

Hurricane Preparedness 2020

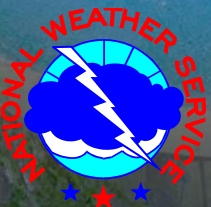


HURRICANE
EVACUATION
ROUTE

Erik Heden

National Weather Service

Newport/Morehead City, NC





Our Mission



The National Weather Service (NWS)

Weather.gov > About the NWS

About the NWS

National Program

About

Serving you in every community in the U.S. Check out who we are and what we do!

NWS Mission

Provide weather, water, and climate data, forecasts and warnings for the protection of life and property and enhancement of the national economy.

NWS Vision

A Weather-Ready Nation: Society is prepared for and responds to weather, water, and climate-dependent events.

Weather-Ready Nation Story

Accurate weather forecasts do not always result in a good outcome. The National Weather Service (NWS) learned this difficult...[Read more](#)





Our Local Office



Eastern part of North Carolina

Includes: Land areas, inland rivers, sounds, and adjacent ocean

Other parts of the state covered by other local offices (Raleigh, Wilmington, etc)





Open 24/7/365



Hurricane Florence

Staff here for 3 to 7 days



Our building is designed to withstand storms

We stay when the weather is bad



Our Website

weather.gov/newport



Weather information from past events, current weather, and forecast

Explore the website and bookmark or save what you like

Go in depth as much as you need

The screenshot shows the NWS website interface for Newport/Morehead City, NC. At the top, there are navigation links: HOME, FORECAST, PAST WEATHER, SAFETY, INFORMATION, EDUCATION, NEWS, SEARCH, and ABOUT. Below the navigation is a local forecast section with a search box for "City, St" or ZIP code and a "Go" button. A "News Headlines" section features a link to "The Fall 2019 Edition Of Our Newsletter, Carolina Skywatcher, Is Now Online!". The main content area is titled "NWS Forecast Office Newport/Morehead City, Newport/Morehead City, NC" and includes a "Weather Forecast Office" label. A navigation bar below the title offers links for "Current Hazards", "Current Conditions", "Radar", "Forecasts", "Rivers and Lakes", "Climate and Past Weather", and "Local Programs". The central focus is a map of the region with a legend for "Watches, Warnings & Advisories": Coastal Flood Advisory (green), High Surf Advisory (purple), Small Craft Advisory (pink), Hazardous Weather Outlook (yellow), and a "Zoom Out" button. A "Click a location below for detailed forecast." prompt is above the map. Below the map, it states "Last Map Update: Tue, Nov. 19, 2019 at 11:58:19 am EST". To the left of the map, there is a weather summary: "Overcast", "49°F", "9°C", and "Get Detailed info". Below this are three weather icons: "Today" (Partly Sunny, High: 55°F), "Tonight" (Mostly Cloudy, Low: 43°F), and a "change location" link. At the bottom, there are three panels: "Tropical" (a red and white cyclone icon), "Local Radar" (a radar map of the region), and "Satellite" (a satellite image of the region, dated 11/19/19 16:46Z GOES-East).



7- Day Forecast

weather.gov/newport



Sky cover



High/low temperatures



Winds



Chance of precipitation

Detailed Forecast

Today	Mostly cloudy, with a high near 54. Light northwest wind.
Tonight	Mostly cloudy, with a low around 38. West wind 5 to 7 mph.
Wednesday	Sunny, with a high near 60. Northwest wind 7 to 9 mph.
Wednesday Night	Mostly clear, with a low around 38. Light north wind.
Thursday	Sunny, with a high near 60. Light and variable wind becoming northwest around 5 mph.
Thursday Night	Partly cloudy, with a low around 44.
Friday	Mostly sunny, with a high near 67.
Friday Night	Mostly cloudy, with a low around 48.
Saturday	A chance of showers. Mostly cloudy, with a high near 64. Chance of precipitation is 50%.
Saturday Night	A chance of showers. Mostly cloudy, with a low around 44. Chance of precipitation is 50%.
Sunday	Partly sunny, with a high near 58.
Sunday Night	Mostly clear, with a low around 39.
Monday	Sunny, with a high near 60.

Extended Forecast for New Bern NC

Today



Mostly Cloudy

High: 54 °F

Tonight



Mostly Cloudy

Low: 38 °F

Wednesday



Sunny

High: 60 °F

Wednesday Night



Mostly Clear

Low: 38 °F

Thursday



Sunny

High: 60 °F

Thursday Night



Partly Cloudy

Low: 44 °F

Friday



Mostly Sunny

High: 67 °F

Friday Night



Mostly Cloudy

Low: 48 °F

Saturday



Chance Showers

High: 64 °F



Weather Briefings

weather.gov/newport



HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Local forecast by "City, ST" or ZIP code

Enter location ...

[Location Help](#)

News Headlines

- [Here's the Updated Skywarn Training Schedule!](#)
- [Here's a Summary on the March 2-5, 2018 Wind/Coastal Flood/Low Water Event.](#)
- [Summary on the Minor Winter Weather Event, March 12-13, 2018](#)

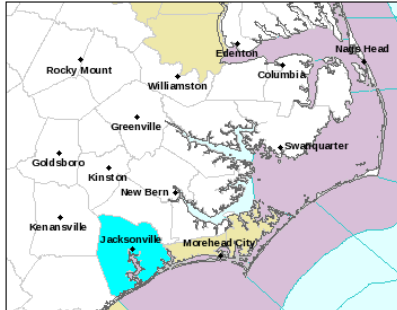
NWS Forecast Office Newport/Morehead City, Newport/Morehead City, NC

Weather Forecast Office

[Weather.gov](#) > Newport/Morehead City, NC

[Current Hazards](#) [Current Conditions](#) [Radar](#) [Forecasts](#) [Rivers and Lakes](#) [Climate and Past Weather](#) [Local Programs](#)

Click a location below for detailed forecast.



Last Map Update: Thu, Mar. 22, 2018 at 11:05:21 am EDT

[Watches, Warnings & Advisories](#)

Radar	Current Weather	Rivers & Lakes	Satellite	Weather Inform Disp	Forecast Maps
Hour by Hour Forecast	Winter Weather	Map View	Surf Forecast/Rip Currents	Weather Hazard Briefing (when applicable)	Local Self-Briefing Pages
Forecaster Discussion	Marine	Text Products	Tropical	Skywarn	Submit Storm Reports



Created prior to bigger events of severe weather

Follow us on Twitter

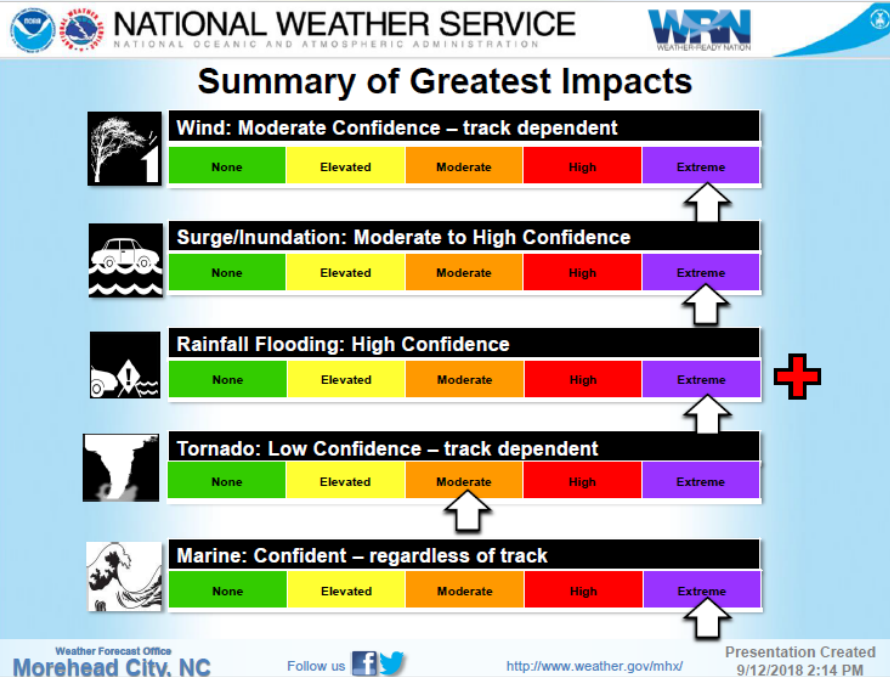
Follow us on Facebook

MXH RSS Feed

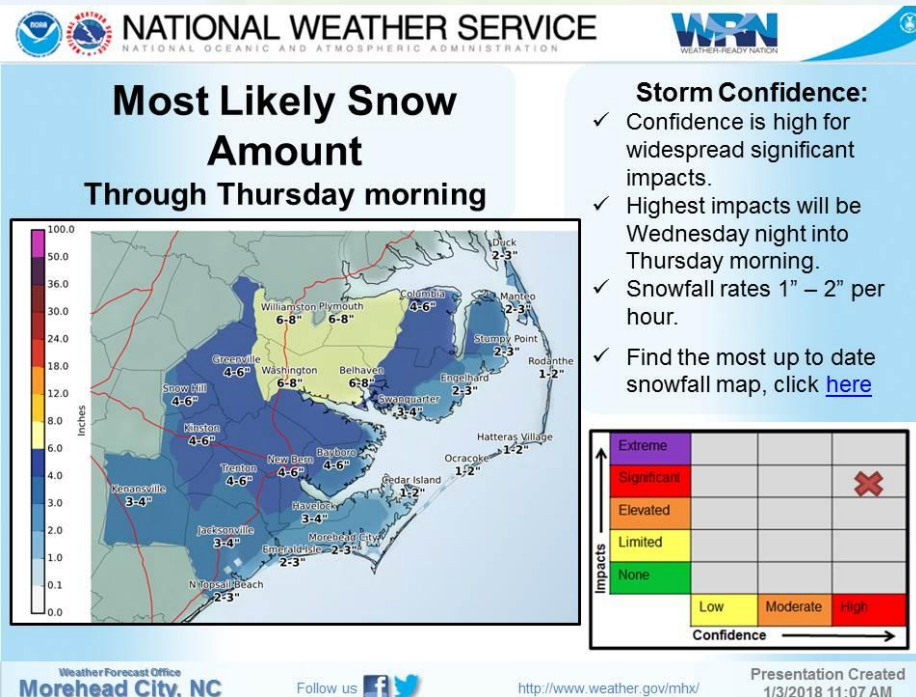


Weather Briefings

weather.gov/newport



January 2018 Winter Storm



Hurricane Florence Impacts



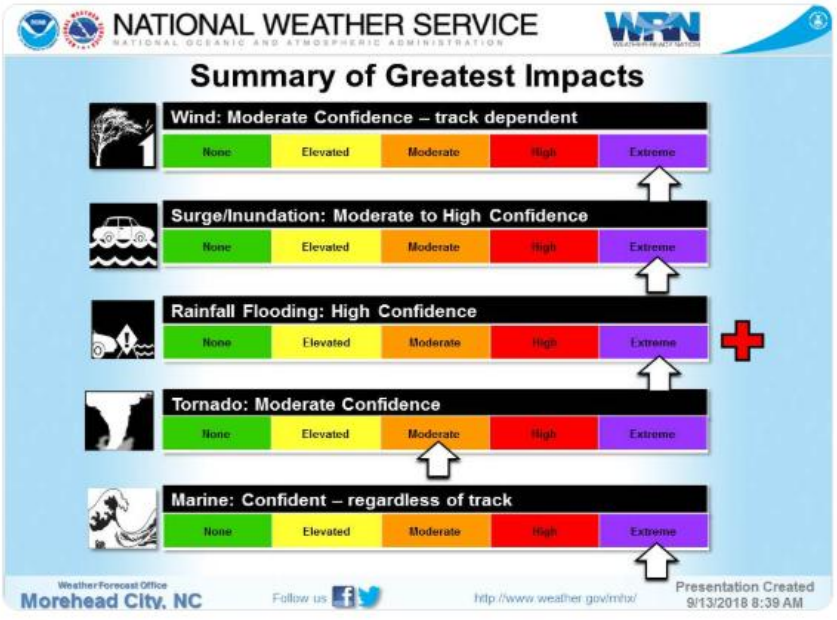
Social Media

Search NWS Morehead City



NWS Newport/Morehead @NWSMoreheadCity

Category of the storm is only related to wind, it does not tell you about all of the impacts with a #hurricane like #florence. Our impacts have not changed with storm surge and catastrophic flooding. Do not let your guard down. weather.gov/media/mhx/Late...



8:44 AM - 13 Sep 2018

765 Retweets 1,078 Likes

40 765 1.1K

YouTube

Search

NATIONAL WEATHER SERVICE
Hurricane Florence Briefing #15
As of: 630 AM
Wednesday, September 12th 2018

What has Changed?

- Track has shifted a bit further south and west, and has slowed significantly near the coast
- Extreme rainfall amounts now are expected across southern coastal counties
- Major River Flooding Likely

Disclaimer: Do not use after 5 PM Wednesday 9/12/18
Next Briefing: By 600 PM Wednesday (9/12/18)

Hurricane Florence NWS Morehead City Wednesday 900 AM Briefing

2,895 views

13 0 SHARE SAVE



NWSMoreheadCity
Published on Sep 12, 2018

SUBSCRIBE 199

Hurricane Florence Lead Up



Mobile Forecasts

mobile.weather.gov



Quickly access hourly forecasts, radar, and more from your local office, ANYWHERE in the country

Can work like a weather "APP" by adding it to home screen

Also works on PCs

National Weather Service

Morehead City NC

Current Conditions

Beaufort Smith Field
Updated: 19 Nov 09:58 am EST

48 °F
Wind NE 3 MPH
Dew Point 46 °F (93% RH)

Overcast

Forecast
19 Nov 09:58 am EST

Today	Tonight	Wednesday
Partly Sunny Hi 55°F	Mostly Cloudy Lo 45°F	Sunny Hi 58°F

Verizon 3:42 PM 50%

mobile.weather.gov

Hourly Forecast

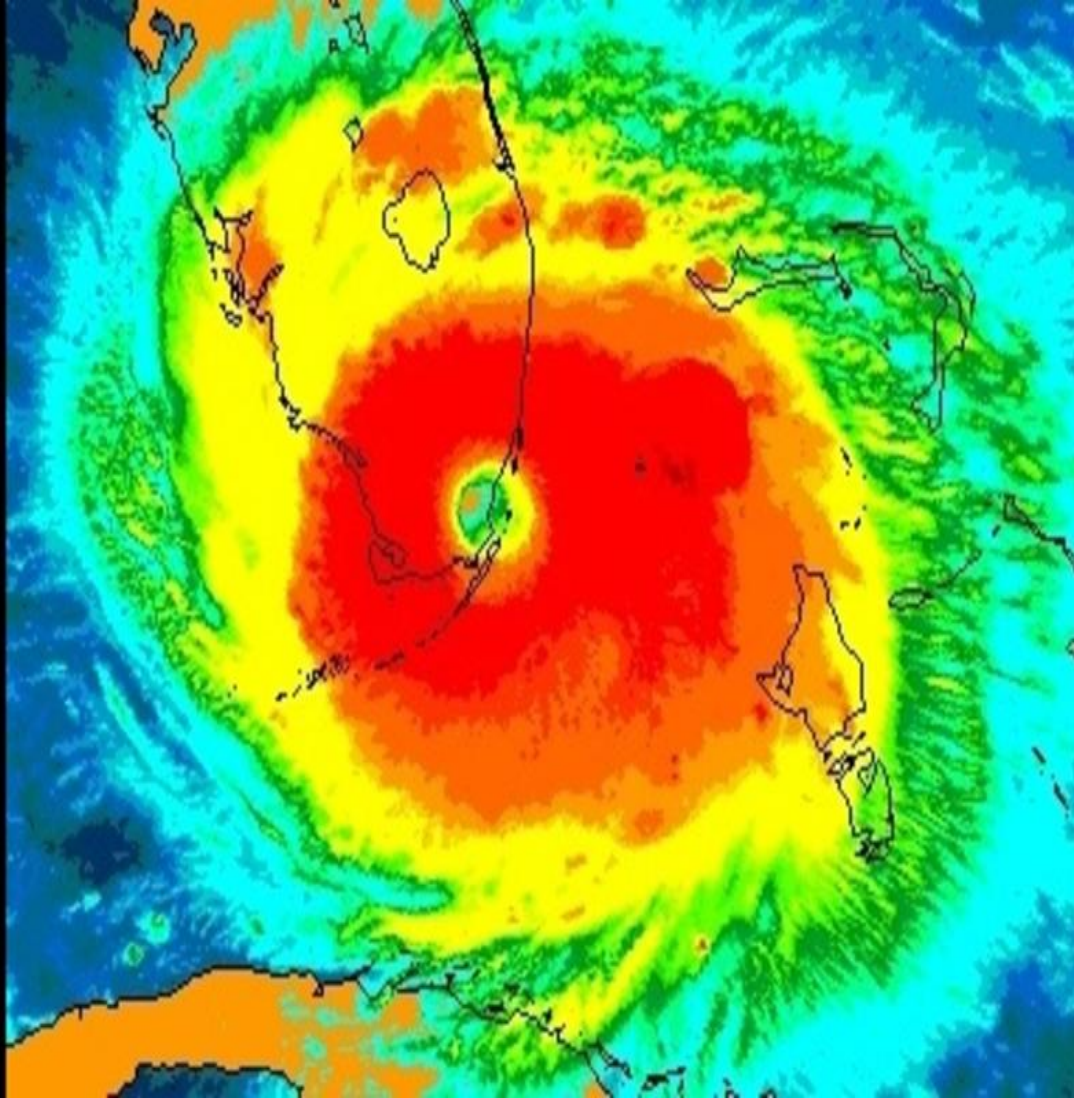
Topeka KS

Tonight Sunday Night

SUN, FEB 26

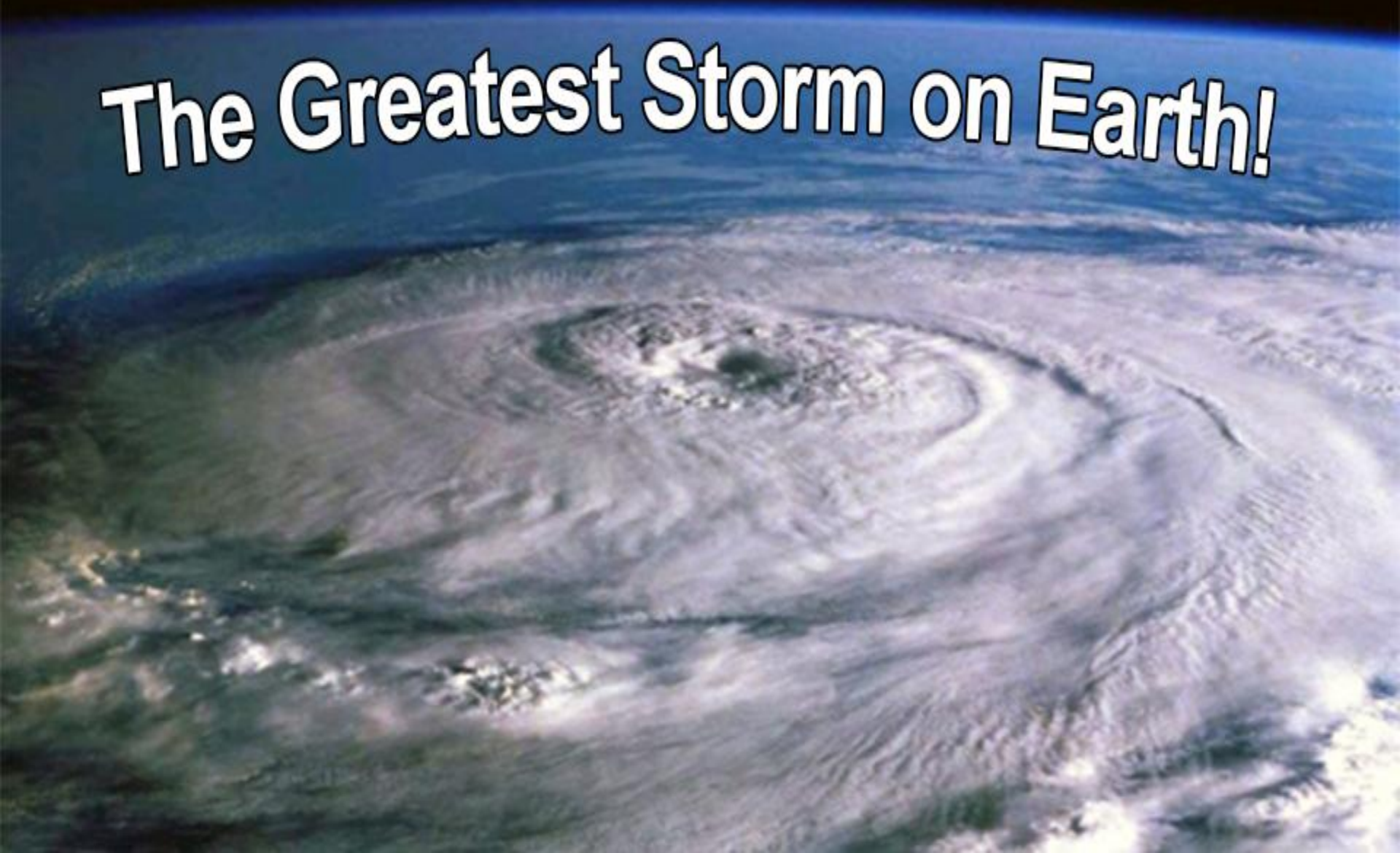
6 am	Chance Snow Temp: 34°F Wind: SSW @ 6 mph 30%
7 am	Chance Rain And Snow Temp: 35°F Wind: SSW @ 5 mph 30%
8 am	Chance Rain And Snow Temp: 36°F Wind: S @ 5 mph 30%
9 am	Chance Rain Temp: 37°F Wind: S @ 5 mph 30%

Hurricanes



Hurricane...

The Greatest Storm on Earth!



Hurricane Names Around The World



Central &
Eastern Pacific
Oceans

Atlantic
Ocean

"Typhoon"

"Cyclone"

Western
Pacific

Indian
Ocean

"Hurricane"

"Hurricane"

"Willy-Willy"

Coast of
Australia

The diagram illustrates the formation of a hurricane over the ocean. A large red 'L' is positioned in the center of the ocean surface, representing a low-pressure system. Two tall, white, cloud-like structures rise from the ocean surface, one on either side of the 'L'. Red arrows show air converging from the left and right towards the center of the 'L' at the surface. From the base of each cloud, a red arrow points straight up. From the top of each cloud, a red arrow curves outwards and then back towards the center of the 'L' at a higher altitude. The background is a light blue sky above a dark blue ocean surface.

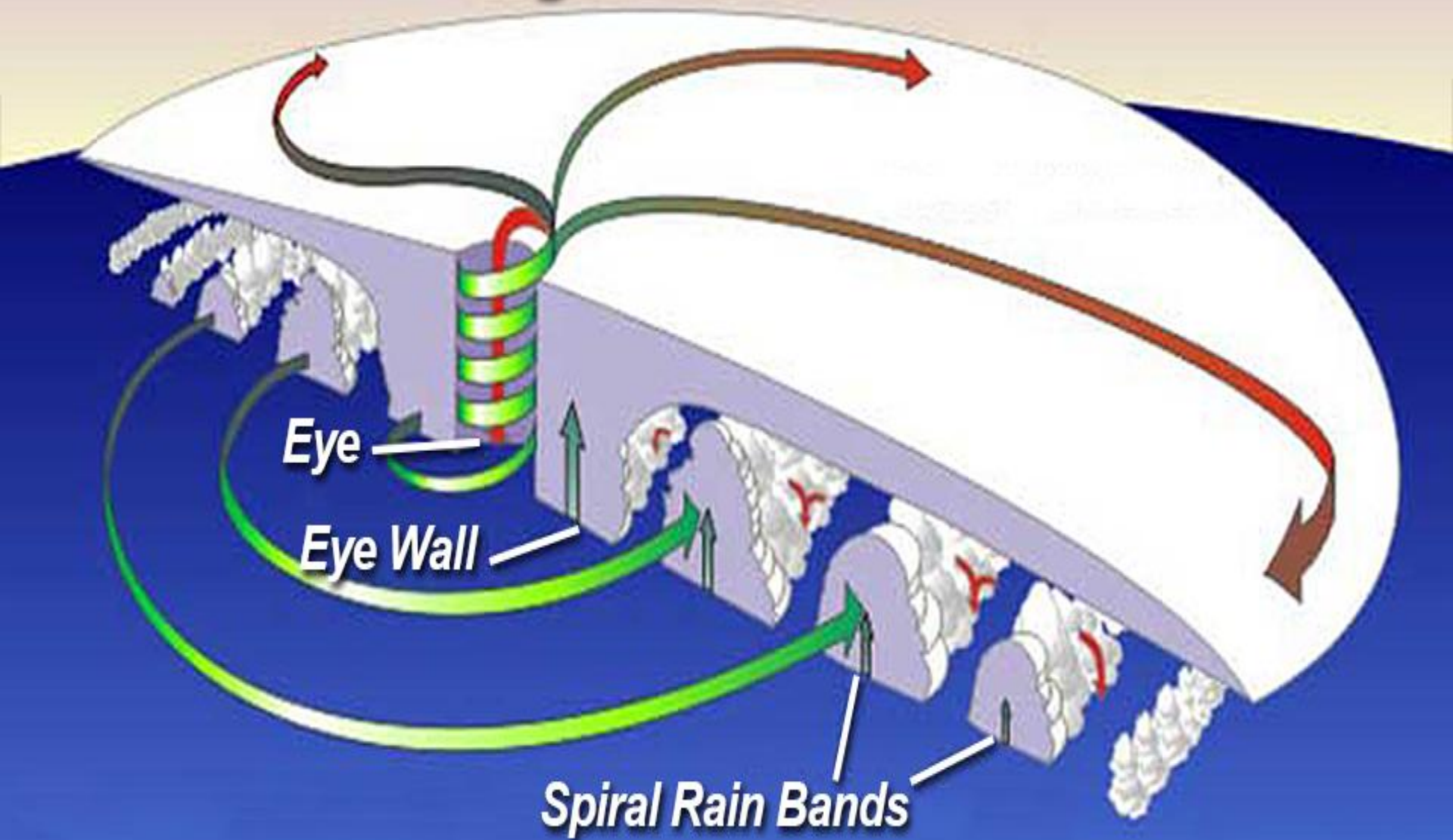
**Light winds aloft
steer the storm**

**Moist air rises
& condenses**

**Warm moist air
converges near
storms center**

**Hurricanes are fueled by warm ocean waters
(more than 80°F)**

Anatomy of a Hurricane

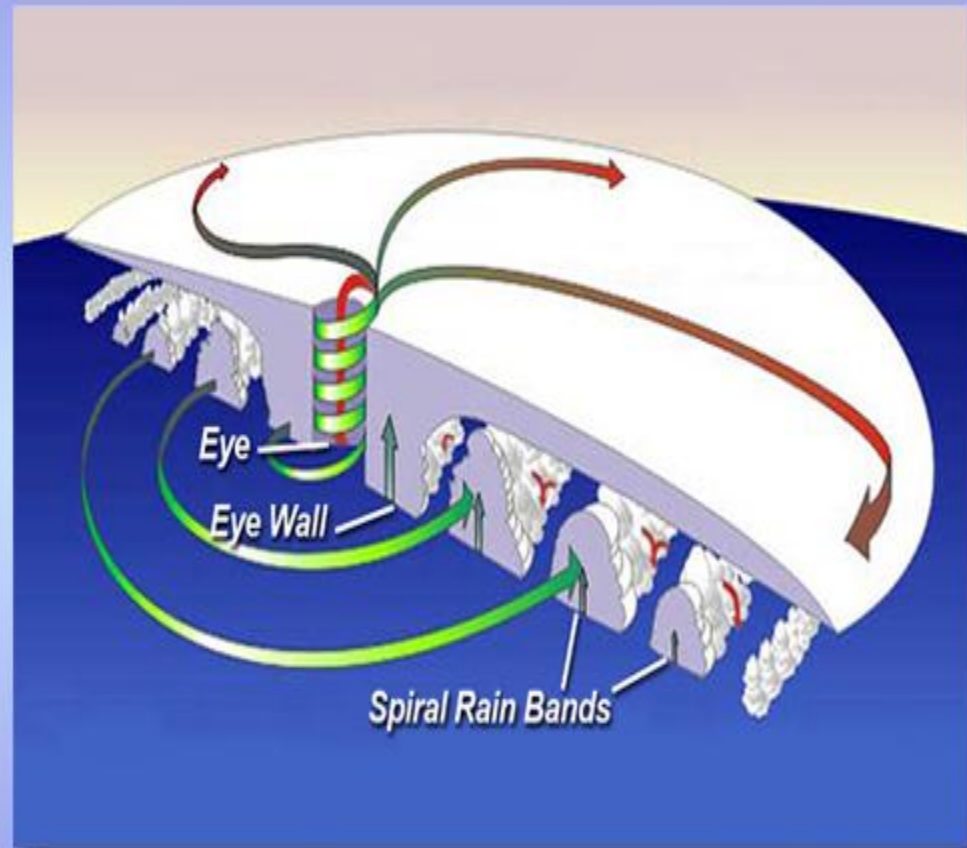


Anatomy of a Hurricane

Eye: Light winds, mostly sunny, very low surface pressure

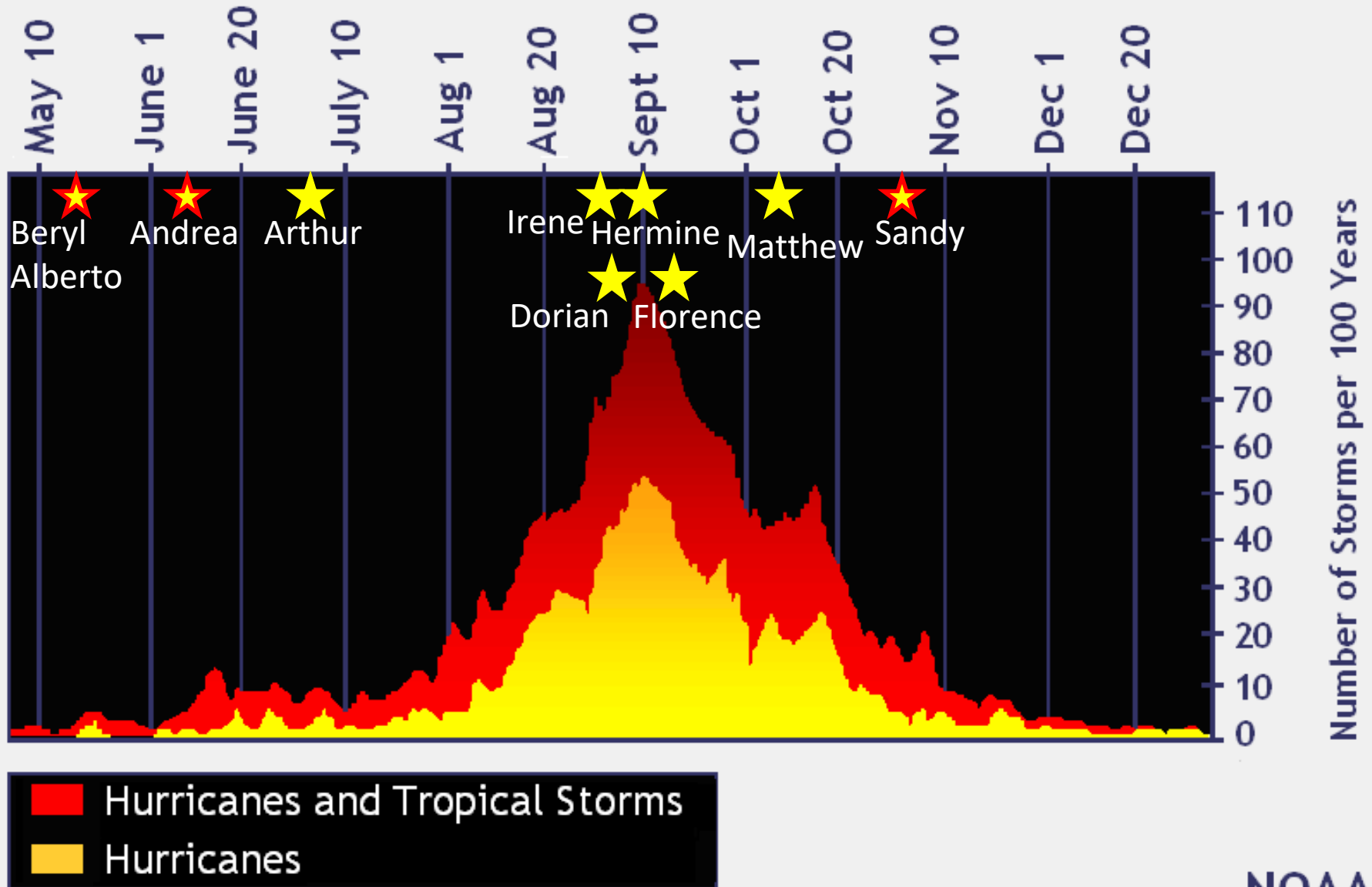
Eye Wall: Strongest winds, heaviest rain

Spiral Rain Bands: Rotate around the storm, moderate to heavy rain, strong winds, possible weak tornadoes





Climatology (North Atlantic Basin)



Hurricane Preparedness

www.weather.gov/wrn/hurricane-preparedness or ready.gov

You Should Prepare Each and EVERY Year

ASSEMBLE DISASTER SUPPLIES.

MAY 5 - Assemble Disaster Supplies

Get your supplies before hurricane season begins. Have enough food and water for each person for at least three days. Be sure to fill your prescriptions and have medicine on hand. Radios, batteries and phonechargers on are also must haves. Gas up your vehicle and extra cash on hand.



Food & Water



Medicine



Batteries, Radio,
Chargers



Gas Up



Cash on Hand



Hurricane Preparedness

www.weather.gov/wrn/hurricane-preparedness or ready.gov

You Should Prepare Each and EVERY Year

**COMPLETE A
WRITTEN PLAN.**

MAY 9 - Complete a Written Plan

Writing down your plan will help you avoid mistakes when faced with an emergency and ensure everyone in your home is prepared for the next storm.



Have photo documentation of valuables



Keep your important documents together for quick access



Share your plan

Tropical Cyclone Products



National Hurricane Center

www.nhc.noaa.gov or hurricanes.gov



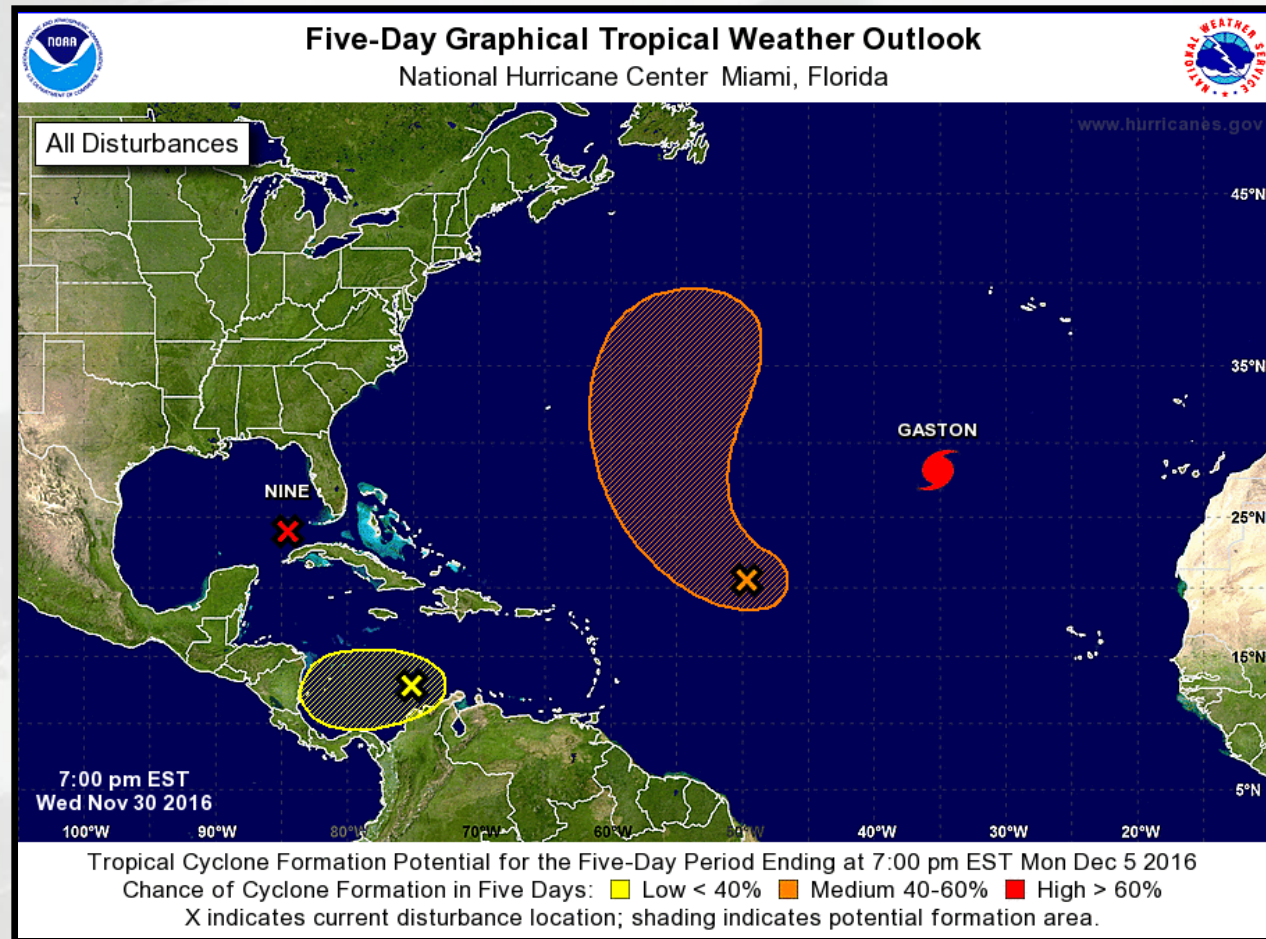
GRAPHICAL TROPICAL OUTLOOK

Provides formation potential for individual disturbances during the next 5 days.

Issued 4 Times A Day

8 and 2 AM/PM EDT

7 and 1 AM/PM EST



National Hurricane Center

www.nhc.noaa.gov or hurricanes.gov



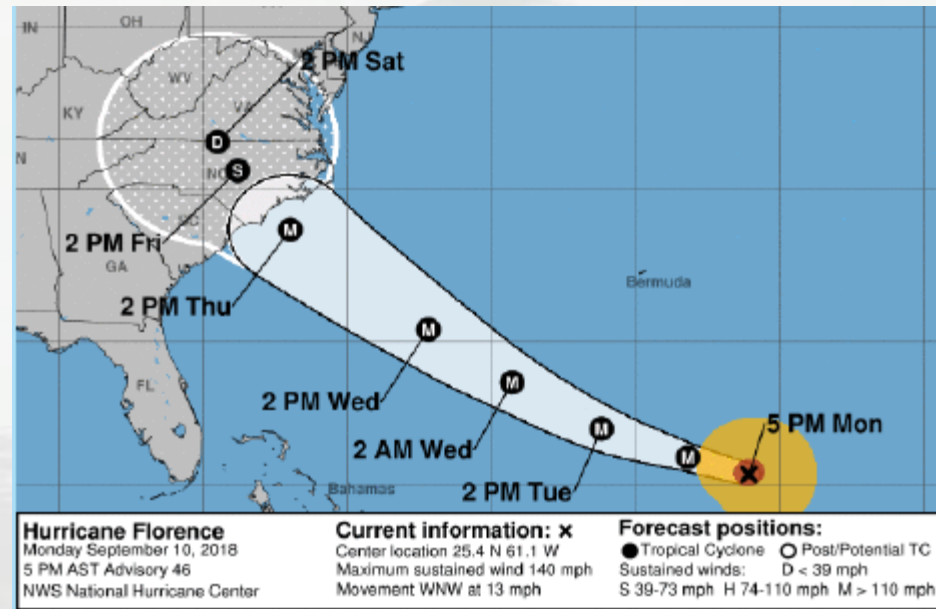
Tropical Cyclone Track Forecast Cone Watches/Warnings Initial Wind Field

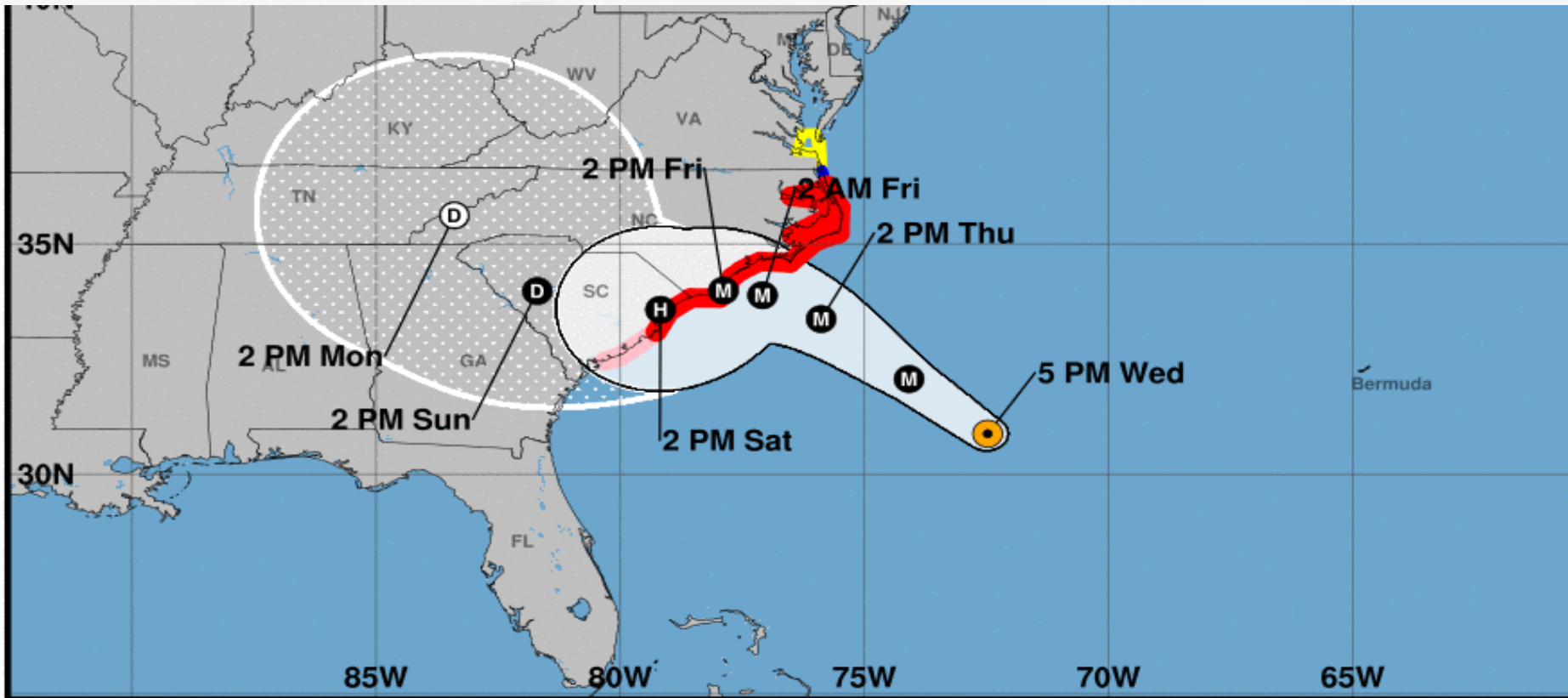
Cone represents probable path of the CENTER of the storm

The cone does NOT show impacts

Impacts can occur hundreds of miles from the center of the storm

The center of the storm passes within the cone roughly 2/3 of the time





Hurricane Florence
 Wednesday September 12, 2018
 5 PM EDT Advisory 54
 NWS National Hurricane Center

Current information: ●
 Center location 30.9 N 72.5 W
 Maximum sustained wind 120 mph
 Movement NW 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 ▨ Day 4-5

Watches:
 ▨ Hurricane ▨ Trop Storm

Warnings:
 ▨ Hurricane ▨ Trop Storm

Tropical Cyclone Impacts

- Wind
- Storm Surge/Wave Run-up
- Rainfall/Freshwater Flooding
- Tornadoes
- Rip Currents



Saffir/Simpson Hurricane Scale

Used to categorize hurricane strength and to give an estimate of potential property damage

Saffir-Simpson Hurricane **Wind** Scale



WIND: 74-95 mph

DAMAGE: Very dangerous winds will produce some damage



WIND: 96-110 mph

DAMAGE: Extremely dangerous winds will cause extensive damage



WIND: 111-129 mph

DAMAGE: Devastating damage will occur



WIND: 130-156 mph

DAMAGE: Catastrophic damage will occur



WIND: 157 mph or higher

DAMAGE: Catastrophic damage will occur

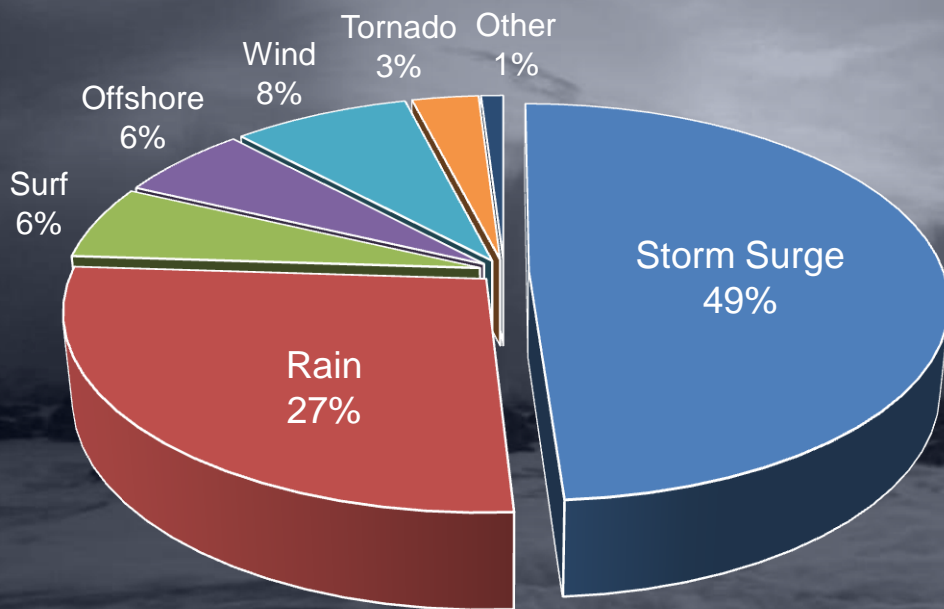


Storm Surge



It's Water, Not Wind

2,544 Fatalities From 1963–2012



- Almost 50% the deaths are due to storm surge
- Over 80% of deaths are due to water
- Wind causes less than 10% of deaths

Florence killed 15 people directly.

11 were water related

Edward N. Rappaport, 2014: Fatalities in the United States from Atlantic Tropical Cyclones: New Data and Interpretation. Bull. Amer. Meteor. Soc., 95, 341–346.



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

WRN
WEATHER READY NATION

Potential Storm Surge Flooding Map

- 6 to 12 feet above ground level from Cape Fear to Cape Lookout, including the Neuse and Pamlico River
- Cape Lookout to Ocracoke Inlet of 5 to 8 feet

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

Weather Forecast Office
Morehead City, NC

Follow us <http://www.weather.gov/mhx/>

Presentation Created 9/11/2018 7:27 AM

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

WRN
WEATHER READY NATION

Potential Storm Surge Flooding Map

- 9 to 13 feet above ground from Cape Fear to Cape Lookout, including the Neuse and Pamlico River
- Cape Lookout to Ocracoke Inlet of 6 to 9 feet
- Ocracoke Inlet to NC/VA border 4 to 6 feet

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

[Click here to view the Potential Storm Surge Flooding Map](#)

Weather Forecast Office
Morehead City, NC

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Presentation Created 9/11/2018 4:23 PM

Storm Surge

8 to 11 feet storm surge inundation in New Bern

Over 1,800 water rescues in New Bern alone

2 to 4 feet of surge Swansboro, Bogue Sound, Emerald Isle



New Bern

Rainfall Flooding





Florence Preliminary Storm Total Rainfall Reports

Created: 9/19/2018 3:44 PM

Totals From 8 AM Thursday – 8 AM Tuesday

Swansboro, NC	34.14"
Jacksonville, NC	30.65"
Albertson, NC	26.26"
Newport NWS, NC	25.62"
Emerald Isle, NC	23.49"
Trenton, NC	19.42"
MCAS New River, NC	19.35"
Kinston, NC	18.92"
New Bern, NC	15.17"
Winterville, NC	13.24"



National Weather Service – Newport/Morehead City

weather.gov/mhx



US National Weather Service Newport/Morehead City



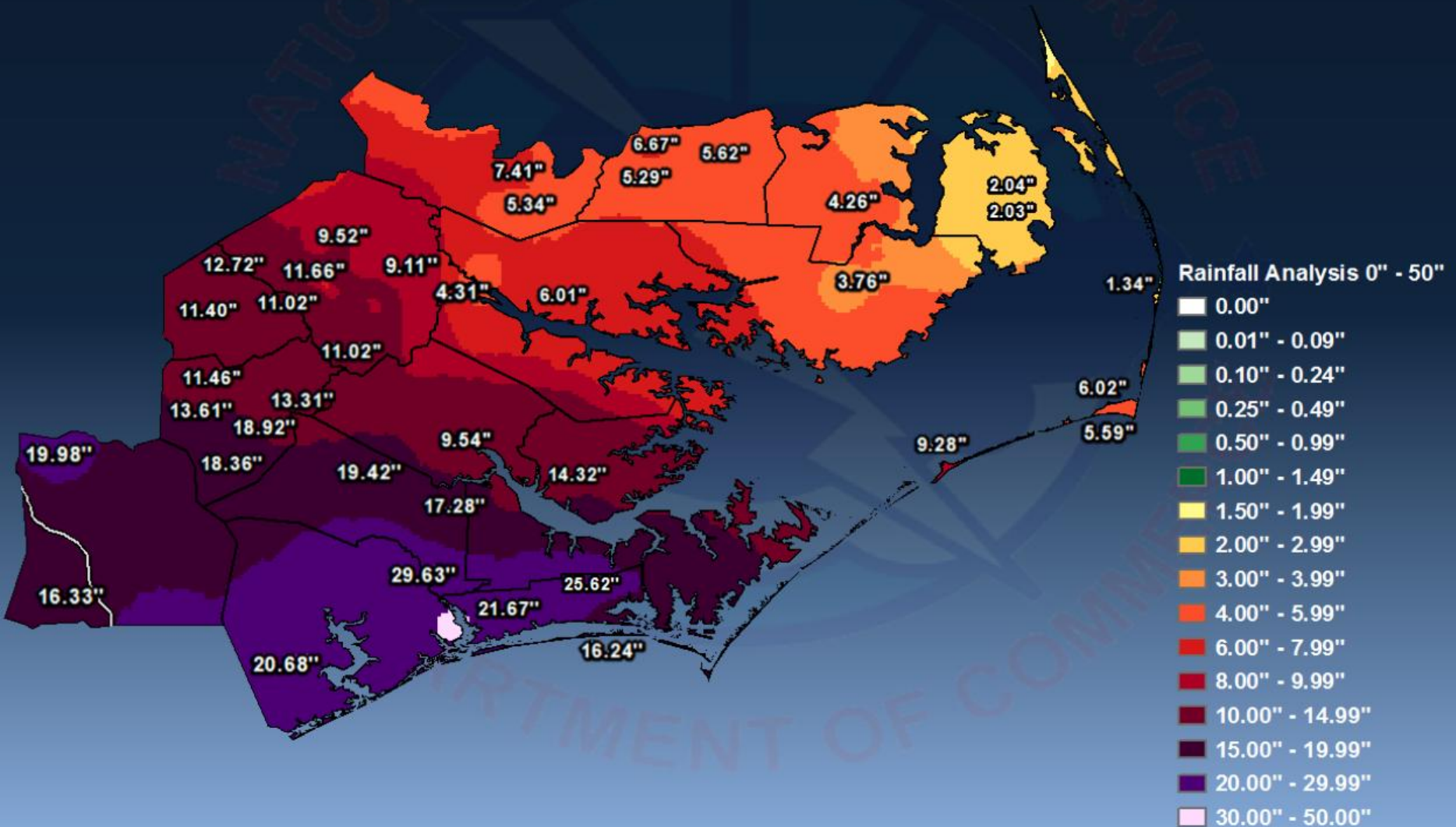
@NWSMoreheadCity



National Weather Service Newport/Morehead City North Carolina

Preliminary Hurricane Florence Rainfall Totals

Data Source: Regional Observations(PNS)



This is an experimental product. Care should be taken in using the data. Unofficial observations are plotted. Values at interpolated locations may not represent actual precipitation totals at that location.

National Weather Service Raleigh, North Carolina

Preliminary Hurricane Florence Rainfall Totals

Data Source: Regional Observations(PNS)

Collaboration with:

NWS Newport/Morehead City, NC

NWS Wilmington, NC

NWS Greenville-Spartanburg, SC

NWS Blacksburg, VA



Near Hookerton (Matthew)

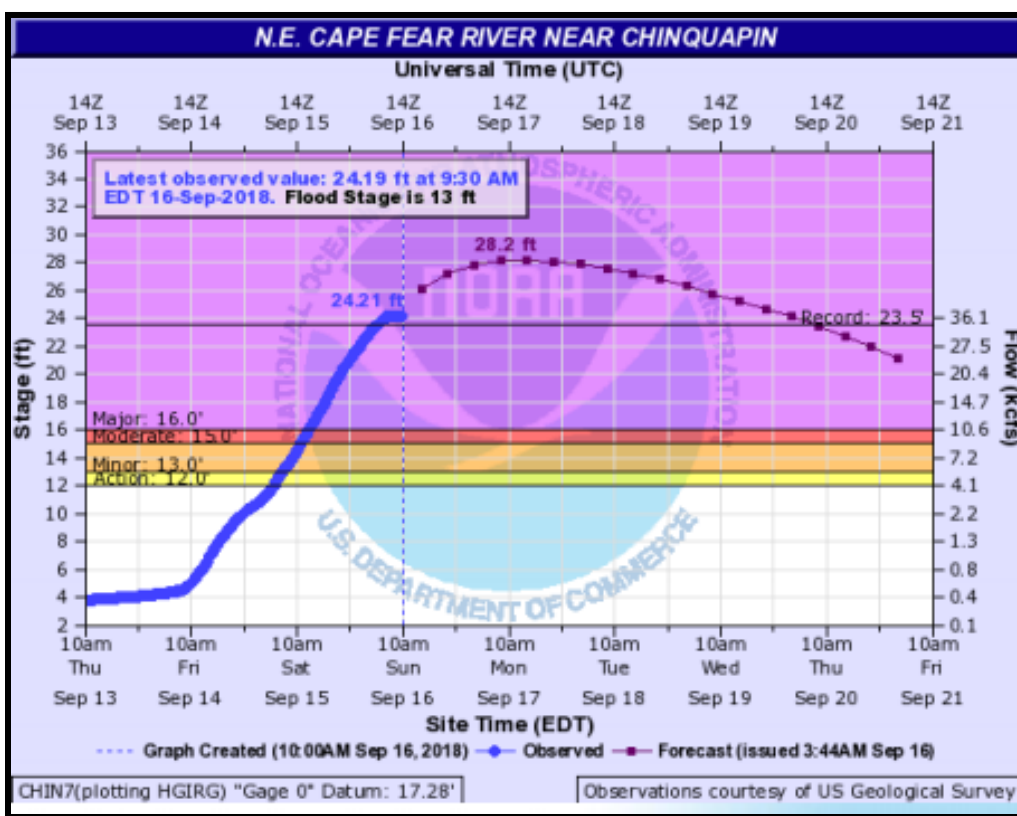


River Flooding

N.E Cape Fear River
Near Chinquapin
gauge and New River
near Gum Branch
(northwest of Jacksonville)

Exceeded
Hurricane Floyd
(flood of record)
levels

Extensive flash flooding
caused numerous road
washouts



TRENT RIVER AT POLLOCKSVILLE

River Flooding



**Exceeded
Hurricane Floyd
(flood of record)
levels**



**Extensive flash flooding
caused numerous road
washouts**

Florence Crest: 20.48 ft.

Wind





Florence Wind Gusts

Created: 10/22/2018 2:09 PM

Peak Wind Gusts (MPH)

Cape Lookout	106
Wilmington	105
Fort Macon	105
Scotts Hill	92
Cherry Point	88
New River Air Station	88
Castle Hayne	74
Beaufort	71
Lumberton	69
Myrtle Beach	61



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Maximum Wind Gusts MPH

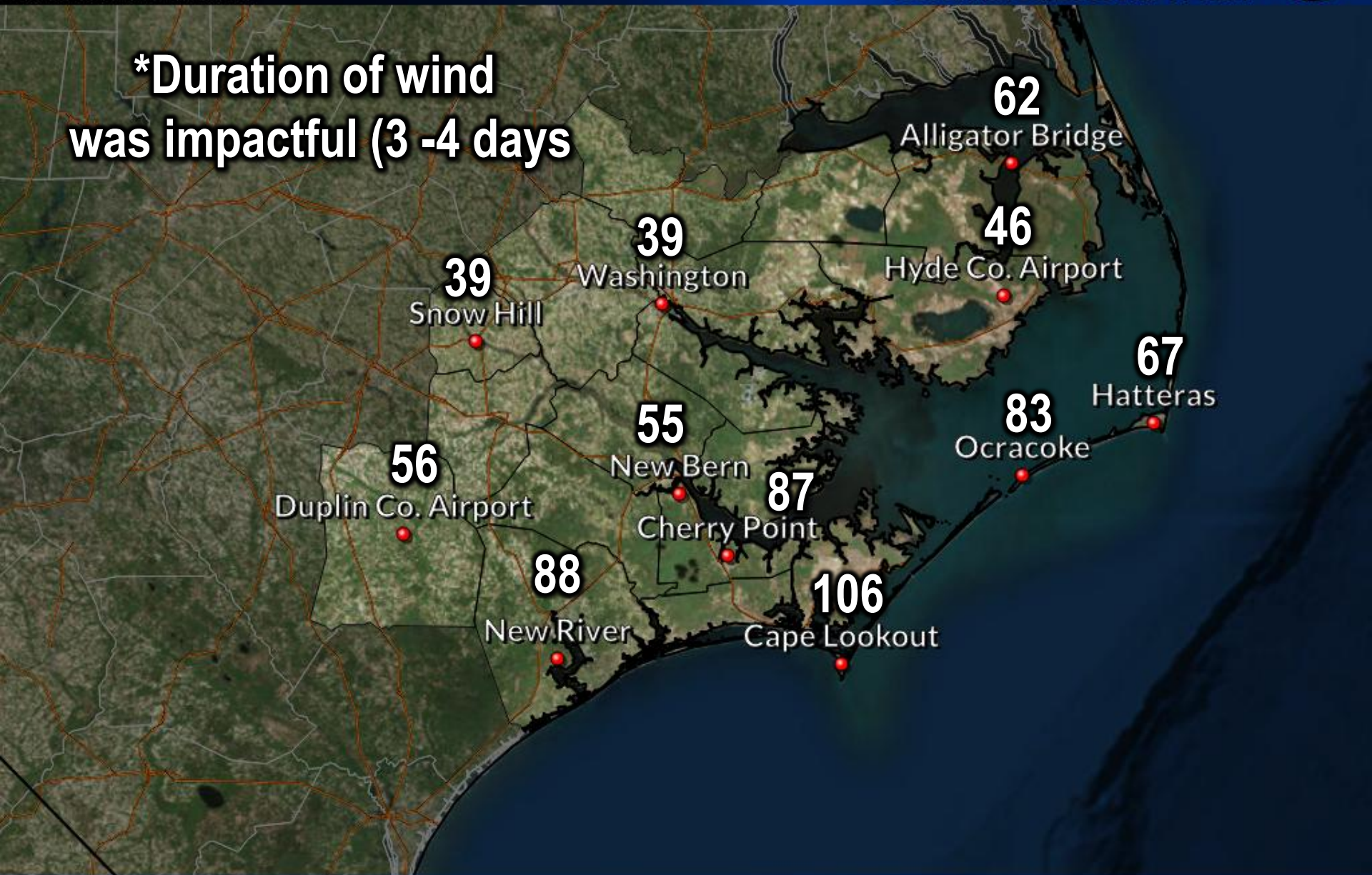
Hurricane Florence

Weather Forecast Office
Newport/Morehead City, NC

Issued Nov 28, 2018 5:19 PM EST



***Duration of wind
was impactful (3 -4 days)**



Tornadoes



Tornadoes

**Over 25 confirmed
tornadoes for coastal
Carolina**

**Enhanced areas of
damage**

**Tornadoes can occur
well away from the
center/well ahead of
landfall**

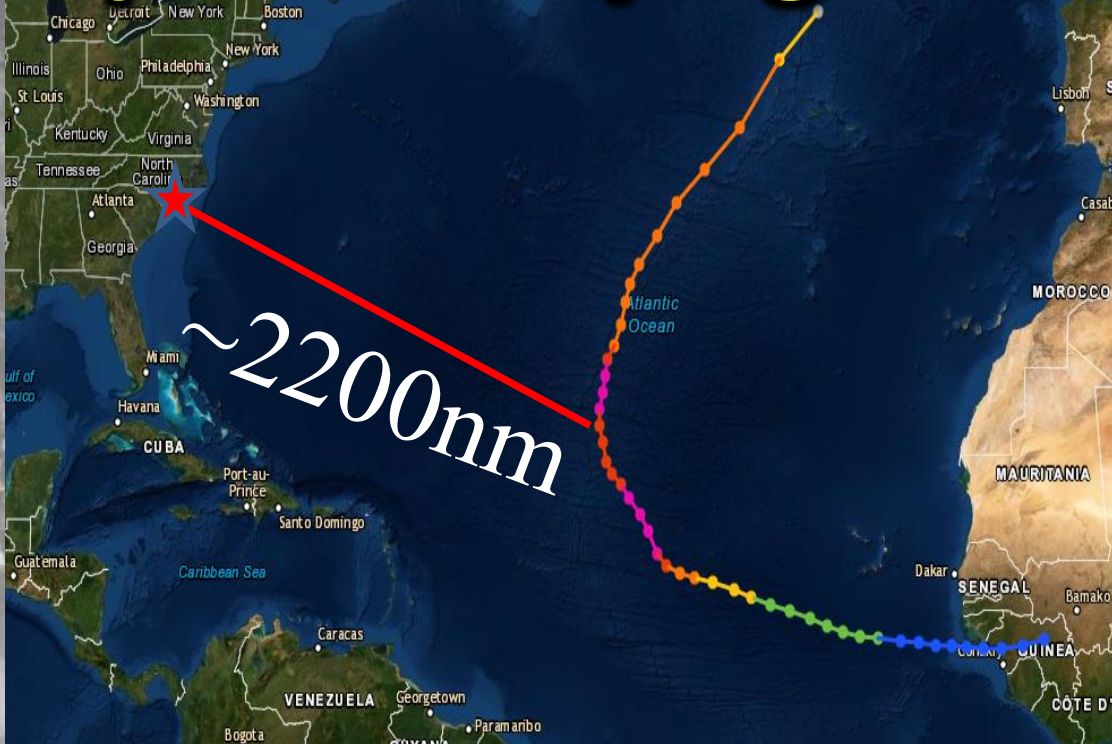


Open Ground Farms

Rip Currents



Rip Currents/High Surf



**Hurricane Lorenzo –
Sept. 23 to Oct. 4,
2019**

- Major Hurricane for several days.
- Northern most Cat 5 on record in Atlantic.
- Recurved well out at sea.
- But generated a significant swell event for the western Atlantic.
- 4 deaths in the Carolinas, 7 total on the East Coast

RIP CURRENTS

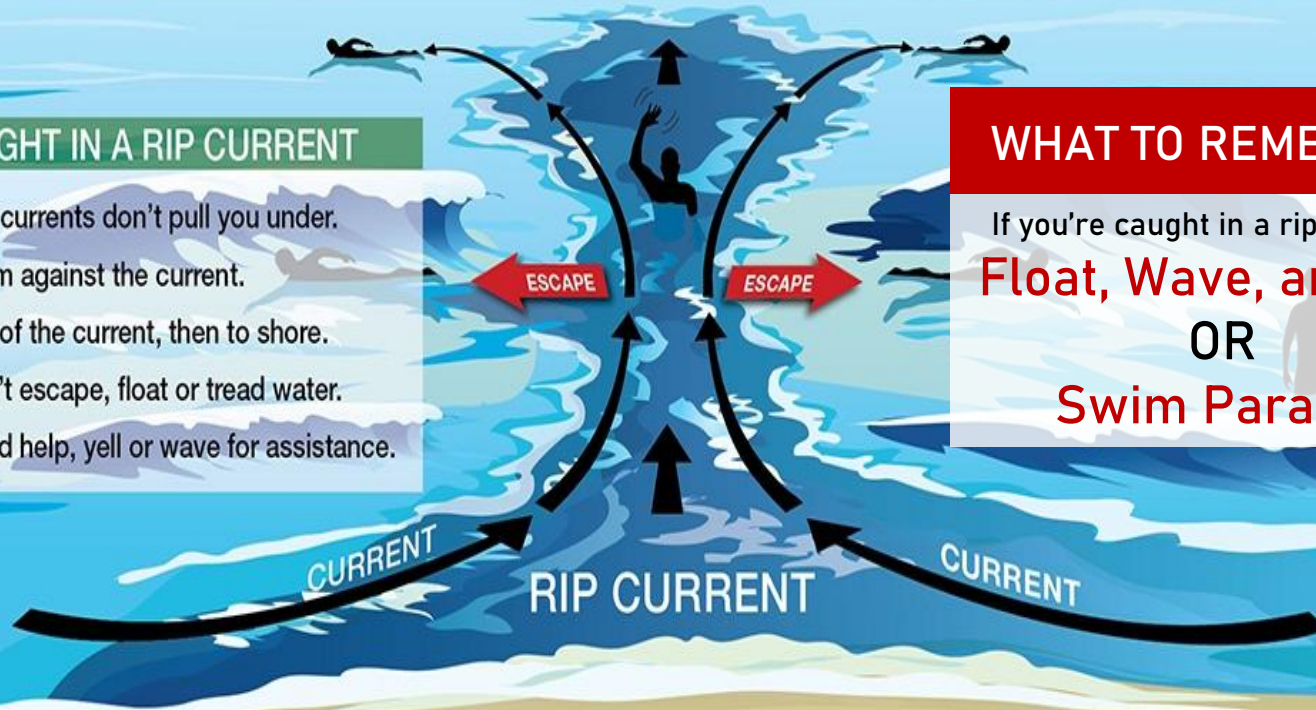
KNOW YOUR OPTIONS

IF CAUGHT IN A RIP CURRENT

- Relax, rip currents don't pull you under.
- Don't swim against the current.
- Swim out of the current, then to shore.
- If you can't escape, float or tread water.
- If you need help, yell or wave for assistance.

WHAT TO REMEMBER

If you're caught in a rip current...
Float, Wave, and Yell
OR
Swim Parallel



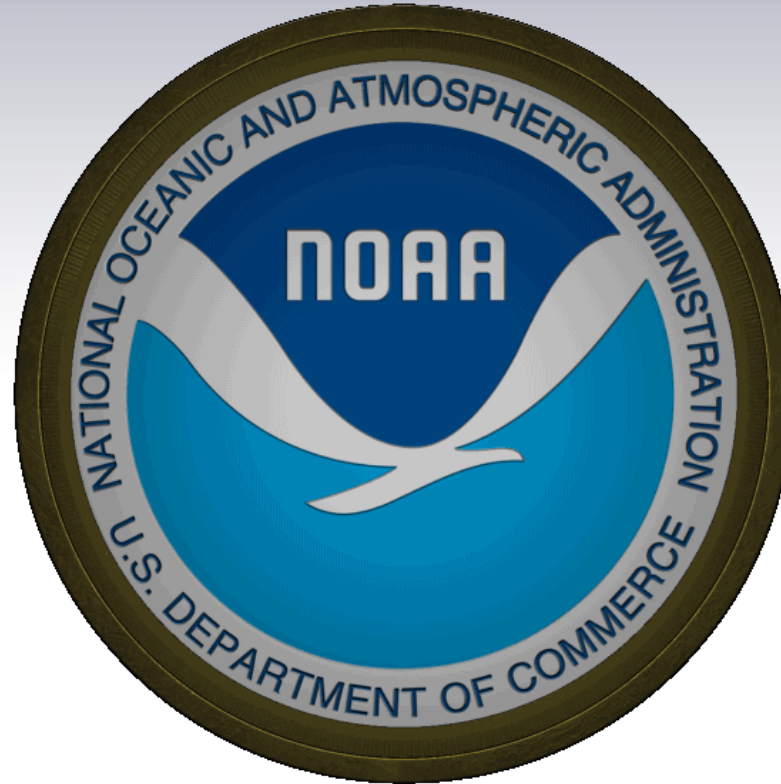
Rip currents are powerful currents of water moving away from shore. They can sweep even the strongest swimmer away from shore. If at all possible, swim near a lifeguard.

Keys To Remember...

- Understand that the Category and track of storm does not inform on impacts. Follow NWS Briefing packages and graphics.
- Understand your Storm Surge Risk using the new Storm Surge Watch/Warning products and Potential Storm Surge Flooding Map.
- Heavy rains and flooding can precede strong winds, do not delay evacuations!
- Never drive through flooded roadways! Make plans to be off the road and remain off the road during any tropical system!
- Deep water can linger and rivers can rise for days following a storm.
- Have multiple means of obtaining warnings. Be prepared to take quick action for tornado warnings!



Thanks for Your Interest!



erik.heden@noaa.gov

www.weather.gov/newport