2022 NavTech Conference
December 2022

# High Resolution Bathymetry Data Collection and Dissemination

**Presented by Jason Creech, CH**
David Evans and Associates, Inc.
Vice President, Nautical Charting Program Manager

# Overview of hydrographic surveys to support precision navigation

## Port of Long Beach Harbor Sounding Program

## Lower Mississippi River S-102 Data Development

**High Resolution Bathymetry Data Collection and Dissemination**

DAVID EVANS AND ASSOCIATES INC.
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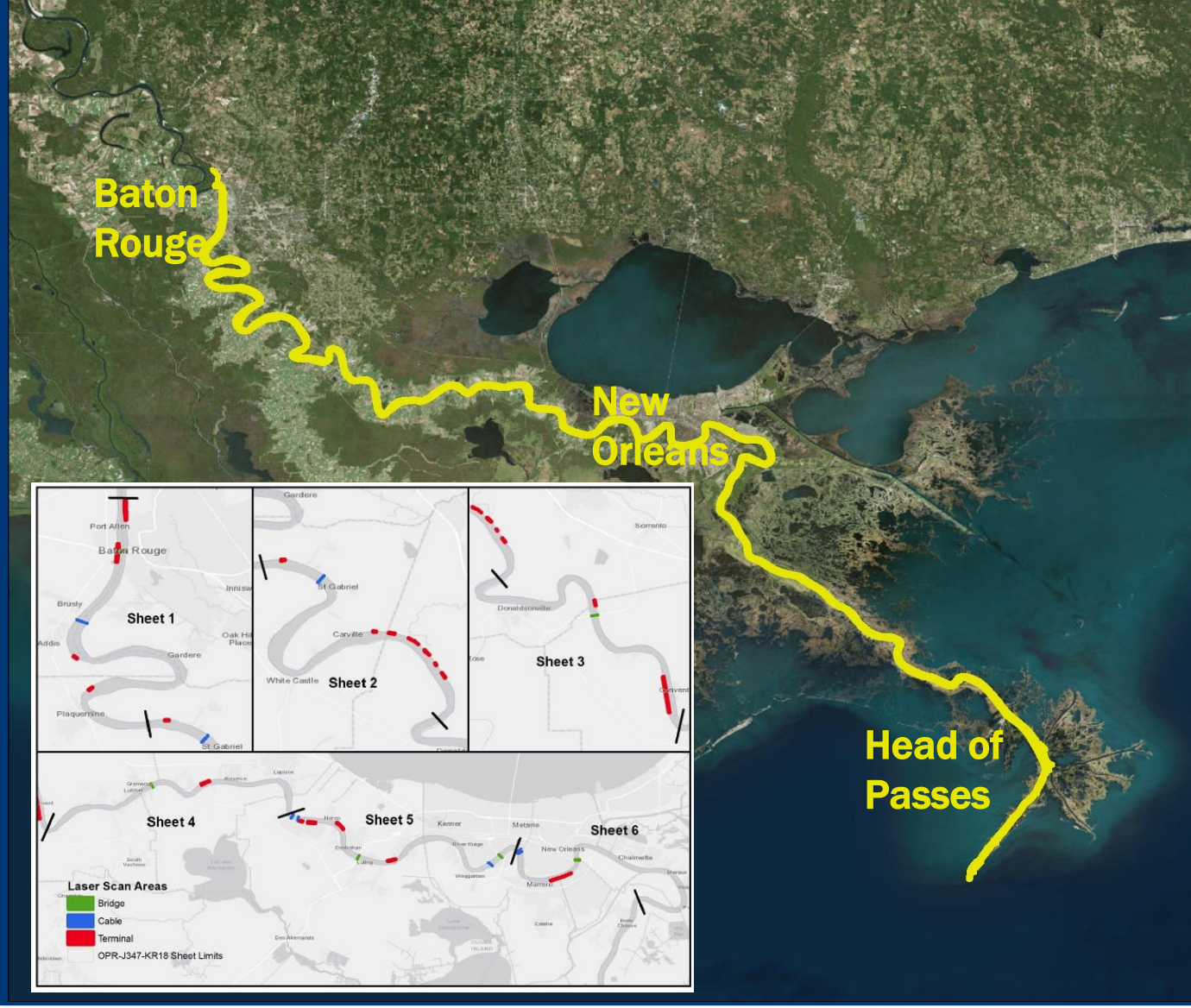
Lower Mississippi River

- 250 miles of the Lower Mississippi River
- NOAA Object Detection multibeam to 2m Low Water Reference Plane
- Laser scan terminals, bridges, overhead cables
- Charted feature verification for baring and submerged items




**Overview of hydrographic surveys to support precision navigation**

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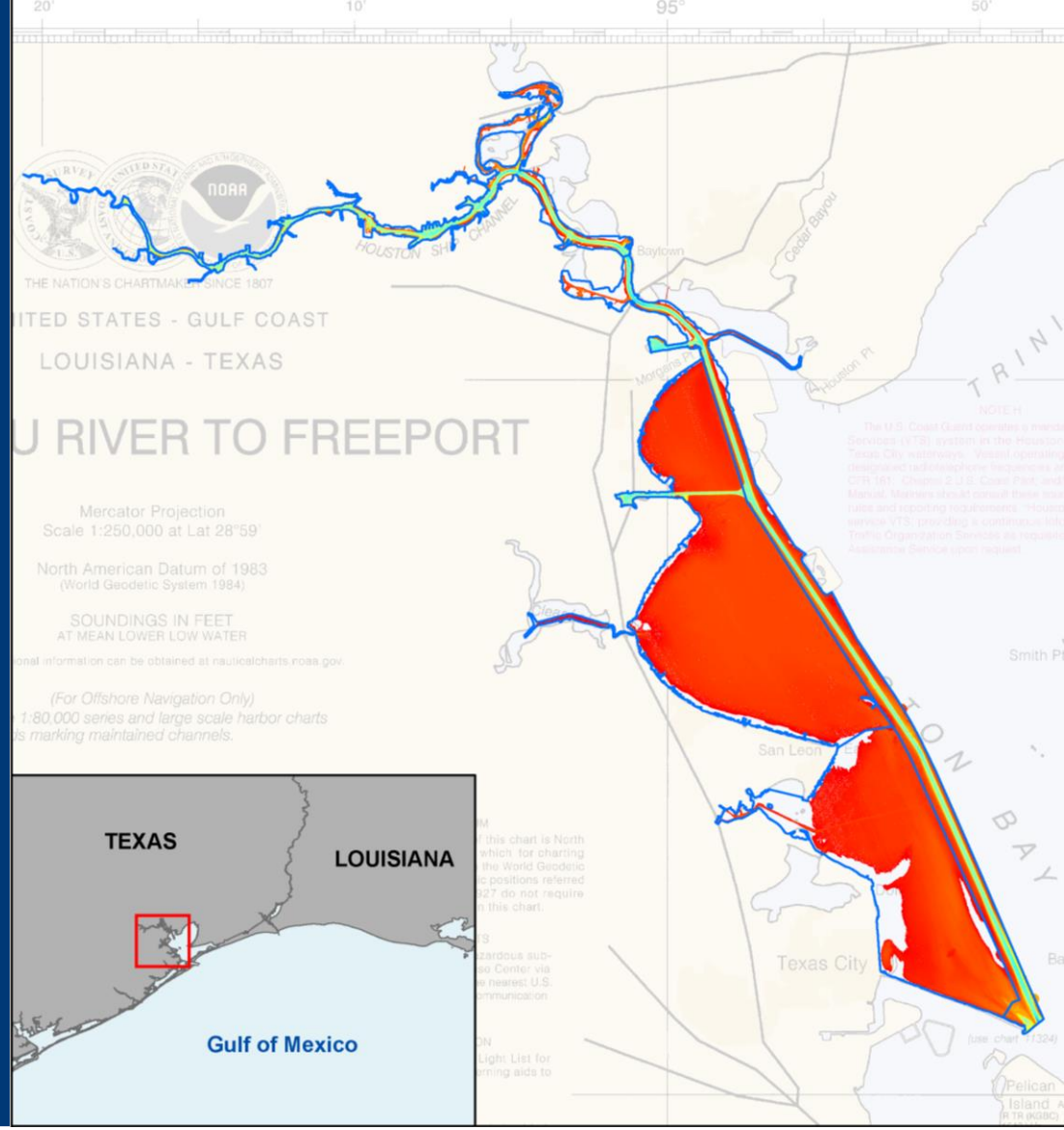
## Houston Ship Channel

- Houston Ship Channel and Western Galveston Bay
- NOAA Object Detection multibeam to 2m MLLW
- Laser scan terminals, bridges, overhead cables
- Charted feature verification for baring and submerged items




**Overview of hydrographic surveys to support precision navigation**

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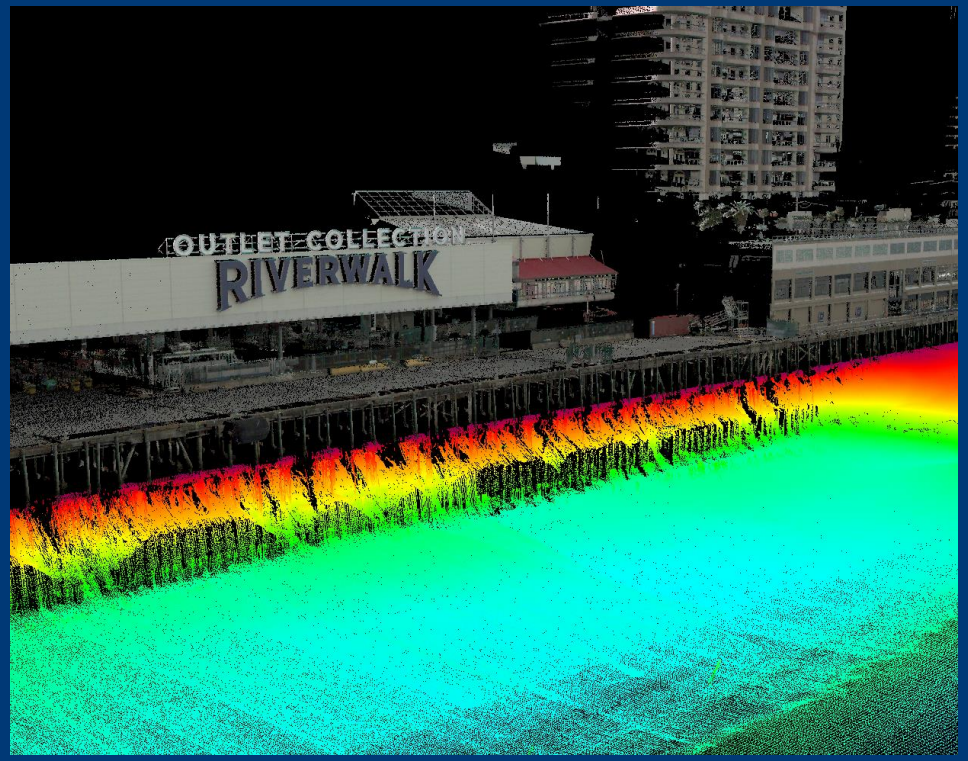


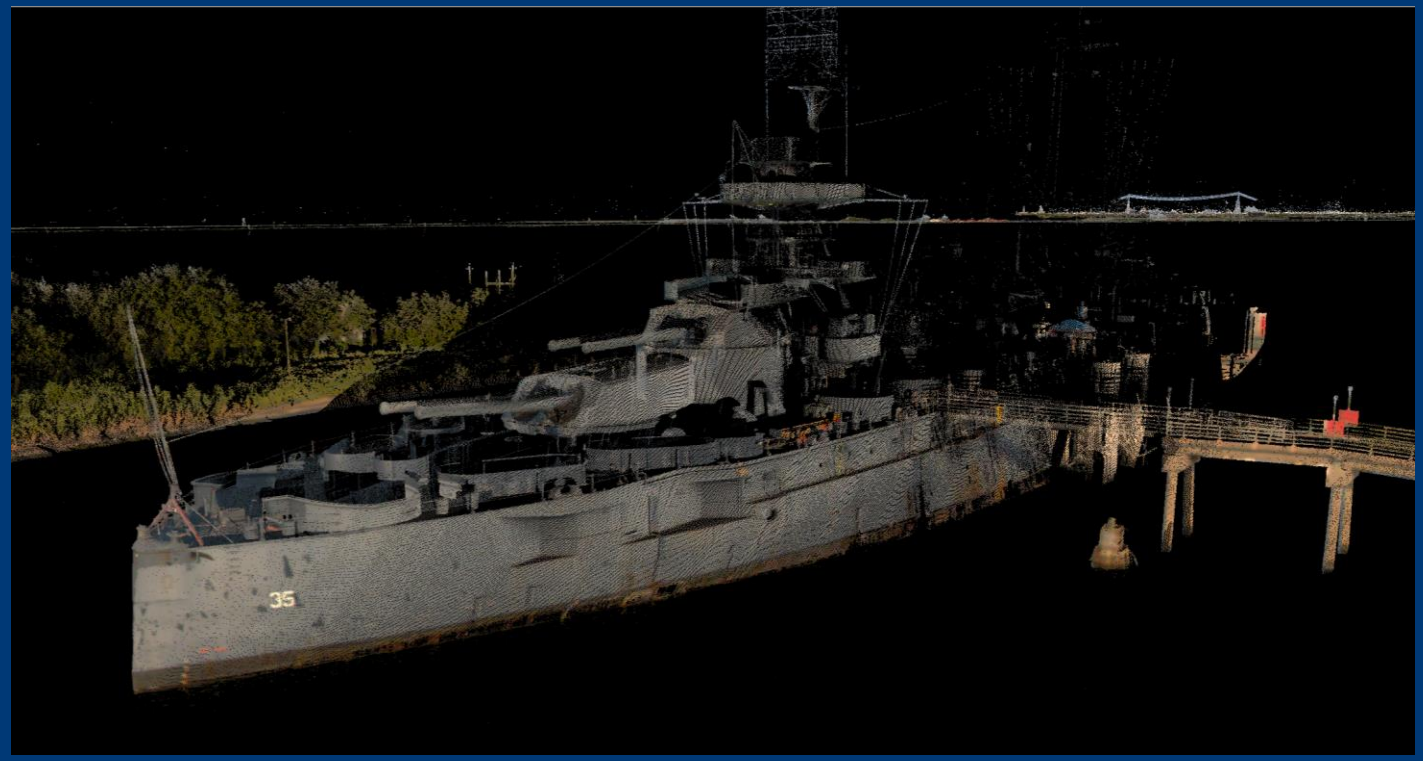


# Overview of hydrographic surveys to support precision navigation

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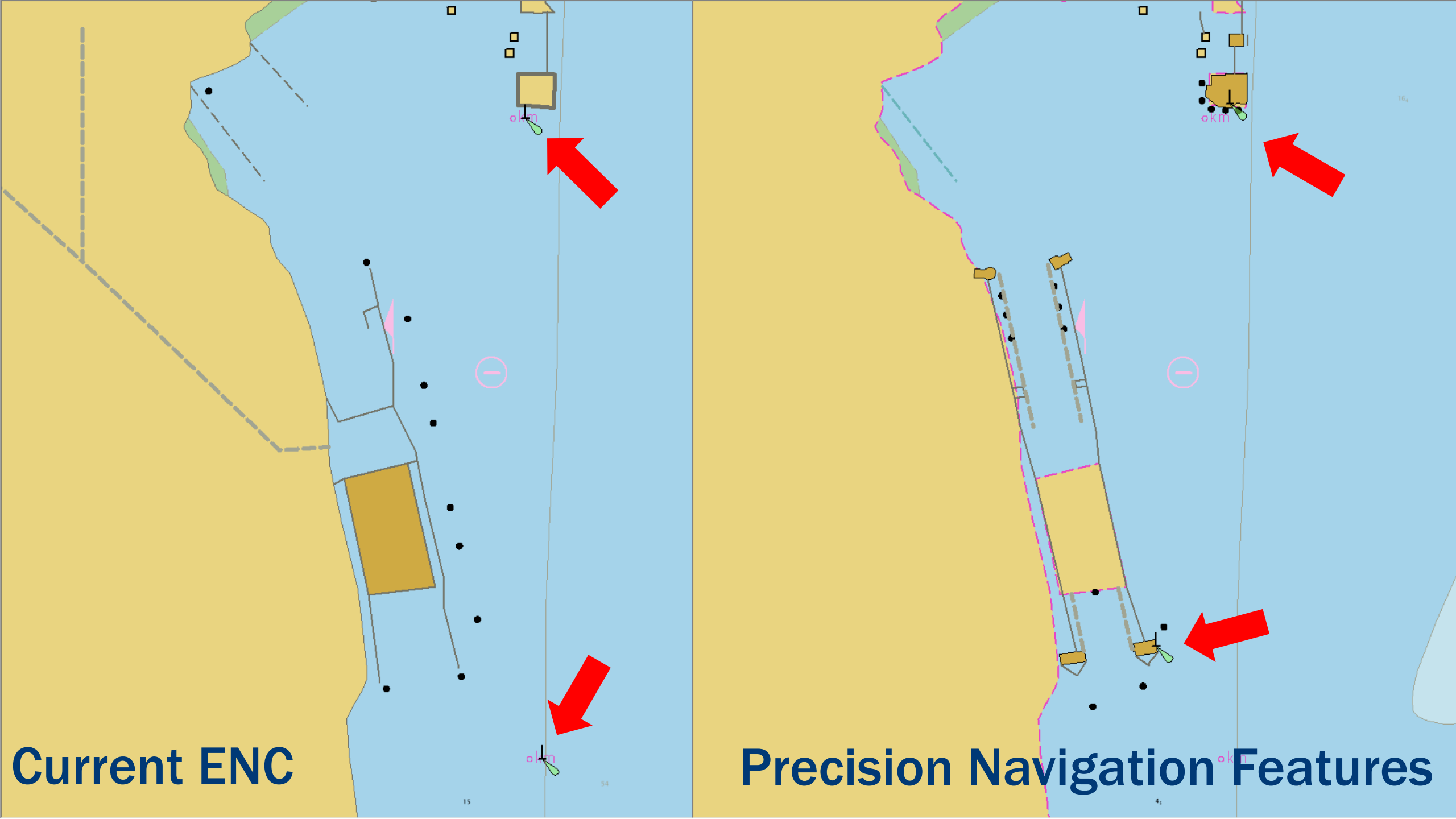
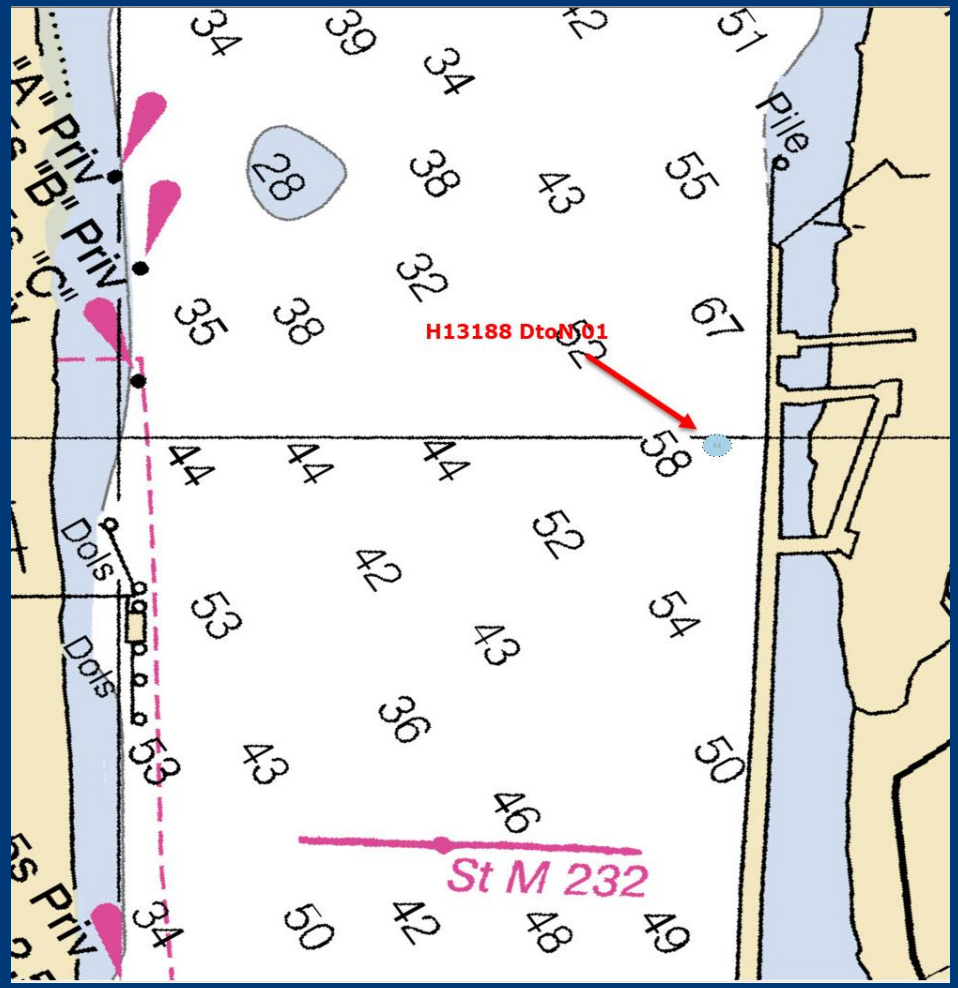
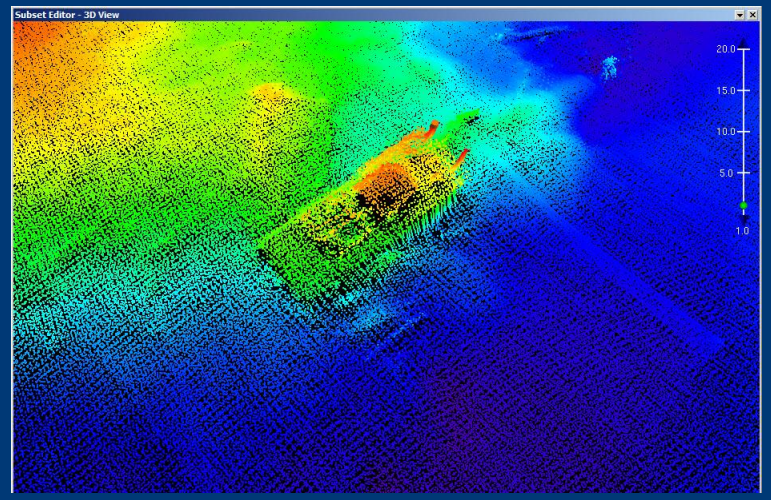
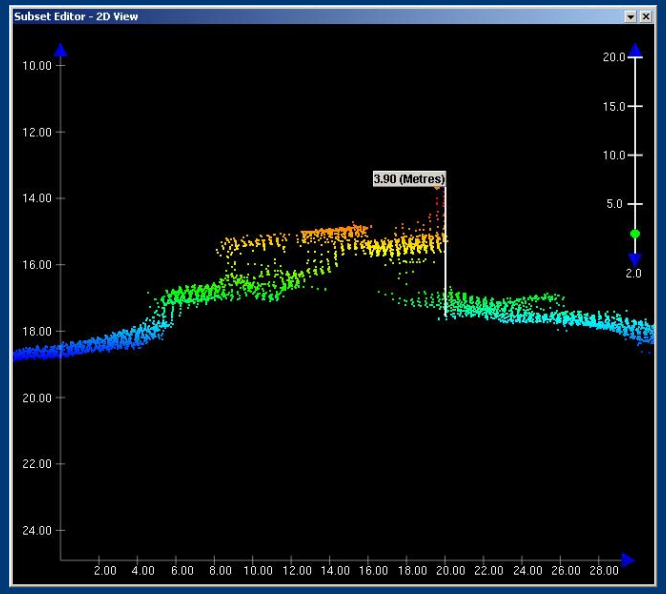

Current ENC
Precision Navigation Features




# Feature Detection

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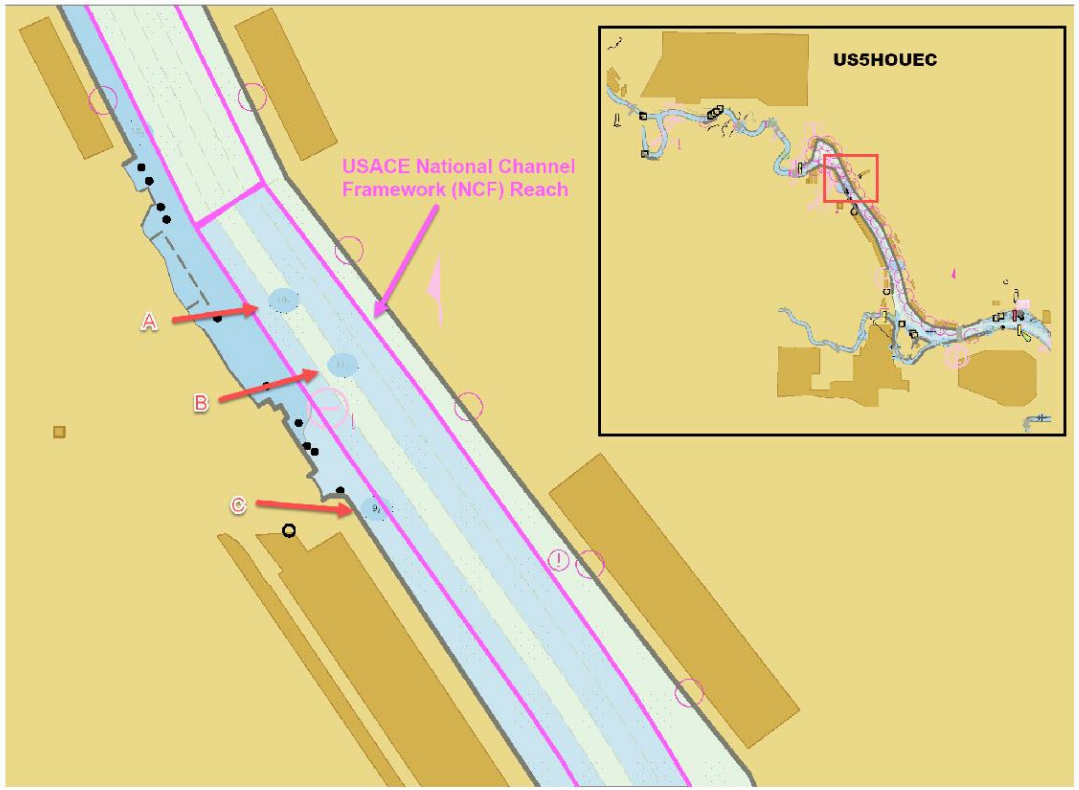


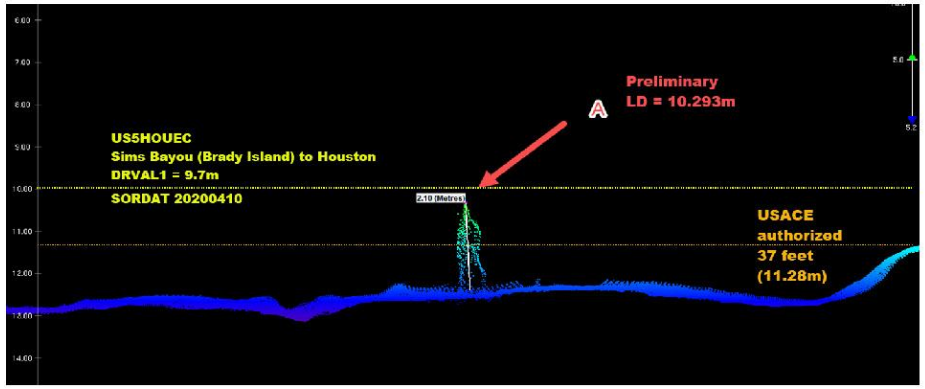


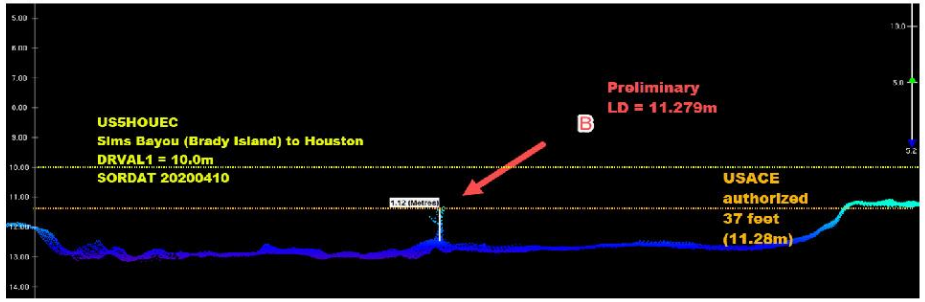


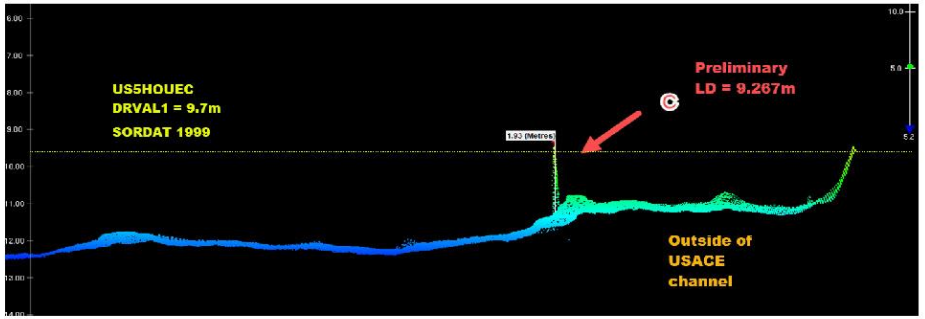


# Feature Detection

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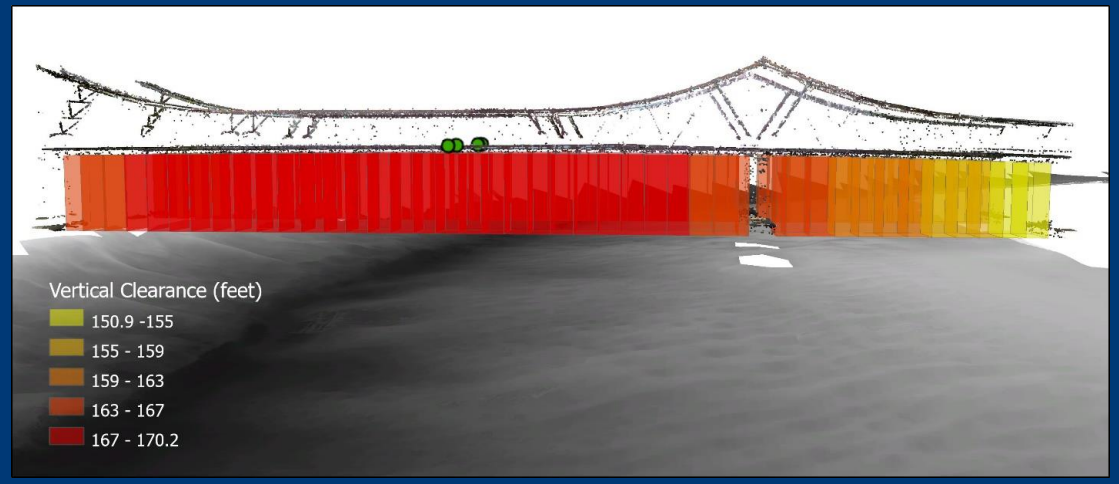
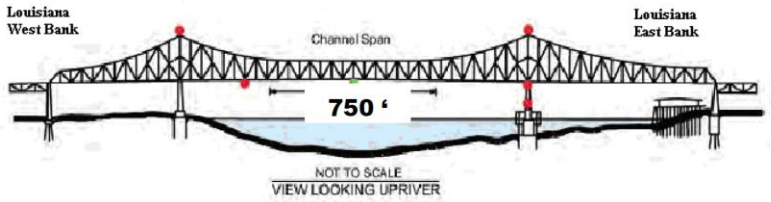
## Crescent City Connection/ GNO Twin Span Bridges Clearance



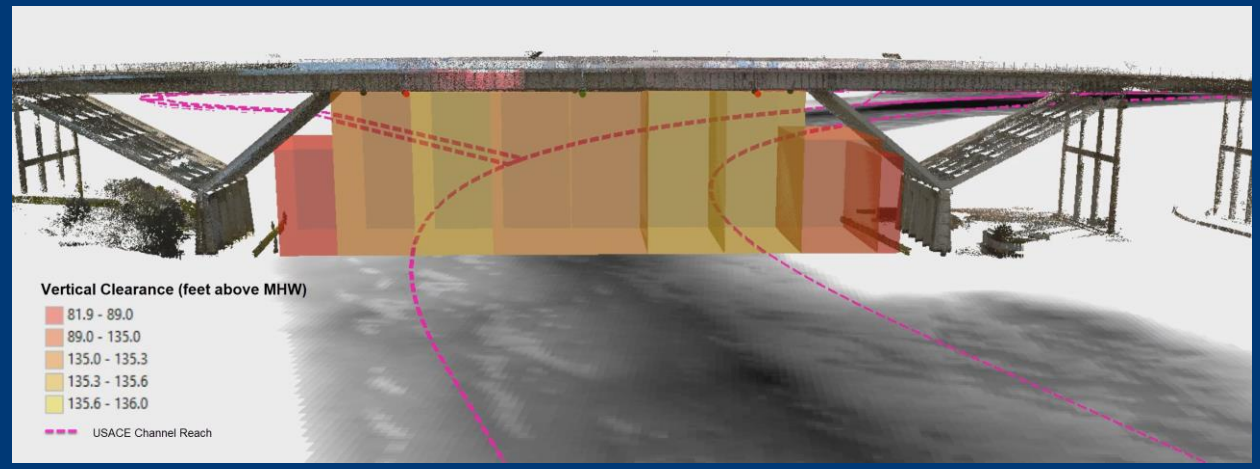

**Crescent City Connection/GNO Twin Spans:**
(Lower span 95.7 AHP Upper Span 95.8 AHP)

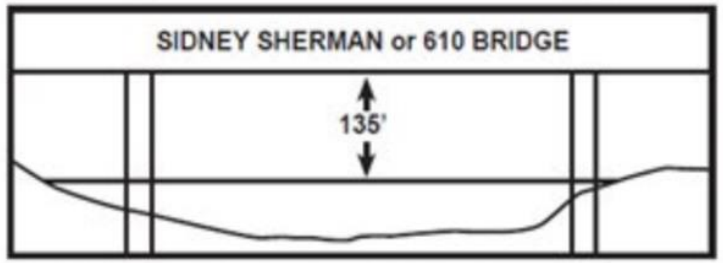



**Channel Span:**
- Vertical Channel Clearance 170 ft. minus the Carrollton gage
- Horizontal Channel Clearance 750 ft.
- There is a total of 1564 ft. of horizontal clearance in the channel span. The center 750 ft. has the 170 ft. of vertical clearance minus the Carrollton gage. On either side of the channel the vertical clearance is reduced to 166.2 ft. minus the Carrollton gage.

**East Span:**
- Vertical Clearance 155 ft. minus the Carrollton gage
- Horizontal Clearance 505 ft.

## Sidney Sherman Bridge Clearance




The vertical clearance on the above scale is based on MHW

# Bridge Clearance

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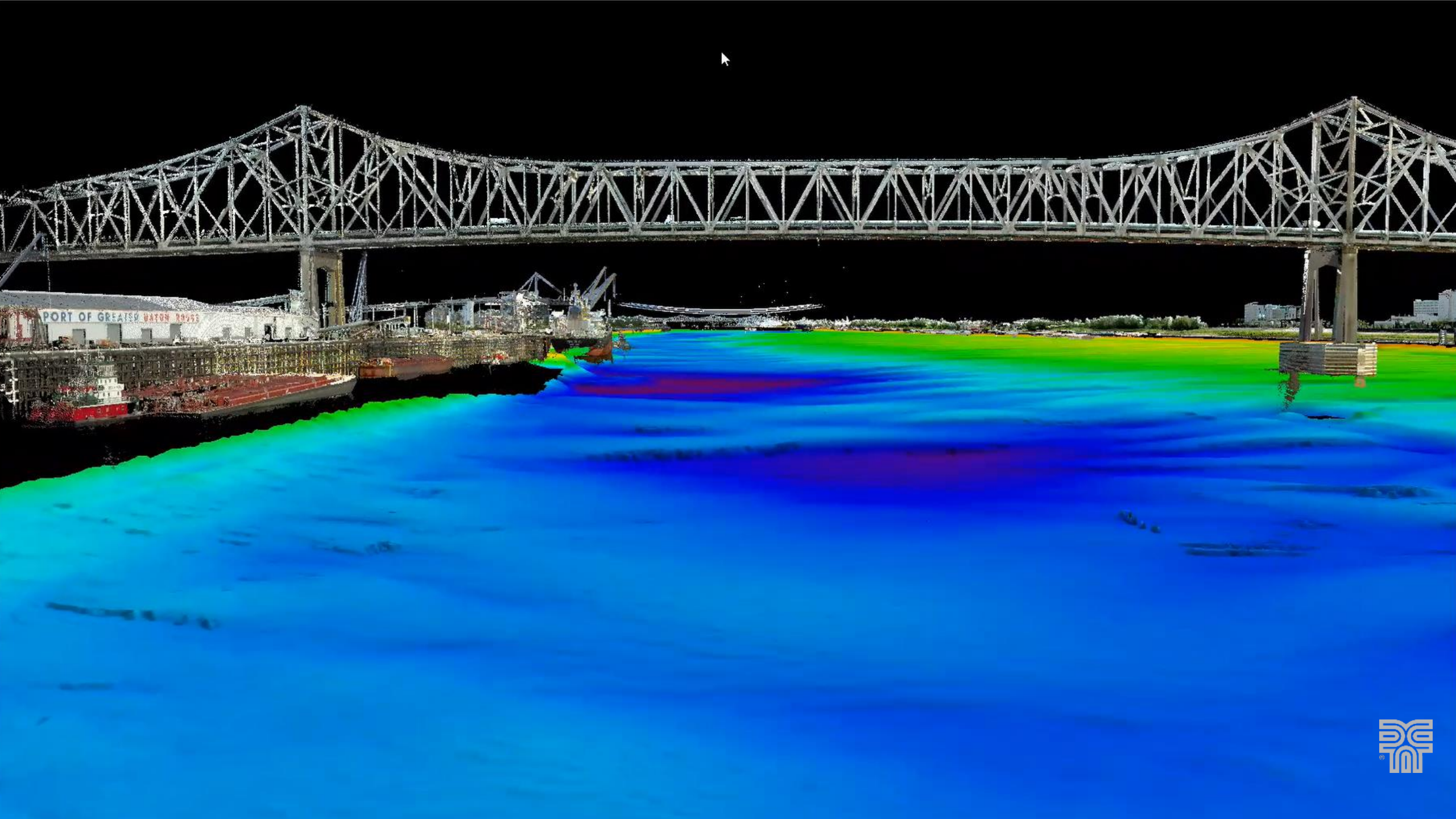
PORT OF GREATER BATON


# Real-Time Air Draft Monitoring of *Ruby Princess*

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MARINE SERVICES

GNSS system with real-time kinematic corrections from Oregon Real-Time Network.

Air Draft computed by taking GNSS height relative to CRD using DEA model, adding height to top of mast, and subtracting tide from NOAA tide stations at Skamokawa, Wauna, and Longview.


# Real-Time Air Draft Monitoring of *Ruby Princess*

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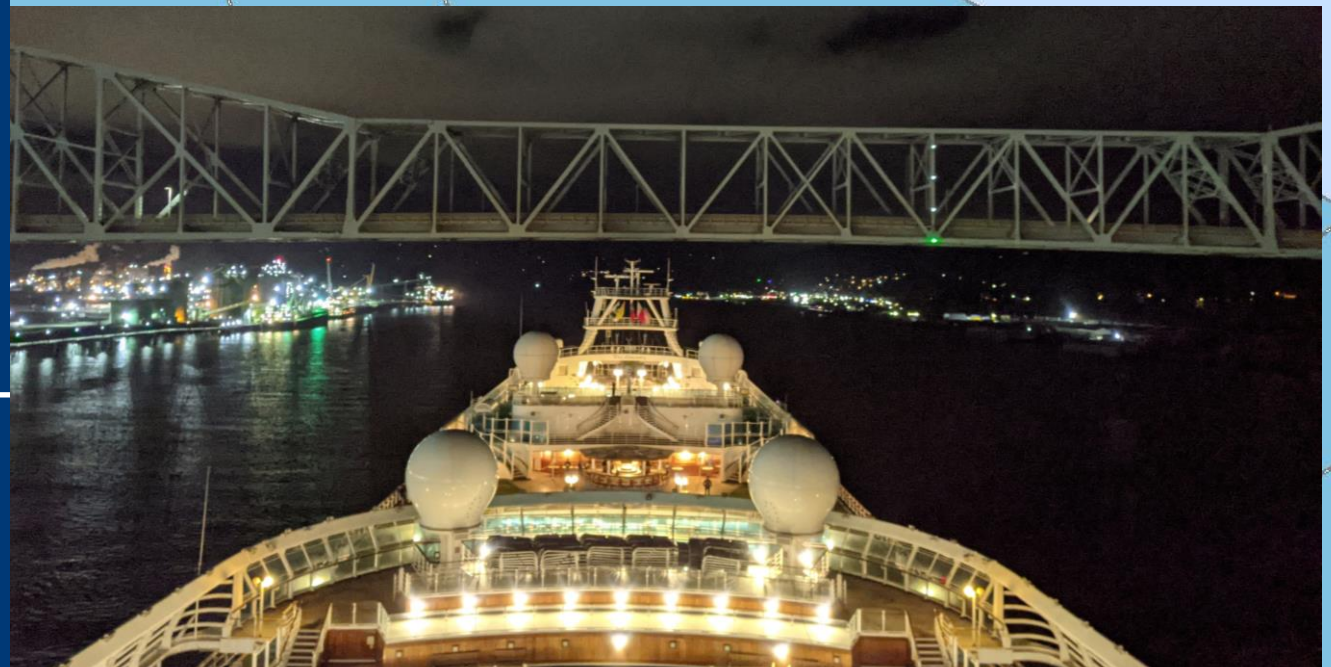
Longview Tide = 2.1’ CRD

Bridge Air Gap 195’ – 2.1’=192.9’

Ruby Air Draft 184.38’ at 8 kts SOG

Clearance = 8.5’




CARIBBEAN PRINCESS

High Resolution data supports many uses

- Navigation
- Modelling
- Training and Simulation
- Research and Development

**Overview of hydrographic surveys to support precision navigation**

DAVID EVANS AND ASSOCIATES INC.
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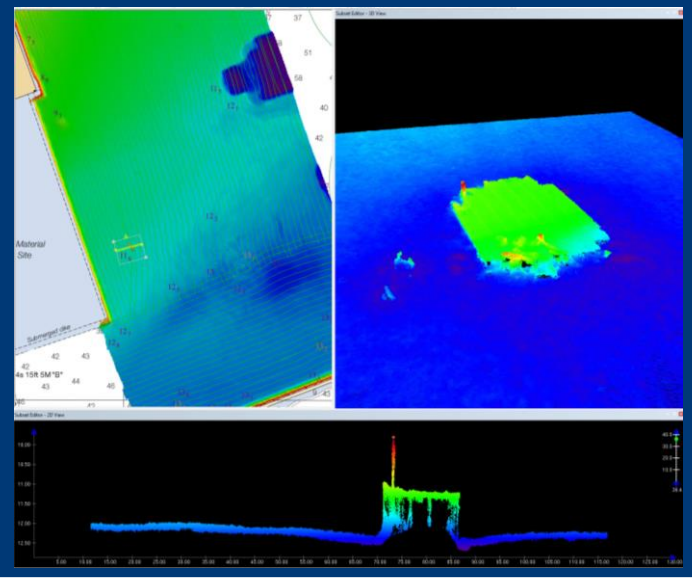
- Managed by Port of Long Beach Survey Division
- Supports POLB engineering, operations, and maintenance
- Data acquisition and processing methods follow NOAA specification
- Provides Jacobsen Pilot Service with up-to-date navigation products
- Data distributed to NOAA for charting (CATZOC A1)



# Port of Long Beach Harbor Sounding Program

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- Port divided into 9 areas
- Yearly surveys resulting in a full resurvey every 2 years
- Surveys use POLB GNSS Control Network
- Meet NOAA accuracy, coverage, and feature detection requirements
- Hazards reported for immediate charting


# Port of Long Beach Harbor Sounding Program

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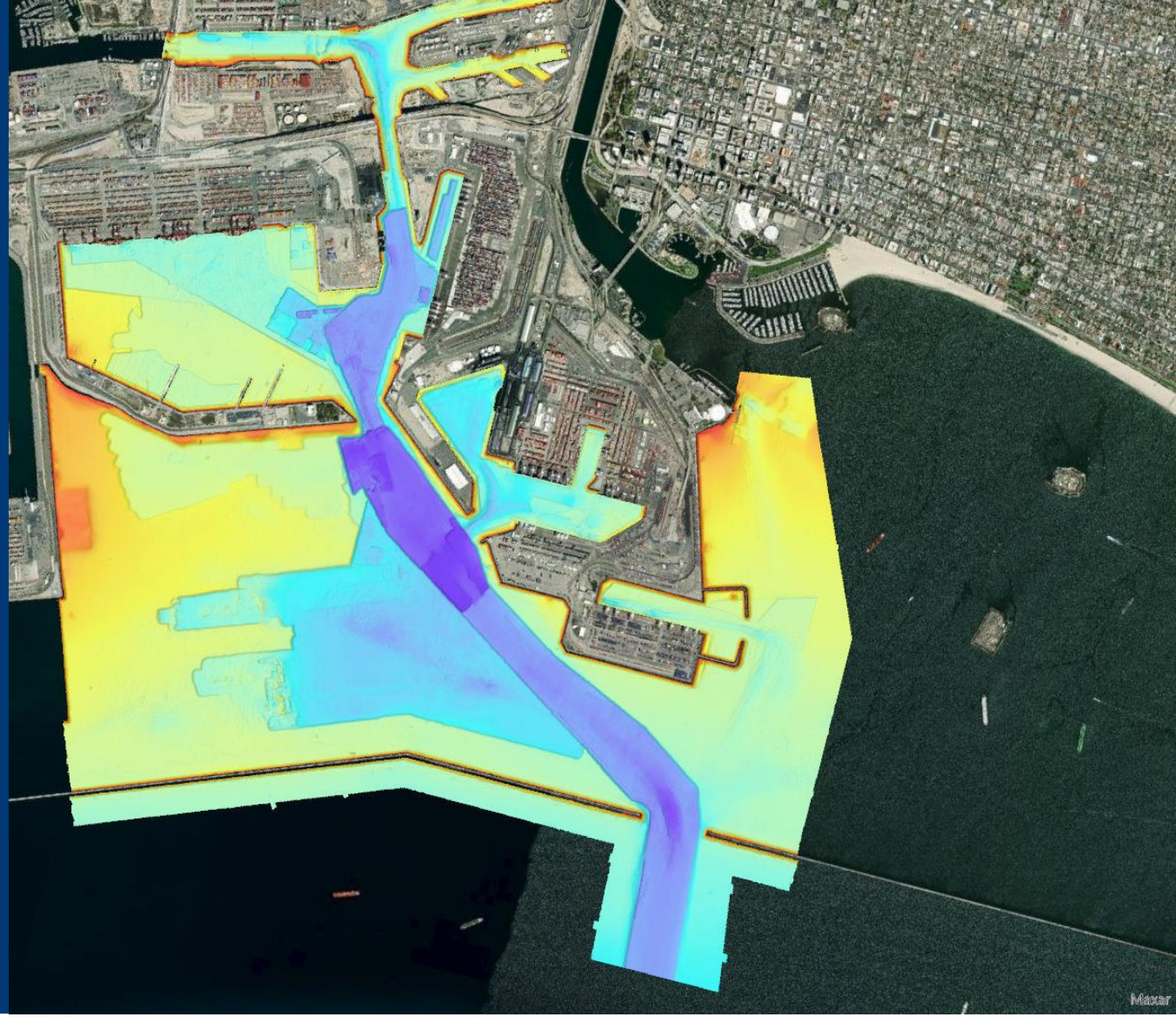
- Survey Coverage from 2 surveys
- Data used to develop products for
  - Port of Long Beach
  - Jacobsen Pilot Service
  - NOAA




# Port of Long Beach Harbor Sounding Program

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## Port

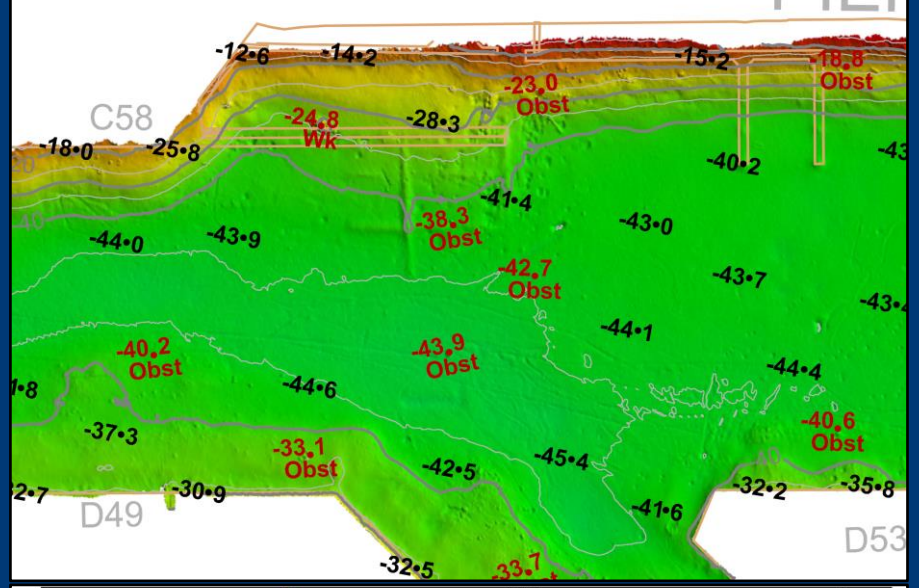
- XYZ Data
- CAD Products
- Maps/Port Atlas
- Report of Survey

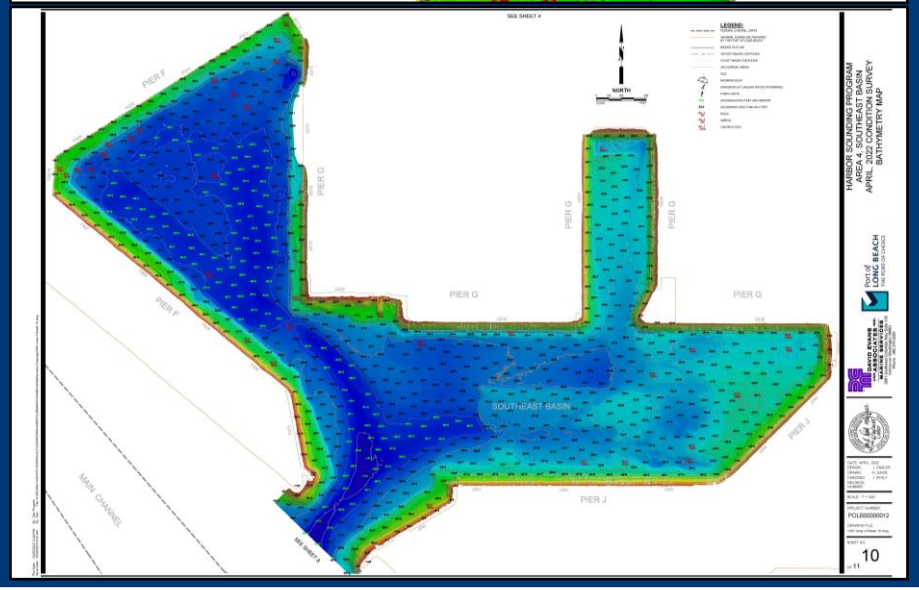
## Pilots

- Hybrid S-102
- Docking Features

## NOAA

- Bathy Surfaces
- Features
- Data
- Report of Survey

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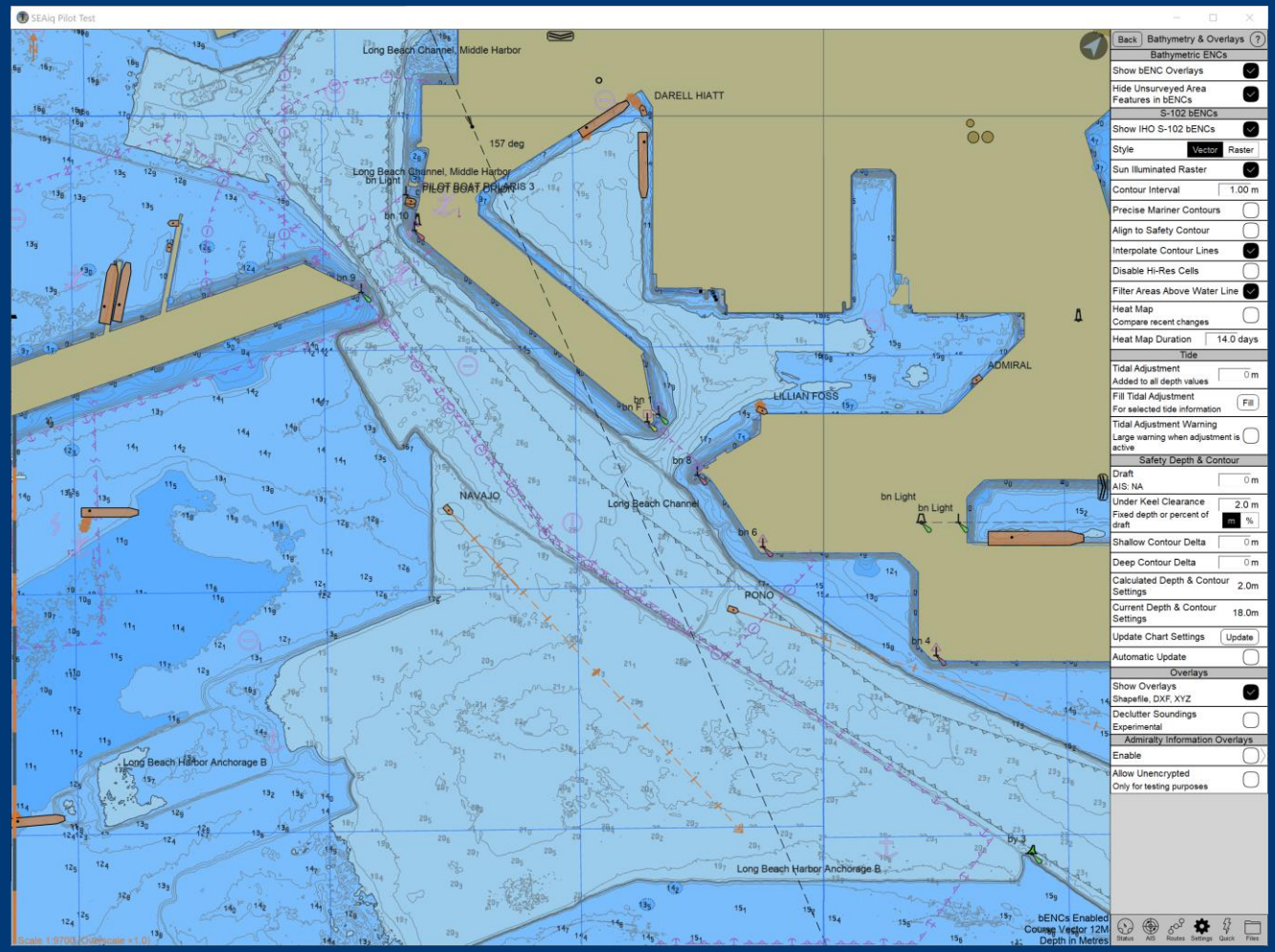


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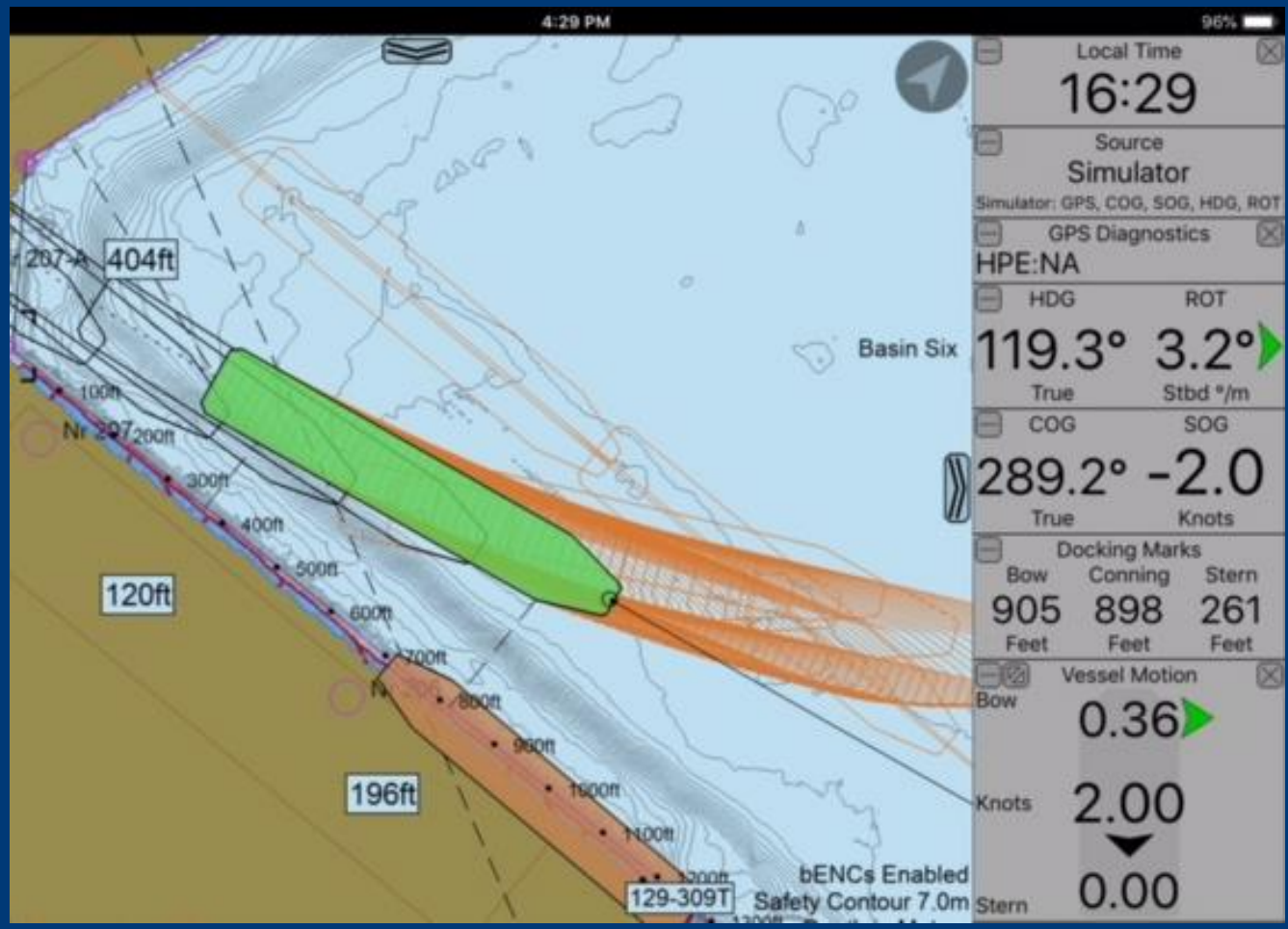


# Port of Long Beach Harbor Sounding Program

DAVID EVANS AND ASSOCIATES INC.
MARINE SERVICES

**Port**

- XYZ Data
- CAD Products
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**Pilots**

- Hybrid S-102
- Docking Features

**NOAA**

- Bathy Surfaces
- Features
- Data
- Report of Survey

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

OCS QMS Controlled Document

## HYDROGRAPHIC DATA REVIEW

### W00628

| | | | |
|---|---|---|---|
| **Project Number** | ESD-PHB-22 | **Registry Number** | W00628 |
| **General Locality** | Port of Long Beach | **Sub-Locality** | Outer Harbor Western Anchorage & Main Channel |
| **Survey Start Date** | July 15, 2020 | **Survey End Date** | July 21, 2020 |

| ENC | Scale | Edition | Update Application Date | Issue Date |
|---|---|---|---|---|
| US6LGBCC | 1:5000 | 4 | 07/14/2021 | 07/14/2021 |
| US6LGBCD | 1:5000 | 6 | 09/02/2021 | 09/02/2021 |
| US5CA62M | 1:12000 | 63 | 01/27/2022 | 01/27/2022 |

| 1 - ESD Prioritization | | |
|---|---|---|
| 1.0 | Prioritizer: robert.short | |
| 1.1 | What was included in the submision? | |
| | Data Types: • Multibeam | Data Files: • Raw Data • Processed Data • Surfaces / Mosaics |
| | Raw data archive at NCEI needed? | Yes |
| 1.2 | Has the data provider granted permission in writing to use the data for charting and to make it publicly available? | Yes |
| 1.3 | If the data were accessed through a public website, include the URL or access information here: | |
| 1.4 | List any points of contact who should be included in survey correspondence: | |
| | Jason Creech, Nautical Charting Program Manager, David Evans & Associates, Inc., Jasc@deainc.com Jeff Ferguson, NOAA California Navigation Manager, jeffrey.ferguson@noaa.gov | |
| 1.5 | Is the survey free from dangers to navigation (DtoNs)? | Yes |
| 1.6 | Considering coverage, quality, uncertainty, and feature detection, what is the estimated CATZOC for the survey as a whole? | CATZOC A1 |

# Port of Long Beach Harbor Sounding Program

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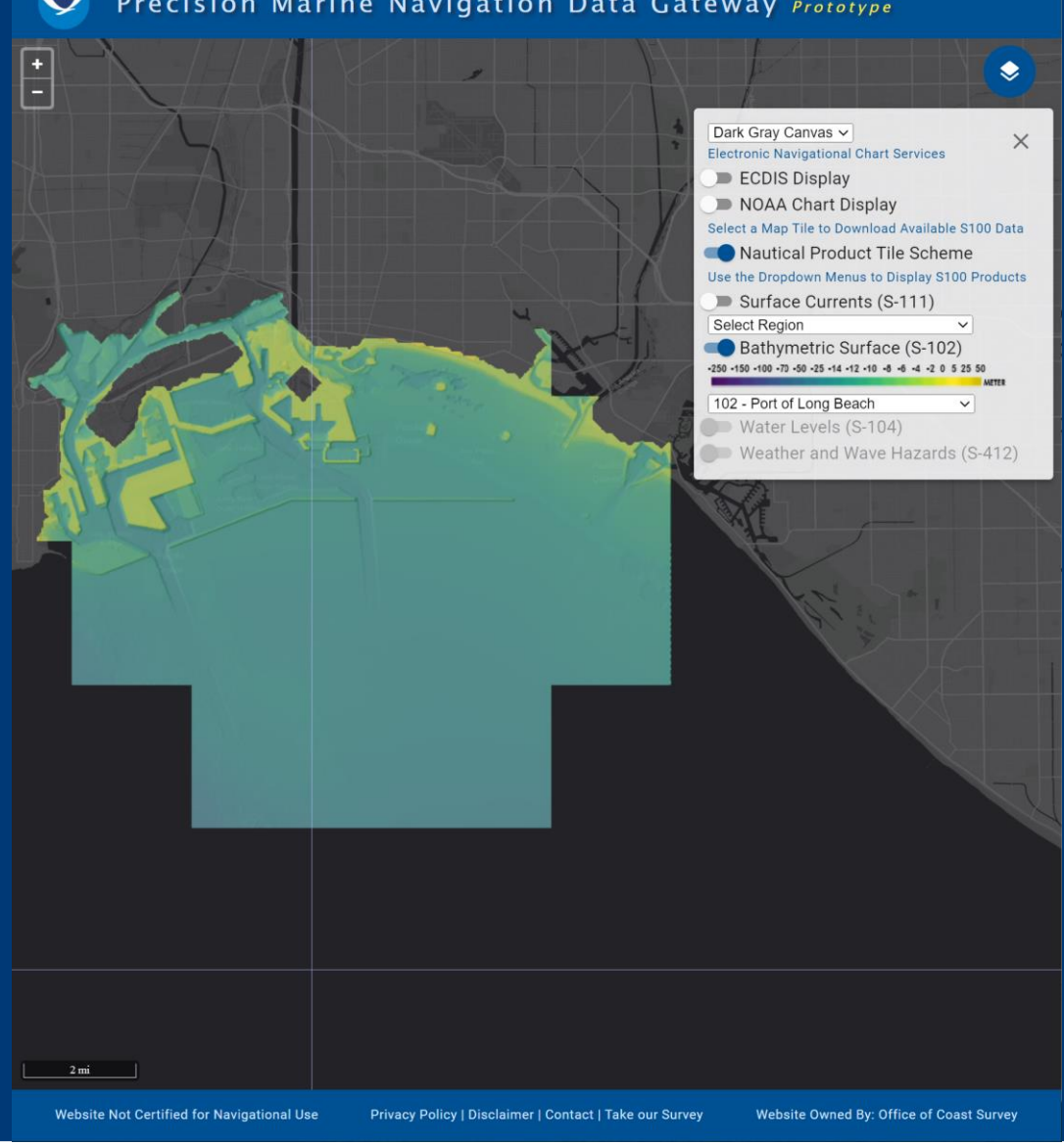
- Hybrid S-102 Surfaces for Pilots
- NOAA publishes 19 S-102 grids covering LA/LB
- Data from POLB HSP surveys are incorporated into the grids to create interim hybrid S-102 products
- 2-meter resolution
- Hybrid S-102s are sent to JPS (testing and planning)




## Port of Long Beach Harbor Sounding Program

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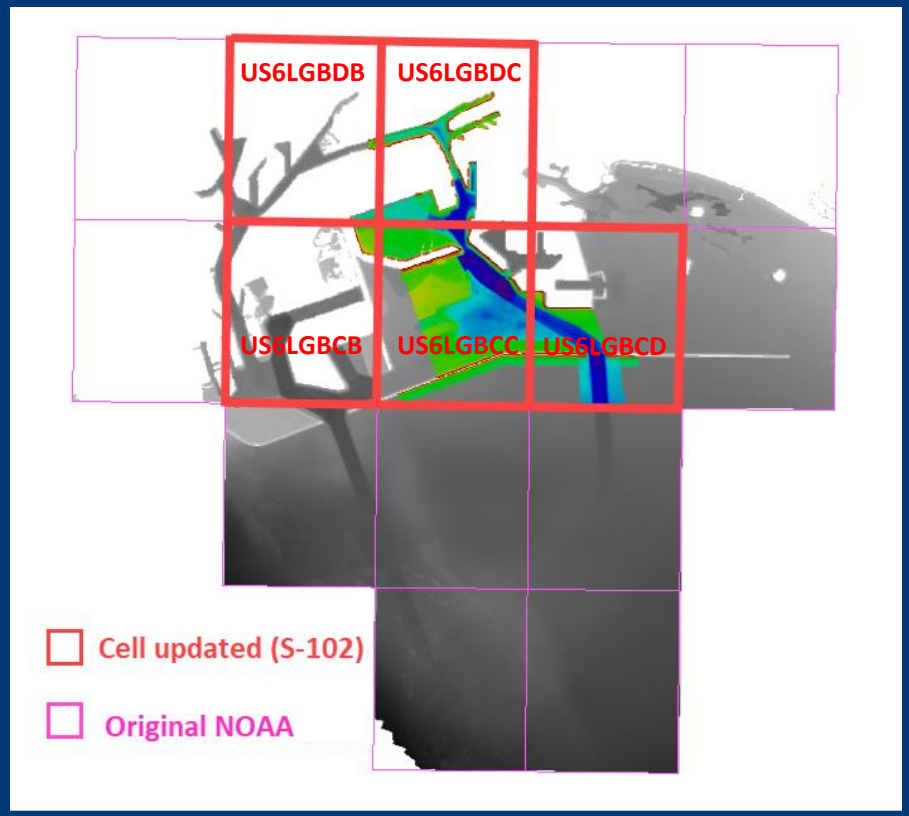


# Port of Long Beach Harbor Sounding Program

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# Port of Long Beach Harbor Sounding Program

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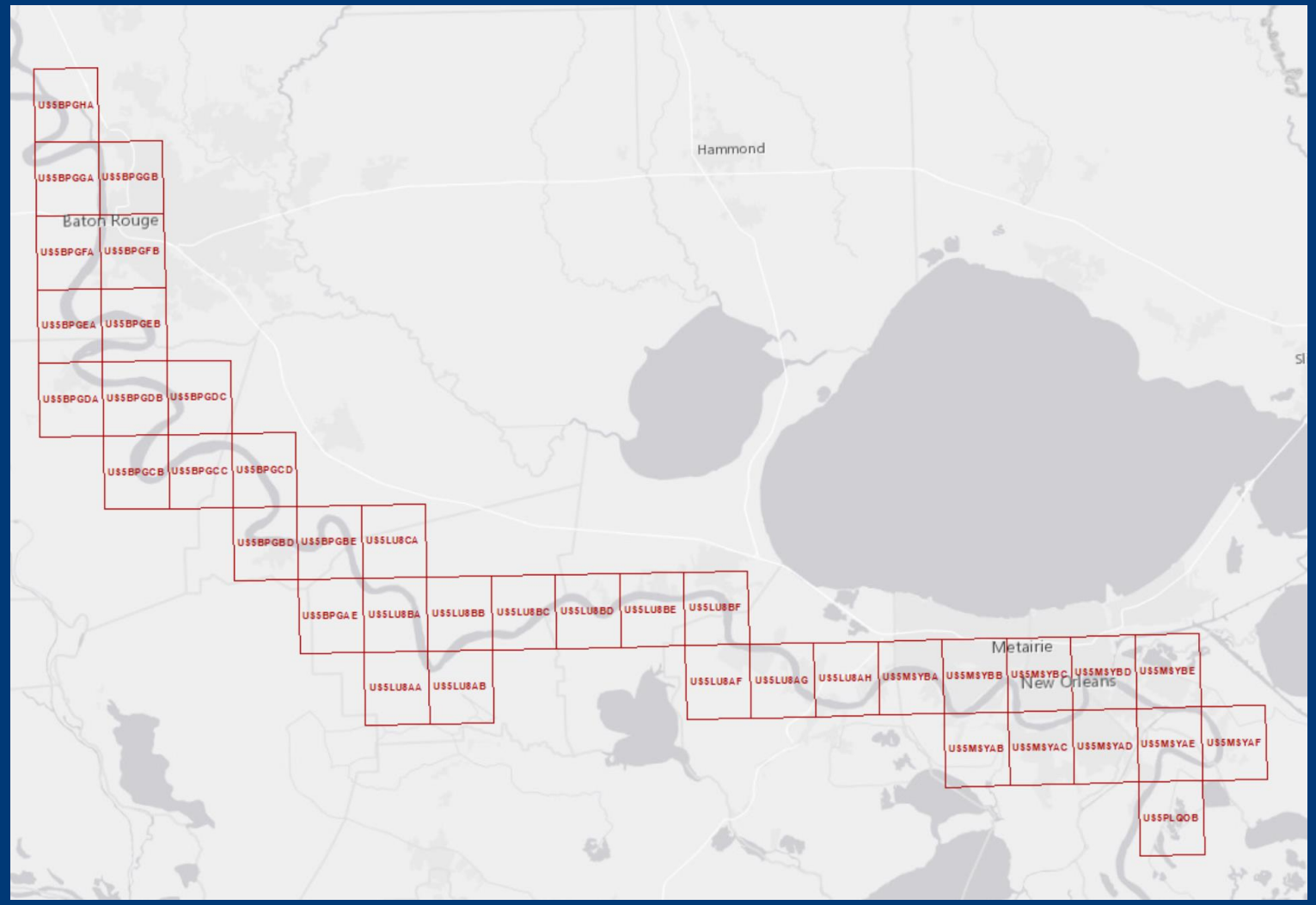
- Test S-102 grids created for the NOBRA Pilots and the Maritime Pilots Institute
- Lower Mississippi RM 75 to 234
- Used 2018/2019 NOAA Surveys housed by NOAA NCEI
- Survey data collected by DEA
- Data reformatted and tiled using NOAA ENC scheme
- 4-meter resolution S-102 grids compatible with Trelleborg Safe Pilot




# Lower Mississippi River S-102 Data Development

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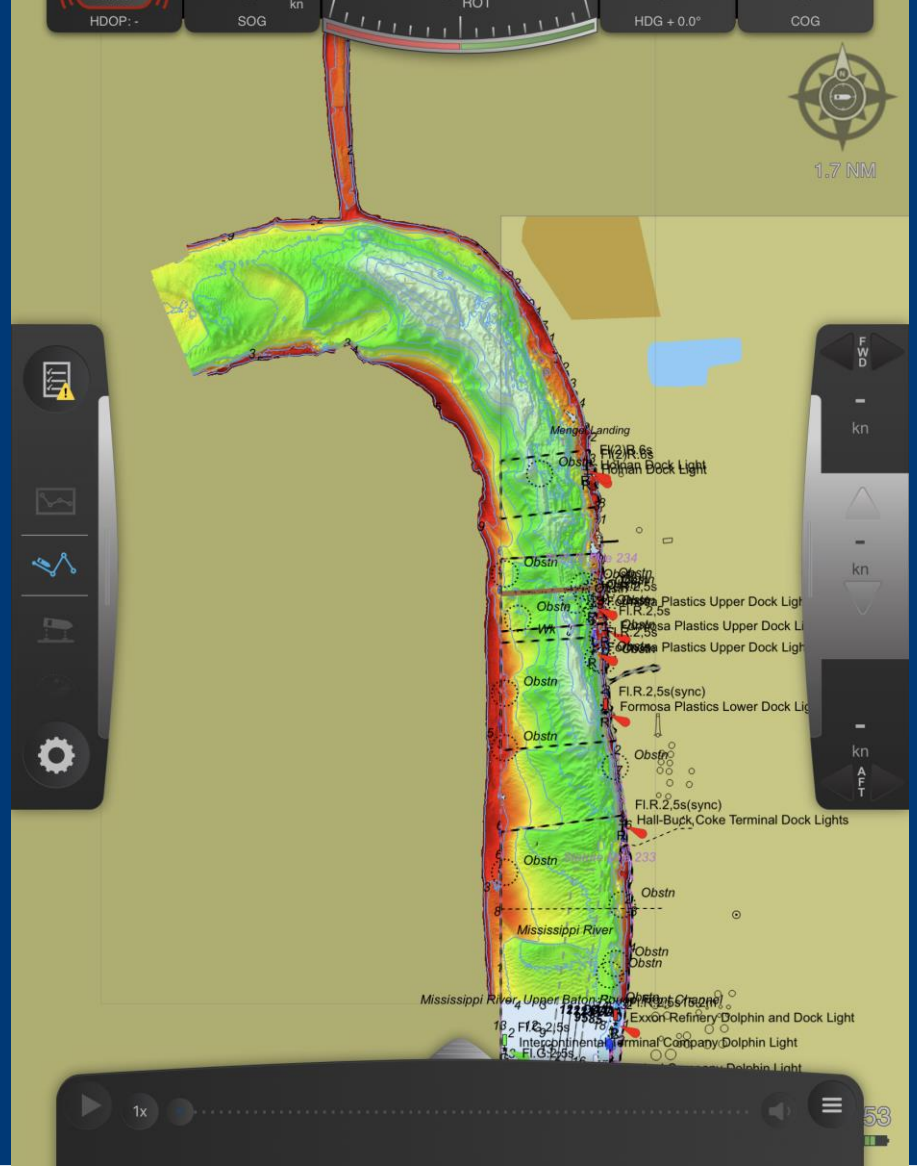


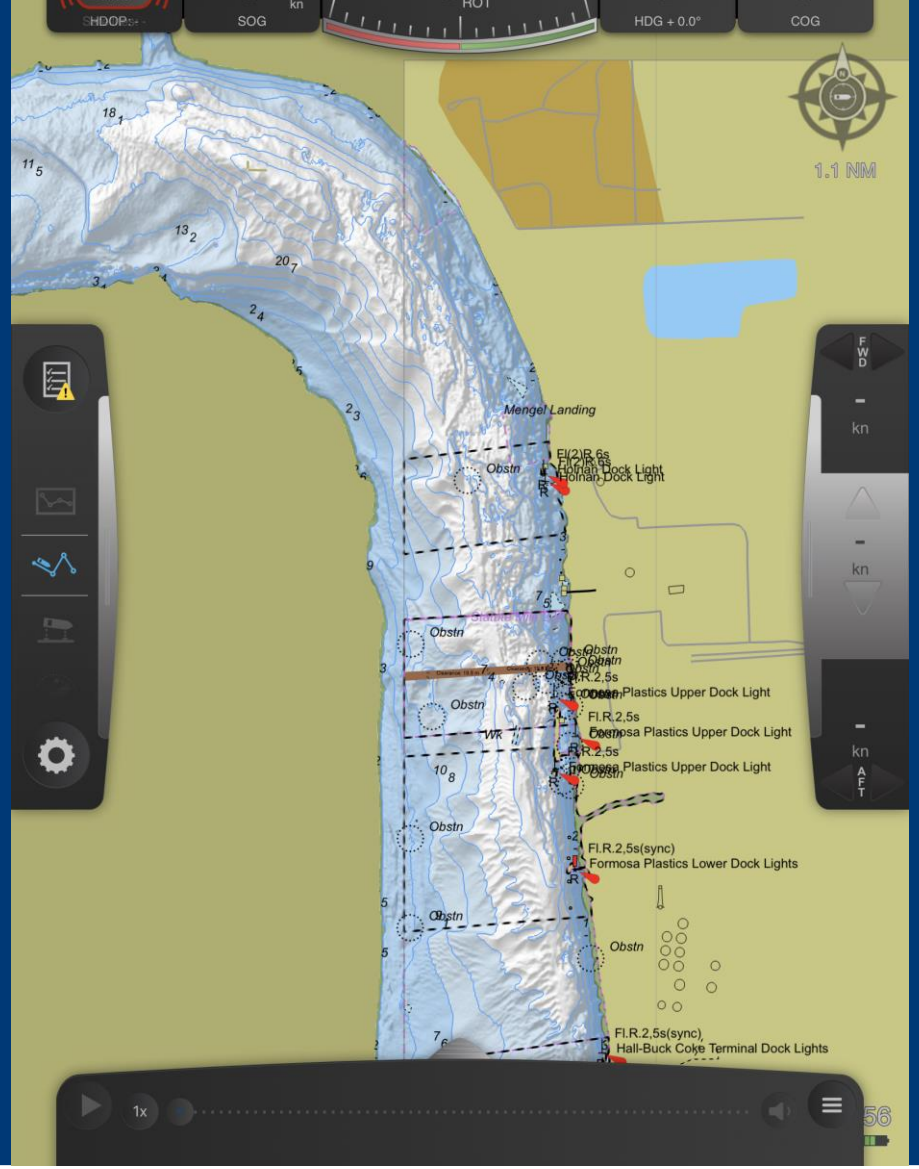


# Lower Mississippi River S-102 Data Development

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