrete
	Vidalia Library	Education	408 Texas St.	Vidalia			$560,000	1997	Concrete
	Clayton Library	Education	8723 LA-566	Clayton			$82,000	1979	Metal
	Police Jury Courthouse	Law Enforcement					$7,575,000	1974	Concrete
	Police Jury Old Courthouse	Law Enforcement					$4,377,500	1936	Concrete
	Police Jury Maintenance Unit	Law Enforcement					$581,500	1973	Concrete
	Police Jury Storage Building	Law Enforcement					$400,000	1973	Concrete
	Police Jury Radio Tower	Law Enforcement					$25,000	2014	Concrete
	Police Jury Storage Shed	Law Enforcement					$85,000	2010	Concrete
	Police Jury Fuel Tanks	Law Enforcement					$80,000	2013	Concrete
	Prison	Prisons and Correctional Facilities					$4,500,000	1997	Concrete
	Prison	Prisons and Correctional Facilities					$5,500,000	2001	Concrete

	Monterey Fire District	Fire Search and Rescue	Green Haven Road	Monterey			$30,000	1995	Concrete
	Monterey Fire Station	Fire Search and Rescue	5867 Hwy 129	Monterey			$50,000	1982	Concrete
	Monterey Fire Station	Fire Search and Rescue	8709 Hwy 129 Eva	Monterey			$75,000	2000	Concrete
	Ferriday Junior High School	Education	201 Martin Luther King Jr. Blvd.	Ferriday	31.62169332	-91.56031376	$524,070.00	2000	Concrete
	Ferriday Upper Elementary	Education	Martin Luther King Jr. Blvd.	Ferriday	31.6200417	-91.56030955	$997,515.00	2000	Concrete
	Concordia Education Center	Education	160 Kindergarten Rd.	Ferriday	31.61907185	-91.56548916	$305,910.00	2000	Concrete
	Ferriday Lower Elementary	Education	110 Bateman Avenue	Ferriday	31.63940891	-91.54838083	$763,695.00	2000	Concrete
	Ferriday Fire Station	Fire Search and Rescue	112 Tennessee Avenue	Ferriday	31.63369949	-91.55230249	$22,800.00	1990	Concrete
	Fire Station	Fire Search and Rescue	112 Tennessee Avenue	Ferriday	31.72075602	-91.54142484	$11,850.00	1995	Concrete
	Charles Sutton Memorial Fire Station	Fire Search and Rescue	Nearby: U.S. 84	Ferriday	31.6150198	-91.60134383	$8,775.00	1995	Concrete
	Fire Station	Fire Search and Rescue	112 Tennessee Avenue	Ferriday	31.58005436	-91.50477478	$27,900.00	1995	Concrete
	Fire Station	Fire Search and Rescue	3791 HWY 568	Ferriday	31.69167758	-91.47411399	$8,175.00	1995	Concrete
	Fire Station	Fire Search and Rescue	3275 HWY 569	Ferriday	31.69266538	-91.44133805	$9,225.00	1995	Concrete
	Concordia Parish Sheriff's Shooting Range	Law Enforcement	None	Ferriday	31.59385568	-91.56034022	$19,125.00	1990	Concrete
	Concordia Parish Correctional Facility	Prisons and Correctional Facilities	26356 LA HWY 15	Ferriday	31.59513464	-91.55804998	$295,875.00	1985	Concrete
	River Correctional Facility	Prisons and Correctional Facilities	26362 LA HWY 15	Ferriday	31.59718692	-91.55810947	$295,875.00	1985	Concrete
	Concordia District Waterworks	Civil Government	27173 Louisiana 15	Ferriday	31.6123836	-91.56365906	$28,485.00	1980	Concrete
	Concordia Parish Police Jury	Civil Government	Nearby: U.S. 84	Ferriday	31.60828678	-91.65198536	$29,400.00	1995	Concrete
	Concordia Parish Health Unit	Hospital or Medical Center	905 Mickey Gilley Ave.	Ferriday	31.62932512	-91.56113337	$930,000	1995	Concrete
	Concordia Medical Center	Hospital or Medical Center	1700 EE Wallace Boulevard	Ferriday	31.56840115	-91.43368857	$138,000.00	1990	Concrete
	Riverland Medical Center	Hospital or Medical Center	1700 EE Wallace Boulevard	Ferriday	31.64697943	-91.5547588	$18,000,000	1958	Concrete

	Vidalia Junior High School	Education	210 Gillespie Street	Vidalia	31.56140283	-91.43427591	$576,315.00	1980	Concrete
	Vidalia High School	Education	2201 Murray Dr.	Vidalia	31.57503937	-91.45372041	$798,525.00	1980	Concrete
	Vidalia Lower Elementary	Education	Concordia Avenue	Vidalia	31.57173066	-91.42860497	$680,535.00	1980	Concrete
	Vidalia Upper Elementary	Education	Concordia Avenue	Vidalia	31.56493574	-91.42364603	$493,425.00	1980	Concrete
	Ferriday High School	Education	E Wallace	Vidalia	31.63786844	-91.55392993	$746,280.00	1980	Concrete
	Vidalia Fire Department Training Facility	Fire Search and Rescue	Nearby: J Logan Sewell Drive	Vidalia	31.5633931	-91.45552594	$12,525.00	1975	Concrete
	Vidalia Fire Department	Fire Search and Rescue	204 Vernon Stevens Boulevard	Vidalia	31.56518375	-91.43281586	$1,500,000	1970	Concrete
	Unknown Fire Station	Fire Search and Rescue	Nearby: 632-796 Par Road 4a 72S	Vidalia	31.52913569	-91.53762888	$8,700.00	1975	Metal
	Vidalia Fire Department	Fire Search and Rescue	204 Vernon Stevens Boulevard	Vidalia	31.57879845	-91.46956138	$185,760.00	1970	Concrete
	Concordia Parish Sheriff's Office	Law Enforcement	Nearby: 400-498 Sycamore Street	Vidalia	31.56508764	-91.43272969	$90,315.00	1980	Concrete
	Concordia Parish Sheriff's Office	Law Enforcement	Nearby: 301-319 Advocate Row	Vidalia	31.575669	-91.4589322	$19,440.00	1990	Concrete
	Concordia Parish Sheriff's Office Work Release	Prisons and Correctional Facilities	Nearby: Furr Road	Vidalia	31.58550467	-91.4949465	$144,600.00	2004	Concrete
	Concordia Parish Department of Revenue & Taxation	Civil Government	111 Thistledown Drive	Vidalia	31.56547523	-91.43336119	$101,250.00	2000	Concrete
	Concordia Parish Courthouse	Civil Government	Carter St	Vidalia	31.57523966	-91.45794161	$276,615.00	1995	Concrete
	Concordia Parish School Board Central Administration	Civil Government	2 Oferrall Street	Vidalia	31.57526119	-91.46986286	$151,335.00	1995	Concrete
	Concordia Chamber of Commerce	Civil Government	1401 Carter St	Vidalia	31.57092463	-91.44000703	$17,280.00	1980	Concrete
	Airport	Airports and Airfields	Nearby: Concordia Parish Airport	Vidalia	31.56583199	-91.50972279	$161,595.00	1970	Concrete
	Waterworks	Civil Government	501 Sycamore	Vidalia			$255,000	1955	Concrete
	Waterworks	Civil Government	501 Sycamore	Vidalia			$205,000	1970	Concrete
	Equipment Building	Civil Government	501 B Sycamore	Vidalia			$225,000	1989	Concrete
	Mechanic Shop	Civil Government	601 Sycamore	Vidalia			$180,000	1975	Concrete
	Carpenter Shop	Civil Government	601 A Sycamore	Vidalia			$40,000	1975	Concrete

	Monterey Fire Station	Fire Search and Rescue	56403 Hwy 129 Acme	Monterey			$50,000	1990	Concrete
	Monterey Fire Station	Fire Search and Rescue	2789 Hwy 129 Boggy Bayou	Monterey			$50,000	2016	Concrete
Clayton									
	Concordia Parish Sheriff Clayton Sub Station	Law Enforcement	31451 LA Hwy 15	Clayton	None	None	$6,900.00	1990	Concrete
	City Hall	Civil Government	Nearby: 137-387 Shady Lane	Clayton	31.72358225	-91.54061609	$32,265.00	1885	Concrete
Ferriday									
	Ferriday Police Department	Law Enforcement	Nearby: Rea Street	Ferriday	31.64139689	-91.55512152	$76,815.00	1990	Concrete
	Ferriday Municipal Building	Civil Government	N 2nd Street	Ferriday	31.63162246	-91.55282491	$126,075.00	1980	Concrete
Ridgecrest									
	Ridgecrest Fire Department	Fire Search and Rescue	110 Foster Drive	Ridgecrest	31.60627776	-91.52382113	$39,285.00	1990	Concrete
	Ridgecrest Town Hall	Civil Government	108 Foster Drive	Ridgecrest	31.60642767	-91.52397104	$22,815.00	1990	Concrete
Vidalia									
	Vidalia Police Department	Law Enforcement	Nearby: Lovice Beard Lane	Vidalia	31.57828985	-91.46985637	$117,180.00	1990	Concrete
	Water Tank/Tower	Civil Government	Industrial Park Rd.	Vidalia			$460,000	1998	Concrete
	Mechanic Shop	Civil Government	700 MLK Drive	Vidalia			$74,000	1975	Concrete
	Eco Devt Off	Civil Government	2003 Billy Deal Dr.	Vidalia			$15,500	1998	Concrete
	City Office Building	Civil Government	Atlas Property	Vidalia			$30,700	1975	Concrete
	Police Department	Law Enforcement	604 John Dale Dr. (603 John Dale)	Vidalia			$205,000	1971	Concrete
	City Convention Center	Civil Government	101 Front Street (112 Front)	Vidalia			$7,200,000	2007	Concrete
	Chamber Building	Civil Government	Carter Street	Vidalia			$60,000	1970	Concrete
	Police Substation	Law Enforcement	Logan Sewell Rd.	Vidalia			$1,000,000	1975	Concrete
	City Hall	Civil Government	200 Vernon Stevens Road	Vidalia			$1,500,000	1990	Concrete
	Police Department	Law Enforcement	202 Vernon Stevens Road	Vidalia			$1,200,000	1990	Concrete

Vulnerable Populations

Vulnerable Populations Worksheet

Concordia Parish

Name	Street	City	Zip Code	Latitude	Longitude
All Hospitals (Private or Public)					
Magnolia Medical LLC	400 Carter Street	Vidalia		31.56675375	-91.4287308
Promise Hospital of Miss Lou	209 Front St	Vidalia		31.56122209	-91.42610105
Riverpark Medical Center	107 Front Street	Vidalia		31.56422078	-91.42132233
Concordia Parish Health Unit	905 Mickey Gilley Ave.	Ferriday		31.62932512	-91.56113337
Concordia Community Health Center	100 Serio	Ferriday		31.6486116	-91.55445022
Concordia Medical Center	1700 EE Wallace Boulevard	Ferriday		31.56840115	-91.43368857
Riverland Medical Center	1700 EE Wallace Boulevard	Ferriday		31.64697943	-91.5547588
Nursing Homes (Private or Public)					
Camellia Hospice	4004 Carter Street	Vidalia		31.57388237	-91.4602434
Ferriday Elderly Housing	53 Smith Lane	Ferriday		31.64442351	-91.56402877
Heritage Manor		Ferriday			
Mobile Home Parks					
C&M Mobile Park	HWY 84 W	Ferriday			
Palmetto Builders	HWY 425	Ferriday			
Jerry Clark's in Vidalia (Name?)	Off Texas St.	Vidalia			
Pecan Acres	Off Moose Lodge Rd.	Vidalia			
Riverview RV Park	Vidalia Riverfront	Vidalia			
Behind School Board Office (Name?)	Westside Dr.	Vidalia			

National Flood Insurance Program (NFIP)

ELEMENT F: STATE REQUIREMENT
National Flood Insurance Program (NFIP)

Concordia Parish

	Concordia Parish	Clayton	Ferriday	Ridgecrest	Vidalia
Insurance Summary					
How many NFIP polices are in the community? What is the total premium and coverage?	805 policies;$386,230 premium; $197,632,700 coverage	16 policies; $7,396 premium; $2,339,300 coverage	54 policies; $29,348 premium; $13,848,3000 coverage	25 policies;$4,385,000 coverage; $8,641 premium	343 policies; $178,638 premium; $81,749,200 coverage
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?	1522 claims paid; $13,070,861	23 claims paid; $144,700	15 claims paid; $147,812	6 claims paid; $257,641	86 claims paid $504,817
How many structures are exposed to flood risk with in the community?	Base number on claims identified	various	various	various	various
Describe any areas of flood risk with limited NFIP policy coverage.	Concordia park, Belle Grove, Levens Addition	none	none	none	none
Staff Resources					
Is the Community FPA or NFIP Coordinator certified?	Yes	No	no	no	Yes
Is flood plain management an auxiliary function?	Yes	yes	yes	yes	Yes
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	IBIS provides permit review, GIS, inspections	IBIS provides permit review, GIS, inspections	IBIS provides permit review, GIS, inspections	IBIS provides permit review, GIS, inspections	Yes- consultants
What are the barriers to running an effective NFIP program in the community, if any?	Personnel resources	funding, staffing	funding, staffing	funding, staffing	funding, staffing

Compliance History					
Is the community in good standing with the NFIP?	Yes	YEs	YEs	YEs	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No	No	No	No	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact(CAC)?	Unknown	No	Unknown	Unknown	Unknown
Is a CAV or CAC scheduled or needed? If so when?	No	No			
Regulation					
When did the community enter the NFIP?	4/3/1978	8/1/1978	12/15/1977	4/3/1978	28656
Are the FIRMs digital or paper?	Digital	digital	digital	digital	digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meets	meets	meets	meets	Meet
Community Rating System (CRS)					
Does the community participate in CRS?	N/A	No	No	No	No
What is the community's CRS Class Ranking?	N/A	No	No	No	No
Does the plan include CRS planning requirements?	N/A	No	No	No	No