Hurricane Dorian 09.04.19 Analysis

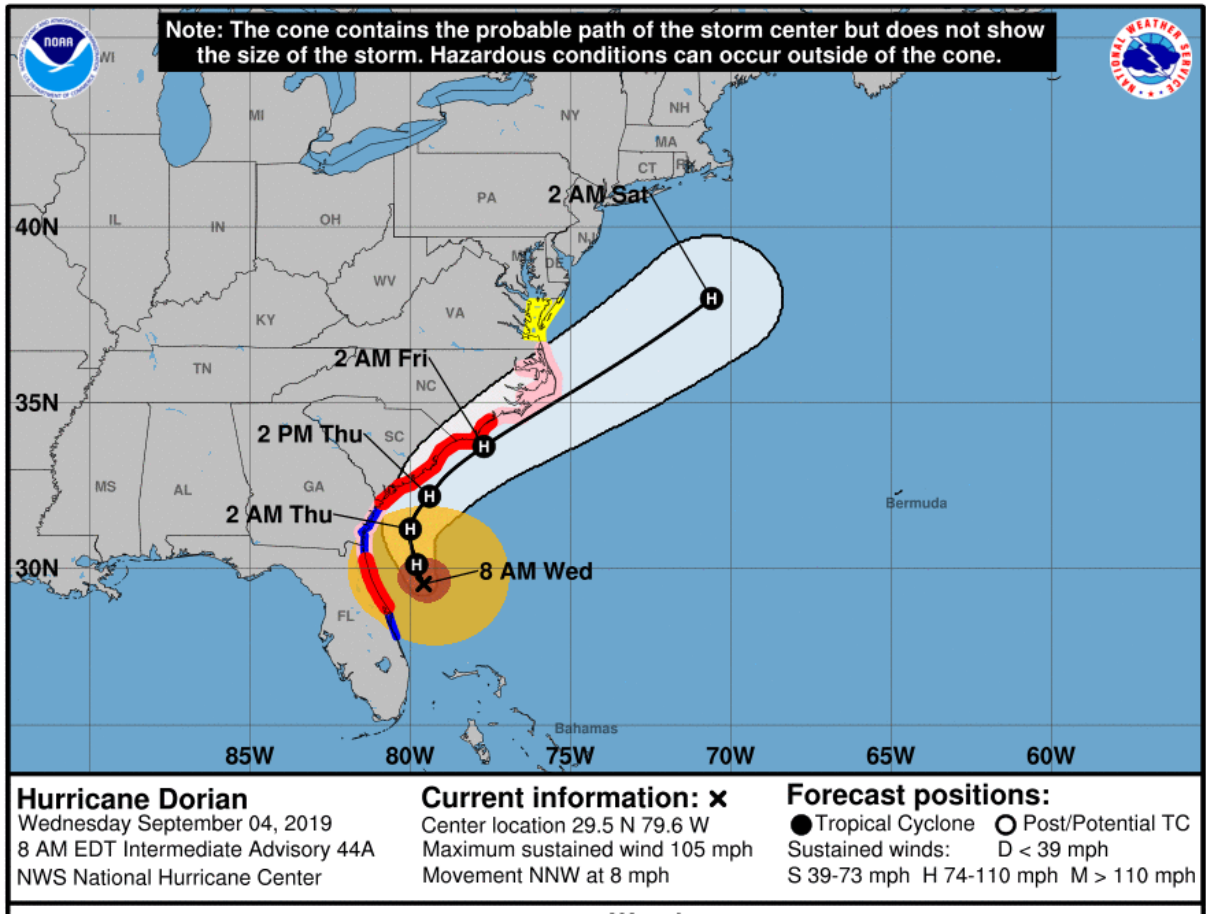
Risk Services Division

4 September 2019

Legal Notice

Hurricane Dorian
Status at 09:00 EDT (13:00 UTC) 4 September, 2019

- Dorian is a Category 2 hurricane however, the eye has become broader and hurricane-force winds extend further outward up to 60 miles (95km)
- The center of Hurricane Dorian is located at 29.61N 79.6 W about 90 miles (145km) ENE of Daytona Beach, Florida, and 135 miles (215km) ESE of Jacksonville, Florida
- Dorian is moving north-northwestward (330º) at 8 mph (13 km/h) parallel to the northeastern coast of Florida
- Maximum sustained winds are 105 mph (165 km/h) with higher gusts
- Hurricane-force winds extend outward up to 60 miles (95 km) from the center, and tropical-storm-force winds extend outward up to 175 miles (280 km)
- Life-threatening storm surge and dangerous winds are expected along portions of the Florida east coast and the coasts of Georgia, South Carolina, and North Carolina
- The risk of wind and rain impacts along portions of the Virginia coast and the southern Chesapeake Bay are increasing



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Summary

At 0900 AM EDT (1300UTC), the National Hurricane Center reports the center of Hurricane Dorian is located at 29.61N 79.6 W about 90 miles (145km) ENE of Daytona Beach, Florida, and 135 miles (215km) ESE of Jacksonville, Florida. Dorian is moving slowly north-northwestward (330º) at 8 mph (13 km/h) parallel to the northeastern coast of Florida. A northwest or north-northwest motion is expected through this morning. A turn toward the north is forecast by this evening, followed by a turn to the north-northeast on Thursday morning. On this track, the core of Dorian will move dangerously close to the Florida east coast and the Georgia coast through tonight. The center of Dorian is forecast to move near or over the coast of South Carolina and North Carolina Thursday through Friday morning.

Maximum sustained winds are near 105mph (165 km/h) with higher gusts. Dorian is a category 2 hurricane on the Saffir-Simpson Hurricane Wind Scale however, the eye has become broader and hurricane-force winds extend further outward. Some weakening is expected during the next couple of days however, Dorian is expected to remain a powerful hurricane during the next few days.

Hurricane-force winds extend outward up to 60 miles (95 km) from the center and tropical-storm-force winds extend outward up to 175 miles (280 km).

The estimated minimum central pressure is 964mb (28.47 inches).

Discussion

Hurricane Dorian is expected to more or less maintain its intensity for at least the next 24 hours. After that time period, increasing vertical shear should cause gradual weakening. However, the system is expected to maintain close to Category 2 strength until it passes near or over the North Carolina outer banks.

Dorian is moving slowly north-northwestward to northwestward. Over the next day or so, the hurricane is forecast to gradually turn toward the north. Thereafter, Dorian should accelerate north-northeastward to northeastward.

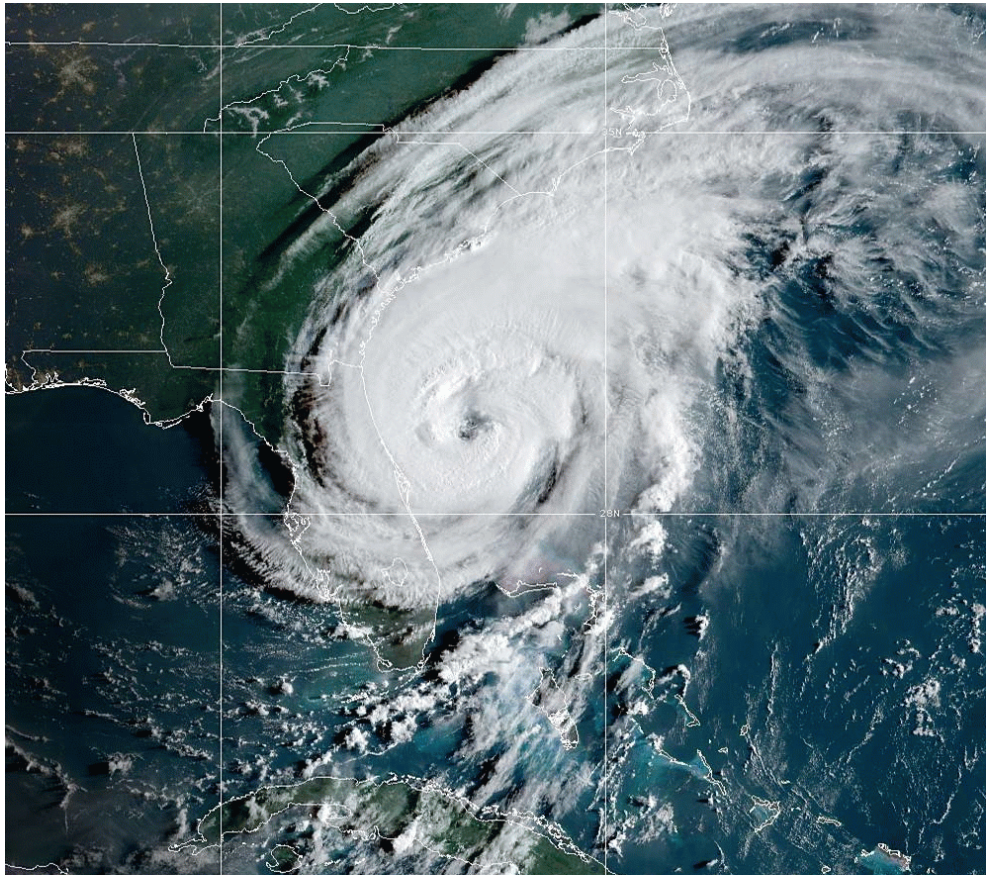
The current NHC track continues to take Dorian dangerously close to the southeast U.S. Coast, all interests from northeast Florida to the Carolinas should remain vigilant to the possibility of experiencing destructive winds, flooding rains, and life-threatening storm surges from this hurricane.

Key Messages

1. Life-threatening storm surge and dangerous winds are expected along portions of the Florida east coast and the coasts of Georgia, South Carolina, and North Carolina, regardless of the exact track of Dorian's center. Water levels could rise well in advance of the arrival of strong winds. Residents in these areas should follow advice given by local emergency officials.

2. The risk of wind and rain impacts along portions of the Virginia coast and the southern Chesapeake Bay are increasing. Residents in these areas should continue to monitor the progress of Dorian.

3. The flash flood threat will spread up the southeast U.S. coast today and Thursday, then across the coastal Mid-Atlantic region on Friday. There is a high risk of flash-flooding on Thursday across coastal sections from northeast South Carolina into southern North Carolina.



Watches and Warnings

A hurricane warning is in effect for:
- **Volusia/Brevard County Line to Ponte Vedra Beach, Florida**
- **North of Savannah River to Surf City, North Carolina**

A hurricane watch is in effect for:
- **north of Ponte Vedra Beach, Florida to Savannah River**
- **north of Surf City, North Carolina to the North Carolina/Virginia border**
- **Pamlico and Albemarle Sounds**

A Tropical Storm Warning is in effect for:
- **Sebastian Inlet, Florida to the Volusia/Brevard County line, Florida**
- **North of Ponte Vedra Beach, Florida to Savannah River**

A Tropical Storm Watch is in effect for:
- **the North Carolina/Virginia Border to Chincoteague, Virginia**
- **Chesapeake Bay from Smith Point Southward**

A Storm Surge Warning is in effect for:
- **Sebastian Inlet, Florida to Surf City, North Carolina**

A Storm Surge Watch is in effect for:
- **north of Surf City, North Carolina to Poquoson, Virginia including Hampton Roads**
- **Pamlico and Albemarle Sounds**
- **Neuse and Pamlico Rivers**

A Hurricane Warning means that hurricane conditions are expected somewhere within the warning area. A warning is typically issued 36 hours before the anticipated first occurrence of tropical-storm-force winds, conditions that make outside preparations difficult or dangerous. Preparations to protect life and property should be rushed to completion.

A Hurricane Watch means that hurricane conditions are possible within the watch area. A watch is typically issued 48 hours before the anticipated first occurrence of tropical-storm-force winds, conditions that make outside preparations difficult or dangerous.

A Tropical Storm Warning means that tropical storm conditions are expected somewhere within the warning area within 36 hours.

A Tropical Storm Watch means that tropical storm conditions are possible within the watch area, generally within 48 hours.

A Storm Surge Warning means there is a danger of life-threatening inundation, from rising water moving inland from the coastline, during the next 36 hours in the indicated locations. This is a life-threatening situation. Persons located within these areas should take all necessary actions to protect life and property from rising water and the potential for other dangerous conditions. Promptly follow evacuation and other instructions from local officials.

A Storm Surge Watch means there is a possibility of life-threatening inundation, from rising water moving inland from the coastline, in the indicated locations during the next 48 hours.

Hazards Affecting Land

WIND: Tropical storm conditions are currently affecting portions of the northeastern coast of Florida, and should begin along the Georgia coast later this morning.

Hurricane conditions are expected somewhere within the Hurricane Warning area in Florida today. Tropical storm conditions will begin within the Hurricane Warning area in the Carolinas later today, with hurricane conditions by tonight.

STORM SURGE: The combination of a dangerous storm surge and the tide will cause normally dry areas near the coast to be flooded by rising waters moving inland from the shoreline.

The water could reach the following heights above ground somewhere in the indicated areas if the peak surge occurs at the time of high tide:

- Isle of Palms to Myrtle Beach SC: 5 to 8 ft
- Savannah River to Isle of Palms SC: 4 to 7 ft
- Myrtle Beach SC to Cape Lookout NC: 4 to 7 ft
- Cape Lookout NC to Duck NC, including Pamlico and Albemarle Sounds and the Neuse and Pamlico Rivers: 4 to 6 ft
- Volusia/Brevard County Line FL to Savannah River: 3 to 5 ft
- Sebastian Inlet FL to Volusia/Brevard County Line FL: 2 to 4 ft
- Duck NC to Poquoson VA, including Hampton Roads: 2 to 4 ft

Water levels could begin to rise well in advance of the arrival of strong winds. The surge will be accompanied by large and destructive waves. Surge-related flooding depends on the how close the center of Dorian comes to the coast, and can vary greatly over short distances.

RAINFALL: Dorian is expected to produce the following rainfall totals through late this week:

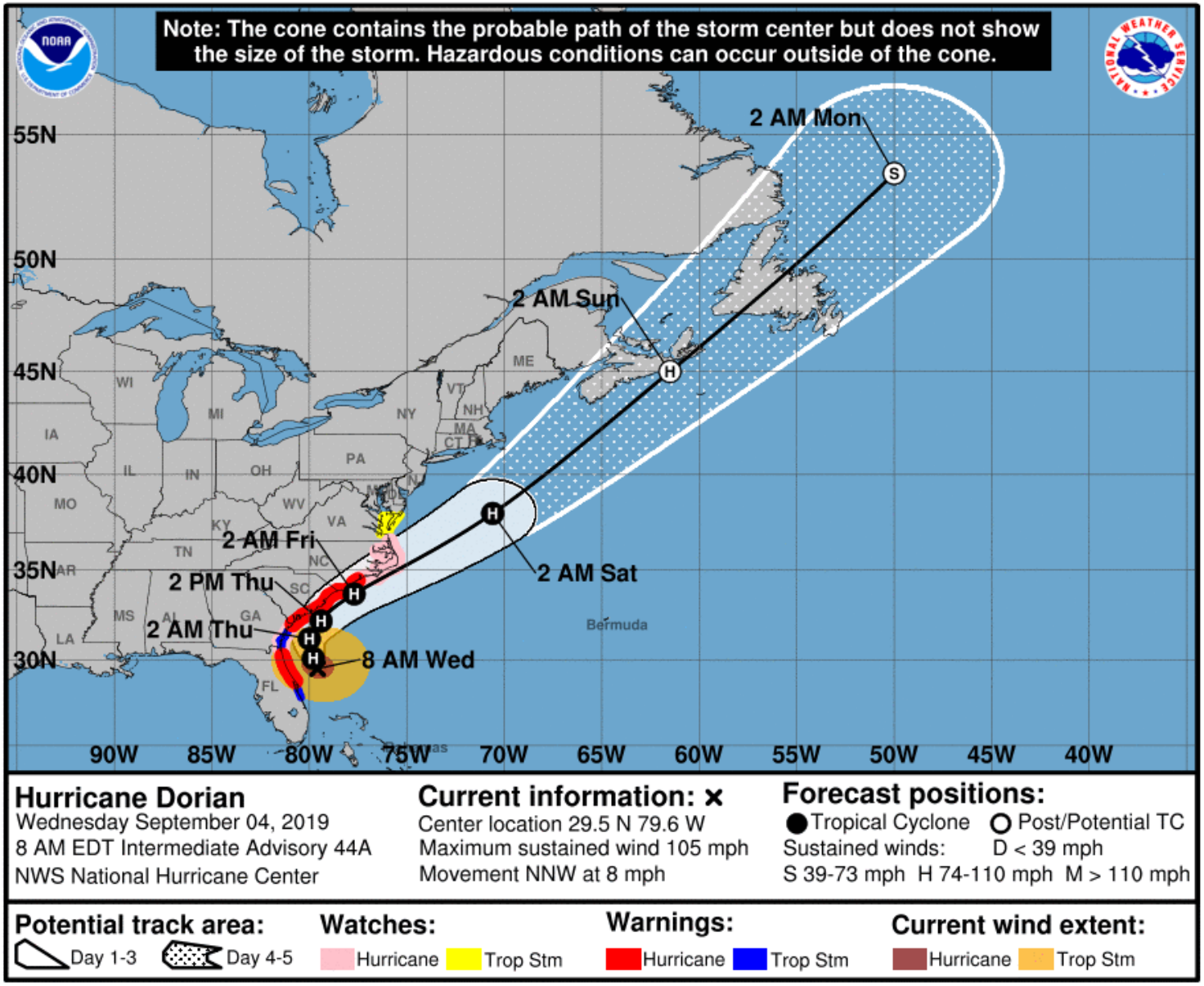
- Coastal Carolinas:5 to 10 inches, isolated 15 inches
- Atlantic Coast from Daytona Beach, Florida to the Georgia/South Carolina border: 3 to 6 inches, isolated 9 inches near the Georgia coast
- Southeast Virginia: 2 to 4 inches, isolated 6 inches

This rainfall may cause life-threatening flash floods.

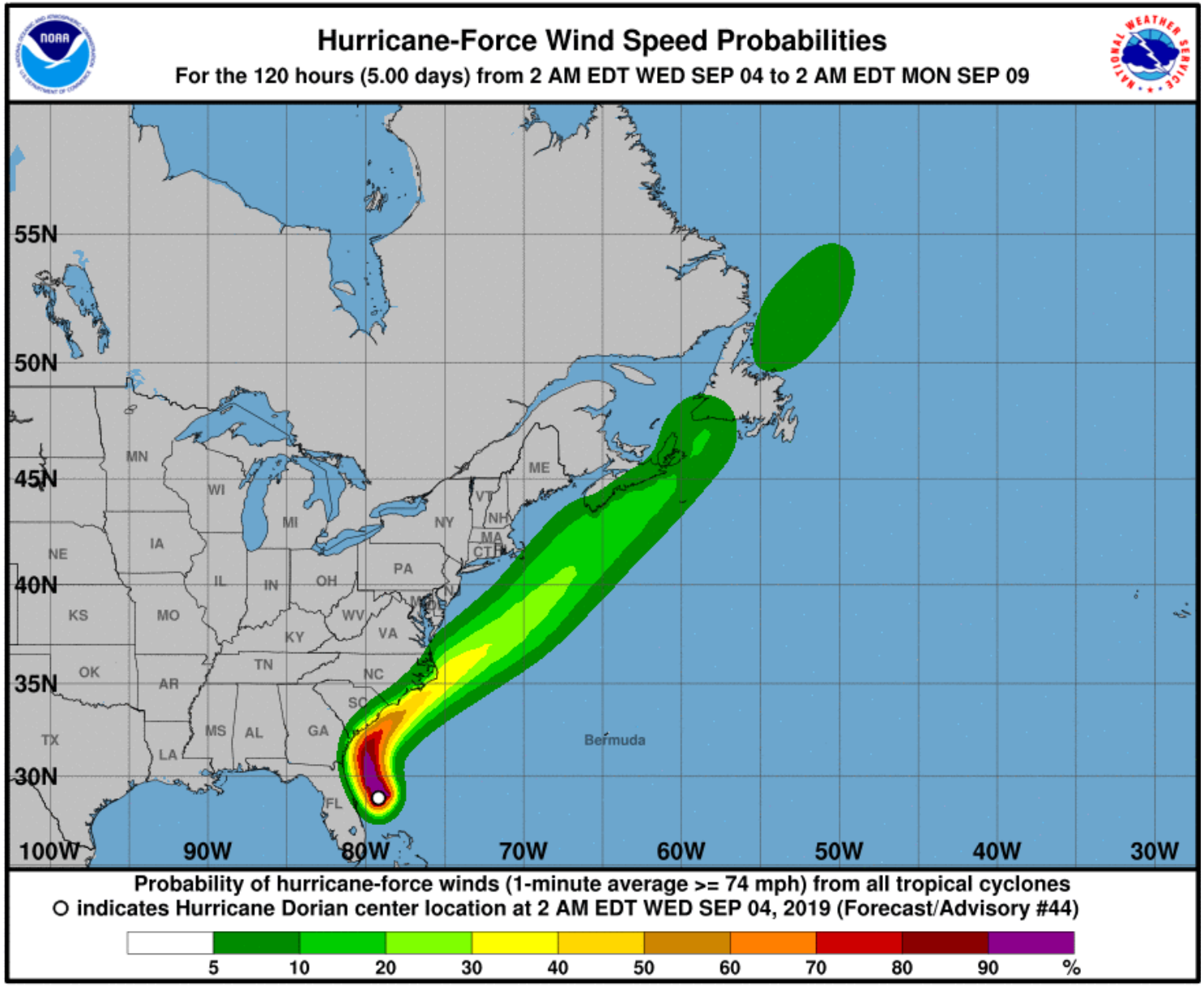
SURF: Large swells will affect the northwestern Bahamas, and the entire southeastern United States coast from Florida through North Carolina during the next several days. These swells are likely to cause life-threatening surf and rip current conditions.

Tornadoes: Isolated tornadoes are possible near the immediate east coast of Florida through tonight. This risk will shift to along the immediate Georgia coast and coastal Carolinas today into Thursday.

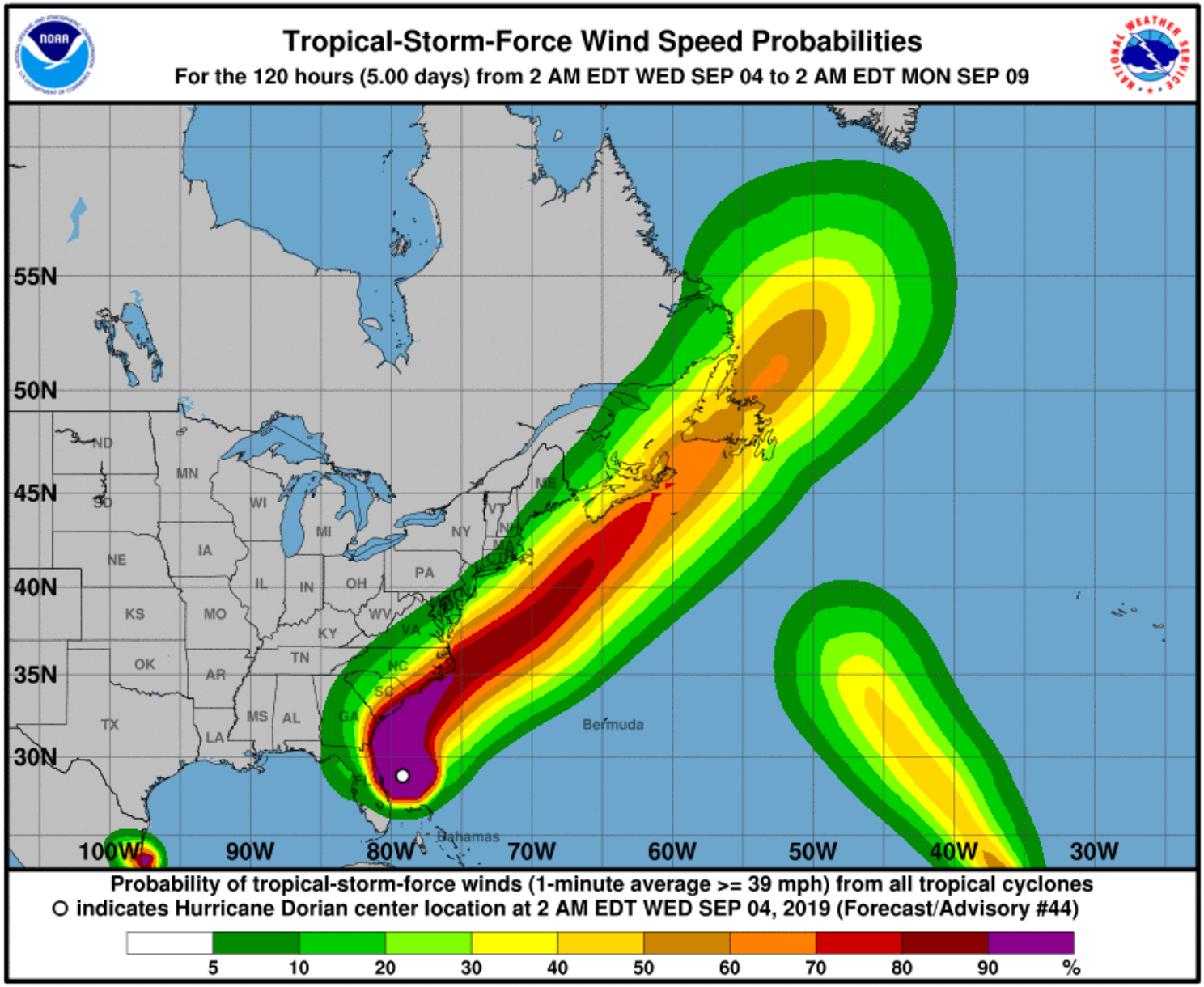
Current Predicted Path (5 Day)



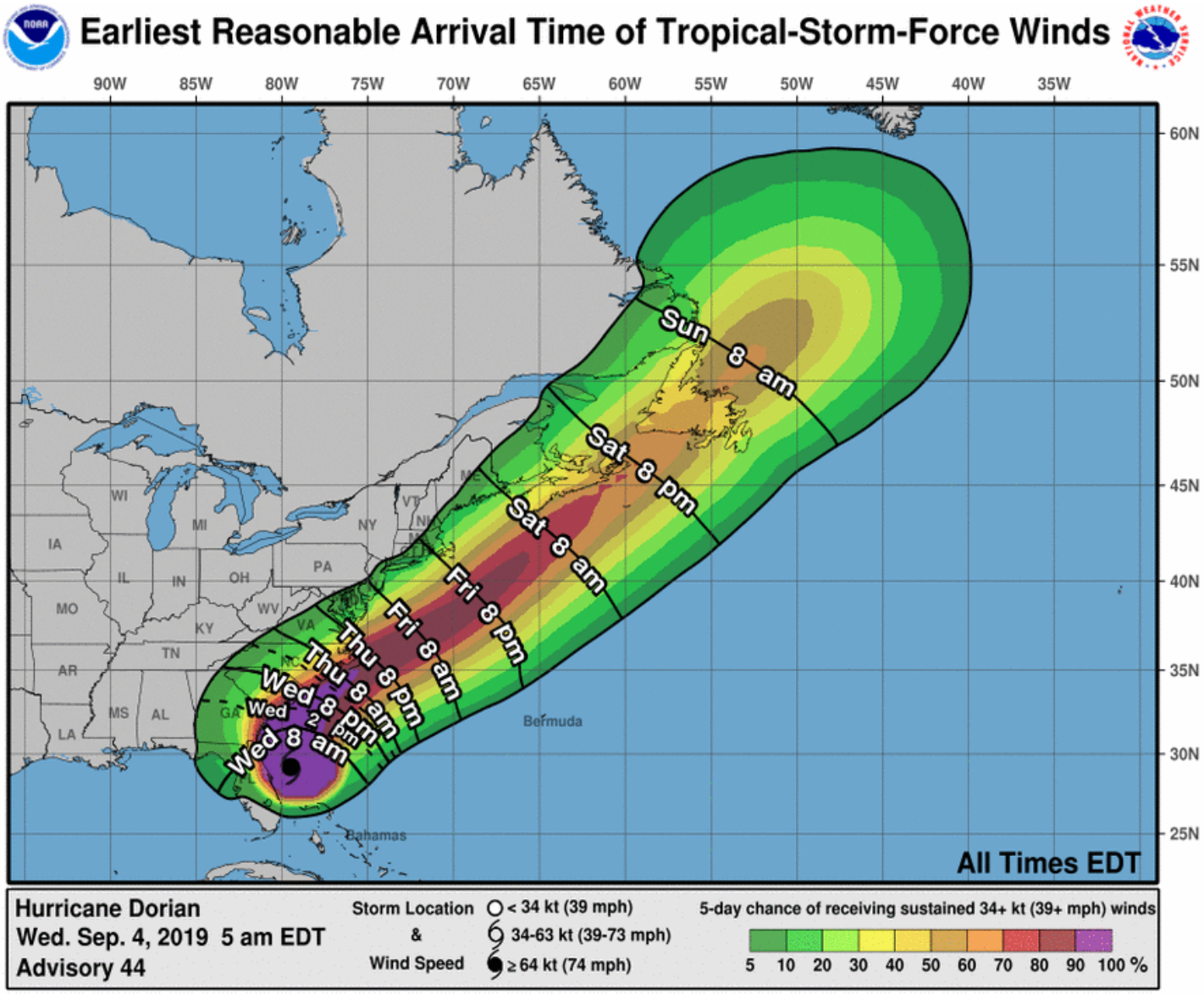
Hurricane-Force Wind Speed Probabilities



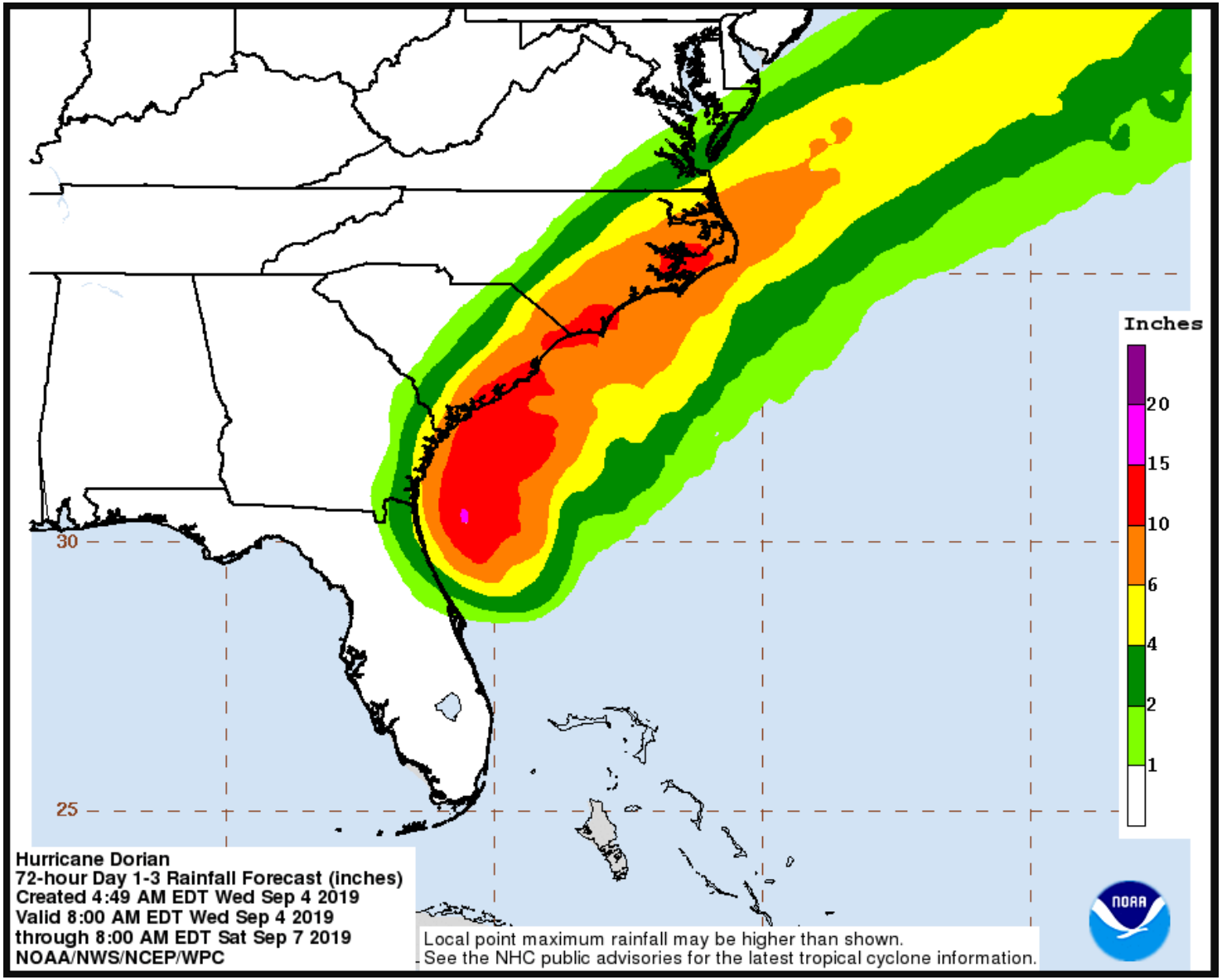
Tropical-Storm-Force Wind Speed Probabilities



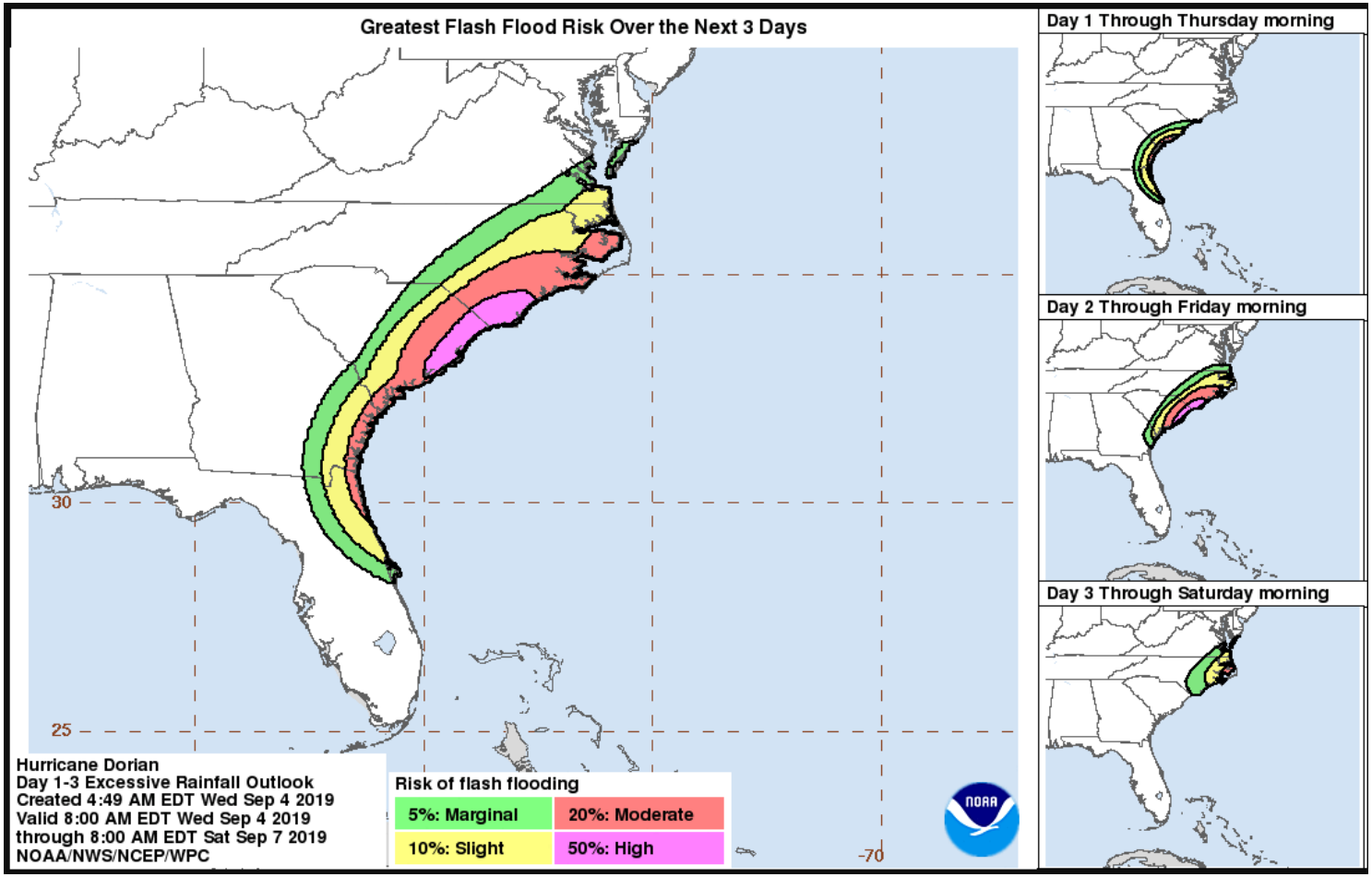
Most Likely Arrival Time of Tropical-Storm-Force Winds



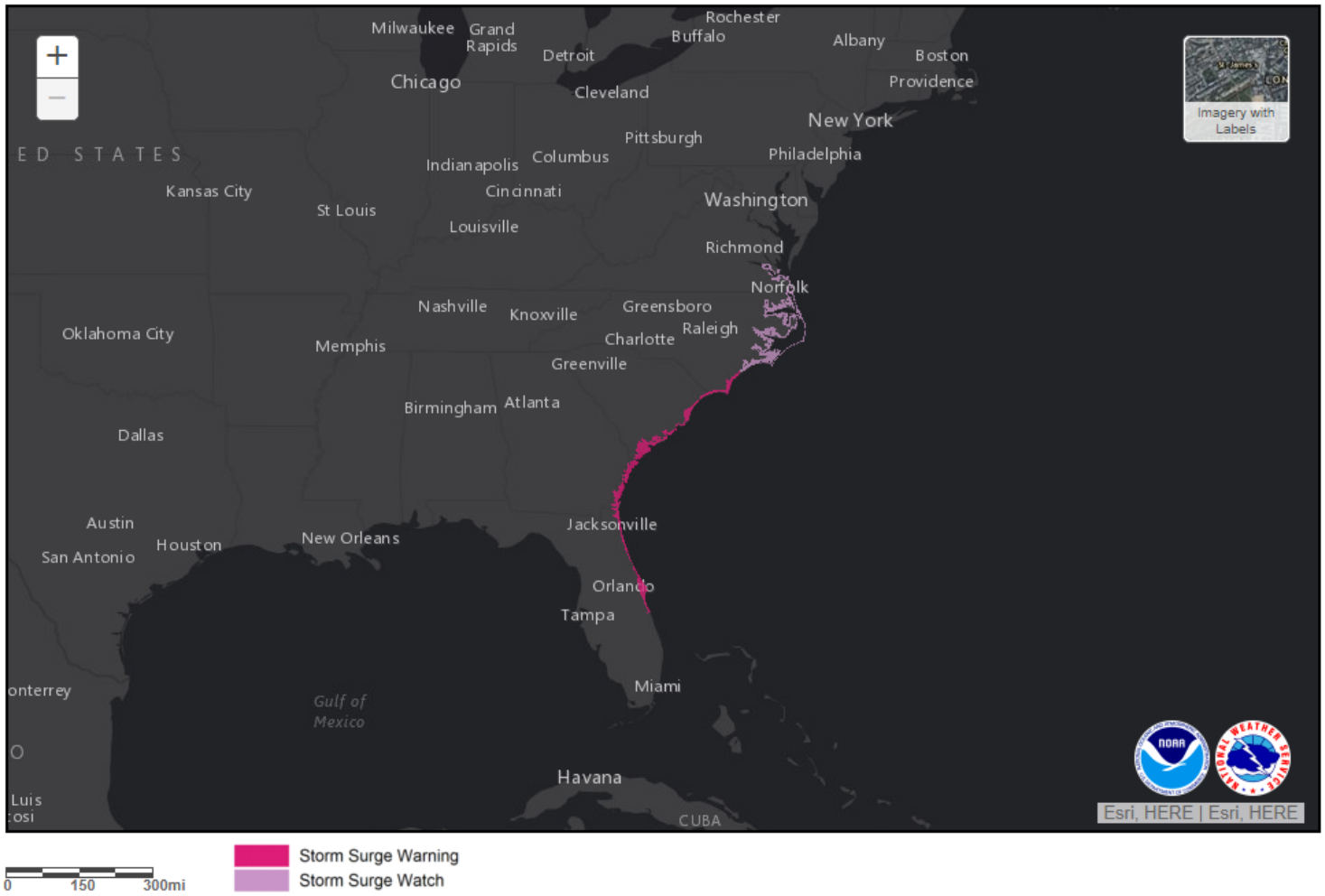
Rainfall Potential



Flash Flood Risk Over Next 3 Days



Storm Surge Watch/Warning Graphic



Safety Procedures & Readiness

Hurricane Hazards

While hurricanes pose the greatest threat to life and property, tropical storms and depressions also can be devastating. The primary hazards from tropical cyclones (which include tropical depressions, tropical storms, and hurricanes) are storm surge flooding, inland flooding from heavy rains, destructive winds, tornadoes, and high surf and rip currents.

- Storm surge is the abnormal rise of water generated by a storm's winds. This hazard is historically the leading cause of hurricane related deaths in the United States. Storm surge and large battering waves can result in large loss of life and cause massive destruction along the coast.
- Storm surge can travel several miles inland, especially along bays, rivers, and estuaries.
- Flooding from heavy rains is the second leading cause of fatalities from landfalling tropical cyclones. Widespread torrential rains associated with these storms often cause flooding hundreds of miles inland. This flooding can persist for several days after a storm has dissipated
- Winds from a hurricane can destroy buildings and manufactured homes. Signs, roofing material, and other items left outside can become flying missiles during hurricanes.
- Tornadoes can accompany landfalling tropical cyclones. These tornadoes typically occur in rain bands well away from the center of the storm
- Dangerous waves produced by a tropical cyclone's strong winds can pose a significant hazard to coastal residents and mariners. These waves can cause deadly rip currents, significant beach erosion, and damage to structures along the coastline, even when the storm is more than a 1,000 miles offshore

Now is the time to prepare. All residents and visitors in the path of Hurricane Lane should review these tips:

- Check to make sure your emergency kit is stocked and test your family communications plan.
- Know your evacuation routes and how to find higher ground. Determine where you would go, and how you would get there if instructed to evacuate. *If directed to evacuate by local officials, evacuate*.

Stay vigilant and continue to monitor local radio or TV stations and local emergency management officials for updated weather and emergency information.

- The FEMA App (available in English and Spanish) provides National Weather Service alerts (for up to 5 areas), emergency kit checklists, directions to open shelters, safety preparation tips and more.
- Make plans to secure your property:
  - Cover all of your home's windows. Permanent storm shutters offer the best protection for windows. A second option is to board up windows with 5/8" marine plywood, cut to fit and ready to install. Tape does not prevent windows from breaking.
  - Reinforce your garage doors; if wind enters a garage it can cause dangerous and expensive structural damage.
  - Plan to bring in all outdoor furniture, decorations, garbage cans, and anything else that is not tied down.
  - Determine how and where to secure boats and other marine craft.
- You can safely install a generator for emergencies. Remember, never run a generator inside and keep it away from windows, doors, and vents.
- If using candles, please use caution. If possible, use flashlights instead. If you must use candles, do not burn them on or near anything that can catch fire.
- Your phone is an important tool to ensure your family's safety. Make sure to charge your phone and other electronic devices.
- Businesses of all sizes are encouraged to follow local public safety authority direction and to share safety messaging with employees in order to reduce risk.
- If you have a National Flood Insurance Program (NFIP) flood insurance policy, you may be eligible for reimbursement for actions taken to protect your property. Call your insurance agent to find out more.

The Saffir-Simpson Hurricane Wind Scale

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph.

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 kt 119-153 km/h	**Very dangerous winds will produce some damage:** Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph 83-95 kt 154-177 km/h	**Extremely dangerous winds will cause extensive damage:** Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 kt 178-208 km/h	**Devastating damage will occur:** Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156 mph 113-136 kt 209-251 km/h	**Catastrophic damage will occur:** Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher 137 kt or higher 252 km/h or higher	**Catastrophic damage will occur:** A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

For Additional Information:

American Red Cross	http://www.redcross.org/
US Coast Guard Storm Center	https://www.uscg.mil/news/stormcenter/
US National Hurricane Center	www.nhc.noaa.gov
US Federal Emergency Management Agency	http://www.ready.gov/hurricanes
FEMA – Mobile App	https://www.fema.gov/mobile-app
FEMA – Flooding	https://www.fema.gov/media-library-data/1522342356506-54bd8d92d0d0d07bca4c1250ebde2b21/Flood_508.pdf
Ready Gov	www.ready.gov
Listo Gov (Spanish)	www.listo.gov
Emergency Management Agencies	https://www.fema.gov/emergency-management-agencies
Caribbean Disaster Emergency Management Agency	http://www.cdema.org/index.php?option=com_wrapper&view=wrapper&Itemid=417
Smart Traveler Enrollment Program	https://step.state.gov/