

HYDROGRAPHIC SERVICES REVIEW PANEL

A federal advisory committee, advising the NOAA Administrator

Charting the U.S. Maritime Arctic

ISSUE AND STATUS

Globalization and climate change are causing extraordinary impacts on the maritime Arctic in the early 21st century. For the U.S. maritime Arctic, the increases in marine accessibility, driven by Arctic sea ice retreat, mean longer ice-free seasons, potentially longer seasons of navigation, and increasing marine operations. One of the nation's strategic challenges is the lack of maritime infrastructure in most of the region north of the Aleutian Islands and throughout the U.S. Exclusive Economic Zone. Greatly expanded hydrography and charting, and increased geodetic and oceanographic observations, are critical to this frontier region.

The U.S. Arctic gained attention during President Obama's 2015 visit to Alaska. He was the first president to travel above the Arctic Circle, and he spoke about infrastructure needs in the U.S. Arctic to enhance safety and security – including requirements for mapping and charting. A White House Fact Sheet proposed new investments including coastal instrumentation for monitoring to enable safe marine operations and transportation.

CHALLENGES

Only an estimated 4.1% of the U.S. maritime Arctic is charted to modern international navigation standards, posing significant safety issues for Arctic marine operations.

The vastness, remoteness and seasonal ice conditions of the U.S. maritime Arctic force shorter hydrographic survey seasons and present unique mobilization and cost challenges for NOAA's survey operations.

One cannot compare the surveying and charting needs of this frontier region to other U.S. maritime regions such as the East, West, and Gulf coasts that have both a long history of survey work and strong political support. Nor can one easily compare the current economic viability of other U.S. ports and harbors with the Arctic's potential long-term strategic and economic benefits.



Comparison of Alaska navigationally significant areas to rest of nation. Credit: NOAA

A key challenge is to prioritize requirements for diverse marine operations and uses in the U.S. maritime Arctic:

- Summer supply operations to coastal communities and Prudhoe Bay/North Slope (seasonal tug-barge operations)
- Federal offshore lease sites
- Approaches to the Red Dog Mine complex at Kivalina for international shipping (bulk carriers with zinc ore)
- Bering Sea fisheries
- Navy and Coast Guard operations
- Federal law enforcement operations
- Establishing transit routes
- Seabed telecommunications cables
- Eco-tourism
- Emerging coastal ports
- Identification of places of refuge



MORE CHALLENGES

There is inadequate fundamental geospatial and oceanographic infrastructure to support nautical charting and accurate positioning services along the coasts of the Chukchi and Beaufort Seas. This includes gaps in geodetic coverage, tides and currents, hydrographic surveys and shoreline mapping – the basic building blocks of an accurate nautical chart.

It is difficult to establish a minimum annual Arctic survey rate, using current and future budget levels, given the uncertainties of the length of the ice-free navigation season, changing use priorities, and funding levels.

Funding limitations in the Offices of Coast Survey and National Geodetic Survey have held back more contract survey data in Alaska by commercial surveyors.

With a range of newly developed hydrographic survey technologies and tools, one challenge is to employ alternative acquisition strategies to the current approach of full bottom sonar coverage.

RECOMMENDATIONS FOR NOAA ACTION

- Establish a congressional line item in the NOAA budget (annual minimum \$30M) for Arctic hydrography, charting, and associated geodetic and oceanographic observations, consistent with the National Strategy for the Arctic Region.
- Fund replacement of the Nation's only federal hydrographic ships that are capable of conducting Arctic survey operations.
- Use the interagency process to identify national security requirements for enhanced hydrography and charting of the changing U.S. maritime Arctic.
- Identify places of refuge and deep draft ports within the entire U.S. maritime Arctic using an interagency process, such as through the U.S. Committee on the Marine Transportation System and in consultation with State of Alaska and local interests.
- Make hydrography and charting of the U.S. maritime Arctic among the highest priorities in NOAA's internal Arctic Strategy, for execution consistent with U.S. Arctic strategies and implementation plans.
- Plan and fund an average annual survey rate of 1000 square nautical miles based on expanded surveying of marine corridors, port approaches and refuge areas.
- Continue working closely with the U.S. Coast Guard on surveying and charting select marine corridors through the Bering Strait region and other Alaskan coastal regions where feasible.
- Improve access to the National Spatial Reference System and fundamental oceanographic data on tides and currents in the U.S. maritime Arctic. Fill identified gaps in tide gauges and co-located Continuously Operating Reference Stations that are critical to environmental observation and surveying this frontier region.
- Further explore potential private sector partnerships for bathymetric information, especially working with commercial marine firms that operate routinely in summer to coastal communities and the North Slope.
- Take the lead to identify a method and database to definitively measure, age, and categorize seabed ice gouging in the region (in advance of seabed cable laying), perhaps as a cross-agency initiative with USGS and USACE.
- Include private sector partnerships.

Partners include: U.S. Coast Guard; U.S. Geological Survey; U.S. Army Corps of Engineers; Naval Oceanographic Office; State of Alaska; University of Alaska Fairbanks (operator of the Polar R/V Sikuliaq); commercial survey companies; Alaska's coastal communities; Alaska Native regional corporations; Marine Exchange of Alaska; commercial tug and barge operators; Red Dog Mine; fishing industry; and others.

In October 2003, Secretary of Commerce Don Evans established the Hydrographic Services Review Panel as directed by the Hydrographic Services Improvement Act of 2002, Public Law 107-372. Panel members, appointed by the NOAA Administrator, include a diverse field of experts.

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