Hurricane Season 2024

Active Season Becoming More Likely !

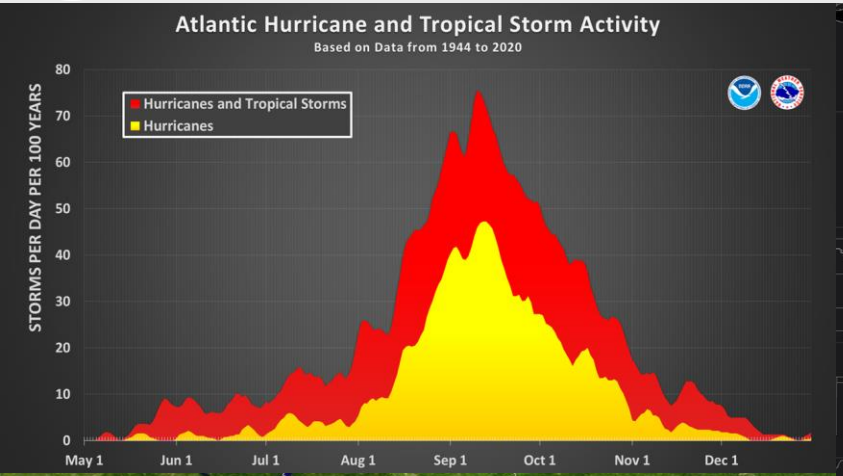
Hurricane

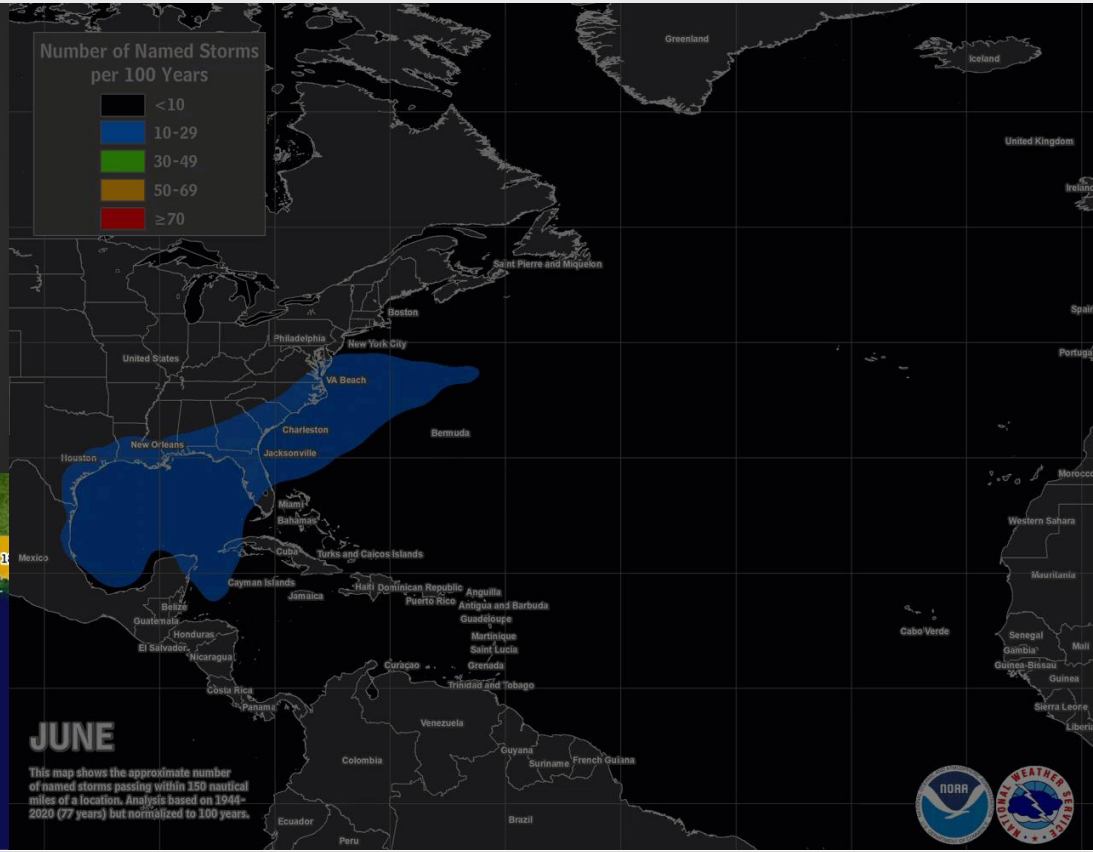
A tropical cyclone with constant wind speed of 74 mph or greater.

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

Named Storm Climatology

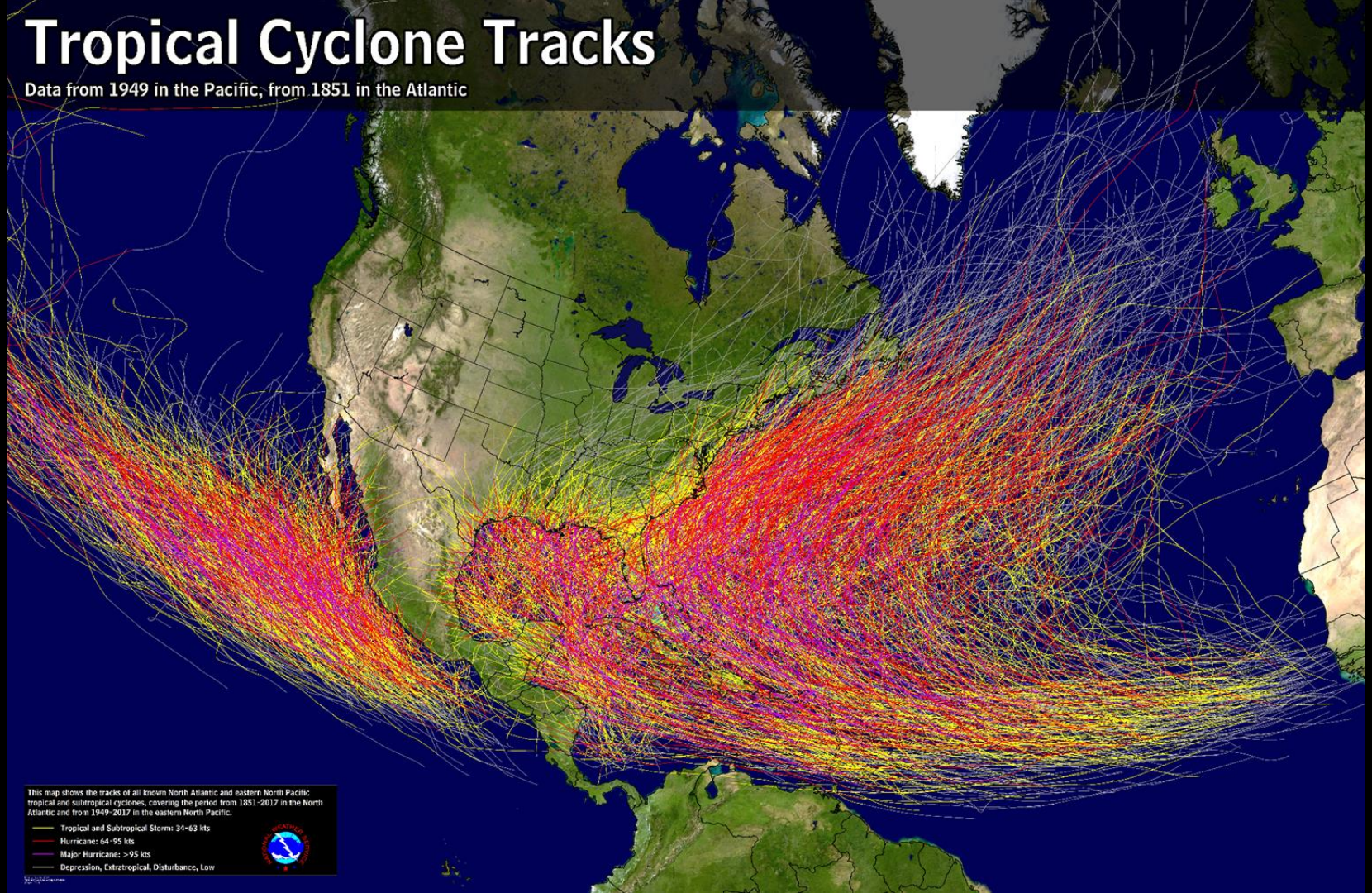
Monthly Climatology of Named Storms





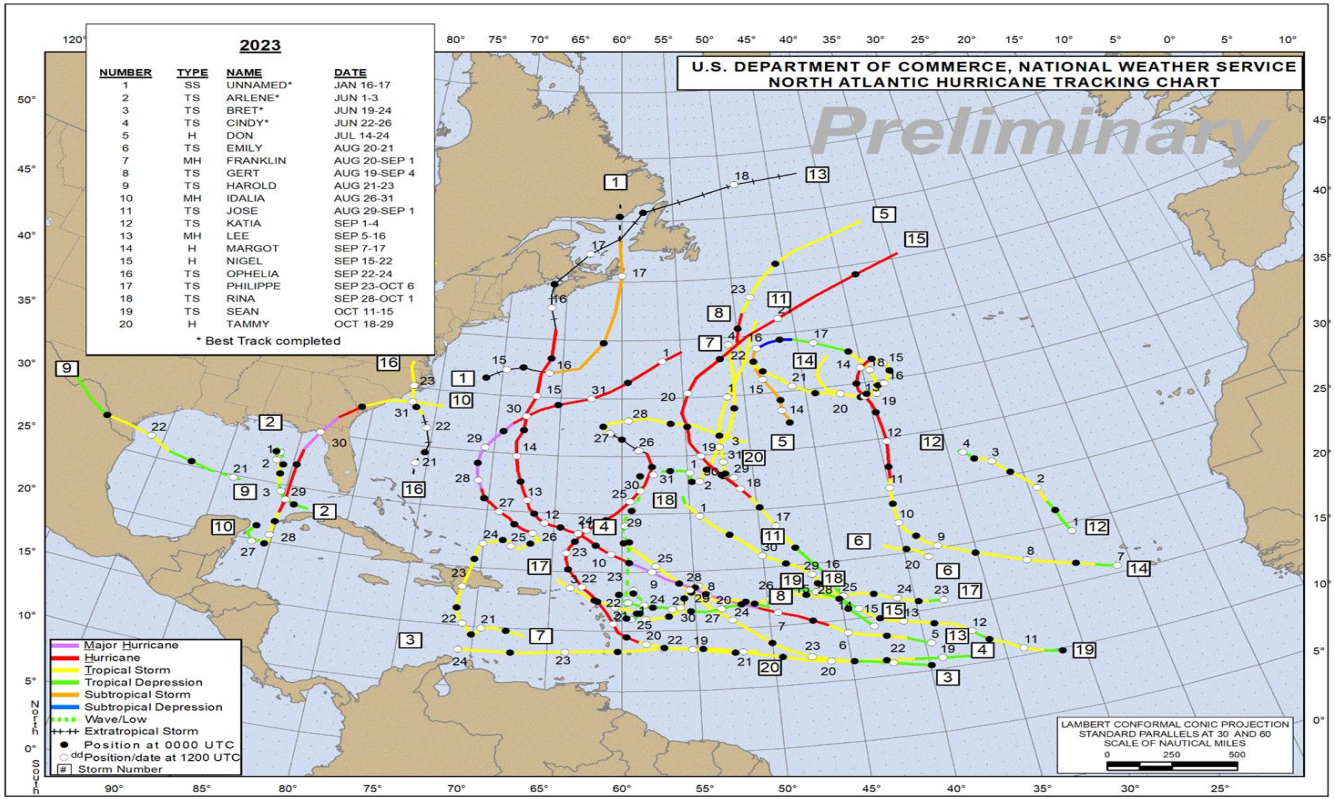
Tropical Cyclone Tracks

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



2023 Season: What Happened

Quiet Year for Louisiana and SE Texas



2024 Names

Hurricane Season Starts on June 1st ends November 30th

Alberto	Helene	Oscar
Beryl	Isaac	Patty
Chris	Joyce	Rafael
Debby	Kirk	Sara
Emesto	Leslie	Tony
Francine	Milton	Valerie
Gordon	Nadine	William

Current Look 2024 Hurricane Season

Active Year Ahead?

National Hurricane Center

Official Forecast is to be release around May 15th

Forecasted ENSO PHASE

Neutral or La Nina

Good for Storm Development

Sea Surface Temperatures

Above Average

Good for Storm Development

BLUF:

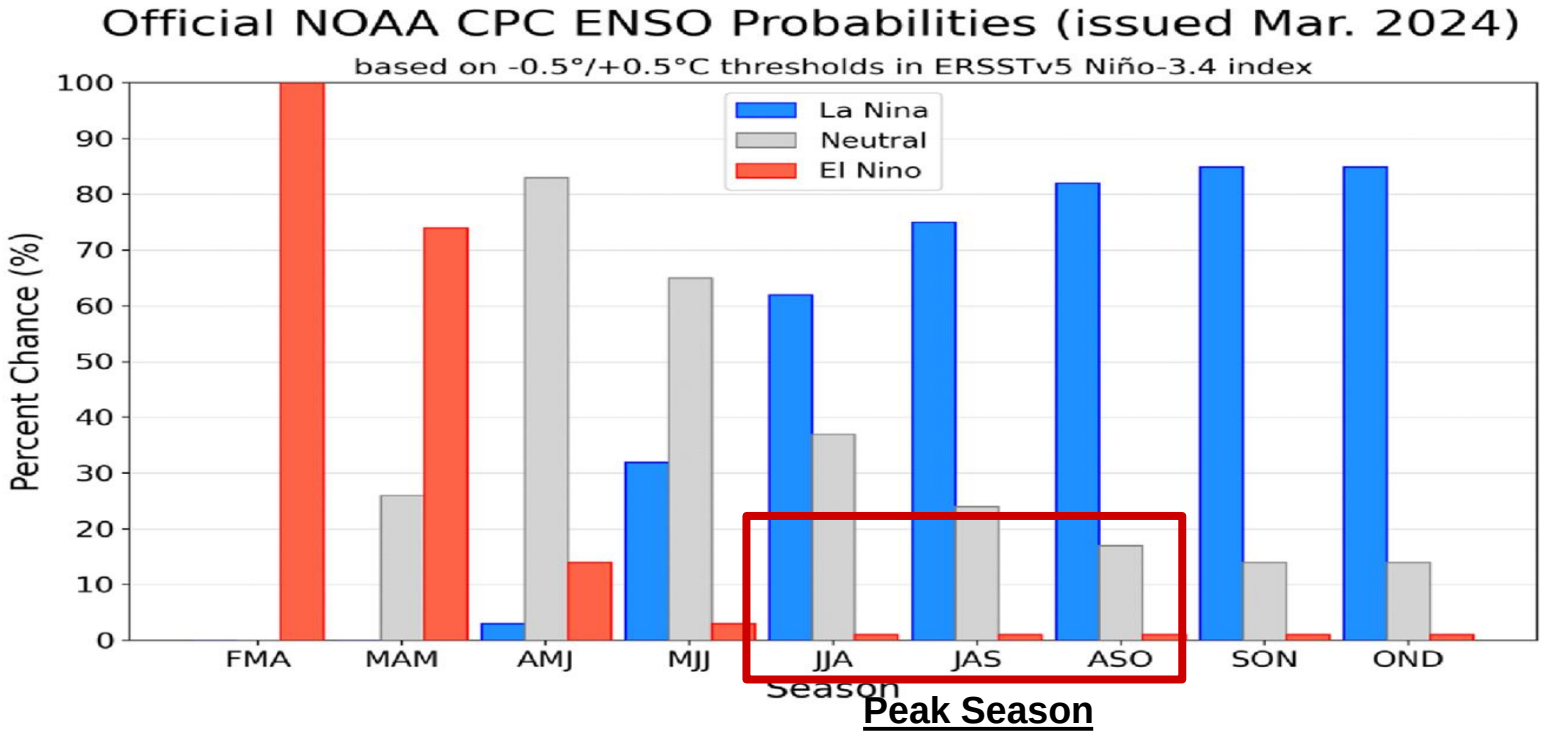
A concerning setup is forming.
More information to come

Forecast Confidence:

Medium: ENSO models have been consistent.

El Nino Advisory is now in effect

El Nino developed in early June

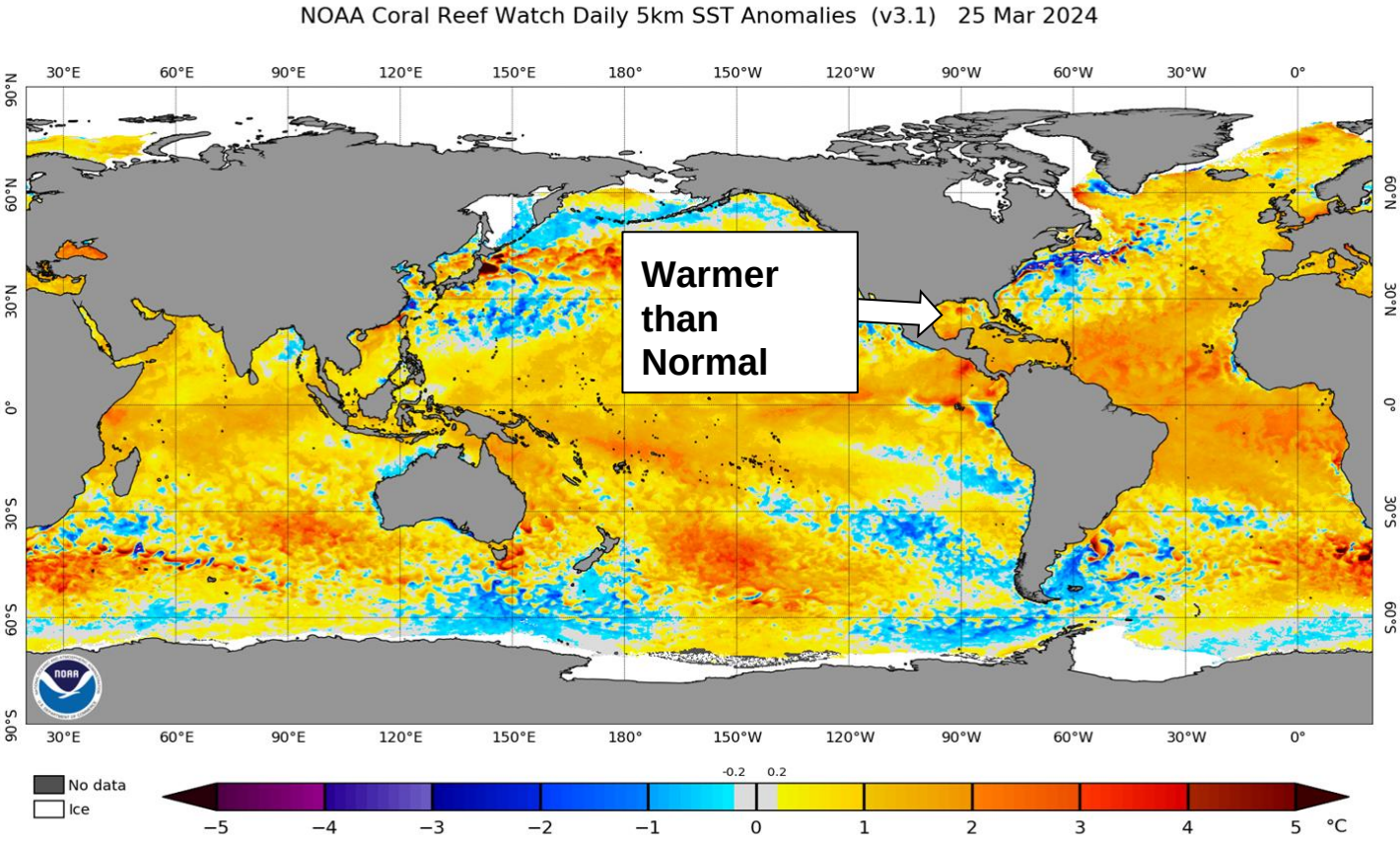


Peak Season

Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N-5°S, 120°W-170°W). Figure updated 14 March 2024.

Sea Surface Temperature Anomaly

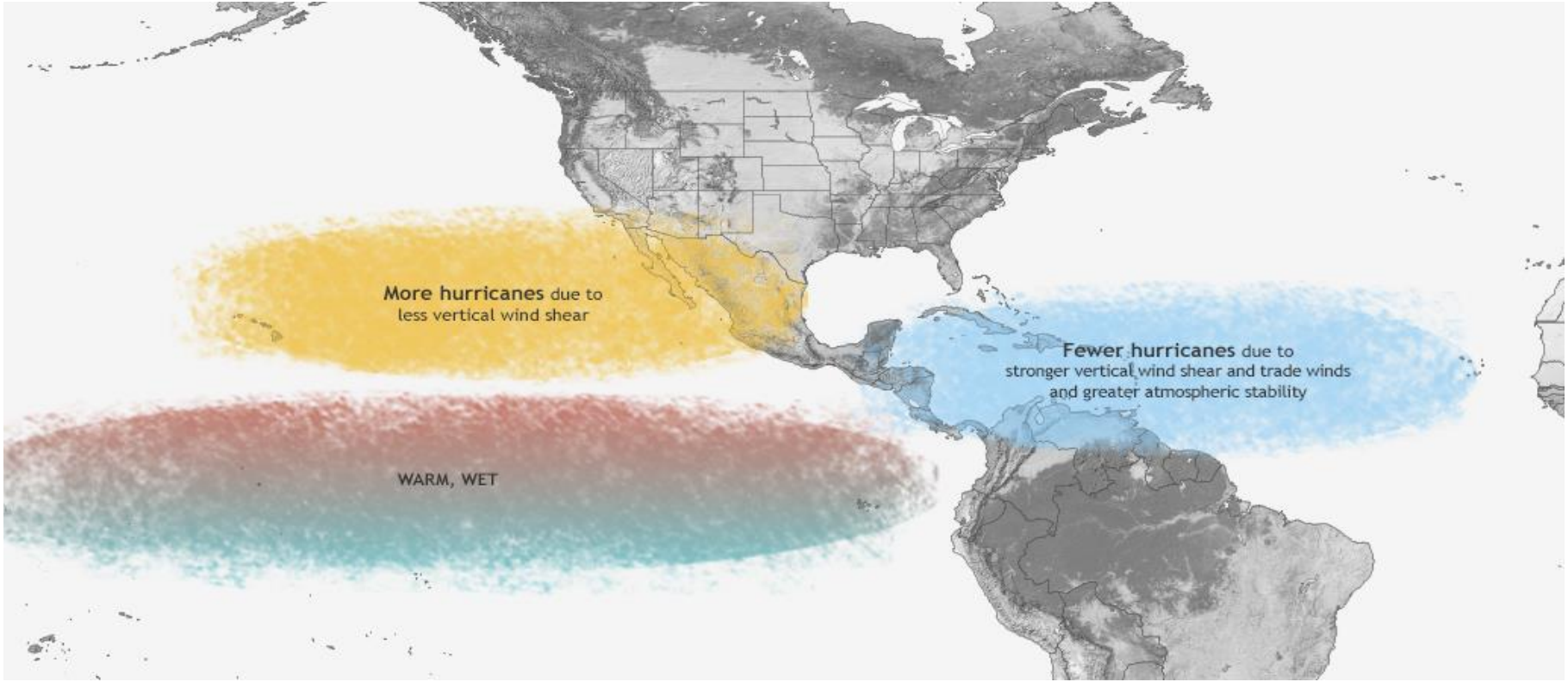
Warmer than normal temperatures are present over the Atlantic and Gulf



National Weather Service
Lake Charles, LA

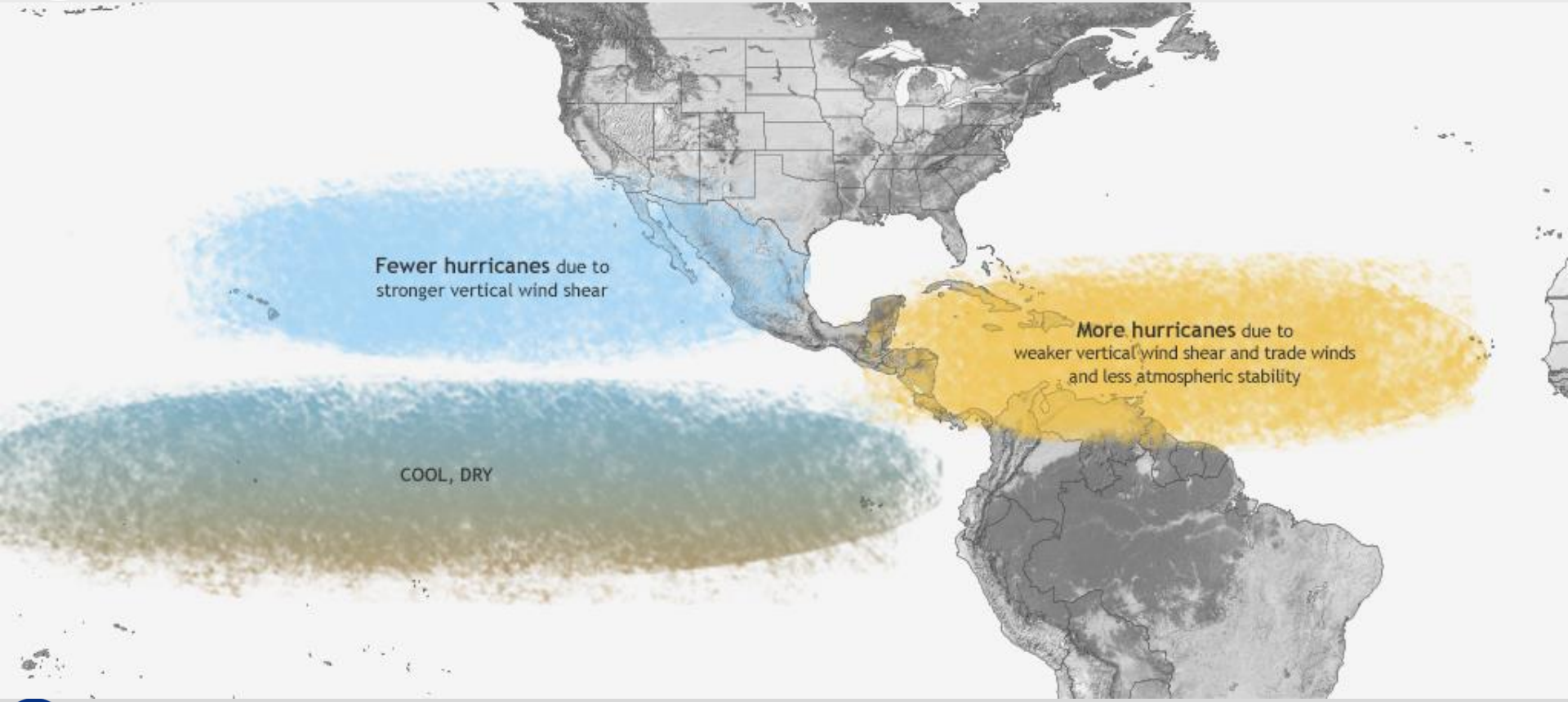
El Nino's Tropical Influence

El Nino typically brings fewer hurricanes in the Atlantic Basin



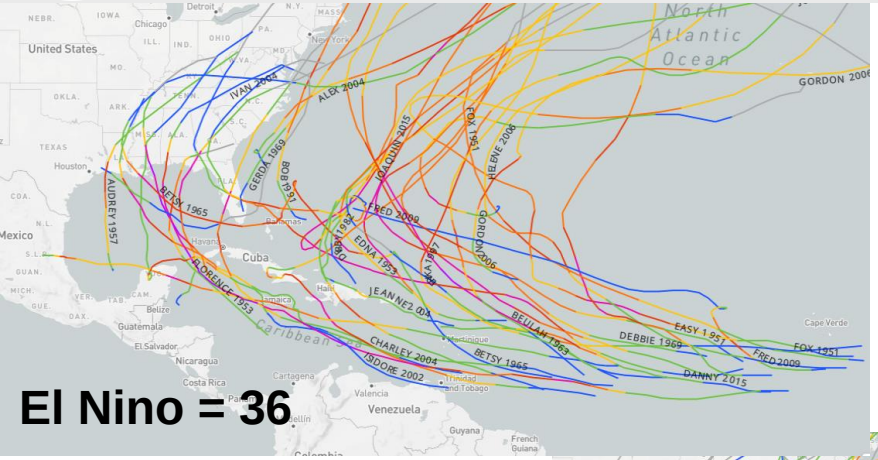
La Nina's Tropical Influence

La Nina typically brings more hurricanes in the Atlantic Basin

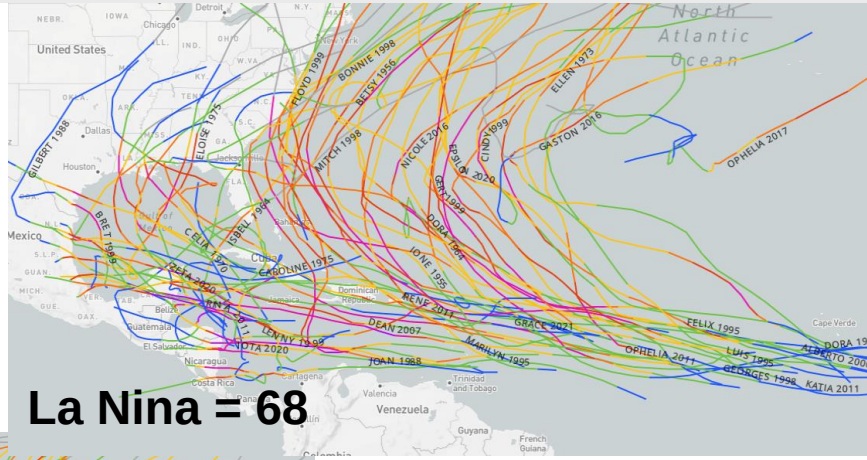


Major Hurricane Correlations

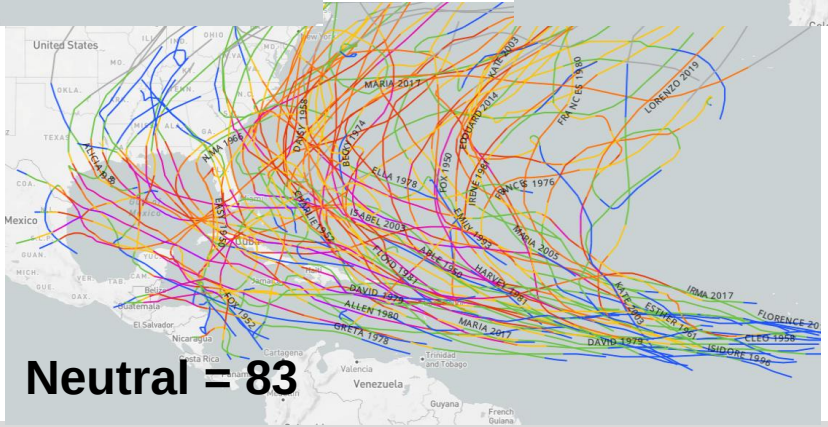
El Nino has brought fewer major hurricanes throughout history.



El Nino = 36



La Nina = 68



Neutral = 83

- Category 5
- Category 4
- Category 3
- Category 2
- Category 1
- Tropical Storm
- Tropical Depression
- Extratropical

Colorado State 2023 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 has been released

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

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

National Hurricane Center

The first NHC forecast will be release on the third week of May

The Weather Channel 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

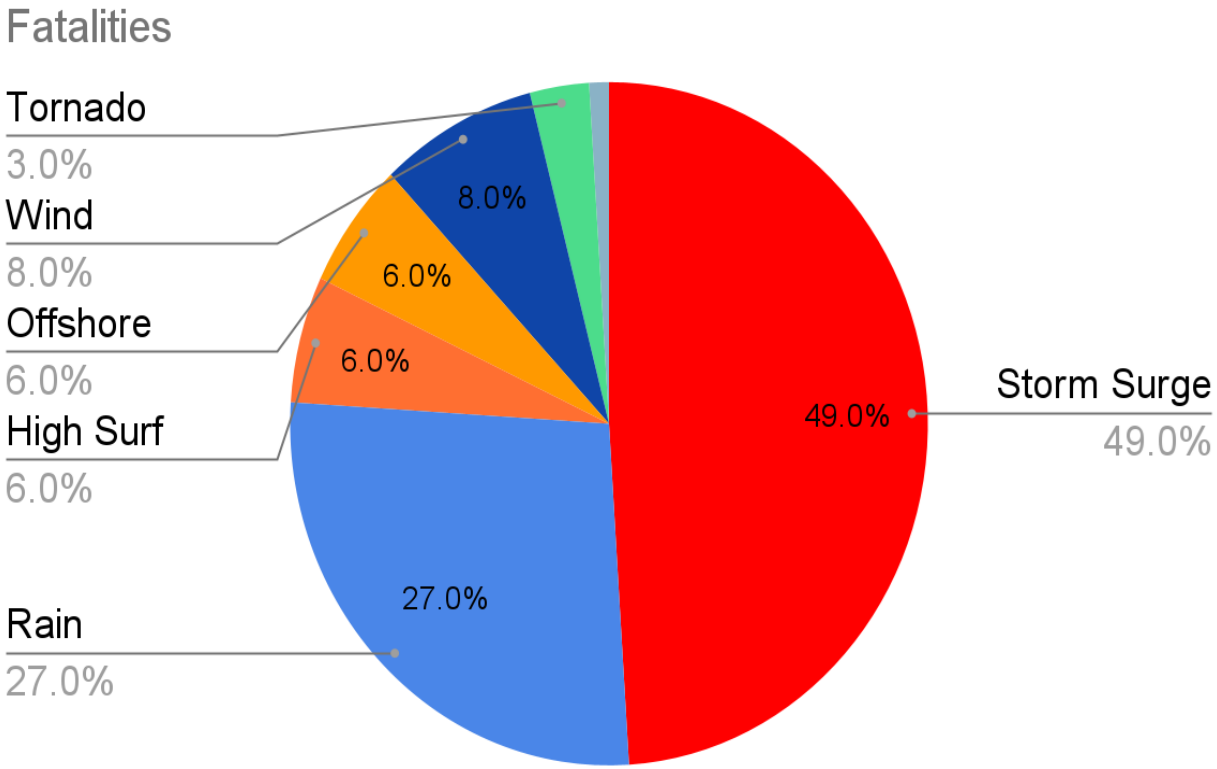
The Weather Channel

Hurricane Fatalities

Multiple Threats

Roughly 75% of hurricane fatalities are related to water

Half of all fatalities are due to storm surge



Storm Surge

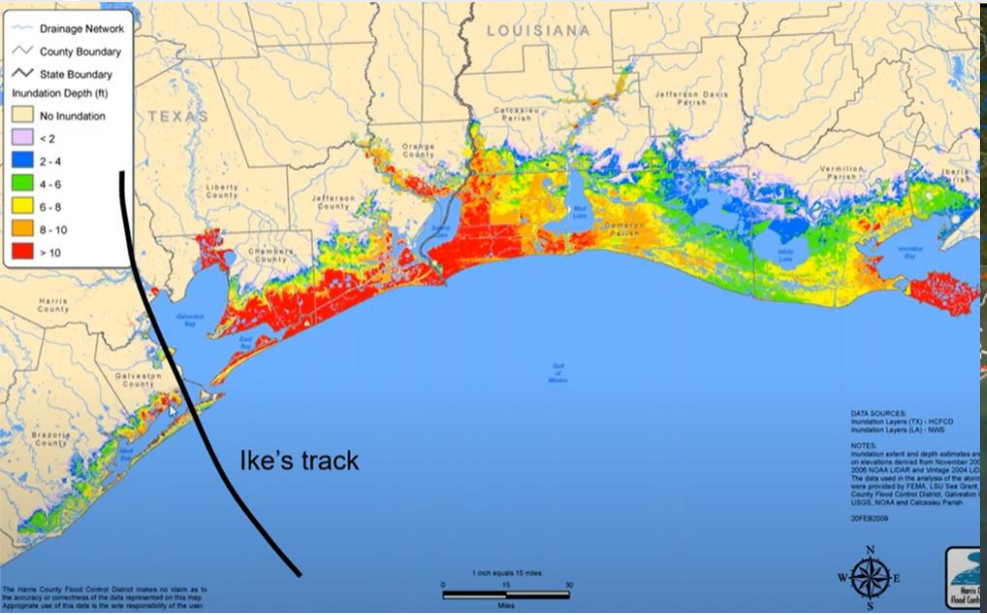
Hurricane Katrina

Before Katrina

After Katrina

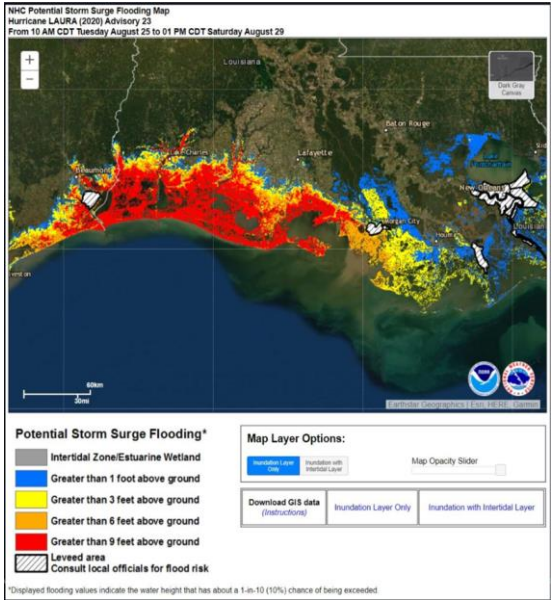
Saltwater Vegetation Burn

Post Hurricane Ike

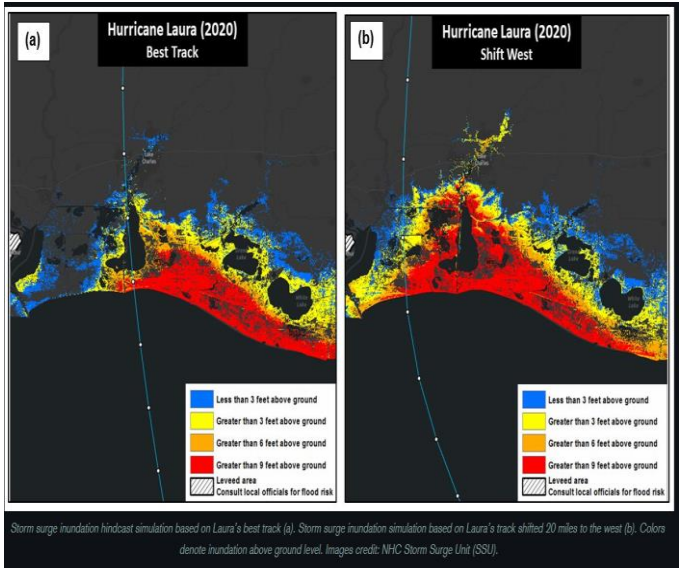


Hurricane Laura

Forecast and what happened



What we had to prepare for



Storm surge inundation hindcast simulation based on Laura's best track (a). Storm surge inundation simulation based on Laura's track shifted 20 miles to the west (b). Colors denote inundation above ground level. Images credit: NHC Storm Surge Unit (SSU).

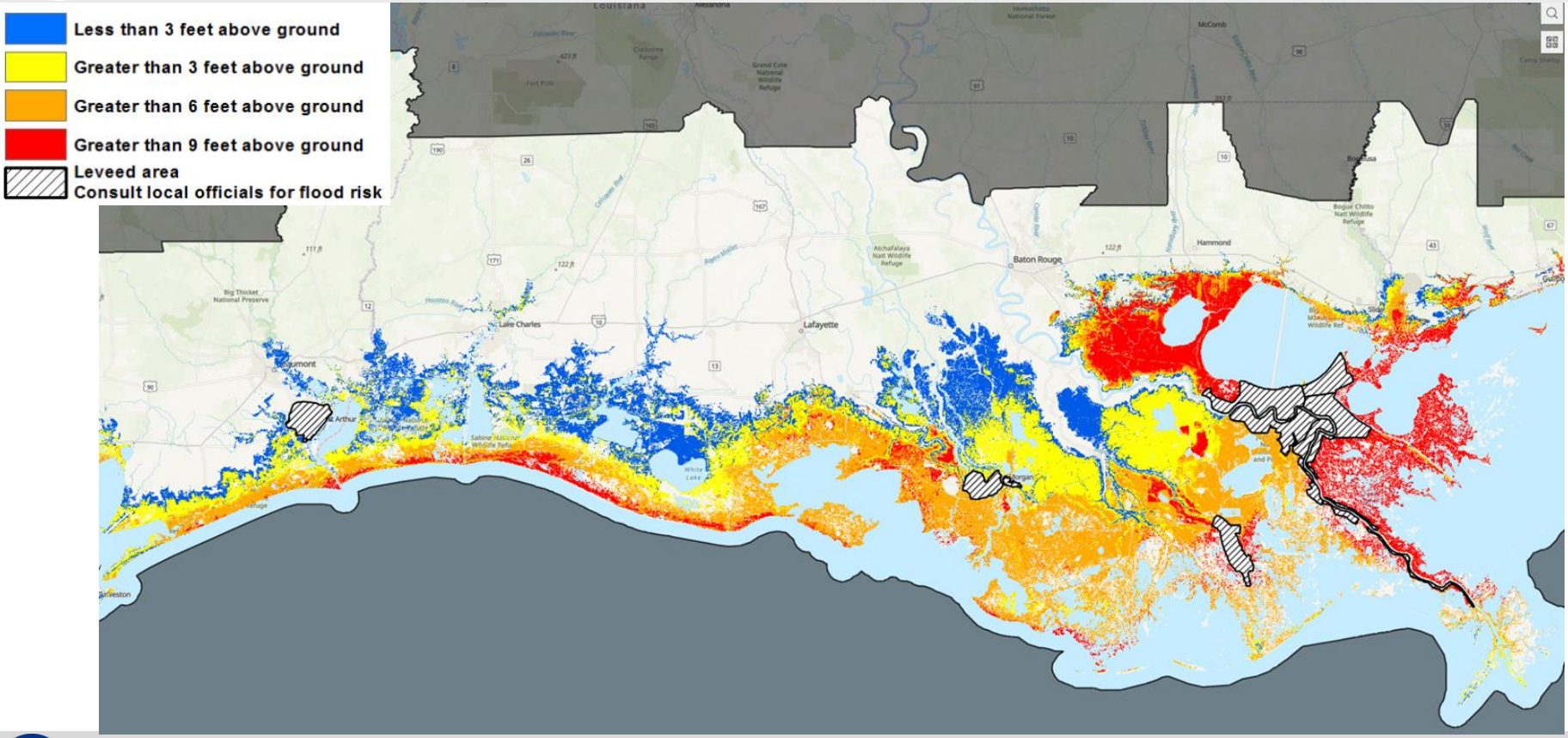
Shift 20 miles to the east made a big difference

USGS survey team extrapolating the high water mark to the outside of the home to survey its elevation of 17.1 ft above ground level. Image credit: U.S. Geological Survey

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

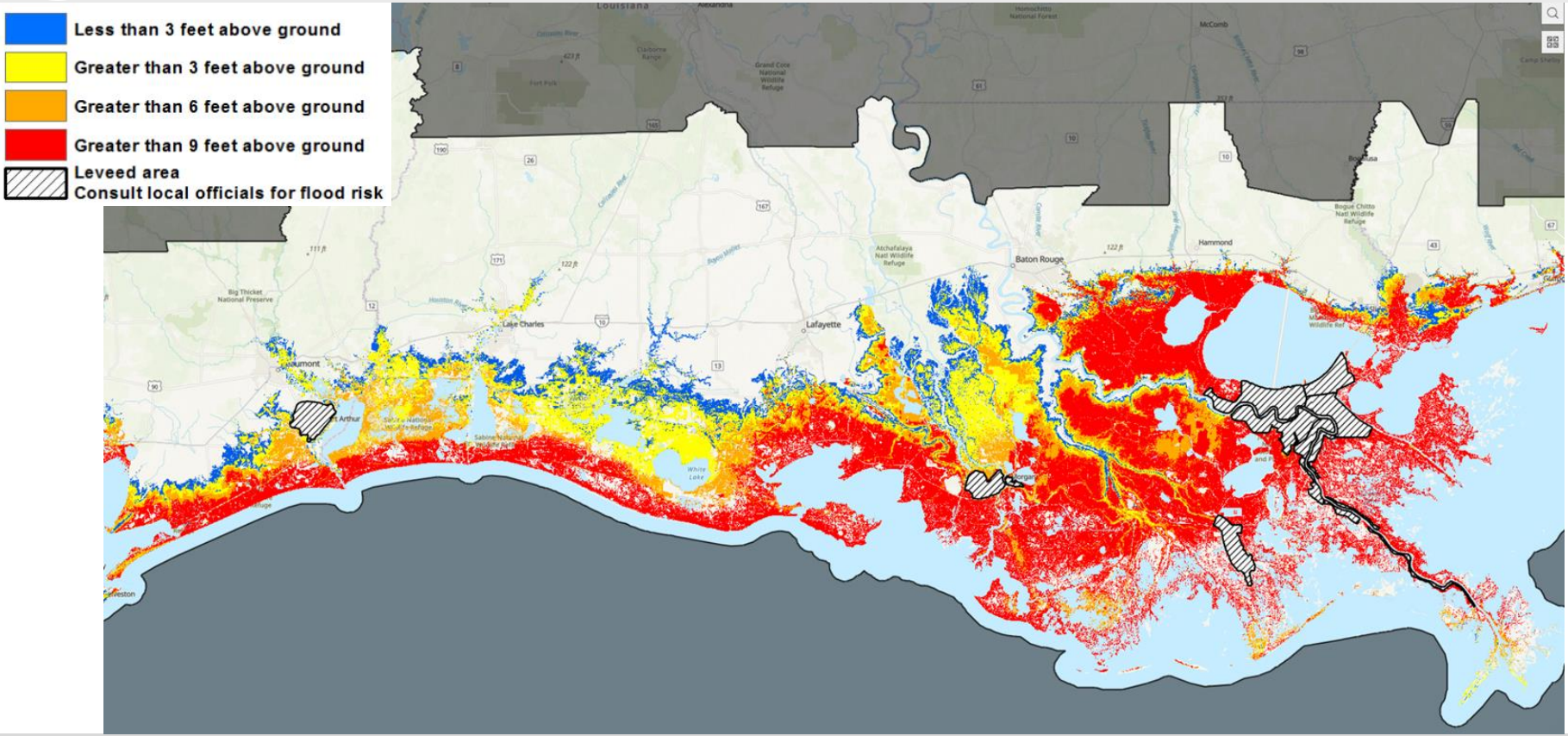
Storm Surge in Louisiana and SE Texas

Category 1



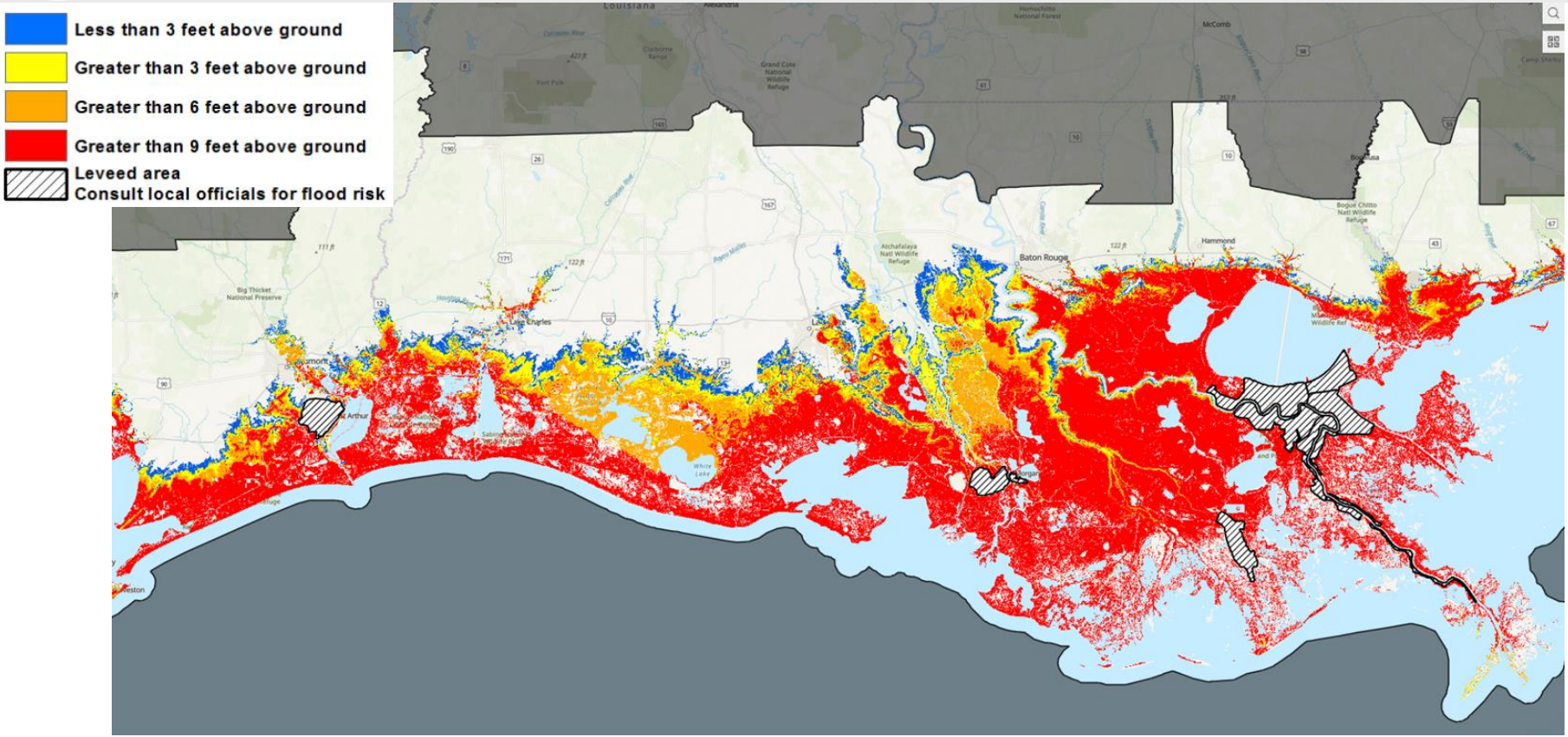
Storm Surge in Louisiana and SE Texas

Category 2



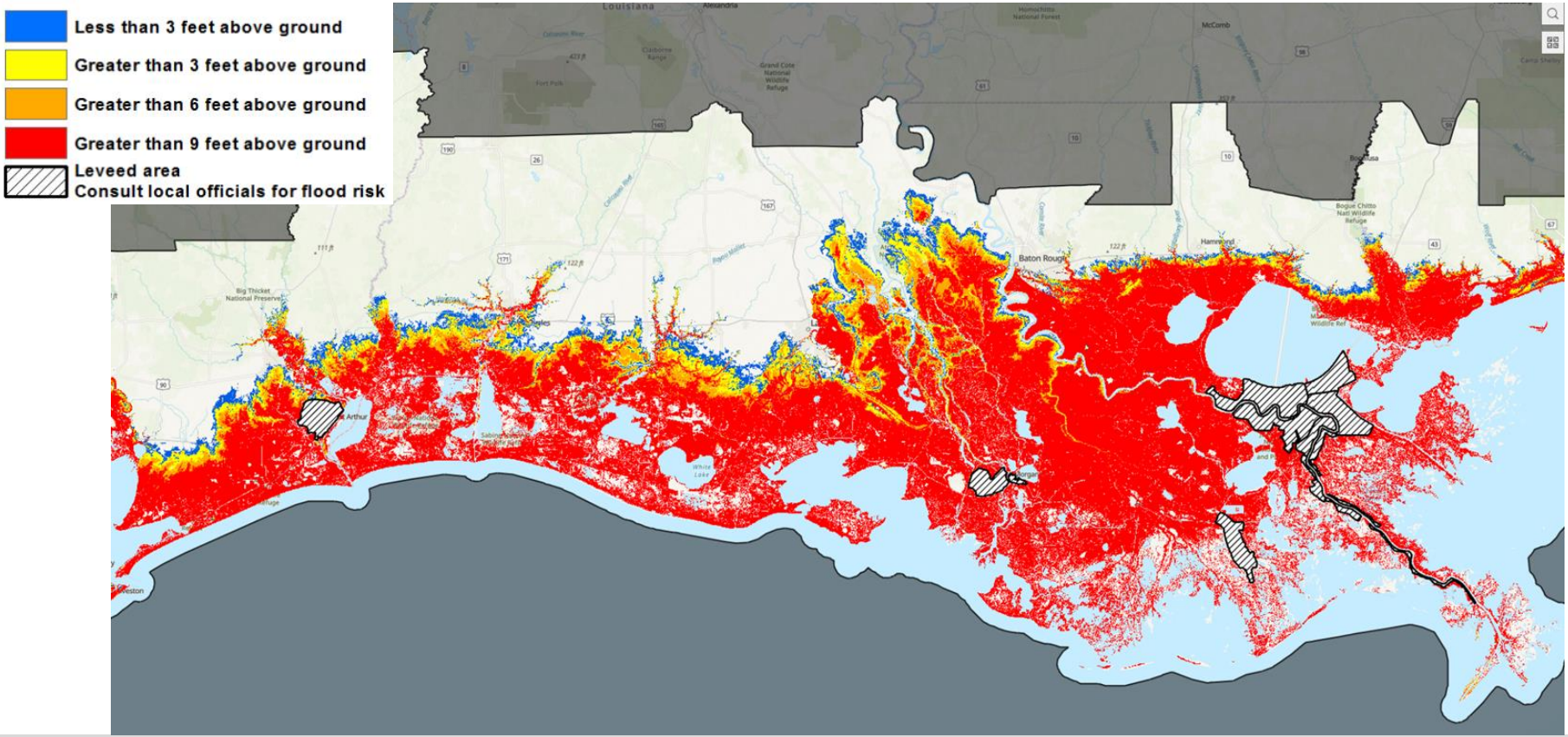
Storm Surge in Louisiana and SE Texas

Category 3



Storm Surge in Louisiana and SE Texas

Category 4

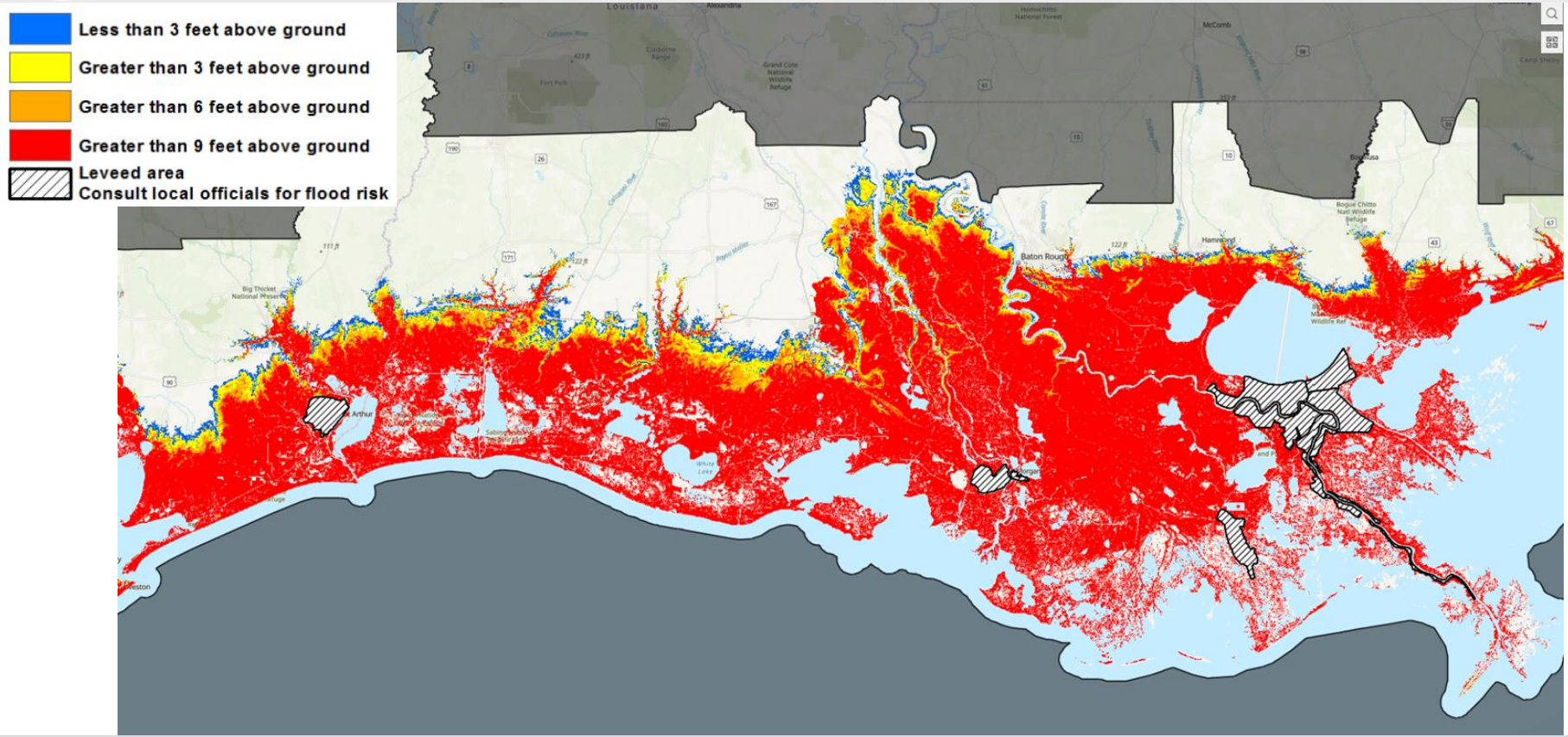


National Oceanic and Atmospheric Administration
U.S. Department of Commerce

National Weather Service
Lake Charles, LA

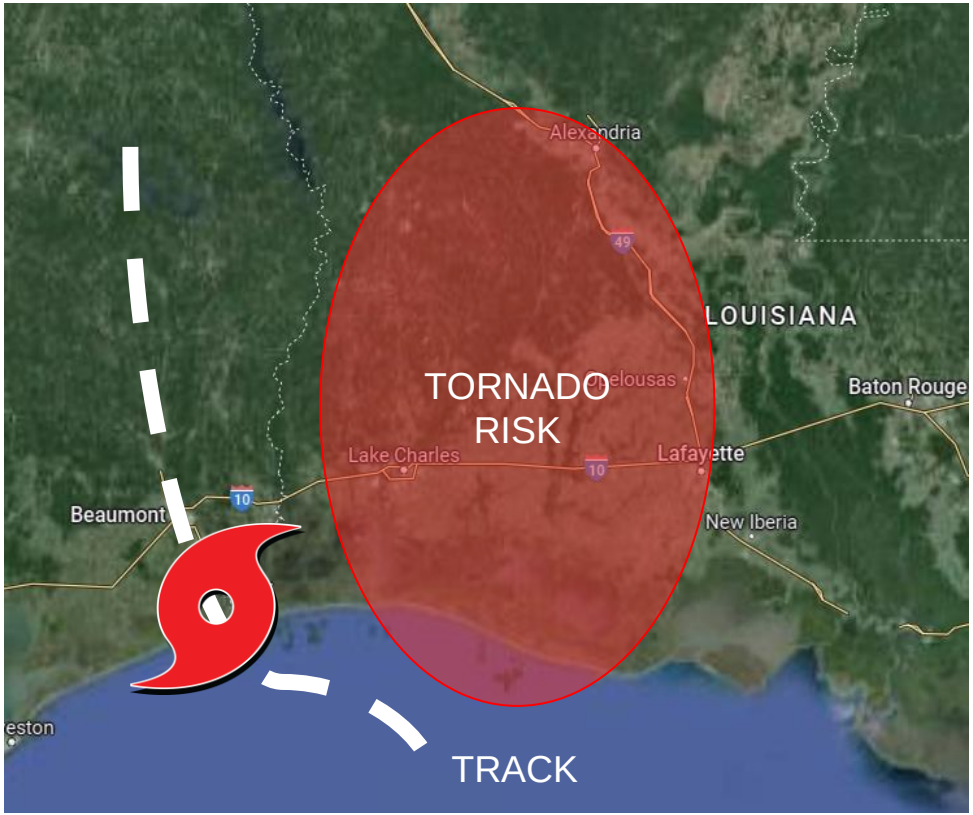
Storm Surge in Louisiana and SE Texas

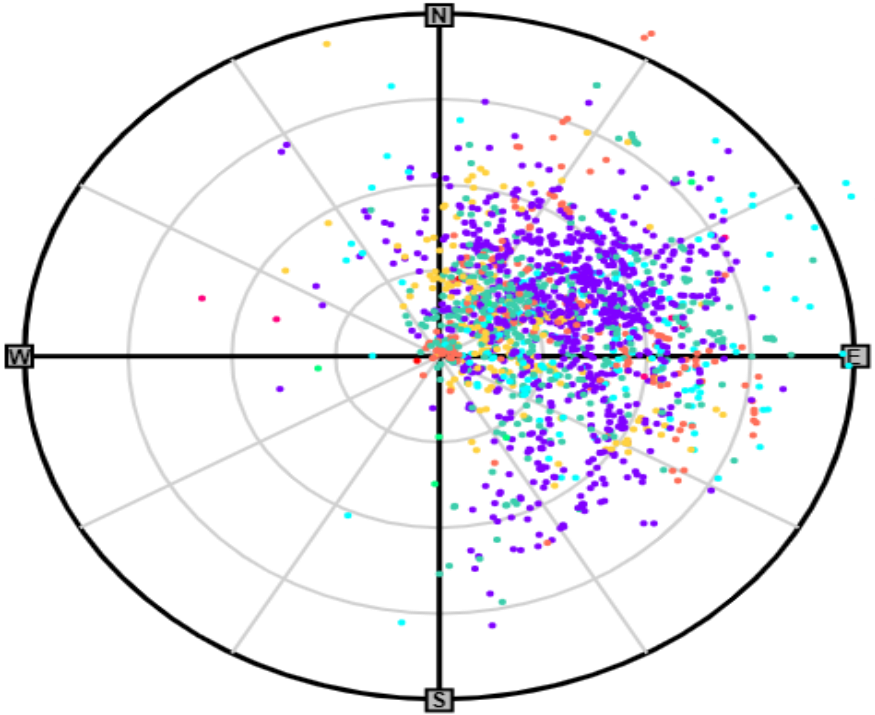
Category 5



Landfalling Hurricanes Spawn Tornadoes

70% of hurricanes produce tornadoes

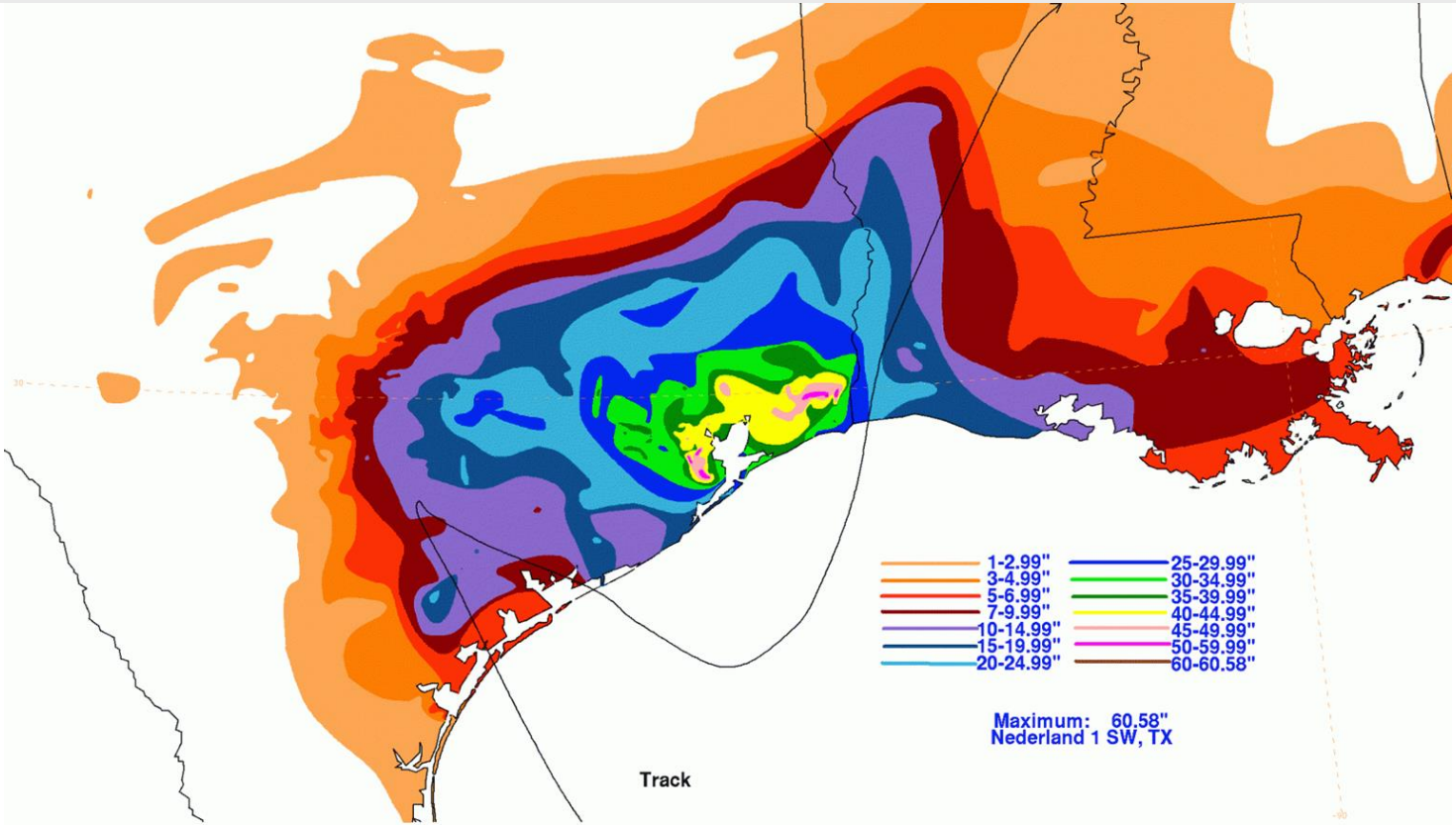




1995-2024

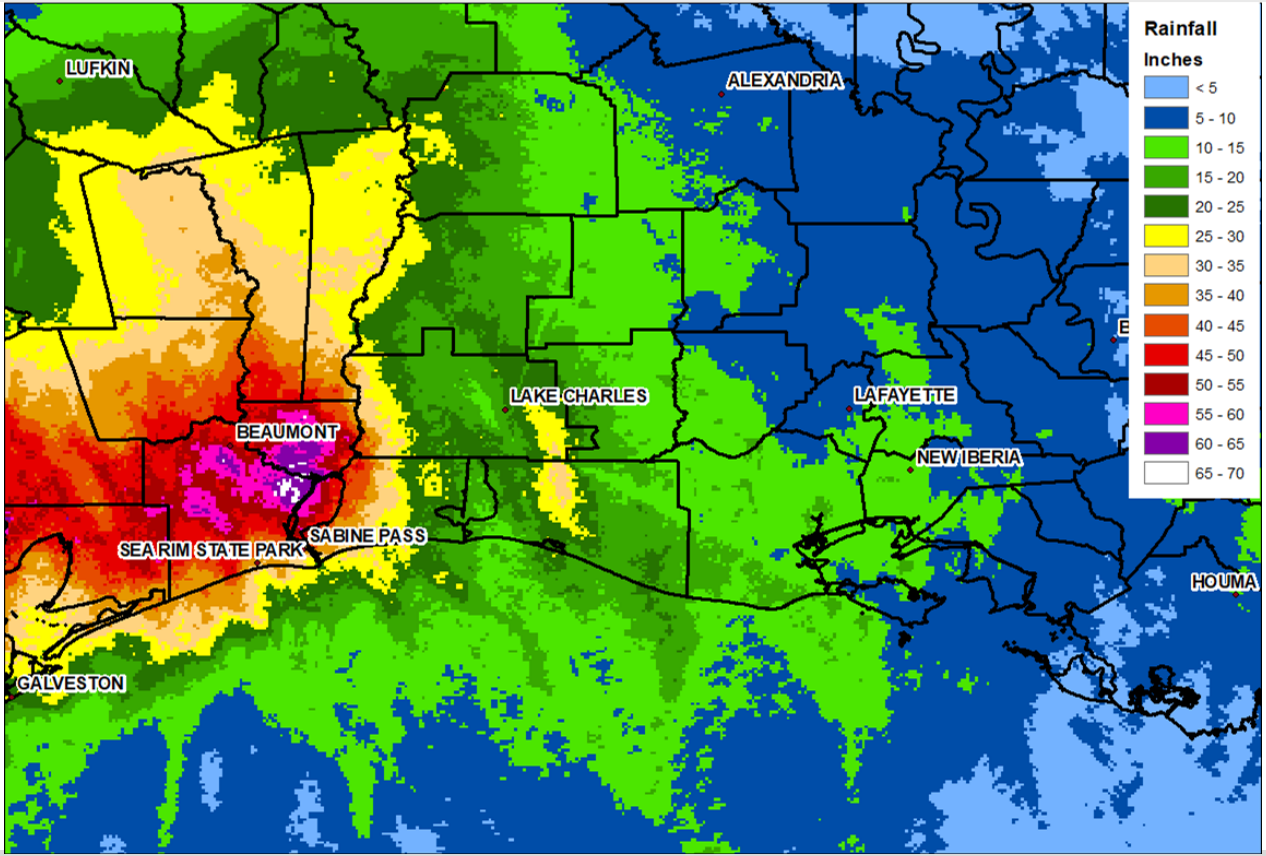
Excessive Rainfall from Hurricanes

Hurricane Harvey Rainfall Analysis



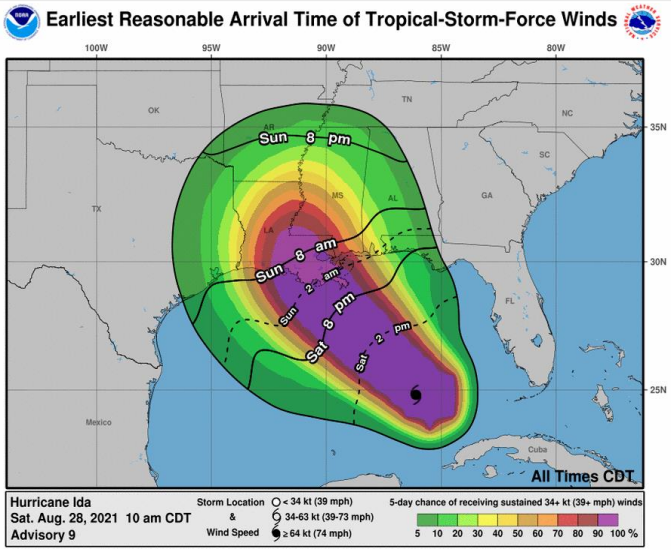
Hurricane Harvey

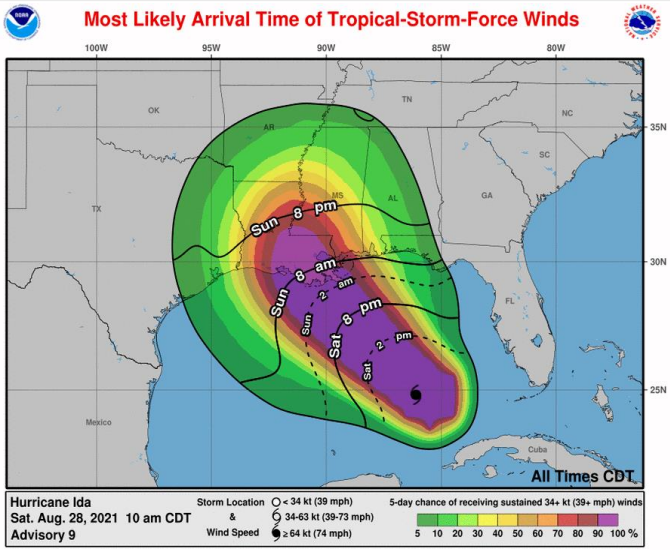
Radar Derived Storm Total Rainfall



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

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.

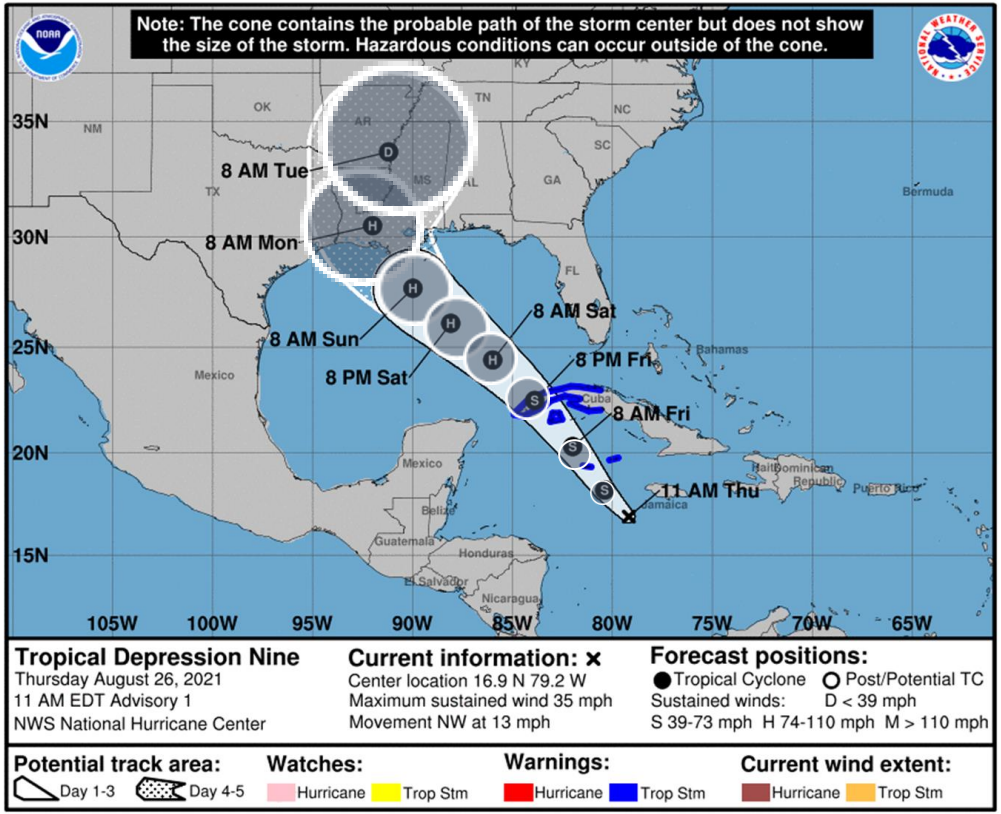
How the Cone is Made

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

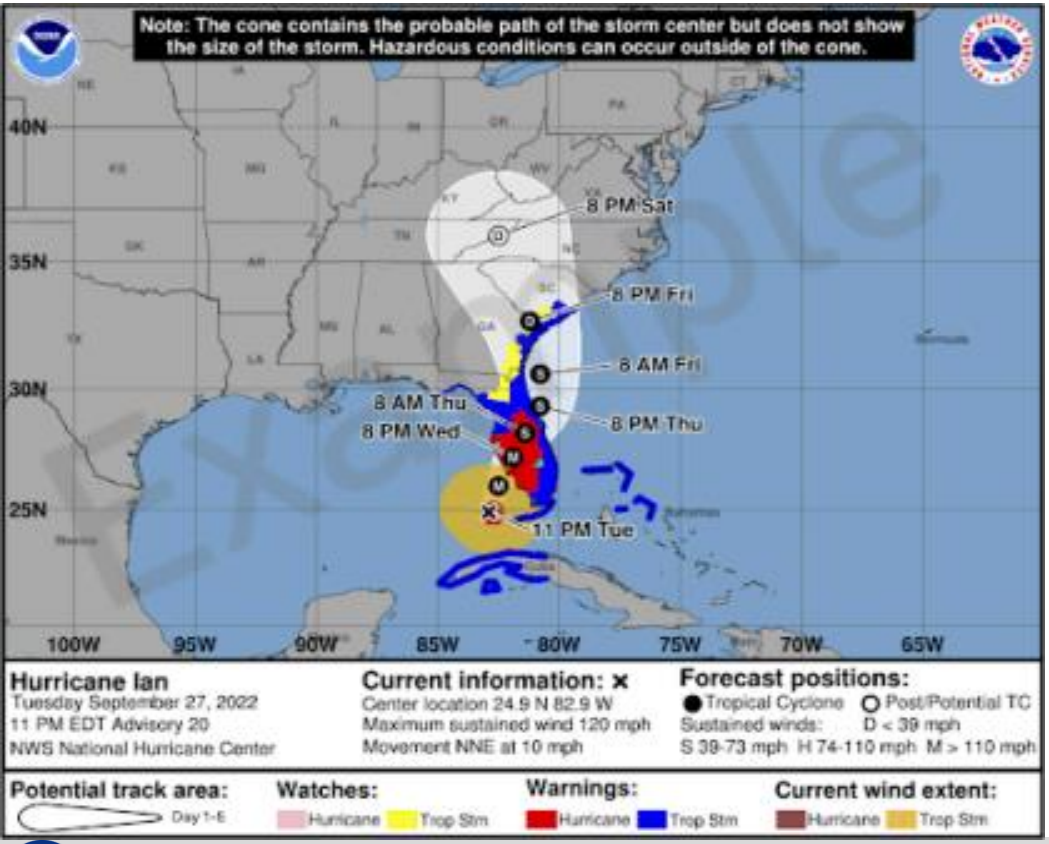
A cone is drawn based on those circles

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



Updated Cone of Uncertainty

Inland Watches and Warnings

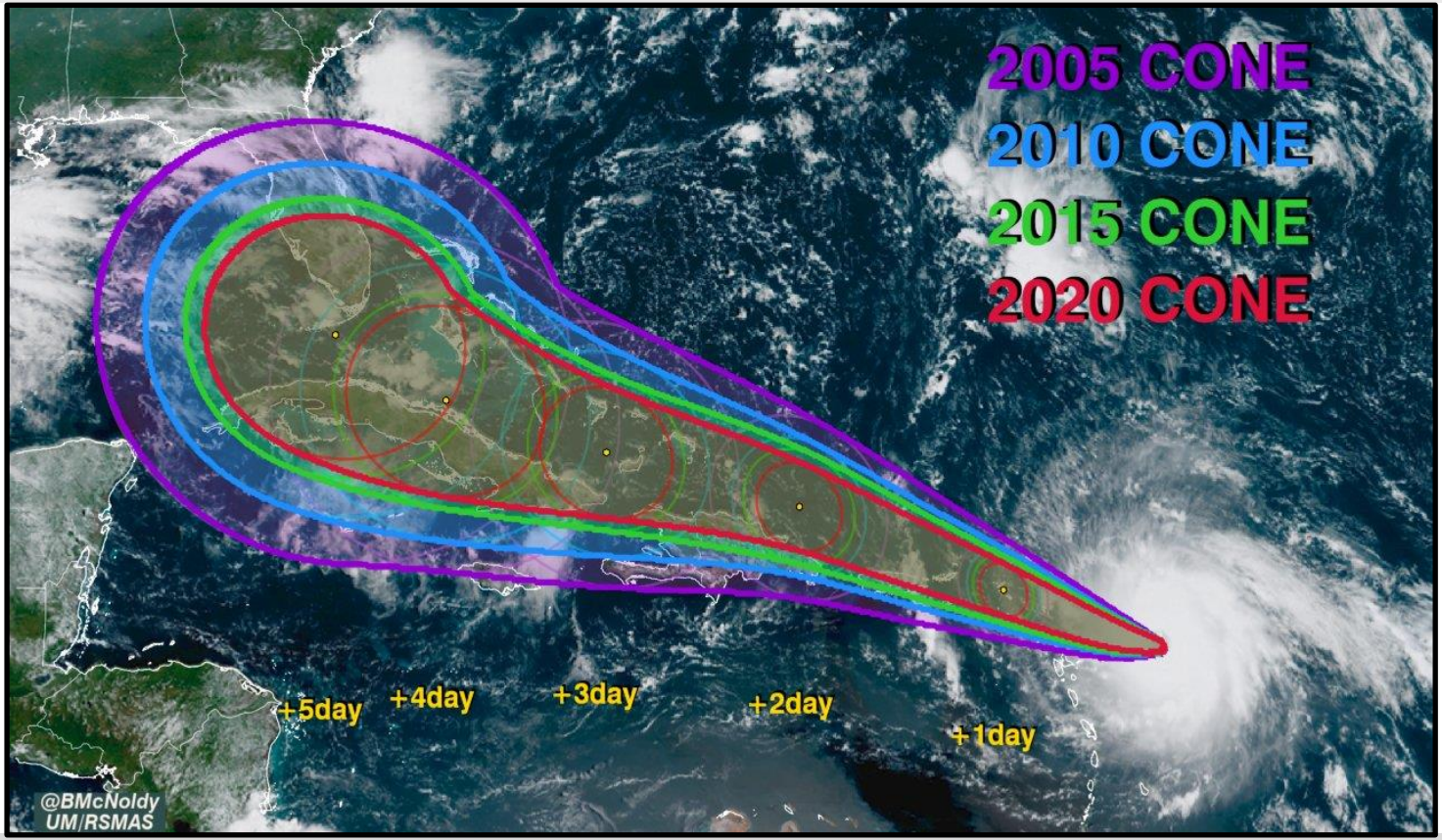


In 2024 a new version of the cone will be tested

They will now include inland watches and Warnings

What the Cone Actually is

Represents the mostly likely path of the center of cyclone.



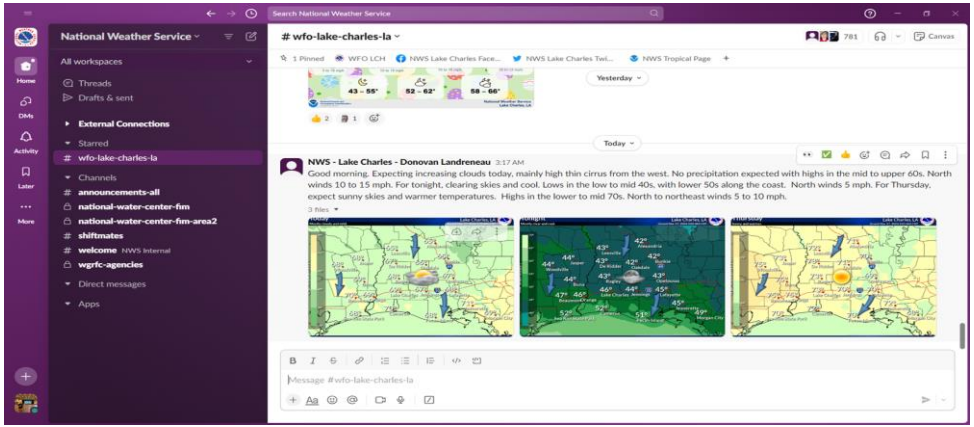
Forecast Cycle to Briefings

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

NWSChat 2.0: Slack

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



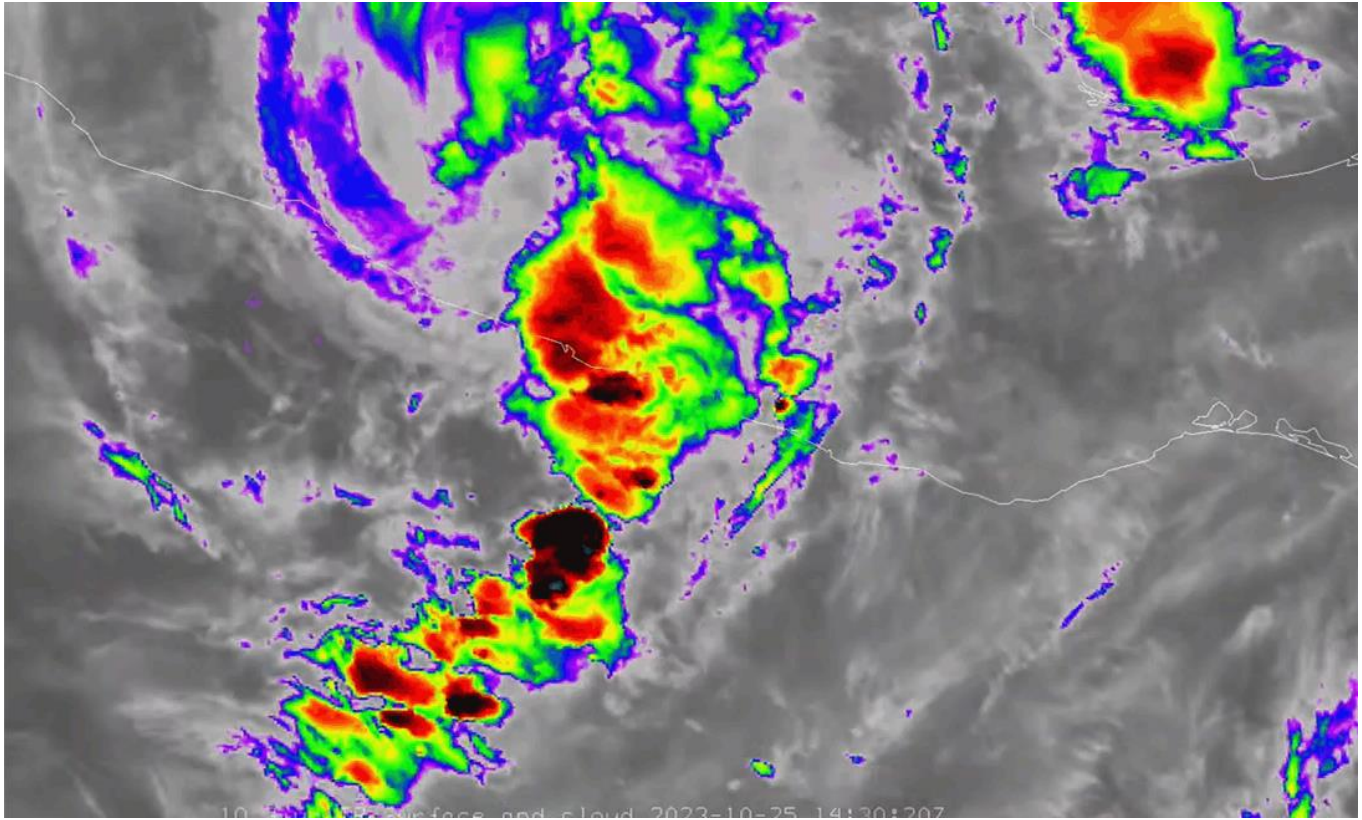
- ➔ Limited Access
- ➔ Free to use
- ➔ Desktop and App version
- ➔ Direct link to the Forecasters on Duty
- ➔ Briefing Slides and videos will be posted here

SCAN TO SIGN UP

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.



NWS Products to Monitor

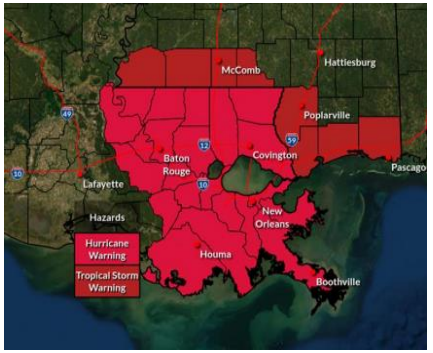
A product timeline from the National Weather Service

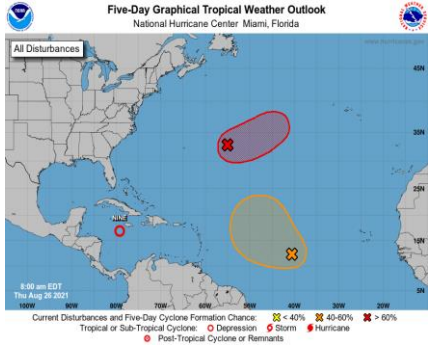
7 Days Out

- 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: nicholas.slaughter@noaa.gov

THANK YOU