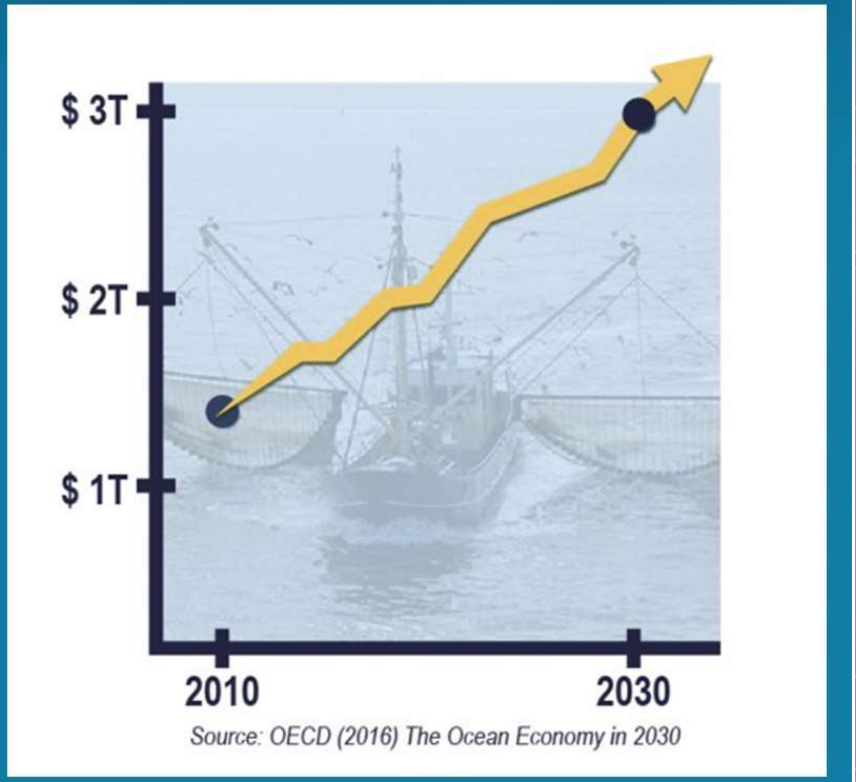

PRECISION
MARINE
NAVIGATION
Information Infrastructure for the New Blue Economy

What is precision marine navigation?

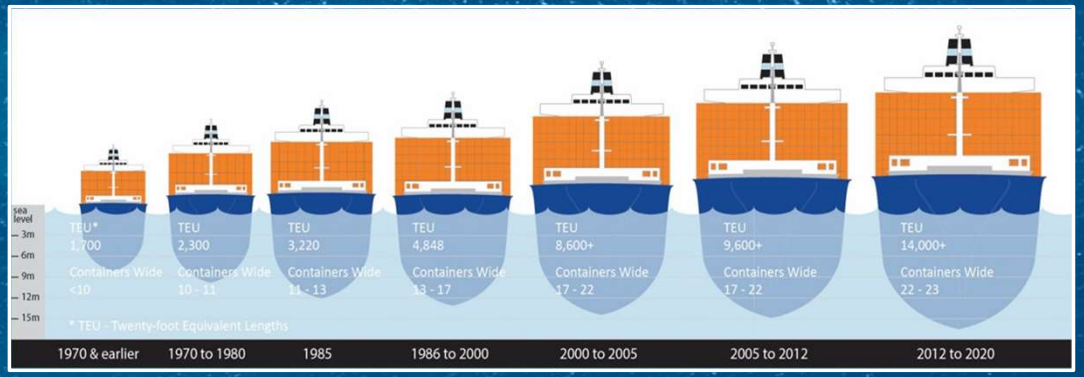
…the ability of a vessel to safely and efficiently navigate within the U.S. EEZ and operate in close proximity to the seafloor, bridges, narrow channels, or other marine hazards.

The Maritime Economy

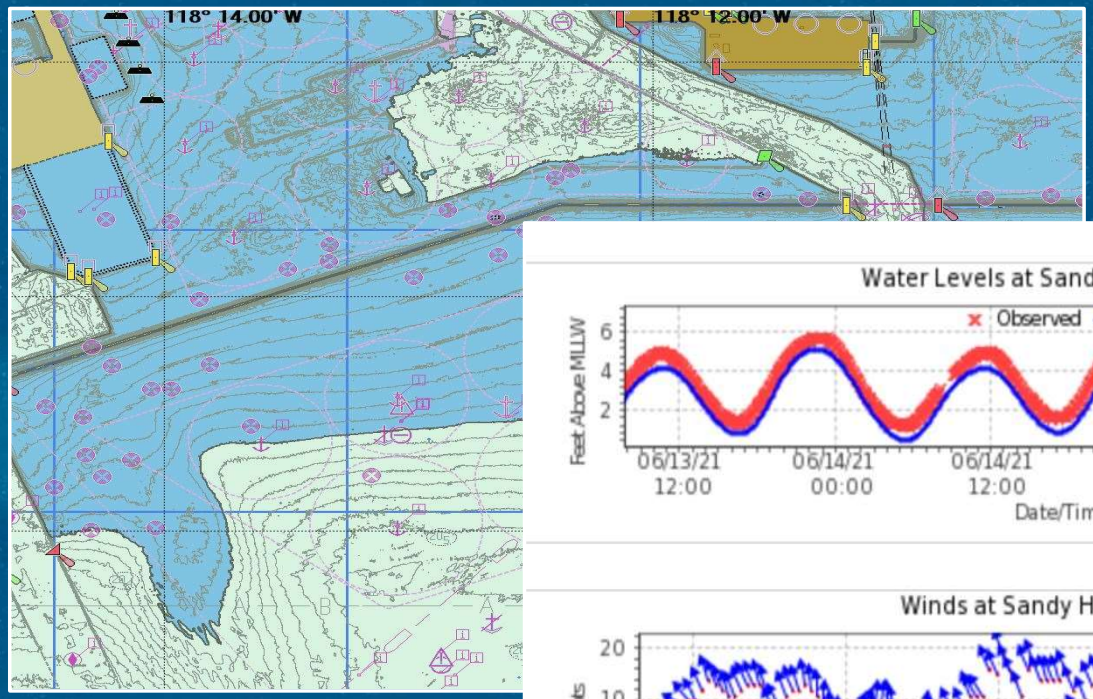
Projected Global Growth by 2030

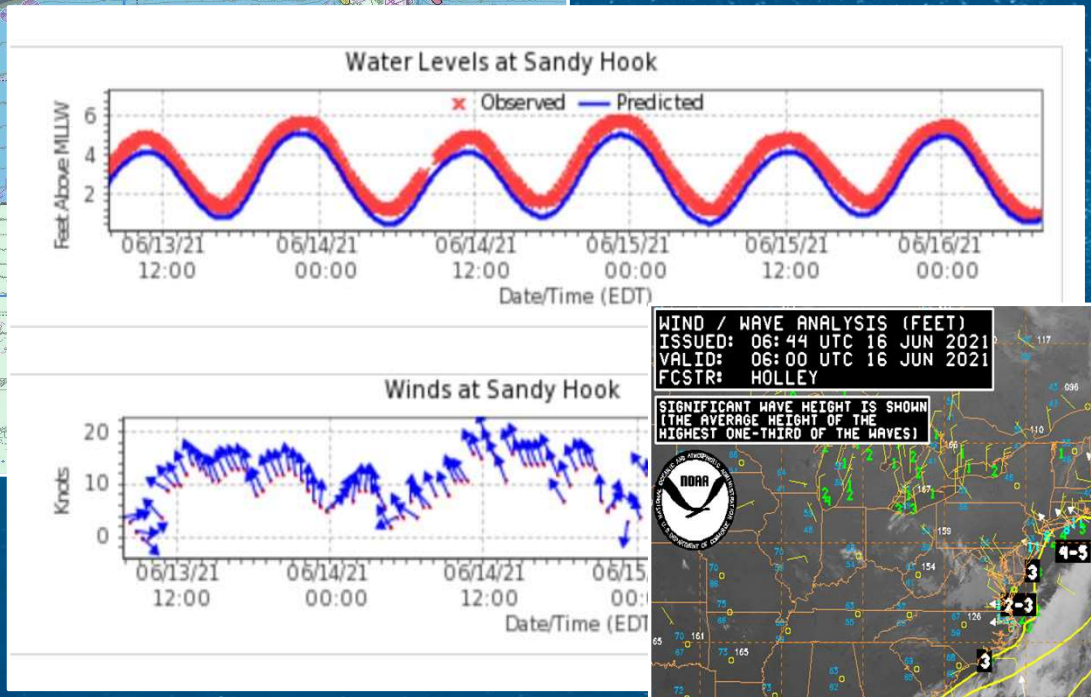


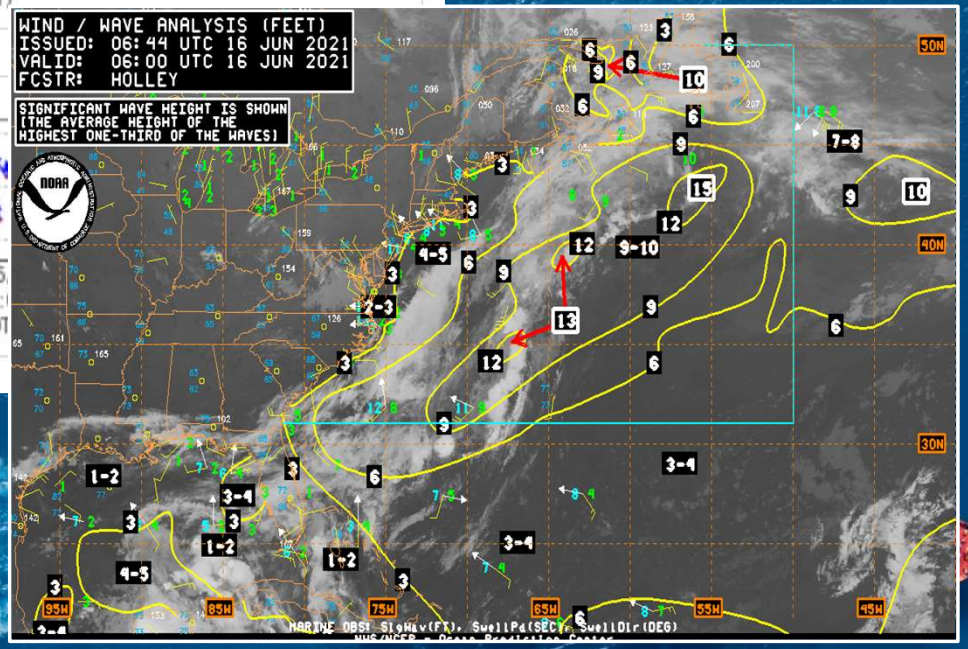
Source: OECD (2016) The Ocean Economy in 2030



NOAA's Navigation Products



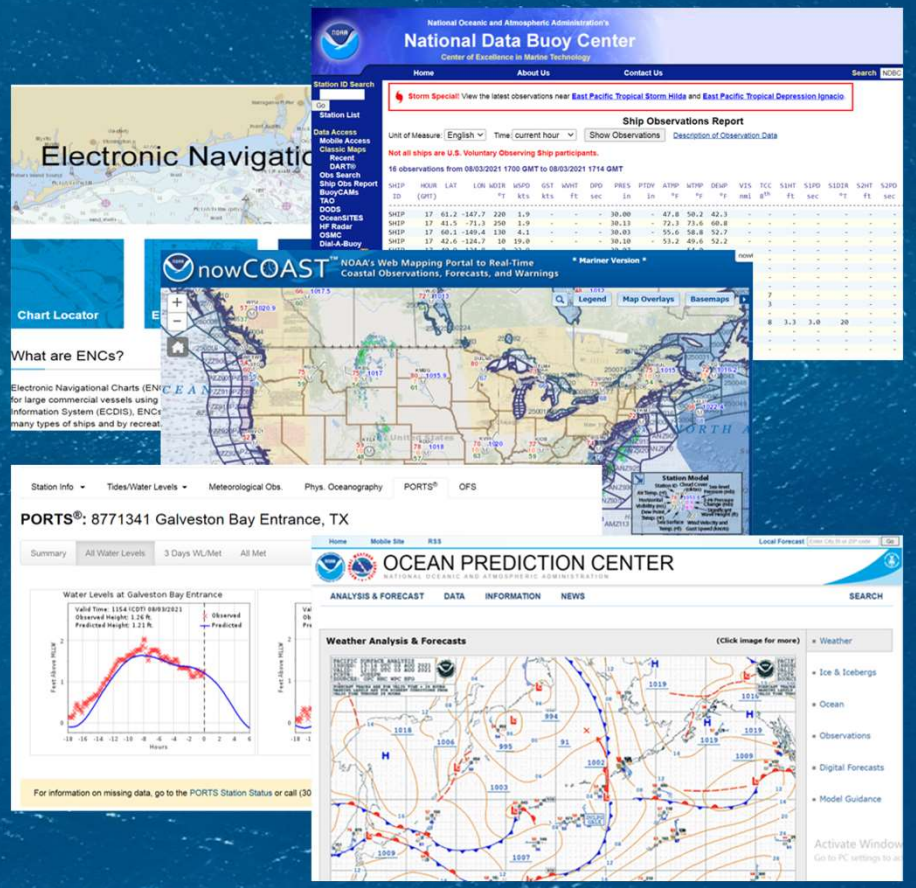




Navigation Data Challenges

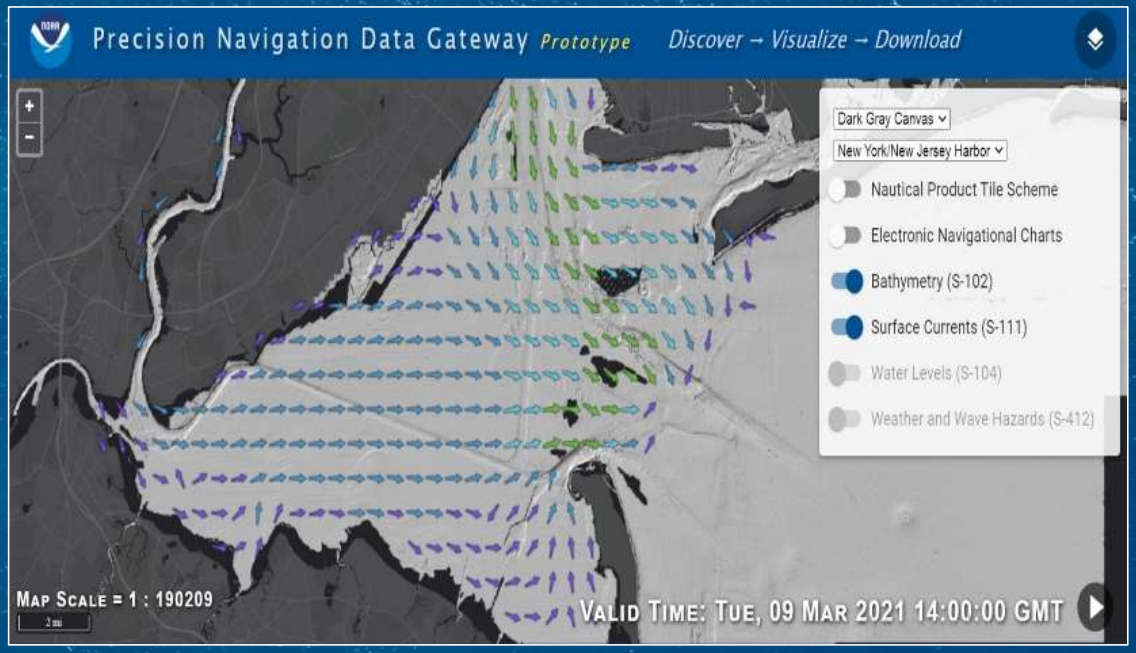
Difficult to access and process NOAA's navigation data, due to:

- ❑ Multiple devices and systems required to access the data
- ❑ Datasets spread across various websites and data servers
- ❑ Datasets are encoded in different formats that are not navigation standards



Precision Marine Navigation Program

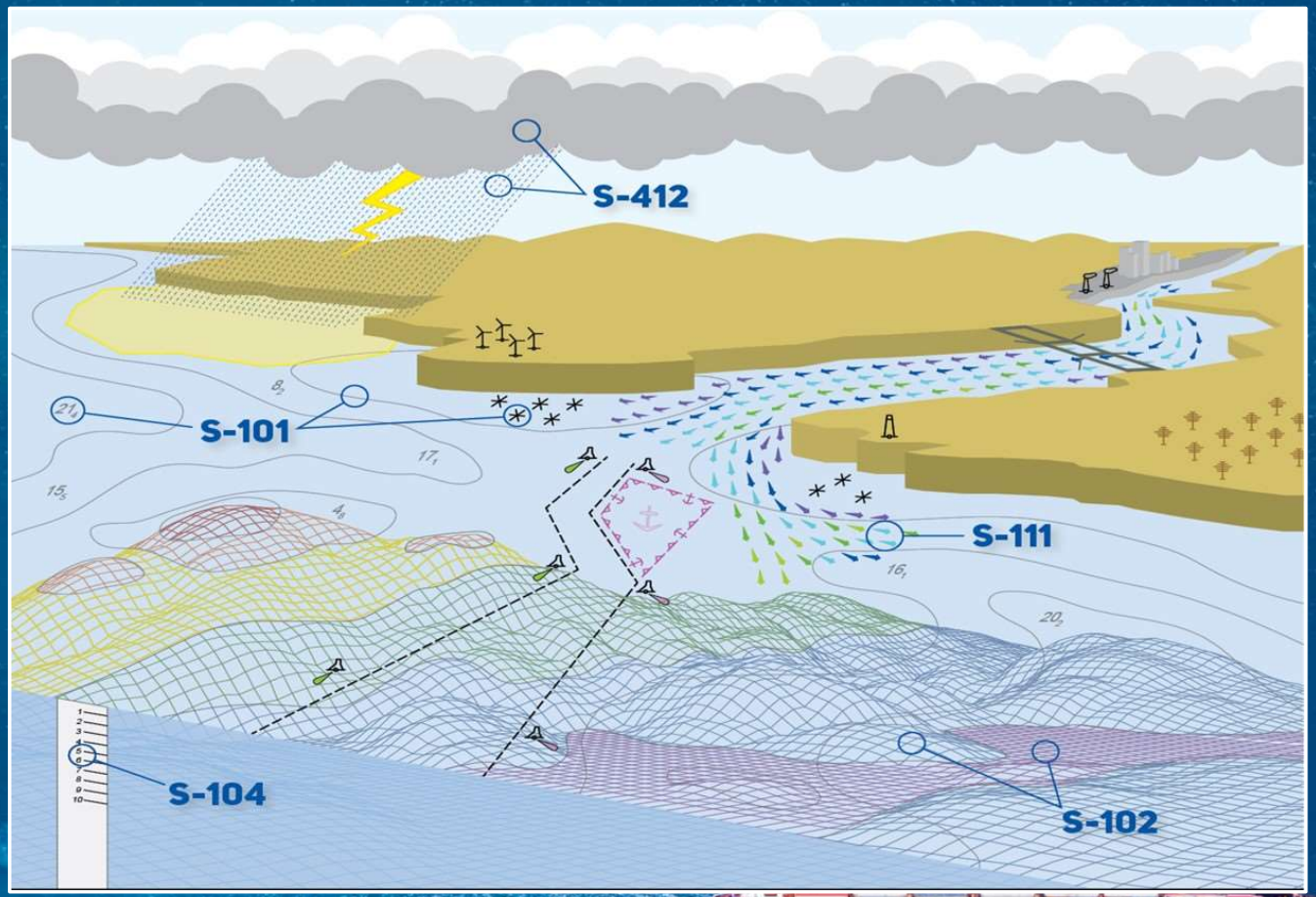
- Leveraging International Standards (S-100)
- Precision Marine Navigation Data and Dissemination Services
- Machine to Machine capability
- Marinenavigation.noaa.gov Website



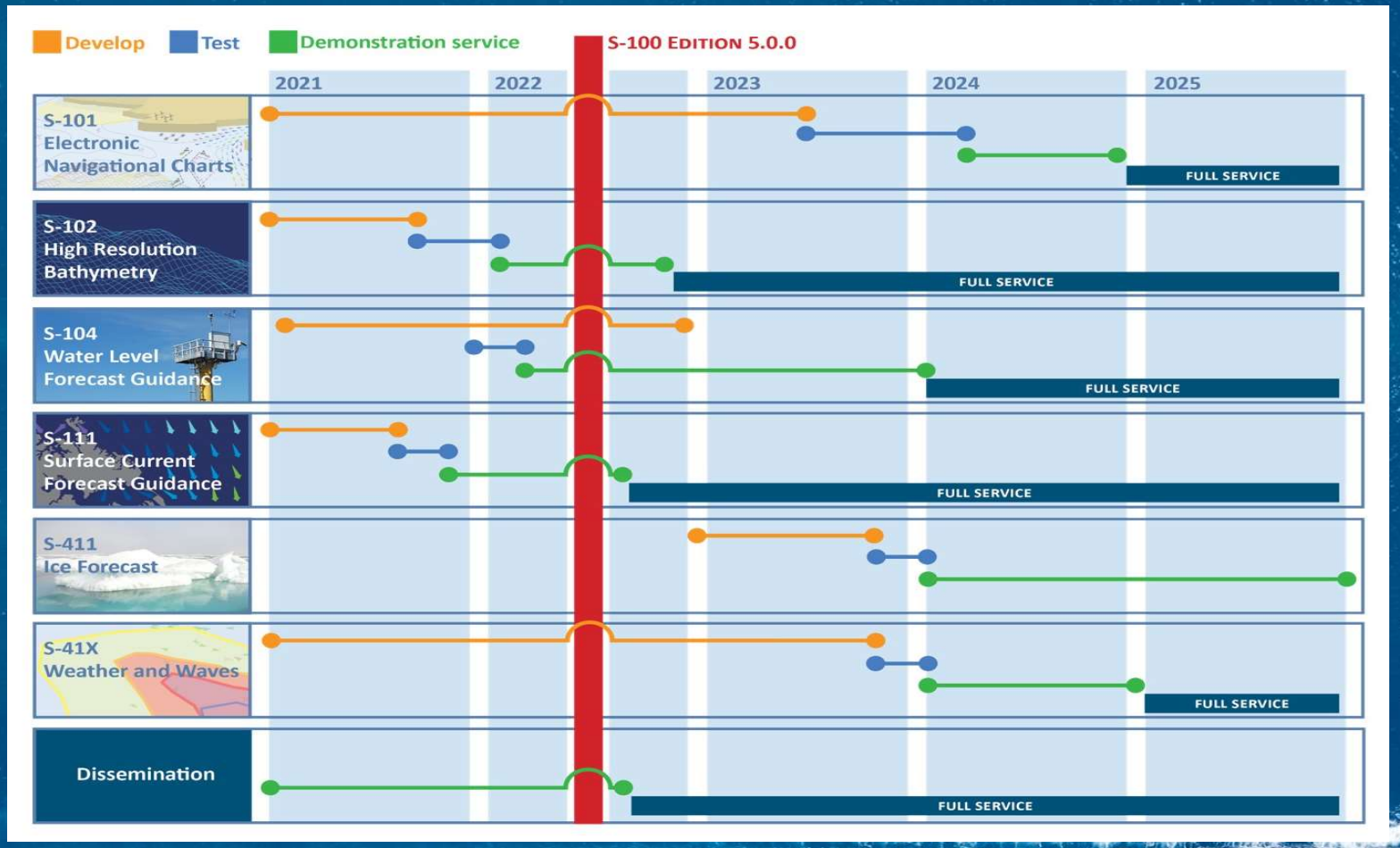
S-100 Data Framework

S-100 Data Products

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



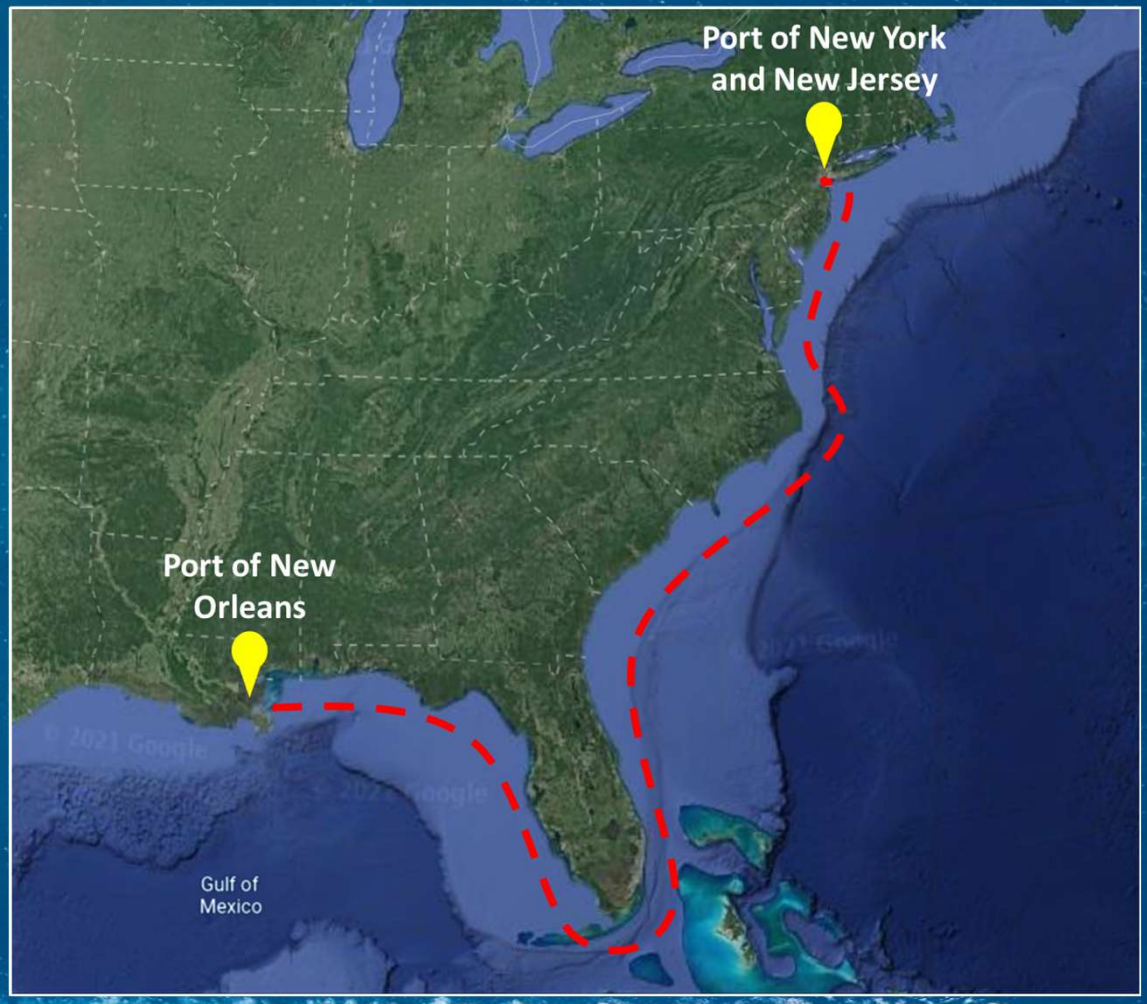
PMN Rollout


Develop
Test
Demonstration service
S-100 Edition 5.0.0
2021
2022
2023
2024
2025
S-101 Electronic Navigational Charts
FULL SERVICE
S-102 High Resolution Bathymetry
FULL SERVICE
S-104 Water Level Forecast Guidance
FULL SERVICE
S-111 Surface Current Forecast Guidance
FULL SERVICE
S-411 Ice Forecast
S-41X Weather and Waves
FULL SERVICE
Dissemination
FULL SERVICE

Ship Transit from New Orleans to New York/New Jersey

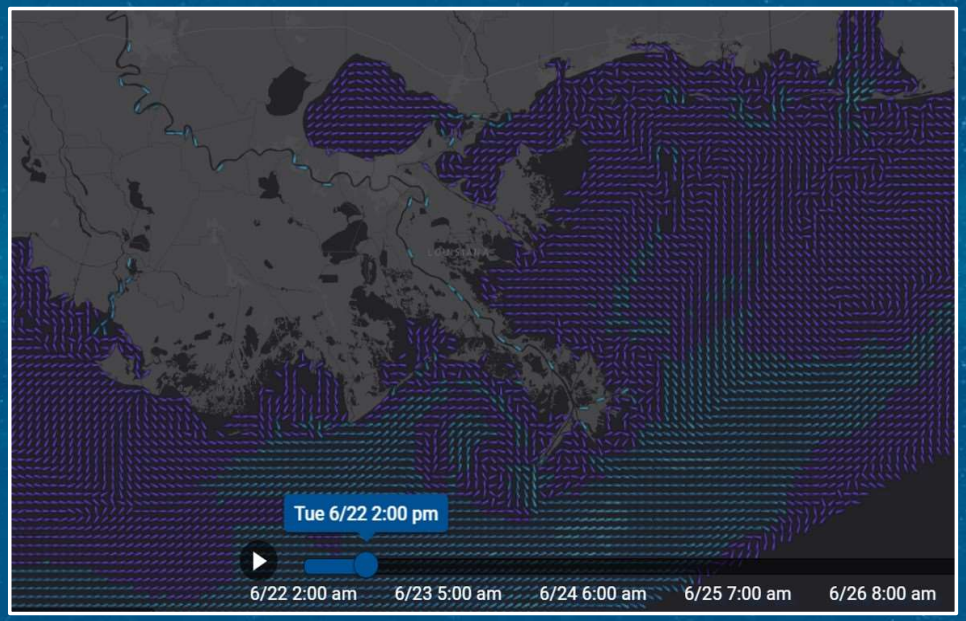
Navigation Considerations:

- ❑ Depths/Bathymetry in channels
- ❑ Surface current systems
- ❑ Water levels
- ❑ Waves and severe weather hazards
- ❑ Traffic and congestion (AIS)

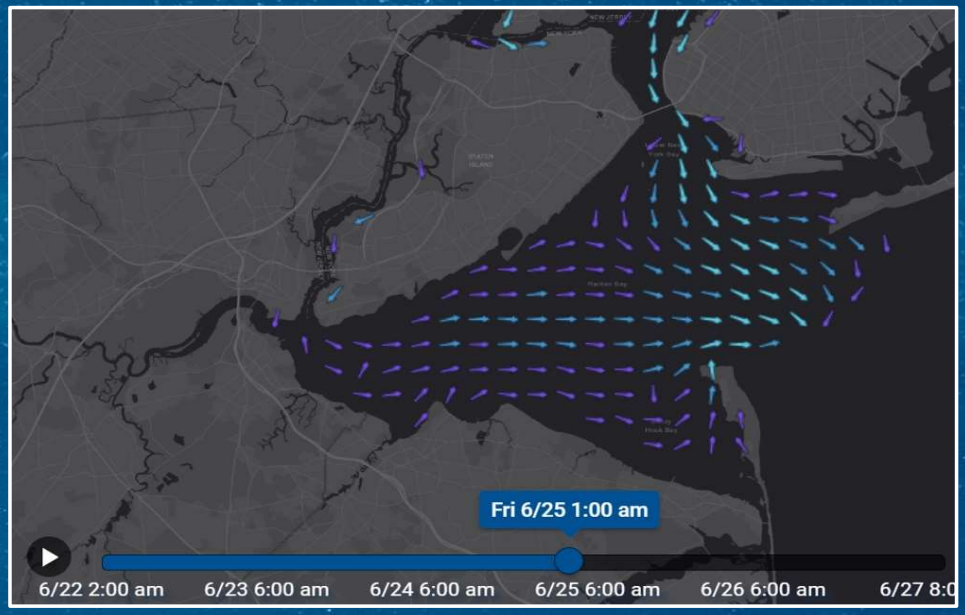


Pre-Voyage: Route Planning

S-111 12-hour Forecast (NOLA)

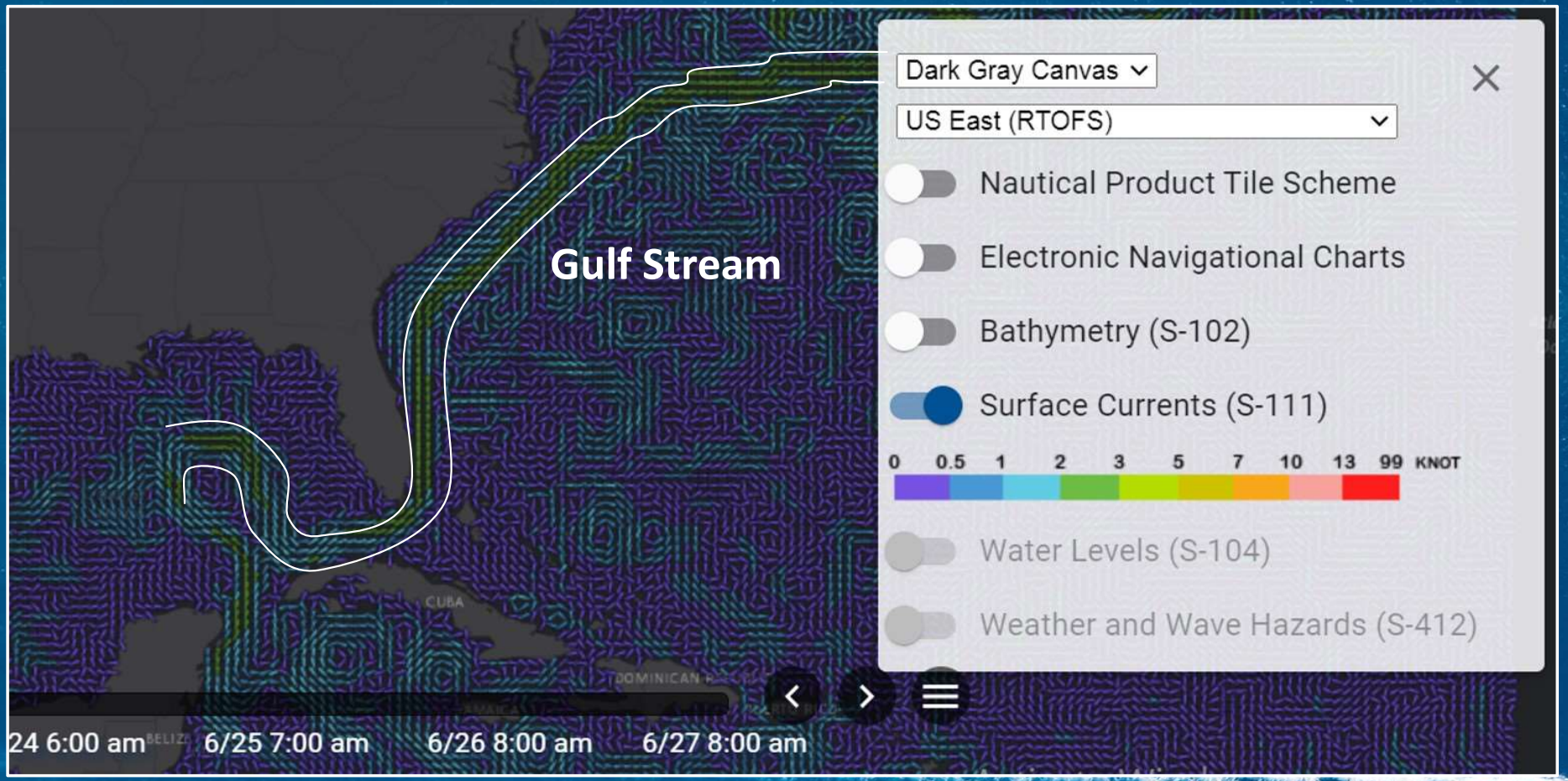


S-111 72-hour Forecast (NYC)

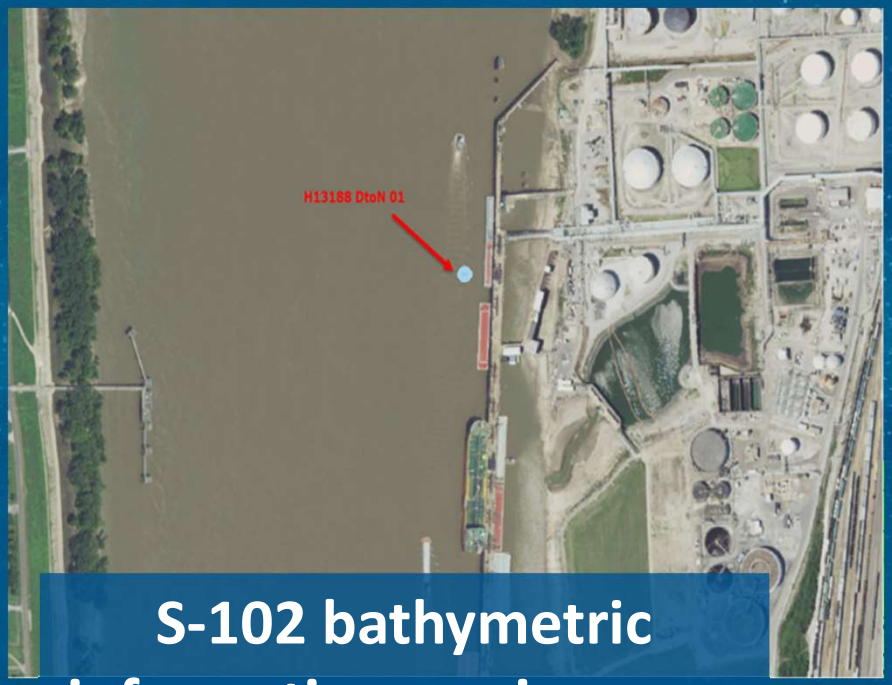


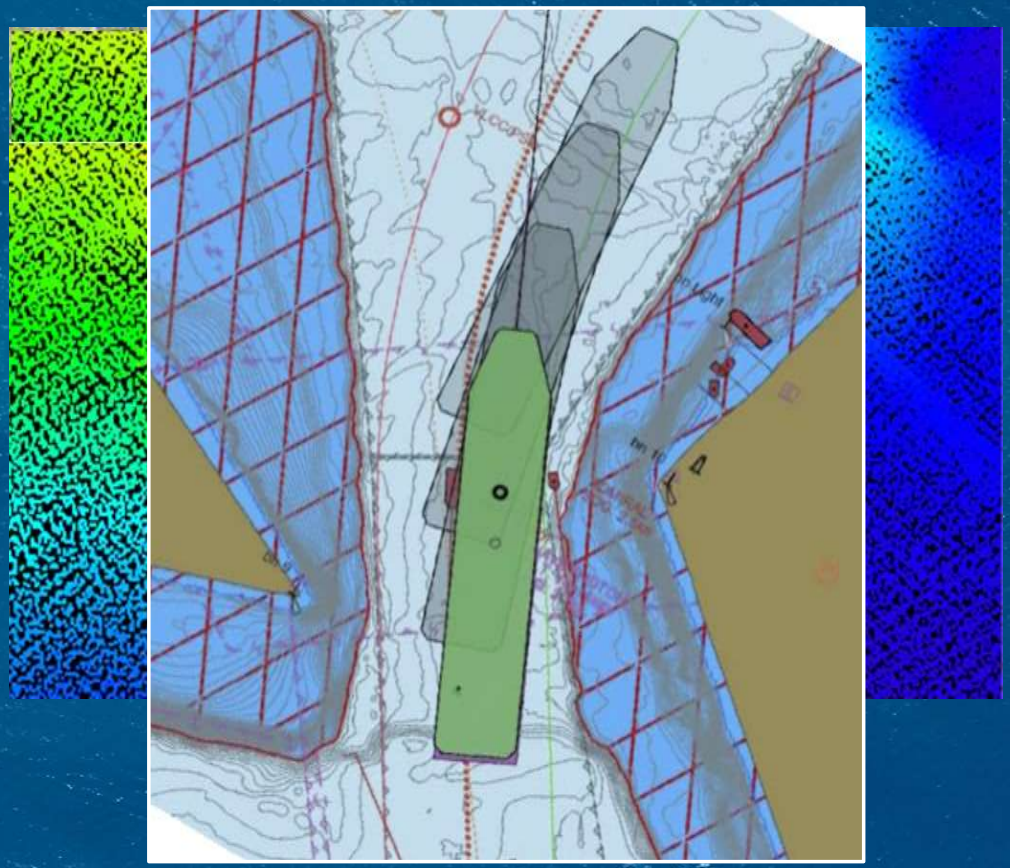
S-111 surface current data enables route optimization;
Fuel reductions = emissions reductions and cost savings

Pre-Voyage: Route Planning



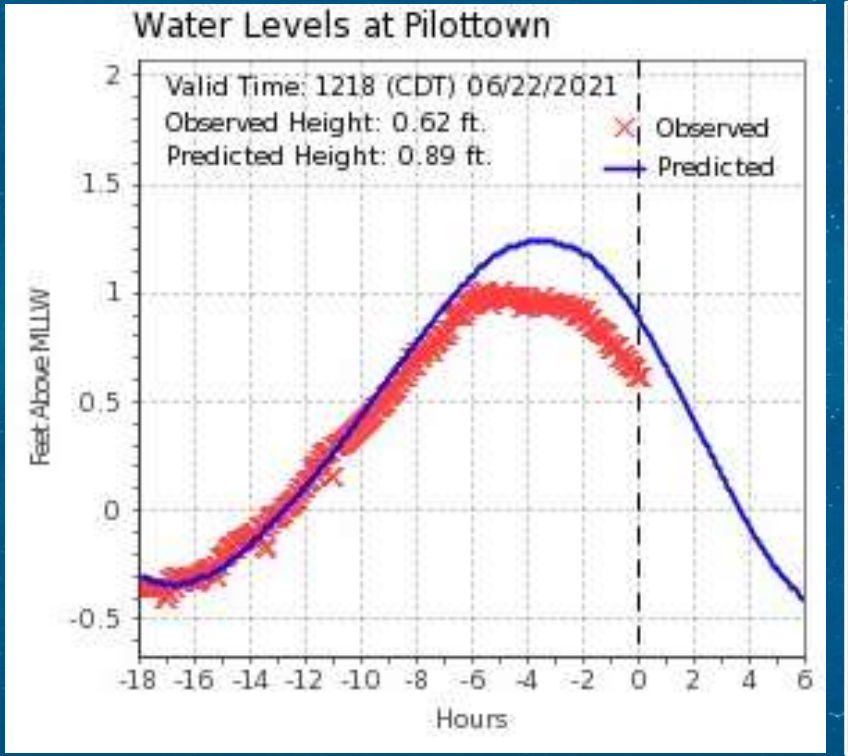
South of Baton Rouge, LA: S-102 Bathymetry

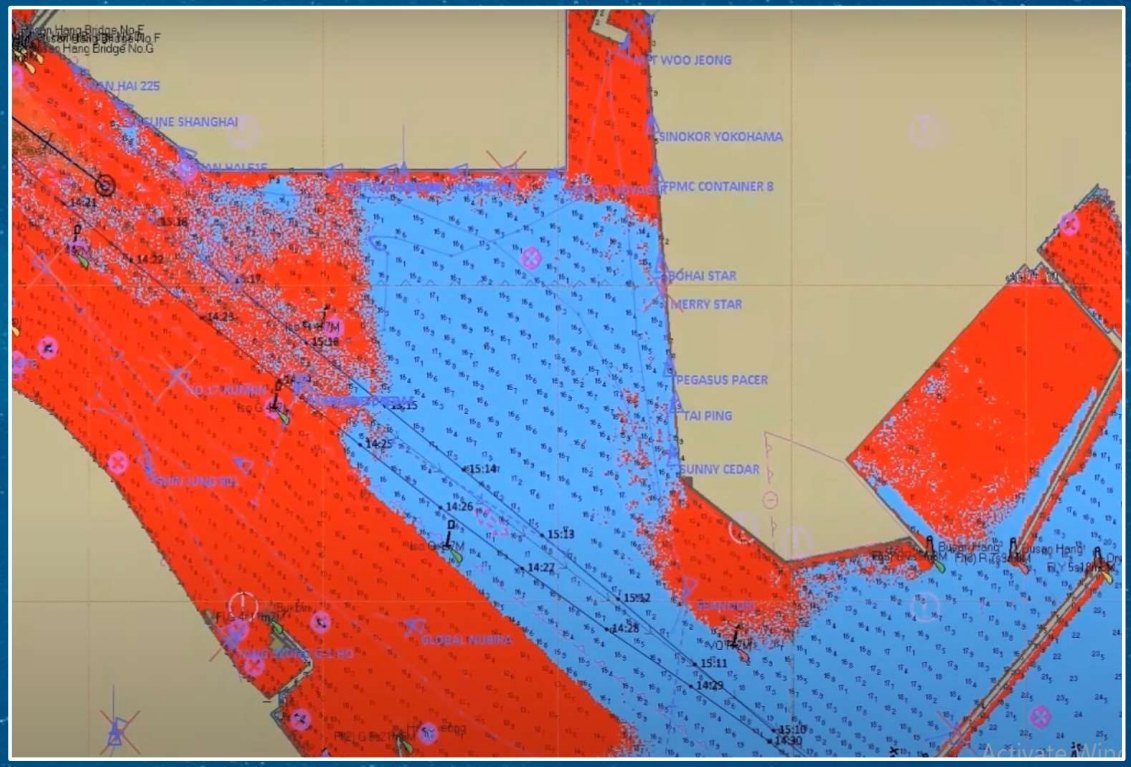




S-102 bathymetric information can increase safety and enable deeper drafts

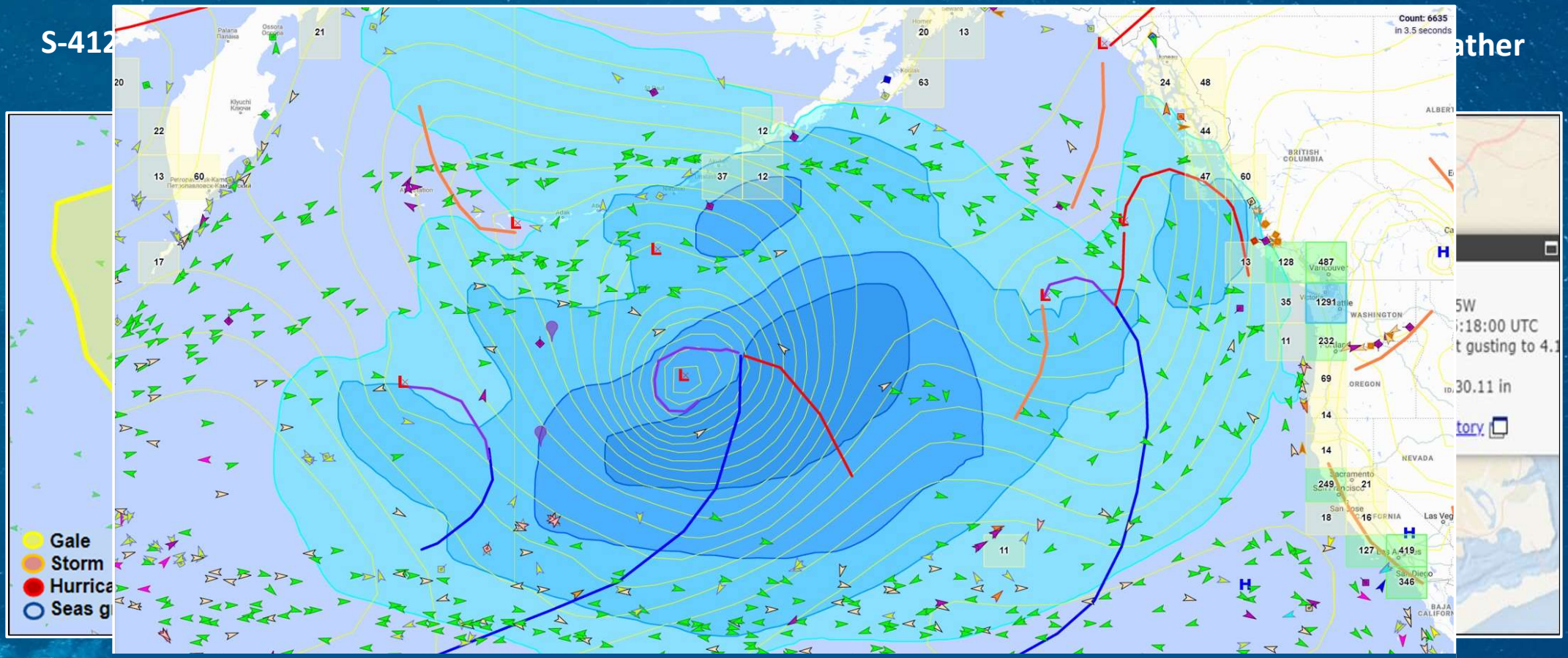
Leaving New Orleans: Water Levels





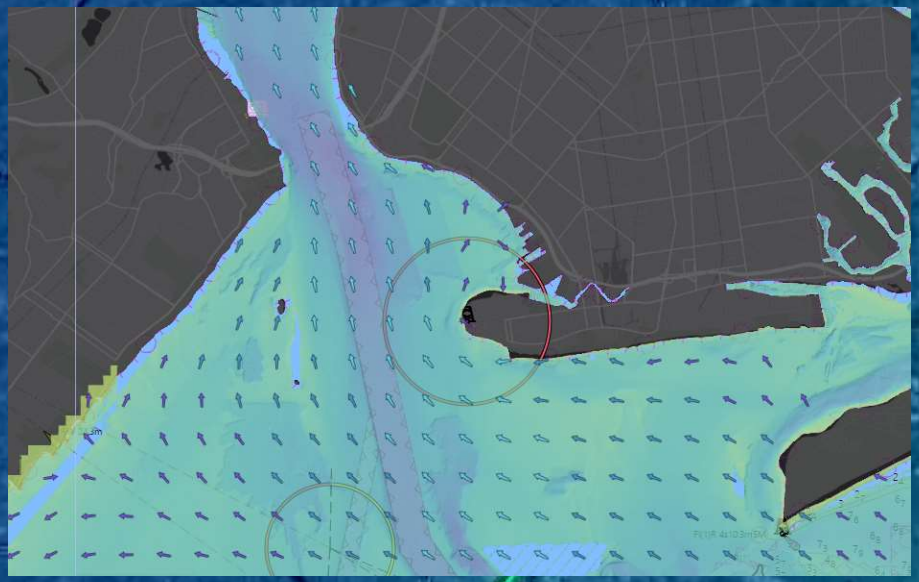
S-104 data will make it clear where it is safe for the ship to maneuver

At Sea: Waves and Weather



S-41X will provide critical marine weather information to ensure safety at sea

Arriving at New York/New Jersey:



Using PMN services can improve efficiency and reduce congestion

Benefits of Precision Marine Navigation

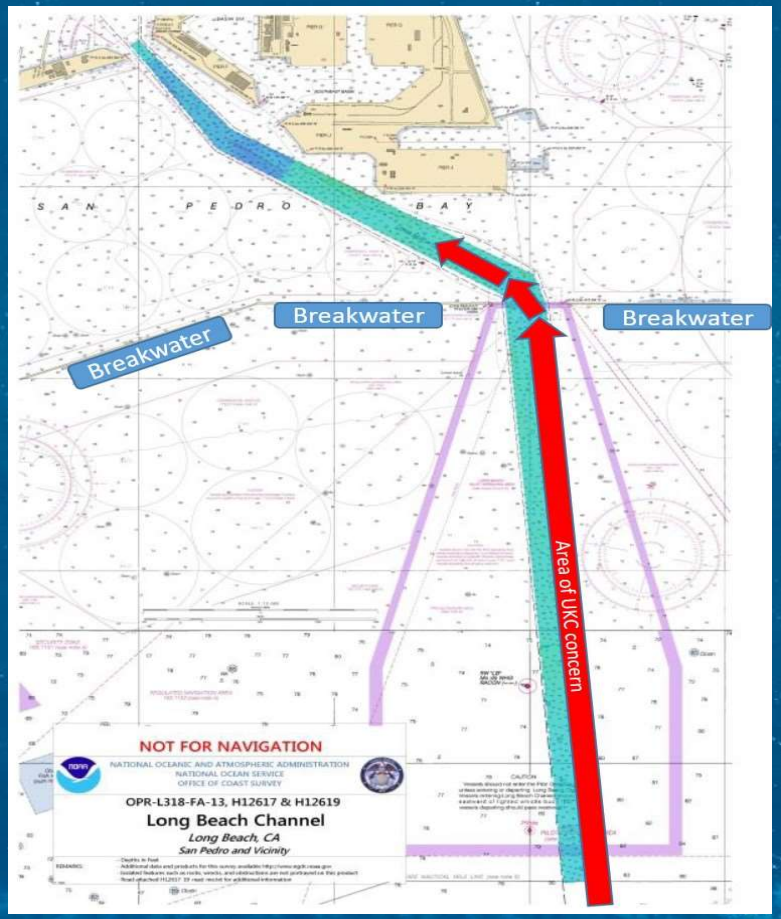
Making the marine navigation data more accessible can enhance the decision-making process, leading to increased efficiency…

- ❑ Optimizing routes for fuel savings and reduced CO_2 emissions
- ❑ Reducing lightering offshore (Safety issue)
- ❑ Reducing port wait times

…and improved safety

- ❑ Reduced collisions, allisions, and groundings
- ❑ Avoiding hazardous weather conditions

PMN Success Story



Underkeel Clearance concerns in the Long Beach Channel:

- ❑ Dredged to 76’ to allow tankers with 69’ draft
- ❑ Long period swells necessitated draft limitation of 65’
- ❑ Forced offshore lightering

New surveys allowed for S-102 data

- ❑ Draft increased to 69’
- ❑ Millions of dollars in savings

Thank You!

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