

The National Hurricane Center's Tropical Analysis and Forecasting Branch Weather Support for the USCG

Stephen Konarik

NHC/TAFB Marine Forecaster

USCG/Navy/NOAA Partners Focal Point



NHC Staff & Support

Director's Office

- Director
- Deputy Director
- Public Affairs Officer
- Administrative Officer
- 2 Administrative Support
- Administrative Support Contractor
- Librarian

World
Meteorological
Organization
Regional
Association IV
Hurricane
Attachments

Visiting
Scientists

Hurricane Specialist Unit (HSU)

- Branch Chief
- 6 Senior Hurricane Specialists & Warning Coordination Meteorologist
- 4 Hurricane Specialists
- Navy Hurricane Specialist

Tropical Analysis & Forecast Branch (TAFB)

- Branch Chief
- 5 Lead Marine Forecasters
- 6 Marine Forecasters
- 6 Surface Analysts

US Air Force

3 from the Chief, Aerial Reconnaissance Coordination, All Hurricanes Unit (CARCAH)

FEMA

2 Hurricane Liaison Team

Technology & Science Branch (TSB)

- Branch Chief
- Science Operations Officer
- 6 Meteorologist/Programmers
- 3 National Centers for Environmental Prediction Central Operations

Storm Surge Unit (SSU)

- Team Lead
- 3 Storm Surge Specialists
- National Oceanic and Atmospheric Administration Corps Officer
- 5 Storm Surge Support Contractors

TSB Project Contractors:

- 3 Hurricane Forecast Improvement Project Developers
- Joint Hurricane Testbed Facilitator

Tropical Analysis & Forecast Branch

Tropical Analysis & Forecast Branch (TAFB)

- Branch Chief
- 5 Lead Marine Forecasters
- 6 Marine Forecasters
- 7 Surface Analysts

TAFB Configuration

- Pacific Desk
- Atlantic Desk
- Surface Analyst Desk
- Experimental IDSS Desk

Pacific Desk

- Produce forecast for the Pacific waters east of 140W.
- Issue Marine Warnings
- High Seas Forecast
- Offshore Forecast
- Tropical Weather Discussion -Pacific

Atlantic Desk

- Produce forecast for the Gulf of Mexico, Caribbean and N. Tropical Atlantic
- Issue Marine Warnings
- High Seas Forecast
- Offshore Forecast
- NAVTEX/VOBRA

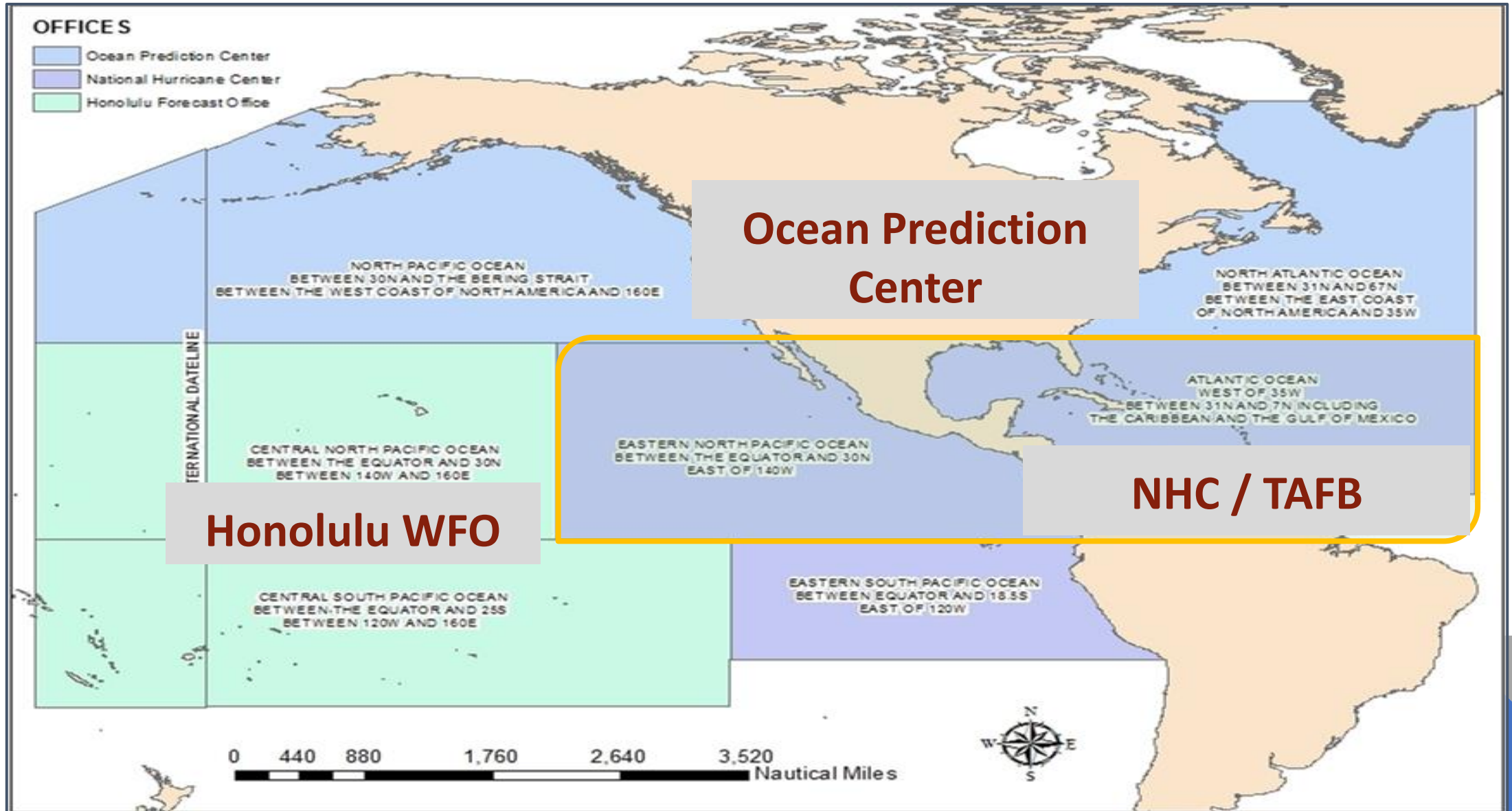
Surface Analyst

- Unified Surface Analysis
- Intermediate weather maps for WPC
- Coordinate with OPC, HFO and WPC
- Track tropical waves
- Tropical Weather Discussion - Atlantic
- Surface features: 24, 48, & 72 hr

Experimental 4th IDSS Desk

- Spot Marine Forecast
- Provide IDSS briefings to USCG
- Assists Dvorak classifications
- Social media Twitter/ Briefings

TAFB Area of Responsibility



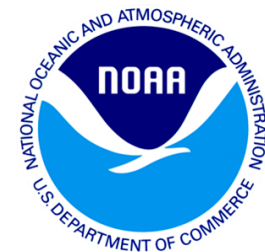
USCG/NOAA Memorandum of Agreement

Interagency coordination to support our common goals

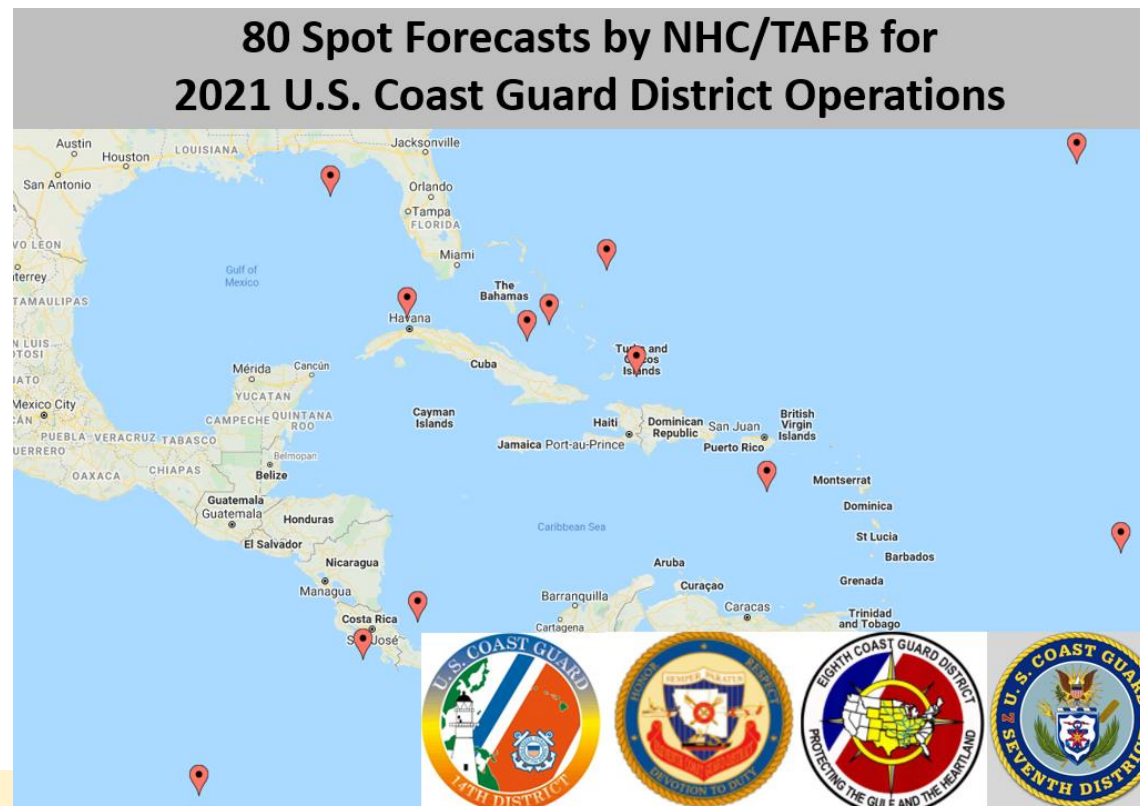


Tropical Analysis and Forecast Branch
NWS National Hurricane Center

- “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...”



- 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



We provide spot forecasts for our
Offshore Waters and High Seas

2019: 54

2020: 37

2021: 73

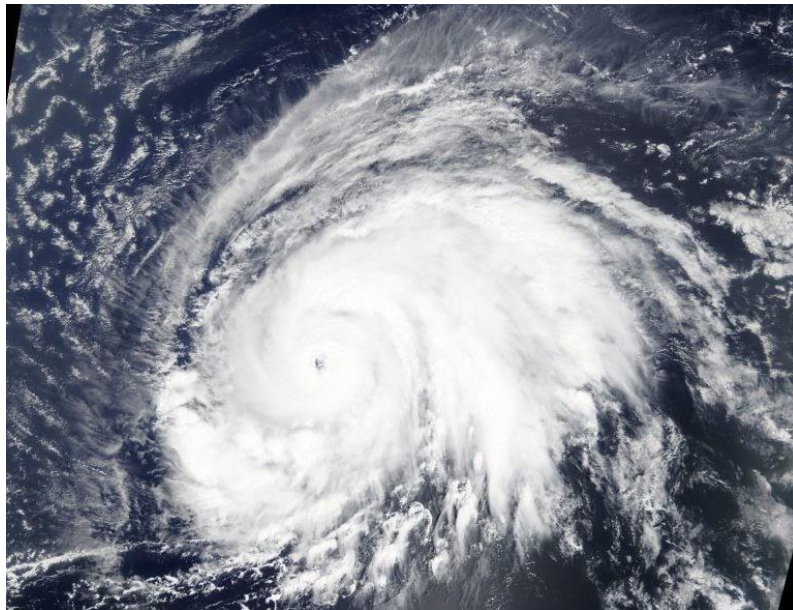
Example: *Bourbon Rhode* Sinking

Hurricane Lorenzo (2019)



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

- 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 north-northwest 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 |

Spot Forecast Content

What marine weather information can we provide?



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

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.

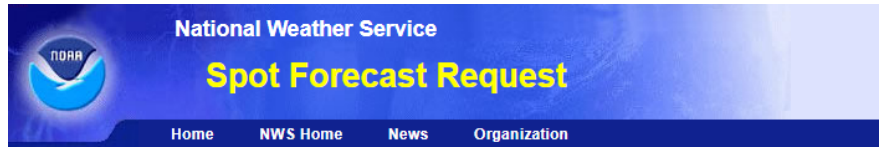


Requesting Spot Forecasts

How do you submit a direct forecast request?



Tropical Analysis and Forecast Branch
NWS National Hurricane Center



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'](#)

Submit Spot Request

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

Monitor Spot Forecasts

Monitor:
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
Spot 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

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- 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**

Tropical Briefings



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

TYPICALLY ISSUED WHEN

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

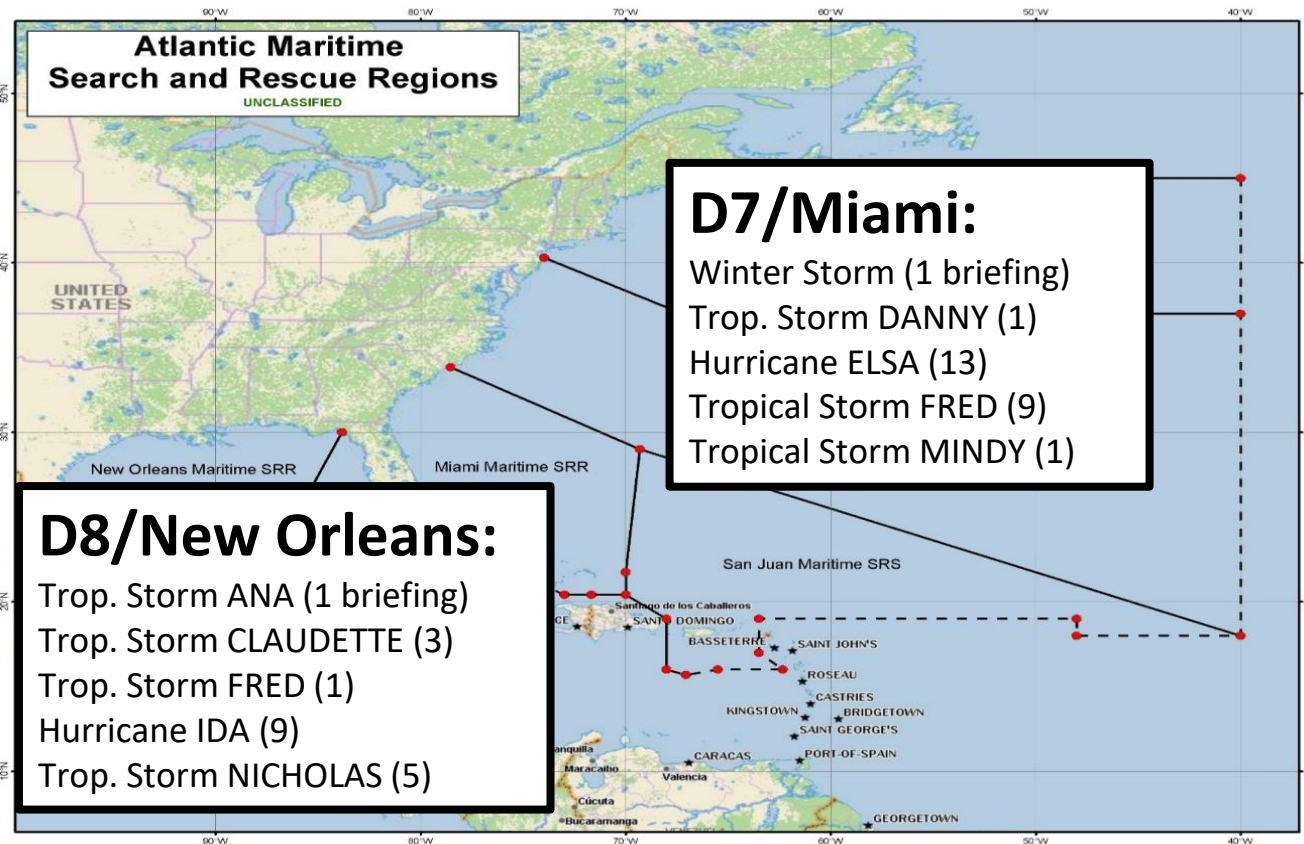
2019 briefings: 42

2020 briefings: 82

2021 briefings: 44

BRIEFING GOALS

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

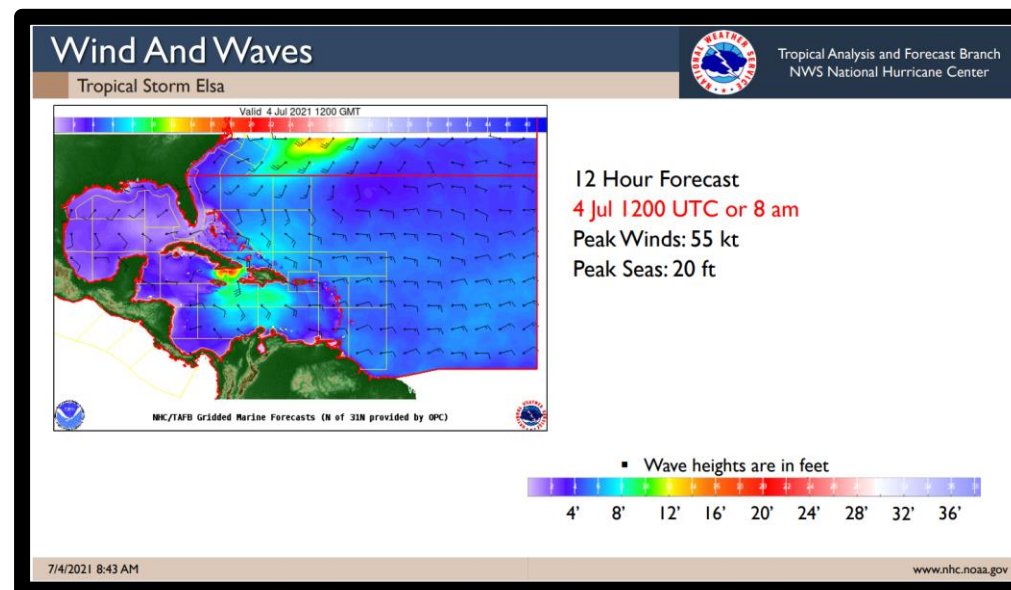
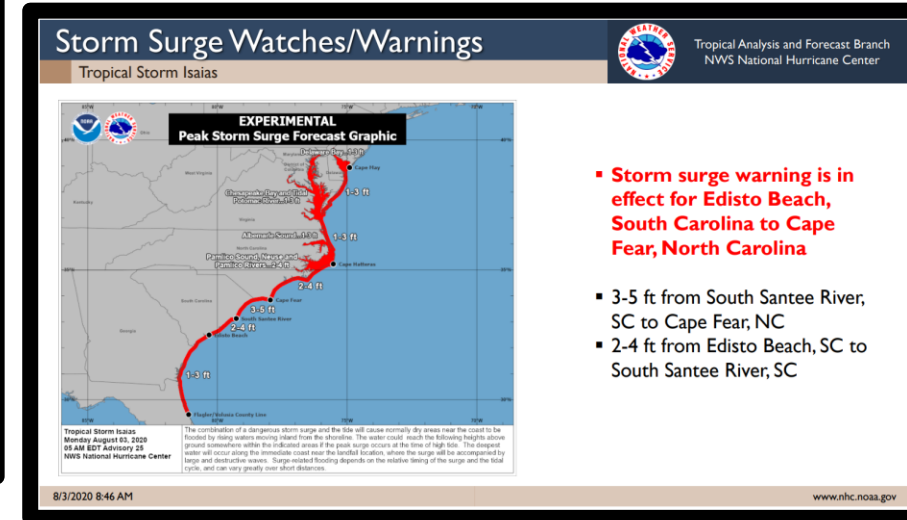
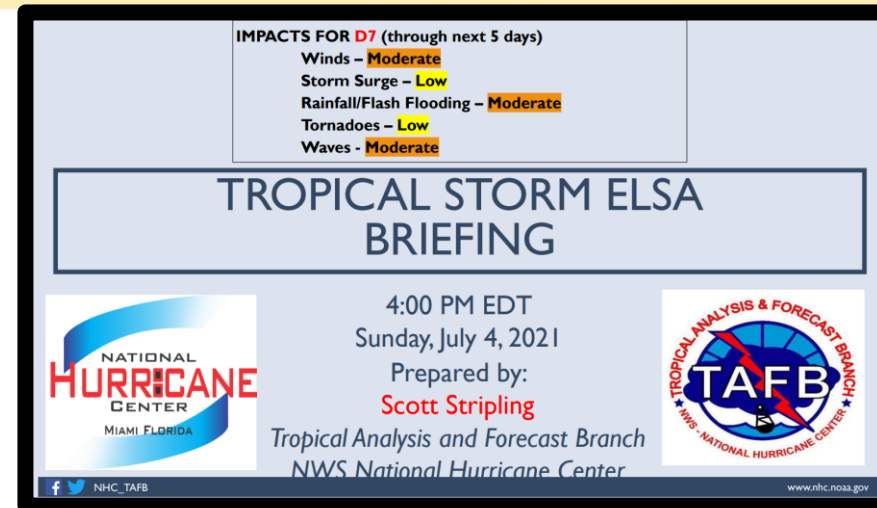


Tropical Briefings



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

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



Example of Tropical Briefing



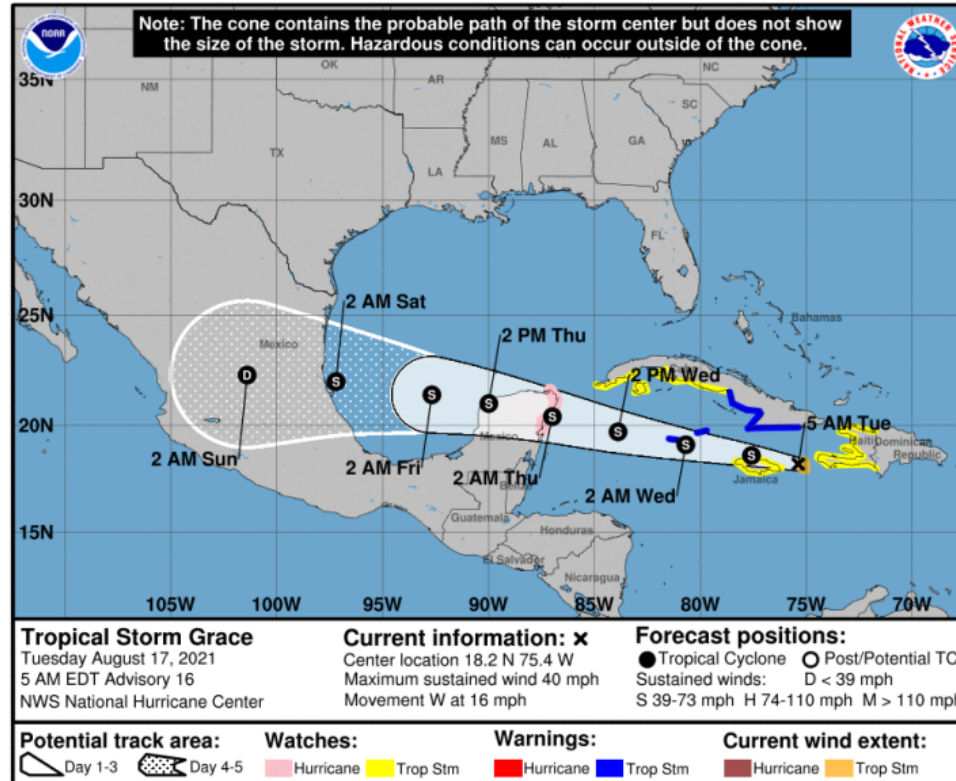
Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Forecast Information

Tropical Storm Grace



Tropical Analysis and Forecast Branch
NWS National Hurricane Center



NOTE: Do not focus on the exact track. Impacts can occur well outside the area enclosed by the cone.

- **Grace will pull away from Haiti late today. Winds will diminish from the SW peninsula of Haiti during the afternoon, but seas near the coast may not subside until this evening. Rainfall may not end until late afternoon or evening.**

- **Grace expected to strengthen and move westward**

- Current center forecast positions through the next 5 days (if applicable) illustrated by dots
- White swath of potential track error added to each side of the forecast track through day 3
- Hatched swath of potential track error added to each side of the forecast track days 4-5

** Swaths are calculated using average track errors and actual track may be well inside, or possibly outside the potential track areas indicated.

8/17/2021 8:39 AM

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Example of Tropical Briefing



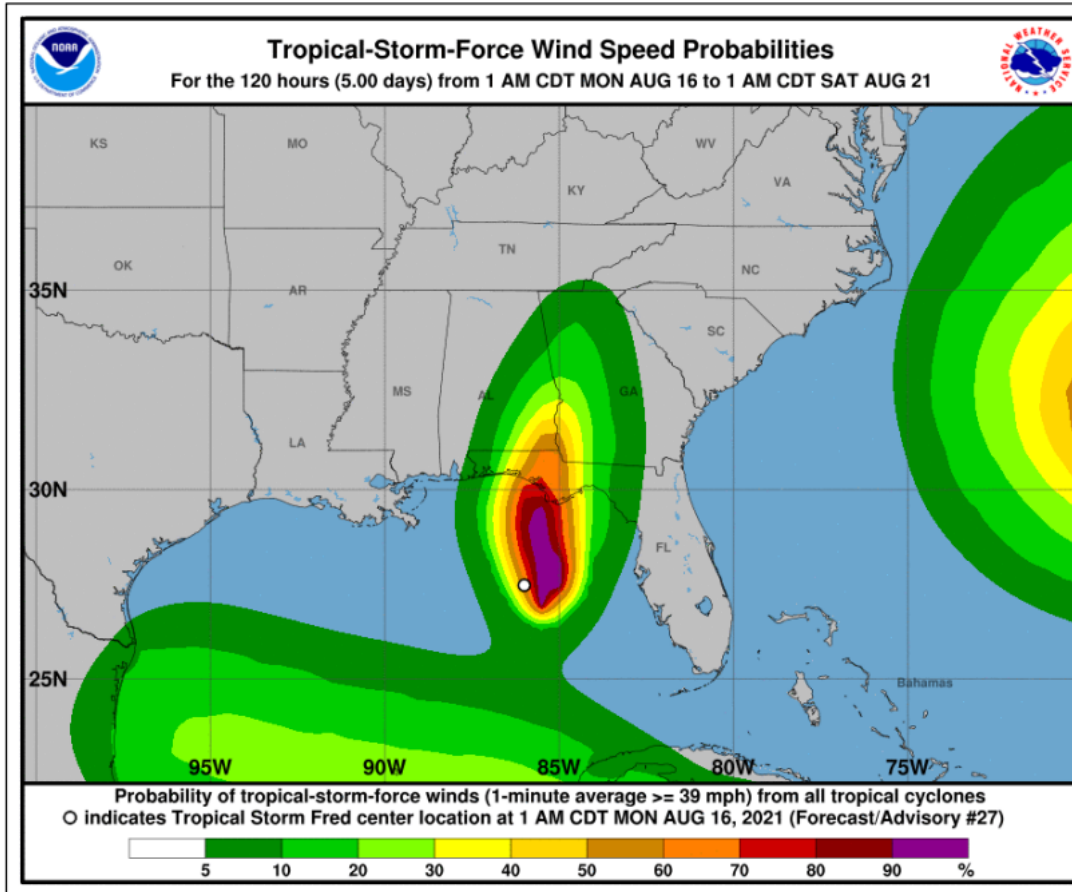
Tropical Analysis and Forecast Branch
NWS National Hurricane Center

T.S. Wind Speed Probabilities

Tropical Storm Fred



Tropical Analysis and Forecast Branch
NWS National Hurricane Center



- **Apalachicola: 75%**
- **Panama City: 85%**
- **Destin: 30%**
- Probabilities of sustained tropical storm force winds (34 kt to 63 kt) over the next 5 days, based off this cyclone's wind radii and track.
- Clear or dark green are the lowest chances of 0-30%.
- Yellow to orange is 31-70%
- Red through purple are the highest probabilities of 71%-100%
- See the color bar below the image for more details.

8/16/2021 8:47 AM

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Example of Tropical Briefing



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NWS National Hurricane Center

Hurricane Wind Speed Probabilities

Hurricane Camila



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NWS National Hurricane Center



- Charleston: 50-60%
- Savannah: 40%
- Probabilities of sustained hurricane force winds (64 kt +) have increased for both cities since the previous advisory

Example of Tropical Briefing



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Most Likely Time of Arrival and Tropical Storm Wind Speed Probabilities

Hurricane Camila



Tropical Analysis and Forecast Branch
NWS National Hurricane Center



- **Charleston: Tuesday night**
- **Savannah: Wednesday morning**
- The most likely time of arrival of Tropical Storm Force Winds (34 kt to 63 kt) for this cyclone based off the current track and wind radii.

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Example of Tropical Briefing



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Expected Storm Total Rainfall and Chance of Rainfall Flooding - Weather
Prediction Center

Hurricane Camila



Tropical Analysis and Forecast Branch
NWS National Hurricane Center



- Total rainfall in inches over the next 3 days



Risk of rainfall exceeding flash flood guidance
within 25 miles of a point

HIGH: > 50%
MDT: 20%-50%

SLGT: 10%-20%
MRGL: 5%-10%

Day 3
(Wednesday)

Risk of rainfall exceeding flash flood guidance
within 25 miles of a point

HIGH: > 50%
MDT: 20%-50%

SLGT: 10%-20%
MRGL: 5%-10%

Refer to map legend for Valid Time

Example of Tropical Briefing



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Tornado Potential - Storm Prediction Center

Hurricane Camila



Tropical Analysis and Forecast Branch
NWS National Hurricane Center



Day 3 (Wednesday)

10

Example of Tropical Briefing



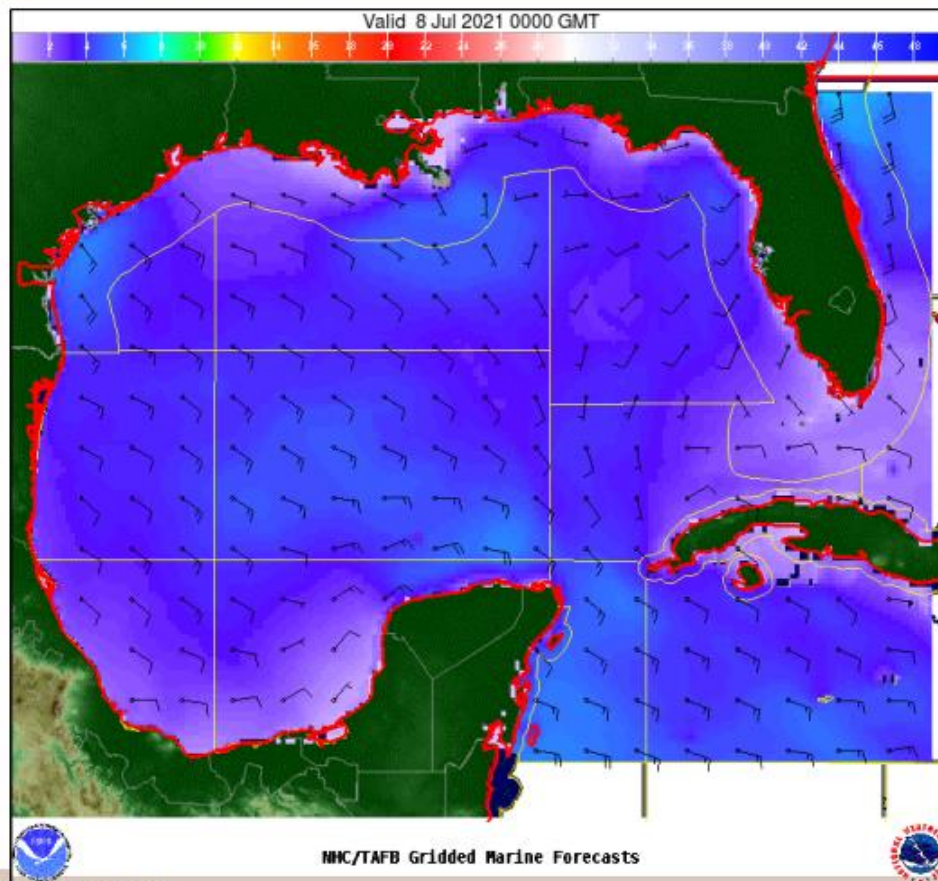
Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Wind And Waves

Tropical Storm Elsa



Tropical Analysis and Forecast Branch
NWS National Hurricane Center



12 Hour Forecast
8 Jul 0000 UTC or 8 pm
Inland across S central Georgia
Peak Winds: 35 kt
Peak Seas: 4-5 ft NE Gulf waters

▪ Wave heights are in feet



7/7/2021 3:35 PM

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Example of Tropical Briefing



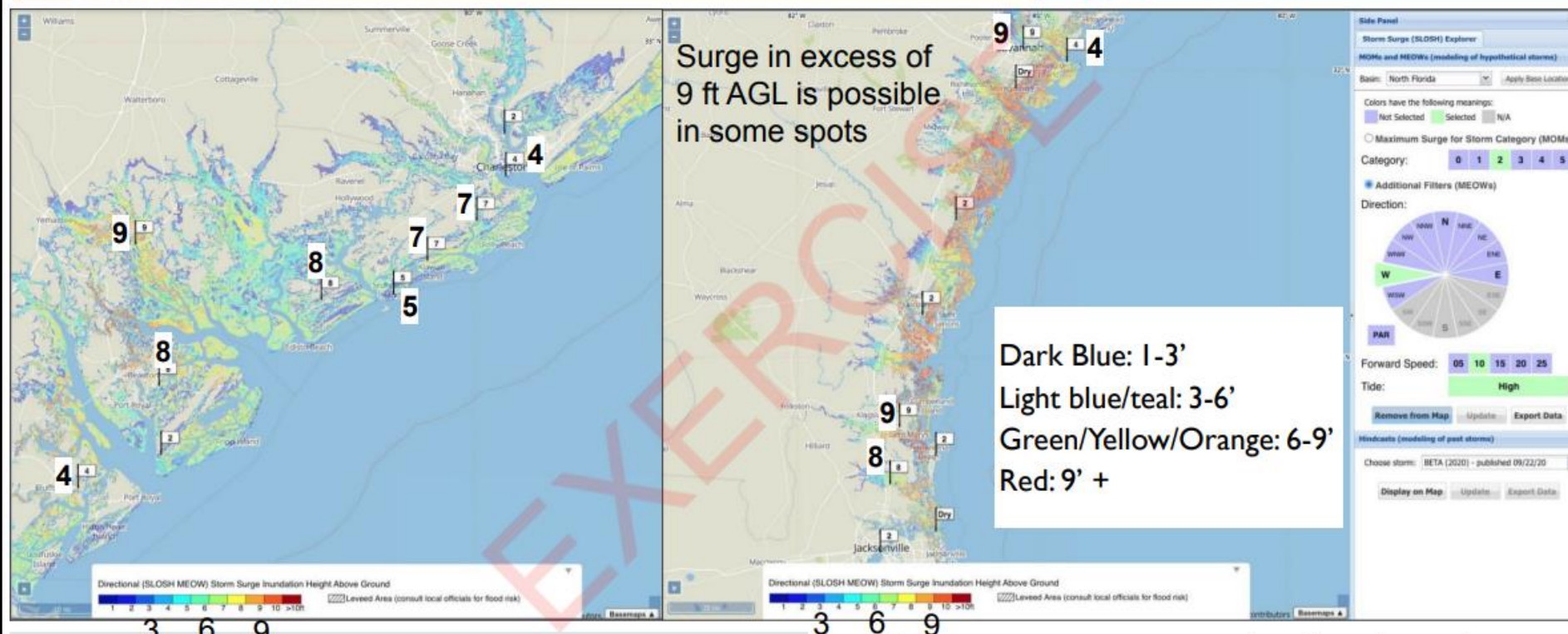
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NWS National Hurricane Center

Storm Surge

Hurricane Camila



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NWS National Hurricane Center



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Example of Tropical Briefing



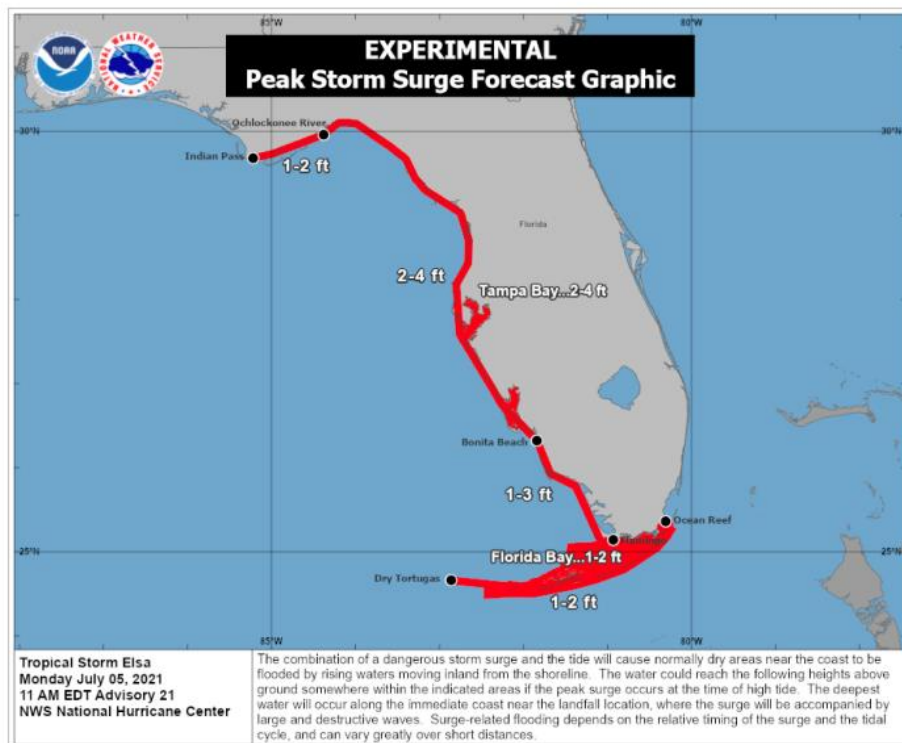
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NWS National Hurricane Center

Potential Peak Storm Surge / Watches and Warnings

Tropical Storm Elsa



Tropical Analysis and Forecast Branch
NWS National Hurricane Center



- Potential storm surge is represented in feet above the ground at any given point.

7/5/2021 3:46 PM

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Example of Tropical Briefing



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Key Messages

Tropical Storm Elsa



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Key Messages for Tropical Storm Elsa
Advisory 20: 5:00 AM EDT Mon Jul 05, 2021

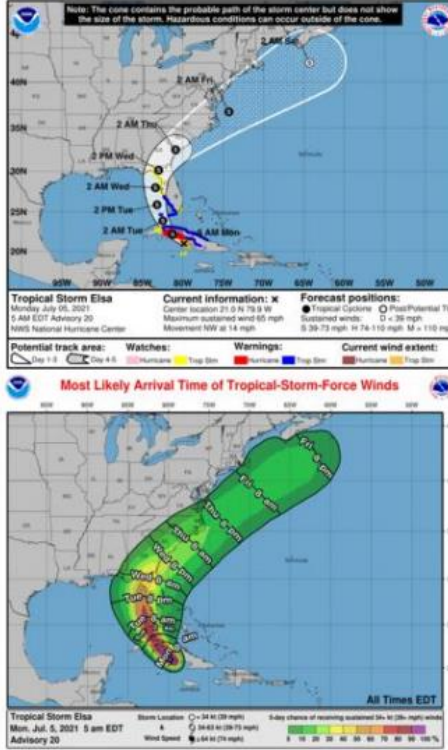
1. Heavy rain will impact the Cayman Islands and Cuba today resulting in significant flooding and mudslides over Cuba. As Elsa approaches the Florida Keys, Florida Peninsula, and coastal Georgia Monday through Wednesday, heavy rainfall may result in isolated flash, urban, and minor river flooding. Mid to late week, heavy rains across coastal South Carolina and North Carolina may result in isolated flash and urban flooding.

2. Tropical storm conditions and a dangerous storm surge are expected to continue across portions of central and western Cuba today. Hurricane conditions are also possible along the south coast this morning.

3. Tropical storm conditions are expected in portions of the Florida Keys and southwestern Florida tonight and Tuesday, where a Tropical Storm Warning is in effect. A Tropical Storm Watch and a Storm Surge Watch are in effect for much of the west coast of Florida.

4. There is a risk of tropical storm conditions and storm surge impacts along the coasts of Georgia and the Carolinas Wednesday and Thursday.

For more information go to hurricanes.gov



| Forecast positions: |
|---------------------------------------|
| ● Tropical Cyclone |
| ○ Potential TC |
| Sustained winds: 30 mph |
| 39-73 mph: 14-74-110 mph: M = 110 mph |

| Potential track area: |
|-----------------------|
| Day 1-3 |
| Day 4-5 |
| Hurricane |
| Trop. Storm |
| Watches |
| Warnings |
| Current wind extent: |
| Hurricane |
| Trop. Storm |

Most Likely Arrival Time of Tropical-Storm-Force Winds

Tropical Storm Elsa
Mon. Jul. 5, 2021 5 am EDT
Advisory 20

- Tropical Storm conditions and heavy rainfall expected across Cuba today and will spread across the Straits of Florida and into extreme south Florida waters today through this evening.
- Tropical Storm winds will move into Straits of Florida early this afternoon with seas quickly building to around 20 ft again this evening through tonight as Elsa passes across Lower Florida Keys.
- Elsa expected to approach Tampa Bay/ St Petersburg area late Tuesday afternoon with moderate storm surge potential inside the bay.

7/5/2021 8:42 AM

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USCG Weather Support Webpage

<https://www.nhc.noaa.gov/uscg/>



Tropical Analysis and Forecast Branch
NWS National Hurricane Center

NHC Tropical Cyclone
Status Updates



Latest Hurricane
Briefings
Available to
Download

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[District 8 Briefing](#)

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Submit NWS Spot
Forecast Request



USCG Weather Support Webpage

<https://www.nhc.noaa.gov/uscg/>

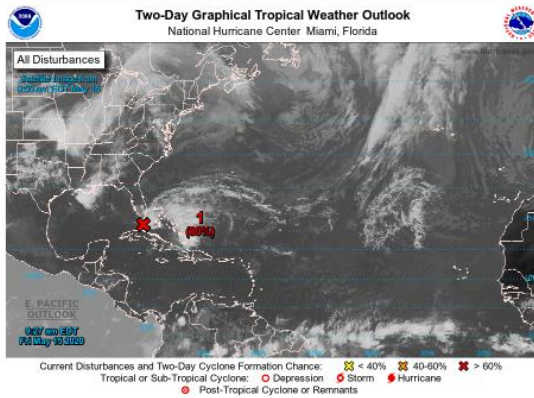


Tropical Analysis and Forecast Branch
NWS National Hurricane Center

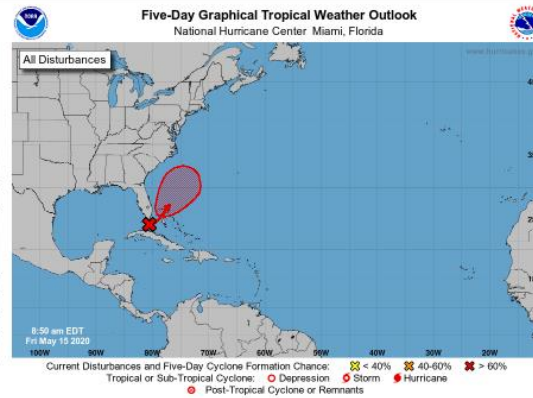
Tropical Update

[Top of Page](#)

Atlantic Tropical Cyclones/Disturbances

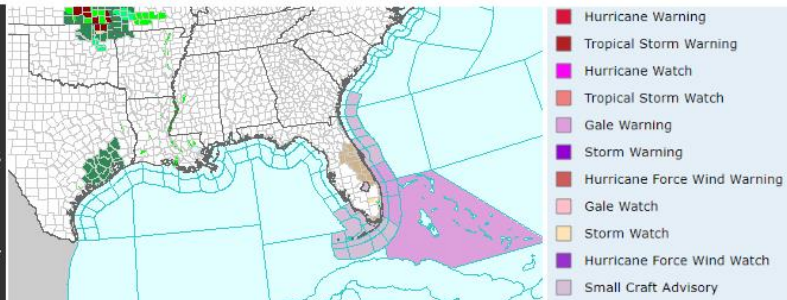


Atlantic Tropical Weather Outlook



NWS Watch, Warning, and Advisory Map

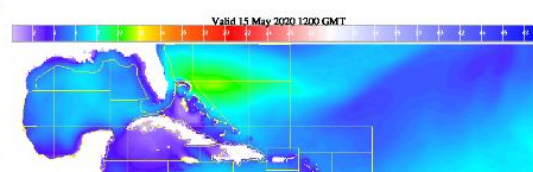
Hover over map to enlarge.
Click on map for full map and product legend.



Offshore Waters Forecast Text Products



Marine Graphical Forecast Map



Current Marine Conditions

[Top of Page](#)

Gulf of Mexico Satellite Imagery



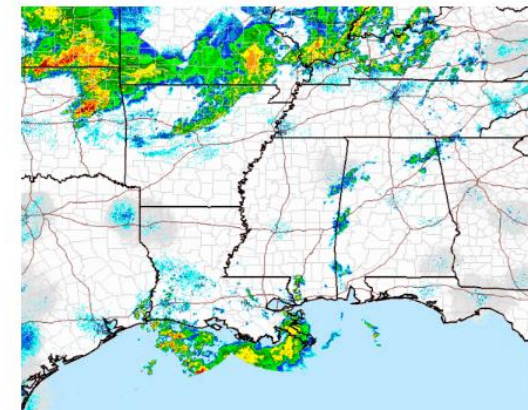
15 May 2020 13:51Z NOAA/NESDIS/STAR GOES-East GEOCOLOR

SW Atlantic/Caribbean Satellite Imagery

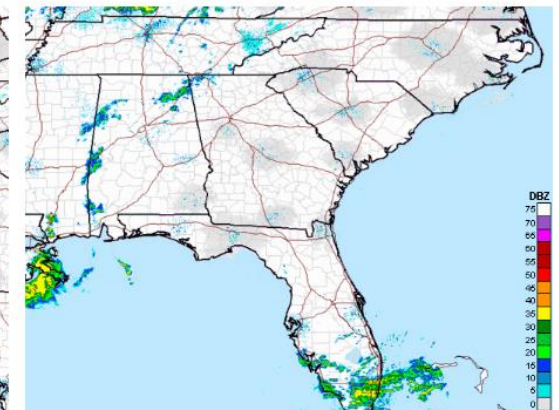


15 May 2020 13:30Z NOAA/NESDIS/STAR GOES-East GEOCOLOR

Lower Mississippi Valley Radar Loop



Southeast U.S. Radar Loop

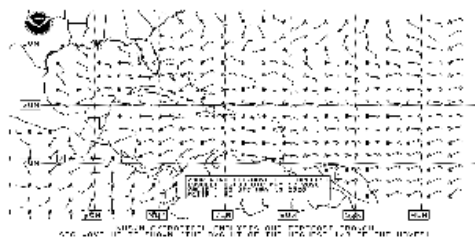




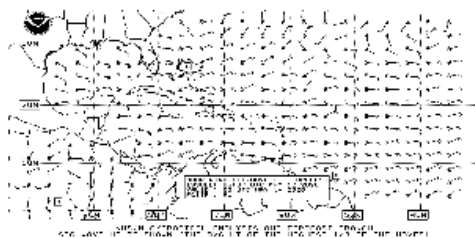
Gulf of Mexico & Atlantic Marine Forecasts

[Top of Page](#)

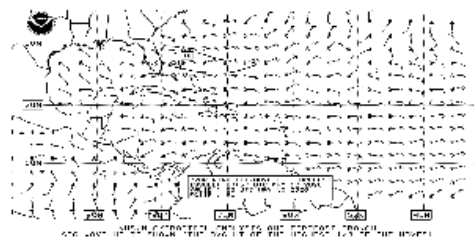
24-hr Wind & Wave Forecast



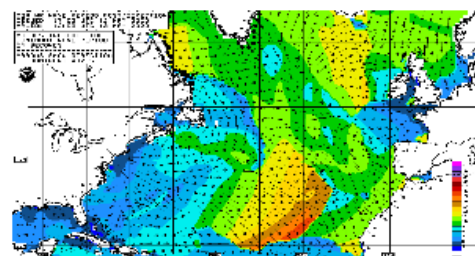
48-hr Wind & Wave Forecast



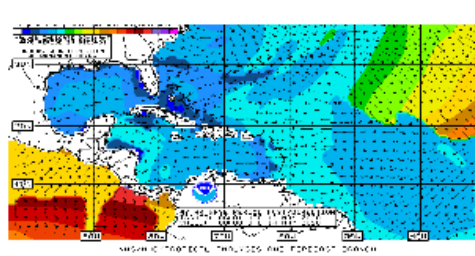
72-hr Wind & Wave Forecast



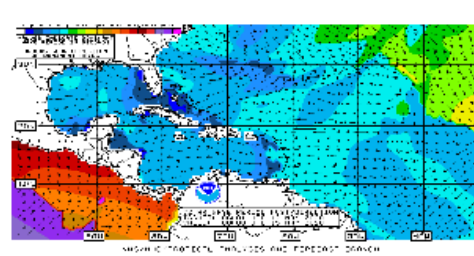
24-hr Wave Period & Direction Forecast



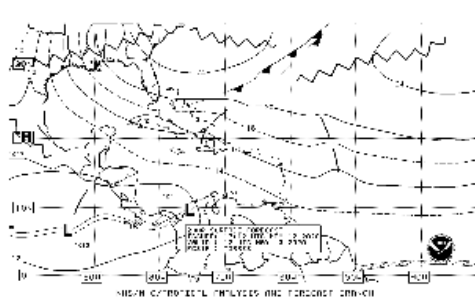
48-hr Wave Period & Direction Forecast



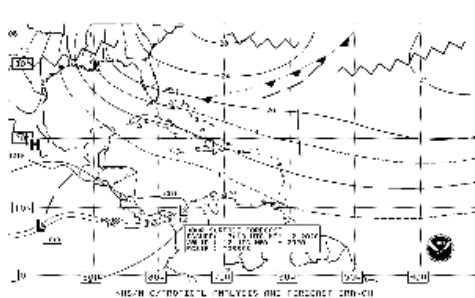
72-hr Wave Period & Direction Forecast



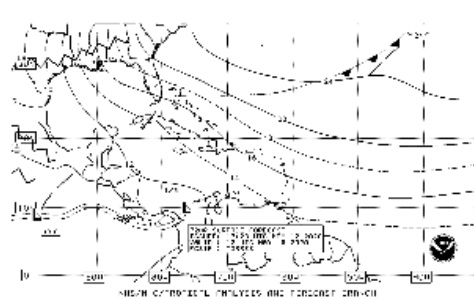
24-hr Surface Features Forecast



48-hr Surface Features Forecast



72-hr Surface Features Forecast





Tropical Analysis and Forecast Branch
NWS National Hurricane Center

Thank you for your continued partnership!

