



Hurricane Season 2024

Active Hurricane Season is Likely



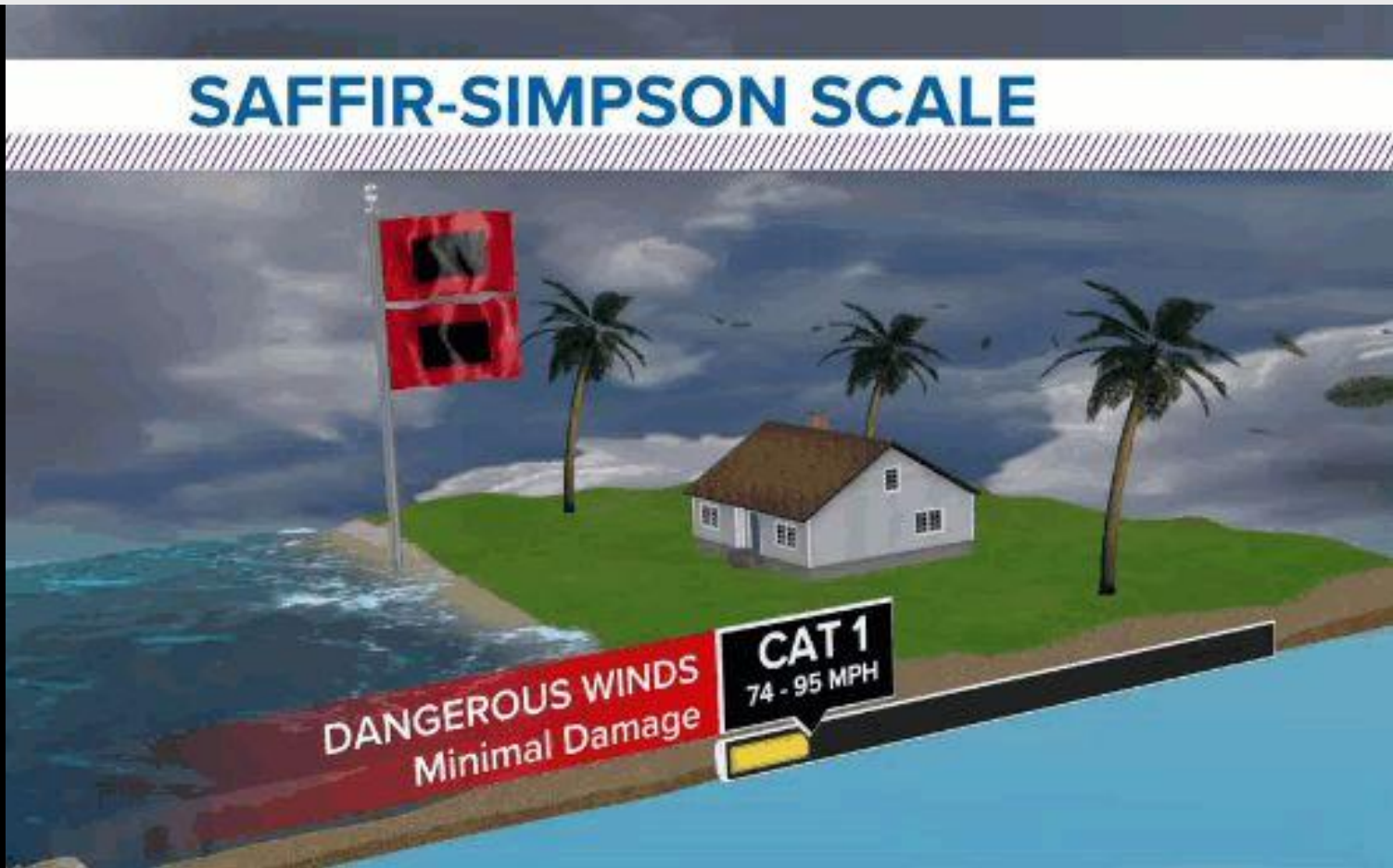
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National Weather Service
Lake Charles, LA



The Saffir-Simpson Scale

Category	Winds (mph)
1	74-95
2	96-110
3	111-129
4	130-156
5	157+



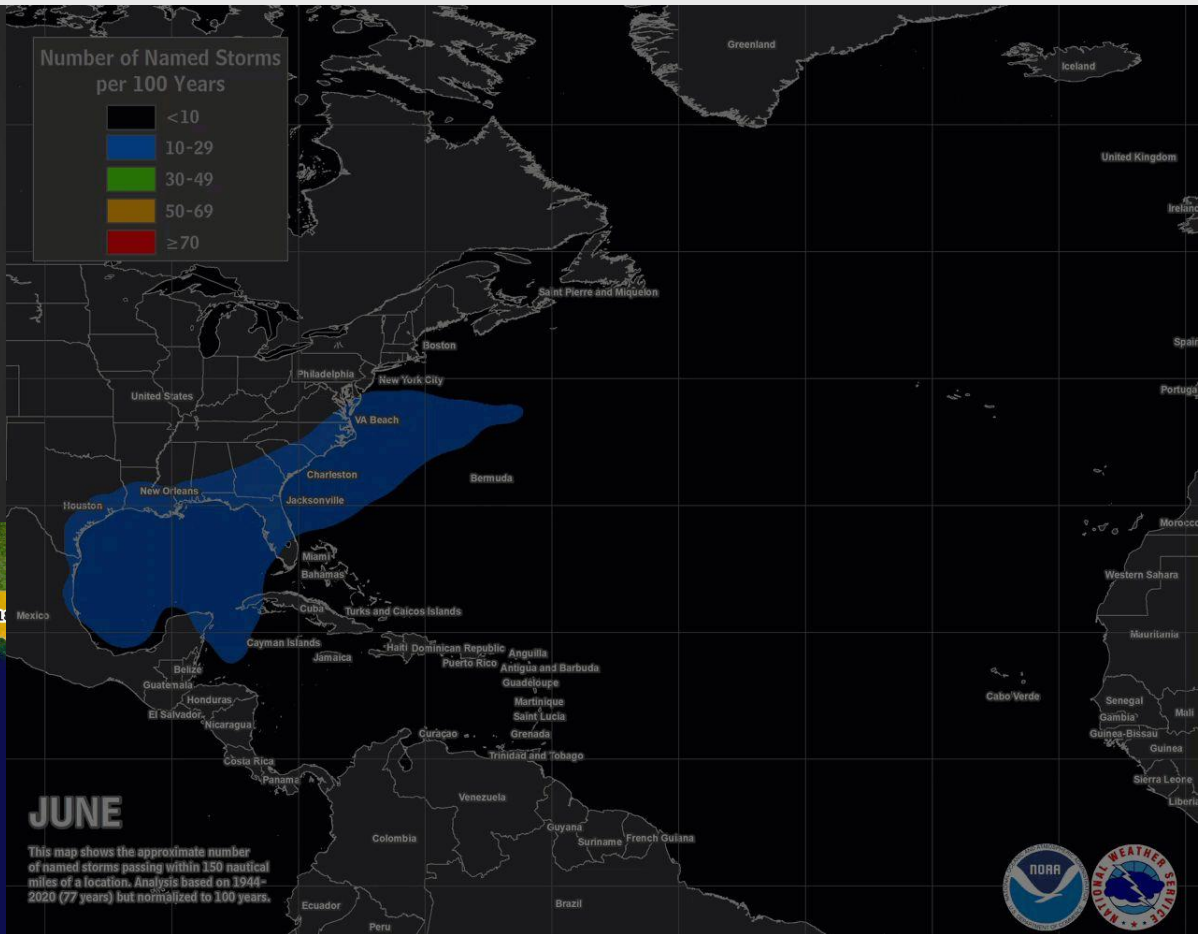
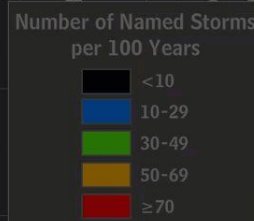
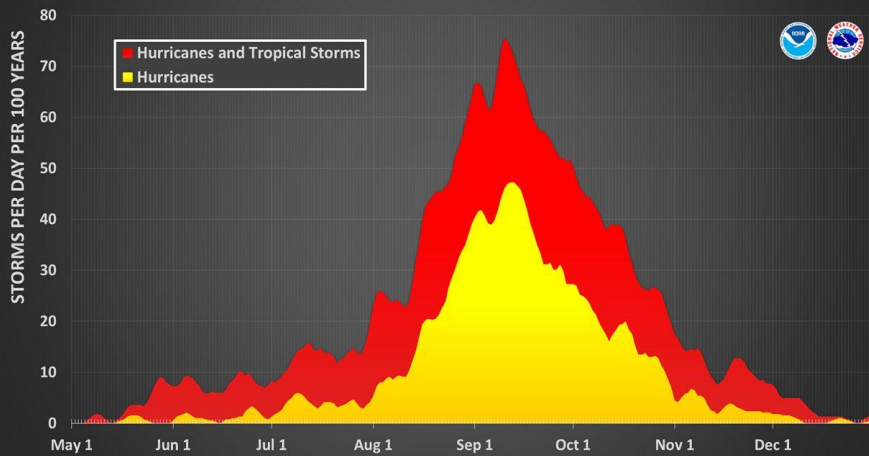


Named Storm Climatology

Monthly Climatology of Named Storms

Atlantic Hurricane and Tropical Storm Activity

Based on Data from 1944 to 2020



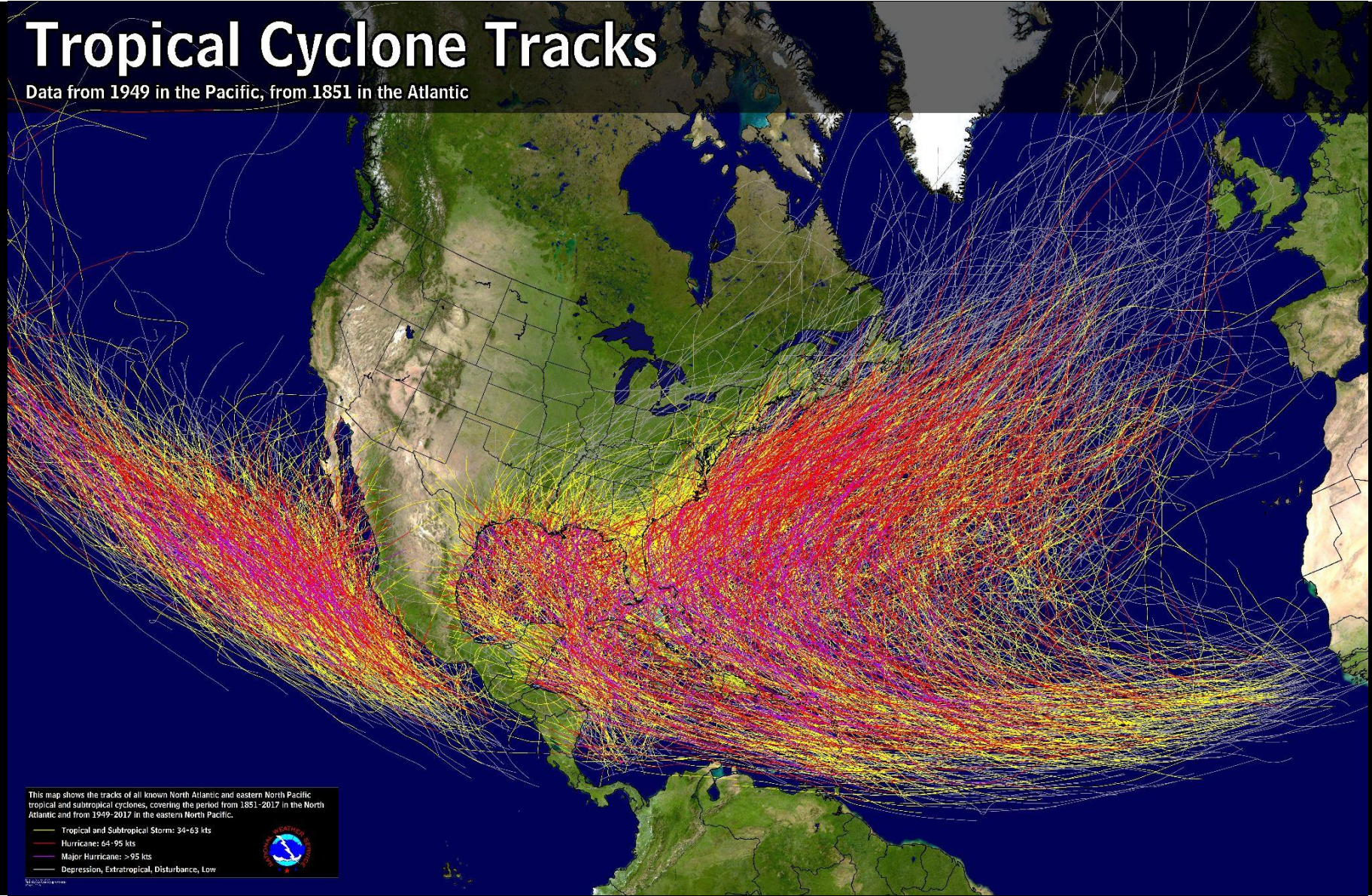
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Tropical Cyclone Tracks

Data from 1949 in the Pacific, from 1851 in the Atlantic



This map shows the tracks of all known North Atlantic and eastern North Pacific tropical and subtropical cyclones, covering the period from 1851-2017 in the North Atlantic and from 1949-2017 in the eastern North Pacific.

- Tropical and Subtropical Storm: 39-63 kts
- Hurricane: 64-95 kts
- Major Hurricane: > 95 kts
- Depression, Extratropical, Disturbance, Low

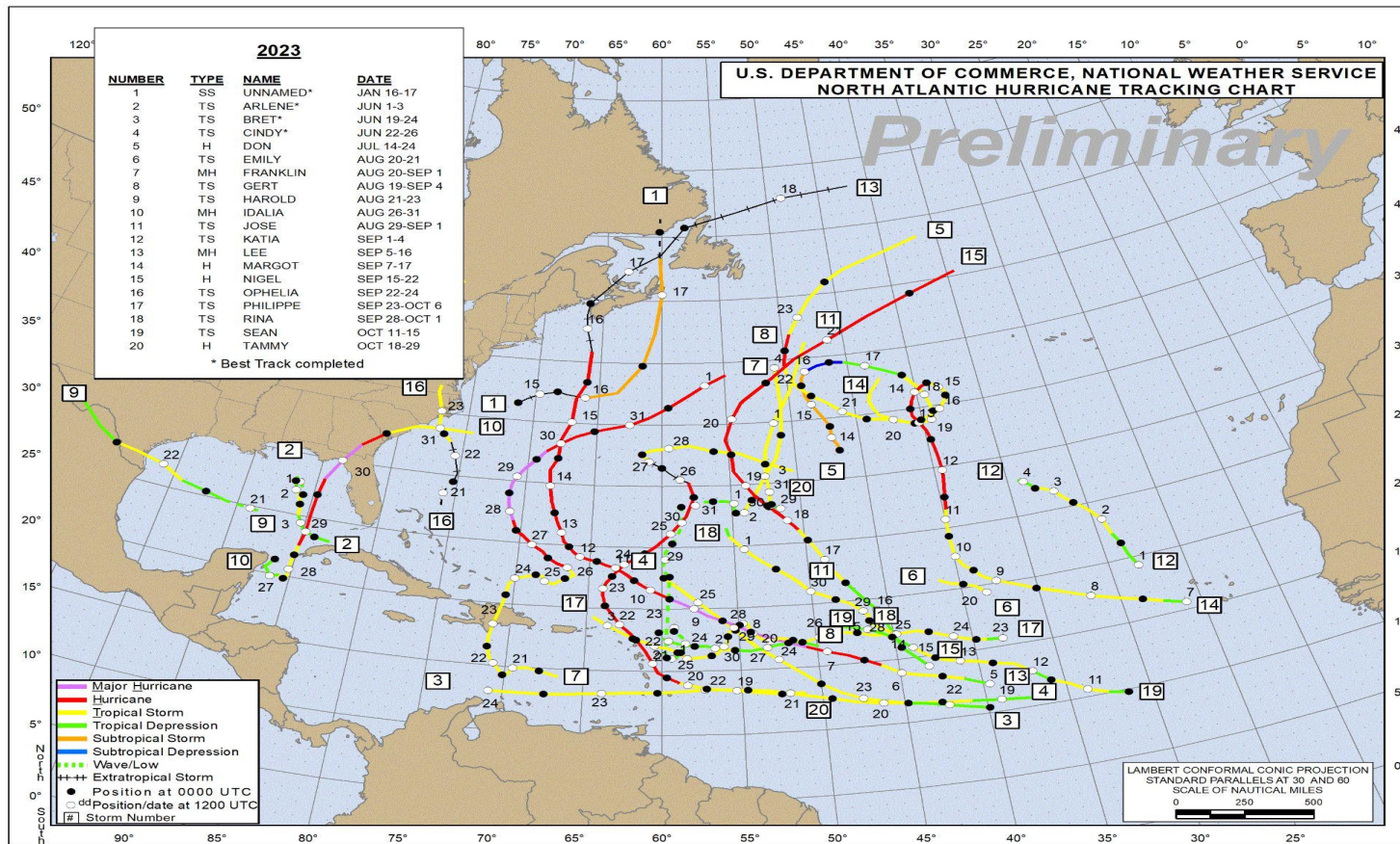


NOAA



2023 Season: What Happened

Quiet Year for Louisiana and SE Texas



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2024 Names

Hurricane Season Starts on June 1st ends November 30th

Alberto
Beryl
Chris
Debby
Emesto
Francine
Gordon

Helene
Isaac
Joyce
Kirk
Leslie
Milton
Nadine

Oscar
Patty
Rafael
Sara
Tony
Valerie
William



Current Look 2024 Hurricane Season

Active Year Ahead?



**Official Forecast
is to be released
on May 23rd**

Forecasted ENSO PHASE

Neutral or La Nina



Good for Storm
Development

Sea Surface Temperatures Above Average



Good for Storm
Development

Bottom Line Up Front:

A concerning setup is
forming.
More information to
come.

Forecast Confidence:

Medium: ENSO
models have been
consistent.

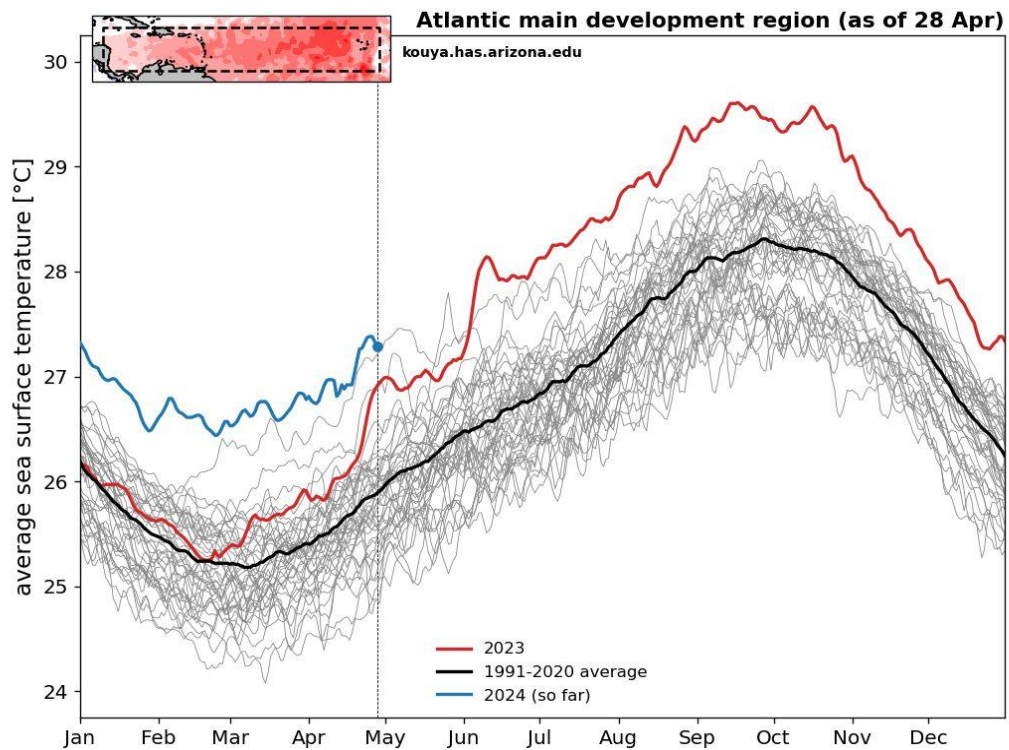




Sea Surface Temperature Anomaly

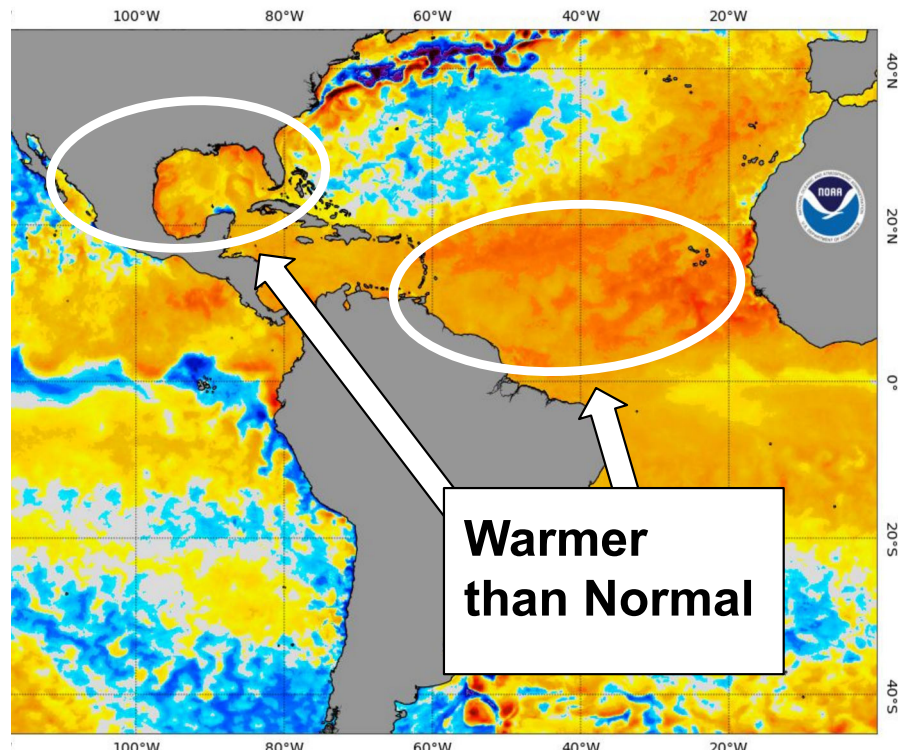
Warmer than normal temperatures are present over the Atlantic and Gulf

Watch Daily 5km SST Anomalies (v3.1) 9 May 2024



powered by NOAA THREDDS + Python

source: NOAA OISST



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El Nino Advisory / La Nina Watch

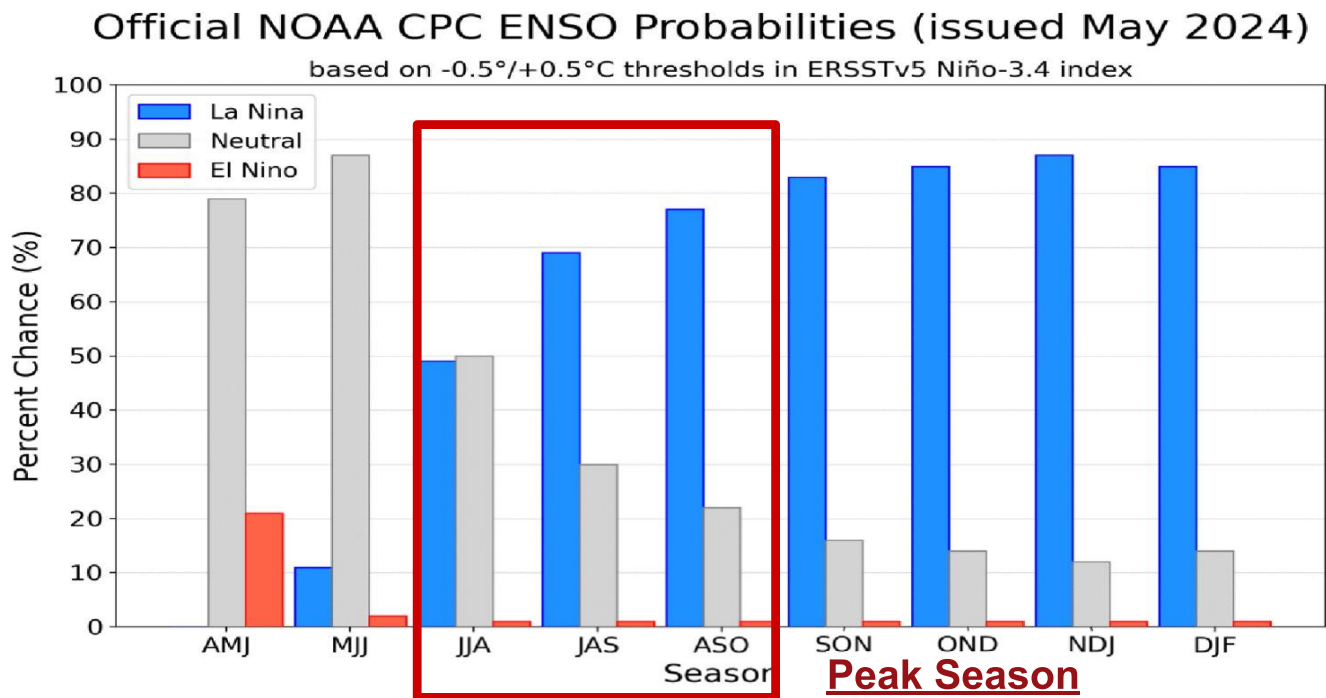


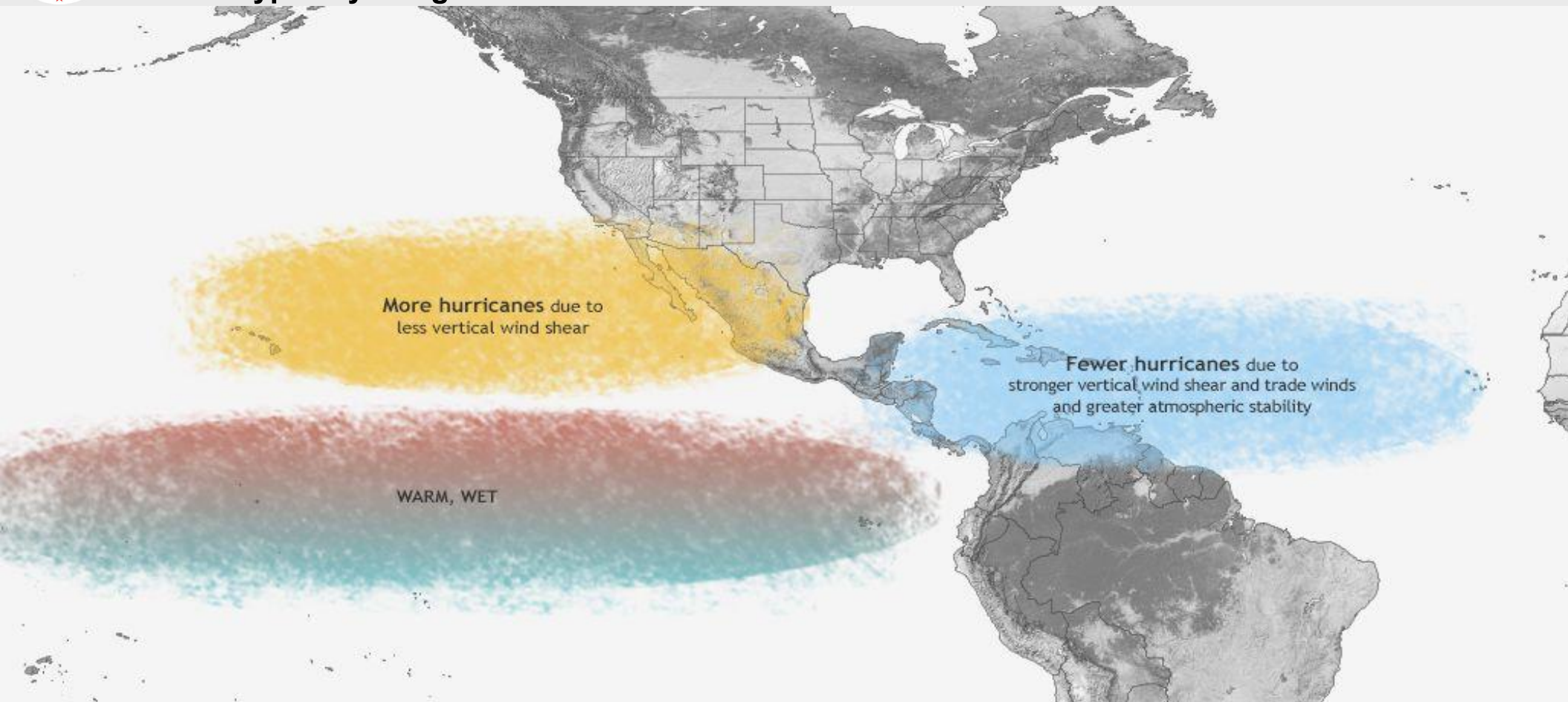
Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N - 5°S , 120°W - 170°W). Figure updated 9 May 2024.





El Nino's Tropical Influence

El Nino typically brings fewer hurricanes in the Atlantic Basin



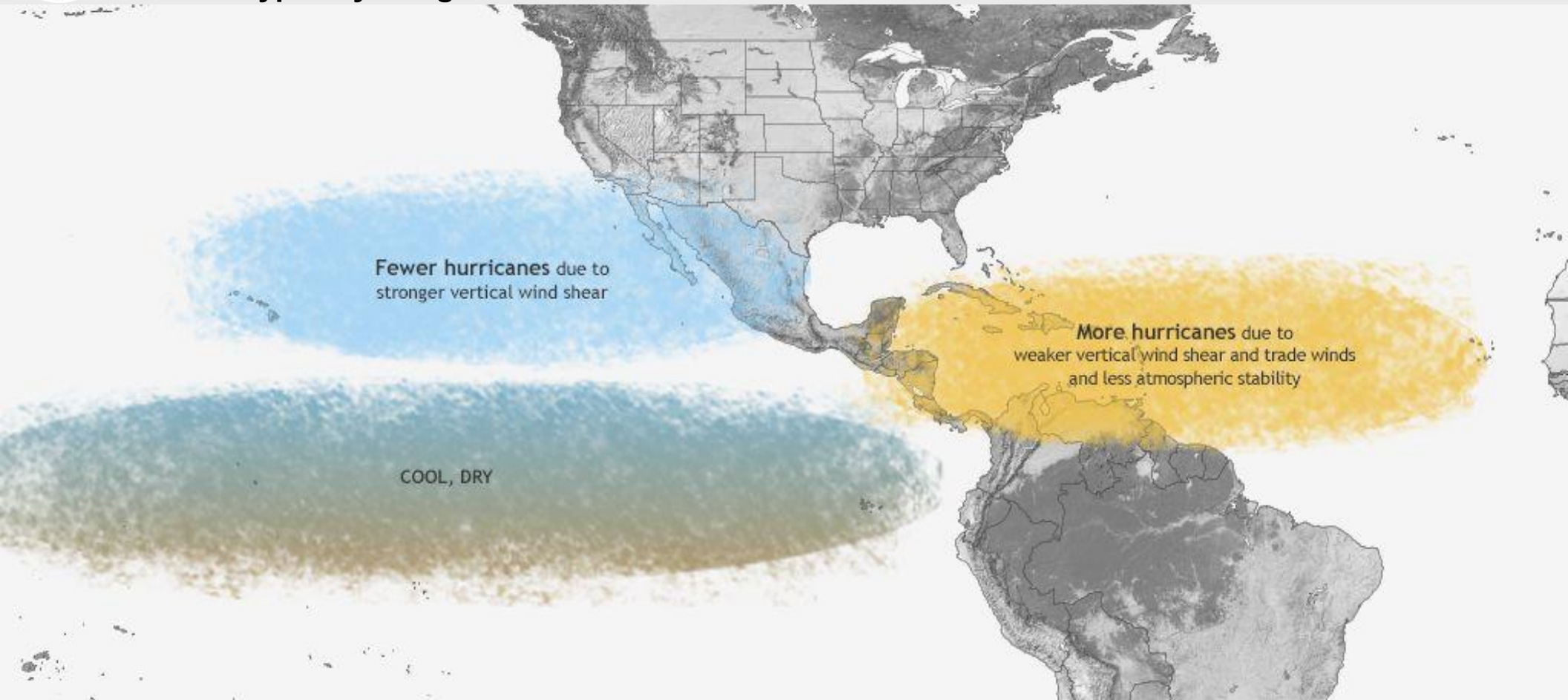
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La Nina's Tropical Influence

La Nina typically brings more hurricanes in the Atlantic Basin



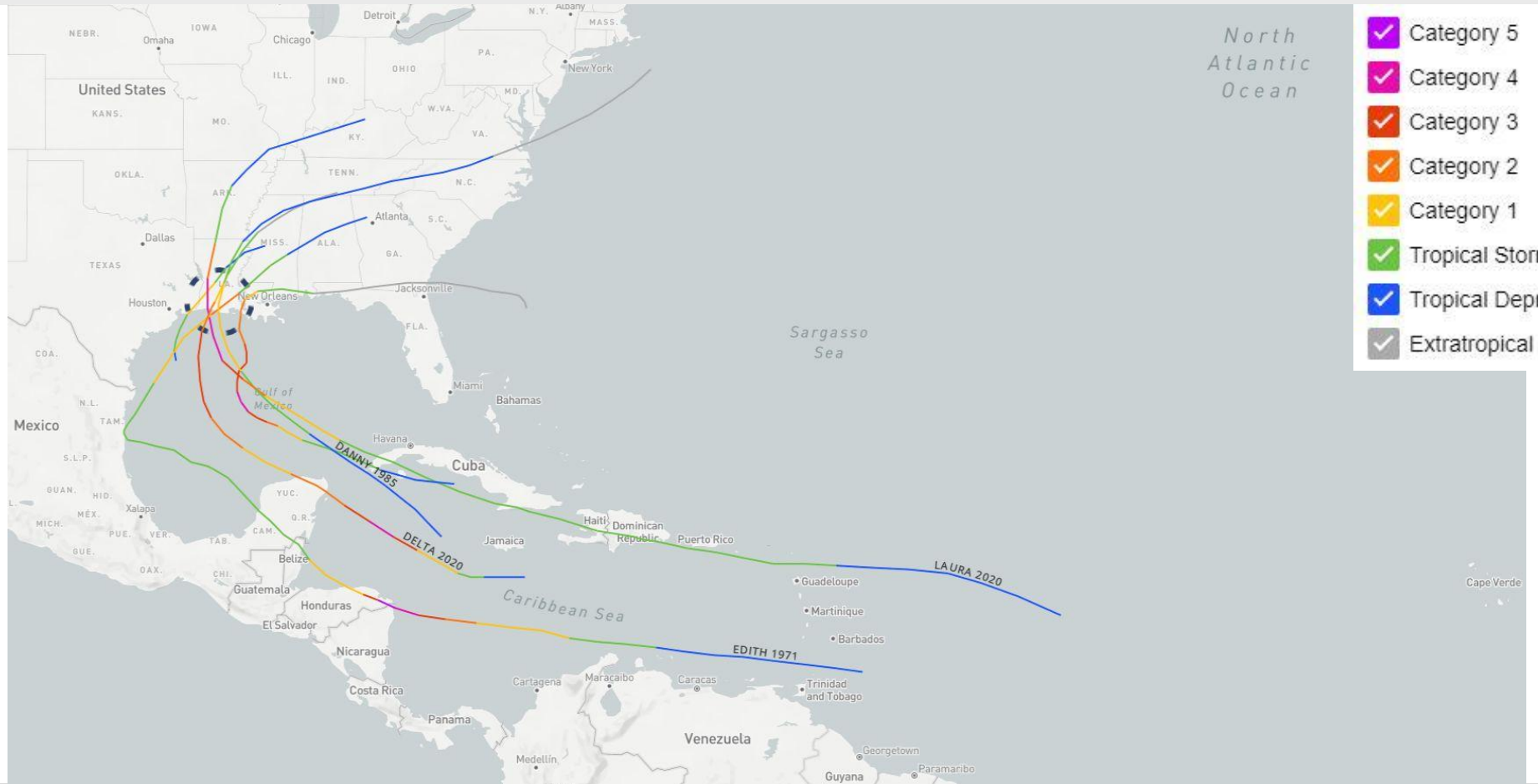
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Lake Charles Forecast Area Hurricane History

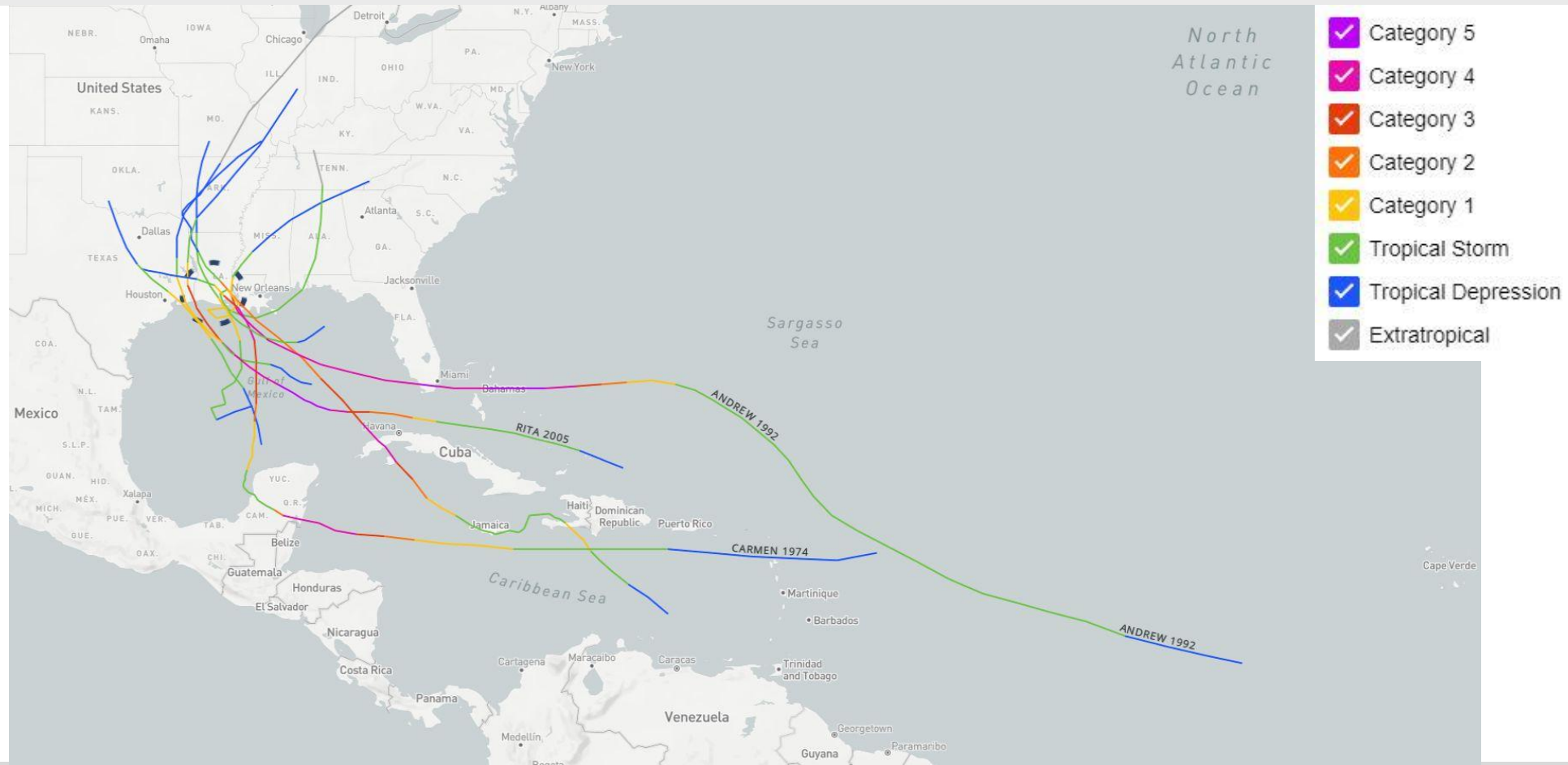
La Nina Hurricanes





Lake Charles Forecast Area Hurricane History

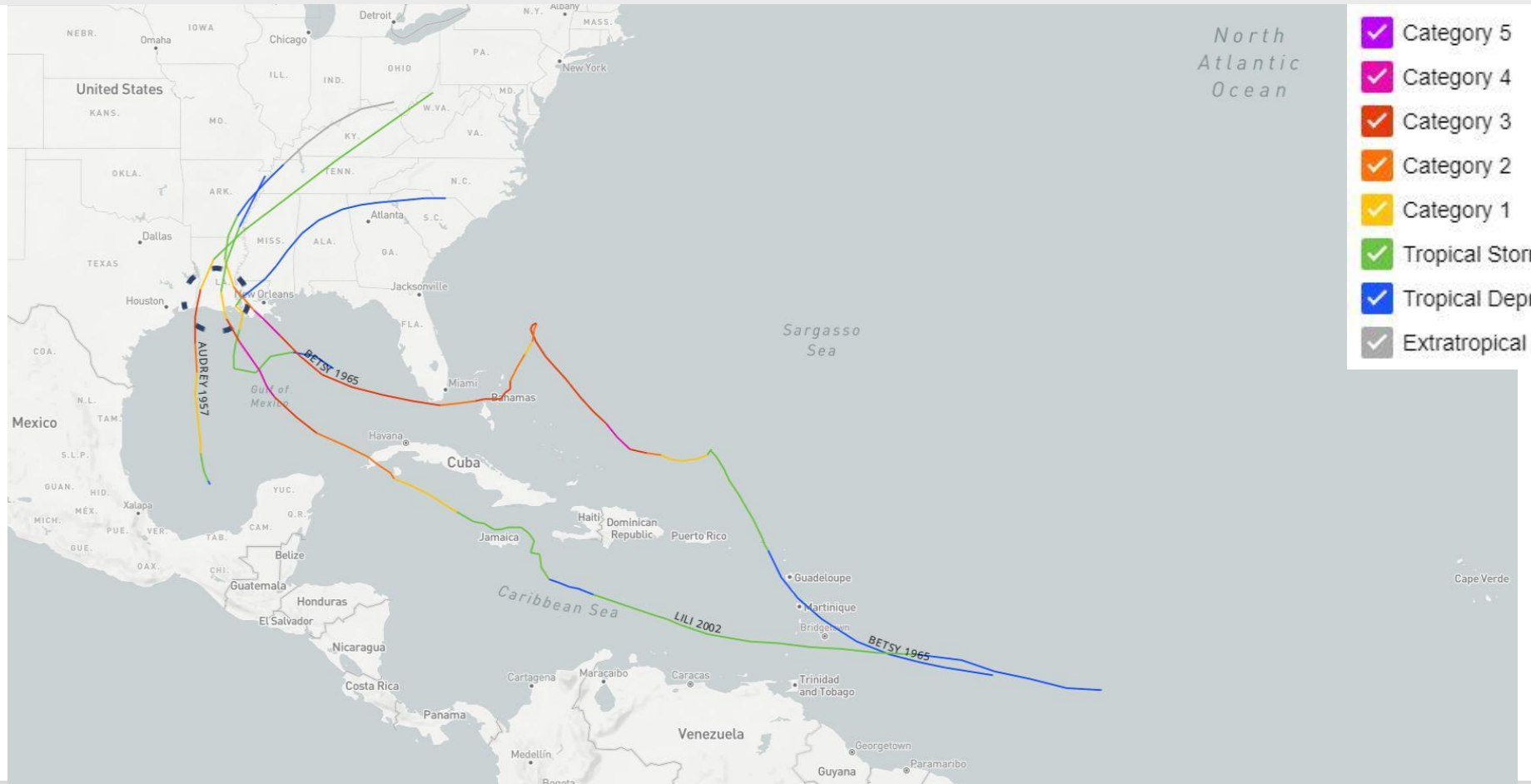
ENSO Neutral Hurricanes





Lake Charles Forecast Area Hurricane History

El Nino Hurricanes



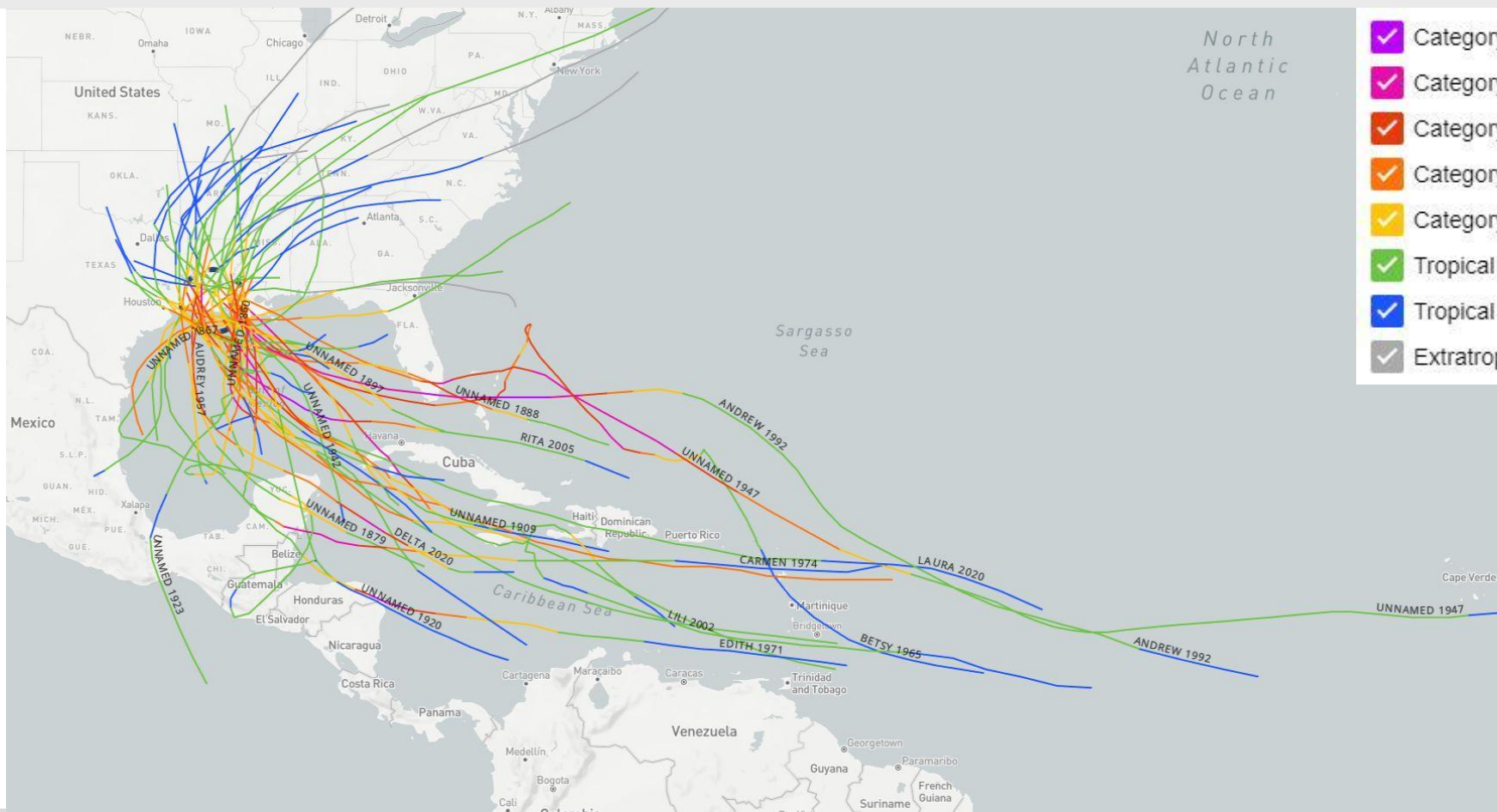
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Lake Charles Forecast Area Hurricane History

All Hurricanes since 1856



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Colorado State 2024 Forecast

Atlantic Basin Tropical Activity

Forecast Parameter	Forecast	1991 - 2020 Average
Named Storms	23	14.4
Hurricanes	11	7.2
Major Hurricanes	5	3.2



**COLORADO STATE
UNIVERSITY**

The Colorado State Forecast is for a very active season



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The Weather Channel 2024 Forecast

Atlantic Basin Tropical Activity

Forecast Parameter	Forecast	1991 - 2020 Average
Named Storms	25	14.4
Hurricanes	12	7.2
Major Hurricanes	6	3.2





AccuWeather 2024 Forecast

Atlantic Basin Tropical Activity

Forecast Parameter	Forecast	1991 - 2020 Average
Named Storms	20-25	14.4
Hurricanes	8-12	7.2
Major Hurricanes	4-7	3.2



AccuWeather is forecasting a well above average season with a record breaking number storms and impacts





National Hurricane Center 2024 Forecast

Atlantic Basin Tropical Activity

Forecast Parameter	Forecast	1991 - 2020 Average
Named Storms	—	14.4
Hurricanes	—	7.2
Major Hurricanes	—	3.2

Not Released Yet

The first NHC forecast will be release on 23rd of May





Hurricane Fatalities

Multiple Threats

Roughly 75% of hurricane fatalities are related to water

Half of all fatalities are due to storm surge

Fatalities

Wind

8.0%

Offshore

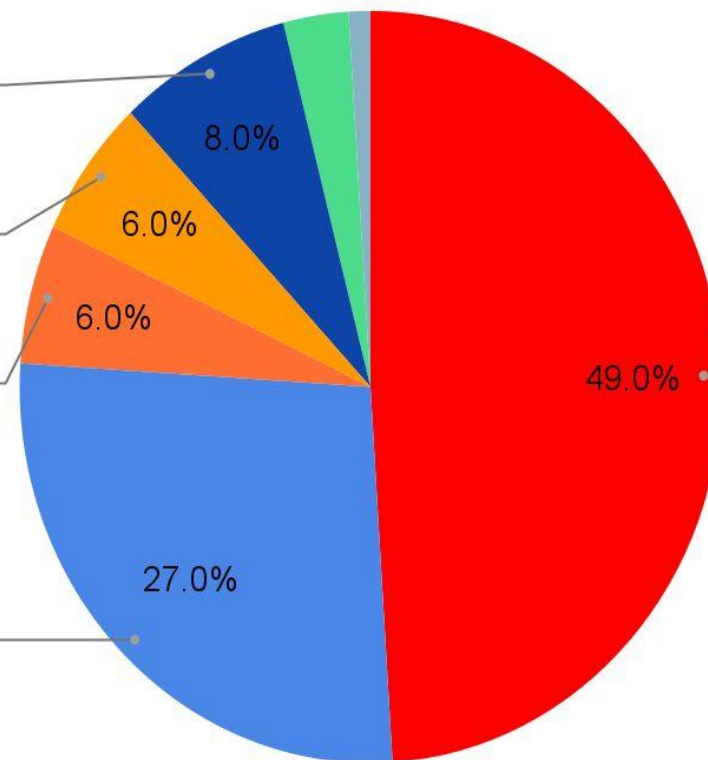
6.0%

High Surf

6.0%

Rain

27.0%



Storm
49.0%





Storm Surge

Hurricane Katrina

Before Katrina



After Katrina



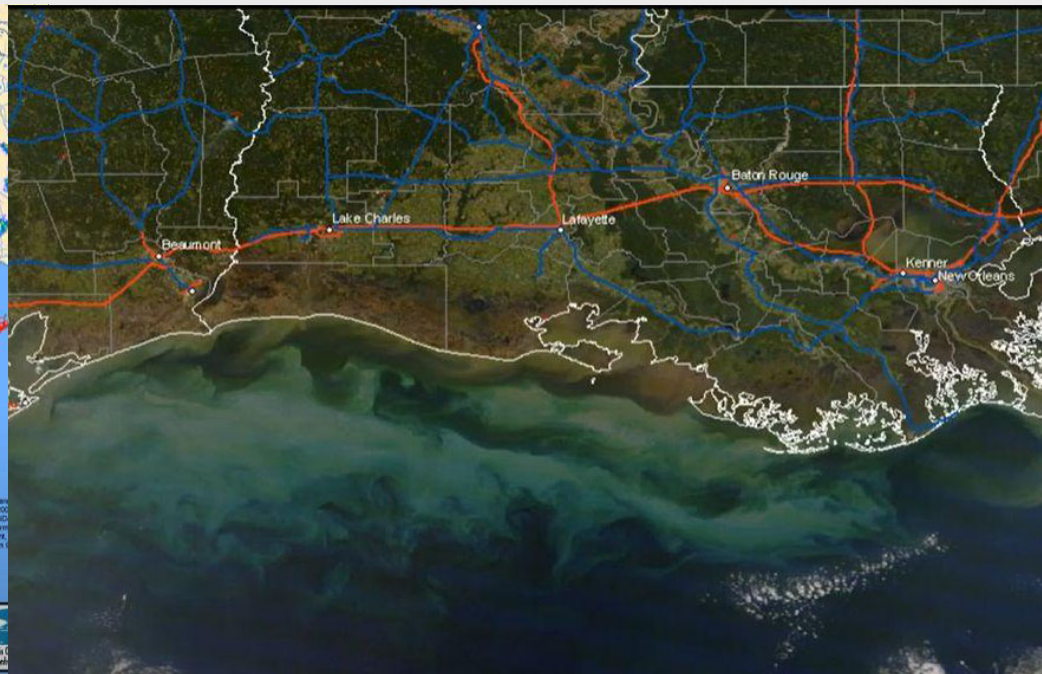
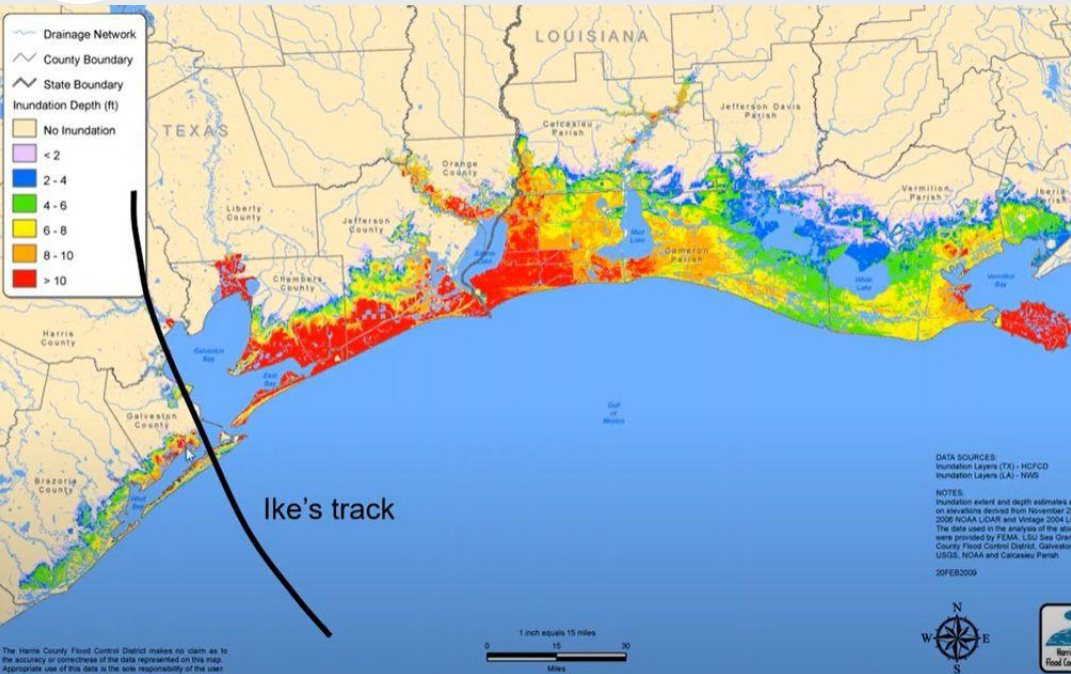
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Saltwater Vegetation Burn

Post Hurricane Ike



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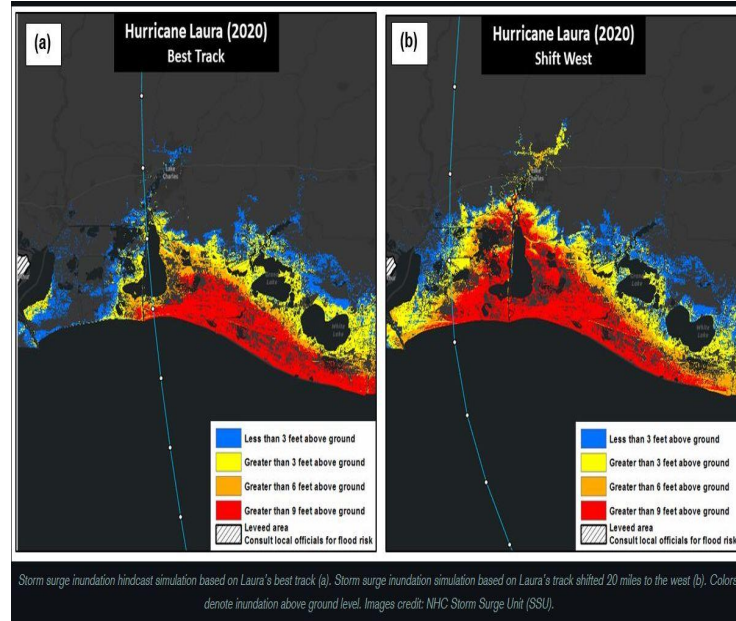
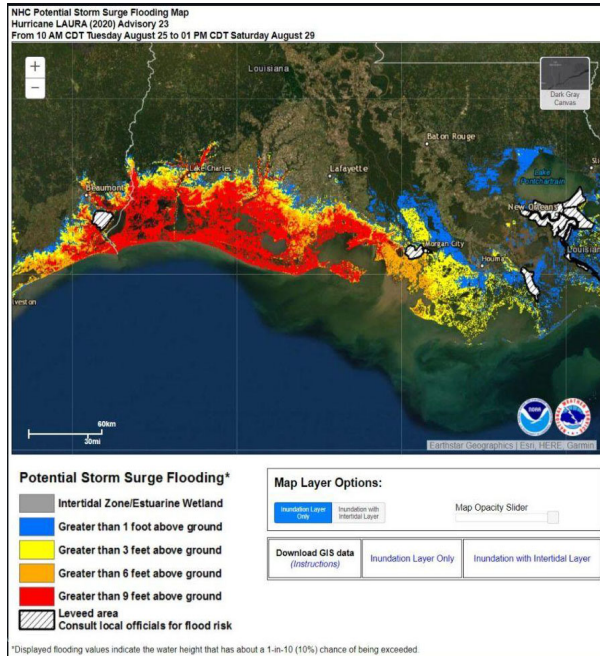
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Hurricane Laura

Forecast and what happened



What we had to prepare for

Shift 20 miles to the east made a big difference

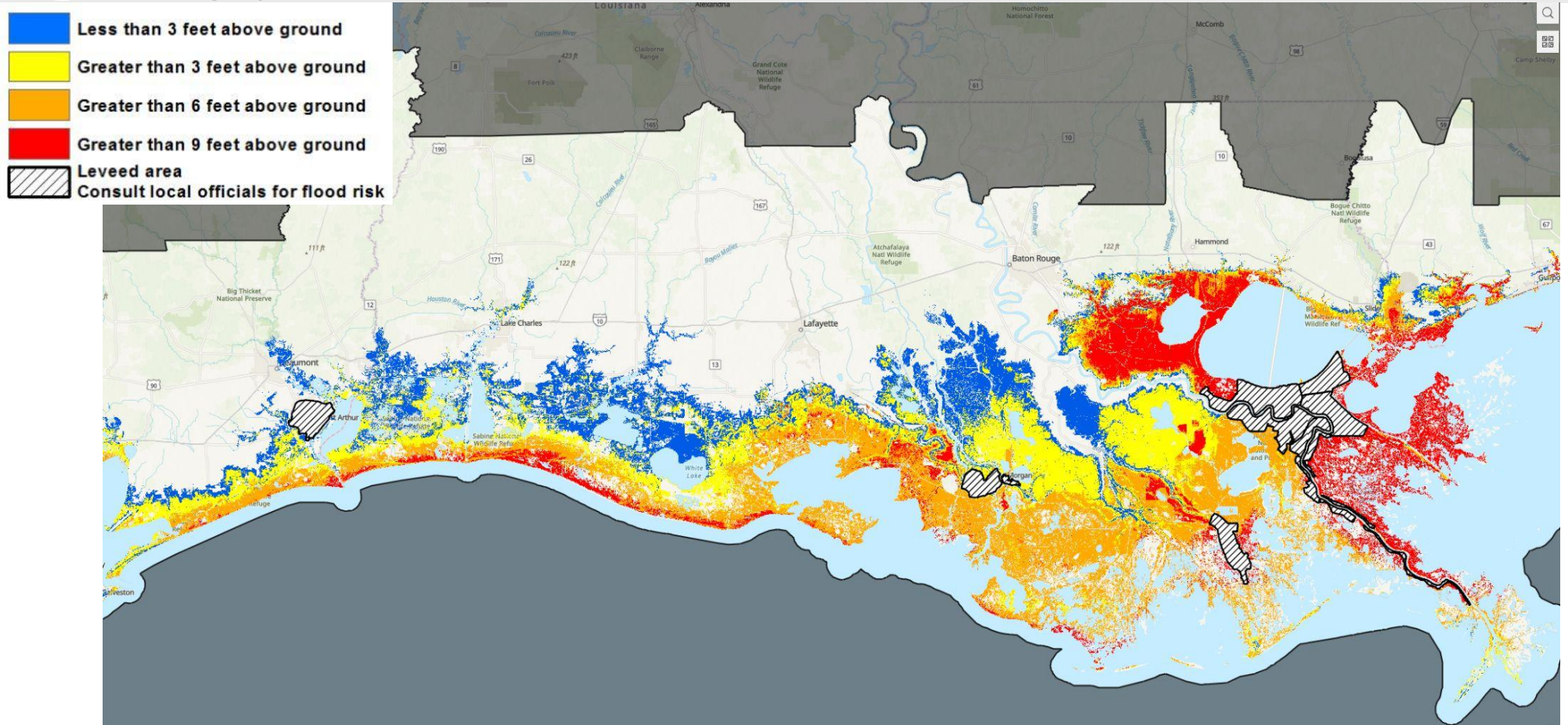
Record Louisiana Storm surge 20.8 feet NAVD88 or 17.1 feet Above Ground in Creole.

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Storm Surge in Louisiana and SE Texas

Category 1




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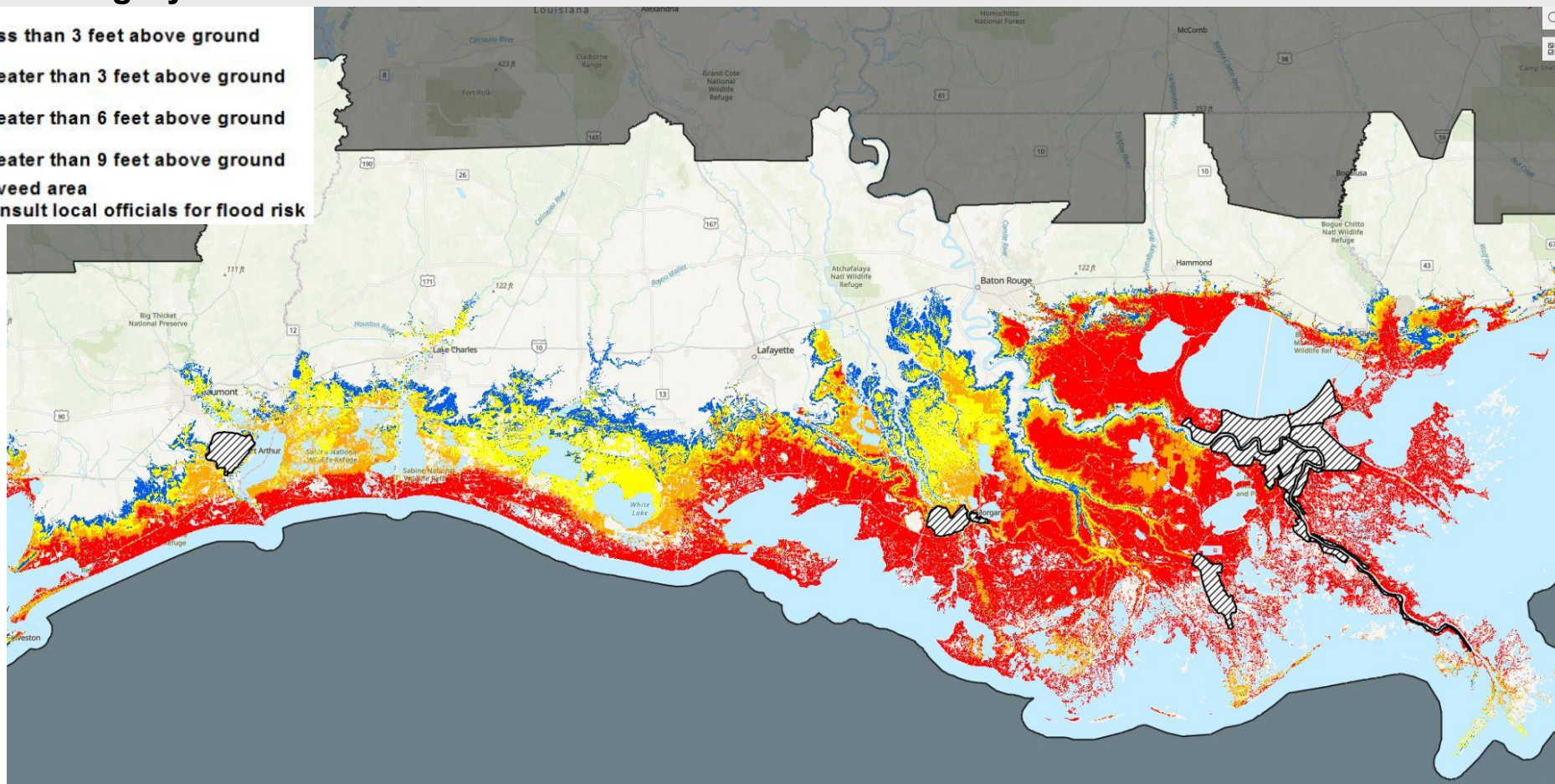
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Storm Surge in Louisiana and SE Texas

Category 2

-  Less than 3 feet above ground
-  Greater than 3 feet above ground
-  Greater than 6 feet above ground
-  Greater than 9 feet above ground
-  Leveed area
-  Consult local officials for flood risk




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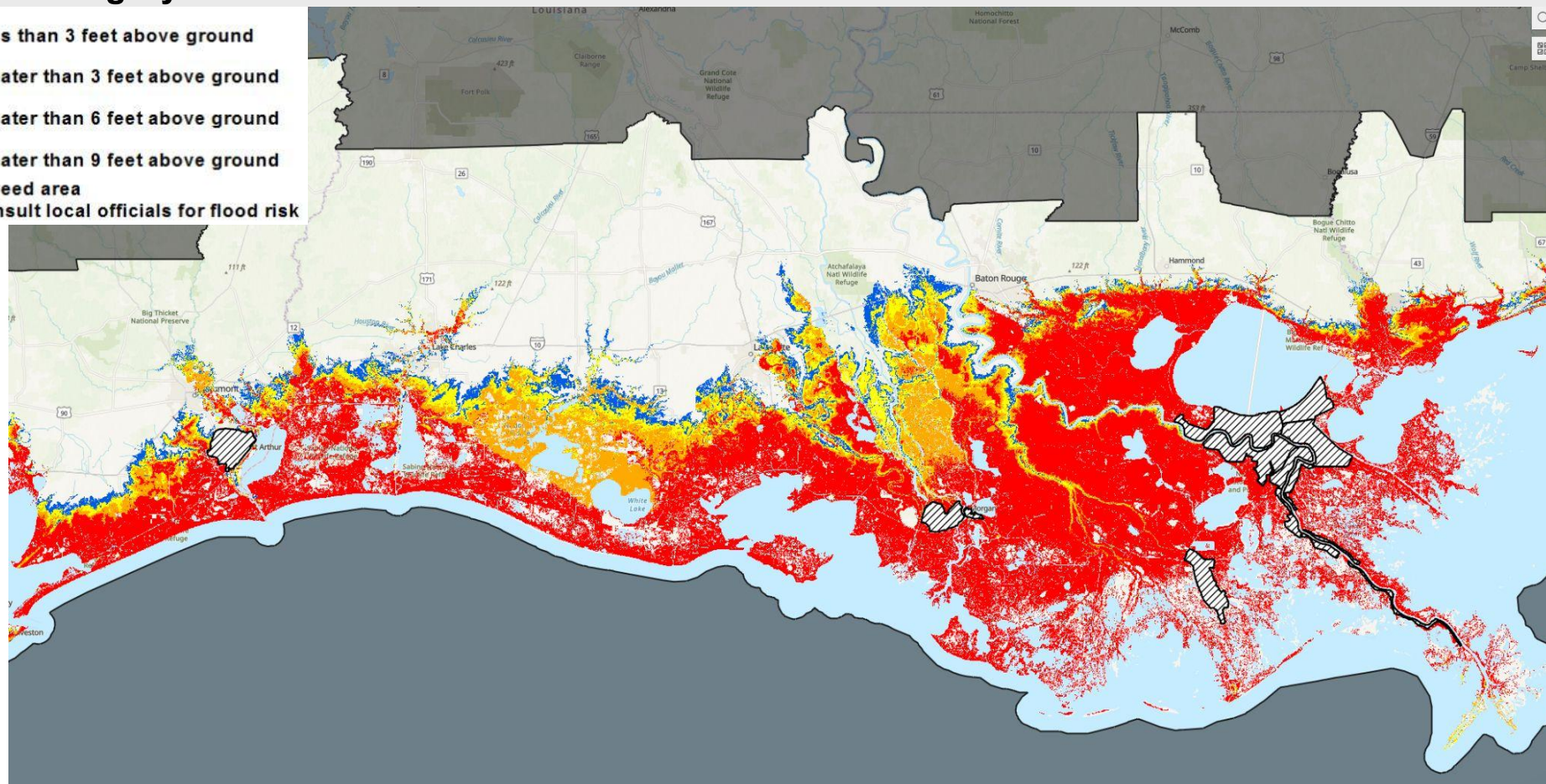
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Storm Surge in Louisiana and SE Texas

Category 3

-  Less than 3 feet above ground
-  Greater than 3 feet above ground
-  Greater than 6 feet above ground
-  Greater than 9 feet above ground
-  Leveed area
-  Consult local officials for flood risk



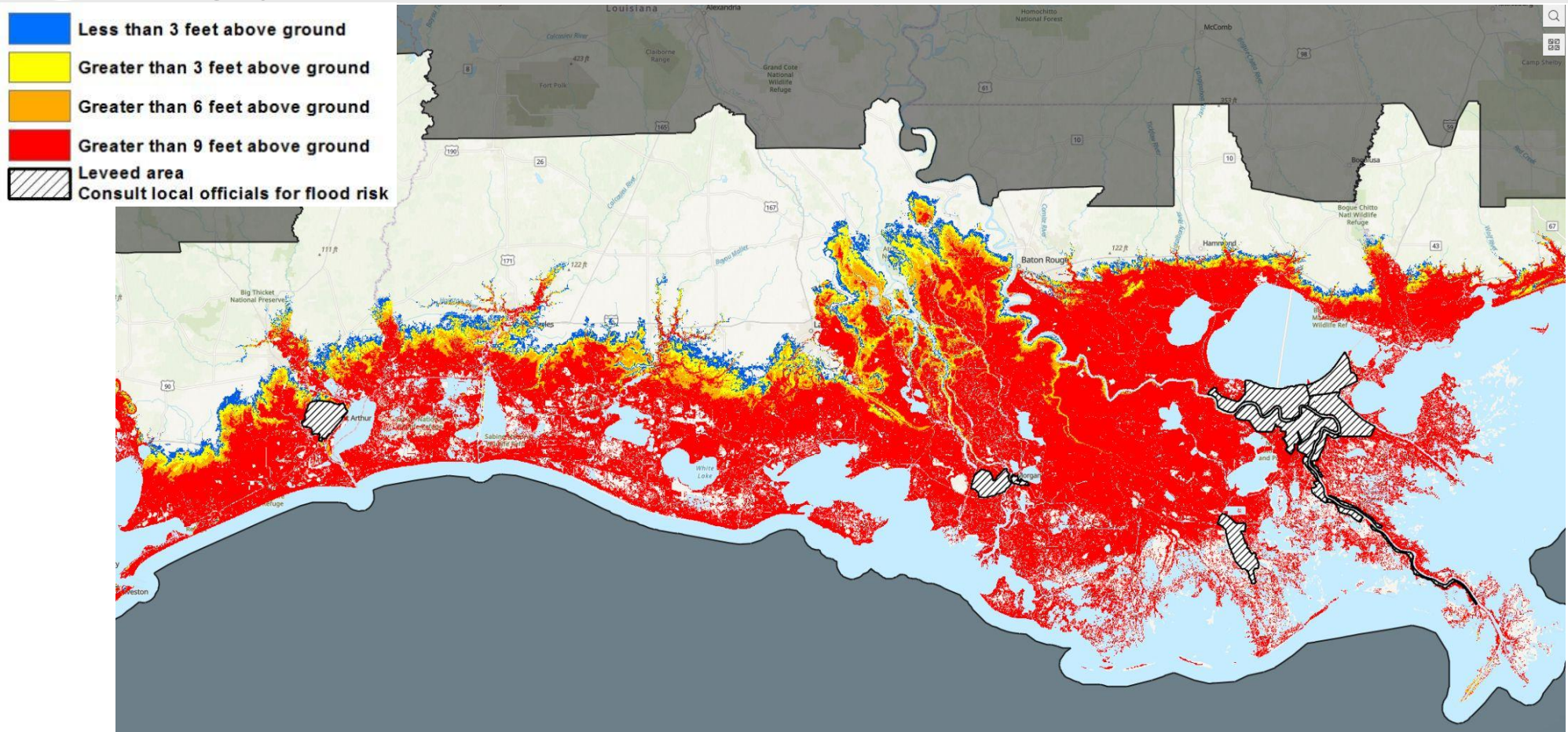
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Storm Surge in Louisiana and SE Texas


Category 4

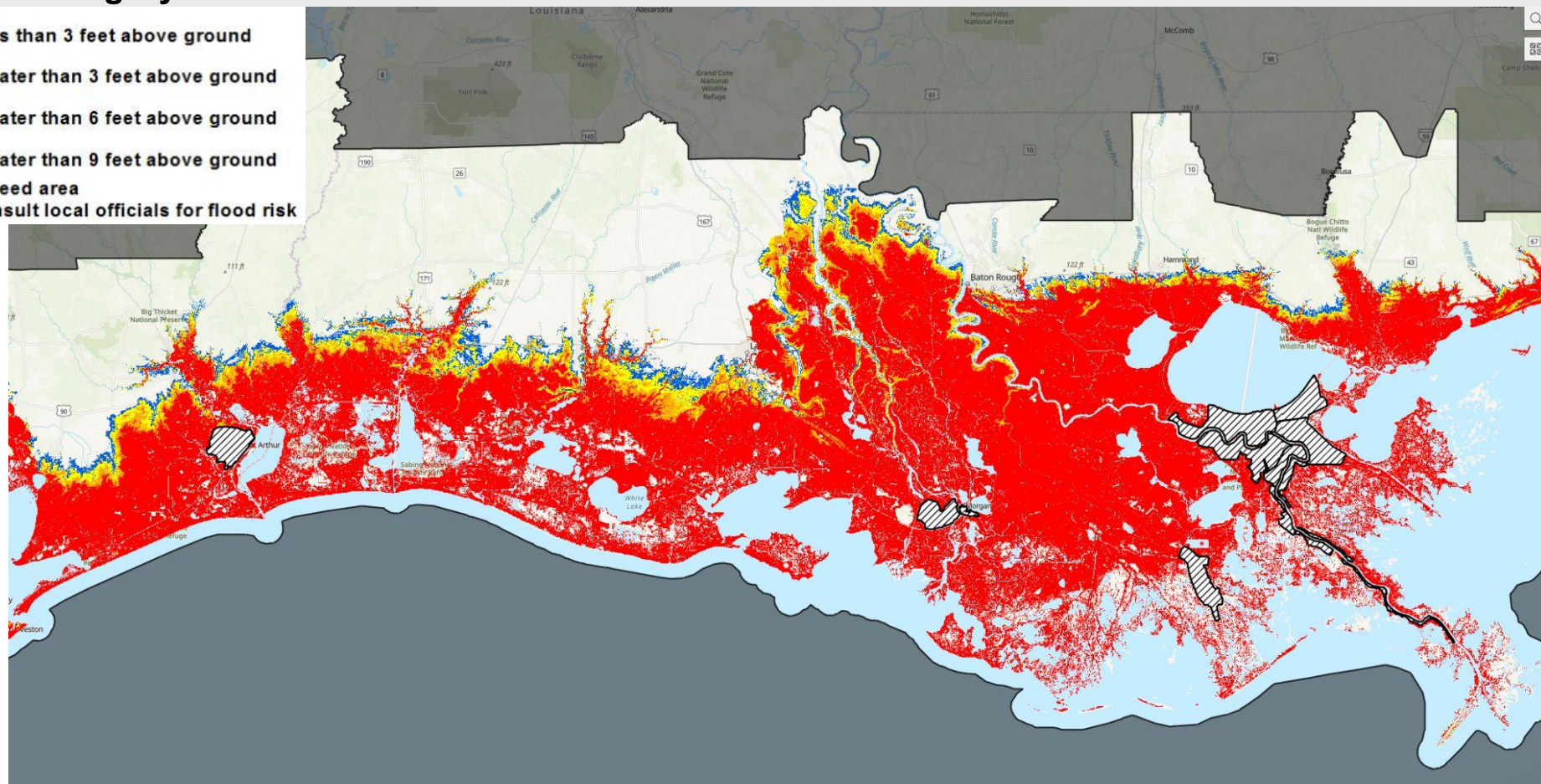




Storm Surge in Louisiana and SE Texas

Category 5

-  Less than 3 feet above ground
-  Greater than 3 feet above ground
-  Greater than 6 feet above ground
-  Greater than 9 feet above ground
-  Leveed area
-  Consult local officials for flood risk



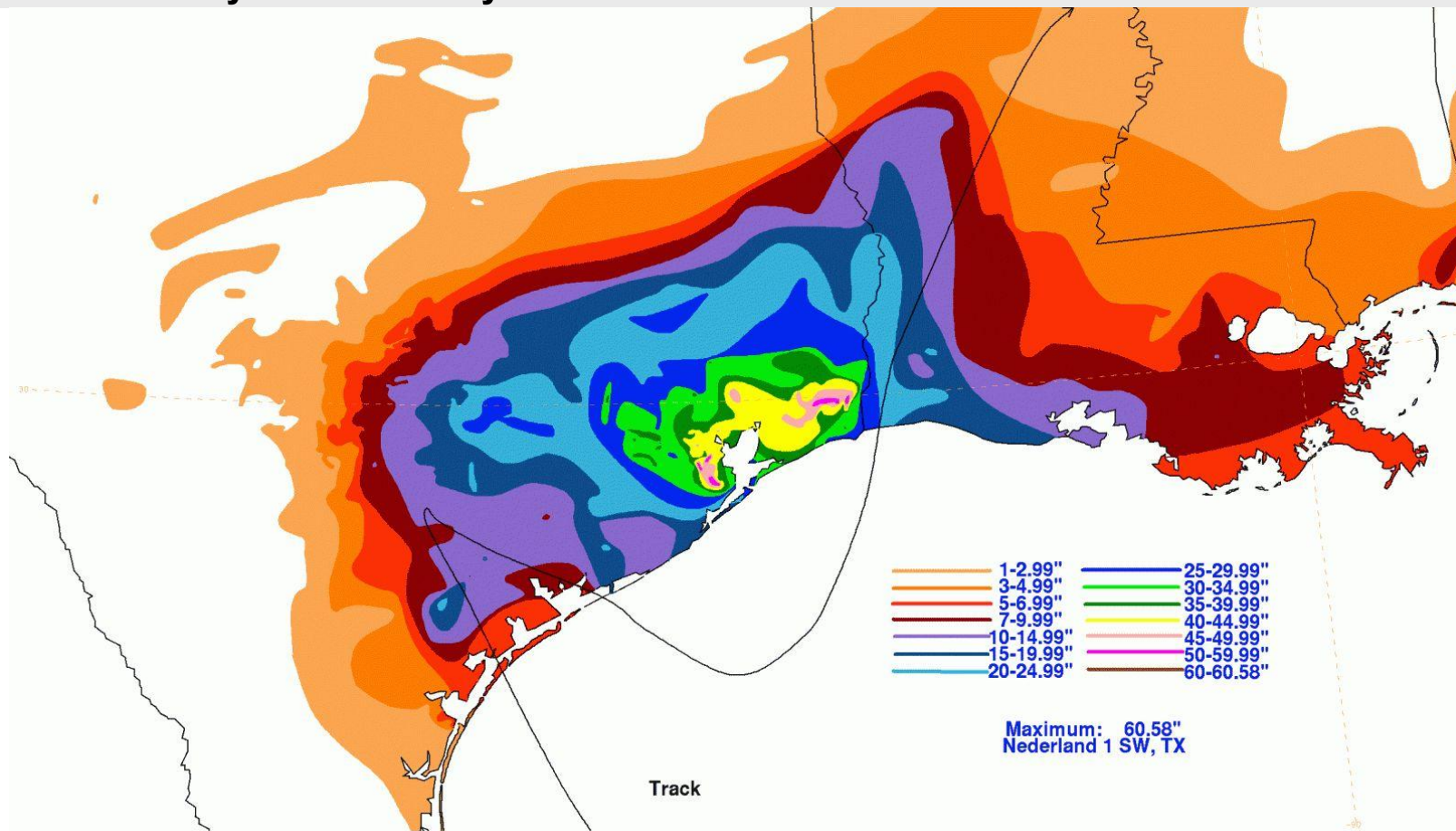
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Excessive Rainfall from Hurricanes

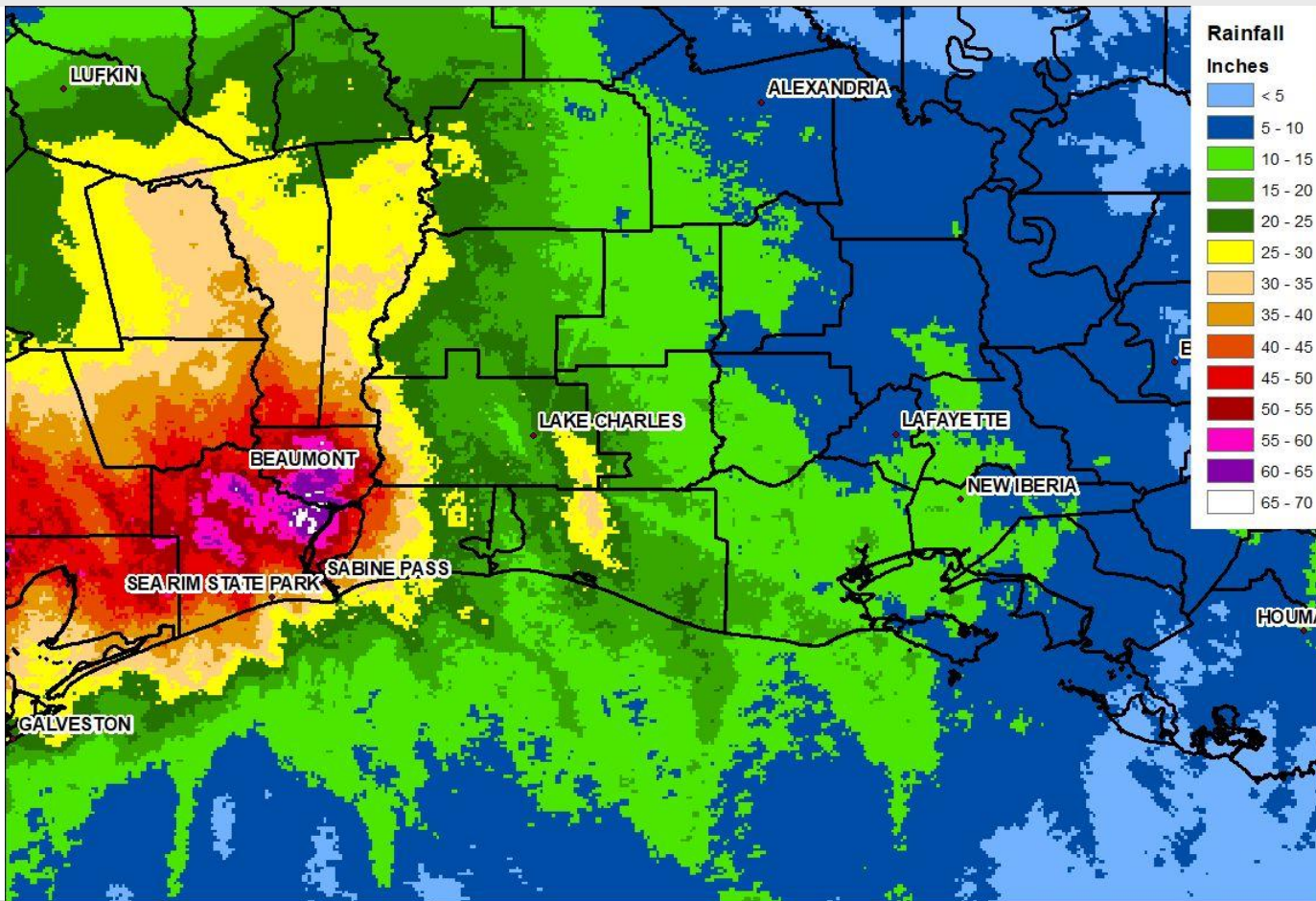
Hurricane Harvey Rainfall Analysis





Hurricane Harvey

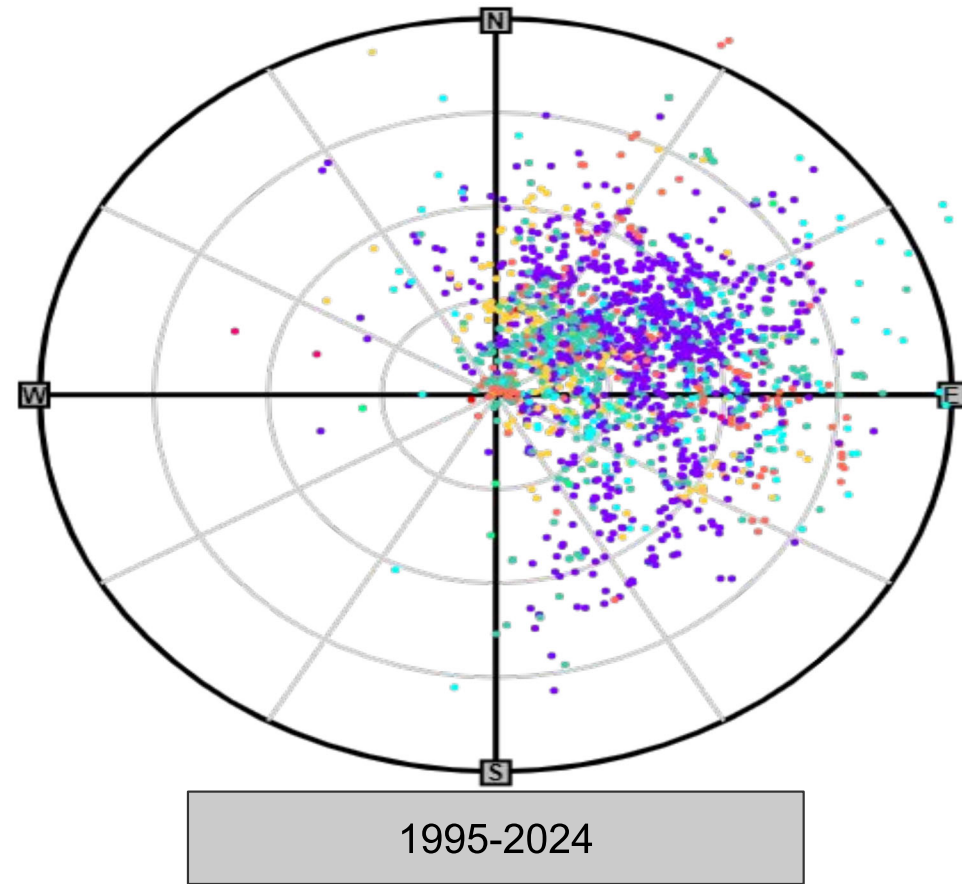
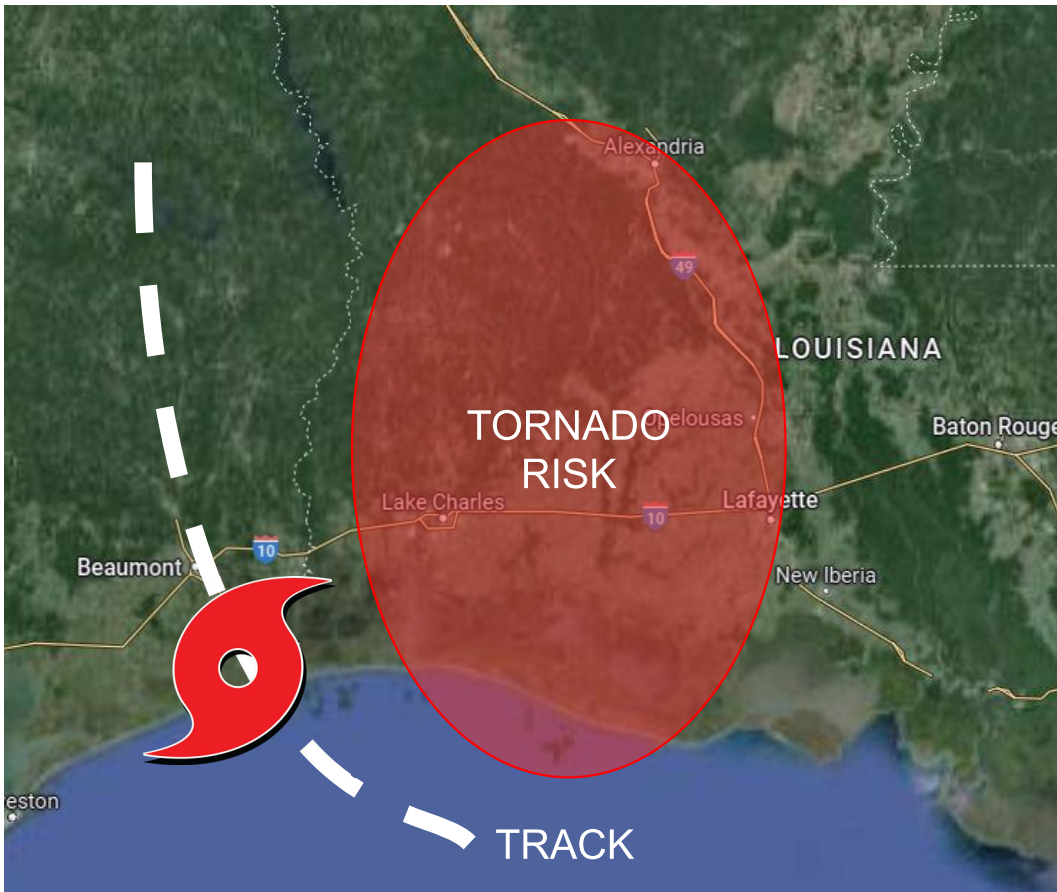
Radar Derived Storm Total Rainfall





Landfalling Hurricanes Spawn Tornadoes

70% of hurricanes produce tornadoes





Landfalling Hurricanes Spawn Tornadoes

70% of hurricanes produce tornadoes

Eastern side of hurricanes are received most tornadoes.

Might not be in the cone but can still feel impacts.

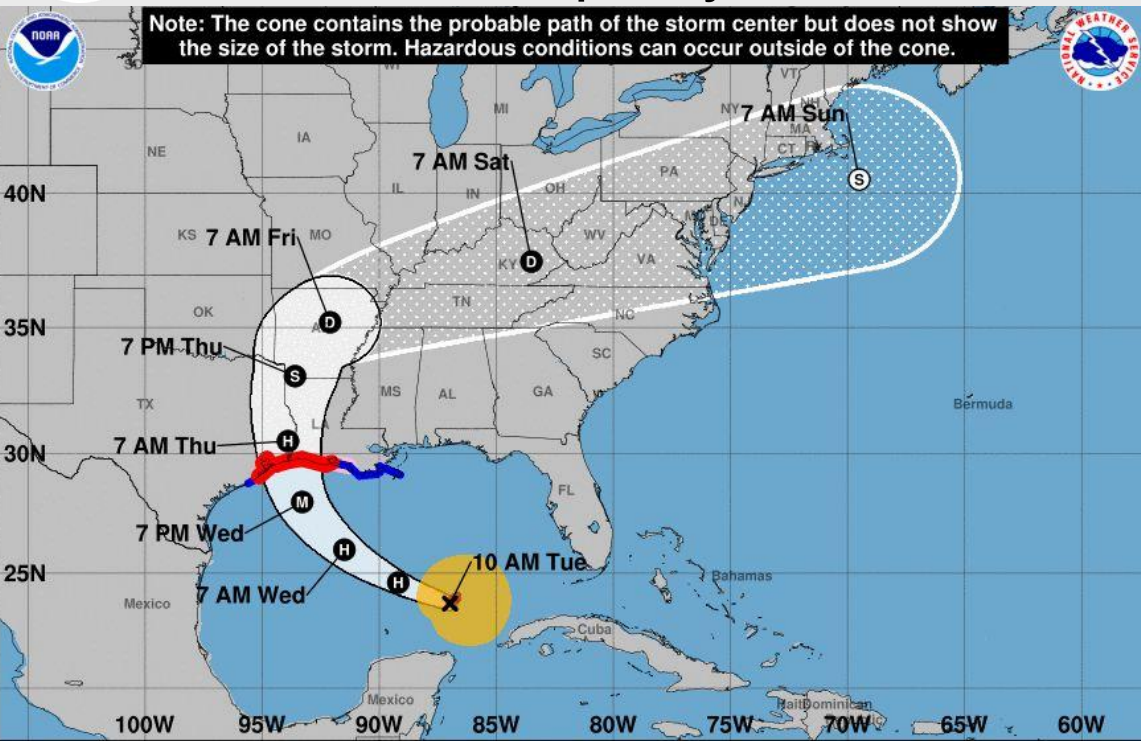




Cone of Uncertainty

Probable track of tropical cyclone center.

Note: The cone contains the probable path of the storm center but does not show the size of the storm. Hazardous conditions can occur outside of the cone.



Hurricane Laura Tuesday August 25, 2020 10 AM CDT Advisory 23 NWS National Hurricane Center		Current information: x Center location 23.7 N 87.0 W Maximum sustained wind 75 mph Movement WNW at 16 mph	Forecast positions: ● Tropical Cyclone ○ Post/Potential TC Sustained winds: D < 39 mph S 39-73 mph H 74-110 mph M > 110 mph
Potential track area: Day 1-3 (dotted pattern) Day 4-5 (stippled pattern)	Watches: H Hurricane (pink) T Trop Stm (yellow)	Warnings: H Hurricane (red) T Trop Stm (blue)	Current wind extent: H Hurricane (brown) T Trop Stm (yellow)

Keep in mind that impacts could occur away from the cyclone center, and outside of the cone area.



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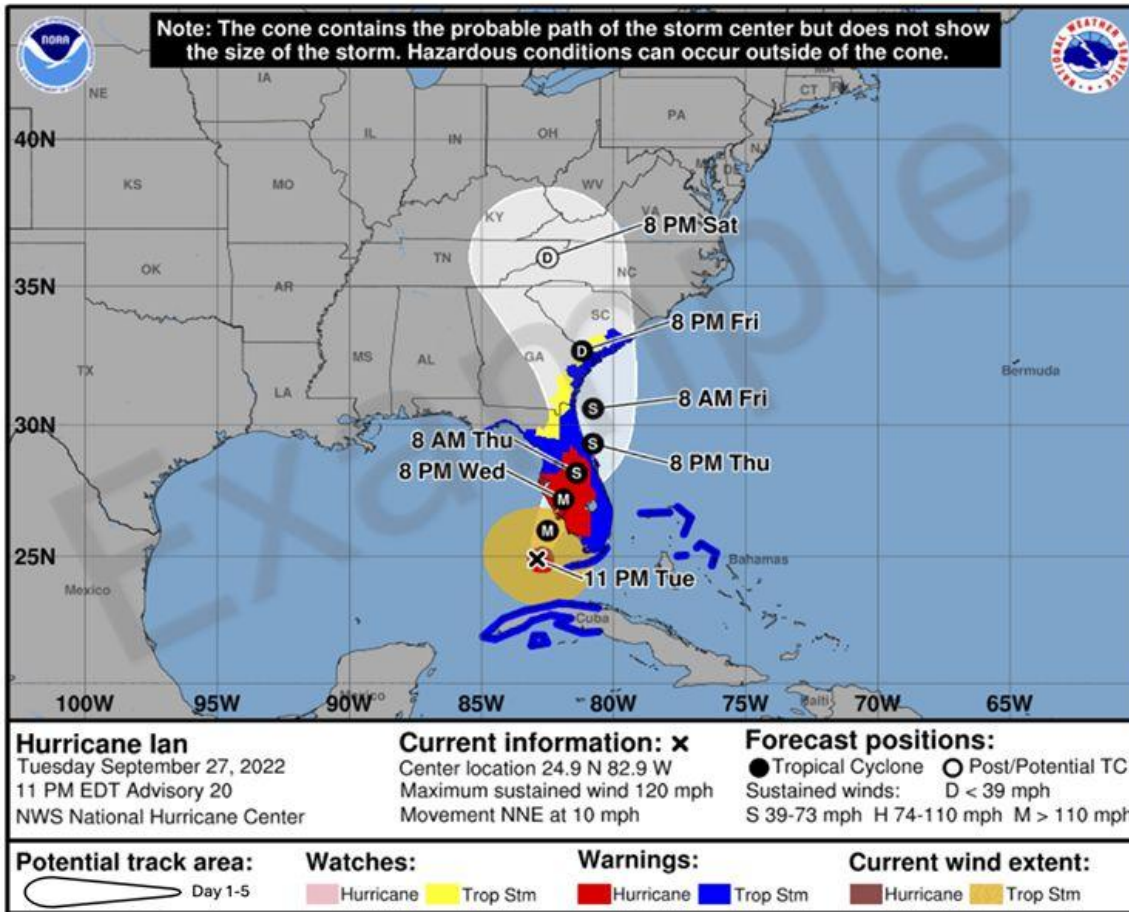


Updated Cone of Uncertainty

Inland Watches and Warnings

In 2024 a new version of the cone will be tested.

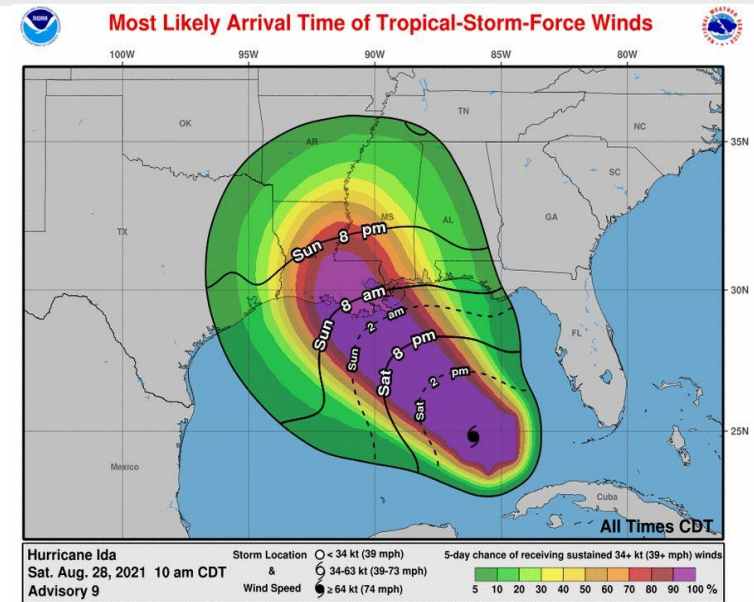
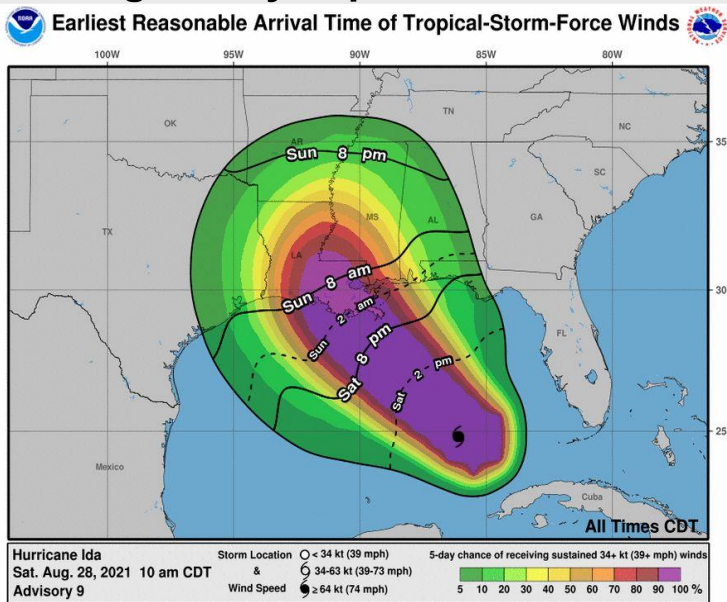
They will now include inland watches and warnings.





Time of Arrival Graphics

Timing is very important!



- Provides probabilistic time of arrival of 34 KT/39 MPH winds
- Earliest reasonable is based on 10% threshold- 90% chance that the storm will arrive AFTER the time on the graphic.
- Most likely is based on 50% threshold

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How Hurricane Forecasts are Made

Uses model spread for track uncertainty.

Based on 1,000 realistic alternative scenarios created using:

- Official NHC track and intensity forecast
- Historical NHC track and intensity forecast errors
- Climatology and persistence wind radii model

Uses model spread to account for track uncertainty.





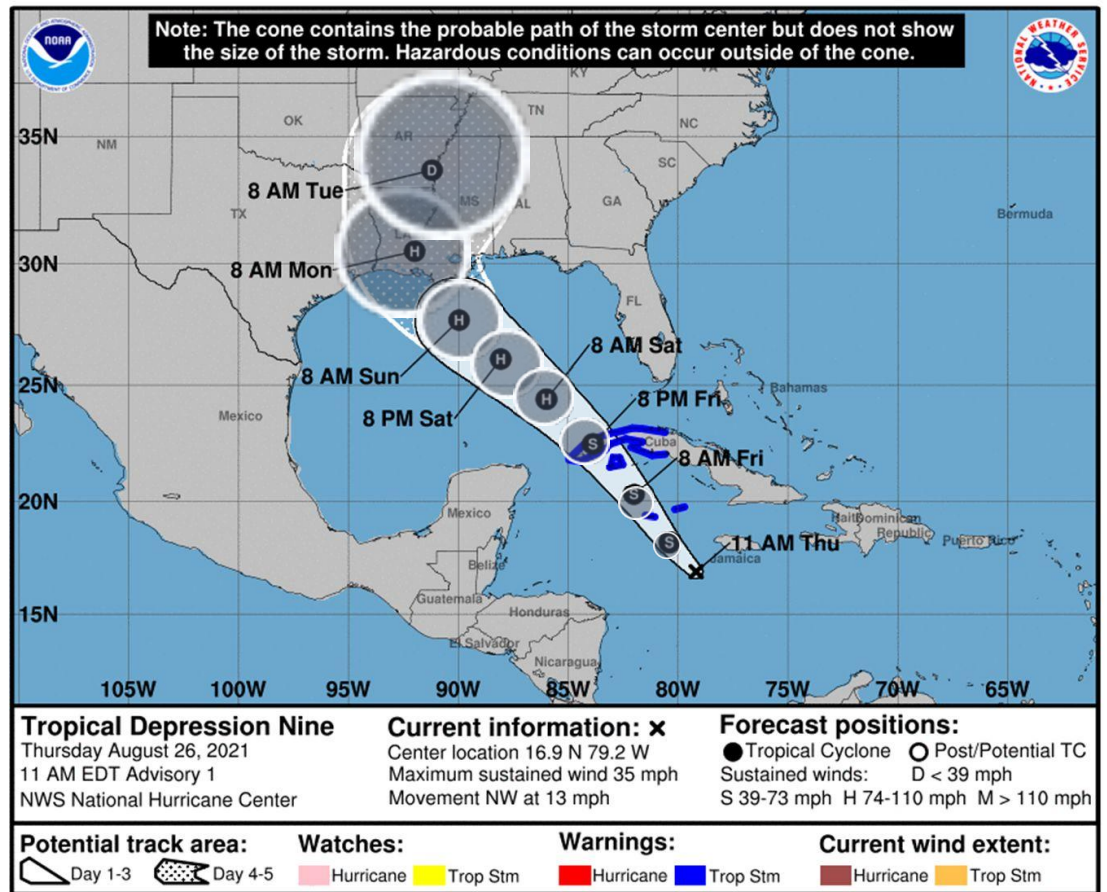
How the Cone is Made

Made from circles based on 67th percentile of NHC error over last 5 years.

Circles are “drawn” around each forecast point (12, 24, 36 h, etc.) based on the 67th percentile of the NHC track forecast error over the past 5 years at that forecast lead time

A cone is drawn based on those circles

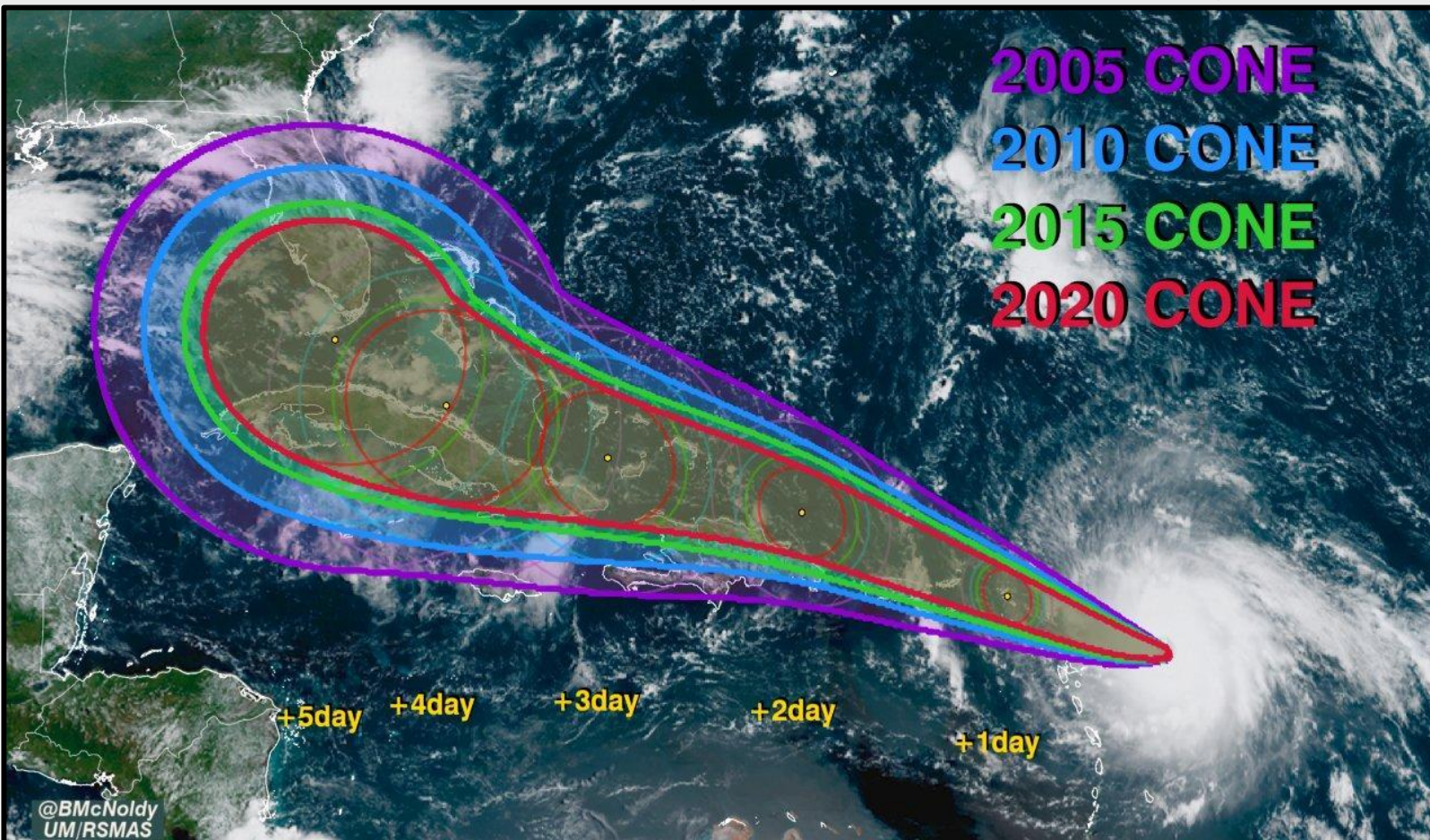
The cone size does not change through the season and does not change for each storm.





How the cone of uncertainty has changed...

With improvements in forecasts and statistical analysis, the cone has shrunk over the years.



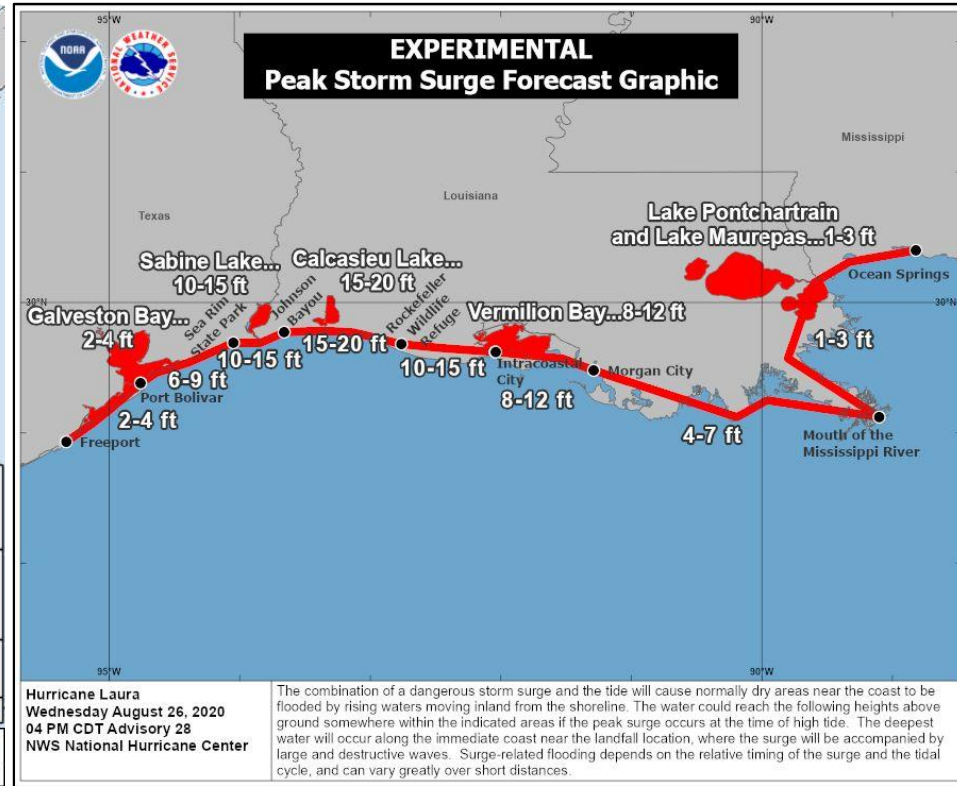
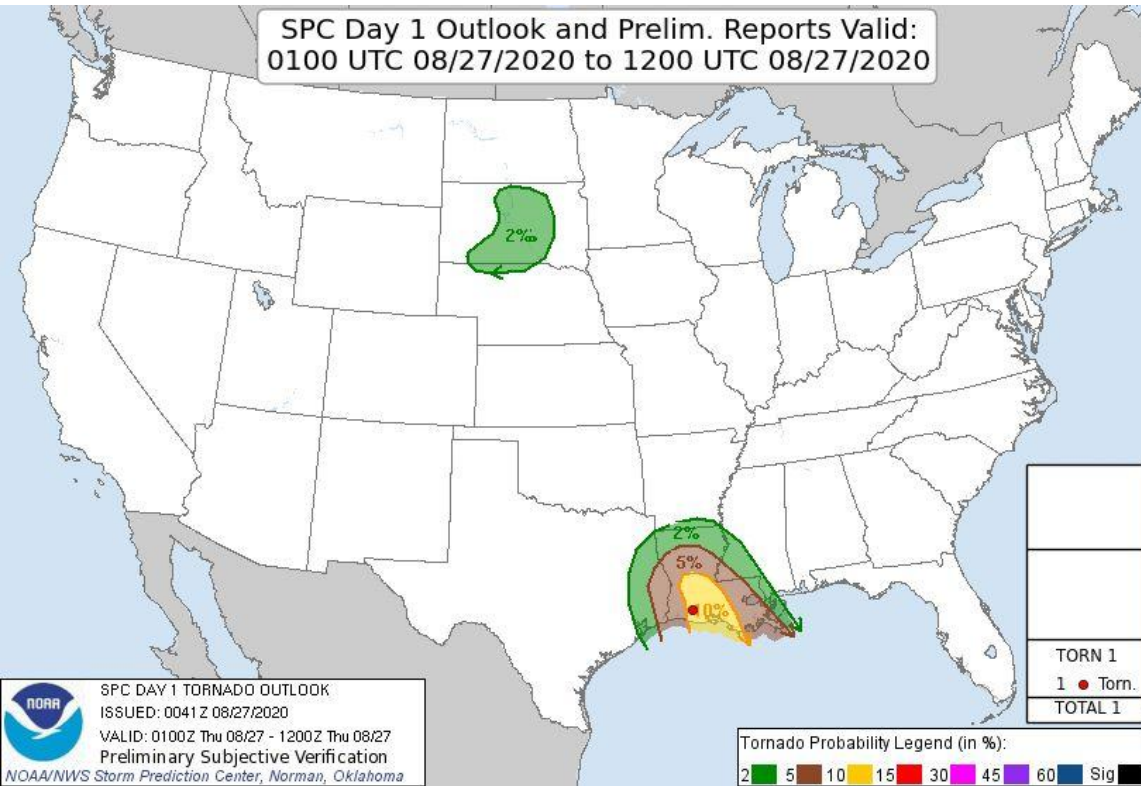
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Reminder: The Cone Doesn't Represent Impacts

Storm surge, flooding, damaging wind gusts, and tornadoes



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Forecast Cycle to Briefings

Timeline of Forecast Cycle and Updated Briefings

- 7am - Hurricane Forecaster Begins Observation Analysis
- 7:45 am - Once cyclone center, storm speed/direction, and intensity are determined, the hurricane models are then initiated.
- 9am Forecast Track is internally finalized.
- 9:15am Hurricane Center Collaborates with NWS Field Offices
- 9:30am to 10am Cone of Uncertainty, Timing and Probability Products are Issued
- 10:15am NWS Lake Charles Brief Emergency Management Directors
- 10:45am NWS Lake Charles Brief all other Partner Groups

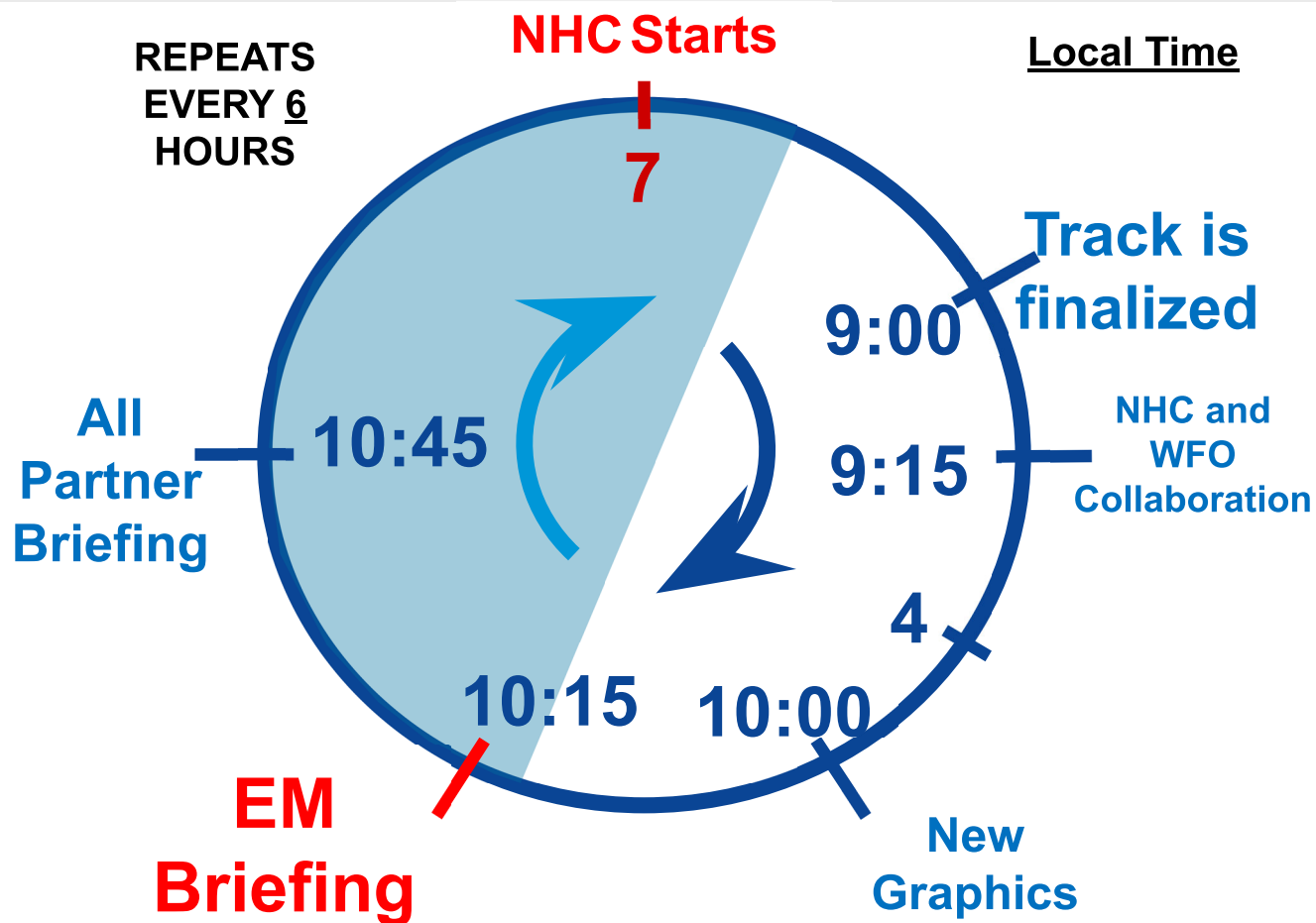




The Cycle: From the Forecast to Briefings

Timeline of Forecast Cycle and Updated Briefings

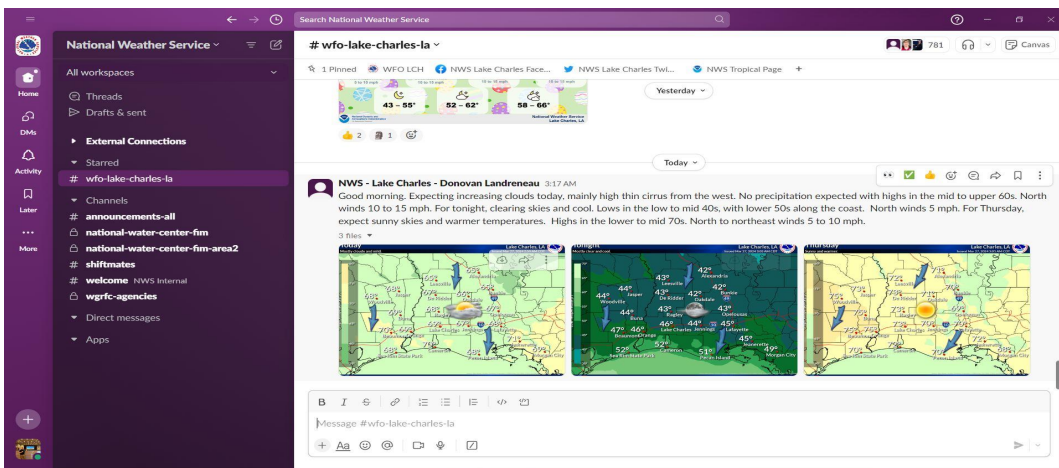
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NWSChat 2.0: Slack

<https://partnerservices.nws.noaa.gov/registration/>



- Limited Access
- Free to use
- Desktop and App version
- Direct link to the Forecasters on Duty
- Briefing Slides and videos will be posted here



SCAN TO SIGN UP



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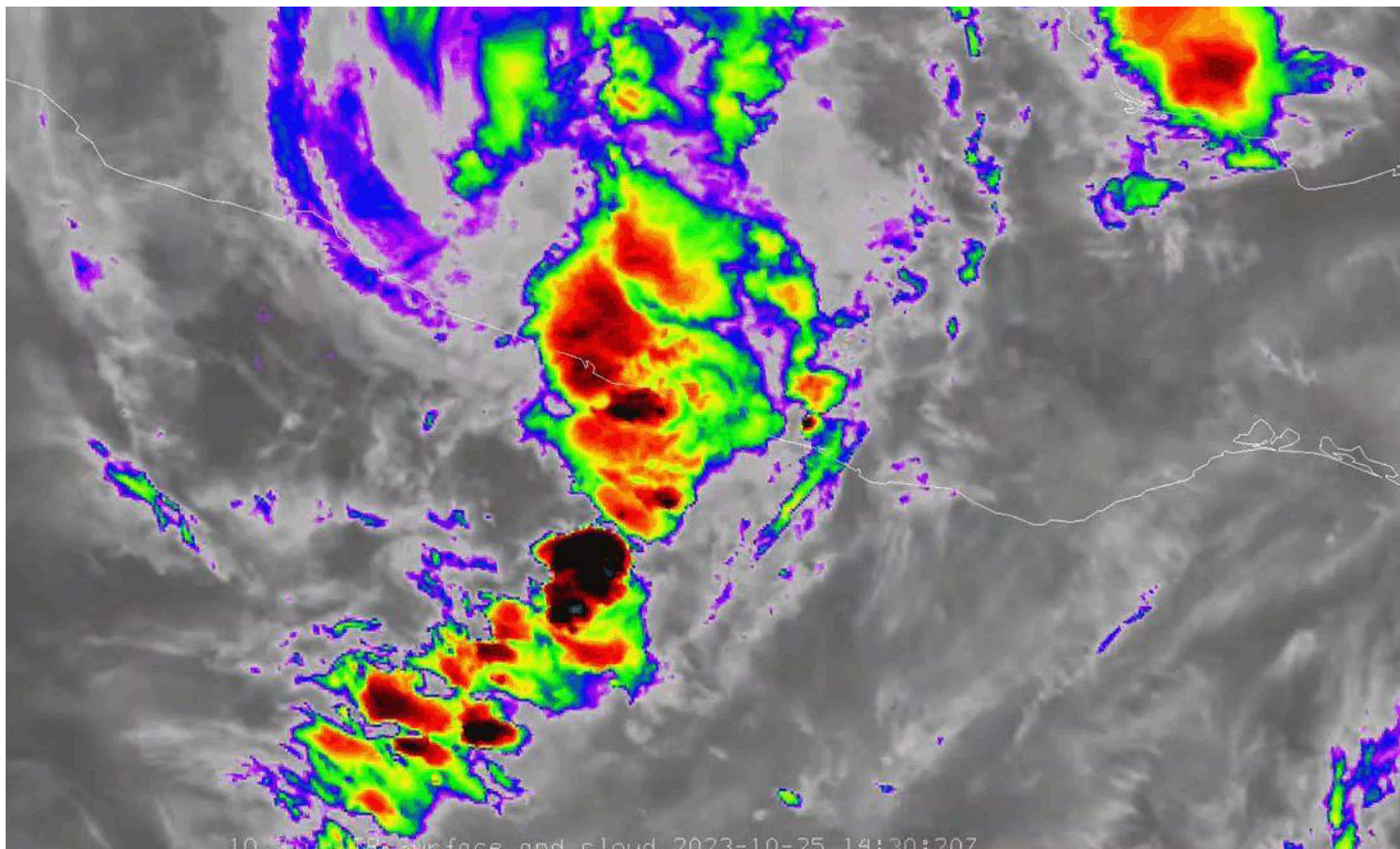
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Hurricane Otis - Rapid Intensification

Acapulco, Mexico

- Tropical Storm to Category 5 Hurricane in 24 hours.
- 165 mph wind speeds at landfall. This was 110 mph increase in wind speed within a 24 hour period.
- 46 deaths and 58 individuals remain unaccounted for.



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NWS Products to Monitor

A product timeline from the National Weather Service

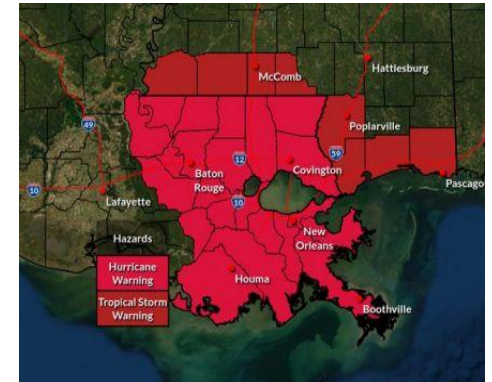
7 Days Out

- Tropical Weather Outlook



60 Hours Out*

- PSurge (for select, well-behaved storms)

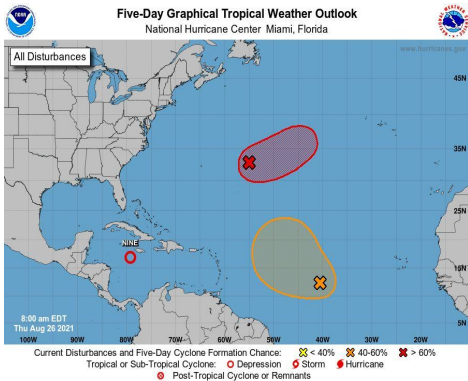


5 Days Out

- NHC Advisory Packages (cone, wind speed probabilities, TOA)
- SLOSH MOMs and MEOWs*

48 Hours Out

- Watch/Warning Products
- Hurricane Threats and Impacts Graphics
- PSurge/Inundation Forecasts





Resources & Contacts

- NWS Lake Charles Phone Number: **(337) 477-5285 ext. 1**
- NWS Lake Charles Webpage: www.weather.gov/LCH
- Online Severe Weather Reporting: stormReport
- NWS Lake Charles Facebook www.facebook.com/NWSLakeCharles
- NWS Lake Charles Twitter twitter.com/NWSLakeCharles

- Presenter Email: marti.calhoun@noaa.gov

THANK YOU & VISIT US ANYTIME

