

# 2025 HURREVAC Training Webinar Series

## Day 2 – Wind Forecast Features

July 29, 2025



**FEMA**



NATIONAL HURRICANE PROGRAM



**HURREVAC**

HURRICANE DECISION SUPPORT TOOL

# Attendee information



## Registration

- You are automatically signed in when you join
- Registration is still open for Days 3 & 4

## Audio

- All attendees are muted
- If having audio issues, restart webinar or try watching link on a different device (laptop/desktop strongly recommended)

## Live Transcription

- Available in English and Spanish
- Opens in a separate browser window
- Links are in the chat window and reminder email from 1 hour ago

## Downloadable handouts

- Today's slides
- HURREVAC Workspace Guide
- Also available from [hurrevac.com](http://hurrevac.com) in the **Learning Resources** section

# Attendee information



## Questions

- Submit in the question box

## Feedback

- Daily survey launches after webinar
- Link also in follow-up email

## Recording

- Will be posted by tomorrow morning on our YouTube channel and the **Learning Resources** tab of [hurrevac.com](http://hurrevac.com)
- Available if you miss a session, or as a year-round resource

## Certificate

- One for each day attended
- Emailed from GoToWebinar about one hour after conclusion
- If missing, check junk/spam first
- Certificates cannot be generated for groups, or makeup viewing on YouTube



# THIS WEEK'S AGENDA

~~MON. JULY 28: Introduction to HURREVAC~~

**TUES. JULY 29: Wind Forecast Features**

**WED. JULY 30: Storm Surge and Flooding Hazards**

**THURS. JULY 31: Evacuation Timing Features**

Registration is still open for Days 3 & 4 at [webinars.hurrevac.com](https://webinars.hurrevac.com)



# Today's Presenters



## **Robbie Berg**

Warning Coordination Meteorologist  
National Hurricane Center

## **John Boyer**

Sea Island Software



NATIONAL HURRICANE PROGRAM

# HURREVAC WEBINAR SERIES

## *Day 2 – Wind Products*



### NHC TROPICAL CYCLONE- AND WIND-RELATED PRODUCTS

- Tropical Weather Outlook
- Forecast Advisory
- Error Cone
- Wind Speed Probabilities
- Time of Arrival Graphics
- Watches and Warnings



# TROPICAL WEATHER OUTLOOK

## *Assessment of Tropical Activity*

**NATIONAL HURRICANE CENTER**  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

TROPICAL WEATHER OUTLOOK  
NWS NATIONAL HURRICANE CENTER MIAMI FL  
800 PM EDT MON OCT 20 YYYY

For the North Atlantic...Caribbean Sea and the Gulf of America:

**Bay of Campeche (AL92):**  
Showers and thunderstorms associated with an area of low pressure located over the southwestern Bay of Campeche have changed little in organization since this afternoon. This system has the potential to become a tropical cyclone during the next couple of days while it moves slowly eastward across the southern Bay of Campeche. Later in the week, the low is forecast to interact and possibly merge with a frontal system over the southeastern Gulf of America or northwestern Caribbean Sea. An Air Force Reserve reconnaissance aircraft is scheduled to investigate the disturbance tomorrow afternoon, if necessary. Interests in the Yucatan Peninsula should monitor the progress of this system.

- \* Formation chance through 48 hours...medium...50 percent.
- \* Formation chance through 7 days...medium...60 percent.

Forecaster Brown

Where is it located?

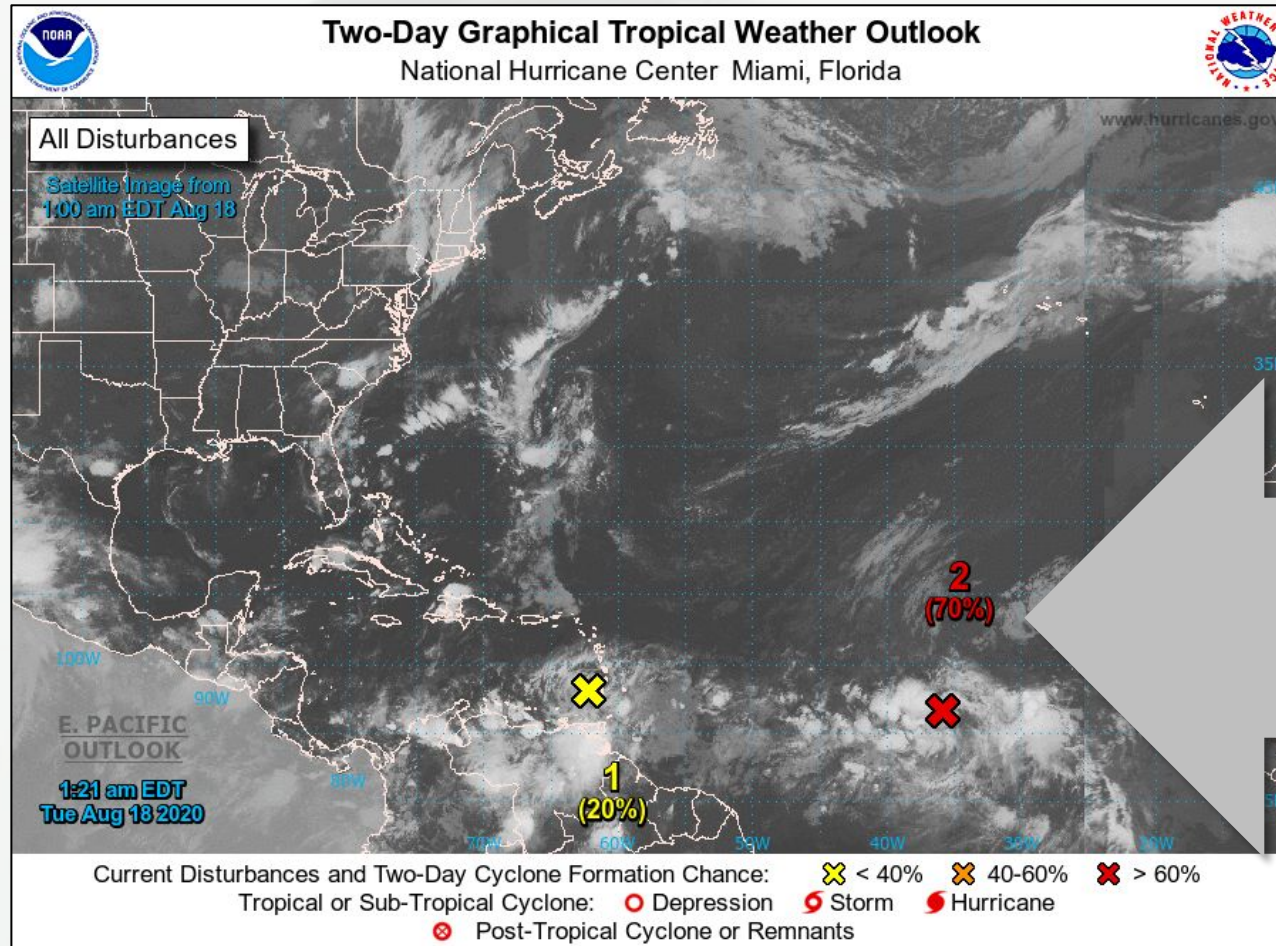
Potential for development?  
Headed where?

2- and 7-Day  
Formation Chances



# TROPICAL WEATHER OUTLOOK

## *2-Day Formation Potential*



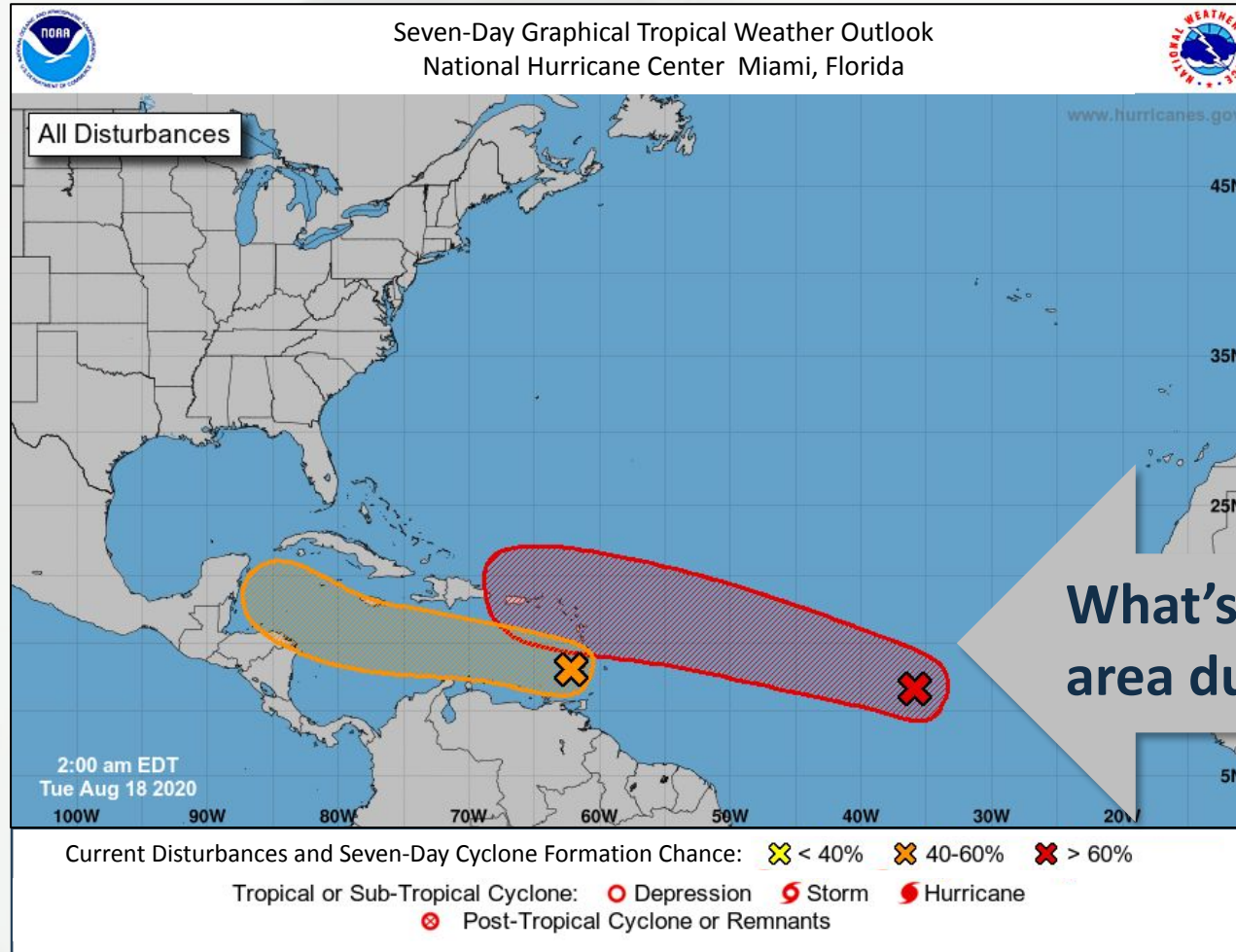
- Current location of disturbances
- Formation chance during the next 48 hrs

- **CATEGORICAL**  
(Low, Medium, and High)
- **PROBABILITIES**



# TROPICAL WEATHER OUTLOOK

## 7-Day Formation Potential (Default on hurricanes.gov)



- Initial location of disturbance (x) indicated
- Formation potential during the next 7 days
  - Shading represents formation area

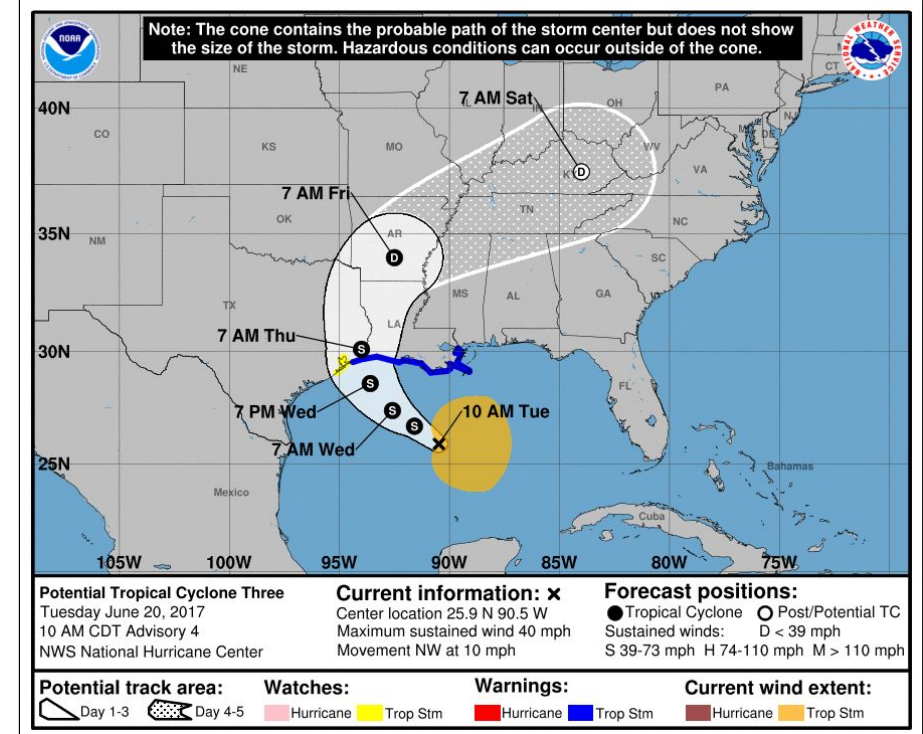
What's the chance it forms in this area during the next 7 days?

# NATIONAL HURRICANE CENTER ADVISORIES

## *Potential, Post-, Tropical Cyclones*

- **Tropical Cyclones**
  - Tropical Depressions
  - Tropical Storms
  - Hurricanes
- **Post-Tropical Cyclones**
  - Was a tropical cyclone but remains a wind/surge threat to land (e.g., Sandy & Hermine)
- **Potential Tropical Cyclones**
  - Systems not yet a tropical cyclone
  - Threat of TS-force winds or significant surge on land within 72 hours. (Extended from 48 h in 2025)

### Potential Tropical Cyclone Three (Cindy 2017)



# NHC WIND PRODUCTS

Critical for preparedness and evacuation decision making

- **Deterministic:**

- Based on a perfect NHC Track & Wind Radii Forecast
  - No forecast uncertainty accounted for
  - Track and TS/Strong TS radii out to 5 days
  - Hurricane radii out to 3 days

9 out of 10  
meteorologists  
recommend



**probabilistic**



- **Wind Speed Probabilities:**

- Accounts for Track, Intensity, and Size Uncertainty
- Chance of TS, Strong TS, and Hurricane-force winds
- Time of Arrival (TOA) of TS-force winds



# FORECAST ADVISORY

## *Position. Size. Radii. Intensity.*



### NATIONAL HURRICANE CENTER

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

TROPICAL STORM MICHAEL FORECAST/ADVISORY NUMBER 7  
NWS NATIONAL HURRICANE CENTER MIAMI FL AL142018  
0900 UTC MON OCT 08 2018

A TROPICAL STORM WATCH HAS BEEN ISSUED FROM THE SUWANEE RIVER TO ANNA MARIA ISLAND FLORIDA...INCLUDING TAMPA BAY.

PRESENT MOVEMENT TOWARD THE NORTH OR 360 DEGREES AT 6 KT

ESTIMATED MINIMUM CENTRAL PRESSURE 983 MB  
MAX SUSTAINED WINDS 60 KT WITH GUSTS TO 75 KT.

50 KT..... 80NE 80SE 0SW 0NW.  
34 KT.....120NE 150SE 90SW 100NW.  
12 FT SEAS..135NE 120SE 30SW 60NW.  
WINDS AND SEAS VARY GREATLY IN EACH QUADRANT. RADII IN NAUTICAL MILES ARE THE LARGEST RADII EXPECTED ANYWHERE IN THAT QUADRANT.

REPEAT...CENTER LOCATED NEAR 20.6N 85.5W AT 08/0900Z  
AT 08/0600Z CENTER WAS LOCATED NEAR 20.2N 85.5W

FORECAST VALID 08/1800Z 21.7N 85.6W  
MAX WIND 70 KT...GUSTS 85 KT.

64 KT... 30NE 30SE 0SW 0NW.  
50 KT... 90NE 90SE 30SW 30NW.  
34 KT...130NE 150SE 90SW 120NW.

FORECAST VALID 09/0600Z 23.5N 86.1W

Current wind radii

Forecast wind radii




# FORECAST ADVISORY

## *Position. Size. Radii. Intensity.*

### WIND RADII

- NHC forecasts the wind radii in four quadrants

 **NATIONAL HURRICANE CENTER**  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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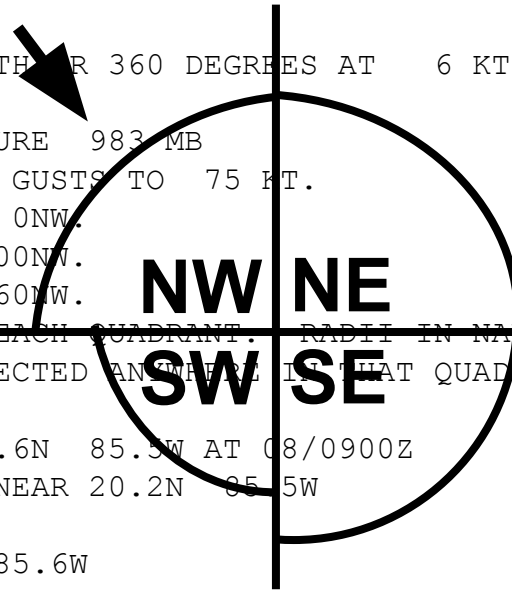
PRESENT MOVEMENT TOWARD THE NORTH-NORTHWEST 360 DEGREES AT 6 KT

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FORECAST VALID 09/0600Z 23.5N 86.1W



Radii are the largest distance from the center in a quadrant

Leads to an inherent over-estimate of radii, especially near land

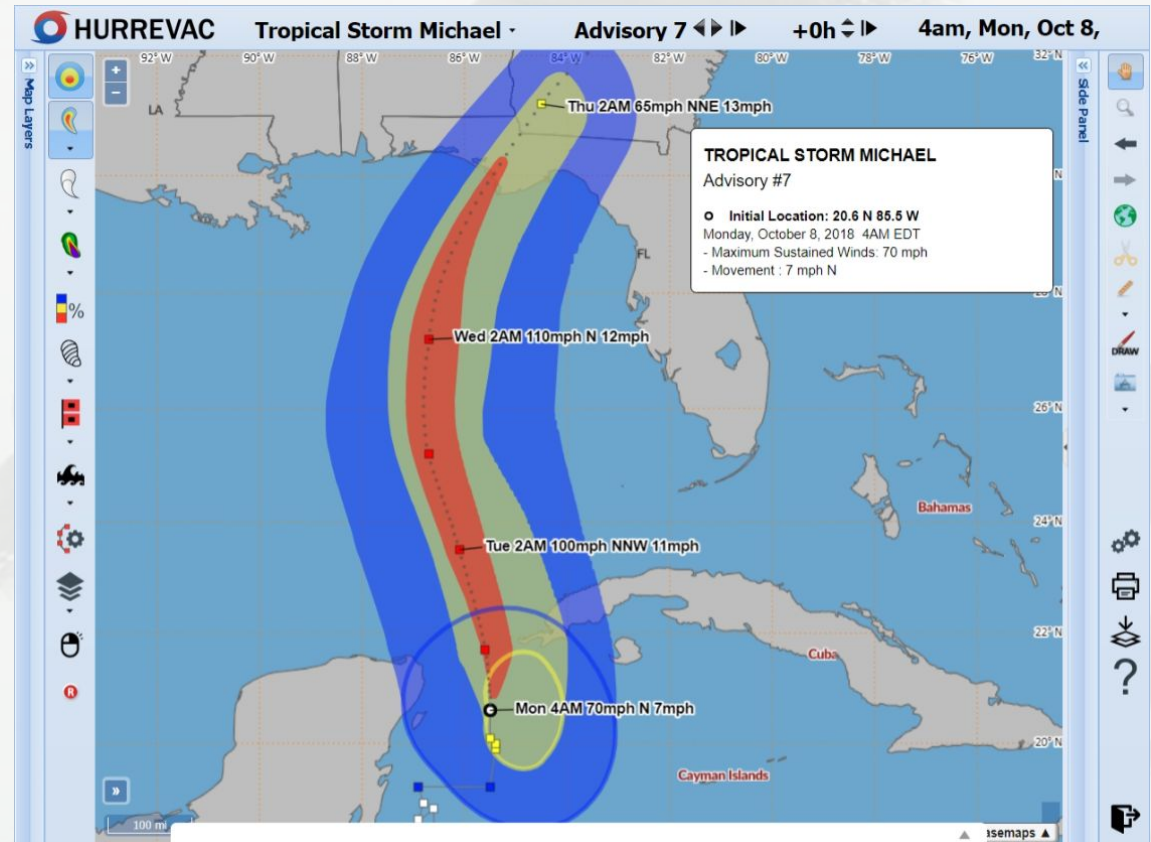
# FORECAST ADVISORY

## *Position. Size. Radii. Intensity.*

### WIND RADII

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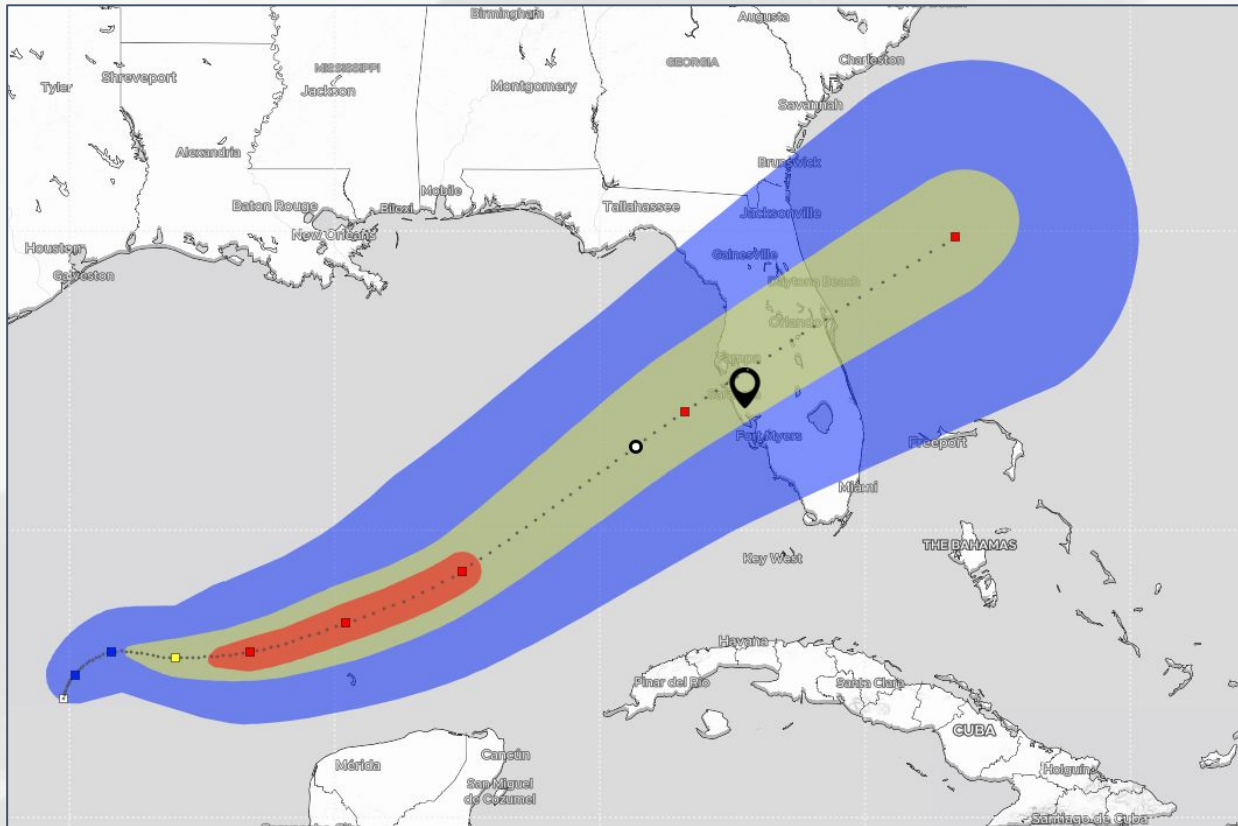
	34 kt (Blue)	50 kt (Yellow)	64 kt (Red)
12 hr	Yes	Yes	Yes
24 hr	Yes	Yes	Yes
36 hr	Yes	Yes	Yes
48 hr	Yes	Yes	Yes
60 hr	Yes	Yes	Yes
72 hr	Yes	Yes	Yes
96 hr	Yes	Yes	N/A
120 hr	Yes	Yes	N/A



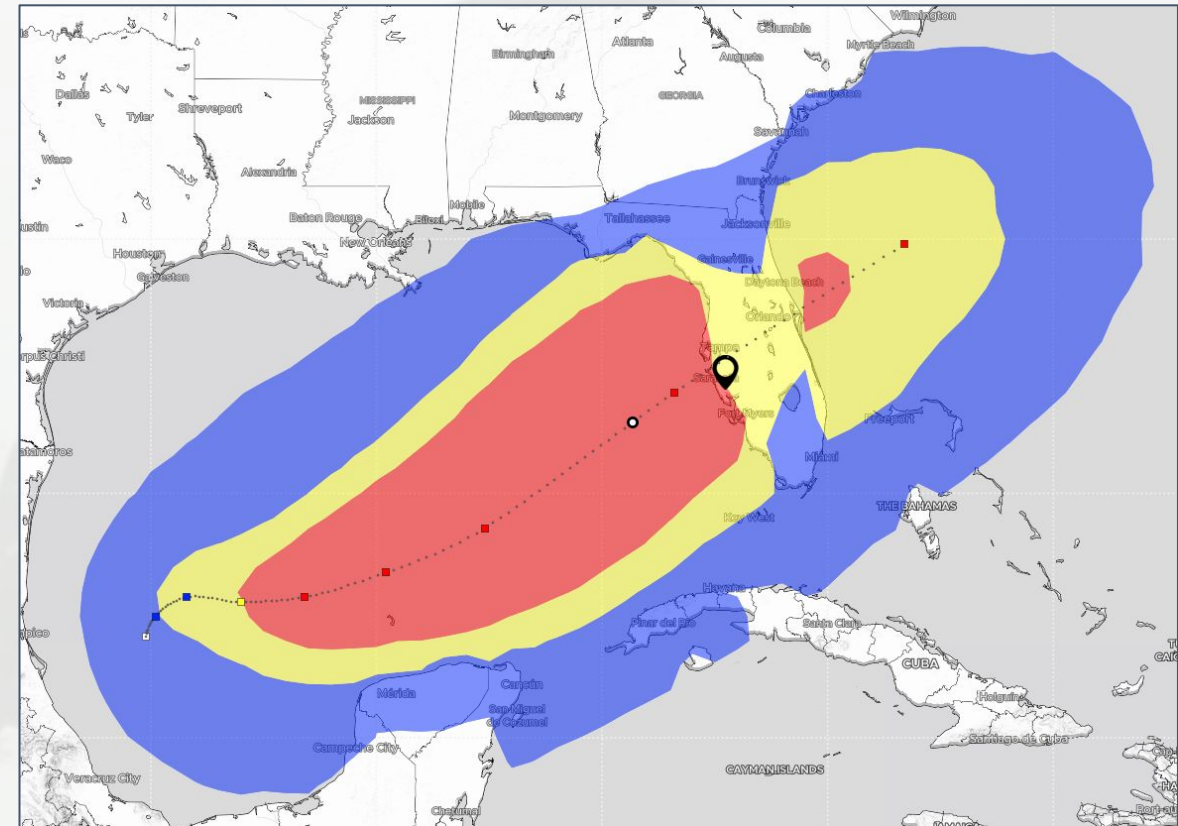
# NHC WIND PRODUCTS

## *Example: Hurricane Milton (2024)*

### DETERMINISTIC



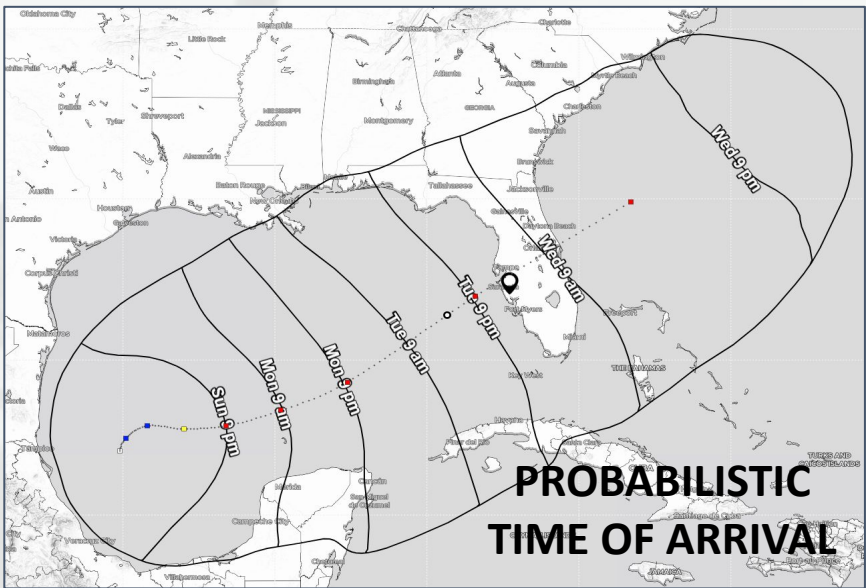
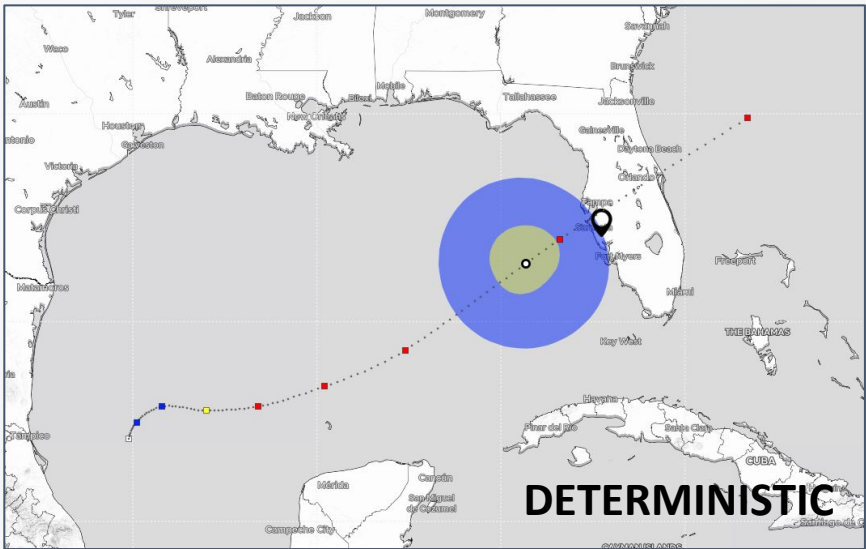
### PROBABILISTIC (Reasonable Worst Case)





# NHC WIND PRODUCTS

## Example: Hurricane Milton (2024)





## WIND TIMING FOR SARASOTA, FL

Tropical Storm (34kt/39mph)			
5 day total WSP			55%
TIME OF ARRIVAL	DATE	DAY	HOURS
Earliest Reasonable	10/8 2PM EDT	Tuesday	75
Most Likely	10/9 1AM EDT	Wednesday	86
Deterministic	10/9 3AM EDT	Wednesday	88
TIME OF DEPARTURE	DATE	DAY	HOURS
Most Likely	10/9 1PM EDT	Wednesday	98
Latest Reasonable	10/10 2AM EDT	Thursday	111
Deterministic	10/9 10PM EDT	Wednesday	107
Strong Tropical Storm (50kt/58mph)			
5 day total WSP			25%
TIME OF ARRIVAL	DATE	DAY	HOURS
Earliest Reasonable	10/8 8PM EDT	Tuesday	81
Most Likely	10/9 5AM EDT	Wednesday	90
Deterministic	10/9 8AM EDT	Wednesday	93
TIME OF DEPARTURE	DATE	DAY	HOURS
Most Likely	10/9 10AM EDT	Wednesday	95
Latest Reasonable	10/9 8PM EDT	Wednesday	105
Deterministic	10/9 5PM EDT	Wednesday	102



# NHC STORM INFO BOX ON *hurricanes.gov*

## Day 2 – Wind Products

**NATIONAL HURRICANE CENTER**  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION


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### Tropical Storm Michael


**...MICHAEL ALMOST A HURRICANE... ...HURRICANE WATCH ISSUED FOR THE FLORIDA PANHANDLE AND FLORIDA BIG BEND...**

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<b>4:00 AM CDT Mon Oct 8</b> Location: 20.6°N 85.5°W Moving: N at 7 mph Min pressure: 983 mb Max sustained: 70 mph	<b>Public Advisory #7</b> 400 AM CDT	<b>Aviso Publico #7</b> 400 AM CDT	<b>Forecast Advisory #7</b> 0900 UTC	<b>Forecast Discussion #7</b> 400 AM CDT	<b>Wind Speed Probabilities #7</b> 0900 UTC
	<b>NWS Local Products</b> 613 AM CDT	<b>US Watch/Warning</b> 452 AM CDT			




Wind Speed Probabilities




Arrival Time of Winds




Wind History




Warnings/Cone Interactive Map




Warnings/Cone Static Images




Warnings and Surface Wind



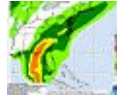
Key Messages




Storm Surge Inundation



Storm Surge Watch/Warning



U.S. Rainfall Potential



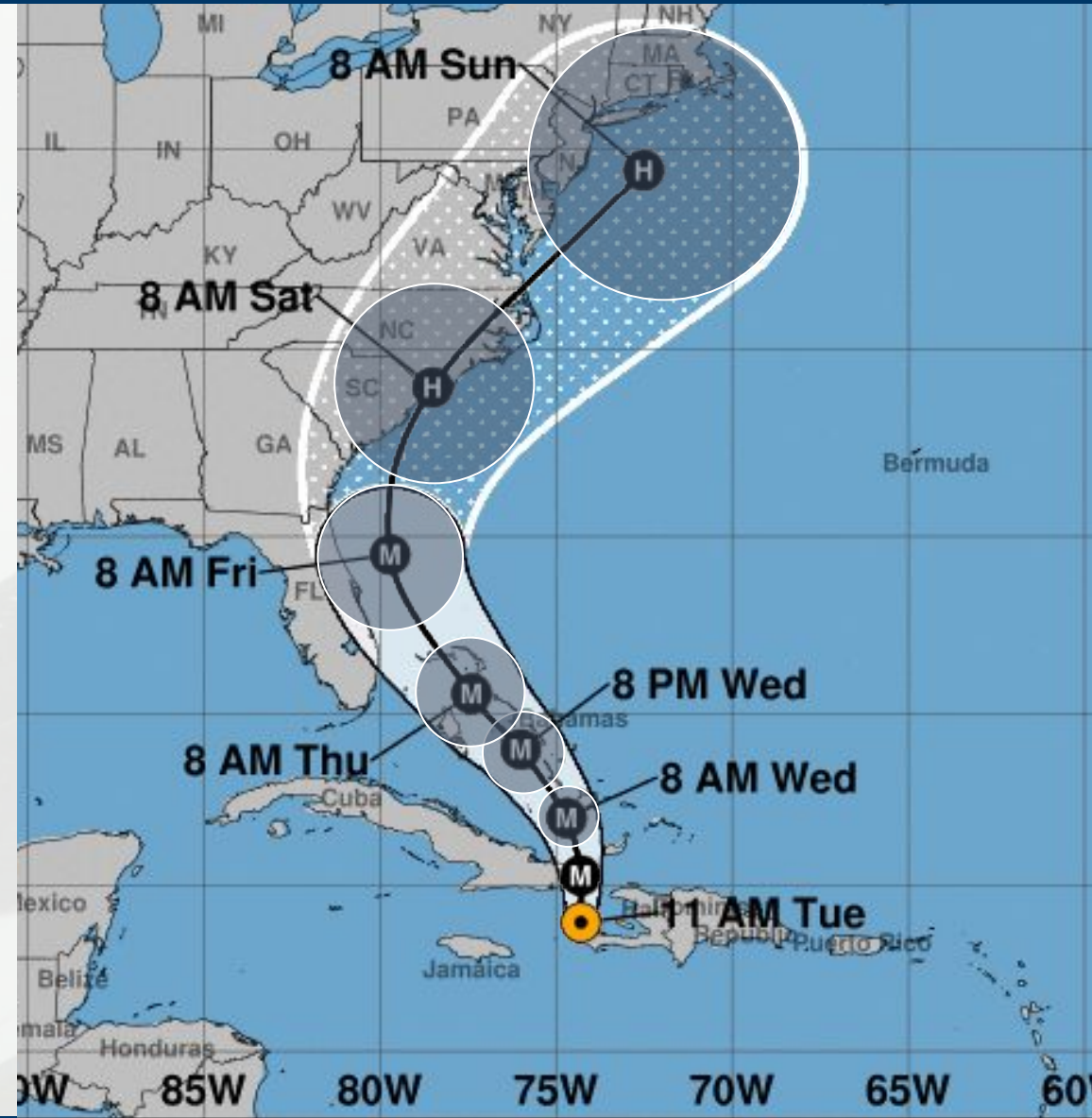
Flash Flood Potential

# FORECAST ERROR CONE

*The cure for the skinny black line?*

## ERROR CONE

- Probable track of the center of the tropical cyclone
- Formed by connecting circles centered on each forecast point
- Each circle uses NHC historical (5-year) track errors  
Actual storm position will be within the circle 67% of the time

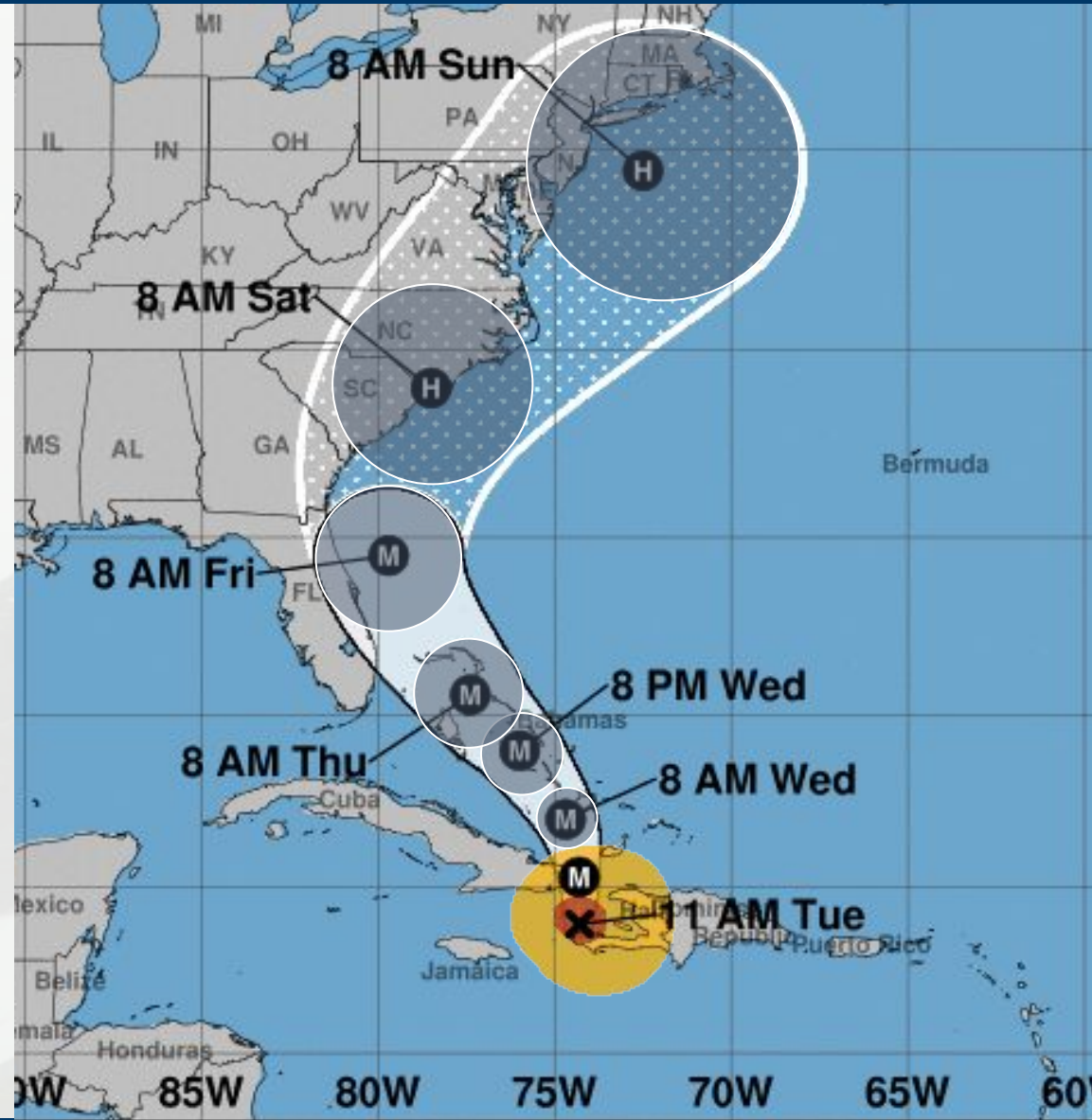


# FORECAST ERROR CONE

*No worries, not in the cone?*

## ERROR CONE

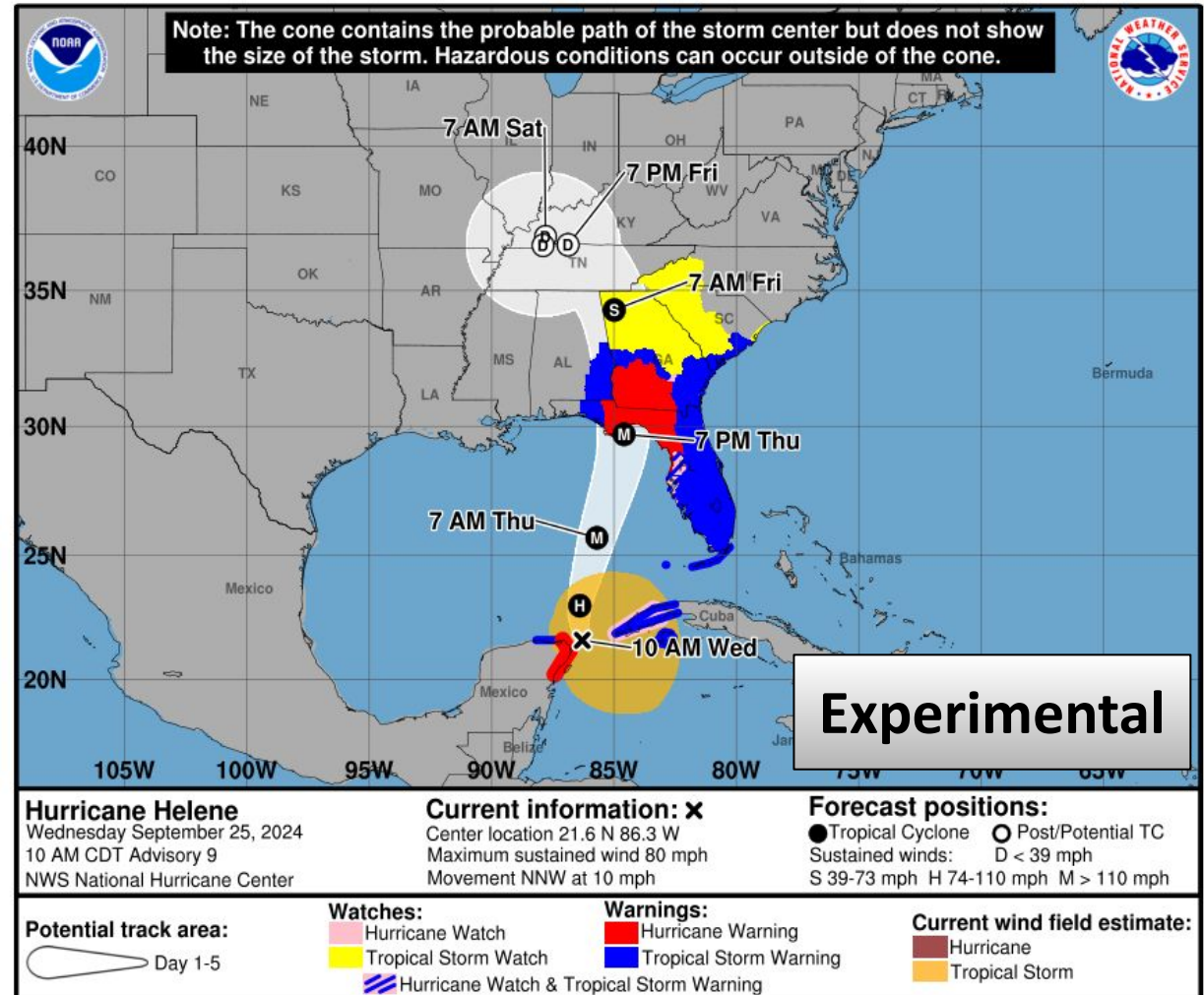
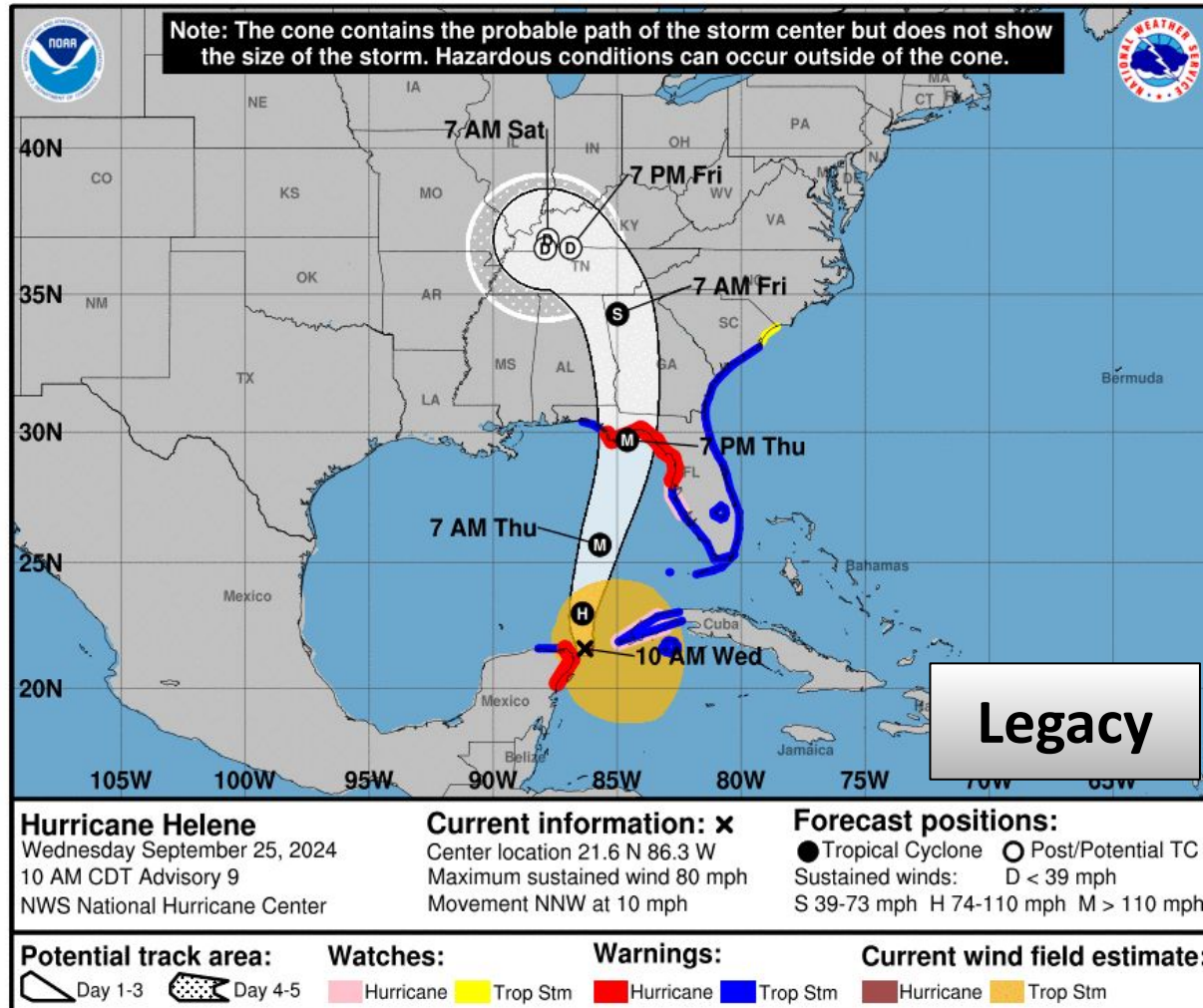
- Only displays information about track uncertainty  
Nothing about specific impacts
- Impacts can occur well outside the area enclosed by the cone  
Center is expected to be outside the cone about 1/3 of the time





# New Cone Helps to Convey Wind Risk

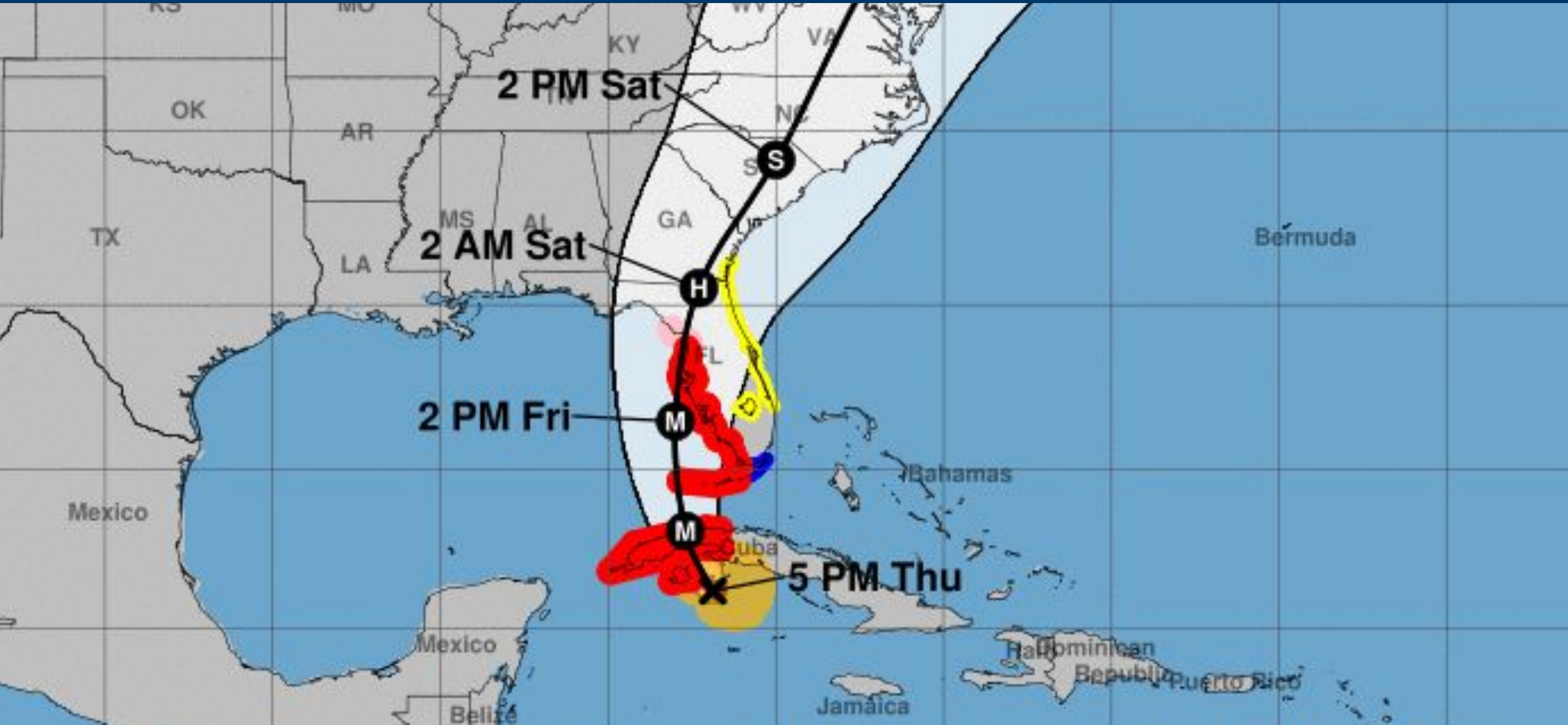
Depicts coastal and inland areas in the U.S. under hurricane and tropical storm watches and warnings





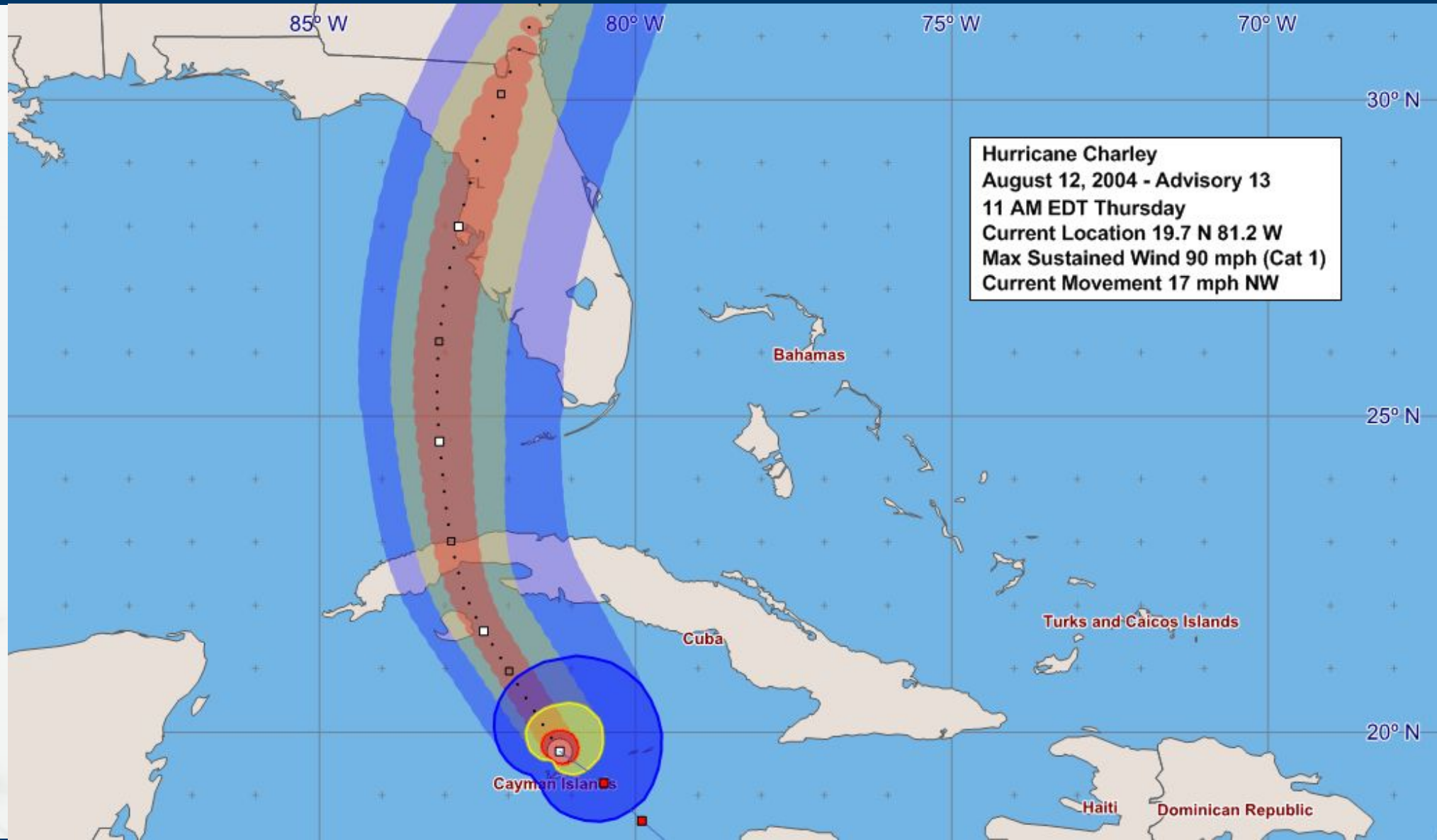
# HURRICANE CHARLEY

*Don't focus on the skinny black line.*



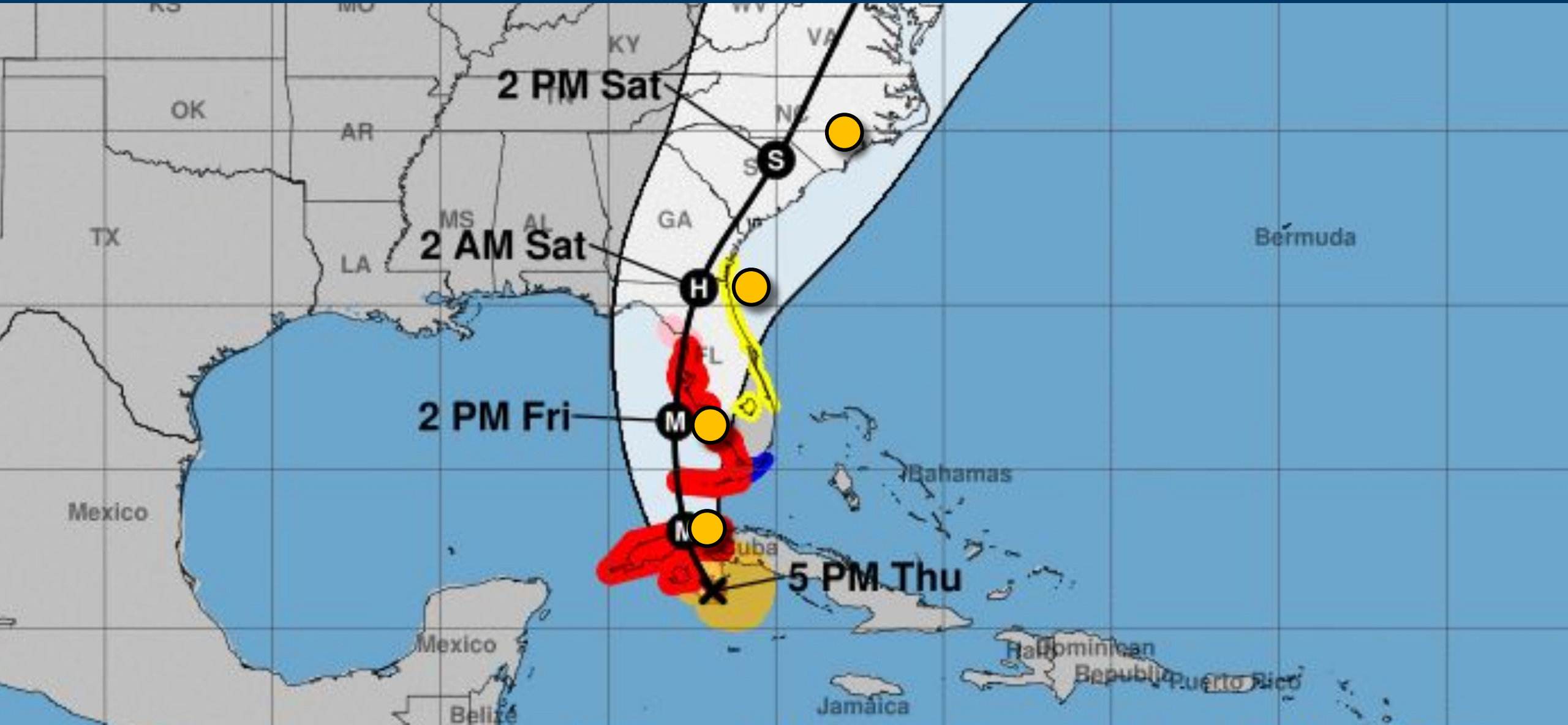
# HURRICANE CHARLEY

*Don't focus on the skinny black line.*



# HURRICANE CHARLEY

*Don't focus on the skinny black line.*





# HURRICANE CHARLEY

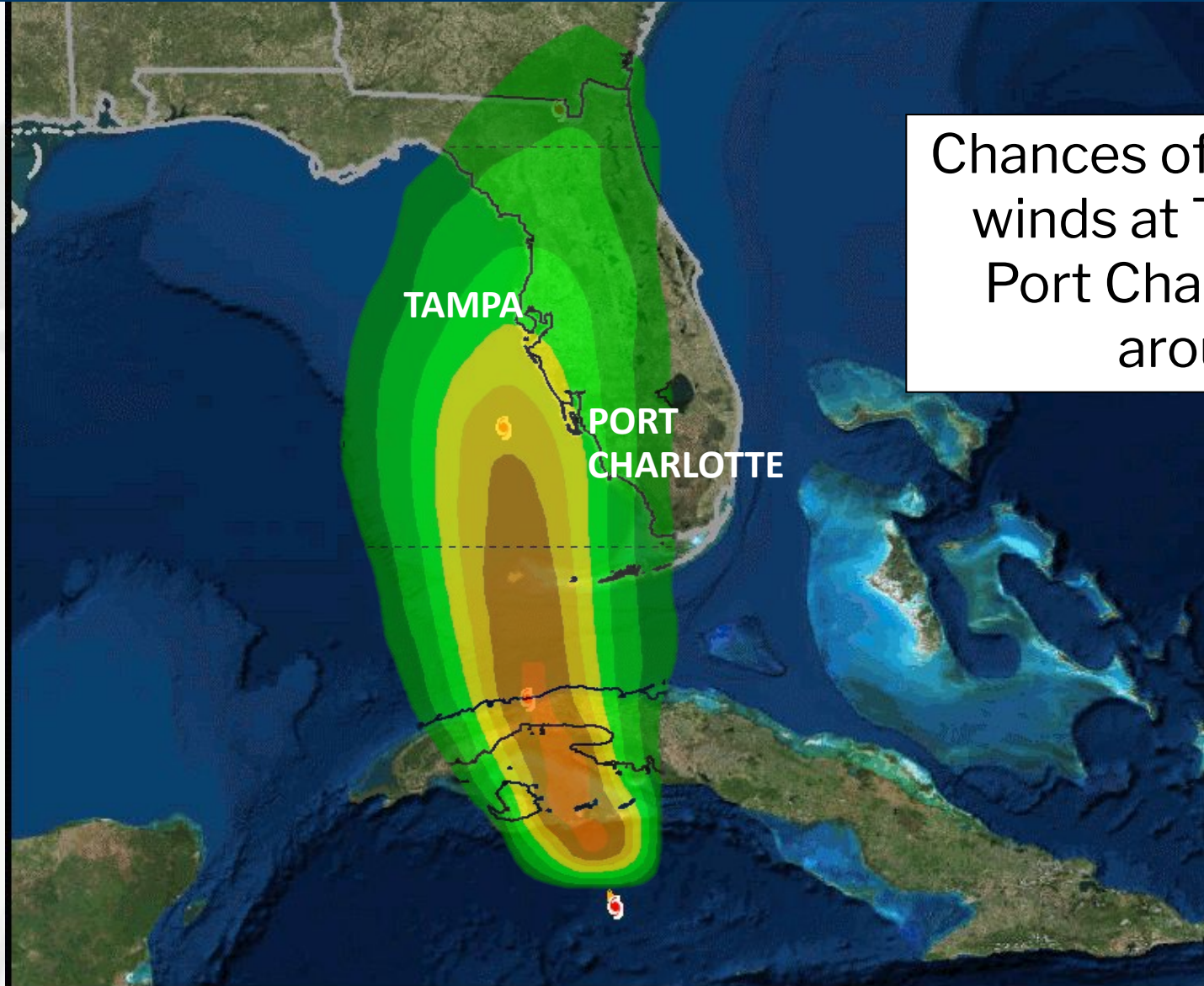
*Would alternate scenarios help?*





# HURRICANE CHARLEY


*Would alternate scenarios help?*



Chances of hurricane-force winds at Tampa Bay and Port Charlotte are both around 30%

# WIND SPEED PROBABILITIES

## Text Product



NATIONAL HURRICANE CENTER

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

TROPICAL STORM MICHAEL WIND SPEED PROBABILITIES NUMBER7

NWS NATIONAL HURRICANE CENTER MIAMI FLAL142018

0900 UTC MON OCT 08 2018

- - - - WIND SPEED PROBABILITIES FOR SELECTED LOCATIONS - - - -



TIME PERIODS	FROM 06Z MON TO 18Z MON	FROM 18Z MON TO 06Z TUE	FROM 06Z TUE TO 18Z TUE	FROM 18Z TUE TO 06Z WED	FROM 06Z WED TO 06Z THU	FROM 06Z THU TO 06Z FRI	FROM 06Z FRI TO 06Z SAT
FORECAST HOUR	(12)	(24)	(36)	(48)	(72)	(96)	(120)
- - - - -							
LOCATION	KT						
TALLAHASSEE FL 34	X	X ( X )	1 ( 1 )	6 ( 7 )	68 (75)	6 (81)	X (81)
TALLAHASSEE FL 50	X	X ( X )	X ( X )	1 ( 1 )	41 (42)	6 (48)	X (48)
TALLAHASSEE FL 64	X	X ( X )	X ( X )	X ( X )	20 (20)	4 (24)	X (24)
APALACHICOLA 34	X	X ( X )	5 ( 5 )	29 (34)	57 (91)	1 (92)	X (92)
APALACHICOLA 50	X	X ( X )	X ( X )	6 ( 6 )	59 (65)	2 (67)	X (67)
APALACHICOLA 64	X	X ( X )	X ( X )	1 ( 1 )	39 (40)	1 (41)	X (41)
PANAMA CITY FL 34	X	X ( X )	4 ( 4 )	26 (30)	60 (90)	1 (91)	X (91)
PANAMA CITY FL 50	X	X ( X )	X ( X )	6 ( 6 )	57 (63)	1 (64)	X (64)
PANAMA CITY FL 64	X	X ( X )	X ( X )	1 ( 1 )	37 (38)	X (38)	X (38)

Location-Specific Probabilities

- Tropical-Storm-Force
- 58 mph
- Hurricane-Force

# WIND SPEED PROBABILITIES

## Text Product



NATIONAL HURRICANE CENTER

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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PANAMA CITY FL 64	X	X ( X )	X ( X )	1 ( 1 )	37 (38)	X (38)	X (38)


Onset Probabilities

•Timing information



# WIND SPEED PROBABILITIES

## Text Product

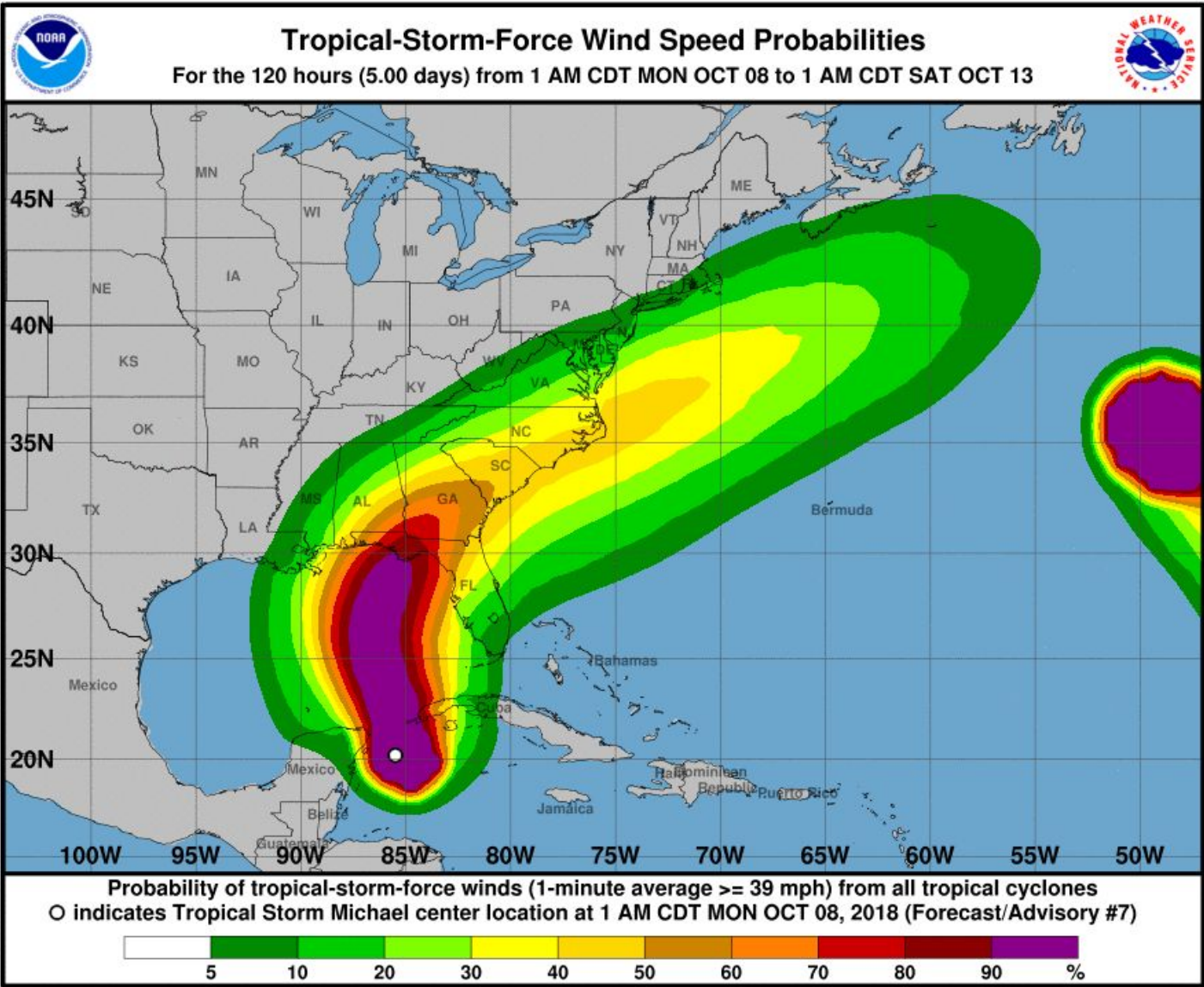
<div><div></div><div><div>NATIONAL HURRICANE CENTER</div><div>NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</div></div></div>								
TROPICAL STORM MICHAEL WIND SPEED PROBABILITIES NUMBER 7								
NWS NATIONAL HURRICANE CENTER MIAMI FL AL142018								
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TIME	FROM	FROM	FROM	FROM	FROM	FROM	FROM	
PERIODS	06Z MON	18Z MON	06Z TUE	18Z TUE	06Z WED	06Z THU	06Z FRI	
	TO	TO	TO	TO	TO	TO	TO	
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Cumulative Probabilities

- Total chance through the time period

# WIND SPEED PROBABILITIES

## 5-Day Cumulative Graphic

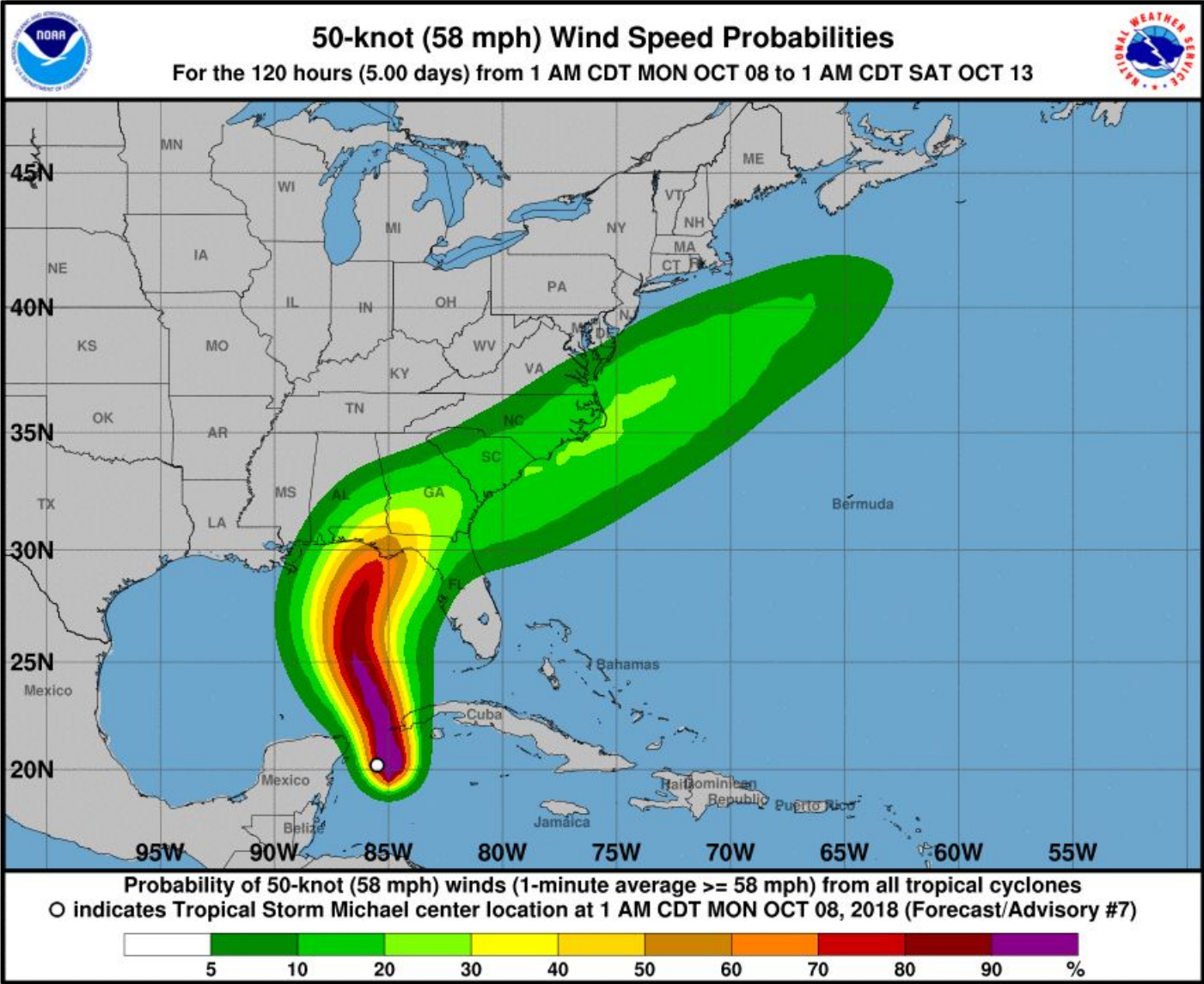


### Location-Specific Probabilities

- Tropical-Storm-Force
- 58 mph
- Hurricane-Force

# WIND SPEED PROBABILITIES

## 5-Day Cumulative Graphic



### Location-Specific Probabilities

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# WIND SPEED PROBABILITIES

## *5-Day Cumulative Graphic*

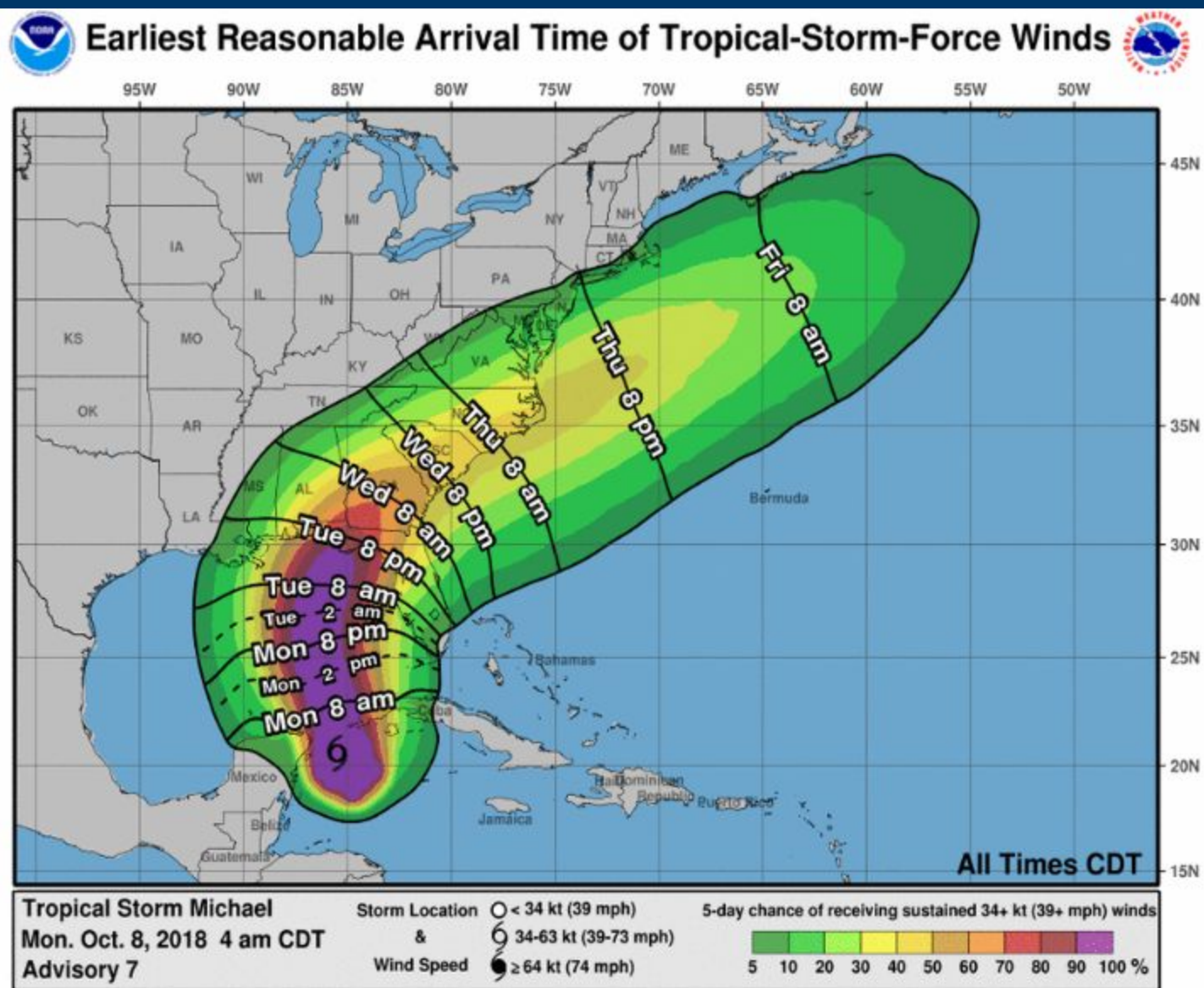


### Location-Specific Probabilities

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# WIND SPEED PROBABILITIES

## *Time of Arrival of TS Winds*



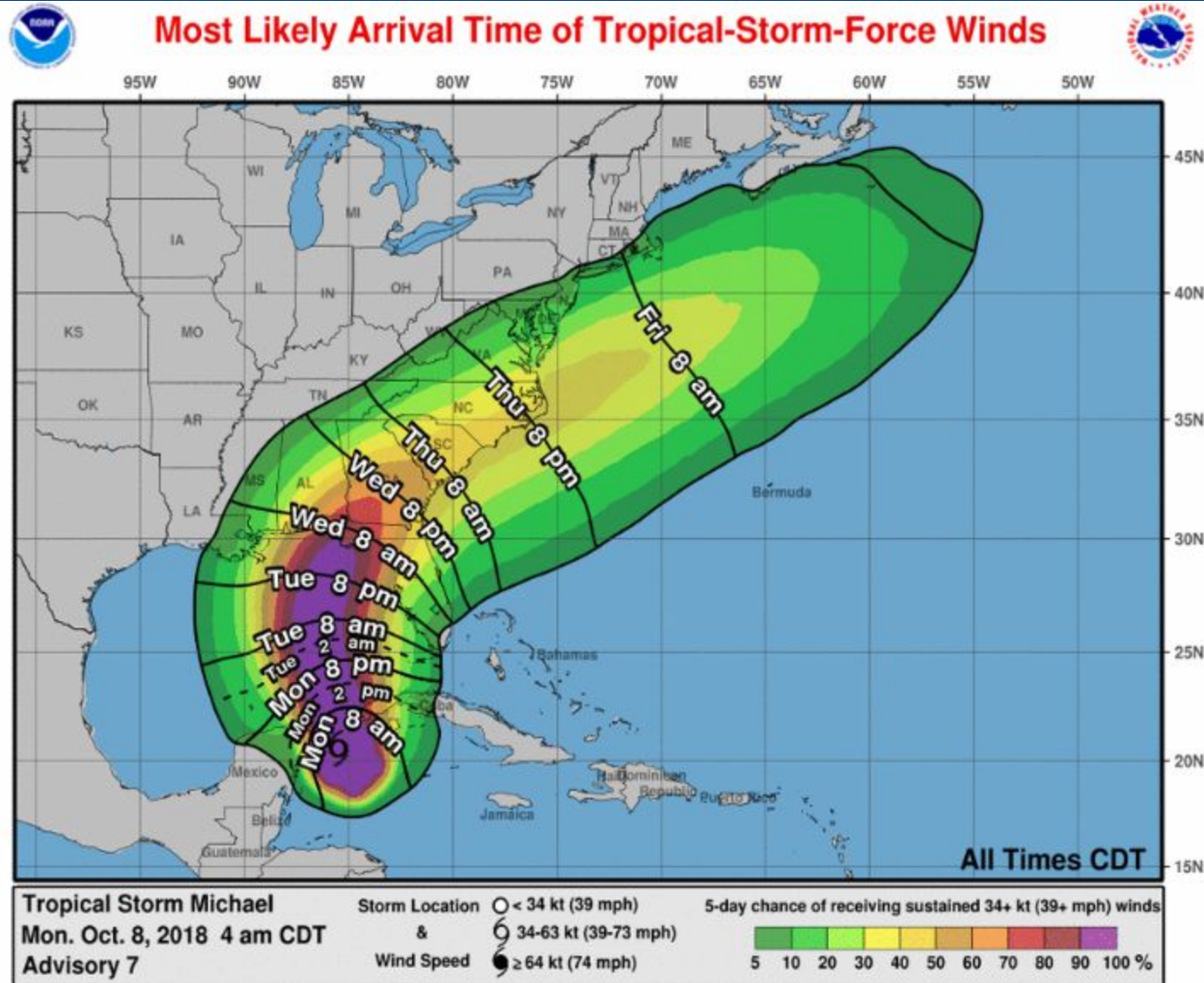
Time of Arrival of TS Winds

- Earliest Reasonable
- Most Likely



# WIND SPEED PROBABILITIES

## *Time of Arrival of TS Winds*



## Time of Arrival of TS Winds

- Earliest Reasonable
- Most Likely



# WATCHES & WARNINGS

*Where. When. What. Action.*



## TROPICAL STORM WATCH

Tropical storm conditions are **possible** somewhere within the watch area, generally **within 48 hours**

## TROPICAL STORM WARNING

Tropical storm conditions are **expected** somewhere within the warning area, generally **within 36 hours**



# WATCHES & WARNINGS

*Where. When. What. Action.*



## NATIONAL HURRICANE CENTER

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



### HURRICANE WATCH

Hurricane conditions are **possible** somewhere within the watch area, generally **within 48 hours**

### HURRICANE WARNING

Hurricane conditions are **expected** somewhere within the warning area, generally **within 36 hours**

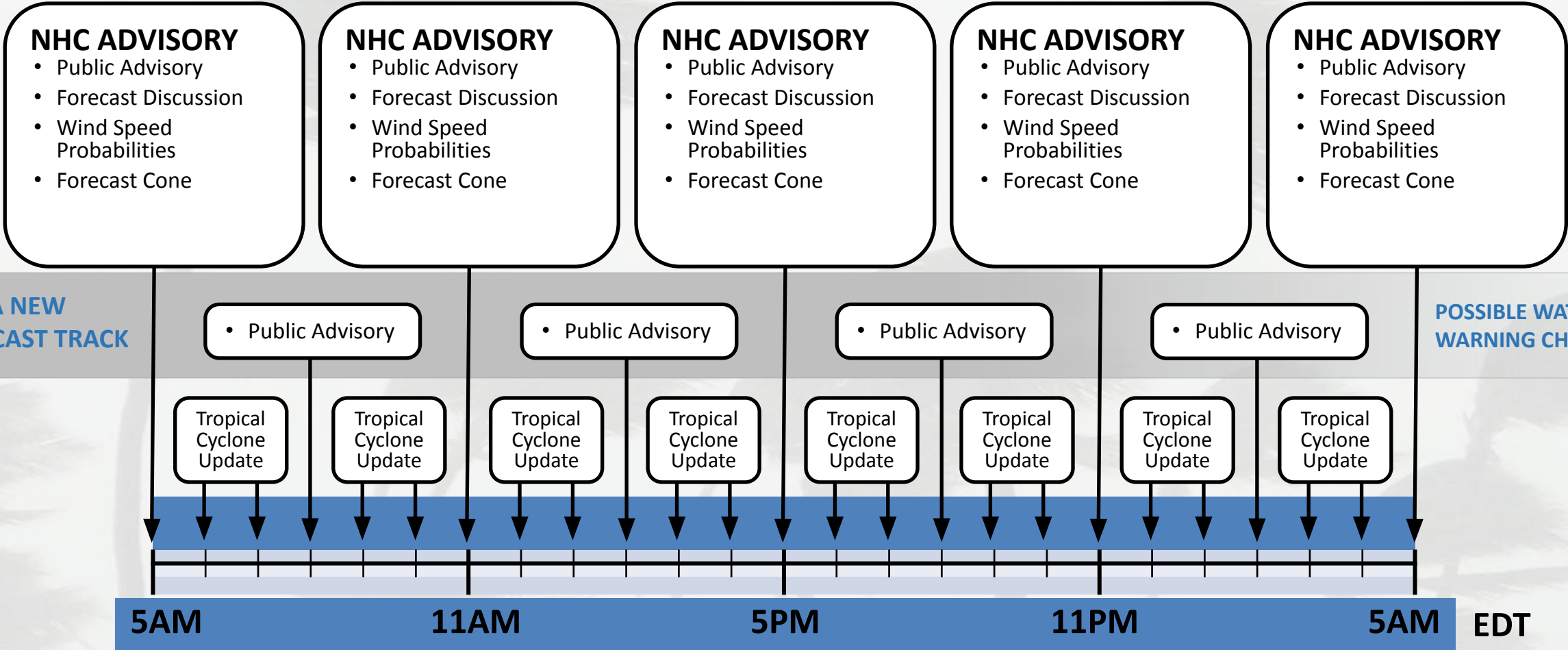
**Note:** The lead time for Hurricane Watches and Warnings is tied to the anticipated arrival time of tropical-storm-force winds



# NHC ADVISORY TIMELINE

## Scheduled Updates

WATCHES, ADVISORIES, AND FORECASTS IN EFFECT and eye tracked by radar





# Questions/Comments on NHC Products

Robbie Berg

Warning Coordination Meteorologist

National Hurricane Center

[robert.berg@noaa.gov](mailto:robert.berg@noaa.gov)

# HURREVAC Demo







## Goals for Today

1. Plot NHC wind products on the map
2. Explore differences between probabilistic and deterministic products
3. Make a wind report for *one* locality
4. Create a report with wind information for *many* localities
5. Use points of interest (POI) to customize wind information



NATIONAL HURRICANE PROGRAM





## COMING UP THIS WEEK

~~MON. JULY 28: Introduction to HURREVAC~~

~~TUES. JULY 29: Wind Forecast Features~~

**NEXT - WED. JULY 30: Storm Surge and Flooding Hazards**

**THURS. JULY 31: Evacuation Timing Features**

Registration is still open for Days 3 & 4 at [webinars.hurrevac.com](https://webinars.hurrevac.com)

# Thank you!

HURREVAC Support Team  
[support@hurrevac.com](mailto:support@hurrevac.com)



**FEMA**



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**HURREVAC**

HURRICANE DECISION SUPPORT TOOL