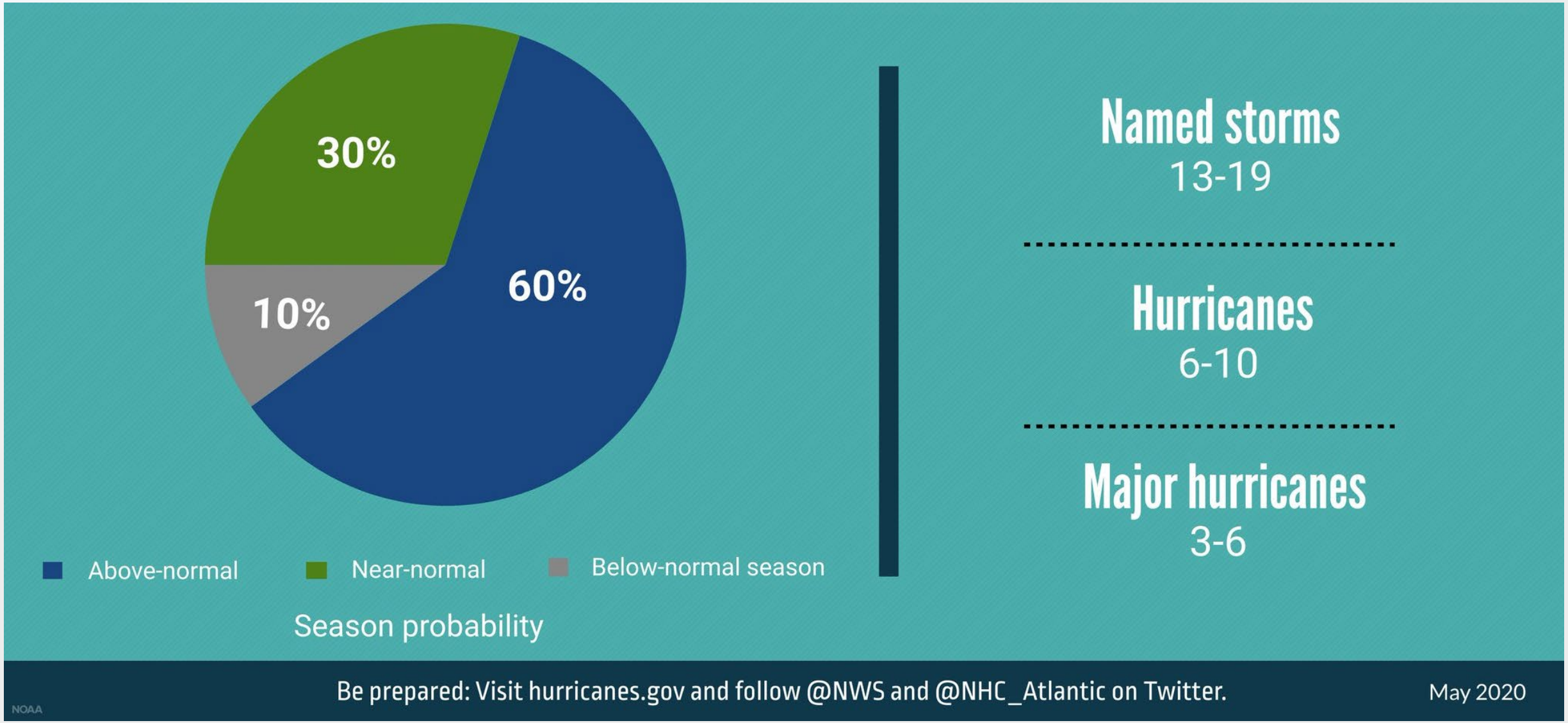
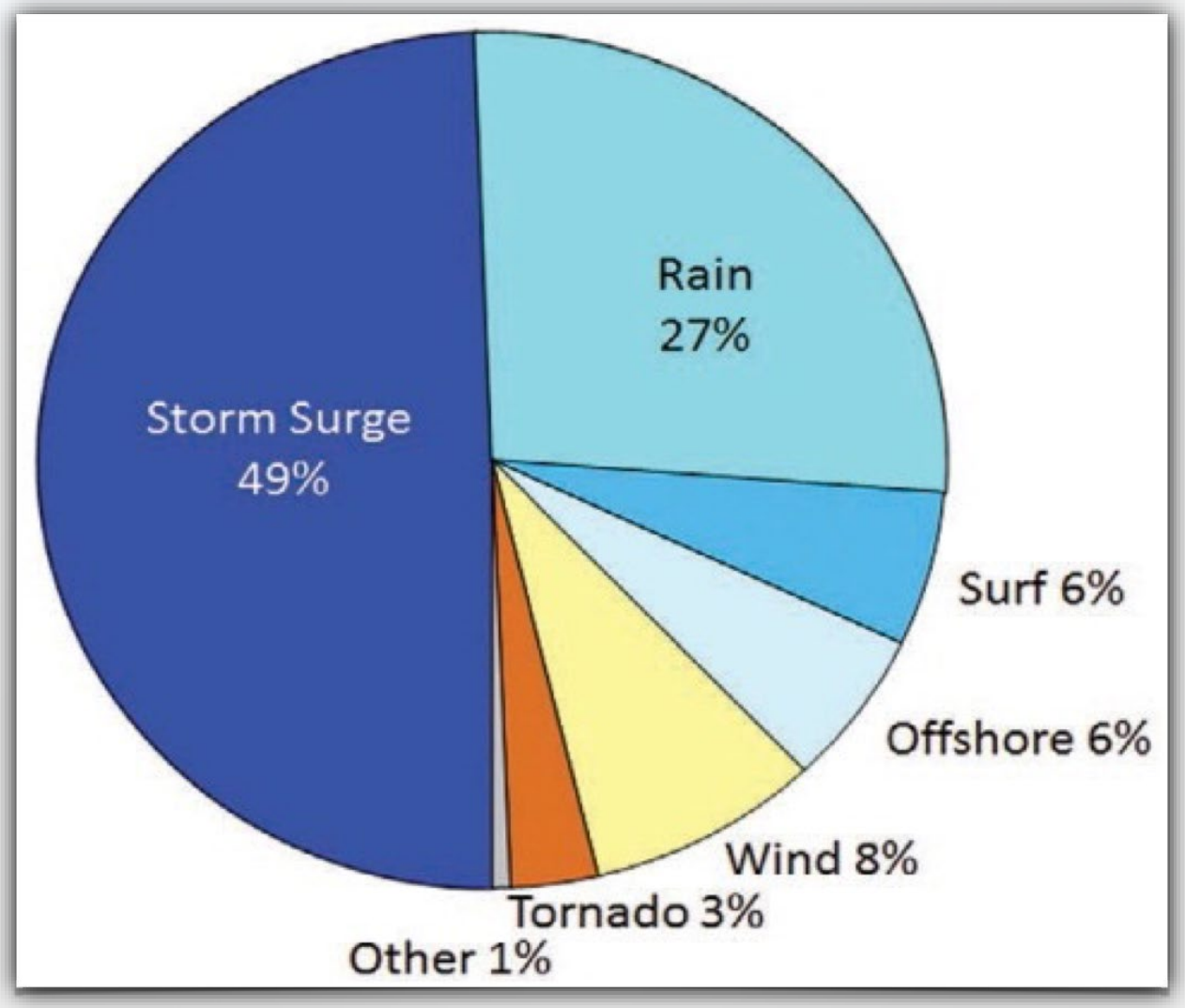
2020 Hurricane Season Outlook And Storm Surge Forecasts

Danielle Manning
NWS New Orleans/Baton Rouge

2020 Atlantic Basin Hurricane Outlook



Tropical Cyclone Direct Fatalities



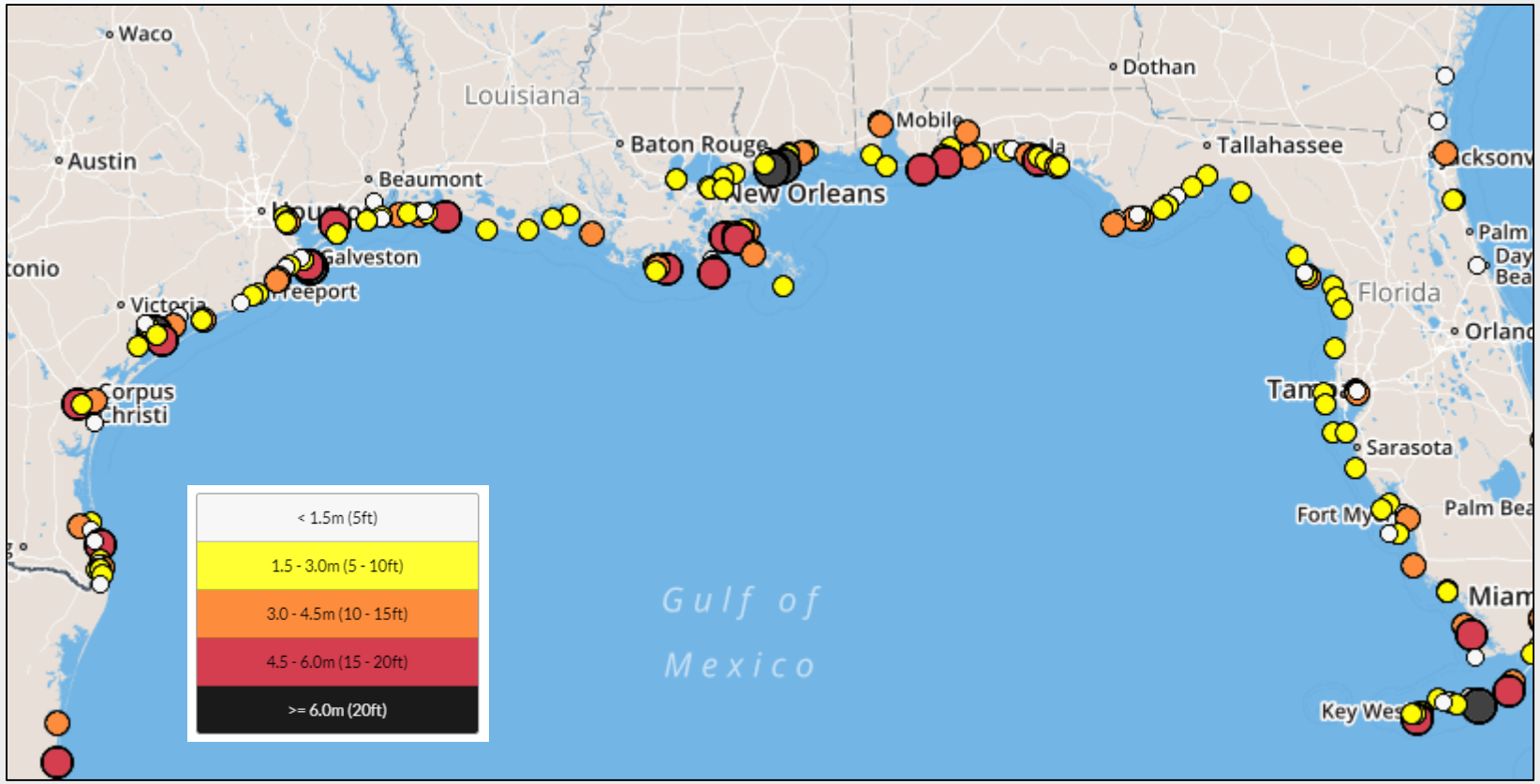
- Water kills!
- Storm Surge is responsible for nearly half of all fatalities
- Water as a whole is responsible for almost 90% of all direct fatalities

Factors Influencing Storm Surge

1. Where the circulation center crosses the coast
2. Direction of storm motion relative to the coast
3. Wind strength (storm intensity)
4. Radius of maximum winds
5. Overall size of storm (outer wind radii)
6. Slope of the continental shelf
7. Shape of the coastline and other coastal features (barrier islands, bays, rivers, levees, etc)

…It's Complicated!

Gulf of Mexico Storm Surge Events 1880-2011

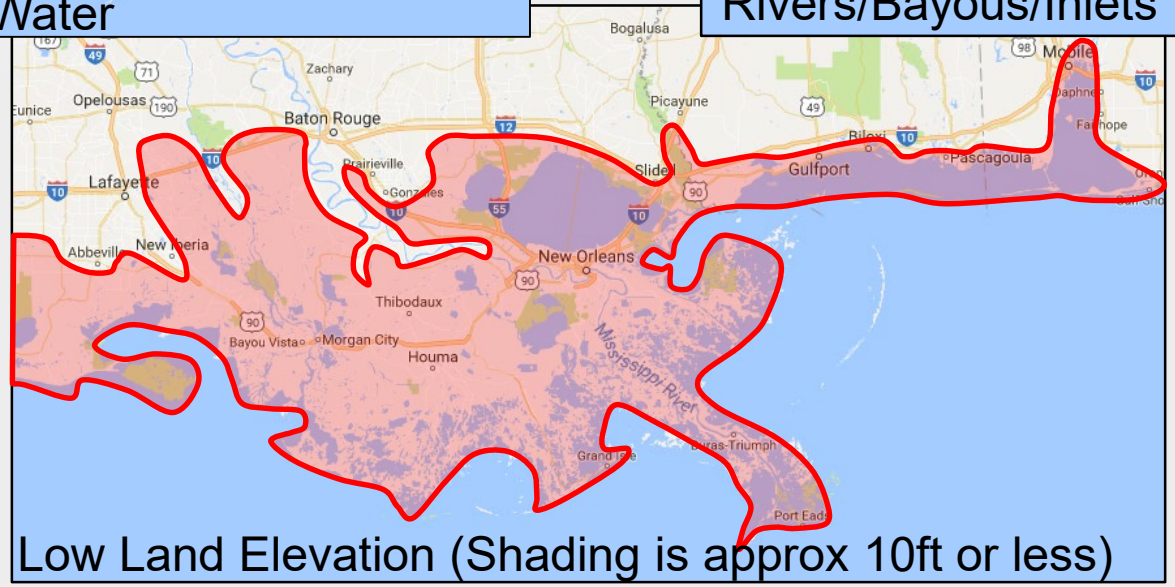


- There have been 5 storm surges of 20ft or more in the Gulf of Mexico
- The two highest occurred in virtually the same location near the Mississippi/Louisiana border
- What makes this area so vulnerable?

Local Geographical Surge Influences

Concave Areas that Funnel Water

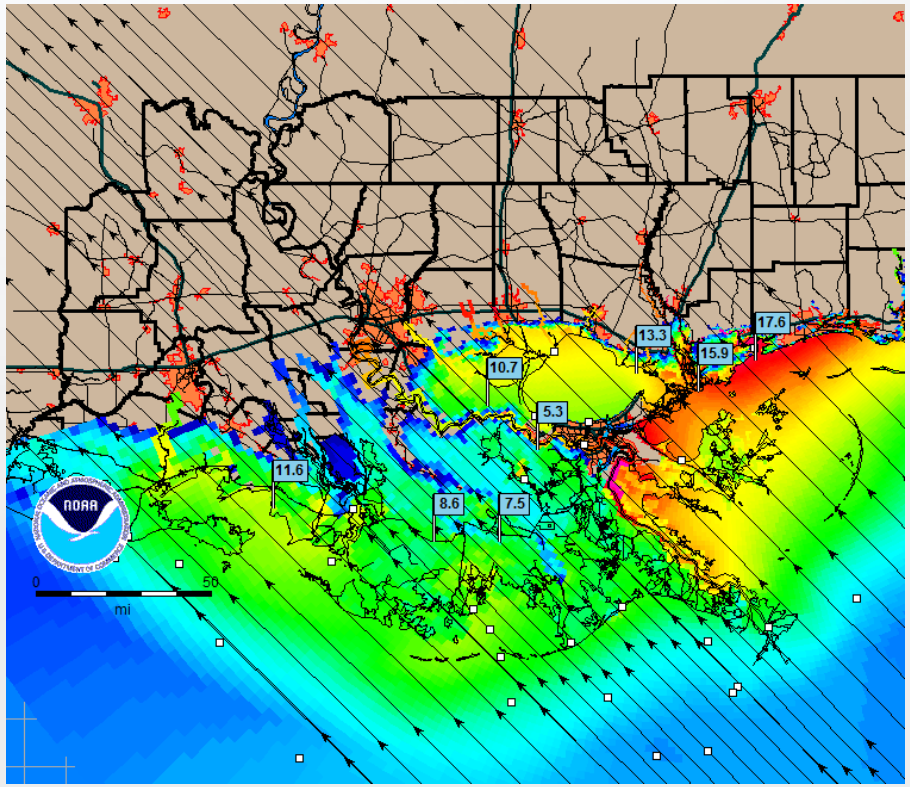
Rivers/Bayous/Inlets



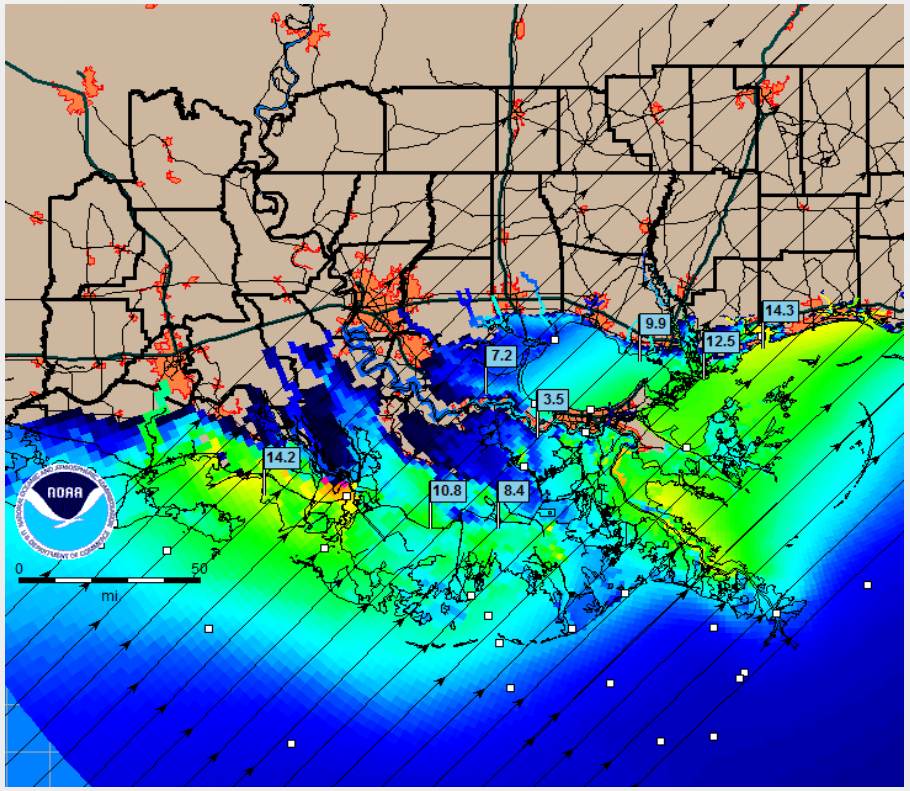
Low Land Elevation (Shading is approx 10ft or less)

Storm Surge Influences: Angle of Approach

Category 3 Moving NW at 10 mph



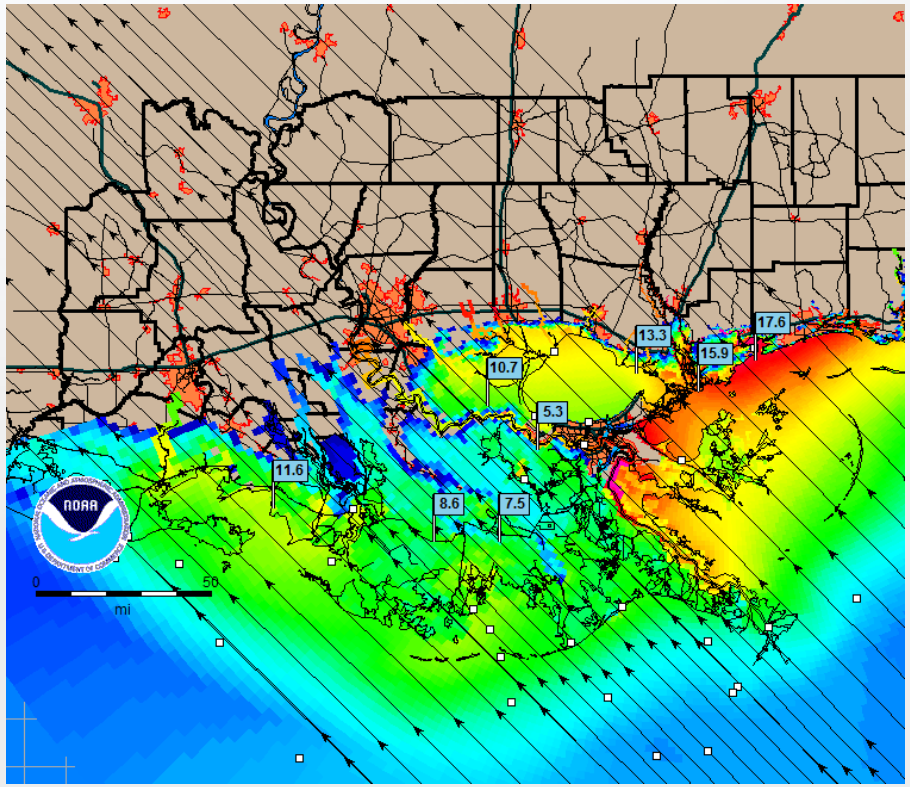
Cat 3 Moving NE at 10 mph



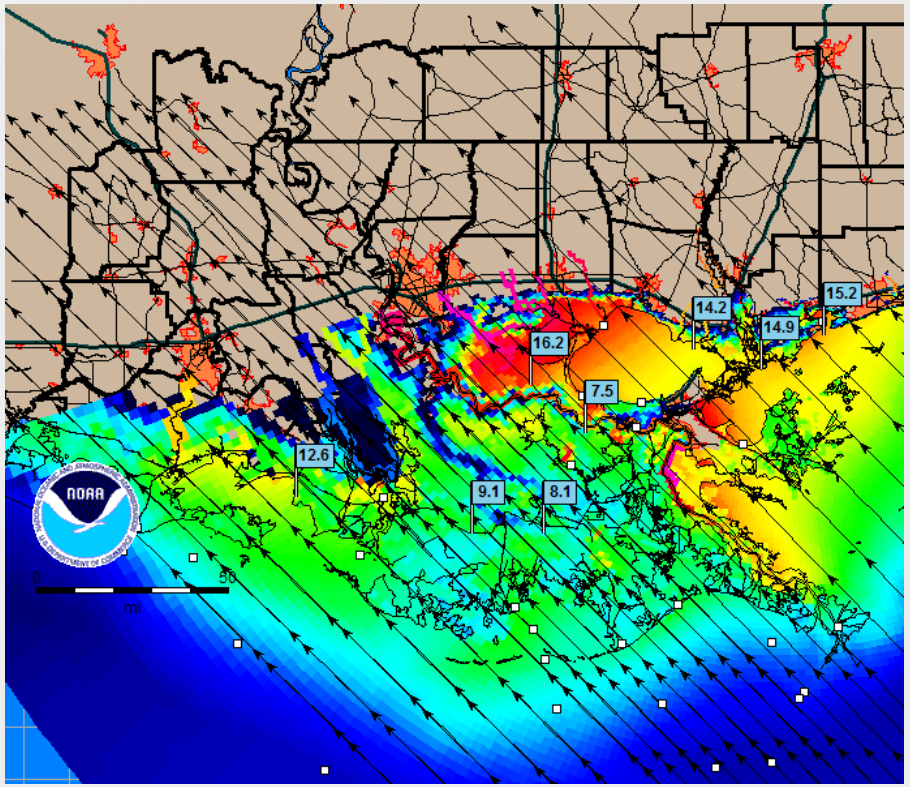
Angle of approach will determine which “nooks and crannies” the water will get into and become trapped

Storm Surge Influence: Forward Speed

Category 3 Moving NW at 10 mph

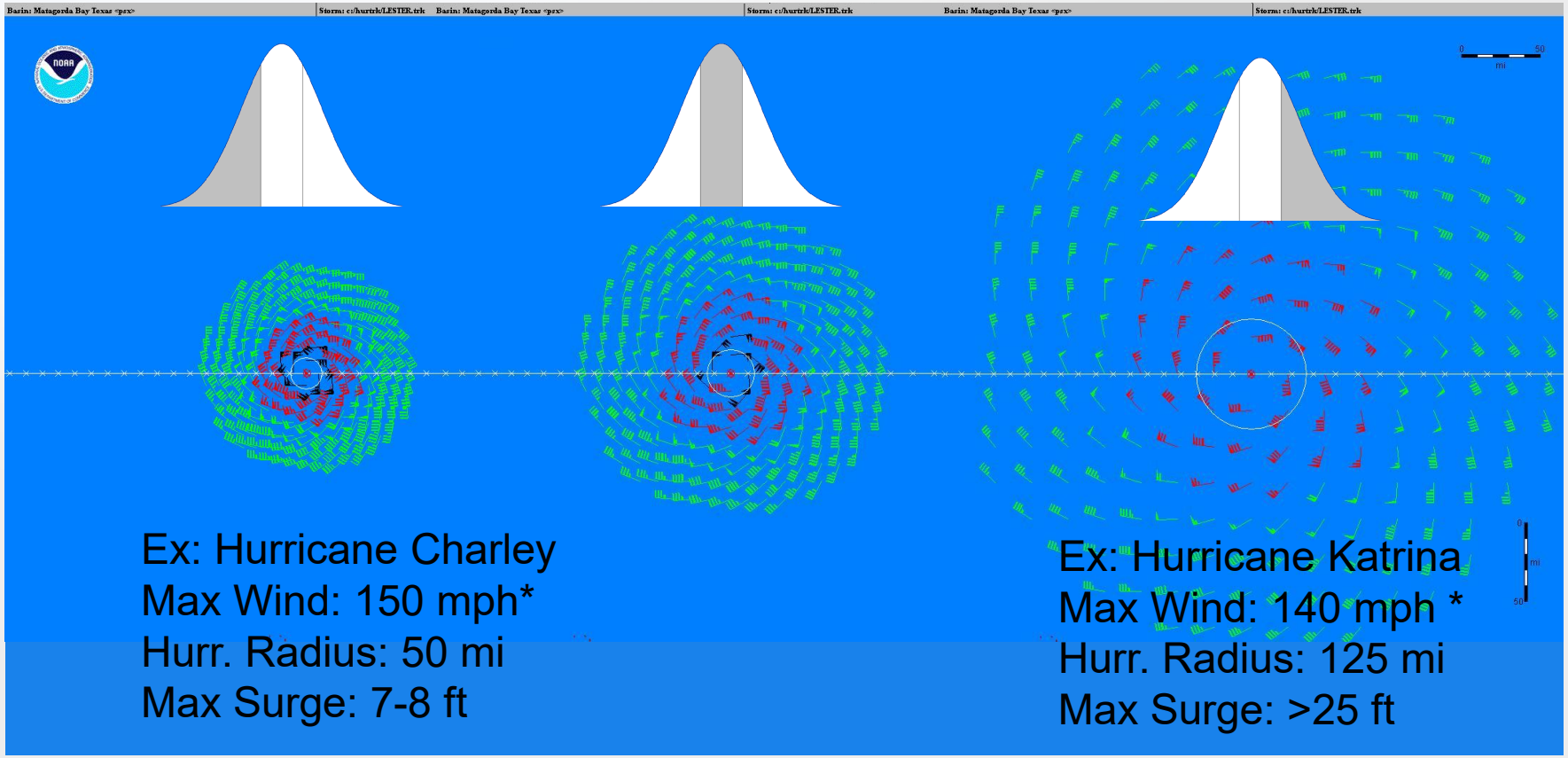


Cat 3 Moving NW at 5 mph



Longer duration of strong winds allows water to work its way farther inland, while also resulting in a slight reduction along the immediate coast in some areas

Storm Surge Influences: Storm Size

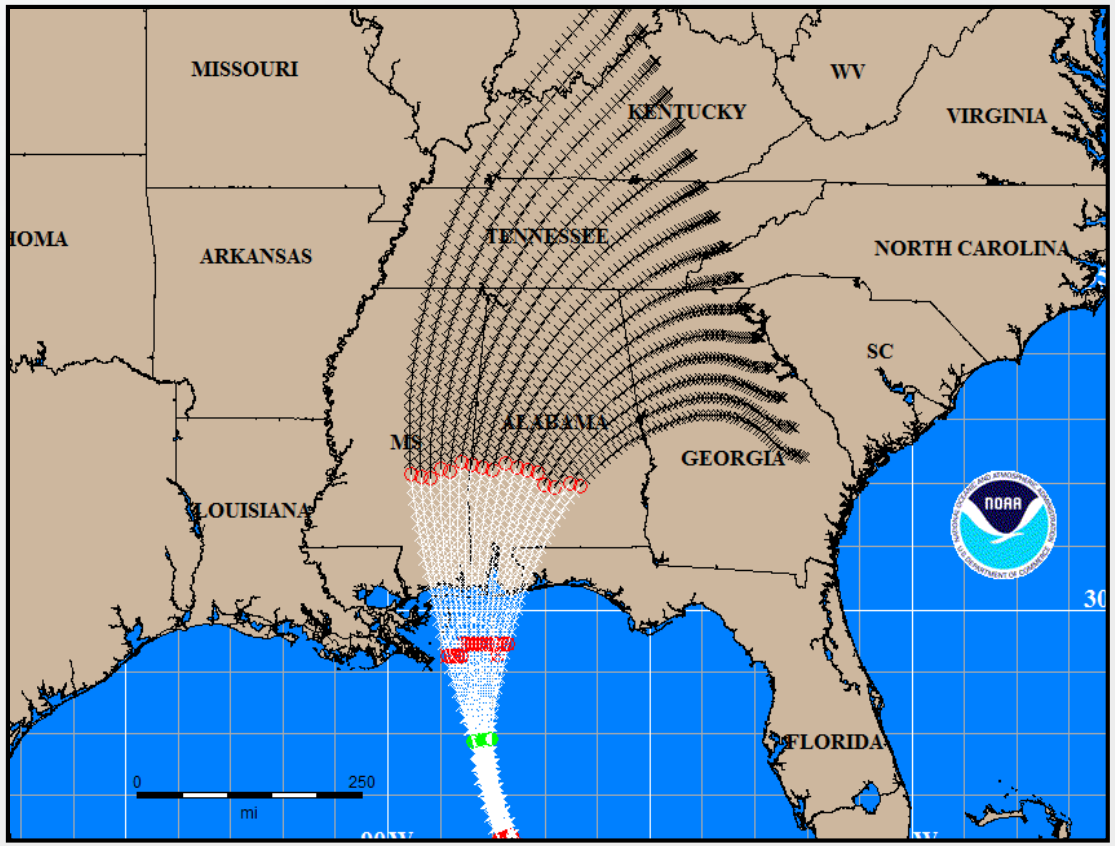


Are we dealing with a Charley (2004) or a Katrina (2005)?

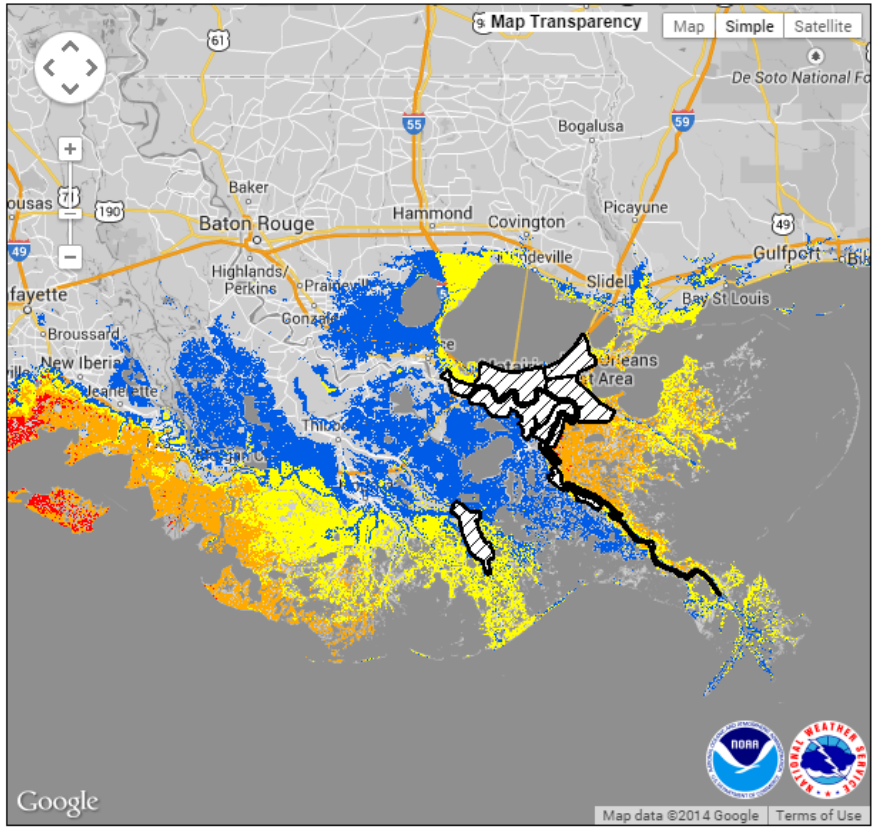
* Maximum winds at last offshore position

Storm Surge Forecasts: Accounting for Error

- So how do we account for these many error sources when forecasting storm surge?
- Probability!
- Based on the current track and intensity forecast from NHC, and accounts for reasonable errors in speed, direction, intensity, and storm size



Storm Surge Communication – Inundation Map



Potential Storm Surge Flooding*

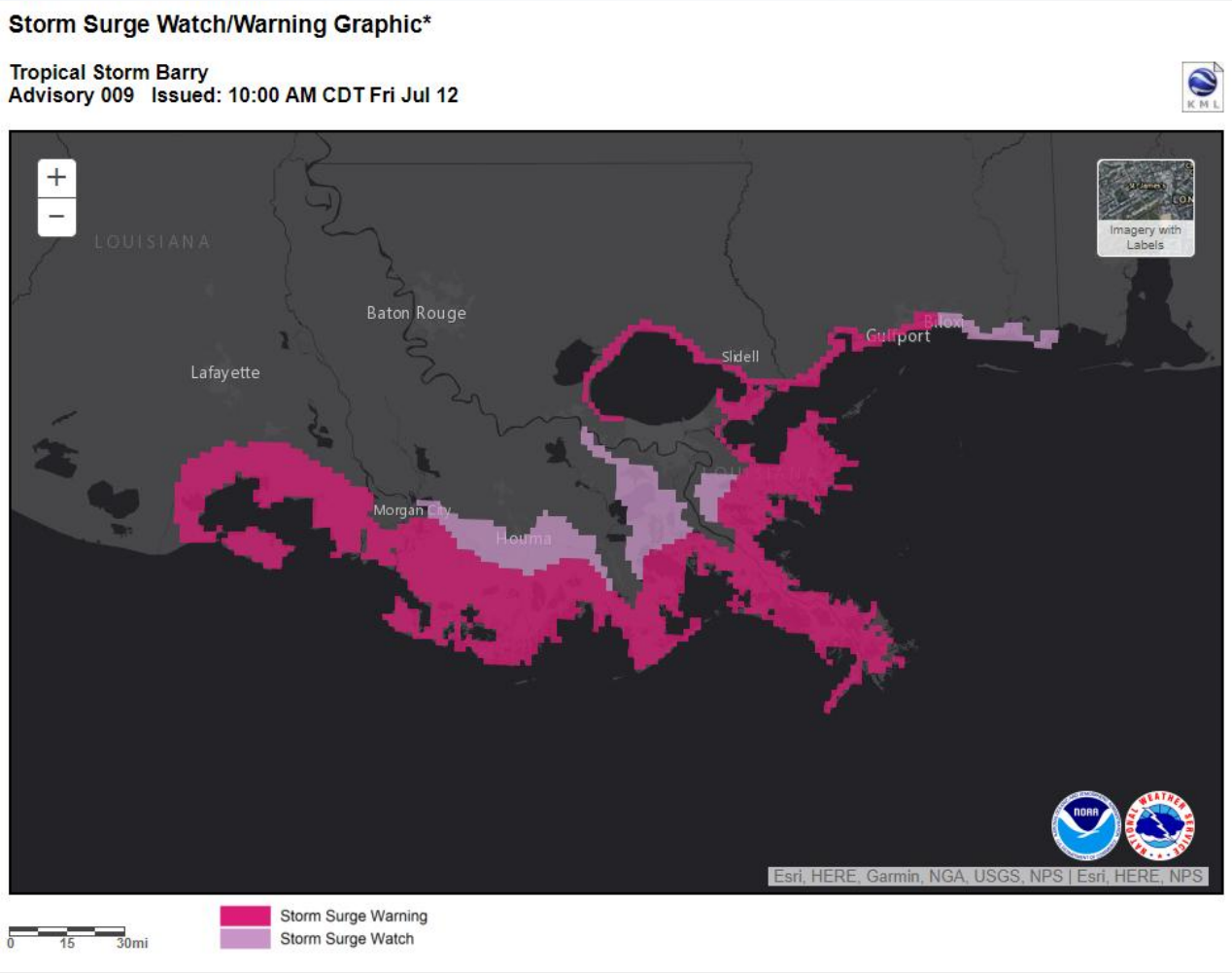
- Up to 3 feet above ground
- Greater than 3 feet above ground
- Greater than 6 feet above ground
- Greater than 9 feet above ground
- Levee protected area
  Consult local officials for flood risk

*Displayed flooding values indicate the water depth that has about a 1-in-10 (10%) chance of being exceeded.

The potential storm surge hazard is not depicted within certain levee-protected areas, such as the Hurricane and Storm Damage Risk Reduction System in Louisiana. A diagonal hatch pattern is used to display these areas on the map. These areas are highly complex, and local officials are best equipped to forecast and monitor the threat of storm surge flooding inside these areas. Customers are asked to consult local officials for flood risk inside these leveed areas.

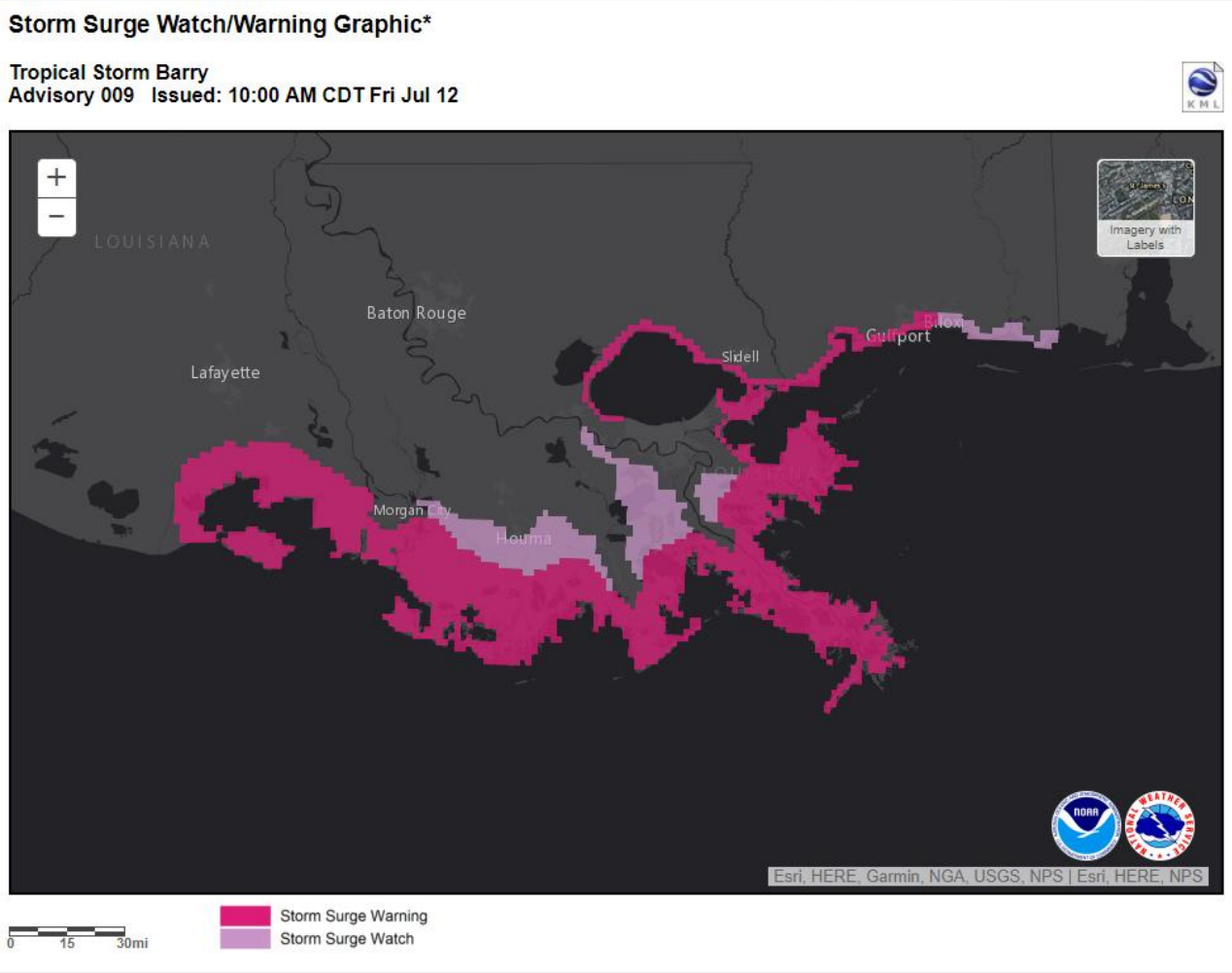
- Represents the “reasonable worst case” scenario for each point
- These are the values you should prepare for
- Values on the map only have a 10% chance of being exceeded (based on 1000 storm surge model runs)

Storm Surge Watch/Warning Graphic



- **Storm Surge Watch**
  There is a *possibility* of life-threatening storm surge inundation within *48 hours*
- **Storm Surge Warning**
  There is a *danger* of life-threatening storm surge inundation within *36 hours*

Storm Surge Watch/Warning Graphic



- Storm Surge Warnings WILL be tone alerted on NOAA Weather Radio
- Storm Surge Warnings MAY be tone alerted via the Wireless Emergency Alert (WEA) system

Storm Surge Communication – Key Points

- All of the storm surge products only account for storm surge flooding
  - They do NOT include fresh water (rain) flooding
  - They do NOT include any drainage flooding (water flowing downstream)
- To get a full picture of the overall flooding threat, also need to consider rainfall and river forecasts
- Tone alerts through weather radio will likely “over warn”
  - NWR alerts on a parish/county level, so if a warning is issued for any part of the parish/county, radios across the entire parish/county will get the alert

Contact Information

- Website: www.weather.gov/NewOrleans
- Facebook: NWSNewOrleans
- Twitter: @NWSNewOrleans
- YouTube: NWSNewOrleans
- Phone: 504-522-7330 x4
  985-649-0429 x4