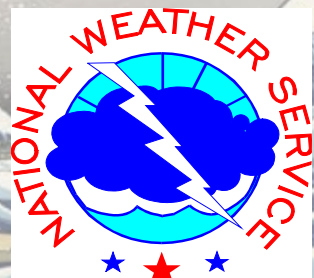


# Overview of National Hurricane Center/ Tropical Analysis and Forecast Branch (TAFB) Marine Products and Services

WMO Region IV Hurricane Workshop  
February 28<sup>th</sup>, 2022

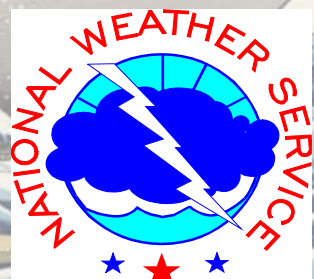
Eric Christensen

[eric.christensen@noaa.gov](mailto:eric.christensen@noaa.gov)



# Overview of National Hurricane Center/ Tropical Analysis and Forecast Branch (TAFB) Marine Products and Services

To provide meteorological analysis, forecasts and warnings over the tropical and subtropical oceans for the protection of life and property



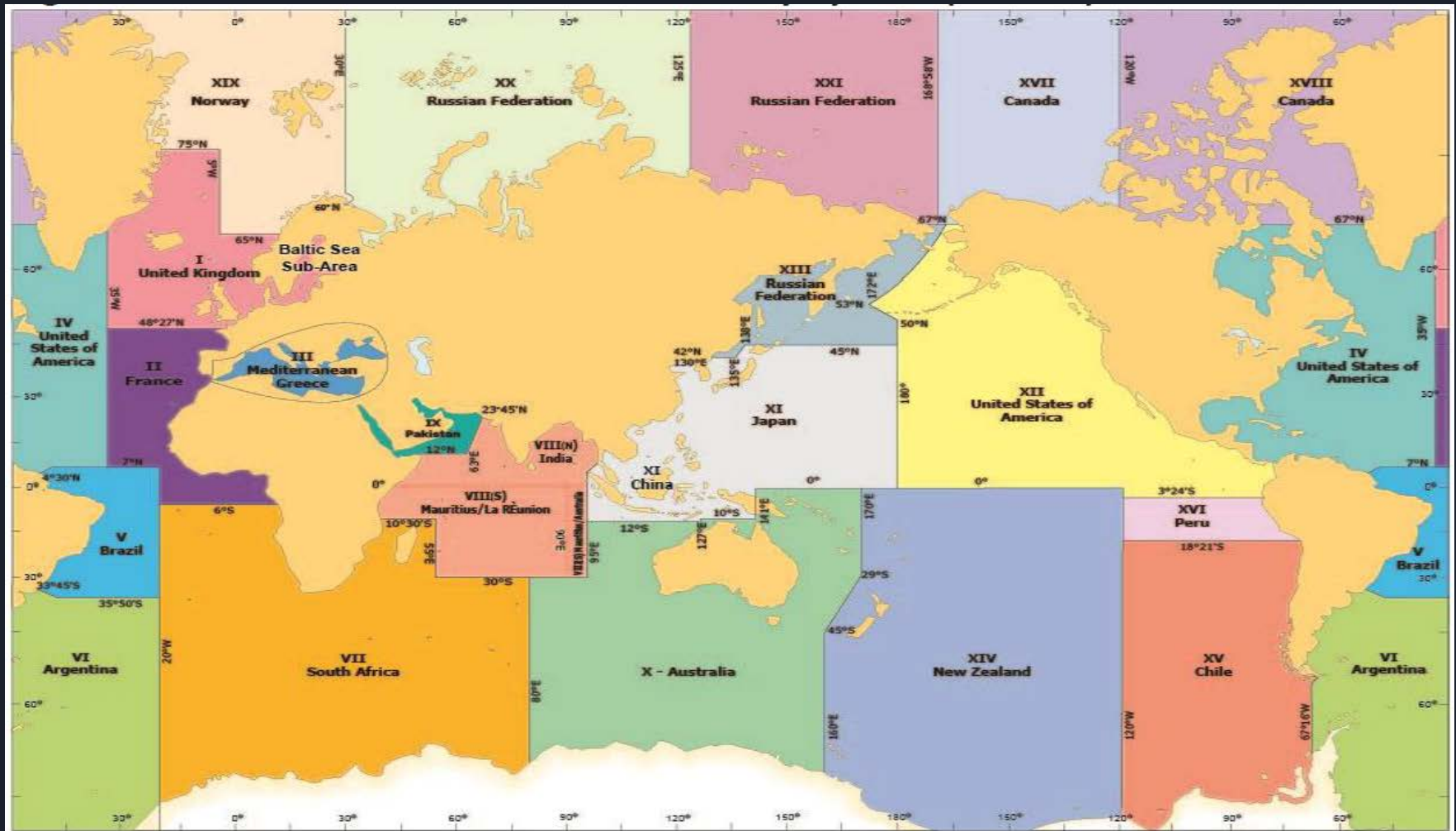


# A Bad Cruise



# Global High Seas Forecasts

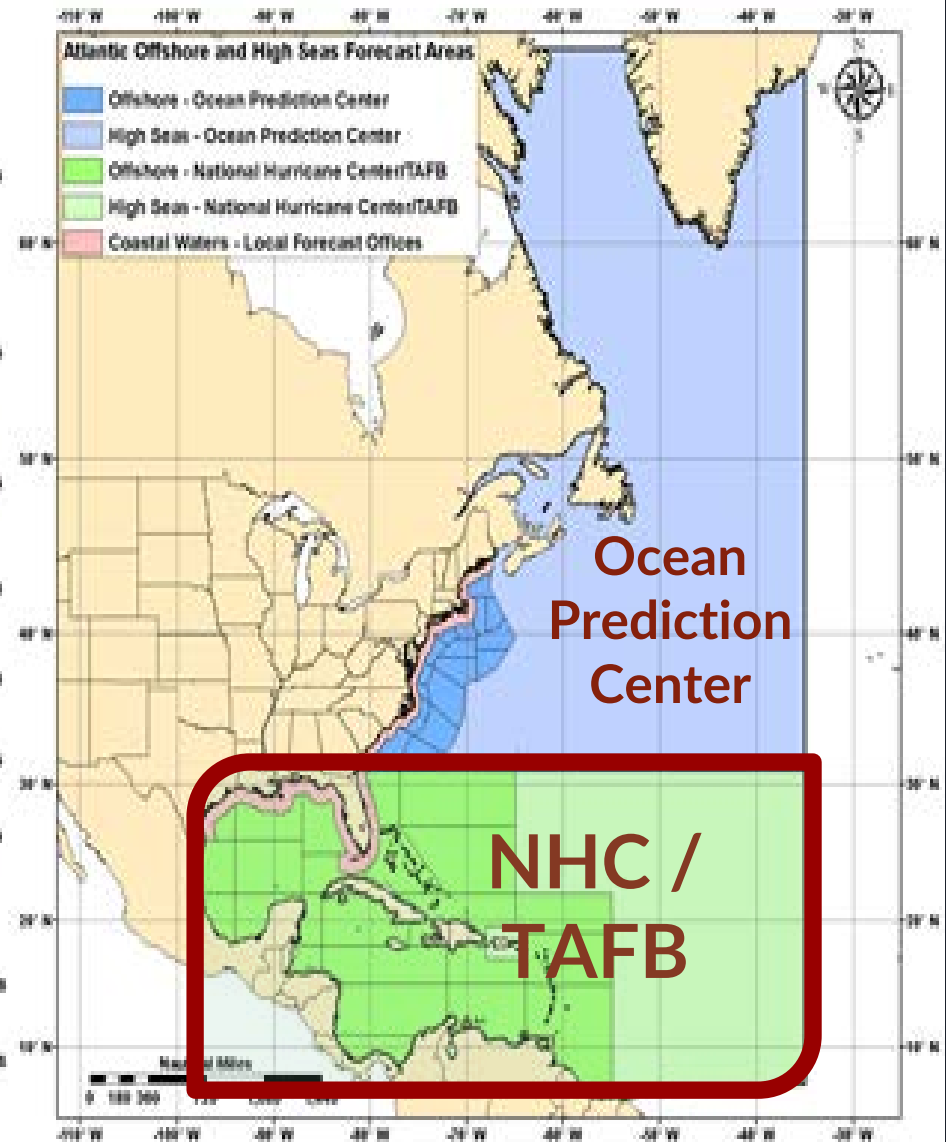
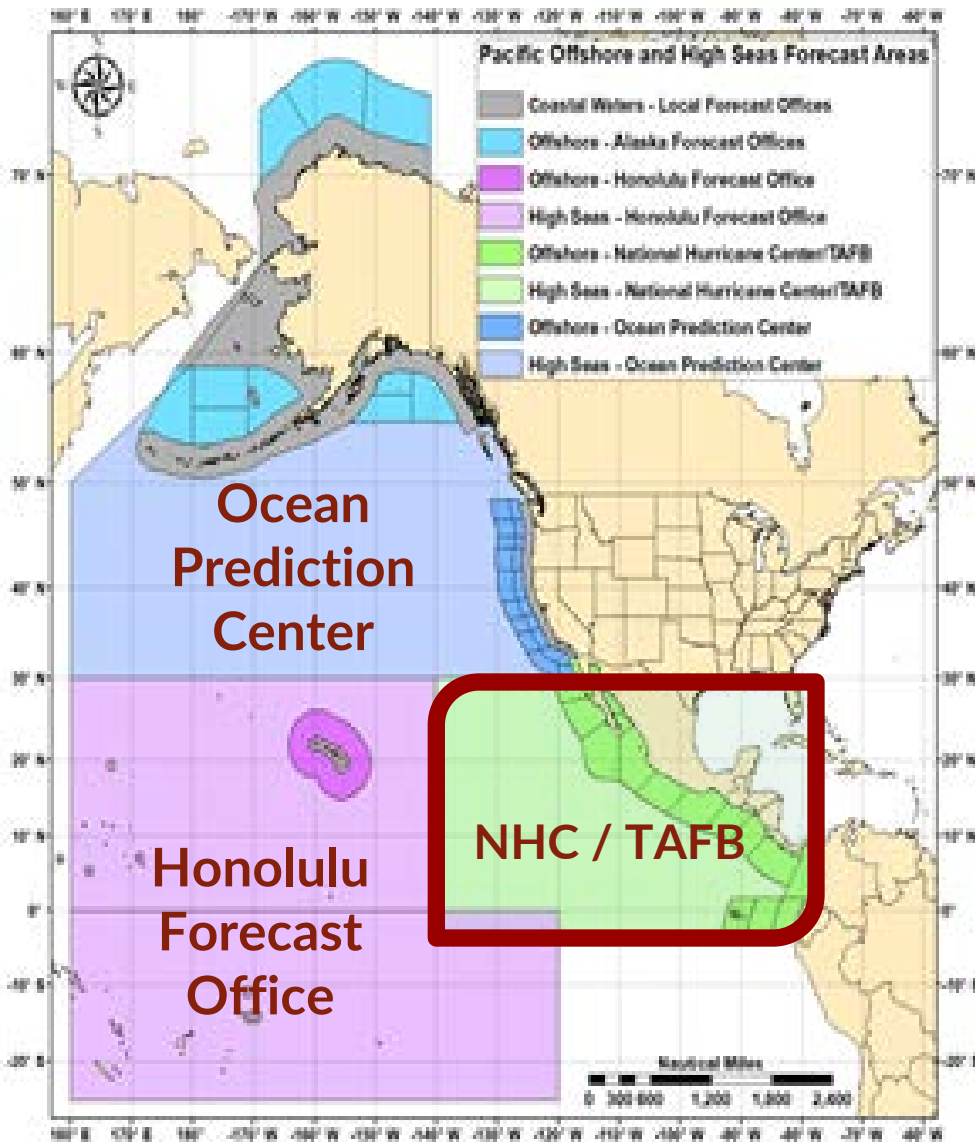
## - International Maritime Organization



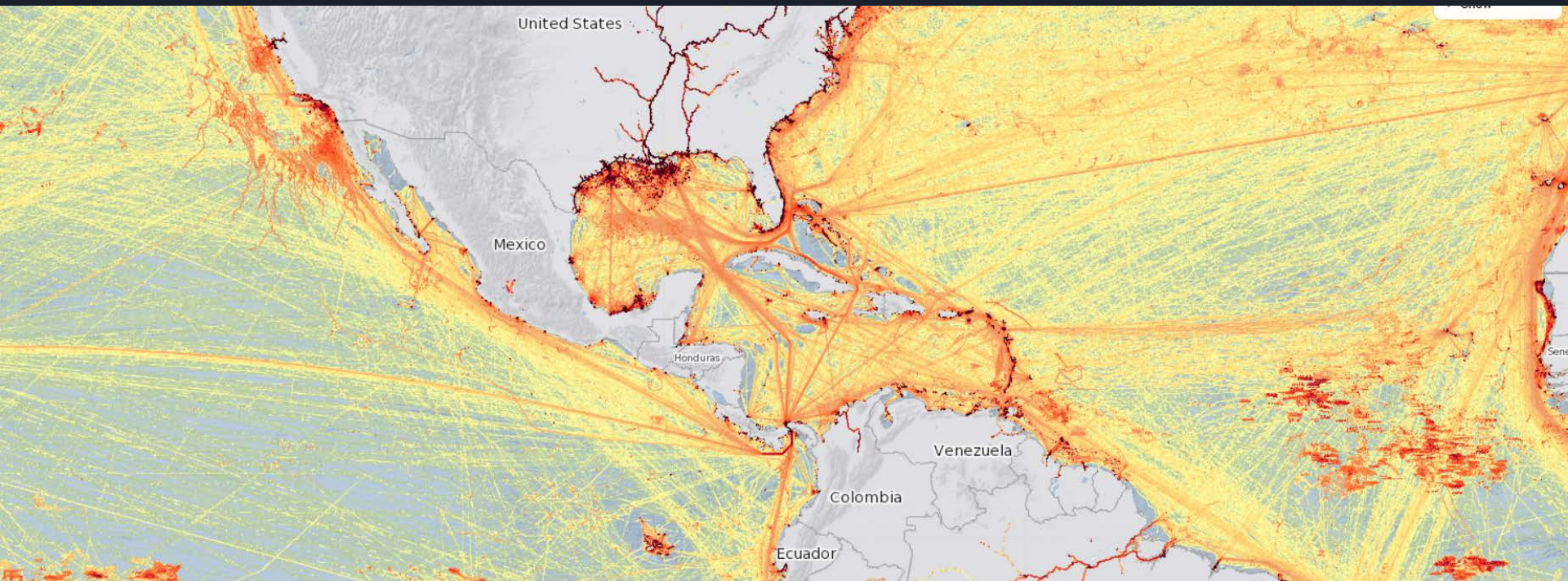




# NHC/TAFB - Areas of Responsibility



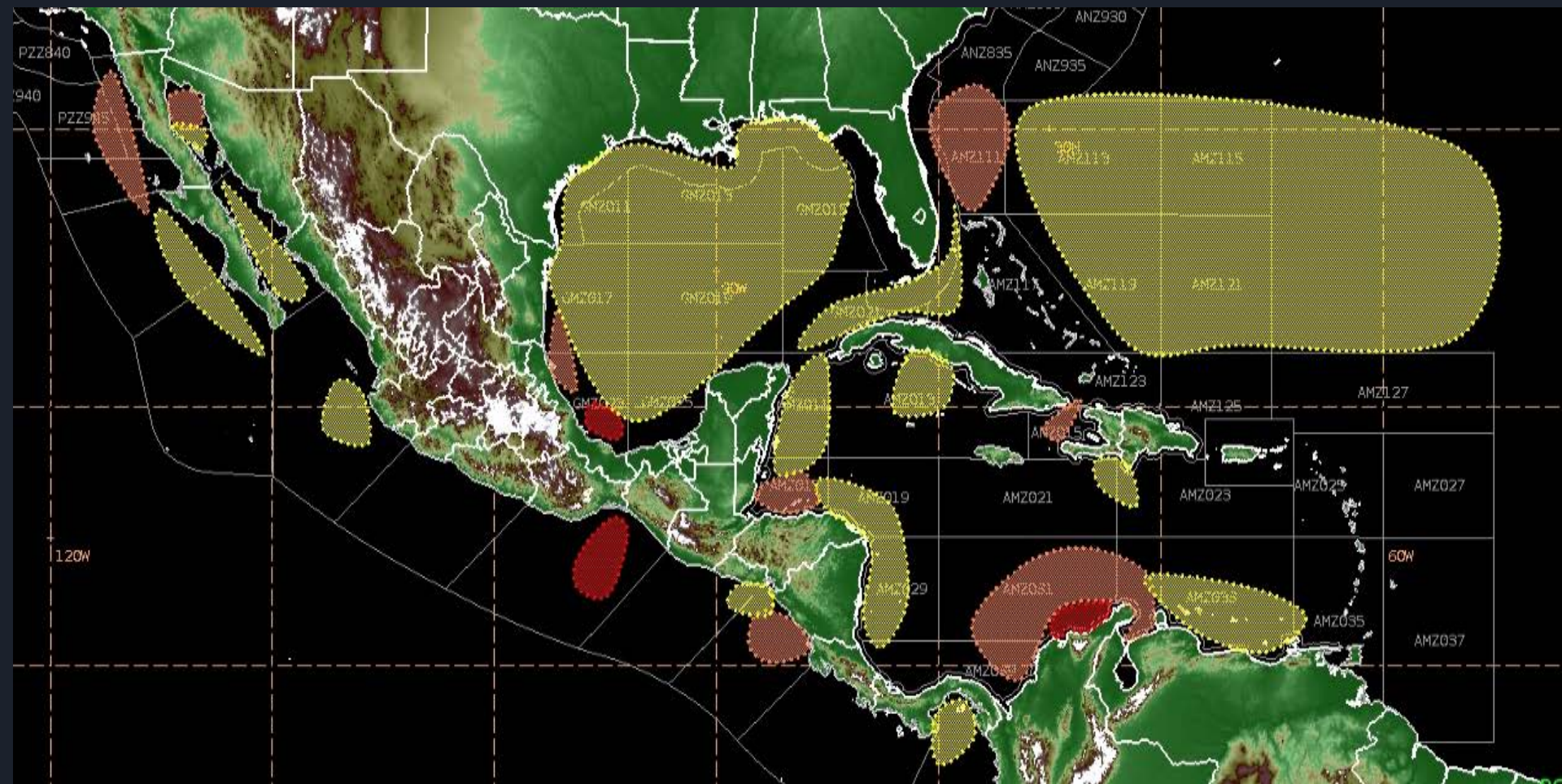
# Ships over the Open Ocean



<https://globalmaritimetraffic.org/gmtds.html/>

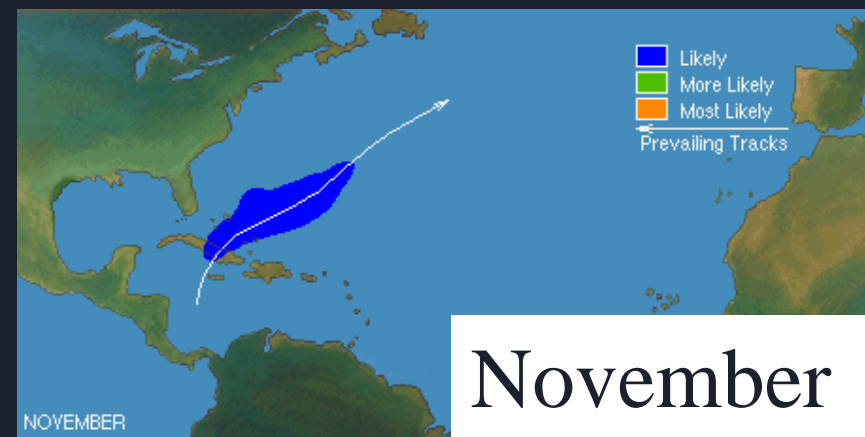
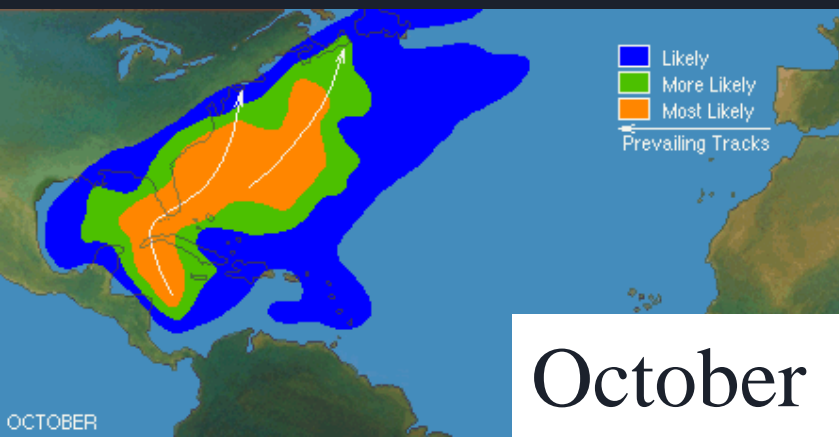
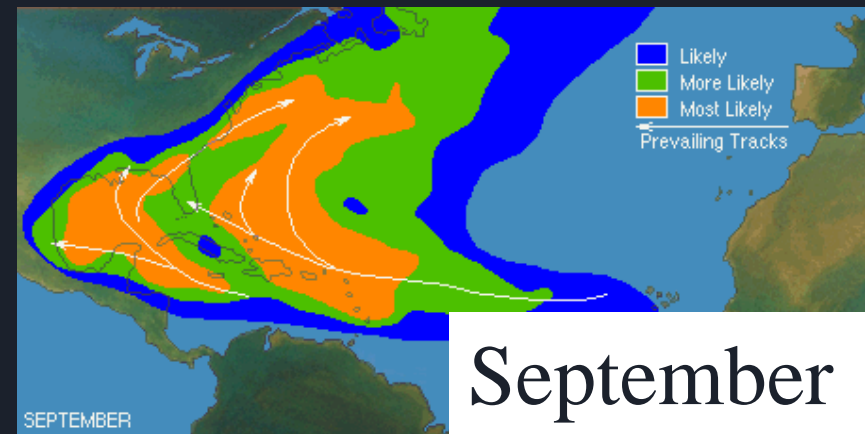
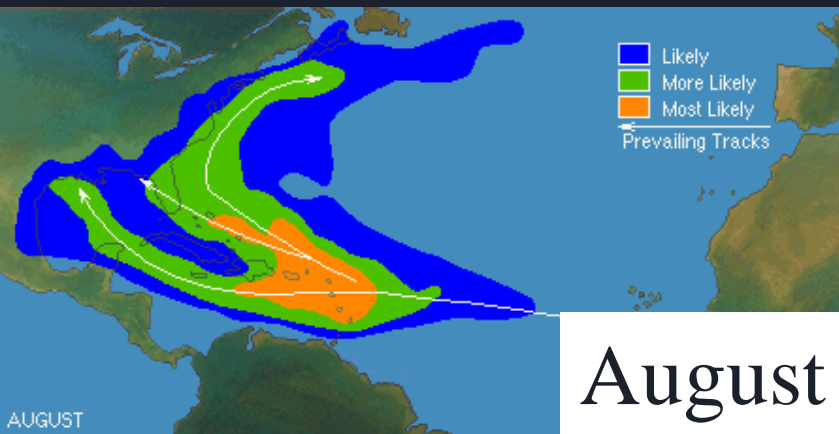
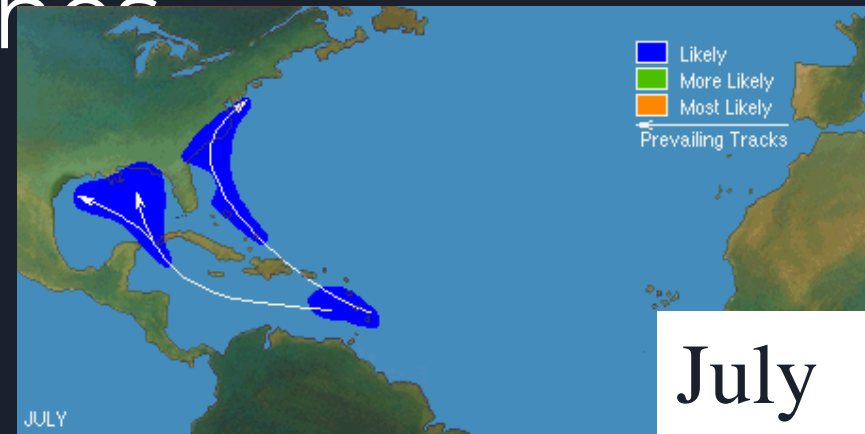
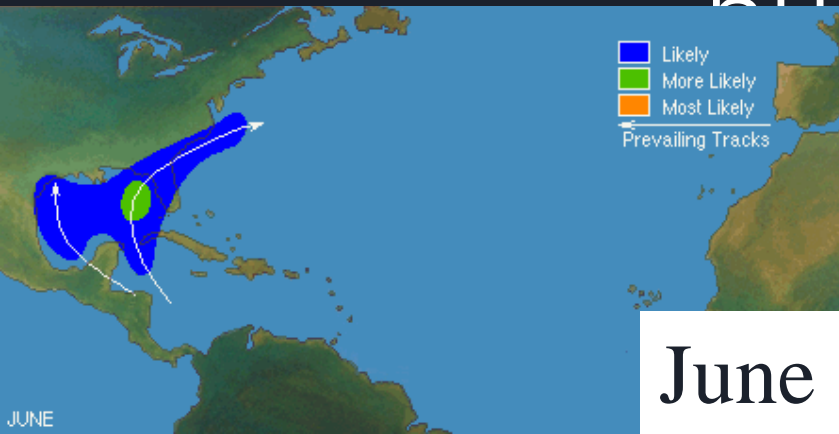


# Typical areas for gale conditions



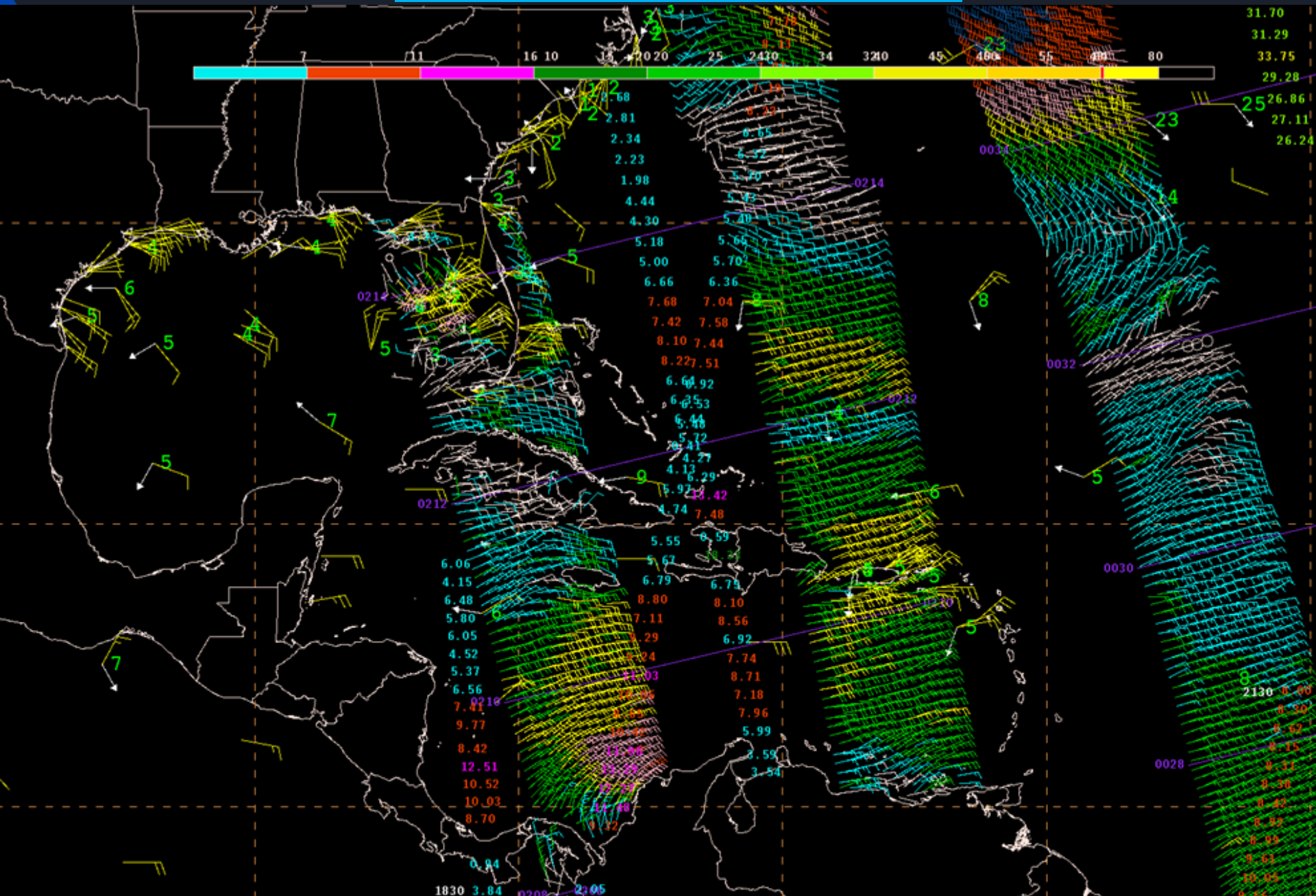
Note that the main areas for gales are near gaps and coastal terrain  
- this is not a coincidence!

# Typical areas for tropical storms and hurricanes



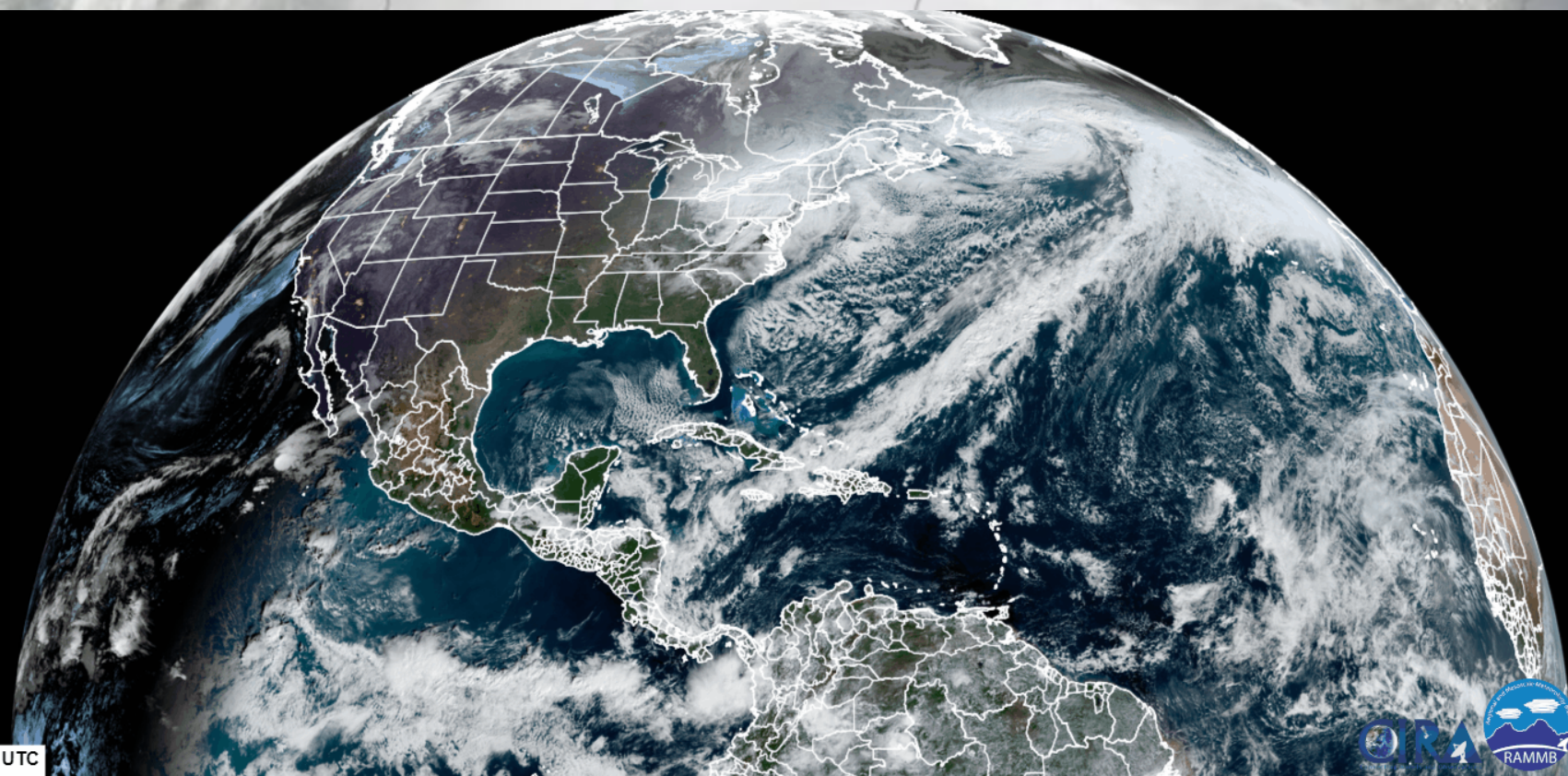


# Tools - Observations





# Tools - Observations



**GOES-16: A new era of geo-stationary satellite imagery and data**

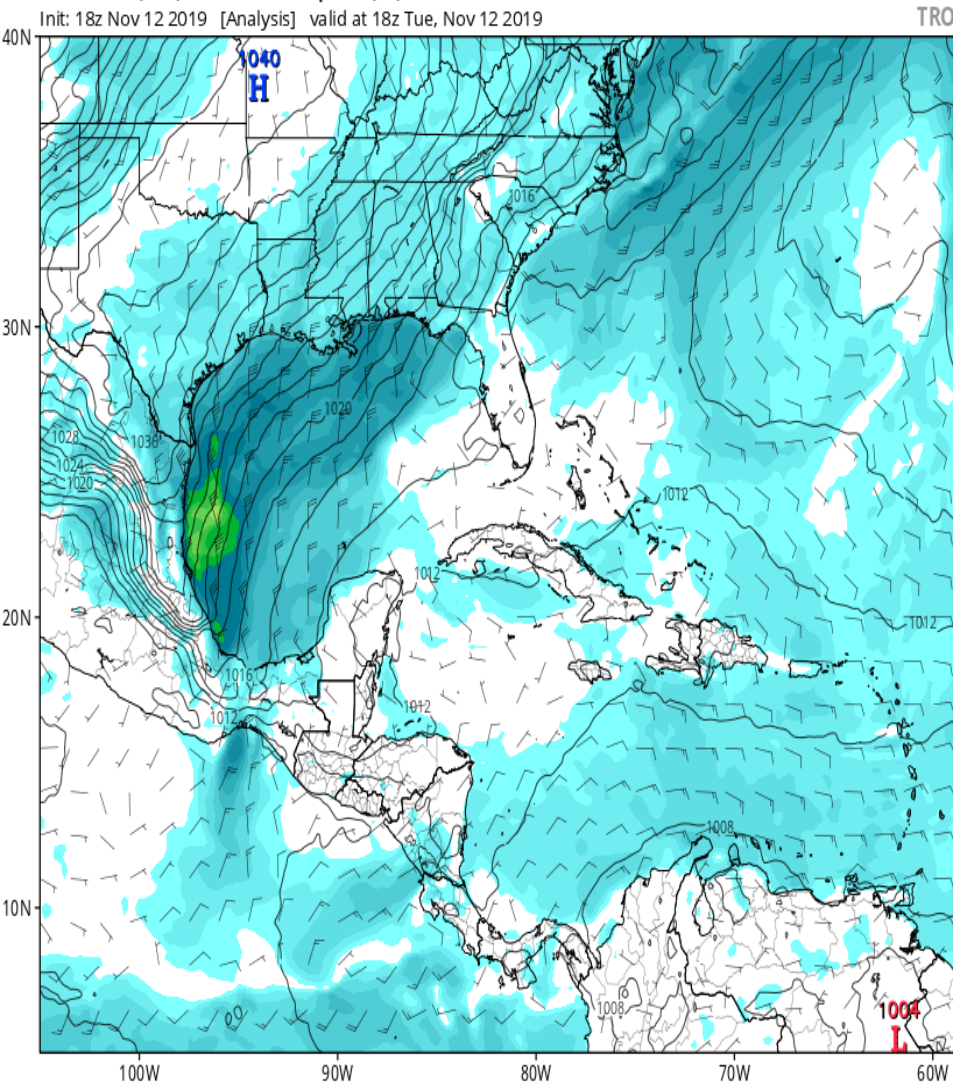




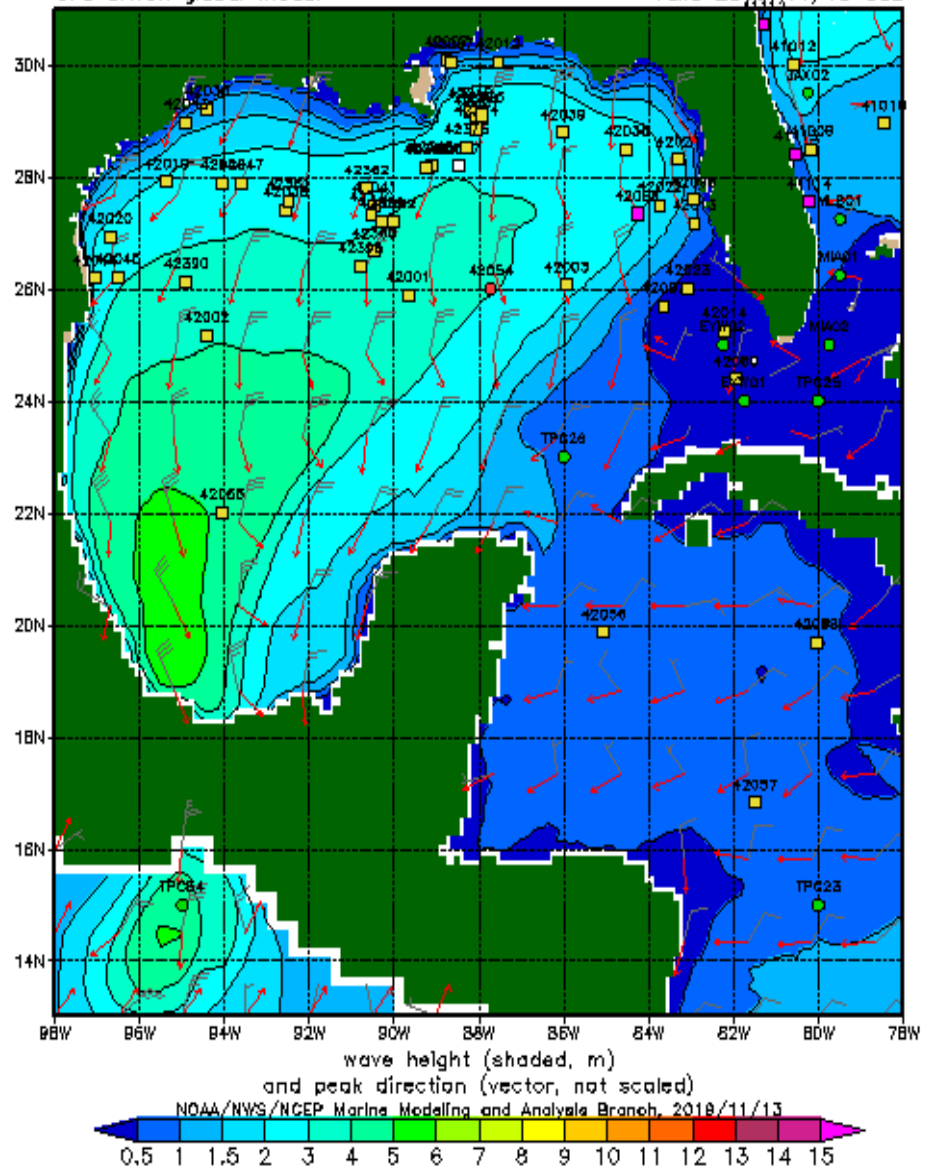
# Tools - Models

GFS MSLP (mb) & 10m Wind Speed (kt)

Init: 18z Nov 12 2019 [Analysis] valid at 18z Tue, Nov 12 2019

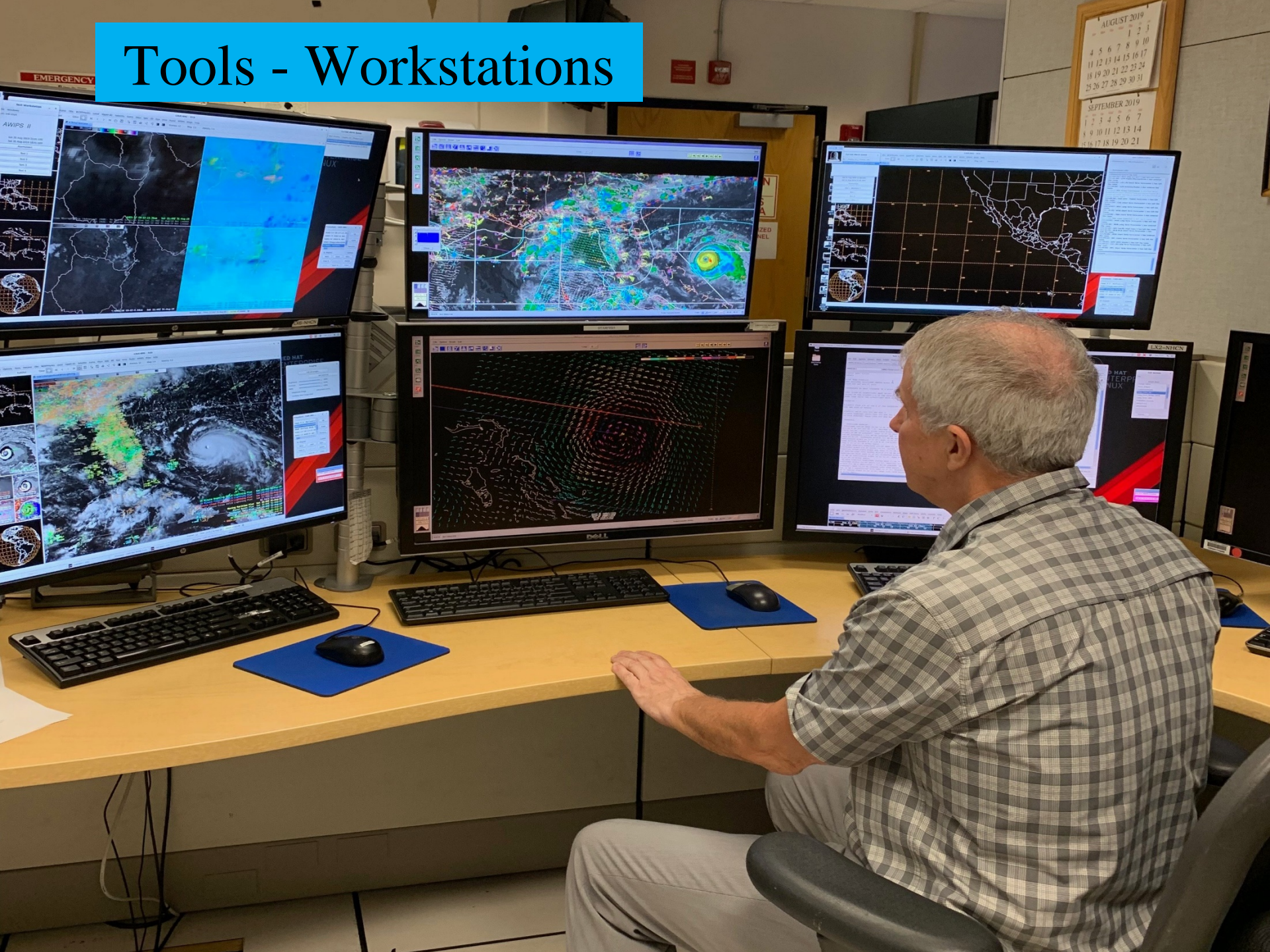


NMWW3 20191113 t12z hindcast  
GFS driven global model valid 2019/11/13 03z





# Tools - Workstations

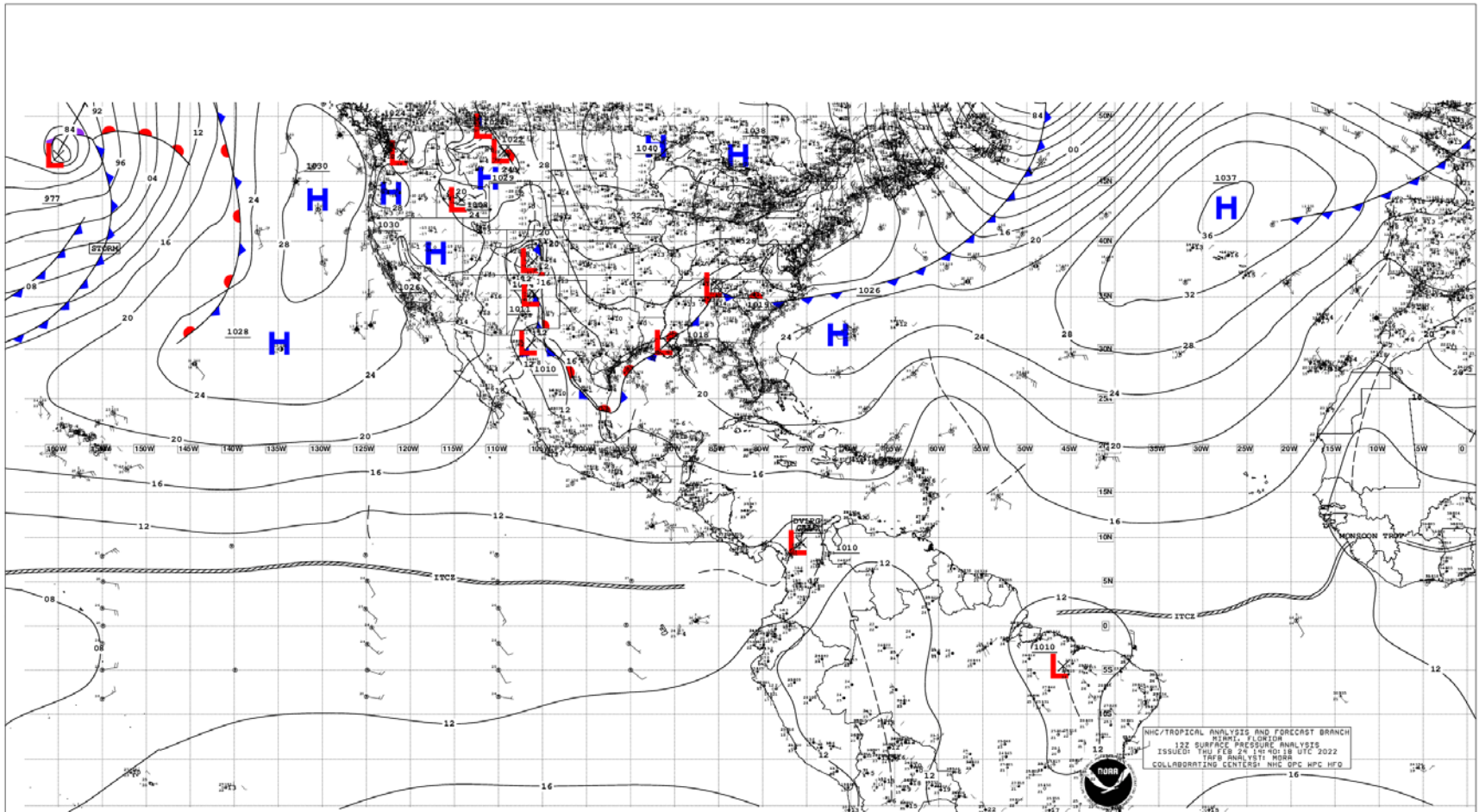




# Unified Surface Analysis

## Areas of Responsibility

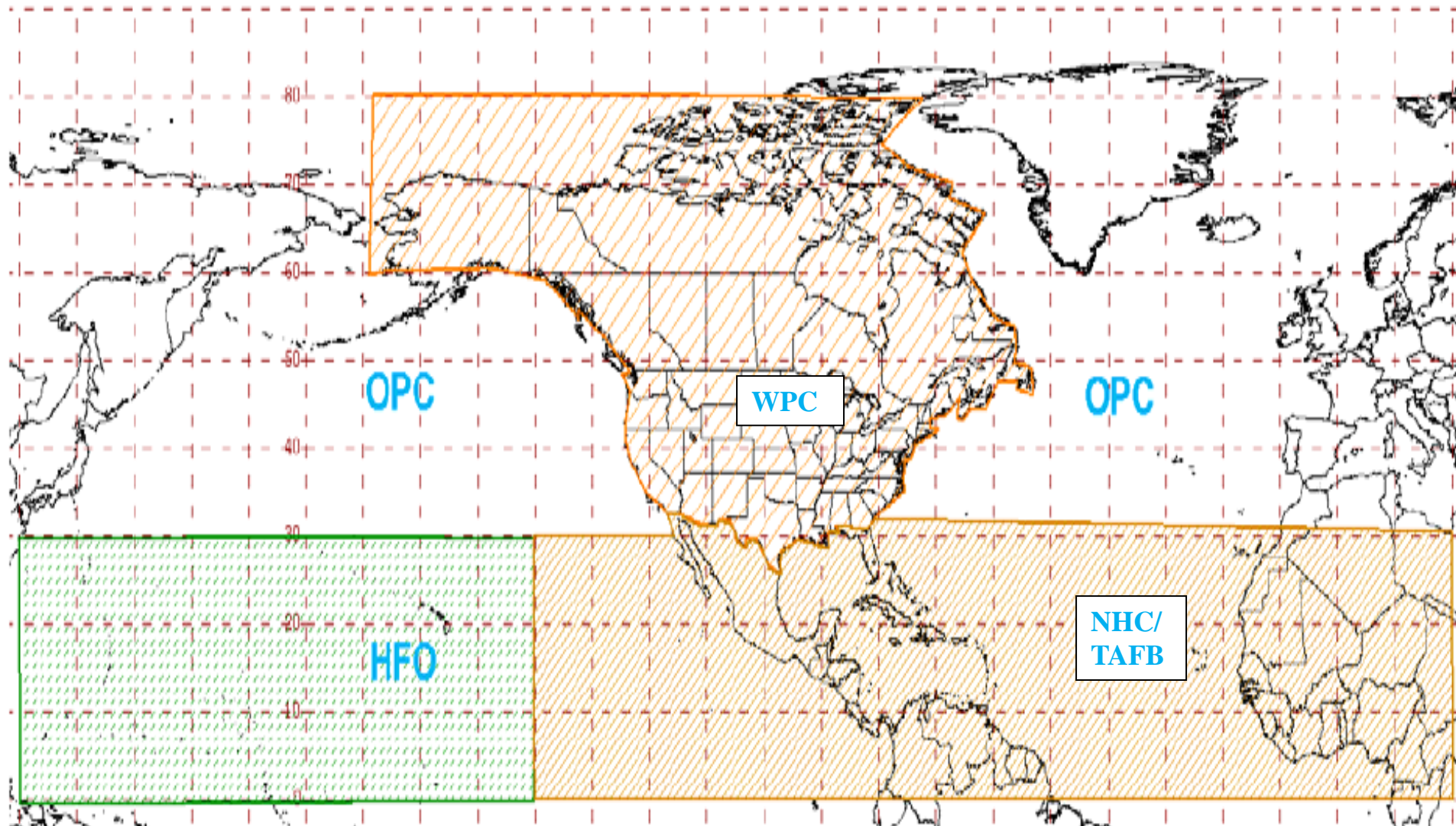
[https://www.nhc.noaa.gov/tafb\\_latest/USA\\_latest.gif](https://www.nhc.noaa.gov/tafb_latest/USA_latest.gif)



# Unified Surface Analysis

## Areas of Responsibility

[https://www.nhc.noaa.gov/tafb\\_latest/USA\\_latest.gif](https://www.nhc.noaa.gov/tafb_latest/USA_latest.gif)





# Tropical Weather Discussions

The Tropical Weather Discussion describes major synoptic weather features and significant areas of disturbed weather in the tropics.

<https://www.nhc.noaa.gov/text/MIATWDAT.shtml>

## Content:

### Special Features

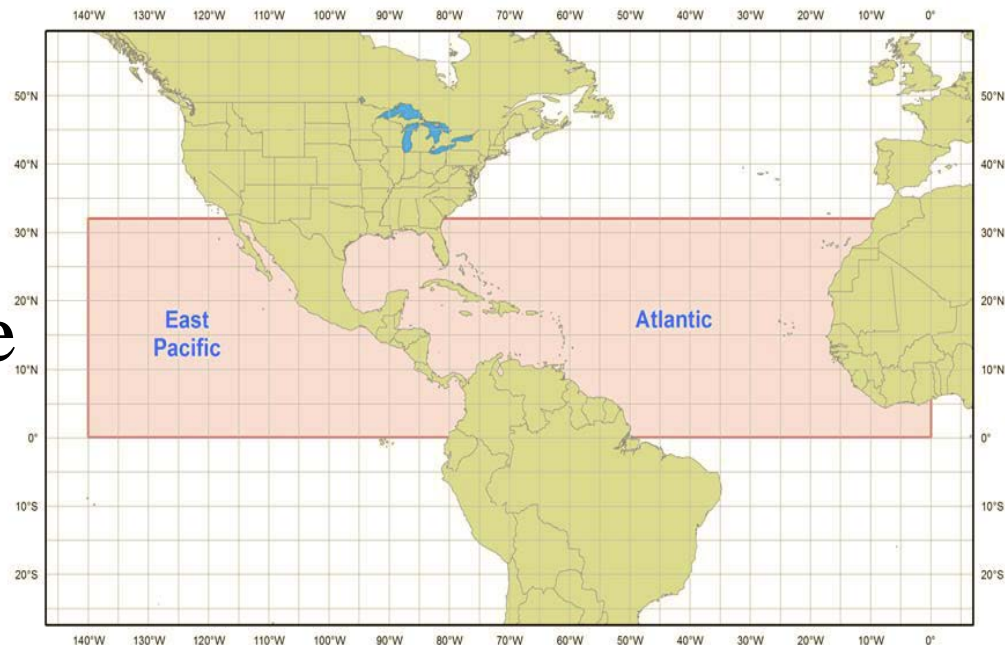
- Tropical Disturbances
- Tropical Cyclones
- Gales/Storm/Hurricane

### Warnings

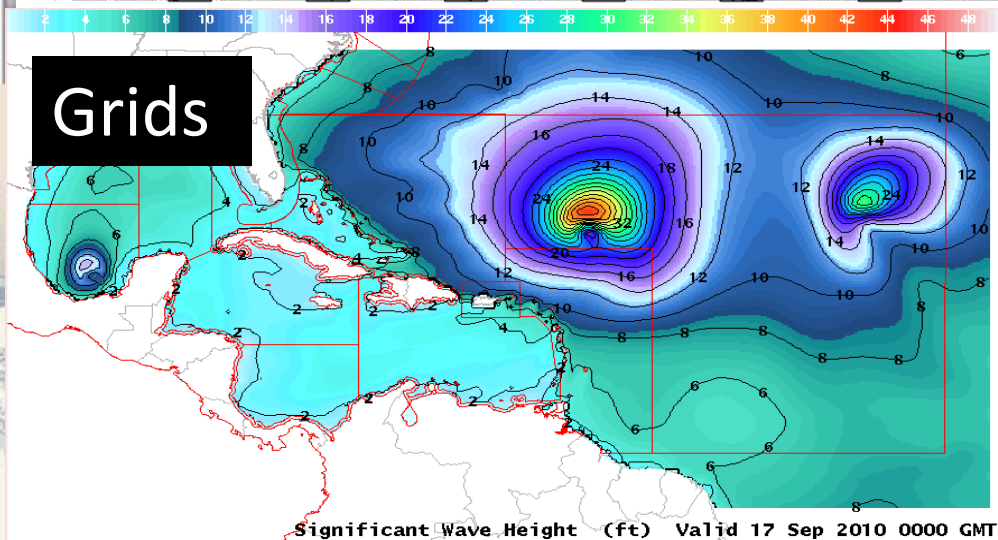
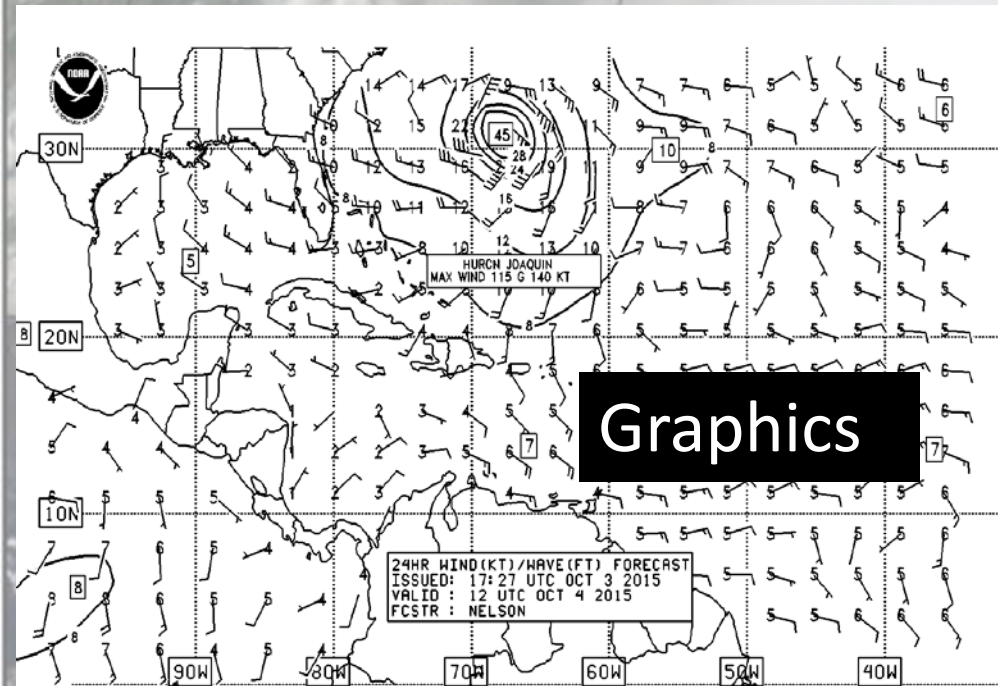
### Tropical Waves

### ITCZ

### Discussion



# NHC/TAFB Wind and Wave Forecasts



## High Seas and Offshores Text Forecasts

HIGH SEAS FORECAST  
NWS NATIONAL HURRICANE CENTER  
1030 UTC FRI OCT 02 2015

SUPERSEDED BY NEXT ISSUANCE IN 6 HOURS

SEAS GIVEN AS SIGNIFICANT WAVE HEIGHT...WHICH IS THE AVERAGE HEIGHT OF THE HIGHEST 1/3 OF THE WAVES. INDIVIDUAL WAVES MAY BE MORE THAN TWICE THE SIGNIFICANT WAVE HEIGHT.

PAN PAN

ATLANTIC FROM 07N TO 31N W OF 35W INCLUDING CARIBBEAN SEA AND GULF OF MEXICO.

SYNOPSIS VALID 0600 UTC FRI OCT 02.  
24 HOUR FORECAST VALID 0600 UTC SAT OCT 03.  
48 HOUR FORECAST VALID 0600 UTC SUN OCT 04.

.WARNINGS.

...HURRICANE WARNING...

.HURRICANE JOAQUIN NEAR 23.3N 74.7W 935 MB AT 0900 UTC OCT 02 MOVING NW OR 315 DEG AT 3 KT. MAXIMUM SUSTAINED WINDS 115 KT GUSTS 140 KT. TROPICAL STORM FORCE WINDS WITHIN 160 NM W SEMICIRCLE...140 NM NE QUADRANT AND 180 NM SE QUADRANT. SEAS 12 FT OR GREATER WITHIN 400 NM NE QUADRANT...150 NM SE QUADRANT...120 NM SW QUADRANT...AND 300 NM NW QUADRANT WITH SEAS TO 39 FT. ELSEWHERE S OF 28N BETWEEN 70W AND 78W WINDS 20 TO 33 KT. SEAS 9 TO 12 FT. N OF 28N BETWEEN 70W AND 75W E WINDS 20 TO 25 KT SEAS 8 TO 10 FT. REMAINDER OF AREA N OF 21N BETWEEN 65W AND 78W AND OUTSIDE OF THE BAHAMAS WINDS 20 KT OR LESS. SEAS 8 TO 11 FT IN MIXED SWELL.



# TAFB National Digital Forecast Database

## Gridded Marine Forecasts

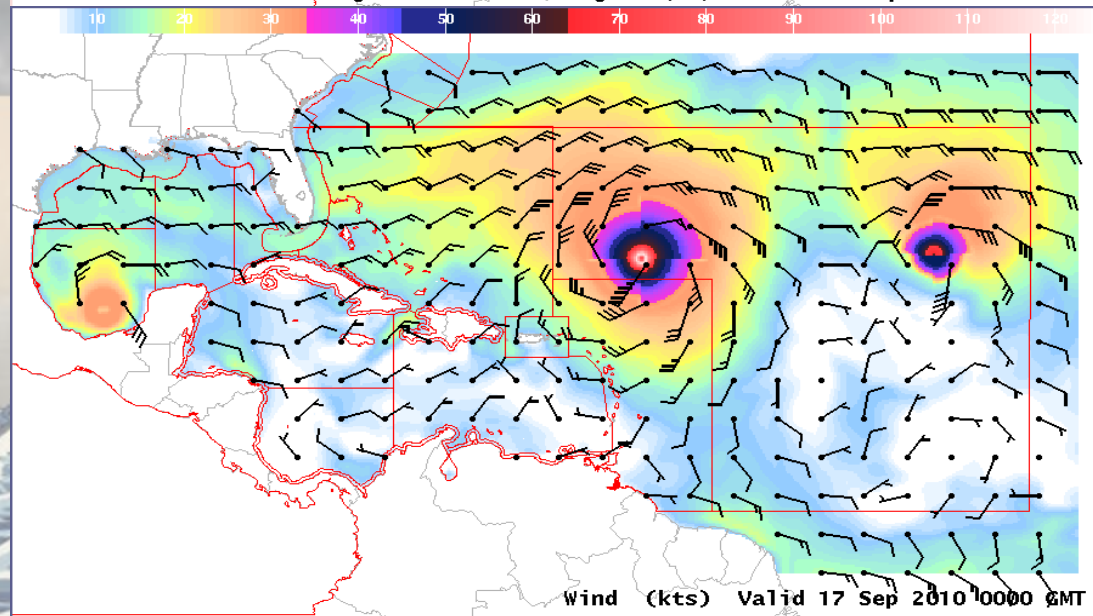
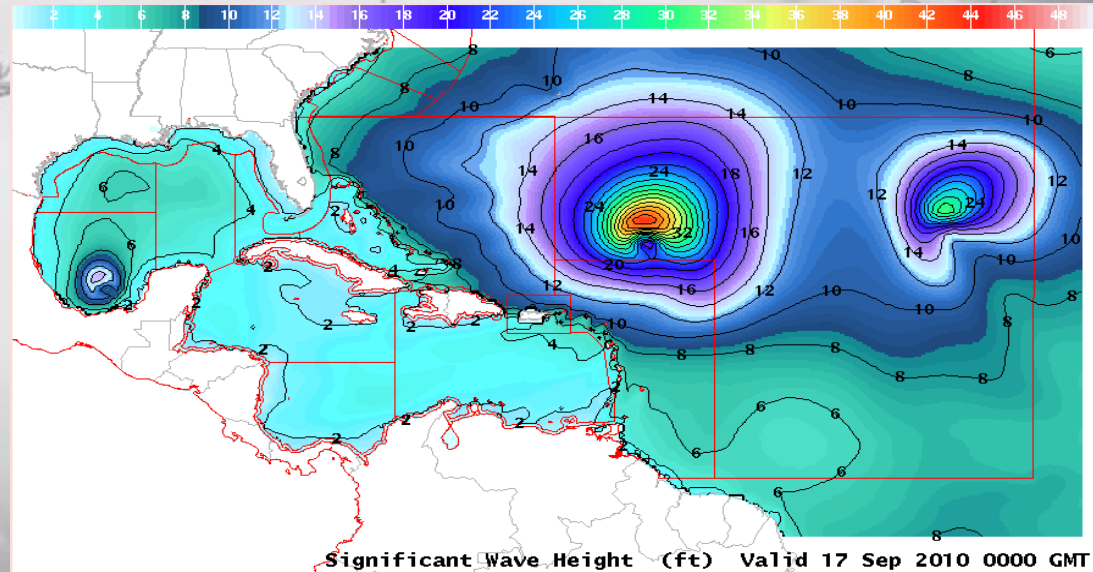
### Spatial/Temporal resolution

- 10 KM
- 6 Hourly out to 144 hr  
(3 Hourly to 72 hr)

### Parameters

- 10-M Wind/Gusts
- Significant Wave Height
- Hazards

<https://digital.weather.gov/>



# How do I get weather forecasts over the open ocean?

**NOAA Weather Radio** - Reliable weather broadcasts out to 25nm from shore

**HF radio** - Long distance broadcast range with coastal and offshore weather information

**VHF radio** - Marine radio on channels 16 and 22A - Primarily broadcasts for coastal areas

**NAVTEX** - Medium Frequency weather broadcasts on 518 khz with a range up to 200 nm - Low cost and automated

**InMarsat C SafetyNET** - Satellite transmission of High Seas forecasts and warnings – Part of Global Marine Distress and Safety System

**Iridium SafetyCast** – Satellite transmission of High Seas forecasts and warnings - Part of Global Marine Distress and Safety System (Becoming operational now)

**FTPMail** - User can request and receive NWS text and graphic products via email using ftp commands - Low bandwidth email

**Marine Composite Page** – Winds/Waves/Warnings in graphical form via low bandwidth internet - [https://www.nhc.noaa.gov/marine/forecast/enhanced\\_atlcfull.php](https://www.nhc.noaa.gov/marine/forecast/enhanced_atlcfull.php)

For more information: <https://weather.gov/marine> (Dissemination menu)



# TAFB High Seas

- High Seas Forecast is a text forecast issued primarily for large ocean going vessels.
- High Seas Forecast includes synopsis of primary weather features and a 48 hour forecast.
- High Seas Forecast primarily for strong winds (25 KT or greater) and/or seas 8 FT or higher.
- TAFB issues two text high seas forecasts four times a day.



<https://www.nhc.noaa.gov/text/MIAHSFAT2.shtml>

- OFF's are designed for recreational/smaller fishing vessels up to giant cargo/cruise ships.

- Warnings are issued for conditions up to 48 hours from issuance time. A headline such as “**Gale** Conditions Possible” can be included for events beyond 48 hours.

- **Tropical Storm** and **Hurricane** Warnings normally based on **34kt/64kt** wind radii given in the tropical cyclone advisory.

[https://www.nhc.noaa.gov/marine/offshores\\_eastpac.php](https://www.nhc.noaa.gov/marine/offshores_eastpac.php)

## TAFB Offshore Zones



- Currently, Offshore Waters Forecasts extend out 5 days.
- Winds less than 5 ft are described as “Variable Wind Less than 5 kt”



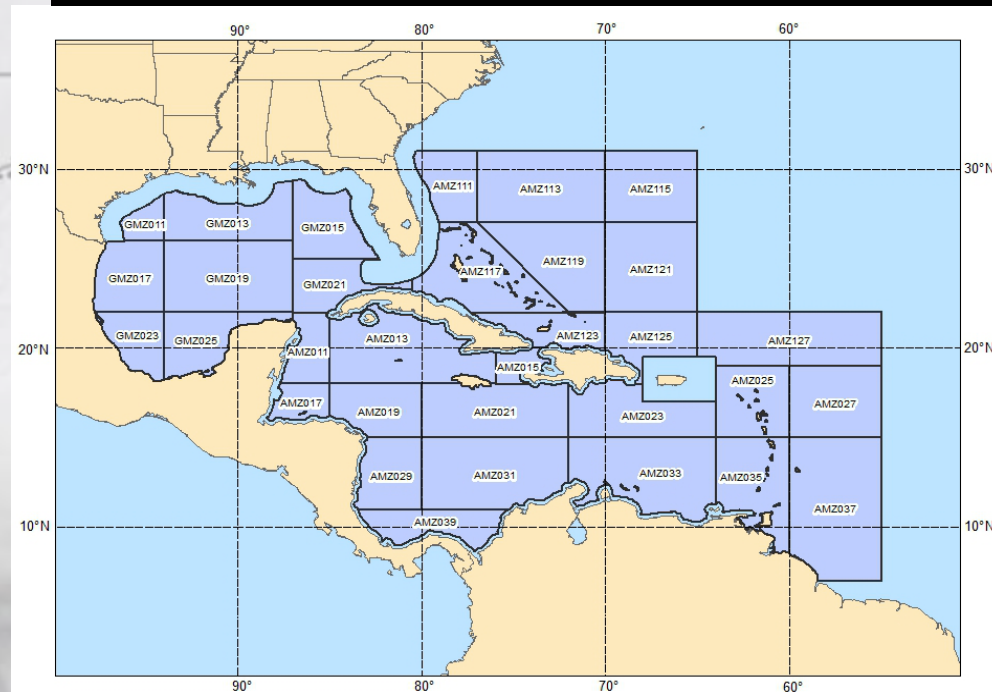
- OFF's are designed for recreational/smaller fishing vessels up to giant cargo/cruise ships.

- Warnings are issued for conditions up to 48 hours from issuance time. A headline such as “**Gale** Conditions Possible” can be included for events beyond 48 hours.

- **Tropical Storm** and **Hurricane** Warnings normally based on **34kt/64kt** wind radii given in the tropical cyclone advisory.

<https://www.nhc.noaa.gov/marine/offshores.php>

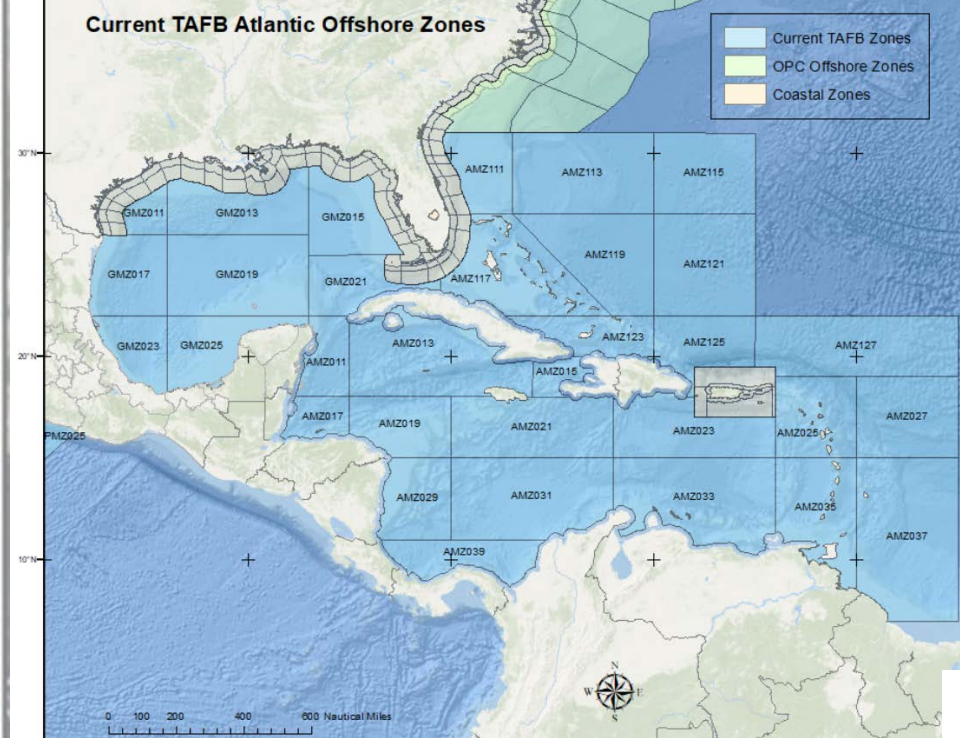
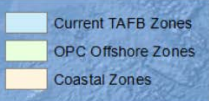
## TAFB Offshore Zones



- Currently, Offshore Waters Forecasts extend out 5 days
- Winds less than 5 ft are described as “Variable Wind Less than 5 kt”

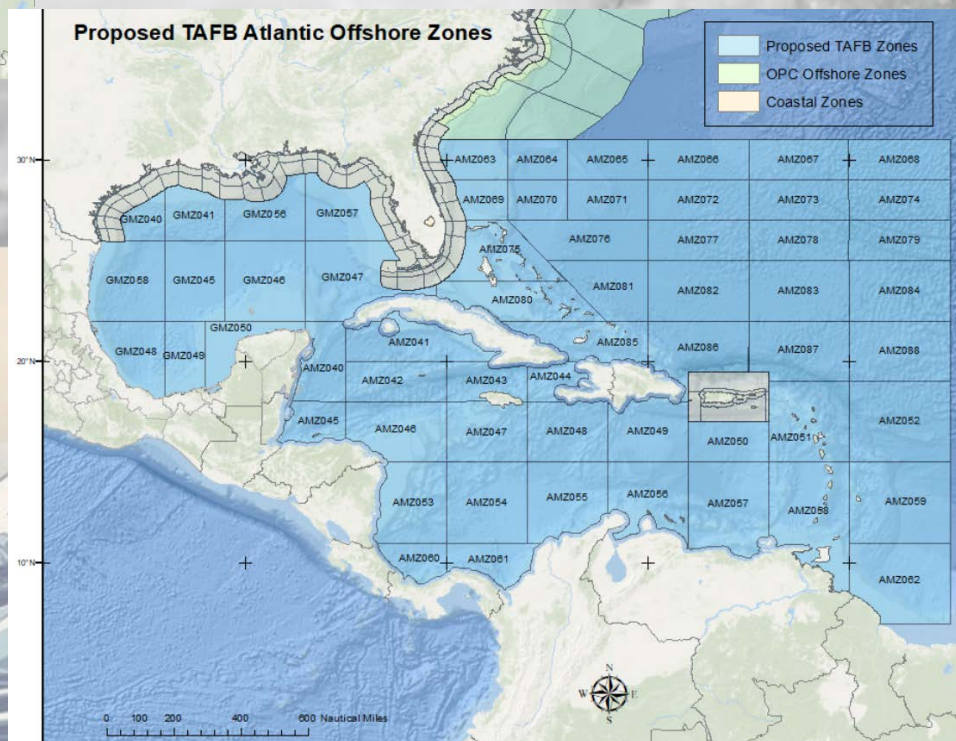
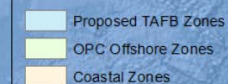


**Current TAFB Atlantic Offshore Zones**



# TAFB Offshore Zones

**Proposed TAFB Atlantic Offshore Zones**



**For more information,  
please see  
<https://storymaps.arcgis.com/stories/ebc71a5d460d4a6e952f90d5578d87db>**



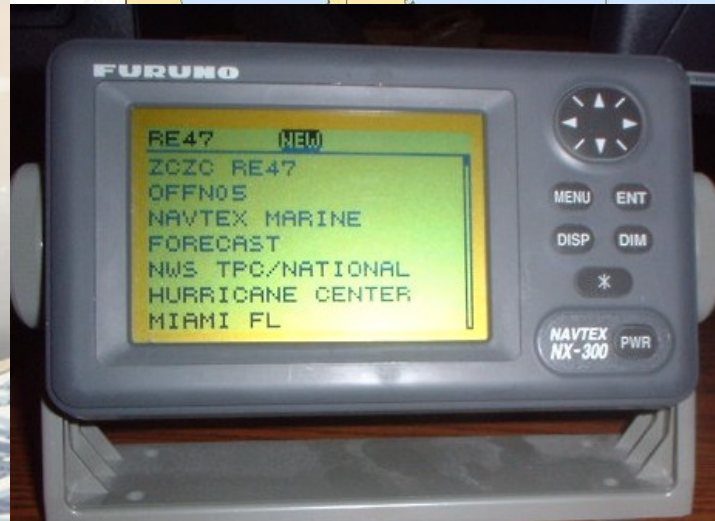
# Navigational Telex (NAVTEX)

**NAVTEX is an internationally required broadcast of coastal urgent marine safety information to ships.**

**In the United States there are 12 U.S. Coast Guard transmitter locations. TAFB products are transmitted from Miami, San Juan, and New Orleans, and contribute to the Charleston broadcast.**

<https://www.nhc.noaa.gov/text/MIAOFFN04.shtml>

NAVTEX Zones

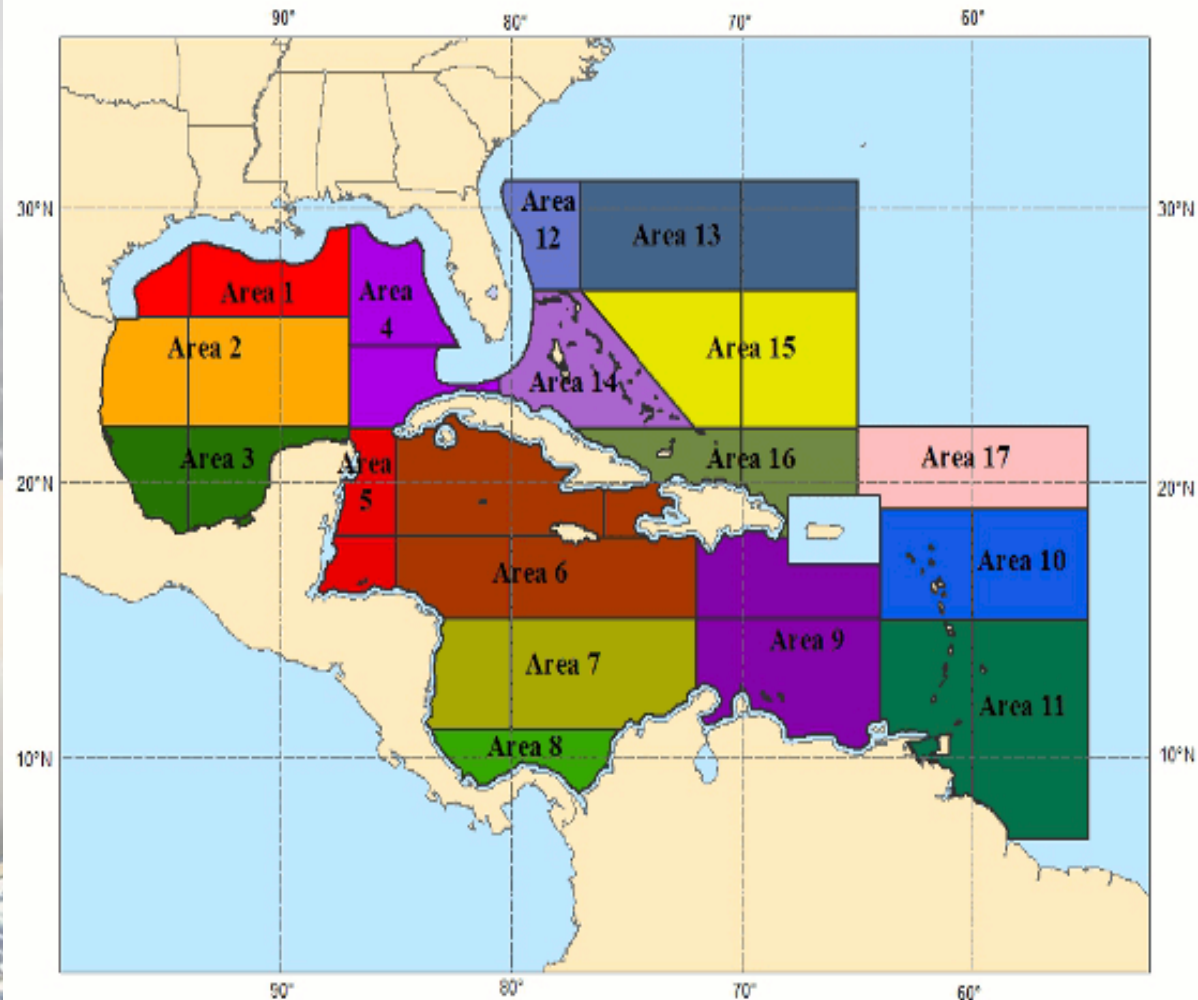


# High Frequency Voice Broadcasts (VOBRA)

The USCG broadcasts basic weather information prepared by the NWS (**Ocean Prediction Center**, **National Hurricane Center** and **Honolulu Forecast Office**) via high frequency voice broadcasts (VOBRA) to vessels operating in areas beyond the range of coastal NOAA Weather Radio.

The VOBRA forecasts are prepared at a lower resolution than the offshore forecasts.

VOBRA Zones



<https://www.nhc.noaa.gov/text/MIAOFFN21.shtml>



# MARINE RADIOFAX

TAFB provides graphical products for  
three U.S. Coast Guard transmitters:

NEW ORLEANS (NMG)

POINT REYES (NMC)

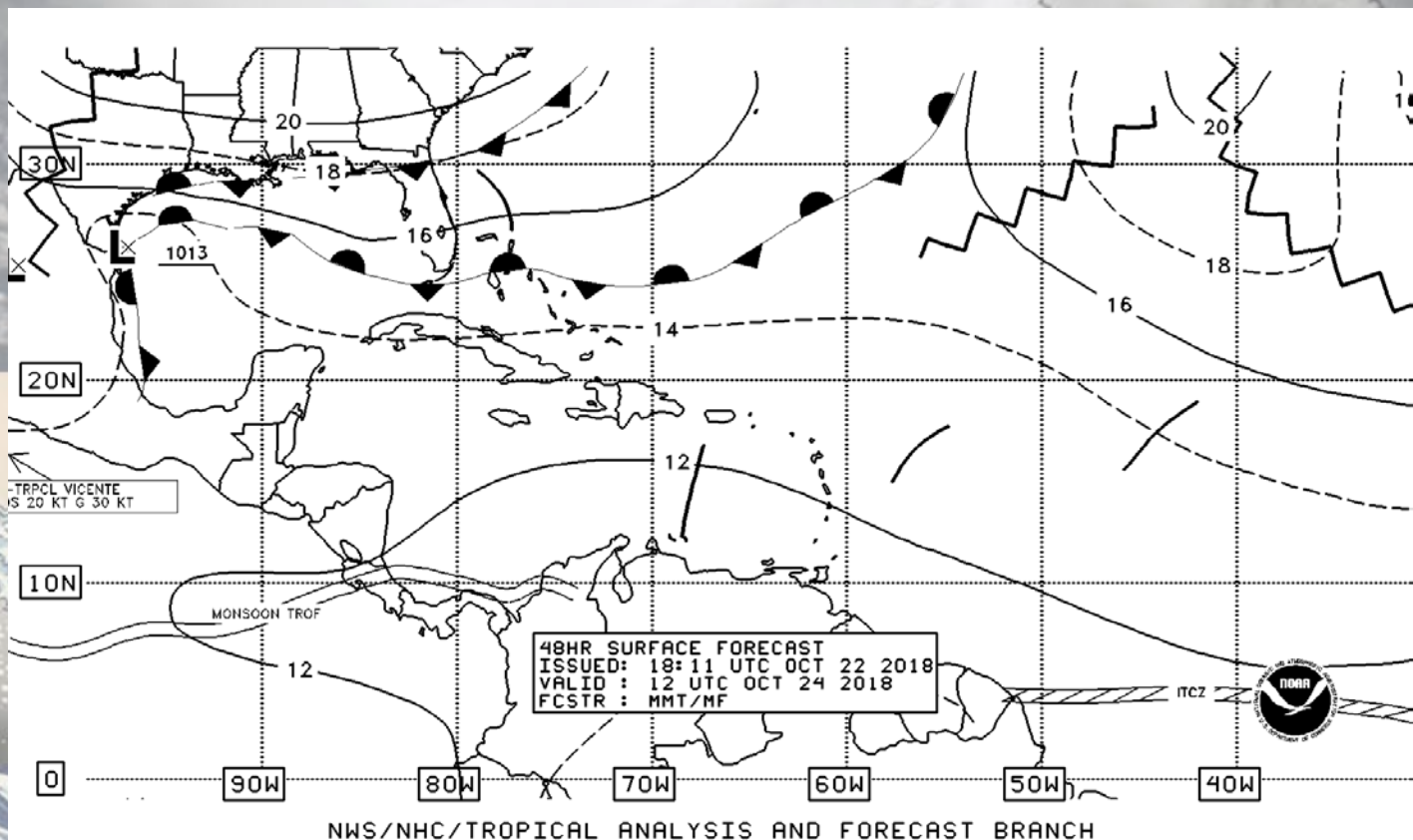
HAWAII (KVM70)



# Surface Prog Graphics

- Fronts, troughs, tropical cyclones, tropical waves, ridges
- 24, 48, and 72 hr Forecasts
- W. Atlantic, Caribbean, Gulf of Mexico, and E. Pacific
- Issued twice daily

[https://www.nhc.noaa.gov/tafb/latest/atlsfc72\\_latestBW.gif](https://www.nhc.noaa.gov/tafb/latest/atlsfc72_latestBW.gif)

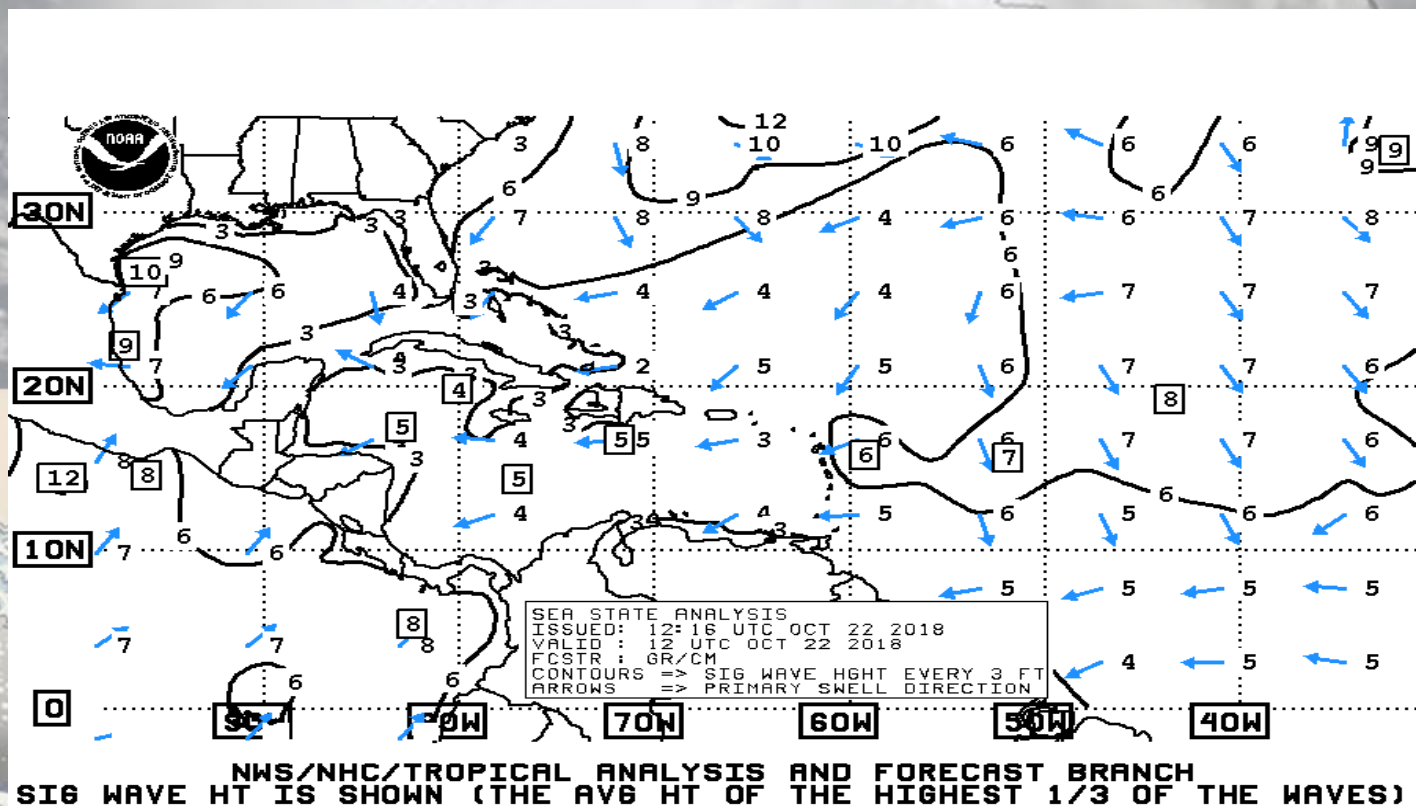




# Sea State Analysis Graphics

- Significant Wave Height Analysis (the average height of the highest one-third of the waves) and Primary Swell Direction
- W. Atlantic, Caribbean, Gulf of Mexico, and E. Pacific
- Issued twice daily

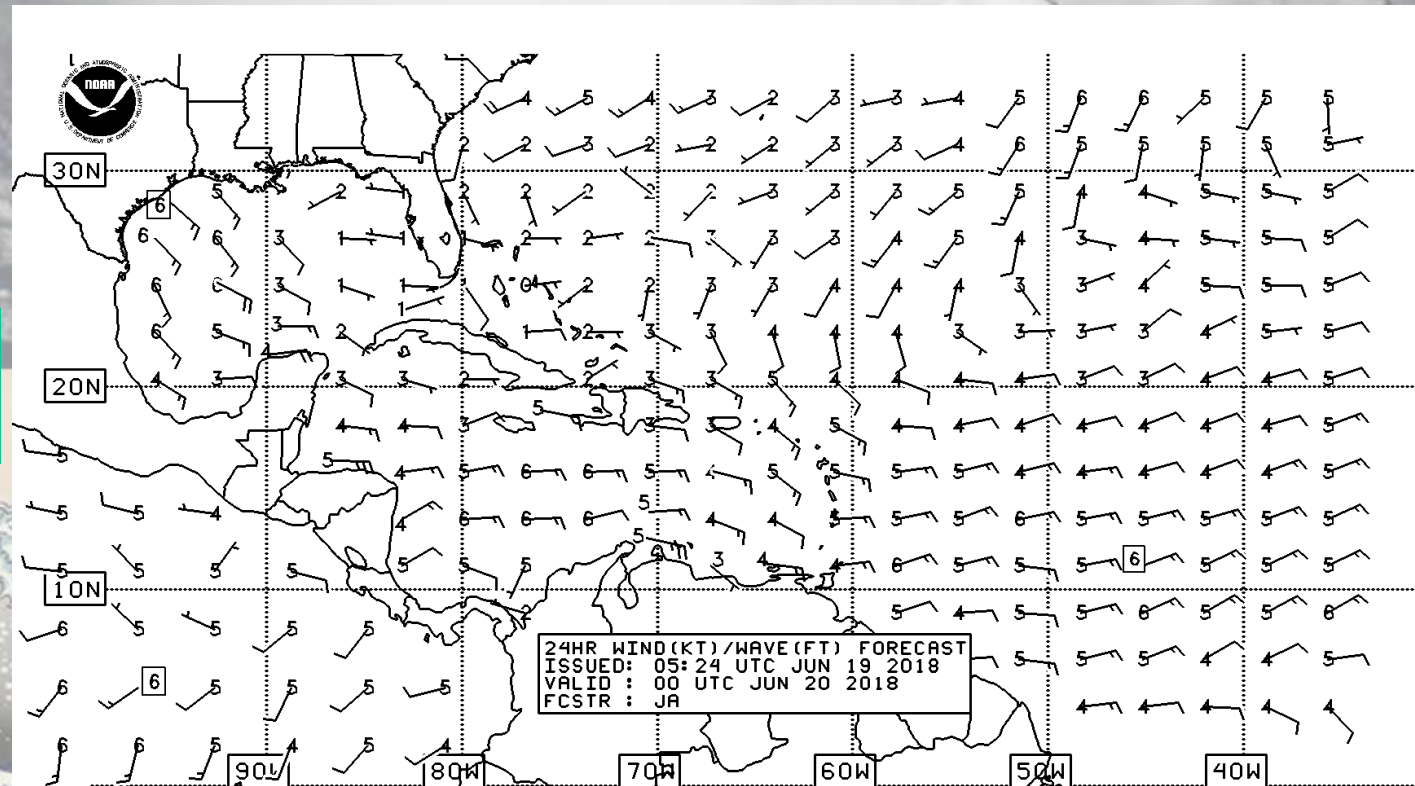
[https://www.nhc.noaa.gov/atfb\\_latest/atlsea\\_latestBW.gif](https://www.nhc.noaa.gov/atfb_latest/atlsea_latestBW.gif)



# WIND / WAVE Forecast Graphics

- Surface Winds and Significant Wave Height Predictions
- 24, 48, and 72 hr Forecasts
- W. Atlantic, Caribbean, Gulf of Mexico, and E. Pacific
- Issued twice daily

[https://www.nhc.noaa.gov/tafb\\_latest/atl72\\_latestBW.gif](https://www.nhc.noaa.gov/tafb_latest/atl72_latestBW.gif)



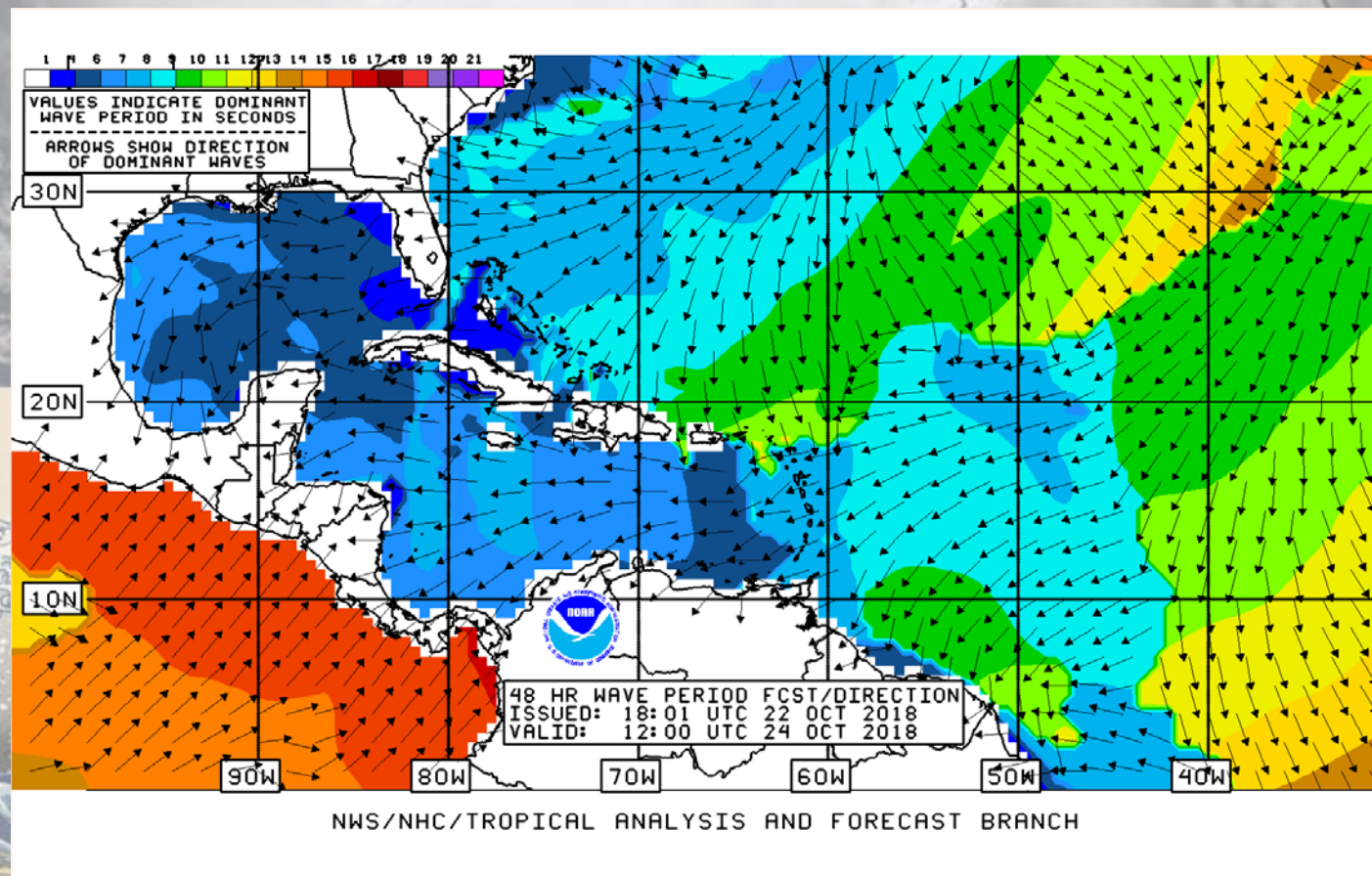
NWS/NHC/TROPICAL ANALYSIS AND FORECAST BRANCH  
SIG WAVE HT IS SHOWN (THE AVG HT OF THE HIGHEST 1/3 OF THE WAVES)



# WAVE PERIOD/DIRECTION Forecast Graphics

- Dominant wave period and direction
- 48 and 72 hr Forecasts
- W. Atlantic, Caribbean, Gulf of Mexico, and E. Pacific
- Issued twice daily

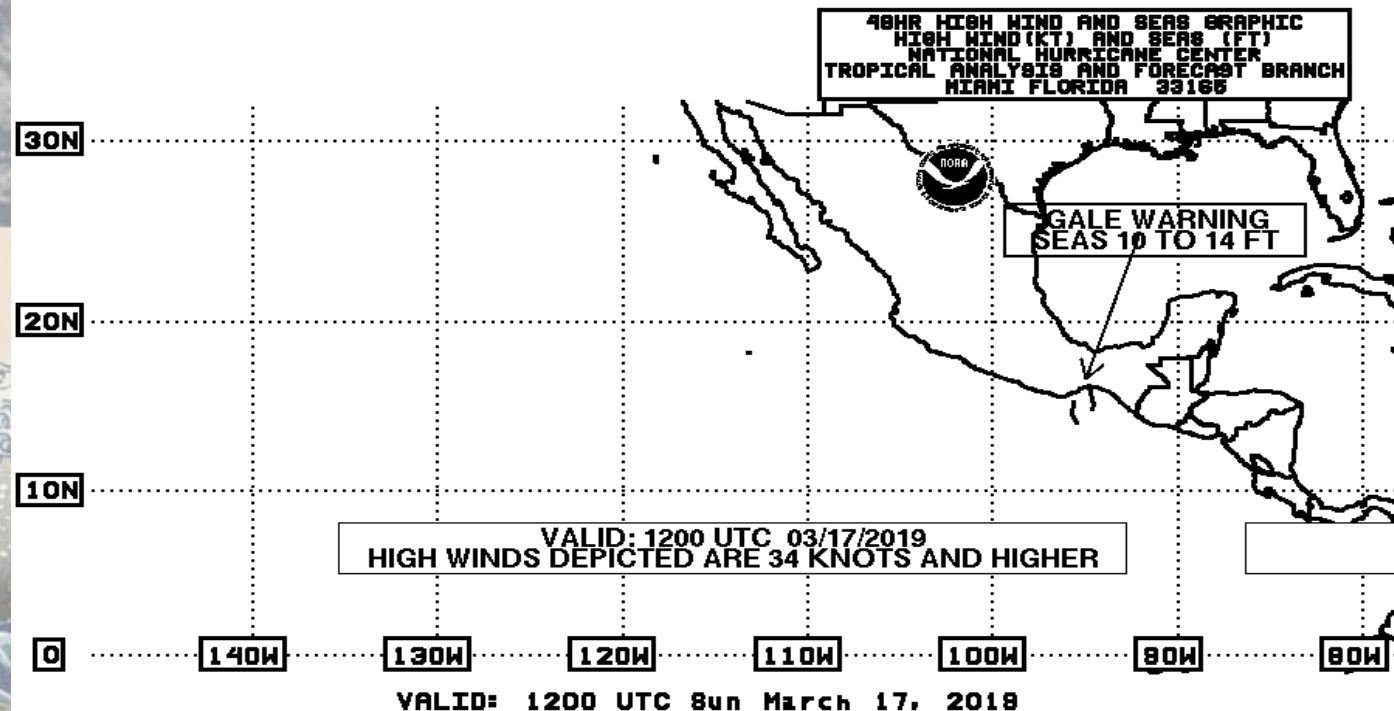
[https://www.nhc.noaa.gov/tafb\\_latest/atl48per\\_latest.gif](https://www.nhc.noaa.gov/tafb_latest/atl48per_latest.gif)



# High Wind and Seas Graphic

- 48 hr forecast depiction of Gale, Storm, and Hurricane-Force Wind Warnings (with peak seas)
- W. Atlantic, Caribbean, Gulf of Mexico, and E. Pacific
- Issued four times daily
- Issued 1 December to 14 May

[https://www.nhc.noaa.gov/tafb\\_latest/hiwind\\_pac\\_latestBW.gif](https://www.nhc.noaa.gov/tafb_latest/hiwind_pac_latestBW.gif)

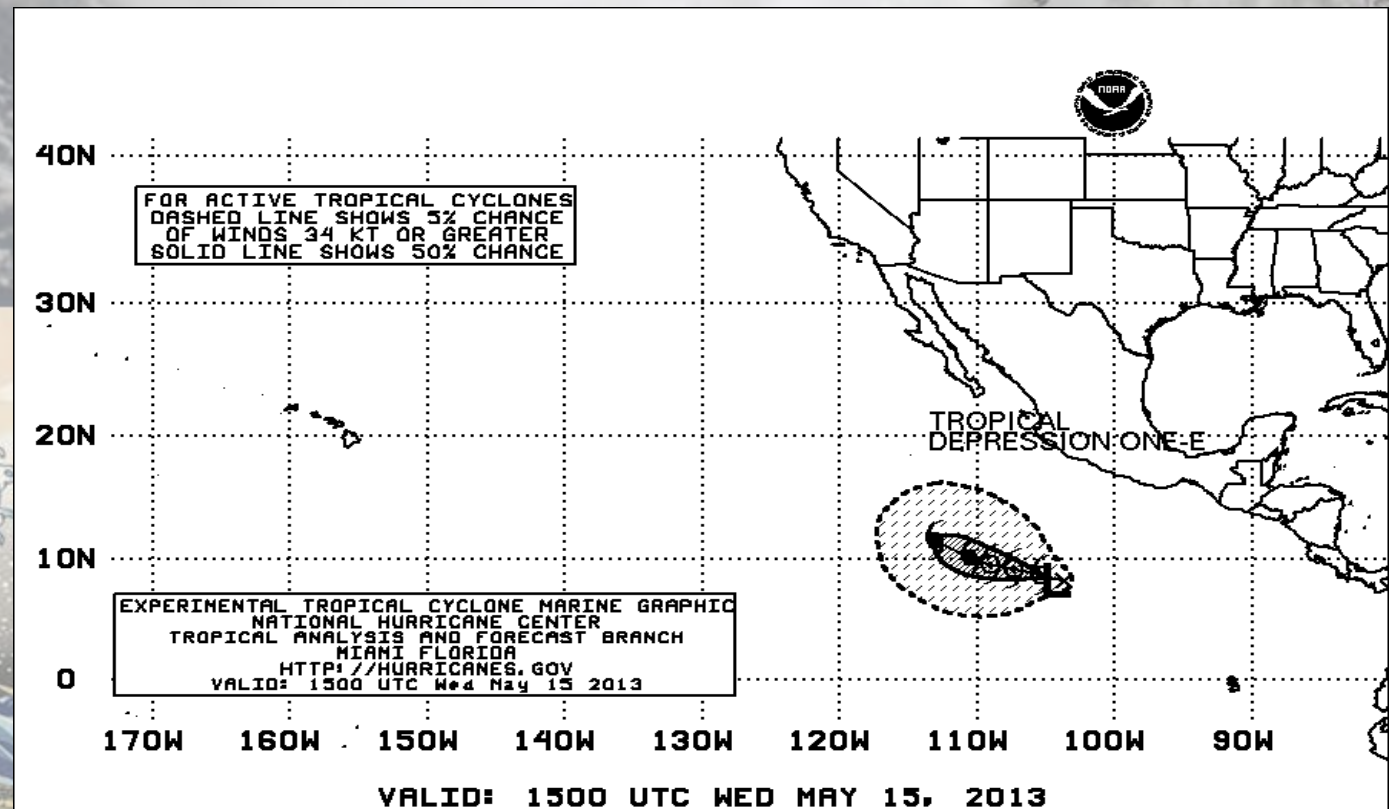




# Tropical Cyclone Danger Graphic

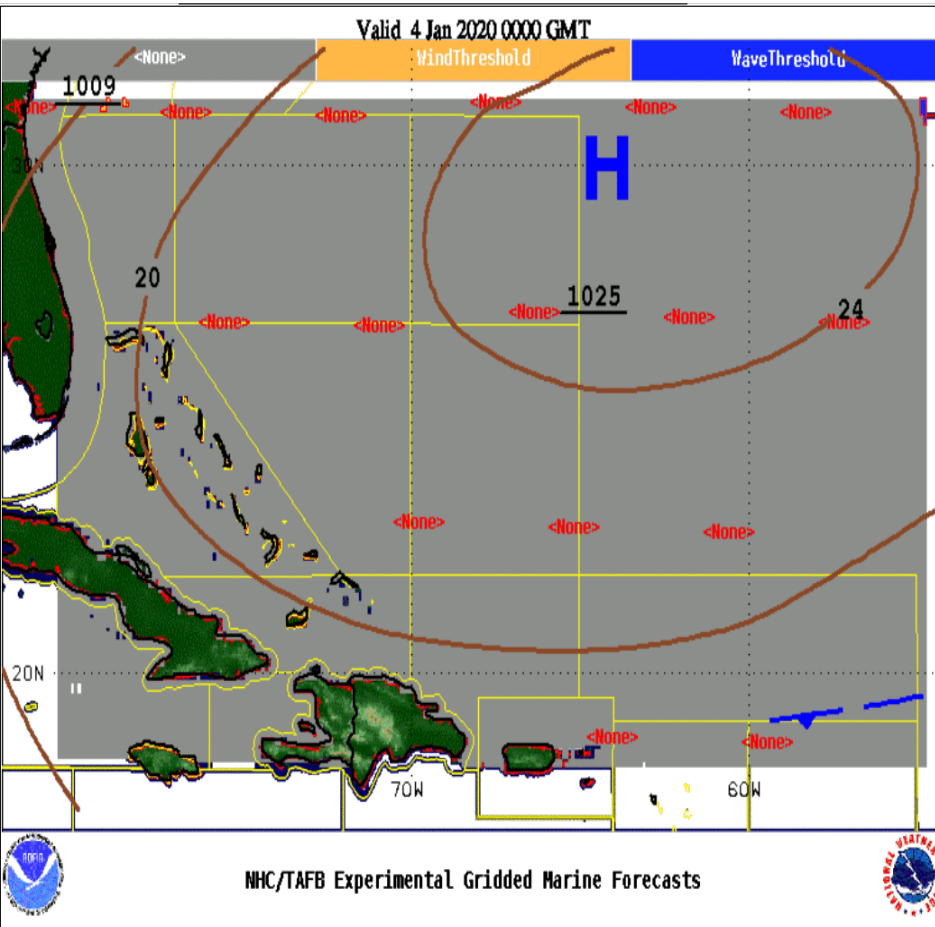
- Wind Speed Probabilities-Based – Uses 5% and 50% chance of 34 kt (tropical storm force winds)
- 5 Day Forecasts
- W. Atlantic, Caribbean, Gulf of Mexico, and E. Pacific
- Issued four times daily during hurricane season

[https://www.nhc.noaa.gov/tafb/latest/danger\\_atl\\_latestBW.gif](https://www.nhc.noaa.gov/tafb/latest/danger_atl_latestBW.gif)

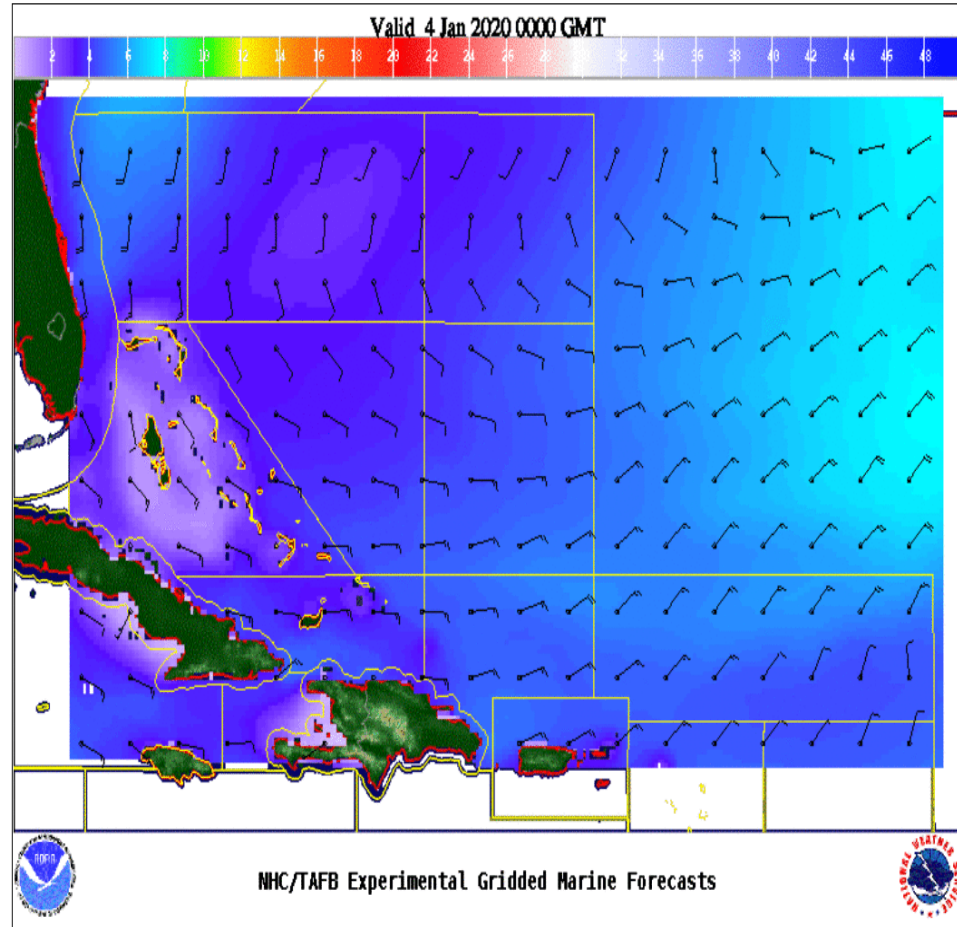


# Marine Composite Page – Winds, Waves, Warnings, and Features

[https://www.nhc.noaa.gov/marine/forecast/enhanced\\_atlcfull.php](https://www.nhc.noaa.gov/marine/forecast/enhanced_atlcfull.php)



Red: Gale Warning  
Orange: Winds  $> 23$  kt   Blue: Seas  $\geq 8$  ft

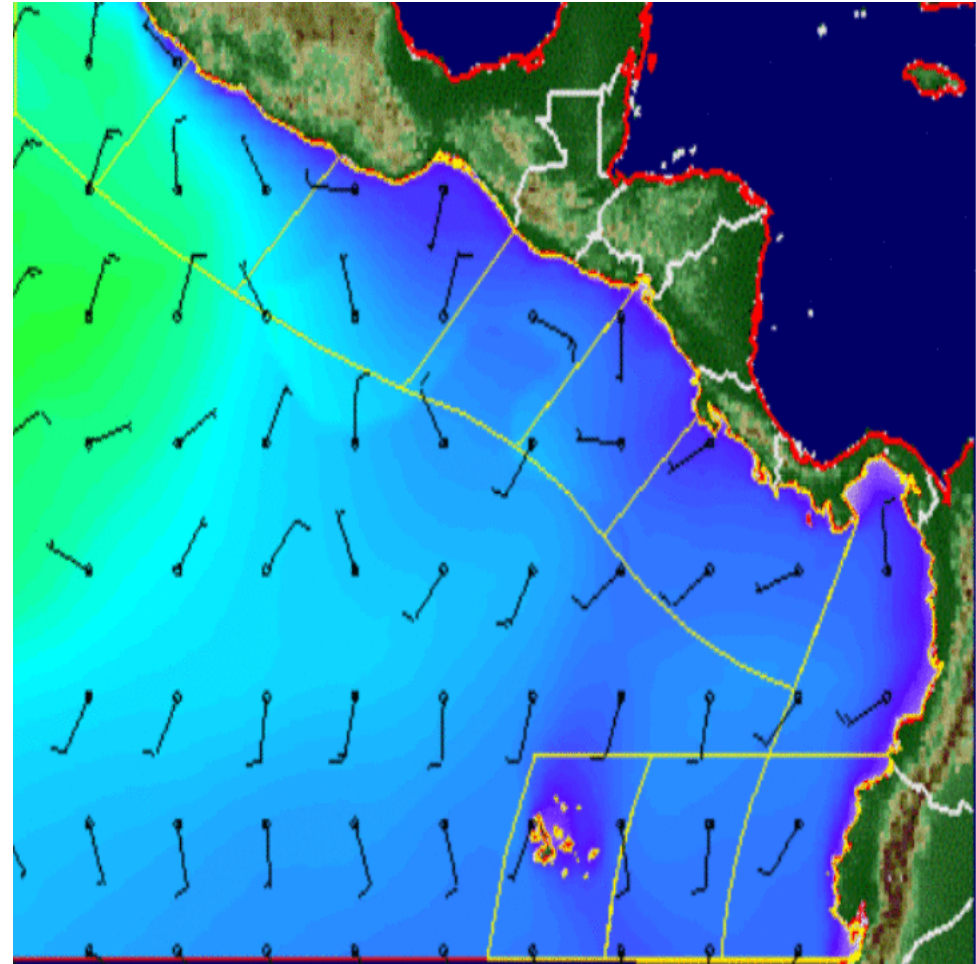


Colors: Seas (in feet)  
Flags: Wind barbs (in knots)



# Marine Composite Page – Winds, Waves, Warnings, and Features

[https://www.nhc.noaa.gov/marine/forecast/enhanced\\_atlcfull.php](https://www.nhc.noaa.gov/marine/forecast/enhanced_atlcfull.php)



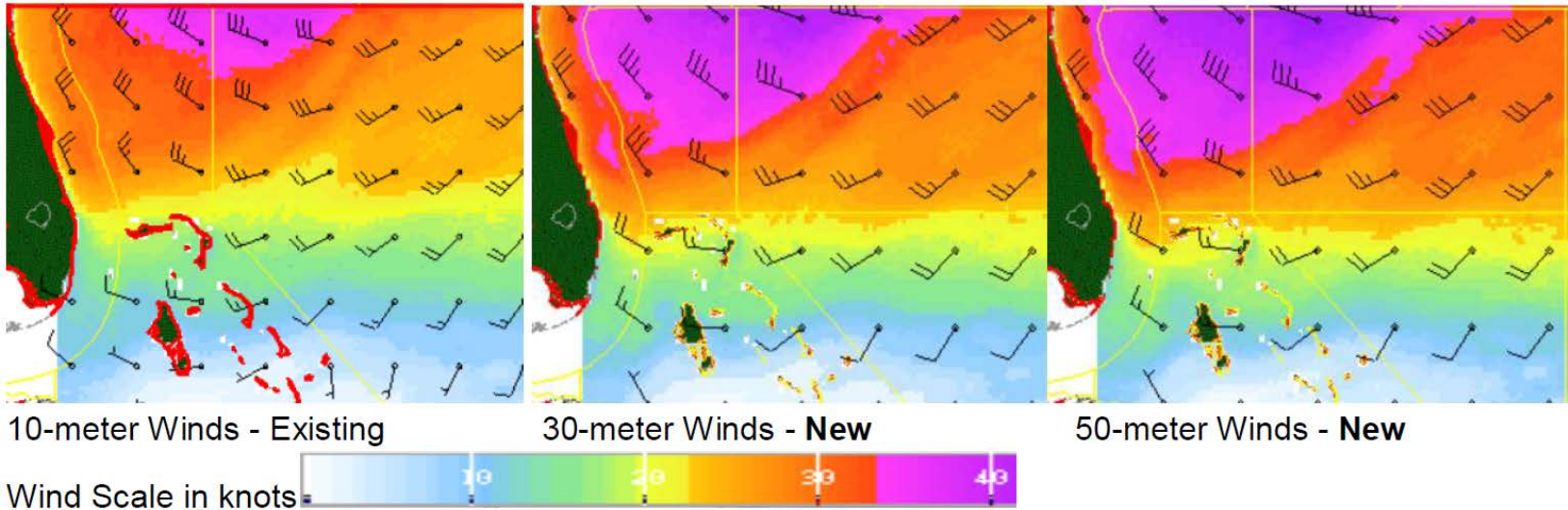
Red: Gale Warning      Green: Storm Warning  
Orange: Winds > 23 kt      Blue: Seas  $\geq$  8 ft

Colors: Seas (in feet)  
Flags: Wind barbs (in knots)

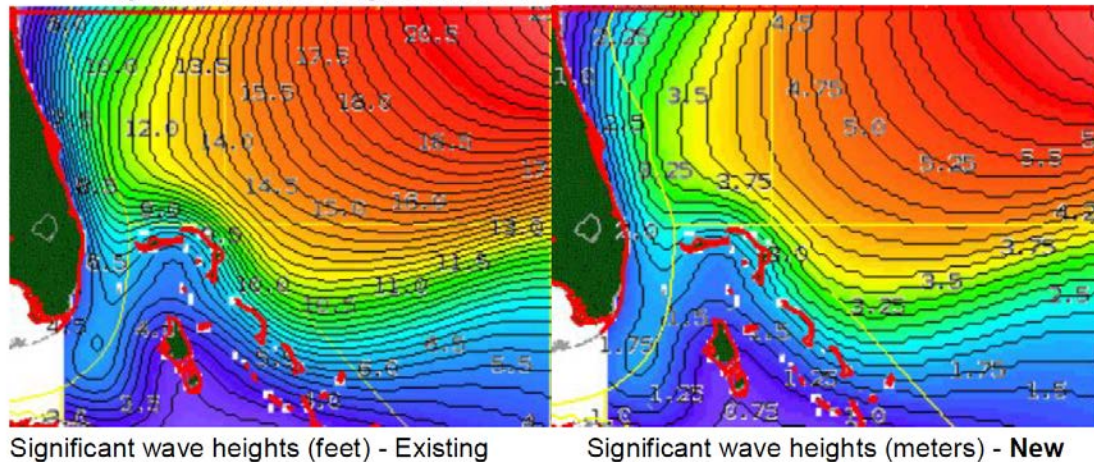
# Marine Composite Page – Added in February 2021

[https://www.nhc.noaa.gov/marine/forecast/enhanced\\_atlcfull.php](https://www.nhc.noaa.gov/marine/forecast/enhanced_atlcfull.php)

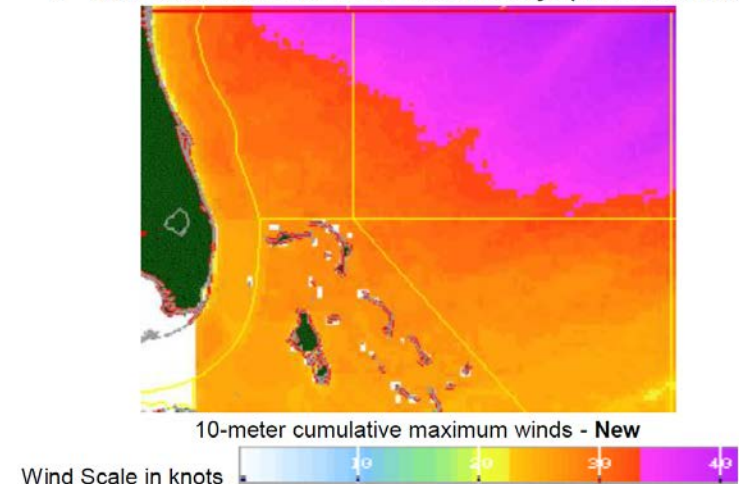
- 30-meter (~100 feet) and 50-meter (~165 feet) Winds:



- Significant Wave Heights in meters:

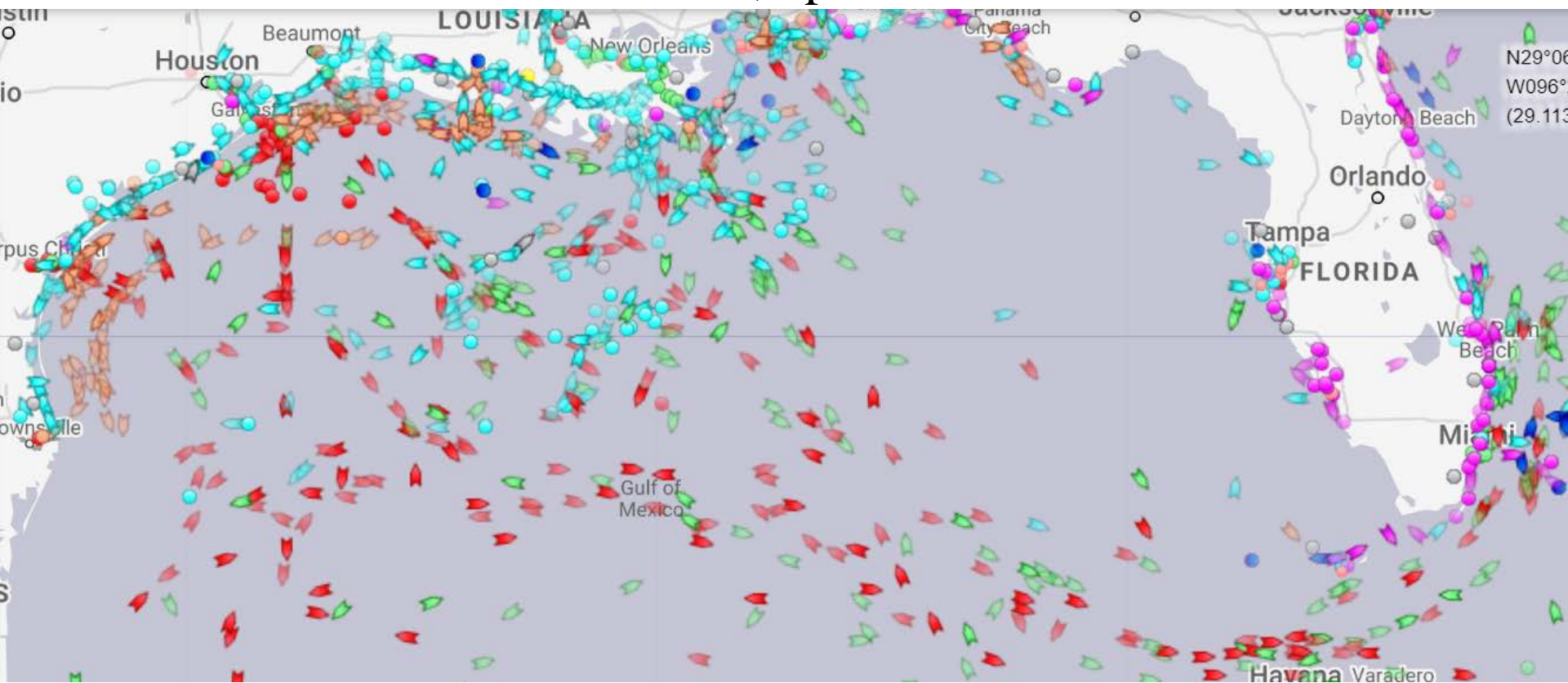


- Cumulative Maximum Winds over five days (10-meter winds):



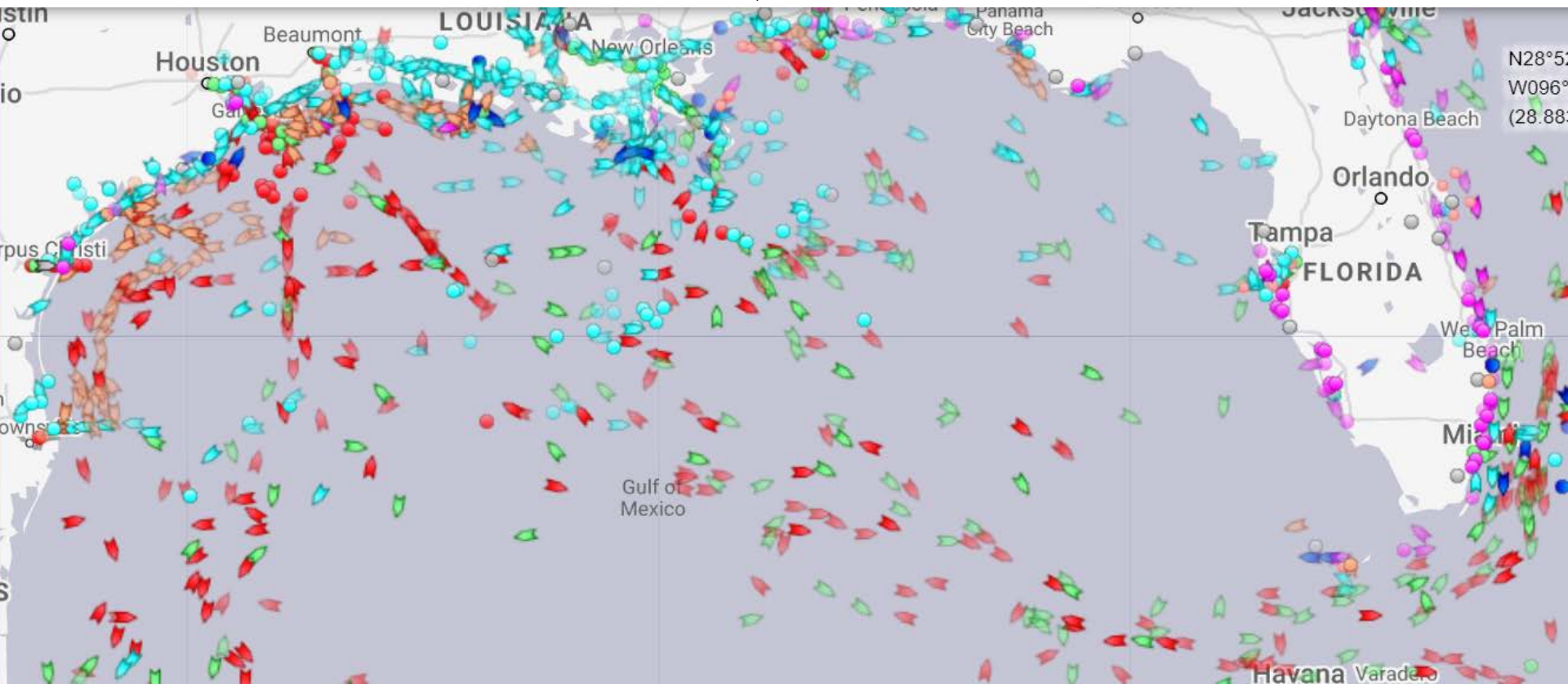


# Hurricane Delta - 2020 October 6<sup>th</sup>, 2pm EDT Weather Avoidance by Ships



marinetraffic.com

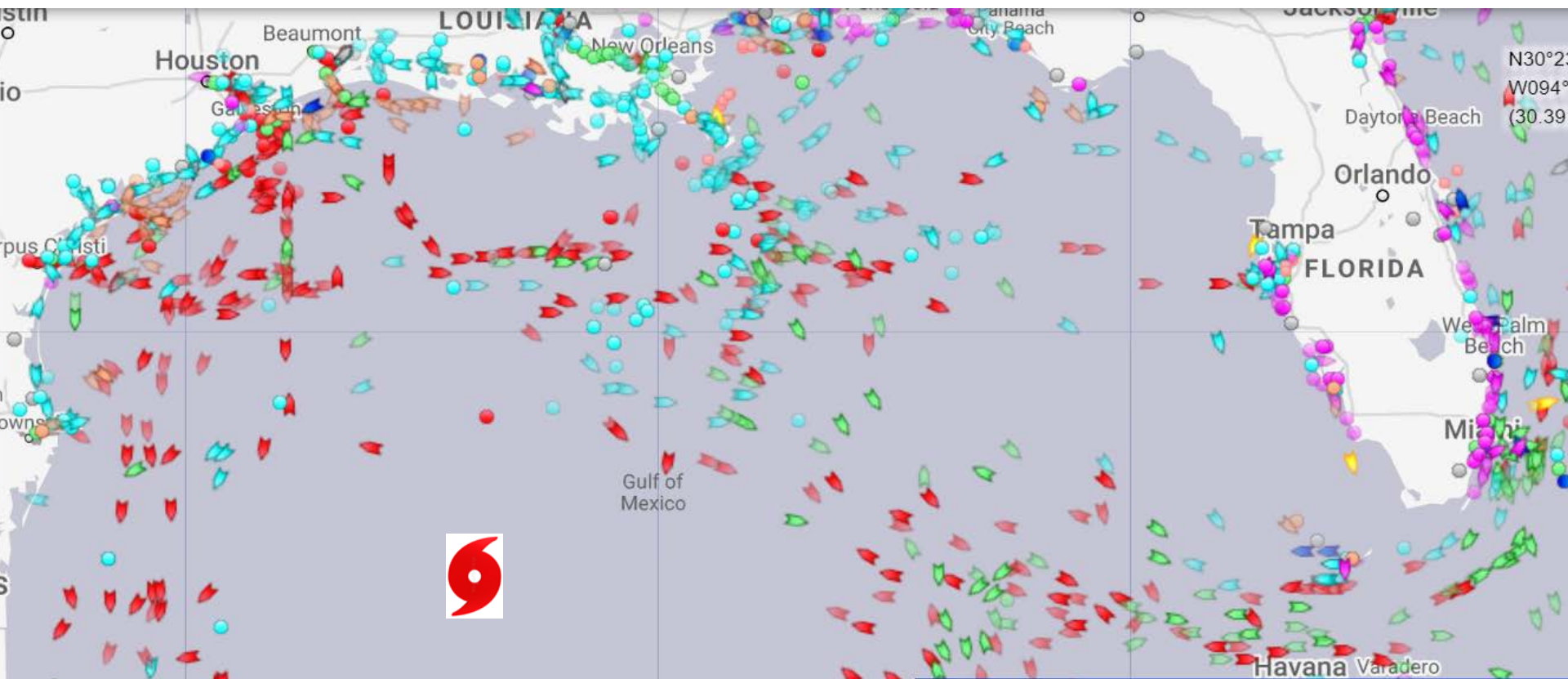
# Hurricane Delta - 2020 October 7<sup>th</sup>, 9am EDT Weather Avoidance by Ships



marinetraffic.com

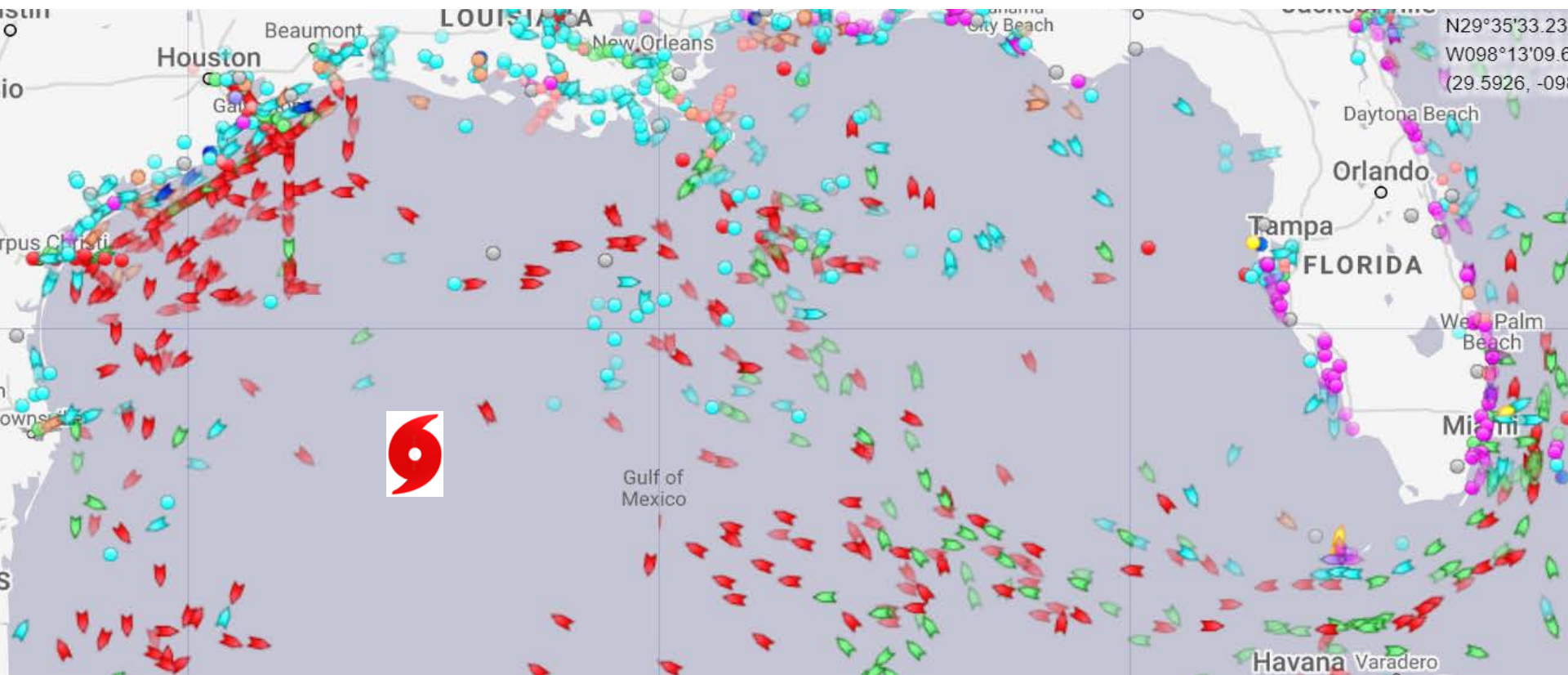


# Hurricane Delta - 2020 October 8<sup>th</sup>, 9am EDT Weather Avoidance by Ships



marinetraffic.com

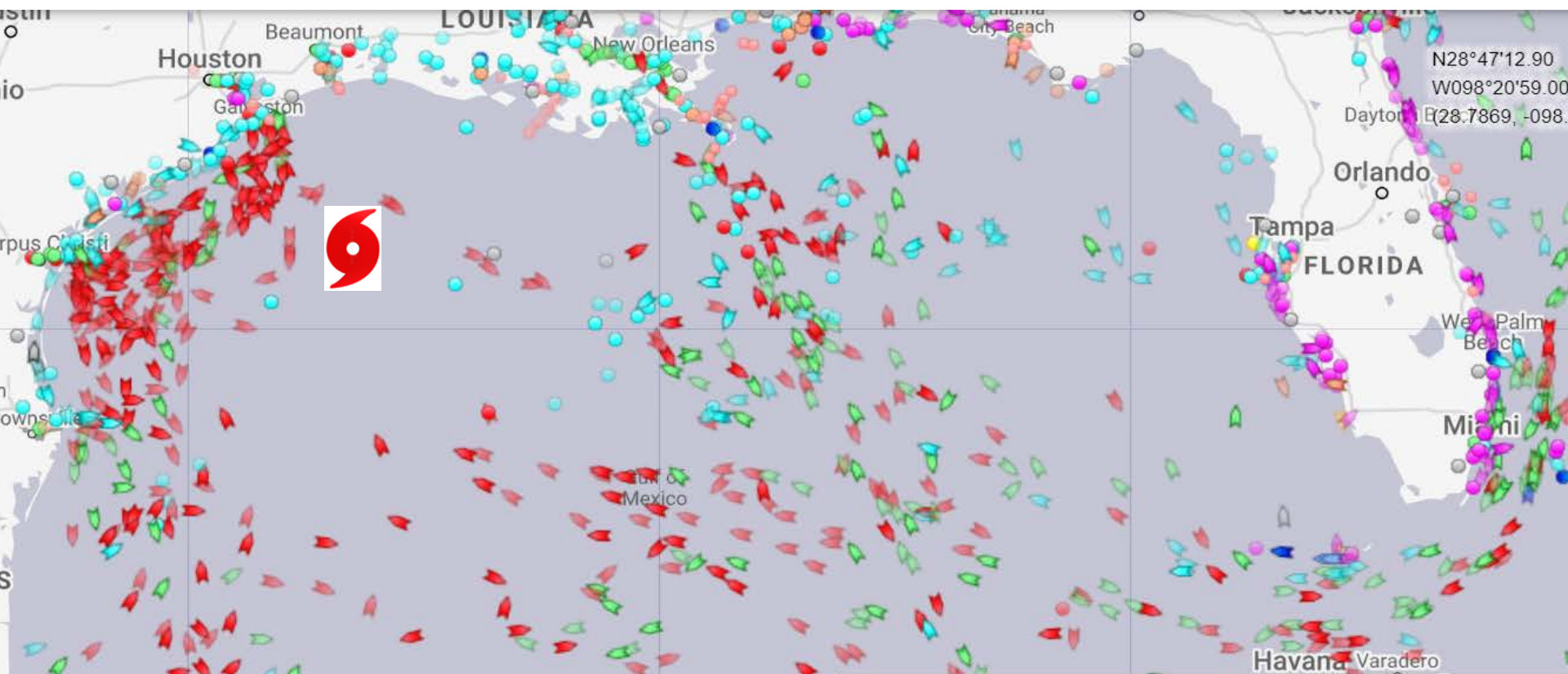
# Hurricane Delta - 2020    October 8<sup>th</sup>, 5pm EDT    Weather Avoidance by Ships



marinetraffic.com



# Hurricane Delta - 2020 October 9<sup>th</sup>, 9am EDT Weather Avoidance by Ships



marinetraffic.com

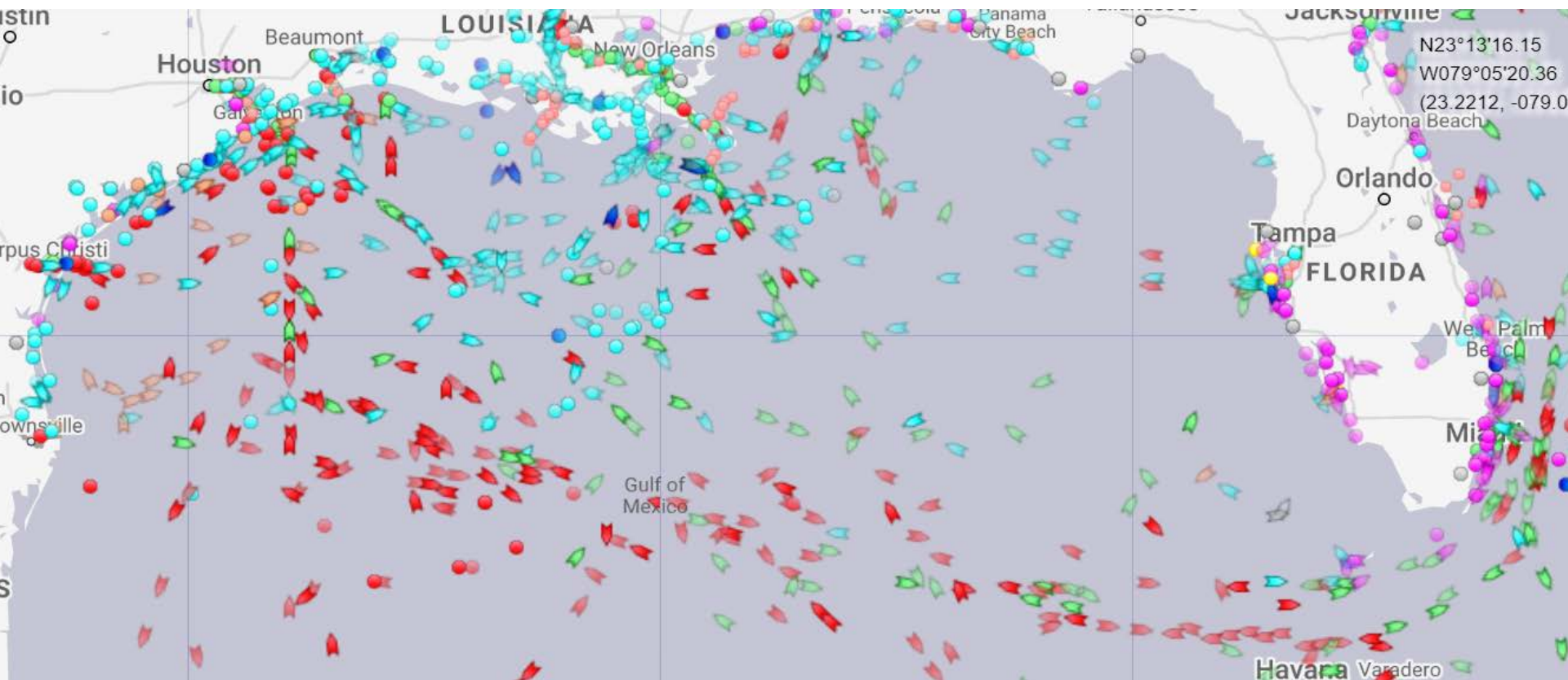
# Hurricane Delta - 2020 <sup>6</sup> October 10<sup>th</sup>, 1pm EDT Weather Avoidance by Ships



marinetraffic.com



# Hurricane Delta - 2020 October 11<sup>th</sup>, 7am EDT Weather Avoidance by Ships



marinetraffic.com

# 2020 Impact-based Decision Support Services to U.S. Coast Guard Districts by Tropical Analysis and Forecast Branch (TAFB)/National Hurricane Center (NHC)

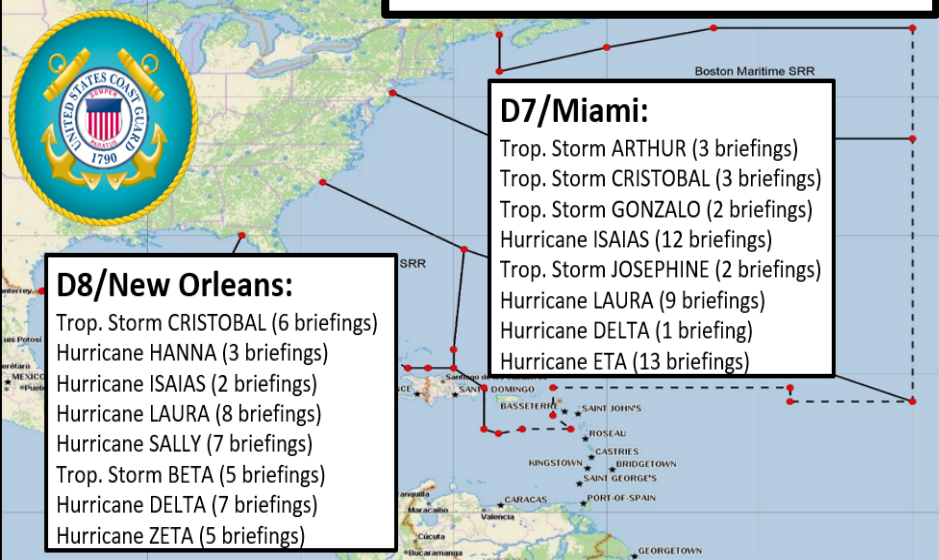
## 37 Spot Forecasts by NHC/TAFB for 2020 U.S. Coast Guard District Operations



## Atlantic Maritime Search and Rescue Regions

UNCLASSIFIED

## 88 Hurricane Briefings



"The Spot Forecast is a huge tool year-round for us during search-and-rescue.

Likewise, I really want to thank all those responsible for creating the [Coast Guard weather webpage](https://www.uscg.mil/Weather/SpotForecasts/), which is extremely valuable to us. It has so many of the products that we use on a daily basis, so I thank you and the entire team for that."

USCG District 7 Commandant  
RADM Eric Jones

"You [NHC/TAFB] are a crucial and critical partner to us. On behalf of all of District 8 with 4,000 men and women that serve here in uniform, we are very, very grateful for the support you have given us. We consider you one of our key partners to ensure that the American public is served well across all of District 8. We're very proud of the relationship that we enjoy with you all."

USCG District 8 Commandant  
RADM John Nadeau



# 2020 TAFB Social Media Highlights



## Twitter

Automated Marine Warning Tweets began January 2020



*Comparing Twitter Stats from 2019 to 2021*

	2019	2020	2021
Tweets Sent	126	1,527	1,806
Profile Visits	17,010	57,476	288,800
Followers	23,100	27,203	29,160

[twitter.com/NHC\\_TAFB](https://twitter.com/NHC_TAFB)

## Tweet Bank

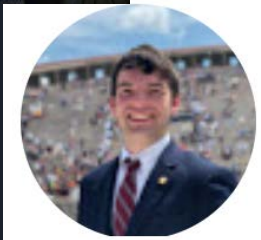
- Over 100 manual tweets on TAFB Climatology data
- Tweet Templates available for non tropical & tropical events

## Weekly Marine Briefing

- Weekly Marine Weather Briefing macros created
- Experimental 5 Day Briefing each Monday

# National Hurricane Center/Tropical Analysis and Forecast Branch

<https://www.nhc.noaa.gov/marine/?atlc>



1-305-229-4424 -Atlantic/Gulf/Caribbean 1-305-229-4425 -Pacific

On Twitter:

[@NHC\\_TAFB](#)