Marine Navigation and Port Recovery

Kyle Ward - 24 May 2021
Safe and efficient transportation and commerce: helping decision makers along the coast make the best choices for their communities.
$36B annually spent on boating*

$7M/day lost due to UKC in Houston

16M boats in use in US

$36B annually spent on boating*

Tens of thousands
SOLAS

Hundreds of thousands
Non-SOLAS Commercial

A million
Large recreational

Tens of millions
Small recreational

NOAA Navigation Services Customers

*NMMA 2016
Coast Survey is the Nation’s Chart Maker

U.S. marine transportation system:
95,000 miles of coastline
25,000 miles of navigable channels
Coast Survey is the Nation’s Chart Maker

Who we are

- U.S. Department of Commerce
- National Oceanic and Atmospheric Administration
- National Ocean Service
- Office of Coast Survey

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

**Improvements:**
- Reduce unwarranted alarms
- Convert to metric
- Provide timelier data
- Improve chart coverage
- Create an orderly layout
- Reduce uncertainties
- Improve chart update information
- Increase efficiency

**Outcome:** Ease of access to more precise, higher-resolution charts that deliver the most up-to-date navigation information possible
NOAA begins transition exclusively to electronic navigation charts

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.

NOAA rolls up paper charts

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

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.
Resources For Transitioning to ENC

Paper plots will still be available

https://nauticalcharts.noaa.gov/
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 even 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!!
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
• 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/
### U.S. Coast Guard – Captain of the Port

Port Status based on arrival gale force winds:

<table>
<thead>
<tr>
<th>APPROXIMATE TIME</th>
<th>PORT CONDITION</th>
<th>PORT STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1 – November 30</td>
<td>Seasonal Alert</td>
<td>Open</td>
</tr>
<tr>
<td>72 Hours</td>
<td>Whiskey</td>
<td>Open</td>
</tr>
<tr>
<td>48 Hours</td>
<td>X-Ray</td>
<td>Open</td>
</tr>
<tr>
<td>24 Hours</td>
<td>Yankee</td>
<td>Closed to inbound traffic</td>
</tr>
<tr>
<td>12 Hours</td>
<td>Zulu</td>
<td>Closed to all traffic</td>
</tr>
<tr>
<td>Storm Passes</td>
<td>Recovery</td>
<td>Open at completion of port surveys; vessel traffic control measures remain in effect</td>
</tr>
</tbody>
</table>
Partners and Customers in Recovery

U.S. Army Corps of Engineers
Partners and Customers in Recovery

Ports/Pilots
The Public

Partners and Customers in Recovery
Assessment and Anticipation

Pre – COVD protocols
Team Preparation and Deployment
2017 Irma and Maria Response

2017 Atlantic Hurricane Season

1. NOAA’s Office of Coast Survey Response Efforts
   The 2017 Atlantic Hurricane Season was powerful, with the strongest storms in more than a decade. The Office of Coast Survey responded to hurricane threats in various ways—preparing for, monitoring, and responding to efforts supporting the NOAA’s Office of Coast Survey.

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

Photo by Tom Jaffurs
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.
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.
Example of a contact report and digital terrain models delivered to the USCG and other stakeholders a day after acquisition.
Some Obstructions found in the multibeam and sidescan sonar data:

- Wreck, Redhook Bay, St Thomas, USVI
- Wreck, Charlotte Amalie, St Thomas, USVI
- Wrecks, Charlotte Amalie, St Thomas, USVI
- Containers, Limetree Bay, St Croix
On the Fly Reporting and Night Processing

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