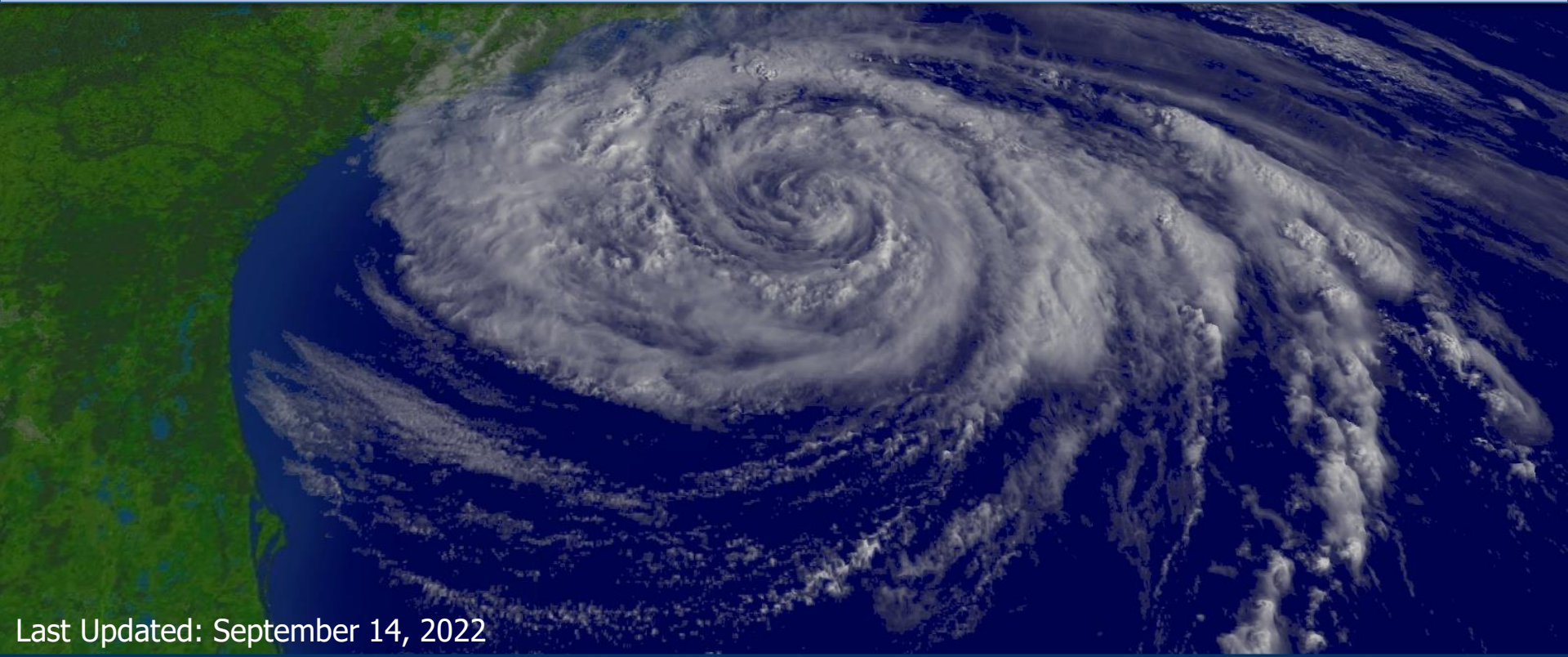
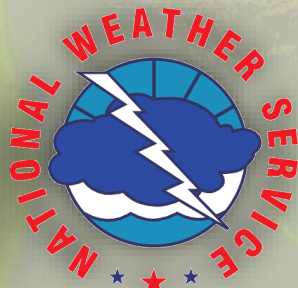


# Hurricane Guide for Southeast South Carolina/Georgia *Plan, Act, Survive!*



Last Updated: September 14, 2022



National Weather Service  
Charleston, SC  
[weather.gov/chs/](https://weather.gov/chs/)

## This guide will help you:

- prepare for hurricane season
- stay informed of the latest tropical cyclone threats
- stay safe during a hurricane
- learn about local tropical cyclone history

NOTE: Numerous links are provided throughout this guide to get more information!

# Outline

- **Tropical Cyclone Hazards**
- Being Prepared and Staying Informed
- Tropical Cyclone Basics
- Tropical Cyclone Climatology
- Tropical Cyclone History for Southeast South Carolina and Southeast Georgia



# Main Tropical Cyclone Hazards

Storm Surge



High Winds



Rip Currents



Tornadoes/Waterspouts



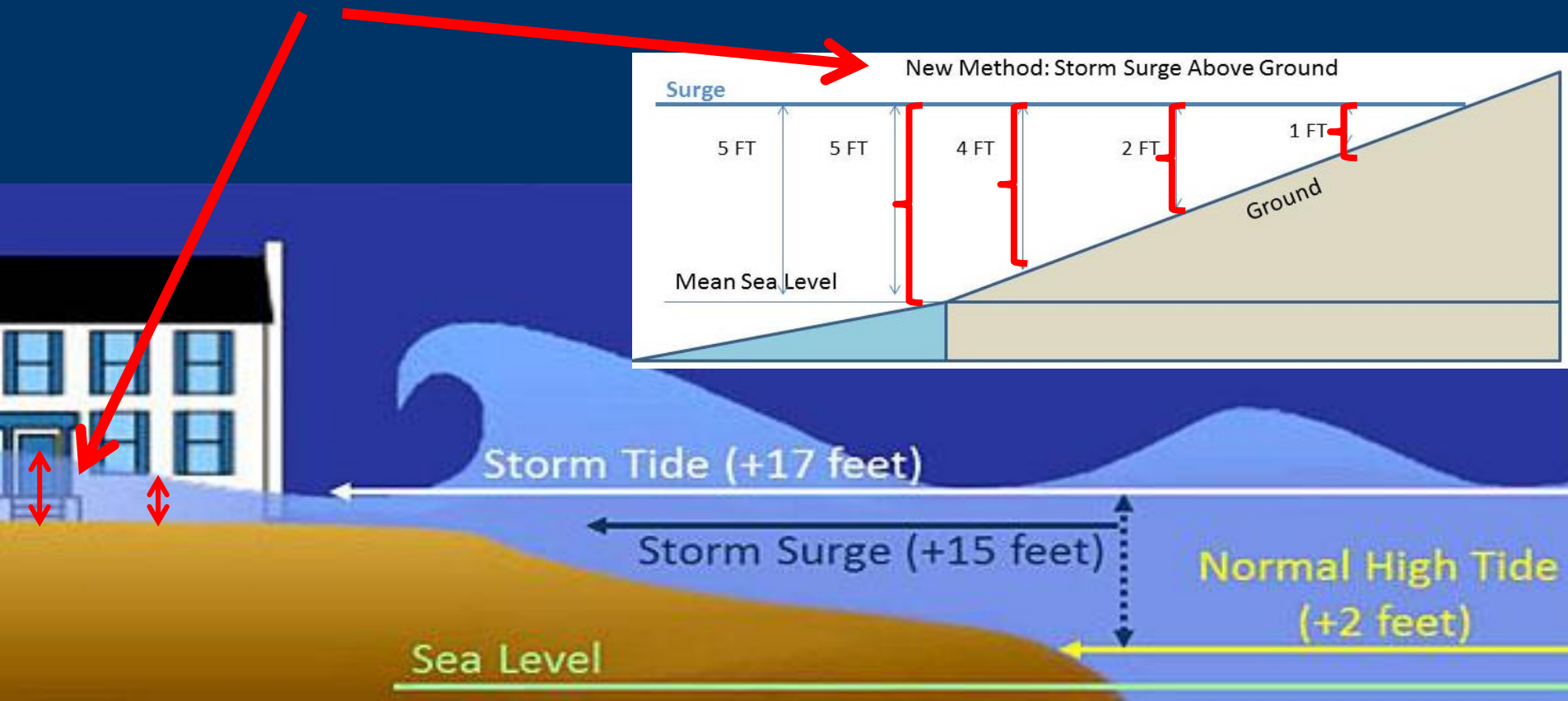
Flooding Rains





# Storm Surge Terminology

- Storm surge: abnormal rise of water generated by a storm
- Storm tide: storm surge + astronomical tide
- Inundation: height/depth of water above the ground

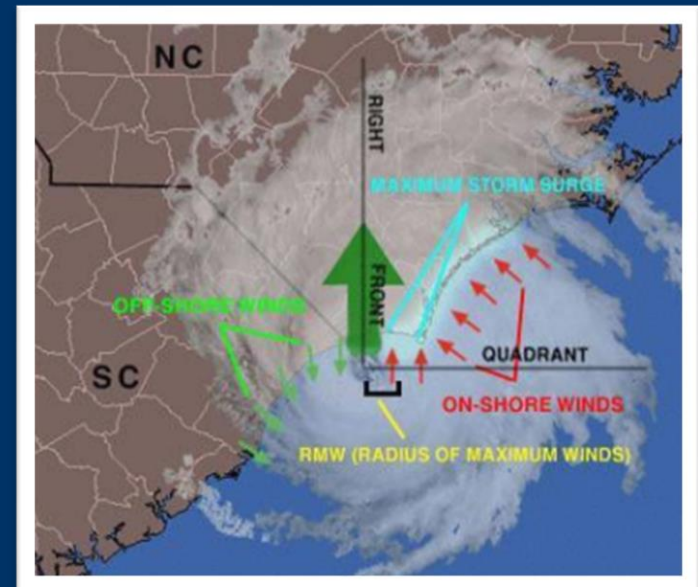


# Storm Surge Facts

- Greatest threat to life and property along the coast
- **Can occur rapidly and forcefully and travel many miles inland in low-lying areas (such as along the SC/GA coasts)**
- Produced mainly by strong winds blowing over the ocean for an extended period
- Stronger, larger and faster storms generally produce higher surge
- The amount of surge is not solely dependent on the storm category
- Highest surges at the coast typically occur to the right of where the center of the storm comes ashore (blue area outlined in the image to the right)



Isle of Palms, SC after Hurricane Hugo (1989)





# Storm Surge Facts

- There will be more flooding if the highest surge occurs around high astronomical tide (compared to low tide)
- The coastal areas of SC/GA are very surge-prone given the low elevation and gently sloping continental shelf offshore
- In 1989, Hurricane Hugo produced the highest water levels ever recorded on the U.S. East Coast (~20 foot storm tide above Mean Sea Level at Bulls Bay, SC and ~10 foot storm tide above MSL in downtown Charleston, SC)

« Images courtesy of NWS



Romain Retreat, SC (near Bulls Bay) after Hugo (1989)



Edisto Beach, SC after Matthew (2016)



# Storm Surge Impacts



Folly Beach, SC – before Hugo



Folly Beach, SC – after Hugo



Hurricane Ivan (2004):  
- Category 3; 10-16 foot surge



Hurricane Ike (2008):  
- Category 2  
- 15-20 foot surge



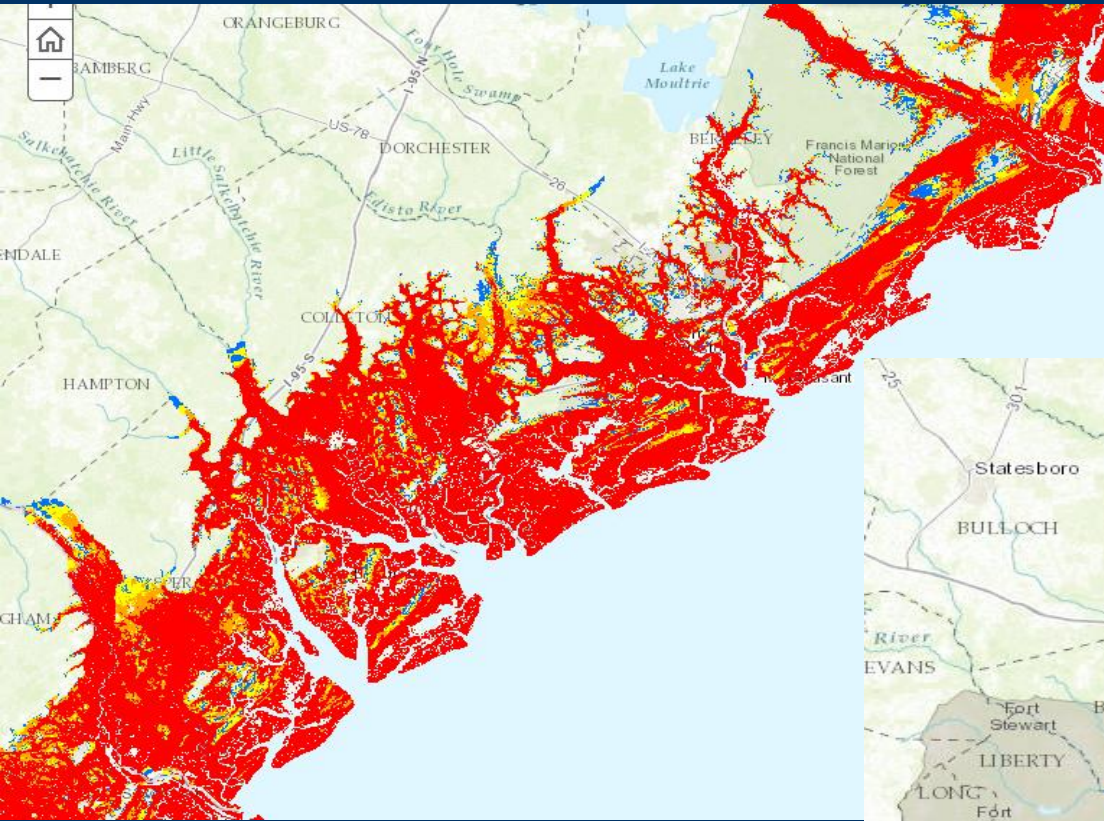
# Are You At Risk From Storm Surge?

- If you live in/near any of the shaded areas on the maps on the next few slides you are vulnerable to storm surge!
- Check out [NOAA's storm surge hazard maps](#)
- Determine whether you are in an [evacuation zone](#)
- **Evacuate if advised to do so by local authorities!**
- Keep in mind that if you don't evacuate, your location may become an "island" cut off from emergency officials

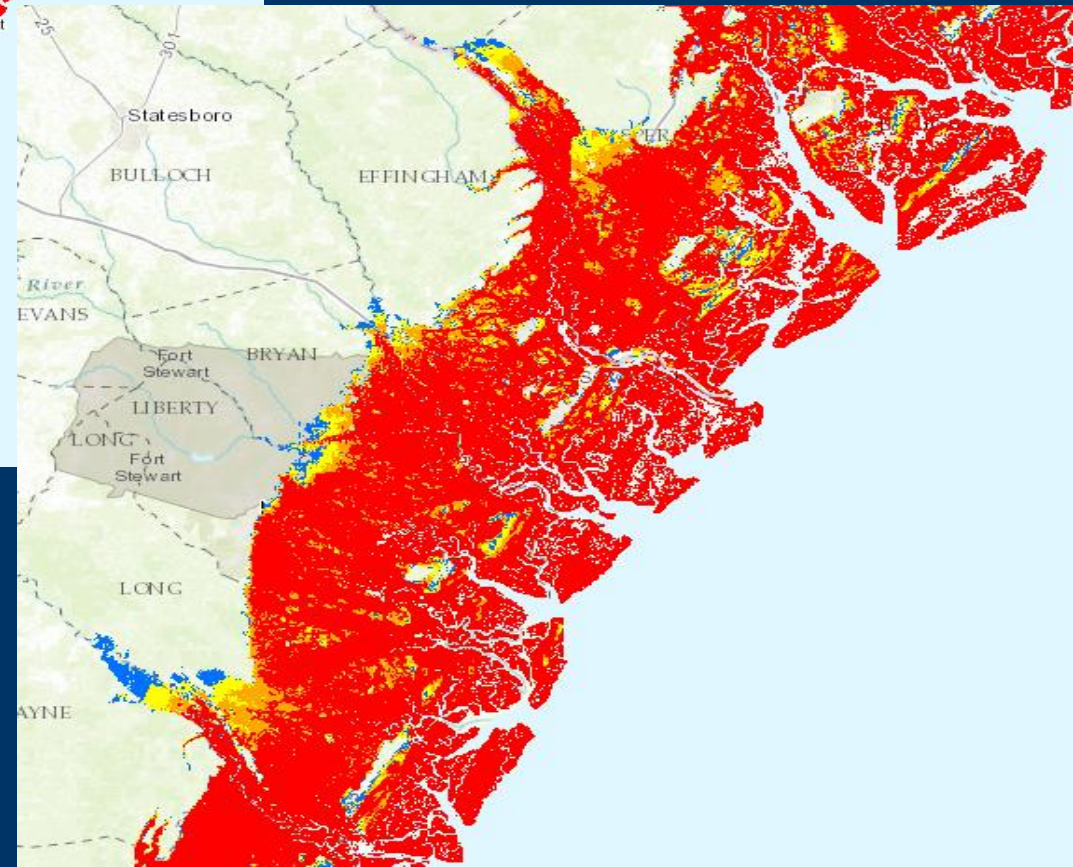


# Local Storm Surge Risk

## SC Lowcountry/GA Coastal Empire



➤ The deepest water is denoted in red and the most shallow water is denoted in blue.



- Due to the low-lying nature of the area and the nearby ocean bathymetry, much of the region is vulnerable to storm surge inundation, even well inland!
- Note how you don't have to be on the beach to experience inundation!

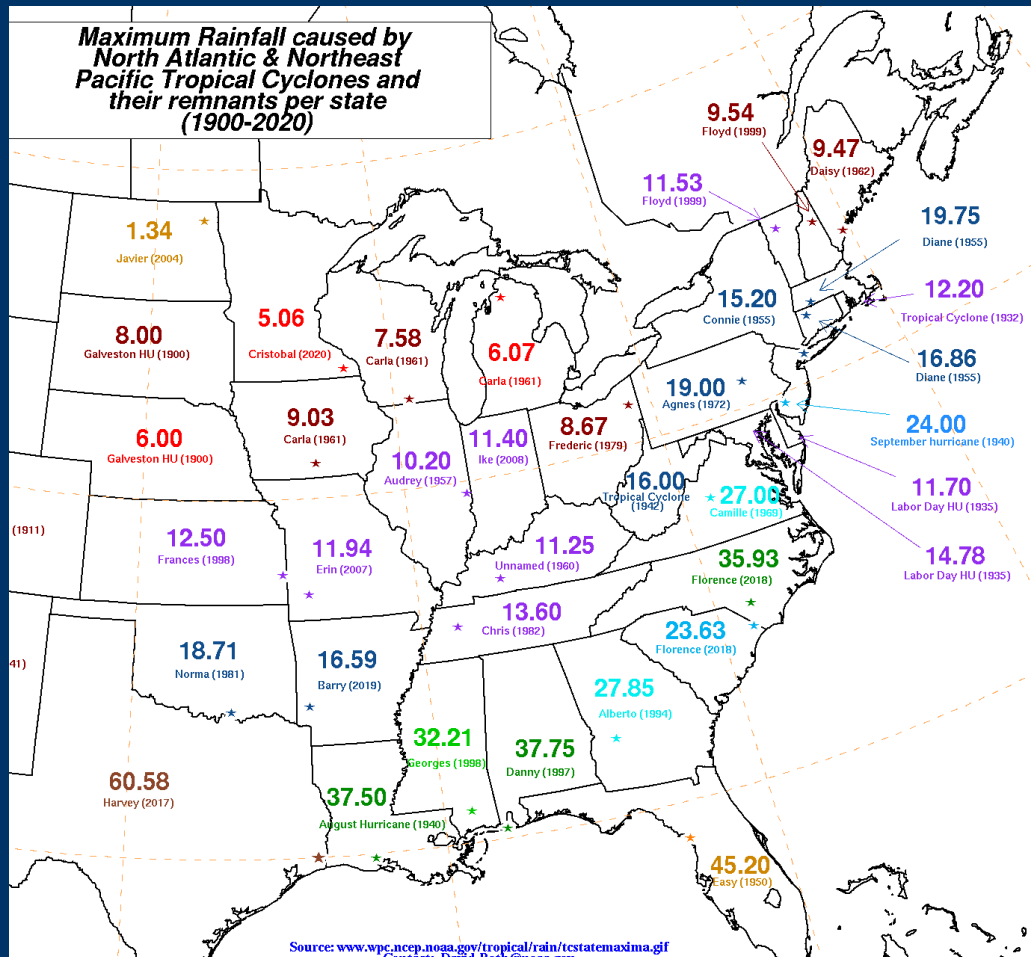


# Flooding Rainfall

- When you think “hurricane”, “tropical storm” or even “tropical depression”, “flooding”!
- Most deaths in recent tropical cyclones have been from inland fresh water flooding
- Weak storms can still produce a lot of rainfall
- Slow-moving storms can produce more rainfall
- Determine whether you live in a flood zone and evacuate if advised to do so by local officials
- Never drive through flooded roads since you don't know how deep the water is and the road may be washed out

**\*\*\* It only takes ~1 foot of water to move most small vehicles!!**

# Flooding Rainfall



Flooding on Interstate 95 from Tropical Storm Bonnie (2016)

« Images courtesy of NWS/Weather Prediction Center (left) and WTOC-TV (right)

- The coastal areas of SC and GA, particularly in urban areas like downtown Charleston and Savannah, are particularly vulnerable to flooding given the added influence of the storm tides

# High Winds

- Strong, damaging winds can occur hundreds of miles from the coast
- In fact, Hurricane Hugo in 1989 produced hurricane force wind gusts in Charlotte, NC which toppled numerous trees and power lines (see image to the left below)



Beaufort County, SC after Hurricane Matthew (2016)



# High Wind Facts

- Generally the stronger the storm at landfall the longer it will take for the winds to diminish
- Coastal areas/high-rise buildings:
  - winds normally higher due to less surface friction
- Inland areas away from the immediate coast:
  - sustained winds generally lower than at coast, but gusts can be similar to sustained winds at coast



# High Wind Safety

- Cover all windows and doors with plywood or shutters
  - Do NOT leave any windows/doors open to relieve pressure
  - Tape does NOT work!
- Reinforce garage doors as they are typically weak points
- Store all outdoor items that could become deadly missiles
- Evacuate to a more sturdy structure if you live in a mobile/manufactured home, especially if advised to do so by local authorities
- During a storm, go to your “safe place” which should be the most interior room on the lowest floor of your building that is not prone to flooding and protect your head with helmets or pillows





# Tornadoes/Waterspouts

- Typically short-lived (minutes) and weak (EFO-EF1: up to 110 mph), although can be much stronger
- Typically occur within the storm's outer rain bands and near the center (eye wall)
- During the storm, if the NWS issues a "Tornado Warning" or "Extreme Wind Warning" for your location, go to your "safe place" (i.e., most interior room on lowest floor not prone to flooding)





# Outline

- Tropical Cyclone Hazards
- **Being Prepared and Staying Informed**
- Tropical Cyclone Basics
- Tropical Cyclone Climatology
- Tropical Cyclone History for Southeast South Carolina and Southeast Georgia

# Before the Storm...



- Determine whether you are vulnerable to flooding from storm surge
  - If you live in/near any of the shaded areas on the surge maps found earlier in this guide you are vulnerable to storm surge inundation!
  - Refer to your county's emergency management office... [SC](#) / [GA](#)
- Learn if you live in a pre-designated [evacuation zone](#)... [SC](#)
- If you are [evacuating](#), find a hotel/shelter and learn evacuation routes
- Get a [disaster supply kit](#) that includes sufficient food and water
- Consider prepping your home by boarding up windows/doors with plywood and trimming trees and shrubbery
- Review your insurance policy (Note: flooding is not covered and must be purchased via the [National Flood Insurance Program](#) for which there is roughly a 30 day waiting period)
- Make plans for your pets since some shelters/hotels do not accept them

**Remember...preparation is key!**

# *If evacuating...leave early!!*



*Motorists trapped on Interstate 26 ahead of Hurricane Floyd (1999)*

***\*\*An average size car will flip in 115 mph winds!***



# Tropical Cyclone Wind/Storm Surge Watches and Warnings

Watches – conditions possible within ~48 hours of TS force winds

Tropical Storm	Tropical storm force winds (39-73 mph)
Hurricane	Hurricane force winds (74+ mph)
Storm Surge	Life-threatening inundation (3+ feet above ground)

Warnings – conditions expected within ~36 hours of TS force winds

Tropical Storm	Tropical storm force winds (39-73 mph)
Hurricane	Hurricane force winds (74+ mph)
Storm Surge	Life-threatening inundation (3+ feet above ground)

# If a Watch is Issued For Your Area...

- Determine whether you are vulnerable to flooding from storm surge and/or heavy rainfall
- Learn if you live in a pre-designated evacuation zone and what the official evacuation routes are
- Evacuate if you are advised to do so by officials, and do so early!
- If evacuating, notify your friends/family and note that some shelters/hotels do not accept pets
- Review your disaster plan and check your supply kit
- Prepare your home by trimming weak/dead branches, covering windows/doors and bringing in unsecured outdoor items
- Inspect/secure mobile home tie downs
- Gas your vehicles and get cash since ATMs won't work w/o power
- Store drinking water in jugs, bottles and clean bathtubs
  - at least 1 gallon per person per day for 3 days is recommended



# If a Warning is Issued For Your Area...

- **Rush protective actions to completion!!**
- Evacuate as soon as possible, especially if advised to do so by authorities!
  - Notify friends/family of where you are going
  - Take your disaster supply kit with you
  - Unplug appliances and turn off electricity/main water valve
- If not evacuating...
  - Be sure you are not vulnerable to flooding from storm surge or heavy rainfall
  - Ready your disaster supply kit
  - Turn your refrigerator/freezer to their coldest settings and keep closed as much as possible
  - Cover windows/doors and store unsecured outdoor items
  - Fill bathtubs and large containers with water for cleaning/flushing purposes in case clean tap water becomes unavailable
    - at least 1 gallon per person per day for 3 days is recommended
  - Inspect/secure mobile home tie downs
  - If power is lost, turn off major appliances to reduce power "surge" when electricity is restored

# After the Storm...

- If you have evacuated, don't return home until notified by officials
- Watch for downed trees/power lines, glass, nails, and other debris as well as snakes, insects and other animals
- Don't drive through flooded roads
- Don't run power generators indoors
- Help your neighbors
- Be patient
- More recovery tips....  
<https://www.ready.gov/recovering-disaster>



# Staying Informed:

## Real-time Storm Information

### ➤ Social Media:

- NWS Charleston Facebook:

<https://www.facebook.com/NWSCharlestonSC>

- NWS Charleston Twitter: [@NWSCharlestonSC](https://twitter.com/NWSCharlestonSC)



### ➤ Mobile:

- <https://www.nhc.noaa.gov/mobile/>

### ➤ Internet:

- NWS Charleston, SC: <https://www.weather.gov/chs/>

- National Hurricane Center: <https://hurricanes.gov/>

### ➤ NOAA Weather Radio:

- <https://www.nws.noaa.gov/nwr/>

### ➤ Local TV/Radio





# NWS Tropical Products/Services

## National Hurricane Center

- Forecasts the development, track, and strength of tropical/sub-tropical cyclones

## NWS Charleston, SC

- Forecasts the potential impacts from tropical/sub-tropical cyclones in southeast SC/GA



[hurricanes.gov](https://hurricanes.gov)

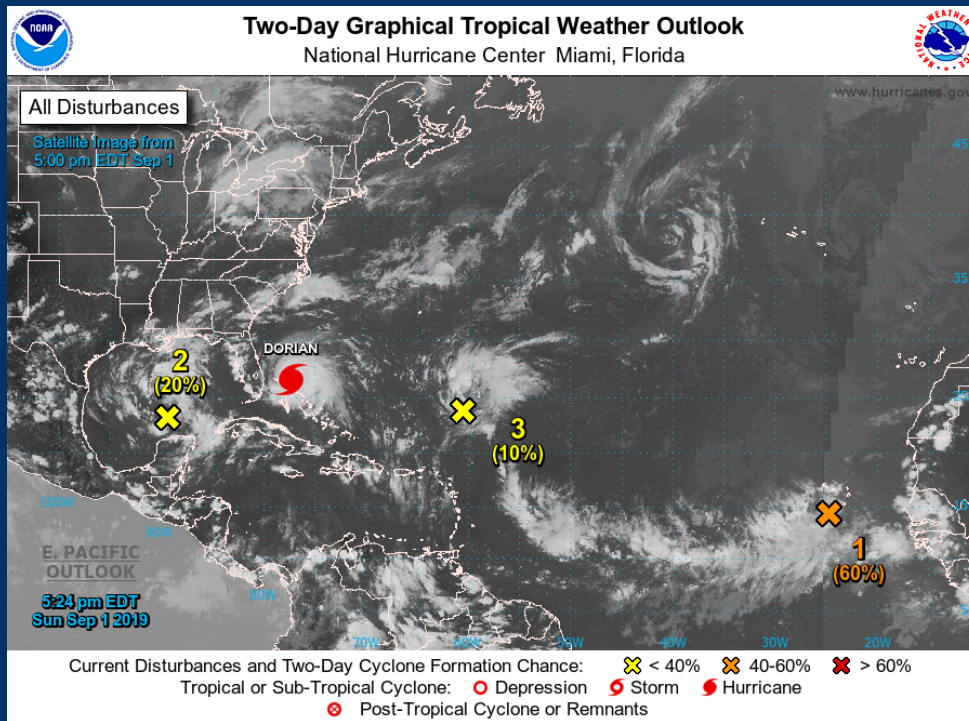


[weather.gov/chs](https://weather.gov/chs)

# NHC Tropical Weather Outlook

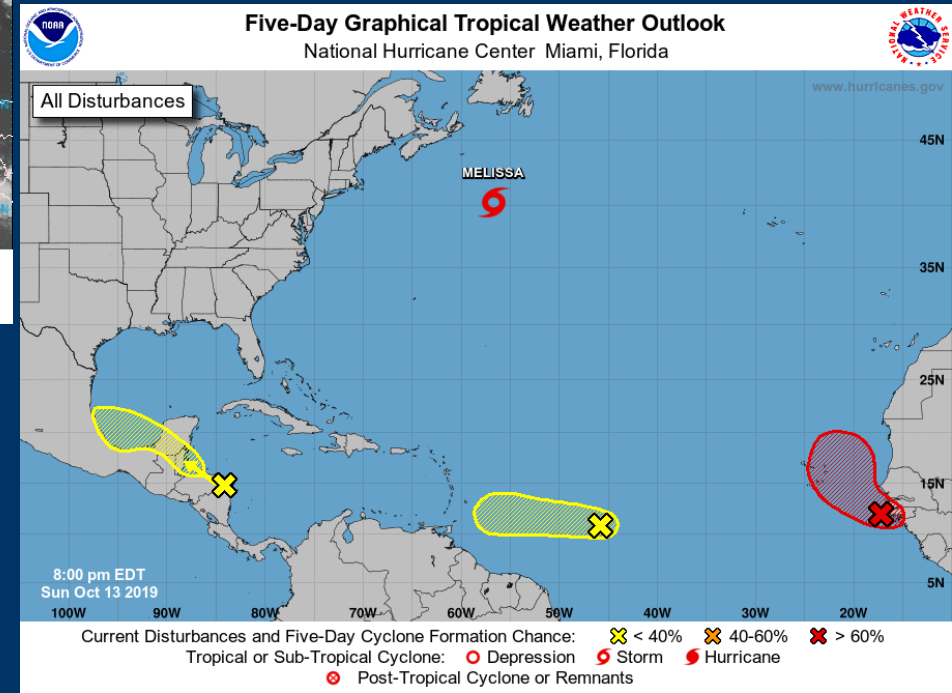
<https://www.nhc.noaa.gov/gtwo.php?basin=atlc&fdays=2>

➤ Shows current storms and areas of possible tropical/sub-tropical cyclone formation



## 2-day Outlook

## 5-day Outlook



# NHC Track Forecast Cone

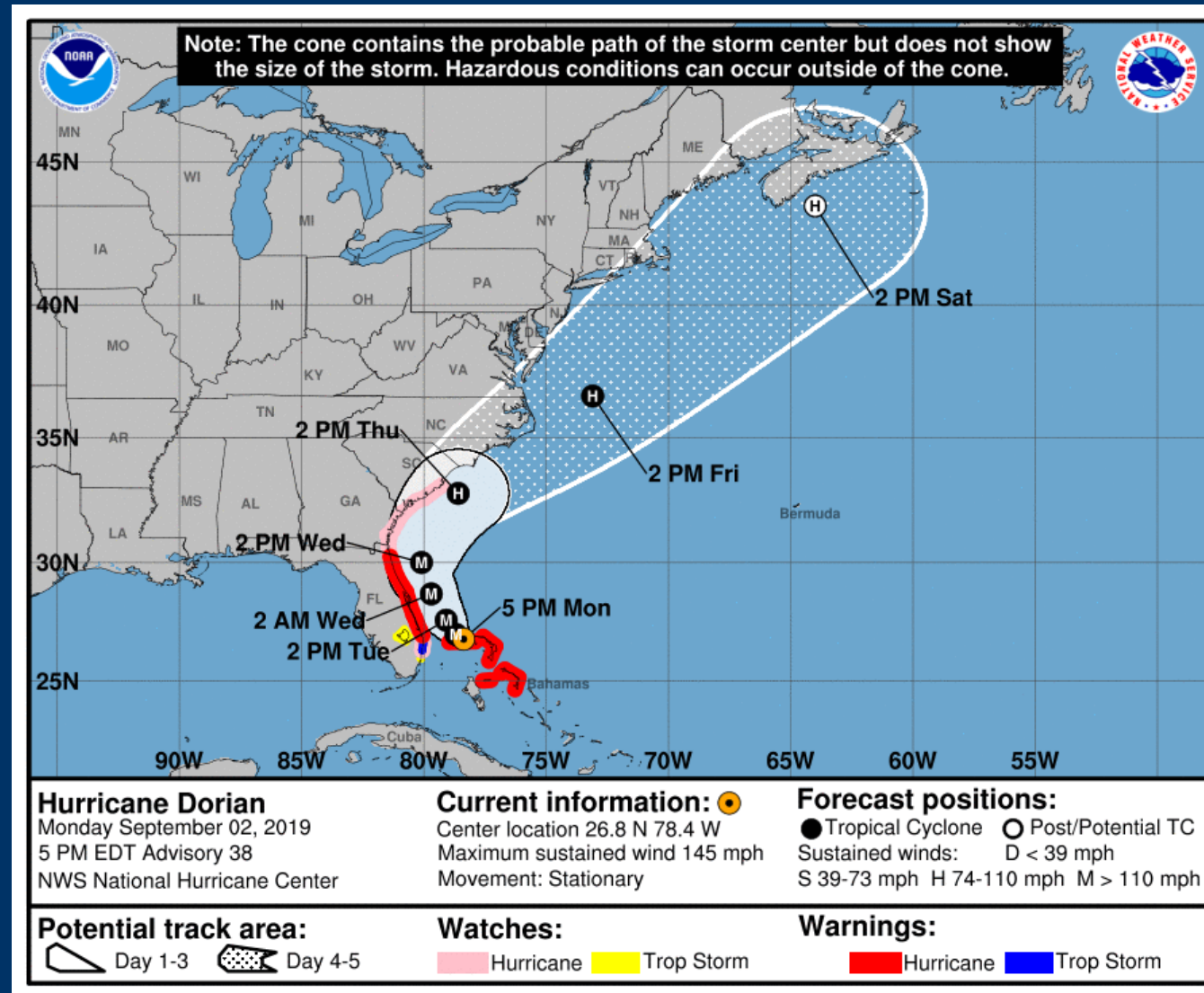
➤ <https://www.nhc.noaa.gov/cyclones/>

➤ <https://www.youtube.com/watch?v=O4QRN5gUeO8&feature=youtu.be>

➤ Shows the likely storm track along with the latest tropical storm/hurricane watches and warnings

➤ Can toggle on current wind field

➤ The “cone” does **NOT** indicate the area of possible impact, just the likely track of the storm center!

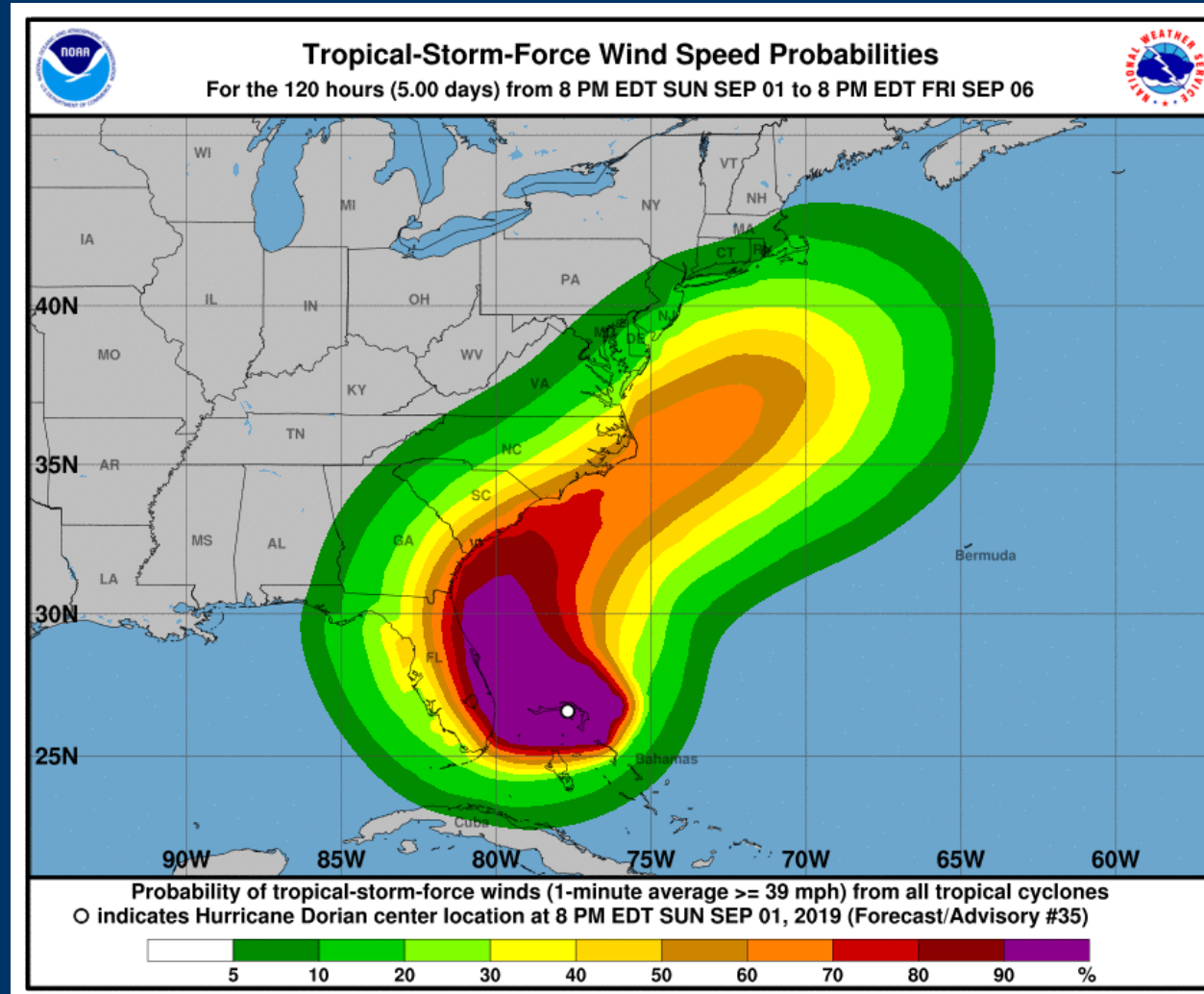




# NHC Wind Speed Probabilities

➤ <https://www.nhc.noaa.gov/cyclones/>

- Shows the chance of 34 knot (tropical storm force), 50 knot, and 64 knot (hurricane force) sustained winds through the next 5 days, as well as during particular time periods
- Accounts for uncertainty in the storm's track/size/intensity
- **NOTE: Low probabilities do NOT necessarily imply low risk!**
- Product description:
  - <https://www.nhc.noaa.gov/aboutnhcgraphics.shtml?#WINDPROB>



➤ The graphic above shows the probabilities of tropical storm force winds during the next 5 days

# NHC Wind Speed Probabilities Example

➤ <https://www.nhc.noaa.gov/aboutnhcprod.shtml?#PWS>

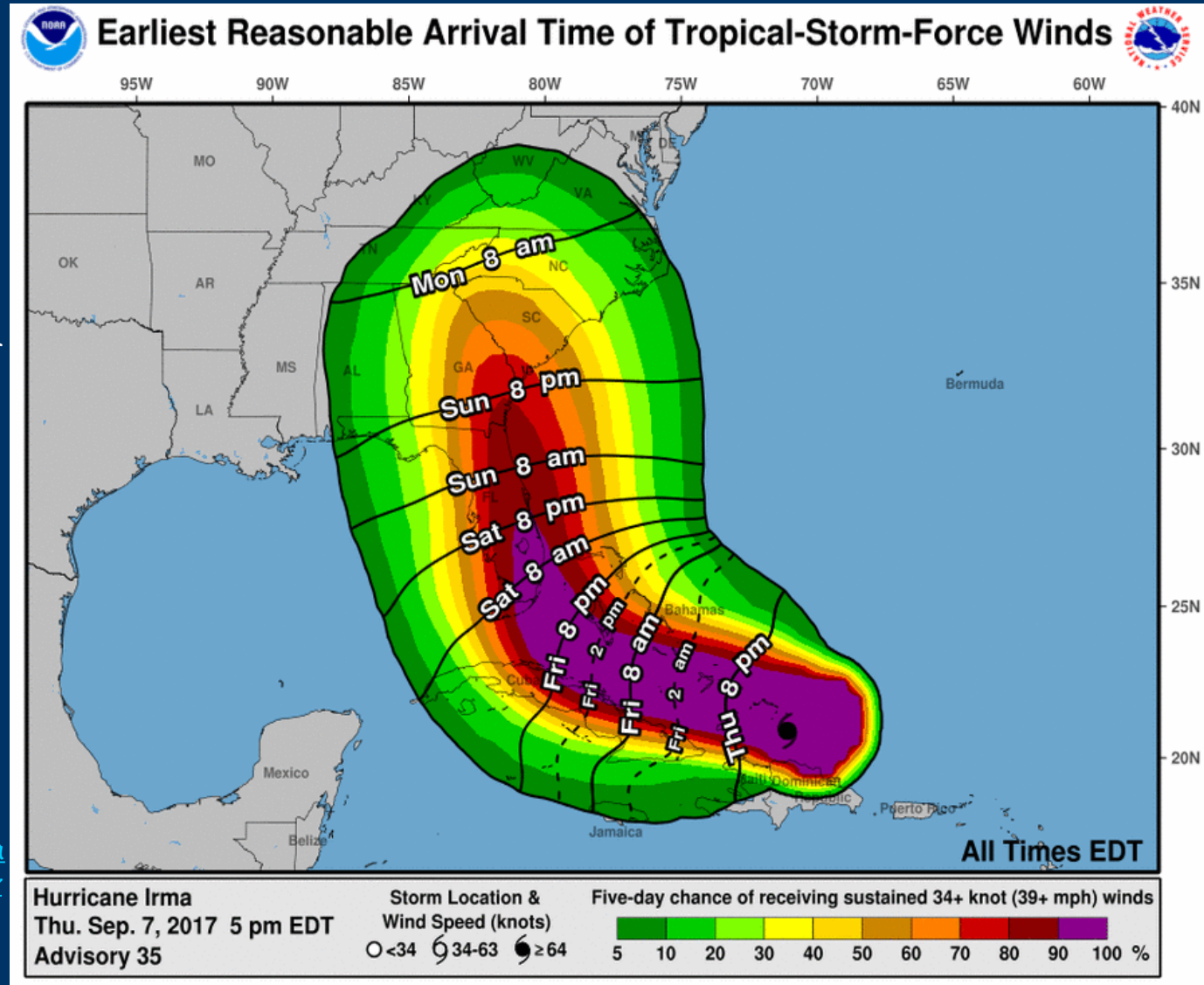
Forecast Hour	12	24	36	48	72	96	120
CHARLOTTE NC	34 X	X ( X)	X ( X)	X ( X)	1 ( 1)	3 ( 4)	3 ( 7)
MOREHEAD CITY	34 X	X ( X)	4 ( 4)	6 (10)	13 (23)	4 (27)	2 (29)
MOREHEAD CITY	50 X	X ( X)	X ( X)	X ( X)	4 ( 4)	2 ( 6)	X ( 6)
MOREHEAD CITY	64 X	X ( X)	X ( X)	X ( X)	1 ( 1)	1 ( 2)	X ( 2)
WILMINGTON NC	34 X	X ( X)	4 ( 4)	4 ( 8)	6 (14)	4 (18)	1 (19)
WILMINGTON NC	50 X	X ( X)	X ( X)	X ( X)	1 ( 1)	1 ( 2)	1 ( 3)
WILMINGTON NC	64 X	X ( X)	X ( X)	X ( X)	X ( X)	1 ( 1)	X ( 1)
COLUMBIA SC	34 X	X ( X)	1 ( 1)	X ( 1)	X ( 1)	2 ( 3)	2 ( 5)
MYRTLE BEACH	34 X	1 ( 1)	3 ( 4)	2 ( 6)	4 (10)	2 (12)	1 (13)
CHARLESTON SC	34 X	2 ( 2)	3 ( 5)	X ( 5)	1 ( 6)	1 ( 7)	1 ( 8)
SAVANNAH GA	34 X	2 ( 2)	2 ( 4)	X ( 4)	X ( 4)	X ( 4)	1 ( 5)



➤ The probability for tropical storm force winds (34 kt) at Savannah, Georgia in the 12-24 hour time period is 2%, the cumulative probability through 48 hours is 4% and the cumulative probability for the entire 5-day period (120 hours) is 5%.

# NHC Wind Time of Arrival Graphics

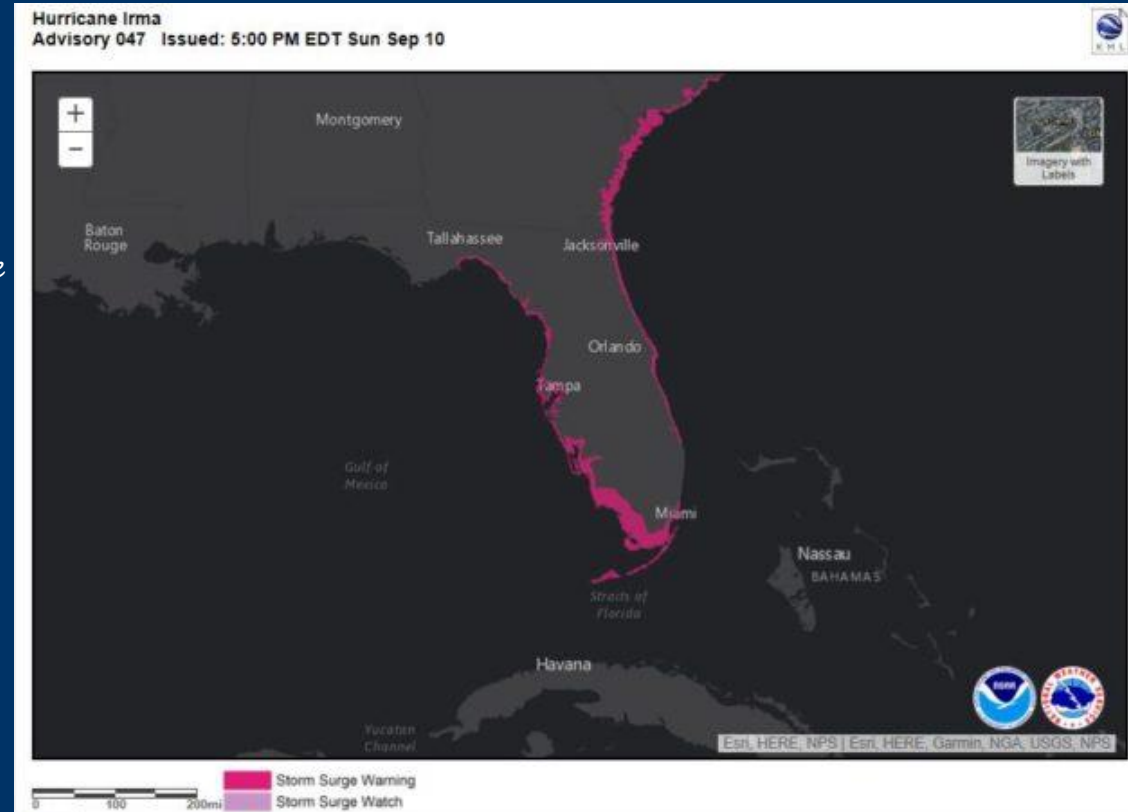
- “Earliest reasonable” arrival time of sustained TS-force winds (shown to the right; represents the time that has no more than a 10% chance of seeing the onset of sustained TS-force winds)
- “Most Likely” arrival time of sustained tropical storm-force winds (not shown; represents the time before or after which the onset of TS-force winds is equally likely)
- Product description:
  - <https://www.nhc.noaa.gov/experimental/arrivaltimes/>





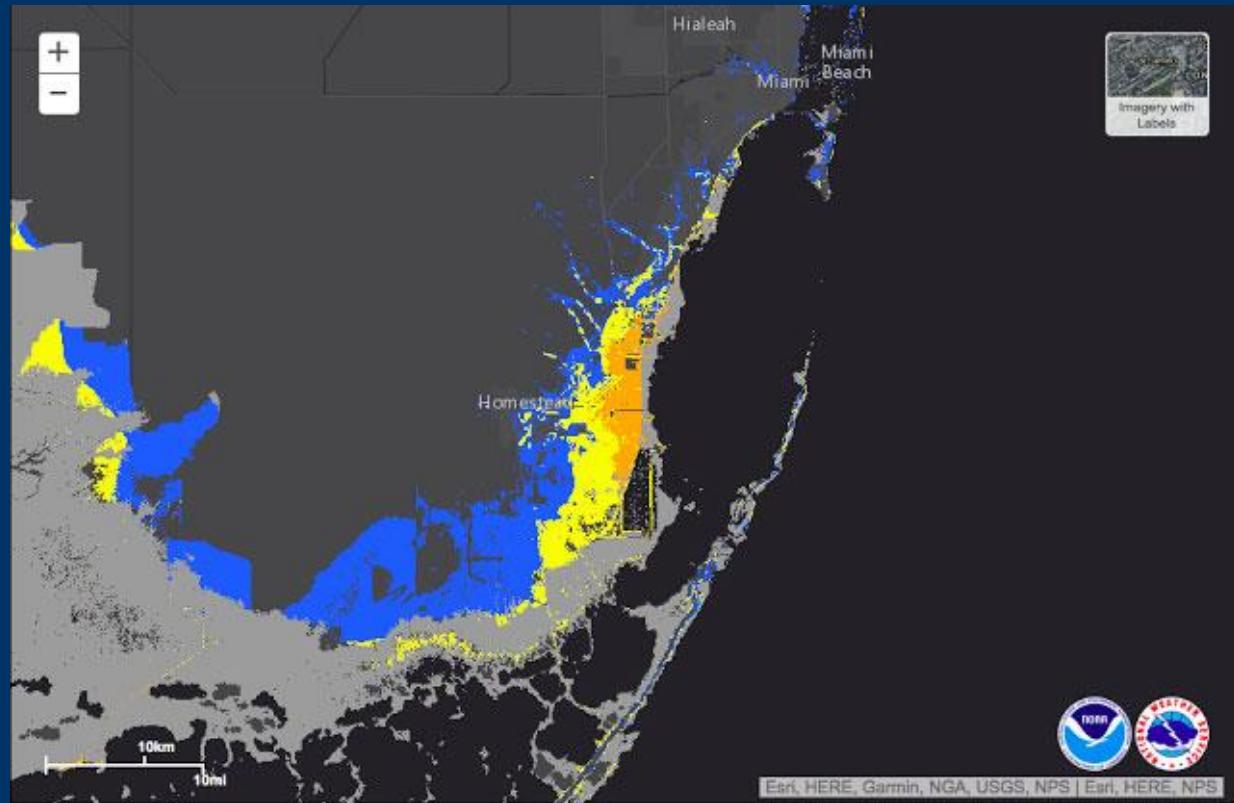
# NHC Storm Surge Watch/Warning

- Highlights areas that have a significant risk of life-threatening storm surge inundation from a hurricane (or tropical storm)
  - Watch: conditions possible somewhere in the watch area within ~48 hours
  - Warning: conditions expected somewhere in the warned area within ~36 hours
- Subjectively determined based on collaboration between the NHC and local WFOs
- Available on the NHC's website shortly after each Advisory is issued
- Product description:
  - <https://www.nhc.noaa.gov/aboutnhc/graphics.shtml?#WSURGE>








# NHC Potential Storm Surge Flooding Map

- Shows potential inundation (i.e., water heights above ground) that could result from a storm's surge combined with the astronomical tide (i.e., storm tide)
- Available on the NHC's website ~60-90 minutes after the 1<sup>st</sup> Hurricane Watch is issued for a storm (sometimes with a Tropical Storm Watch) and updated with each subsequent advisory
- **ALWAYS** represents a reasonable worst-case scenario that people should prepare for
  - Thus, best used in the earlier stages of a storm
- Product description:
  - <https://www.nhc.noaa.gov/aboutnhcgraphics.shtml?#INUNDATION>



## Potential Storm Surge Flooding\*

	Intertidal Zone/Estuarine Wetland
	Greater than 1 foot above ground
	Greater than 3 feet above ground
	Greater than 6 feet above ground
	Greater than 9 feet above ground

## Map Layer Options:

Inundation Layer Only

Inundation with Intertidal Layer

Map Opacity Slider

[Download GIS data](#)  
(Instructions)

[Inundation Layer Only](#)

[Inundation with Intertidal Layer](#)

# NWS Charleston Products

## Hurricane Local Statement (HLS)

HURRICANE MATTHEW LOCAL STATEMENT INTERMEDIATE ADVISORY NUMBER 35A  
NATIONAL WEATHER SERVICE CHARLESTON SC AL142016  
807 PM EDT THU OCT 6 2016

THIS PRODUCT COVERS SOUTHEAST SOUTH CAROLINA AND SOUTHEAST GEORGIA

**\*\*DANGEROUS HURRICANE MATTHEW WILL IMPACT THE REGION FRIDAY INTO SATURDAY\*\***

### NEW INFORMATION

\*\*\*\*\*  
\* CHANGES TO WATCHES AND WARNINGS:

\*\*\*\*  
\* CURRENT WATCHES AND WARNINGS:

\*\*\*\*  
\* STORM INFORMATION:

### SITUATION OVERVIEW

### POTENTIAL IMPACTS

\*\*\*\*\*  
\* WIND:

\*\*\*  
\* SURGE:

\*\*\*  
\* FLOODING RAIN:

\*\*\*  
\* TORNADOES:

### PRECAUTIONARY/PREPAREDNESS ACTIONS

\*\*\*  
\* ADDITIONAL SOURCES OF INFORMATION:

\*\*\*  
NEXT UPDATE

\*\*\*

➤ “Big Picture”  
overview of the  
storm, including  
the potential  
impacts across  
the SC  
Lowcountry/GA  
Coastal Empire

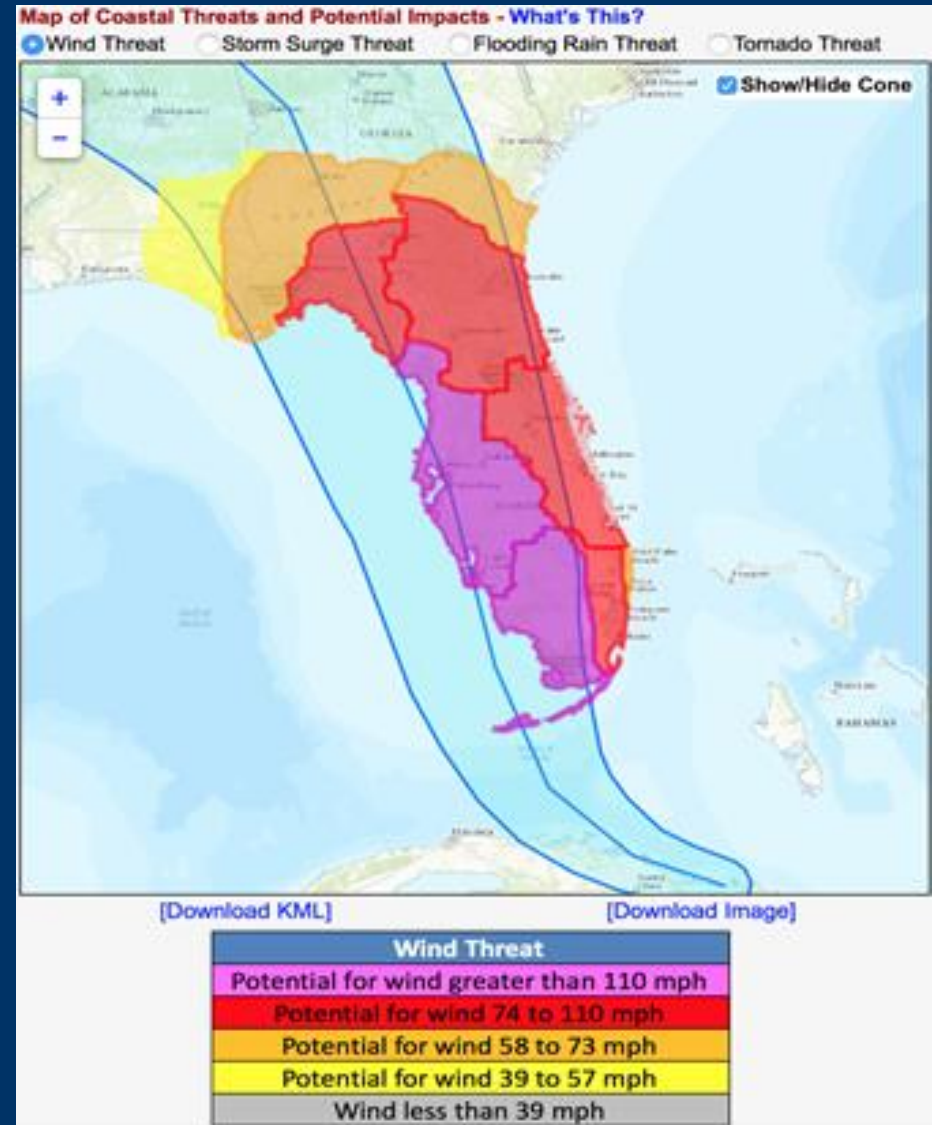
⏪ Portion of a HLS issued for  
Hurricane Matthew (2016)



# NWS Charleston Products

## Hurricane Threats and Impacts Graphics

- Shows the threat levels and potential impacts from wind, storm surge, rainfall and tornadoes that people should prepare for
- Provides recommended protective actions
- Product description:
  - [https://www.weather.gov/media/srh/tropical/PDD\\_HTI.pdf](https://www.weather.gov/media/srh/tropical/PDD_HTI.pdf)



# NWS Charleston Products

## Post-storm Report (PSH)

POST TROPICAL CYCLONE REPORT...TROPICAL STORM MICHAEL...CORRECTED  
NATIONAL WEATHER SERVICE CHARLESTON SC  
404 AM EST SAT NOV 10 2018

NOTE: THE DATA SHOWN HERE ARE PRELIMINARY....AND SUBJECT TO UPDATES  
AND CORRECTIONS AS APPROPRIATE.

THIS REPORT INCLUDES EVENTS OCCURRING WHEN WATCHES AND/OR WARNINGS  
WERE IN EFFECT...OR WHEN SIGNIFICANT FLOODING ASSOCIATED WITH MICHAEL  
COUNTIES INCLUDED...CHARLESTON...BERKELEY...DORCHESTER...COLLETON...  
BEAUFORT...JASPER...HAMPTON...ALLENDALE...CHATHAM...EFFINGHAM...  
SCREVEN...JENKINS...BULLOCH...BRYAN...LIBERTY...EVANS...CANDLER...  
TATTNALL...LONG...MCINTOSH

OCT 17...CORRECTED FOR...BUOYS 41004/41008 AND FBIS1  
NOV 10...CORRECTED FOR...METAR...NON-METAR AND MARINE OBSERVATIONS

A. LOWEST SEA LEVEL PRESSURE/MAXIMUM SUSTAINED WINDS AND PEAK GUSTS

-----  
METAR OBSERVATIONS...

NOTE: ANEMOMETER HEIGHT IS 10 METERS AND WIND AVERAGING IS 2 MINUTES

-----  
LOCATION ID MIN DATE/ MAX DATE/ PEAK DATE/  
LAT LON PRES TIME SUST TIME GUST TIME  
DEG DECIMAL (MB) (UTC) (DIR/KT) (UTC) (DIR/KT) (UTC)

-----  
KCHS-CHARLESTON INTL AIRPORT-SC  
32.90 -80.04 1000.3 11/1056 190/031 11/1156 200/045 11/1156  
KSAV-SAVANNAH INTL AIRPORT-GA  
32.13 -81.20 999.3 11/0753 170/032 11/0653 180/046 11/0653

➤ Summary of  
meteorological  
data and  
impacts across  
southeast SC/GA  
and the nearby  
Atlantic waters

⏪ Portion of the PSH issued for  
Tropical Storm Michael  
(2018)

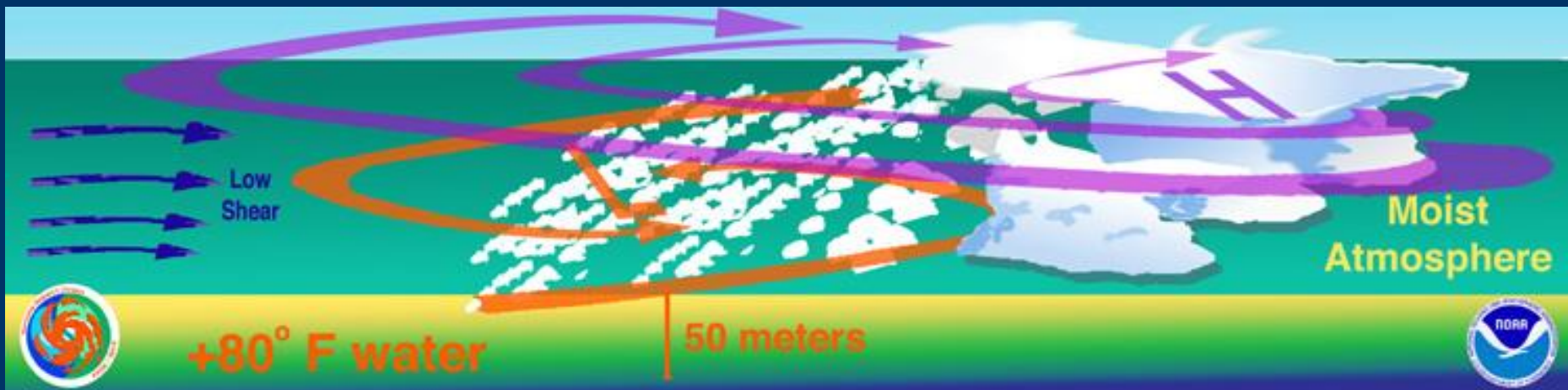
# Outline

- Tropical Cyclone Hazards
- Being Prepared and Staying Informed
- **Tropical Cyclone Basics**
- Tropical Cyclone Climatology
- Tropical Cyclone History for Southeast South Carolina and Southeast Georgia



# Tropical Cyclone Basics

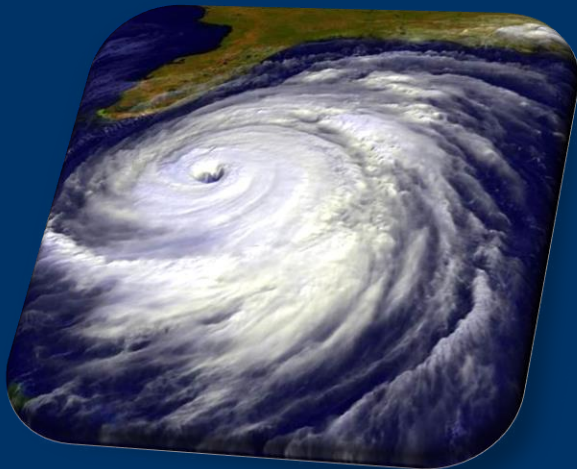
- Tropical Cyclone: rotating system of showers and thunderstorms originating over tropical or subtropical waters and having a closed low-level circulation (i.e., at least one isobar around the center)
- Ingredients needed for development:
  - Ocean water temperatures 80 degrees Fahrenheit or greater
  - Low amounts of vertical wind shear (i.e., winds of different strengths/directions at different heights)
  - Moist and unstable air (i.e., air prone to rising)
  - Pre-existing near-surface low pressure with sufficient spin



# Tropical Cyclone Stages

- Tropical Disturbance
- Tropical Depression
- Tropical Storm
- Hurricane

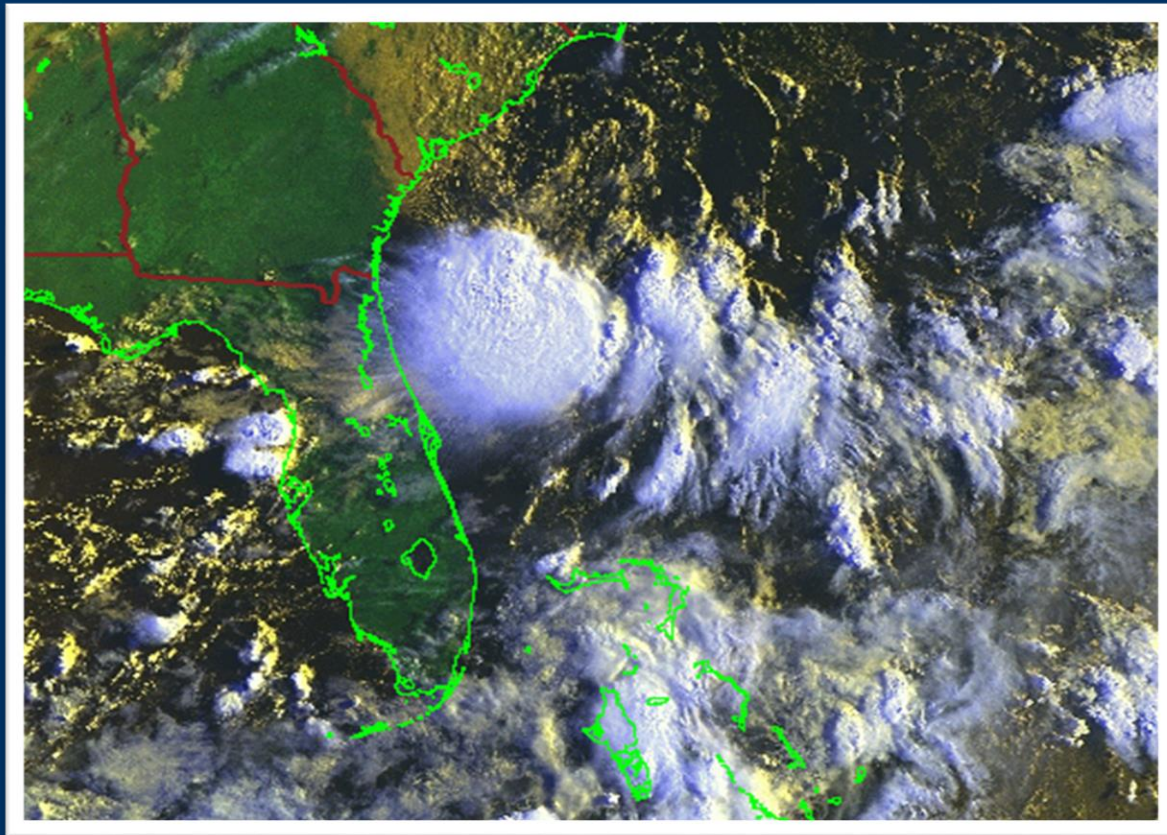
- Potential tropical cyclone: disturbance which has a high chance of becoming a tropical cyclone
- Post-tropical cyclone: former tropical cyclone which no longer possesses sufficient tropical characteristics but can still produce strong winds and heavy rain



# Tropical Cyclone Stages

## Tropical Disturbance

- no organized surface circulation
- disorganized cluster of thunderstorms

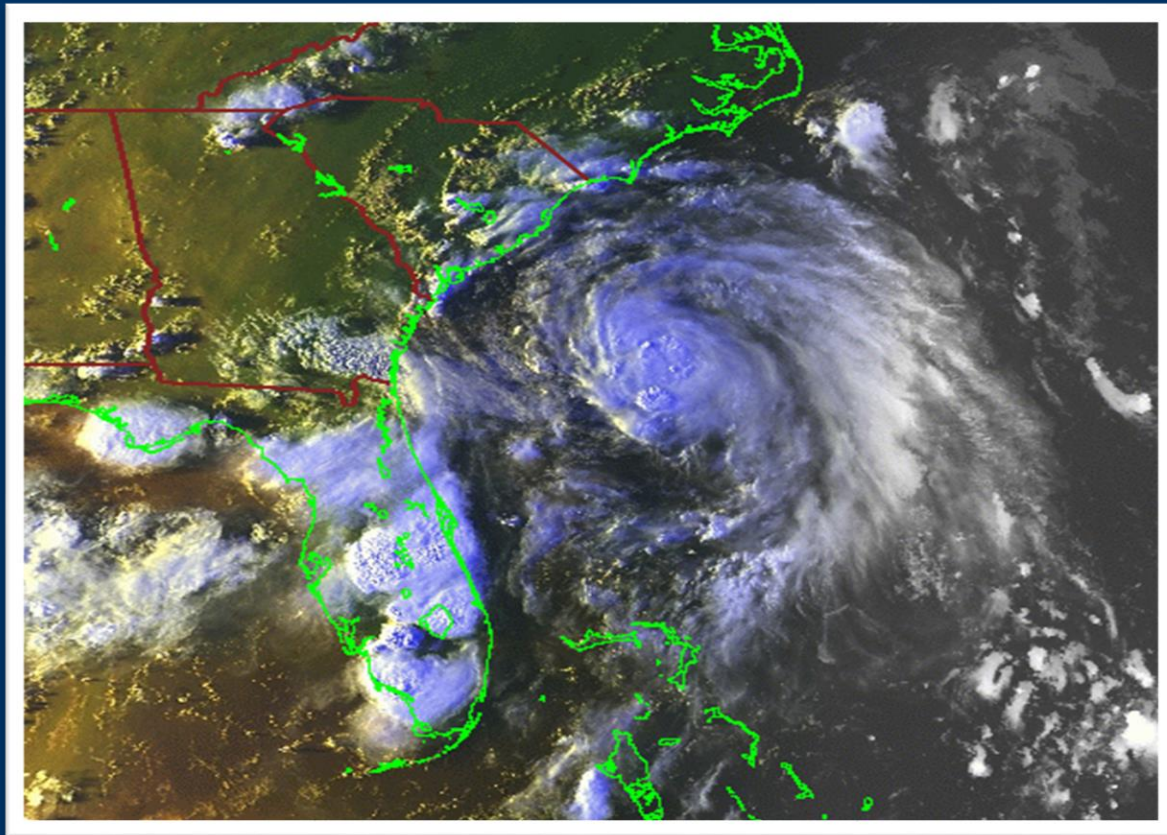




# Tropical Cyclone Stages

## Tropical Depression

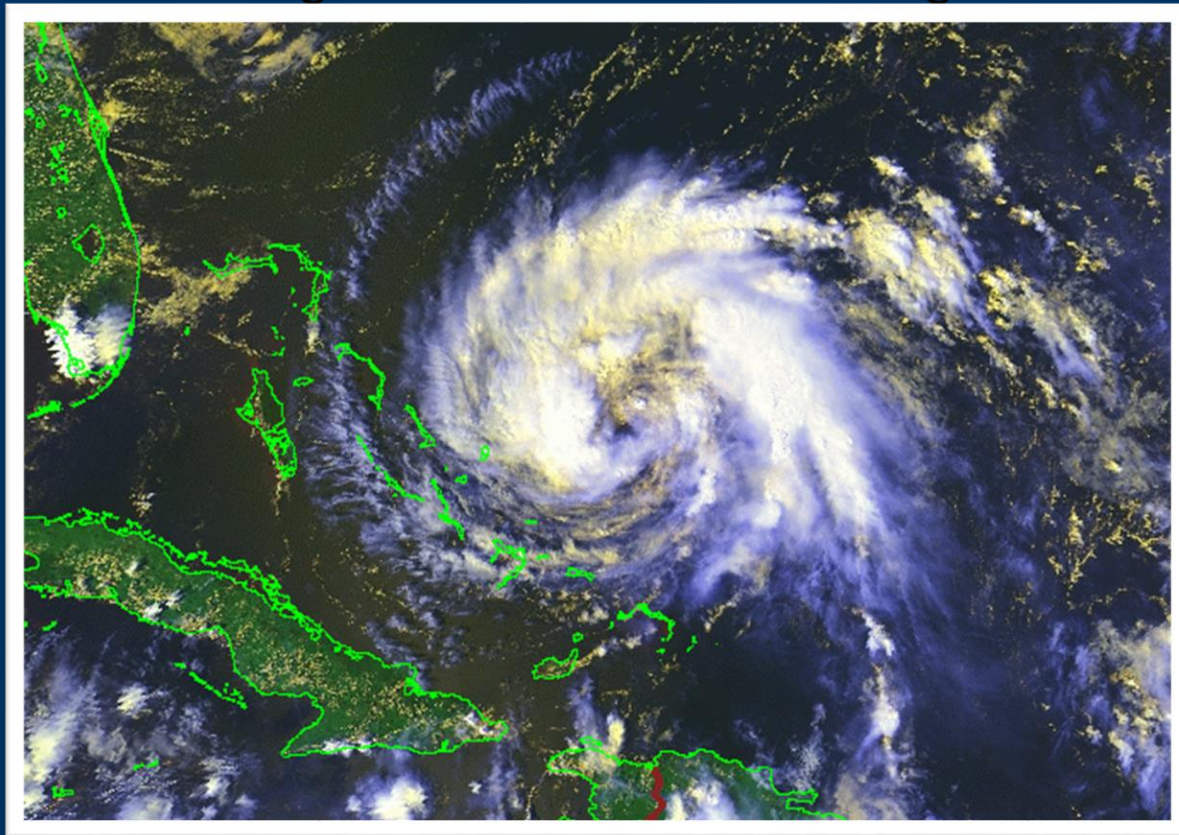
- sustained winds less than 39 mph
- surface low pressure better organized



# Tropical Cyclone Stages

## Tropical Storm

- sustained winds of 39-73 mph
- more organization of thunderstorms around the center
  - gets a name at this stage

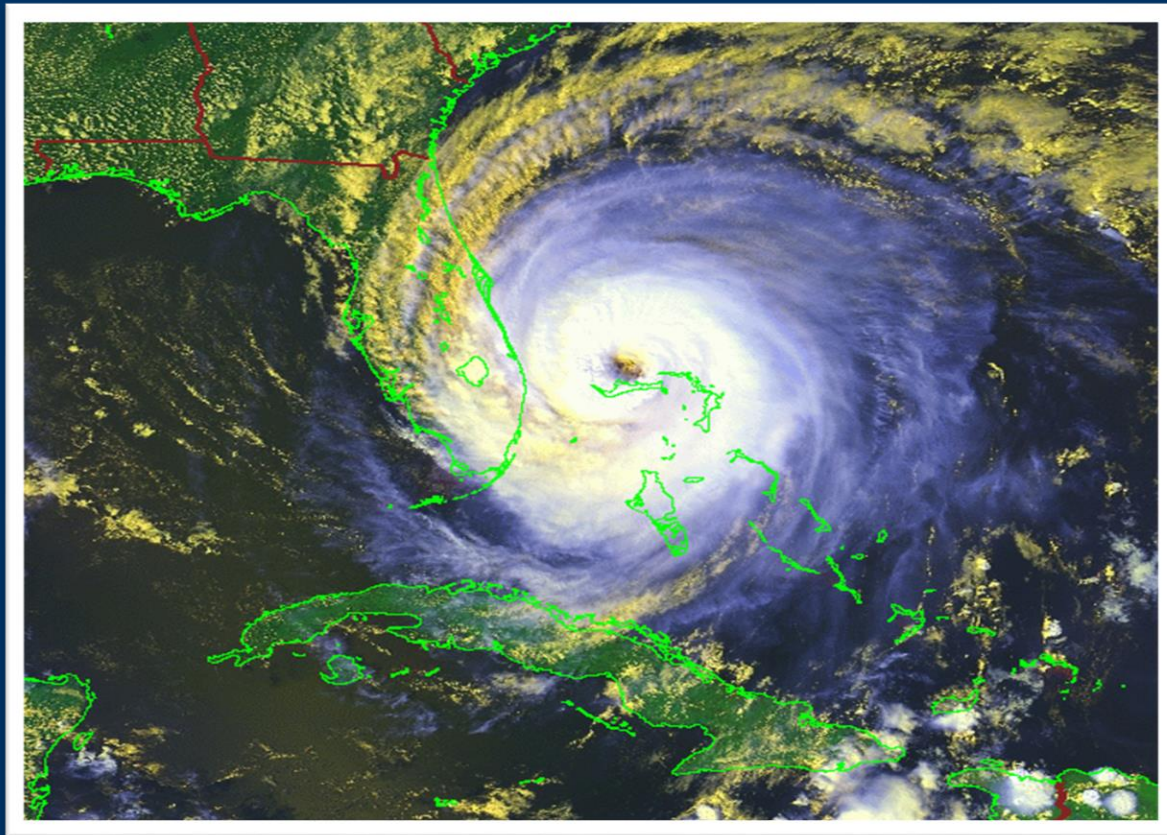




# Tropical Cyclone Stages

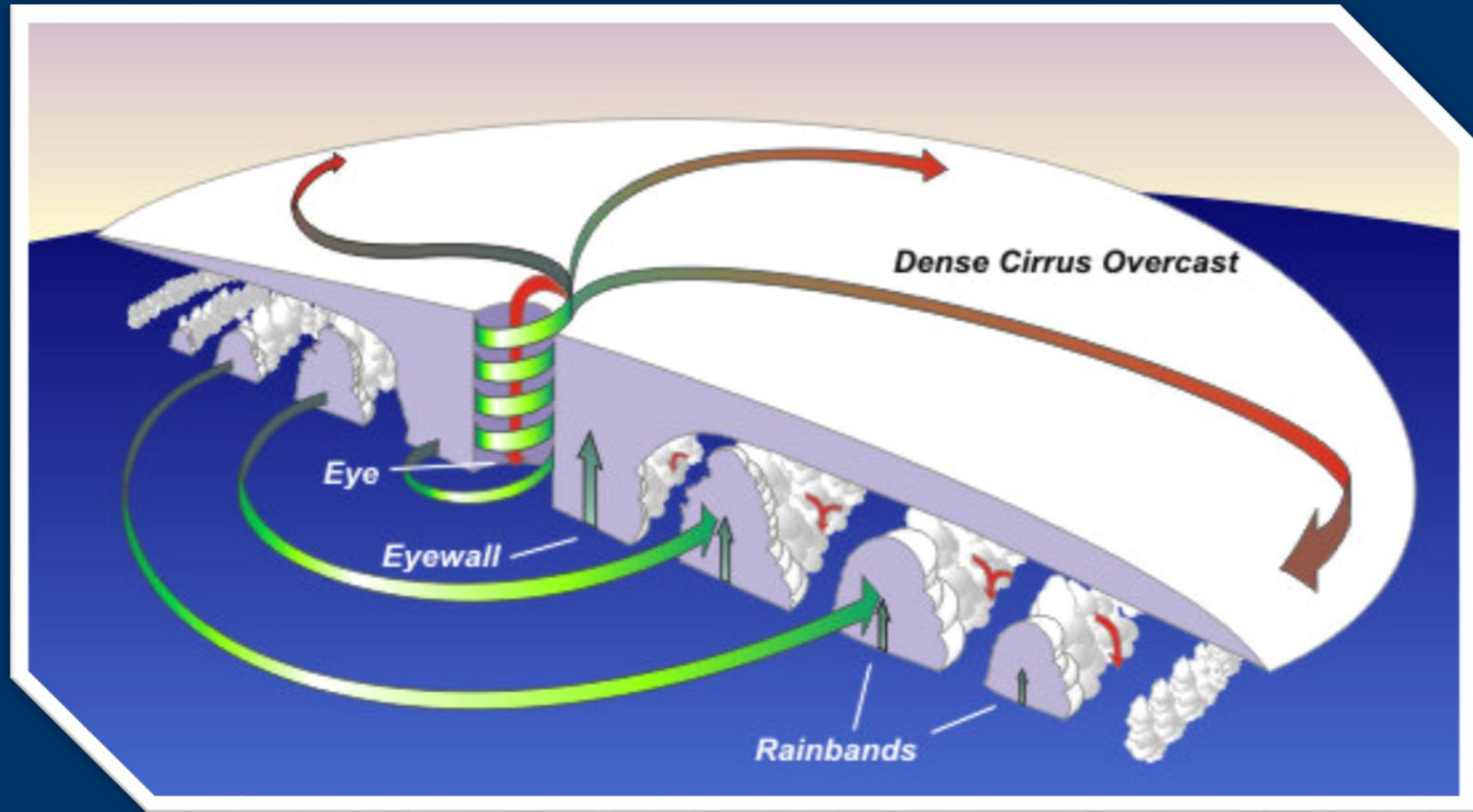
## Hurricane

- sustained winds of 74 mph or greater
- very well-organized system with thunderstorms around the central “eye” as well as in rain bands spiraling inward toward the center





# Hurricane Structure



- The eye wall surrounds the calm eye and typically contains the strongest winds
- The outer rain bands contain gusty winds, heavy rain and some tornadoes

# Saffir-Simpson Hurricane Wind Scale

➤ <https://www.nhc.noaa.gov/aboutsshws.php>

➤ Category 1:

- 74-95 mph winds
- minimal damage

➤ Category 2:

- 96-110 mph winds
- moderate damage

➤ Category 3:

- 111-129 mph winds
- major damage

➤ Category 4:

- 130-156 mph winds
- extreme damage

➤ Category 5:

- 157+ mph winds
- catastrophic damage



Major hurricanes (Cat 3-5)  
produce 85% of all hurricane  
damage!

**NOTE: This scale should NOT be used to determine the amount of storm surge a hurricane can produce!!**

# Hurricane Observing & Forecasting

## Aircraft – “Hurricane Hunters”

- **NOAA P-3/Air Force Reserve WC-130**
  - samples storm environment between 500 – 10,000 feet
- **NOAA Gulf Stream IV**
  - samples a large area around storm ~45,000 feet high

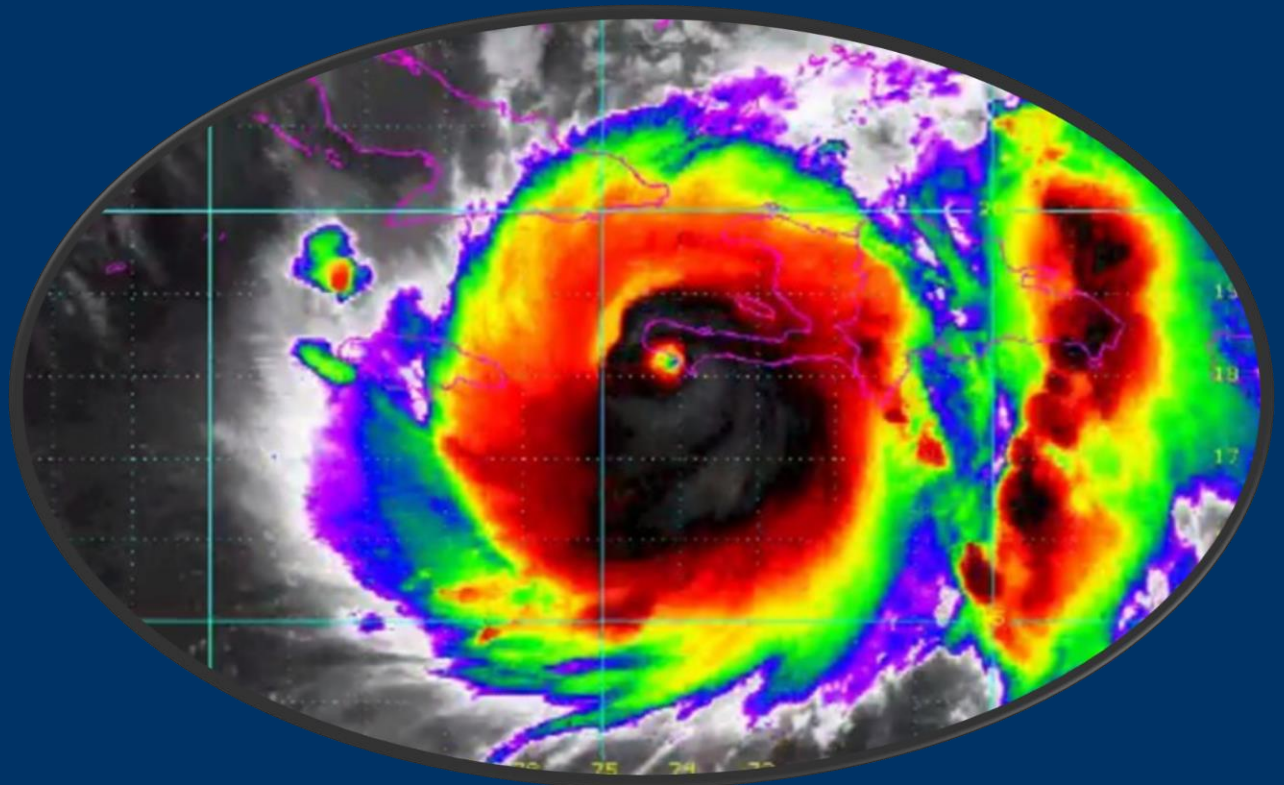
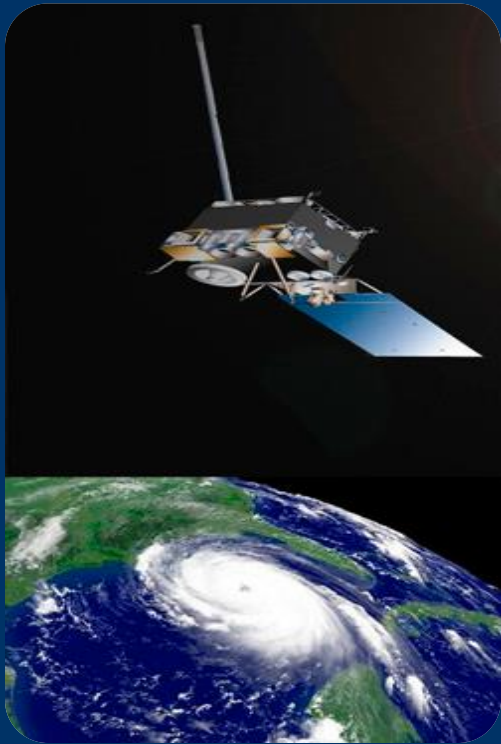




# Hurricane Observing & Forecasting

## Satellites

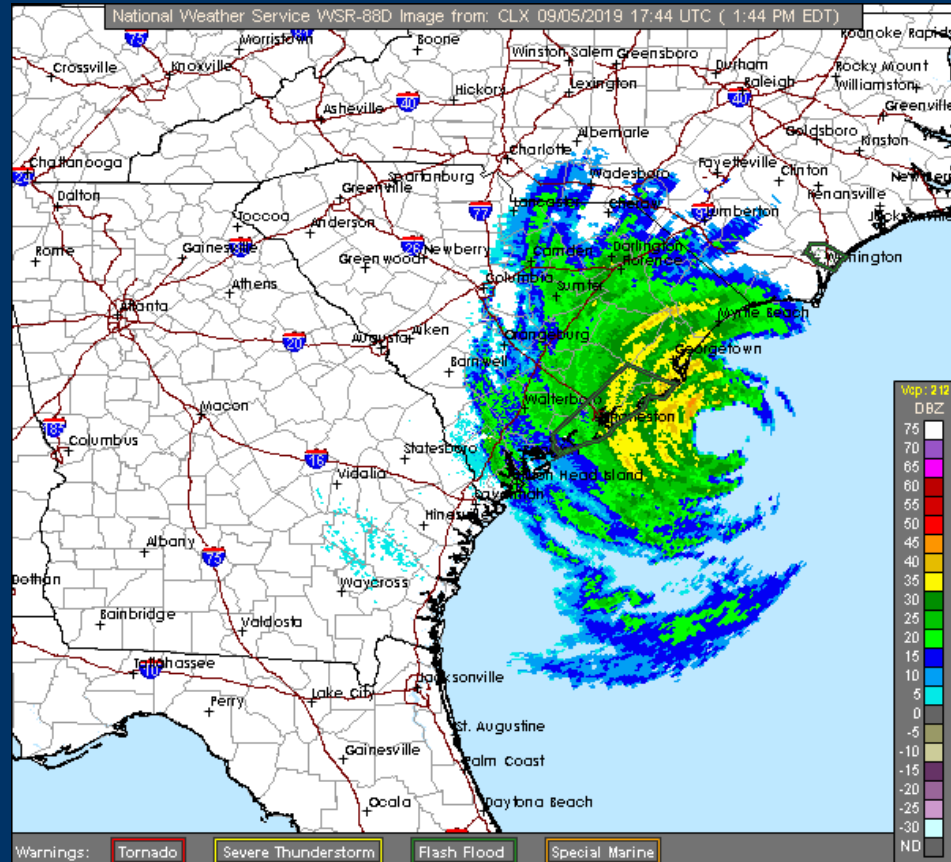
- *Global Network of Geostationary and Polar Orbiters*
  - *used for hurricane analysis, tracking and forecasting*



# Hurricane Observing & Forecasting

## NWS Doppler Radar

- observe rain, wind and possibly tornadoes
- help determine the center of the storm (which is important for track forecasting)



# Hurricane Observing & Forecasting

## Buoys, Ships, & Land-based Observations

- observe atmospheric and oceanic conditions

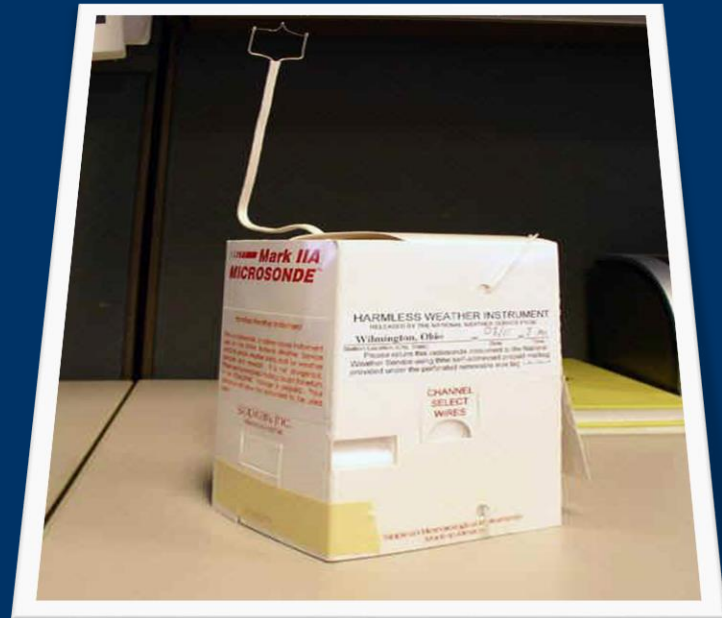




# Hurricane Observing & Forecasting

## Weather Balloons/Radiosondes

- launched up to 4 times per day during hurricanes
- observe atmospheric pressure, temperature, wind and humidity up to ~20 miles high
- help initialize weather forecast models

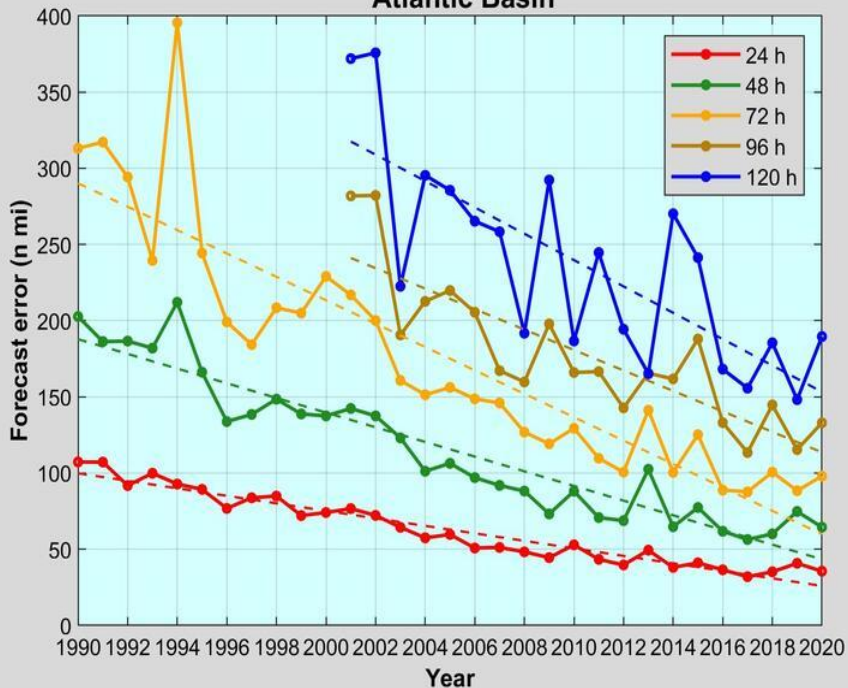


# Hurricane Observing & Forecasting

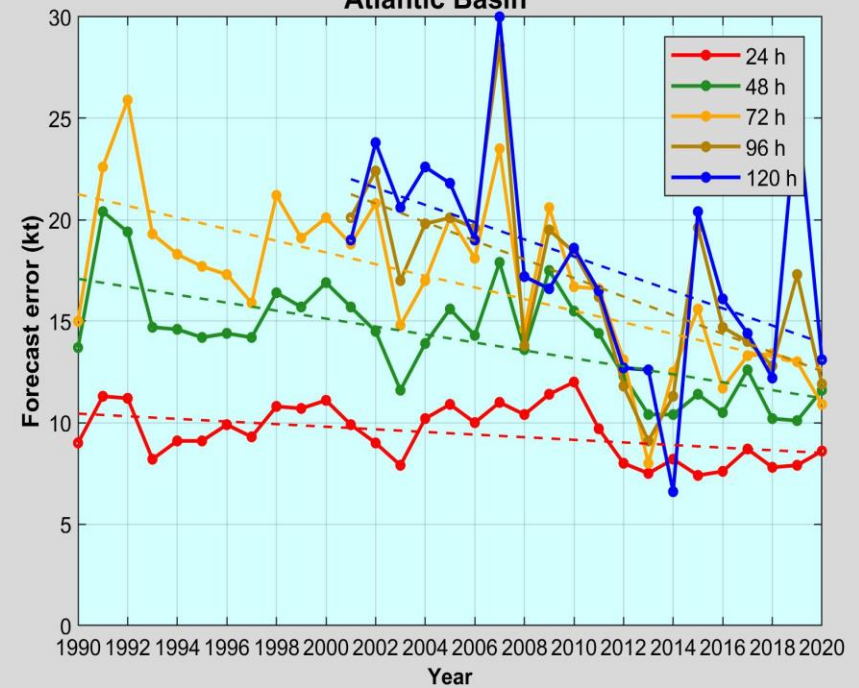
## Forecast Models

- There are many different types of models utilized by the National Hurricane Center to make their storm track/intensity forecasts
- As shown below, the [NHC's official track/intensity forecasts](#) have been improving over the last several decades (especially track forecasts)

NHC Official Track Error Trend  
Atlantic Basin



NHC Official Intensity Error Trend  
Atlantic Basin



# Outline

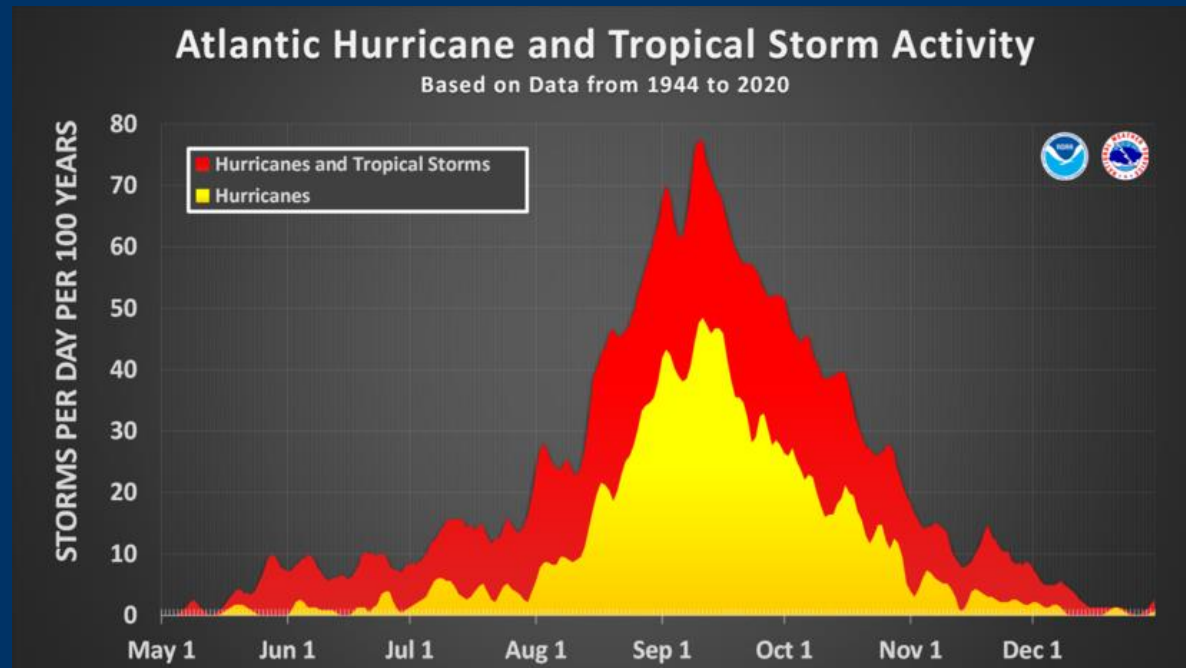
- Tropical Cyclone Hazards
- Being Prepared and Staying Informed
- Tropical Cyclone Basics
- **Tropical Cyclone Climatology**
- Tropical Cyclone History for Southeast South Carolina and Southeast Georgia



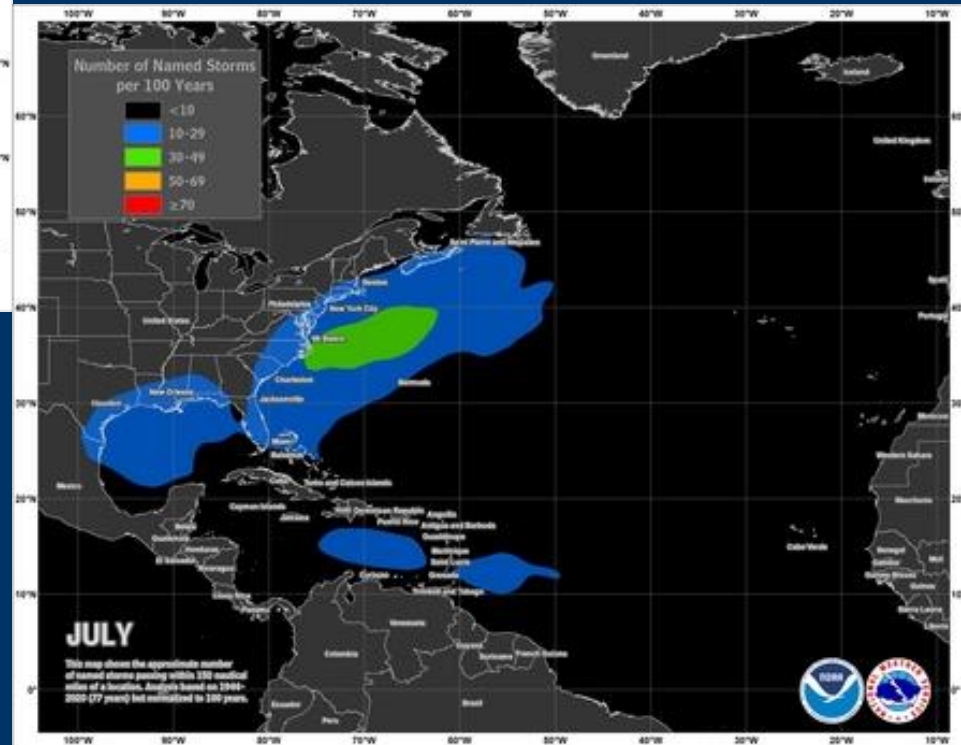
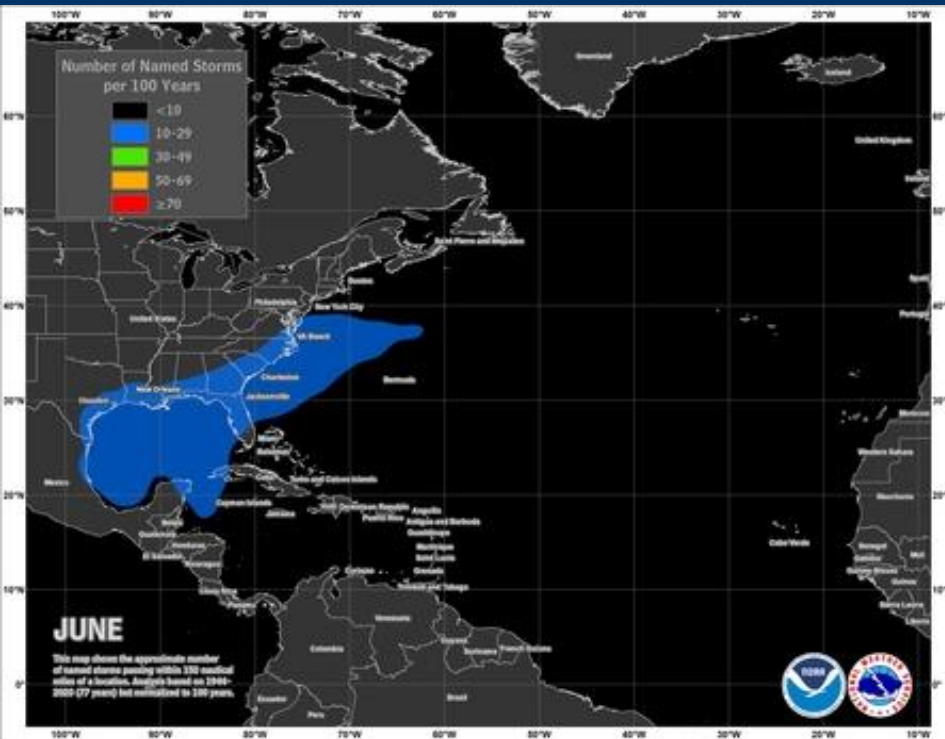
# Atlantic Basin Hurricane Season

Officially June 1 – November 30

- Includes most of northwest Atlantic Ocean, the Caribbean Sea and the Gulf of Mexico
- Peak of the season is ~ September 10
- Tropical cyclones can occur before June and after November
- More info:  
<https://www.nhc.noaa.gov/climo/>

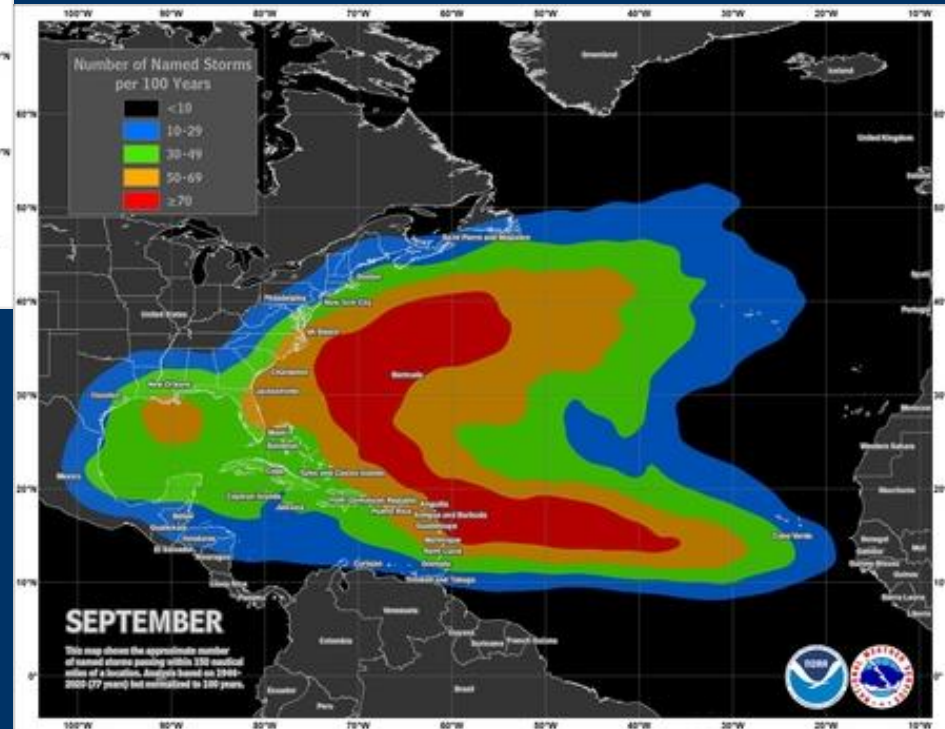
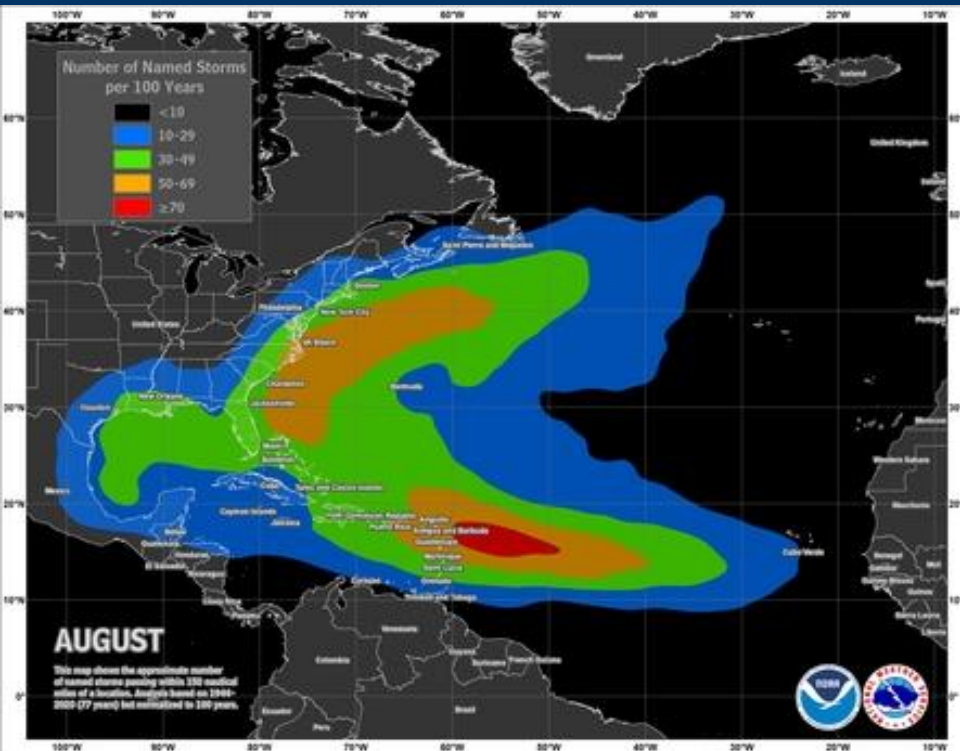


# Tropical Cyclone Formation Areas By Month



» Images courtesy of NWS/NHC

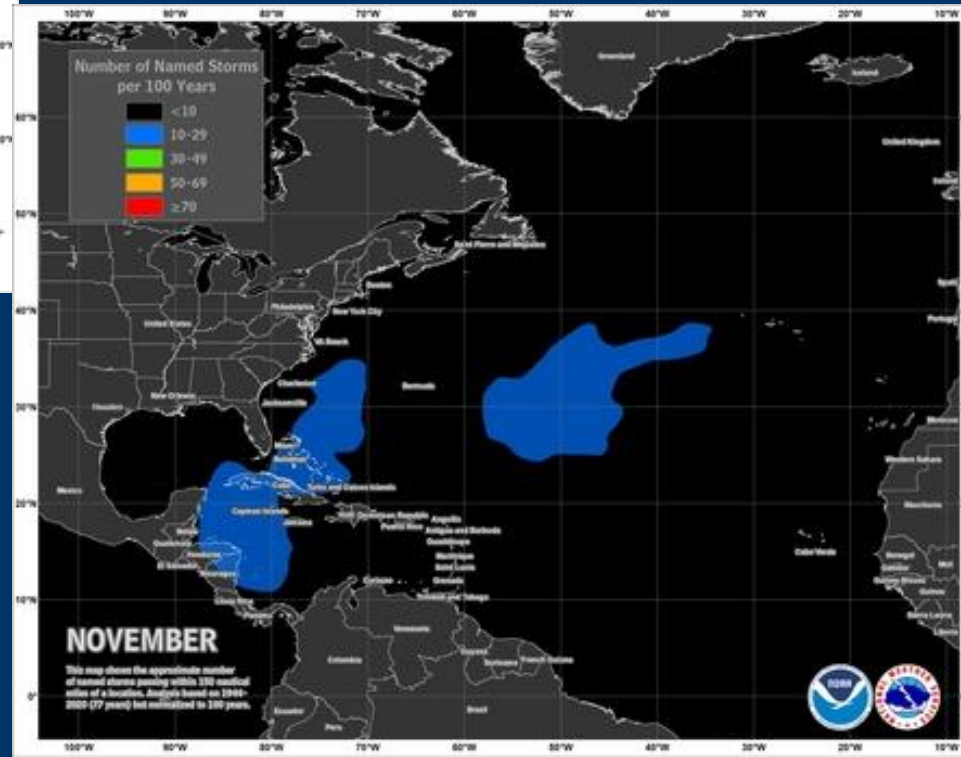
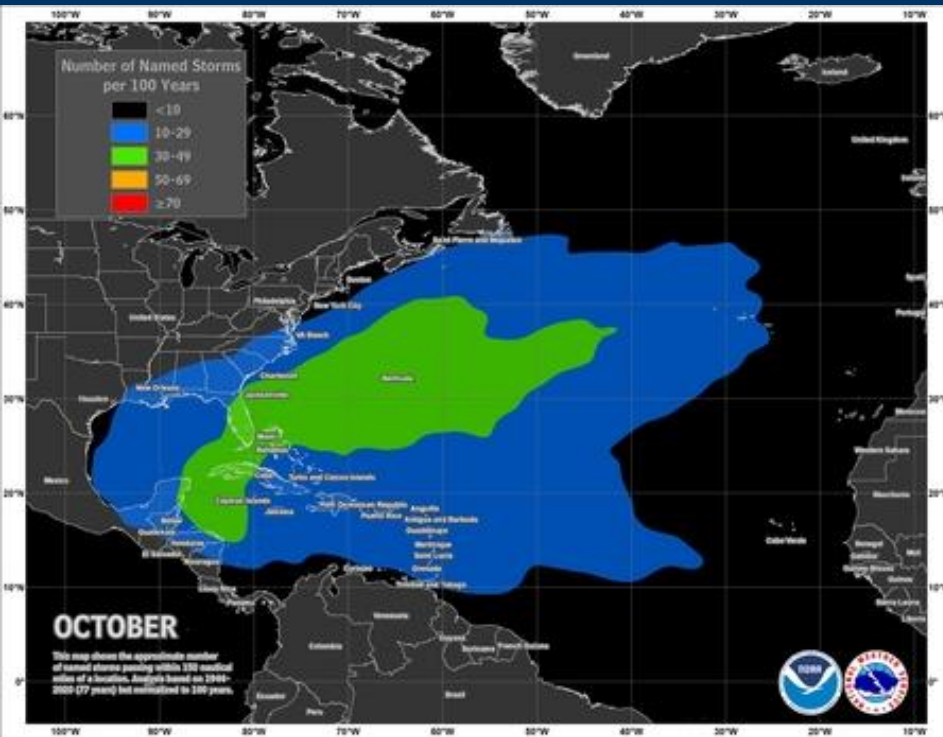
# Tropical Cyclone Formation Areas By Month



» Images courtesy of NWS/NHC

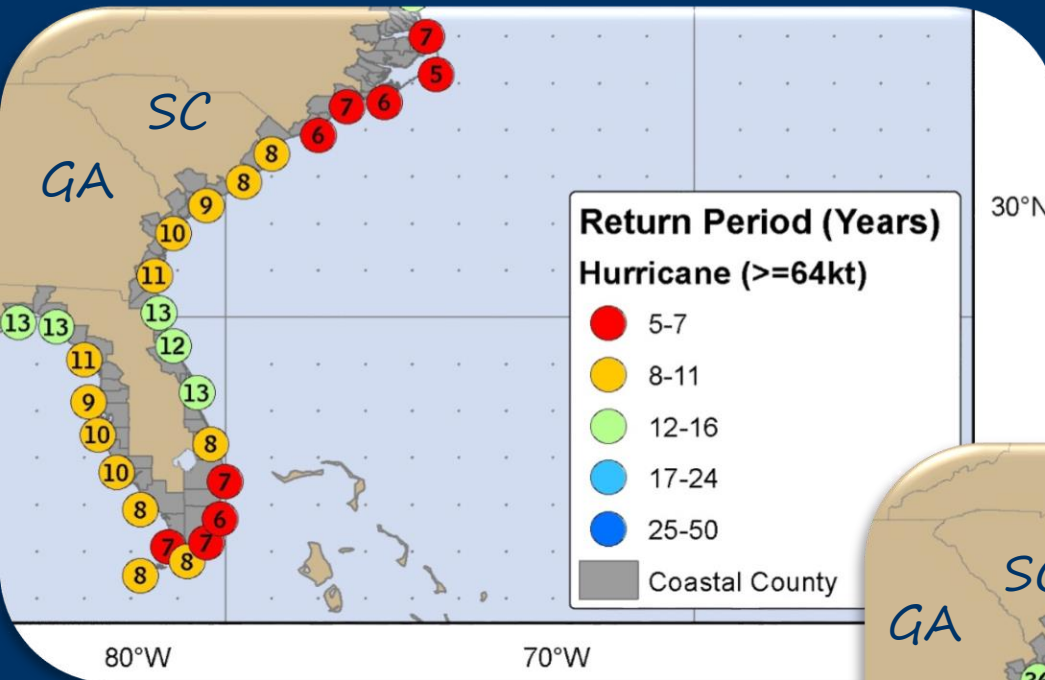


# Tropical Cyclone Formation Areas By Month



» Images courtesy of NWS/NHC

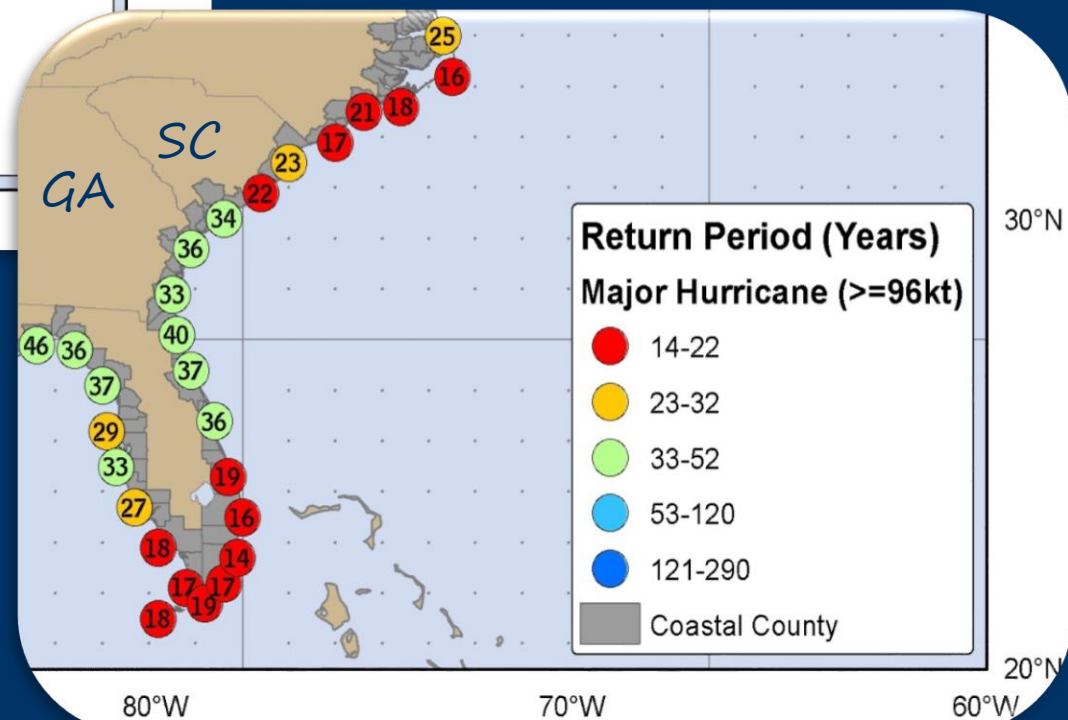
# Southeast U.S. Hurricane Return Periods



➤ *Return Period*: frequency of a particular event

➤ *On average*, a hurricane passes within 58 miles of Charleston (Savannah) every 8 (10) years with a major hurricane doing so every 22 (36) years

➤ More info:  
<https://www.nhc.noaa.gov/climo/#returns>



# Outline

- Tropical Cyclone Hazards
- Being Prepared and Staying Informed
- Tropical Cyclone Basics
- Tropical Cyclone Climatology
- Tropical Cyclone History for Southeast South Carolina and Southeast Georgia



# Local Tropical Cyclone History

<https://www.weather.gov/chs/TChistory>

- From 1851 (when official records begin) through 2021, 42 tropical cyclones (tropical depressions, tropical storms and hurricanes) have made landfall in the NWS Charleston County Warning Area (Charleston County, SC southward through McIntosh County, GA), including:
  - 7 tropical depressions
  - 10 tropical storms
  - 25 hurricanes, 5 of which were Cat 3-5, including:
    - Unnamed - Sep 1854
    - "Great Sea Islands Hurricane" - Aug 1893
    - Unnamed - Oct 1893
    - Gracie - Sep 1959
    - Hugo - Sep 1989

» Images courtesy of NOAA



# Important Links



## ➤ Tropical Cyclone Safety/Preparedness

➤ National Weather Service:

➤ <https://www.weather.gov/safety/hurricane>

➤ NWS Charleston, SC:

➤ [Hurricane Preparedness Webinar](#)

➤ [Hurricane Basics Webinar](#)

➤ NWS National Hurricane Center:

➤ <https://www.weather.gov/wrn/hurricane-preparedness>

➤ NOAA Extreme Weather Information Sheets:

➤ <https://www.ngdc.noaa.gov/newis/>

➤ Federal Emergency Management Agency:

➤ <https://www.fema.gov/>

➤ Department of Homeland Security:

➤ <https://www.ready.gov/hurricanes>

➤ South Carolina Emergency Management Agency (includes evacuation zone/route info):

➤ <https://www.scemd.org/>

➤ Georgia Emergency Management Agency (includes evacuation zone/route info):

➤ <https://gema.georgia.gov/>

## ➤ Tropical Cyclone Forecasts

➤ NHC: <https://hurricanes.gov/>

➤ NWS Charleston, SC: <https://weather.gov/chs/tropical>

# Important Links



## ➤ Storm Surge

- NHC: <https://www.nhc.noaa.gov/surge/>
- Risk Maps: <https://www.nhc.noaa.gov/nationalsurge/>

## ➤ Southeast SC/GA Tropical Cyclone History

- <https://www.weather.gov/chs/TChistory>

## ➤ Tropical Cyclone Frequently Asked Questions (FAQ)

- <https://www.aoml.noaa.gov/hrd-faq/>

## ➤ NOAA Education Resources – Hurricanes

- <https://www.noaa.gov/education/resource-collections/weather-atmosphere-education-resources/hurricanes>

## ➤ Tropical Cyclone Names

- <https://www.nhc.noaa.gov/aboutnames.shtml>

## ➤ Blank Tracking Charts

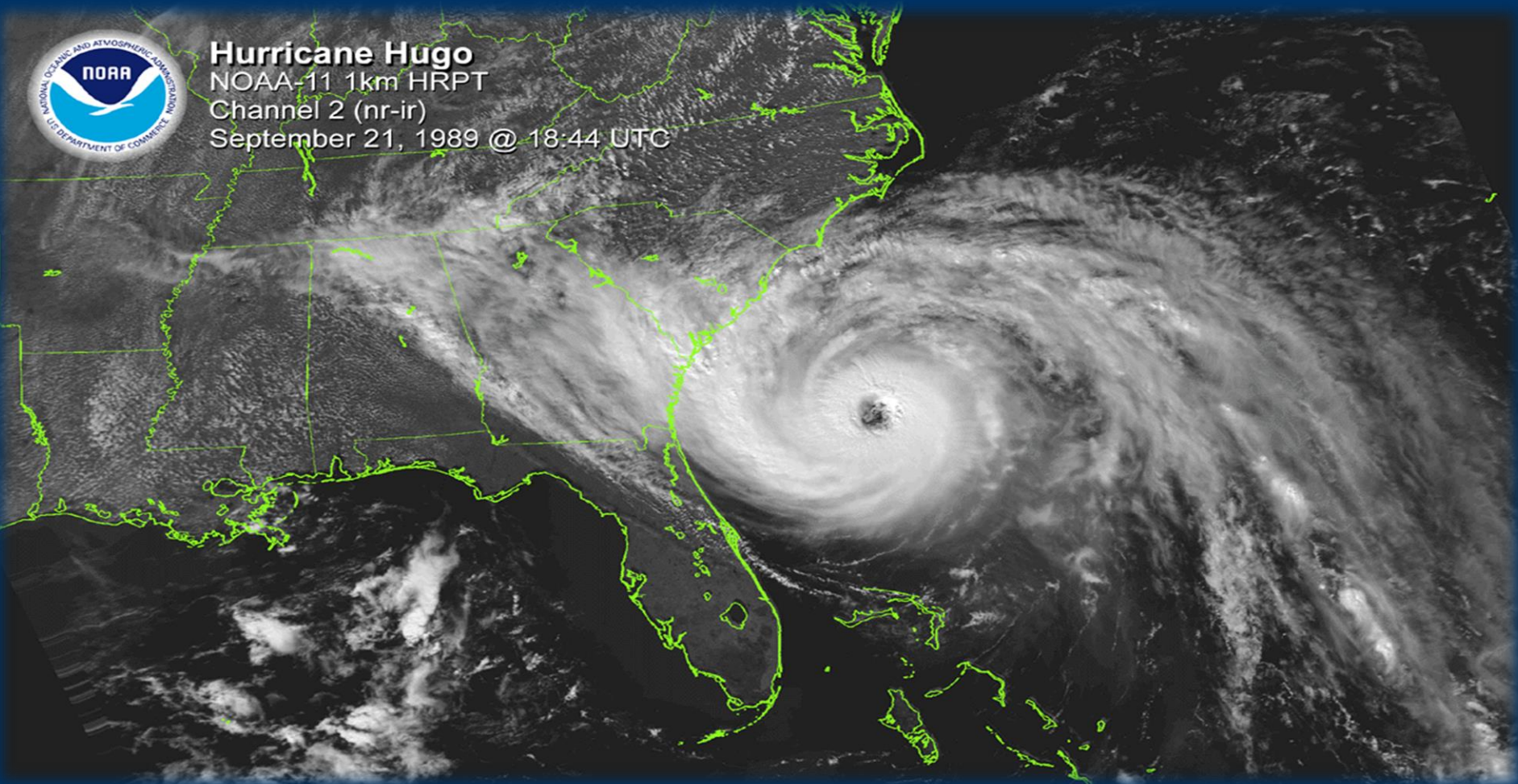
- [https://www.nhc.noaa.gov/tracking\\_charts.shtml](https://www.nhc.noaa.gov/tracking_charts.shtml)



# We Wish You a Safe Hurricane Season!



**Hurricane Hugo**  
NOAA-11 1km HRPT  
Channel 2 (nr-ir)  
September 21, 1989 @ 18:44 UTC



[weather.gov/chs](https://weather.gov/chs)



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<https://www.facebook.com/NWSCharlestonSC>

