United States of America

Country Report

to the

U.S.-Canada Regional Hydrographic Commission

National Oceanic and Atmospheric Administration

Naval Meteorology and Oceanography Command

National Geospatial-Intelligence Agency

April 29, 2013

Outline

- US Interagency Responsibilities and Personnel Transitions
- Maritime Transportation System and E-nav
- Disaster Response 2012-2013
- Geospatial products and georeferencing priorities
- Validation
- International Priorities

Reference: General Organizational Information

U.S. mapping and charting responsibilities

U.S. Department of Commerce

- NOAA – Nautical Charts to U.S. EEZ 200 nautical mile limit, Hydrography/National Shoreline surveys, Legal Boundaries, Tides and Currents,

U.S. Department of Defense

- Naval Meteorology and Oceanography Command – Surveying International Waters
- National Geospatial Intelligence Agency – Nautical Charts for International Waters
- Army Corps of Engineers – Maintenance of navigable channels & navigable inland waterways

U.S. Department of Homeland Security

- Coast Guard – Maintenance of maritime Aids to Navigation, Local Notice to Mariners
- FEMA – Disaster Response and Floodplain Mapping

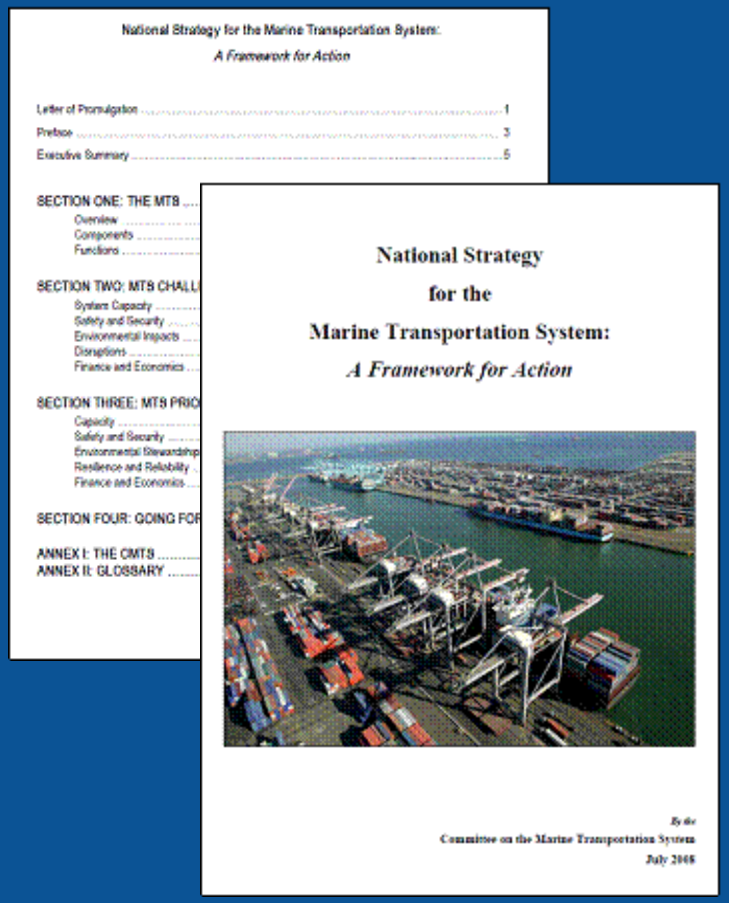
U.S. Department of Interior

- U.S. Geological Survey – Interior to coastline base maps

US Personnel Transition 2013

- **NOAA**
  - Acting Under Secretary of Commerce for Oceans and Atmosphere and Acting NOAA Administrator
    - Dr. Kathy Sullivan replaced Dr. Jane Lubchenco
  - NOAA Deputy Under Secretary for Oceans and Atmosphere for Operations
    - David Kennedy replaced Dr. Kathy Sullivan
  - NOS Assistant Administrator
    - Dr. Holly Bamford replaced David Kennedy
  - OCS Director and National Hydrographer
    - RDML Gerd F. Glang replaced CAPT John Lowell (August 2012)
  - OCS Marine Chart Division Chief
    - CDR Shep Smith replaced CAPT Doug Baird (Feb 2013)
- **NGA**
  - Chief Hydrographer
    - John Lowell replaced RADM Chris Andreasen (Feb 2013)
- **Navy**
  - Oceanographer of the Navy
    - RDML Jonathan White replaced David RDML Titley
  - Commander Naval and Meteorological Operations Command (CNMOC) and Hydrographer of the Navy
    - RDML Brian Brown replaced RDML Jonathan White

The National Strategy for the Marine Transportation System



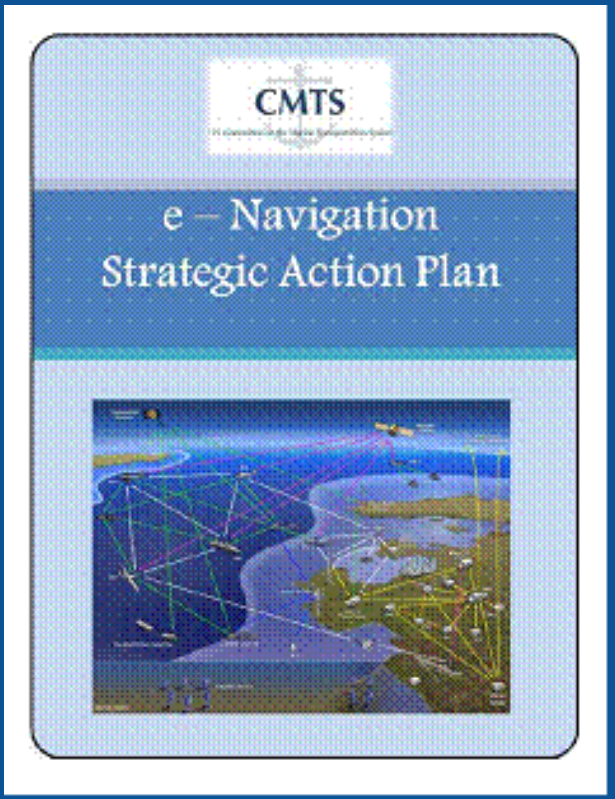
- Established by the Cabinet-level CMTS
- Goal - Use modern technology to support a safer, more efficient, more secure and environmentally sound Marine Transportation System
- 5 themes
  - Capacity
  - Safety and Security
  - Environmental Stewardship
  - Resiliency and Reliability
  - Finance and Economics
- Establishes IAT's to make and execute plans.
- eNav IAT established Feb. 2011
- 11 participating agencies

http://www.cmts.gov/

U.S. e-Navigation Strategic Action Plan

VISION

"To establish a framework that enables the transfer of data between and among ships and shore facilities, and that integrates and transforms that data into decision and action information."

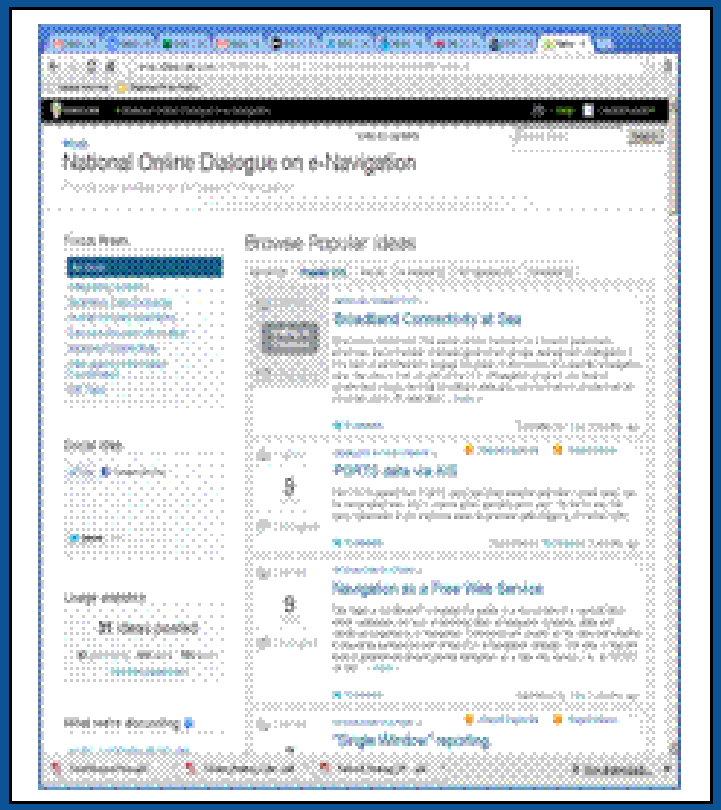


http://www.cmts.gov/downloads/CMTS_e-Navigation_Strategic_Action_Plan_Feb_2012.pdf

e-Navigation Online Dialog

Top 5 Ideas

- Broadband Connectivity at Sea
- Navigation as a Free Web Service
- Single Window Reporting
- PORTS Data via AIS
- Use an Open Source Reference System Architecture for e-Navigation

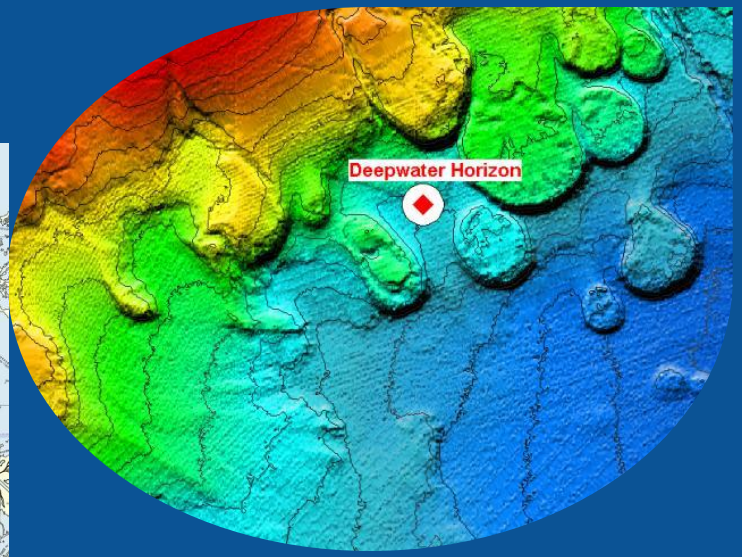


http://enav.ideascale.com

Next Steps

- New Work Plan by the IAT
- IAT will recommend several projects, including those from the On-Line Dialog, and assign them to agencies, and ask the CMTS to direct action
- The Strategic Action Plan 'focus areas' will be revisited for potential projects
- Collection of solutions will continue.
- Upon finalization of the IMO eNav work, the IAT will likely recommend additional projects indicated by the IMO plan.

NOAA navigation products are used in response to oil spills



Environmental Response Management Application (ERMA)

Web-based GIS system supporting environmental response efforts and operations

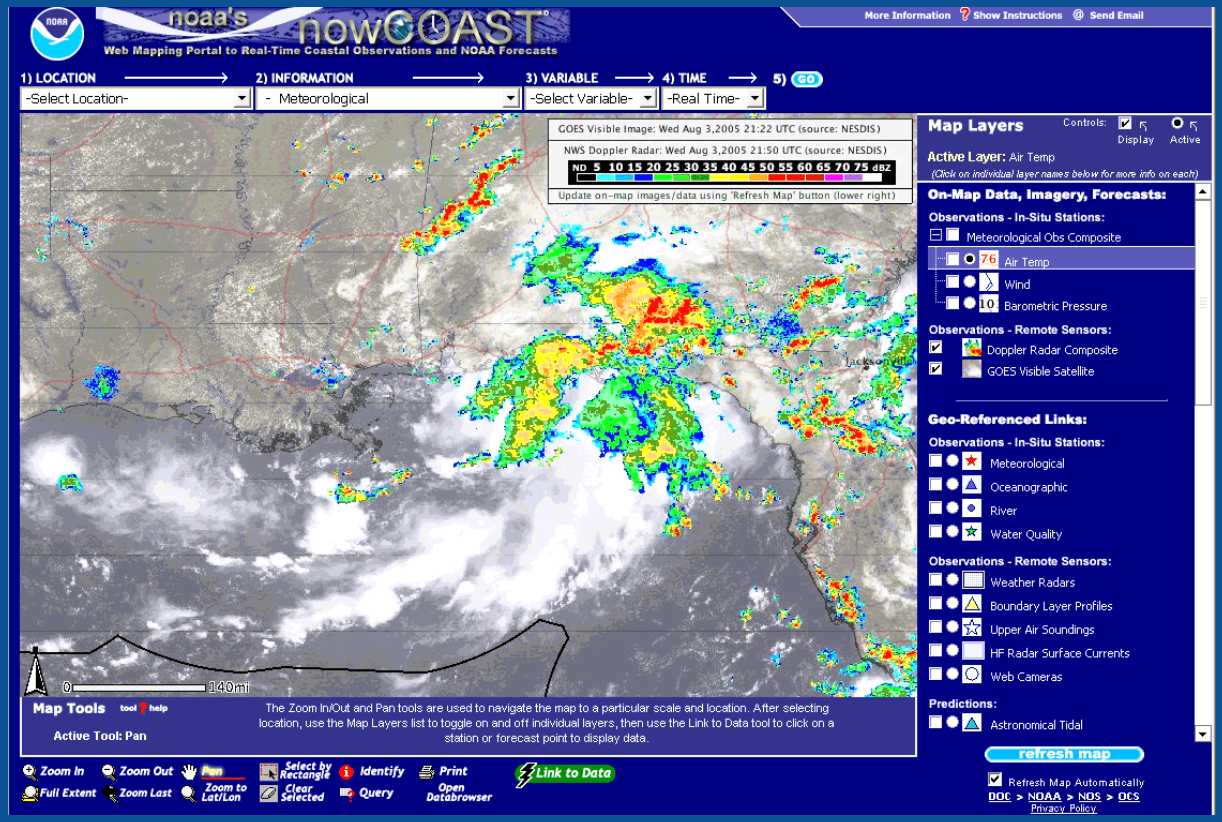
- Developed by NOAA as pilot project in 2008
- Expanded for use in Haiti after earthquake
- Full operations for Gulf Oil Spill

Newly acquired imagery printed with shoreline impacts

Something was needed for the general public

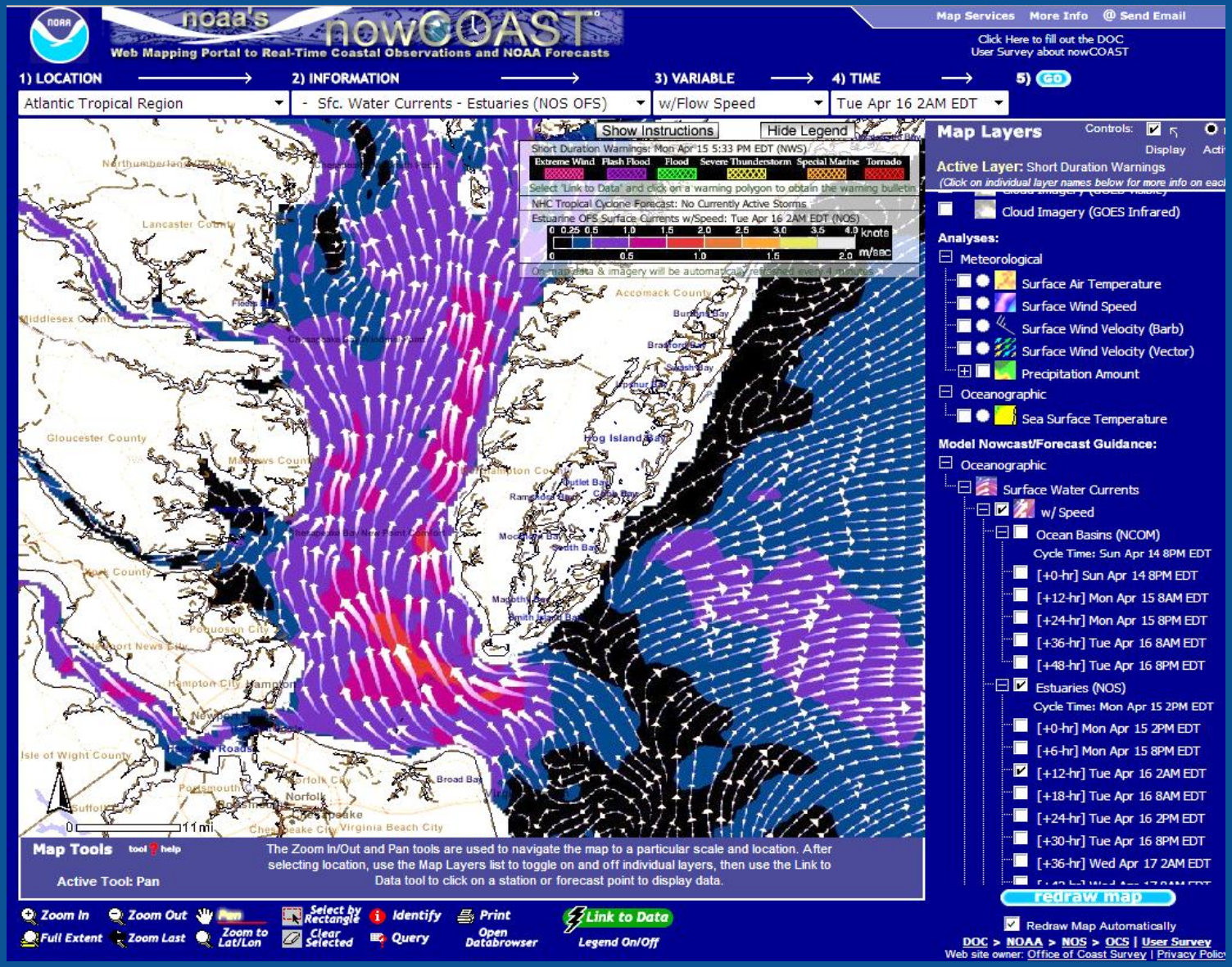
nowCOAST

NOAA Map-Based Web Portal to Real-Time Coastal Observations & NOAA Forecasts

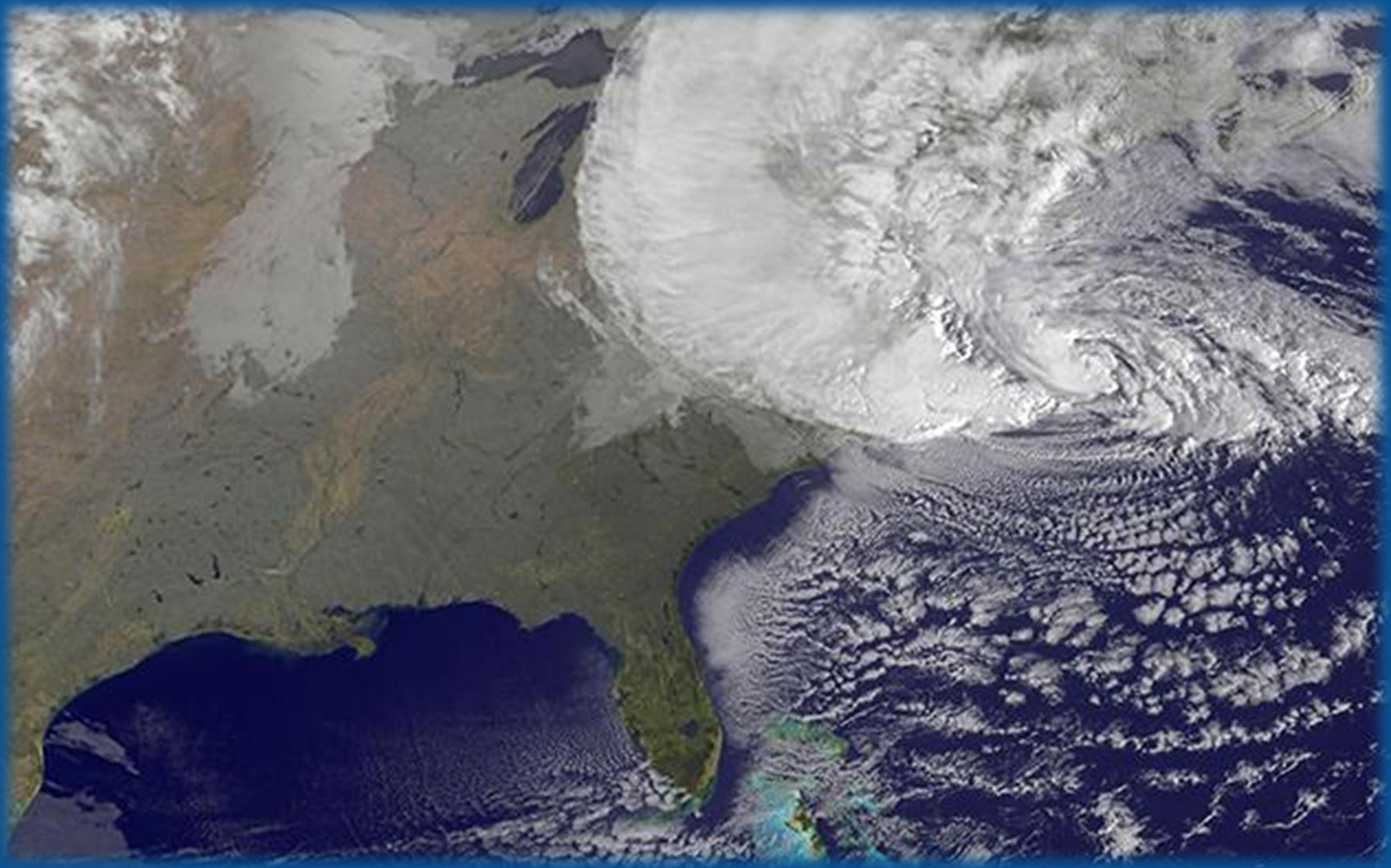


Meteorological, Oceanographic, & River observations from national and regional networks as well as NOAA (NOS & NWS) forecasts for U.S. coastal areas.

http://nowcoast.noaa.gov/

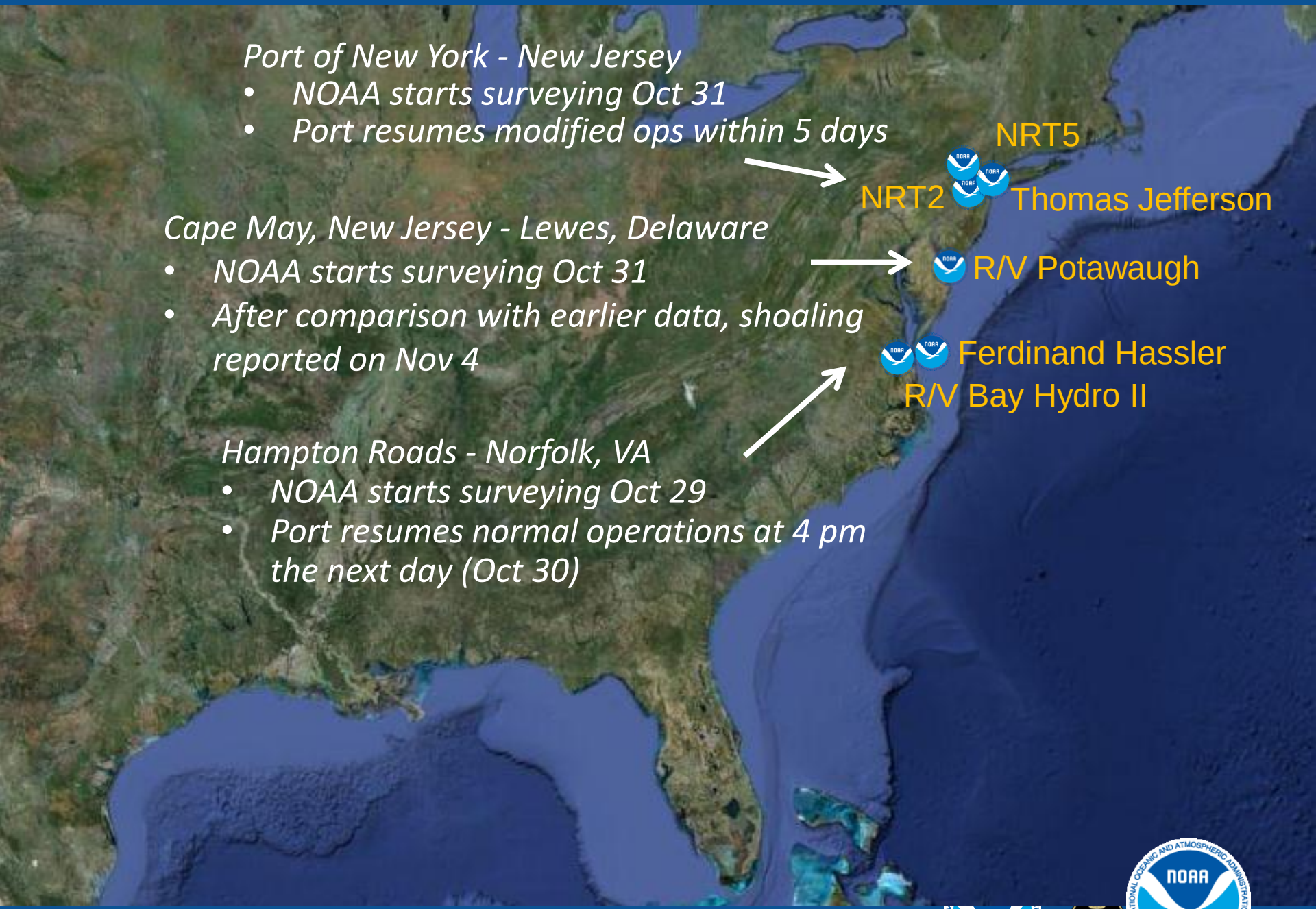


U.S. Hydrographic Services



HURRICANE SANDY

U.S. Hydrographic Services


Port of New York - New Jersey
• NOAA starts surveying Oct 31
• Port resumes modified ops within 5 days
NRT5
NRT2
Thomas Jefferson
Cape May, New Jersey - Lewes, Delaware
• NOAA starts surveying Oct 31
• After comparison with earlier data, shoaling reported on Nov 4
R/V Potawaugh
Ferdinand Hassler
R/V Bay Hydro II
Hampton Roads - Norfolk, VA
• NOAA starts surveying Oct 29
• Port resumes normal operations at 4 pm the next day (Oct 30)

ESRI Tools at NGDC Under Development

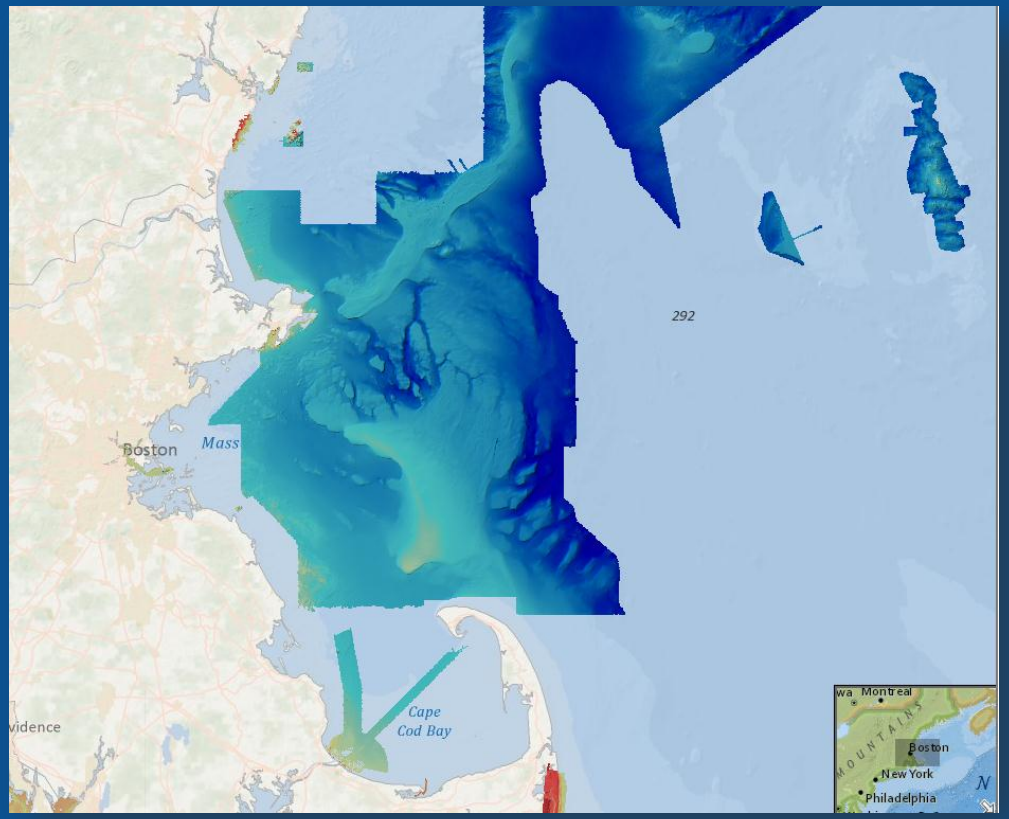
http://maps.ngdc.noaa.gov/viewers/bathymetry/

Present:

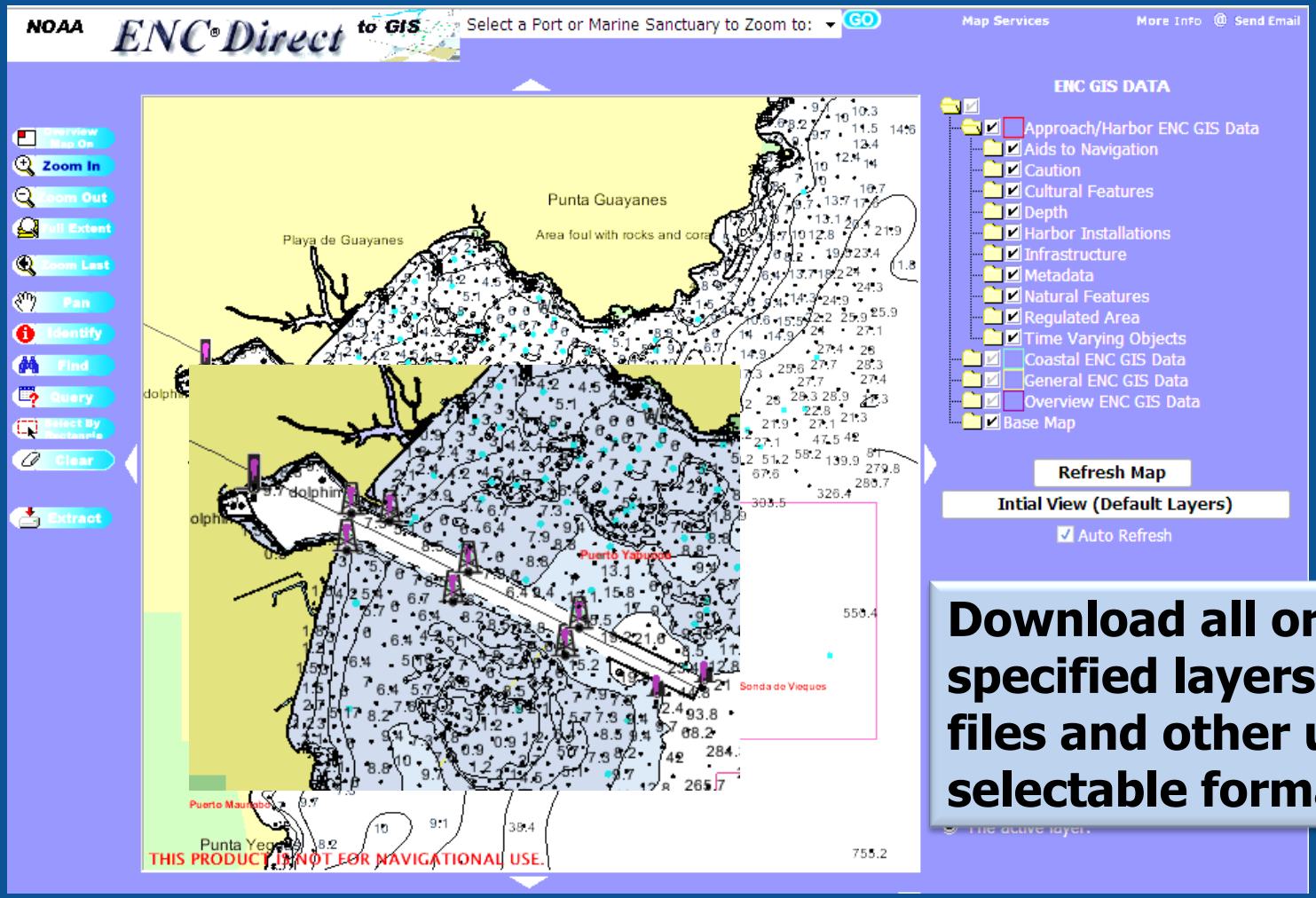
- Access to multibeam BAGS
- Access to point sounding data

Under Development:

- ESRI ArcGIS with Image Server
- Grid Resolution on the Fly
- Selection of “most recent” soundings

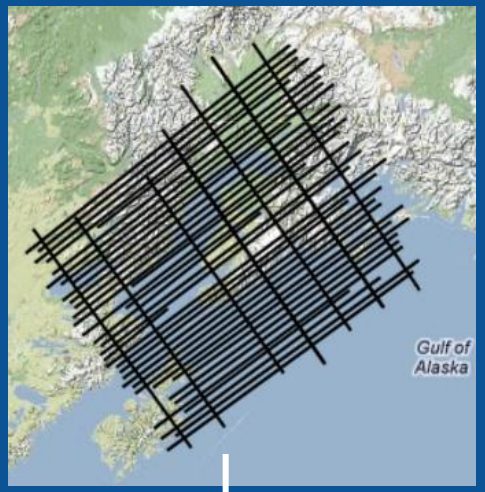


ENC Direct to GIS



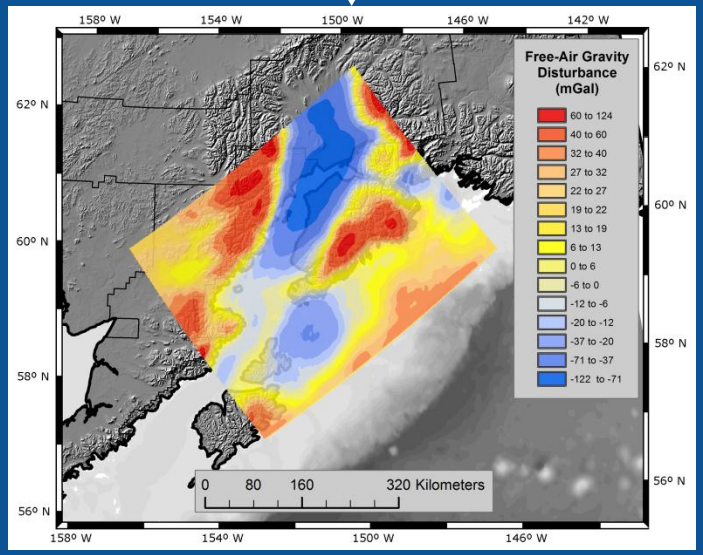
Download all or specified layers in .shp files and other user selectable formats

GRAV-D Gravity for the Redefinition of the American Vertical Datum



- Purpose: To redefine the official civilian vertical datum as the geoid through the use of GNSS technology and a gravimetric geoid model

- GRAV-D Data Processing
  - Positioning is critical
  - Software has evolved since 2007
- Evaluation: Crossovers & EGM08
- Data Release to Public
- Ongoing R&D

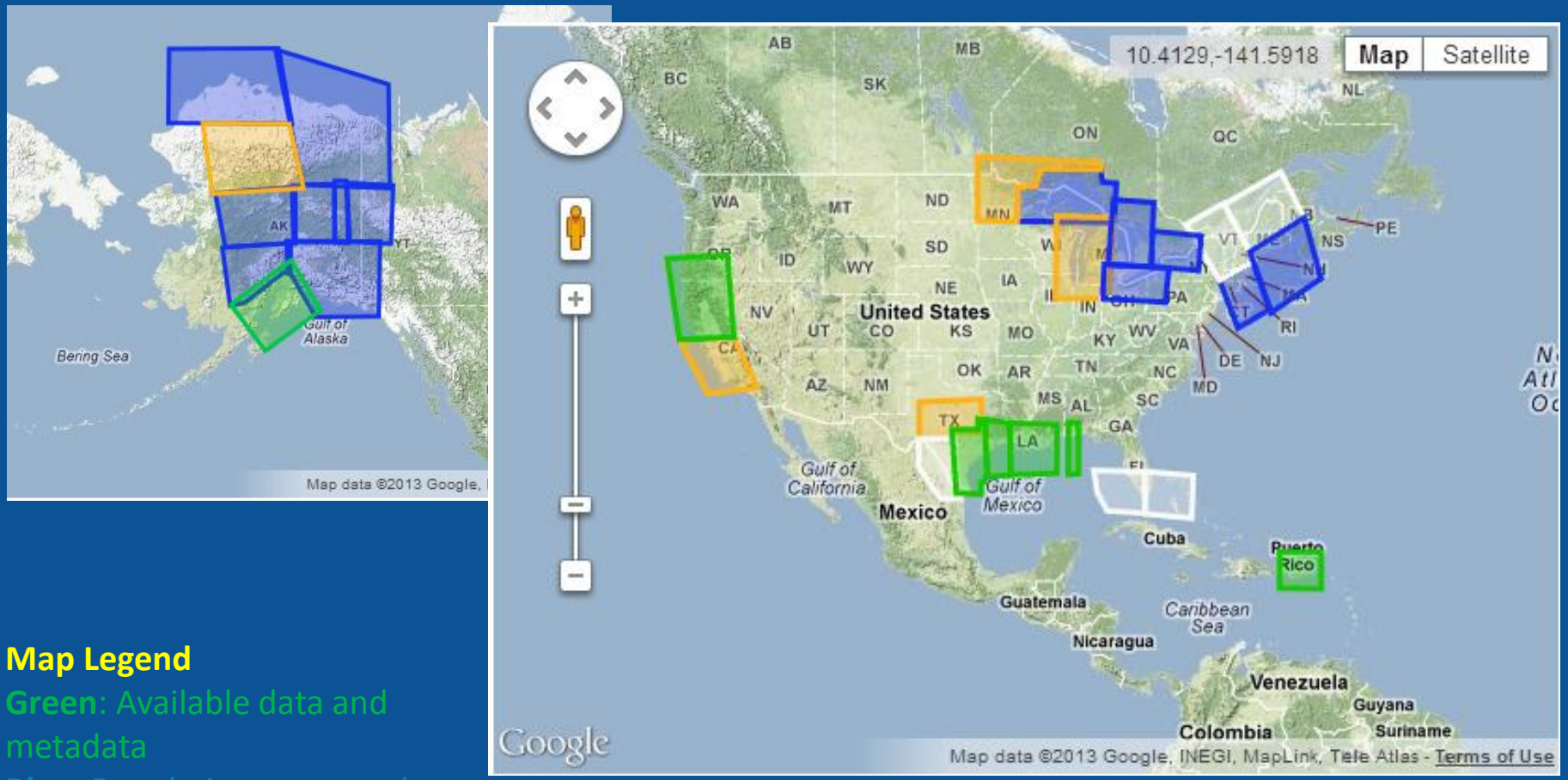


Gravity for the Redefinition of the American Vertical Datum (GRAV-D)

- **In 2010, began operational collection of airborne gravity data to calculate a geoid model and ultimately a new vertical reference system for accurate height measurements up to 2 cm in the U.S. and territories**
  - Provides highly accurate height measurements that determine where water flows
  - Connects satellite and terrestrial gravity measurements for efficient and accurate gravity monitoring

- **Benefits**: $522 million in additional annual benefits from completion of a modernization of the vertical component of the NSRS through gravity collection from GRAV-D program
- **Priorities**: Working in Alaska/Arctic as a priority through 2013, then will move to the Great Lakes and coastal areas

GRAV-D Status (January 2013)



Map Legend

Green: Available data and metadata

Blue: Data being processed

Orange: Data collection underway

White: Planned for data collection

VDatum

- All elevation data are referenced to a vertical datum
- BUT there are many <u>different</u> vertical datums in use around the nation
- For elevation data sets to be blended together they must be referenced to the <u>same</u> vertical datum:

VDATUM provides a solution!!

Ellipsoidal Datums

WGS 84,
NAD 83 (NSRS)
+17 others

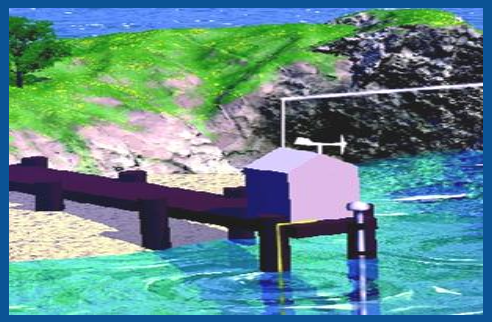
Orthometric Datums

(MSL)

NAVD 88,
NGVD 29

Tidal Datums

MHHW, MHW,
MTL, DTL, LMSL,
MLW, MLLW



Validation - GPS Water Level Buoy

- Establish baseline for separation model between tidal datum and ellipsoid
- Tool for VDatum validation
- Ability to place “tide gauge” away from shore in areas of interest

Four 30-day deployments in different environments adjacent to shore water level gauge

AXYS Hydrolevel Water Elevation Monitoring Buoy

Validation - Bathymetric Mapping AUV

- Can position and depth data meet NOAA standards?
- Can this AUV be operated safely from NOAA ships?
- What are the efficiency gains?

Hydroid REMUS-600 with Kongsberg EM3002 Sonar and Advanced Navigation System

Size: 32.4 cm x 3.25 m (~1 x 10 1/2 feet)
Weight: 270 kg (~600 lbs)

Successful Transition to Operations: OCS Emergency Response Side Scan Sonar AUV

- Pool of qualified operators, biannual training requirement
- Hand deployable; easy to ship and transport
- Other applications (Habitat mapping, debris identification for removal)

Hydroid REMUS-100 with Marine Sonic Side Scan Sonar &
VCT Harborscan with Klein UUV 3500 Side Scan Sonar

VCT Size: 19 cm x 2.4 m (7.5 in x 8 feet)
Weight: 55 kg (~120 lbs)

U.S. International Priorities

- International Partnerships and Capacity Building
- Increased data access and sharing among nations and organizations (LiDAR, Vdatum, Ship Surveys)
- Advancing Digital Standards - S101, S100
- Emergency Prevention, Preparedness, and Response Capacity
- Transboundary charts – lessons learned, best practices
- Marine Spatial Planning Infrastructure support
- Elimination of ENC Gaps and Overlaps in accordance with the WEND Principles

Saudi Arabia – Working to set up new Hydrographic Offices

Key IHO Meetings Calendar

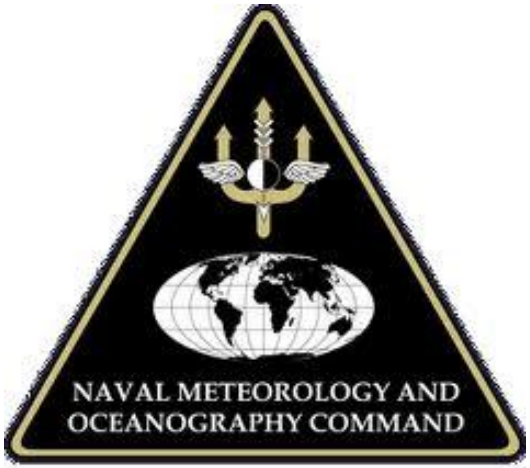
- S100/S101 Roadmap (March 25-29)
- USCHC-36 (April 29)
- WEND WG-3 (May 13; Monaco)
- SCWG (May 29; Silver Spring, MD)
- IRCC-4 (June; Australia; RDML Glang)
- SNPWG (June; Silver Spring, MD)
- TSMAD/DIPWG (June, Silver Spring, MD)
- ARHC-4 (October 28)

General Background Information

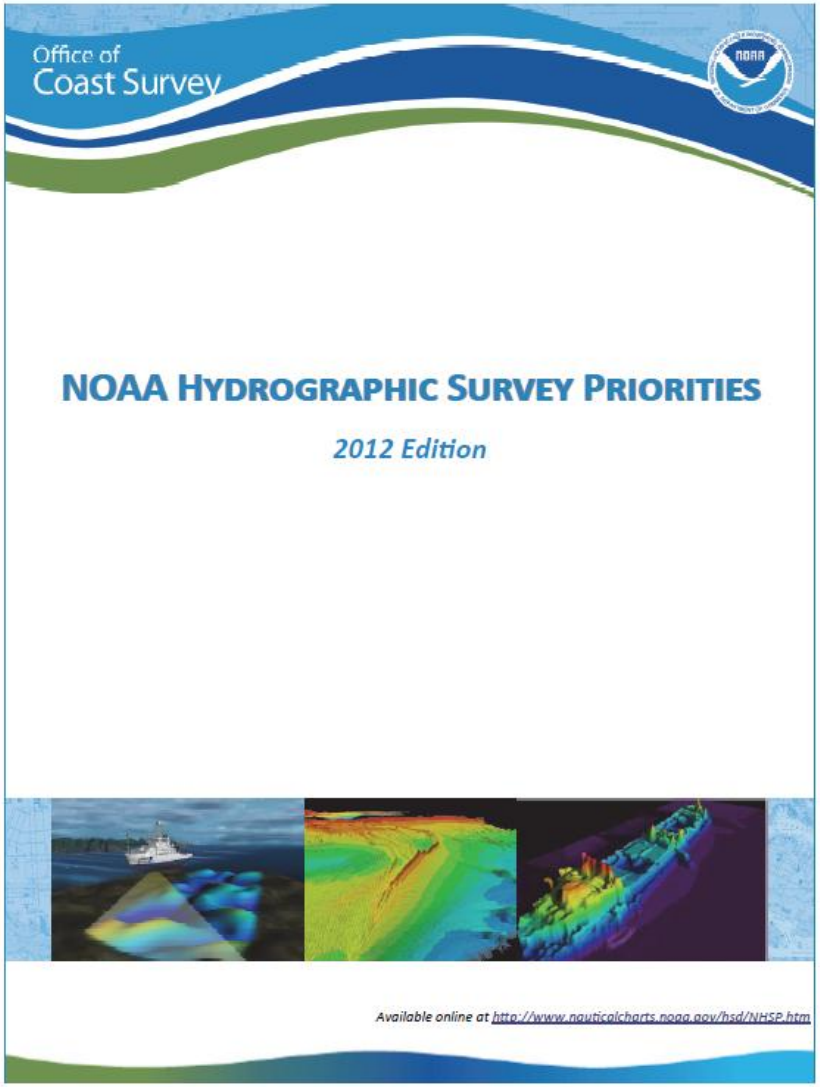
- U.S. survey priorities (2012)
- Statistics and figures
  - MTS, ENCs productions, ENC overlaps
- OCS Organizational Challenges
- US Canada DNC Cooperation status (as of 2013) and NGA hard copy chart distribution
- Websites

Thank you


NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE


NAVAL METEOROLOGY AND
OCEANOGRAPHY COMMAND

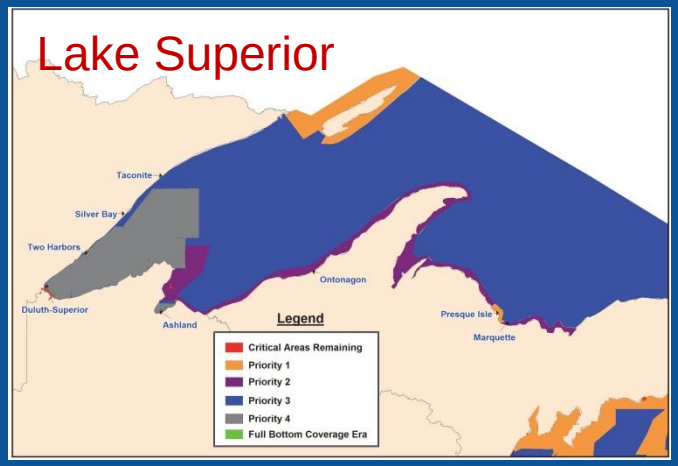

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

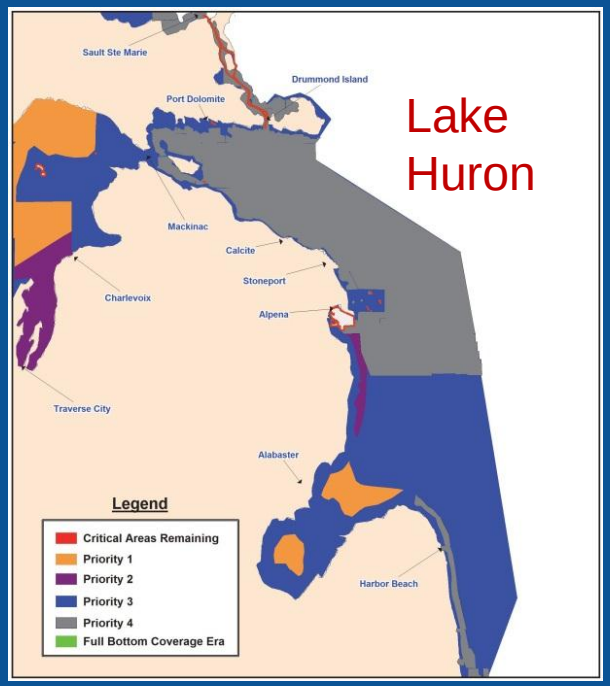


NOAA Hydrographic Survey Priorities

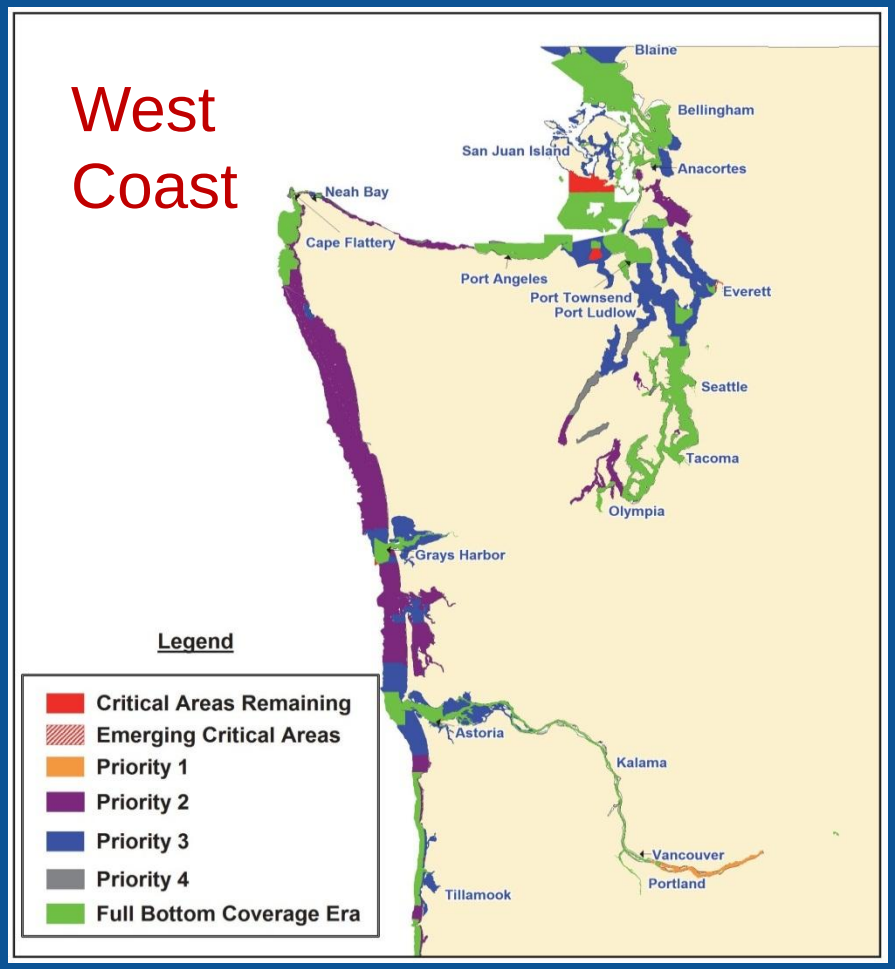
Available online at http://www.nauticalcharts.noaa.gov/hsd/NHSP.htm

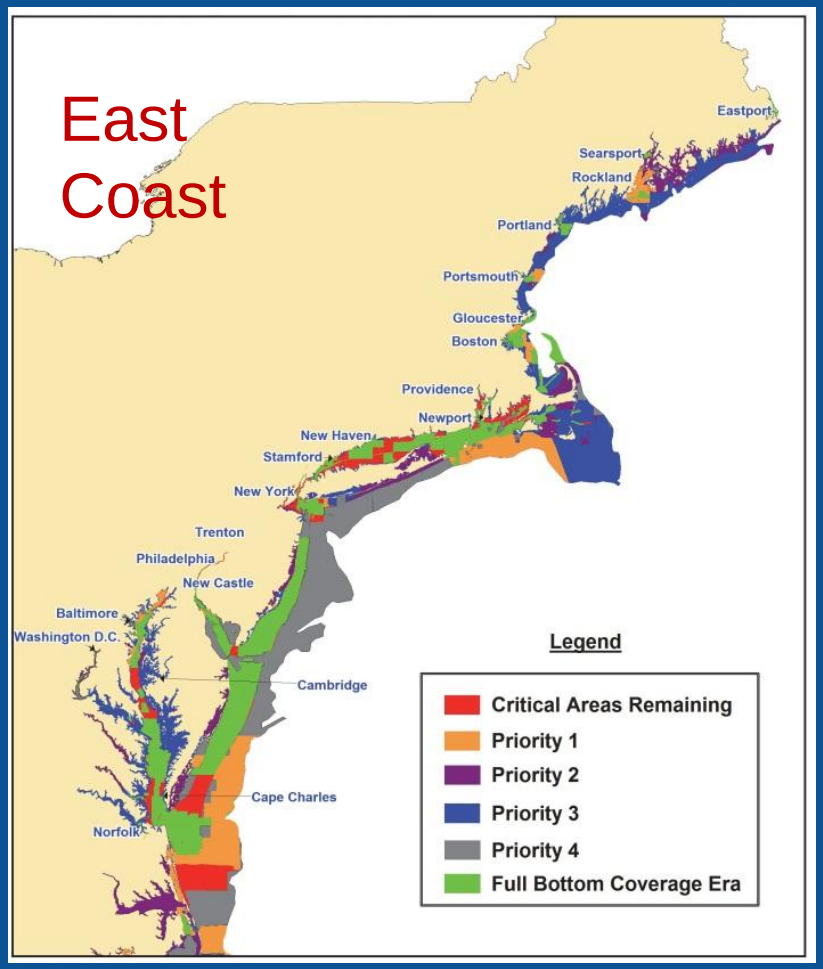
U.S. 2013 Survey Priorities in the Great Lakes



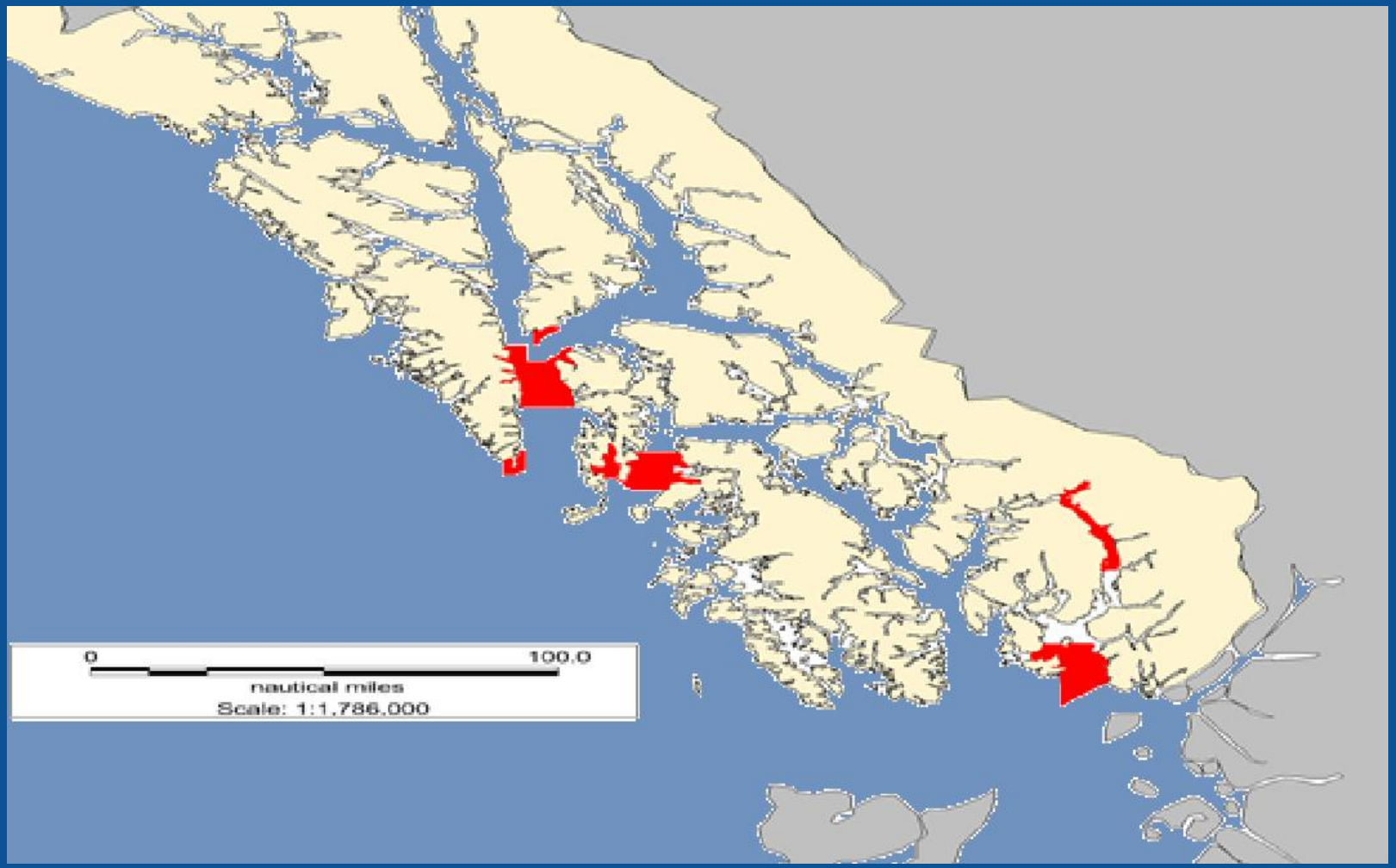


US Survey Priorities 2013: West and East Coast





US Survey Priorities 2013: Alaskan Panhandle



U.S. Marine Transportation System

- 99% volume of U.S. overseas trade is by ship*
- 25,000 miles of navigable channels*
- 3700+ marine terminals*
- 326 public/private ports*
- 238 locks in 192 locations*
- 13+ million jobs*
- $649 billion annually to the U.S. GDP*
- $212 billion in annual port sector federal/state/local taxes*
- 12 million cruise passengers
- 78 million recreational boaters
- 110,000 fishing vessels

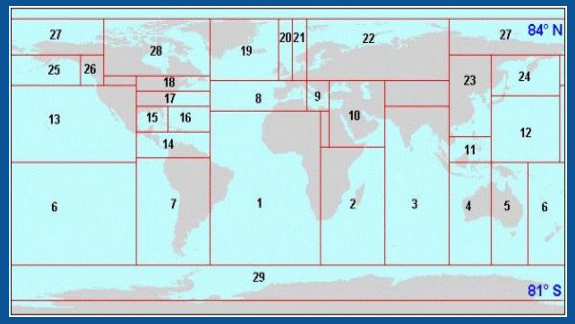
US Dept of Transportation, Maritime Administration
http://www.marad.dot.gov/ports_landing_page/marine_transportation_system/MTS.htm

Challenges

- The total value of marine freight is estimated to increase by 43 percent domestically and 67 percent internationally between 2010 and 2020.*
- Ferry passenger transport is experiencing rapid growth in response to land-transport congestion.*
- Commercial fishing and military use of the MTS also is expected to grow.*
- The increasing demands on our MTS also must be safely handled and balanced with environmental values, in order to ensure that freight and people move efficiently to, from, and on our waterfronts.

* As per US Dept. of Transportation, Bureau of Transportation Statistics

NGA Digital Nautical Charts



Canada co-produces DNC for NGA

NGA global DNC coverage: http://dnc.nga.mil/NGAPortal/DNC.portal

DNC	Libraries	Harbor	Approach	Coastal	General	
18	260	185	69	4	2	
	15	9	4	1	1	US
	245	176	65	3	1	CAN
26	104	64	31	6	3	
	47	29	14	2	2	US
	57	35	17	4	1	CAN
27	26	8	9	6	3	
	15	2	6	5	2	US
	11	6	3	1	1	CAN
28	45	14	10	15	6	
	9	3	3	2	1	US
	36	11	7	13	5	CAN

Total Libraries = 435: US = 86 Canada = 349

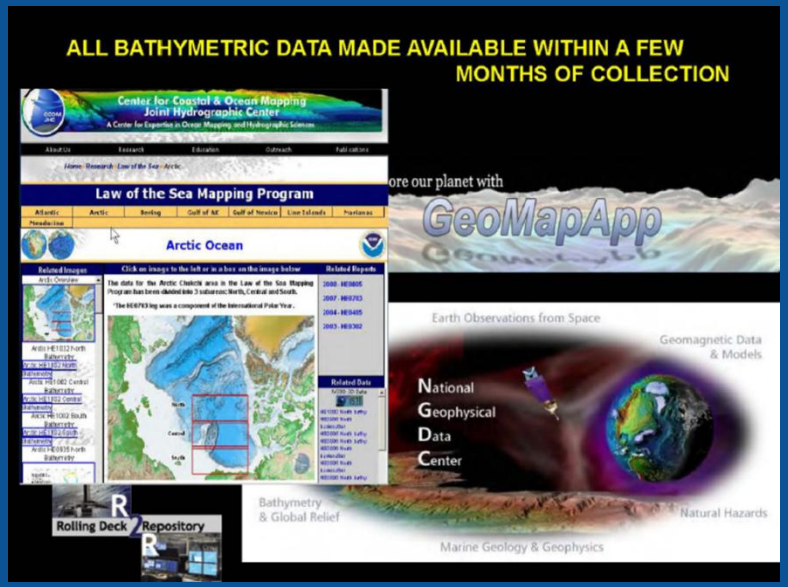
Changes in NGA Hardcopy Charts

- NGA has adopted 232 Canadian charts for chart coverage in the USCHC region
  - Printed and distributed to only US Gov't users

- NGA has withdrawn thousands of charts for public sale over the past few months
  - Only 20 charts are now available for entire North America Region
  - Available through http://www.oceangrafix.com

Data sharing

…all of NOAA's offices shall provide open access to ocean and coastal datasets for the purposes of transparency and collaboration…



NOAA is directed to present all datasets in useful and meaningful ways to all users.

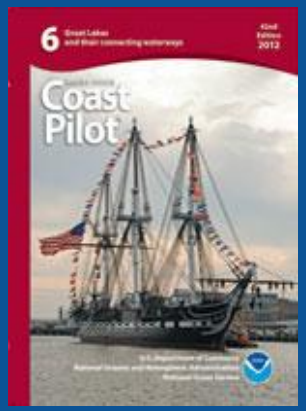
http://www.ngdc.noaa.gov

ENC Status and Distribution

- Current status
  - The United States has completed its ENC coverage to meet IMO obligations including the top 175 US ports by tonnage and associated approaches plus the transit ENC's between these ports
  - 744 US ENCs in the USCHC Region
  - 928 US ENCs
- Certified ENC distributors
    - PRIMAR, UKHO, Maris, Jeppessen, Chart World
- www.nauticalcharts.noaa.gov/mcd/index.htms

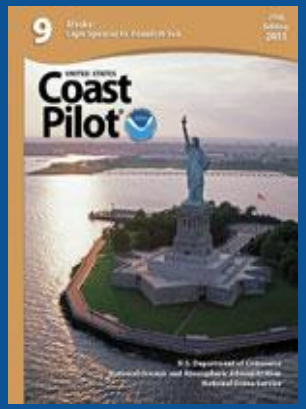
New Coast Pilot Production System

East Coast (north)
42 edition 2012



Great Lakes
43 edition 2013

Alaska (panhandle)
34 edition 2012



Alaska
30 edition 2012

- HTML generated from the XML
  - HTML is created on the fly
  - Display is optimized for web viewing
- Web-based search capability
- Search By Geographic Location (coming soon)
- New smart phone and tablet apps from 3rd party providers
- POD books from 3rd party providers

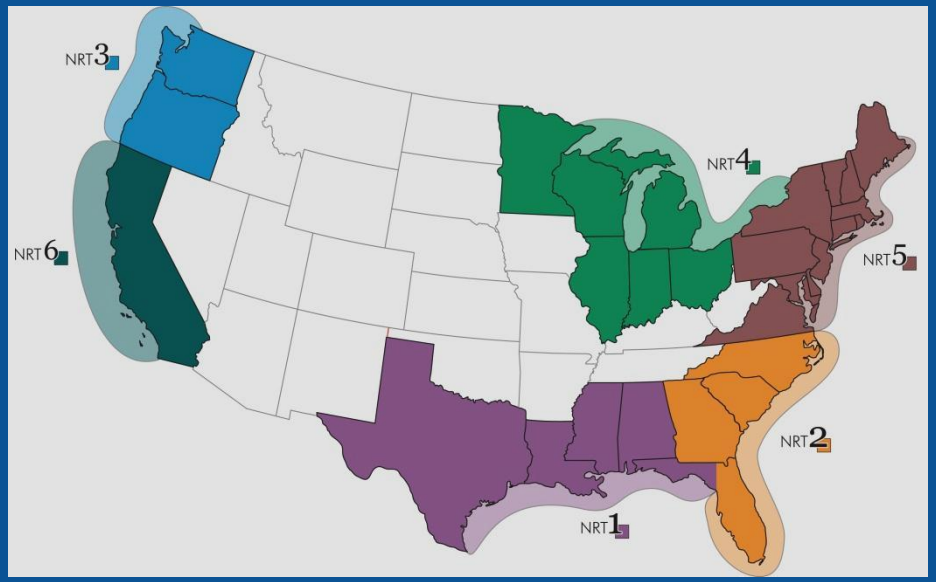
http://www.nauticalcharts.noaa.gov/nsd/cpdownload.htm
http://www.nauticalcharts.noaa.gov/nsd/cpsearch.php

Elimination of transboundary ENC Overlaps (80+)

- Canada, New Zealand, Mexico, Japan, Republic of Korea
- Remaining: Canada, Russian Federation, Cuba

Coast Survey is set up for rapid maritime response

Navigation managers coordinate activities and assets with Coast Guard, port officials, and other agencies



Navigation response teams and NOAA survey ships, if available, conduct surveys

Web Sites

http://chartmaker.noaa.gov/

www.nga.mil/maritime

http://www.usno.navy.mil/