

**THE FAST-CHANGING ARCTIC:  
RETHINKING ARCTIC SECURITY  
FOR A WARMER WORLD**  
Edited by Barry Scott Zellen

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# 1. The Fast-Changing Maritime Arctic<sup>1</sup>

*Lawson W. Brigham*

The maritime Arctic continues to experience a steady pace of development and expansion of marine operations. In recent times, a record number of vessels have transited the Northwest Passage, and several milestone operations have occurred in the Russian Arctic. Affecting all commercial and naval operations, and of particular importance to planners of future ventures, is the recently observed decline of the Arctic Ocean's sea-ice cover, as well as its year-to-year variability. While this historic retreat and climate-change impacts on the Arctic received global attention, the realities of the region's natural-resource development and greater commercial use have gained higher profiles in political discussions.

## **Sea Ice Changes**

NASA researchers and the National Snow and Ice Data Center, University of Colorado at Boulder, reported that the area of the Arctic Ocean covered by sea ice on September 12, 2009, was the third lowest since satellite measurements began in 1979. While this area was larger than the record minimum coverage observed in 2007 and the minimum area for 2008, it represents one of the smallest areas on record. Arctic sea-ice coverage has declined by nearly 12 per cent each of the past three decades, for a remarkable total decrease of 34 per cent.<sup>2</sup>

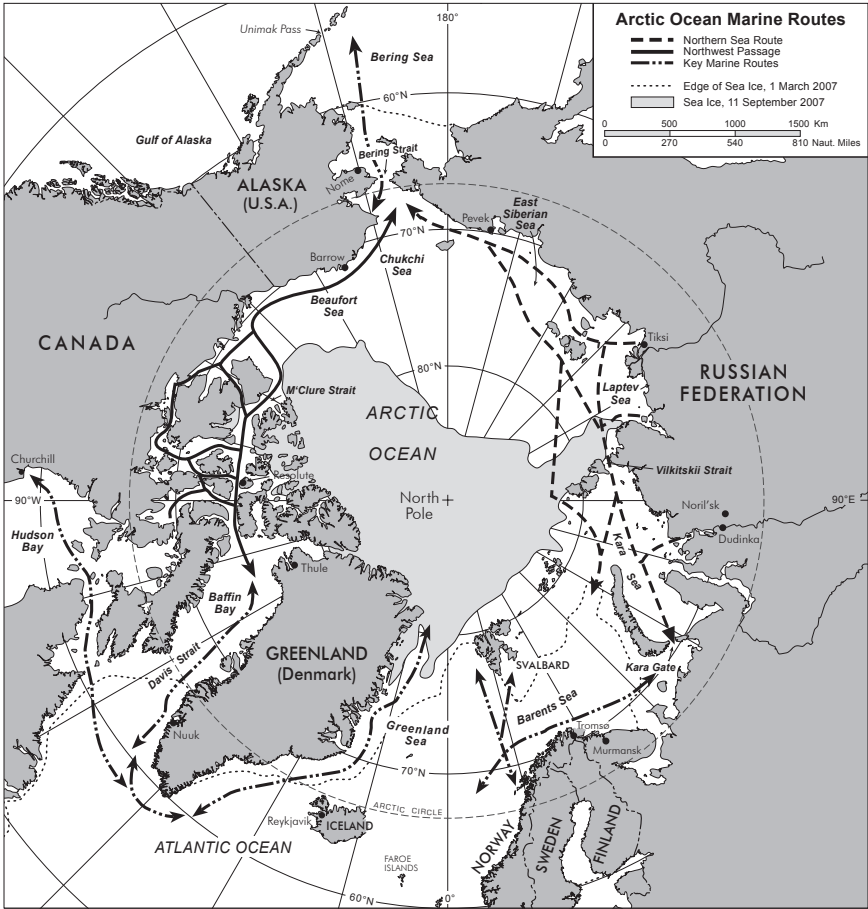


FIG. 1. ARCTIC OCEAN MARINE ROUTES.

Despite this extraordinary change in coverage and observed thinning of sea ice (estimated from recent satellite measurements compared with declassified sonar measurements from U.S. Navy submarines), much of the Arctic Ocean today remains fully or partially ice-covered for most of the year. This is a significant factor when considering new regulatory requirements for polar-class ships and potential operational restrictions for non-icecapable naval and commercial ships.

Much speculation has also continued about what year the entire Arctic Ocean might be essentially ice-free for a short period in summer. It is

plausible that this could happen by 2030, according to recent simulations of sea-ice models driven by global climate change. From a practical maritime perspective, the significance of this physical change in the Arctic Ocean will be the disappearance of multiyear ice, ice that survives the summer melt for one year or longer. It is this older sea ice that is more difficult to break, and its presence makes it more challenging to operate in the Arctic offshore. Its potential disappearance could in future decades make this ocean significantly more navigable.

## Increasing Activity

During August and September 2009, two German merchant ships, the heavy-lift vessels *Beluga Fraternity* and *Beluga Foresight*, sailed from Ulsan, Korea, to the Atlantic Ocean along the northern coast of Eurasia. The voyages captured global media attention and represent a significant new maritime linkage of Asian suppliers to the Russian Arctic. The primary task of the two ice-strengthened ships (built in 2008) was to deliver forty-four heavy plant modules to barges on the Ob River in western Siberia; additional cargo was reported to have been carried in October from Archangel, on the White Sea, to Nigeria.<sup>3</sup>

Along the Northern Sea Route, defined in Russian law as the sailing routes between Bering Strait west to Kara Gate at the southern end of Novaya Zemlya, ice conditions were very light. However, convoy escort was still provided by the Russian nuclear-powered icebreakers *50 Let Pobedy* and *Rossiya*. Significantly, details of the fees paid for the icebreaker escort services and Russian pilots were not reported. Earlier in the summer, the *50 Let Pobedy* carried tourists on two voyages to the North Pole.

Sweden's non-nuclear-powered icebreaker *Oden*, on a scientific voyage, also reached the Pole on August 23, its sixth visit there since 1991. The ship conducted scientific operations north of Greenland along the Lomonosov Ridge, July 31 through September 10, for the Danish Continental Shelf Project and the Swedish Polar Research Secretariat.

Two year-round Arctic marine transportation systems were fully operational during 2009 in the Barents and Kara seas. Three icebreaking tankers operated by Sovcomflot shuttled oil from the offshore Varendey terminal in the Pechora Sea to Murmansk. A five-ship fleet of new icebreaking

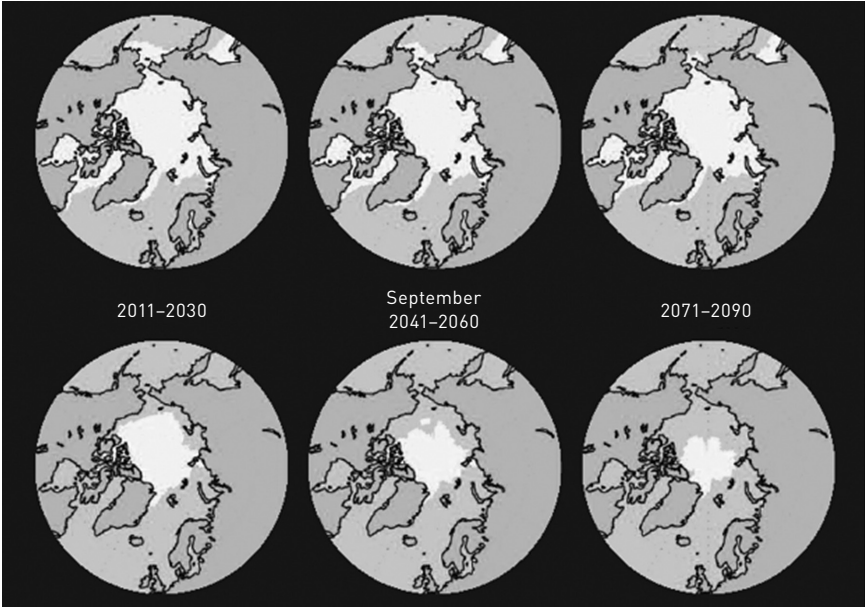


FIG. 2. PROJECTED SEA-ICE EXTENT FROM 2004 ARCTIC CLIMATE IMPACT ASSESSMENT. IN 2004, THE ARCTIC CLIMATE IMPACT ASSESSMENT PROJECTED THAT YEAR-ROUND SEA ICE COULD DISAPPEAR BY CENTURY'S END. SOME EXPERTS NOW BELIEVE THIS COULD HAPPEN AS EARLY AS 2030, IF NOT SOONER, MAKING THE ARCTIC OCEAN SIGNIFICANTLY MORE NAVIGABLE. (SOURCE: ARCTIC CLIMATE IMPACT ASSESSMENT.)

containerships carried nickel plates from the port of Dudinka on the Yenisey River (it services the mining and smelting complex in Norilsk) to Murmansk, an operation that has been year-round for three decades. The commercial ice-breaking ships used in both of these systems are designed to operate without icebreaker escort. The year 2009 also marked the fiftieth anniversary of the operation of the first nuclear-powered surface ship, Russia's icebreaker *Lenin*, now a museum ship in Murmansk.

In the Canadian Arctic, thirteen vessels – eleven yachts and two ice-strengthened tour ships, the Bahamian-flagged *Bremen* and *Hanseatic* – sailed the routes of the Northwest Passage in east and west directions between the Pacific and Atlantic oceans. Of the 135 full transits of the various routes of the Passage since Roald Amundsen's historic voyage in 1903–6 (60 voyages since 2000), the thirteen vessels represent the highest number of full transits in a single summer season.<sup>4</sup>

Three notable scientific expeditions were conducted in the central Arctic Ocean, two of which were primarily related to gathering data to support the extended continental shelf claims of several Arctic nations. The *Oden's* voyage for Denmark and Sweden is described previously. Additionally, the U.S.–Canada Arctic Continental Shelf Survey was conducted August 7 to September 16, 2009, using the U.S. Coast Guard icebreaker *Healy* (WAGB-20) and Canadian Coast Guard icebreaker *Louis S. St-Laurent*, operating in and near Canada Basin within the central Arctic Ocean.

And the Russian research vessel Professor Khromov was used to support a joint Russia–U.S. expedition named the Russian–American Long-term Census of the Arctic. The National Oceanic and Atmospheric Administration and Russian Academy of Sciences team collected oceanographic data and conducted biological surveys in the East Siberian and Chukchi seas as far north as 70 degrees. The bilateral nature of these three operations in the Arctic Ocean shows the levels of successful international collaboration that can be achieved today in Arctic science and affairs.

## **Agreements and Cooperation**

At the April 29, 2009, Arctic Council Ministerial Meeting in Tromsø, Norway, the Arctic Marine Shipping Assessment 2009 Report (AMSA) was approved and released. This comprehensive study outlines a framework for protecting the region's people and marine environment. Led by Canada, Finland, and the United States since 2005 under the council's working group on Protection of the Arctic Marine Environment, AMSA focuses on marine safety and environmental protection.

The assessment can now be considered a baseline (relying on a historic snapshot of Arctic marine activity collected for 2004), a strategic guide for many stakeholders involved in future uses of this ocean, and a policy document of the Arctic Council. The report was negotiated and represents a consensus document of the eight Arctic states. AMSA reaffirms the Arctic state view that the United Nations Convention on the Law of the Sea (UNCLOS) remains the legal framework that influences and guides current and future governance of the Arctic Ocean. AMSA also acknowledges that the International Maritime Organization (IMO) is the lead and appropriate UN body that can

**ARCTIC MARINE SHIPPING ASSESSMENT 2009 REPORT,  
SELECTED RECOMMENDATIONS**

- Develop a comprehensive, multination Arctic SAR agreement.
- Update and mandatorily apply relevant parts of IMO's Guidelines for Ships Operating in Arctic Ice-Covered Waters.
- Augment global IMO ship safety and pollution prevention conventions with specific mandatory Arctic requirements or other provisions for ship construction, design, equipment, crewing, training, and operations.
- Explore the possible harmonization of Arctic marine shipping regulatory regimes, including measures to protect the central Arctic Ocean, consistent with UNCLOS.
- Consider surveys of indigenous Arctic marine use.
- Identify areas of heightened ecological and cultural significance, and explore the need for specially designated marine areas for environmental protection.
- Increase cooperation in oil spill prevention and continue to develop circumpolar pollution response capabilities.
- Continue to develop a comprehensive marine traffic awareness system to improve monitoring and tracking of marine activity, enhance data sharing in near real-time, and augment vessel management services.
- Engage Arctic states with relevant international organizations to further assess the effects on marine mammals of ship noise, disturbance, and ship strikes in Arctic waters.
- Invest in hydrographic, meteorological, and oceanographic data in support of safe navigation and voyage planning in Arctic waters in Ilulissat, where a declaration was signed reaffirming the importance of UNCLOS as the legal framework for addressing issues in the Arctic Ocean.

focus on marine-safety and environmental-protection measures for the global maritime industry, including operations in the Arctic.

The study also, importantly, included the concerns and perspectives of the region's indigenous residents. One of the key AMSA findings noted as a serious concern was the lack of basic marine infrastructure in the Arctic (such as charts, communications, search and rescue, ports, salvage, environmental response, and more), except for the Norwegian coast and coastal northwest Russia. A number of the AMSA recommendations (see box) show the breadth of issues addressed by this study and its clear message by the Arctic Council to the global community.

The council also approved formation of a task force to address the development of an Arctic search and rescue agreement. The U.S. Coast Guard and Department of State hosted the first meeting of this task force in December 2009 to begin the process. During the year, IMO held significant discussions on Arctic marine safety. The organization developed a plan for ship-construction standards and ice-navigator qualifications to be implemented as early as 2014. The Swedish shipping company Rederi AB TransAtlantic formed an International Ice Advisory Board, a group of ice-navigation experts, to facilitate the dialogue and dissemination of operation information to global maritime interests. Meetings of the Ice Board have been held in Lulea and Kalmar, two of Sweden's coastal cities.

## **Diplomacy and Strategic Interests**

Canada has received media attention recently for publishing new rules regulating domestic and foreign ship traffic in Arctic waters. The plan calls for a new Northern Canada Vessel Traffic Services Zone that would require registration of ships 300 tons or greater, tugs with a two-ship tonnage of 500 tons or more, and any vessel carrying dangerous goods or potential pollutants.

The announcement of the new regulations noted that the rules were "consistent with international law regarding ice-covered areas," in reference to Arctic 234 of UNCLOS. This allows coastal states to adopt and enforce non-discriminatory regulations for the prevention, reduction, and control of marine pollution in ice-covered waters within the exclusive economic zone.

There have been few reports on the status of Canada's planned army training center in Resolute and refurbishment of a deepwater port in Nanisivik.



Both Arctic facilities were announced in August 2007 by Prime Minister Stephen Harper as measures to boost Canada's sovereignty in the region. The Arctic/Offshore Patrol Ship project (six to eight ice-capable, armed patrol ships), announced in 2007, continues with a planned first ship delivery in 2014.

Canada also held a second ministerial meeting of the five Arctic Ocean coastal states (Canada, Denmark, Norway, Russia, and the United States, which border the Arctic Ocean) on March 29, 2010. Discussions were held on the need for deepening cooperation as seabed claims are submitted, and the importance of addressing the many challenges of greater Arctic Ocean accessibility.<sup>5</sup> Concern was expressed outside and within the group that missing from the meeting were Iceland, Finland, Sweden, and representatives of the Arctic's indigenous peoples. Denmark had hosted the first meeting of this group in May 2008.

In October 2009, the United States took action in closing off more than 150,000 square nautical miles of U.S. Arctic waters (north of Bering Strait in the Chukchi and Beaufort seas) to commercial fishing. U.S. Commerce Secretary Gary Locke, who has authority over North Pacific Fisheries Management Council decisions, noted that this was a precautionary measure pending further study of the region, which is undergoing significant Arctic environmental change.<sup>6</sup> One of the diplomatic complications of this closure is that among the areas in which the United States suspended fishing is the disputed zone in the Beaufort Sea, which is on the border with Canada. In November 2009 Vice Chief of Naval Operations Admiral Jonathan W. Greenert released to the public a U.S. Navy Arctic Roadmap, a thirty-three-page strategic plan developed by the Navy's Task Force Climate Change and led by Oceanographer of the Navy Rear Admiral David Titley. This roadmap notes the changing Arctic environment and focuses on several objectives, including the development of strong cooperative partnerships, assessing fleet readiness and mission requirements, and improving environmental prediction in the region.

Soon after this Navy initiative, Senator Lisa Murkowski (R-AK) and Congressman Don Young (R-AK) submitted bills to study the possibility of building a deepwater port in the U.S. Arctic. Issues to be assessed include the location and strategic capabilities for such a port. Replacement of the aging Polar-class icebreakers and continued lack of coastal icebreaking assets in the

U.S Arctic remain challenging tasks, given the ongoing replacement of U.S. Coast Guard cutters and aircraft in the lengthy Deepwater program.

The Stockholm International Peace Research Institute's March 2010 release of a report titled *China Prepares for an Ice-free Arctic* received global media attention. This report reviews China's expanding polar research capabilities, describes its commercial interests in summertime trans-Arctic voyages, and comments on the nation's diverse views on engagement with the Arctic states.<sup>7</sup> Many others see China's real interests in terms of access to the region's immense natural-resource wealth.

The Arctic has been a strategic waterway for submarines during the past half-century, a legacy that continues. In March 2009 an ice exercise was held in the central Arctic Ocean involving the USS *Annapolis* (SSN-760) and USS *Helena* (SSN-725). Less well known is the number of surface ships that have voyaged to the North Pole and crossed the Arctic Ocean.

There have been eighty icebreaker voyages to the North Pole during 1977–2009, twenty in support of science and the remaining sixty for marine tourism on board Russian icebreakers. Icebreakers from Sweden, Germany, the United States, Canada, and Norway have also reached the North Pole. Only one was not conducted during the summer season, when the sea ice is at its minimal extent and thickness. The voyages' dates indicate a short summer navigation season of ten weeks (July through mid-September).

The first surface ship to reach the North Pole was the Soviet nuclear-powered icebreaker *Arktika* on August 17, 1977. The ship sailed along a track from Murmansk east to the Laptev Sea and then north to the Pole. She returned on a direct route to homeport. The distance covered was 3,852 nautical miles, sailed in fourteen days at a remarkable speed of 11.5 knots.<sup>8</sup>

The Soviet icebreaker *Sibir* reached the North Pole on May 25, 1987, navigating in near-maximum thickness of Arctic sea ice. This ship rescued personnel from the Soviet North Pole Drift Station 27 and also established the new Drift Station 29 in the northern Laptev Sea, during a demanding voyage in the central Arctic Ocean from May 8 to June 19, 1987.<sup>9</sup>

Seven of the voyages that reached the North Pole were also trans-Arctic, or complete crossings of the ocean for tourism and scientific research: In August 1991, the Soviet nuclear icebreaker *Sovetskiy Soyuz* carried tourists across the central Arctic Ocean. During July and August, 1994, the Canadian Coast Guard's *Louis S. St-Laurent* and U.S. Coast Guard's *Polar Sea* (WAGB-11) conducted the first scientific transect of the Arctic Ocean by

surface ship. The icebreakers sailed from Bering Strait to the North Pole and out of the Arctic through Fram Strait (between Greenland and Svalbard), a voyage of some 2,200 nautical miles directly across the central Arctic Ocean. The Russian nuclear-powered icebreaker *Yamal* sailed on two trans-Arctic voyages with tourists during the summer of 1996. And a second scientific transect of the Arctic Ocean by icebreaker was accomplished in summer 2005 by Sweden's *Oden* and the U.S. Coast Guard's *Healy*.

These trans-Arctic voyages indicate that marine access throughout the entire Arctic Ocean in summer has been achieved by highly capable nuclear- and non-nuclear-powered polar icebreakers.

## Continuing Operations

Shell Oil should gain approval to conduct drilling on its lease sites on the seabed of the Chukchi Sea, off northwest Alaska. Operations during summer 2012 in this relatively remote region will require a sizable fleet of on-scene icebreakers and support vessels. Cairn Energy, which commenced drilling off Greenland's west coast near Disko Island in 2010 and 2011, is poised to drill again in 2012. A 60,000-ton drillship, the UK-flag *Stena Forth*, was chartered to conduct these challenging offshore operations. Built in Korea, the ship and an ice-management team of icebreakers have contended with drifting icebergs in this operational area of Baffin Bay.<sup>10</sup> Finding substantial oil or gas at one or both of the lease sites will generate significant international interest and potential Arctic investment.

In addition to offshore drilling, experimental voyages along Russia's Northern Sea Route will continue during summer 2012. Sovcomflot, Russia's largest shipping company, has indicated plans for 2012 to conduct continued experimental voyages of an oil tanker sailing from the Varendey offshore terminal east along the Northern Sea Route to Asia.<sup>11</sup> One of Sovcomflot's 70,000-deadweight-ton shuttle tankers normally carrying oil to Murmansk will be used for these international voyages.<sup>12</sup> Trial voyages of liquid natural gas ships from western Siberia to Asia may also occur.

The technical and operational challenges posed by these voyages have been known for some time and largely overcome in recent years. However, what remains unclear is the overall economic viability of such Arctic voyages, given the costs of icebreaker escort, whether necessary for passage or not, as

well as other service fees along the route. These voyages are primary examples of future linkages of Russian Arctic natural resources to global markets. Further, this flurry of marine activity is indicative of continued investment in Arctic marine operations despite the current global economic situation.

Globalization, climate change, and geopolitics continue to shape the future of the maritime Arctic. International bodies such as the Arctic Council and International Maritime Organization have awakened to the urgent need to protect Arctic people and the marine environment. They must also address the key issue of inadequate marine infrastructure in much of the region. Many wildcard issues remain to play out, such as the future of Greenland, strategic interests of new stakeholders, future oil and gas discoveries, the plausible loss of multiyear Arctic sea ice, emerging seasonal shipping routes, and much more. Nevertheless, one thing is certain: The Arctic Ocean will be a busier and more complex place.

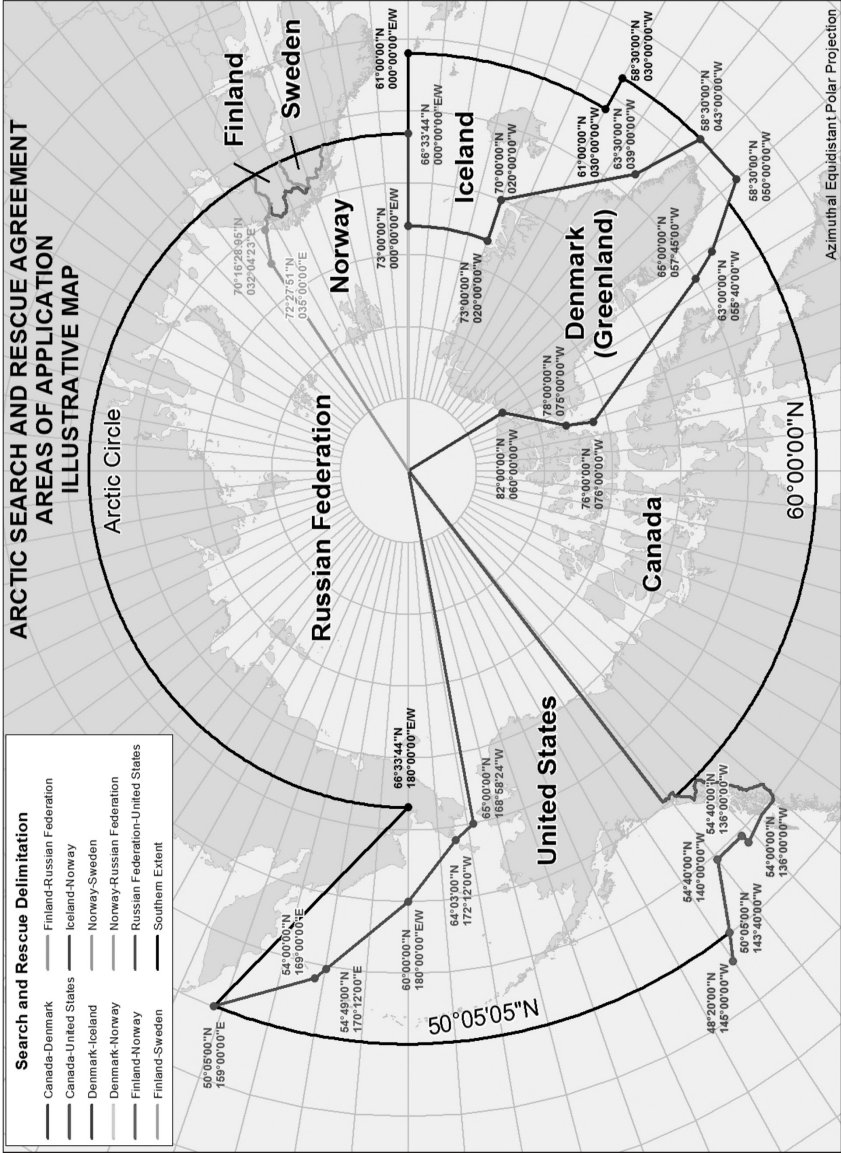
## **U.S. Coast Guard Must Enhance its Polar Roles in a Fast-Changing Arctic<sup>13</sup>**

The U.S. Coast Guard led the U.S. delegation during the negotiations of new Arctic search-and-rescue (SAR) agreement among the eight Arctic states that was signed in May 2011. Coast Guard experts have also been members of delegations addressing Antarctic SAR and tourism. These are excellent and appropriate initiatives, given the service's federal responsibilities in maritime SAR and safety in both polar regions.

But the timely actions are not enough. The Coast Guard must be more proactive and engaged to ensure that our many polar maritime interests are given proper attention. Importantly, what needs to be accomplished does not need to be directly linked to the justification and acquisition of polar icebreakers. The following modest plan would energize and enhance the service's key roles in polar affairs:

- *Arctic Council Involvement:* The Coast Guard must be a regular member of the U.S. delegation to the Arctic Council to provide broad maritime expertise. This intergovernmental forum is an evolving policy body that will continue to address emerging marine issues.

FIG. 3. ARCTIC SEARCH AND RESCUE AGREEMENT AND RESCUE AGREEMENT AREAS OF APPLICATION.



- *Arctic Emergencies Forum:* The Coast Guard should assume the role of U.S. representative to the Arctic Council's working group on Emergency Prevention, Preparedness, and Response, now chaired by the United States. Officials at the Department of Energy staff both the chair and a lead U.S. representative position. The Coast Guard can contribute maritime expertise, particularly in marine-pollution response.
- *Arctic Ocean Protection:* The service must be a regular member of the U.S. delegation to the Arctic Council's working group on Protection of the Arctic Marine Environment, which conducts assessments and drafts policy strategies for the Arctic ministers. The Arctic Marine Shipping Assessment (AMSA) was conducted under its auspices, and Coast Guard experts contributed extensively to the study. An Arctic Ocean Review is ongoing in the group, and the Coast Guard must participate in its development.
- *AMSA Implementation Plan:* AMSA was released in 2009, and the Coast Guard has smartly developed an internal tracking system to facilitate implementation of its seventeen recommendations. A publicly released implementation plan would be an important next step, similar to the U.S. Navy Arctic Roadmap of late 2009 and NOAA's Arctic Vision and Strategy to be released later in 2010.
- *U.S. Delegation to the International Maritime Organization (IMO):* The Coast Guard should strengthen the polar maritime expertise of the U.S. delegation to the IMO, which it leads. The IMO is developing a mandatory code for polar ships and is beginning to address safety and environmental protection issues unique to the Arctic. This requires new expertise in polar operations and ship design.
- *Polar Code Implementation:* A mandatory IMO polar code could be fully developed by 2014; included will be sections on safety equipment, ice-navigator standards, polar ship-construction standards, and more. The Coast Guard

should draft regulations and develop an implementation strategy for applying the polar code in U.S. Arctic waters.

- *Ice-Operations Capacity in the U.S. Arctic:* The Coast Guard has no ice-capable ships that can operate in the shallow, ice-covered coastal waters of Alaska (where deep-draft polar icebreakers cannot operate) or in deeper ice-covered waters when polar icebreakers are unavailable. An ongoing Arctic mission analysis should yield requirements to fill this gap in federal maritime capability in terms of enforcement and security. Ice-capable, multimission buoy tenders may be one answer, but more options need to be explored.
- *Antarctic Treaty Delegations:* The Coast Guard should be a regular member of the U.S. delegation to the annual Antarctic Treaty consultative meetings, and of working groups, especially when issues related to marine operations and marine tourism are discussed.
- *Arctic Oil-Spill Experts Group:* In the wake of BP's massive 2010 Gulf oil spill, the service should consider establishing a group of experts to review the issues and research needs for responding to an Arctic marine oil spill.
- *Future Polar Marine Operations:* The service should sponsor and engage fully in technical and operational forums to discuss the future of polar marine operations, including offshore development, fishing, marine tourism, commercial ship voyaging, and infrastructure needs.

These suggested tasks are not onerous or expensive. However, they are crucial to furthering U.S. interests in the polar regions. And being more engaged can surely be beneficial in arguing the nation's future polar icebreaker needs. The Coast Guard has the responsibility and the professional polar expertise to engage actively in these pursuits, and all of us expect no less.

## Notes

- 1 Reprinted, with permission, from “The Fast-Changing Maritime Arctic,” *Proceedings* 136, no. 5 (2010): 54–59. Copyright 2010, U.S. Naval Institute, [www.usni.org](http://www.usni.org).
- 2 “Arctic Sea Ice Extent Is Third Lowest on Record,” NASA, October 6, 2009; [http://www.nasa.gov/topics/earth/features/seaicemin09\\_prt.htm](http://www.nasa.gov/topics/earth/features/seaicemin09_prt.htm). In 2012, Arctic Ocean sea ice retreated even further to its lowest observed level. As NOAA’s 2012 Arctic Report Card observed: “Based on estimates produced by the National Snow and Ice Data Center, on September 16, 2012 the sea ice cover reached its minimum extent for the year of 3.41 million km<sup>2</sup>. This was the lowest in the satellite record; 18% lower than in 2007, when the previous record of 4.17 million km<sup>2</sup> was recorded. Overall, this year’s minimum was 3.29 million km<sup>2</sup> (49%) below the 1979–2000 average minimum of 6.71 million km<sup>2</sup>. The last six years, 2007–2012, have the six lowest minimum extents since satellite observations began in 1979.” See: D. Perovich, W. Meier, M. Tschudi, S. Gerland, and J. Richter-Menge, “Sea Ice,” Arctic Report Card: Update for 2012, National Oceanic and Atmospheric Administration (NOAA), December 3, 2012, [www.arctic.noaa.gov/reportcard/sea-ice.html](http://www.arctic.noaa.gov/reportcard/sea-ice.html).
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- 5 Minister of Foreign Affairs of Canada, Chair’s Summary of March 29, 2010, Arctic Ocean Foreign Ministers meeting.
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- 11 Sovcomflot press release, December 26, 2009, “Sovcomflot President and CEO Sergey Frank Meets with Prime Minister Vladimir Putin.”
- 12 Lloyd’s List, February 23, 2010, “SCF to test Northern Sea Route.”
- 13 “The Coast Guard Must Enhance Its Polar Roles,” is reproduced from the “Nobody Asked Me But . . .” column in *Proceedings* 136/8/1290 (August 2010): 290.



