



Tropical Update



10:30 AM EDT

Wednesday, November 6, 2024

Hurricane Rafael

Rafael Likely to Become a Major Hurricane Later Today

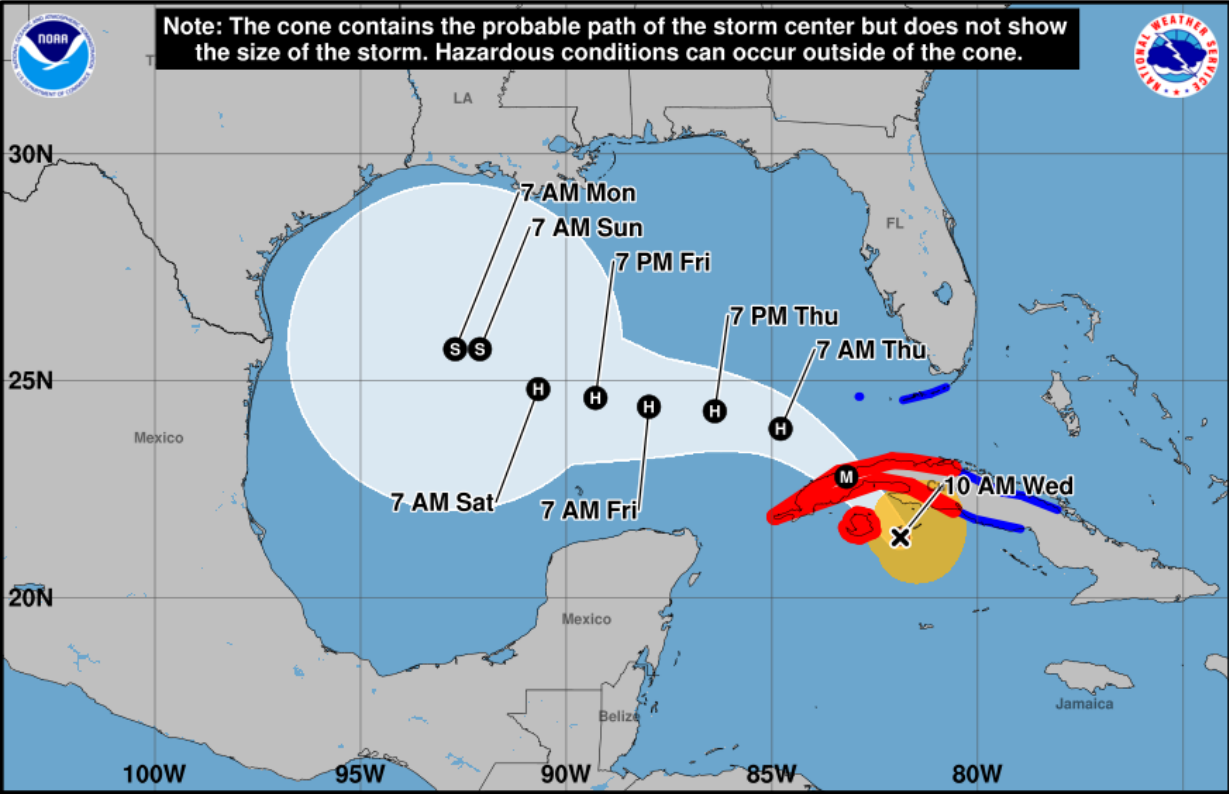
Marginal Risk For Flash Flooding Across North Florida and Along the Keys Today; A Couple of Brief Tropical Tornadoes Possible Along the Southwest Coast and Keys Today

This update is intended for government and emergency response officials, and is provided for informational and situational awareness purposes only. Forecast conditions are subject to change based on a variety of environmental factors. For additional information, or for any life safety concerns with an active weather event please contact your County Emergency Management or Public Safety Office, local National Weather Service forecast office, or visit the National Hurricane Center website at www.hurricanes.gov.



Hurricane Rafael

From the National Hurricane Center (NHC)

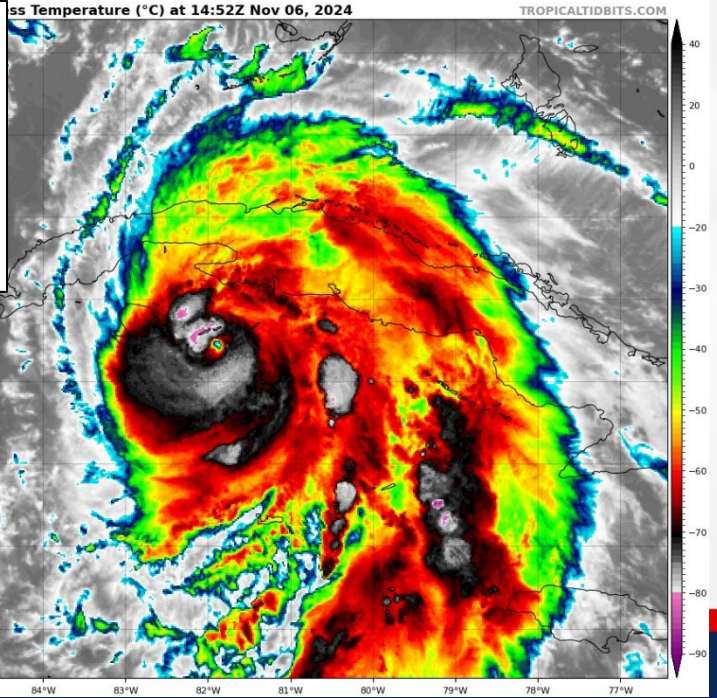


Hurricane Rafael Wednesday November 06, 2024 10 AM EST Advisory 12 NWS National Hurricane Center	Current information: x Center location 21.4 N 81.9 W Maximum sustained wind 110 mph Movement NW at 14 mph	Forecast positions: ● Tropical Cyclone ○ Post/Potential TC Sustained winds: D < 39 mph S 39-73 mph H 74-110 mph M > 110 mph	
Potential track area: Day 1-5	Watches: Hurricane Trop Stm	Warnings: Hurricane Trop Stm	Current wind field estimate: Hurricane Trop Stm

- **Location:** 60 miles ESE of the Isle of Youth, 246 miles S of Key West, Florida
- **Maximum Sustained Winds:** 110 mph (Category 2)
- **Current Movement:** NW at 14 mph
- **FL Watches/Warnings:**
 - **Tropical Storm Warning** in effect for the Lower & Middle Keys (Monroe County)

A general northwestward motion is anticipated over the next day or so, followed by a gradual west-northwestward turn in the Gulf of Mexico. On the forecast track, Rafael is expected move near or just east of the Isle of Youth during the next few hours, and make landfall in western Cuba today. Rafael is forecast to move into the southeastern Gulf of Mexico tonight. Additional strengthening is expected, and Rafael is forecast to be a major hurricane when it makes landfall in Cuba later today. Rafael is forecast to weaken over Cuba but is expected to emerge into the southeastern Gulf of Mexico as a hurricane.

Satellite presentation of Rafael has continued to improve this morning with the eye becoming apparent in geostationary imagery. Radar data from the Cayman Islands and reports from NOAA and Air Force Hurricane Hunter indicate Rafael has a double eyewall structure.





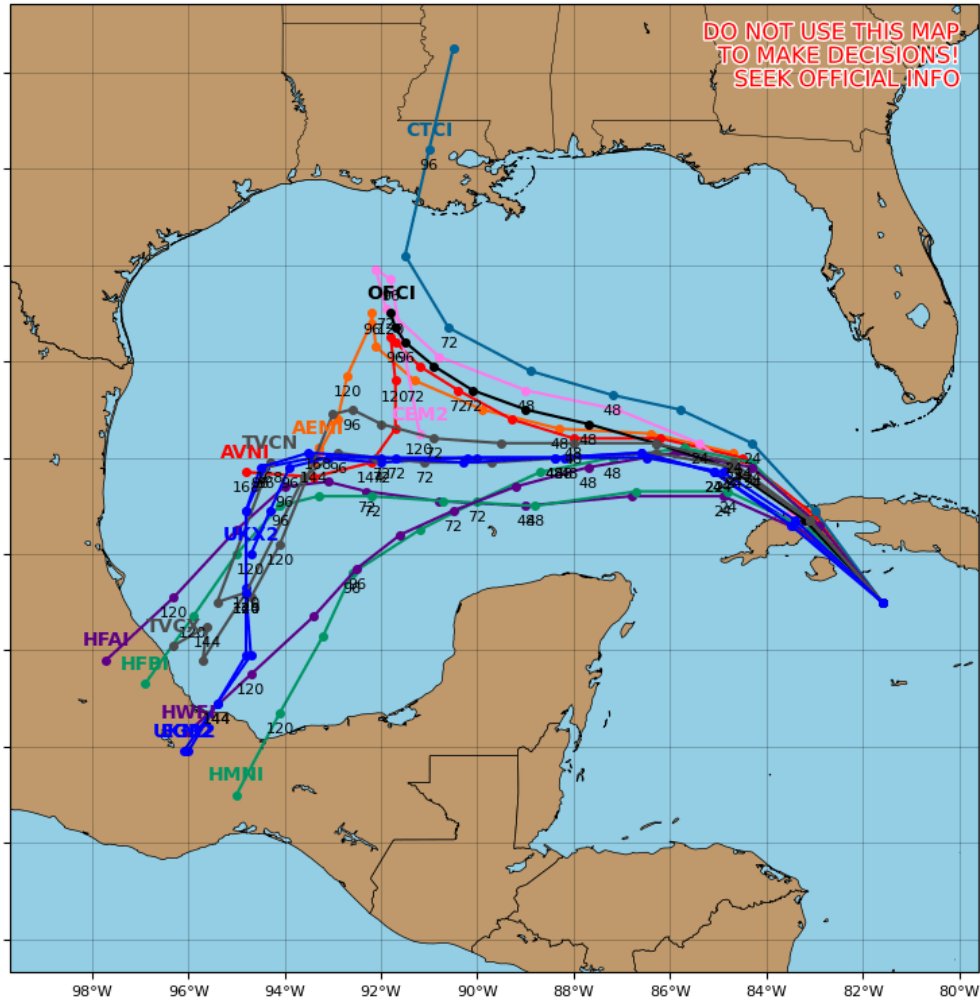
Forecast Computer Models – Next 5 Days

Hurricane Rafael

Hurricane RAFAEL Model Track Guidance

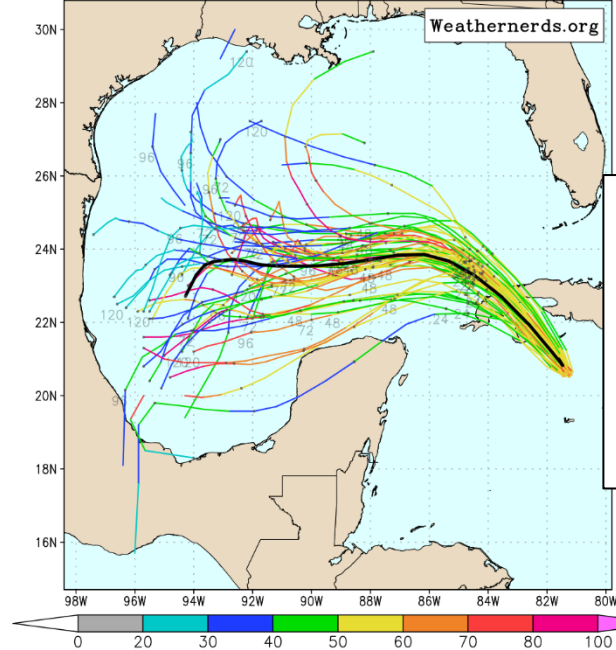
Initialized at 12z Nov 06 2024

Levi Cowan - tropicaltidbits.com



Rafael is currently on the southwestern side of an area of high pressure over the western Atlantic, and this feature will likely steer the system generally northwest for the next 24 hours. Once Rafael emerges north of Cuba and into the southeastern Gulf of Mexico, computer forecast models this afternoon have worked to a better agreement during the 24 to 48-hour timeframe that the center of Rafael should turn more westward as the high pressure system builds westward along the northern Gulf Coast and eastern Gulf of Mexico. After the 48-hour timeframe, there remains some significant spread in the model guidance, due to the variability in how fast or how slow Rafael will shear apart. Much of the guidance now suggests that the area of high pressure will remain to the north of the system through much of the forecast period.

ECMWF Ens. (0-120h only), init: 2024110606, AL18 Rafael color = max wind (kt)



The European Forecast Model Ensemble has consistently shown a weaker system curving more west over the central Gulf of Mexico; the American Forecast Model Ensemble continues to show a more eastward solution, bringing the weakening Rafael to the northern Gulf Coast next weekend.



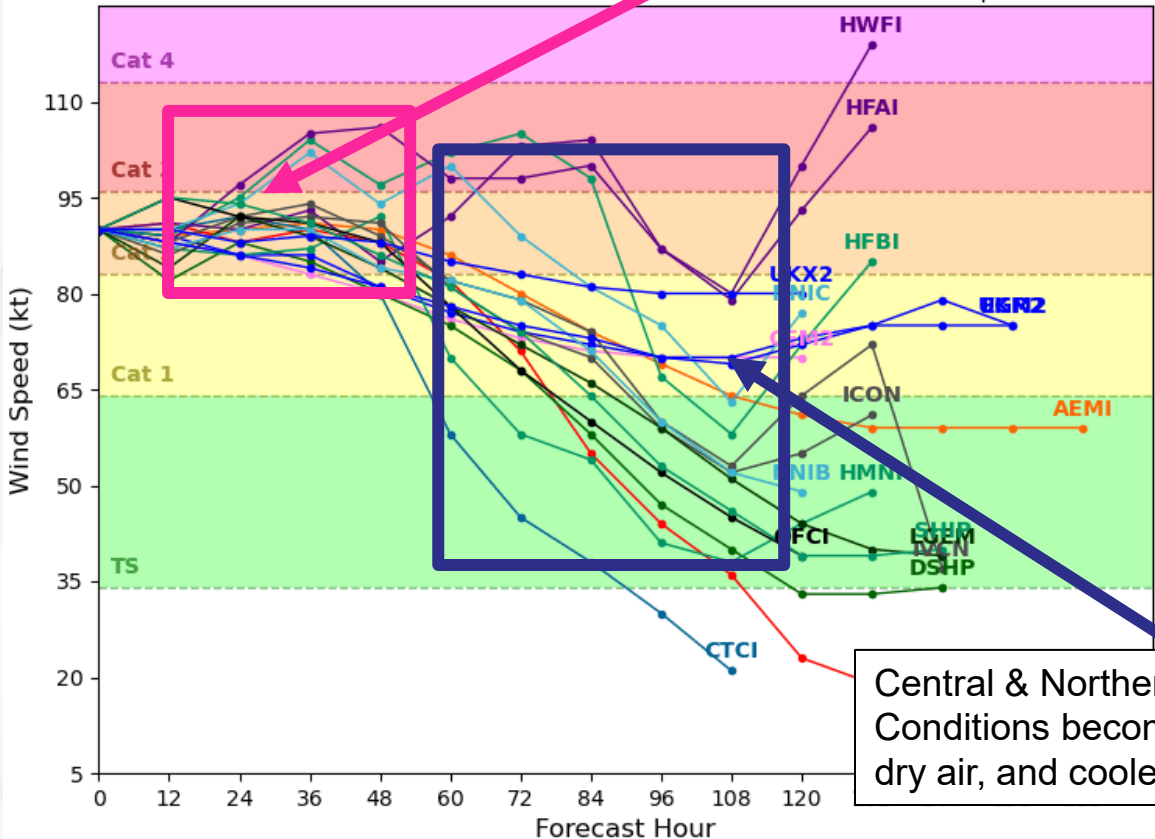
Forecast Computer Models – Next 5 Days

Tropical Storm Rafael

Caribbean & Southern Gulf of Mexico
Conditions **favorable** for intensification to major hurricane-strength.

Hurricane RAFAEL Model Int
Initialized at 12z Nov 06 2024

Levi Cowan - tropicaltidbits.com



Rafael is expected to remain in an environment of very warm sea surface temperatures, weak upper-level winds, and high moisture until the center reaches western Cuba. With these favorable conditions, the system is forecast to reach major hurricane status before landfall in Cuba. Once Rafael enters the central Gulf of Mexico, computer forecast models are in good agreement that increasing wind shear, significantly drier air, and cooler water temperatures will likely lead to Rafael weakening and eventually dissipating.

Central & Northern Gulf of Mexico
Conditions become **unfavorable** for the system, and strengthening is stopped. Upper-level winds, dry air, and cooler water temperatures will induce weakening during the 3 to 5-day timeframe.

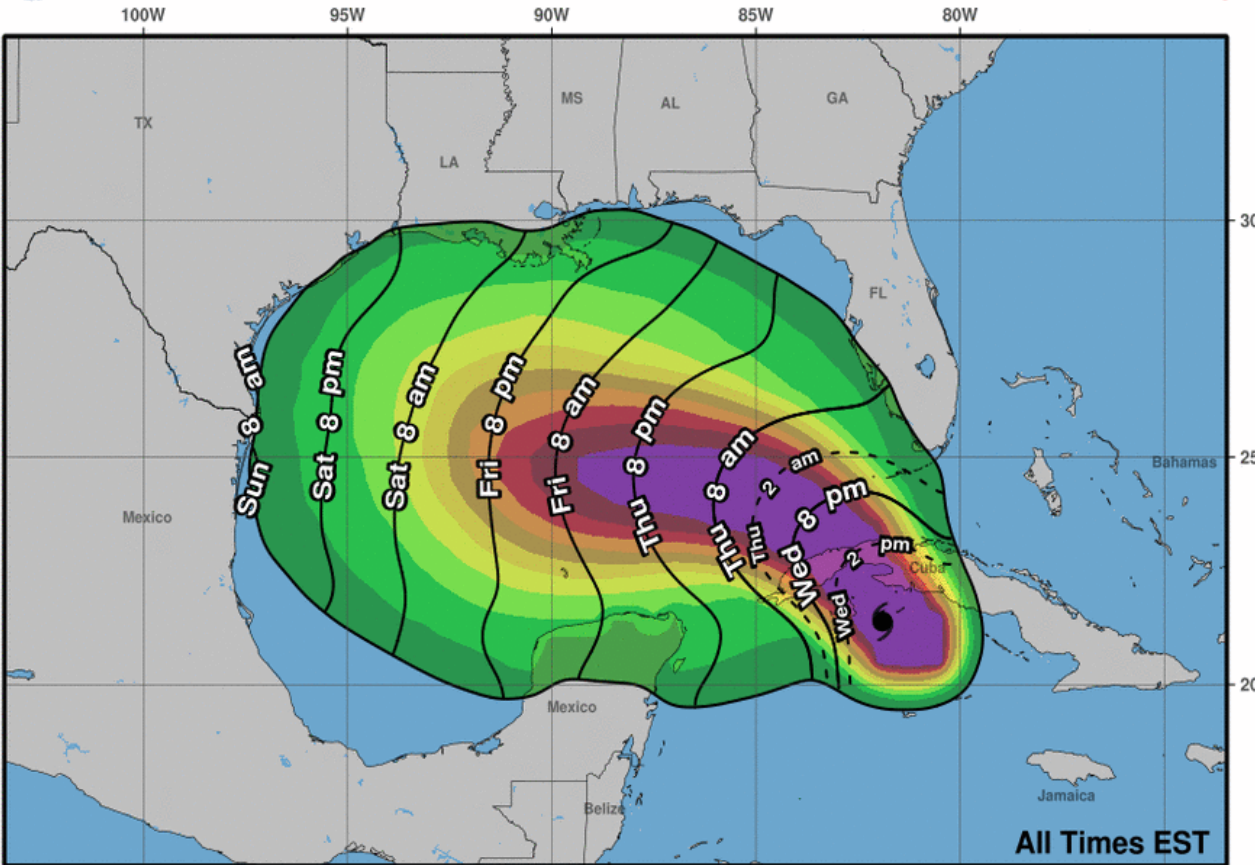


Wind Timing of Arrival

From the National Hurricane Center (NHC)



Most Likely Arrival Time of Tropical-Storm-Force Winds



Hurricane Rafael
 Wed. Nov. 6, 2024 10 am EST
 Advisory 12

Storm Location ○ < 34 kt (39 mph)
 & ○ 34-63 kt (39-73 mph)
 Wind Speed ● ≥ 64 kt (74 mph)

5-day chance of receiving sustained 34+ kt (39+ mph) winds
 5 10 20 30 40 50 60 70 80 90 100 %

All Times EST

- While the greatest probabilities (*shaded*) for tropical storm-force conditions are forecast to remain to the west of the Florida Peninsula, tropical storm-force conditions along the Lower and Middle Keys will be possible as Rafael moves northwestward over the southeastern Gulf of Mexico.
- Rafael is a lopsided system with most of its thunderstorm activity and gusty winds displaced east of its center; trends within the size of the wind field will continue to be monitored as Rafael emerges over the southeastern Gulf of Mexico as localized tropical storm-force conditions may brush the Southwest Florida Coast.
- Tropical storm-force conditions will most likely arrive along the Florida Keys this evening into the early overnight hours.
- Tropical storm-force conditions could arrive as early as late this afternoon along the Florida Keys.



Key Messages

From the National Hurricane Center (NHC)



Key Messages for Hurricane Rafael Advisory 12: 10:00 AM EST Wed Nov 06, 2024

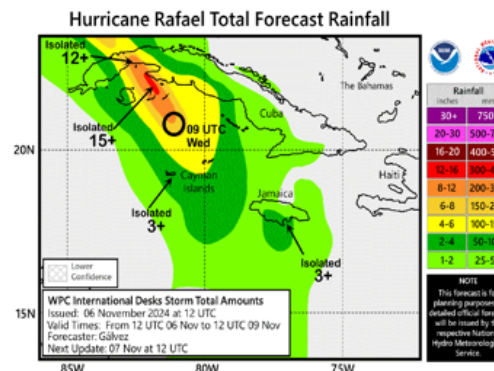
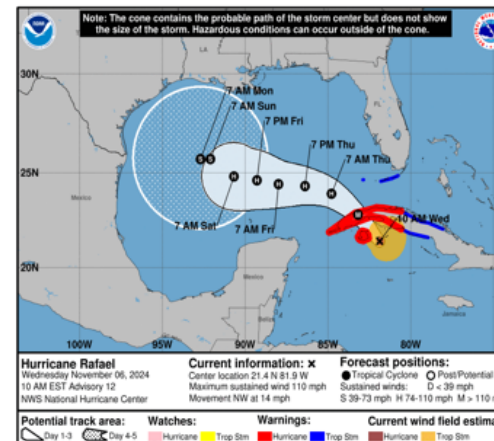


1. Rafael is forecast to become a major hurricane before it reaches western Cuba and the Isle of Youth. A hurricane warning is in effect for this region, where a life-threatening storm surge, damaging hurricane-force winds, and destructive waves are expected.

2. Tropical-storm-force winds, especially in gusts, are expected in the Lower and Middle Florida Keys beginning later today and tonight.

3. Rafael will bring areas of heavy rain to the Cayman Islands and western Cuba through Thursday. Flash flooding and mudslides are expected in areas of higher terrain in western Cuba.

4. It is too soon to determine what, if any, impacts Rafael could bring to portions of the western Gulf Coast. Residents in this area should regularly monitor updates to the forecast.



For more information go to hurricanes.gov



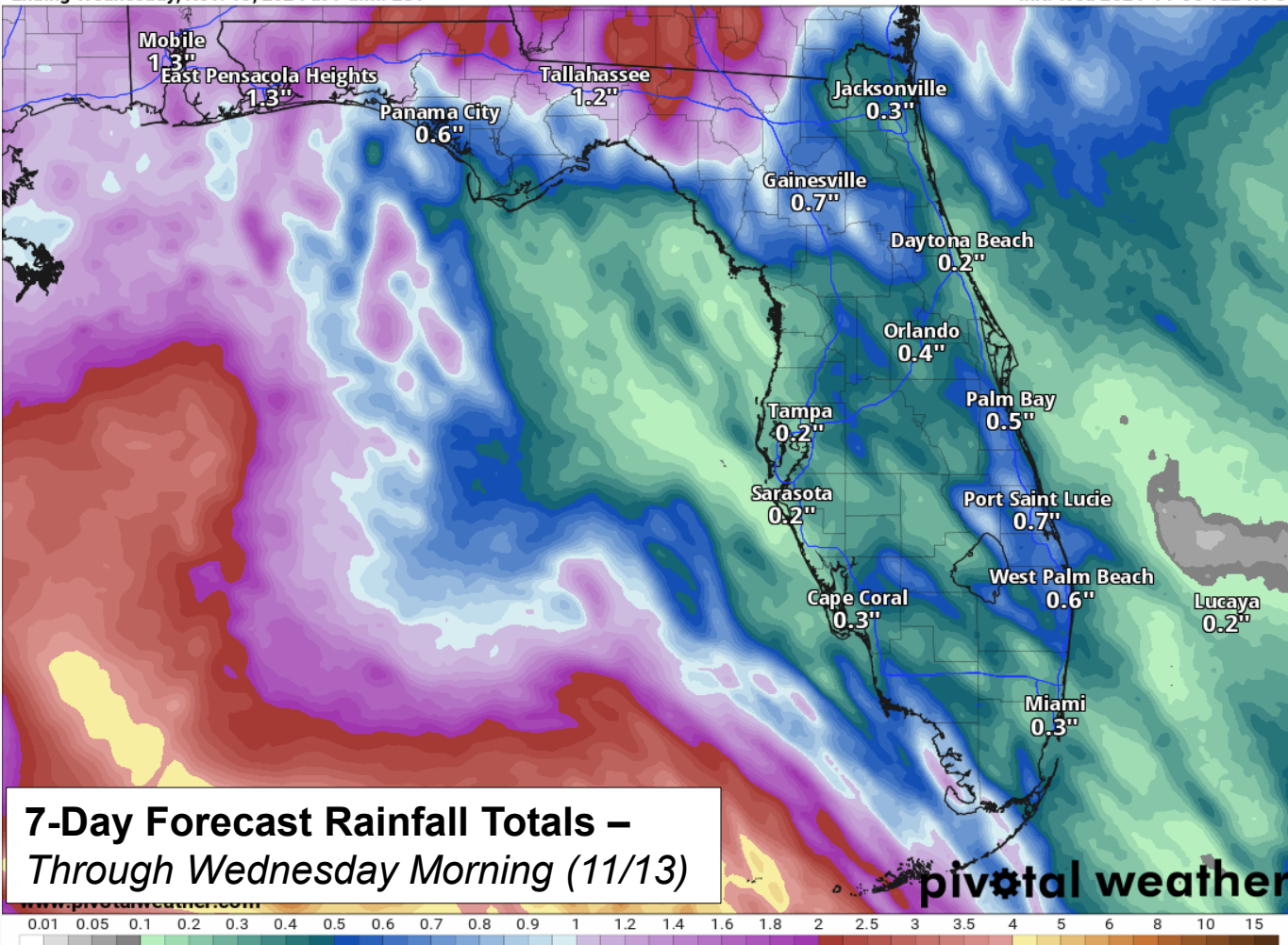
Rainfall Totals – Next 7 Days

From the Weather Prediction Center (WPC)

7-Day Precipitation (in)

Ending Wednesday, Nov. 13, 2024 at 7 a.m. EST

Init: Wed 2024-11-06 12z WPC



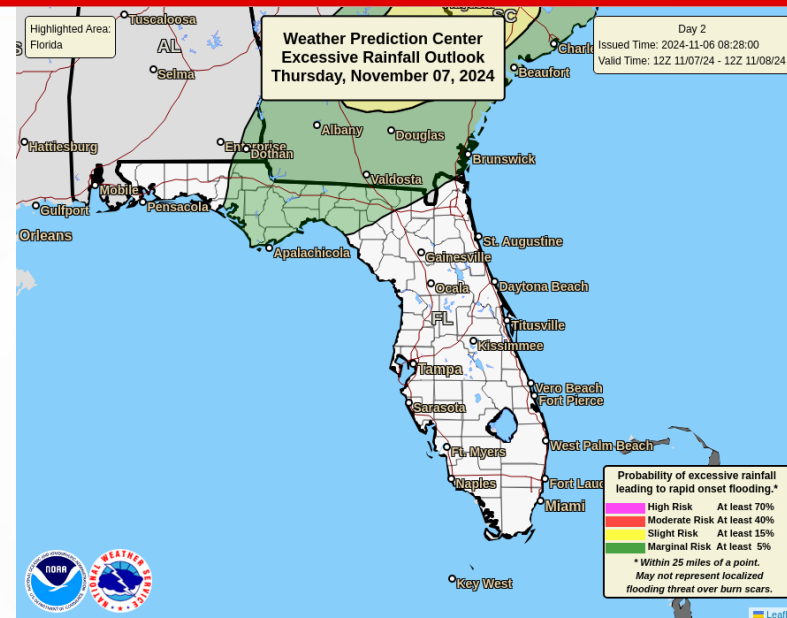
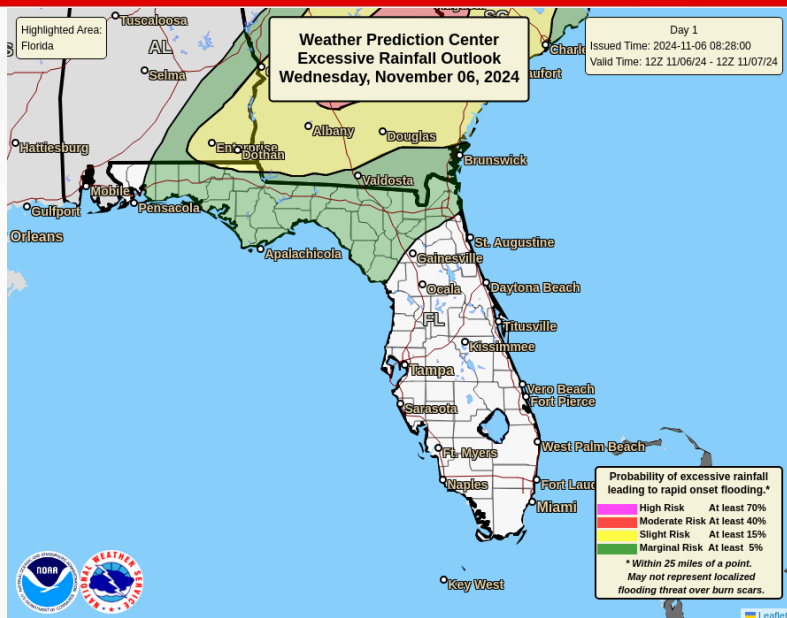
7-Day Forecast Rainfall Totals –
Through Wednesday Morning (11/13)

- Rain chances will begin to increase along the Florida Keys this morning (70-85% chance of rain), becoming increasingly scattered and widespread further north across South and Central Florida (30-60% chance of rain) and North Florida (55-85% chance of rain) throughout the day.
- Exact rainfall totals and the placement of heavy rainfall will remain **track dependent**; however, generally 1-3" of rain can be expected with locally higher amounts upwards of 3-6" possible, primarily north of the I-4 corridor and along the Southwest Coast and Keys.
- The heaviest rainfall totals over the next 7-day forecast period appears to reside along and north of the I-10 corridor to the I-75 corridor, Suwannee River Valley, Southwest Coast, and along the Keys courtesy of Rafael and the approaching frontal system.



Flash Flooding – Wednesday & Thursday

From the Weather Prediction Center (WPC)

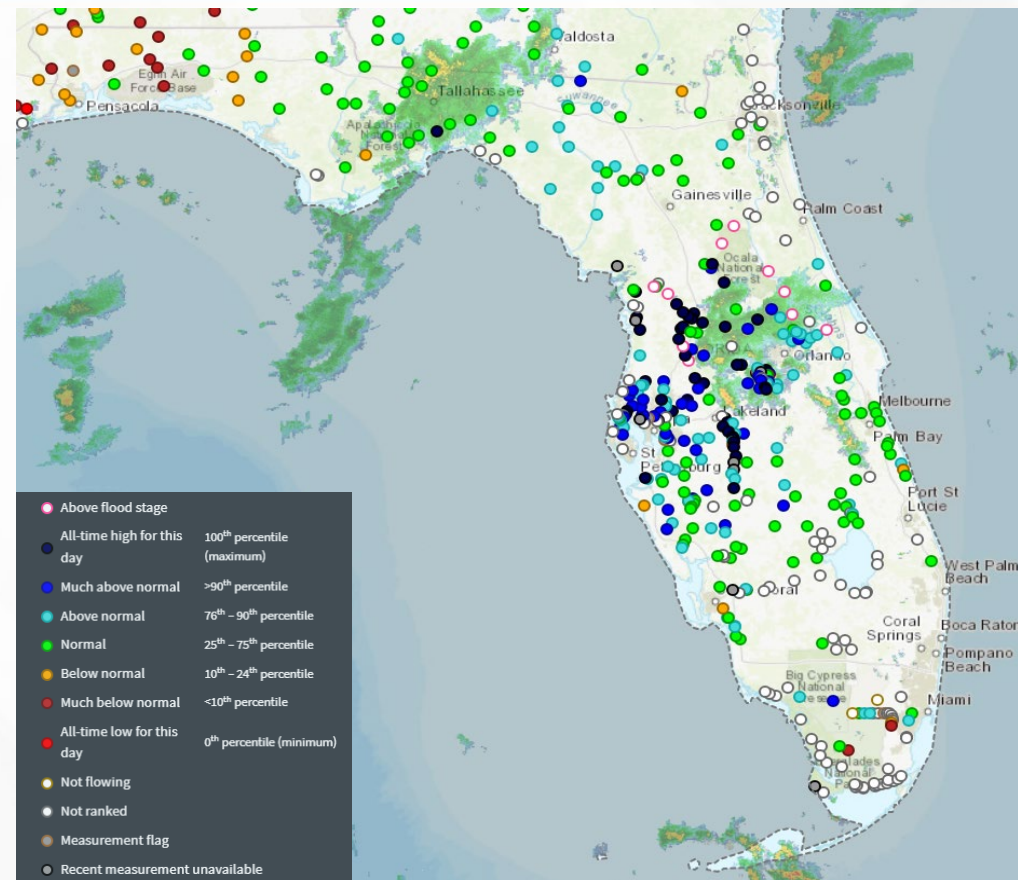
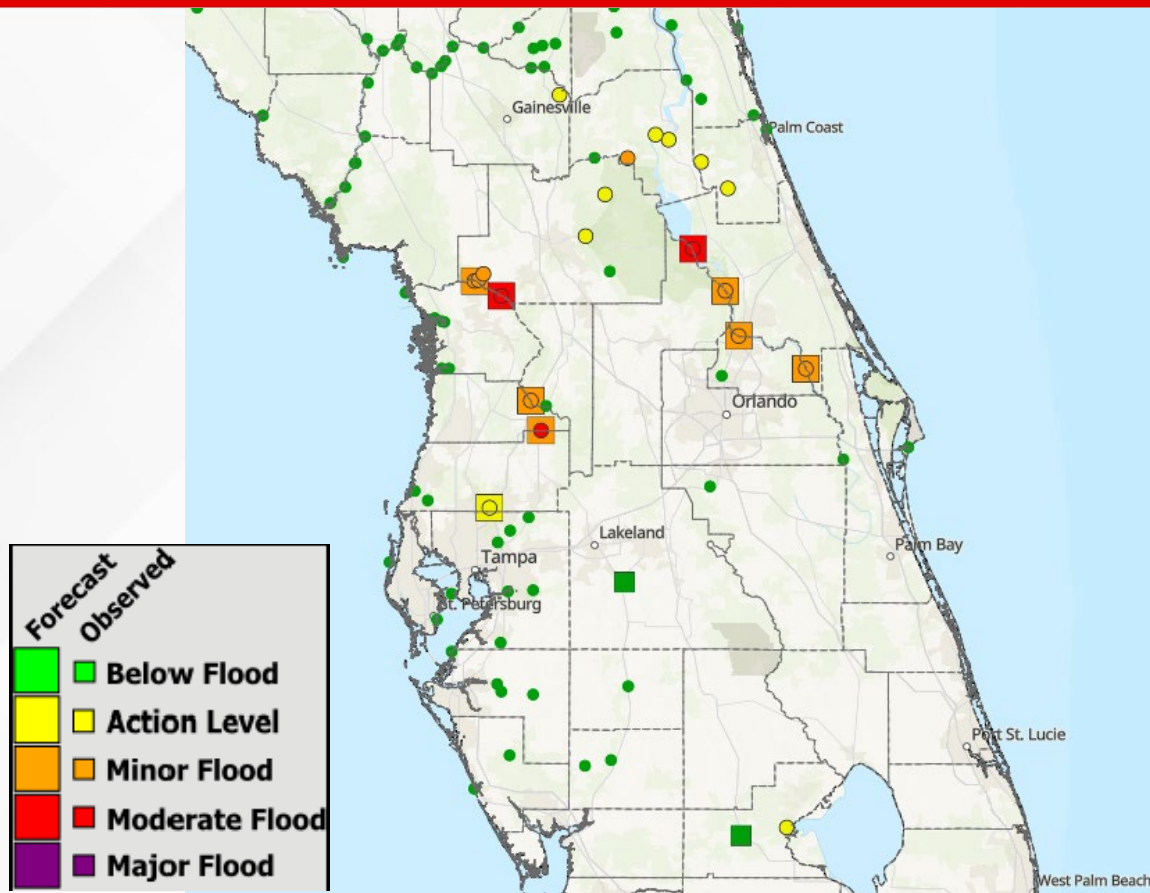


- Rain is on the way to recently dry portions of Florida this morning, peaking in intensity and coverage later today through Thursday.
- Most of the initial rainfall across the Florida Panhandle and western Florida Big Bend will be beneficial; however, localized **nuisance flooding** will be possible if north-to-south training rainbands develop away from Hurricane Rafael.
- Rainfall totals continue to run above normal for this time of year along the I-4 corridor and central Florida Peninsula, courtesy of recent tropical systems; locally heavy rains will likely lead to a quicker onset to **flooding and ponding water** concerns along low-lying/poor drainage urban corridors.
- There is still some uncertainty on the exact location of the heaviest rainfall totals mid to late this week as the proximity to the Gulf of Mexico tropical cyclone will allow for some heavier and more concentrated shower and thunderstorm activity through the state. The Weather Prediction Center (WPC) is outlooking a **Marginal Risk (level 1 of 4) for Flash Flooding** across much of North Florida and along the Lower and Middle Keys.
- The **Marginal Risk (level 1 of 4)** continues across the Eastern Panhandle eastward to the I-75 corridor Thursday as a signal for locally heavy rainfall may lead to isolated enhancements to **nuisance flooding and ponding water**.
- Rainfall totals and the placement of these higher rainfall totals may change, depending on the evolution of Hurricane Rafael and its interaction with a frontal system later this week. *Updates to the rainfall forecasts and Excessive Rainfall Outlooks will be possible.*



River Flooding

From National Weather Service (NWS)

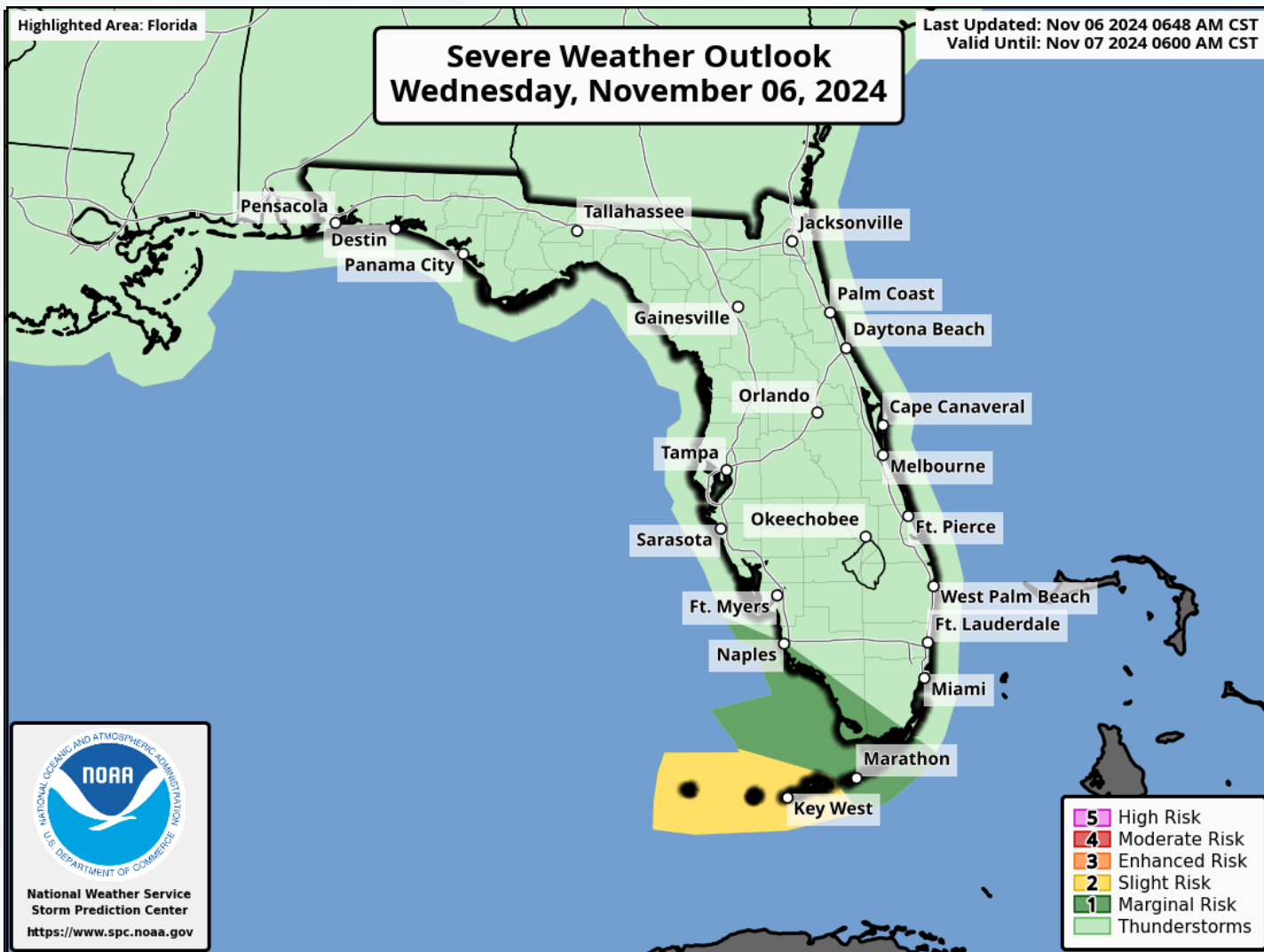


Minor to moderate riverine flooding continues across the Withlacoochee and St. Johns River basins in response to Hurricane Milton in early October. The upper portions of the Withlacoochee ([US 301 Trilby](#) and [Croom](#)) continued to see water levels very slowly decline, while lower portions of the river ([Holder near SR 200](#) and [Dunnellon](#)) continue to see water levels hold steady within a crest. The lower Withlacoochee can expect water levels to remain steady over the next day or so before beginning to very slowly decline. Similarly, the St. Johns River continues to see water levels at all forecast points ([Astor](#), [Lake Harney](#), [Deland](#) and [Sanford](#)) hold steady or very slowly decline as onshore winds persist along tidal portions of the river, keeping discharge rates slow.



Isolated Tropical Tornadoes

From the Storm Prediction Center (SPC)



Understanding Severe Thunderstorm Risk Categories

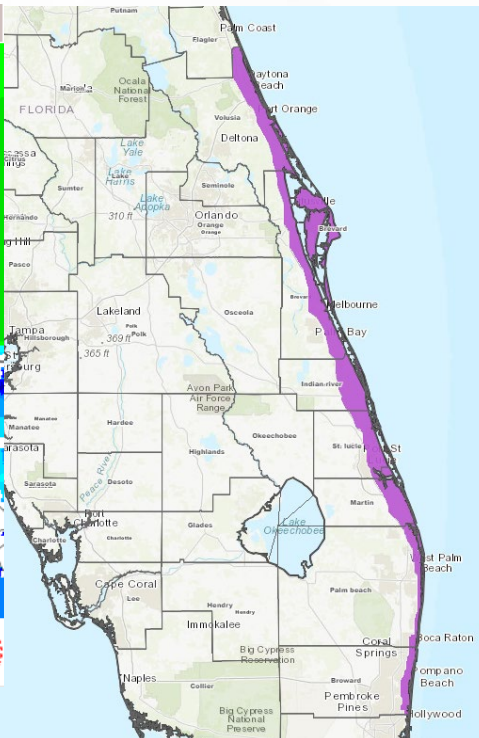
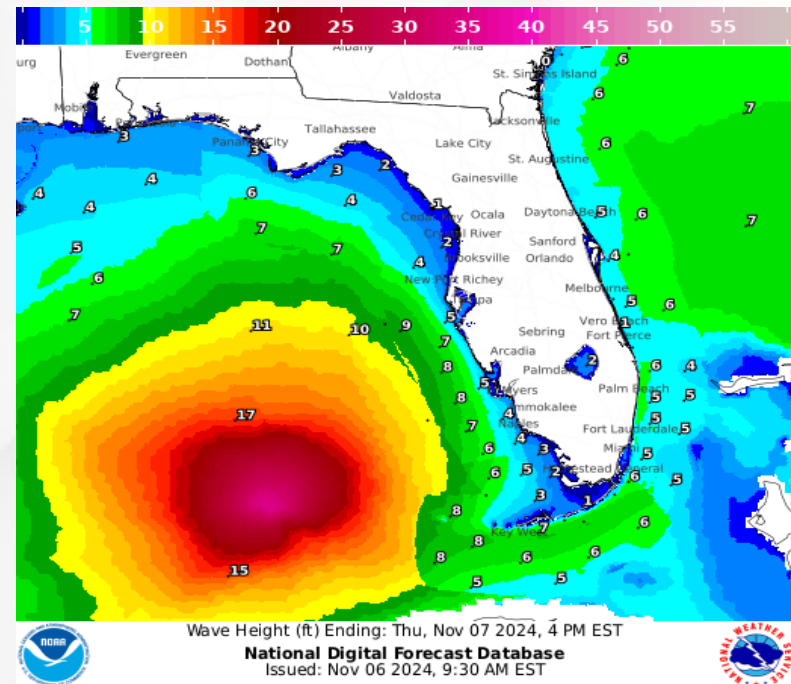
THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with <u>all</u> thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense

The Storm Prediction Center (SPC) has upgraded the risk for isolated tropical tornadoes along the Lower and Middle Florida Keys to a **Slight Risk (level 2 of 5)** beginning late this morning. A **Marginal Risk (level 1 of 5)** has been expanded into additional portions of Southwest Florida as any outer rainbands from Rafael move onshore. Atmospheric conditions, coupled with daytime heating, appear conducive for a few waterspouts and these may move across land as tornadoes. The overall threat looks to diminish tonight as favorable conditions subside and thunderstorm activity recedes to the Gulf of Mexico waters.



Forecast Wave Heights & Rip Currents

From the National Weather Service (NWS)



North Florida Gulf Coast		Today	Thu	Fri	Sat	Sun	Mon	Tue
Rip Current		Red	Red	Red	Red	Red		
Marine Hazard		White	Orange	Orange	Yellow	White	White	White

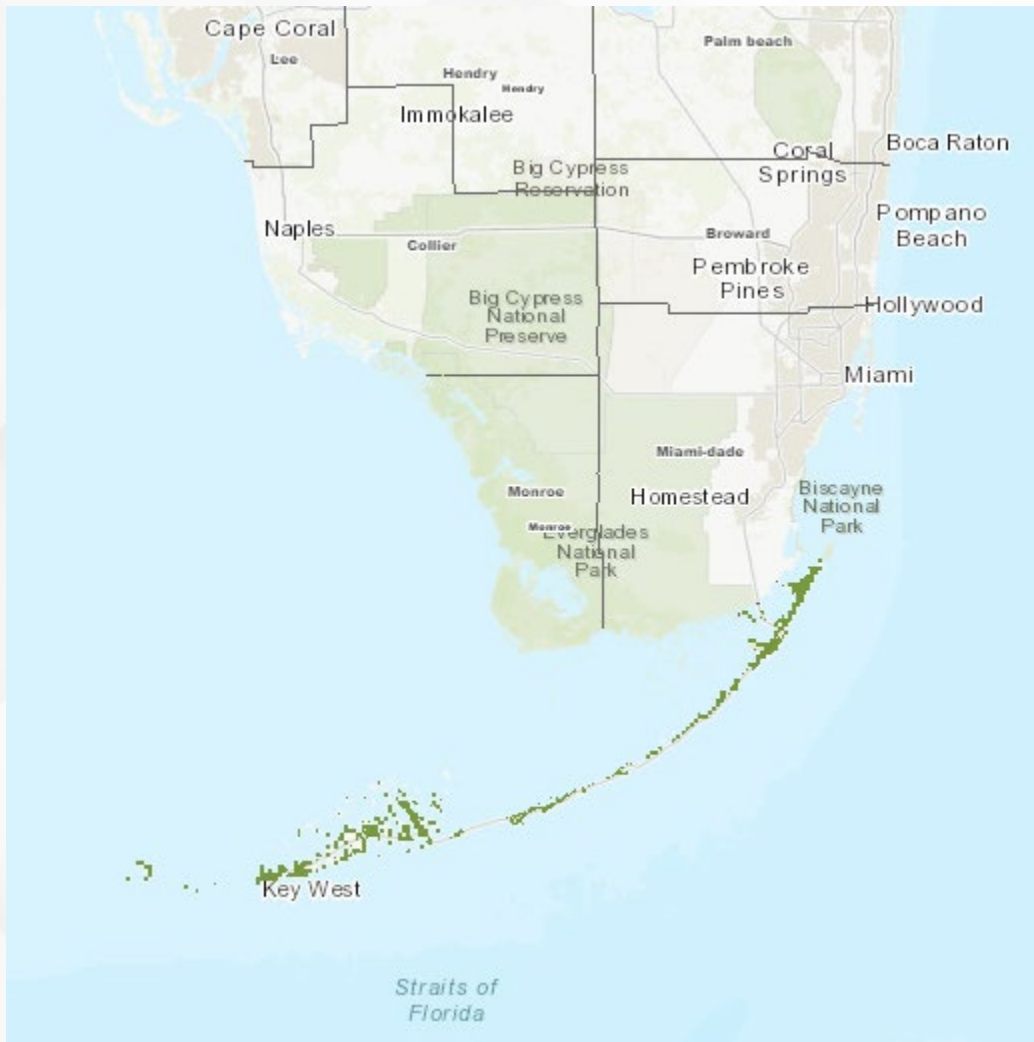
Florida West Coast		Today	Thu	Fri	Sat	Sun	Mon	Tue
High Surf		Yellow	Yellow	White	White	White		
Rip Current		Yellow	Red	Red	Yellow	Green		
Marine Hazard		Orange	Orange	Yellow	White	White	White	White

- Deteriorating beach and marine conditions can be expected through the week along many Florida coastlines, with **High Surf Advisories** now in effect along portions of the Florida East Coast. Large breaking waves of 5-7' can be expected in the surf zone, with locally higher breakers possible. Breakers of 7-10' will be possible along the Southeast Florida Coast through Thursday evening.
- Additional High Surf Advisories will be issued as conditions warrant along Florida Panhandle and Gulf Coast beaches later this week and into the weekend.
- A **high risk of rip currents** will develop along statewide beaches by Wednesday, and largely linger through the remainder of the week.



Coastal Flooding Potential

From the National Weather Service (NWS)



A **Coastal Flood Statement** remains in effect along the Florida Keys. **Coastal flooding**, with potential saltwater flooding, for oceanside portions of the Florida Keys is forecast Wednesday and Wednesday night. Water levels could reach up to 2' above normally dry ground, or about 1' higher than recent high tides.

As Rafael continue to trek northwestward over the central and northern Gulf, onshore flow along portions of the Florida Panhandle and Big Bend will continue to be monitored. As tides have already been running in elevated levels, onshore wind and large swells may lead to instances of **coastal flooding**; however, trends will continue to be monitored.

Coastal Flood Watch, Warning, and Advisories will be issued as conditions warrant.



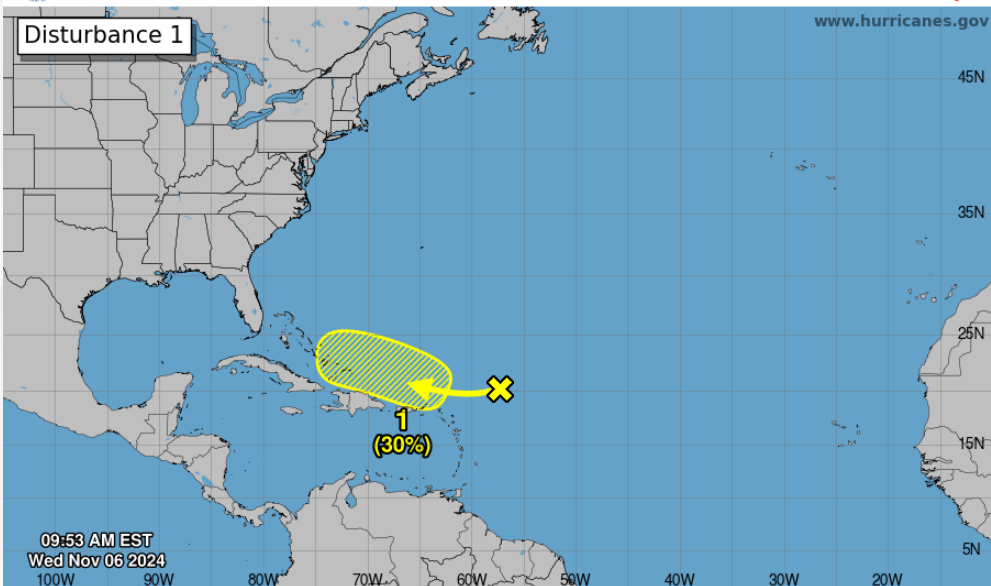
Tropical Weather Outlook

Disturbance 1 – Southwestern Atlantic



Seven-Day Graphical Tropical Weather Outlook

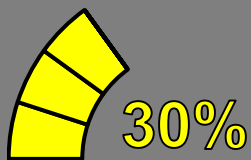
National Hurricane Center Miami, Florida



Current Disturbances and Seven-Day Cyclone Formation Chance: < 40% 40-60% > 60%
 Tropical or Sub-Tropical Cyclone: Depression Storm Hurricane
 Post-Tropical Cyclone or Remnants



48 Hour Formation



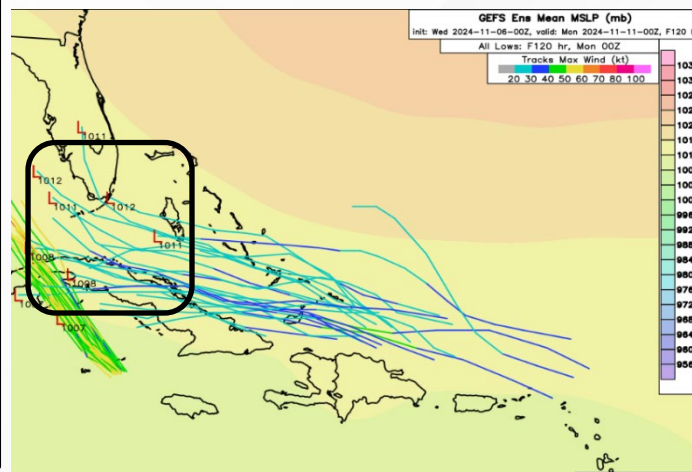
7 Day Formation

A trough of low pressure is producing an area of disorganized showers and thunderstorms several hundred miles east-northeast of the Leeward Islands. This system is expected to move generally westward during the next few days, and an area of low pressure could form near the northern Leeward Islands tonight or Thursday. Afterward, some gradual development of this system is possible toward the end of the week and into the early part of the weekend while it moves near or to the north of the Virgin Islands and Puerto Rico, and approaches the Southeast Bahamas

This system poses no direct threat to Florida over the next 5 to 7 days; trends within the model guidance will continue to be monitored regarding the development of this area of disturbed weather later this week. Computer forecast models carry quite a bit of uncertainty with the formation and evolution of this potential disturbance.

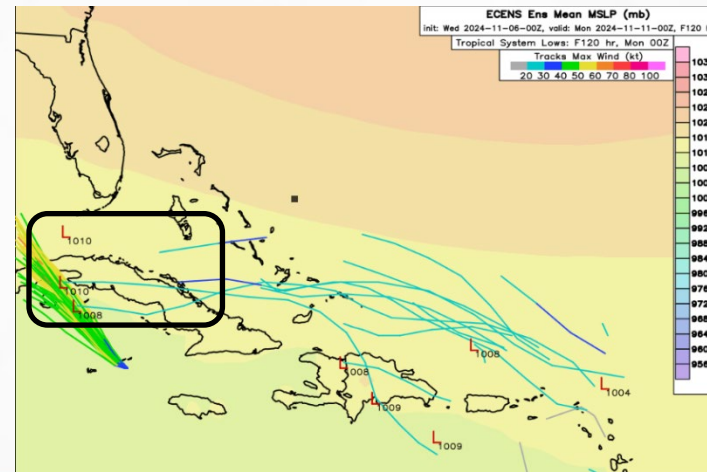
Chance of development through 48 hours...**low...20%**

Chance of development through 7 days...**low...30%**



American Model Ensemble

Valid: Monday (11/11) Morning



European Model Ensemble

Valid: Monday (11/11) Morning



Summary

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Hurricane Rafael:

- As of 10:00 AM EST, Rafael is currently located about 60 miles ESE of the Isle of Youth and 246 miles south of Key West, Florida and moving northwestward at 14 mph.
- A general northwestward motion is anticipated over the next day or so, followed by a gradual west-northwestward turn in the Gulf of Mexico.
- On the forecast track, Rafael is expected to move near or just east of the Isle of Youth during the next few hours, and make landfall in western Cuba today.
- Rafael is forecast to move into the southeastern Gulf of Mexico tonight.
- Maximum sustained winds are near 110 mph, making Rafael a Category 2.
- Additional strengthening is expected, and Rafael is forecast to be a major hurricane when it makes landfall in Cuba later today.
- Rafael is forecast to weaken over Cuba but is expected to emerge into the southeastern Gulf of Mexico as a hurricane.
- **Tropical Storm Warnings** are now in effect for the Lower and Middle Florida Keys (west of the Channel 5 Bridge through Key West and the Dry Tortugas).

Florida Outlook:

- Computer model guidance continues to show signs of better agreement regarding Rafael's near-term forecast track within the next 24 to 48-hour timeframe.
 - Once the system emerges over the southeastern Gulf of Mexico tonight into Thursday, computer model guidance shows greater uncertainty regarding the evolution and movement of the system.
- The Storm Prediction Center (SPC) maintains the Slight Risk (level 2 of 5) for isolated tropical tornadoes along the Lower and Middle Florida Keys, with a Marginal Risk (level 1 of 5) extending along the far southwestern Florida Peninsula late this morning into late this evening.
 - Favorable wind fields will increase through the daytime hours, coupled with abundant tropical moisture, may lead to isolated waterspouts and tropical tornadoes to develop within Tropical Storm Rafael's outer rainbands.
- Rain chances will begin to increase along the Florida Keys this morning (70-85% chance of rain), becoming increasingly scattered and widespread further north across South and Central Florida (30-60% chance of rain) and North Florida (55-85% chance of rain) throughout the day.
- Exact rainfall totals and the placement of heavy rainfall will remain track dependent; however, generally 1-3" of rain can be expected with locally higher amounts upwards of 3-6" possible, primarily north of the I-4 corridor and along the Southwest Coast and Keys.
- The heaviest rainfall totals over the next 7-day forecast period appears to reside along and north of the I-10 corridor to the I-75 corridor, Suwannee River Valley, Southwest Coast, and along the Keys courtesy of Rafael and the approaching frontal system.
- The Weather Prediction Center (WPC) is outlooking a Marginal Risk (level 1 of 4) for Flash Flooding across much of North Florida and along the Middle and Lower Keys. The Marginal Risk (level 1 of 4) continues for eastern Panhandle through the Big Bend to the I-75 corridor, Thursday as a signal for locally heavy rainfall may lead to isolated enhancements to nuisance flooding and ponding water.
- Rivers, creeks and streams across Central Florida continue to flow at or above normal streamflows following the widespread heavy rainfall from Hurricanes Helene and Milton.
- There is a Coastal Flood Statement now in effect along the Florida Keys. Coastal flooding, with potential saltwater flooding, for oceanside portions of the Florida Keys is forecast today and tonight. Water levels could reach up to 2' above normally dry ground, or about 1' higher than recent high tides.

The next briefing packet will be issued Wednesday Afternoon. For the latest information, please visit the [National Hurricane Center website](#).



Tropical Update

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State Meteorological Support Unit

Florida Division of Emergency Management

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