

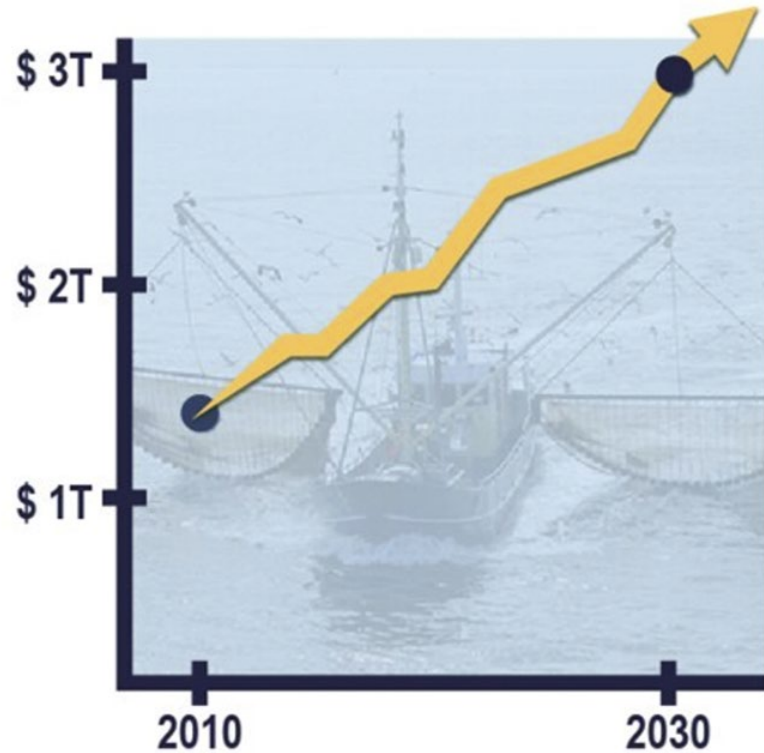


PRECISION MARINE NAVIGATION

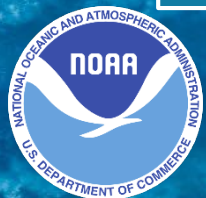
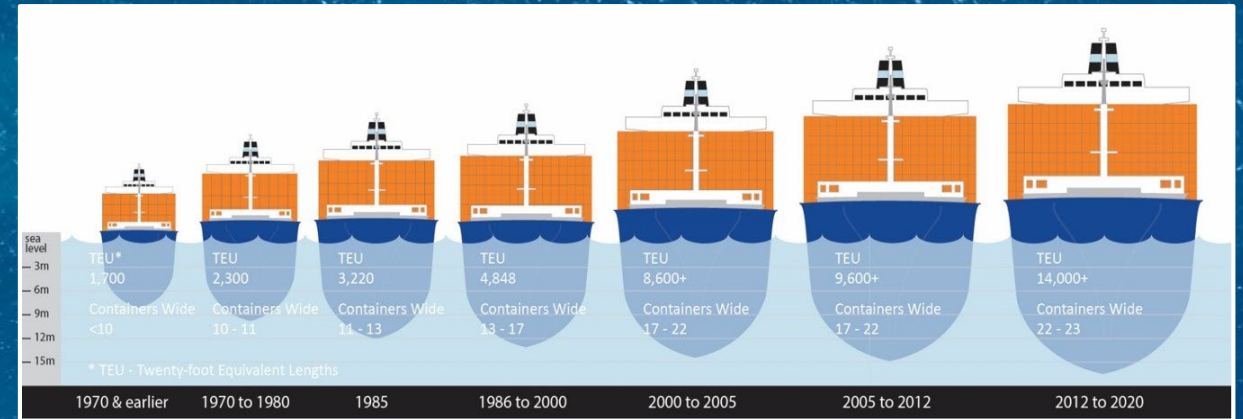
Information Infrastructure for the New Blue Economy

The Maritime Economy

Projected Global Growth by 2030



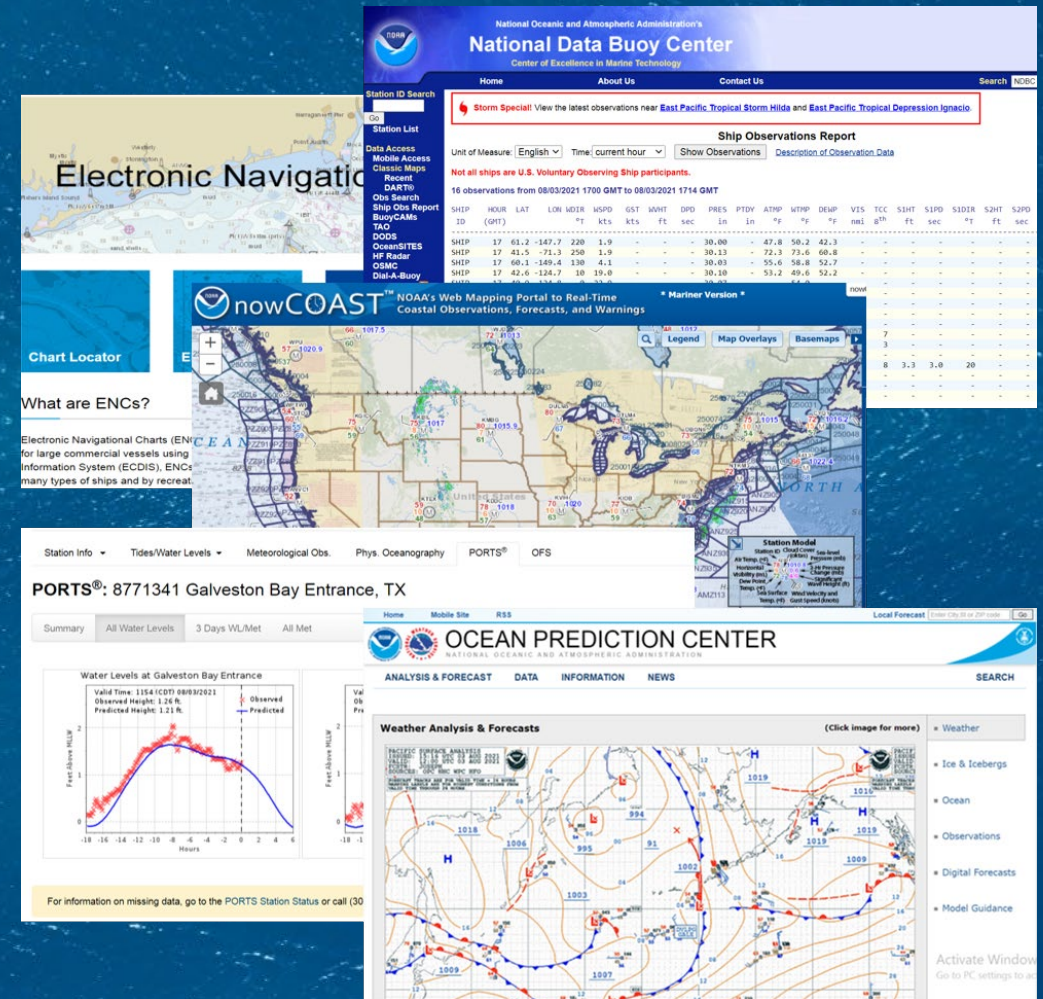
Source: OECD (2016) *The Ocean Economy in 2030*



Navigation Data Challenges

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

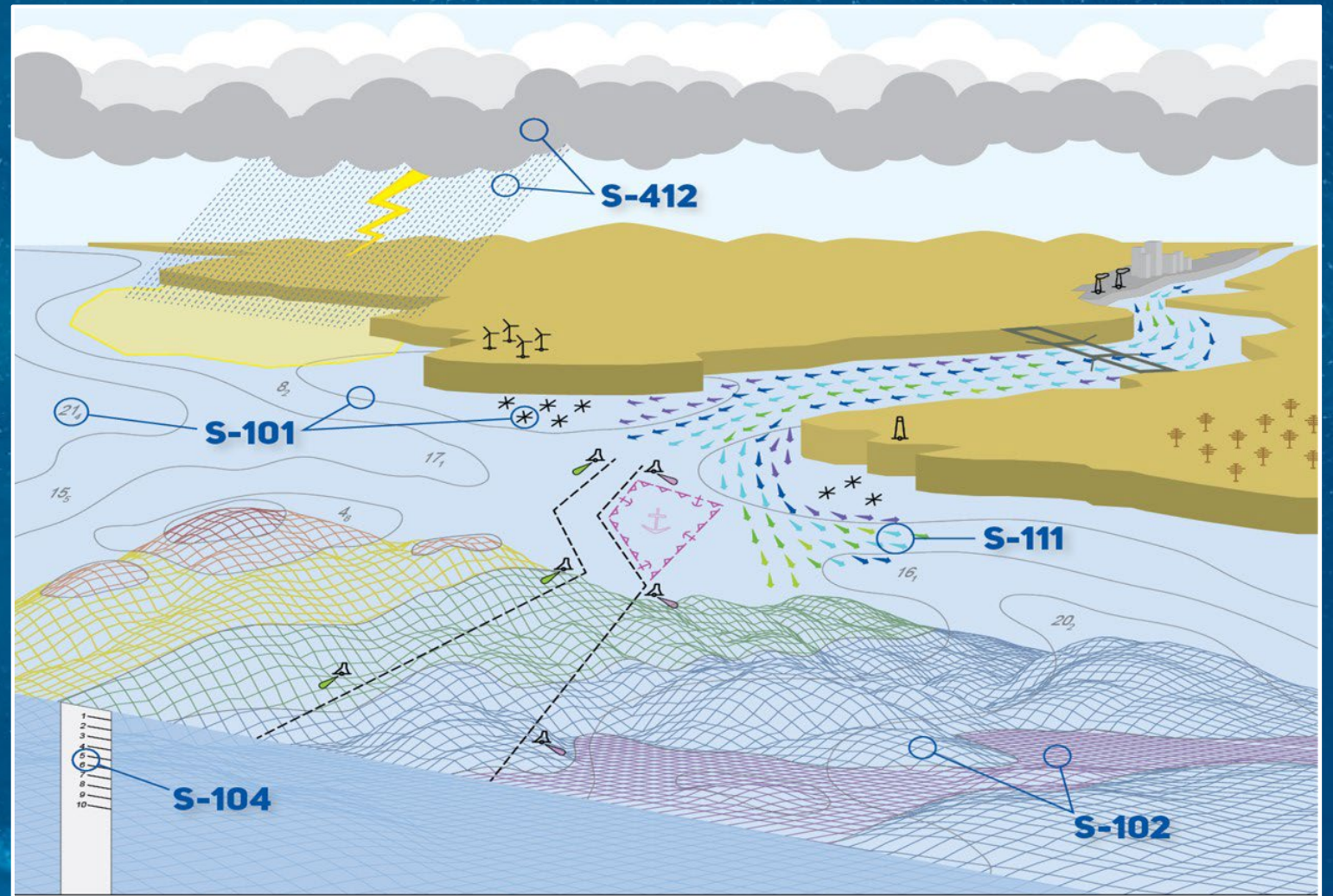
- ❑ Multiple devices and systems required to access the data
- ❑ Datasets spread across various websites and data servers
- ❑ Datasets are encoded in different formats that are not navigation standards



S-100 Data Framework

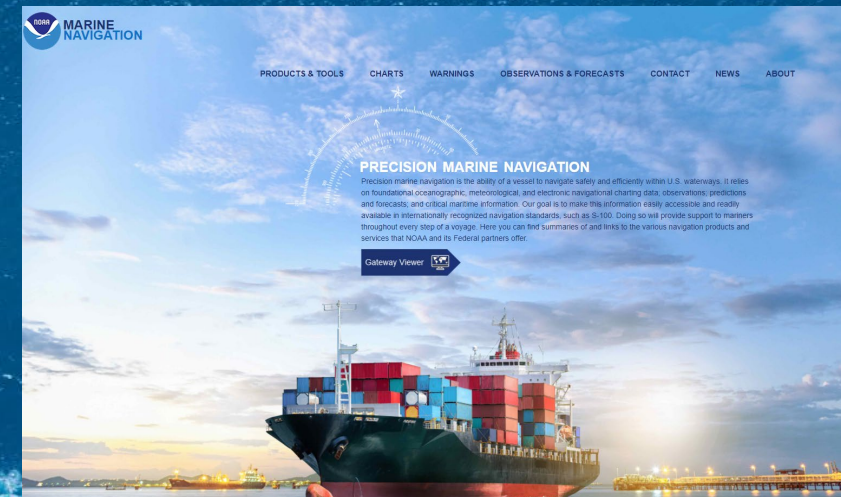
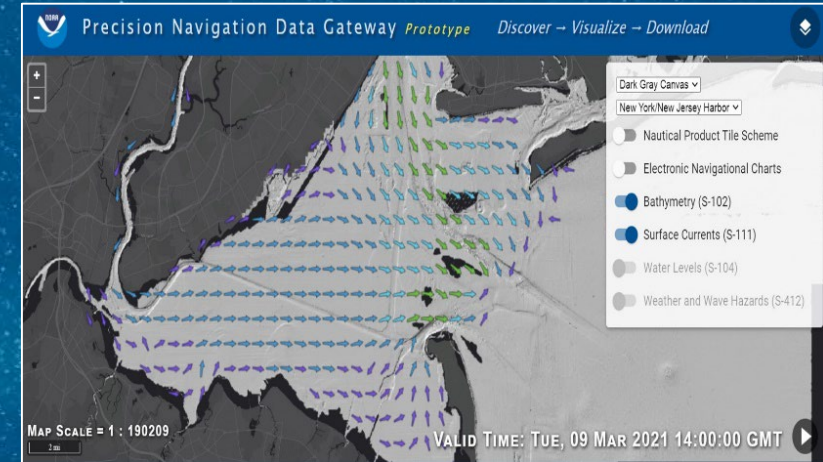
S-100 Data Products

- ❑ **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



Precision Marine Navigation Program

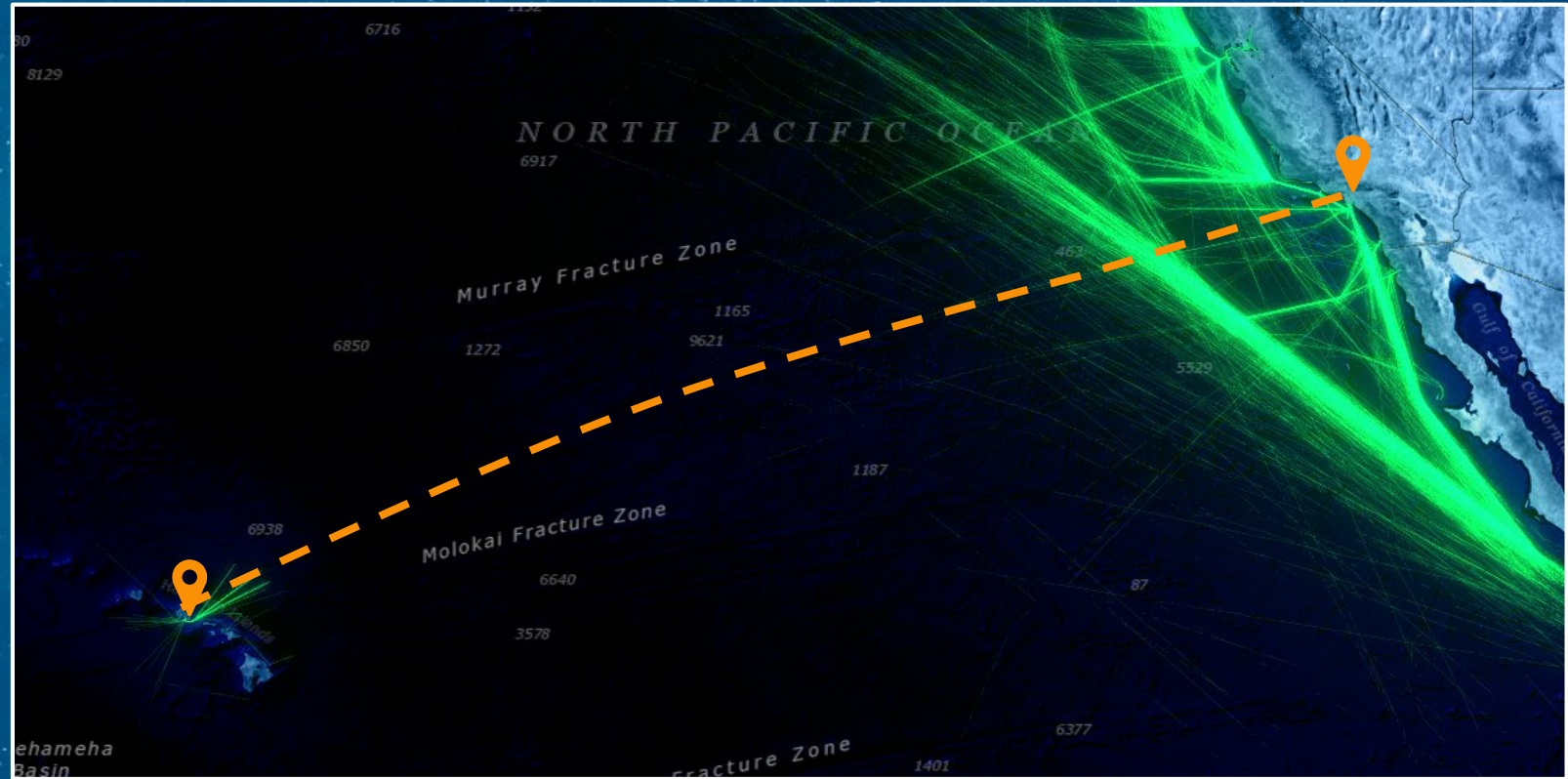
- ❑ Leveraging International Standards (S-100)
- ❑ Precision Marine Navigation Data and Dissemination Services
- ❑ Machine to Machine capability
- ❑ [Marinenavigation.noaa.gov](https://marinenavigation.noaa.gov) Website



Ship Transit: Los Angeles to Honolulu

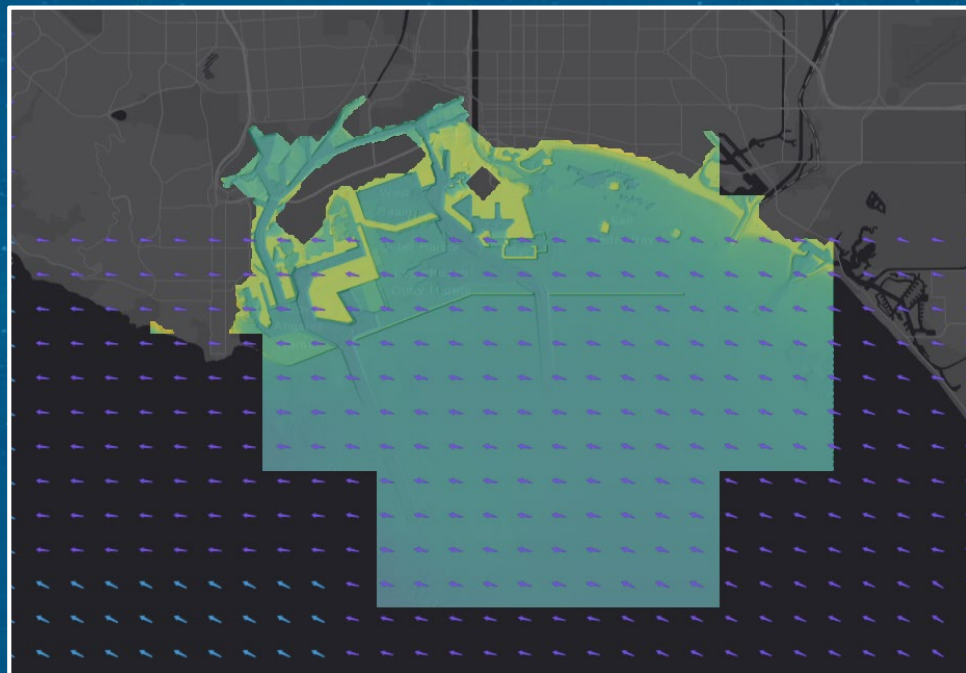
Navigation Considerations:

- ☐ Depths/Bathymetry in channels
- ☐ Surface current systems
- ☐ Water levels
- ☐ Waves and severe weather hazards



Pre-Voyage: Route Planning

S-111 12-hour Forecast (LA/LB)



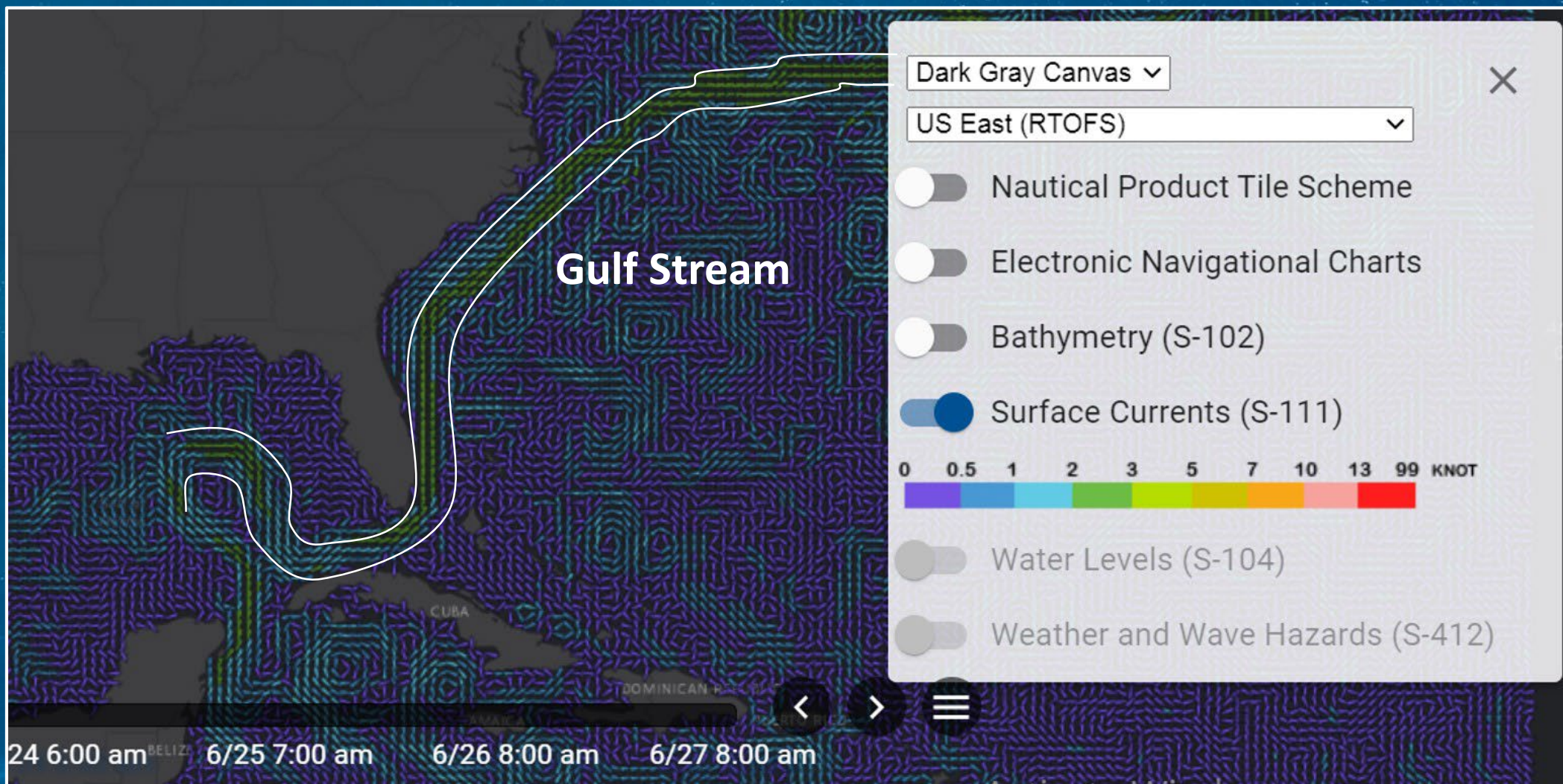
S-111 72-hour Forecast (Pacific Basin)



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

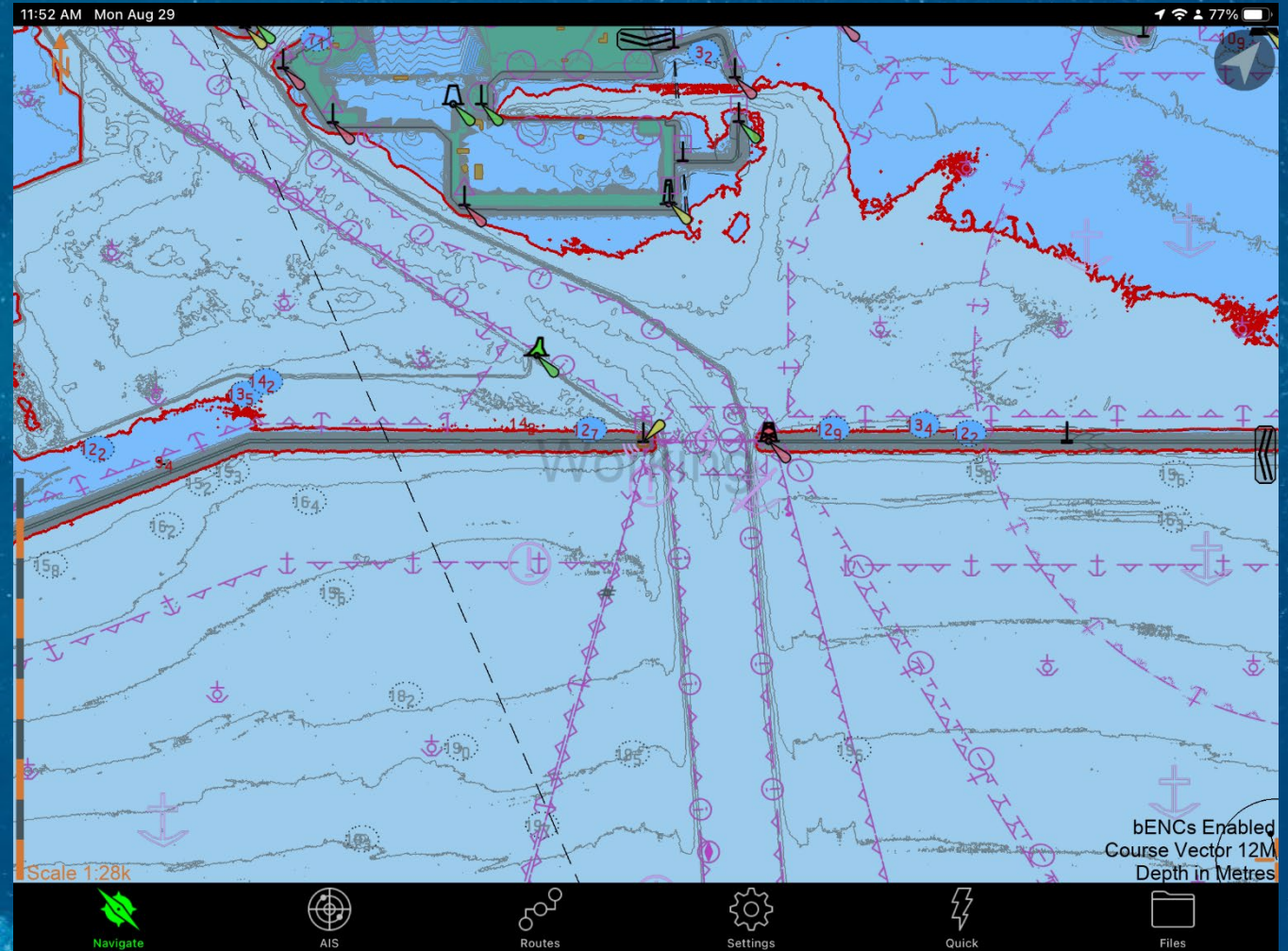


Pre-Voyage: Route Planning

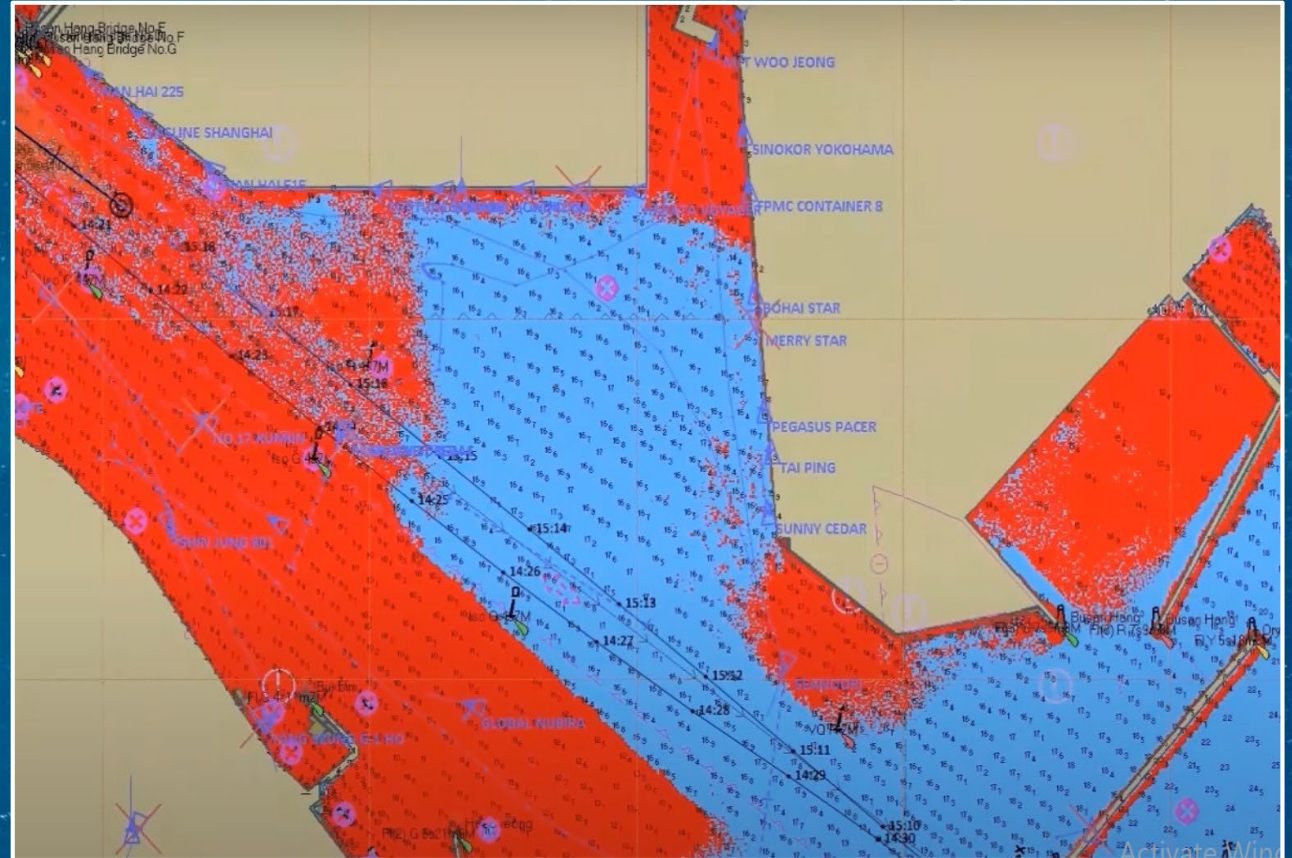
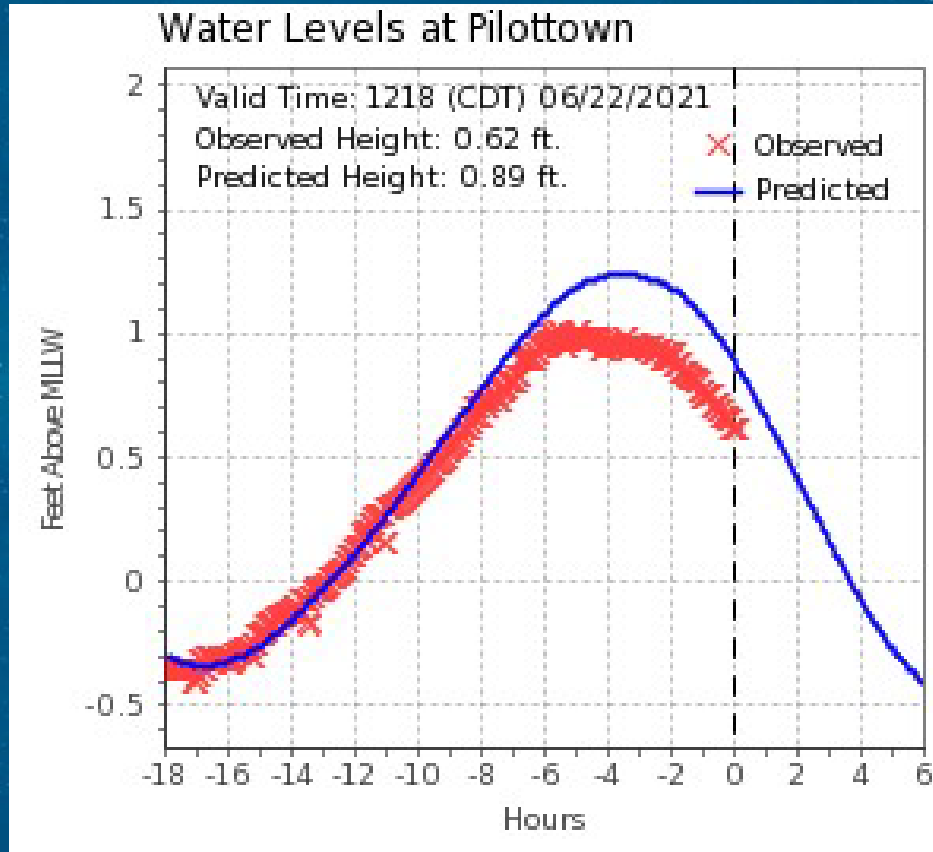


Los Angeles/Long Beach: S-102 Bathymetry

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



S-104 Water Levels forecast Information

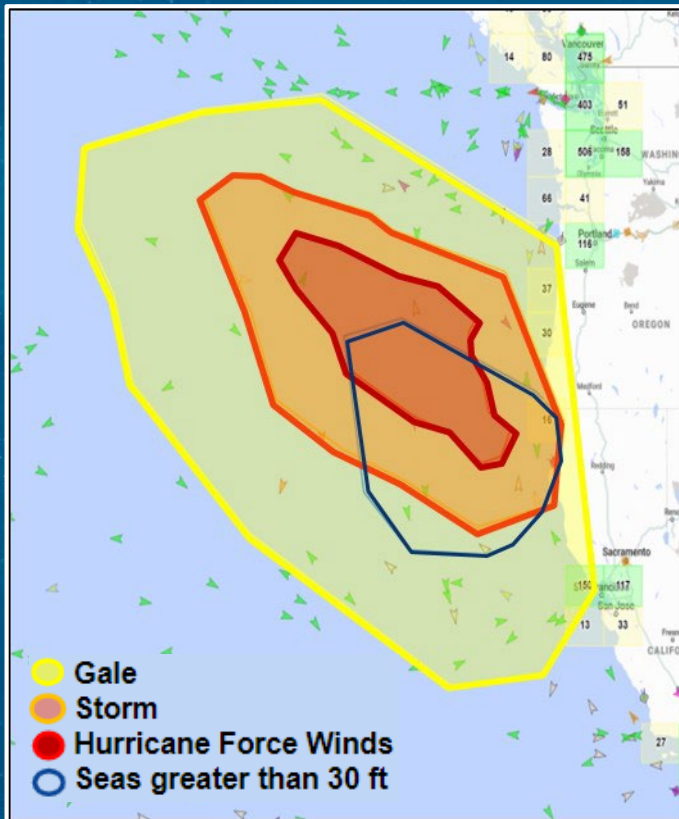


S-104 data will make it clear where it is safe for the ship to maneuver

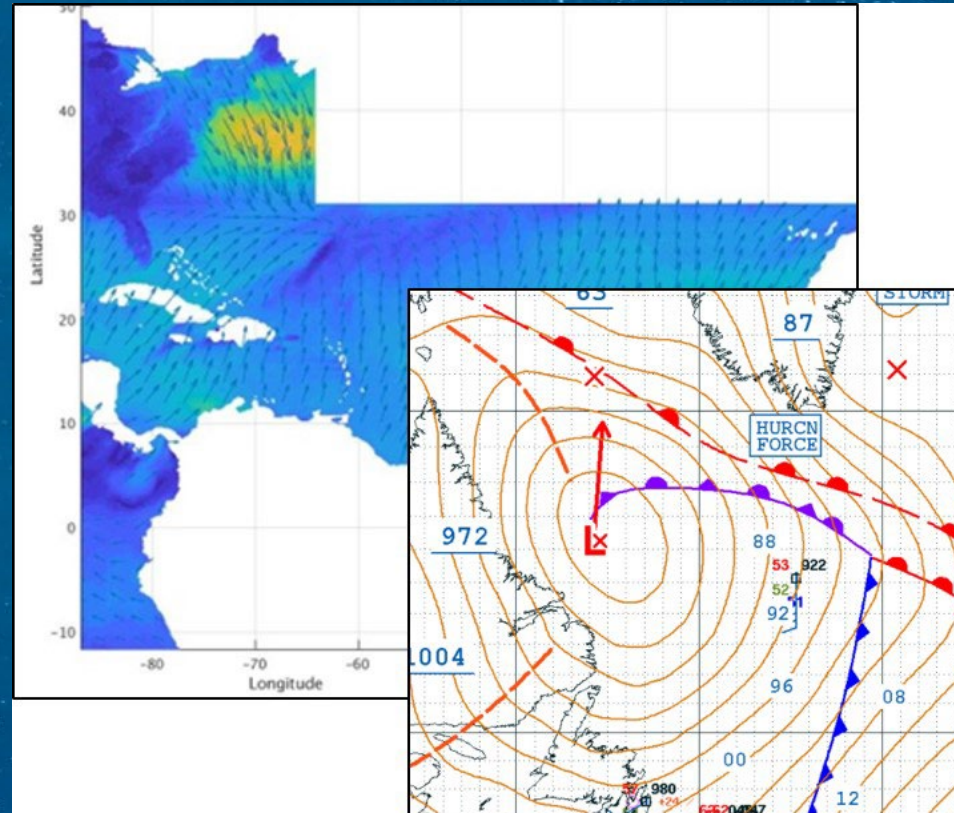


At Sea: Waves and Weather

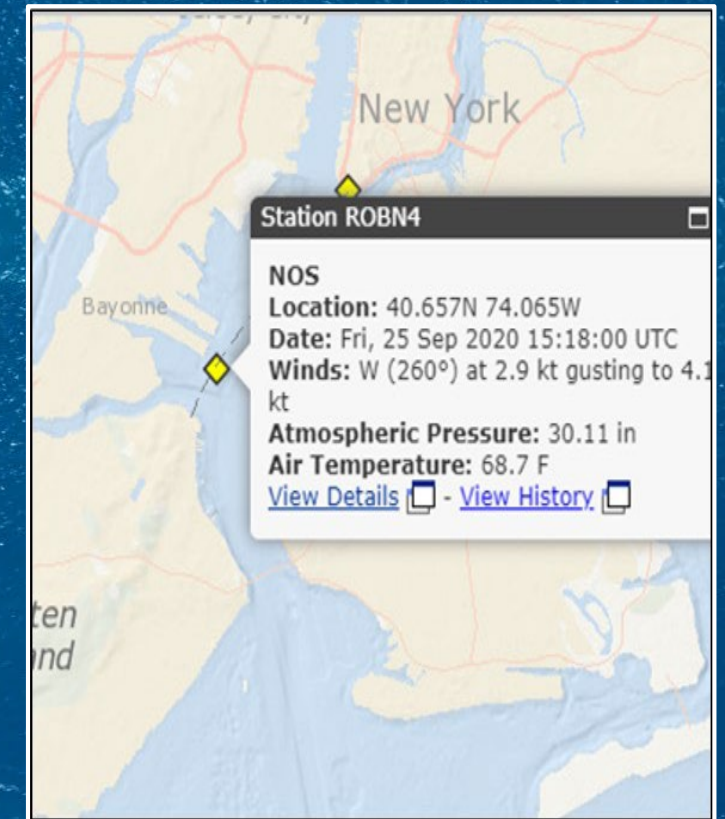
S-412: Wave and Weather Hazards



S-413: Wave and Weather Conditions

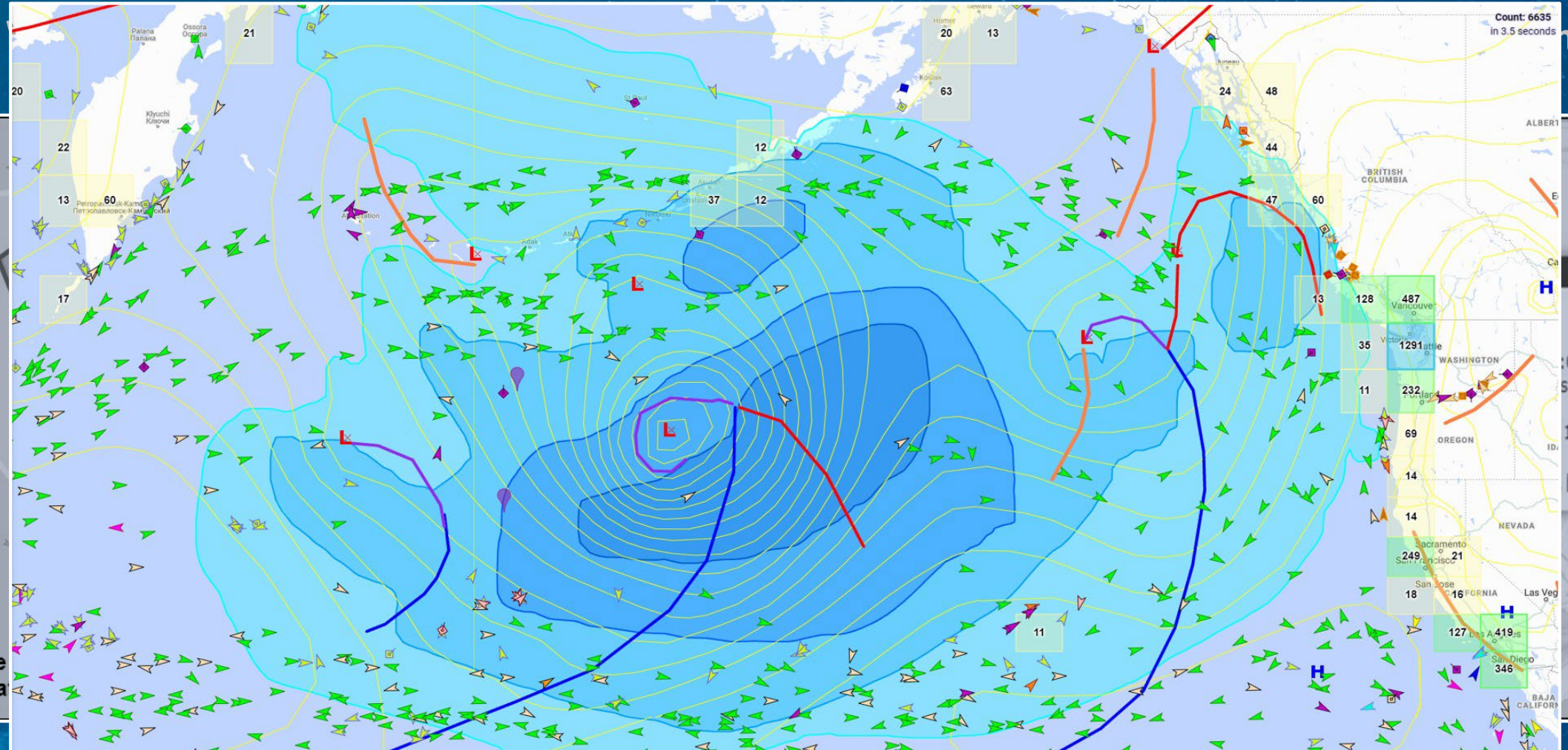


S-414: Wave and Weather Observations



At Sea: Waves and Weather

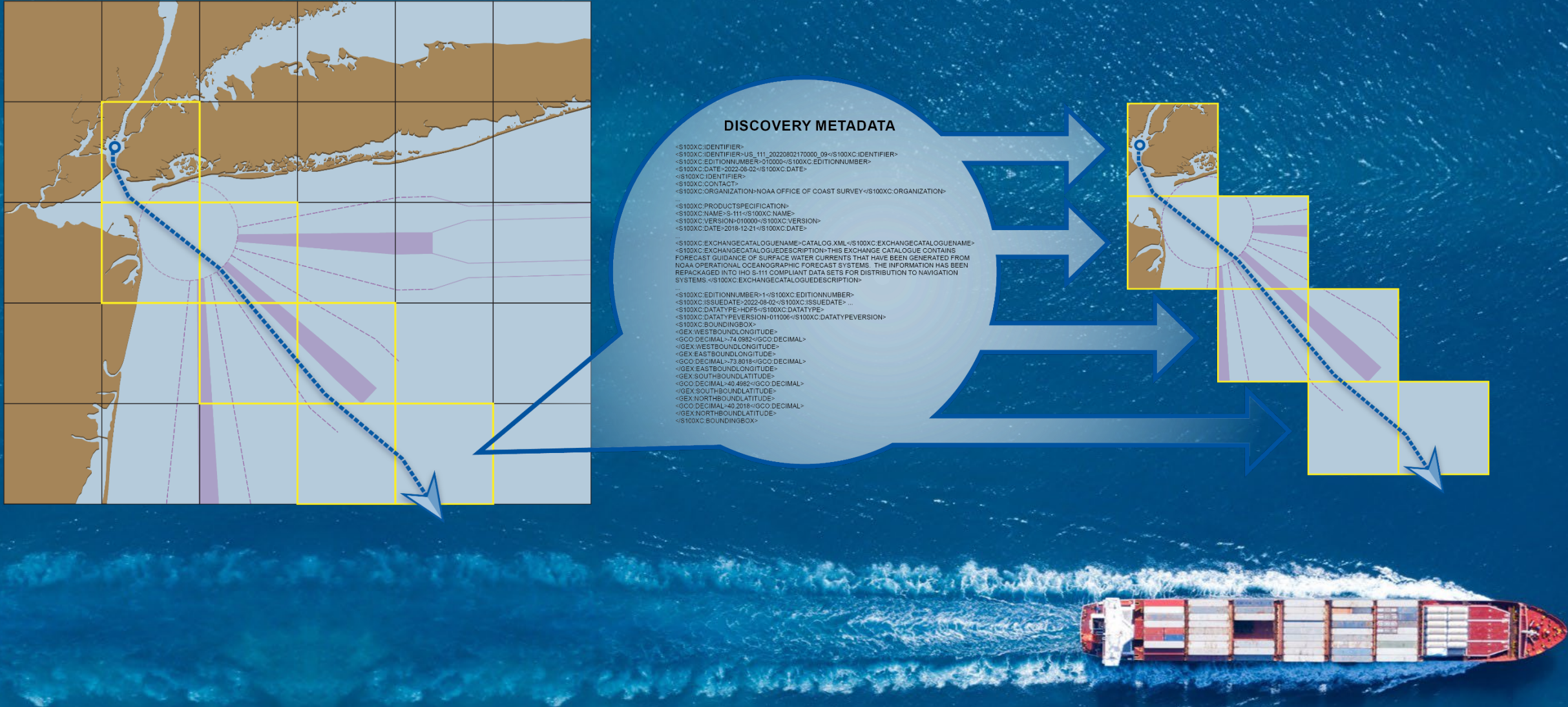
S-412:



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



The Power of S-100 Discovery Metadata



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 CO2 emissions
- ☐ Reducing lightering offshore (Safety issue)
- ☐ Reducing port wait times

...and improved safety

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

