



## Hurricane Dorian 09.03.19 Analysis

Risk Services Division

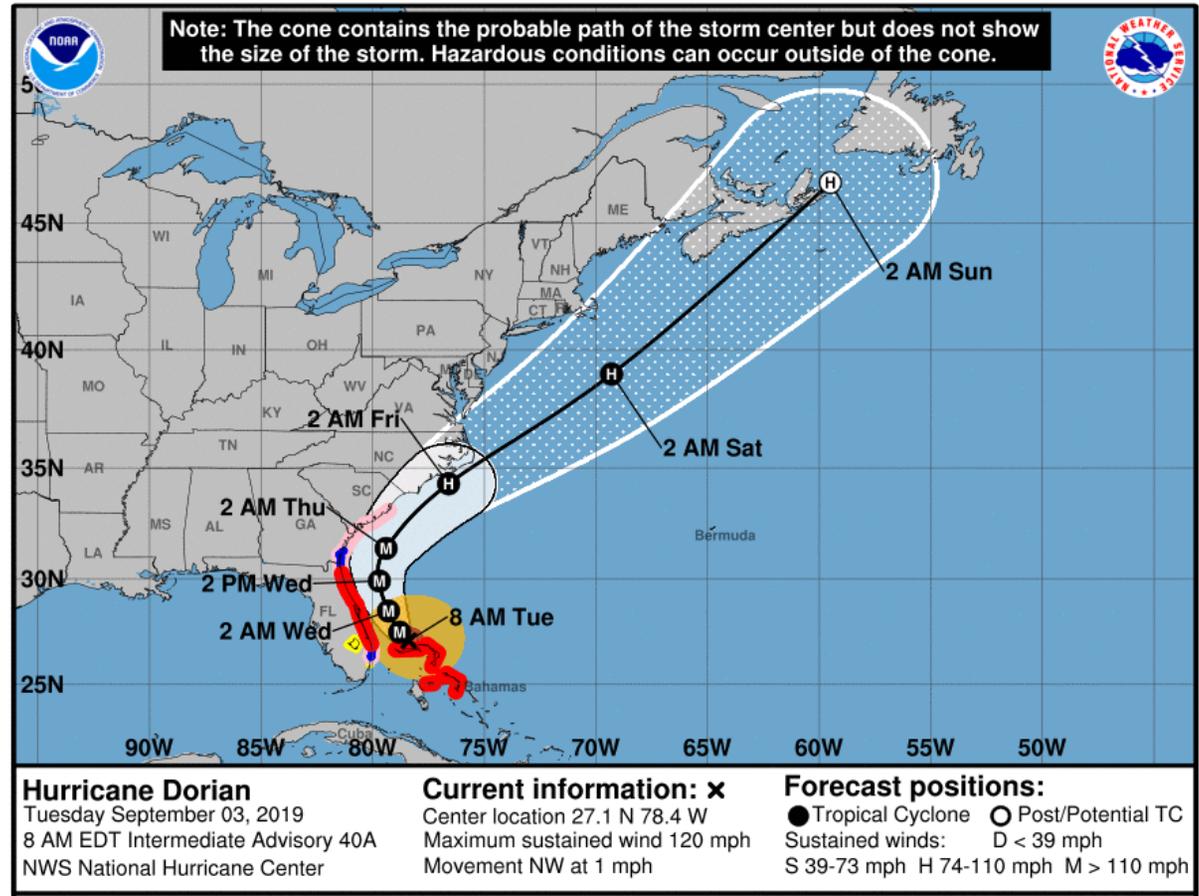
3 September 2019

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## Hurricane Dorian Status at 09:00 EDT (13:00 UTC) 3 September, 2019

- Devastating winds and storm surge will continue to affect Grand Bahama Island for several more hours
- Dorian is a Category 3 hurricane and is beginning to move slowly northwest however the southern eyewall continues to batter Grand Bahama Island
- The center of Hurricane Dorian is located at 27.1N 78.5 W about 45 miles (70km) NNE of Freeport Grand Bahama Island, and 105 miles (165km) ENE of West Palm Beach, Florida
- Dorian is moving northwestward (325°) at 1 mph (2 km/h)
- Maximum sustained winds are 115 mph (185 km/h) with wind gusts to 140mph (220km/h)
- Hurricane-force winds extend outward up to 45 miles (75 km) from the center, and tropical-storm-force winds extend outward up to 140 miles (225 km)
- Life-threatening storm surge and dangerous hurricane-force winds are expected along portions of the Florida east coast and the coasts of Georgia and South Carolina, regardless of the exact track of Dorian's center. Water levels could begin to rise well in advance of the arrival of strong winds



## Summary

At 0900 AM EDT (1300UTC), the National Hurricane Center reports the eye of Hurricane Dorian was located at 27.1N 78.5 W about 45 miles (70km) NNE of Freeport Grand Bahama Island, and 105 miles (165km) ENE of West Palm Beach, Florida. Dorian is beginning to move northwest at approximately 1mph (2 km/h) and a slightly faster motion toward the northwest or north-northwest is expected later today and tonight. A turn toward the north is forecast by Wednesday evening, followed by a turn to the north-northeast Thursday morning.

On this track, the core of Dorian will gradually move north of Grand Bahama Island through this evening. The hurricane will then move dangerously close to the Florida east coast late today through Wednesday evening, very near the Georgia and South Carolina coasts Wednesday night and Thursday, and near or over the North Carolina coast late Thursday.

Maximum sustained winds are near 115mph (185 km/h) with gusts to 140mph (225km/h). **Dorian is a category 3 hurricane** on the Saffir-Simpson Hurricane Wind Scale and is expected to remain a powerful hurricane during the next couple of days.

Hurricane-force winds extend outward up to 45 miles (75 km) from the center and tropical-storm-force winds extend outward up to 160 miles (260 km).

The estimated minimum central pressure is 952mb (28.11 inches).

## Discussion

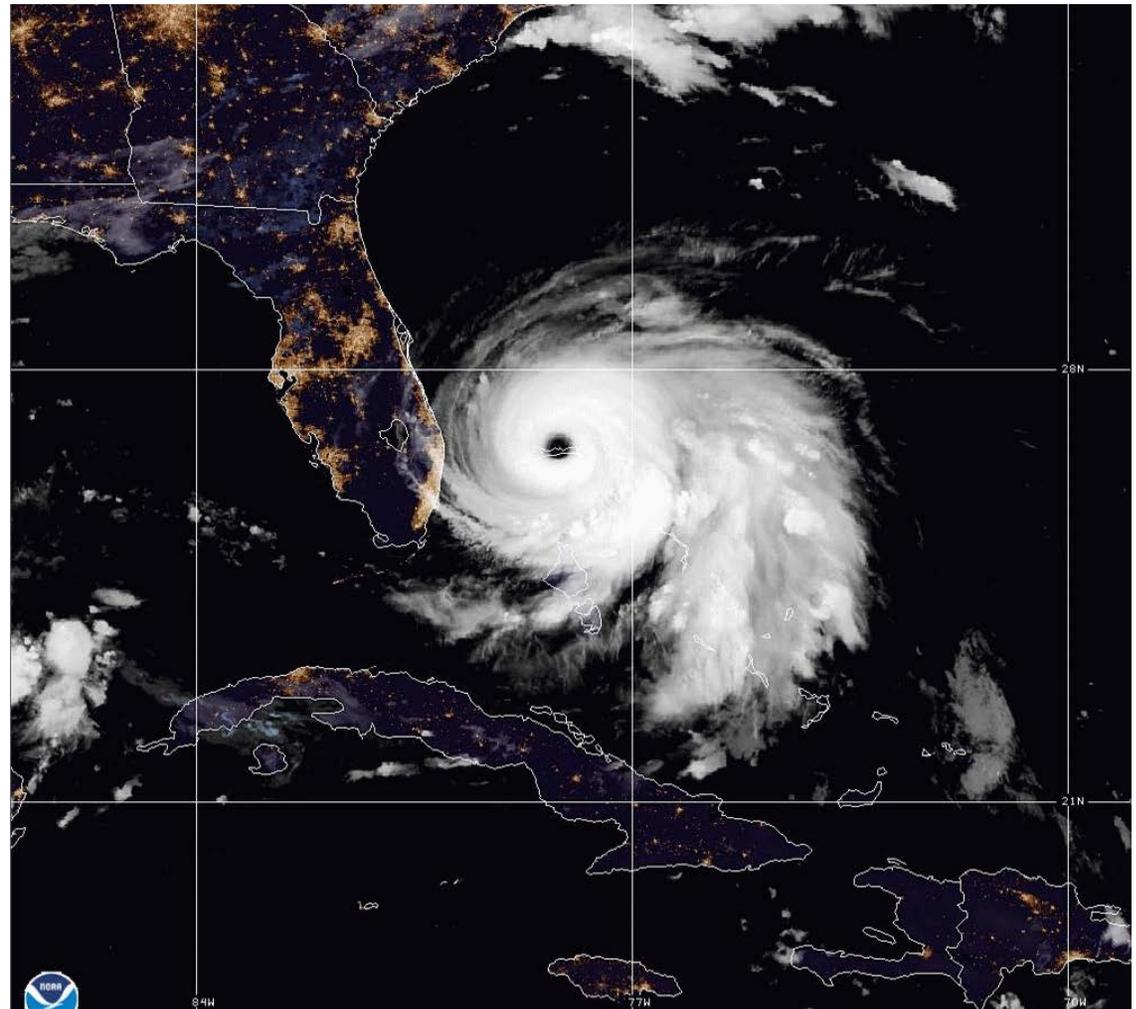
Hurricane Dorian is expected to more or less maintain its intensity for about 36 hours. After that time period, increasing vertical shear should cause gradual weakening. However, the system is likely to remain a major hurricane for the next few days.

Dorian has been nearly stationary for the past 18 hours but atmospheric changes should see Dorian begin to move north-northwestward later today. The system should turn northward with a gradual increase in forward speed as it moves in approximately 48 hours and then accelerate northeastward.

Although the current NHC track forecast does not show Dorian making landfall along the Florida east coast, the track remains uncertain and there is still a reasonable risk that the hurricane will deviate from the forecast track and move very near or over the coastline.

### Key Messages

1. Devastating winds and storm surge will continue to affect Grand Bahama Island for several more hours. Everyone there should remain in shelter.
2. Life-threatening storm surge and dangerous hurricane-force winds are expected along portions of the Florida east coast and the coasts of Georgia and South Carolina, regardless of the exact track of Dorian's center. Water levels could begin to rise well in advance of the arrival of strong winds. Residents in these areas should follow advice given by local emergency officials.
3. The risk of life-threatening storm surge and hurricane-force winds continues to increase along the coast of North Carolina. Residents in these areas should follow advice given by local emergency officials.
4. The flash flood threat will increase today and tonight along the Florida peninsula, then spread up the southeast and mid-Atlantic coast during the middle and latter part of the week.



## Watches and Warnings

**A hurricane warning is in effect for Grand Bahama and the Abacos Islands in the northwestern Bahamas**

**A hurricane warning is in effect for Jupiter Inlet to Ponte Vedra Beach, Florida**

**A hurricane watch is in effect for north of Deerfield Beach, Florida to Jupiter Inlet, Florida and north of Ponte Vedra Beach, Florida to South Santee River, South Carolina**

**A Tropical Storm Warning is in effect for North of Deerfield Beach, Florida to Jupiter Inlet, Florida and North of Ponte Vedra Beach FL to Altamaha Sound GA**

**A Tropical Storm Watch is in effect for North of Golden Beach, Florida to Deerfield Beach, Florida and Lake Okeechobee**

**A Storm Surge Warning is in effect for Lantana, Florida to Savannah River**

**A Storm Surge Watch is in effect for North of Deerfield Beach, Florida to south of Lantana, Florida and Savannah River to South Santee River, South Carolina**

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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.

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.

## Hazards Affecting Land

**WIND:** Devastating hurricane conditions continue on Grand Bahama Island.

Hurricane conditions are expected within the Hurricane Warning area in Florida by late this evening. Hurricane conditions are possible in the Hurricane Watch area beginning Wednesday.

In South Florida, tropical storm conditions are expected within the Tropical Storm warning area through today, and are possible in the Tropical Storm watch area through this morning. Along the coast of northeastern Florida and Georgia, tropical storm conditions are expected within the Tropical Storm Warning area on Wednesday.

**STORM SURGE:** A life-threatening storm surge will raise water levels by as much as 10 to 15 feet above normal tide levels in areas of onshore winds on Grand Bahama Island. Near the coast, the surge will be accompanied by large and destructive waves. Water levels should very slowly subside on the Abaco Islands today.

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:

- Flagler/Volusia County Line to South Santee River SC: .4 to 7 ft
- Lantana to the Flagler/Volusia County Line: 3 to 5 ft
- North of Deerfield Beach, Florida to Lantana, Florida: 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:

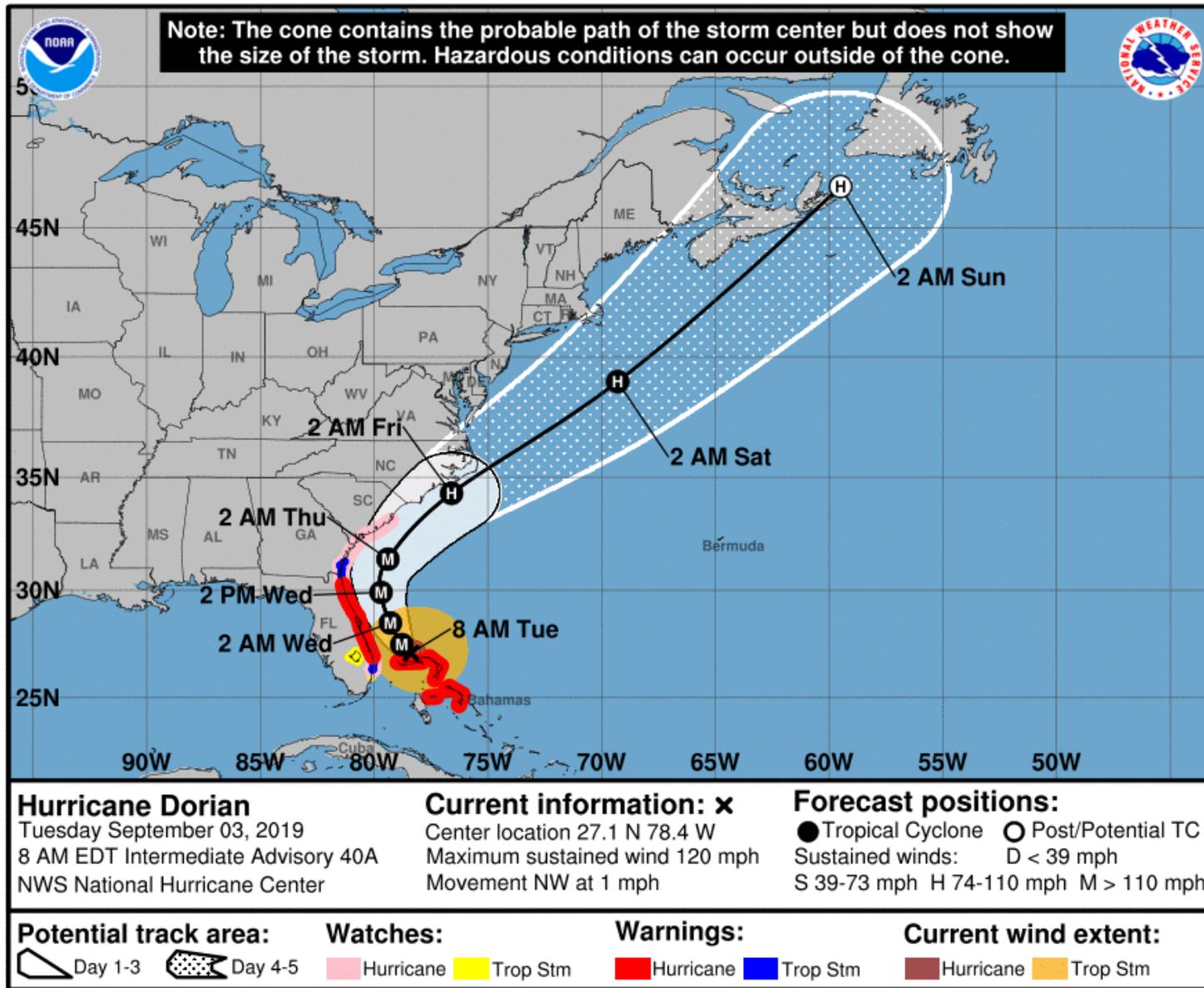
- Northwestern Bahamas: 3 to 6 inches, isolated storm totals to 30 inches
- Coastal Carolinas: 5 to 10 inches, isolated 15 inches
- Atlantic Coast from the Florida peninsula north of West Palm Beach through Georgia: 3 to 6 inches, isolated 9 inches
- Southeast Virginia: 2 to 4 inches, isolated 6 inches

This rainfall may cause life-threatening flash floods.

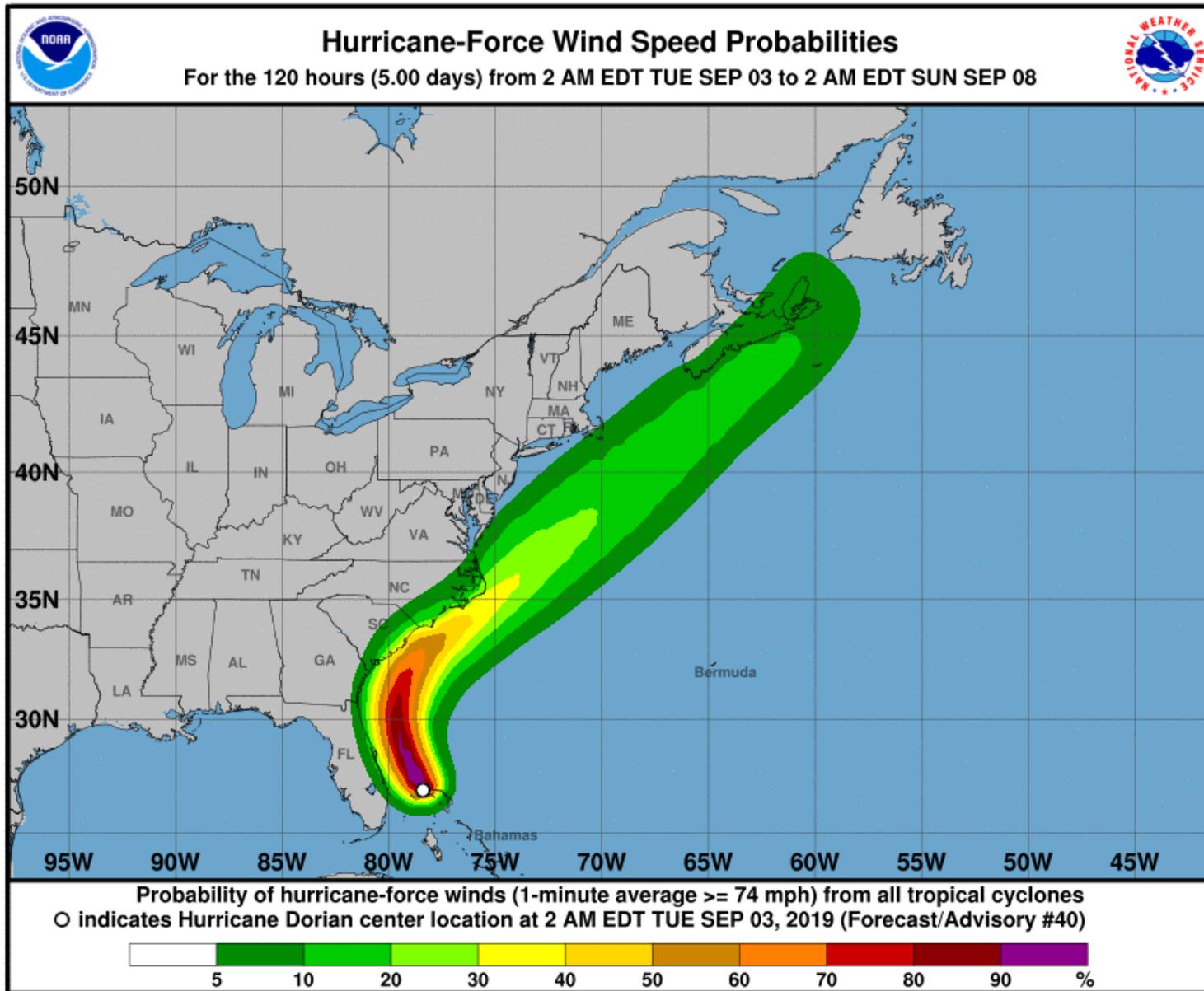
**SURF:** Large swells are affecting the northwestern Bahamas, the Florida east coast, and the coast of Georgia. These swells are expected to spread northward along much of the remainder of the southeastern United States coast during the next couple of days. These swells are likely to cause life-threatening 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 coastal Georgia and coastal Carolinas on Wednesday into Thursday.

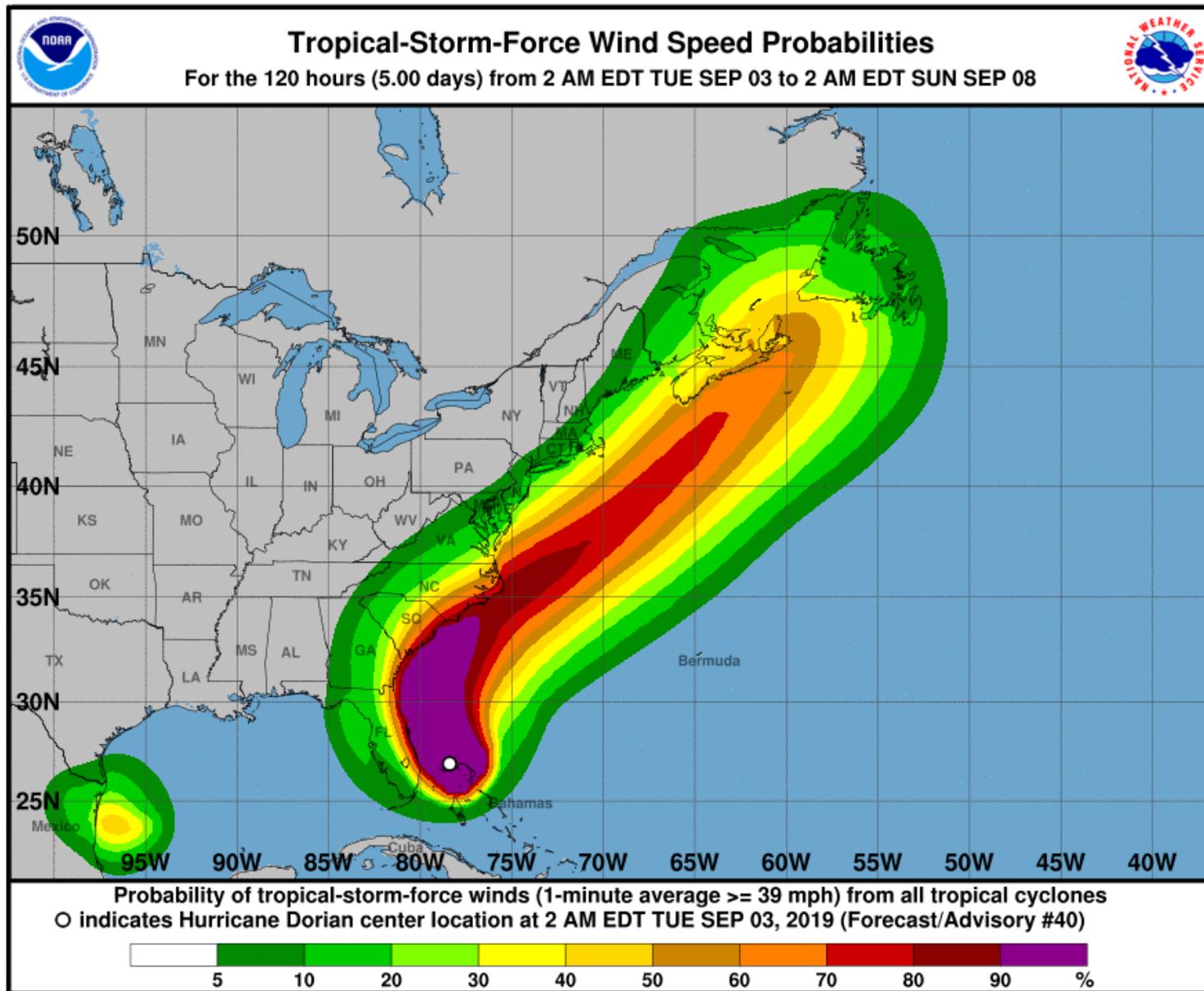
Current Predicted Path



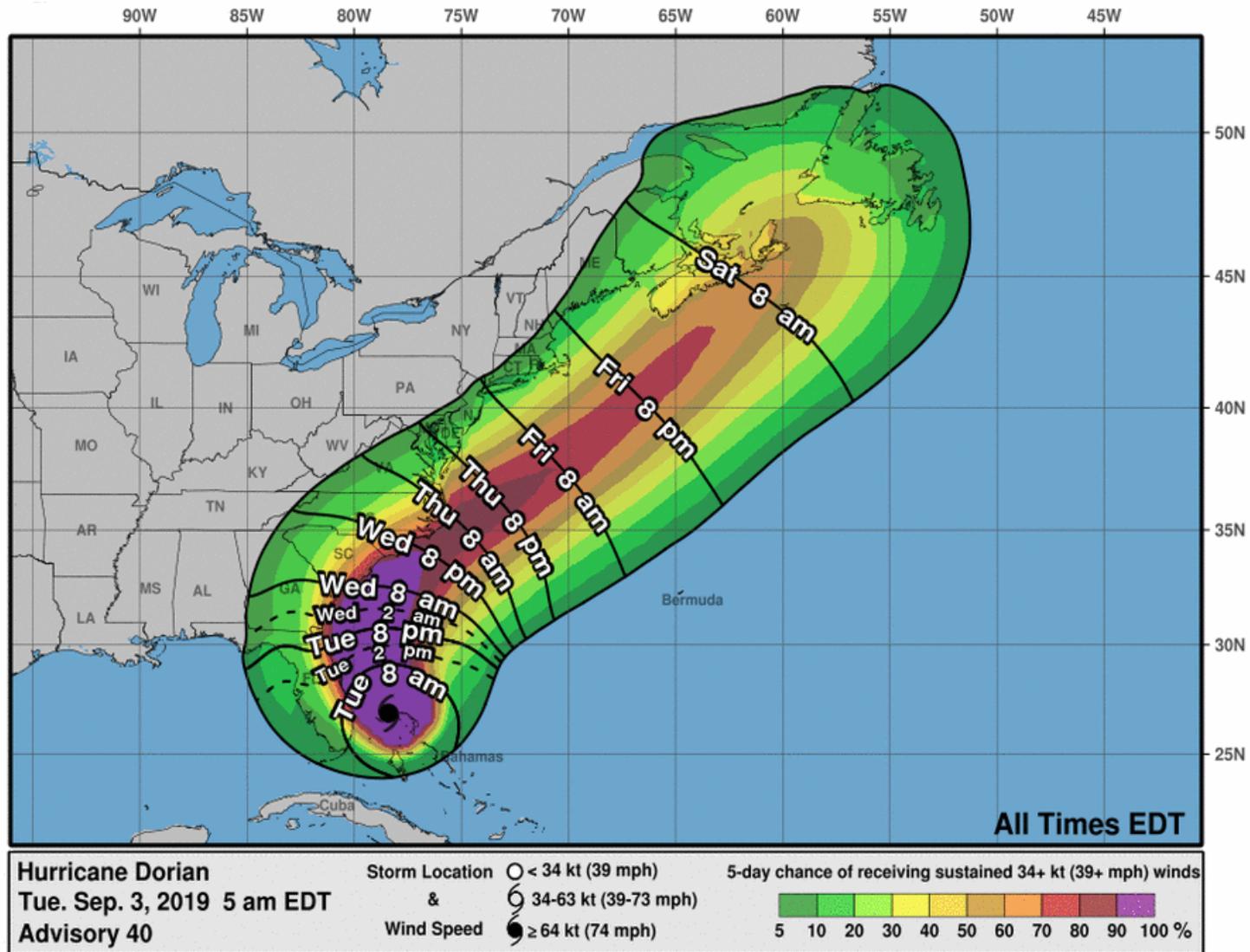
Hurricane-Force Wind Speed Probabilities



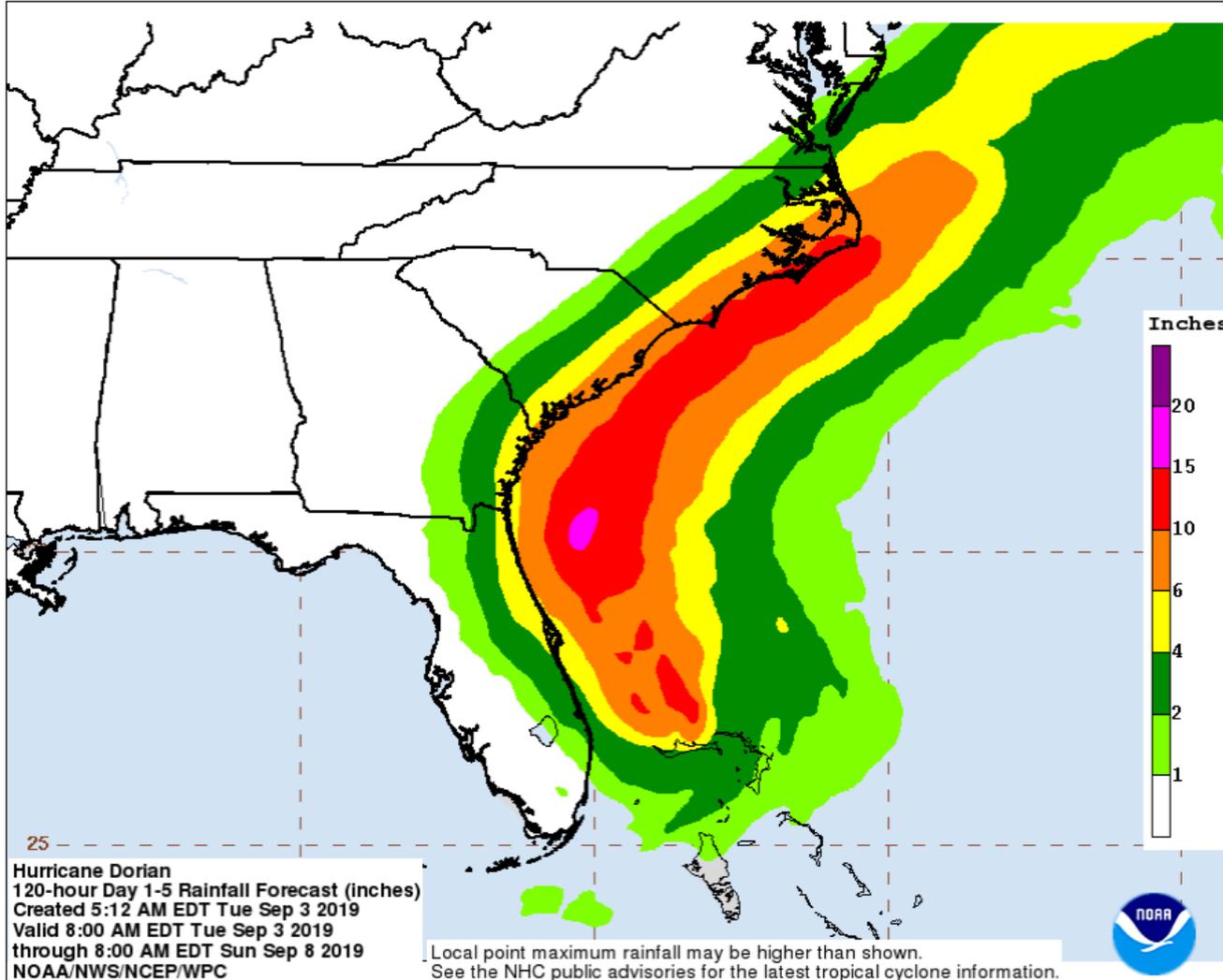
Tropical-Storm-Force Wind Speed Probabilities



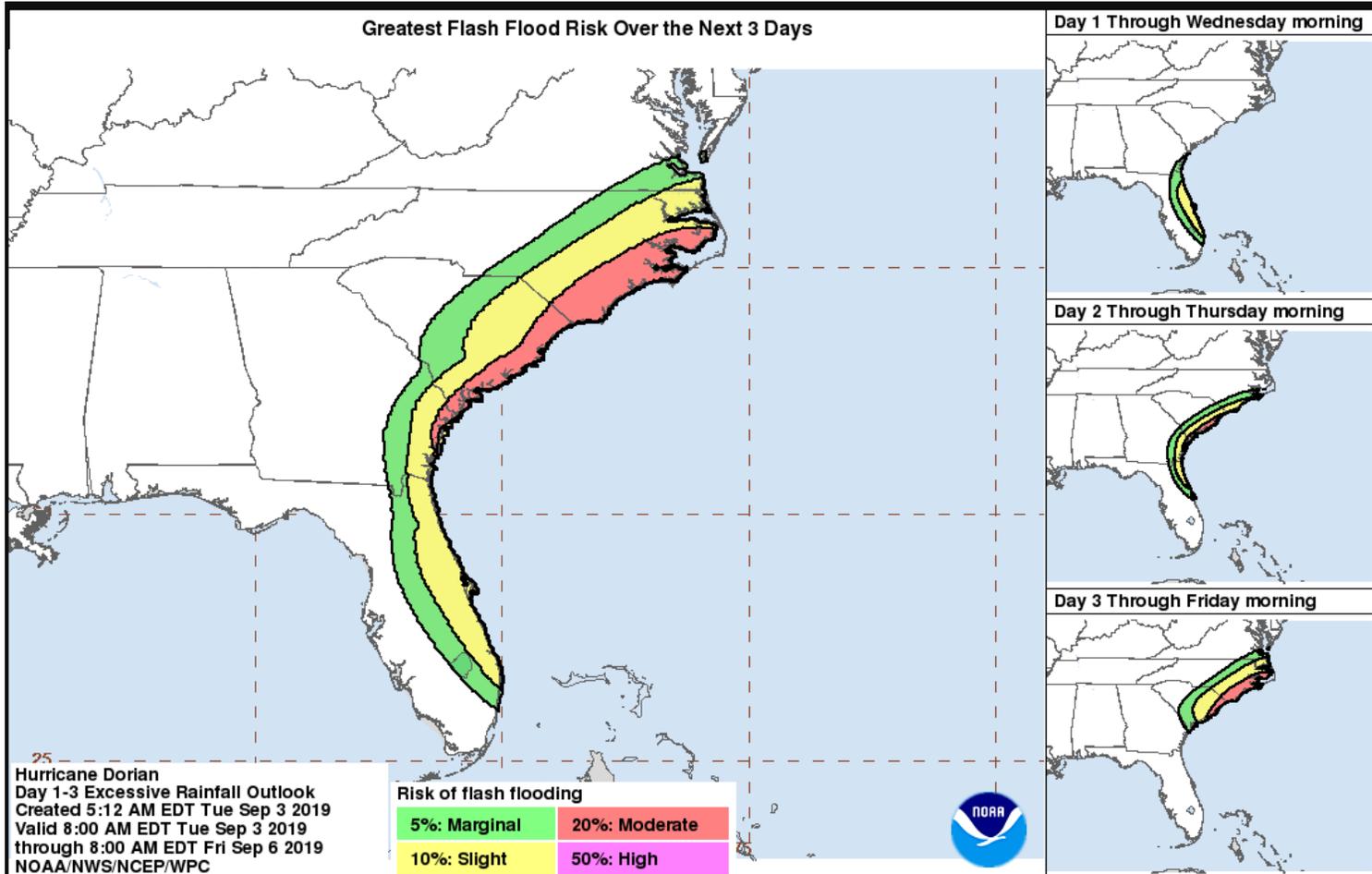
Most Likely Arrival Time of Tropical-Storm-Force Winds



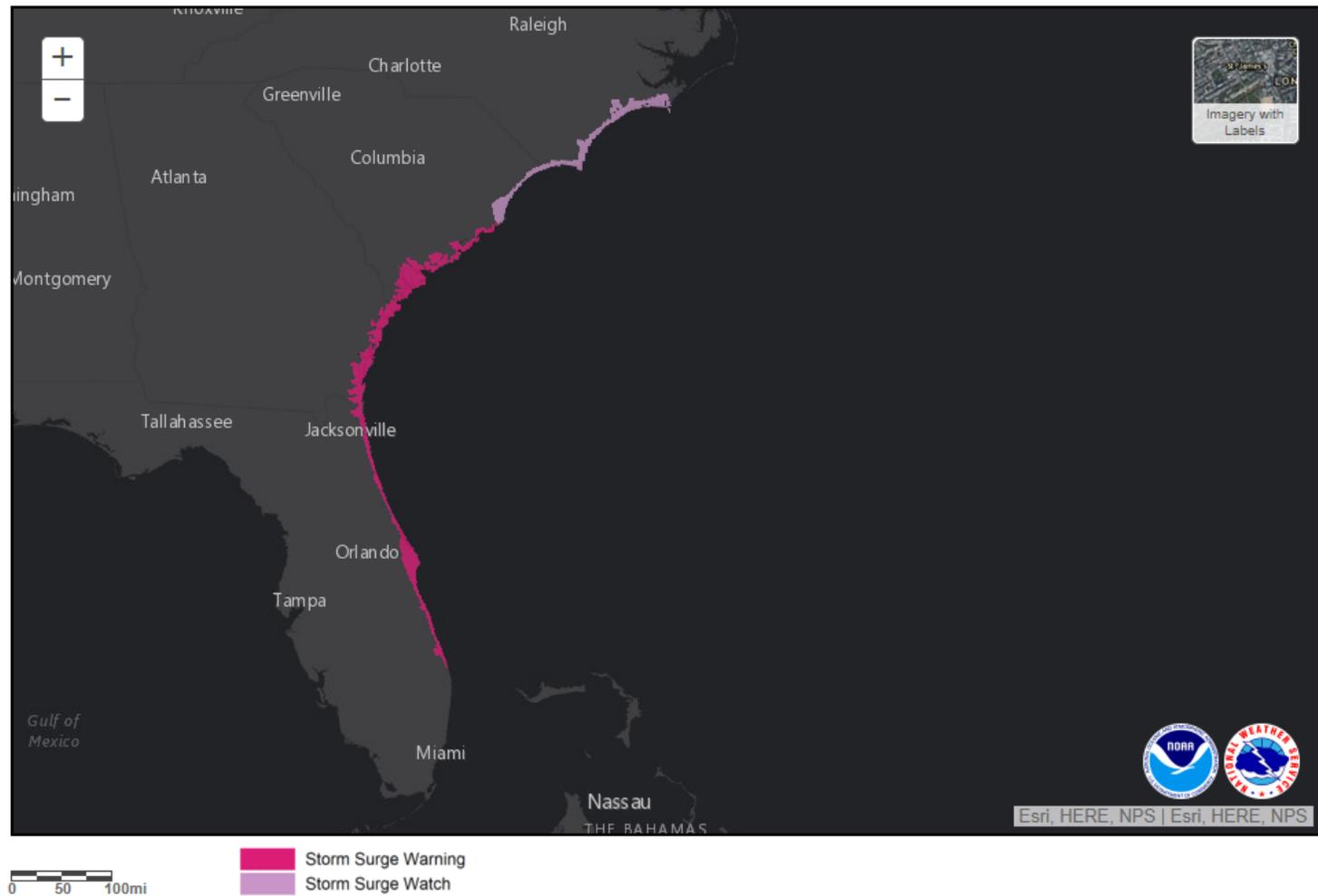
Rainfall Potential



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	<b>Very dangerous winds will produce some damage:</b> 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	<b>Extremely dangerous winds will cause extensive damage:</b> 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	<b>Devastating damage will occur:</b> 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	<b>Catastrophic damage will occur:</b> 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	<b>Catastrophic damage will occur:</b> 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	<a href="http://www.redcross.org/">http://www.redcross.org/</a>
US Coast Guard Storm Center	<a href="https://www.uscg.mil/news/stormcenter/">https://www.uscg.mil/news/stormcenter/</a>
US National Hurricane Center	<a href="http://www.nhc.noaa.gov">www.nhc.noaa.gov</a>
US Federal Emergency Management Agency	<a href="http://www.ready.gov/hurricanes">http://www.ready.gov/hurricanes</a>
FEMA – Mobile App	<a href="https://www.fema.gov/mobile-app">https://www.fema.gov/mobile-app</a>
FEMA – Flooding	<a href="https://www.fema.gov/media-library-data/1522342356506-54bd8d92d0d0d07bca4c1250ebde2b21/Flood_508.pdf">https://www.fema.gov/media-library-data/1522342356506-54bd8d92d0d0d07bca4c1250ebde2b21/Flood_508.pdf</a>
Ready Gov	<a href="http://www.ready.gov">www.ready.gov</a>
Listo Gov (Spanish)	<a href="http://www.listo.gov">www.listo.gov</a>
Emergency Management Agencies	<a href="https://www.fema.gov/emergency-management-agencies">https://www.fema.gov/emergency-management-agencies</a>
Caribbean Disaster Emergency Management Agency	<a href="http://www.cdema.org/index.php?option=com_wrapper&amp;view=wrapper&amp;Itemid=417">http://www.cdema.org/index.php?option=com_wrapper&amp;view=wrapper&amp;Itemid=417</a>
Smart Traveler Enrollment Program	<a href="https://step.state.gov/">https://step.state.gov/</a>