## NHC/TAFB Weather Support for the USCG

Stephen Konarik
NHC/TAFB Marine Forecaster
USCG/Navy/NOAA Partners Focal Point



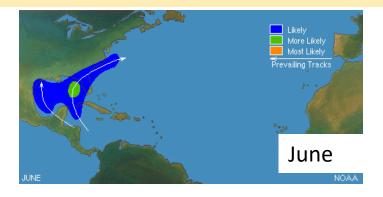


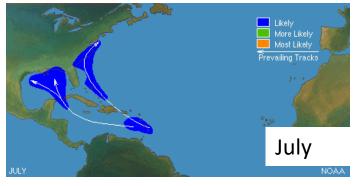


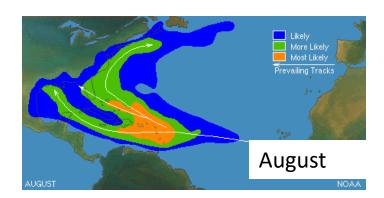
### Typical Areas for Tropical Storms and Hurricane Formation

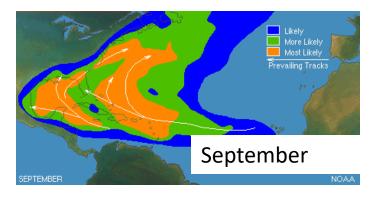


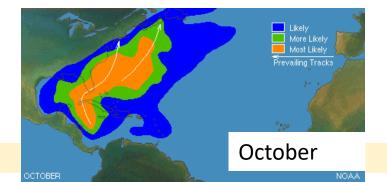
## Tropical Analysis and Forecast Branch NWS National Hurricane Center

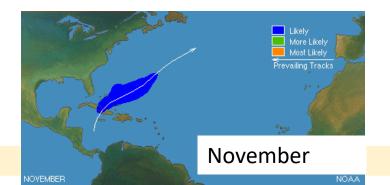












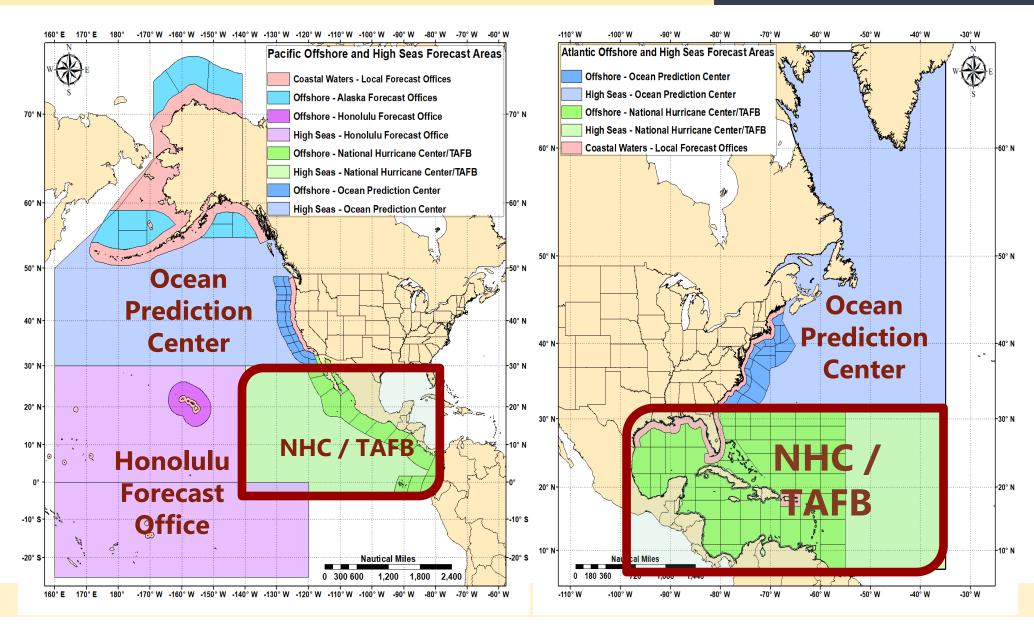
Interagency coordination to support our common goals

 "NOAA/NWS agrees to provide USCG units with weather information necessary for the safe and successful accomplishment of their assigned missions."

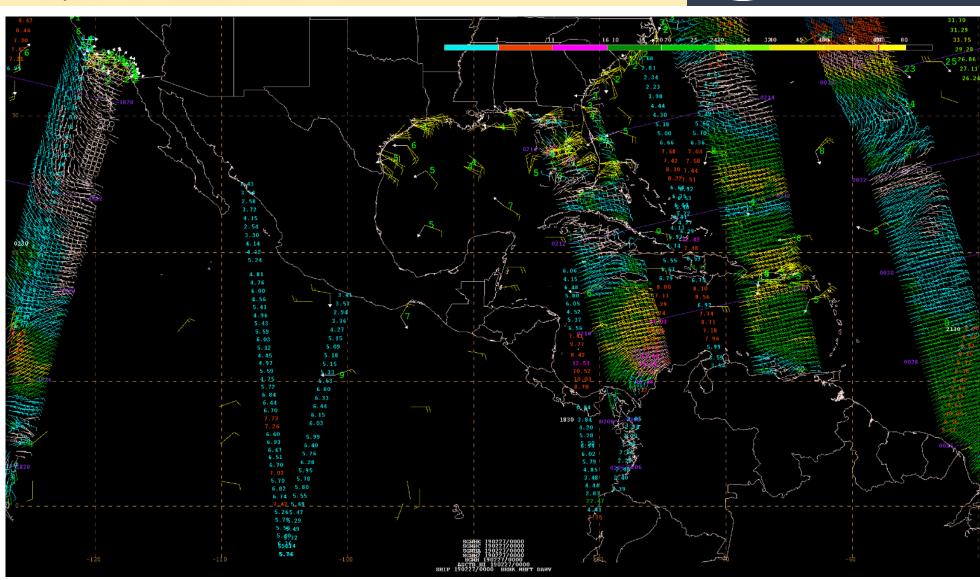
 Interagency coordination through "meteorological forecasts and warnings provided by the NOAA/NWS in support of USCG missions."

 "...Specific forecasts (i.e., Spot Forecasts) and briefings may be provided for extraordinary events..."





Ship reports, Buoys, Satellite derived winds and waves, Etc.



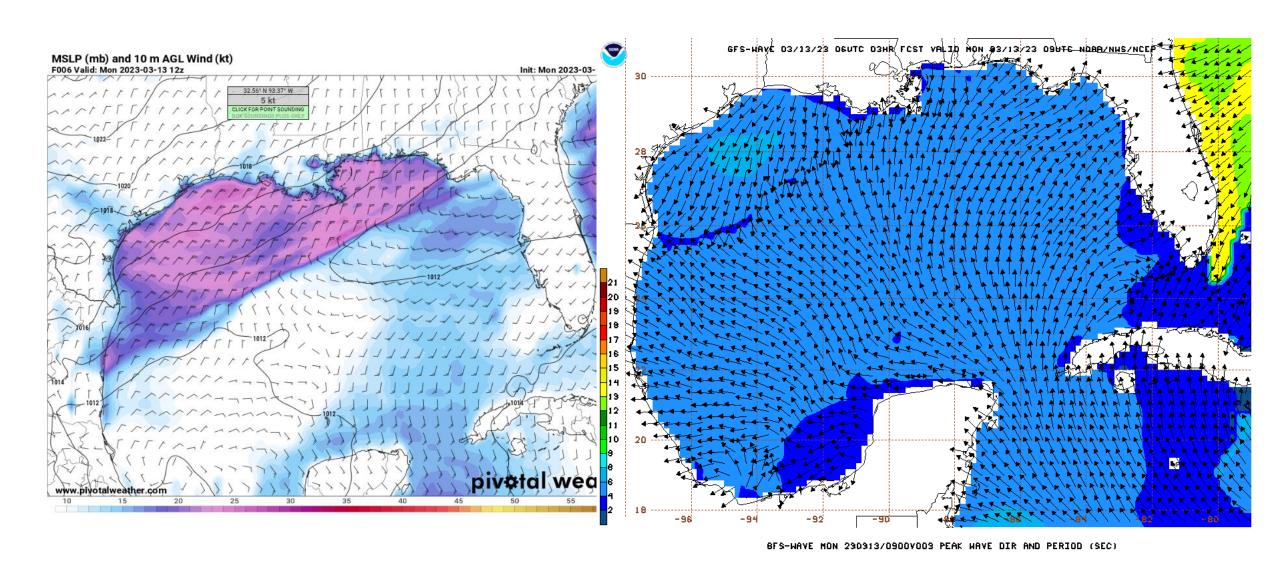
GOES-16: A new era of geo-stationary satellite imagery and data



13 Mar 2023 13:10Z - NOAA/NESDIS/STAR - GOES-East - GEOCOLOR Composite

## Tools We Use: Global Computer Models

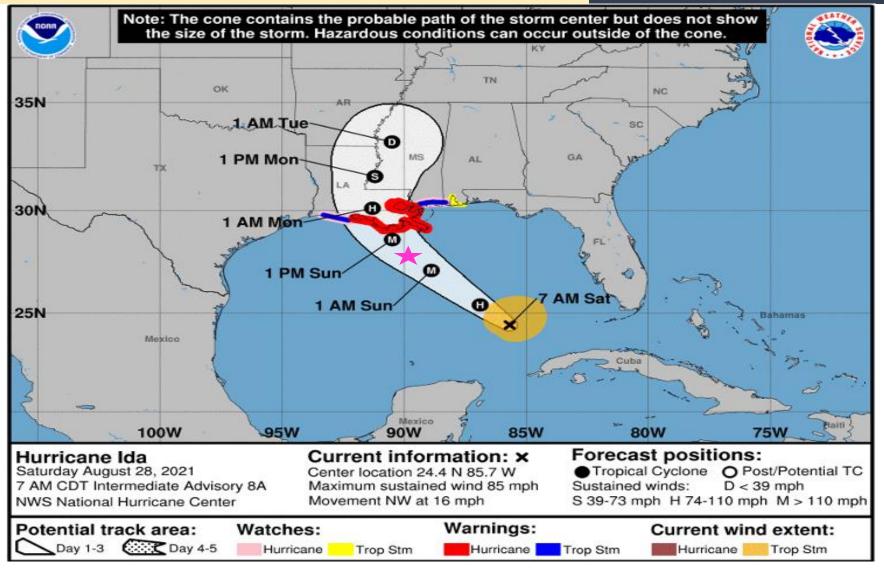


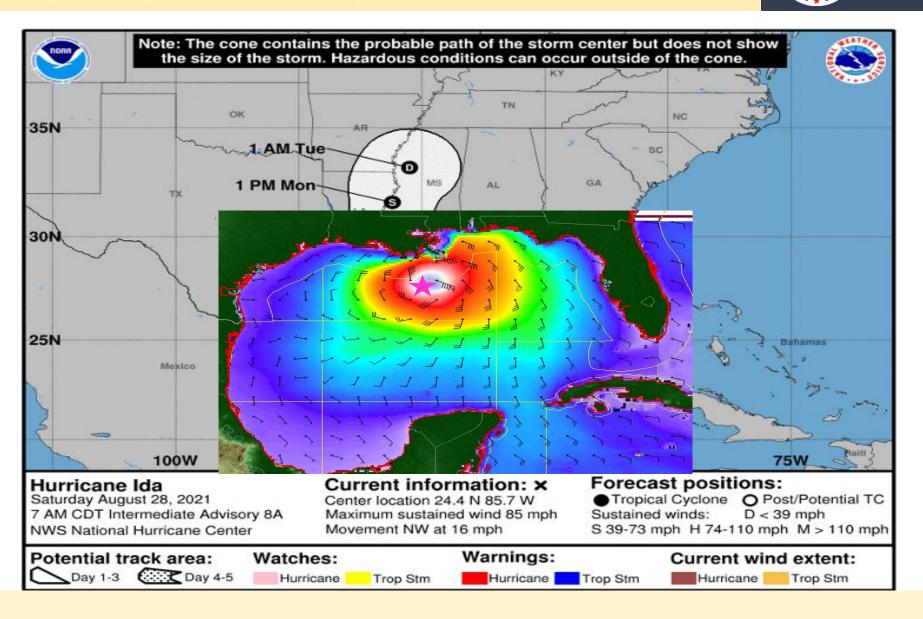


## Tools We Use: NHC/HSU Forecasts



Tropical Analysis and Forecast Branch NWS National Hurricane Center

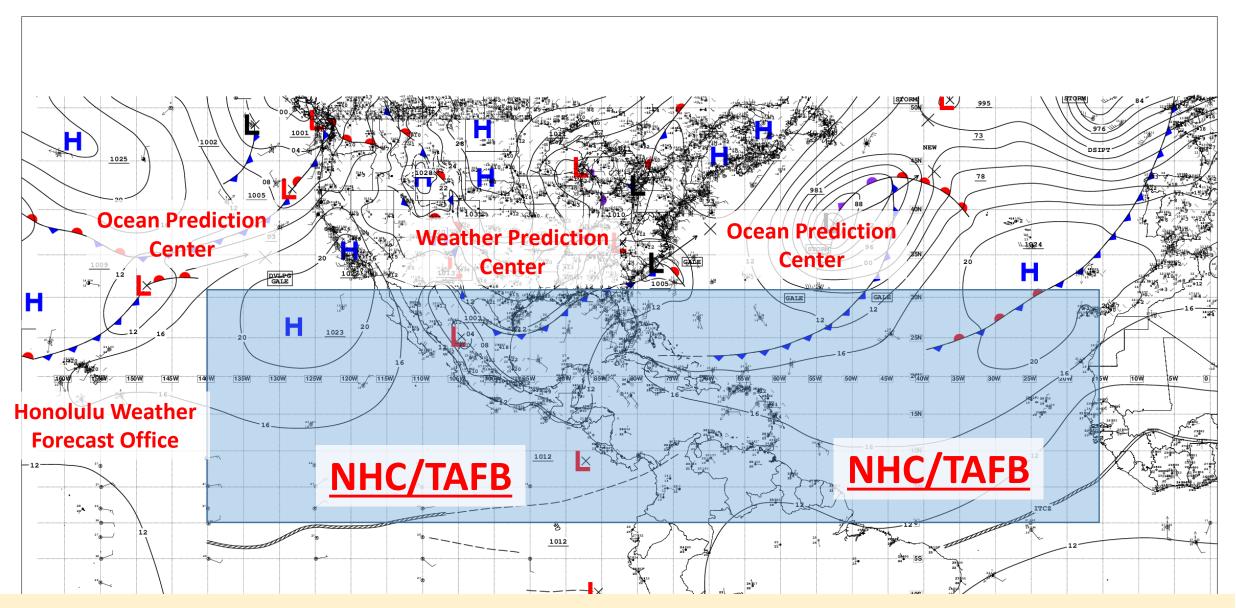




## Information We Produce: Unified Surface Analysis



Tropical Analysis and Forecast Branch NWS National Hurricane Center



## Information We Produce: Tropical Weather Discussion



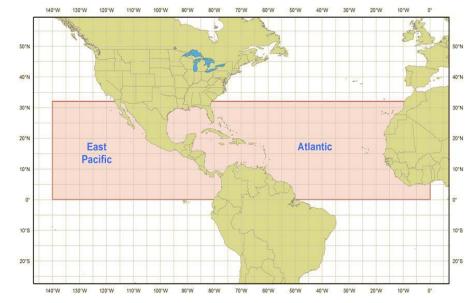
## Tropical Analysis and Forecast Branch NWS National Hurricane Center

Describes major synoptic weather features and significant areas of disturbed weather in

the Tropical Atlantic, including the Gulf of Mexico.

#### **Includes:**

- Special Features
- Tropical Disturbances
- Tropical Cyclones
- Gale/Storm/Hurricane Warnings
- Tropical Waves
- ITCZ/Monsoon Trough
- Synoptic Discussion



Tropical Weather Discussion NWS National Hurricane Center Miami FL 1205 UTC Mon Mar 13 2023

Tropical Weather Discussion for North America, Central America Gulf of Mexico, Caribbean Sea, northern sections of South America, and Atlantic Ocean to the African coast from the Equator to 31N. The following information is based on satellite inagery, weather observations, radar and meteorological analysis.

Based on 0800 UTC surface analysis and satellite imagery through 1000 UTC.

#### ...SPECTAL FEATURES...

Atlantic Gale Warning: A cold front enters the forecast waters near 31N48W and continues southwestward to 24N60W then to near 23N70W, where it have begun to dissipate. Gale-force SW winds are within 180 nm E of the front and N of 29N, where seas are 13 to 17 ft in westerly swell. Behind the front, gale-force westerly winds prevail to the N of 30N between the front and 56W. Large NW swell trailing the front is producing seas of 16 to 23 ft across this area. Fresh to strong winds extend southward to 25N E of the front and to 27N behind the front. and eastward to 44W. Numerous showers with some moderate thunderstorms are within 180 nm ahead of the front affecting mainly across the waters N of 24N. The active weather is expected to shift eastward with the front through this afternoon as the front moves quickly eastward across the waters N of 27N. Gale-force winds are expected to lift N of 31N and the discussion area by sunrise, leaving strong winds to near 30 kt and large seas prevailing on both sides of the front. Seas of 12 ft and greater will spread SE to 23N by afternoon, while peak seas near 24 ft are expected to reach along 31N this morning behind the front. Seas of 12 ft and greater will shift SE through Tue night and finally lift out to the NE of the area along 35W late Wed morning.

Please read the latest High Seas Forecast at https://www.nbc.noaa.gov/text/MIAHSFATZ.shtml for more details on the gale event and associated large swell.

#### ...MONSOON TROUGH/ITCZ...

The monsoon trough enters the Atlantic through coast of Sierra Leone near 09M13N, then continues SW to near 09M13N. The ITC2 extends from 09M18N to the equator at 28M to near the coast of NE Brazil near 03.5538W. Scattered moderate convection is noted from 01N to 04M between 03M and 10M. Clusters of moderate to strong convection are noted from 02.5N to 03.55 between TTW and 33W.

#### GULF OF MEXICO...

A weakening ridge dominates most of the Gulf waters, producing moderate to fresh S to SW winds E of 90W. Gentle S winds prevail for the SW and west-central Gulf. The latest buoy and altimeter data show seas of 3 to 5 ft across this area. A cold front has entered the northern Gulf overnight, and extends from the western Florida Panhandle to just south of Brownsville, Texas. Widely scattered moderate convection is along the front across the Florida coastal waters extending into the Big Bend. Fresh to strong N to NE winds are building in behind the front, and have raised seas to 5-7 ft across the Texas coastal waters.

For the forecast, the cold front will sink gradually southward through Tue morning, reaching extreme SW Florida to near Tampico, Mexico, then exit SG of the basin on Wed. Fresh to strong NE winds are expected N of the front Mon through Wed. Strong southerly winds will develop over the W and NM Gulf on Thu ahead of the next approaching cold front forecast to move into the NM Gulf early Fri. This front will reach from the Florida panhandle to the Bay of Campeche Fri night. Gale force winds are possible west of the front off Tampico, Mexico Fri evening.

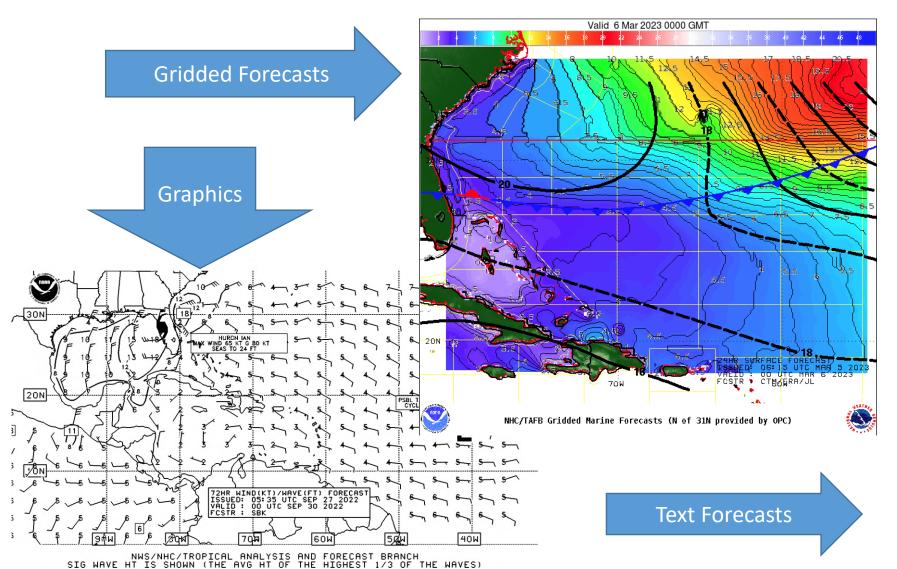
#### CARTBBEAN SEA...

Fair and stable conditions prevail across the Caribbean basin this morning, with patchy low clouds and a few showers possible across W and NW portions. Moderate to locally fresh trades prevail

## Information We Produce: Wind and Wave Forecasts



## Tropical Analysis and Forecast Branch NWS National Hurricane Center



HIGH SEAS FORECAST NWS NATIONAL HURRICANE CENTER MIAMI FL 1630 UTC TUE SEP 27 2022

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.

#### SECURITE

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

SYNOPSIS VALID 1200 UTC TUE SEP 27. 24 HOUR FORECAST VALID 1200 UTC WED SEP 28. 48 HOUR FORECAST VALID 1200 UTC THU SEP 29.

#### .WARNINGS.

...GULF OF MEXICO HURRICANE WARNING...

. HURRICANE IAN NEAR 23.0N 83.6W 950 MB AT 1500 UTC SEP 27 MOVING N OR 360 DEG AT 9 KT. MAXIMUM SUSTAINED WINDS 110 KT GUSTS 135 KT. TROPICAL STORM FORCE WINDS WITHIN 120 NM OF CENTER EXCEPT 100 NM SW QUADRANT. SEAS 12 FT OR GREATER WITHIN 75 NM NE QUADRANT...AND 90 NM NW QUADRANT...AND 90 NM NW QUADRANT WITH SEAS TO 19 FT. ELSEWHERE WITHIN 24N80W TO 26N82W TO 26N82W TO 19N85W TO 20N79W TO 24N80W WINDS 20 TO 33 KT. SEAS 8 TO 12 FT.

.24 HOUR FORECAST HURRICANE IAN NEAR 26.0N 83.0W. MAXIMUM SUSTAINED WINDS 115 KT GUSTS 140 KT. TROPICAL STORM FORCE WINDS WITHIN 130 NM NE QUADRANT...120 NM SE QUADRANT...110 NM SW QUADRANT...AND 150 NM NW QUADRANT. SEAS 12 FT OR GREATER WITHIN 270 NM SW AND 90 NM NE SEMICIRCLES WITH SEAS TO 31 FT. ELSEWHERE WITHIN 28N79W TO 31N86W TO 29N95W TO 24N94W TO 22N87W TO 24N79W TO 28N79W WINDS 20 TO 33 KT. SEAS 8 TO 12 FT. .48 HOUR FORECAST HURRICANE IAN INLAND OVER FLORIDA NEAR 27.8N 82.1W. MAXIMUM SUSTAINED WINDS 75 KT GUSTS 90 KT. TROPICAL STORM FORCE WINDS WITHIN 120 NM S SEMICIRCLE...300 NM NE OUADRANT AND 160 NM NW QUADRANT, SEAS 12 FT OR GREATER WITHIN 360 NM SW SEMICIRCLE OVER GULF WATERS WITH SEAS TO 23 FT...AND WITHIN 360 NM NE QUADRANT OVER ATLC WATERS WITH SEAS TO 15 FT. ELSEWHERE OVER FORECAST WATERS WITHIN 31N77W TO 30N84W TO 31N88W TO 29N92W TO 24N88W TO 25N79W TO 31N77W WINDS 20 TO 33 KT. SEAS 10 TO 12 FT. REMAINDER OF AREA WITHIN 24N82W TO 25N89W TO 29N92W TO 27N97W TO 22N94W 21N86W TO 24N82W WINDS 20 KT OR LESS. SEAS 8 TO 10 FT IN MIXED

.60 HOUR FORECAST TROPICAL STORM IAN INLAND NEAR 28.5N 81.7W.
MAXIMUM SUSTAINED WINDS 60 KT GUSTS 75 KT.
72 HOUR FORECAST TROPICAL STORM IAN INLAND NEAR 29.5N 81.5W.
MAXIMUM SUSTAINED WINDS 50 KT GUSTS 60 KT.
EXTENDED OUTLOOK...USE FOR GUIDANCE ONLY...ERRORS MAY BE LARGE.
96 HOUR FORECAST TROPICAL STORM IAN INLAND NEAR 33.0N 81.8W.
MAXIMUM SUSTAINED WINDS 35 KT GUSTS 45 KT.
.120 HOUR FORECAST POST-TROPICAL EXTRATROPICAL IAN NEAR 35.0N
81.5N. MAXIMUM SUSTAINED WINDS 25 KT GUSTS 35 KT.

FORECAST WINDS IN AND NEAR ACTIVE TROPICAL CYCLONES SHOULD BE USED WITH CAUTION DUE TO UNCERTAINTY IN FORECAST TRACK...SIZE AND INTENSITY.

.SYNOPSIS AND FORECAST.

.ATLC LOW PRES NEAR 13.5N35W 1008 MB. OVER FORECAST WATERS WITHIN 15N35W TO 16N36W TO 15N38W TO 12N38W TO 11N35W TO 15N35W N

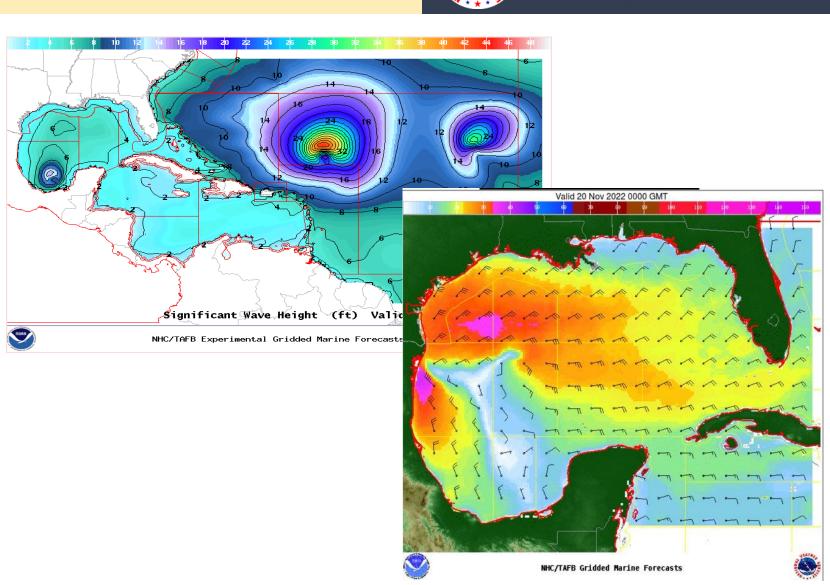
**Gridded Marine Forecasts** 

#### **RESOLUTION**

- 10 km
- 3 hourly to 72 hours
- 6 hourly to 144 hours (6 days)

#### WEATHER PARAMETERS

- 10 meter wind and gusts
- Significant Wave Height
- Hazards



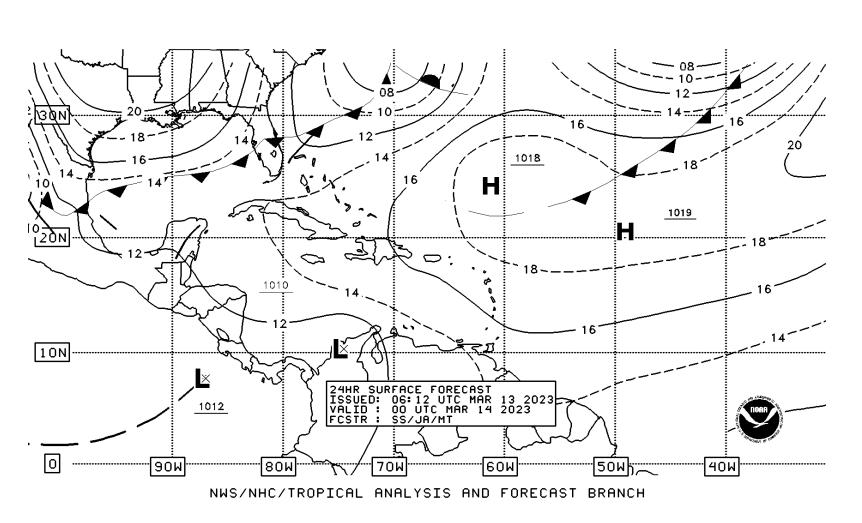


TAFB provides graphical products to mariners via 3 USCG transmitters:

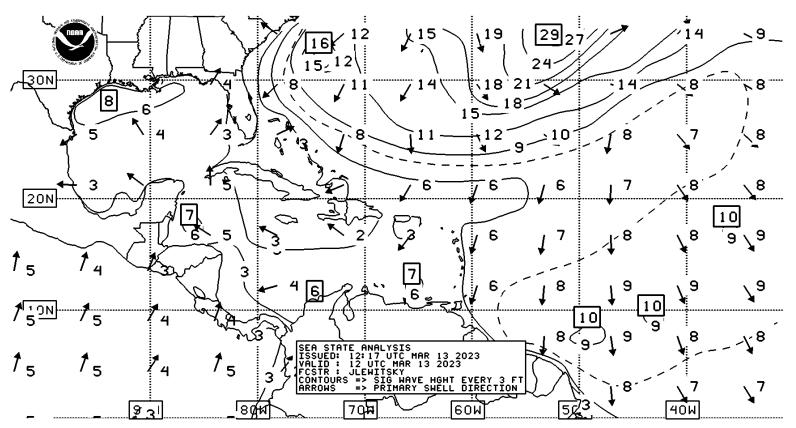
NEW ORLEANS (NMG)
POINT REYES, CA (NMC)
HAWAII (KVM70)

Disseminated via USCG transmitter at New Orleans

- Fronts, troughs, tropical cyclones, tropical waves, ridges
- 24, 48, and 72 hour Forecasts
- Western Atlantic, Caribbean, Gulf of Mexico, and Eastern Pacific
- Issued twice daily



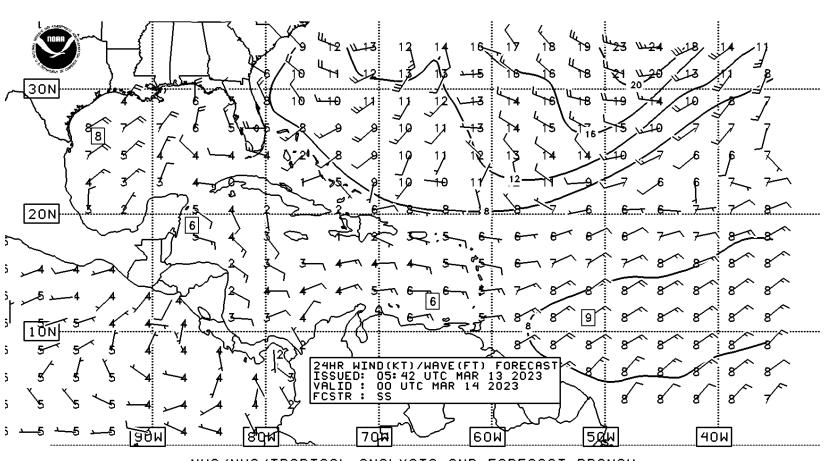
#### Disseminated via USCG transmitter at New Orleans



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

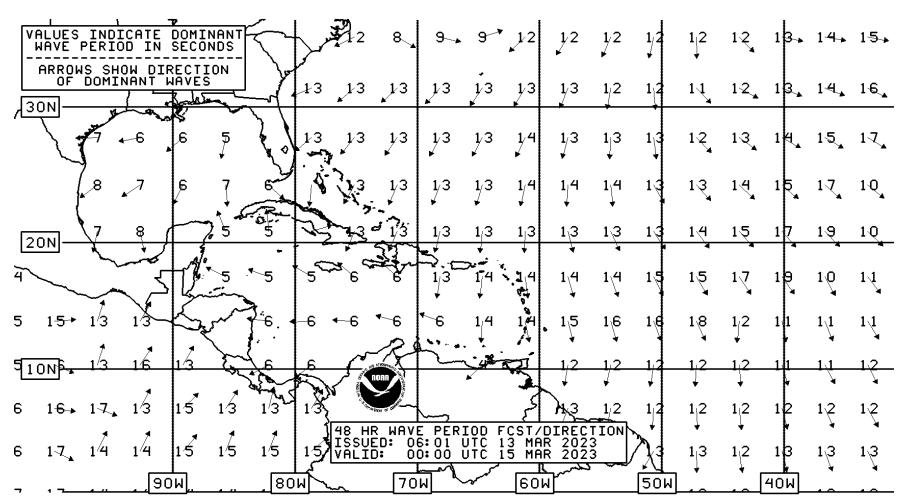
- Significant Wave Height Analysis (the average height of the highest one-third of the waves) and Primary Swell Direction
- Western Atlantic, Caribbean, Gulf of Mexico, and Eastern Pacific
- Issued twice daily

- Surface Winds and
   Significant Wave Height
   Predictions
- 24, 48, and 72 hour Forecasts
- Western Atlantic,
   Caribbean, Gulf of Mexico,
   and Eastern Pacific
- Issued twice daily



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

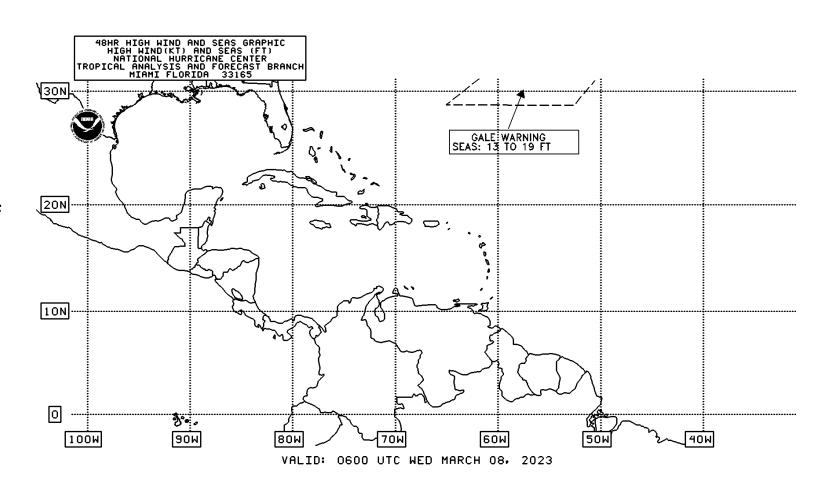
#### Disseminated via USCG transmitter at New Orleans



- Dominant wave period and direction
- 48 and 72 hour Forecasts
- Western Atlantic,
   Caribbean, Gulf of Mexico,
   and Eastern Pacific
  - Issued twice daily

NWS/NHC/TROPICAL ANALYSIS AND FORECAST BRANCH

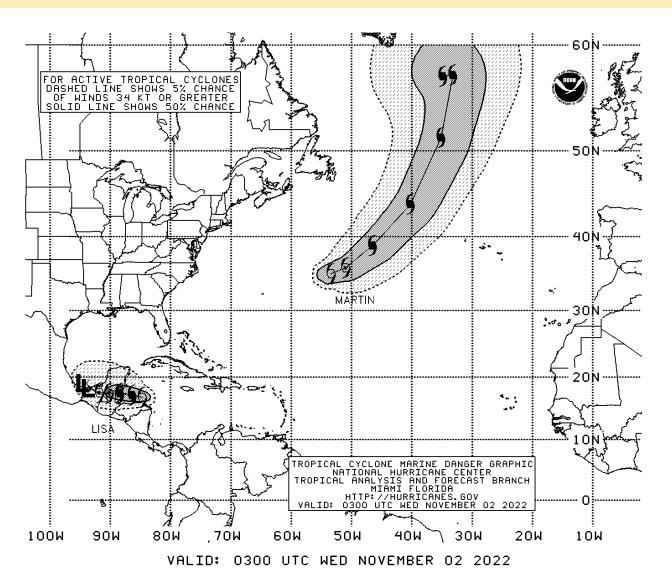
- 48 hour forecast depiction of Gale,
   Storm, and Hurricane-Force Wind
   Warnings (with peak seas)
- Western Atlantic, Caribbean, Gulf of Mexico, and Eastern Pacific
- Issued four times daily
- Issued 1 December to 14 May



## Information We Produce: Tropical Cyclone Danger

## Tropical Analysis and Forecast Branch NWS National Hurricane Center

#### Disseminated via USCG transmitter at New Orleans

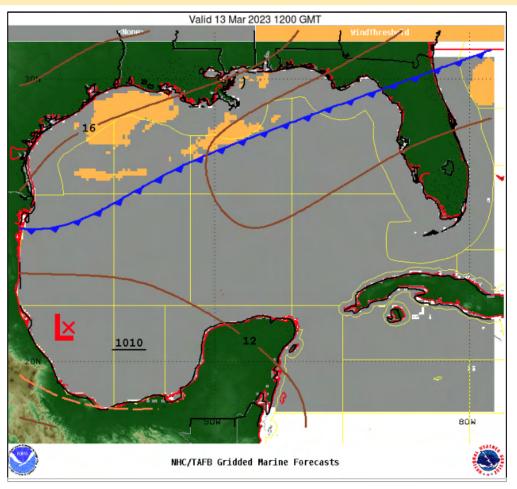


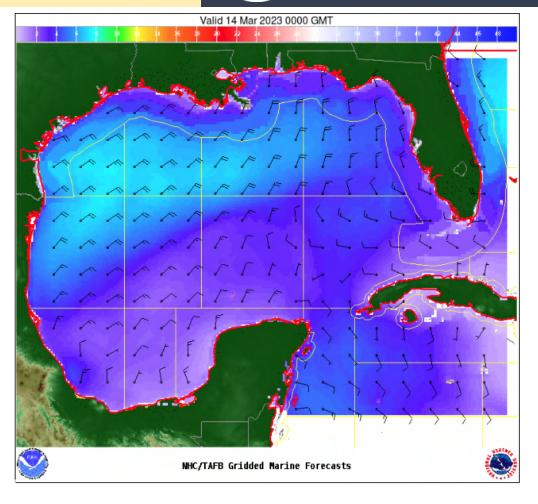
- Wind Speed Probabilities-Based Uses 5% and 50% chance of 34 kt (tropical storm force winds)
- 3 Day Forecasts
- Western Atlantic, Caribbean, Gulf of Mexico, and Eastern Pacific
- Issued four times daily during hurricane season

## Information We Produce: Marine Composite Page

Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Designed for mariners with low-bandwidth internet connections





Red: Gale Warning

Orange: Winds > 23 kt

Blue: Seas > 8 ft

Colors: Seas (in feet)

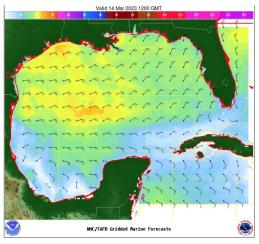
Flags: Wind barbs (in knots)

## Information We Produce: Marine Composite Page

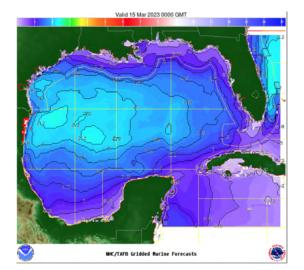
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Tropical Analysis and Forecast Branch NWS National Hurricane Center

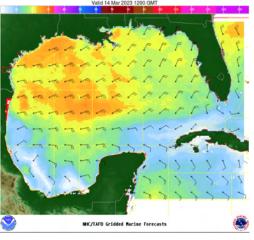
#### Designed for mariners with low-bandwidth internet connections



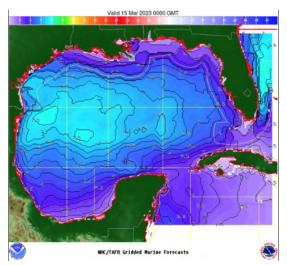
10 meter wind



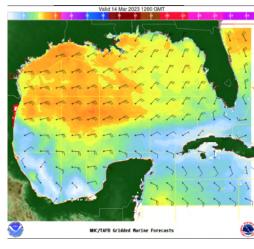
Wave height in feet



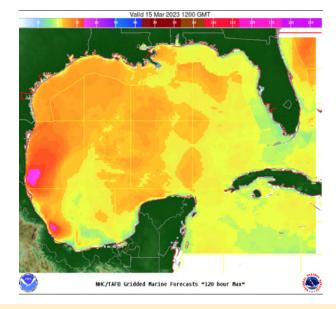
30 meter wind



Wave height in meters



50 meter wind



Cumulative Maximum Wind Speed over next 120 hours (5 days)

### Recent Marine Accidents from Atlantic Hurricanes

Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Sinkings



**EL FARO** 

33 fatalities during Hurricane Joaquin (2015)

**BOURBON RHODE** 

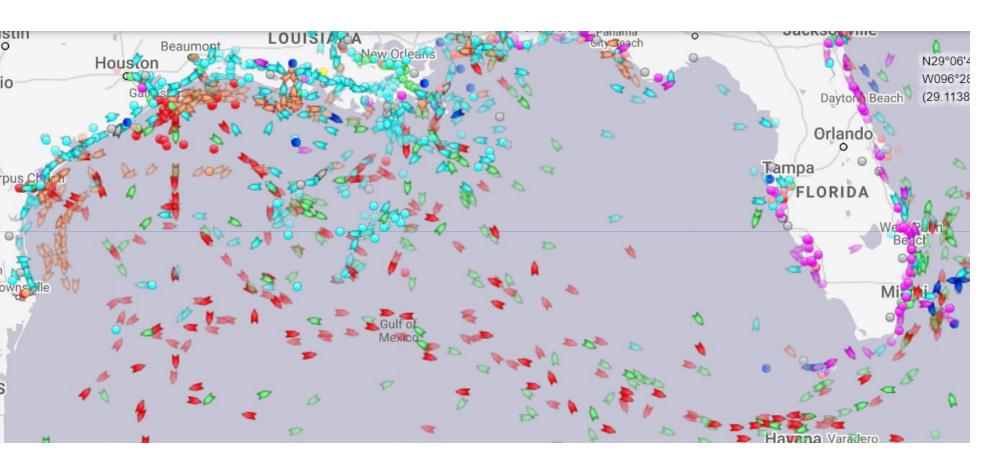
11 fatalities during Hurricane Lorenzo (2019)

**BOUNTY** 

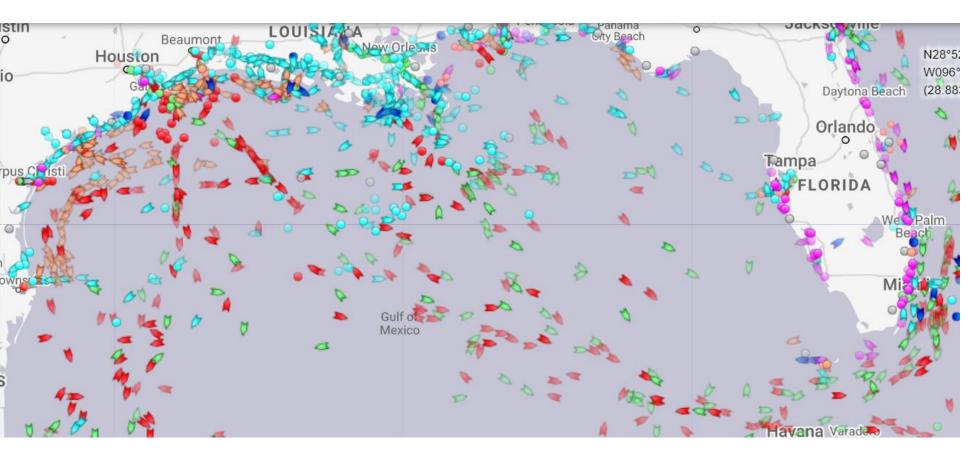
2 fatalities during Hurricane Sandy (2012)

**FANTOME** 

31 fatalities during Hurricane Mitch (1998)

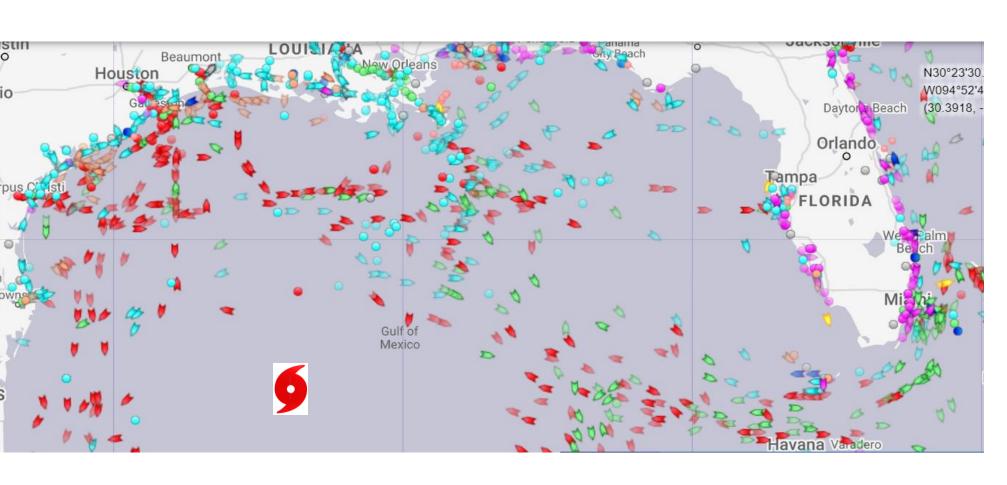


October 6<sup>th</sup>, 2pm EDT



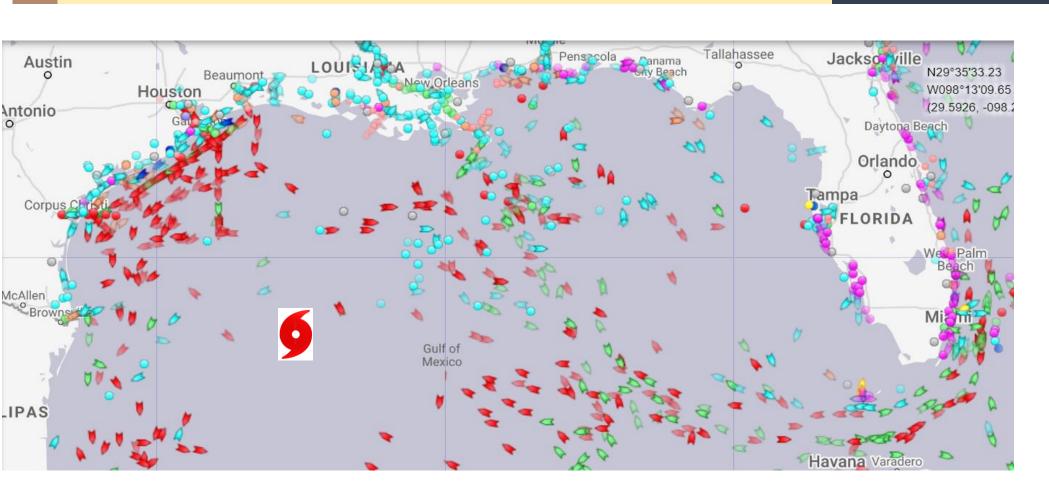
October 7<sup>th</sup>, 9am EDT



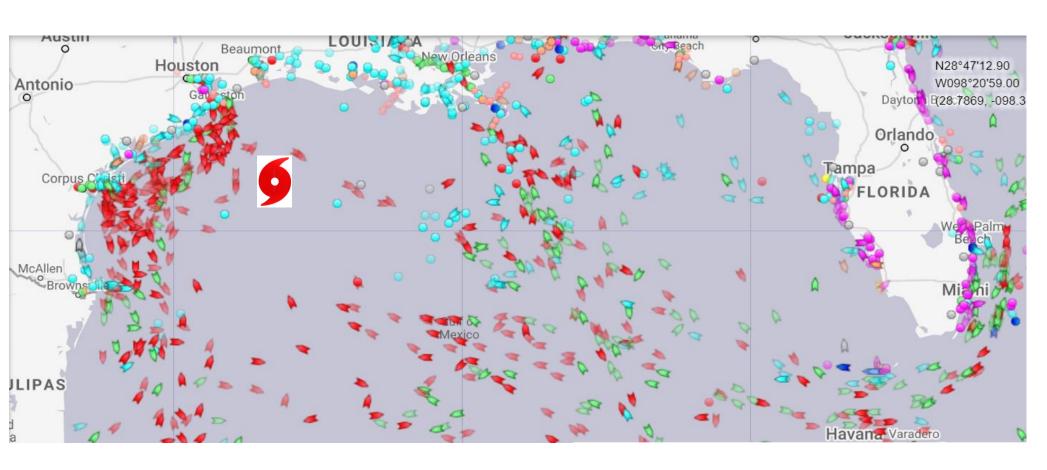


October 8th, 9am EDT

Hurricane Delta - 2020

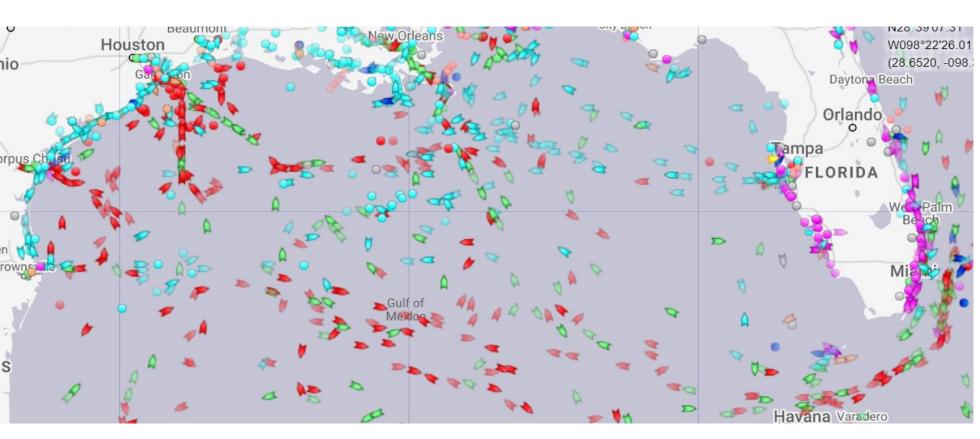


October 8<sup>th</sup>, 5pm EDT

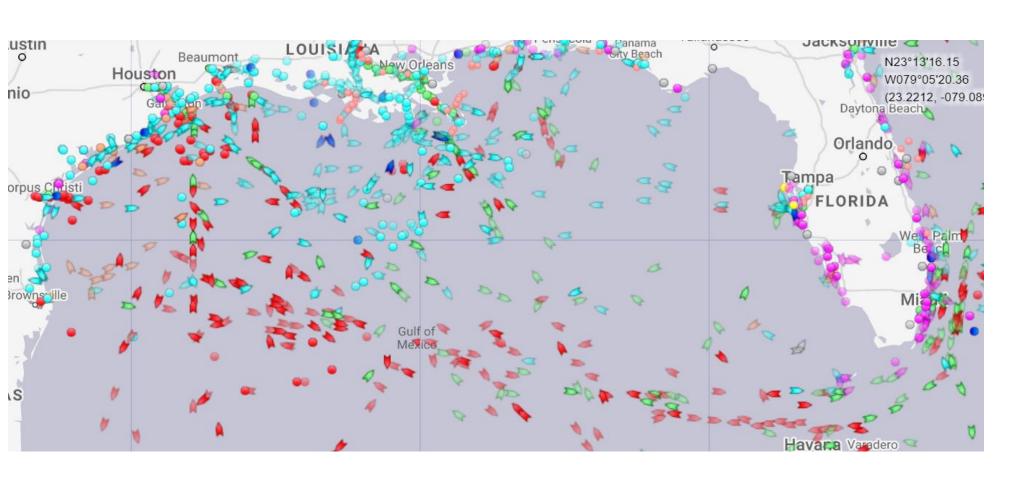


October 9th, 9am EDT





October 10<sup>th</sup>, 1pm EDT



October 11<sup>th</sup>, 7am EDT

- On-demand, site-specific weather forecasts issued by the National Weather Service in support of incident management decisions
  - The National Hurricane Center can issue spot forecasts to support USCG response to marine incidents or search and rescue operations



54 Spot Forecasts by NHC/TAFB for 2022 U.S. Coast Guard District Operations

## Example: Bourbon Rhode Sinking

Hurricane Lorenzo (2019)

 We provided 35 spot forecasts for the Bourbon Rhode SAR and recovery efforts from Sep 26-Oct 5, 2019





SPOT FORECAST FOR Vessel In Distress...USCG NWS NATIONAL HURRICANE CENTER MIAMI FL 929 PM EDT Thu Sep 26 2019

Forecast is based on forecast start time of 2048 EDT on September 26. If conditions become unrepresentative...contact the NWS National Hurricane Center/Tropical Analysis and Forecast Branch at (305)229-4425.

.DISCUSSION...At 500 PM AST (2100 UTC), the center of Hurricane Lorenzo was located near latitude 16.5 North, longitude 40.8 West. Lorenzo is moving toward the northwest near 11 kt and this motion is expected to continue through tonight. A turn toward the northnorthwest is expected on Friday, followed by a turn toward the north on Saturday. Winds and seas for the forecast location will improve during the next couple of days as Hurricane Lorenzo moves farther away.

#### .TONIGHT...

TIME (EDT)	8 PM	10 PM	MIDNGT	2 AM	4 AM
Sky (%)	91	88	88	88	91
Weather cov	SCTTRD	SCTTRD	SCTTRD	SCTTRD	SCTTRD
Weather type	RNSHWR	RNSHWR	RNSHWR	RNSHWR	RNSHWR
Tstm cov	ISOLTD	ISOLTD	ISOLTD	ISOLTD	ISOLTD
Temp	.77	76	76	76	75
Surface wind	SW 30	SW 30	S 30	S 29	S 29
Surface wnd gst.	51	51	50	49	49
Swell hgt (ft)	NW 12	NW 12	NW 12	NW 9	NW 9
Swell period (s)	11	11	11	10	10
Wave period (s).	11	11	11	10	10
Wind wave (ft)	. 9	9	9	9	9
Wave height (ft)	19	19	17	16	16



## **Marine Weather**

- Surface wind/gust (kt)
- Significant wave height (ft)
  - Swell height
  - Wind wave height
- Dominant wave period (s)
- Sea surface temperature (°F)
- Sky coverage/weather
- Max/min temperature (°F)
- Dew point (°F)
- Humidity

## Do you need aviation forecast support?

• Let us know, and we can pass along the incident details and your contact information to the NOAA Aviation Weather Center for further assistance.





## Requesting Spot Forecasts

How do you submit a direct forecast request?





#### Spot Forecast Request

NOTICE - This interface is intended to be used solely for the relay of forecast information to the National Weather Service. Submissions sent through this online form are intended for internal agency use. We are required (by e-Gov Act of 2002) to explicitly state that submission of any information is voluntary. For further information please read our Privacy Policy and Disclaimer. False statements on this form may be subject to prosecution under the False Statement Accountability Act of 1996 (18 U.S.C. § 1001) or other statutes.

#### Incident and Decision Support Forecast Request

This site is the National Weather Service interface to requesting, filling, and monitoring spot forecasts issued by our Forecast Offices and National Centers

#### Click here to provide 'Spot Webpage Testing Feedback'

Interactive Request:

Request a spot forecast using an interactive map, with or without a Lat/Lon of the incident

Spot

Use this to monitor existing spot requests and forecasts.

Please take the online survey to let us know what you think of this interface Download the Product Description Document (PDD)

Spot forecast Release 1, revision 228 Snot forecast database schema 2 20



National Weather Service 1325 East West Highway Silver Spring, MD 20910

Page Author: NWS Internet Services Team Web Master: w-nws.webmaster@noaa.gov Disclaimer Credits Glossary

Comments/Feedback Privacy Policy About Us Career Opportunities  You can directly submit spot forecast requests to us:

https://www.weather.gov/spot/request/

- We will share step-by-step instructions on how to use the web request interface
- If further assistance is needed for a marine incident, feel free to call our 24/7/365 forecast operations:
  - 305-229-4424

## Spot Forecasts in Action



010925Z MAR 23

HYDROLANT 469/23(11).

GULF OF MEXICO.

DNC 15.

VESSEL, EIGHT PERSONS ON BOARD, REQUEST ASSISTANCE IN 26-27.89N 089-14.70W AT

010723Z MAR. VESSELS IN VICINITY REQUESTED

TO KEEP A SHARP LOOKOUT, ASSIST IF POSSIBLE.

REPORTS TO RCC NEW ORLEANS,

PHONE: 855 485 3727, FAX: 504 589 2148,

E-MAIL: D8COMMANDCENTER@USCG.MIL.//

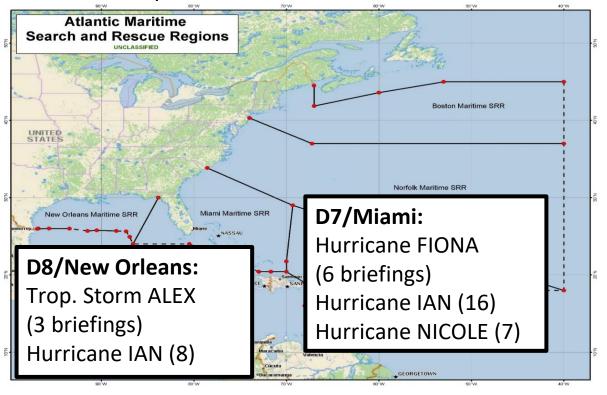
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- If further assistance is needed for a marine incident, feel free to call our 24/7/365 forecast operations:
  - 305-229-4424



- Tropical Storm force winds may be impacting coastline within 5 days
- Hurricane conditions in Search and Rescue Area (SAR) within 5 days



#### **BRIEFING GOALS**

- Potential impacts to mariners over the Gulf of Mexico,
   Caribbean Sea, and Atlantic in their SR
- Potential impacts to <u>major ports in the United States</u>
- Potential impacts to <u>USCG District 7</u> facilities and personnel
- Potential impacts to other countries in the Caribbean that may need USCG assistance.

4/4/2023 4:47 PM www.nhc.noaa.gov

## Tropical Briefings



- Provide tailored information for
  - Wind Hazards, including time of arrival and departure
  - Rainfall/inland flooding potential
  - Storm Surge Information
  - Wave heights
  - Tornadoes



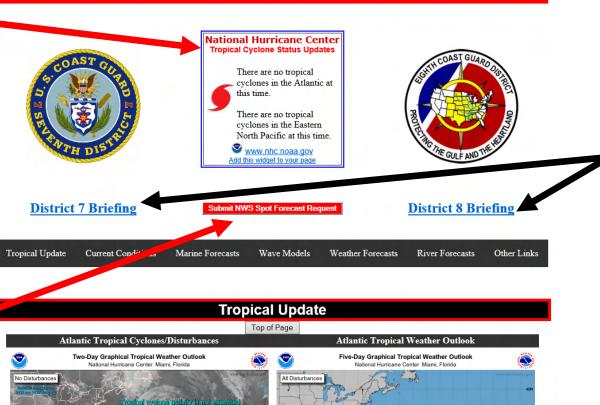
4/4/2023 4:47 PM www.nhc.noaa.gov

NHC/TAFB Experimental Gridded Marine Forecasts

6/15/2020 3:04 PM



NHC Tropical Cyclone Status Updates

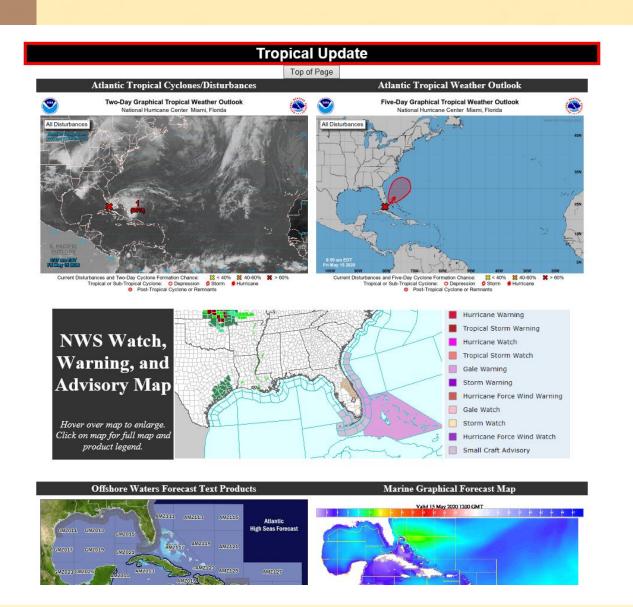


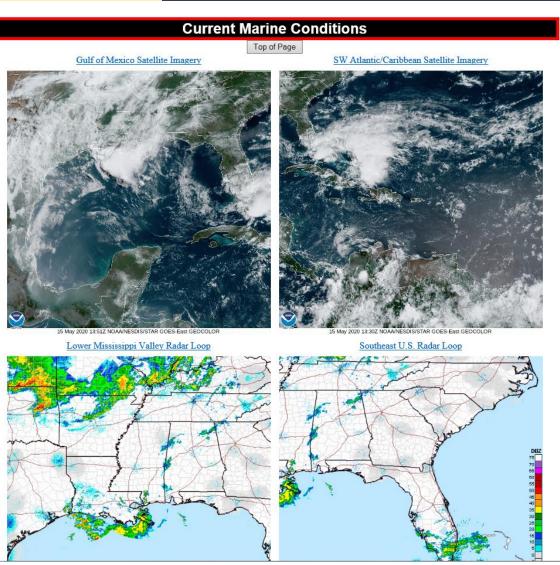
Submit NWS Spot Forecast Request Latest Hurricane
Briefings
Available to
Download
(in development)

## USCG Weather Support Webpage



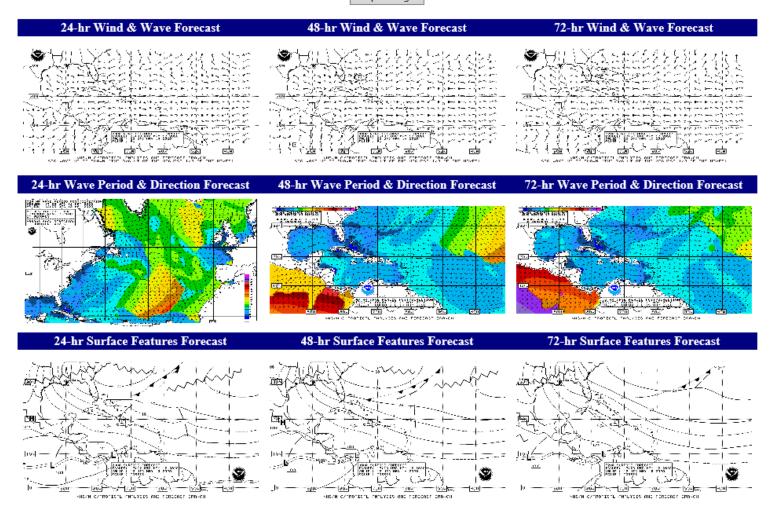
Tropical Analysis and Forecast Branch NWS National Hurricane Center





#### **Gulf of Mexico & Atlantic Marine Forecasts**

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## USCG District 8 Hurricane Tabletop Exercise April 20-21, 2022

#### **Planning**

- Stephen Konarik led the TAFB team with Andrew Hagen and Amanda Reinhart
- Began planning with USCG District 8 in January 2022
- Two separate, simultaneous hurricanes impacting District 8/Gulf of Mexico (Texas coast and Florida Panhandle/Mobile Bay
- Alexandria Andonian (Storm Surge Unit) provided the Storm Surge forecasts

#### Exercise

- Organized 5 full briefings with each having 2 "mini" briefings within them (24 separate briefings altogether)
- On May 8, Chris Landsea, Stephen Konarik, Amanda Reinhart, Brad Reinhart, and Aidan Mahoney toured D8 facilities in New Orleans and provided additional training



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# Thank you for your continued partnership!





