

AAPA Harbor and Navigation Committee  
August 13, 2014  
*Environmental Intelligence in Ports*

Captain Shepard M. Smith, NOAA  
Deputy to the Hydrographer  
Office of Coast Survey

Office of Coast Survey

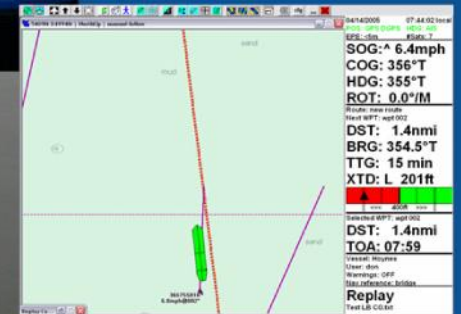
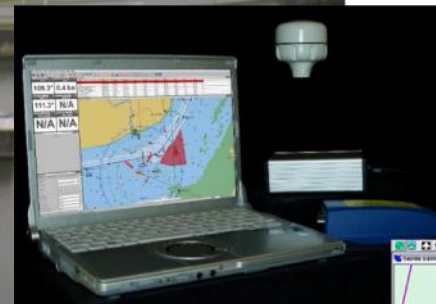




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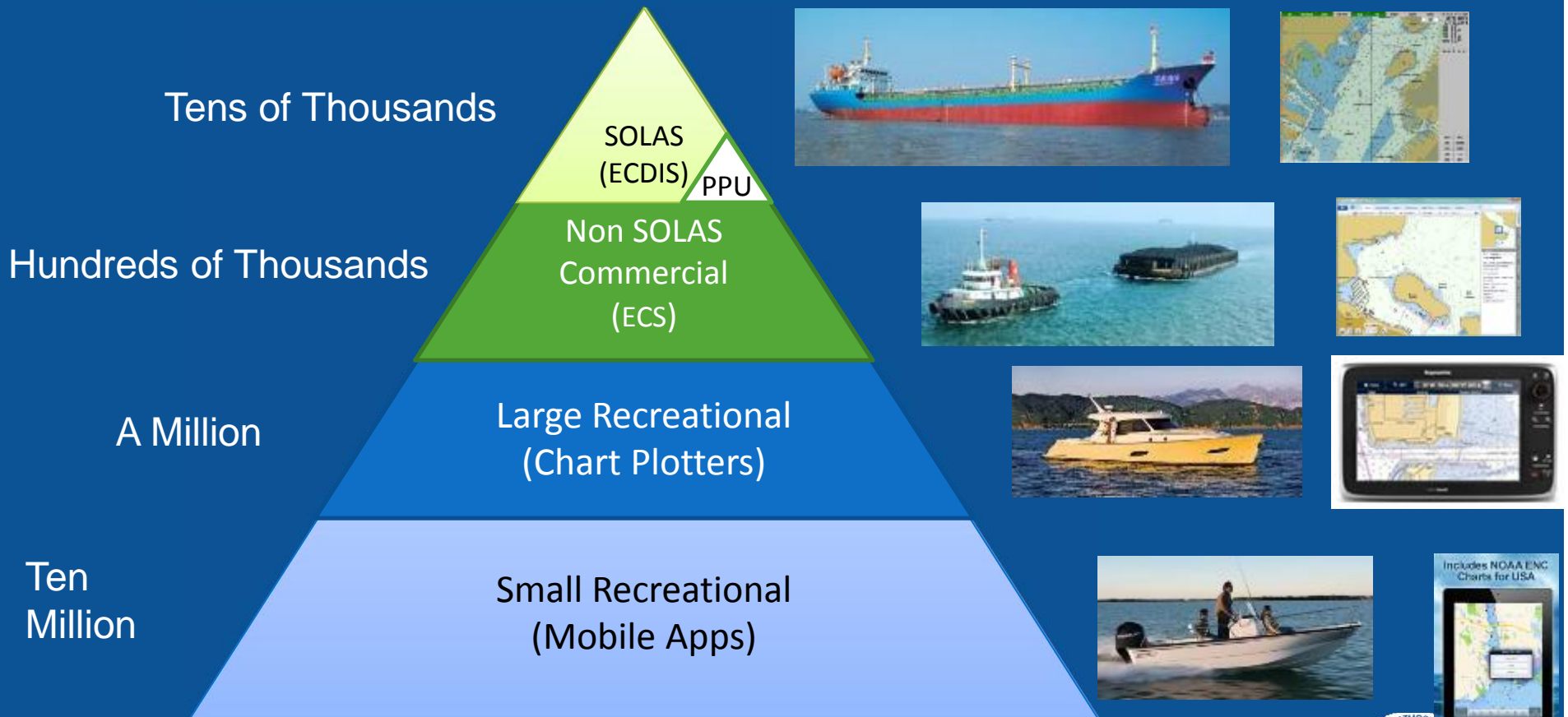
# Precise navigation in ports is different than coastal navigation



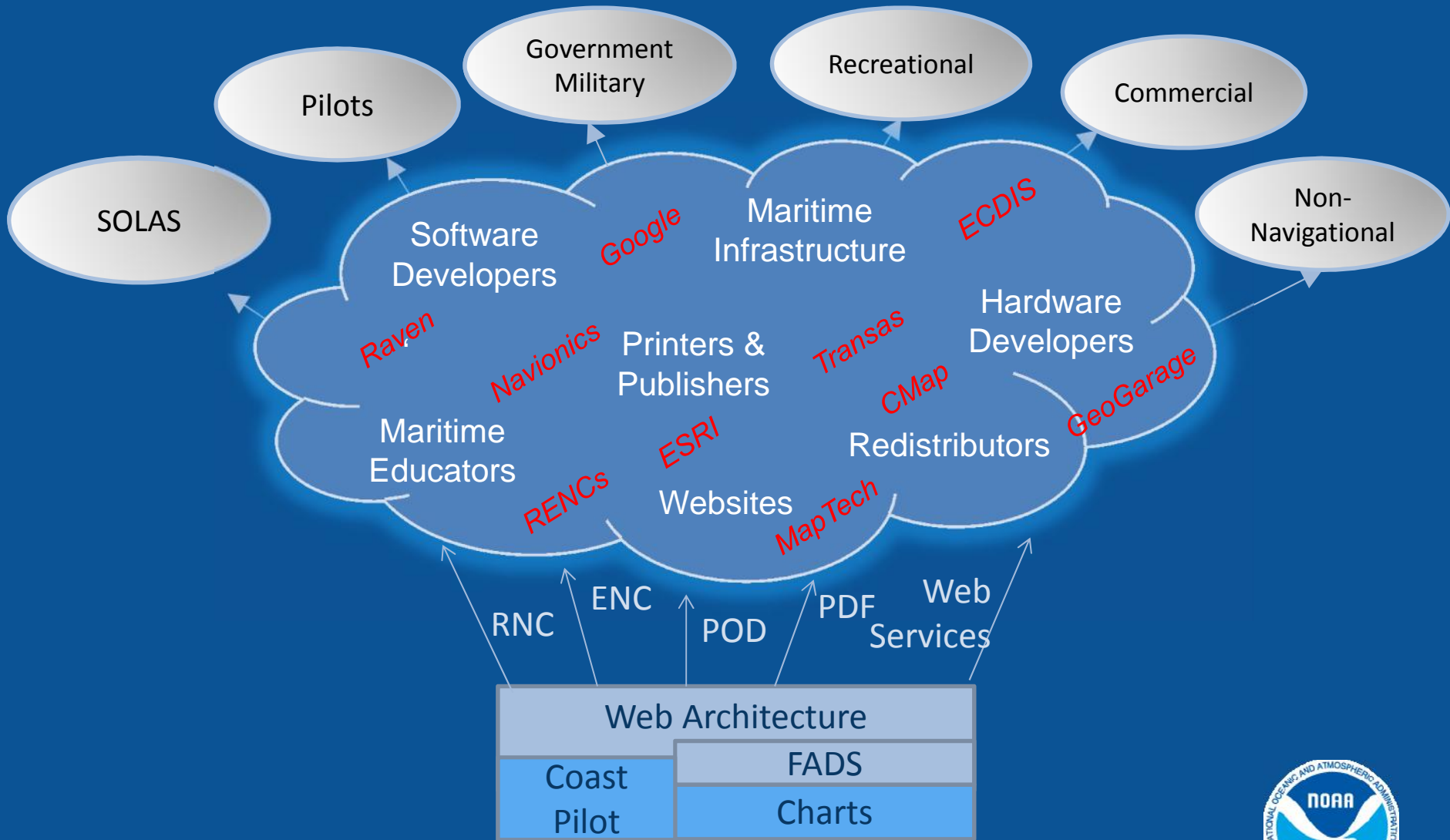
ADNavigation  
NavSIM  
Navicom  
PilotMate



# Focus on ALL the users



# Coast Survey Value Chain



# Embrace Unregulated Navigation Technology

- Tremendous source of innovation
- Medium for chart delivery to millions of customers
- Connectivity creates new opportunities

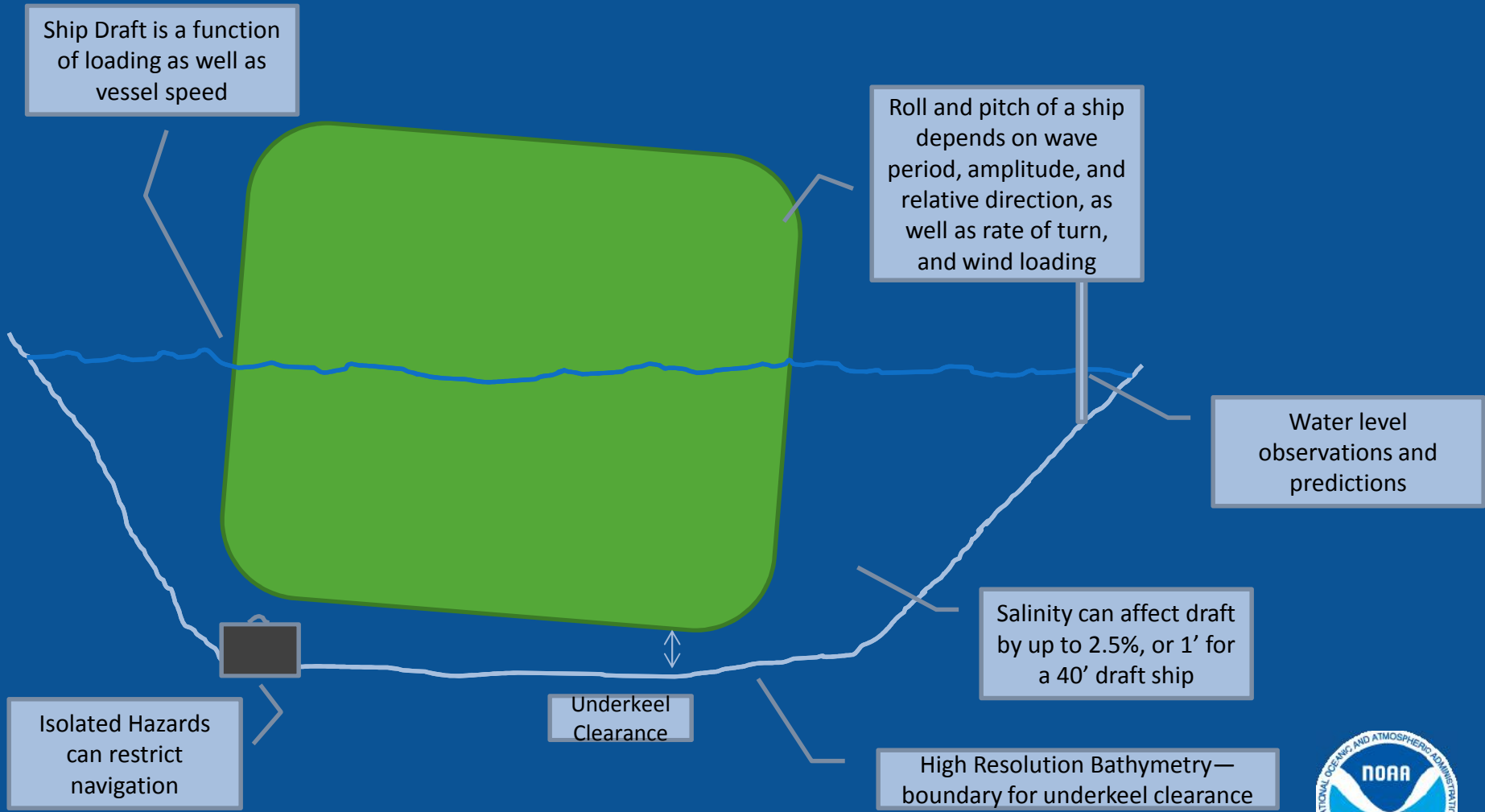


# Bring the information to the point of decision

- Planning-how deep can I load?
- Scheduling-when is the window for this ship movement?
- Risk management-what is the risk of this particular transit?
- Execution-where is the available water right now?
  
- ALL require some environmental information



# Environmental factors affecting ship maneuvering

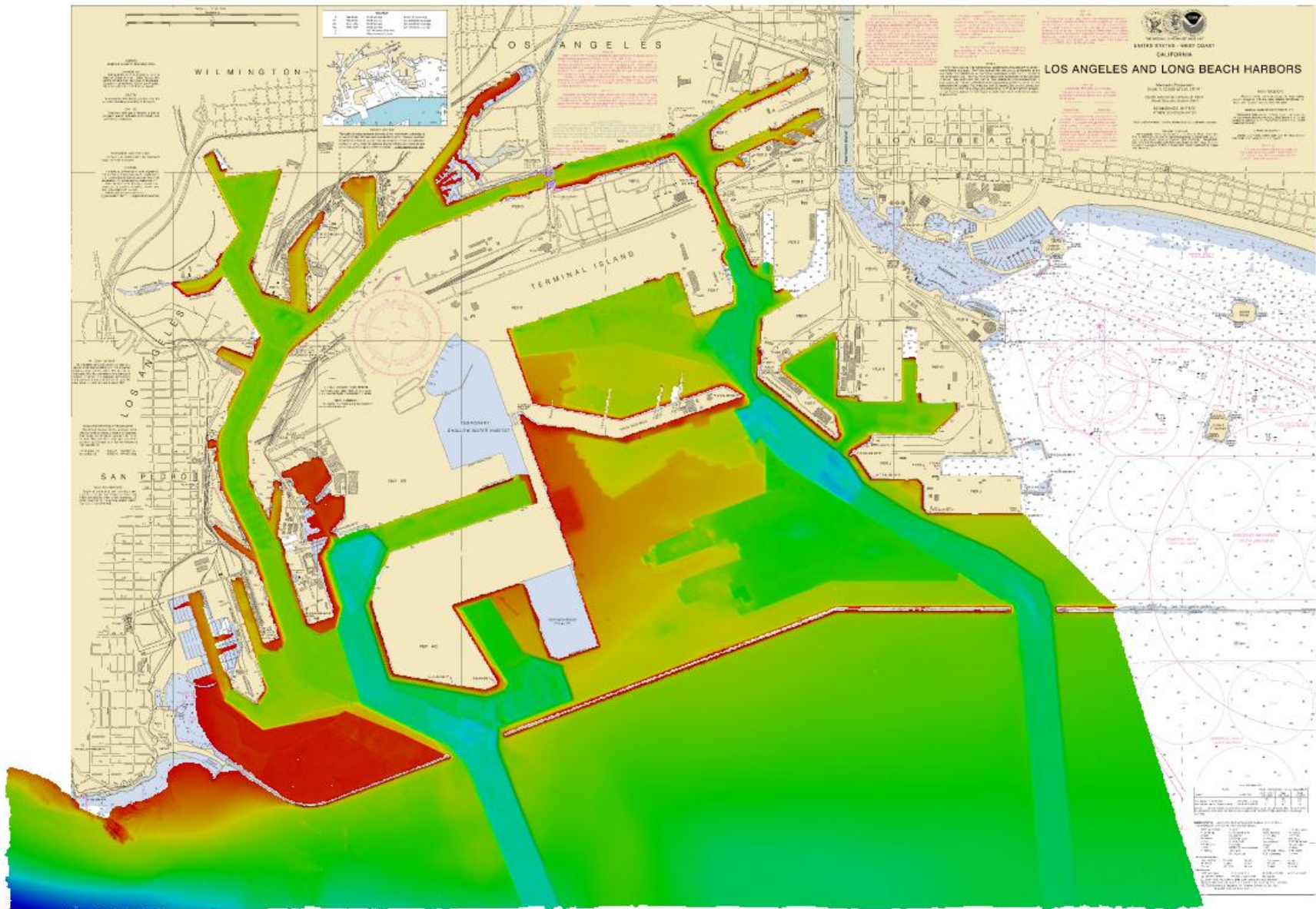




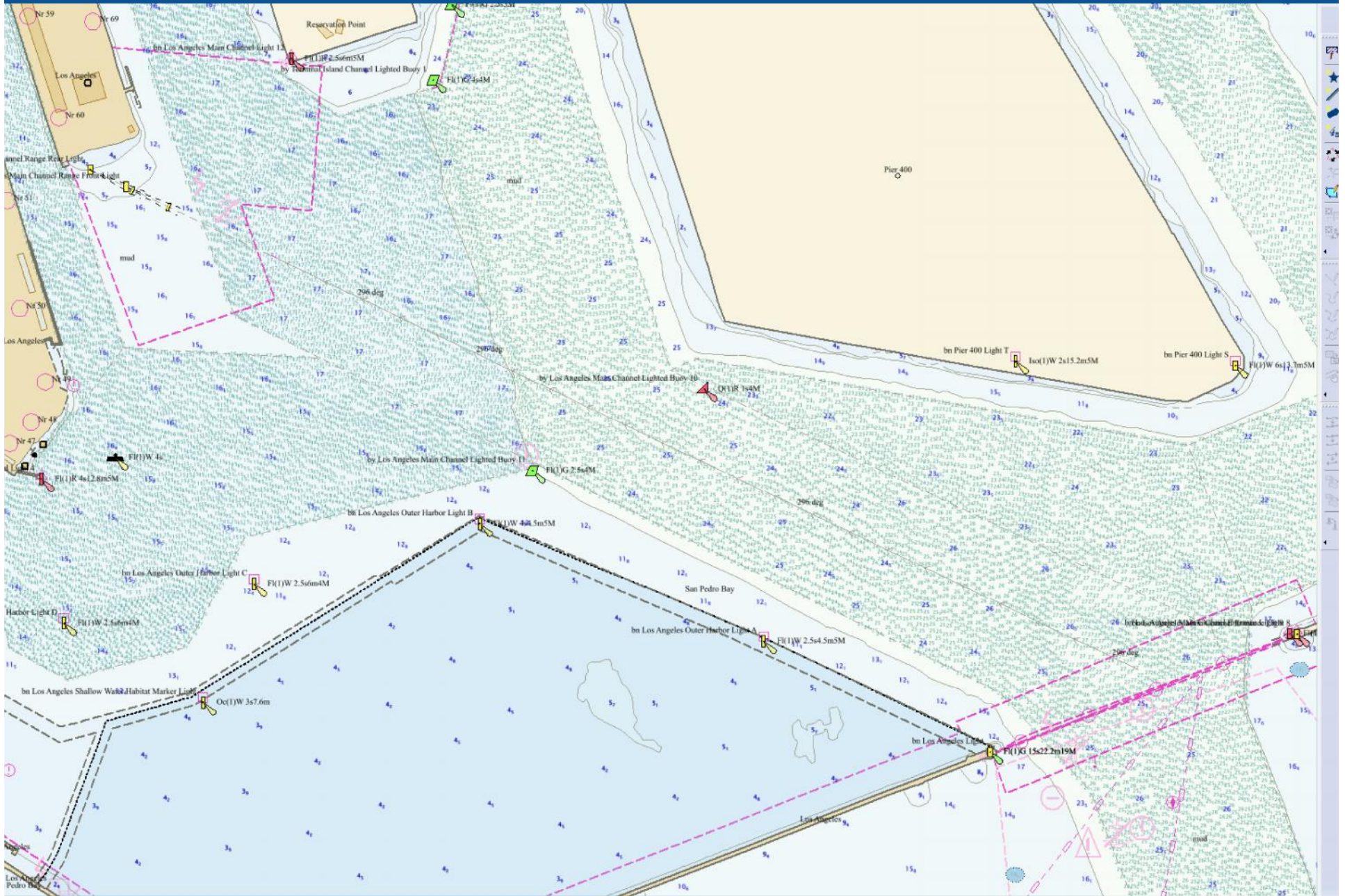
# High Resolution Bathymetry

Survey Scale: 1:6000

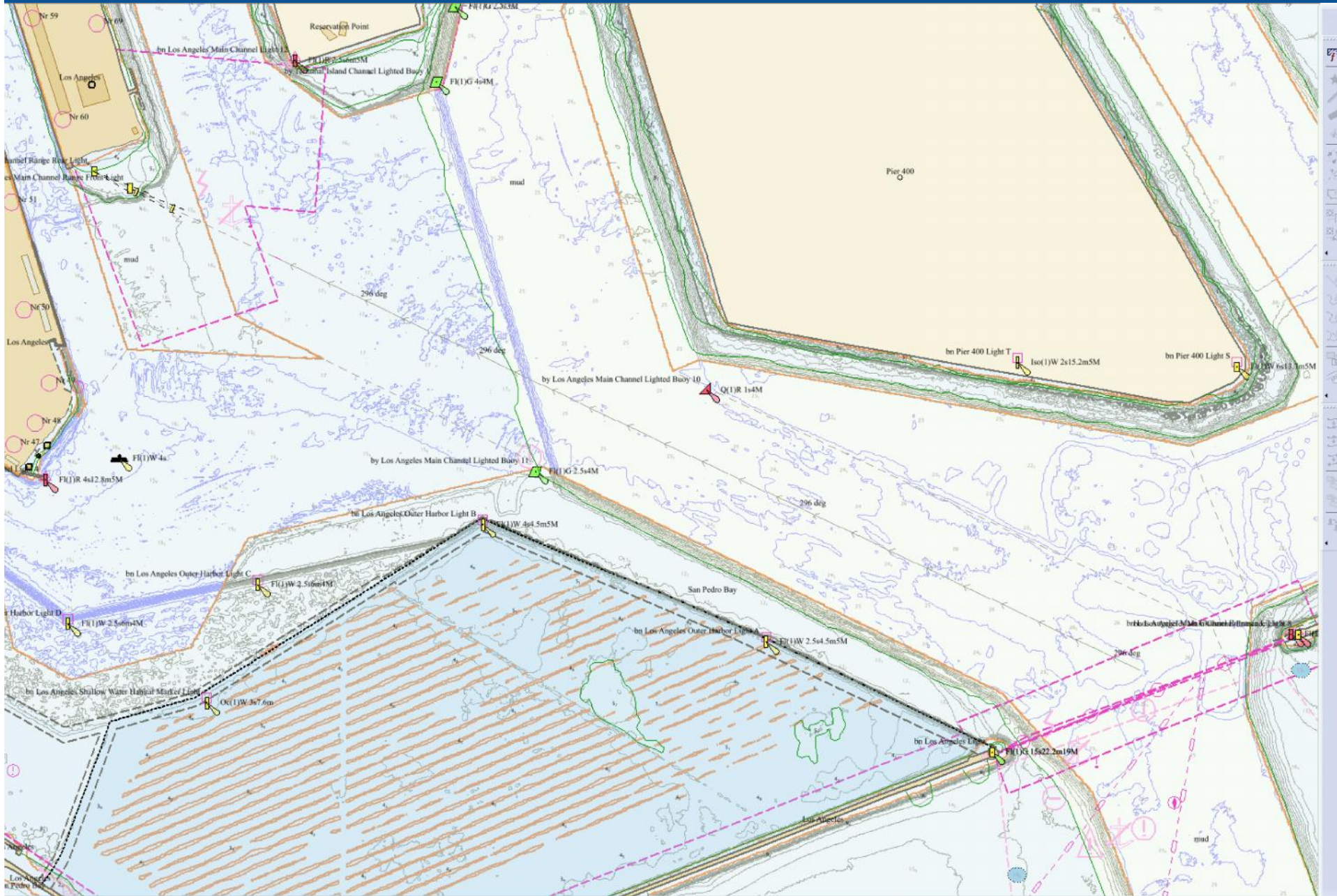
1:12,000



# Soundings 1:3000



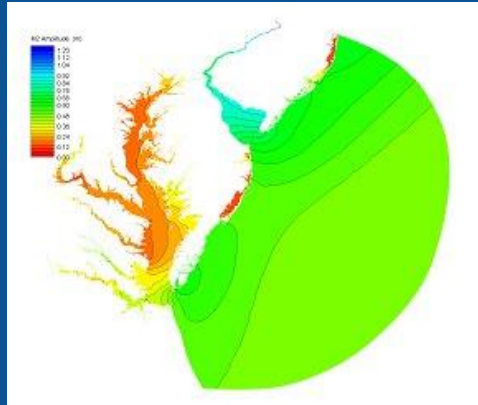
# 1m Contours: Fairway and Outside



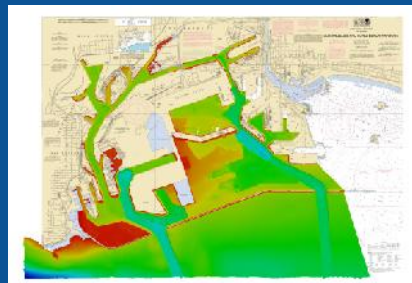
# Full Suite of Environmental Observations and Predictions



Wave observations



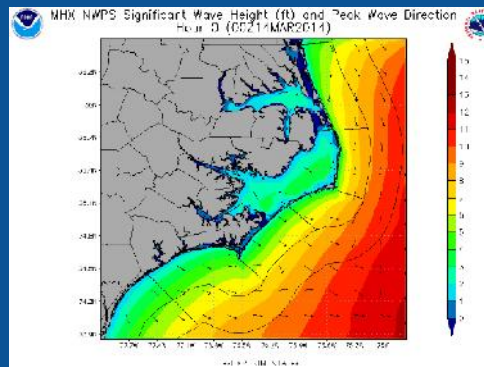
Hydrodynamic Models for predicted water levels, currents and salinity



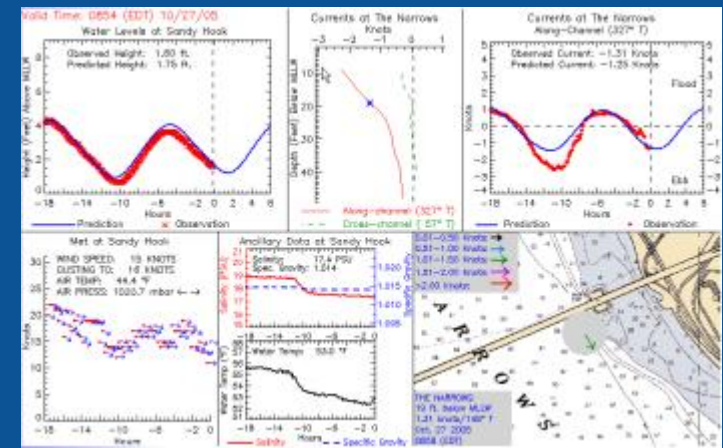
High Resolution bathymetry



Coastal current observations



Coastal Wave predictions



PORTS-Real Time station observations and predictions



# ENC First

- NOAA is retooling our internal systems and workflows to make the ENC our primary chart product
- Changes will be made to the ENC first and distributed weekly, between editions
- This will eliminate the single largest delay in updating charts-waiting for the new edition
- Pacific Islands and California are done, the rest will be done in the next two years.



# Print and Distribution System for Paper Charts

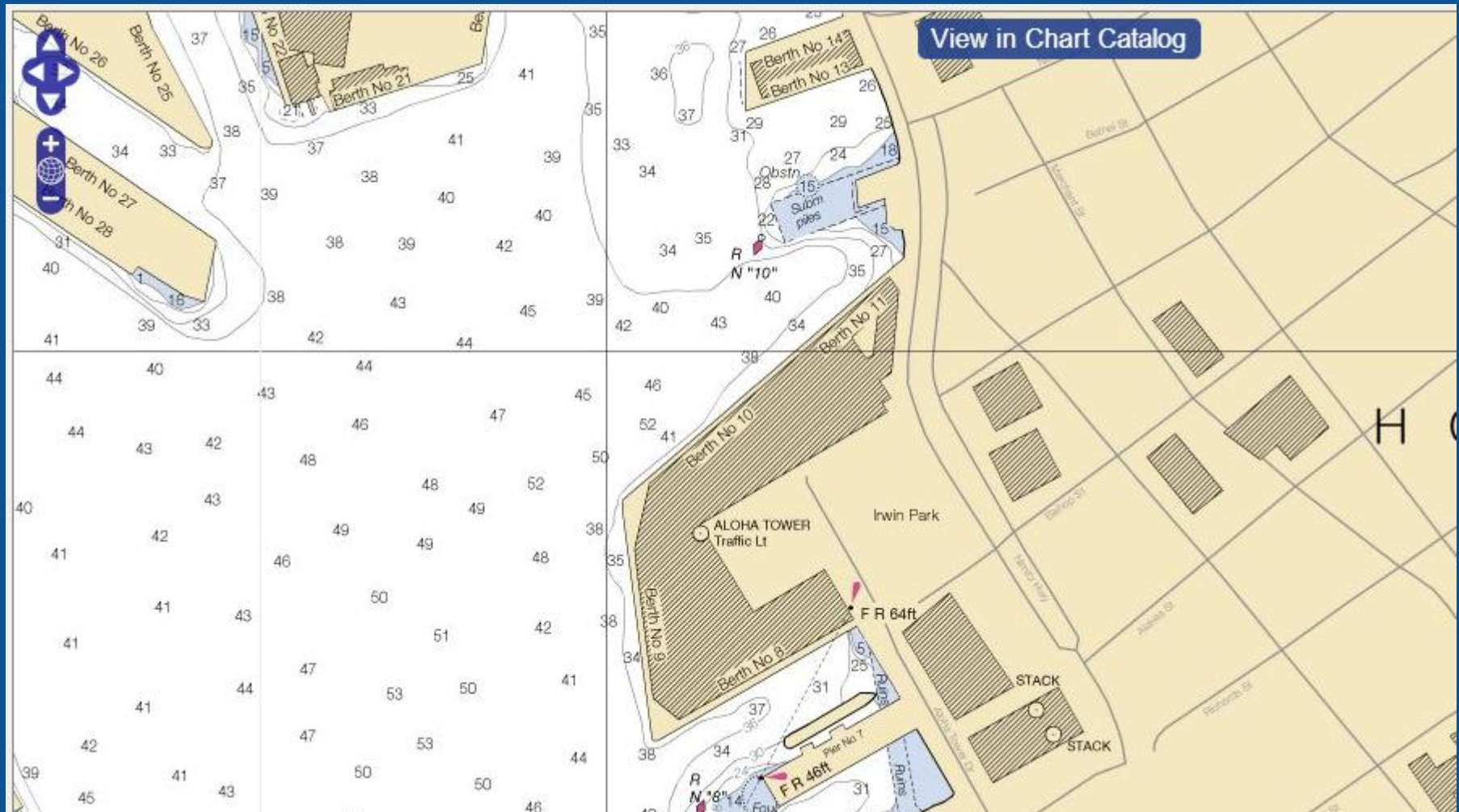
- NOAA privatized all chart printing and distribution April 14, 2014
- We have 15 existing Print on Demand Partners, who offer printed charts suitable for traditional uses
- Government and Military printing will be handled by the Defense Logistics Agency (DLA).



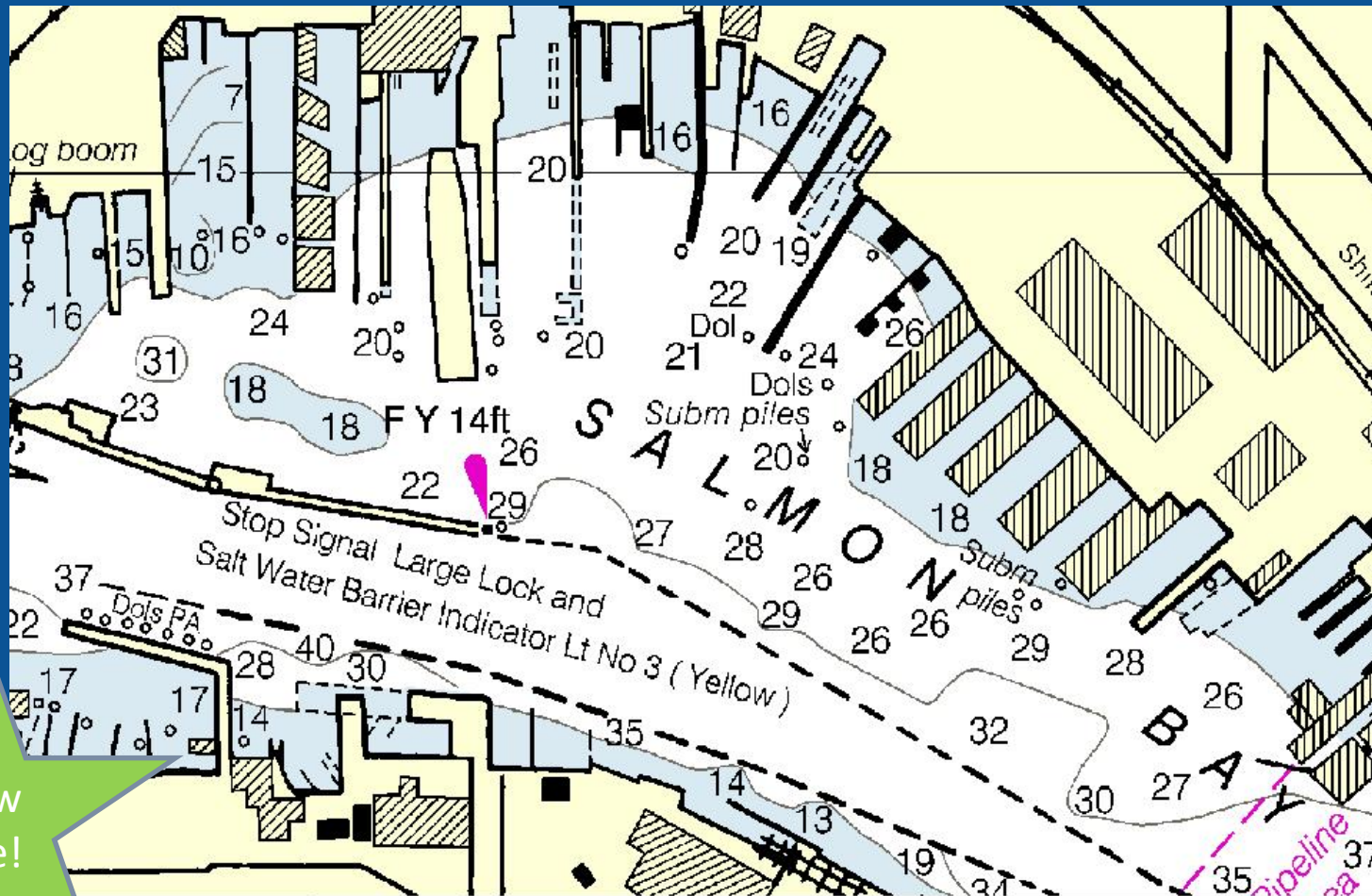
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# First ENC-derived paper chart released



# Freely Available PDF Charts



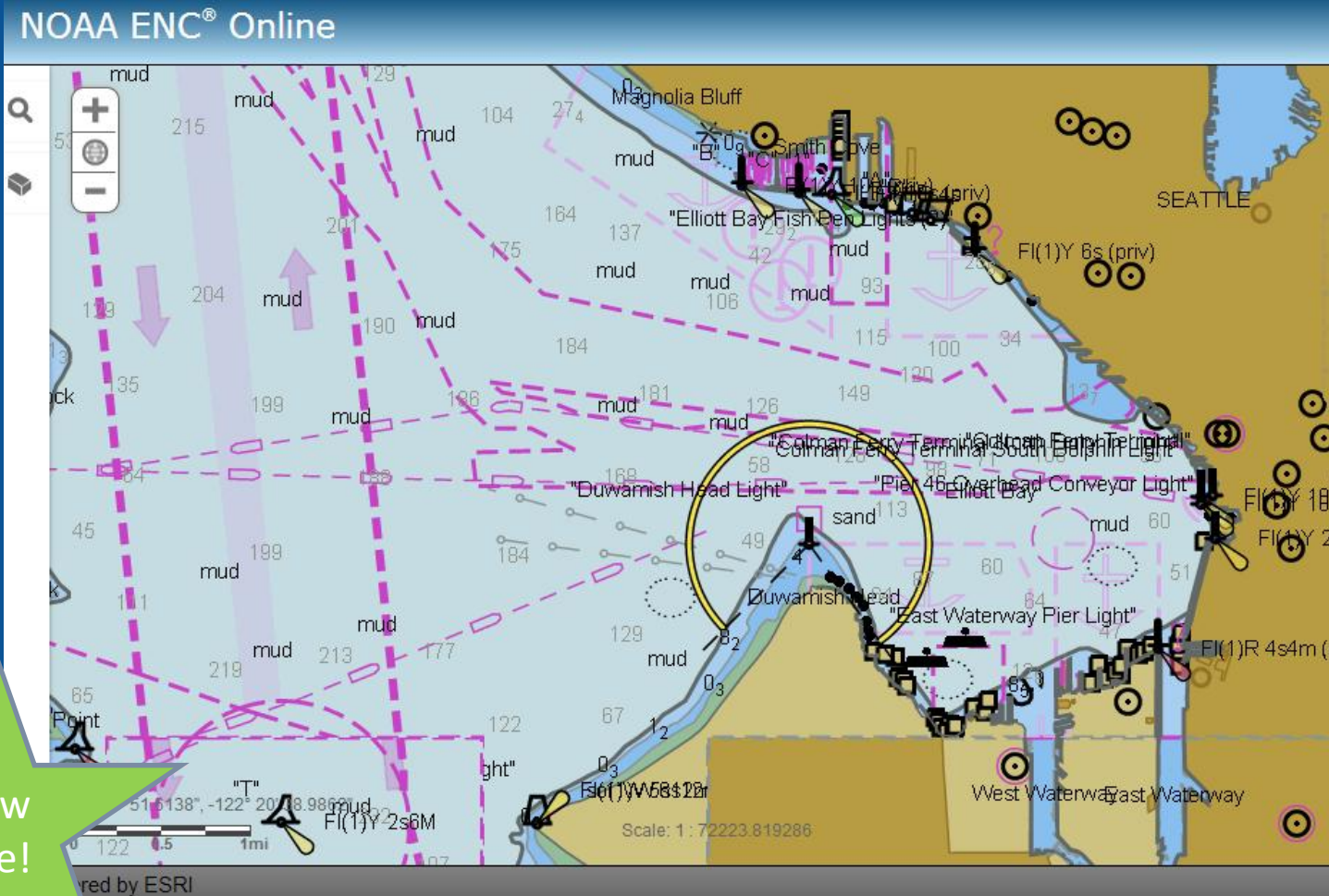
Now  
Live!

Office of Coast Survey





# ENC Online



Now Live!

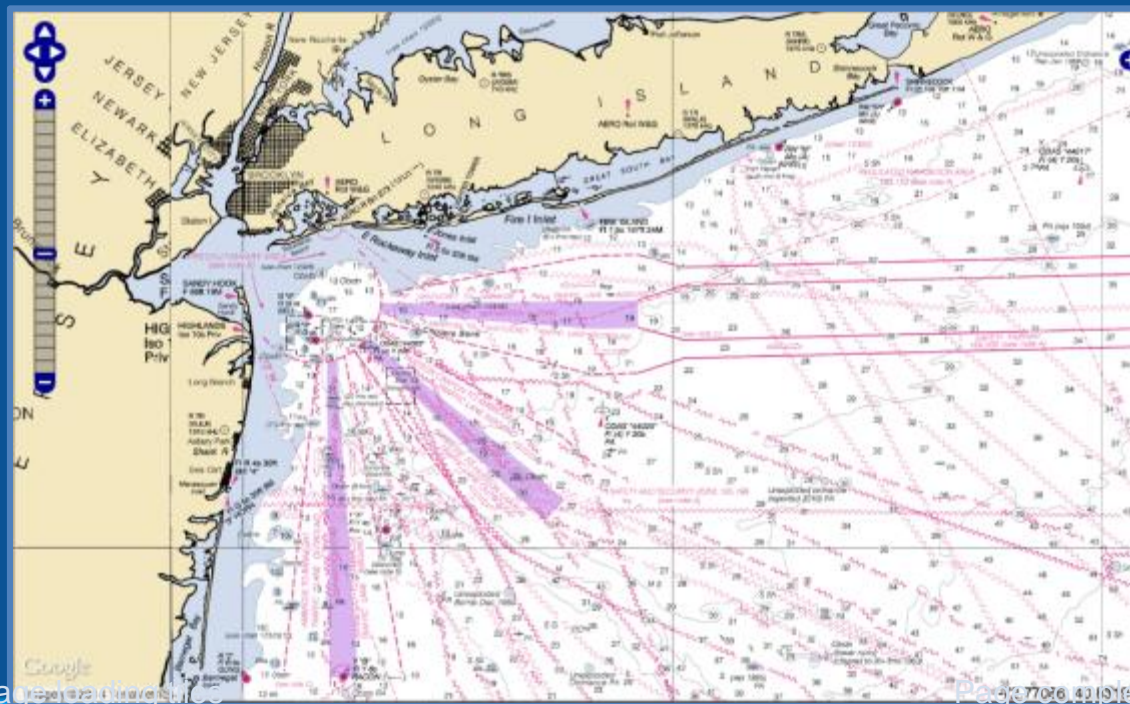


## Online Tile Service

- Quilted and single-chart tilesets
- Published weekly to a public-facing web server
- Tile Map Service specification compatible with with Google Maps, Bing Maps, and OpenLayers APIs
- Planning metadata support
- Targeting early Fall 2014

## Offline Tile Service

- Planned for Late Fall 2014
- Published weekly
- Distributed through navigation systems or chart data providers
- Packaged in offline format (e.g. MBTiles)
- Offline metadata support (e.g. UTFGrid)
- Delta updates
- Targeting early 2015



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# NOAA Navigation **INDUSTRY DAY**



**NOAA is open for business...**  
and wants to meet with application and web developers, and equipment manufacturers, at the **Annapolis Boat Show**.

**October 13, 2014**

**Free NOAA data adds functionality to navigation systems and maritime apps.  
Meet NOAA experts and find out how you can use NOAA data.**



## **NAUTICAL CHARTS**

NOAA charts are available for free, in both raster (BSB) and vector (ENC) formats. In response to the rapid change of web and mobile technology, NOAA will release its entire suite of nautical charts in pre-quilted tile sets for online use. They will also be available in regional geo-packages for use in disconnected applications. Like all NOAA charts, the tile sets will be updated with new information every week.

## **TIDES AND CURRENTS**

Many applications use NOAA's tide and current predictions and observations at specific stations, but NOAA makes continuous models of tides and currents in all coastal areas – not just at pre-determined stations. These models are three-day predictions of tides and currents, updated every six hours. The data is free. NOAA is developing new methods of distributing these models for public use.



## **WEATHER**

NOAA weather data (observations, models, radar, and forecasts) is as critical for safety on the water as on land. National Weather Service experts will describe available

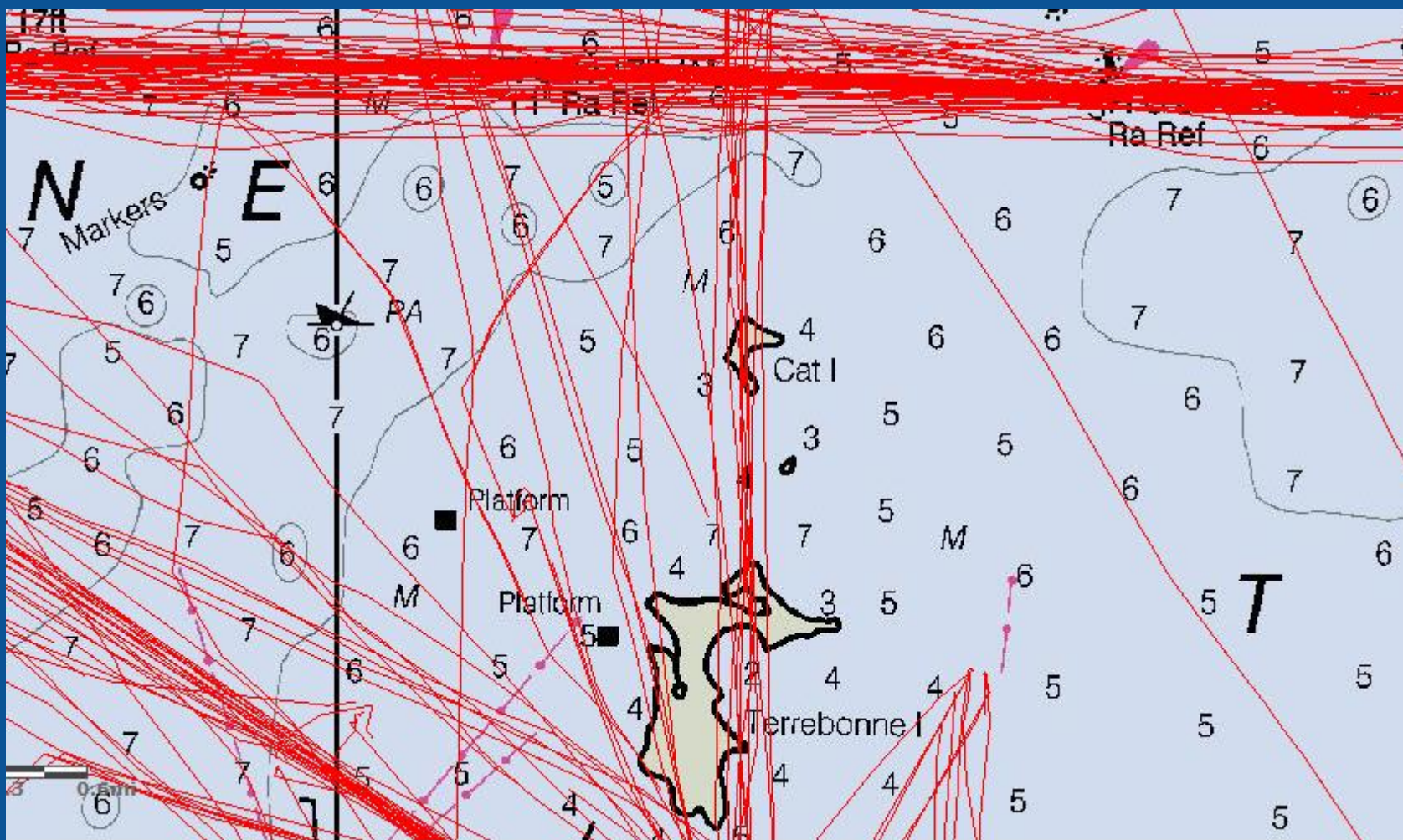
## **OFFSHORE CURRENTS**

NOAA and partners maintain a network of current-measuring radars along many parts of the US coastline. This current data

# Backup Slides



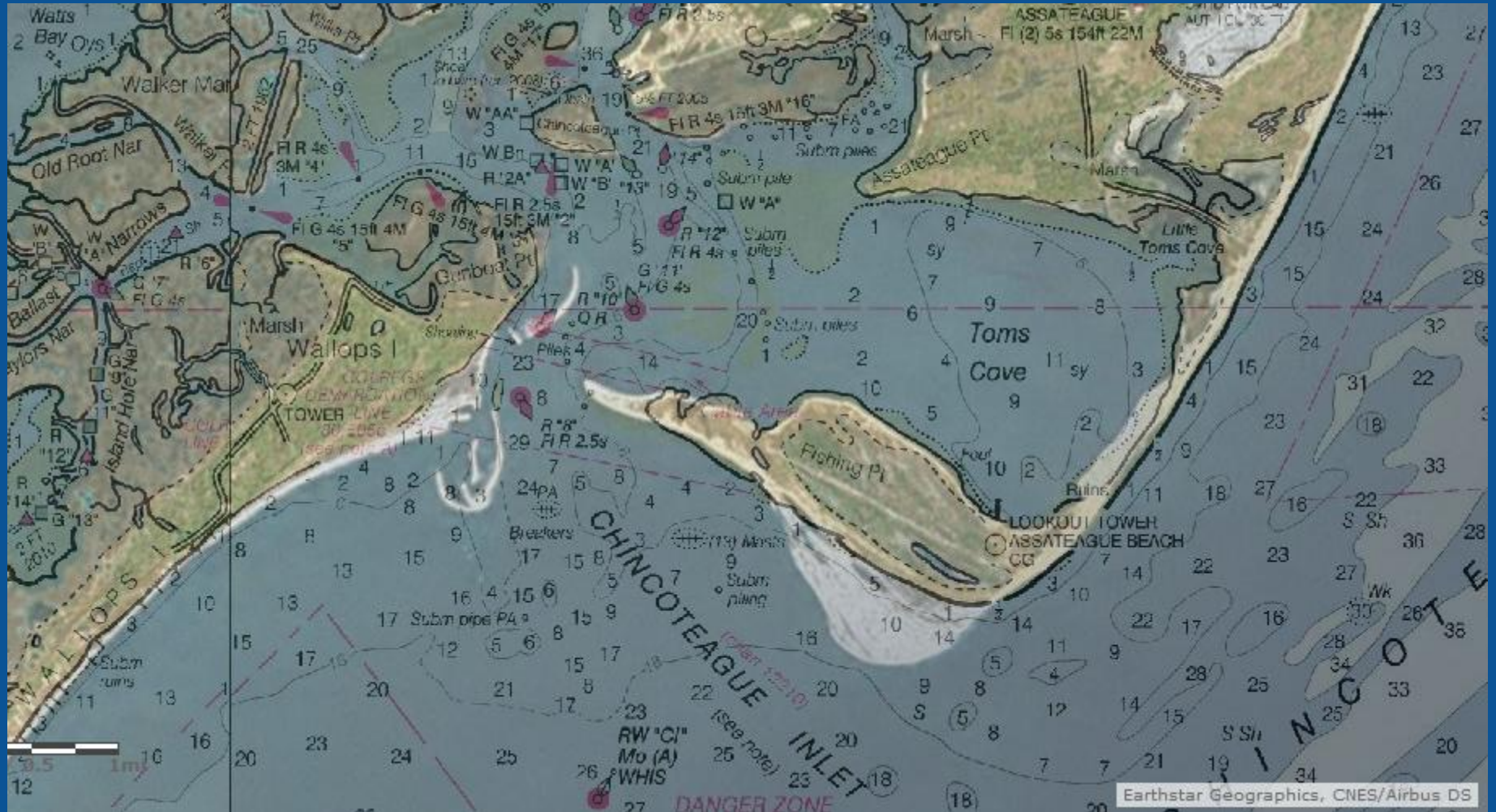
# AIS Traffic Over Land



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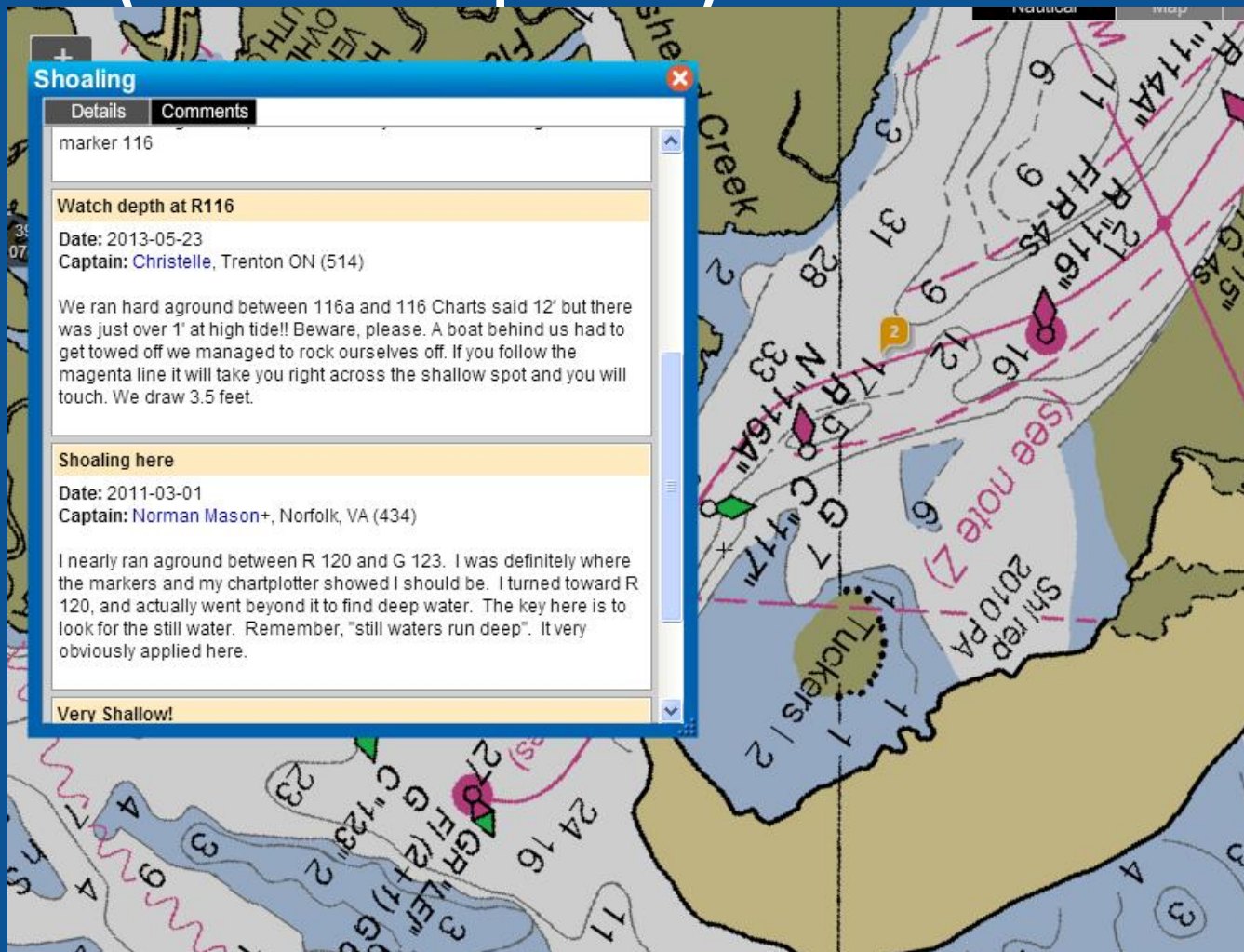
# Dynamic inlets affect both navigation and inundation models



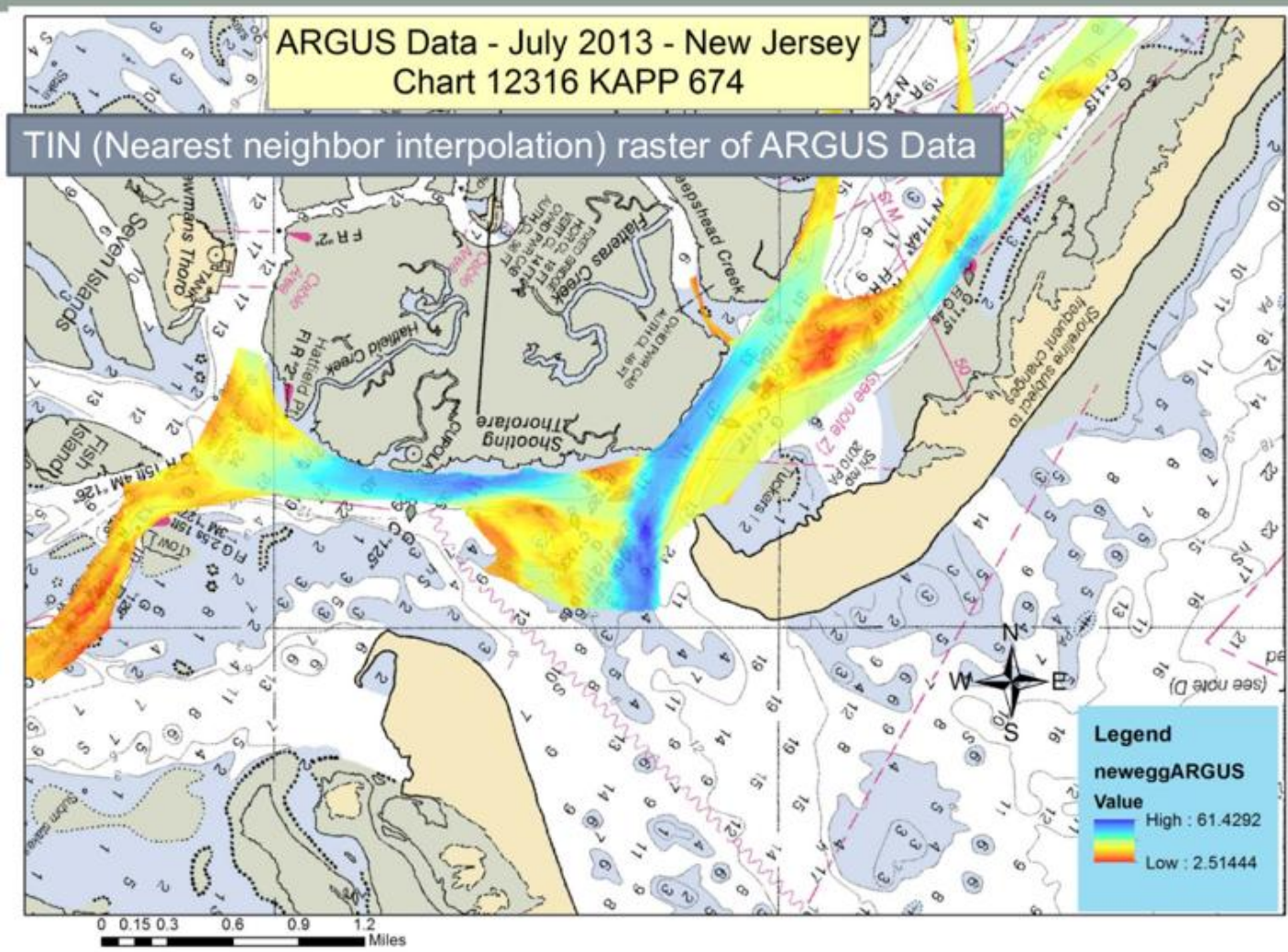
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# Crowdsourced Hazards from Social Media (ActiveCaptain)



# Crowdsourced bathy corroborates report





# ActiveCaptain Crowdsourced Hazards and Comments

