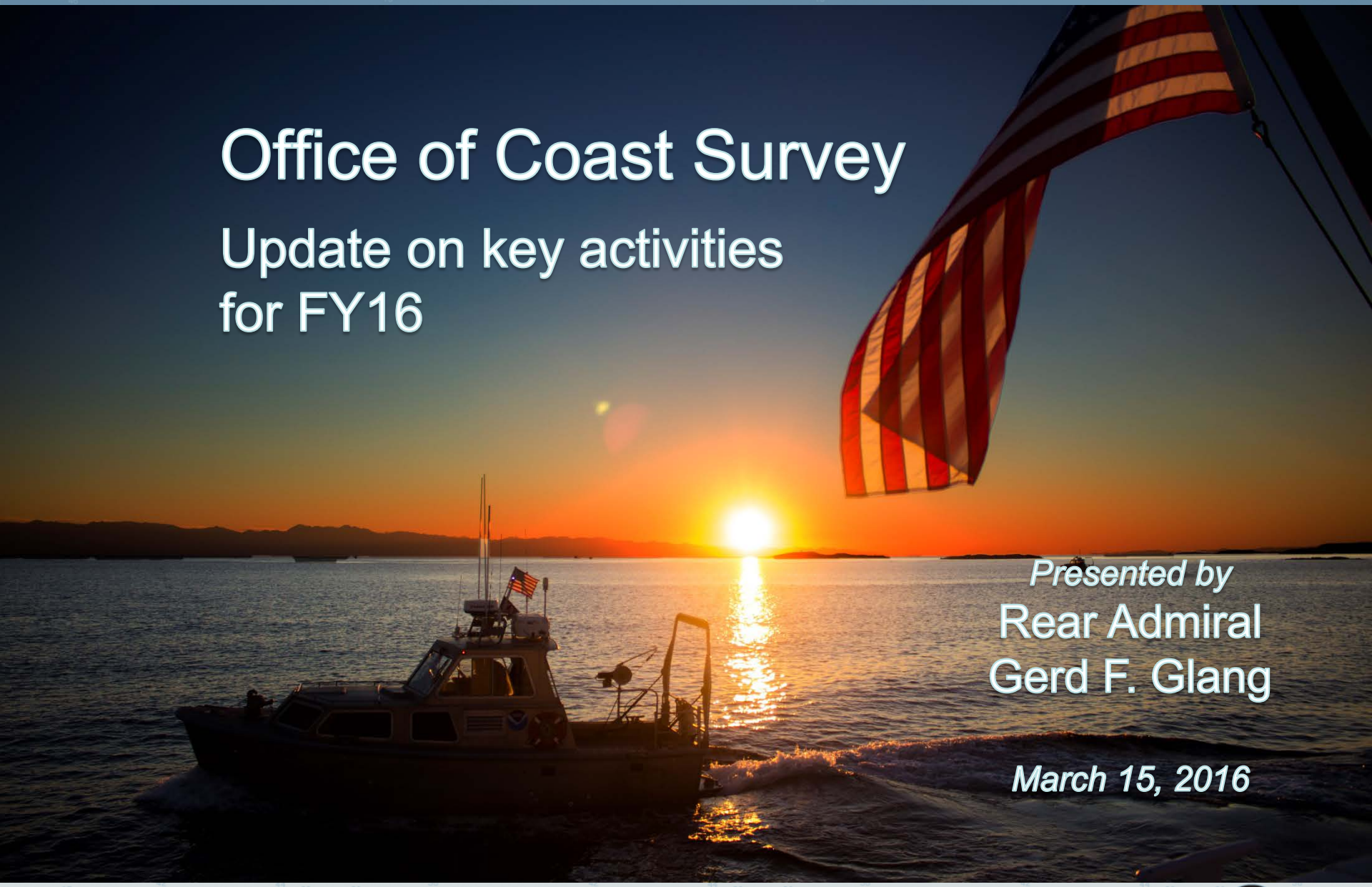
Office of Coast Survey

Update on key activities for FY16



Presented by

Rear Admiral
Gerd F. Glang

March 15, 2016



Be the Experts

Continuously evolve our capabilities and capacities to be the national authoritative source for hydrography and for U.S. navigational charts and related products

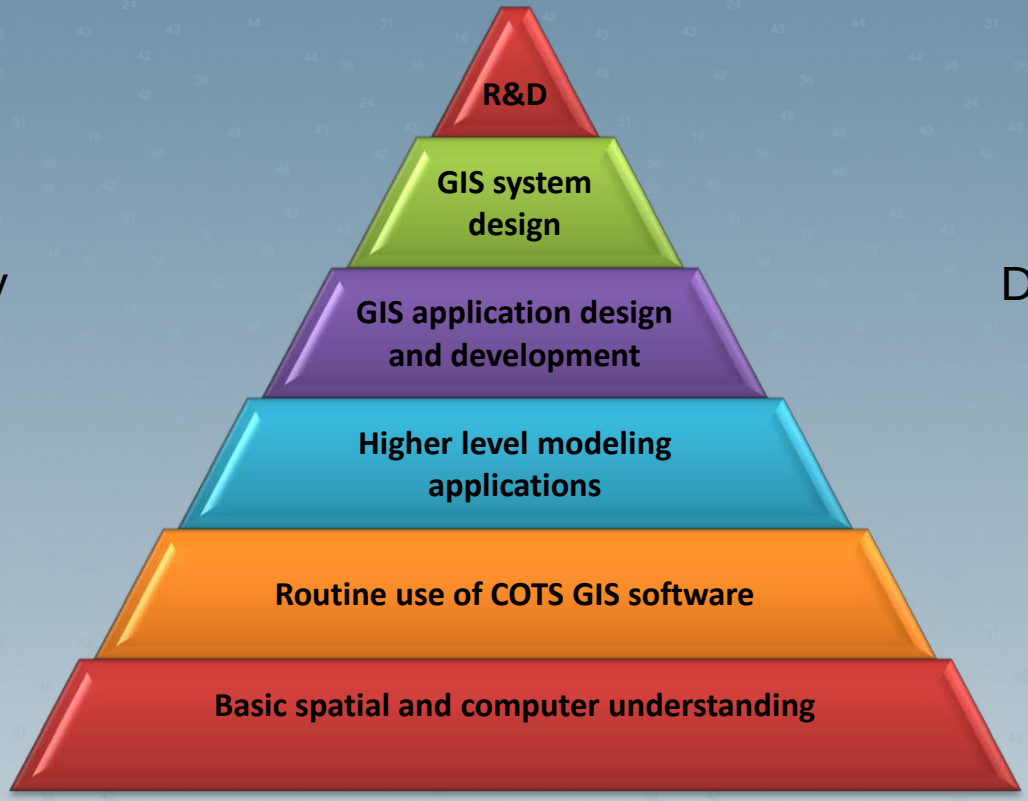
1. **Geospatial data management**
2. **Recapitalize NRT vessels**

Enterprise GIS strategy

Data dictionary

Data architecture

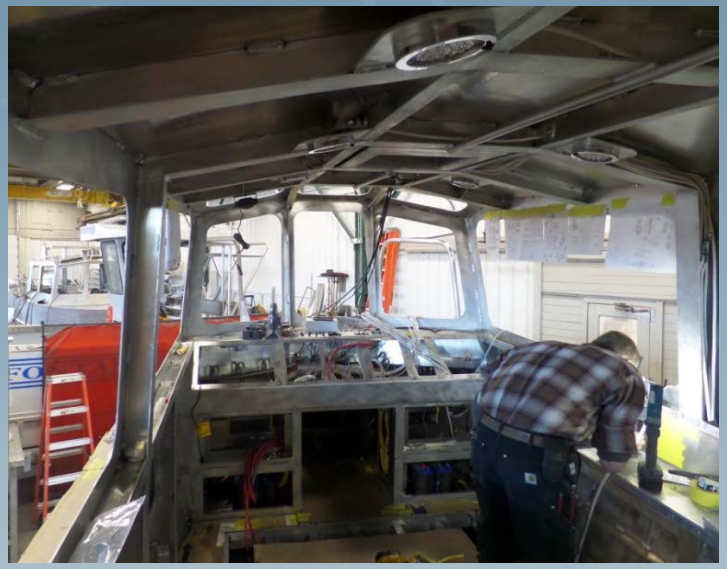
Hardware architecture



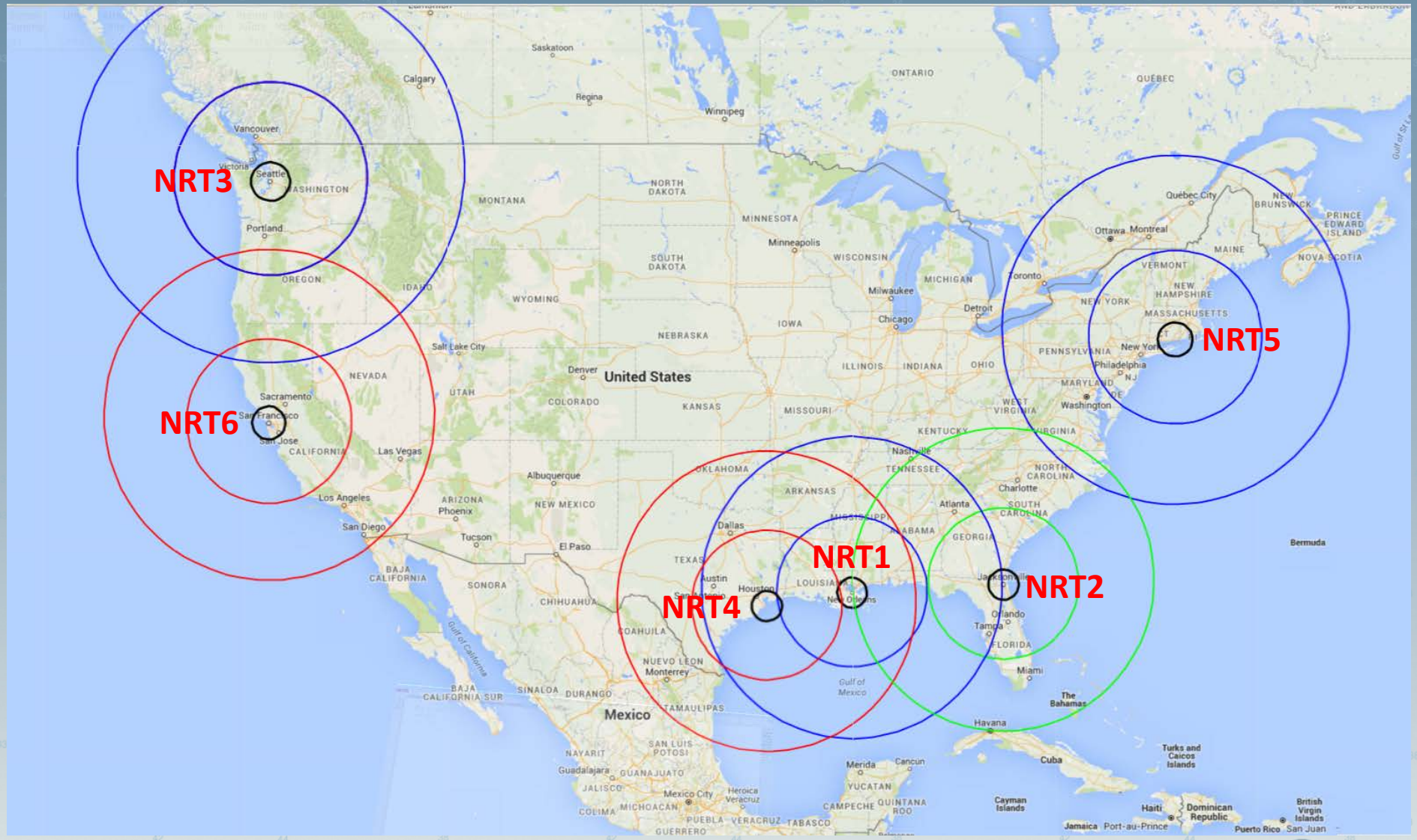
Software Architecture

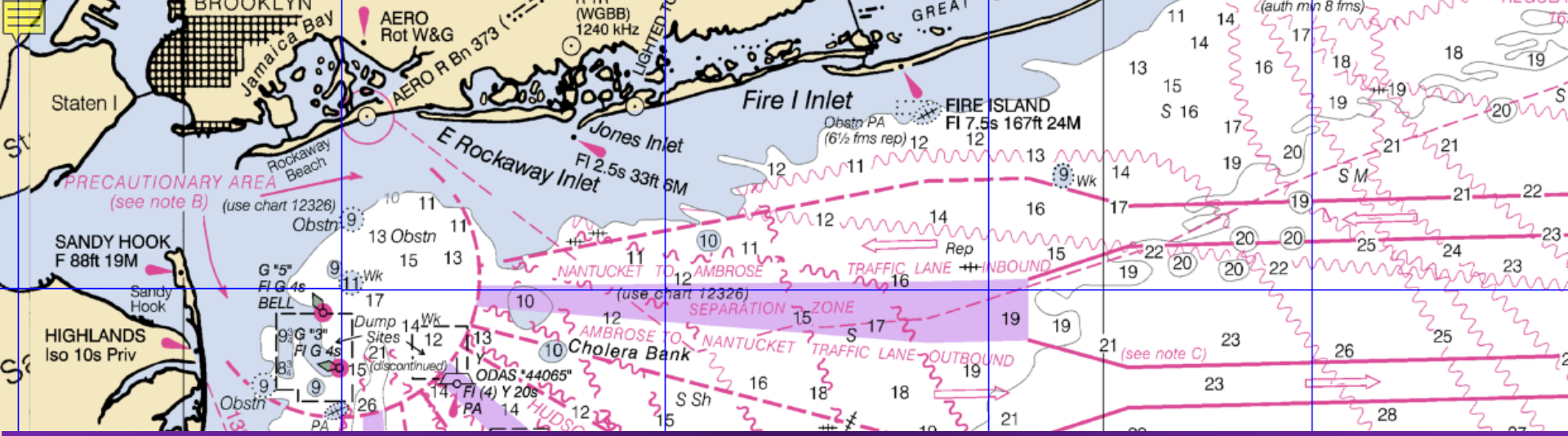
Coast Survey is establishing a GIS strategy with this vision:
Promote an enterprise GIS approach to support Coast Survey business objectives and enable better outcomes for customers of its products and services.

Replacing Navigation Response Team Vessels



NRT locations



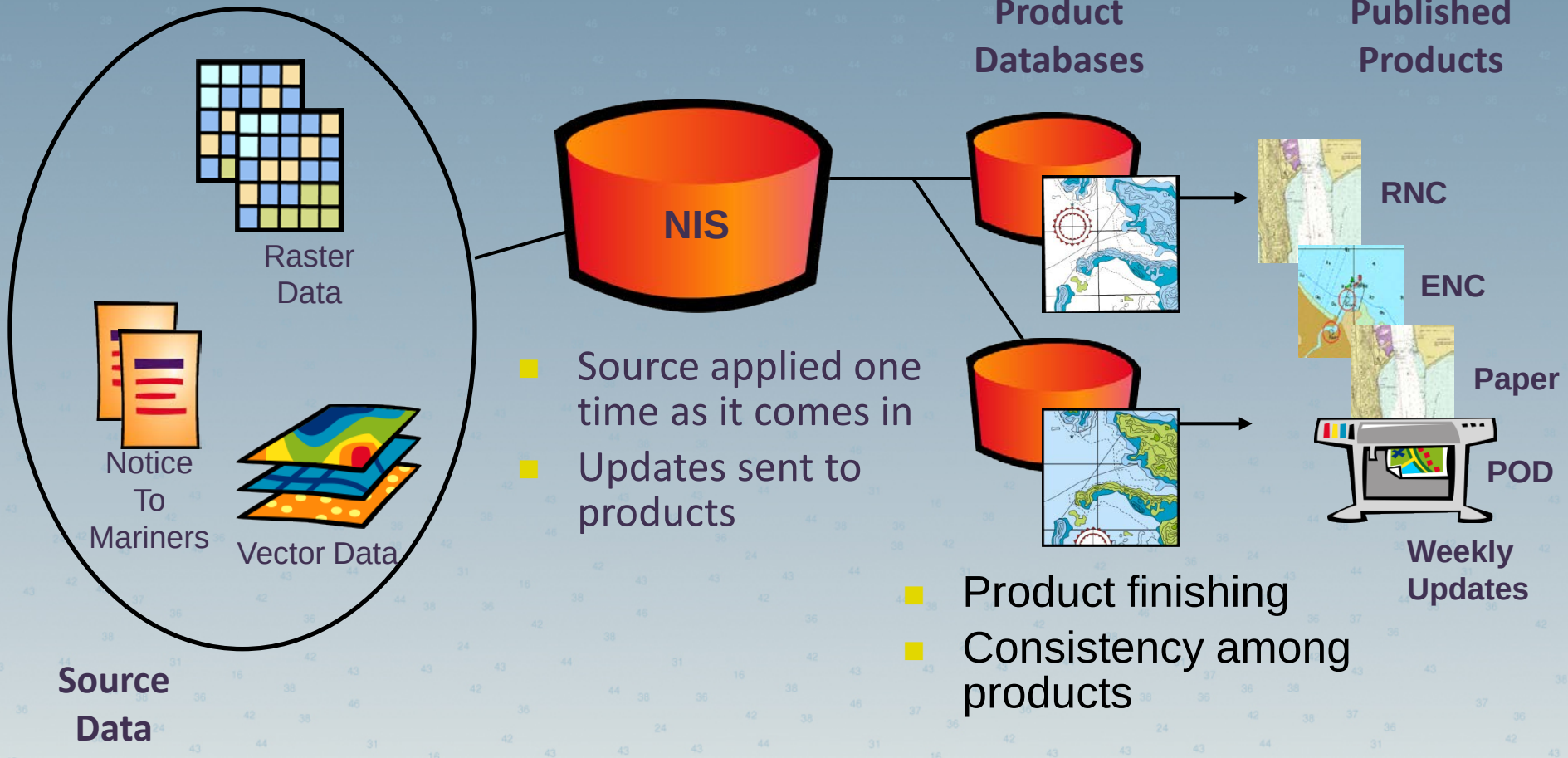


Transform Charting

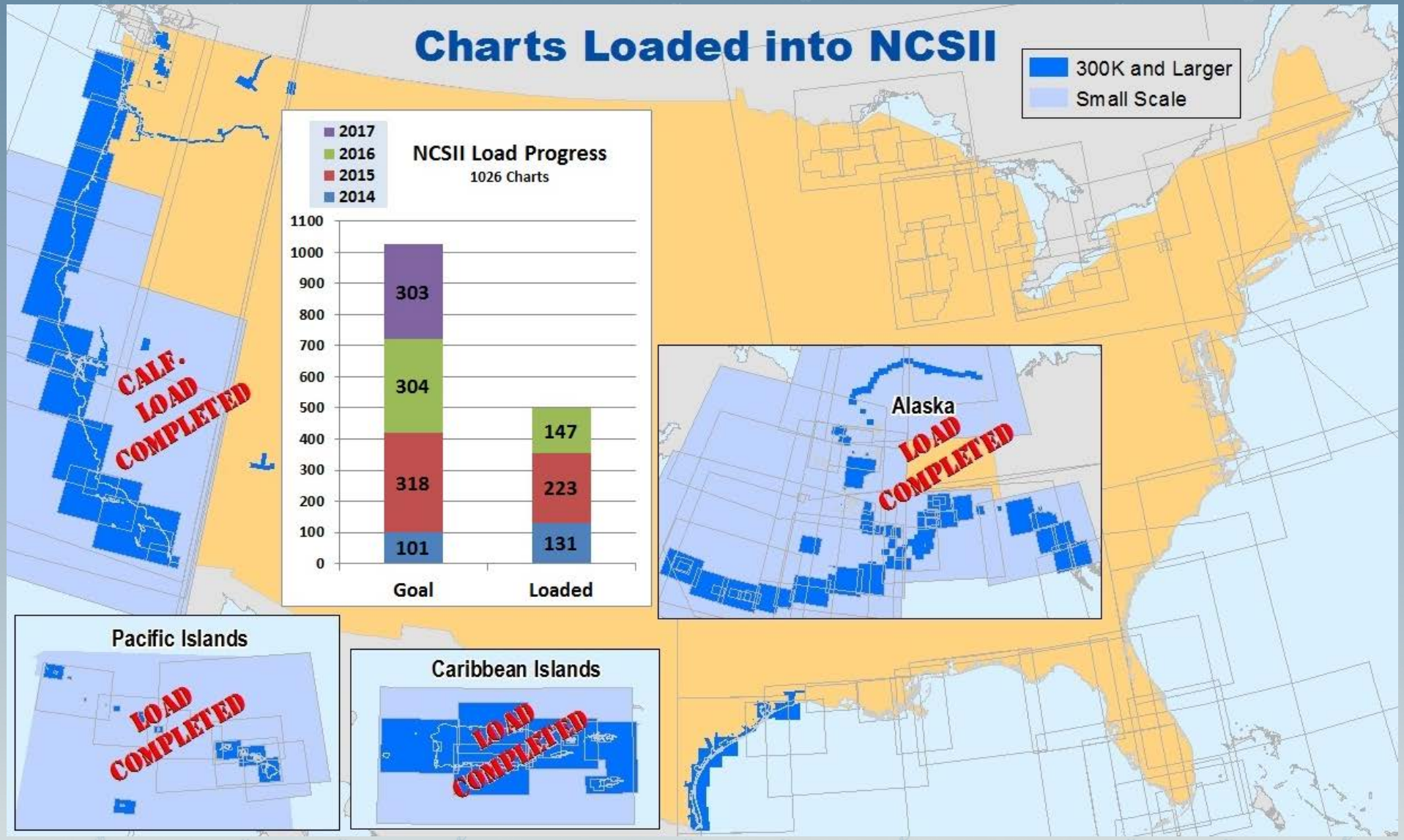
Complete the re-engineering of the chart production environment for more timely and accurate navigation products

1. **Load the NIS database**
2. **Complete template build process**
3. **Fully implement weekly update process**

Nautical Charting System II Production Workflow



Charts Loaded into NCSII



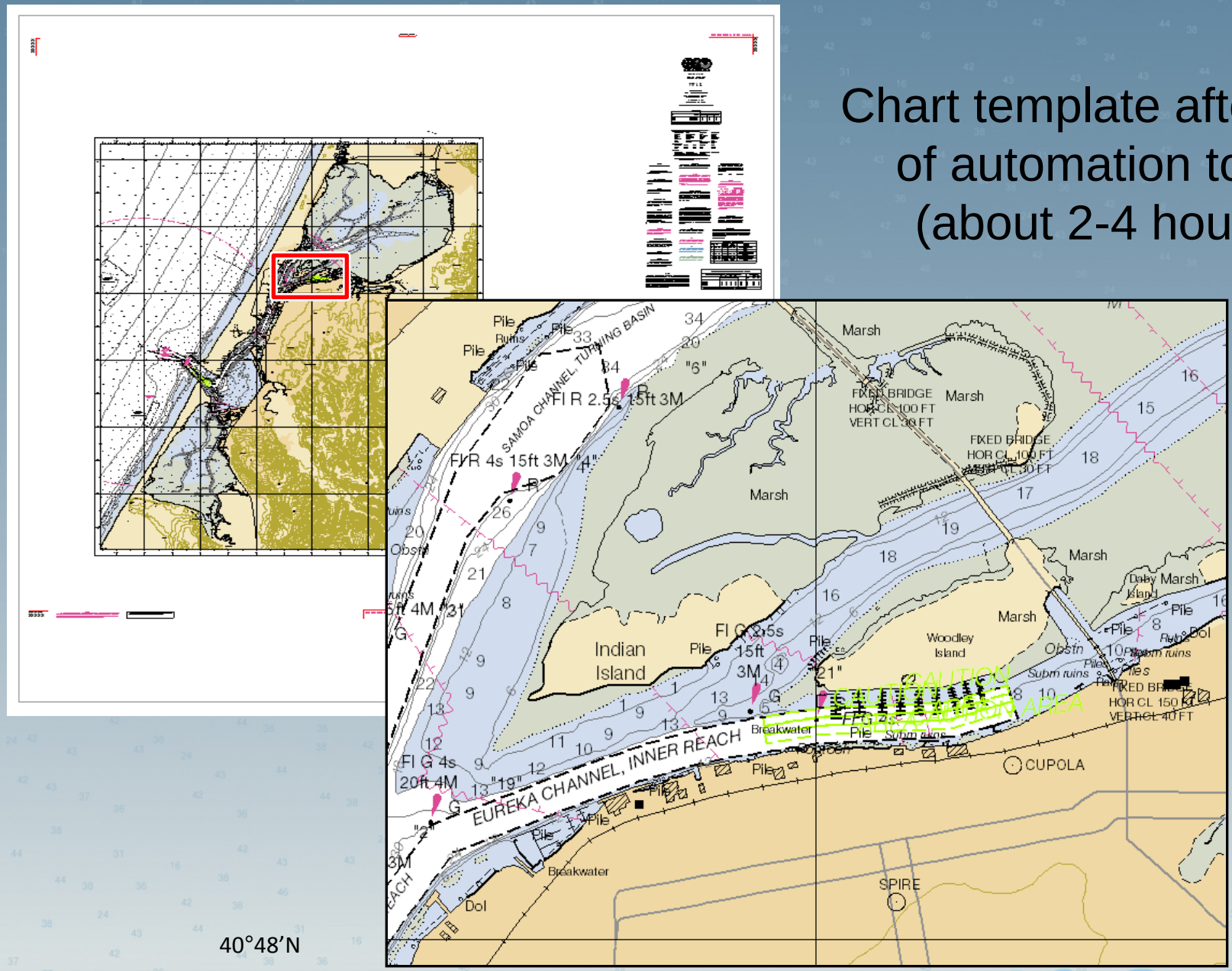
NCSII Chart Templates

- Chart templates are the framework required to build and maintain raster nautical charts for production as print-on-demand paper nautical charts.
  - Template tools are just now available to produce a fit-for-use nautical charts in four work days
  - Uses Esri production mapping toolset (maritime)

- Minimizes compilation work
  - NOAA-constructed configuration files automate the creation of grids, symbology and type styles, and type placement

- Improves source application efficiency
  - automating symbology, type formatting and channel tabulation updates.

Chart template after use of automation tools (about 2-4 hours)



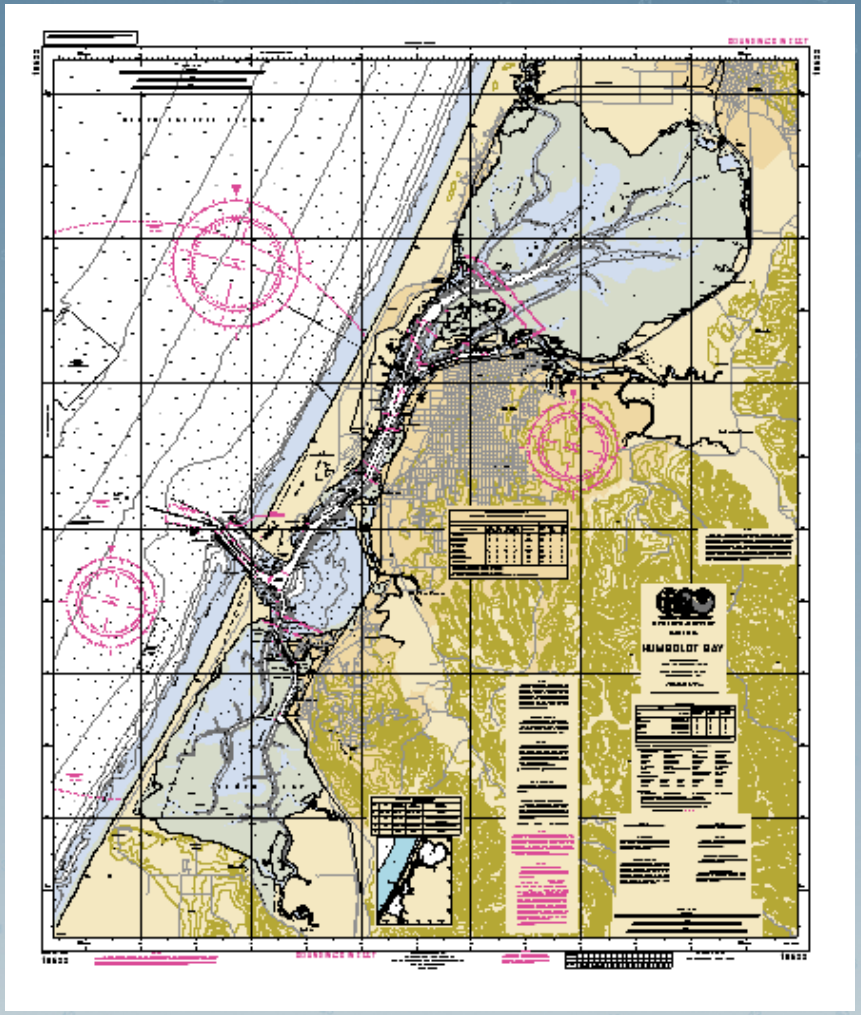
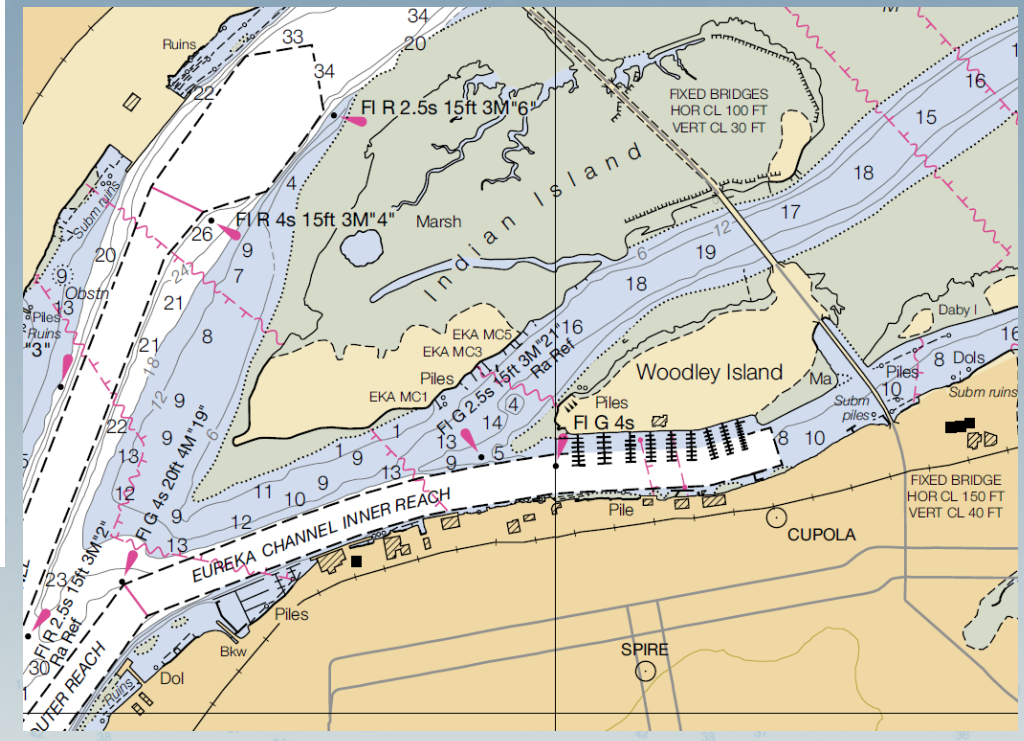
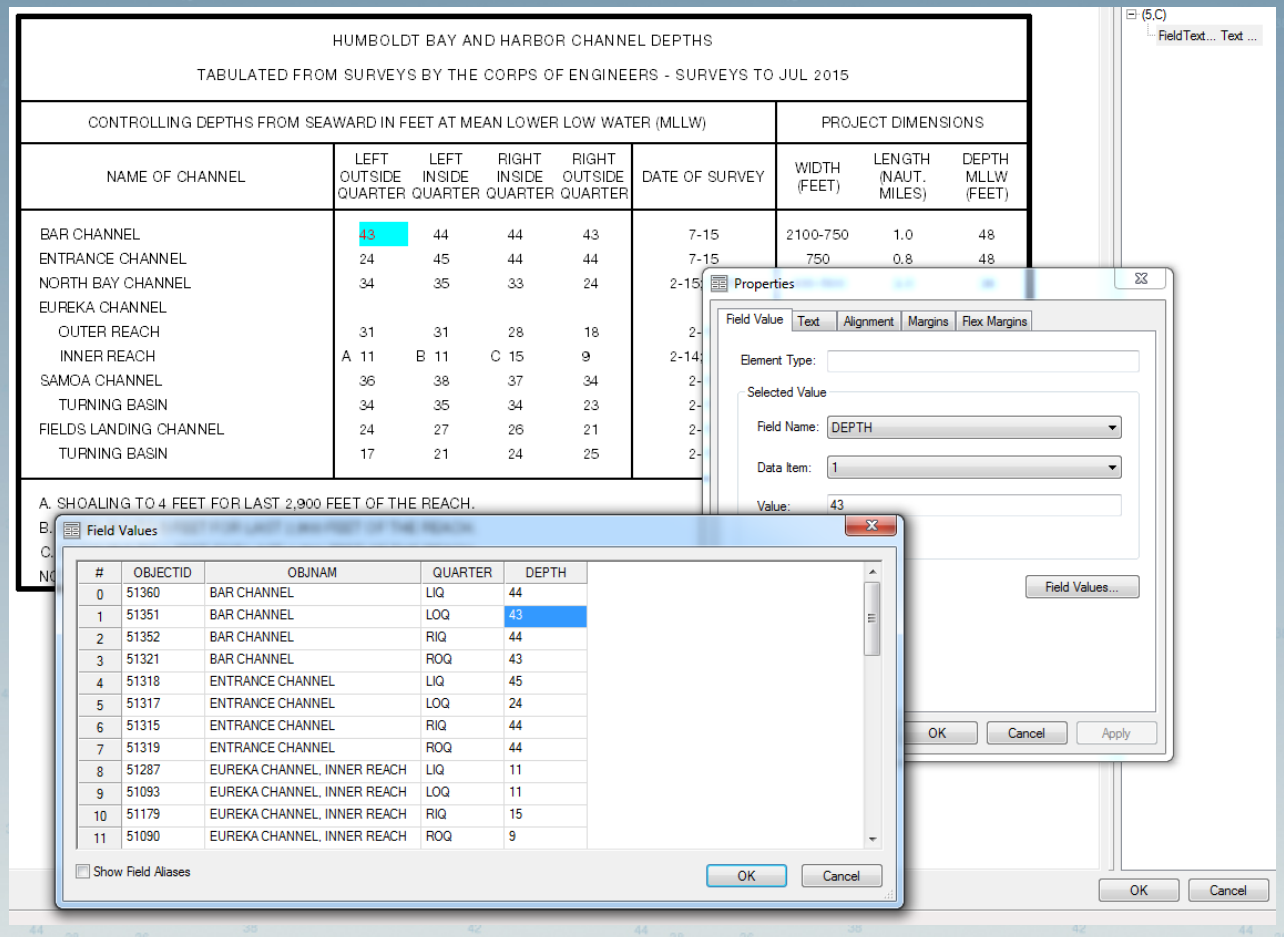


Chart template after completion



Channel Tabulation Automation

Dynamic fields linked to the dredged area features in the chart update automatically when changes are applied.



HUMBOLDT BAY AND HARBOR CHANNEL DEPTHS

TABULATED FROM SURVEYS BY THE CORPS OF ENGINEERS - SURVEYS TO JUL 2015

NAME OF CHANNEL	CONTROLLING DEPTHS FROM SEAWARD IN FEET AT MEAN LOWER LOW WATER (MLLW)					PROJECT DIMENSIONS		
	LEFT OUTSIDE QUARTER	LEFT INSIDE QUARTER	RIGHT INSIDE QUARTER	RIGHT OUTSIDE QUARTER	DATE OF SURVEY	WIDTH (FEET)	LENGTH (NAUT. MILES)	DEPTH MLLW (FEET)
BAR CHANNEL	43	44	44	43	7-15	2100-750	1.0	48
ENTRANCE CHANNEL	24	45	44	44	7-15	750	0.8	48
NORTH BAY CHANNEL	34	35	33	24	2-15			
EUREKA CHANNEL								
OUTER REACH	31	31	28	18	2-			
INNER REACH	A 11	B 11	C 15	9	2-14			
SAMOA CHANNEL	36	38	37	34	2-			
TURNING BASIN	34	35	34	23	2-			
FIELDS LANDING CHANNEL	24	27	26	21	2-			
TURNING BASIN	17	21	24	25	2-			

A. SHOALING TO 4 FEET FOR LAST 2,900 FEET OF THE REACH.

B.

C.

N

Field Values

#	OBJECTID	OBJNAM	QUARTER	DEPTH
0	51360	BAR CHANNEL	LIQ	44
1	51351	BAR CHANNEL	LOQ	43
2	51352	BAR CHANNEL	RIQ	44
3	51321	BAR CHANNEL	ROQ	43
4	51318	ENTRANCE CHANNEL	LIQ	45
5	51317	ENTRANCE CHANNEL	LOQ	24
6	51315	ENTRANCE CHANNEL	RIQ	44
7	51319	ENTRANCE CHANNEL	ROQ	44
8	51287	EUREKA CHANNEL, INNER REACH	LIQ	11
9	51093	EUREKA CHANNEL, INNER REACH	LOQ	11
10	51179	EUREKA CHANNEL, INNER REACH	RIQ	15
11	51090	EUREKA CHANNEL, INNER REACH	ROQ	9

Show Field Aliases

OK Cancel

Properties

Field Value | Text | Alignment | Margins | Flex Margins

Element Type:

Selected Value

Field Name: DEPTH

Data Item: 1

Value: 43

Field Values...

OK Cancel Apply

(5,C)

FieldText... Text ...

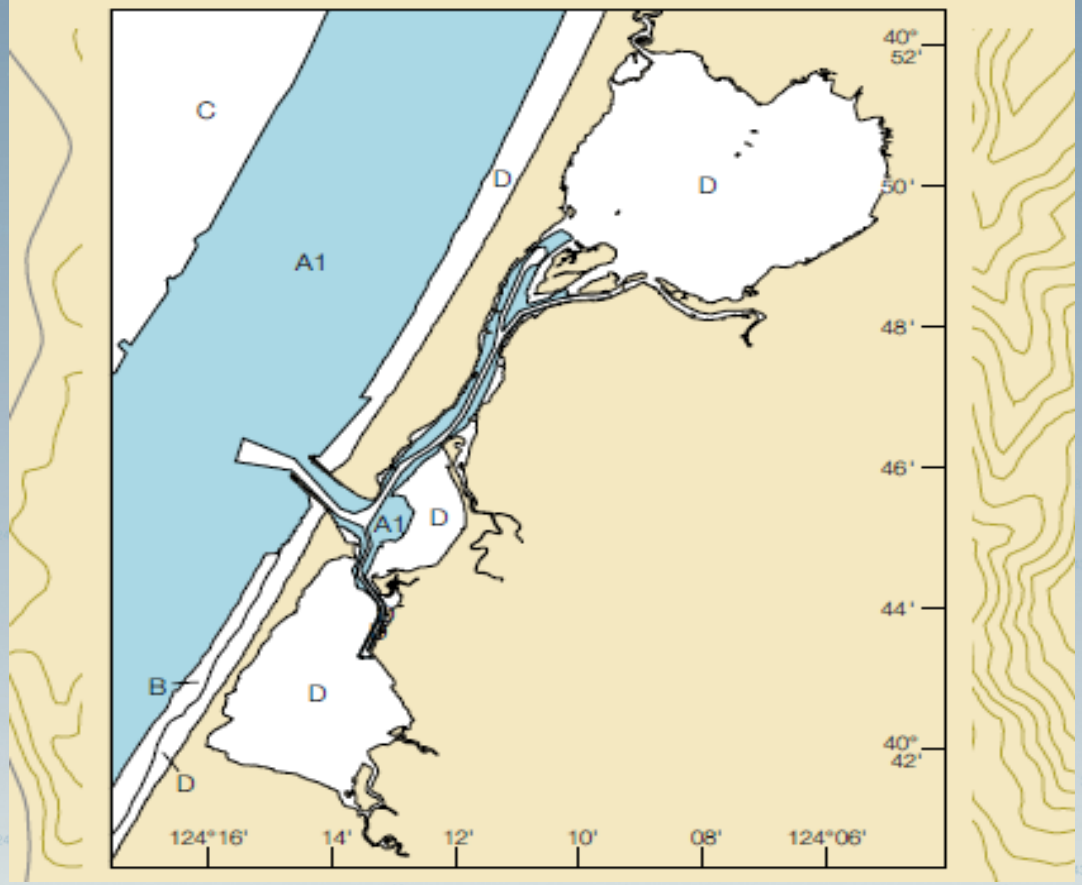
OK Cancel

Zones of Confidence Diagrams

- Enable mariners to assess the limitation of hydrographic data
- Equivalent to the CATZOC attribute used on the ENC
- Based on the IHO S-4 Charting Specification
- All charts produced from NCSII will use ZOC diagrams

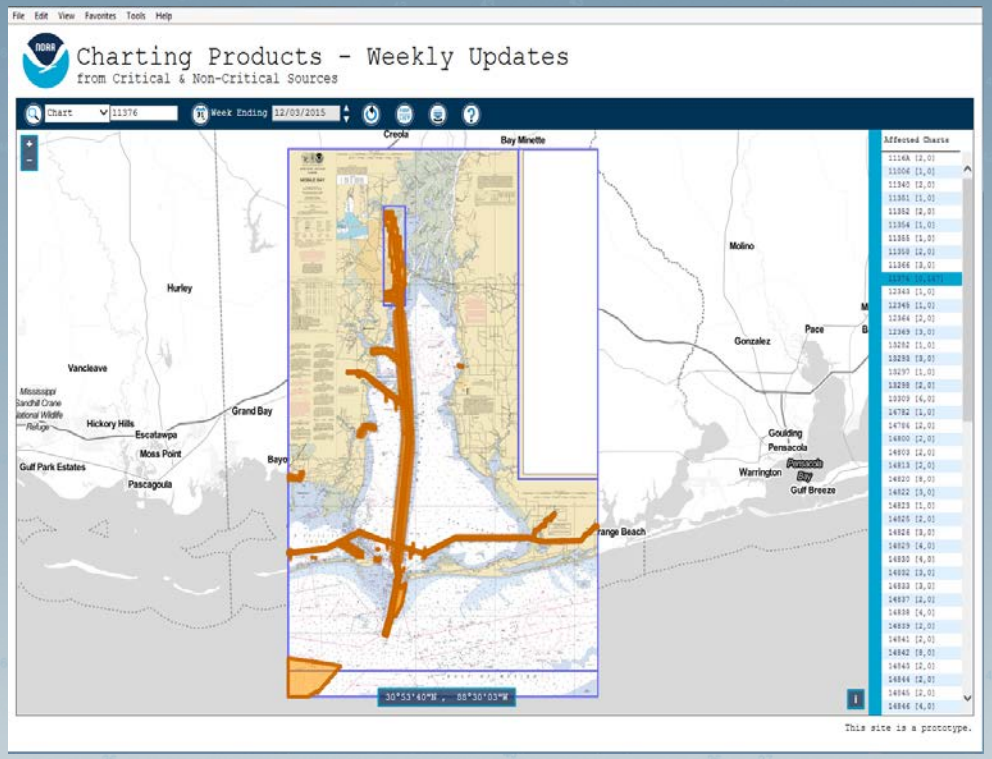
ZOC CATEGORIES
(Refer to Chapter 1, United States Coast Pilot)

ZOC	DATE	POSITION ACCURACY	DEPTH ACCURACY	SEAFLOOR COVERAGE
A1	2008 - 2009	± 16.40ft	= 1.64ft + 1%d	All significant seafloor features detected.
B	1949	± 164.04ft	= 3.28ft + 2%d	Uncharted features hazardous to surface navigation are not expected but may exist.
C	1949	± 1640.42ft	= 6.56ft + 2%d	Depth anomalies may be expected.
D	-	Worse than ZOC C	Worse than ZOC C	Large depth anomalies may be expected.



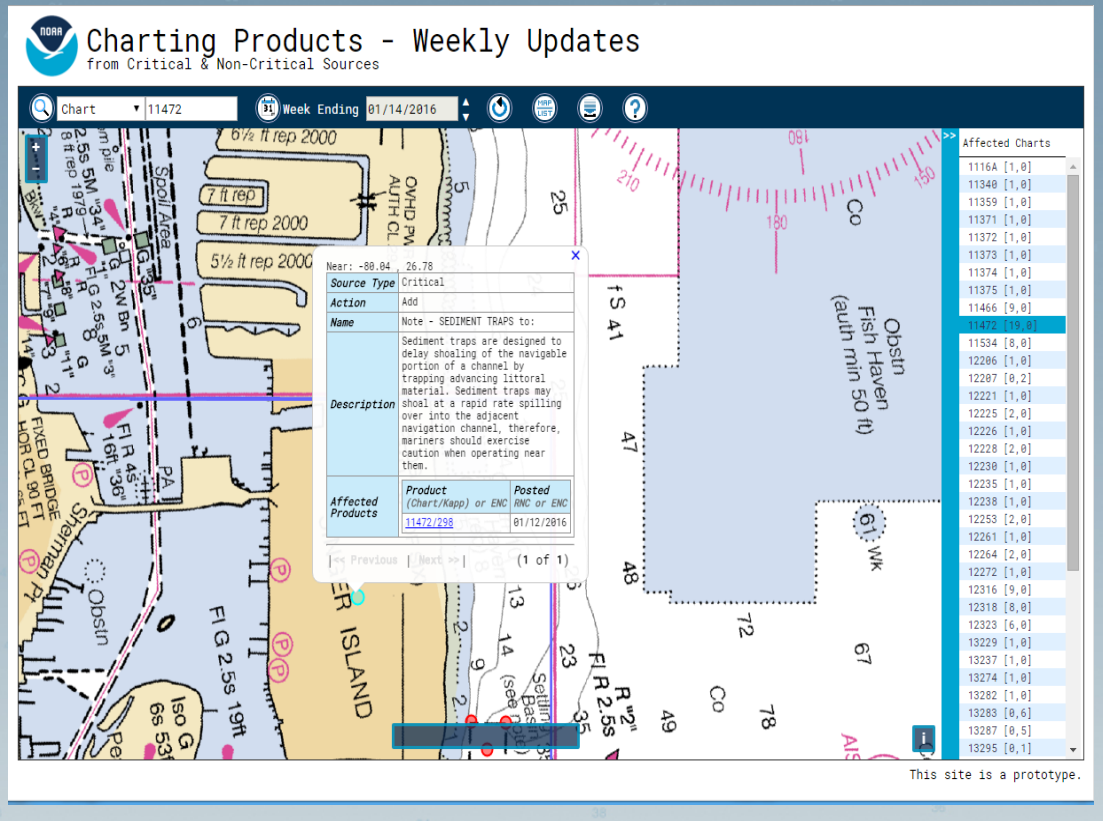
Weekly Updates Webpage

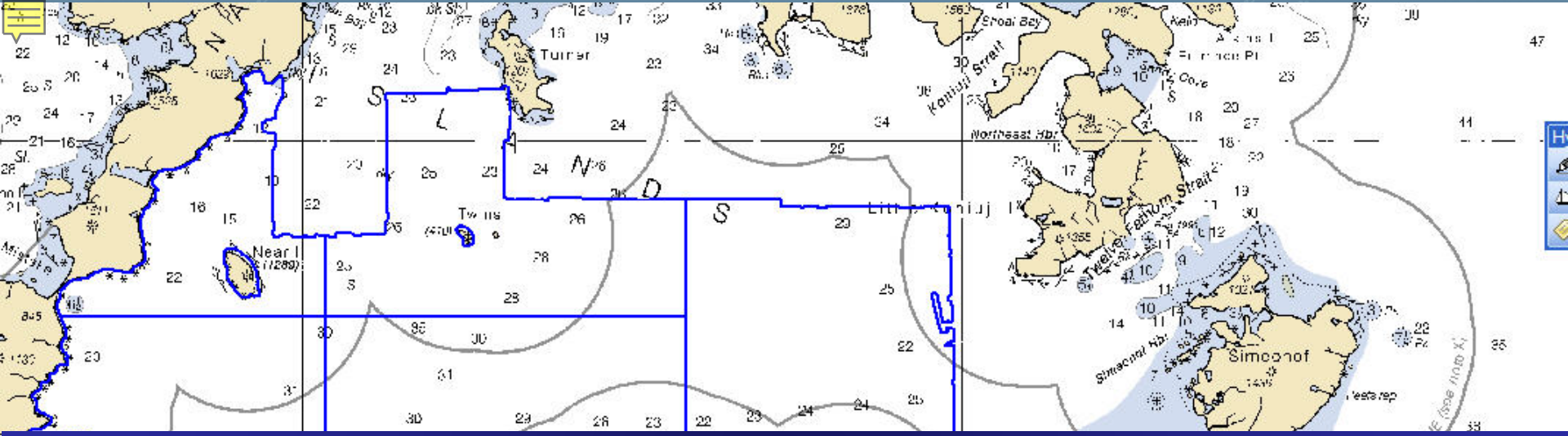
- Designed to communicate where changes have occurred on our products week by week.
- Introduces source areas of interest (AOI's) to show published source not included in the Notice to mariners.



Critical Updates

- User's can discover critical updates that are published each week.
- Polygons and point features for new source representing critical updates can be interrogated to view metadata.





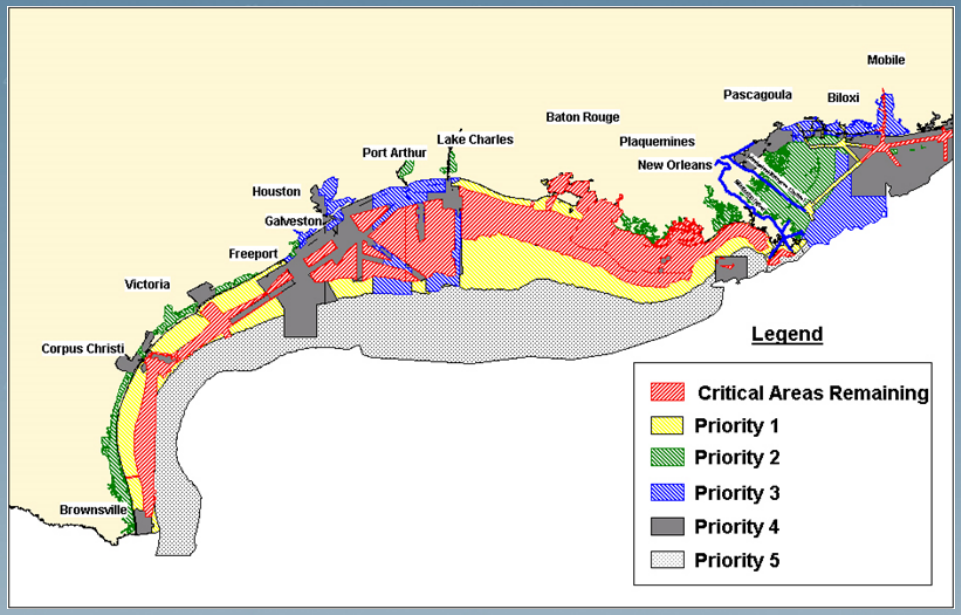
INNOVATE HYDROGRAPHY

Expand capacity to acquire data from a broad base of sources to improve chart content and provide data for multiple purposes

1. **Re-define survey requirements**
2. **Expand use of external data**


NORTHERN
MARIANA ISLANDS
WAKE ISLAND
MIDWAY ISLAND
GUAM
HAWAII
JOHNSTON ISLAND
HOWLAND ISLAND
PALMYRA ATOLL
JARVIS ISLAND
AMERICAN SOMOA
PUERTO RICO
EXCLUSIVE ECONOMIC ZONE 3.4 MILLION SO MILES

- Areas prioritized in 1994
- Ranked from “Critical” to “Priority 5”
- Limited to computing power, software and datasets of the era



- Did not account for a changing seafloor
  - e.g. hurricanes and dynamic inlets
- Did not account for change in use
  - e.g. deeper draft vessels, emerging ports and recreational community

Proposed improvements

- Use GIS with contemporary data sources
  - repeatable, objective, modular, adaptive
- Risk-based model designed to minimize the likelihood and consequence of navigational hazards due to hydrography
- Accounts for degradation of “hydrographic health” in areas of change
  - change in use, and change in seafloor
- Allows for meaningful incorporation of outside source data into survey plans
- Plans published to web service for public and inter-agency review

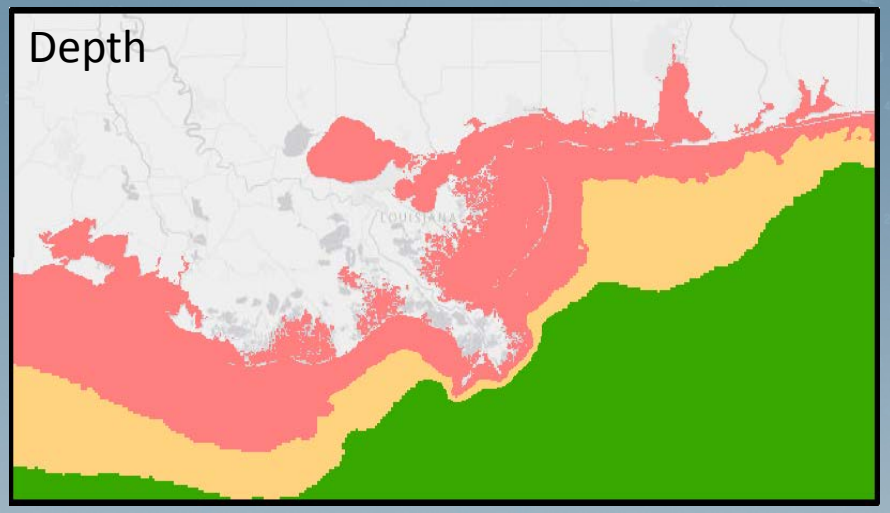
Identify risk

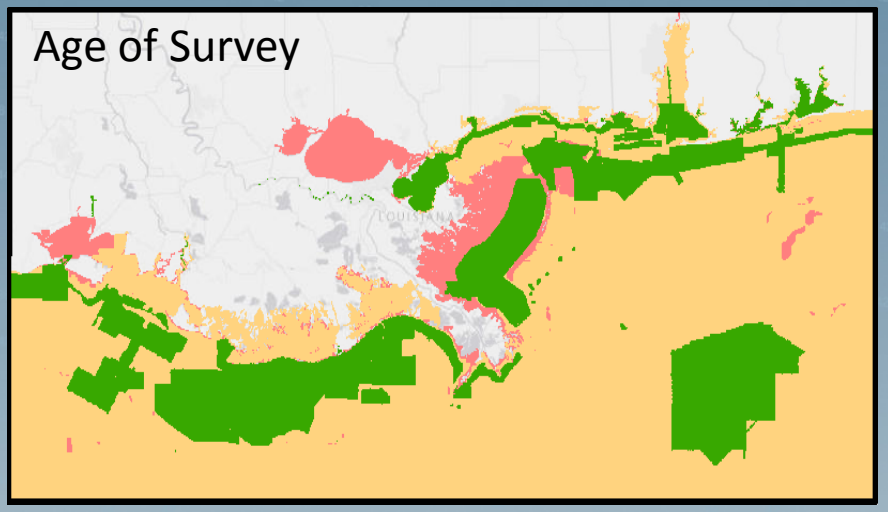
Incorporate data incrementally

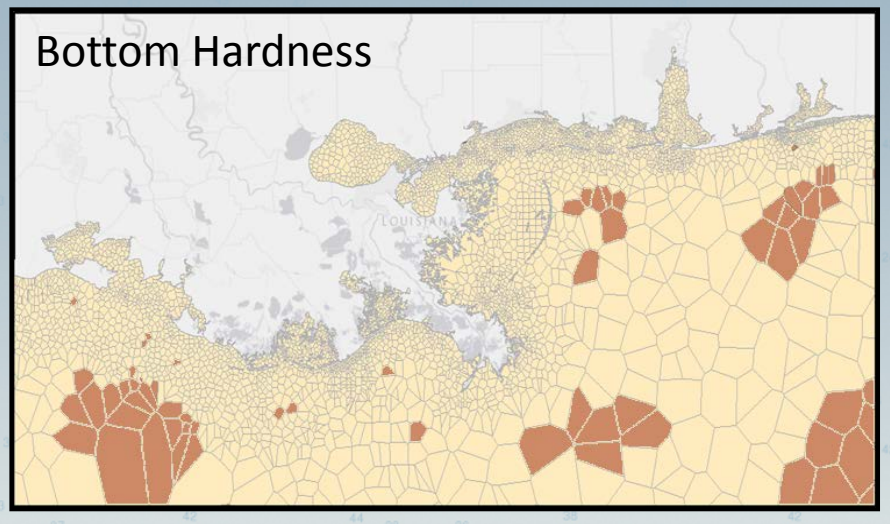
- water depth
- survey vintage
- quality of survey
- density of vessel traffic
- type of vessel traffic
- changeability of seafloor
- seafloor composition

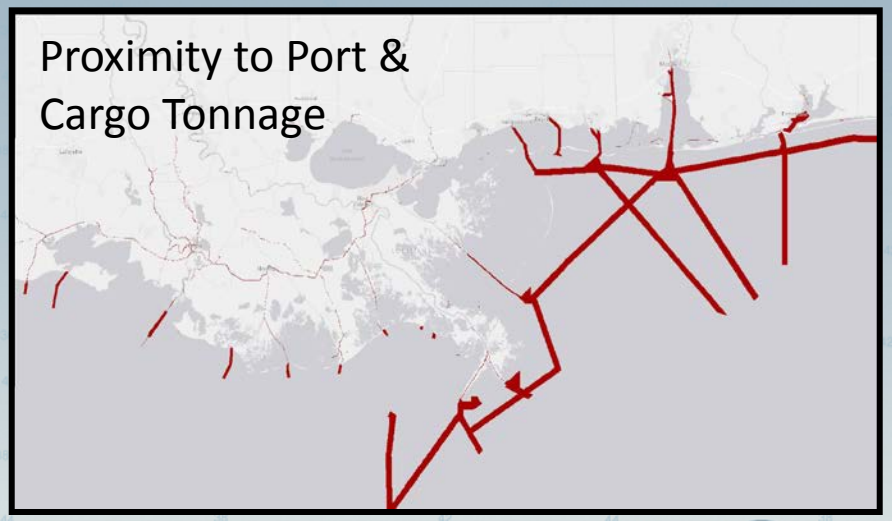
- density of charted PA/PD
- distance from response centers
- proximity to ports
- estimated tonnage of ports
- frequency of storm events
- proximity to “sensitive” areas

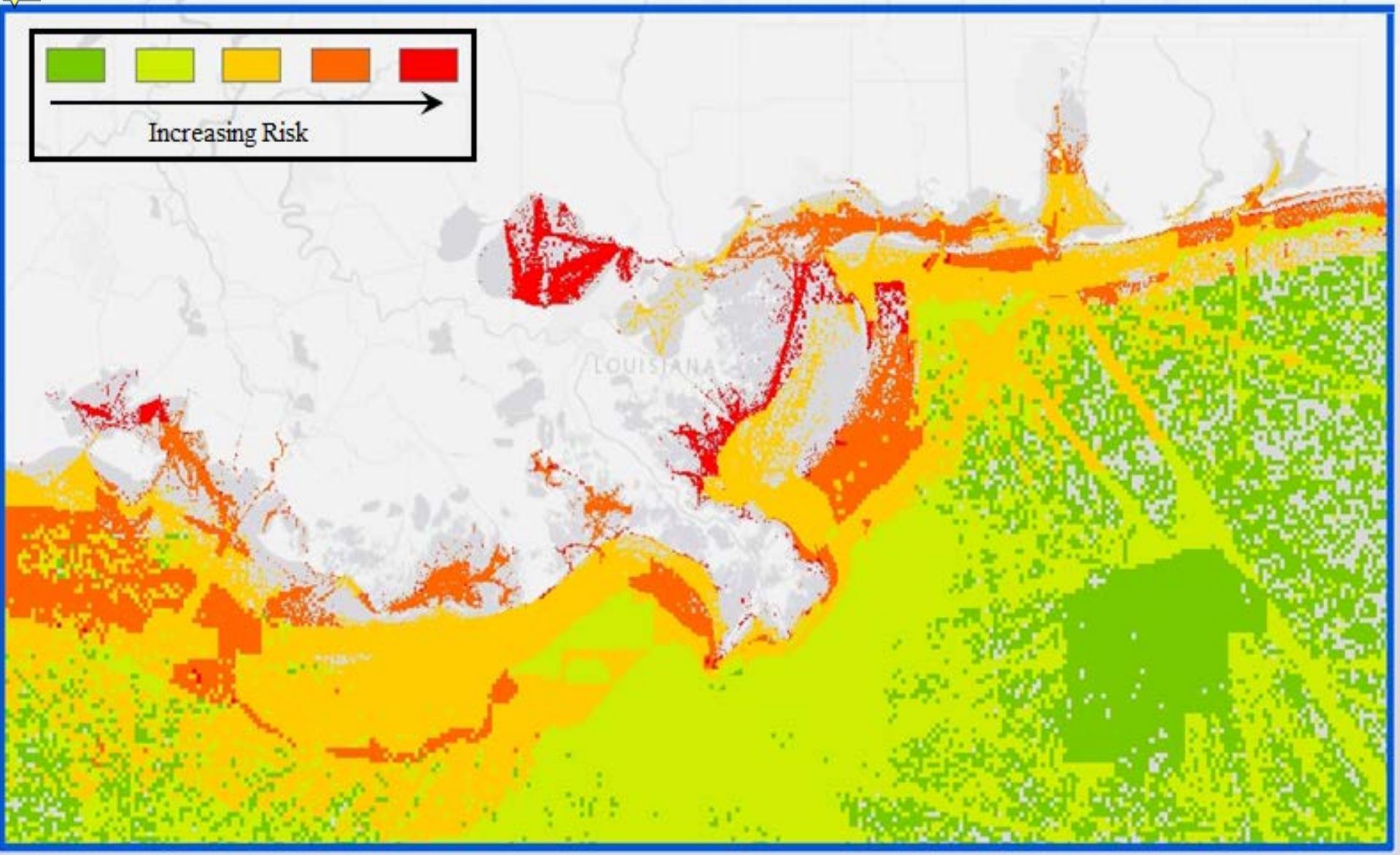
Drivers for Survey Priorities



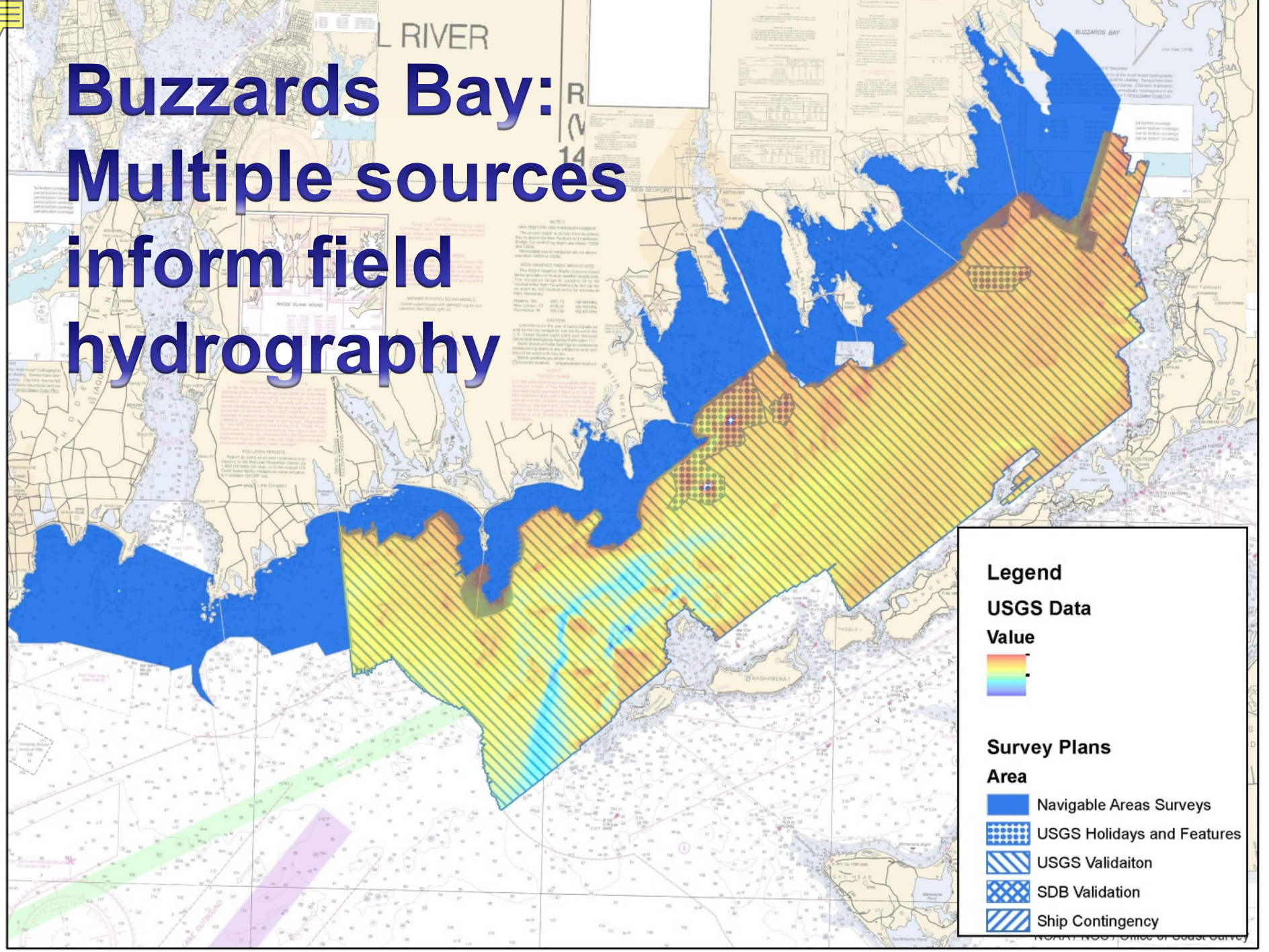






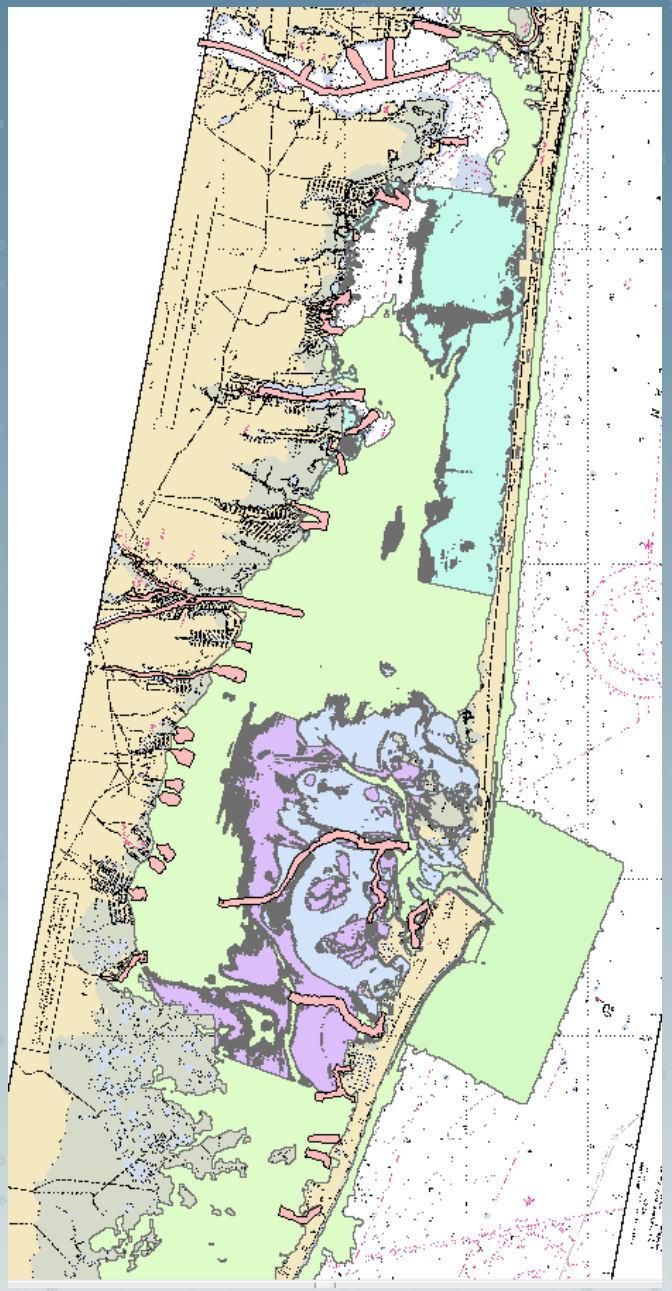

Increasing Risk
LOUISIANA

Buzzards Bay: Multiple sources inform field hydrography

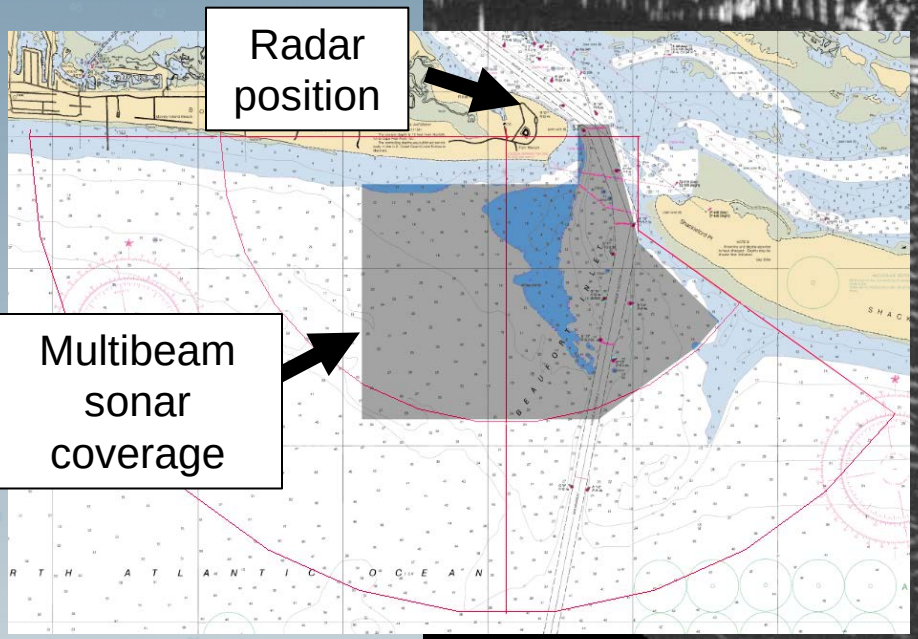


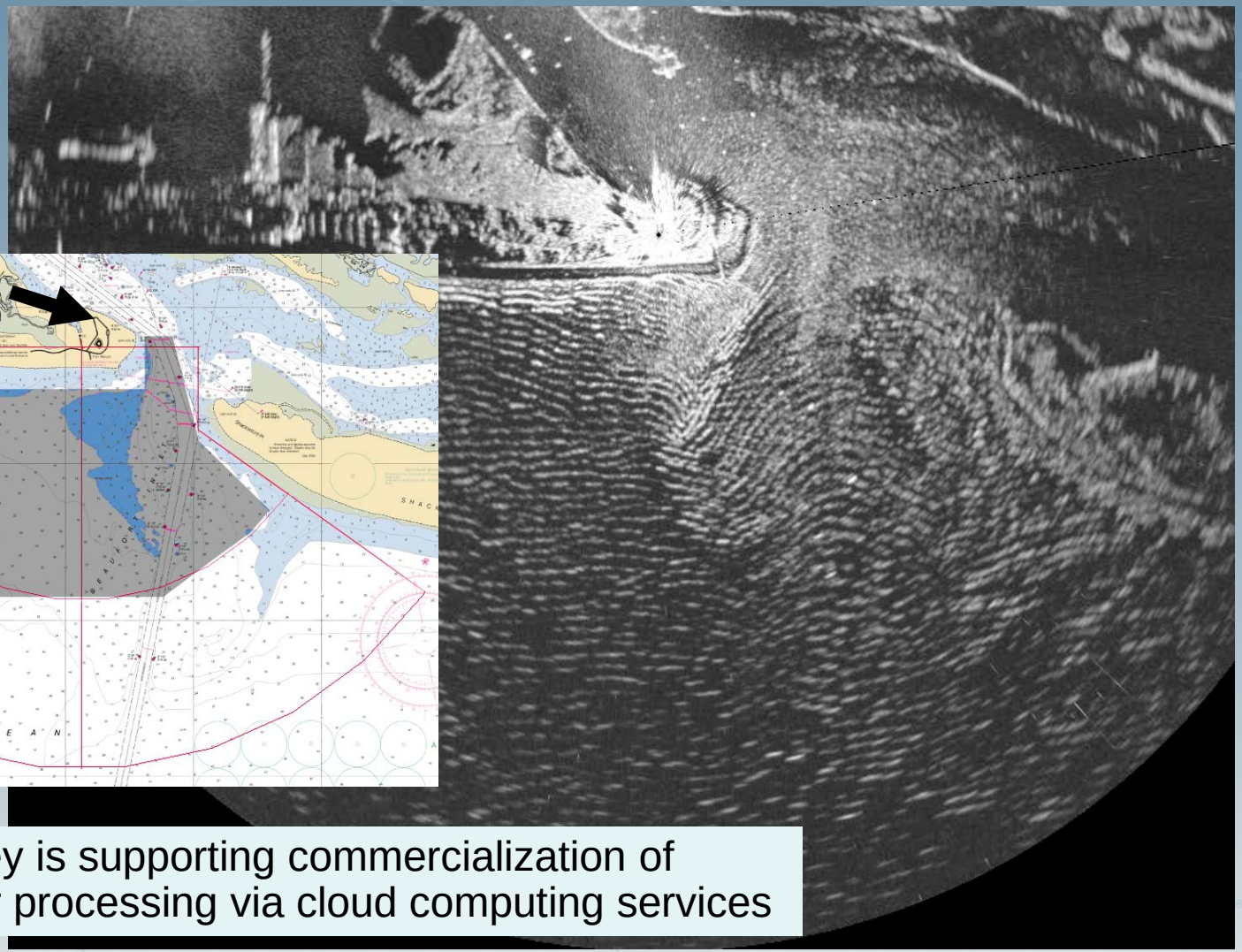
Barnegat Bay: Compilation of multiple sources

- NOAA Lidar surveys
- USGS Lidar surveys
- NOAA hydro contract
- USACE surveys
- NJ DOT
- Satellite Derived Bathymetry



Radar Derived Bathymetry





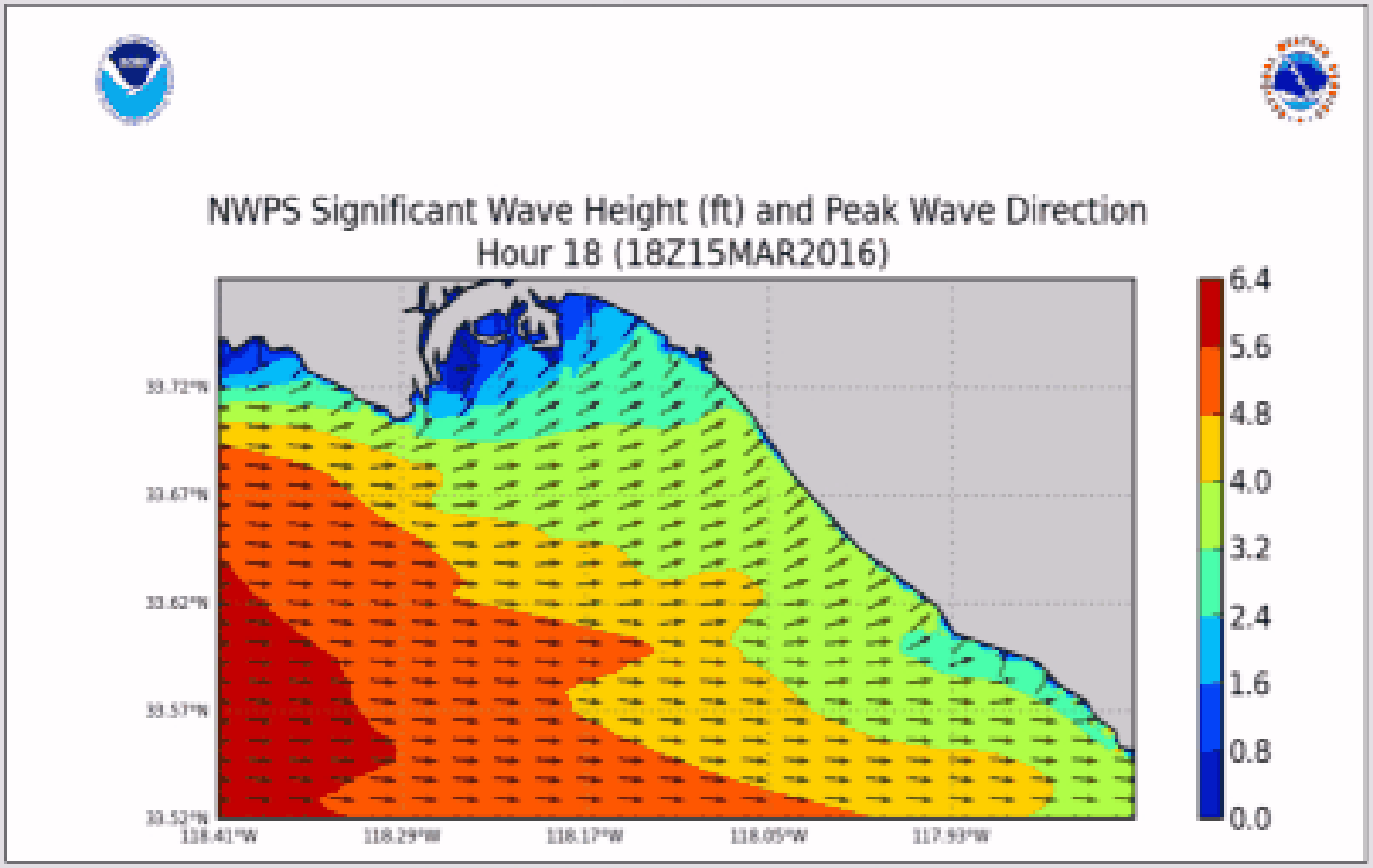
Coast Survey is supporting commercialization of bathymetric radar processing via cloud computing services

CHANGE NAVIGATION

Support the transition to electronic navigation (ECDIS), demonstrate a substantially advanced set of precision navigation information products, and deliver coastal intelligence through advanced data models and products

1. **Precision navigation**
2. **Raster chart tile service**

Los Angeles, California



Wave Height | Wind Speed | Swell | Wave Period | Wave Length | Ocean Depth | Current | SSH

« Step | Step »

< | >

<< | >>

Current

Stop

Close Window

Project Details • Product Description • Survey

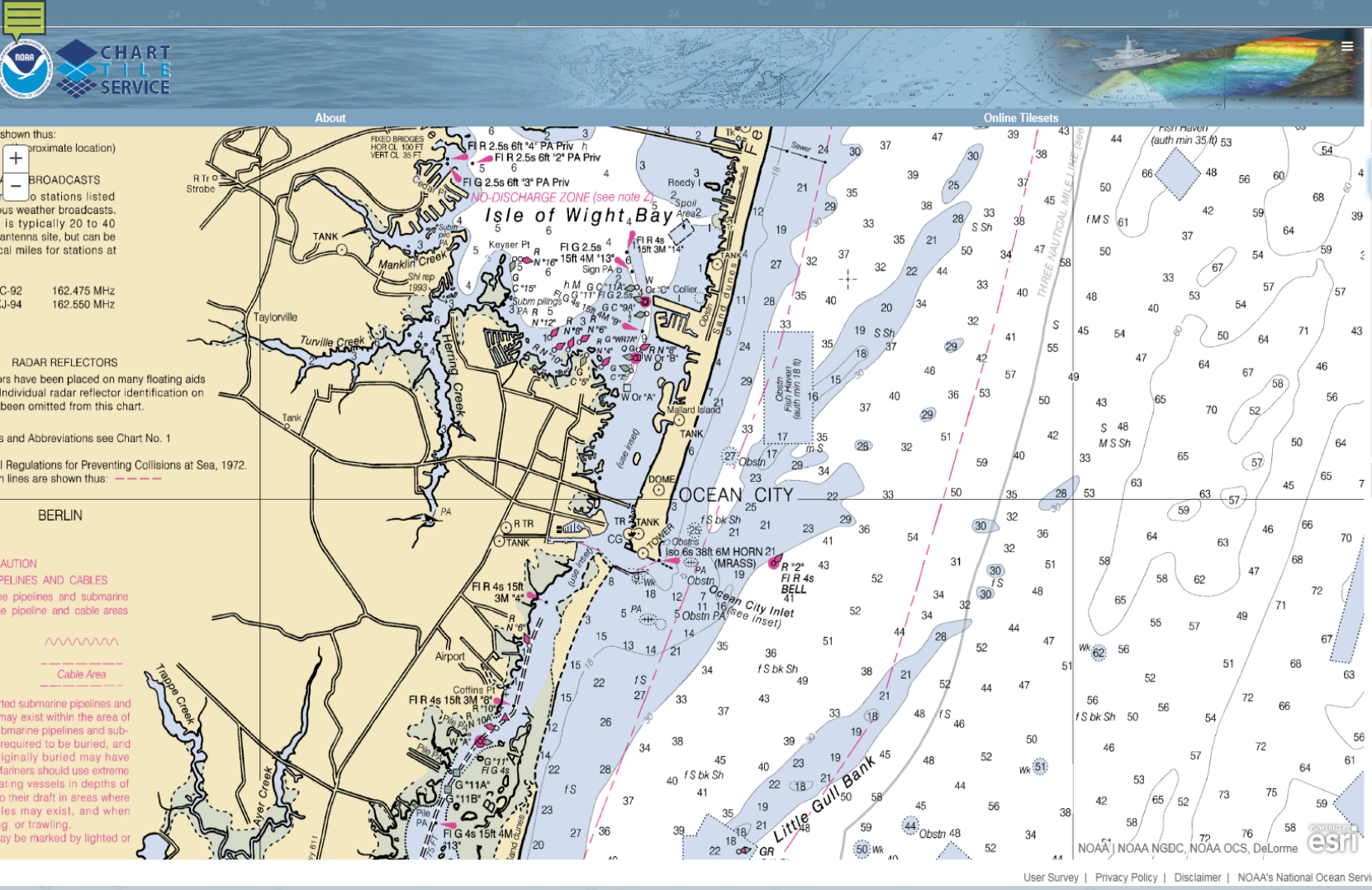


CHART TILE SERVICE

tileservice.charts.noaa.gov

HYDROGRAPHIC SERVICES REVIEW PANEL


iPad
16:15
49%
FEET
WIND-DIR
WIND-SPEED
251°
TRUE
14.0
KNOTS
GUST-DIR
GUST-SPEED
NA
17.0
KNOTS
COG
SOG
108°
TRUE
9.4
KNOTS
HDG
STW
107°
TRUE
NA
DEPTH
32
FEET
WAYPOINT
S CBBT
BTW
DTW
TTG
110°
TRUE
445
METRES
00:02
HOURS
ETA
NLC
16:16 02/29
108°
TRUE
BAY BRIDGE TUN
Time: 15:54 02/29
Level: MLLW +0.39ft↓
Wind: 251°T @ 14.0kn
Gust: 17.0kn
S CBBT
by 8
by 7
M Sh
bn Light
Secure Sea &
Depth in feet
BRIGHTNESS
99%
Status
Routes
AIS
74
Settings
NOAA Charts


Questions?