



Tropical Update



12:00 PM EDT

Tuesday, November 5, 2024

Tropical Storm Rafael

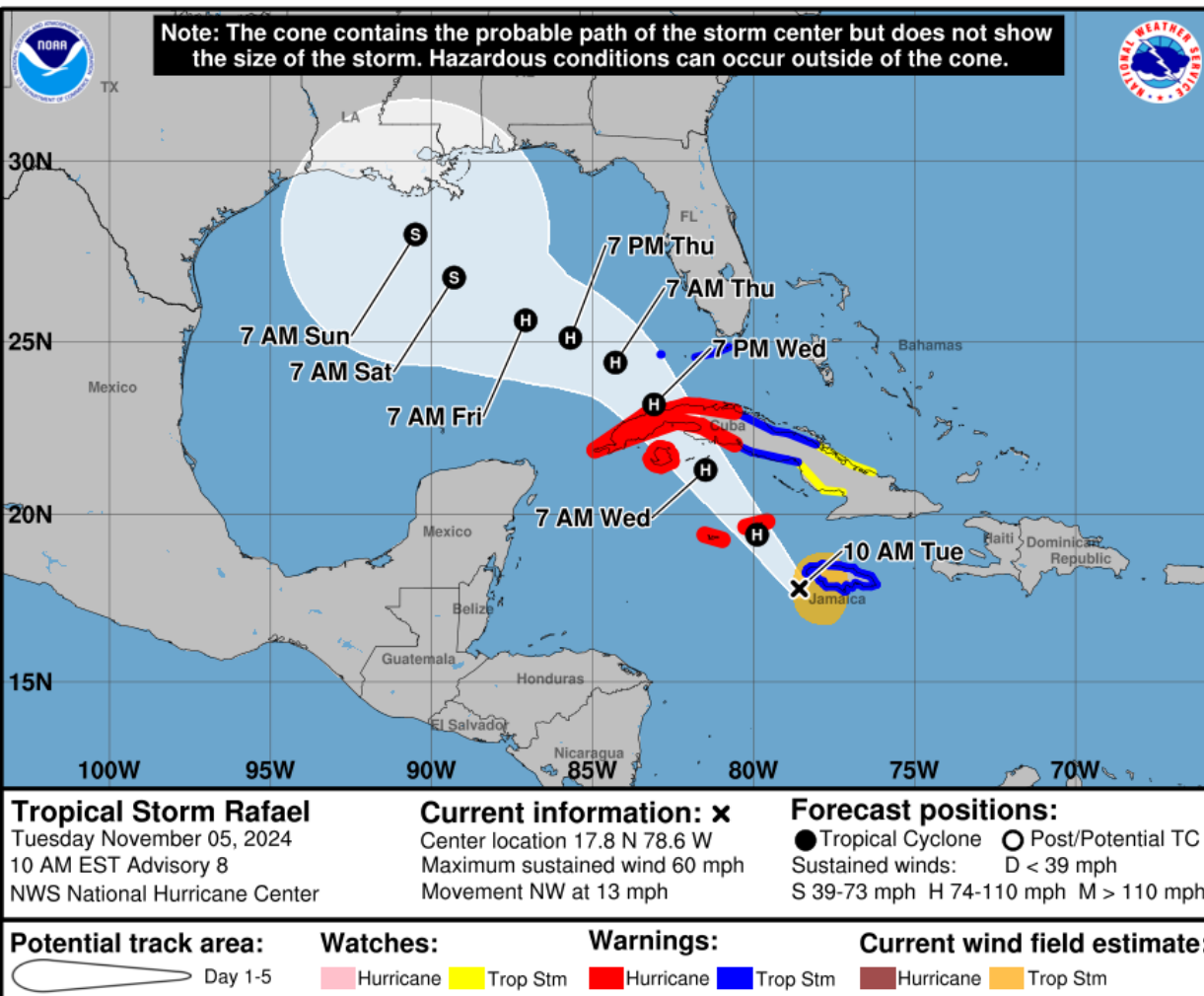
Tropical Storm Warnings Issued for the Lower & Middle Florida Keys

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.



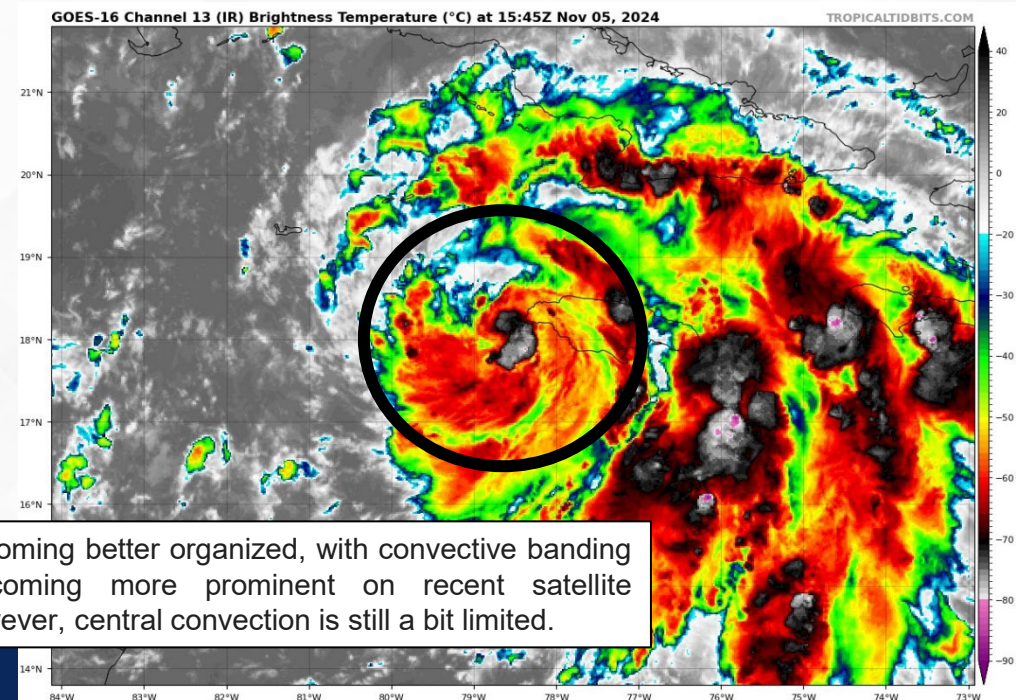
Tropical Storm Rafael

From the National Hurricane Center (NHC)



- **Location:** 65 miles SW Montego Bay, Jamaica, 510 miles SSE of Key West
- **Maximum Sustained Winds:** 60 mph
- **Current Movement:** NW at 13 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 few days. On the forecast track, the storm is expected to move near western Jamaica through early this afternoon, and be near or over the Cayman Islands this evening and tonight, and be near or over western Cuba on Wednesday. Steady to rapid strengthening is expected during the next 24 to 36 hours, and Rafael is expected to become a hurricane as it passes near the Cayman Islands with further strengthening before it makes landfall in Cuba.





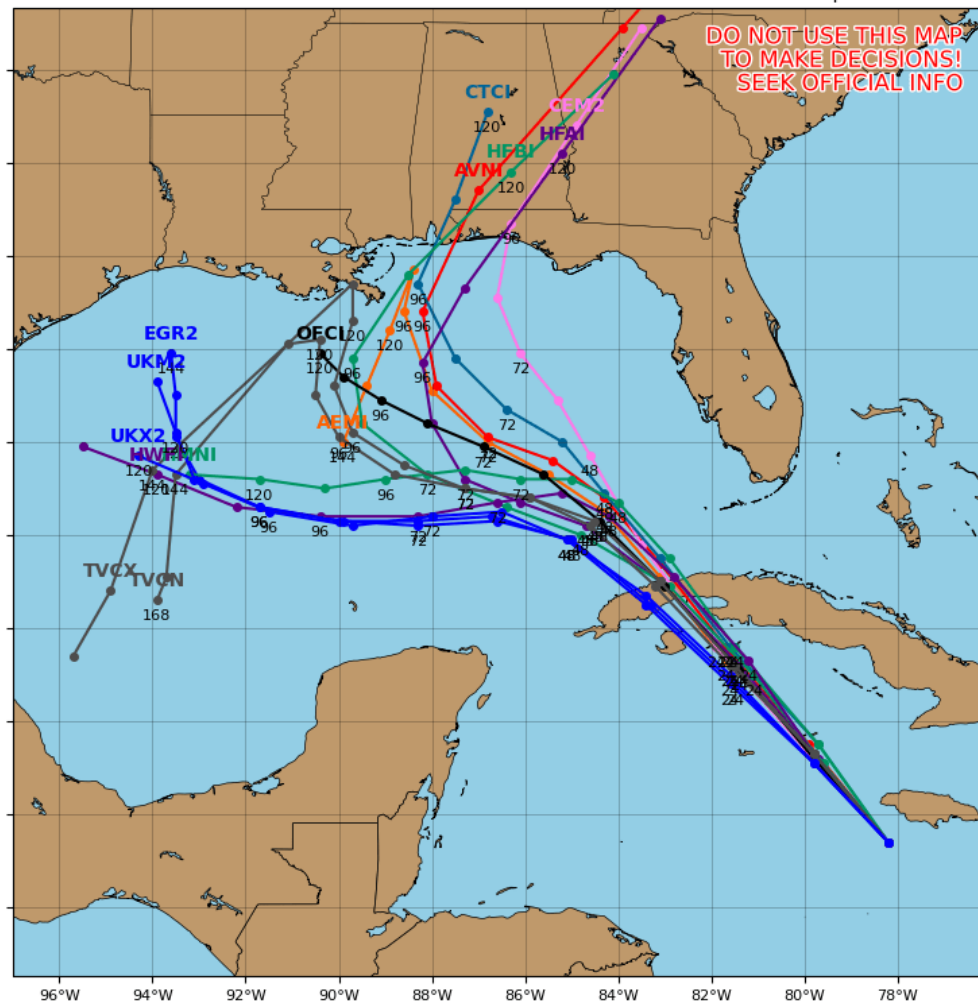
Forecast Computer Models – Next 5 Days

Tropical Storm Rafael

Tropical Storm RAFAEL Model Track Guidance

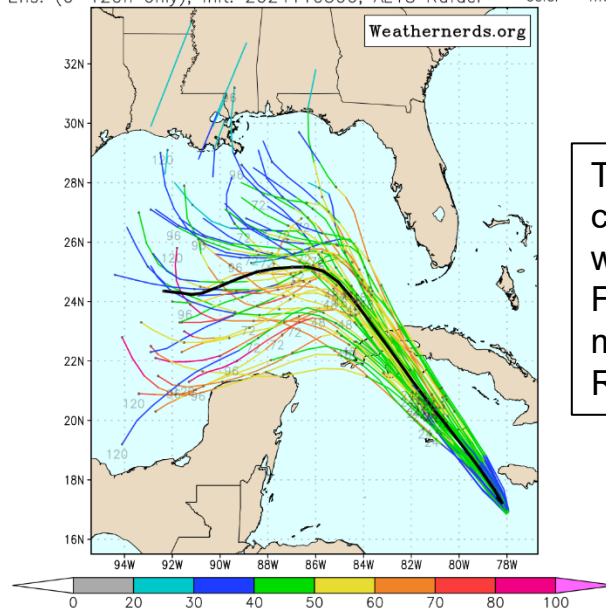
Initialized at 12z Nov 05 2024

Levi Cowan - tropicaltidbits.com



Computer forecast models agree that Rafael will continue to move northwestward over the Caribbean and into the southeastern Gulf of Mexico during the next 24 to 48 hours. After that time, uncertainty across the computer forecast models increase over the central Gulf of Mexico, especially once stronger upper-level winds begin to impact Rafael. A system that more slowly weakens over the central Gulf would be more apt to take an eastern/right solution, bringing Rafael closer to the northeastern Gulf Coast; whereas a system that more quickly weakens over the central Gulf would be more apt to take a western/left solution, bringing Rafael toward the northern-central Gulf Coast. Trends within the steering pressure pattern later this week will continue to be monitored.

ECMWF Ens. (0–120h only), init: 2024110506, 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.

European Forecast Model Ensemble – Tropical Storm Rafael



Forecast Computer Models – Next 5 Days

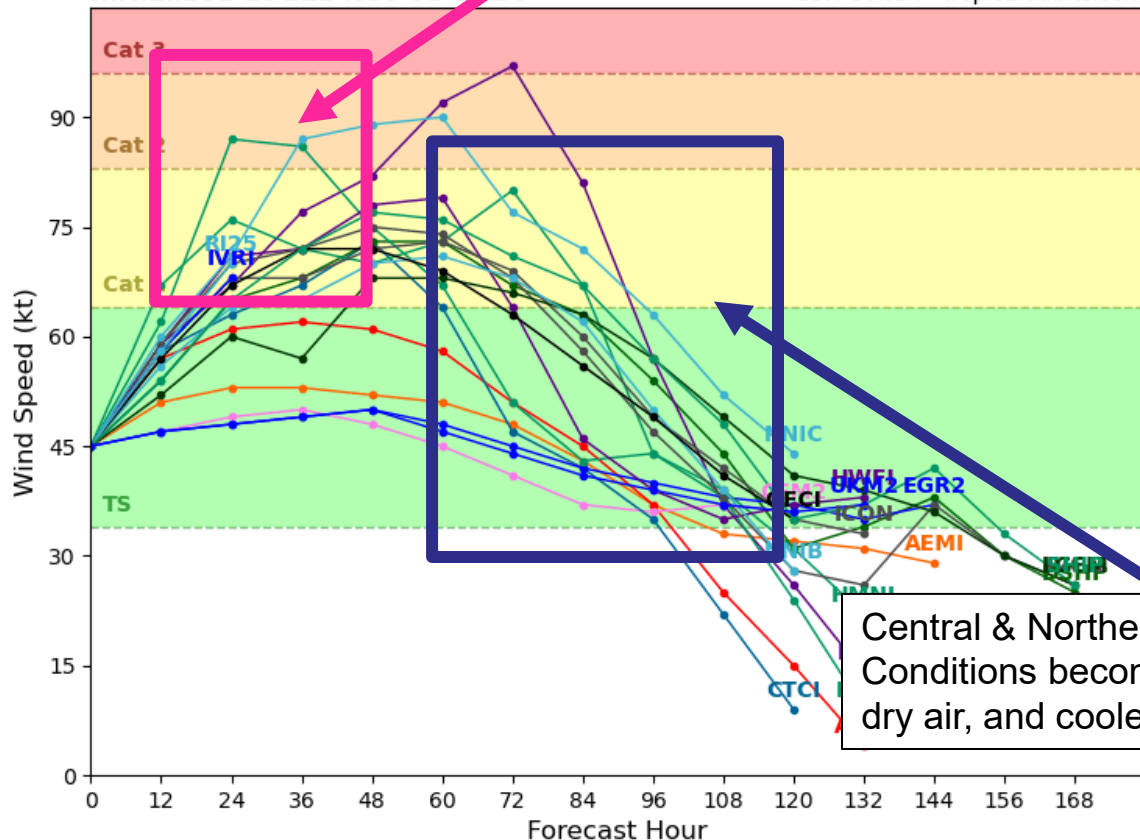
Tropical Storm Rafael

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

Tropical Storm RAFAEL Model Intensity Guidance

Initialized at 12z Nov 05 2024

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Conditions are favorable for steady strengthening during the next 24 to 36 hours if Rafael can develop a stronger inner wind core. Computer forecast models are in good agreement that the system is forecast to reach hurricane strength in about 12 hours and continue to strengthen until it reaches Cuba. Once over the central Gulf of Mexico, Rafael is likely to encounter increasing wind shear, dry air, and cooler water temperatures, which should lead to Rafael weakening and eventually shearing apart over the northern Gulf waters.

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 4 to 5-day timeframe.

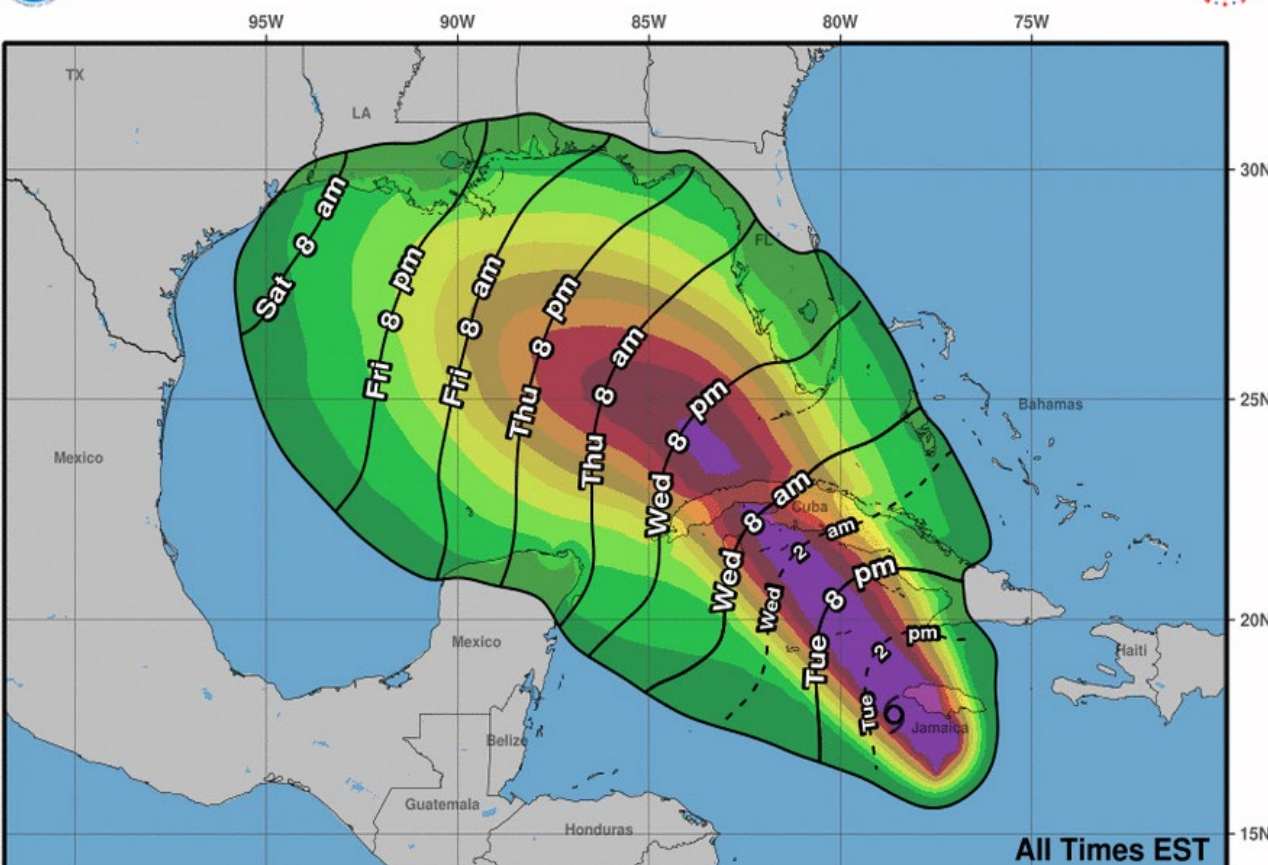


Wind Timing of Arrival

From the National Hurricane Center (NHC)



Most Likely Arrival Time of Tropical-Storm-Force Winds



Tropical Storm Rafael
Tue. Nov. 5, 2024 10 am EST
Advisory 8

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

- 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 during the mid-to-late daytime hours Wednesday.
- Tropical storm-force conditions could arrive as early as Tuesday night into early Wednesday morning along the Florida Keys
- This is a reminder that impacts can still extend well beyond the forecast cone!
- As Rafael emerges over the central and northern Gulf of Mexico, stronger upper-level winds will likely displace much of the system's shower and thunderstorm activity east of its center (toward Florida's Gulf Coast). Locally gusty winds will be possible along many Florida coastlines through the week.



Key Messages

From the National Hurricane Center (NHC)



Key Messages for Tropical Storm Rafael

Advisory 8: 10:00 AM EST Tue Nov 05, 2024

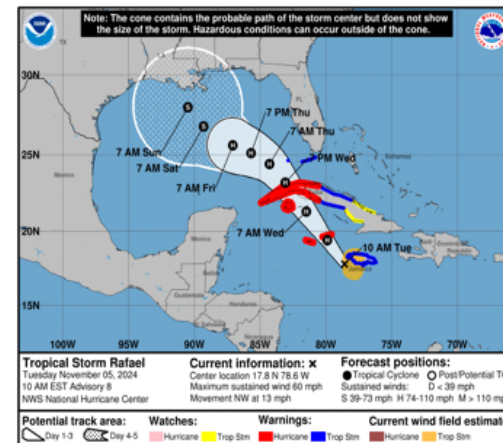


1. Rafael is forecast to be near hurricane intensity when it passes near or over the Cayman Islands by tonight where damaging hurricane-force winds, a dangerous storm surge, and destructive waves are expected. Rafael should reach western Cuba and the Isle of Youth on Wednesday. A hurricane warning is in effect for this region, where a life-threatening storm surge and destructive waves are also expected.

2. Tropical storm conditions are expected in Jamaica through this afternoon. Tropical storm conditions are expected in the Lower and Middle Florida Keys beginning Wednesday and Wednesday night.

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

4. Rafael will bring areas of heavy rain across portions of the Western Caribbean through early Thursday, including the islands of Jamaica and the Cayman, along with southern and western portions of Cuba. Flash flooding and mudslides are possible along the higher terrain in Jamaica and Cuba.



For more information go to hurricanes.gov



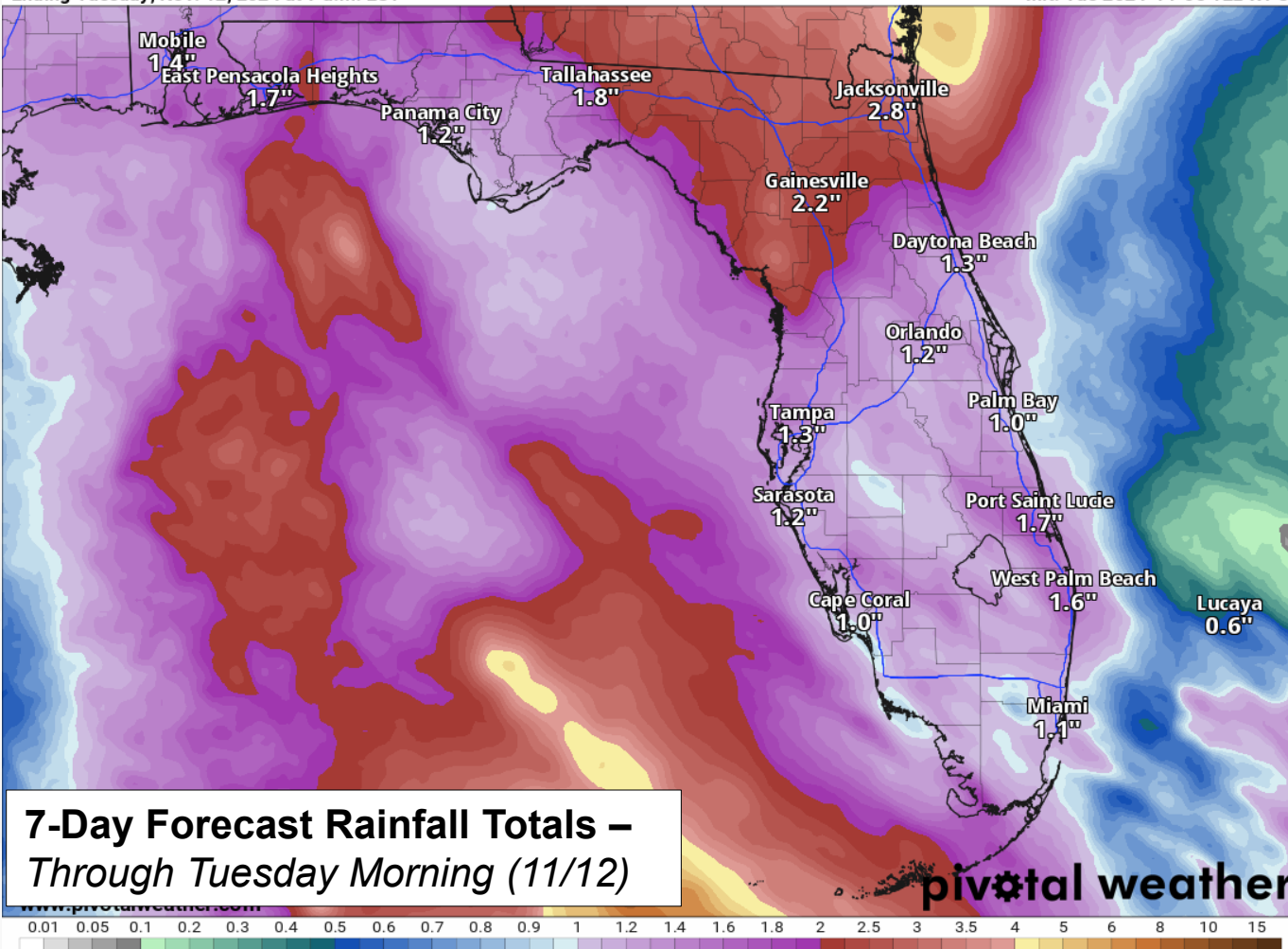
Rainfall Totals – Next 7 Days

From the Weather Prediction Center (WPC)

7-Day Precipitation (in)

Ending Tuesday, Nov. 12, 2024 at 7 a.m. EST

Init: Tue 2024-11-05 12z WPC

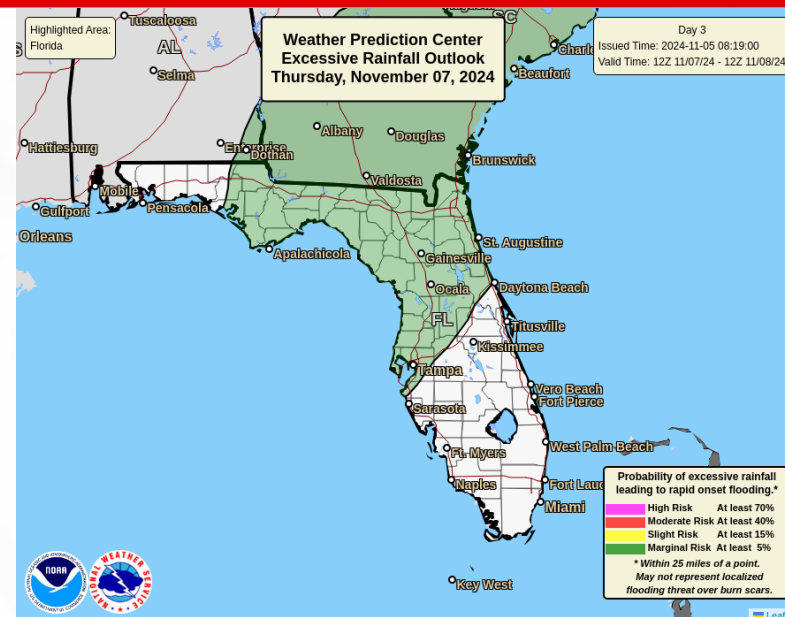
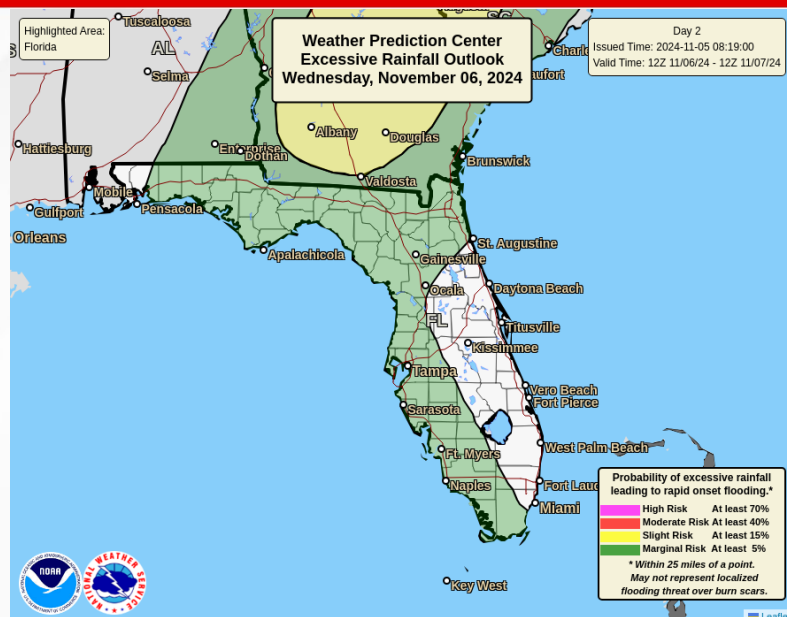


- Rain chances will begin to increase over the southern Florida Peninsula today (45-70% chance of rain), becoming increasingly numerous further north by Wednesday.
- Exact rainfall totals and the placement of heavy rainfall will remain **track dependent**; however, generally 2-3" of rain can be expected with locally higher amounts of 3-6" possible.
- The heaviest rainfall totals over the next 7-day forecast period appears to reside along the eastern Florida Panhandle, Florida Big Bend, and Suwannee River Valley, courtesy of Rafael and the approaching frontal system.



Flash Flooding – Wednesday & Thursday

From the Weather Prediction Center (WPC)



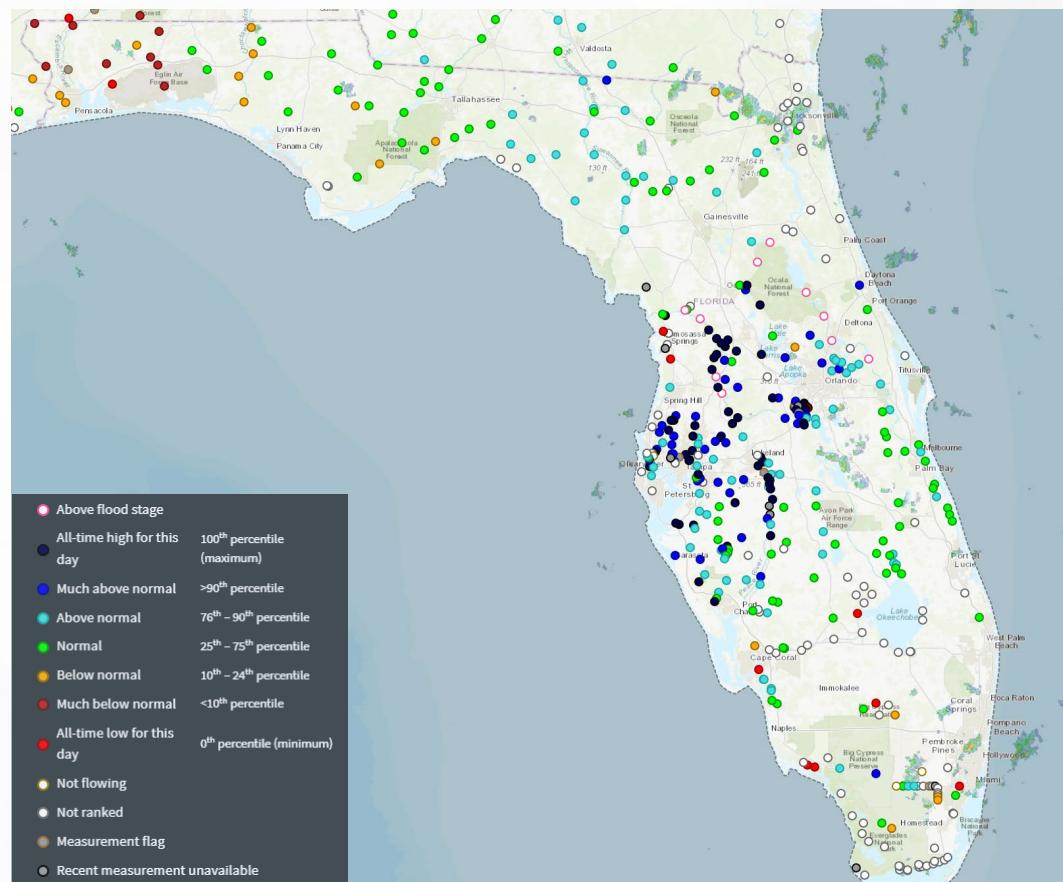
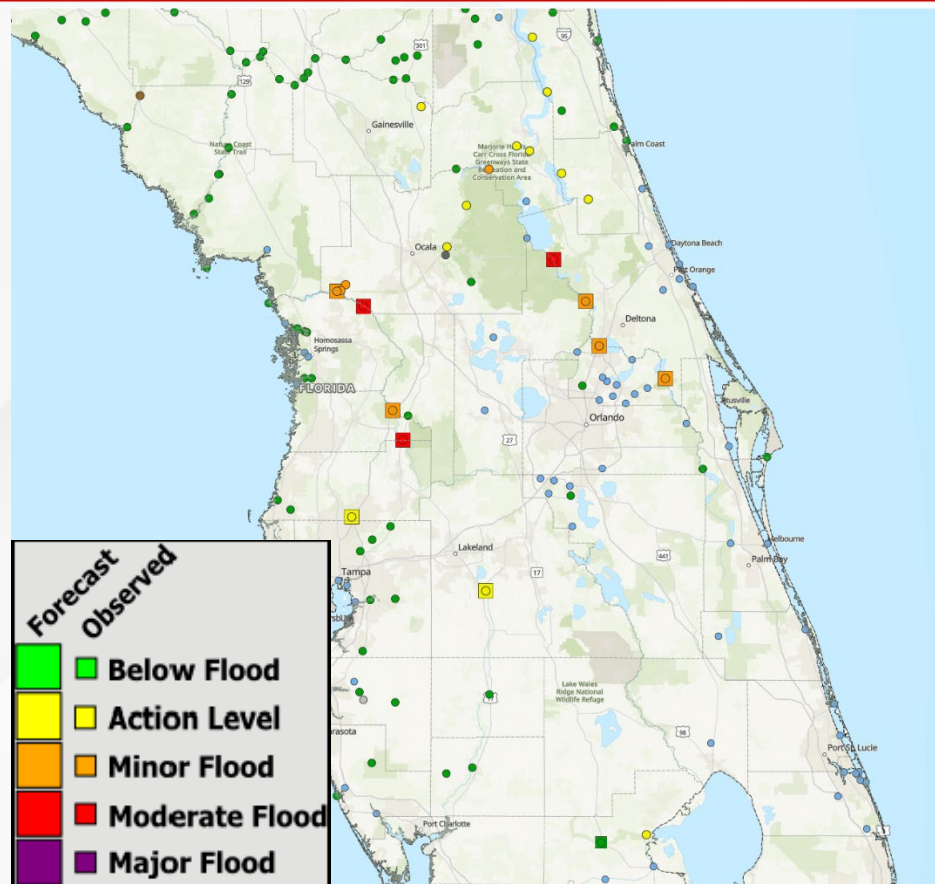
- Rain is on the way to recently dry portions of Florida beginning later tonight, peaking in intensity and coverage Wednesday through Thursday.
- Most of the initial rainfall across the Florida Panhandle and western Florida Big Bend will be beneficial; however, localized **nuisance flooding** will be possible if north-to-south training rainbands develop away from Tropical Storm 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 Peninsula. The Weather Prediction Center (WPC) is outlooking a **Marginal Risk (level 1 of 4) for Flash Flooding** across North Florida and the western Florida Peninsula.
- The **Marginal Risk (level 1 of 4)** continues for North Florida, mainly north of the I-4 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 will likely change, depending on the evolution of Tropical Storm Rafael and its interaction with a frontal system later this week. *Updates to the rainfall forecasts and Excessive Rainfall Outlooks can be expected.*

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River Flooding

From National Weather Service (NWS)

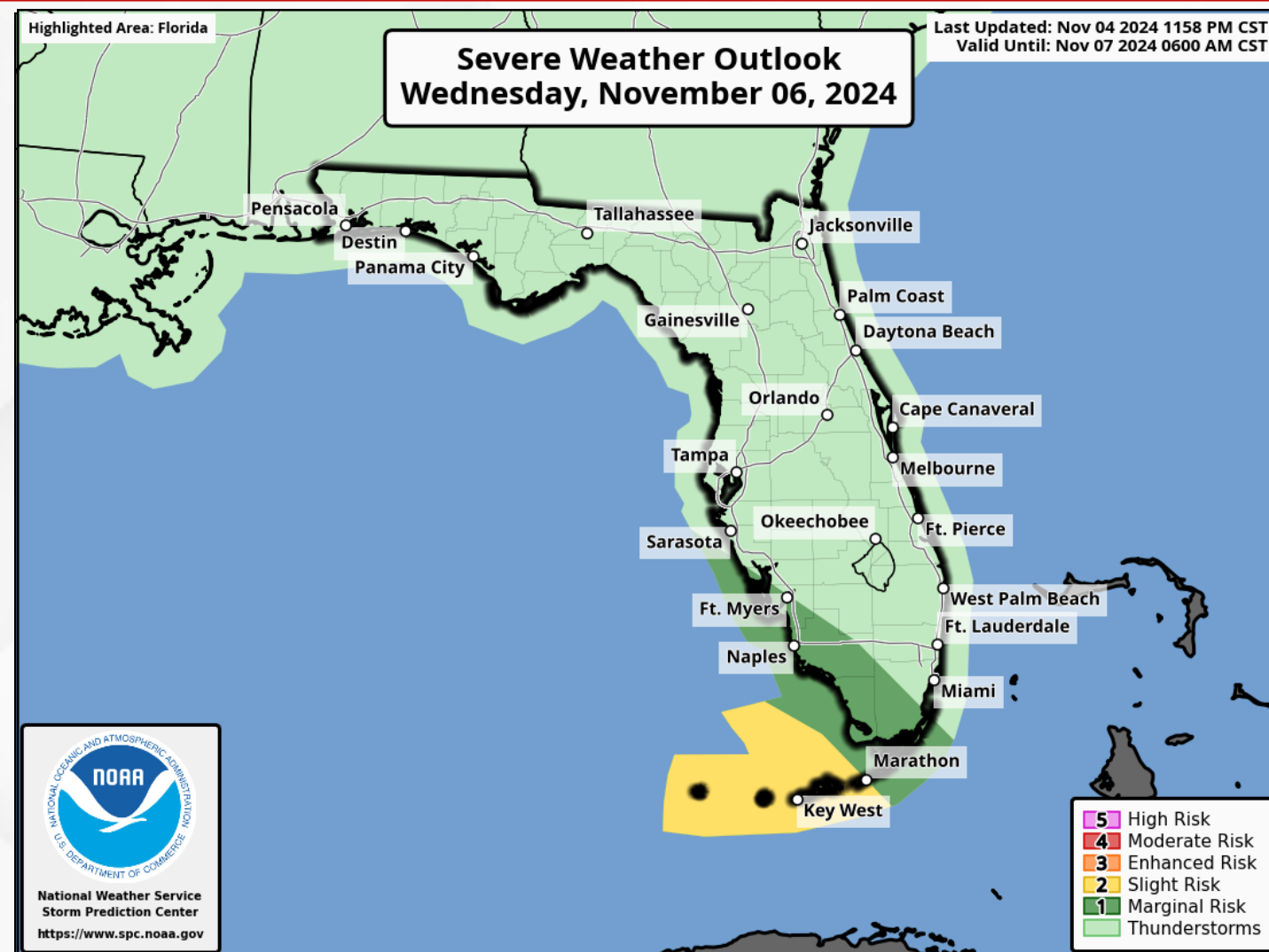


Minor to moderate riverine flooding continues across the Withlacoochee and St. Johns River basins in response to Hurricane Milton in early October. The upper portions of the Withlacoochee ([US 301 Trilby](#) and [Croom](#)) continued to see water levels very slowly decline, while lower portions of the 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](#)) 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

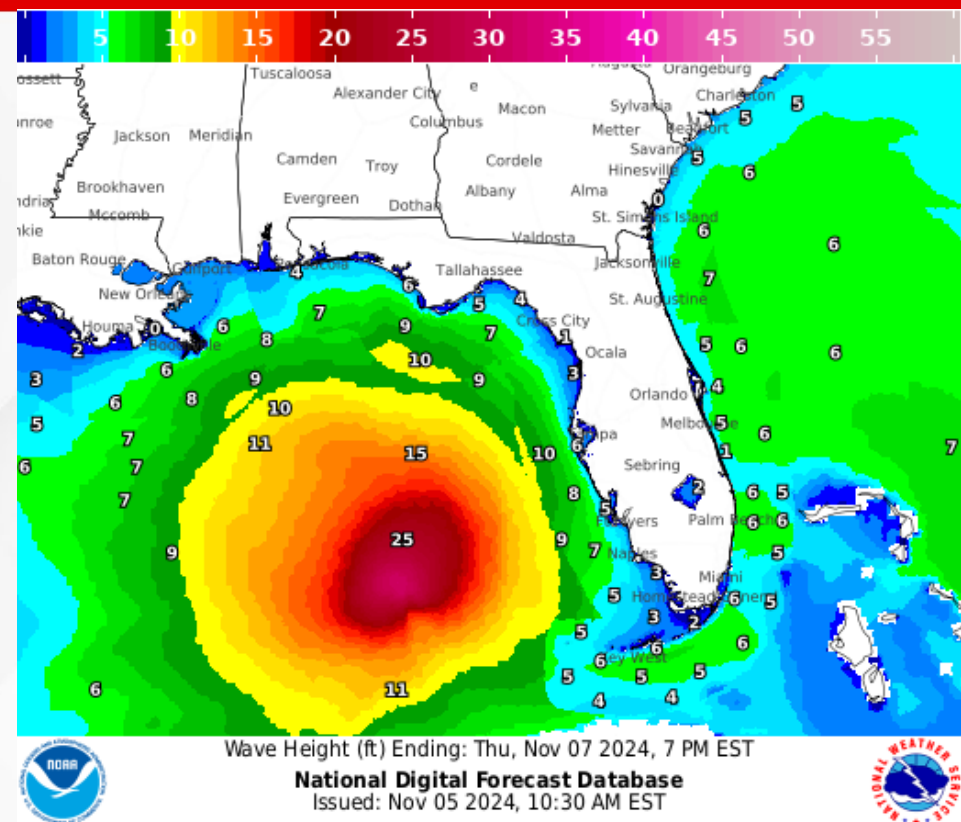
THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe 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 Wednesday. 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 Wednesday night 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		Wed	Thu	Fri	Sat	Sun	Mon
<i>i</i> Rip Current							
<i>i</i> Marine Hazard							

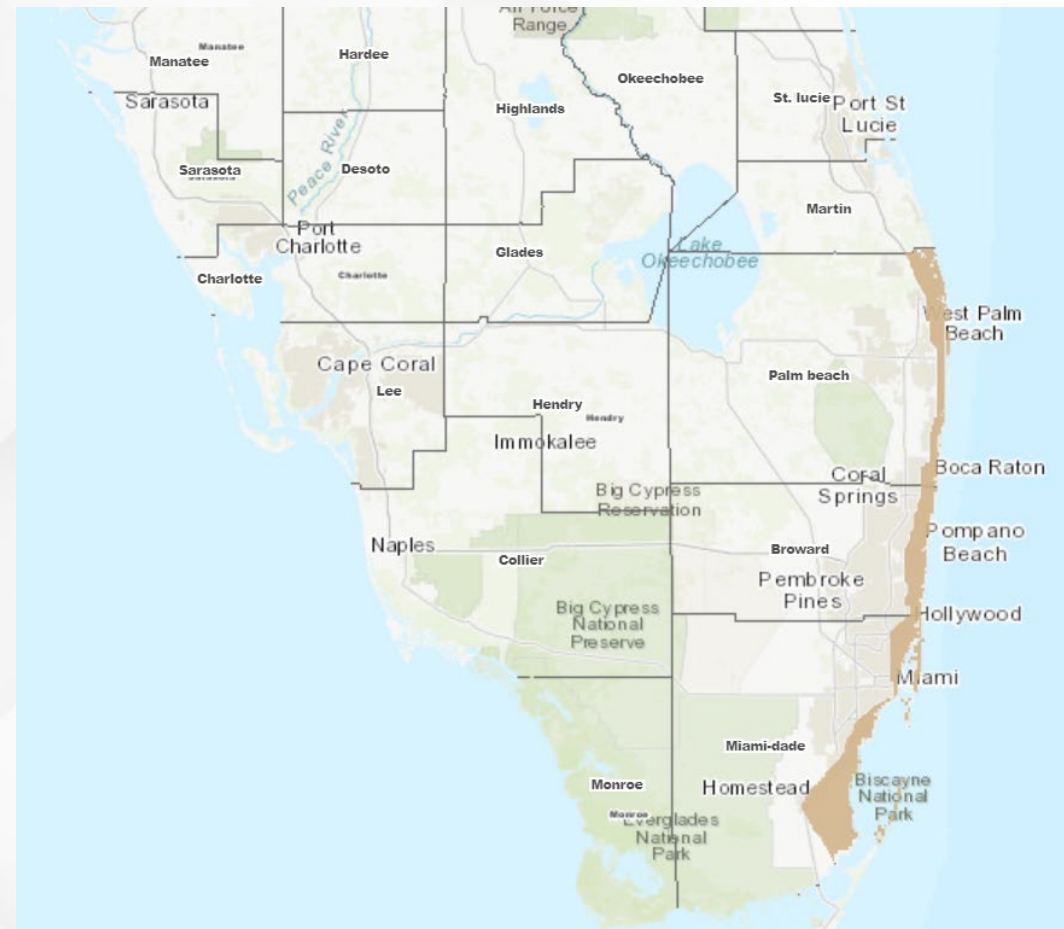
Florida West Coast		Wed	Thu	Fri	Sat	Sun	Mon
<i>i</i> High Surf							
<i>i</i> Rip Current							
<i>i</i> Marine Hazard							
<i>i</i> Coastal Flood							

- An increase in **hazardous beach and coastal conditions** can be expected to develop across Southwest and West-Central Florida beaches beginning midweek as Rafael emerges from the northern Caribbean Sea and into the Gulf of Mexico.
- Wave heights of 2-4' can be expected for all beaches through Wednesday morning for the West Coast, but ocean swells will increase Wednesday evening and overnight.
- By Thursday morning, **wave heights of 4-7'** can be expected to extend from the Florida Keys and northward towards the Panhandle, with **large breaking waves upwards of 7-8'** in surf zone; *High Surf Advisories have been issued for portions of the Florida East Coast.*
- A **high risk for rip currents** can likely be expected for all Florida West Coast beaches Wednesday and Thursday.



Wind Advisories in Effect

From the National Weather Service (NWS)

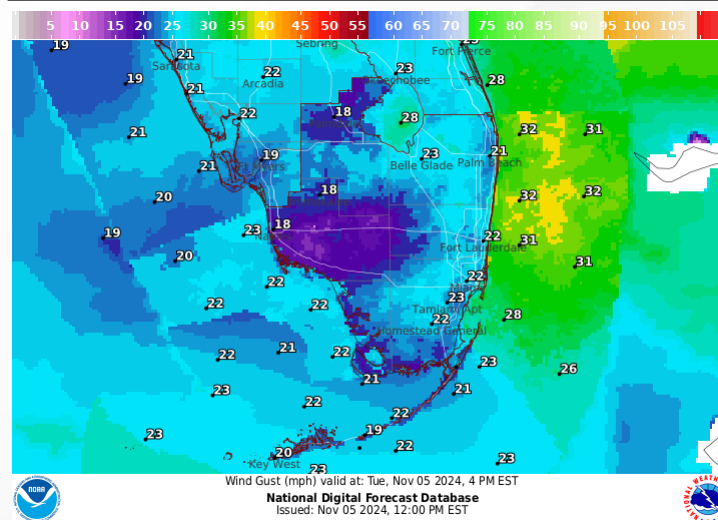


**In Effect through 1:00 AM EST
Wednesday**

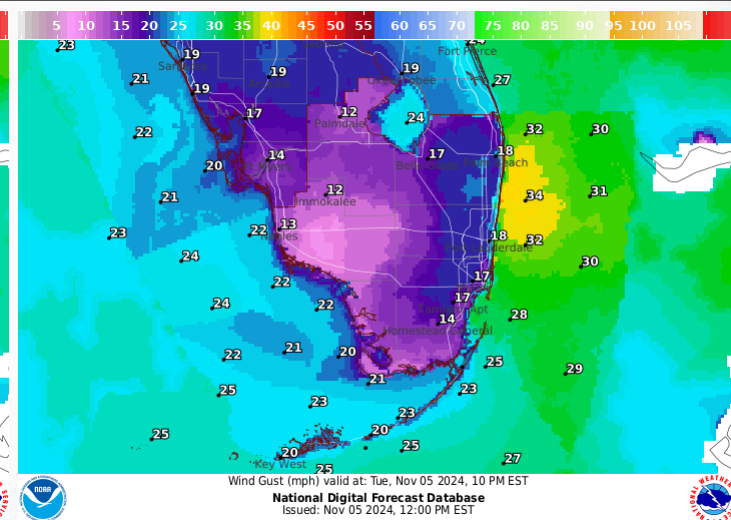
There is a **Wind Advisory** along the immediate Southeast Florida Coast through late tonight (1:00 AM EST Wednesday) as breezy conditions can be expected through the day. Frequent wind gusts of 30-35 mph are forecast, with locally higher gusts reaching 40 mph possible.

This impacts the following counties:

- Coastal Palm Beach
- Coastal Broward
- Coastal Miami-Dade



Forecast Wind Gust – 4:00 PM EST



Forecast Wind Gust – 10:00 PM EST



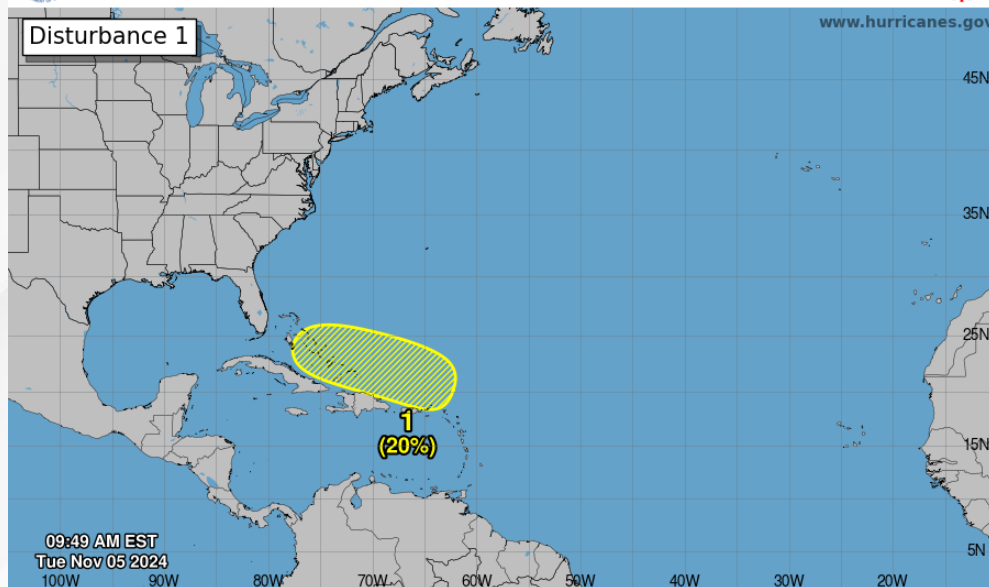
Tropical Weather Outlook

Disturbance 1 – Southwestern Atlantic



Seven-Day Graphical Tropical Weather Outlook

National Hurricane Center Miami, Florida



09:49 AM EST
Tue Nov 05 2024

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

Near 0%

48 Hour Formation



20%

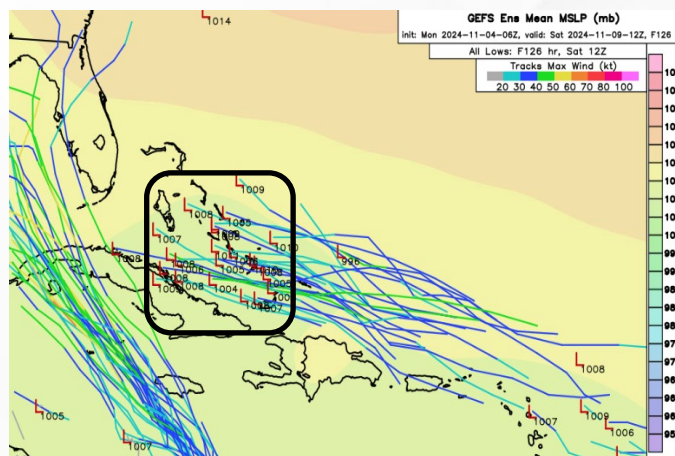
7 Day Formation

An area of low pressure could develop near the northern Leeward Islands in a few days. Some slow development of this system is possible after that time as it moves generally westward over the southwestern Atlantic.

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.

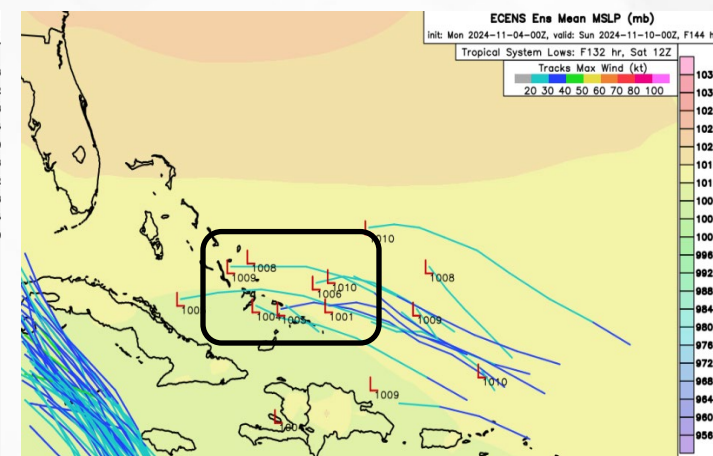
Chance of development through 48 hours...**low...near 0%**

Chance of development through 7 days...**low...20%**



American Model Ensemble

Valid: Saturday (11/9) Morning



European Model Ensemble

Valid: Saturday (11/9) Morning



Summary

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Tropical Storm Rafael:

- As of 10:00 AM EST, Rafael is currently located about 65 miles southwest of Montego Bay, Jamaica, or 510 miles south-southeast of Key West, Florida.
- A general northwestward motion is anticipated over the next few days. On the forecast track, the storm is expected to move near western Jamaica through early this afternoon, and be near or over the Cayman Islands this evening and tonight, and be near or over western Cuba on Wednesday.
- Maximum sustained winds are near 60 mph, and steady to rapid strengthening is expected during the next 24 to 36 hours.
- Rafael is expected to become a hurricane as it passes near the Cayman Islands with further strengthening before it makes landfall in Cuba.
- Tropical storm-force winds extend outward up to 105 miles from the center of circulation.
- **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 moves beyond the Caribbean and enters the Gulf of Mexico by mid-to-late week, computer model guidance shows greater uncertainty regarding the evolution and movement of the system.
- The Storm Prediction Center (SPC) has introduced a 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.
 - While this track will keep the center of the tropical system well offshore the Florida Keys and South Florida, 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 over the southern Florida Peninsula today (45-70% chance of rain), becoming increasingly numerous further north by Wednesday.
- Exact rainfall totals and the placement of heavy rainfall will remain track dependent; however, generally 2-3" of rain can be expected with locally higher amounts of 3-6" possible.
- The heaviest rainfall totals over the next 7-day forecast period appears to reside along the eastern Florida Panhandle, Florida Big Bend, and Suwannee River Valley, 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 North Florida and the western Florida Peninsula. The Marginal Risk (level 1 of 4) continues for North Florida, mainly north of the I-4 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.
- Wind Advisories are in effect for the Southeast Florida coastline this afternoon and tonight as frequent wind gusts of 30-35 mph can be expected, with locally higher wind gusts reaching 40 mph possible.

The next briefing packet will be issued Tuesday Evening. 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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