



# **Plaquemines Parish Hazard Mitigation Plan Update Risk Assessment and Public Meeting**

February 12, 2020  
Belle Chase, LA



# Agenda

- Hazard Mitigation Overview – SDMI Staff
- Hazard Mitigation Planning Process – SDMI Staff
- Risk Assessment – SDMI Staff
- Update on Previous/Current Mitigation Projects –  
Plaquemines OHSEP
- Public Outreach Activities – SDMI & Plaquemines OHSEP



# Hazard Mitigation

- Protect public safety and prevent loss of life and injury;
- Help accomplish community objectives, such as leveraging capital improvements, infrastructure protection, open space preservation, and economic resiliency;
- Prevent damage to a community's economic, cultural and environmental assets;
- Minimize operational downtime and accelerate recovery of government and the private sector after an event

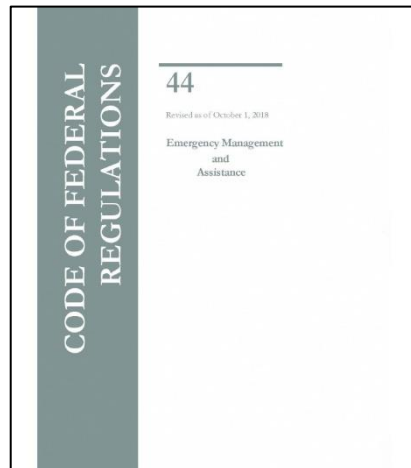


# Why Are We Required To Have A Hazard Mitigation Plan?

- Disaster Mitigation Act of 2000 (DMA 2000)

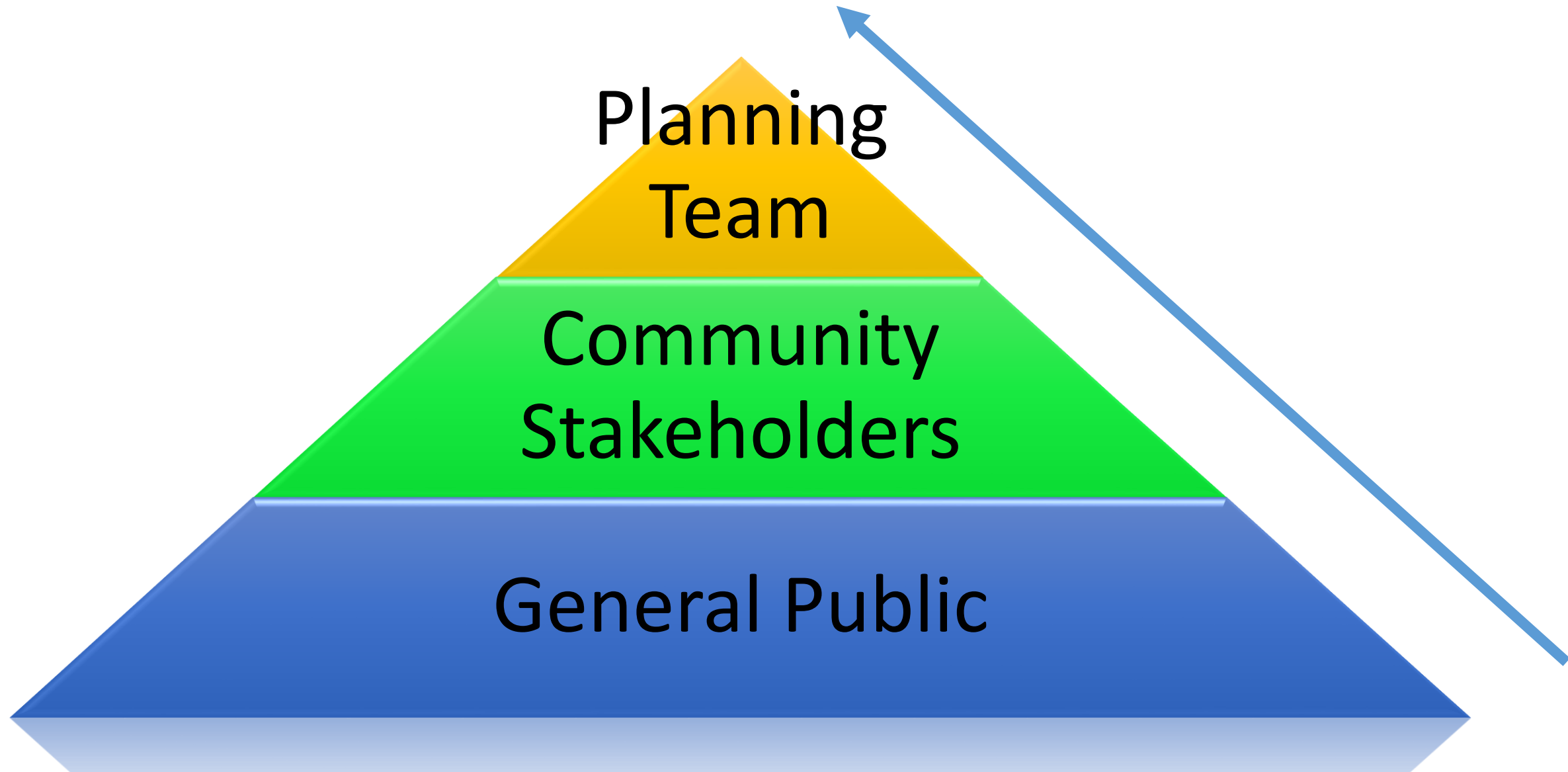
*Section 322 of the Act specifically addresses mitigation planning and requires state and local governments to prepare multi-hazard migration plans as a precondition for receiving FEMA mitigation project grants.*

- Meet federal requirements of Title 44 Code of Regulations (CFR) §201.6 for approval and eligibility to apply for FEMA Hazard Mitigation Assistance grant programs.



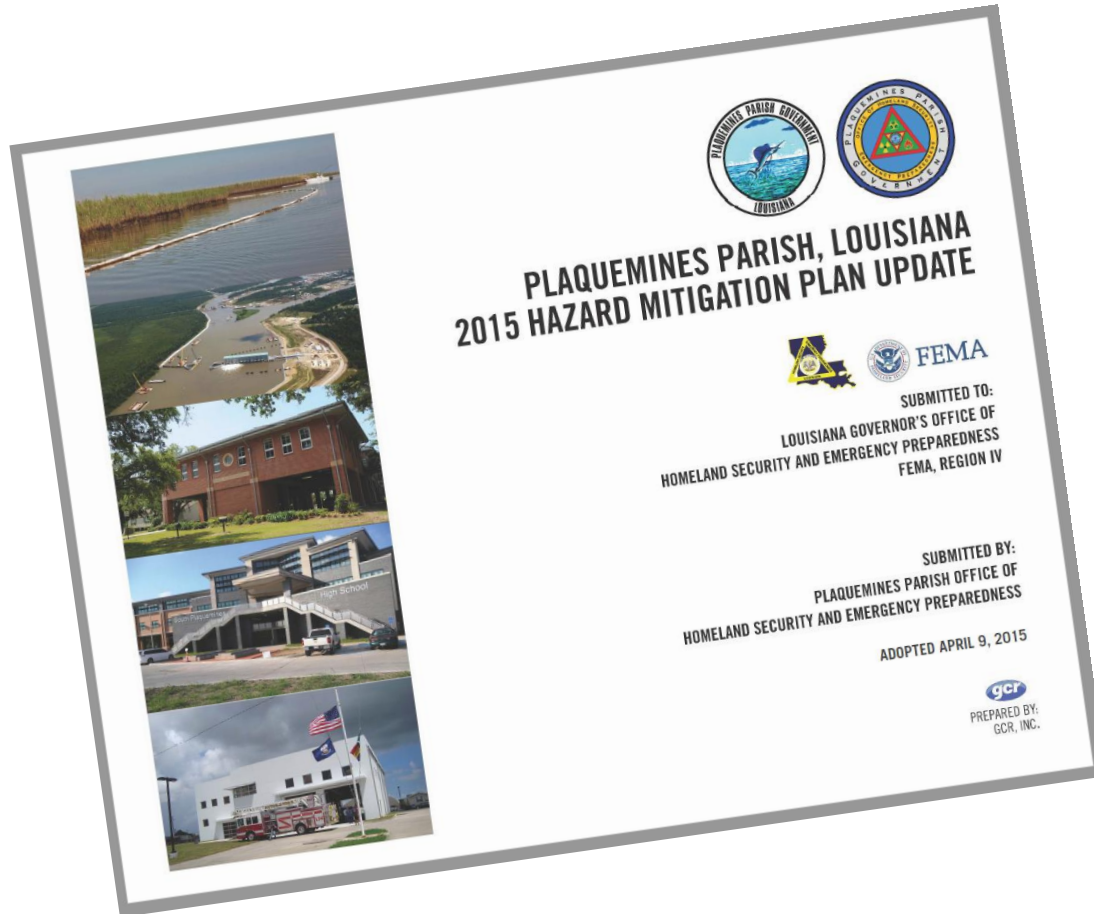
- The approved Plaquemines Parish Hazard Mitigation Plan will allow for distribution of HM funding following future disasters.

# Collaborative Planning Approach





# Planning Development



# New Plan Layout

- **Section 1:** Introduction
  - Updated parish description
  - Updated demographics
  - Economics
- **Section 2:** Hazard Identification and Parish-wide Risk Assessment
- **Section 3:** Capability Assessment
- **Section 4:** Mitigation Strategies
  - New actions
  - Action updates
  - Survey results



# New Plan Layout

- **Appendix A:** Planning Process
- **Appendix B:** Plan Maintenance
- **Appendix C:** Parish Essential Facilities
- **Appendix D:** Plan Adoption
- **Appendix E:** State Required Worksheets





# Hazard Identification and Risk Assessment

- The plan includes descriptions of the natural hazards that affect the jurisdictions in the planning area.
- The hazards identification includes the following:
  - locations affected
  - extent or strength
  - previous occurrences
  - probability of future events



# Hazard Identification and Risk Assessment

- Based on Currently Profiled Risks
- Any Newly Identified Risks
- Prevalent Hazards
- Previous Occurrences
- Probability of Future Events
- Assets Inventory
- Essential Facilities
- Hazard Impact
- Future Development
- Future Hazard Impacts
- Zoning and Land Use
- Hazard Profiles



# Hazard Identification and Risk Assessment

- **Coastal Hazards**
  - Coastal Land Loss
  - Sea Level Rise
  - Subsidence
- **Flooding**
- **Levee Failure**
- **Sinkholes**
- **Thunderstorms**
  - Hailstorms
  - High Winds
  - Lightning
- **Tornadoes**
- **Tropical Cyclones**

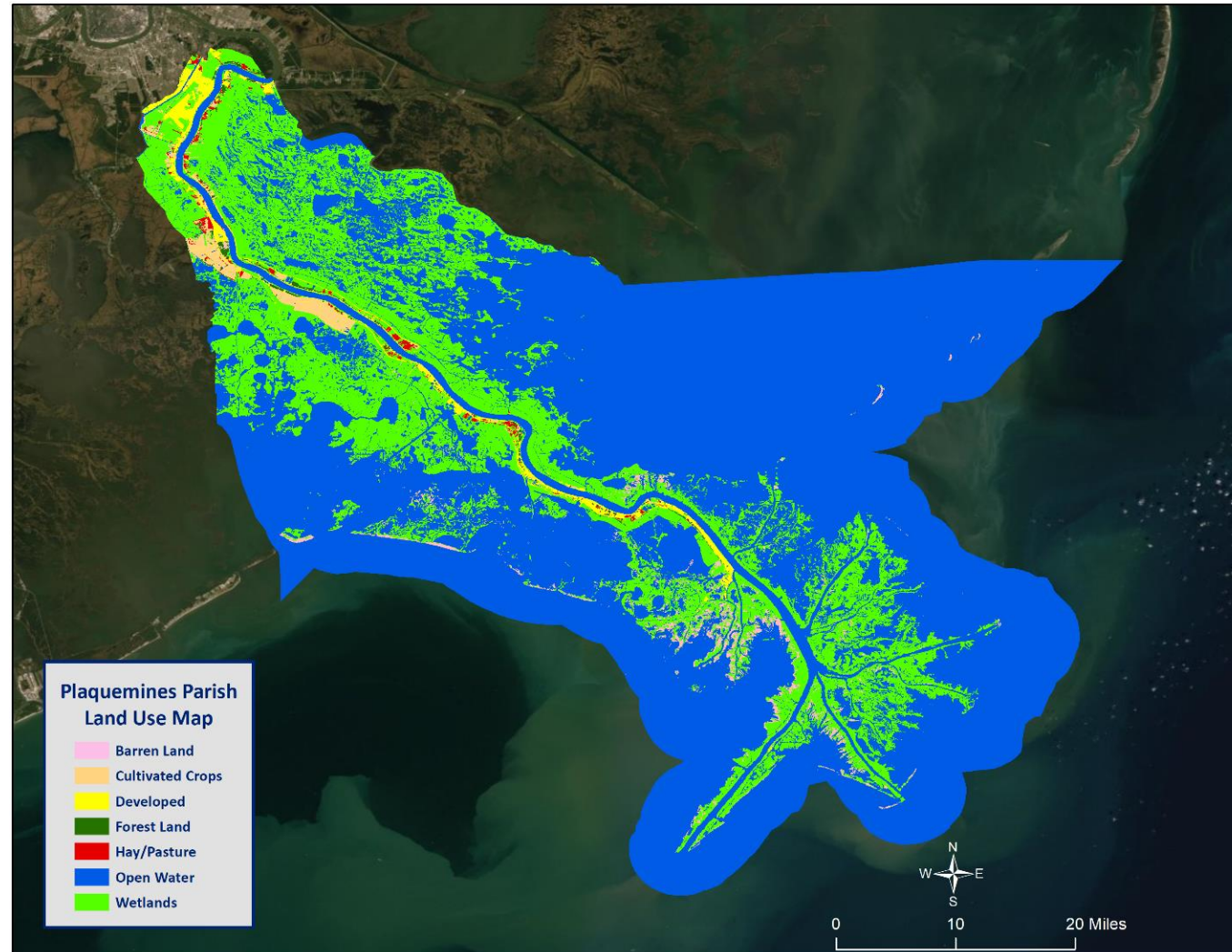


# Risk Assessment Maps



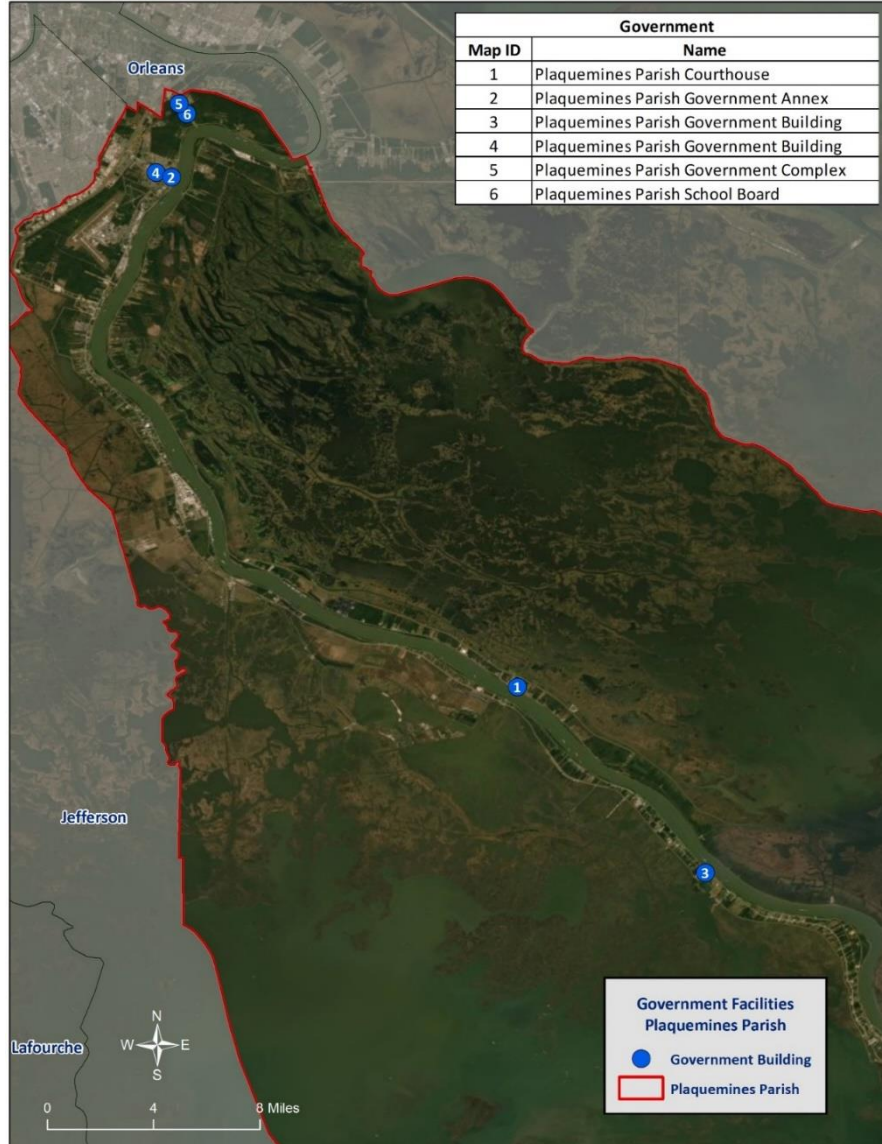


# Plaquemines Parish Land Use





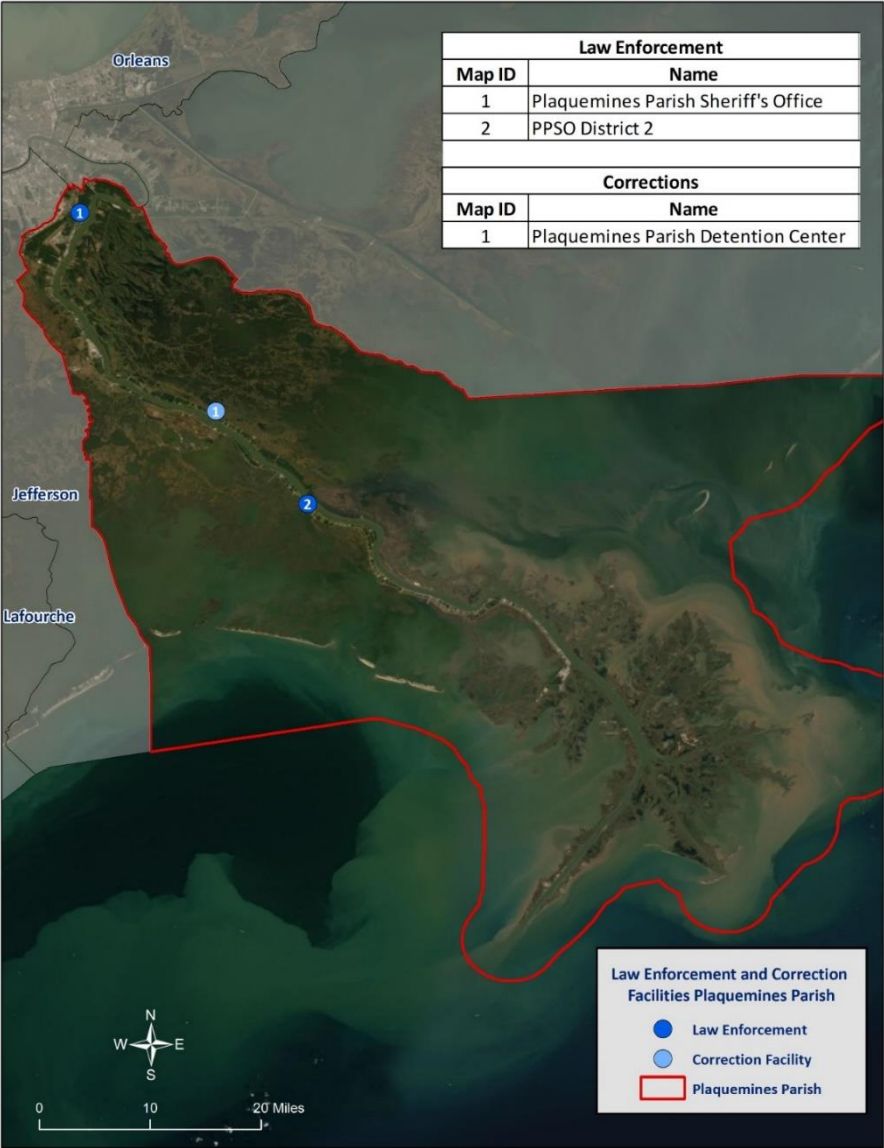
# Critical Facilities: Civil Government



# Critical Facilities: Fire & Rescue



# Critical Facilities: Law Enforcement

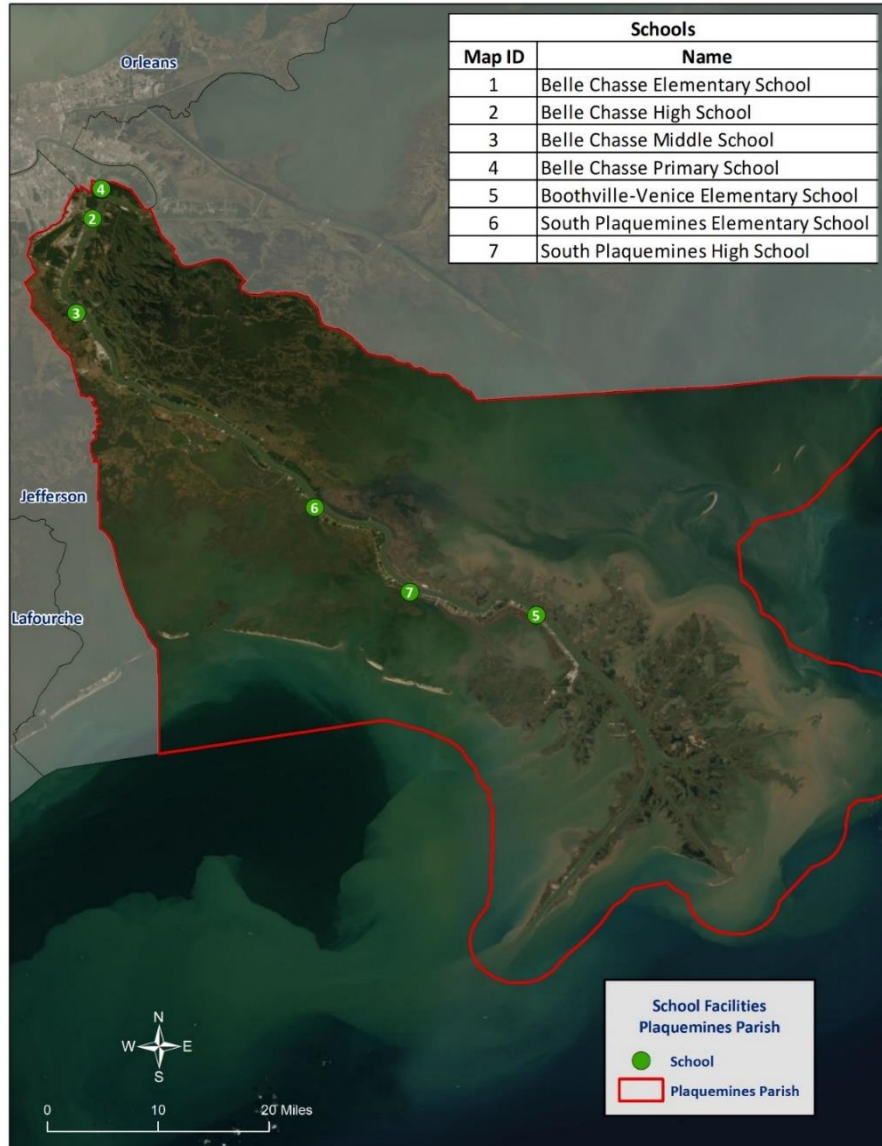


# Critical Facilities: Public Health

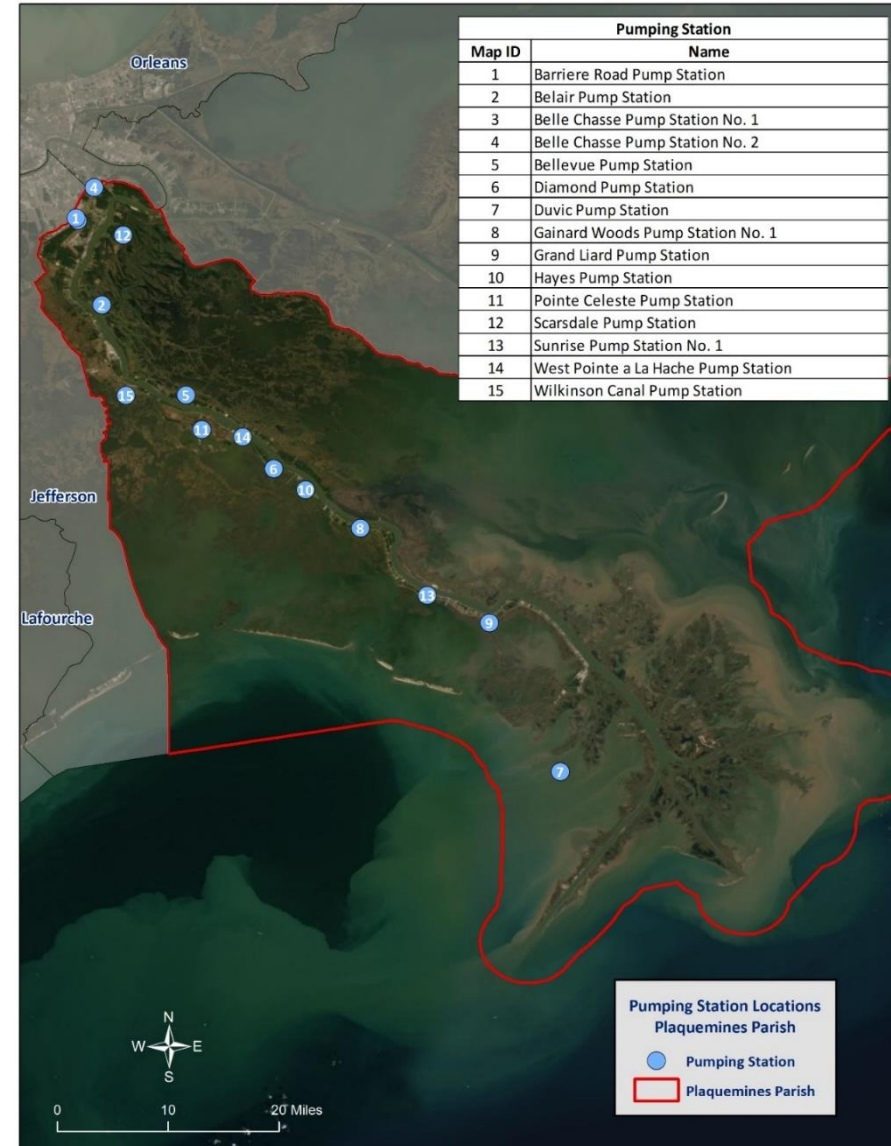




# Critical Facilities: Schools



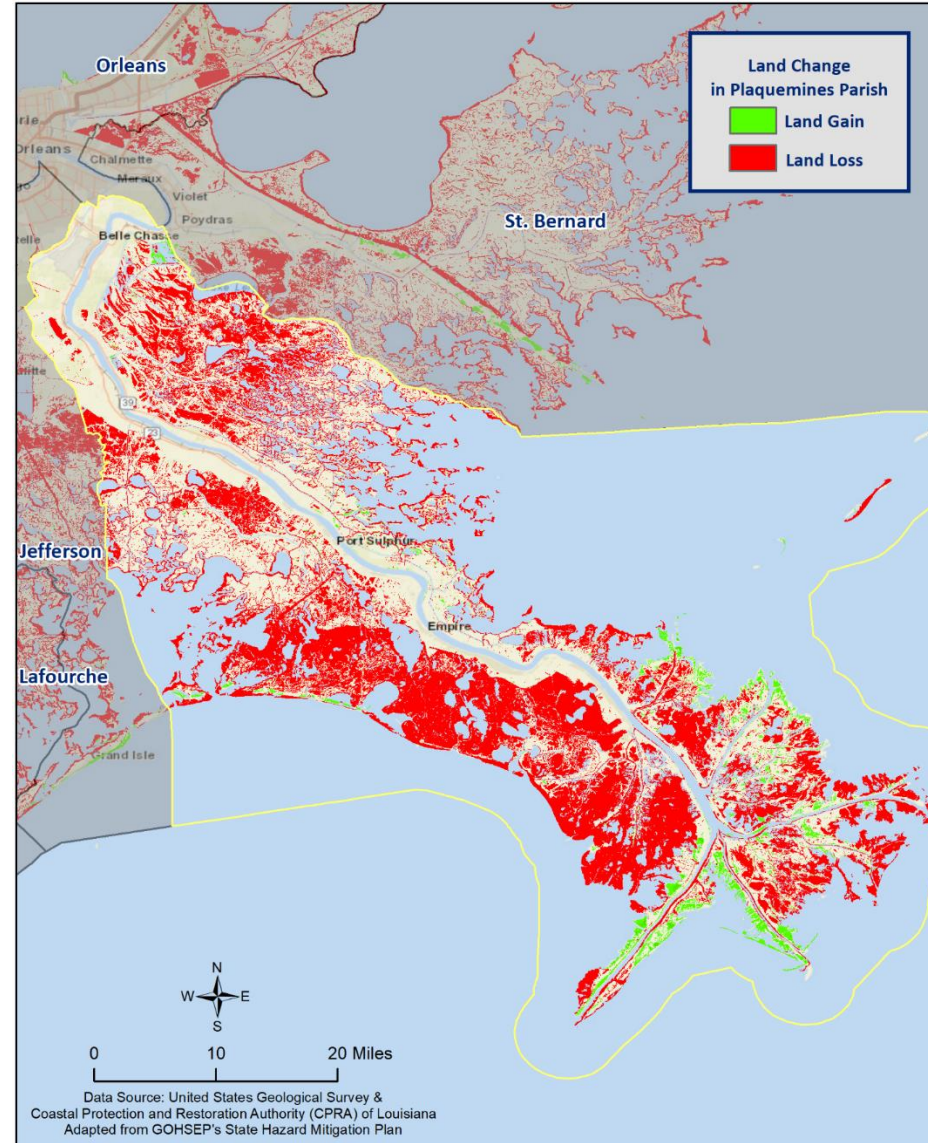
# Critical Facilities: Pumping Stations



# Coastal Hazards

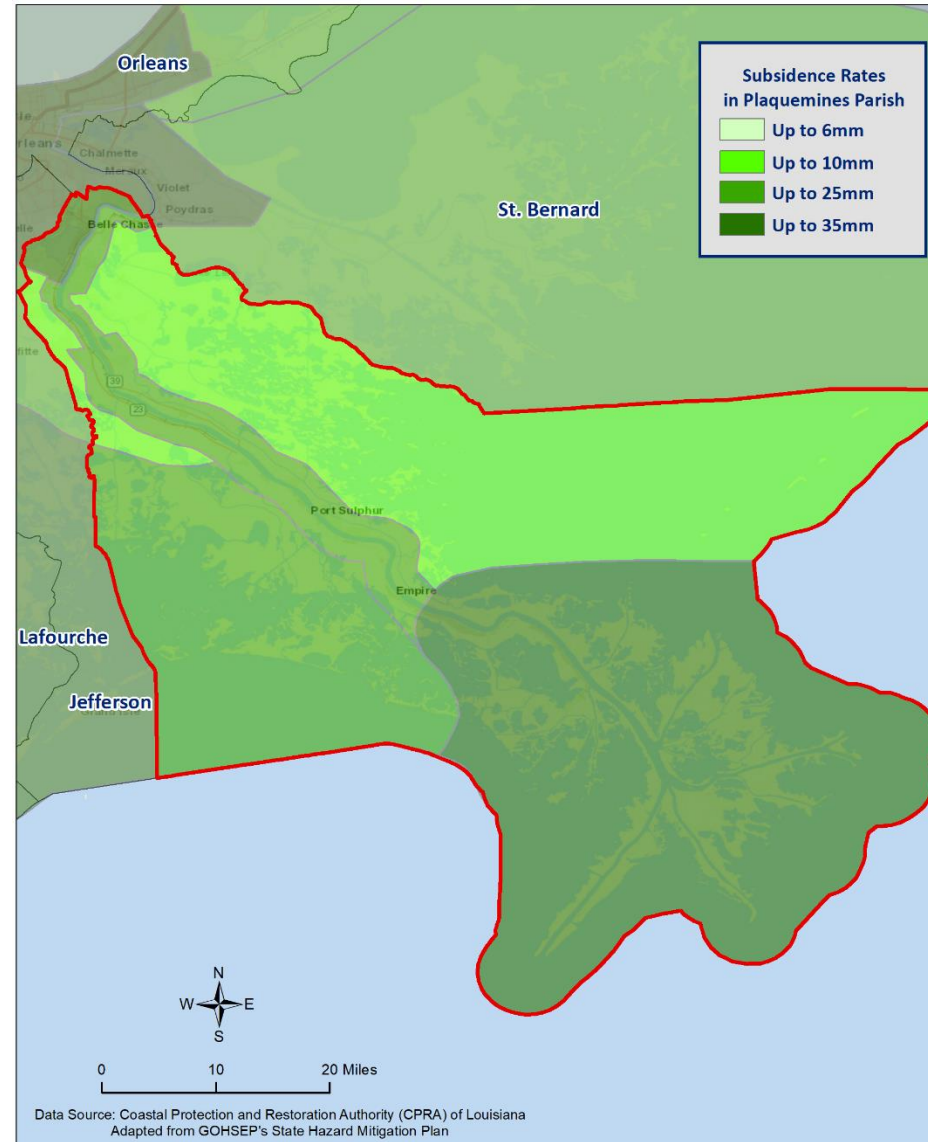
- **Subsidence** is the gradual caving in or sinking of an area of land
  - Slow-acting process with impacts that can be readily seen in coastal parishes over the course of decades
  - Lowers elevations in coastal Louisiana, accelerates the effects of saltwater intrusion
  - Causes structures to become more vulnerable to flooding by lowering elevations
- **Saltwater intrusion** is the movement of salty water into freshwater aquifers or is the encroachment of saline water into freshwater estuaries
  - One of the major causes of subsidence and marshland loss
  - Causes the loss of fresh and intermediate vegetation, which results in rapid erosion of marsh soils and the ultimate conversion of the area to open water

# Land Gain & Loss

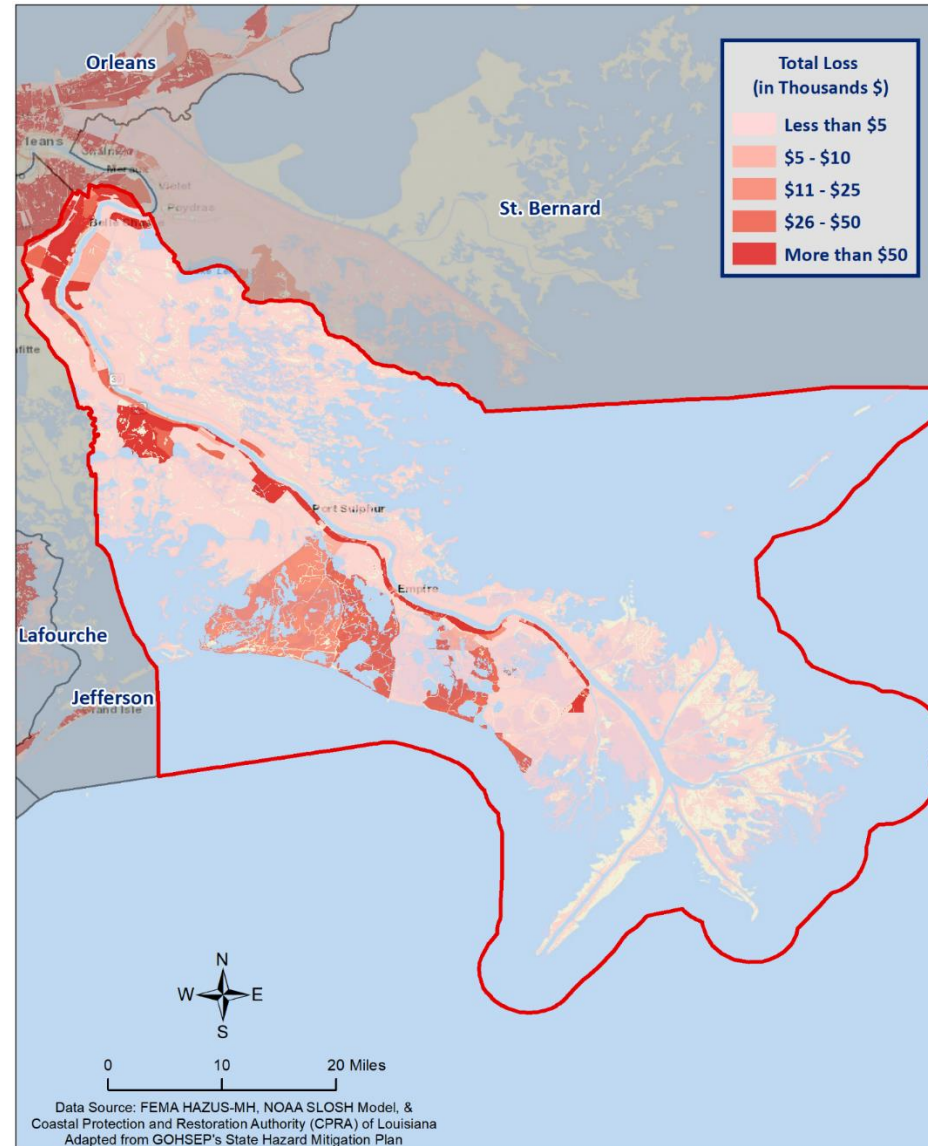




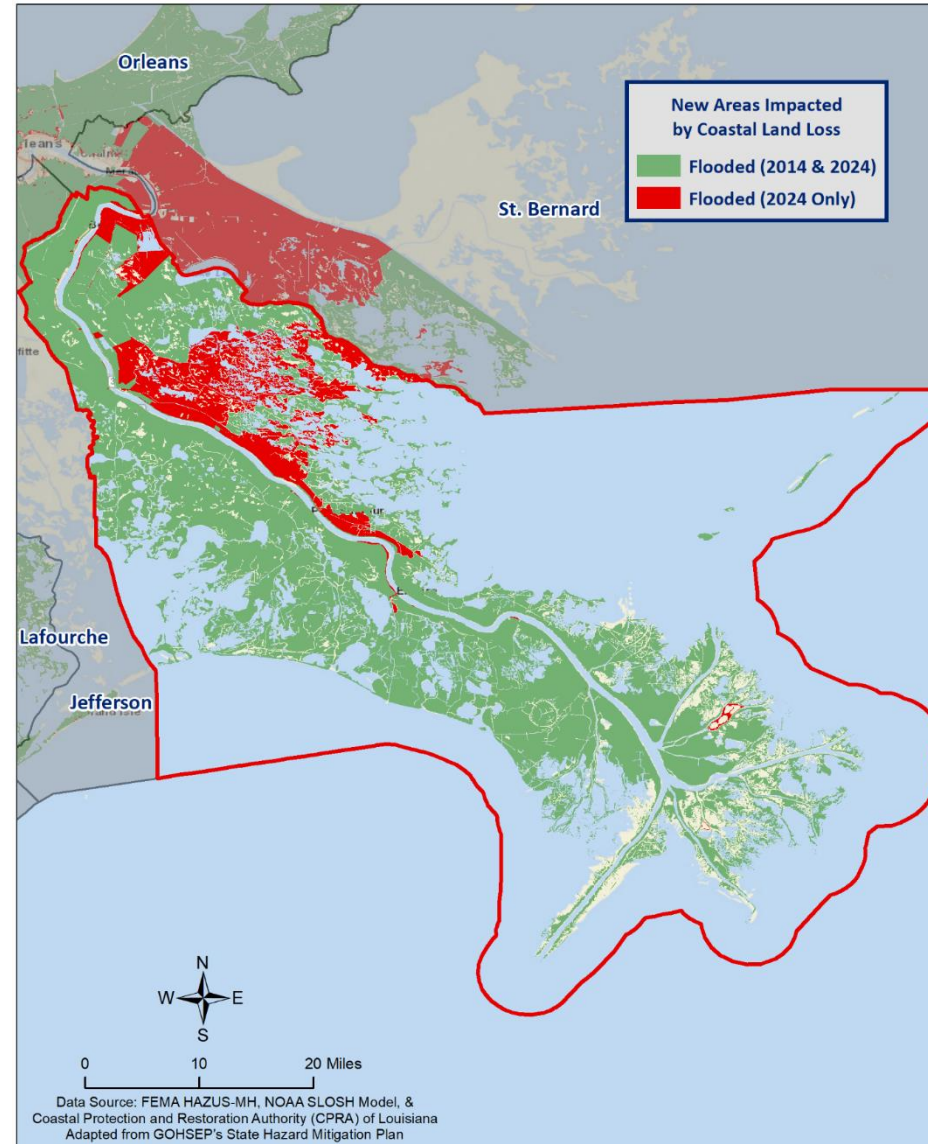
# Subsidence Rates



# Future Total Loss Estimates



# New Areas Impacted by Land Loss



# Flooding

- A flood is the overflow of water onto land that is usually not inundated.
- The National Flood Insurance Program defines a flood as “a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from overflow of inland or tidal waves, unusual and rapid accumulation or runoff of surface waters from any source, mudflow, or collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.”





# Flooding

Types of flooding may include the following:

- Riverine
- Flash
- Ponding
- Backwater
- Urban
- Coastal



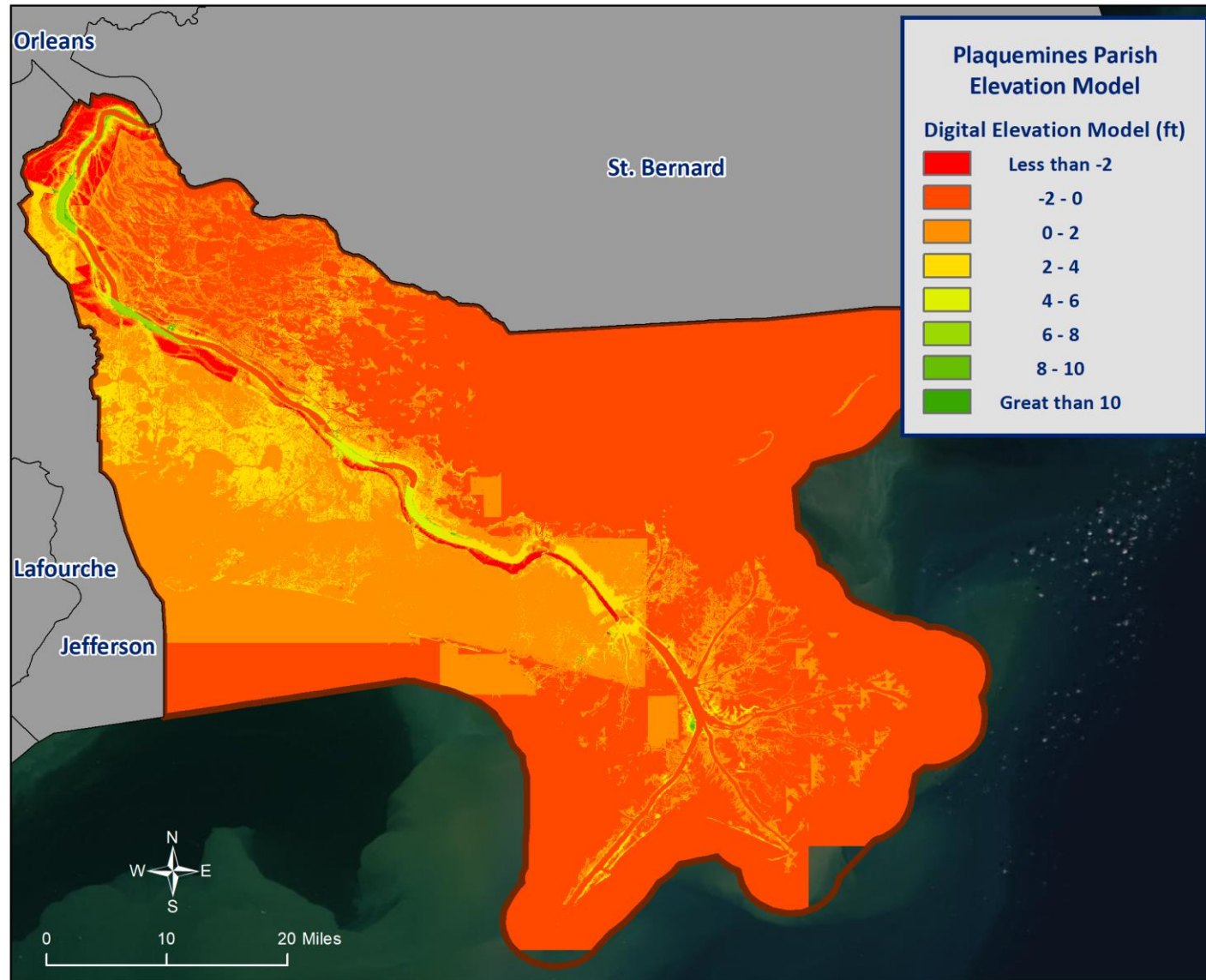


# Flooding

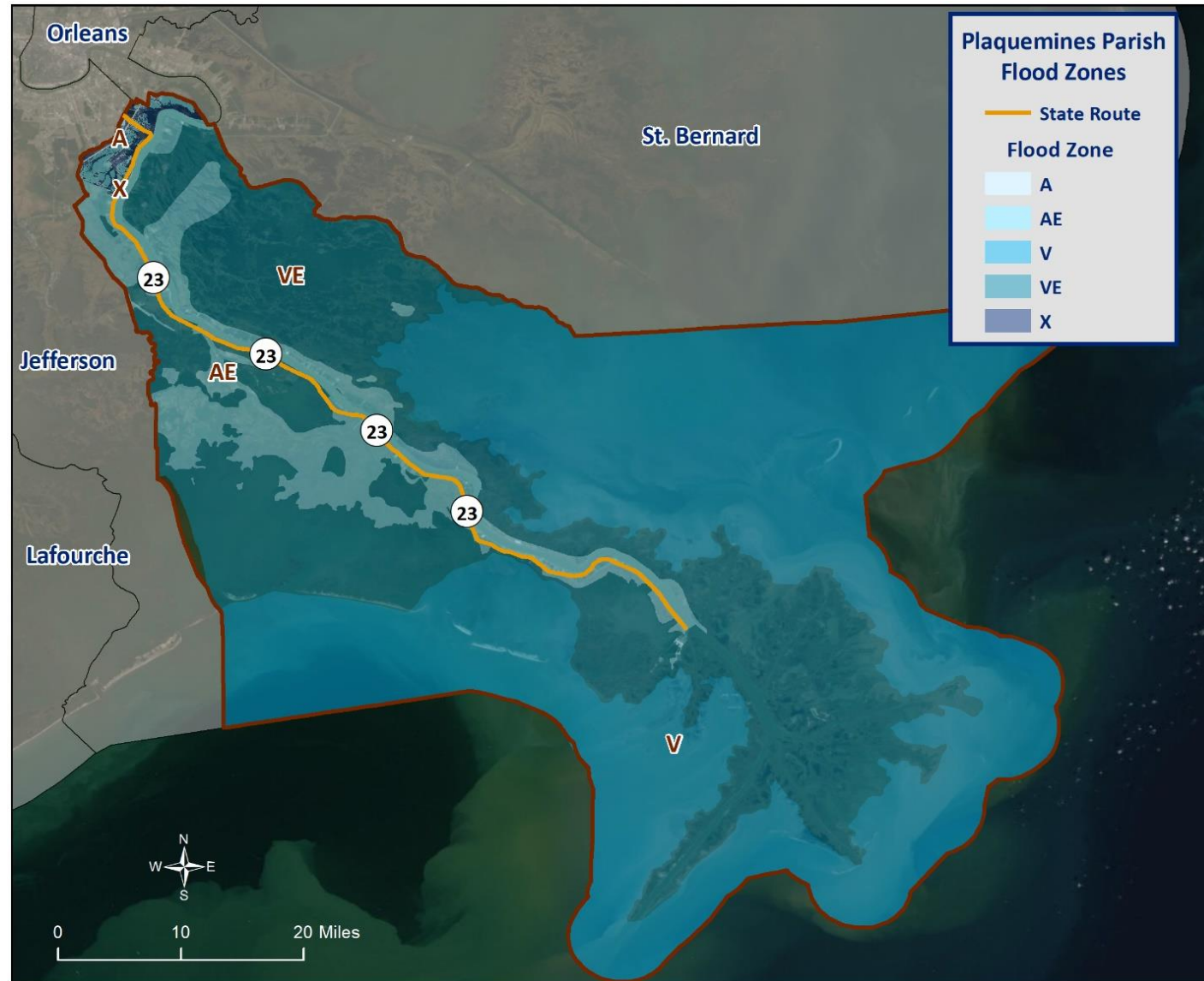
- Some areas flood more often than other properties, even more than those in the mapped 100-year floodplain.
- FEMA defines a “repetitive loss” property as one which has received two flood insurance claim payments for at least \$1,000 over any 10-year period since 1978.
- These properties are important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



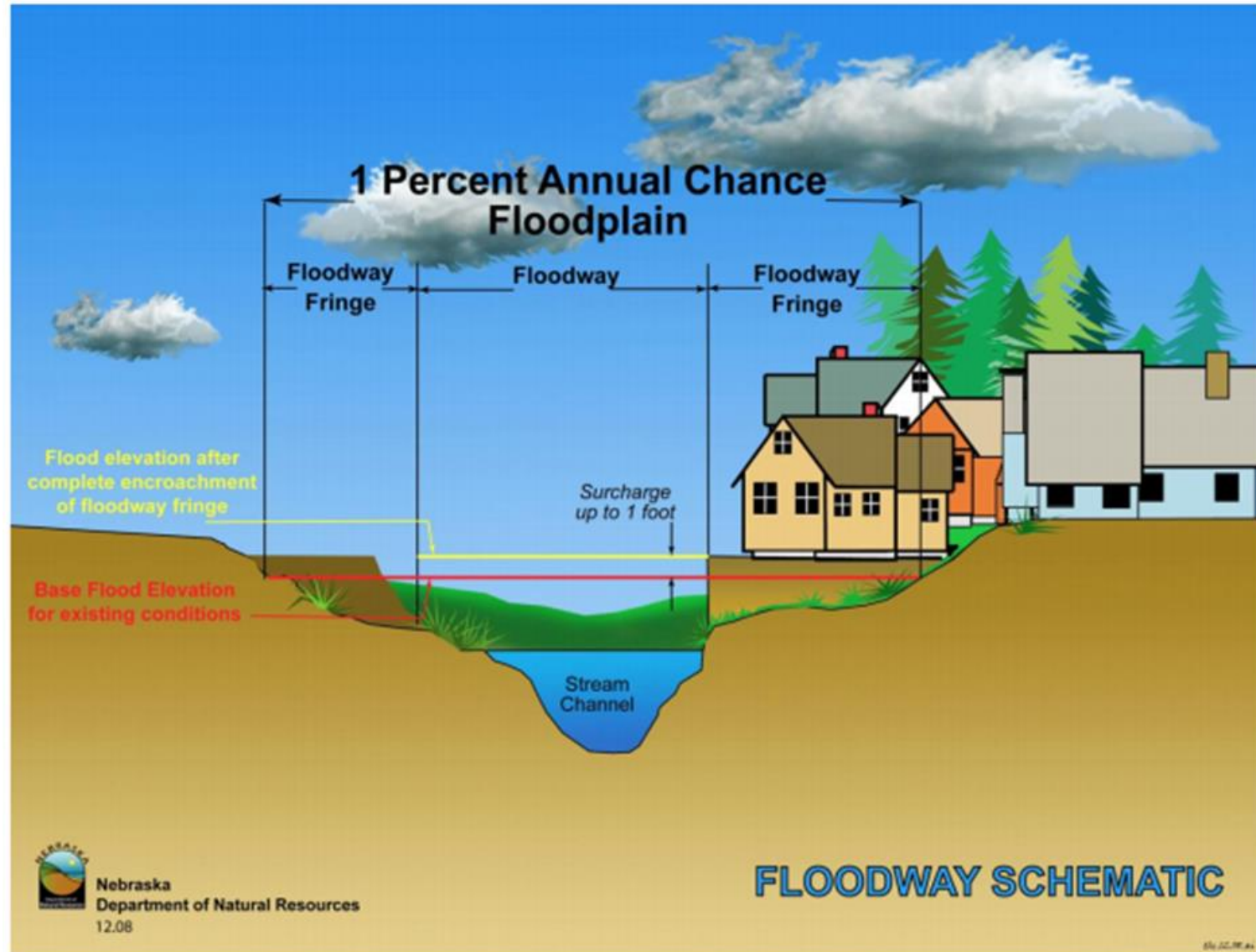
# Digital Elevation Model



# Plaquemines Parish Flood Map

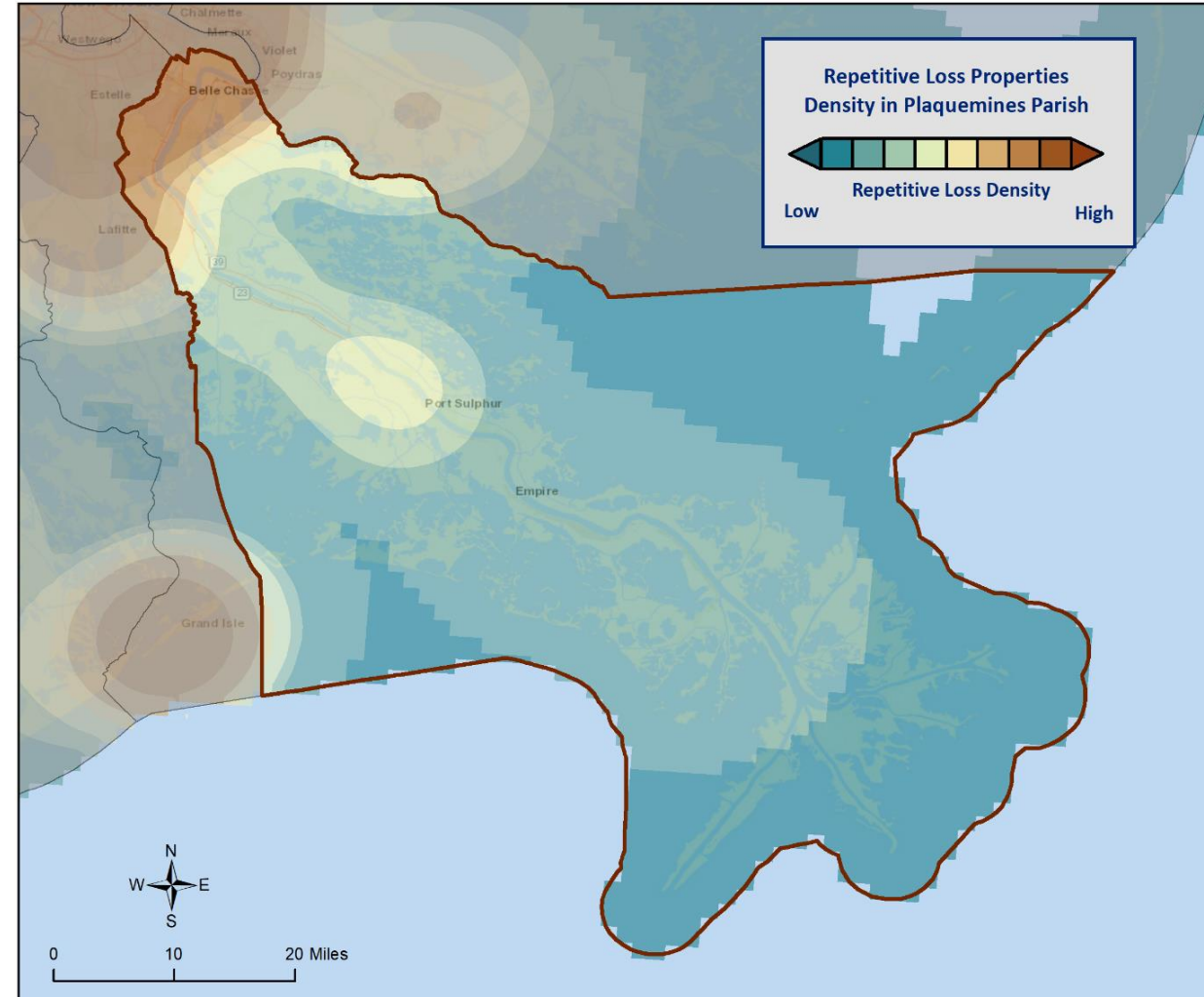
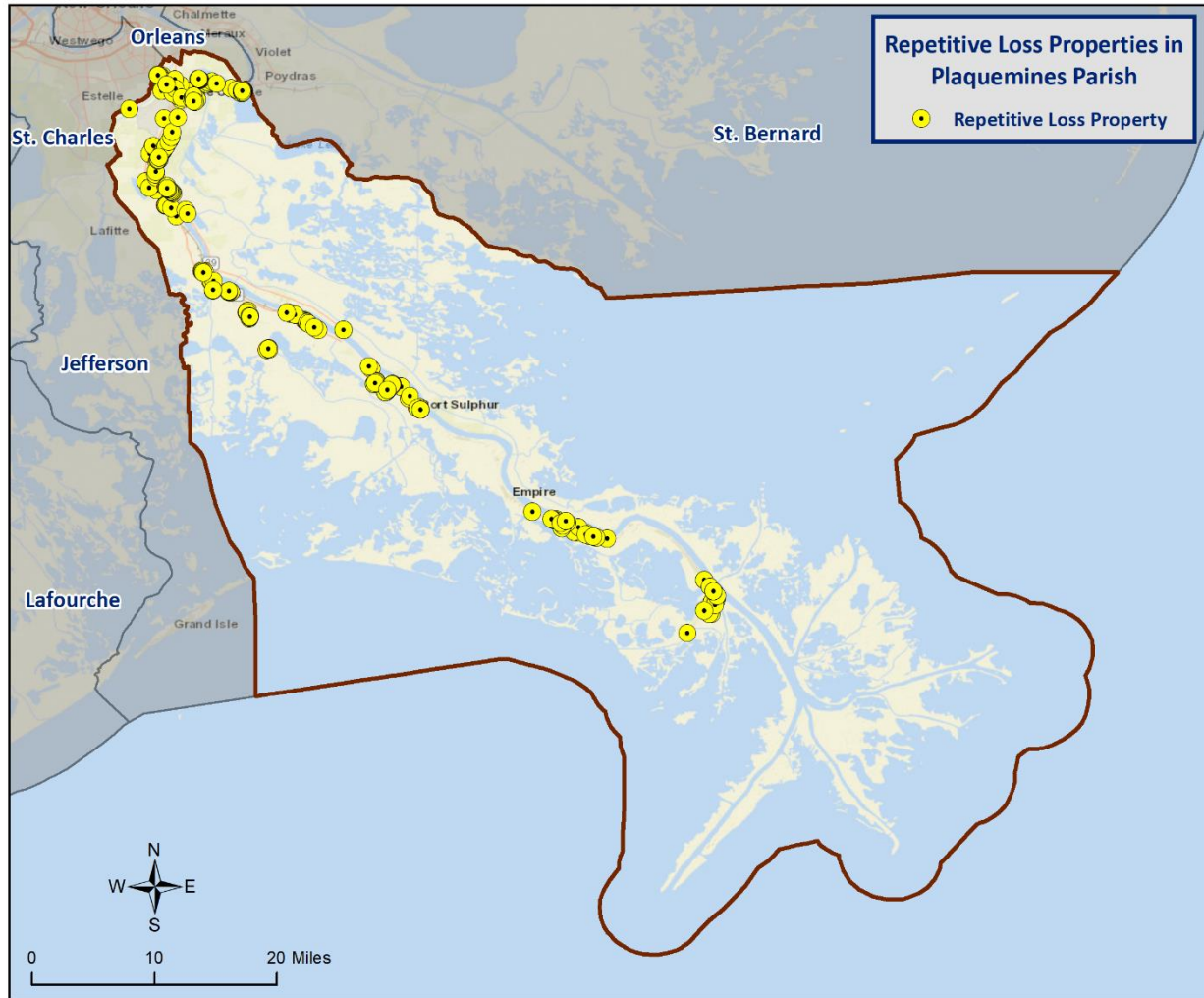


# Floodway Diagram





# Repetitive Loss Properties



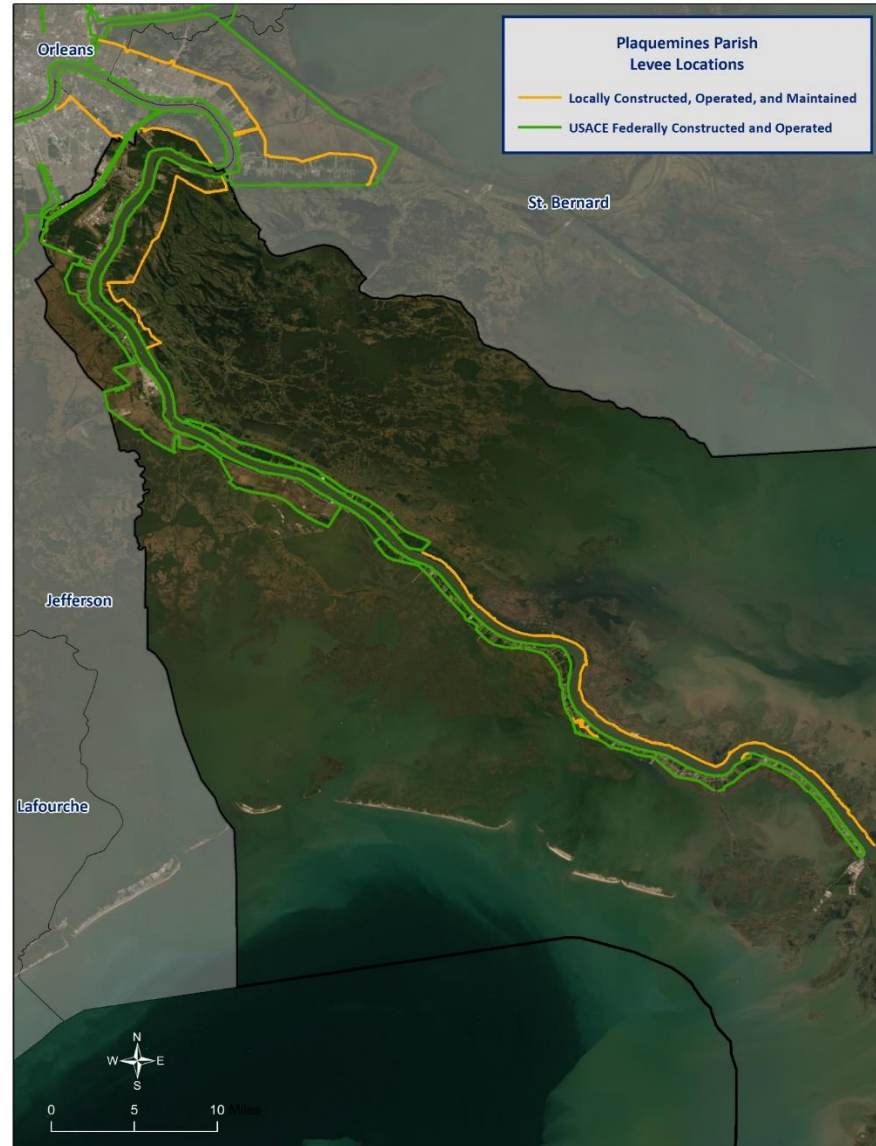


# Levee Failure

- Levees are flood control barriers constructed of earth, concrete, or other materials that protect significant areas of residential, commercial, or industrial development.
- Levee failure involves the overtopping, breach, or collapse of the levee.
- Effects of a levee failure are similar to those of a flood, with the major difference



# Levee Locations



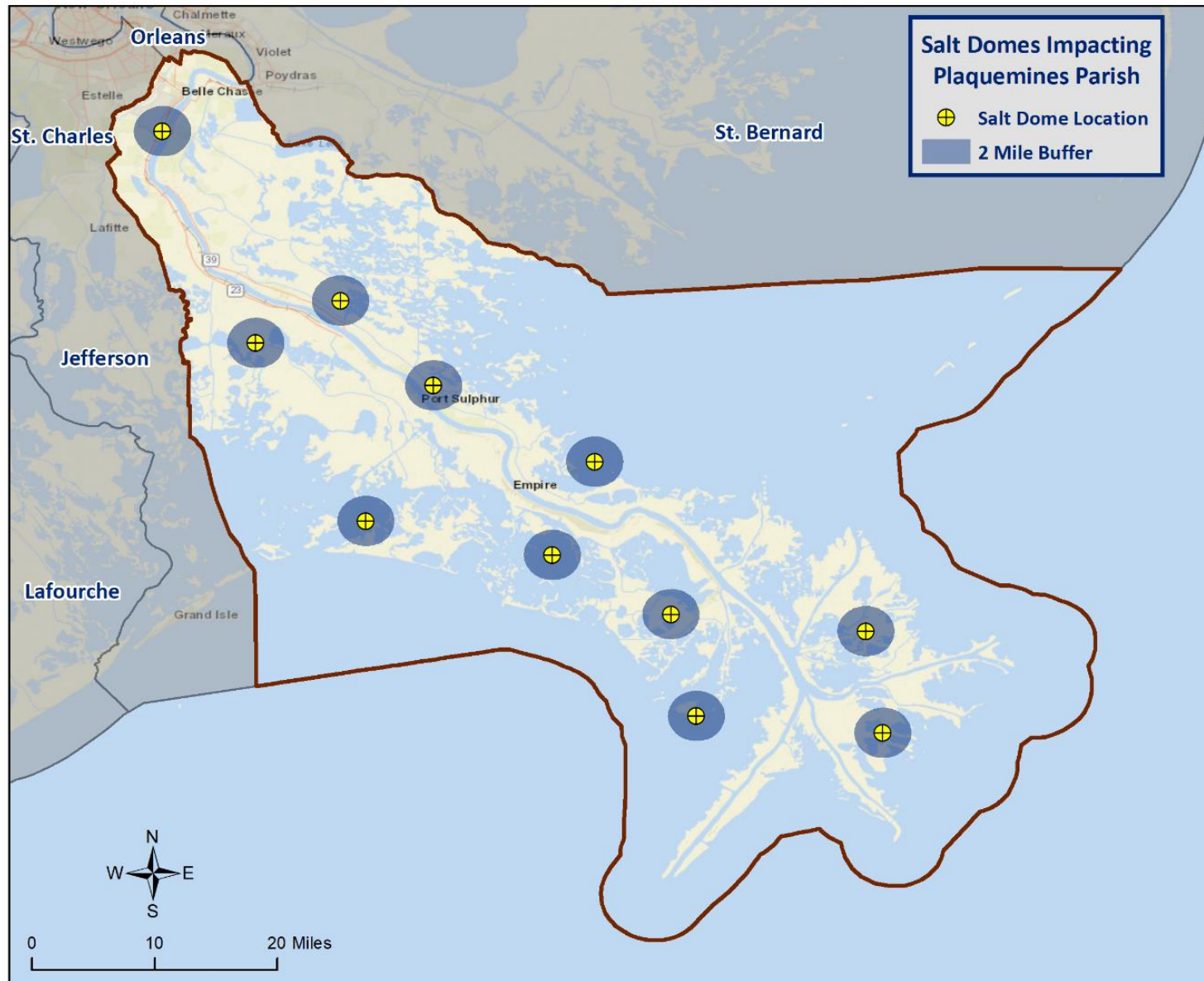
# Sinkholes

- A sinkhole is an area of ground that has no natural external surface drainage – when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface.
- Sinkholes form in areas where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that can naturally be dissolved by groundwater circulating through them.
- As the rock dissolves, spaces and caverns develop underground. Once the spaces underground become too large, there is not enough support for the land above the spaces which causes a sudden collapse on the land surface.





# Sinkhole Locations



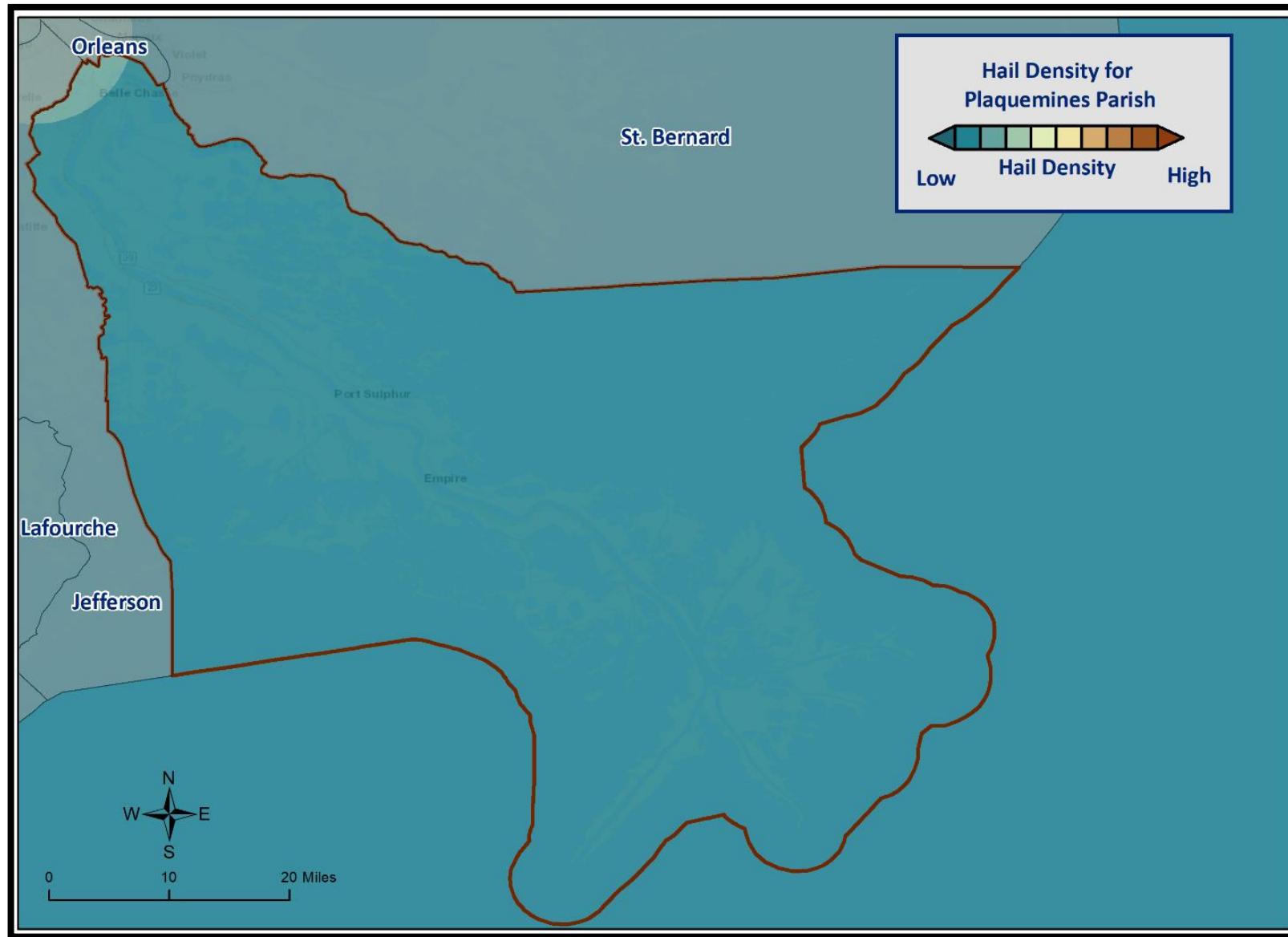


# Thunderstorms

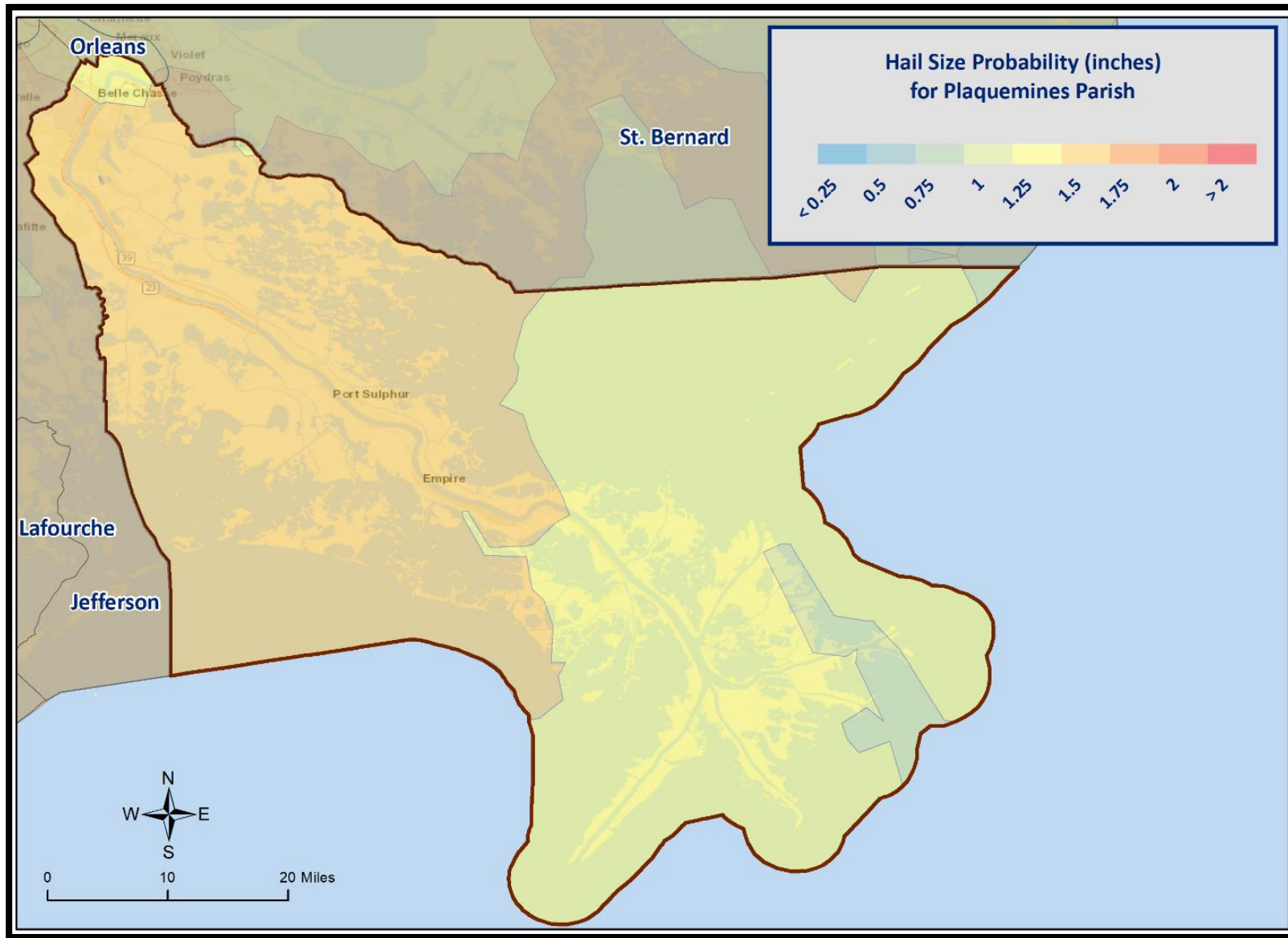
- A **thunderstorm**, also known as an **electrical storm**, a **lightning storm**, or a **thundershower**, is a type of storm characterized by the presence of lightning and its acoustic effect on the Earth's atmosphere known as thunder.
- They are usually accompanied by strong winds, heavy rain, and sometimes snow, sleet, or hail.
- Thunderstorms may line up in a series or rainband, known as a squall line. Strong or severe thunderstorms may rotate, known as supercells. While most thunderstorms move with the mean wind flow through the layer of the troposphere that they occupy, vertical wind shear causes a deviation in their course at a right angle to the wind shear direction.



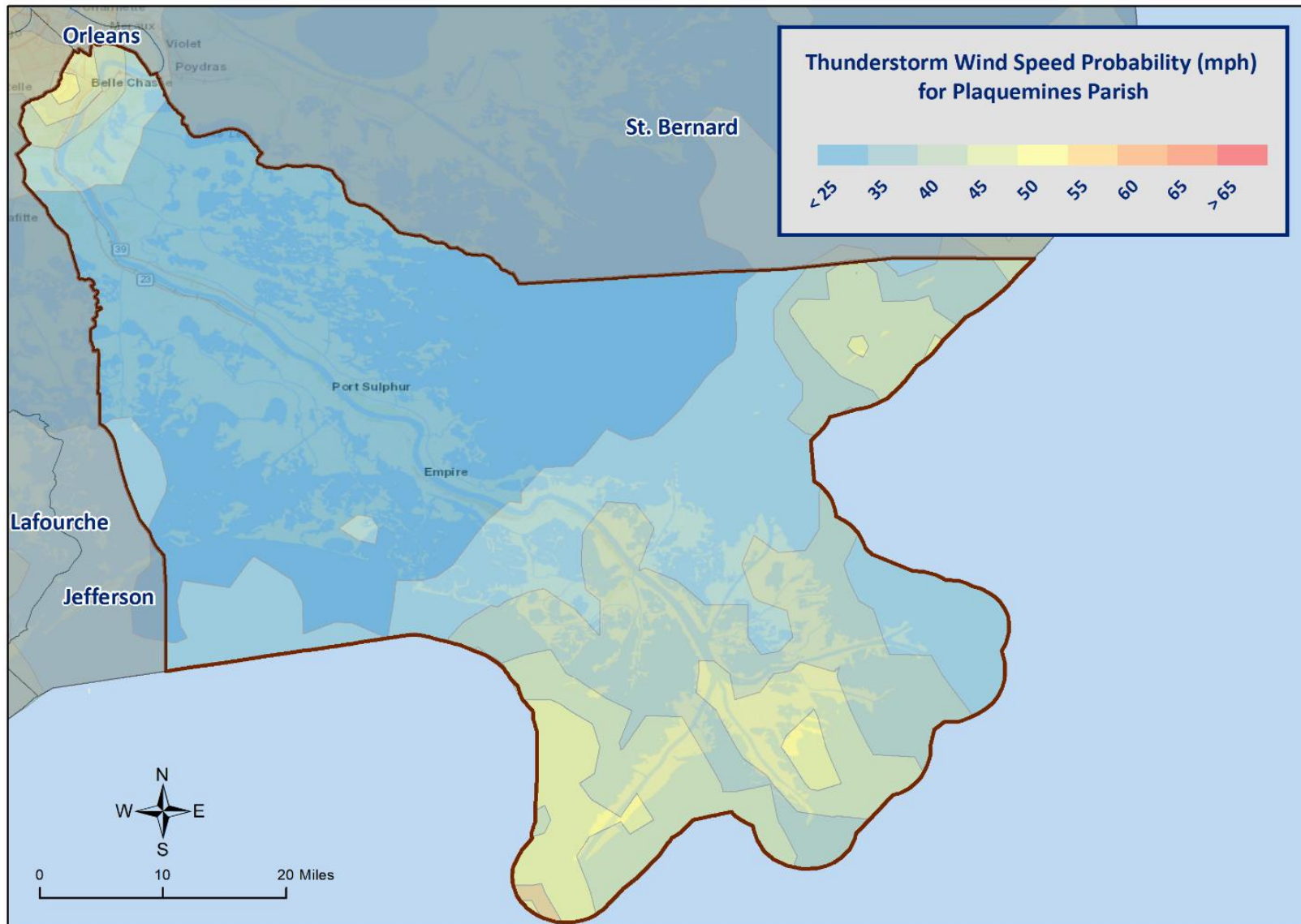
# Density of Prior Hailstorms



# Hail Size Probability



# Wind Speed Probability





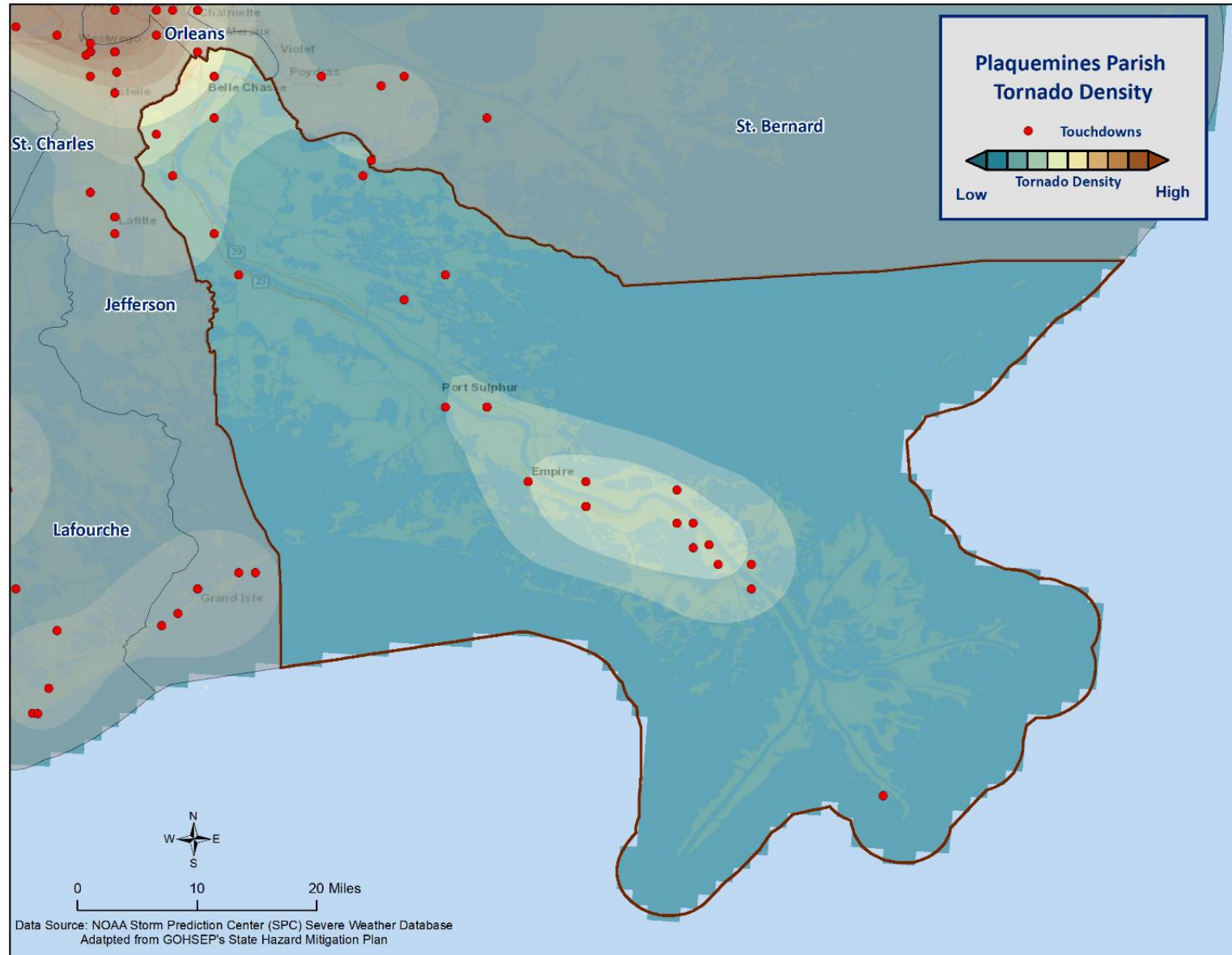
# Tornadoes

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

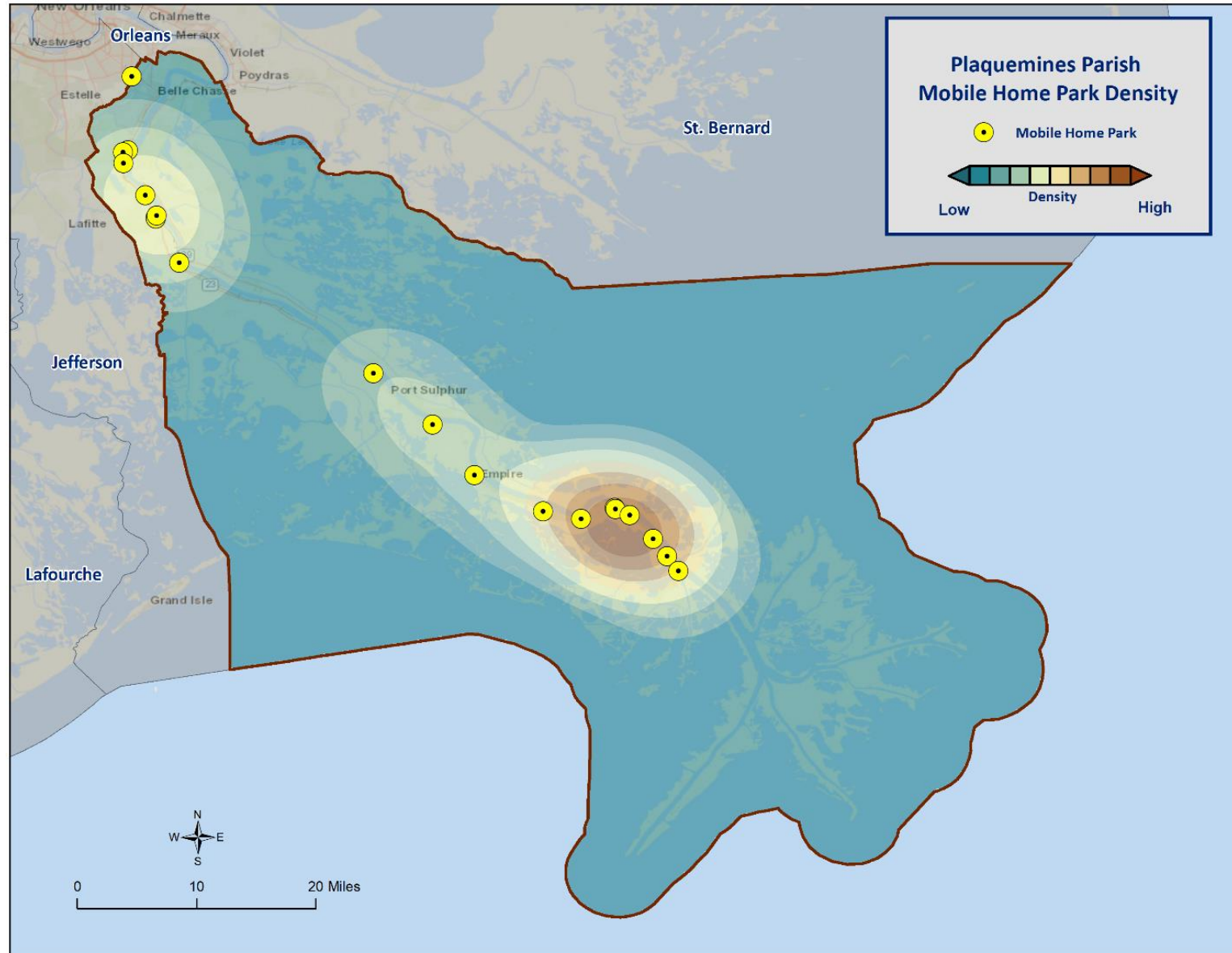
ORIGINAL FUJITA SCALE		ENHANCED FUJITA SCALE	
F5	261-318 mph	EF5	+200 mph
F4	207-260 mph	EF4	166-200 mph
F3	158-206 mph	EF3	136-165 mph
F2	113-157 mph	EF2	111-135 mph
F1	73-112 mph	EF1	86-110 mph
F0	<73 mph	EF0	65-85 mph



# Tornadoes



# Manufactured Home Density



# Tropical Cyclones

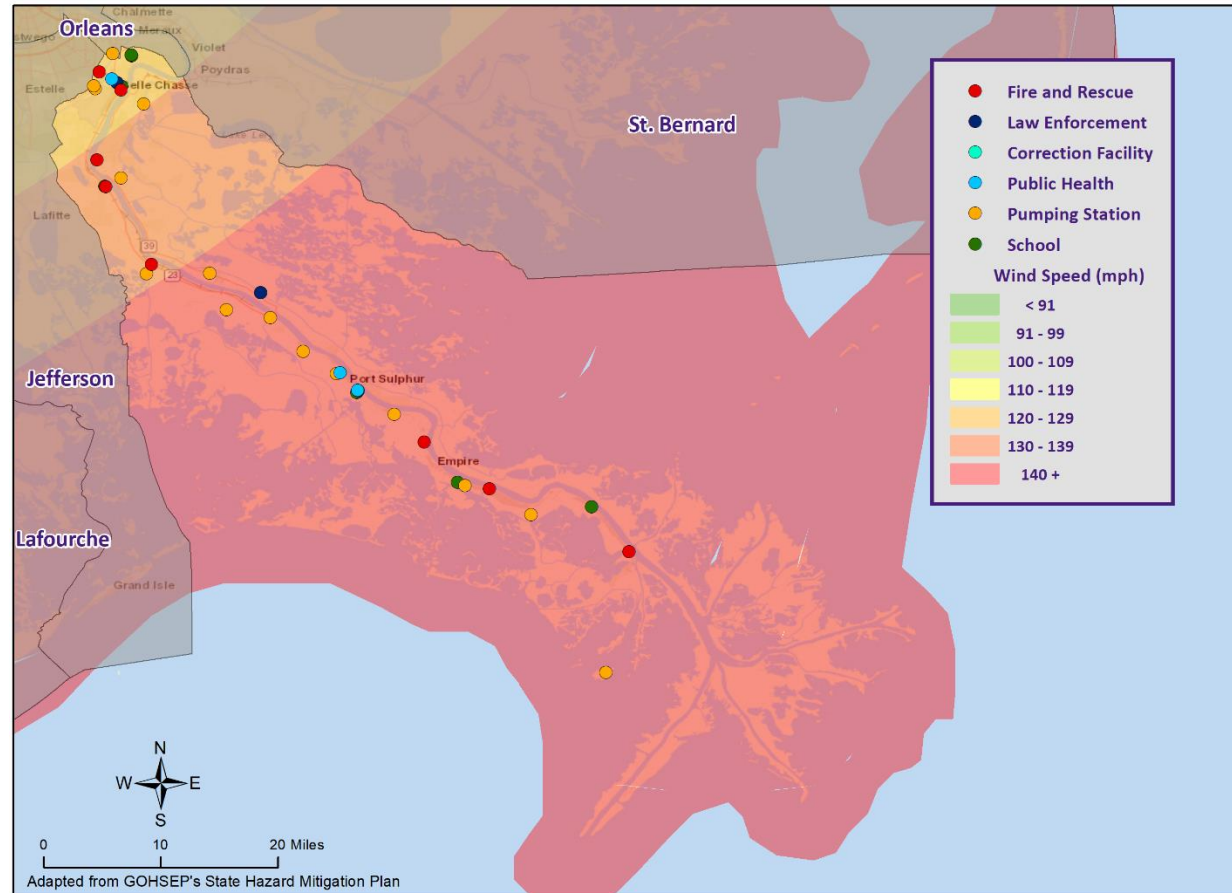
- Tropical cyclones are defined spinning, low-pressure air masses that draw surface air into their centers and attain strength ranging from weak tropical waves to the most intense hurricanes

Saffir-Simpson Hurricane Wind Scale		
	Sustained Wind Speed	Effects
Category 1	74-95 mph (119-153 km/hr)	Very dangerous winds will produce some damage. Low-lying coastal roads flooded, minor pier damage
Category 2	96-110 mph (154-177 km/hr)	Extremely dangerous winds will cause extensive damage. Major damage to exposed mobile homes, evacuation of some shoreline residents
Category 3	111-130 mph (178-209 km/hr)	Devastating damage will occur. Some structural damage to small buildings; serious flooding at coast and many smaller structures near coast destroyed
Category 4	131-155 mph (210-249 km/hr)	Catastrophic damage will occur. High risk of injury or death to people, livestock, and pets due to flying and falling debris. Long-term water shortages will increase human suffering. Most of the area will be uninhabitable for weeks or months.
Category 5	> 155 mph (249 km/hr)	Catastrophic damage will occur. People, livestock, and pets are at very high risk of injury or death from flying or falling debris.  A high percentage of frame homes will be destroyed. Long-term power outages and water shortages will render area uninhabitable for weeks or months.





# Wind Speed Impacts on Critical Infrastructure



# Parish Mitigation Goals

- Reduce losses to existing and future property due to hazards
- Protect the health and well-being of the people of Plaquemines Parish from negative effects of hazards
- Ensure the abilities of emergency services providers to continue operating during hazardous events
- Protect existing public and private infrastructure from damage



# Parish HM Project Status

- Director's Comments



# Public Outreach Activities

- Risk Analysis Activity (Hazard Occurrences)
- Problem Area Identification (Parish Maps)
- Hazard Mitigation Public Opinion Survey
  - <https://www.surveymonkey.com/r/PlaqueminesHMP>





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