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
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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

Gulf Stream

Options:
- Dark Gray Canvas
- US East (RTOFS)
- Nautical Product Tile Scheme
- Electronic Navigational Charts
- Bathymetry (S-102)
- Surface Currents (S-111)
- Water Levels (S-104)
- Weather and Wave Hazards (S-412)
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.
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 CO2 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!

Julia.Powell@noaa.gov