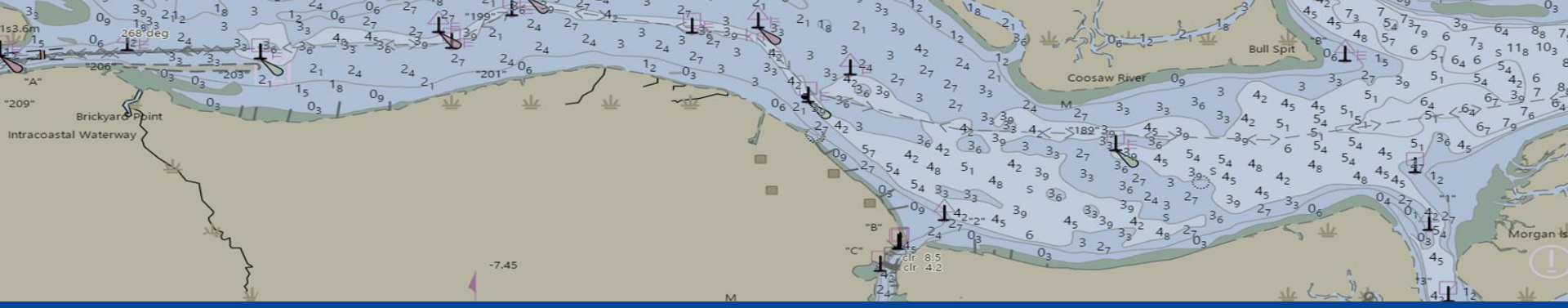
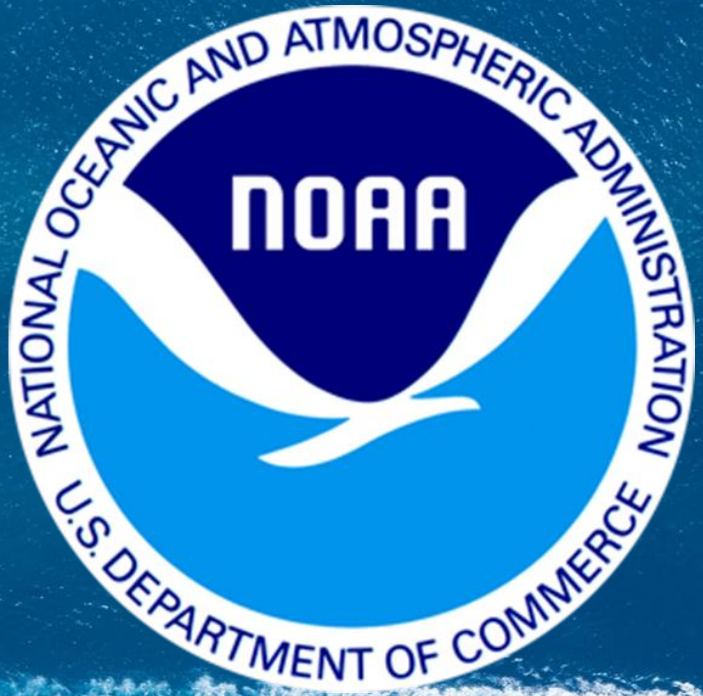


Nautical Charting Update

Presentation to NCBIWA
November 16, 2023

Kyle Ward – Coast Survey
kyle.ward@noaa.gov

NOAA - National Oceanic and Atmospheric Administration



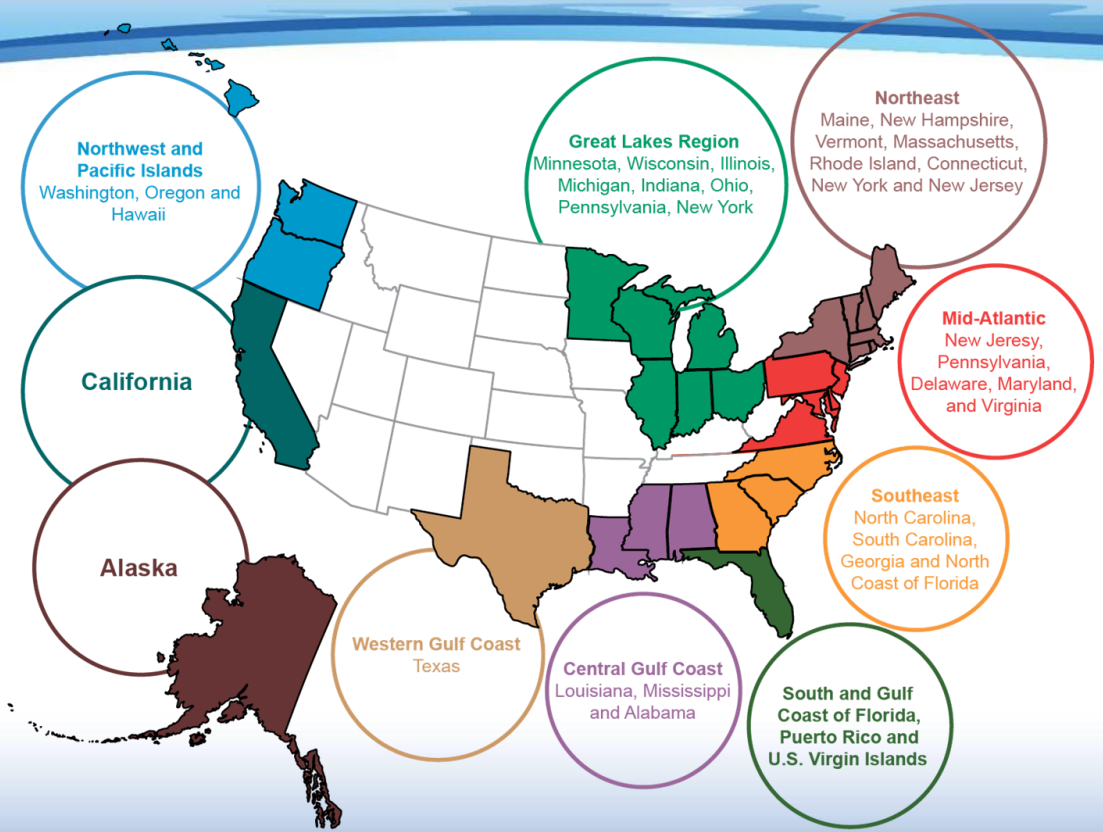
NOAA

Under Secretary of Commerce for Oceans & Atmosphere, and NOAA Administrator
Dr. Richard W. Spinrad

- National Marine Fisheries Service
- National Ocean Service
- National Environmental Satellite, Data & Information Service
- Oceanic & Atmospheric Research
- National Weather Service
  www.weather.gov/pqr/about
- Marine & Aviation Operations

National Ocean Service

Regional Navigation Managers



https://nauticalcharts.noaa.gov/customer-service/regional-managers/index.html

East Coast Navigation Managers

Northeast

Name: Colleen Roche

Email: northeast.navmanager@noaa.gov

Office: 401-782-3252

Mobile: 401-545-0174

Fax:

Colleen became a Navigation Manager in 2018 after working for NOAA for 7 years. Before coming to NOAA she worked as a coastal engineer for 8 years supporting port design and expansion, environmental remediation and beach renourishment efforts. She looks forward to serving as the liaison between NOAA and community.

Southeast

Name: Kyle Ward

Email: kyle.ward@noaa.gov

Office: 843-740-1153

Mobile: 301-651-4852

Fax: 843-740-1329

Kyle Ward became a Navigation Manager in 2011 after working 8 years at NOAA. He enjoys updating charts making boating safer for professional and recreational mariners. A highlight for him has been coordinating hurricane response surveys for ports affected by hurricanes Sandy and Matthew.

Mid-Atlantic

Name: Ryan Wartick

Email: midatlantic.navmanager@noaa.gov

Office:

Mobile: 571-302-0995

Fax:

Ryan Wartick first became a Navigation Manager in 2015 and more recently resumed the role in 2020 after 21+ years of combined active duty service in the Navy and NOAA Corps. He has held a variety of assignments over the years helping NOAA to make and update nautical charts from the Arctic to the Gulf of Mexico and sailed on each NOAA Hydrographic ship in the process. Ryan is excited to continue supporting mariners and the industry.

South Florida, Puerto Rico, U.S. Virgin Islands

Name: Nicolás Alvarado

Email: florida.navmanager@noaa.gov

Office:

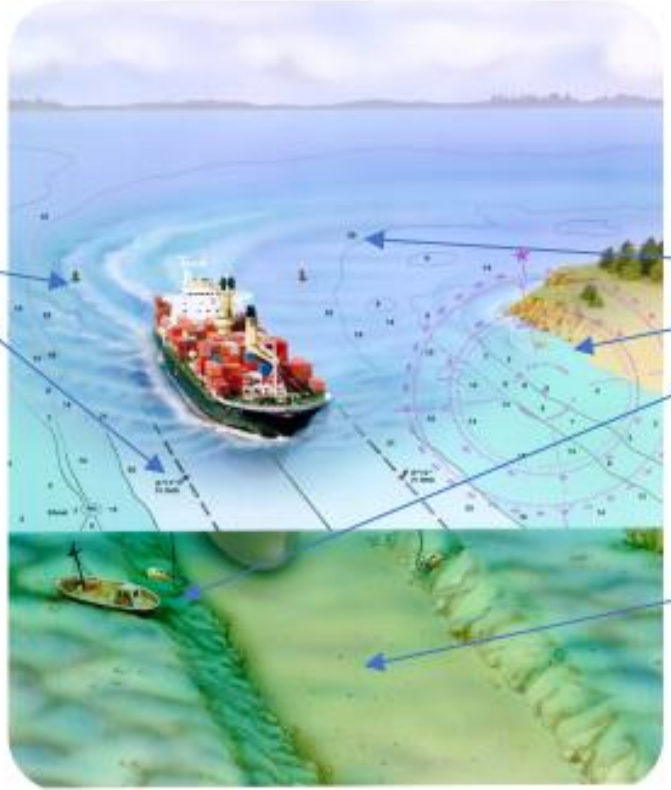
Mobile: 202-253-9536

Fax:

Nicolás (Nic) became a Navigation Manager in 2021 after working at NOAA for 17 years. He worked as a fishery management specialist and an Endangered Species Act consulting biologist for 8 years supporting NOAA Fisheries and worked as a physical scientist for 9 years supporting NOAA Research in the Office of Ocean Exploration & Research. Nicolas holds a Ph.D. from Texas A&M University in Oceanography.

Federal Charting Responsibilities

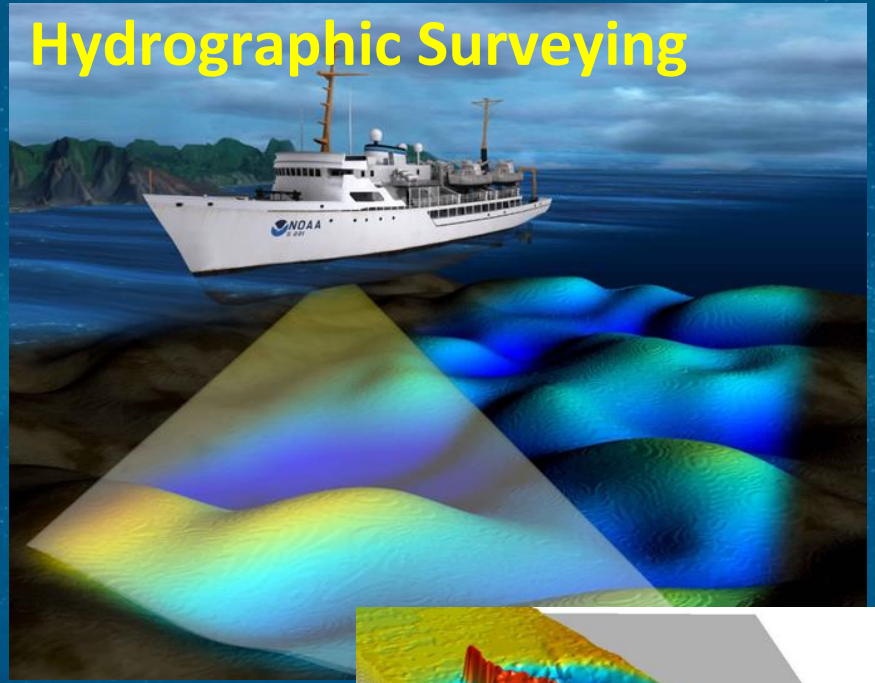
Aids to Navigation
Local Notice to Mariners

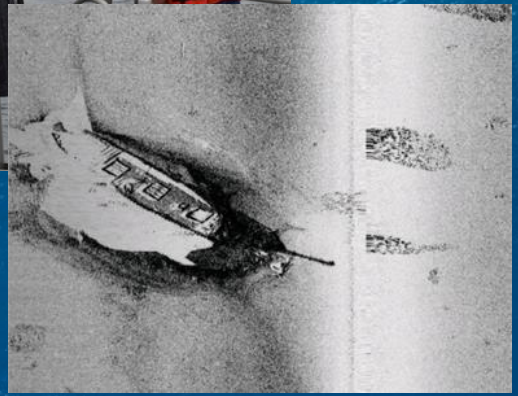


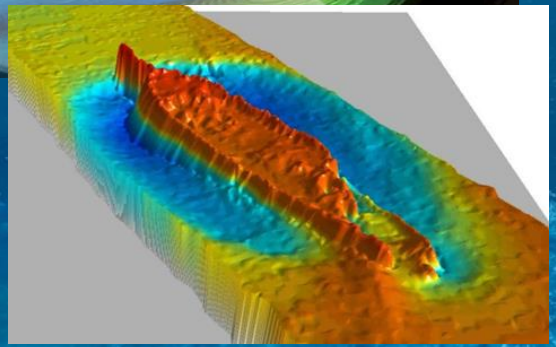
Shoreline, Hazards
Soundings, Contours

Federally Maintained
Channels

Hydrographic Surveying







Recent Coast Survey Projects

NOAA Contractor Geodynamics Field Operation

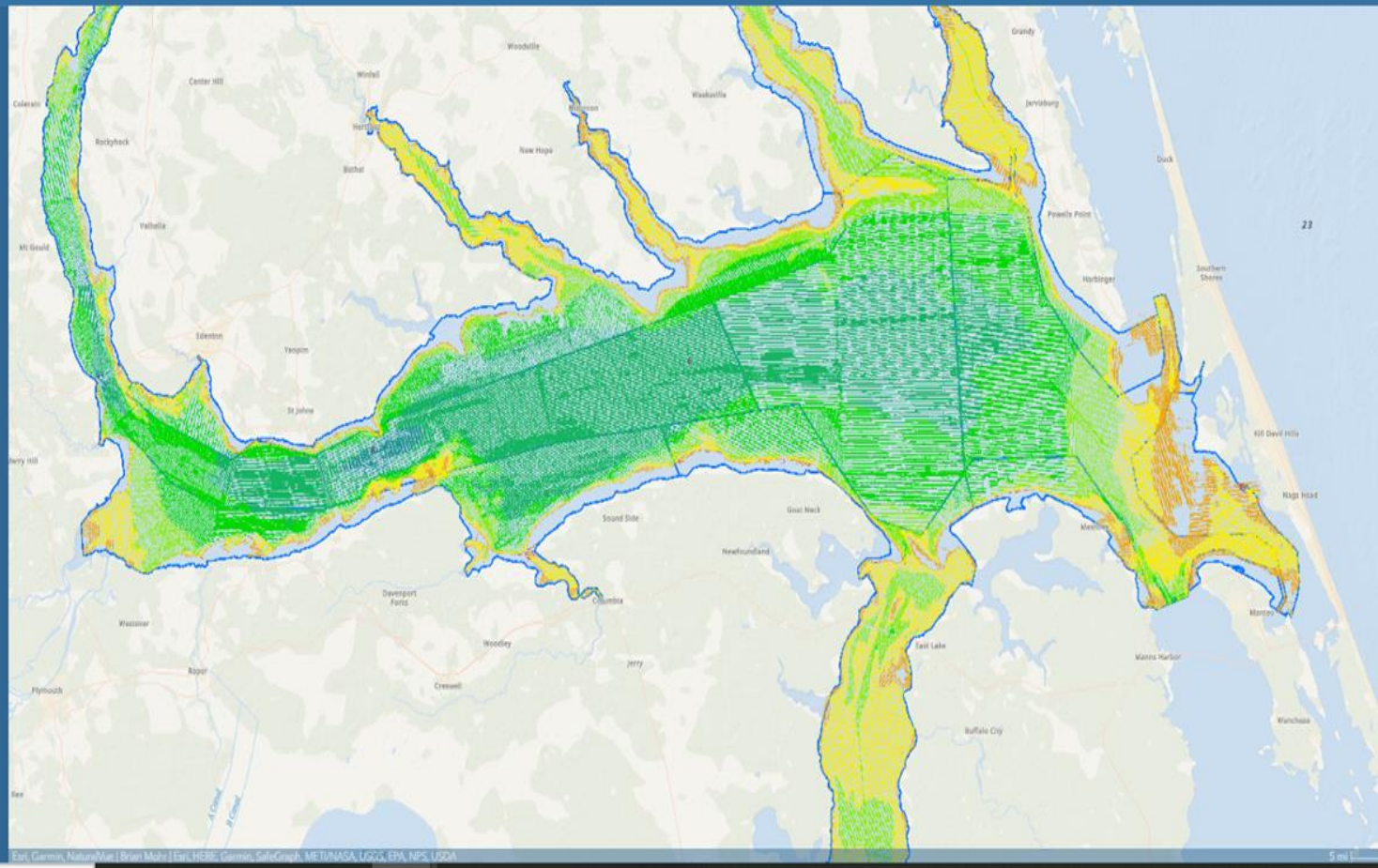
Albemarle Sound

OPR-F330-KR-22

Geodynamics

Albemarle Sound, last surveyed in the 1920s, is a large, shallow, low-salinity estuary which extends approximately 50 nautical miles inland from the Outer Banks barrier islands. For this project, approximately 500 square nautical miles of modern, high-resolution hydrographic data will be collected in Albemarle Sound and connecting rivers.

Commercial and recreational fishing as well as



Recent Coast Survey Projects

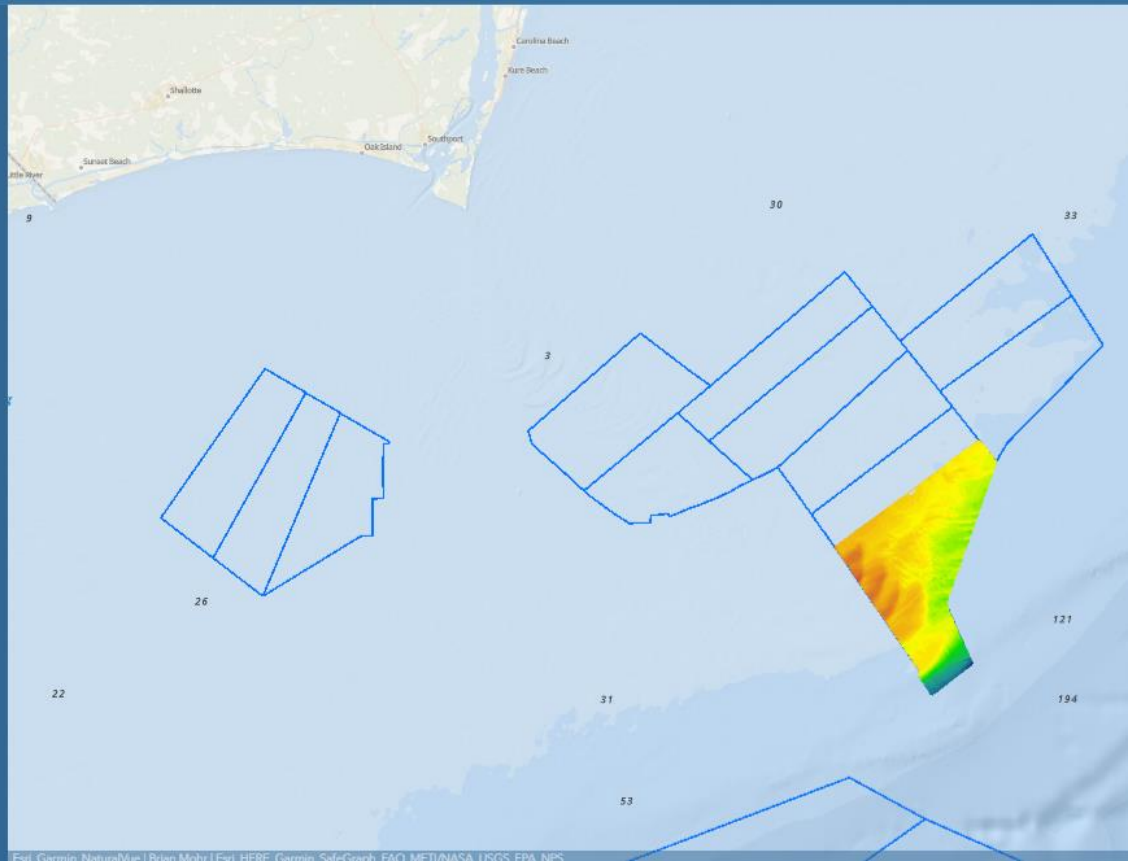
Atlantic Coast Regional Map | Nantucket Sound, MA | Southwest Chesapeake Bay River... | Potomac River | Albemarle Sound | Approaches to Wilmington | Blake Plateau | Approaches to Charleston

NOAA Ship *Ferdinand R. Hassler*

Approaches to Wilmington

OPR-F324-FH-23

The region around Wilmington, North Carolina experiences high vessel traffic transiting the eastern seaboard of the U.S. as well as traffic to and from the port. The Port of Wilmington has been updating its facilities and expanding capacity in recent years, including the ability



06 / 22

Data is collected in the field, then needs to be processed and verified, then…

Where does it go? (Where can you find it?)

NCEI - National Centers for Environmental Info

For archive and public distribution

NBS - National Bathymetric Source

Continually updated, “best” high rez bathy

ENC - Electronic Navigational Charts

NCEI - Crowdsourced Bathymetry Initiative

International Hydrographic Organization
Organisation Hydrographique Internationale

IHO DCDB Home | Contribute Data | Crowdsourced Bathymetry | CSB Mapping Projects

IHO Crowdsourced Bathymetry Initiative

Crowdsourced bathymetry (CSB) is the collection and sharing of depth measurements from vessels, using standard navigation instruments, while engaged in routine maritime operations. CSB can be used to supplement the more rigorous and scientific bathymetric coverage done by hydrographic offices, industry, and researchers around the world.

In 2014, the IHO recognized that traditional survey vessels alone could not be relied upon to solve data deficiency issues and agreed there was a need to encourage and support all mariners in an effort to "map the gaps." An initiative was established to support and enable mariners and professionally manned vessels to collect CSB. This approach leverages underway x, y, z, t data already being collected on vessels with common commercial echo sounders and Global Navigation Satellite System receivers.

Contributing CSB Data to the DCDB

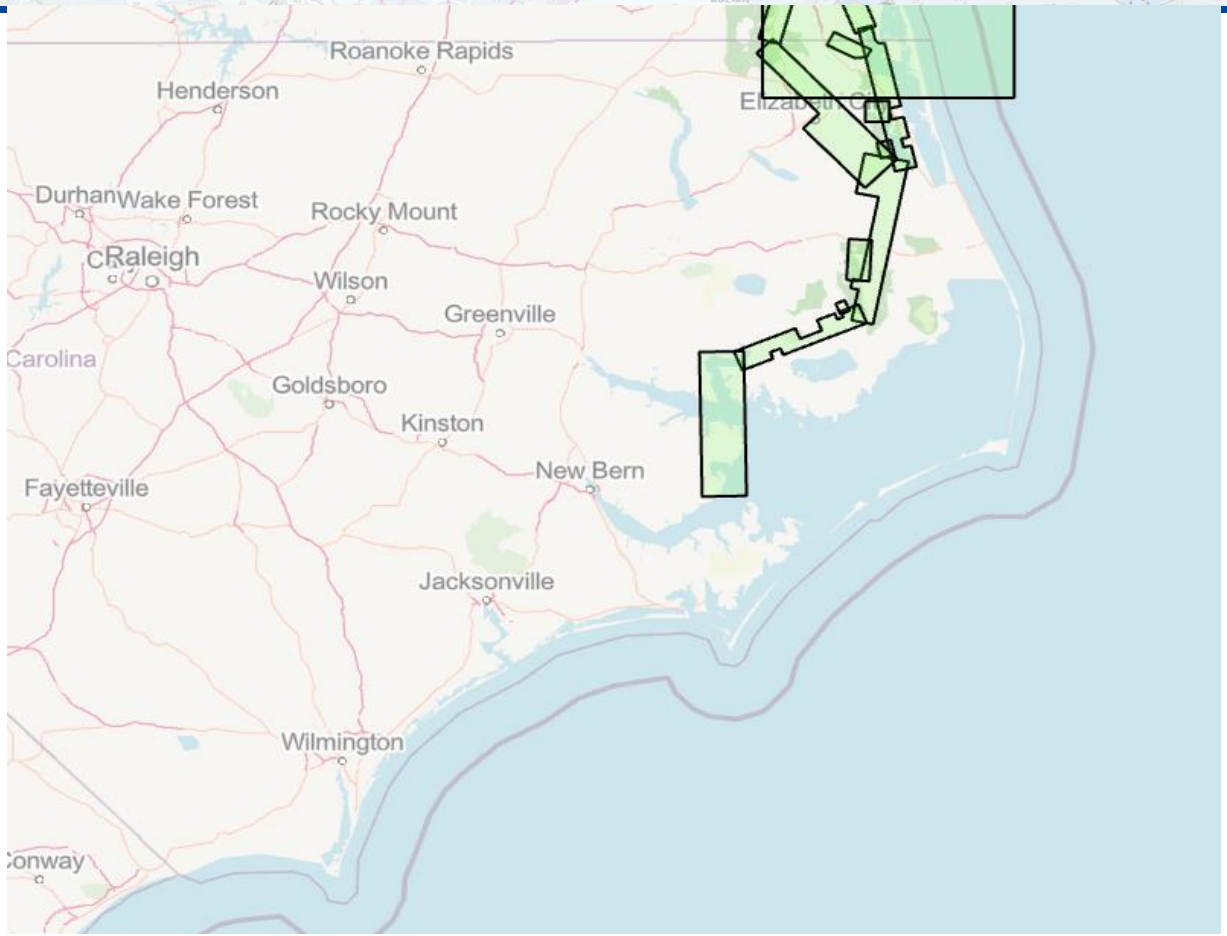
The DCDB accepts CSB contributions through a network of "Trusted Nodes," which may be organizations, companies or universities serving as data liaisons between mariners (data collectors) and the DCDB. Trusted Nodes may supply data logging equipment, provide technical support to vessels, download data from data loggers, and be responsible for data transfer directly to the DCDB. The IHO DCDB intends to publicly release the Trusted Node's data in its original form under the CC0 public domain dedication via the IHO DCDB Viewer.

The following documents clarify some aspects on CSB related to the submission of data to IHO DCDB:

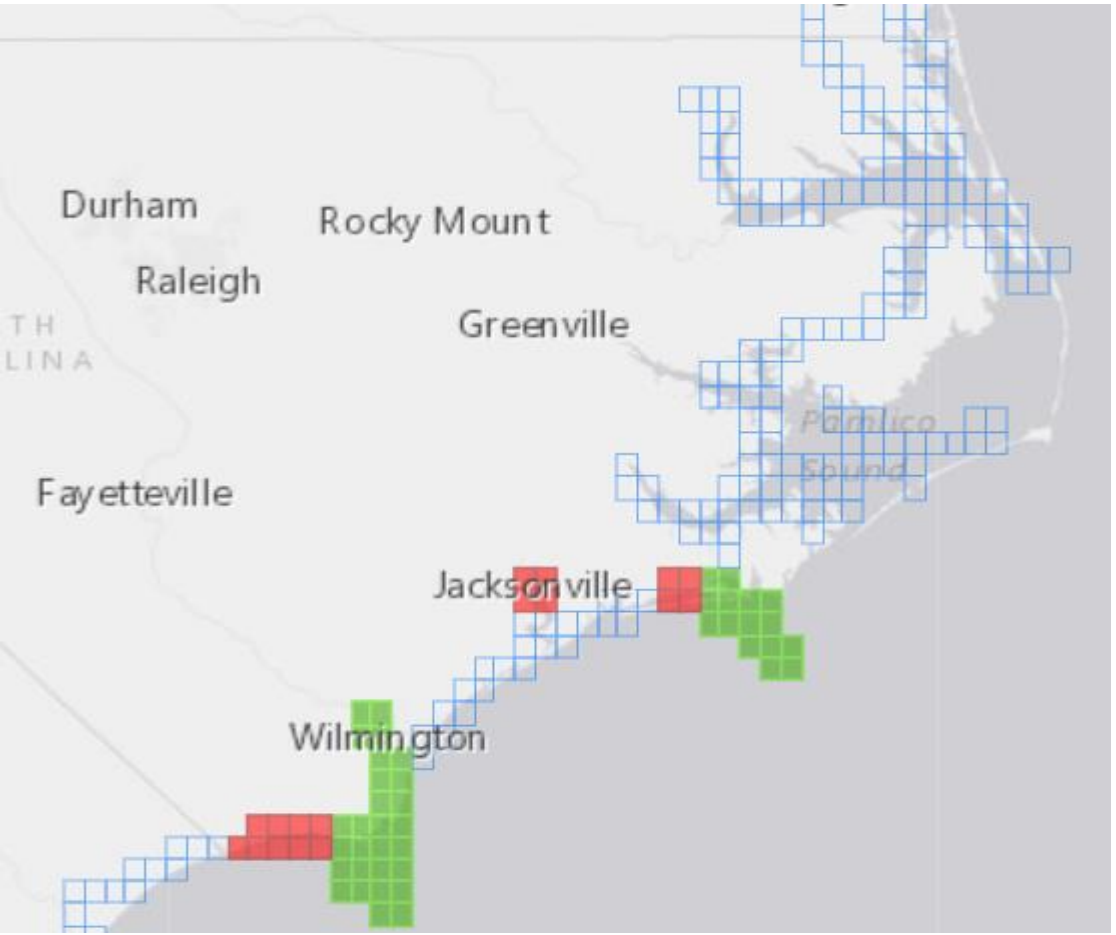
- IHO CSB Trusted Node Agreement Form Template
- Guidance for Submitting CSB Data to the IHO DCDB
- Sample CSB File Formats
- Example CSB GeoJSON file

Those interested in contributing data or becoming a Trusted Node should contact the DCDB at bathydata@iho.int.

Current Paper Chart Coverage



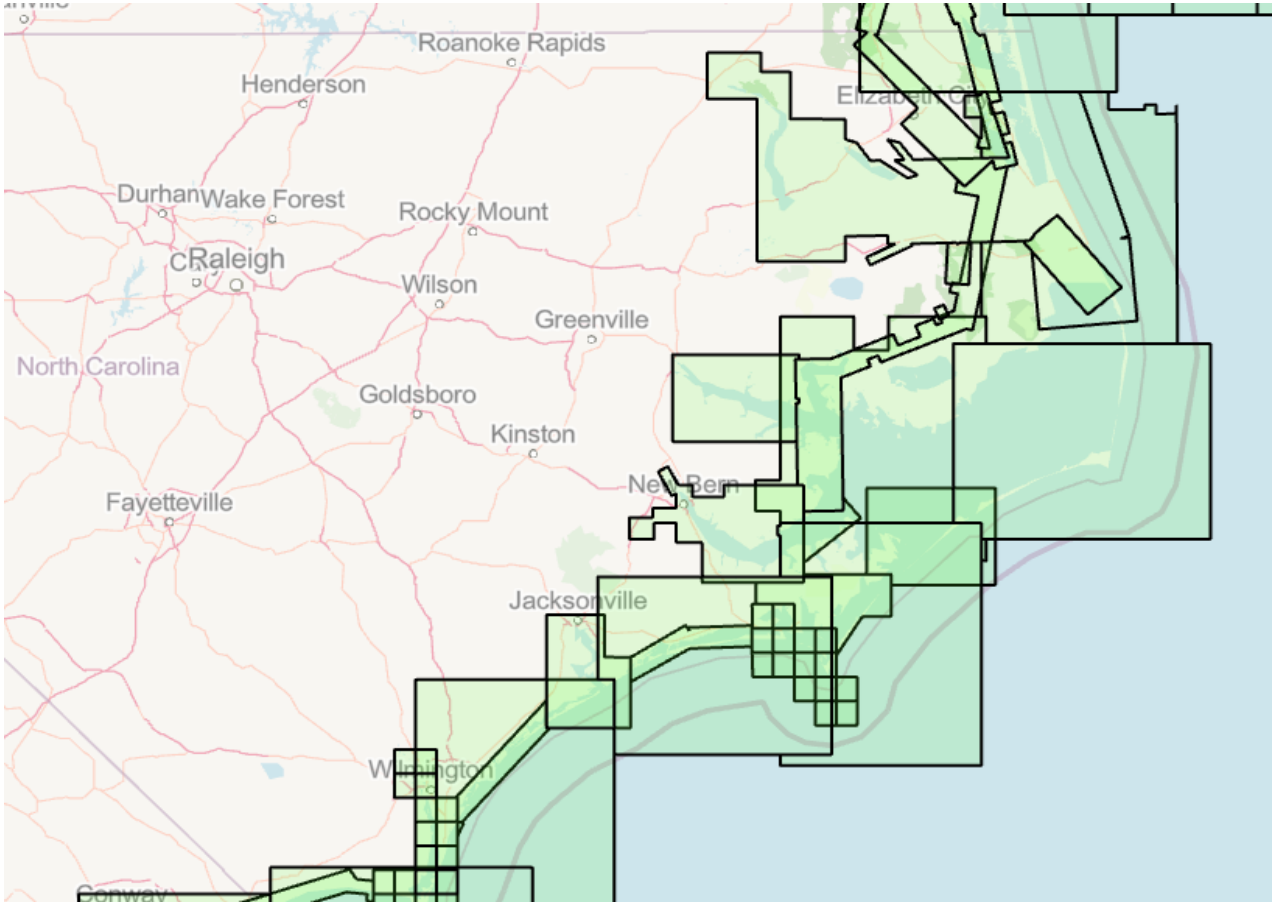
Gridded ENC Progress



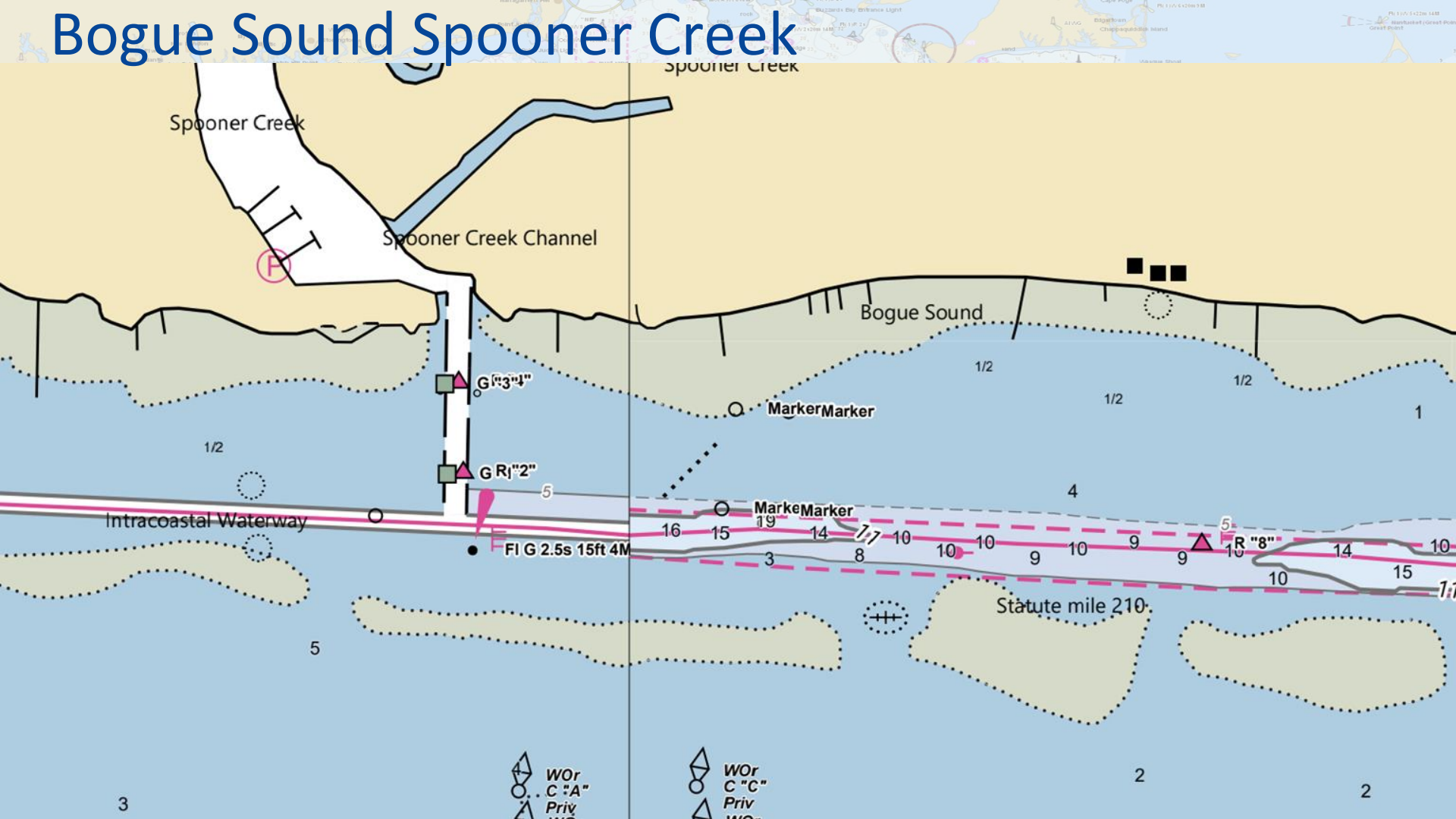
Large Scale Charts
Nov 2023

- Completed
- Final Quality Check
- In Work
- Planned

Current Electronic Chart Coverage



Bogue Sound Spooner Creek



Bogue Sound Spooner Creek

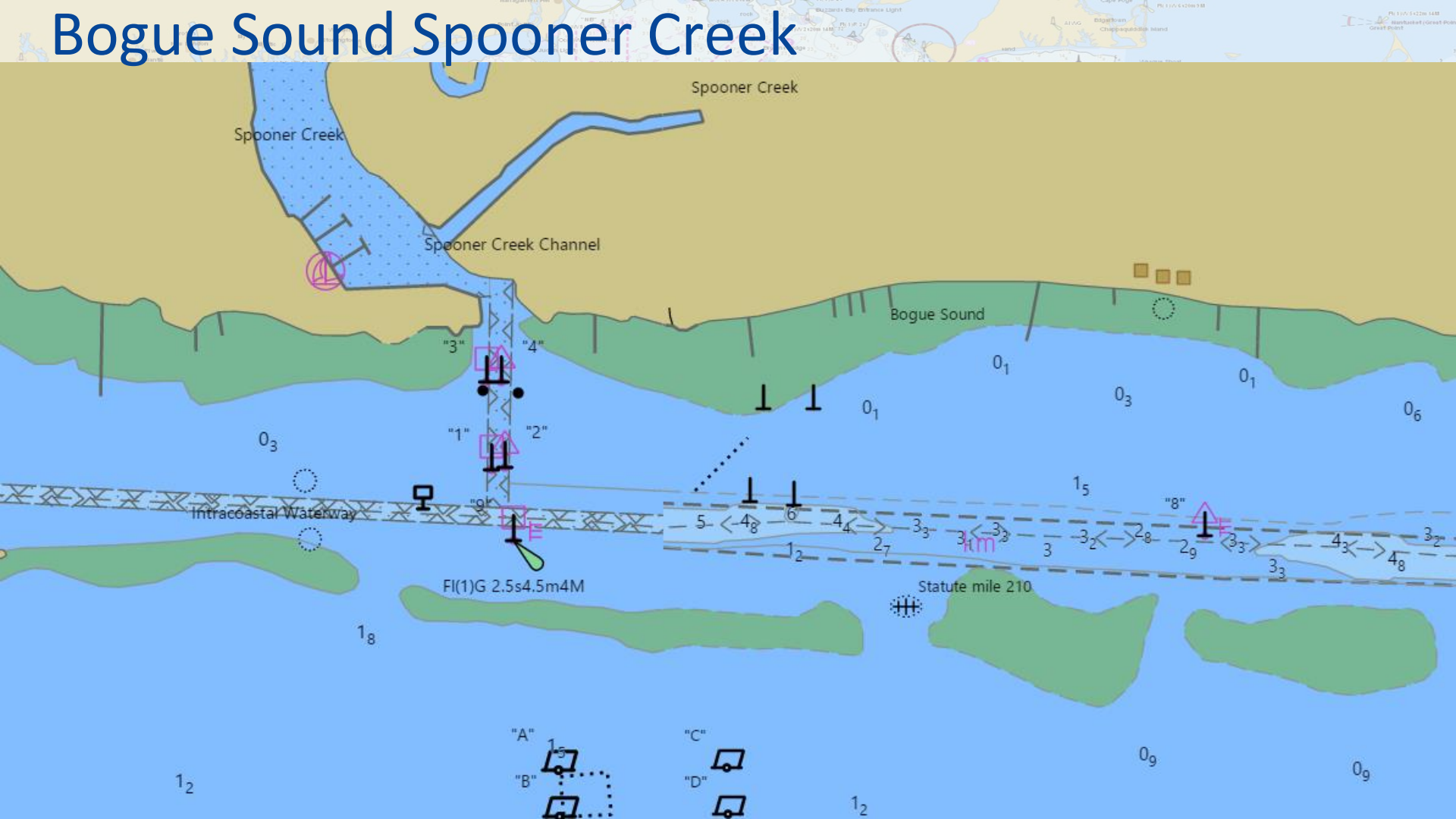


Chart Enhancements

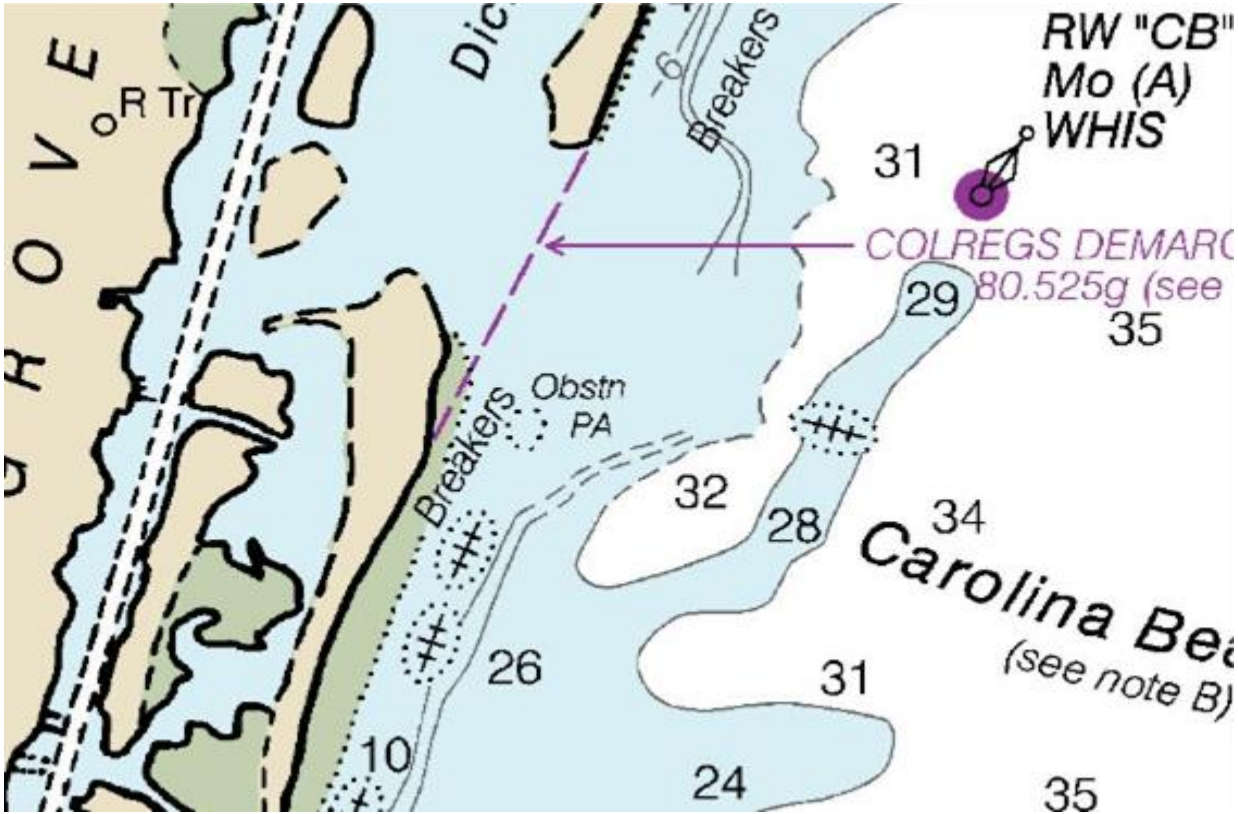


Chart Enhancements

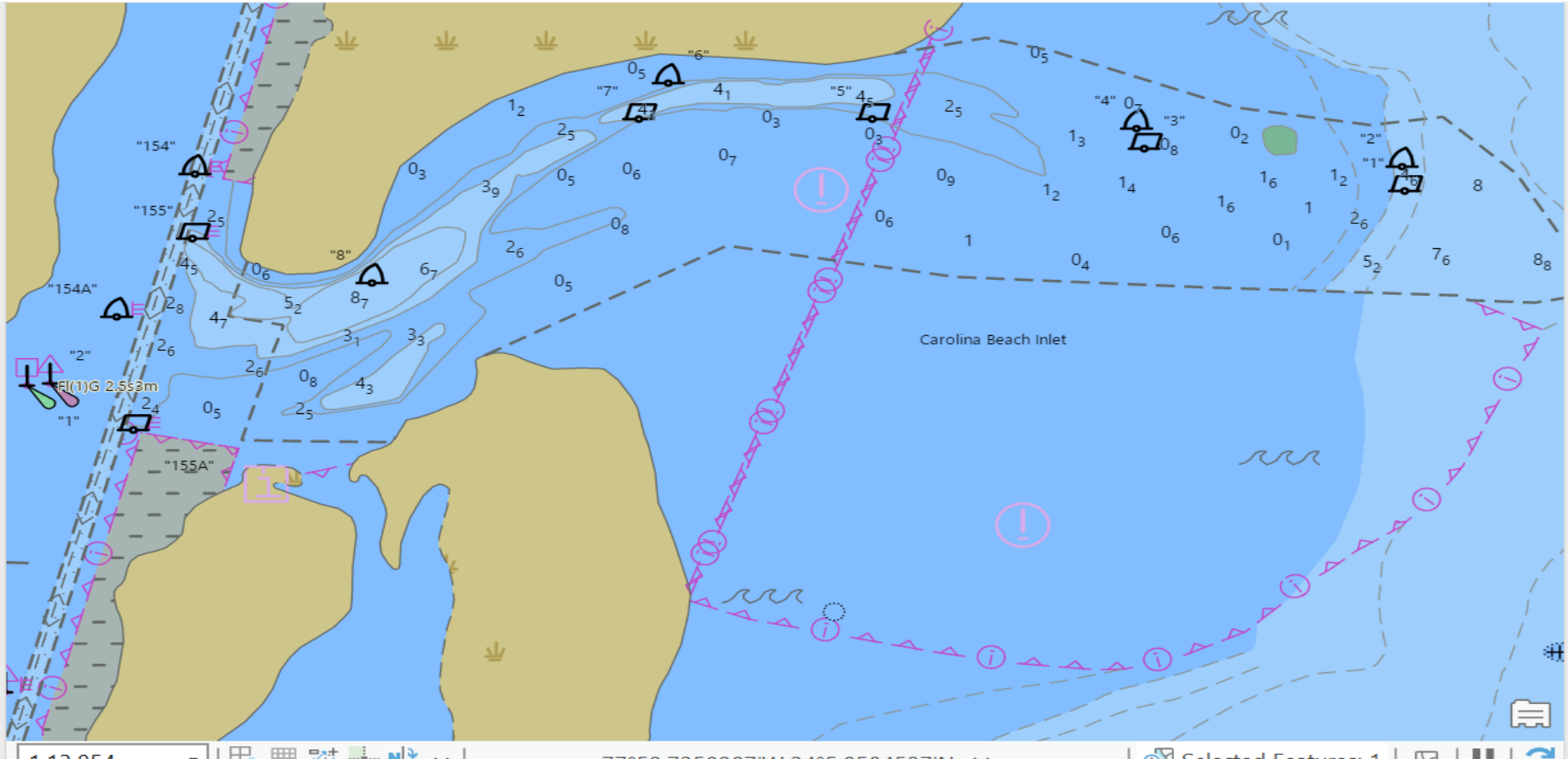
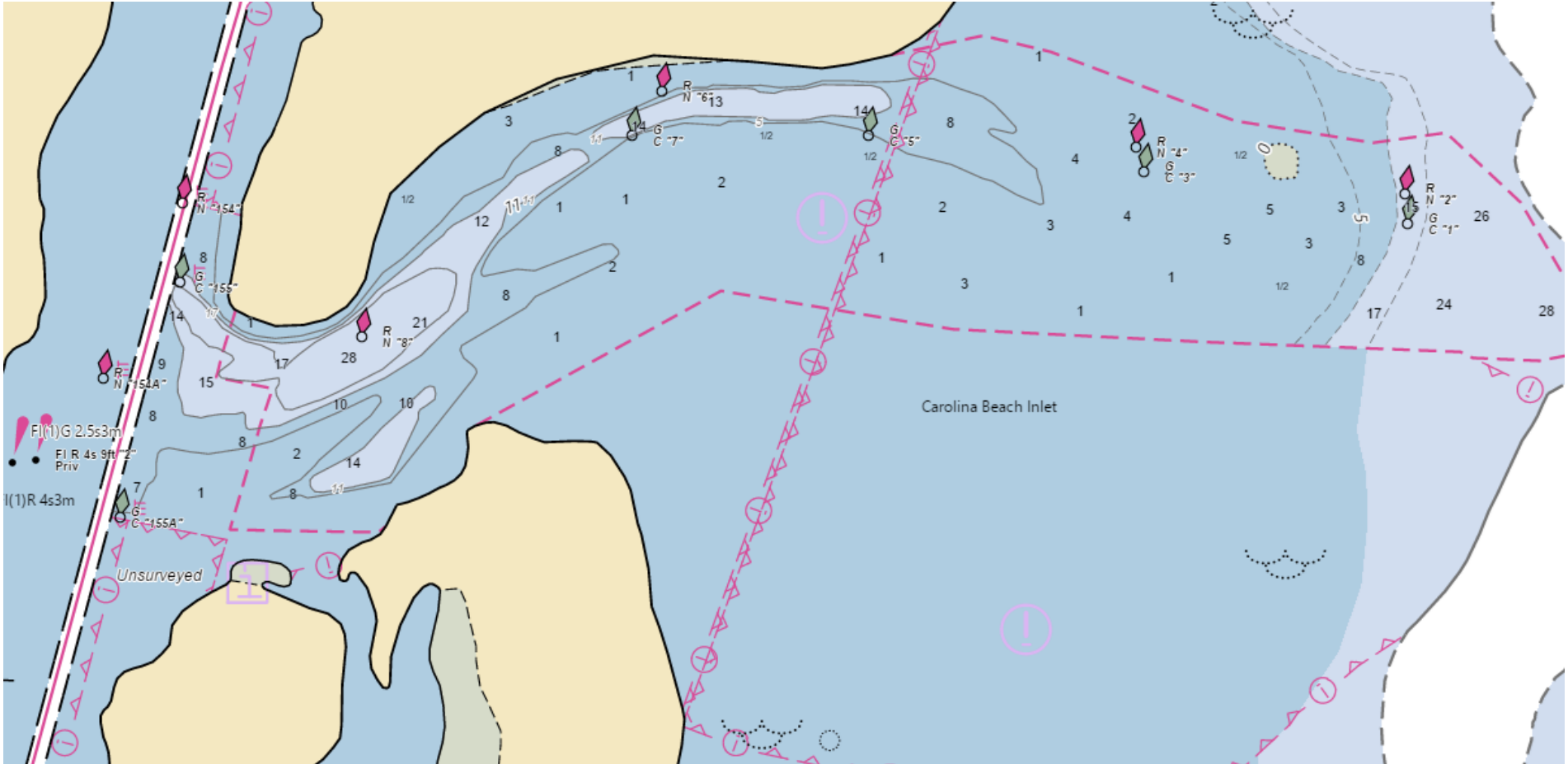


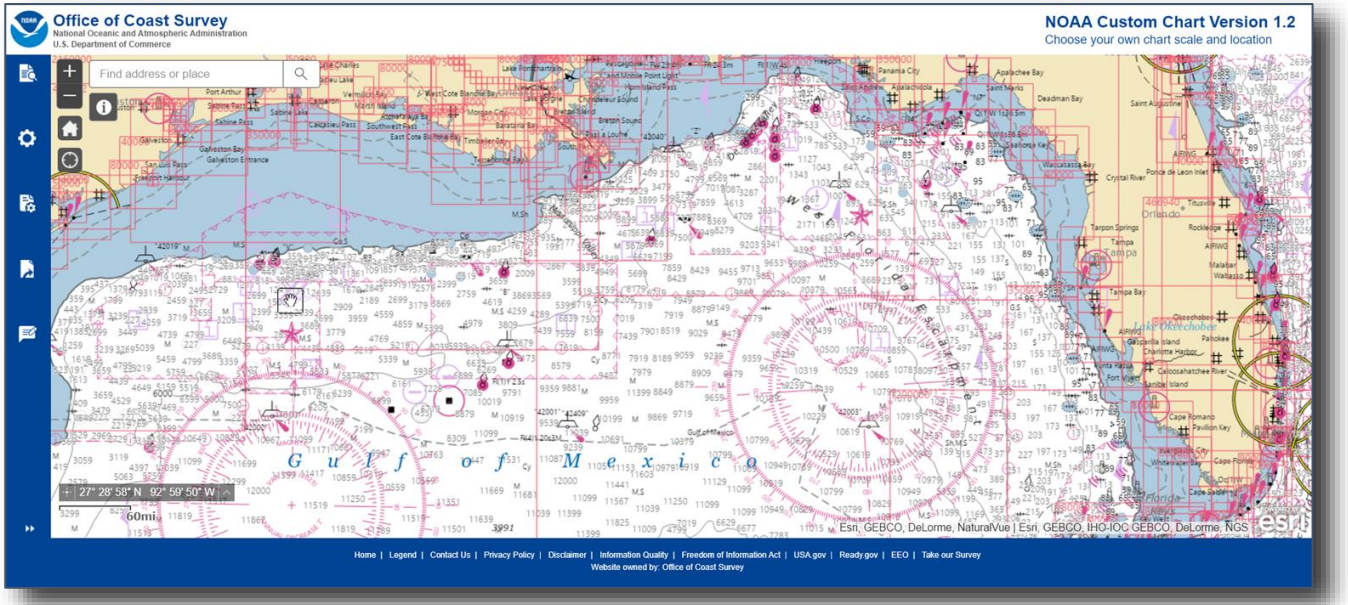
Chart Enhancements



NOAA Custom Chart Tool

NOAA Custom Chart (NCC) is a web app that enables users to create their own customized nautical charts directly from the latest official NOAA electronic navigational chart (NOAA ENC®) data.

NCC outputs geospatially referenced Portable Document Format (PDF) files using the paper size, scale, and location selected by the user. Depths can be displayed in meters, feet, or fathoms and there are a few other display options, such as changing the depth at which a shallow water blue tint is applied and the depiction of a "safety contour" based on a vessel's draft.



NOAA Custom Chart Tool

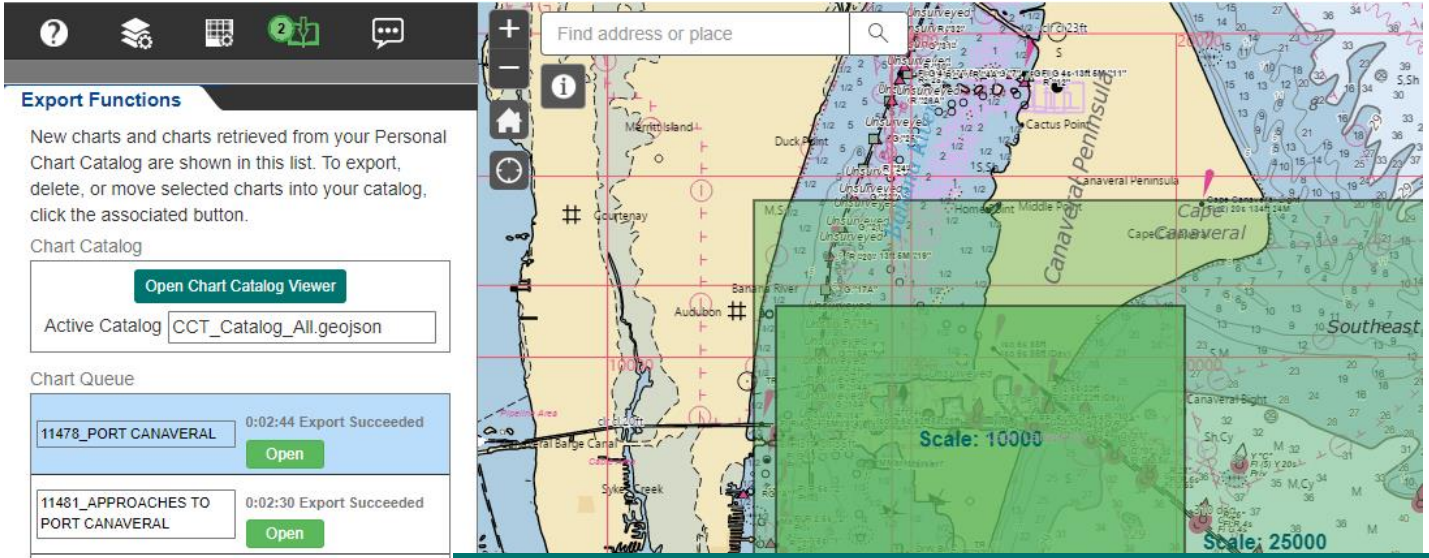


Chart Catalog Viewer

Catalog changes will be lost if you close the application before clicking "Save Chart Catalog".

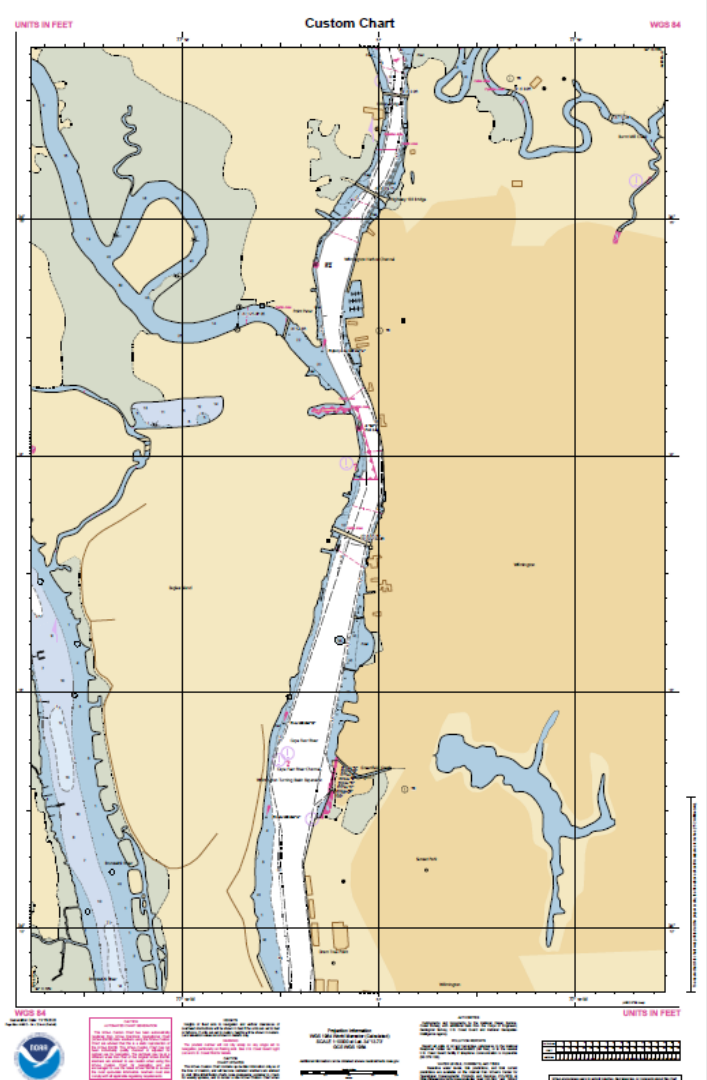
Open Existing Chart Catalog | Create / Save Chart Catalog

Charts in Active Chart Catalog: CCT_Catalog_All.geojson

	Actions	Date	Title	Scale	Page Size	Orientation	Coordinates	Depth Units	Depth Zone Tints
☑	Delete	1/25/2023	11481_APPROACHES TO PORT CANAVERAL	25000	ANSI E	Landscape	28.38°N -80.527°W	Feet	Four

Example Custom Chart

Downtown Wilmington

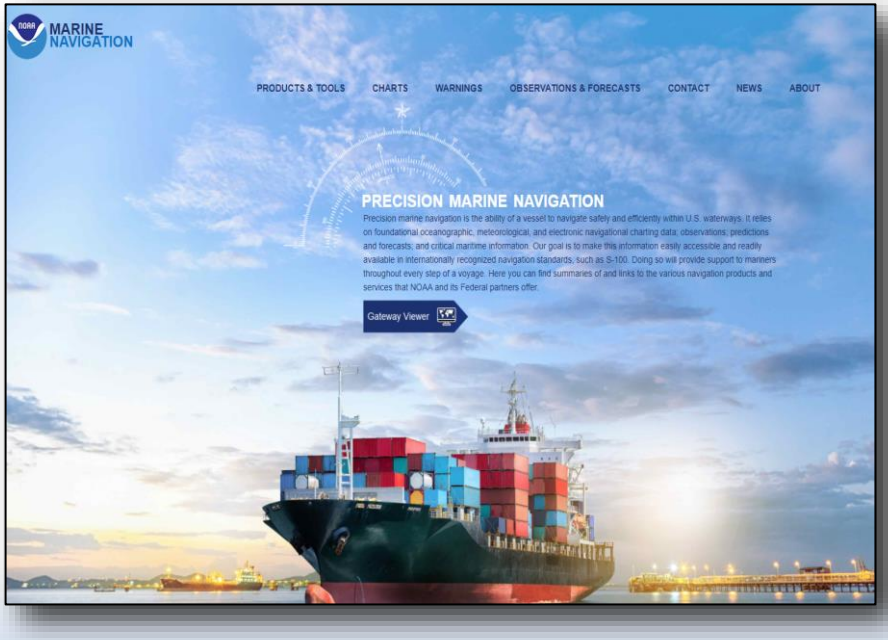


What is Precision Marine Navigation?

…the ability of a vessel to safely and efficiently navigate and operate in close proximity to the seafloor, bridges, narrow channels, or other marine hazards.

Precision Marine Navigation Program

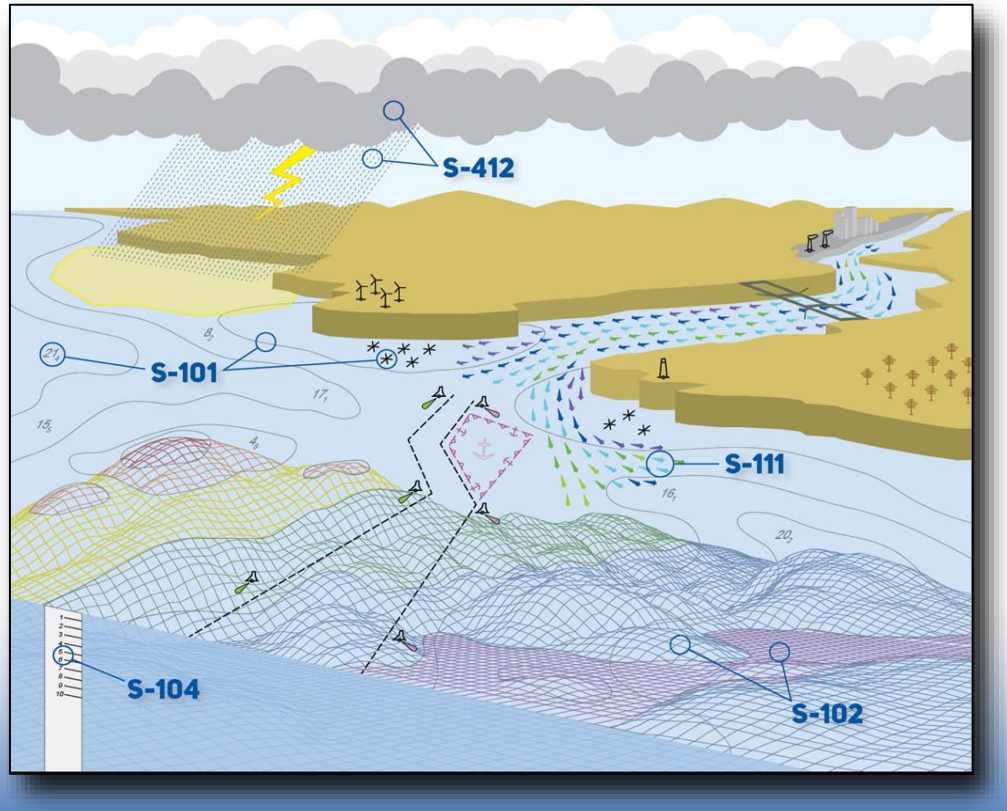
- Leveraging International Standards (S-100)
- Precision Marine Navigation Data and Dissemination Services
- Machine to Machine capability
- Marinenavigation.noaa.gov Website



S-100 Data Framework

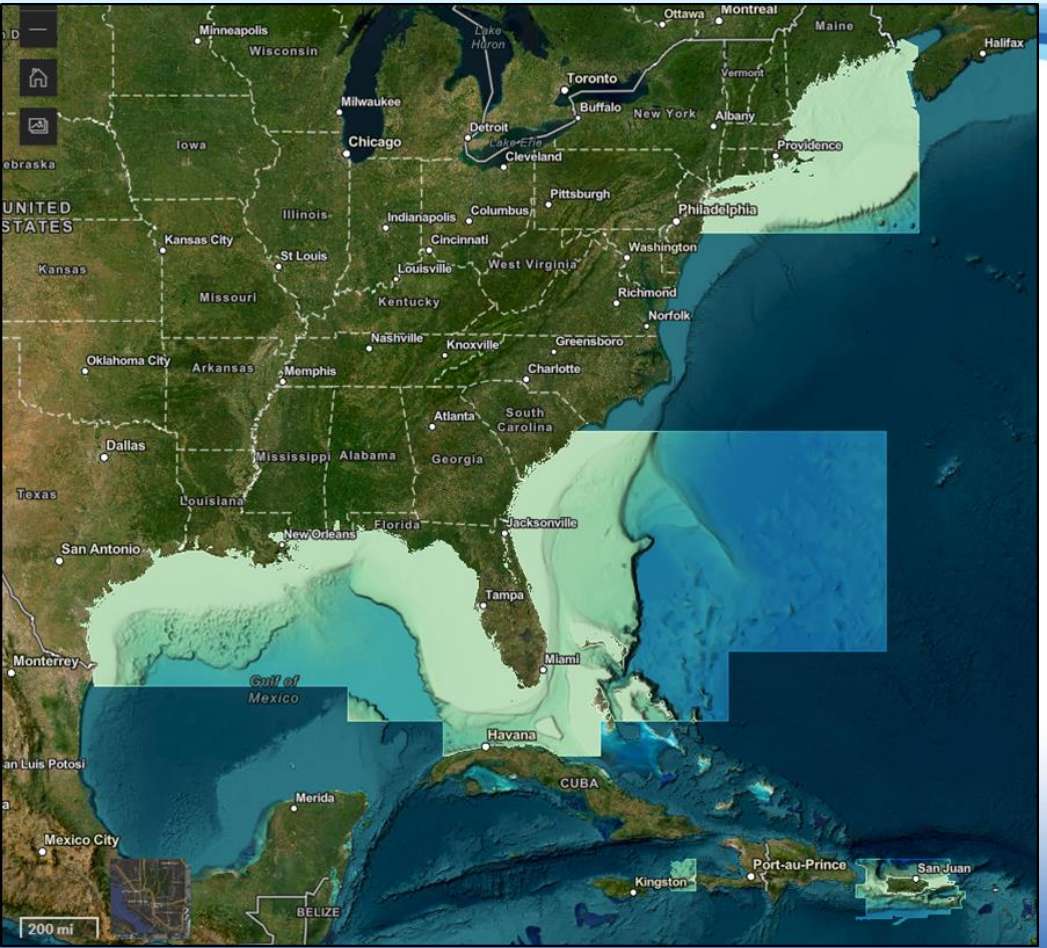
S-100 Data Products

- **S-101**: Electronic Navigational Charts (ENC)
- **S-102:** Bathymetric Surface
- **S-104:** Water Level Information
- **S-111:** Surface Currents
- **S-41X:** Weather Overlays



NOAA Coast Survey

BlueTopo™



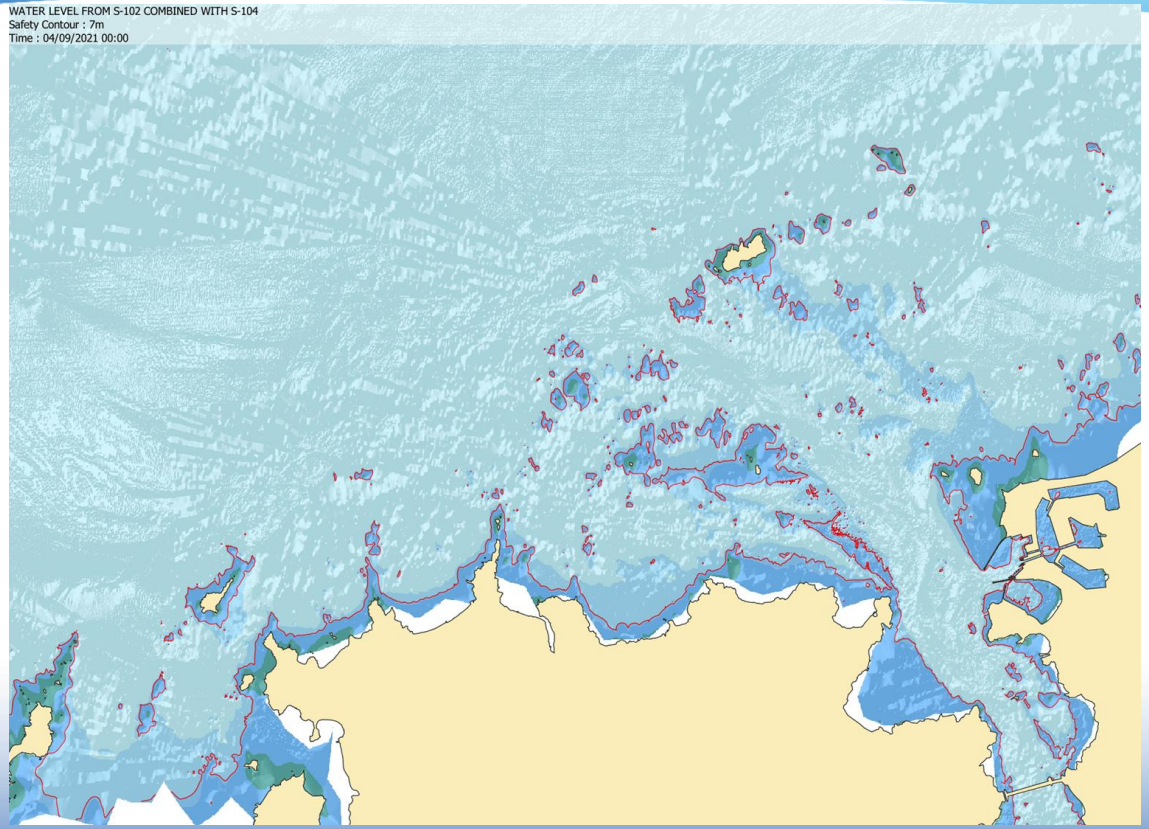
NOT FOR NAVIGATION

Data is on NAVD88

May include unqualified data.

https://nauticalcharts.noaa.gov/data/bluetopo.html

Integrated Water Level and Bathymetry

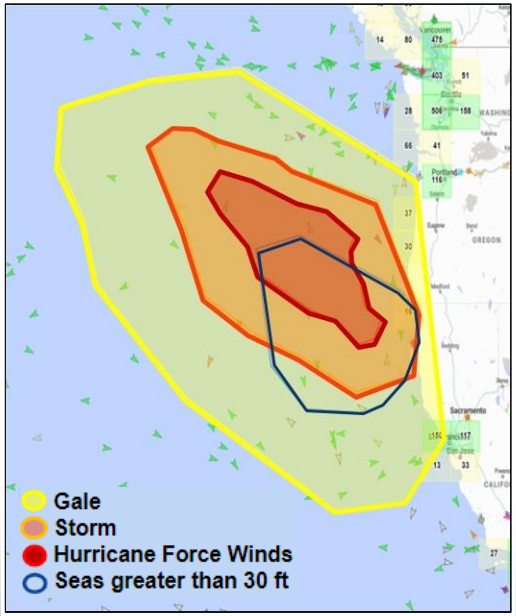


Animation Courtesy of SHOM

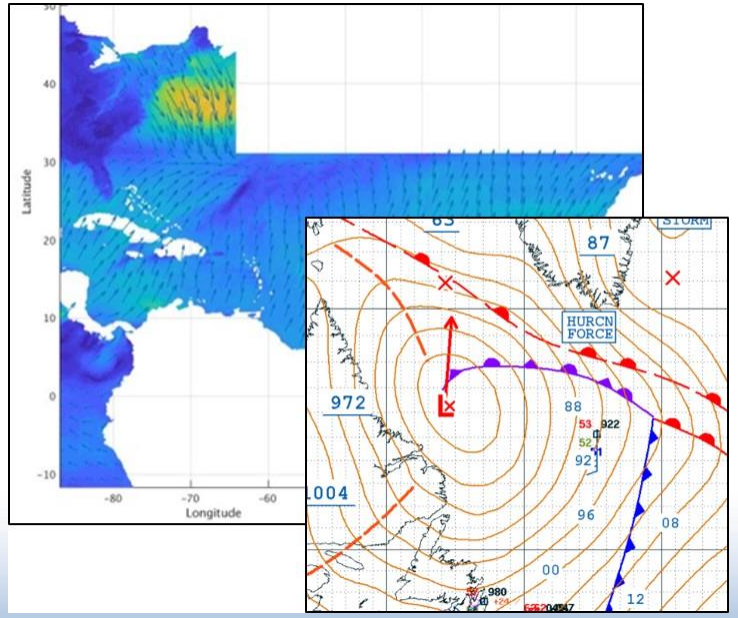
Safety Contour 7m. The safety contour changes are based on S-102 bathymetry and Water Level Adjustment (WLA), using S-104, over a period of 21 hours.

At Sea: Waves and Weather

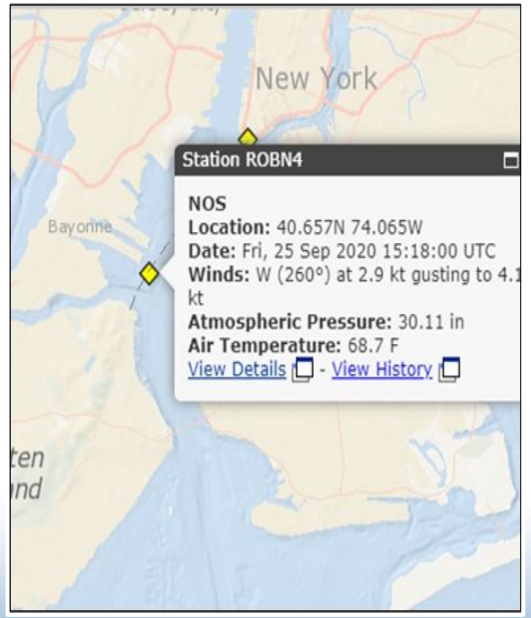
Wave and Weather Hazards (S-412)



Wave and Weather Conditions (S-413)

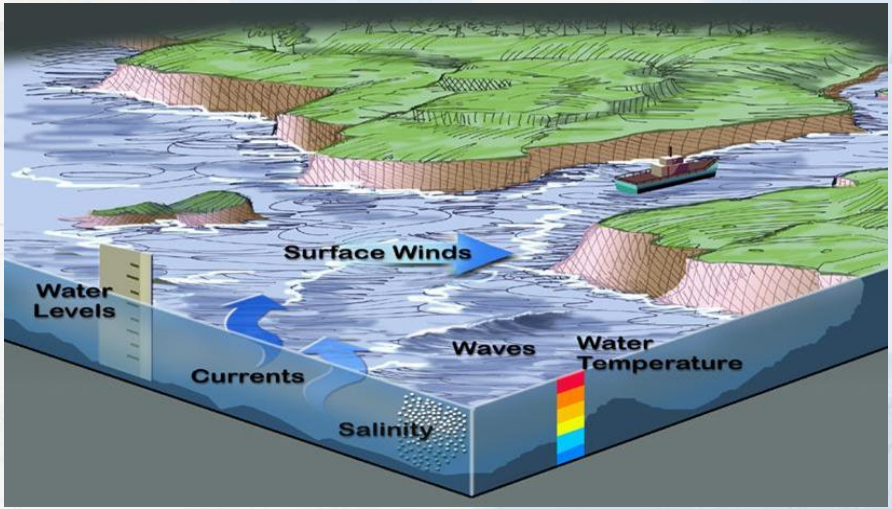


Wave and Weather Observations (S-414)

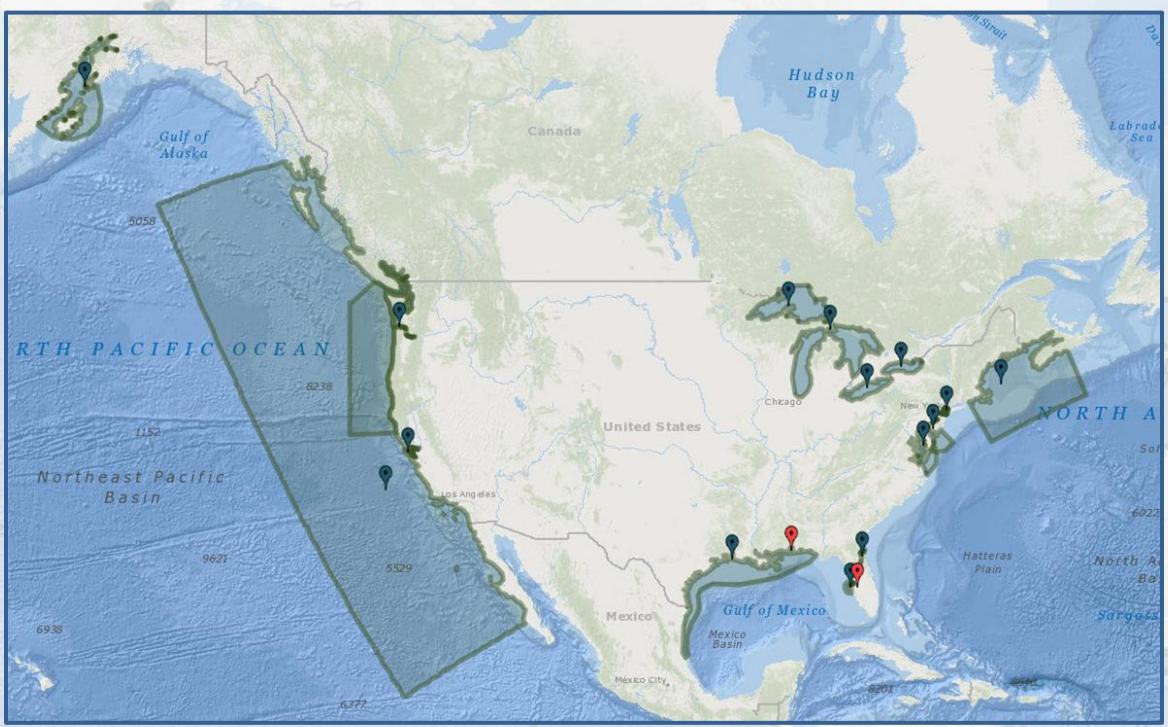


What do operational forecast systems do?

- Produce 24-hour nowcasts and 48- to 120-hour forecasts for:
  - **water levels**
  - **currents**
  - **water temperature**
  - **salinity**
  - **ice concentration, thickness & velocity**
- Run every 6 hours of every day



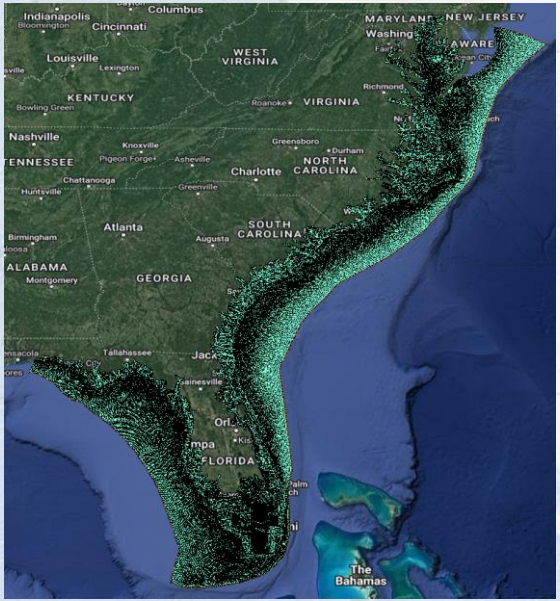
Existing coastal models: 15 total

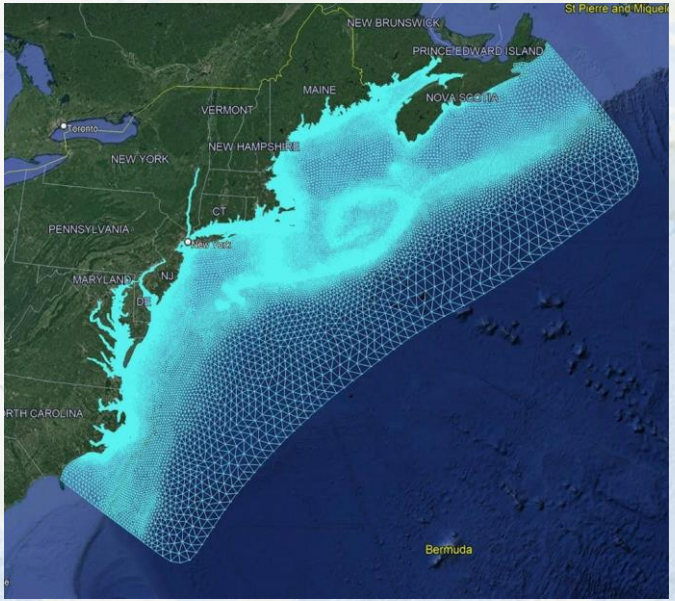


- Cook Inlet, AK
- West Coast
- Columbia River
- San Francisco Bay
- Gulf of Mexico
- Tampa Bay
- St. Johns River
- Lake Erie
- Lake Michigan-Huron
- Lake Ontario
- Lake Superior
- Chesapeake Bay
- Delaware Bay
- New York/New Jersey
- Gulf of Maine

Questions for the Audience

- Model Coverage: Which particular areas (offshore, along the coast and up rivers) do you need a model to include?





How to reach Coast Survey

https://nauticalcharts.noaa.gov/customer-service/assist/

- Submit questions & comments
- Report an error
- 1-888-990-NOAA (1-888-990-6622)

Kyle Ward

kyle.ward@noaa.gov