

## *Office of Coast Survey Latest GIS Applications*

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Geospatial Applications Development Branch  
Coast Survey Development Laboratory

# Agenda

## Coast Survey Geospatial Products & Services

- Current List ([nauticalcharts.noaa.gov](https://nauticalcharts.noaa.gov))
- Recently Updated and New
- In Development



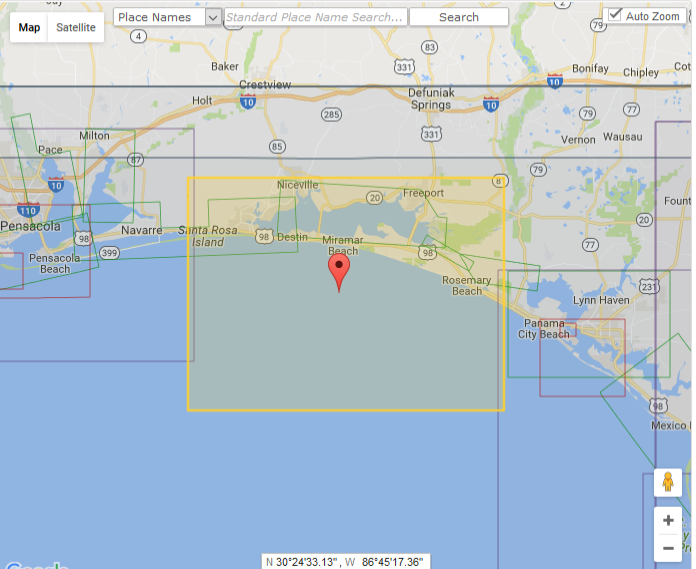
# Nauticalcharts.noaa.gov

- Interactive Chart Catalog
  - Raster (RNCs)
  - Vector (ENCs)
  - Coast Pilot
- Historical Maps and Charts
- Survey Planning
- Public Wrecks and Obstructions
- Seamless Raster Service
- NOAA Tile Service
- ENC Direct to GIS
- nowCOAST
- ENCOOnline Viewer



# Interactive Catalog

Paper Charts (RNC & PDF) Electronic Charts (ENC) Coast Pilot Help



**General Information & Links**  
**NOAA RNCs (RNC):**  
Geo-referenced charts in BSB format.  
**Terms & Conditions**  
**Print-on-Demand (POD):**  
Order POD charts from **Certified Agents**.  
**NOAA PDFs (PDF):**  
Full-size, 400dpi printable charts.  
**NOAA BookletChart (BC):**  
8.5" x 11" printable panels of the charts.  
**Notice to Mariner (NM):**  
Weekly corrections to the RNCs.  
**NOAA ChartViewer (View)**  
**Historical Map & Chart Collection**

**Map Selection Information**  
Chart: 11388 1:80,000

Title:	Choctawhatchee Bay
Type:	Coastal Chart
Scale:	1:80,000
Edition:	18
Print Date:	6/1/2012

**Available Products**  
[View](#) [Buy](#) [PDF](#) [BC](#) [RNC](#) [NM](#)

Chart: 1115A 1:456,394  
Chart: 11360 1:456,394  
Chart: 11006 1:875,000  
Chart: 411 1:2,160,000

**Map Selection Information**  
Chart: US4FL74M

Title:	Choctawhatchee Bay
RNC:	11388
Scale:	1:80,000
Edition:	9.0
Published:	12/14/2016

**Available Products**  
[ENC](#)

Chart: US3GC05M  
Chart: US2GC09M  
Chart: US1GC09M

**Map Selection Information**  
Coast Pilot: 5

Title:	Gulf of Mexico, Puerto Rico, and Virgin Islands
Scale:	1:10000

**Available Products**  
[CP](#)

RNC

ENC

Coast Pilot

<https://www.charts.noaa.gov/InteractiveCatalog/nrnc.shtml>



# Historical Map & Chart Collection

The screenshot shows the NOAA Historical Map & Chart Collection website. At the top left is the logo for the Historical Map & Chart Collection, featuring a compass rose and the text "Historical MAP & CHART COLLECTION". To the right is the NOAA Office of Coast Survey logo. Below these is a navigation menu with links for ABOUT, SEARCH IMAGES, SEARCH PUBLICATIONS, FAQs, COLLECTIONS, and LINKS. The main content area is divided into two columns. The left column contains sections for "CONTENTS AND USE" and "BACKGROUND". The right column features a search interface with two options: "Point on Map" and "Geographic Name". Below the search options are two map screenshots: one showing a selected location with coordinates (Lat: 37.86, Lon: -76.47) and another showing a search result for "Baltimore" with details like "Feature Type: Populated Place" and "County: Baltimore (city)". At the bottom of the page, there is a footer with links for User Survey, Privacy Policy, Disclaimer, NOAA's National Ocean Service, NOAA, and U.S. Department of Commerce. A feedback message is also present: "The Historical Map and Charts team is looking for your feedback. Please let us know if you have any comments, questions, or concerns by submitting an inquiry. We will get back to you as soon as possible."

**Historical MAP & CHART COLLECTION**

Office of Coast Survey

NOAA

ABOUT | SEARCH IMAGES | SEARCH PUBLICATIONS | FAQs | COLLECTIONS | LINKS

**CONTENTS AND USE**

Office of Coast Survey's Historical Map & Chart Collection covers the land and waters of the United States of America, including territories and possessions (past and present). The images are free to download, and may be used for commercial or educational purposes. Although not required, we encourage users to cite "NOAA's Historical Map & Chart Collection" when using the image(s).

**BACKGROUND**

Today's Office of Coast Survey traces its charting efforts back to 1807, when President Thomas Jefferson founded the Survey of the Coast. To celebrate and preserve this long history, NOAA started assembling the collection in 1995 as a data rescue effort. NOAA continues to preserve charts and maps produced by NOAA's Coast Survey and its predecessors, especially the U.S. Coast and Geodetic Survey and the U.S. Lake Survey (previously under the Department of War).

The collection also covers many areas that most people may not realize were once a part of early Coast Survey history. As the first federal scientific agency, the U.S. Coast and Geodetic Survey (as the agency was known from 1878 to 1970) produced land sketches, Civil War battle maps, and aeronautical charting from the 1930s to the 1950s.

**NOW WITH 2 SEARCH OPTIONS:**

**Point on Map**      **Geographic Name**

**Selected Location:**  
Lat: 37.86, Lon: -76.47  
[View Results](#)

**Baltimore**  
Feature Type: Populated Place  
Lat/Lon: 39.2903848-76.6121893  
County: Baltimore (city)  
[Search by Location](#)

The Historical Map and Charts team is looking for your feedback. Please let us know if you have any comments, questions, or concerns by submitting an [inquiry](#). We will get back to you as soon as possible.

User Survey | Privacy Policy | Disclaimer | NOAA's National Ocean Service | NOAA | U.S. Department of Commerce

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

# NOAA Planned Survey Projects - 2016

Search Results   Story Map: NOAA Planne...   +

noaa.maps.arcgis.com/apps/MapSeries/index.html?appid=c04dbcf9398d4933b9bfacd01758b5e1

## Story Map: NOAA Planned Hydrographic Survey Projects - 2016

NOAA's Office of Coast Survey is responsible for planning hydrographic surveys. Planned hydrographic surveys are derived from NOAA's Hydrographic survey priorities, constituent requests submitted through navigational managers, and other factors. Note that these plans are tentative and subject to change based on each fiscal year's budget allocation, developing priorities and emerging constituent requests. Planned hydrographic surveys can be accessed via [REST service](#).

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Project Progress Sketch

**OPR-P136-RA-16**  
North Coast of Kodiak Island  
Rainier Coverage as of 24 OCT 2016

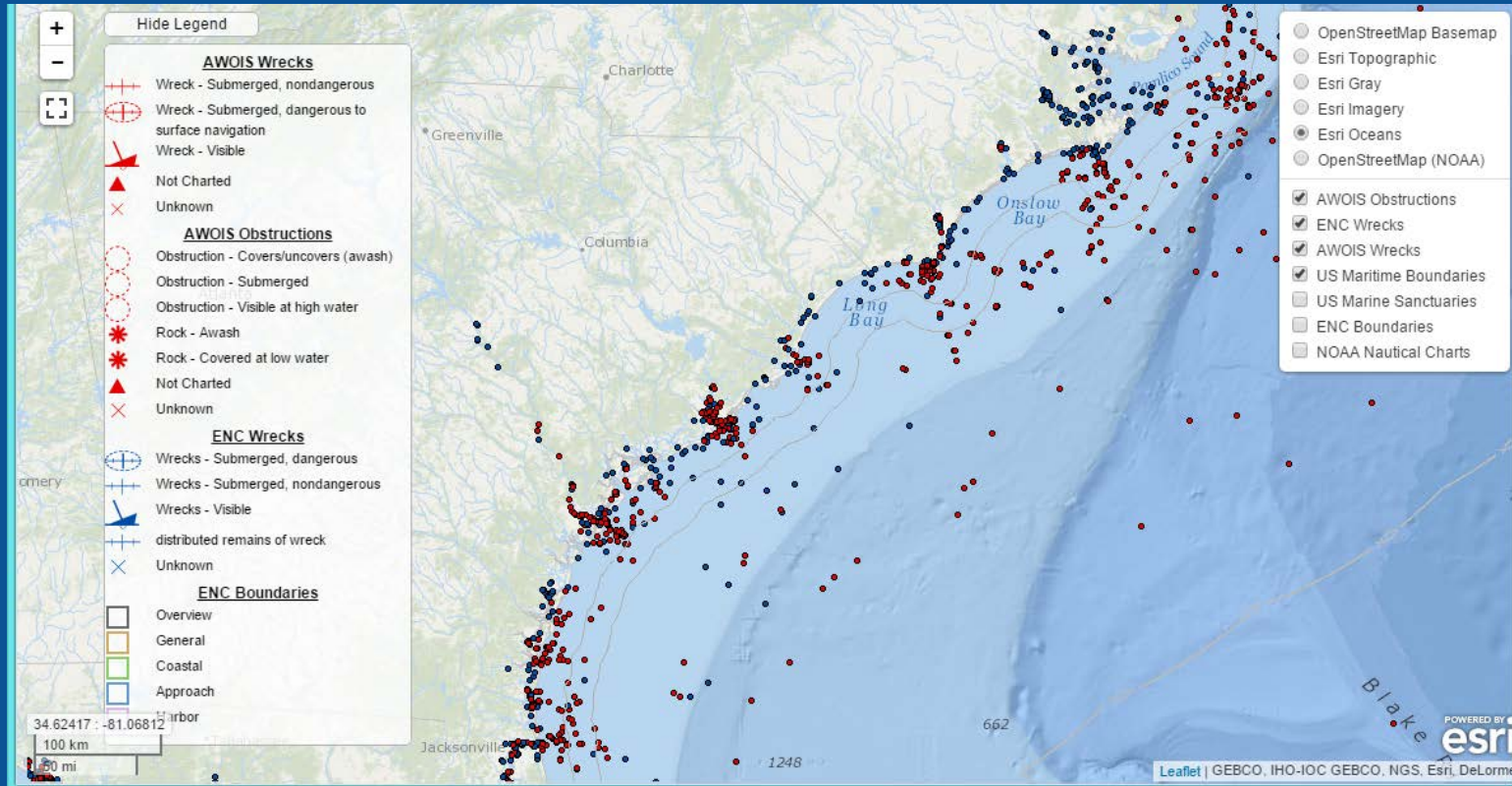
sheets\_WGS84

Story Map

Office of Coast Survey

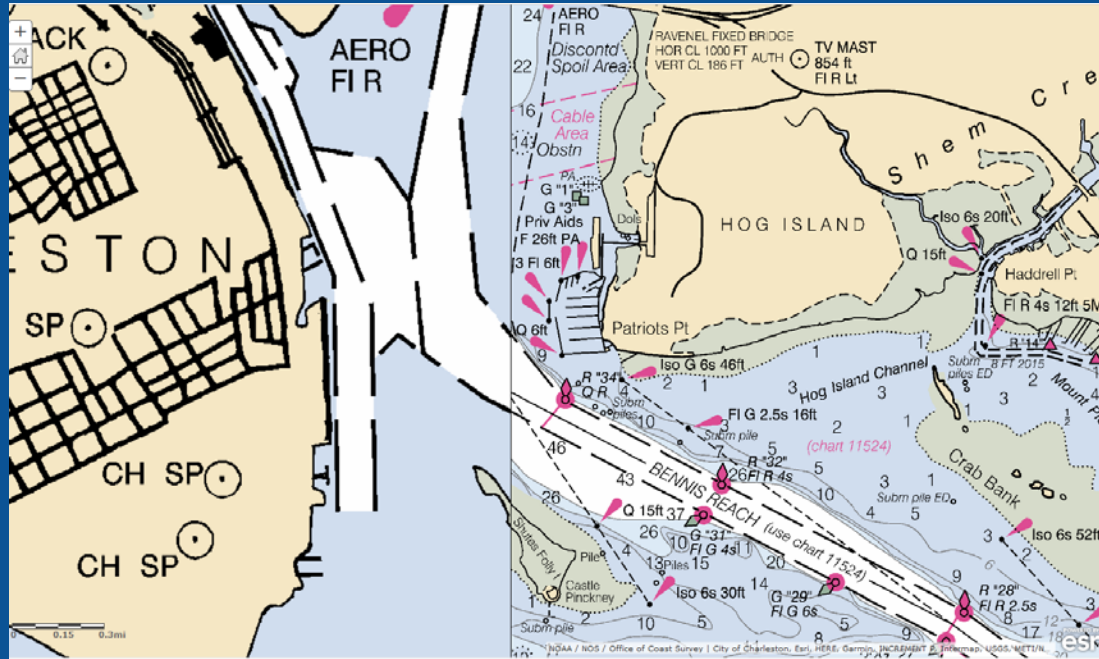


# Public Wrecks & Obstruction Database & Viewer



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

# Seamless Raster Service

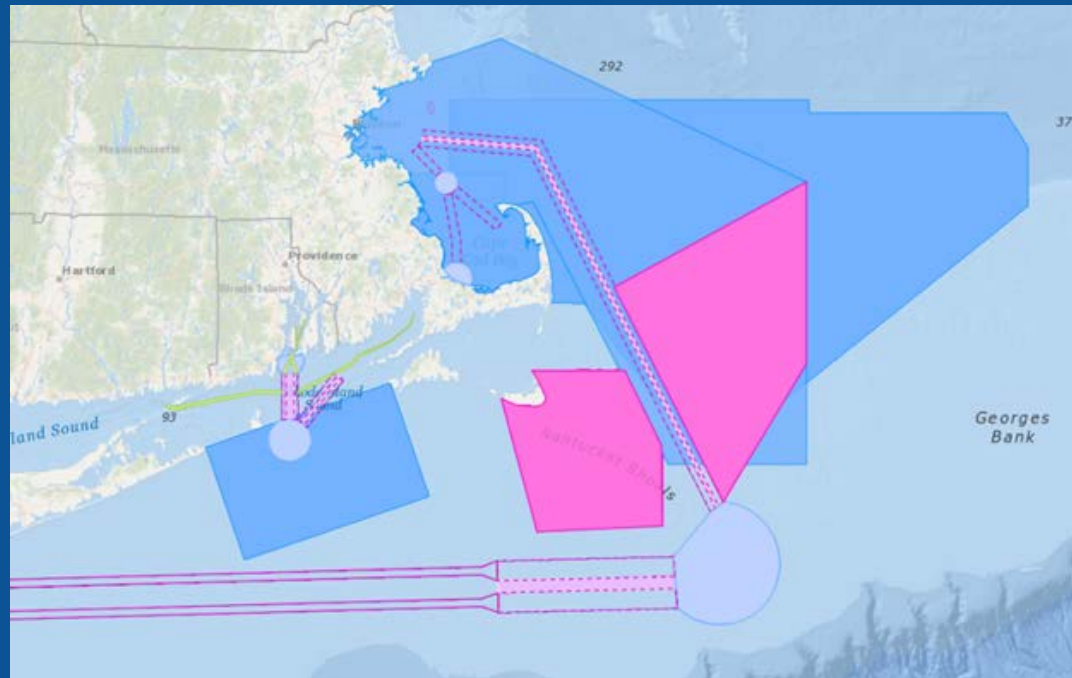


UPDATED WEEKLY  
Supports Web Mapping Services  
KMZ files created to support Google Earth



- The NOAA Chart Tile Service provides standardized nautical chart tilesets for the public
- Eliminates the need for application developers to regularly undergo the cumbersome process of transforming NOAA BSB files into tilesets.
- It provides geo-referenced charts compatible with the Web Map Tile Specifications (WMTS) and Tile Map Service Specification (TMS).
- All tilesets are published on a weekly basis.

# ENC Direct of GIS Authoritative Theme Layers



Updated Shipping Lanes and Regulatory Areas

<https://encdirect.noaa.gov>

# nowCOAST

 **nowCOAST** NOAA's Web Mapping Portal to Real-Time Coastal Observations, Forecasts, and Warnings

\* Mariner Version \*

[nowCOAST for General Use](#) [Map Services](#) [More Info](#) [Contact Us](#)

**nowCOAST 5.0 Beta**  
**\*\* EXPERIMENTAL \*\***

Left-Click on Map for data values, hyperlinks or more information

Right-Click on Map for **Weather Forecast** at Inland & Coastal Locations

Layer Menu

Legend

### Forecasts/Predictions

#### Weather & Marine Weather Forecasts

##### Weather Forecasts:

Right-Click on Map for Weather Forecast at Inland & Coastal Locations

##### Links to Marine Weather Forecasts:

- Beach/Surf Areas
- Coastal Waters
- Offshore Waters
- High Seas

##### Gridded Forecasts:

- Nat'l Digital Forecast Database (NDFD)
- Surface Wind Velocity (Barbs)

#### Tide Predictions

#### Ocean/Estuary/Great Lakes Forecast Guidance

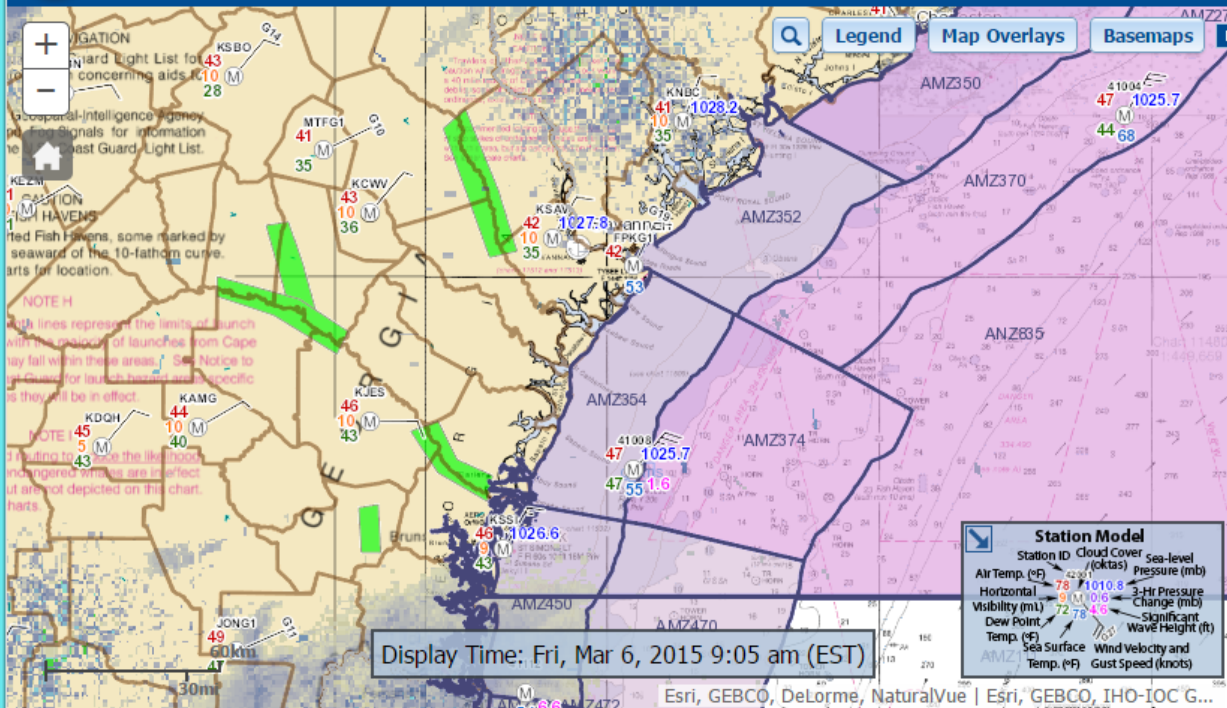
#### River Forecasts

### Hazardous Conditions/Threats

Viewer Settings



DOC | NOAA | NOS | OCS | CSDL | User Survey  
Web site owner: Office of Coast Survey | Privacy Policy

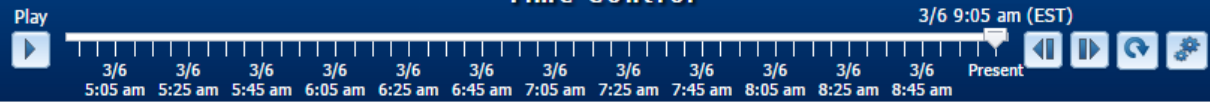


Station Model			
Station ID	Cloud Cover	Sea-level Pressure (mb)	
4810266	10	1010.8	
Air Temp. (°F)	78	3-Hr Pressure Change (mb)	0.1
Horizontal Visibility (mi)	9	Significant Wave Height (ft)	1.5
Dew Point Temp. (°F)	72	Wave Height (ft)	1.5
Sea Surface Temp. (°F)	73	Wind Velocity and Gust Speed (knots)	

Display Time: Fri, Mar 6, 2015 9:05 am (EST)

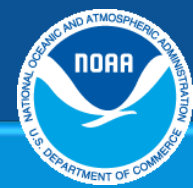
Time Control

3/6 9:05 am (EST)



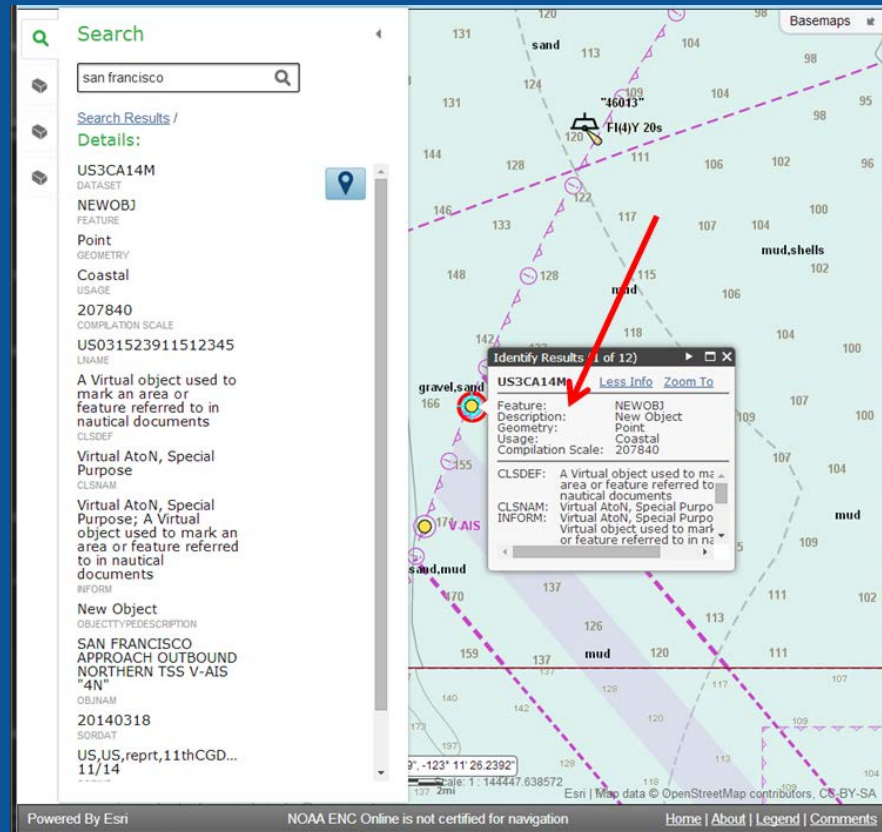
<https://nowcoast.noaa.gov/>

Office of Coast Survey



# NOAA ENC® Online

- Search for ENC features
- Identify by clicking in map window
- Zoom to selected features
- Switch between basemaps
- Adjust transparency
- Switch ECDIS display parameters
- Link to U.S. Chart No. 1
- Able to provide feedback
- Access to up-to-date data



<https://www.nauticalcharts.noaa.gov/ENCOnline/enconline.html>

# Recently Updated or New Products and Services

- Arctic Voyage Planning Guide
- Chart Distribution
  - Weekly Updates
  - Historical
- Precision Navigation Tool (Beta)
- Organizing & Sharing Information
  - Internal OCS GIS Portal
  - External NOAA GeoPlatform





# U.S. ARCTIC VOYAGE PLANNING GUIDE

Home

Important Notice

This Guide

Partners and Authorities

Feedback

Navigation in the Arctic region should be considered dangerous.

This Mariner's Voyage Planning Guide must be kept up to date using the latest applicable notice to Mariners that are available. This Guide does not replace information contained in critical nautical charts and other official nautical publications published by services on the authority of national Governments.

Masters should carefully and in good time plan their passage through Arctic waters, making use of navigational charts of sufficiently large scale and with enough detail to ensure the safety of navigation. The latest edition of nautical charts and publications must be used.

The International Maritime Organization is developing a Polar Code that should be consulted for recommended practices for navigating in polar waters. The Polar Code will be finalized in May and enter into force on January 1, 2017.

**Disclaimer:** The information provided is intended to consolidate information helpful in planning an Arctic voyage, but should not be relied upon exclusively. All relevant information sources should be consulted and all applicable international, national, and state/local (if any) requirements must be adhered to.

Emergency Information

Geography of US Arctic

Navigation

Regulations & Requirements

Weather & Ice







# Historical Chart Updates

Chart 12304 From: 12/31/2015 To: 01/31/2017 Filter:

**DELAWARE BAY**

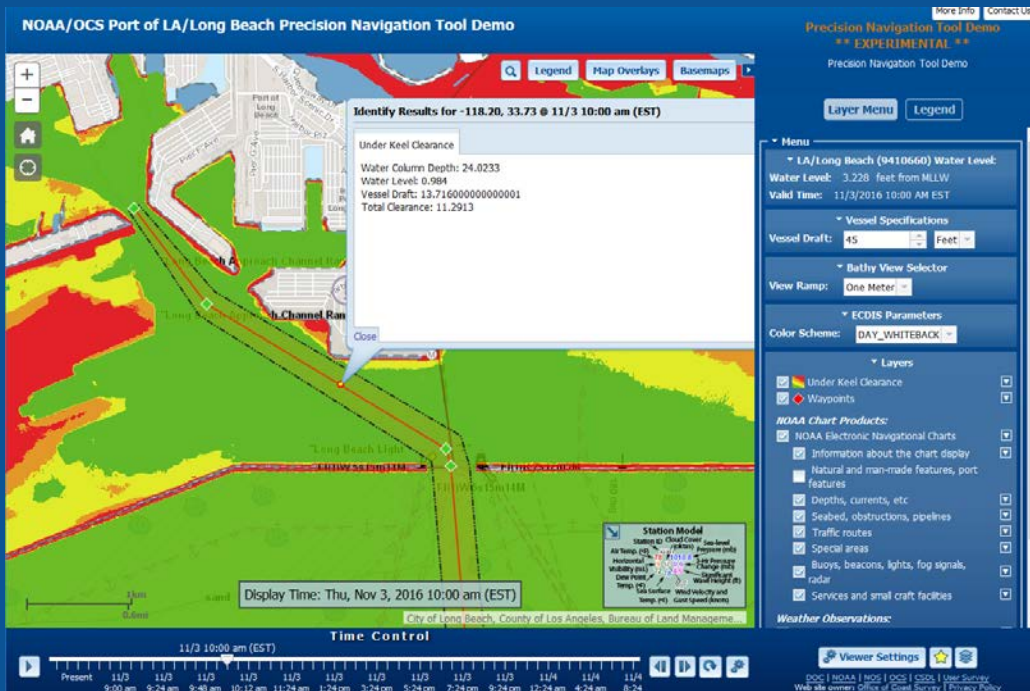
Near: -75.19, 39.08	
ID	263268
Update Type	Critical
Action	Relocate
Name	Delaware Bay Main Channel Light 19
Description	Q G 21ft 5M "19"
Affected by this Update	Product (Chart/Kapp) or ENC
Updated Product	12304/667 03/06/2016
Other Products Updated	US4DE12M 06/29/2016

Navigation: << Previous | Next >> | (1 of 1)

[https://distribution.charts.noaa.gov/historical\\_updates/](https://distribution.charts.noaa.gov/historical_updates/)

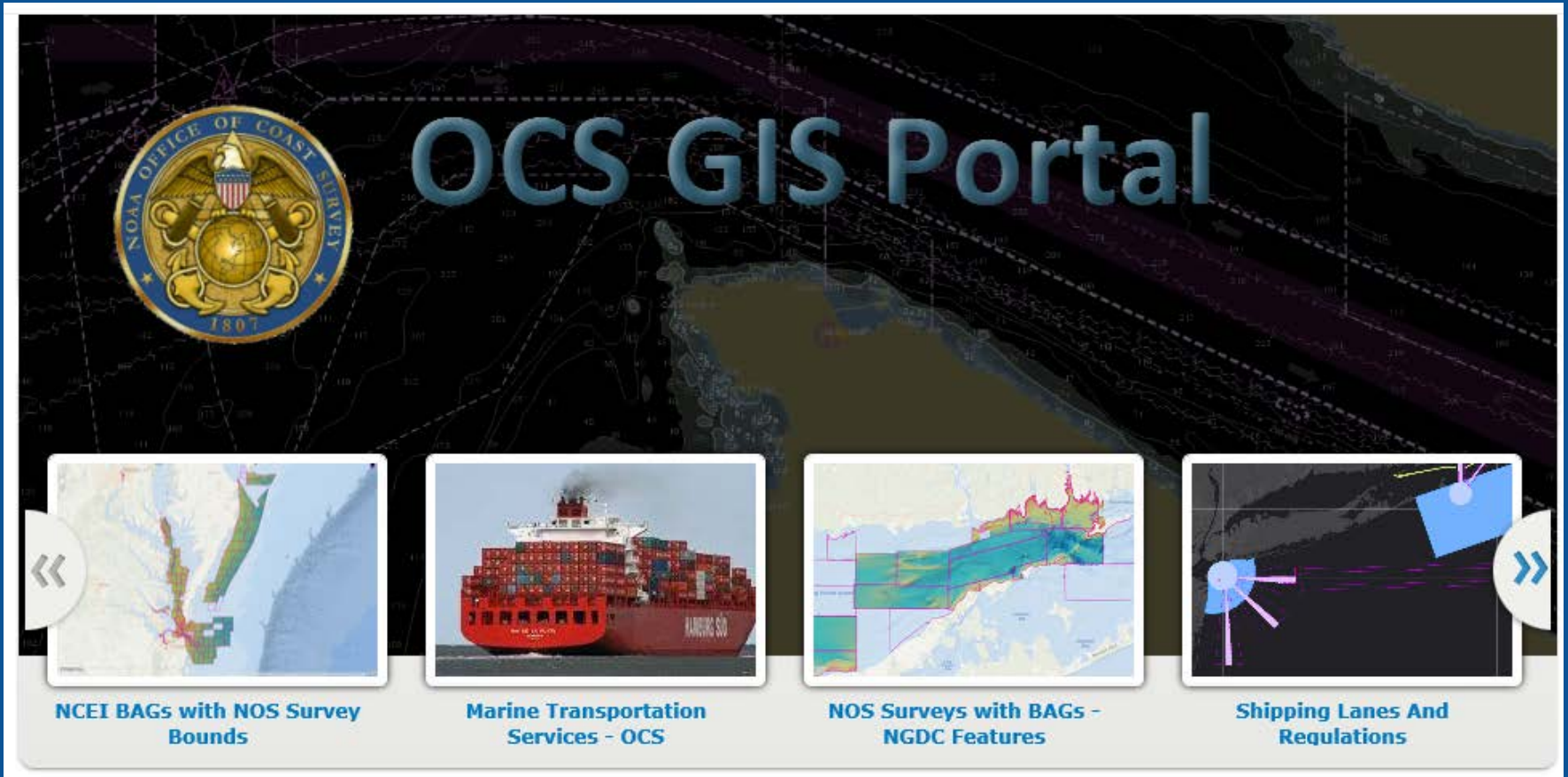


# Precision Navigation Tool Demo



- Forecast Under Keel Clearance based on Total Water Column
- Overlaid weather observations
- Multiple display options
- Developed with input from the maritime community

# Organizing & Sharing Geospatial Information

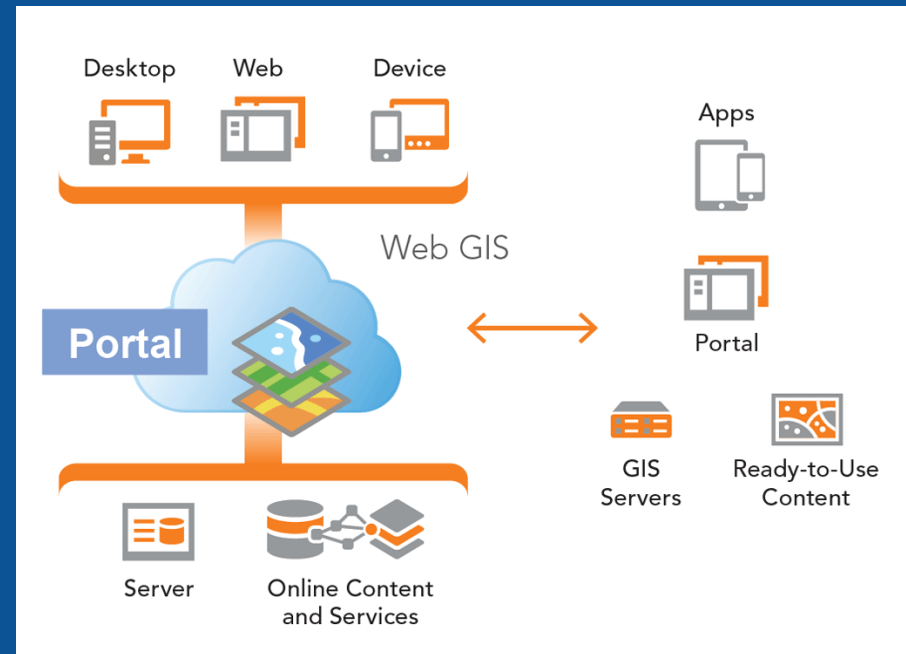


The image displays the OCS GIS Portal interface. At the top left is the NOAA Office of Coast Survey logo, featuring an eagle with a shield and a globe, with the text "NOAA OFFICE OF COAST SURVEY" and "1807". The main title "OCS GIS Portal" is centered in large, blue, 3D-style letters. Below the title are four thumbnails, each with a caption and navigation arrows (left and right) on the sides:

- Thumbnail 1:** A map showing a coastline with various colored overlays. **Caption:** NCEI BAGs with NOS Survey Bounds
- Thumbnail 2:** A large red container ship. **Caption:** Marine Transportation Services - OCS
- Thumbnail 3:** A map showing a coastline with various colored overlays and a grid. **Caption:** NOS Surveys with BAGs - NGDC Features
- Thumbnail 4:** A map showing a coastline with various colored overlays and a grid. **Caption:** Shipping Lanes And Regulations

# Capabilities

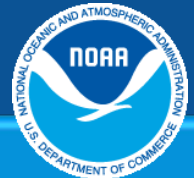
- Configure Portal to Meet Organization Requirements
- Manage Access through User Accounts
- Leverage ArcGIS Server
- Store Feature Data
- Create and Share Content
- View and Edit Content



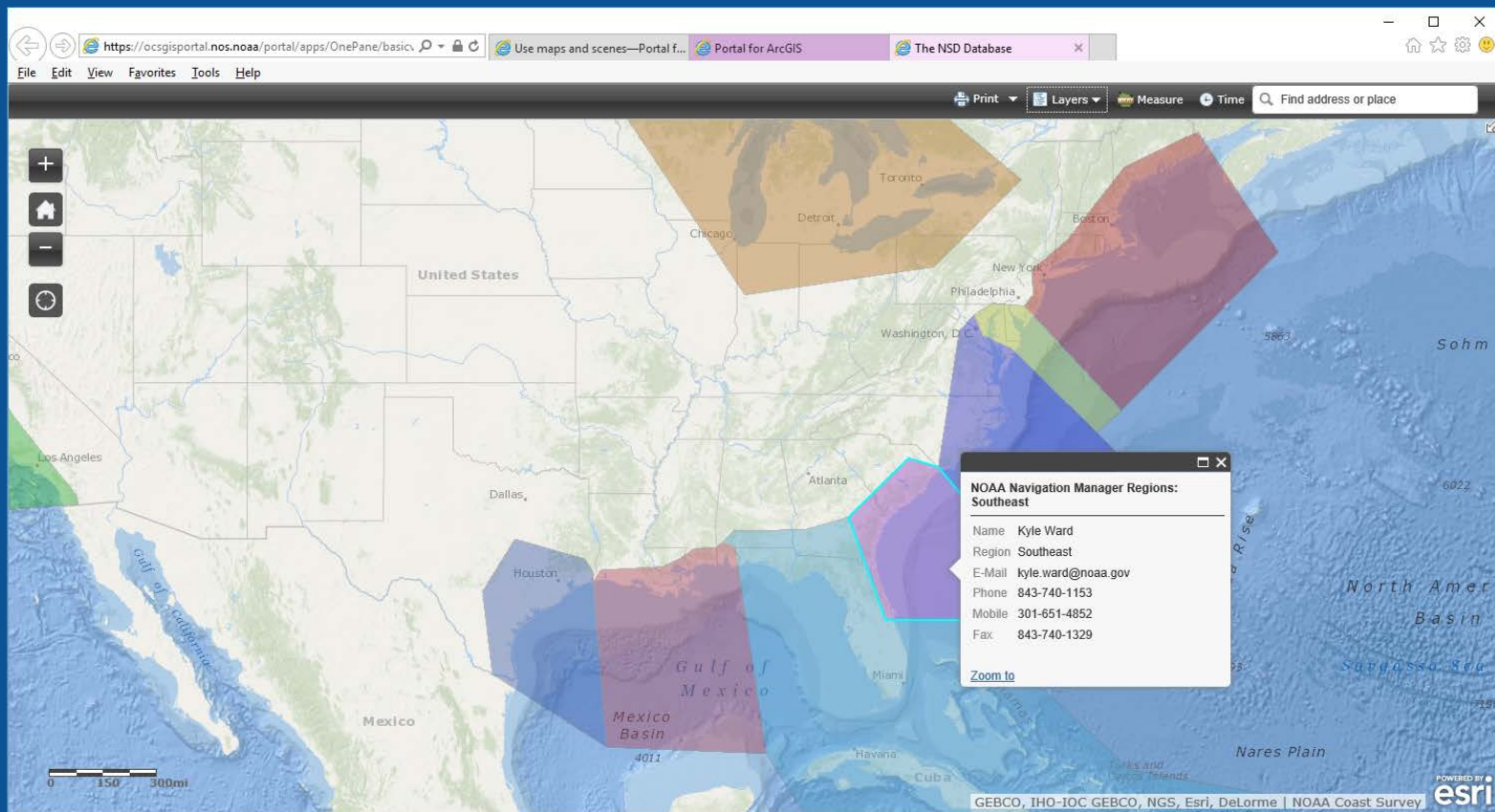
Web GIS Concept Diagram

# Active Captain Application Crowdsource Hazard Reporting

The screenshot shows the 'Active Captain Viewer - Currency and Comments' application. The browser address bar displays 'http://ocs-vs-appd7/flex\_test/ActiveCaptain/'. The application interface includes a map of the Georgetown, Florida area, showing 'Georgetown FI (2) 15M' and 'Winyah B'. A search window is open, titled 'Enhanced Search', with 'Active Captain Hazards' selected as the search layer. The search criteria are 'Search by Hazard Id:' and 'Enter Hazard\_ID:'. A data popup for Hazard ID 44002 is visible, showing details such as '21 Day AERO R 4', 'Comment Frequency', 'Total Comment 112 Count', 'LAST UPDATE 8/17/2016 5:00 PM', 'NAME Shoaling (traditional problem area)', and 'NOTES Marker G91 has been moved to reflect the shoal and is located'. The map also displays various navigational aids and notes, including 'NOTE A' and 'MAGNETIC VARIATION'.



# Navigation Manager Area of Responsibility



# Yukon River ENC



300,000 vs 90,000 Scale Chart





PROTOTYPE  
Welcome to  
NOAA GeoPlatform

Providing geospatial data, maps, and analytics in support of NOAA's mission

### Features



2015-2016 Strong El Niño  
Event Recap by the NWS Los



April 27, 2011: A Day  
Alabama Will Never Forget



Fish Passage at  
Northwest Hydroelectric Proje



Growth Rings: Patterns of  
Urban Development



# Chart Comparison - NOAA Chart 11466

## Why should I update my NOAA chart?

NOAA's Office of Coast Survey



Here you can see a comparison two subsequent editions of NOAA Chart 11466, in the vicinity of Lake Worth Inlet, FL

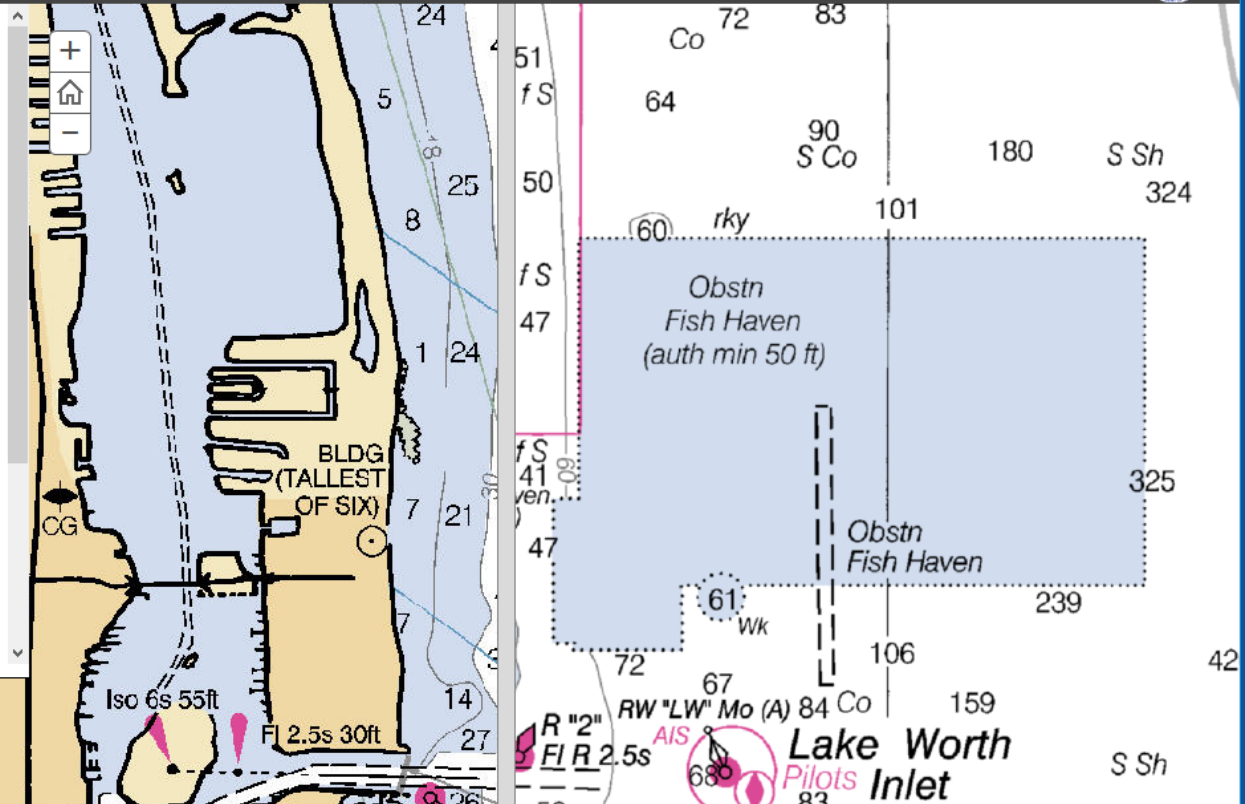
On the left side, you can see the 38th edition of NOAA Chart 11466 (June 2008). On the right side, you can see the 39th edition (April 2011).

The 39th edition includes updated bathymetry from a 2009 hydrographic survey, new shoreline from 2011, and various other data sources.

As you swipe left and right, pay close attention to the following:

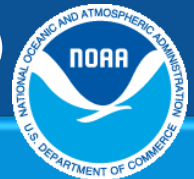
- changing extents of fish havens and spoil areas
- different soundings
- changing shoreline
- removal or LORAN lines

If you are still using old chart editions, you are navigating on outdated information and may possibly be putting yourself at risk.



38<sup>th</sup> Ed (June 2008)

39<sup>th</sup> Ed (April 2011)



# Peer Beneath the Waves Story Map

## Peer Beneath the Waves

Learn more about hydrography and charting. [f](#) [t](#) [e](#)

Bathymetry and nautical chart of Gloucester Harbor



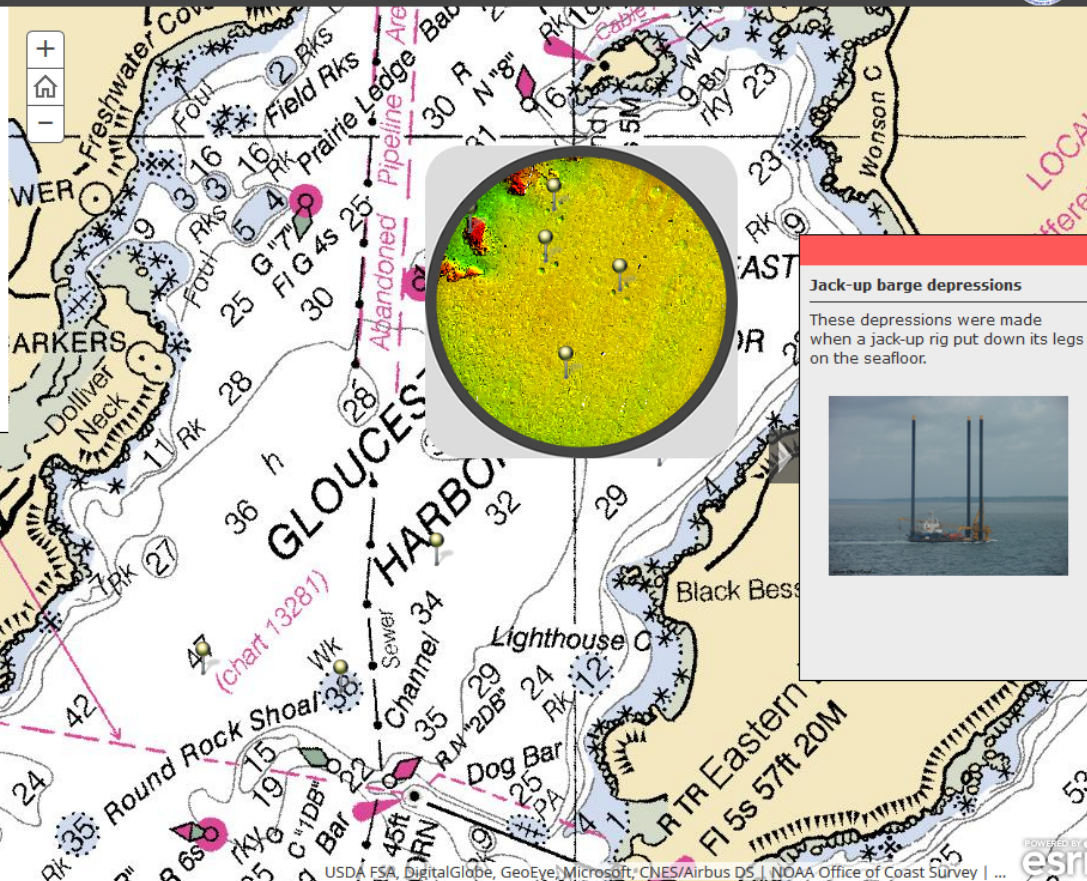
Use this story map to peer beneath NOAA's nautical chart, to "see" the seafloor.

Zoom in and out, move around, and click on the markers to learn more about the seabed in Gloucester Harbor.

The colors in the "digital terrain model" beneath the chart indicate depth. In general, red shows shallow depths, and blue or purple show deeper depths.

The colorful digital terrain model uses NOAA's [hydrographic survey data](#), which is acquired by [multibeam echo sounders](#).

For more information on measuring the seafloor, see a three-minute video: [What is sonar?](#)



USDA, FSA, DigitalGlobe, GeoEye, Microsoft, CNES/Airbus DS, NOAA Office of Coast Survey | ...



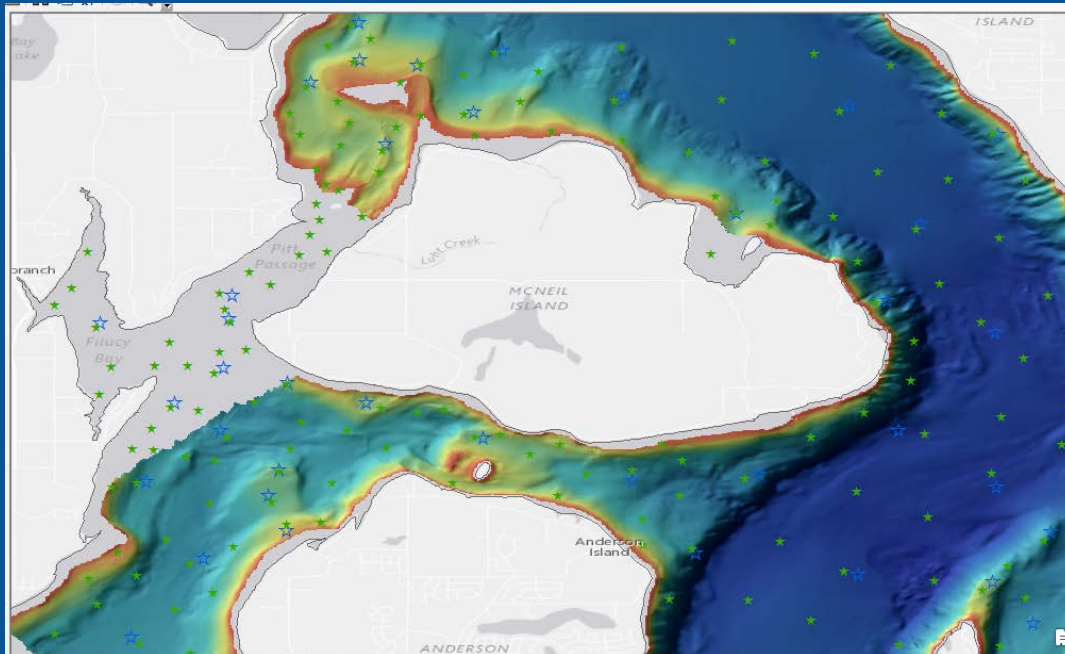
# Outcomes

- Improved effectiveness of geospatial activities across the organization
- Supports collaboration by sharing geospatial resources
- Reduced duplication of effort
- Reduced time spent looking for authoritative data sources

# In Development

- Development of a Navigation Bathymetric Database
- Hydrographic Health Modeling
- ENC Re-scheming
- Seabed 2030

# Navigational Bathymetric Gridded Database Project



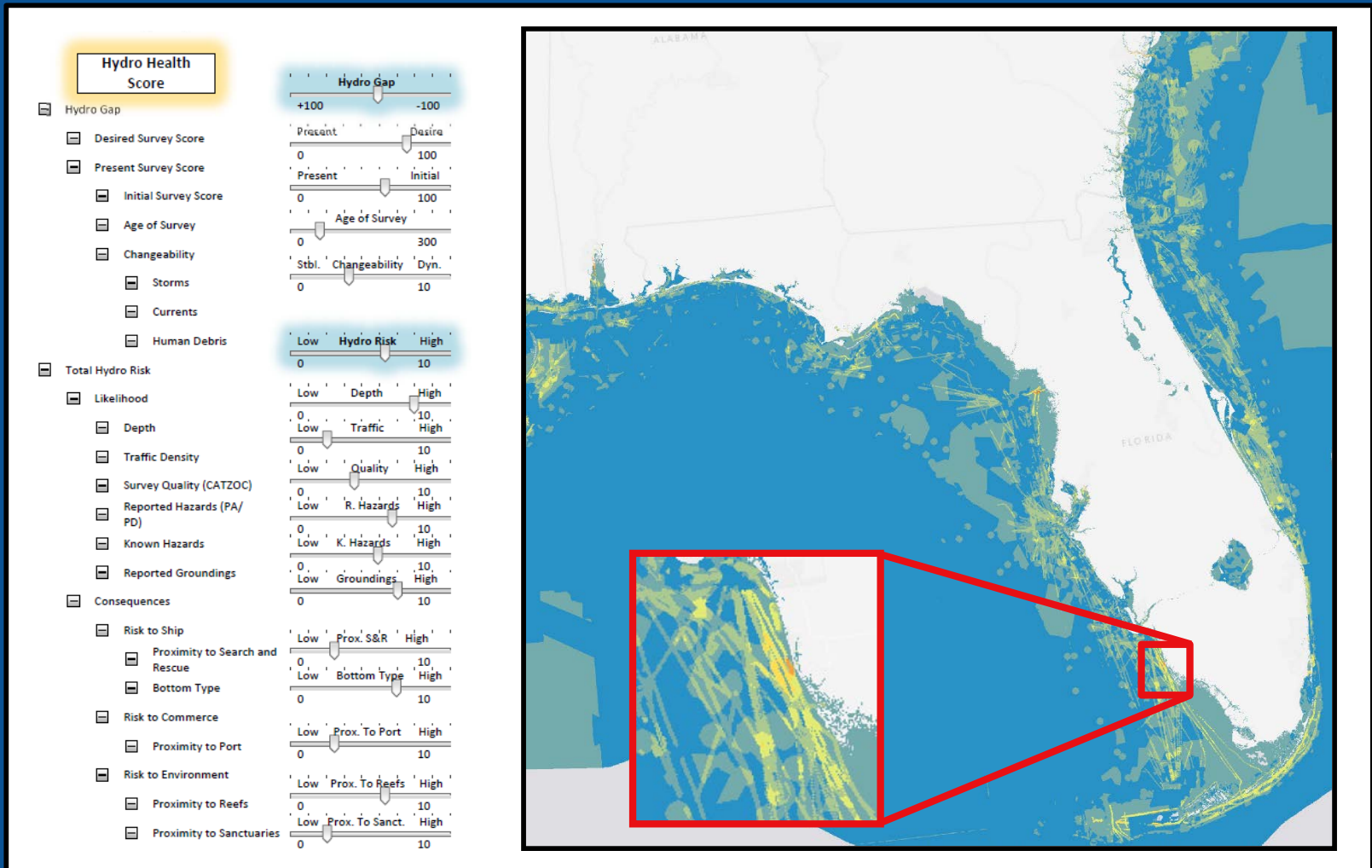
- Access to Full Resolution Hydrographic Survey from Multiple Sources
- Puget Sound as the initial test case
- Ability to link database to current charted sounding
- Create new higher resolution products and services
- Support Rescheming the ENC's

# A Model of Hydrographic Health

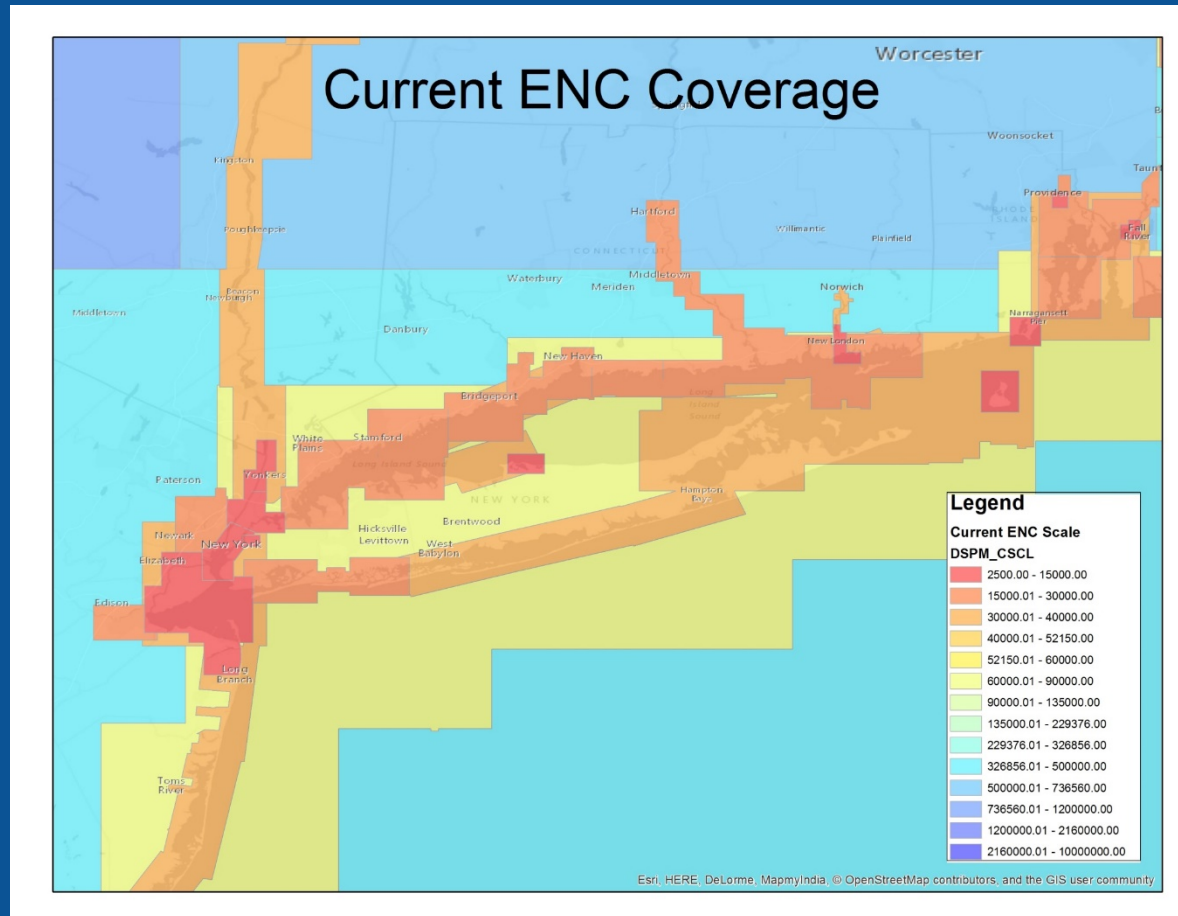
$$\text{Hydrographic Health} = \underbrace{\left( \frac{\text{Desired Survey Score} - \text{Present Survey Score}}{\text{Desired Survey Score}} \right)^2}_{\text{Hydrographic Gap}} \times \underbrace{\sum \left( \text{Consequence} \times \prod (\text{Likelihood}) \right)}_{\text{Hydrographic Risk}}$$

- Hydrographic Gap
  - The difference between the desired and present survey score; the larger the gap, the worse the hydrographic health.
- Hydrographic Risk
  - Modeled as the risk to surface navigation due to inaccurate depths or unknown hazards; the greater the risk, the worse the hydrographic health.

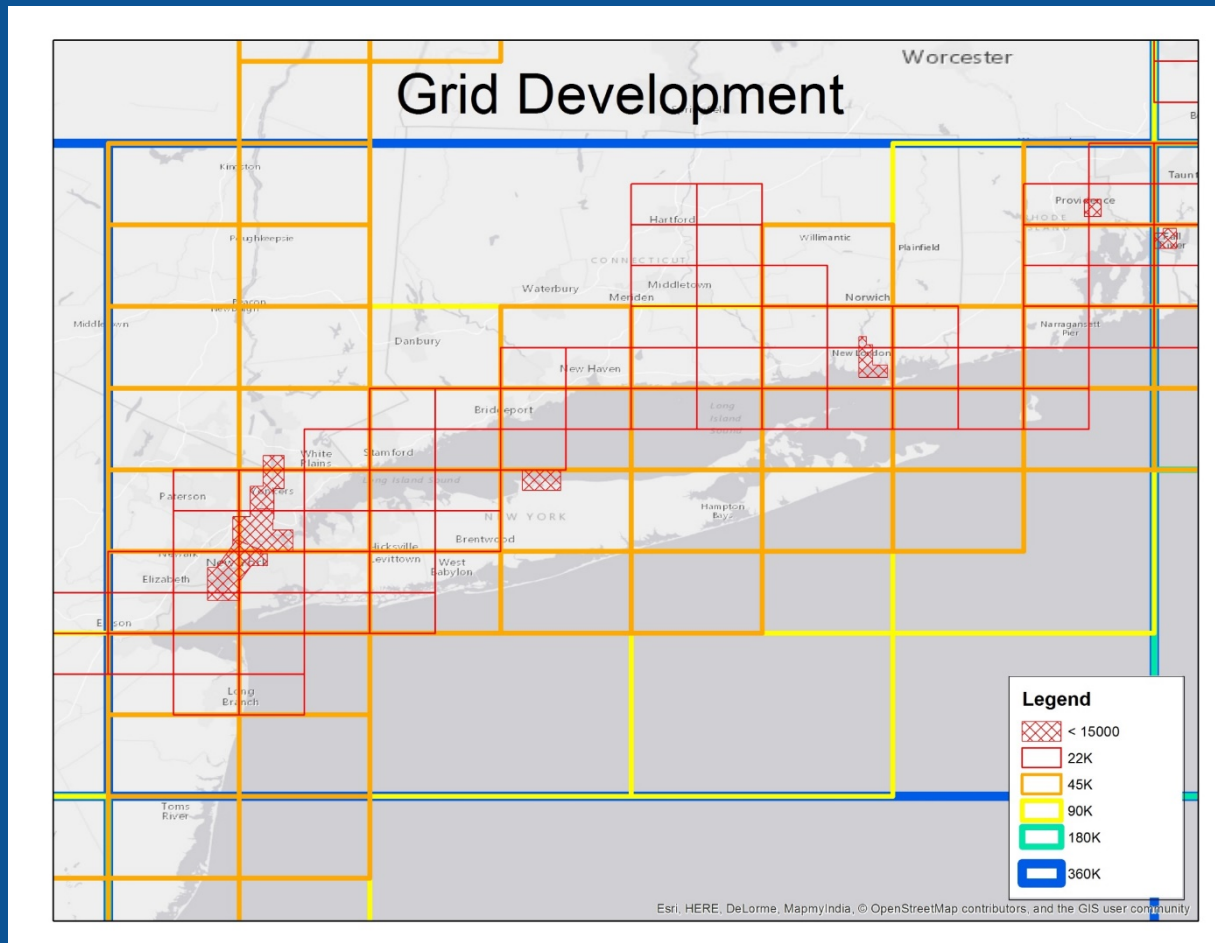
# Survey Area Prioritization



# Proposed ENC Re-scheming



# Proposed ENC Re-scheming



# Seabed 2030

- A quest to map the Seafloor by 2030
  - Currently less than 15% of the seafloor is mapped
- GEBCO is leading the internal effort
  - Held meeting in June 2016 to begin the discussion
- Coast Survey developing a plan to meet the goals of Seabed 2030 for US Waters

# Contact Information

Geospatial Application Development Branch  
Coast Survey Development Laboratory  
Office of Coast Survey, National Ocean Service

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