

HSRP Most Wanted Hydrographic Services Improvements, NOAA's FY2008 Action Plan

Recommendation 1: The HSRP recommends that NOAA aggressively survey and map the 500,000 square nautical miles (SNM) of navigationally significant areas and 95,000 miles of shoreline by:

- Expanding NOAA's in-house and contract survey capabilities to acquire and process more hydrographic and shoreline mapping data;
- Developing and implementing more efficient surveying, mapping, and processing techniques and technologies; and
- Replacing aging single-purpose hydrographic ships with modern, multi-purpose vessels to further maximize the use and reach of NOAA resources.

NOAA agrees with the findings and recommendations of the HSRP. Exponential growth of maritime trade; the number of commercial, military and recreational vessels sailing in U.S. waters; and increasing ship proportions require timely, accurate, and reliable navigation information. Presently NOAA has the capacity to survey roughly 3,000 SNM of navigationally significant EEZ waters, evaluate 12% of priority port area shoreline for change each year, and map 3% of the 95,000 miles of U.S. open coastal shoreline; this capacity does fall short of the 10,000 SNM and 20%/10% total annual requirement, but NOAA is also working to improve data processing efficiencies and reduce the timeframe from data collection to dissemination. NOAA is also actively assessing its fleet recapitalization needs and schedule, keeping multipurpose ships and capability very much in mind. With current funding, NOAA will take the following actions in FY2008:

- Survey 2500 SNM of navigationally significant areas, with roughly 940 SNM through contracts
- Leverage California state mapping funds to contract survey for 2000 additional SNM of multiple use data for nautical charting, habitat characterization, and other NOAA/state coastal responsibilities
- Contract Gulf of Mexico Marine Debris Mapping funds for roughly 935 SNM of navigationally significant area with data potential for updating nautical charts
- Continue engaging on other Integrated Ocean and Coastal Mapping opportunities such as collaborating with the U.S. Army Corps of Engineers on shoreline/nearshore mapping to collect more data via contract resources
- Develop training courses and curricula for enhancing contractor and internal capabilities to collect and process data
- Improve contractor data collection efficiency with digital sensor development and technology transfer to private sector
- Conduct three demonstration projects and required training to enable hydrographic surveying capability on the ellipsoid in NOAA's hydrographic fleet

- Continue managing construction of the HASSLER to replace the 39-year old RUDE in 2009, complete the procurement of a BAY HYDROGRAPHER replacement, operate 2 new hydrographic launches on RAINIER, and sustain 6 navigation response teams.
- Continue development of Autonomous Underwater Standard Operating Procedures for AUV-based hydrographic surveying to expand capacity for in-house and contract data collection

| Current Capacity | 100% Requirement | Agency 100% \$ Estimate | FY08 Goals | FY08 Approp | Gap Analysis (if available) | FY09 Goals (Data available in Feb 2008) |
|---|--|--------------------------------|-------------------|------------------------------------|------------------------------------|--|
| Survey average 3000 SNM a year | Survey 10000 SNM a year | \$130M | 2500 SNM | \$46M in-house and contract | 7500 SNM | 3000 SNM |
| Map 12% of port areas every year | Map 20% of port areas each year | \$16M | 12.0% | \$6.1M | 8% | 14.3% |
| Map 3% of national shoreline each year | Map 10% each year | | 3.0% | | 7% | 3.3% |

Recommendation 2: The HSRP recommends that NOAA take a larger role in improving partnerships with other federal and state agencies and other non-governmental entities to:

- Integrate coastal mapping efforts with coordinated mapping plans and tools such as VDatum; and
- Ensure that the nation's federally maintained channels, approaches, and anchorages are surveyed with full bottom coverage technologies.

The HSRP's views on integration of effort for shoreline mapping, hydrographic surveying and VDatum are directly on target. NOAA concurs, recognizing that the federal government and its partners lack the resources to achieve success in mapping and managing the nation's coasts and oceans under the current operating model. To generate efficiencies, NOAA must avoid redundancy in ocean mapping, leverage partners in shoreline mapping with the VDatum tool and other available tools and capabilities, continue to cooperate with other federal agencies through agreements and improved communication, educate partners on the value of "map once, use many times," and other common-sense, practical integration and data-sharing activities for the U.S. coastal and marine environment.

Because NOAA digital data standards are of the highest order and relied on for tide control and georeferencing certainties, they can be the impetus to further data integration of all programs supporting the MTS, coastal zone management, shoreline mapping, IOOS data sets, geospatial data, federally maintained channels, and even Homeland Security Maritime Domain Awareness issues. To address this concern, at the current FY08 funding levels, NOAA will take the following actions:

- Actively engage in the NOAA IOCM initiative to build ties with internal and external partners and their resources to more effectively accomplish NOAA missions, to include:
 - Serving as a co-chair on the JSOST Interagency Working Group on Ocean and Coastal Mapping (IWG-OCM), ensuring effective interface between managers responsible for ocean and coastal mapping and resource management at the federal, state and local levels. Agencies participating in the IWG include NOAA (NOS, NESDIS, and NMFS), USGS, MMS, and DOD (USACE and Navy).
 - Leveraging California state mapping funds to collect multiple use data for nautical charting, habitat characterization, and other NOAA/state coastal responsibilities, and meet the state's need for data on its coastal waters

- Working with the U.S. Army Corps of Engineers JALBTCX to tailor shoreline/nearshore mapping standards, specifications and a joint National Survey Plan to collaboratively collect more data and potentially increase shoreline mapping prosecution by 30% or more
- Working with other federal agencies and academia on developing the next Coastal Zone Mapping and Imaging LIDAR (CZMIL) system.
- Exploring leverage opportunities with FEMA and state efforts to improve the nation’s baseline floodplain maps
- Participating in USACE Coastal and River Information Service (CRIS) working group with USCG and others to identify data standards and AIS uses.
- Engaging with U.S. Navy and DHS/Coast Guard to define NOAA’s role in Homeland Security mapping for port security and counter-mine measures
- Expand VDatum coverage by executing a national plan to provide 100% of total contiguous coverage of the coasts and Great Lakes by FY 2011.
- Collect GPS geodetic and ellipsoidal ties at water level stations in Alaska, Hawaii, and Puerto Rico (required information before the VDatum tool can be developed there)
- Provide datum workshops to the US Army Corps of Engineers to support the establishment of USACE national standards for referencing vertical heights to MLLW and NAVD88.
- Facilitate funding transfers from USACE for further development of the VDatum tool.
- Participate in Committee on Marine Transportation System National Strategy development, including support for increased USACE funding from the Harbor Maintenance Trust Fund (with funding potential for NOAA in future) and on coordination of activities between the agencies that affect the efficiency and safety of navigation.
- Work with the USACE to establish an approach for a consistent, authoritative, and accurate spatial data reporting system for all channels maintained by the Corps.

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|---|---|-------------------------|-----------------------------|--------------------|------------------------------------|--|
| 28% of top 175 U.S. seaports with VDatum | VDatum covering contiguous U.S.; AK; HI, territories | \$3.5M per year | 30% (58% cumulative) | \$1M | 42% of top U.S. seaports | 5% (63% cumulative) |

Recommendation 3: The HSRP recommends that NOAA expand and fully fund real-time water level and current observations, such as Physical Oceanographic Real Time Systems, or PORTS, in commercial ports, and improve positioning for heights nationwide as critical components of the Integrated Ocean Observing System (IOOS).

NOAA supports the HSRP position for the development of an integrated ocean and coastal observing system and also places a high priority on those components of IOOS that support safe and efficient maritime operations. Baseline data sets of environmental parameters that NOAA gathers, integrates and quality controls for navigation are integral to the advancement of the U.S. IOOS program. To facilitate safe and efficient marine operations (one of the seven societal IOOS goals), NOAA's marine observations enhance situational awareness and facilitate effective decision-making. NOAA's National Water Level Observation Network (NWLON), Current Observation Program, and PORTS are designed to improve navigation safety and efficiency. Authorizing language exists in the Hydrographic Services Improvement Act of 2002 requiring NOAA to fund, develop, and maintain real-time observation systems for maritime use. While funding levels do limit the program's capacity to support navigation safety and efficiency, NOAA will take the following actions:

- Optimize 25 existing NWLON stations by adding meteorological packages (wind speed/direction, air temperature, barometric pressure).
- Expand NWLON to 25 additional locations over 5 years and harden stations to withstand extreme weather events.
- Establish six additional PORTS (Pascagoula, Gulfport, New Orleans, Lake Charles, Sabine, Cherry Point).
- Add air gap sensors to NY/NJ PORTS.
- Release NY/NJ PORTS economic benefits study
- Develop initial High Frequency Radar (HFR) products for iterative testing with navigation community.
- Work with IOOS and US Army Corps of Engineers toward integration of wave data into NOAA PORTS.
- Work with US Coast Guard to conduct operational test of integration of PORTS data into Automatic Identification System.
- Collaborate with eleven states and award additional state competitive grants for Geodetic Survey and Height Modernization efforts.
- Complete the observational phase of the "high resolution snapshot" portion of the NGS Gravity Survey Plan.
- Initiate work on a socio-economic study of CORS and Gravity Survey Plan benefits to the nation.
- Initiate Gravity Field Monitoring and demonstrate validity of airborne gravity collection process through Aerogravity and Surface Observations as means to achieve national geoid to 1 cm.
- Demonstrate GNSS (GPS/GLONASS) static and orbital initial operating capability.

- Outreach expansion to 3 new Regional Height Modernization Forums, in addition to twelve state Height Modernization User Forums.
- Outreach through ten CORS/OPUS presentations as different events.

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| PORTS | 175 seaports | \$25M | 48 seaports total | \$2.8M | 127 seaports | 50 Seaports |
| NCOP | Update 130 locations annually | \$4M | 70 locations | \$1.5M | 60 locations | 70 locations |
| NWLON | 300 NWLON stations | \$32.4M | 205 NWLON stations | \$20.0M | 95 NWLON stations | 210 NWLON stations |
| Number of States participating in National Height Modernization Program each year | 50 states and territories | \$15M per year | 11 States | \$6.15M | 39 States | 16 States (Funding dependent) |
| Conduct a nationwide gravity study and subsequent development of a geoid model | Collect gravity data for 20% of the country each year for 5 years | \$39M | Complete the observational phase of the “high resolution snapshot” portion of the NGS Gravity Survey Plan | \$500K | 100% | Funding dependent |

Recommendation 4: The HSRP recommends that NOAA strengthen its Navigation Services emergency response and recovery capabilities by seeking adequate recognition and funding for its essential support functions within the federal response to all-hazard crises.

The HSRP recommendations on Navigation Services emergency response functions derive in large part from the in-depth assessment it made of NOAA’s response to the 2005 hurricanes in the Gulf of Mexico. While NOAA strives for readiness to support the Nation during incidents such as hurricanes, tsunamis, oil or chemical spills, maritime accidents, abandoned vessel searches, and any other significant incidents, the 2008 appropriation is particularly challenging for Navigation Response Teams and Oil/Hazardous Material response. Recognizing the limitations influencing its 2008 milestones, NOAA has integrated aspects of the HSRP recommendations into its FY2008 operating plan, such that it will:

- Continue coordinating with other federal agencies through the National Response Framework Essential Support Functions during incidents and afterward to review lessons learned and modify procedures accordingly.
- Continue working with Department of Homeland Security and other federal and state agencies to improve preparedness for emergency response product delivery.
- Operate 6 NRTs
- Work within and outside NOAA to develop vessel of opportunity concept for reconnaissance surveys.
- Engage with U.S. Navy and DHS/Coast Guard to define NOAA’s role in Homeland Security mapping for port security and counter-mine measures

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| Operate 6 NRTs | Operate 10 NRTs | \$5M | 6 NRTS; 13 ports validated for ENC's | \$500K | 4 NRTs | 8 NRTs |

Recommendation 5: The HSRP recommends that NOAA expand efforts to deliver its navigation products and services more quickly, and increase outreach to make navigation and non-navigation users more aware of the NOAA mapping and data resources available to them.

NOAA concurs fully with the HSRP recommendation to improve on distribution and outreach efforts. 2007 offered an excellent opportunity for outreach, given the agency’s 200th anniversary of science, service, and stewardship. NOAA Navigation Services participated fully in extensive public outreach efforts with federal, state, and local partnerships, members of Congress, constituents and stakeholders. 2008 offers the opportunity to build on the successes of 2007, such that NOAA will, within the limits of its available funding:

- Produce 40 Electronic Navigational Charts.
- Release the web-based OPUS-DB utility and other online geodetic user tools for public use.
- Initiate work on socio-economic studies of CORS and nautical charting benefits to the nation.
- Hold twelve Height Modernization User Forums, workshops or meetings, and three Regional Height Modernization Forums.
- Educate IOOS partners on the multi-use nature of navigation data and products.
- Improve Tides and Currents product delivery with customizable PORTS displays and web-based predictions (MYPORTS, E-Tides)
- Utilize the Joint Hydrographic Center to expand the constituency of multibeam echo sounding technology beyond traditional nautical charting applications through seminars and an Integrated Ocean and Coastal Mapping data processing center to convert hydrographic survey data into products for other users, and conversely to process mapping data from other sources into useful charting products.

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| 601 Electronic Navigational Charts | 1000 paper-chart comparable ENC's | \$6M | 40 | \$3.6M | 400 ENC's | \$6.35M; 741 ENC's |