



Marine Navigation and Port Recovery

Kyle Ward - 24 May 2021





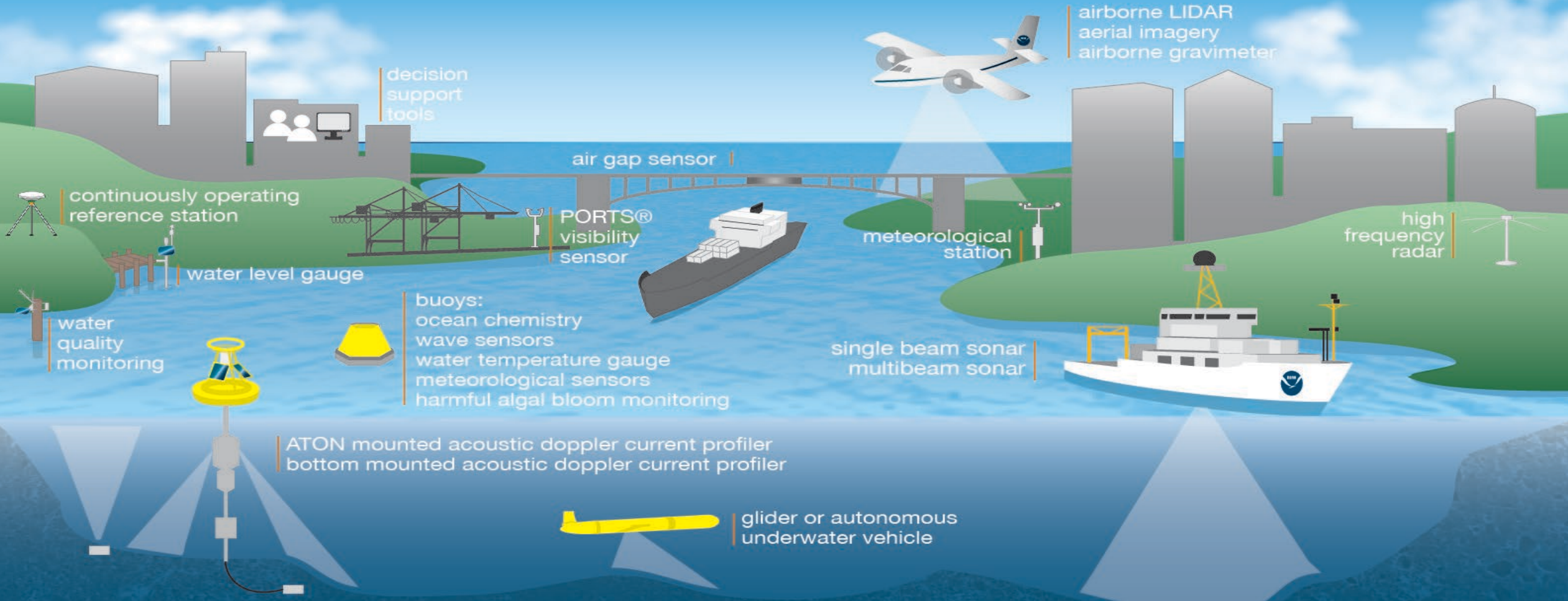


TRANSPORTATION AND COMMERCE

Safe and **efficient** transportation and commerce: helping decision makers along the coast make the best choices for their communities.



satellite communication



NOAA Navigation Services Customers

\$7M/day
lost due
to UKC in
Houston

Tens of thousands SOLAS



Hundreds of thousands Non-SOLAS Commercial



16M
boats in
use in US

A million Large recreational

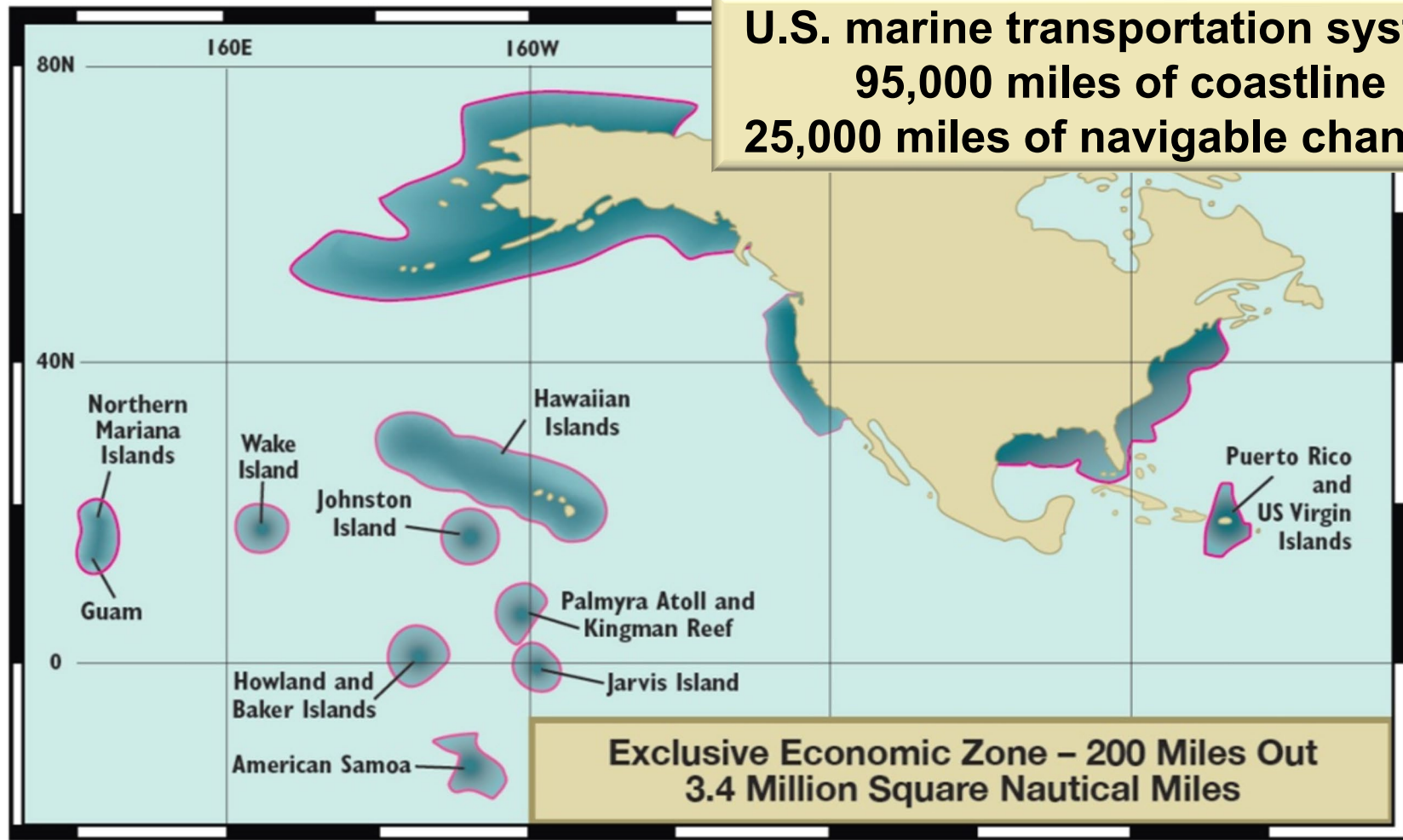


\$36B
annually
spent on
boating*

Tens of millions Small recreational



Coast Survey is the Nation's Chart Maker



**U.S. marine transportation system:
95,000 miles of coastline
25,000 miles of navigable channels**

**Exclusive Economic Zone - 200 Miles Out
3.4 Million Square Nautical Miles**

Coast Survey is the Nation's Chart Maker

Who we are



Our products



Data collection - Conduct hydrographic surveys to collect depth measurements for nautical charts.



Product development - Create nautical charts and other products for safe and efficient navigation.



Product distribution - Distribute nautical charts in multiple formats, capitalizing on digital formats.

Our services



Navigation response - Conduct routine and emergency hydrographic surveys.



Regional support - Navigation managers strategically located in U.S. coastal areas to assist with navigational challenges.



Model development - Develop models for storm surge and hurricane prediction with real-time data feeds.



Technology research - Develop and test new technologies to improve mapping efficiencies.

- One of the responsibilities of a Navigation Manager is to help implement changes within our charting mission that impact users.
- Incorporate stakeholder feedback on these efforts.
- This plan was released in 2017 and details our strategy to improve Nautical Charting



National Charting Plan

A Strategy to Transform Nautical Charting




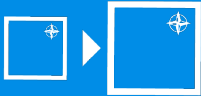




November 1, 2017



Office of Coast Survey
Marine Chart Division

Purpose: Improve NOAA nautical chart coverage, products, and distribution

Improvements:

<p>Reduce unwarranted alarms</p> 	<p>Convert to metric</p> 	<p>Provide timelier data</p> 	<p>Improve chart coverage</p> 
<p>Create an orderly layout</p> 	<p>Reduce uncertainties</p> 	<p>Improve chart update information</p> 	<p>Increase efficiency</p> 

Outcome: Ease of access to more precise, higher-resolution charts that deliver the most up-to-date navigation information possible

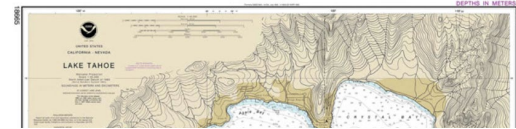


March 2, 2021

NOAA begins transition to electronic navigation charts

by WorkBoat Staff in Government, News

Guest Author: NOAA



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The Ellsworth American.

Thursday - Apr 29, 2021

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112 Main Street, Blue Hill • 207.374.2914
4 Gross Point Road, Orland • 207.469.7313
281 State Street, Ellsworth • 207.667.7134

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NOAA starts phasing out its paper charts

April 13, 2021 by Ethan Center on News, Waterfront

ELLSWORTH — When Karl Brunner takes tourists out on his sail charters and lobster tours, he has a trusty paper nautical chart from the National Oceanic and Atmospheric Administration (NOAA) that acts as a map to the ocean.

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NOAA begins transition exclusively to electronic navigation charts

Digital updates are easier, quicker, increase mariner safety

Oceans & Coasts Charting | nautical charts and maps

SHARE |

February 26, 2021 — NOAA will begin to implement its sunset plan for paper nautical charts this month, starting with the current paper chart 18665 of Lake Tahoe. After August, NOAA's electronic navigational chart will be the only NOAA nautical chart of the area.



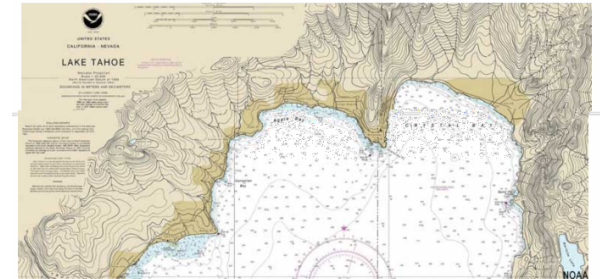
Electronic navigational chart displayed on an Electronic Chart Display and Information System (ECDIS) on NOAA Ship Thomas Jefferson. Photo credit: NOAA

NOAA Kicks Off Transition Exclusively to Electronic Navigation Charts

Mike Schuler

Total Views: 10544

February 26, 2021



NOAA Starts Up Paper Chart Sunset

BY GCN STAFF | MAR 03, 2021

The National Oceanic and Atmospheric Administration has stopped offering the paper and associated raster versions of the marine navigation chart for Lake Tahoe the first chart to be sunsetted under the five-year plan to move to fully electronic navigational charts (ENCs). After August, the agency said in a Feb. 26 announcement the electronic version will be the only NOAA nautical chart of the area.

NOAA Plans to Stop Producing Traditional Paper Charts



File image courtesy NOAA

BY THE MARITIME EXECUTIVE 11-15-2019 09:16:56

On Friday, the U.S. National Oceanic and Atmospheric Administration's Office of Coast Survey announced plans to phase out the production of all traditional paper nautical charts.

Over the next five years, NOAA says that it plans to transition to electronic chart (ENC) products with a focus on improving data consistency and providing larger scale ENC coverage. This process includes replacing 1,200 irregular ENC cells on 130 different scales with a standardized grid system and set of 12 standard scales. This expected to significantly improve the level of detail and consistency in NOAA's

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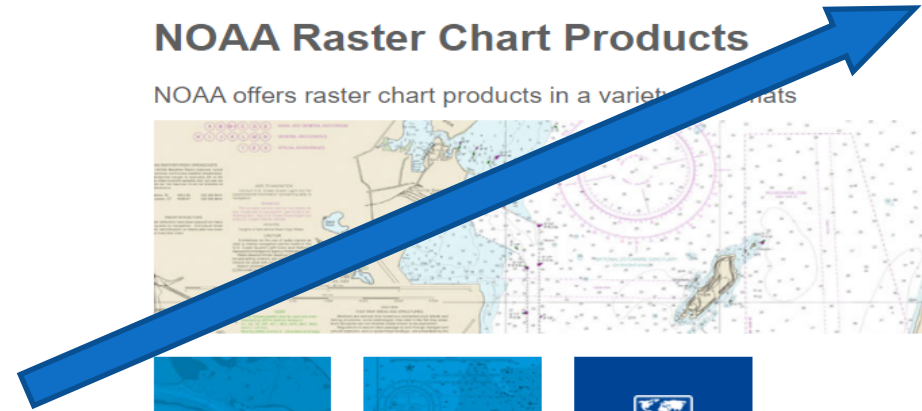
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Office of National

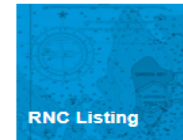
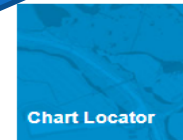
Paper plots will still be available

<https://nauticalcharts.noaa.gov/>



NOAA Raster Chart Products

NOAA offers raster chart products in a variety of formats



Two Ways to Download Raster Products

The **Chart Locator** is an online, interactive map that enables users to locate, view, and download individual RNCs, Full-size nautical charts, and BookletCharts, as well as ENC's.

The **RNC listing** provides several options for downloading individual RNCs or groups of RNCs bundled by state, U.S. Coast Guard District, and other groupings, including downloading all RNCs at once.

Related Links

- [National Charting Plan](#)
- [Purchase a Paper Chart](#)
- [Chart Updates](#)
- [RNC and ENC Comparison](#)
- [RNC Tile Service](#)
- [Chart Carriage Requirements](#)
- [NOAA encourages all mariners to use NOAA ENC® for latest updates and other advantages](#)

How to transition from traditional NOAA paper nautical charts to ENC-based products, including paper NOAA Custom Charts.

End of Traditional Paper Charts - In November 2019, NOAA initiated a five-year process to end all raster nautical chart production, including the five traditional paper chart products described on this webpage and within the expandable blue bars below. NOAA is intent on easing the transition to ENC-based products while continuing to support safe navigation. This includes improving data consistency and providing larger scale coverage for the electronic navigational chart (NOAA ENC®).

New Paper Chart Product - NOAA is aware that some chart users prefer paper charts. Although production of traditional paper charts will stop, a new form of paper nautical chart will be available through the **NOAA Custom Chart** capability (currently in prototype form). This system will enable users to create, customize, and print paper charts themselves, or have large format charts printed and delivered by a NOAA certified print-on-demand (POD) chart agent. We encourage those who want to continue using paper charts to become familiar with the NOAA Custom Chart prototype and [let us know](#) how to improve the system.

These documents provide more details about the sunsetting of NOAA raster/paper charts, ongoing improvements to NOAA's premier electronic navigational chart product, and NOAA Custom Charts.

- [Initial NOAA announcement to end production of traditional paper nautical charts – November 2019](#)
- [Sunsetting Traditional Paper Charts](#) – Explains the sunsetting process, rationale, and affected products.

What is emergency response

- Any systematic response to an unexpected or dangerous occurrence
- The goal of an emergency response is to mitigate the impact of the event on people and the environment.
- NSD's work goes beyond just hurricanes
 - Assist with finding sunken vessels
 - Assessing shoaling areas that pose a danger to navigation
 - Search and recovery

Find what is under the water!!

Past Hurricane and Other Significant Response

- Some Significant Storms
 - Hurricane Katrina – New Orleans - 2005
 - Hurricane Sandy – New York New Jersey - 2012
 - Hurricane Maria – Puerto Rico and USVI - 2017
 - Hurricane Harvey – Houston Galveston - 2017
- Other Responses
 - TWA Flight 800 – Long Island Sound - 1996
 - JFK Jr. Plane Crash – Martha’s Vineyard - 1999
 - Egypt Air Flight 990 – New England - 1999
 - Deep Water Horizon – Gulf of Mexico - 2010



Hurricane Response in 2020

- Responded to four Storms
 - Hurricane Laura – Galveston and Lake Charles
 - Hurricane Sally – Pensacola
 - Hurricane Delta – Lake Charles
 - Hurricane Zeta – Gulfport



Pre- and Post-
Hurricane Michael imagery

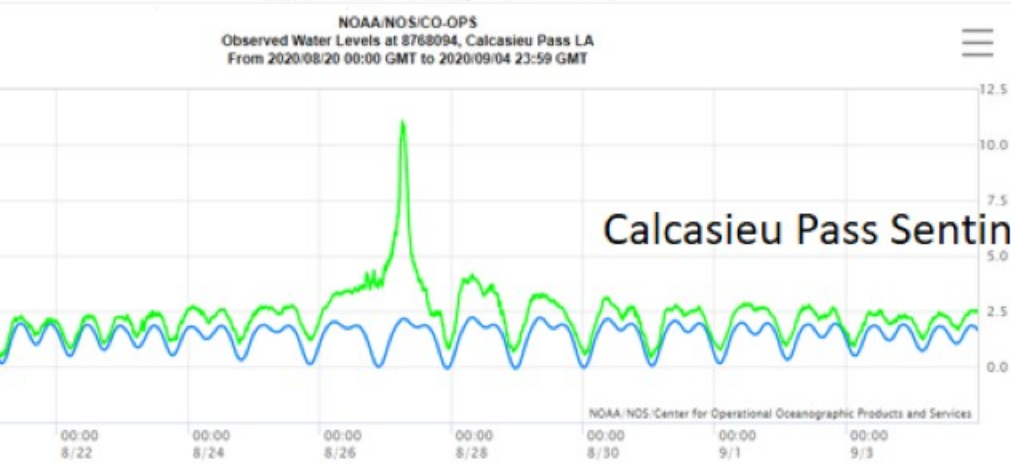
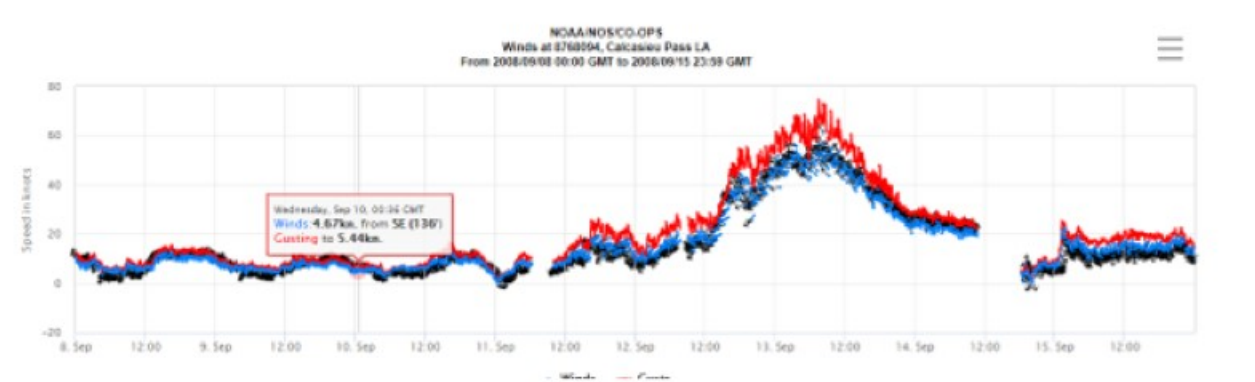
Mexico Beach, FL



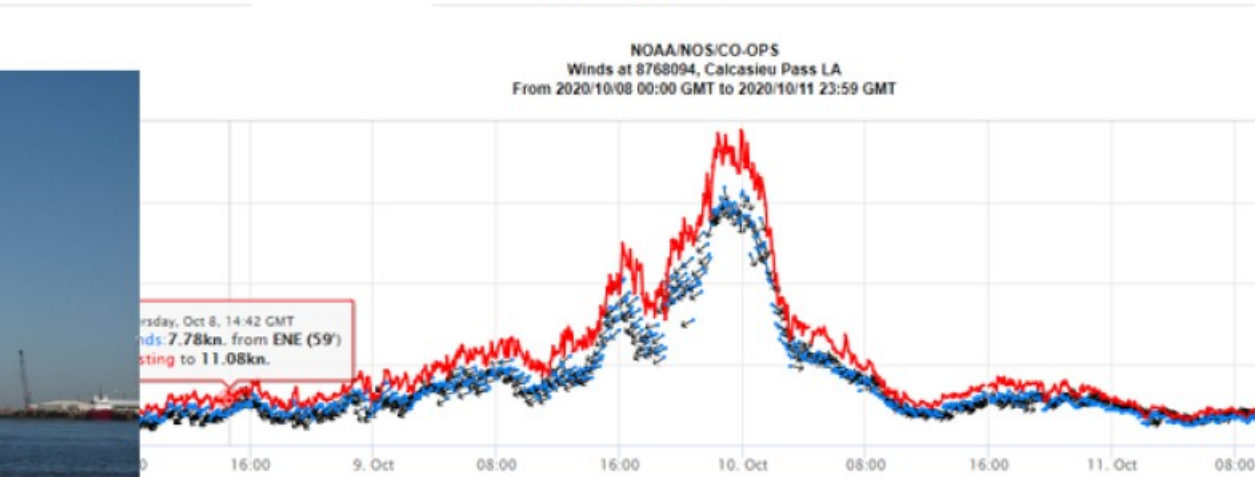
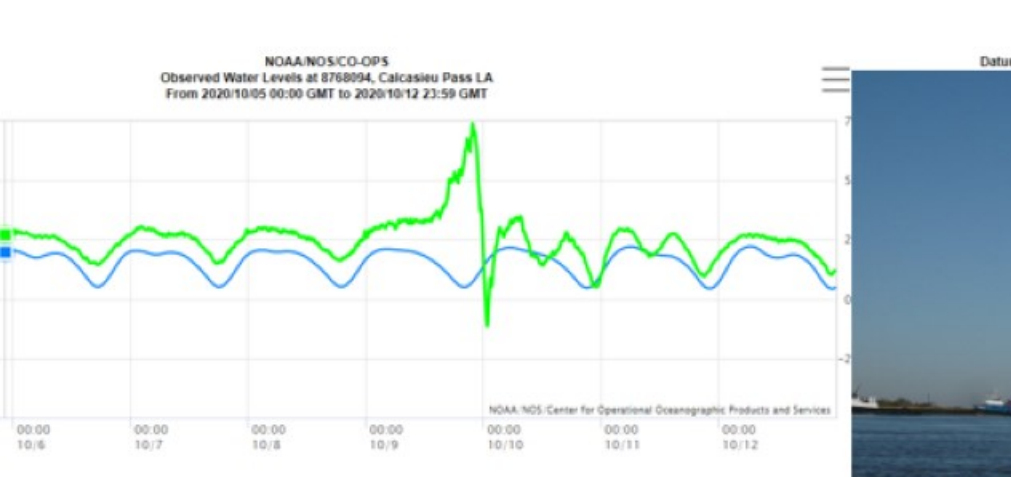
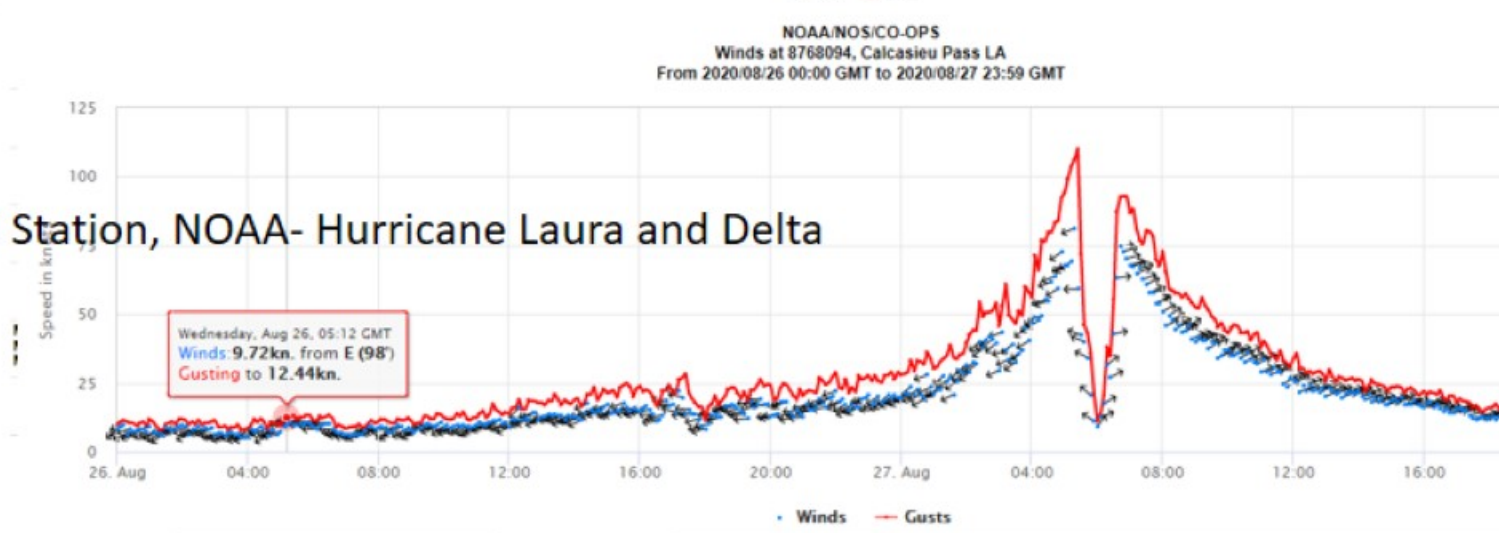
<https://storms.ngs.noaa.gov/>



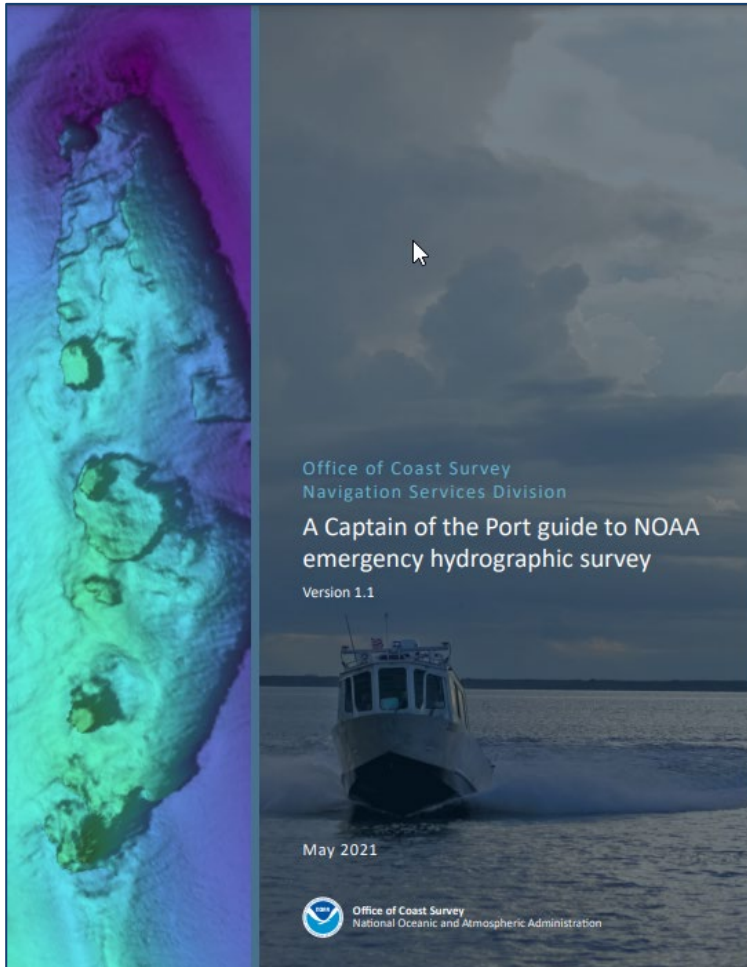
Ike2008
 Laura 2020
 Delta 2020



Calcasieu Pass Sentinel Station, NOAA- Hurricane Laura and Delta



COTP Guide



Mobile Integrated Survey Team (MIST)

Coast Survey maintains two mobile integrated survey team kits for deployment on vessels of opportunity, such as a USCG trailer-able aids to navigation boat. The MIST is a modular system that can be used to collect seafloor imagery and depth soundings. The system includes a mounting pole designed to fit a wide range of vessels. The MIST system fits in the back of a pickup truck and can be shipped overnight.



Figure 4: MIST installed on a trailer-able aids to navigation boat.



Figure 5: Portside view of installed MIST.

3. FIELD UNIT SPECIFICATIONS AND REQUIREMENTS

Navigation Response Team vessel specifications

- Length: 33 feet
- Beam: 8.5 feet
- Draft: 2 feet
- Air Draft: 10 feet
- Fuel: 160 gallons gasoline
- Crew: 3-4
- Power: 35 amps

Requirements

- Berthing: 3-4 if hotels are not available
- Adequate ramp
- Gasoline, if no public supply available
- Room to store trailer and two vehicles
- Food, if response extends a significant amount of time

Bay Hydro II vessel specifications

- Length: 57 feet
- Beam: 24 feet
- Draft: 6 feet
- Air Draft: 28 feet
- Fuel: 1200 gallons diesel (2-inch fill port)
- Crew: 3-4
- Power: 50 amp, 250 volts

Requirements

- Berthing: 3-4 if hotels are not available
- Diesel, if no public supply available
- Food, if response extends a significant amount of time

Mobile Integrated Survey Team specifications

- 1300-pounds of equipment in 22 Pelican cases
- 1 REMUS 100 ~125 pounds
- 3 small Autonomous Survey Vessels ~150 pounds each

Requirements

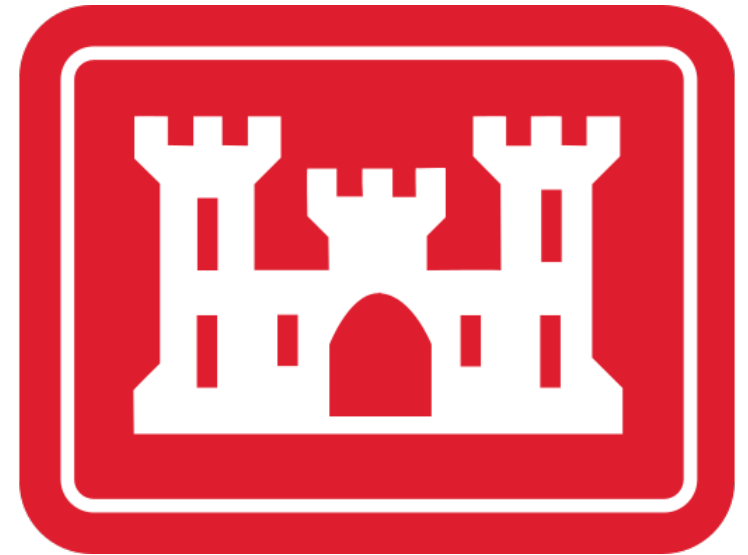
- Vessel of opportunity – preferably a trailer-able aids to navigation boat
- 110-volt power or gasoline supply for generator
- Berthing: 3-4 depending if hotels are not available
- Food, if response extends a significant amount of time
- Partial canopy on vessel of opportunity to protect electronics from weather

U.S. Coast Guard – Captain of the Port Port Status based on arrival gale force winds:

APPROXIMATE TIME	PORT CONDITION	PORT STATUS
June 1 – November 30	Seasonal Alert	Open
72 Hours	Whiskey	Open
48 Hours	X-Ray	Open
24 Hours	Yankee	Closed to inbound traffic
12 Hours	Zulu	Closed to all traffic
Storm Passes	Recovery	Open at completion of port surveys; vessel traffic control measures remain in effect



U.S. Army Corps of Engineers



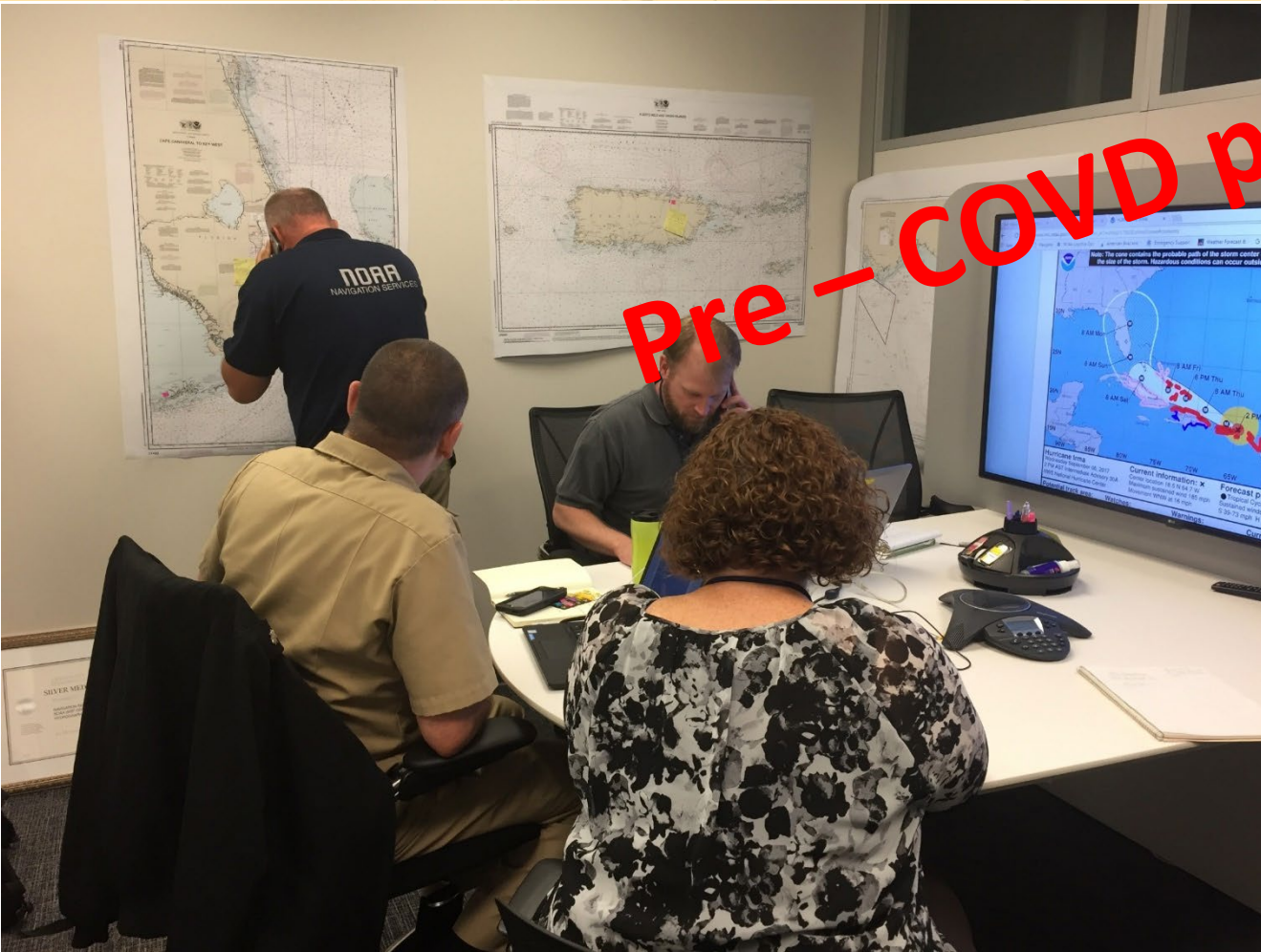
Ports/Pilots



The Public



Pre-COVID protocols





Coast Survey

Survey Operations



2017 Atlantic Hurricane Season

Office of Coast Survey

1 NOAA's Office of Coast Survey Response Efforts

The 2017 Atlantic hurricane season was powerful, with the strongest storms occurring consecutively from late August to early October. The sequential magnitude of four hurricanes in particular—Harvey, Irma, Maria, and Nate—made response efforts challenging for NOAA's Office of Coast Survey.

In the wake of a disaster, Coast Survey is the federal leader in emergency hydrographic response. Before and after a storm event or other disaster, Coast Survey's regional navigation managers and navigation response teams (NRT) work with other NOAA offices, port authorities, maritime industries, the U.S. Coast Guard (USCG),

2 Hurricane Harvey

3 Hurricane Irma

4 Hurricane Maria

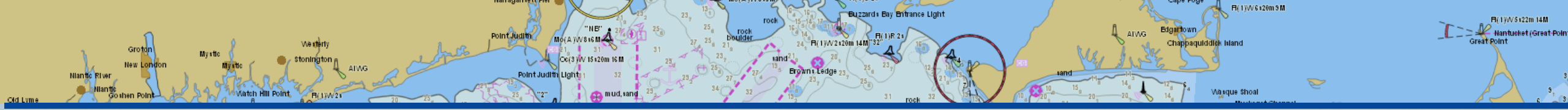
5 Hurricane Nate



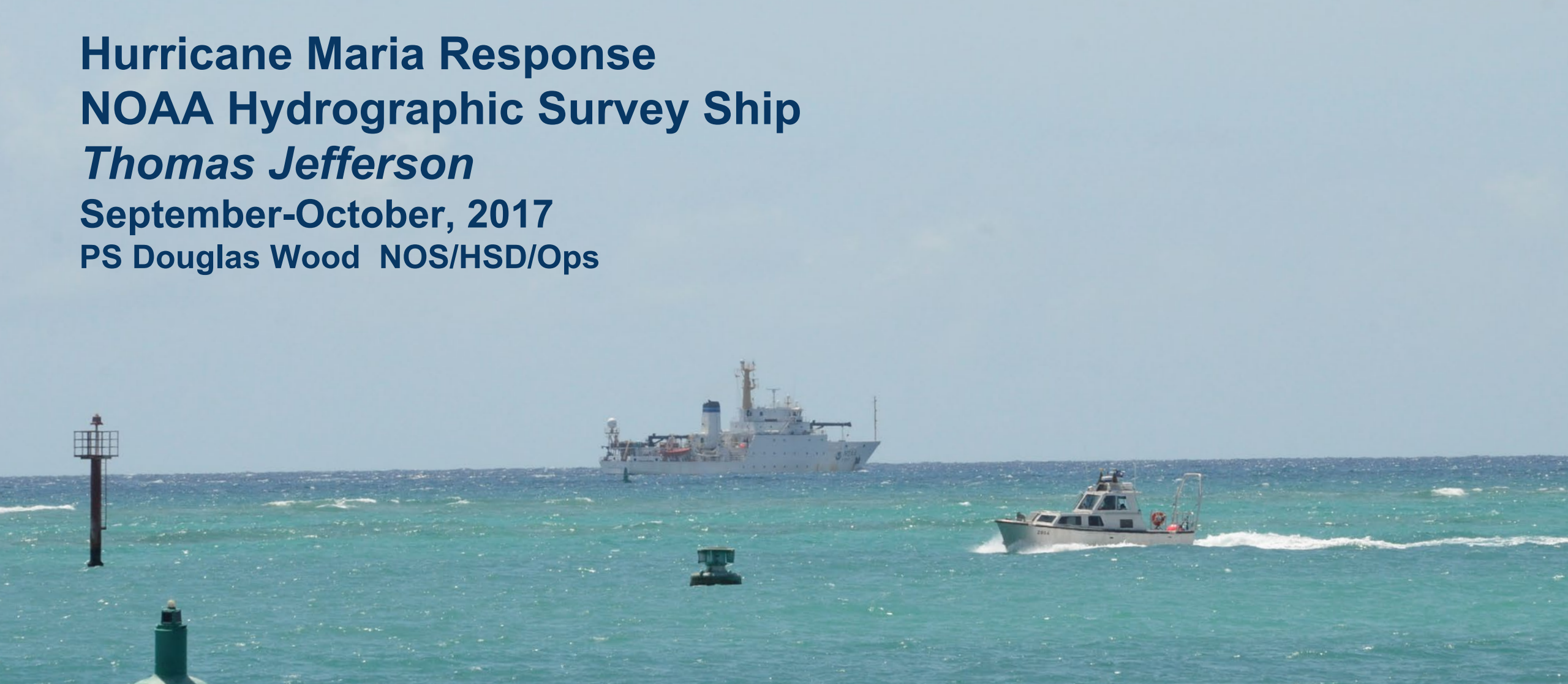
Vessel of Opportunity

Mobile Survey Team
Hurricane Irma Response
Key West, FL
Platform: USCG TANB.





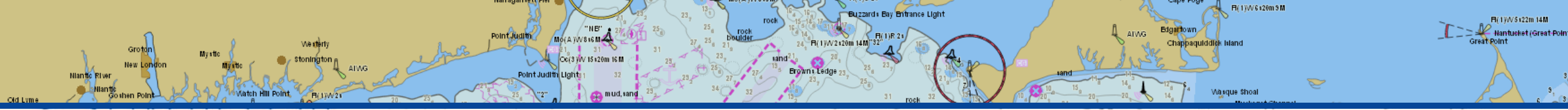
Hurricane Maria Response NOAA Hydrographic Survey Ship *Thomas Jefferson* September-October, 2017 PS Douglas Wood NOS/HSD/Ops



Office of Coast Survey
National Oceanic and Atmospheric Administration

Thomas Jefferson and Survey Launch 2904
Limetree Bay, Saint Croix, USVI, 2 October,
2017

Photo by Tom Jeffers



Deploying from Port Everglades on September 24th after taking on personnel, ship stores, supplies for Nat'l Weather Service San Juan and tide/weather station field repair materials.

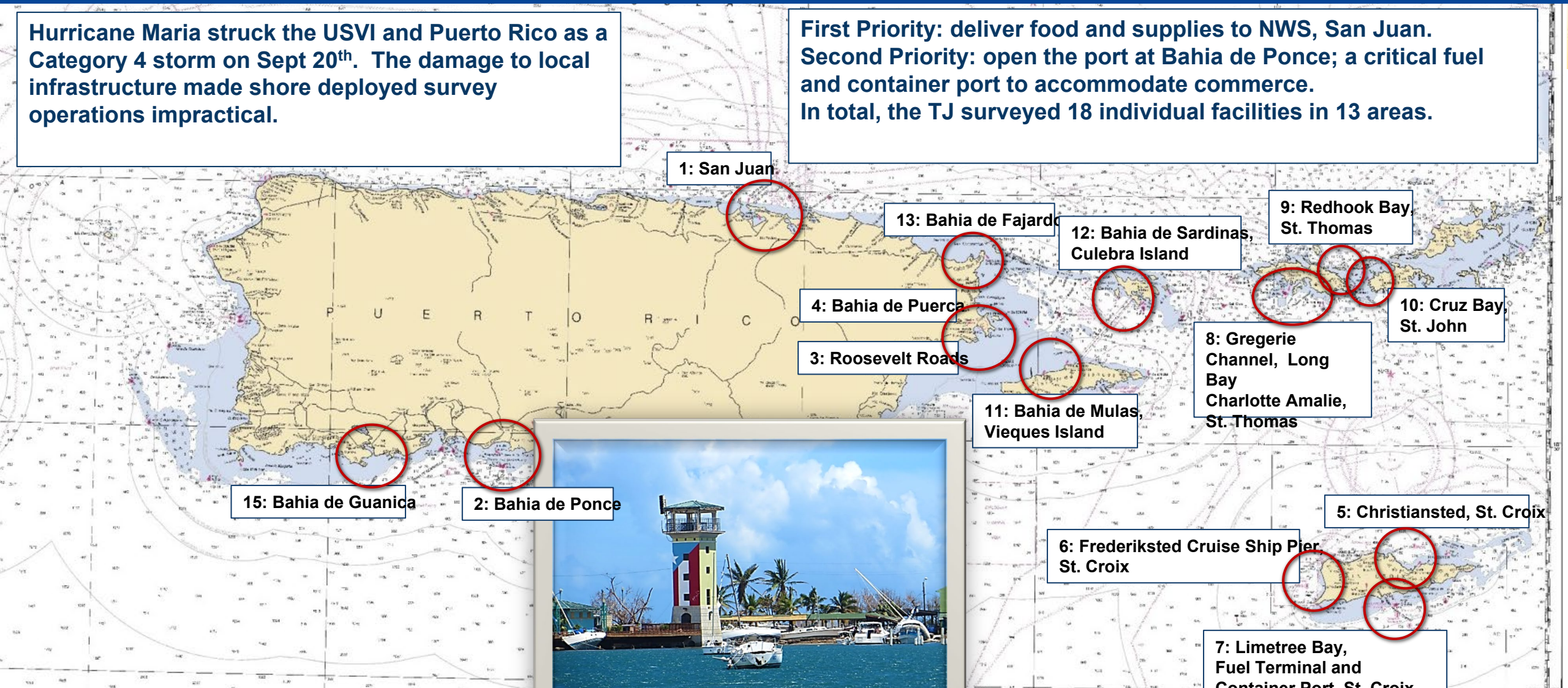


The transit to San Juan took four days; arriving on the 28th.

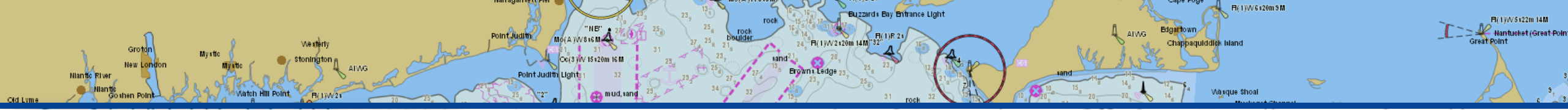


Hurricane Maria struck the USVI and Puerto Rico as a Category 4 storm on Sept 20th. The damage to local infrastructure made shore deployed survey operations impractical.

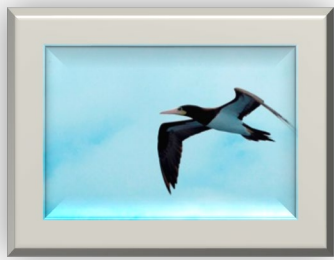
First Priority: deliver food and supplies to NWS, San Juan.
Second Priority: open the port at Bahia de Ponce; a critical fuel and container port to accommodate commerce.
In total, the TJ surveyed 18 individual facilities in 13 areas.

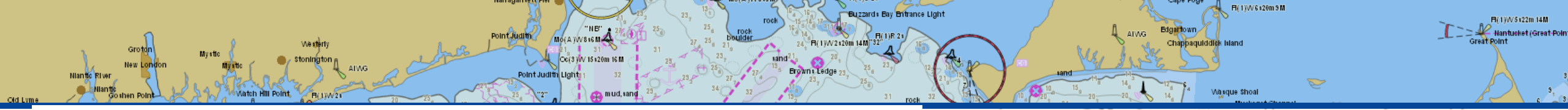


Bahia de Ponce photo by: ST Tracy McMillan



Most hydrographic acquisition was conducted by survey launches 2903 and 2904. For 20 days the ship sustained the crew and support staff and provided facilities for planning and processing data independent from local infrastructure.





NOAA Ship *Thomas Jefferson* (S-222)
 Supplemental Contact Information
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE - OFFICE OF COAST SURVEY

Contact:
 Commanding Officer / Chief of Party
 CDR Chris van Westendorp, NOAA
 co.thomas.jefferson@noaa.gov



Date:	4 October 2017	Comments:	Uncharted wreck near Cay Bay inside designated "A" anchorage.
Latitude:	18.336648 N	Additional media / information:	
Longitude:	64.93101 W		
MBES least depth:	26 ft		
SSS contact height:	3.5 ft		
Contact dimensions:	22 x 9 ft		

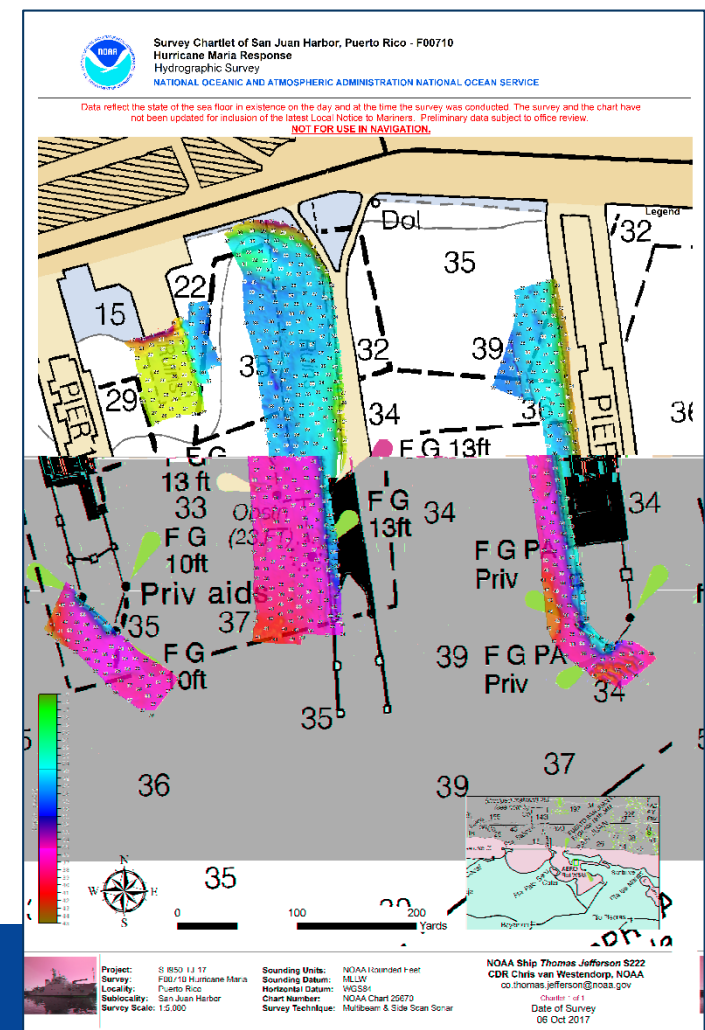
MBES coverage of uncharted wreck

Side Scan View

Project:	S-I950-TJ-17	Chart Number:	25649
Surveys:	F00705	Sounding Units:	Feet (NOAA rounded)
Locality:	US Virgin Islands	Datum:	MLLW
Sublocality:	Charlotte Amalie, St Thomas	Date of survey:	3-4 October, 2017

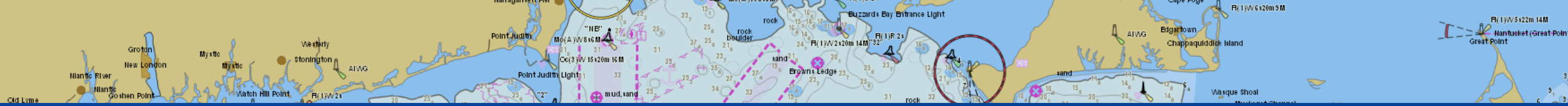
SSS image of wreck.

Example of a contact report and digital terrain models delivered to the USCG and other stakeholders a day after acquisition.

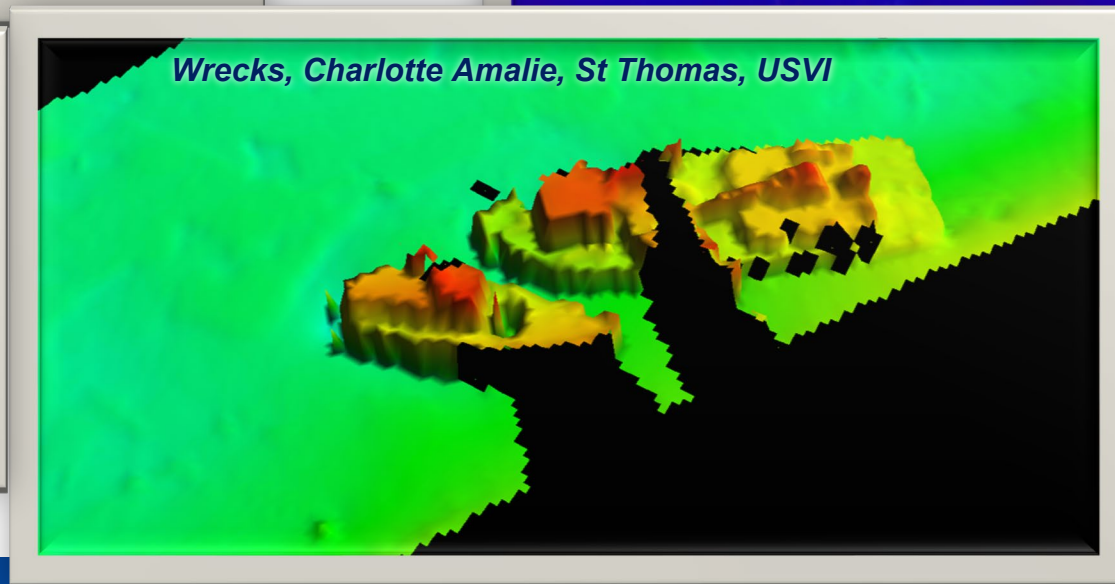
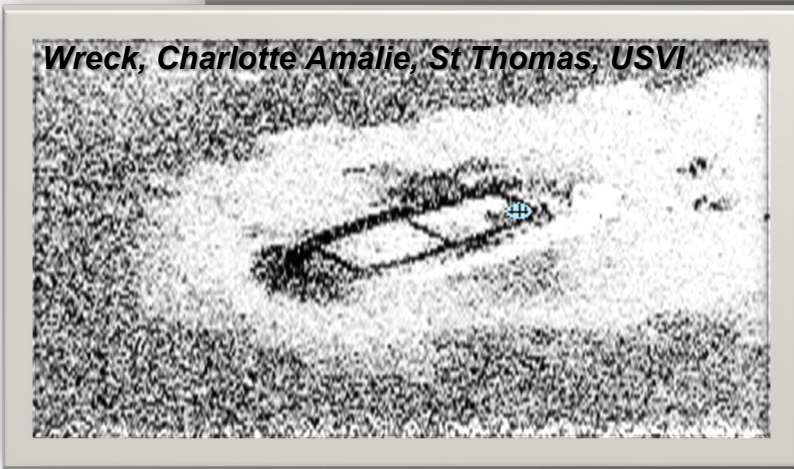
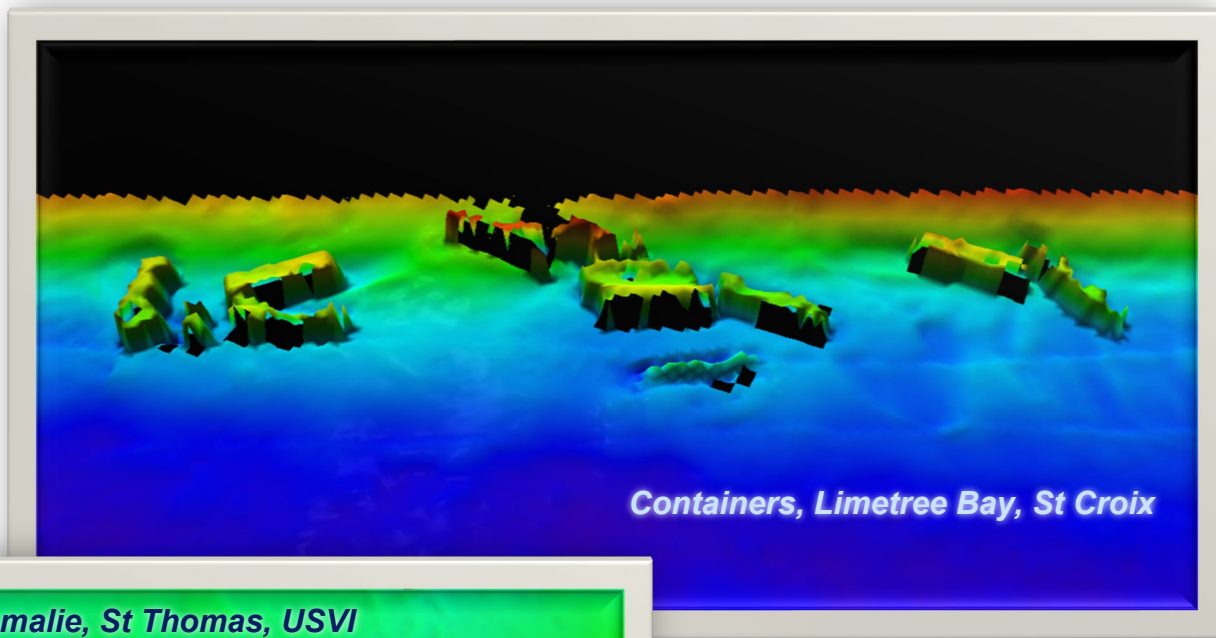
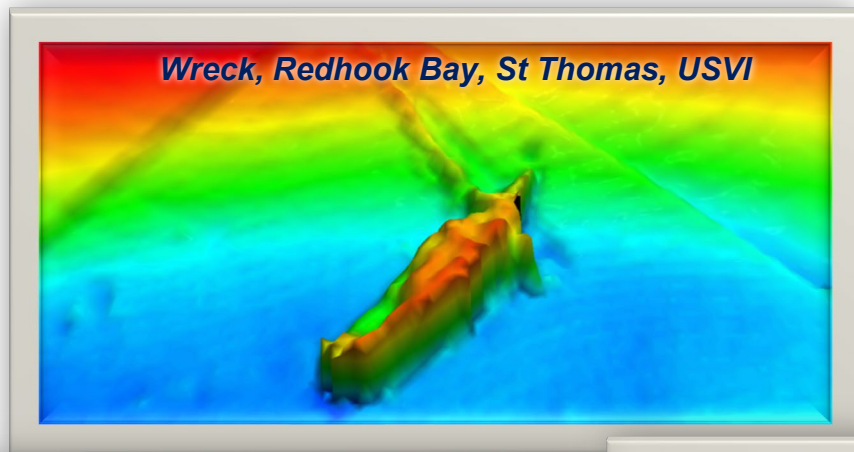


Office of Coast Survey
 National Oceanic and Atmospheric Administration

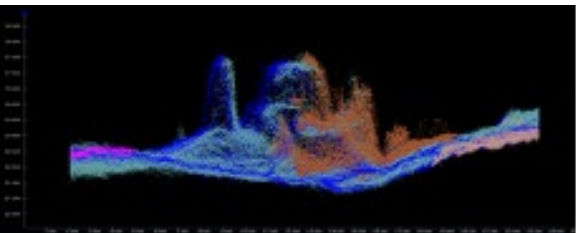
PRELIMINARY PRODUCT - FOR USCG & NOAA DECISIONAL USE ONLY - NOT FOR USE IN NAVIGATION



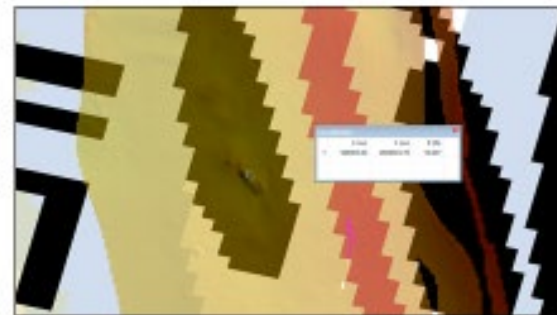
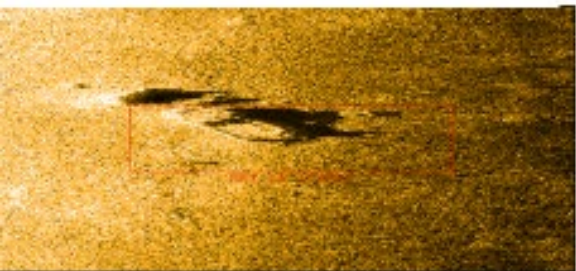
Some Obstructions found in the multibeam and sidescan sonar data:



On the Fly Reporting and Night Processing



Length: 24ft
 Width: 7ft
 Contact Height: 4ft
 Least Depth: 17ft
 Coordinates: 25-56-14.450089N, 080-07-53.472089W



Non-Dangerous wreck discovered on edge of ICW. Least depth of 17 feet poses no threat to navigation.

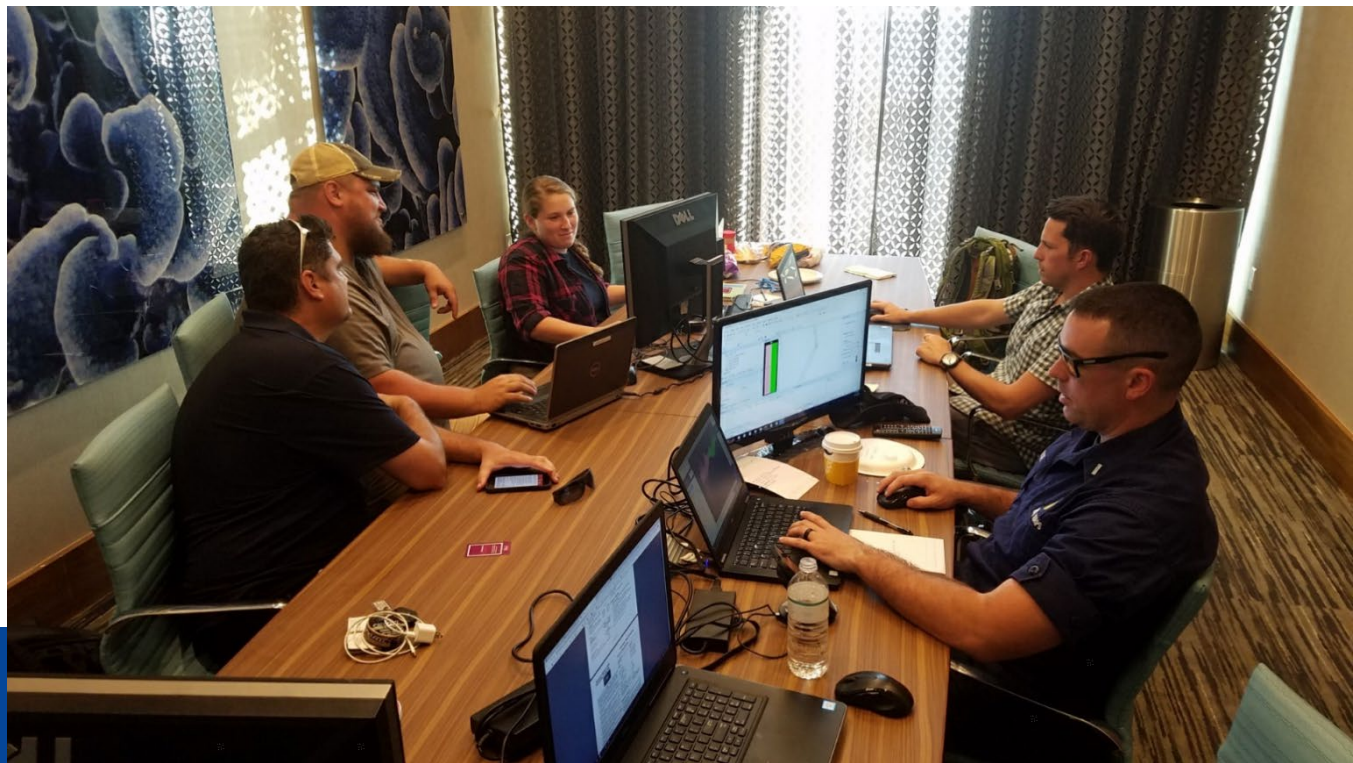


NATIONAL OCEANIC AND
 ATMOSPHERIC ADMINISTRATION
 NATIONAL OCEAN SERVICE

Project: F00778
 Survey: S-H912-NRT2-19
 State: FL
 Locality: MIA to FTL
 Sublocality: Dumbfounding Bay
 Survey Scale: 1:10,000

Sounding Units: Feet
 Sounding Datum: MLLW
 Horizontal Datum: NAD 83 UTM 17 N
 Chart Number: 11467

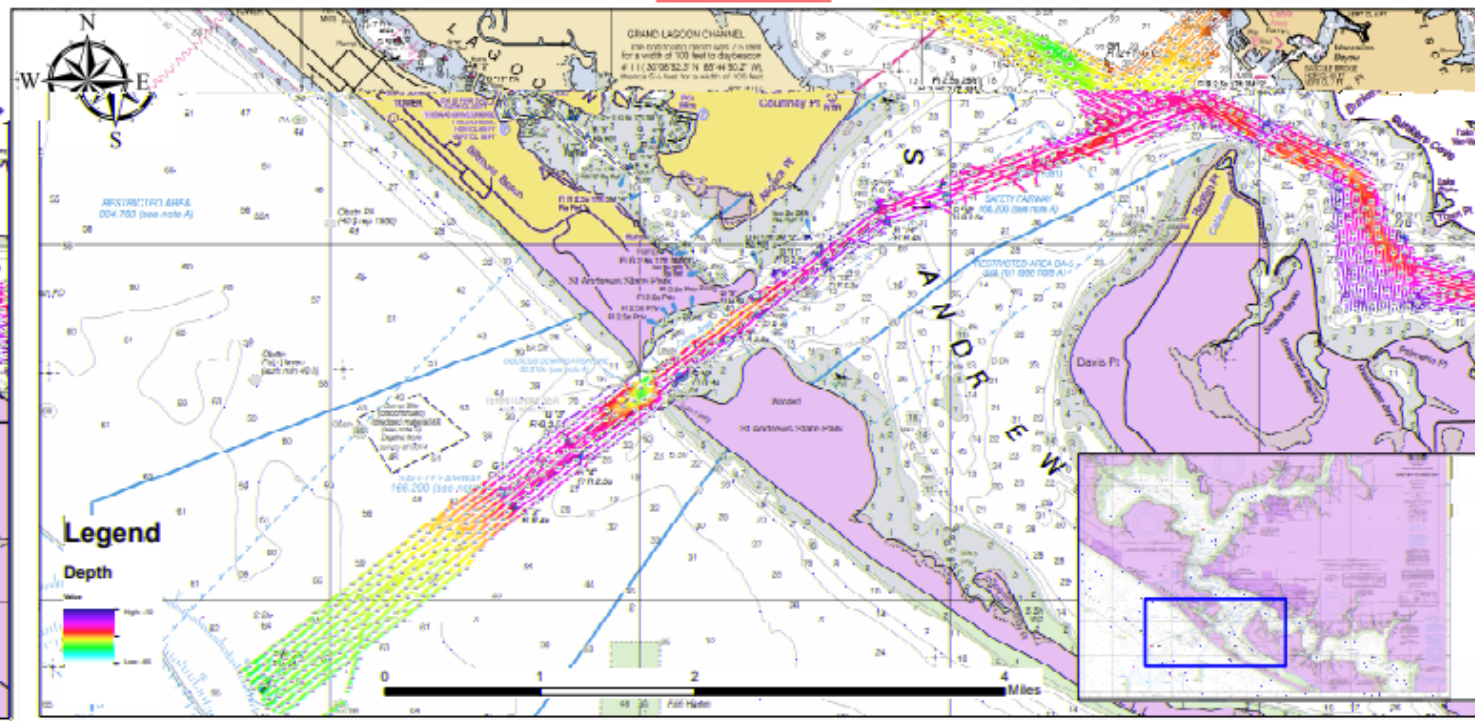
NOAA NRT2
 James
 Kirkpatrick
 Survey Date:
 07/01/2019





Panama City Main Channel | Panama City, FL
Hurricane Michael Response
Navigation Response Branch
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / NATIONAL OCEAN SERVICE

Date reflect the state of the sea floor in existence on the day and at the time the survey was conducted. The survey and the chart have not been updated for inclusion of the latest Local Notice to Mariners. Preliminary data subject to office review.
NOT FOR USE IN NAVIGATION.



Survey: D00261
Sublocality: Panama City Main Channel
Survey Scale: 1:20,000

Sounding Units: NOAA Rounded Feet
Horizontal Datum: NAD83 UTM 16N
Chart Number: NOAA Chart 11390
Survey Technique: Multibeam & Side Scan

Please direct all questions to the
Chief, Navigation Response Branch
Chief.NRB.OCS@noaa.gov

