THE FAST-CHANGING MARITIME ARCTIC

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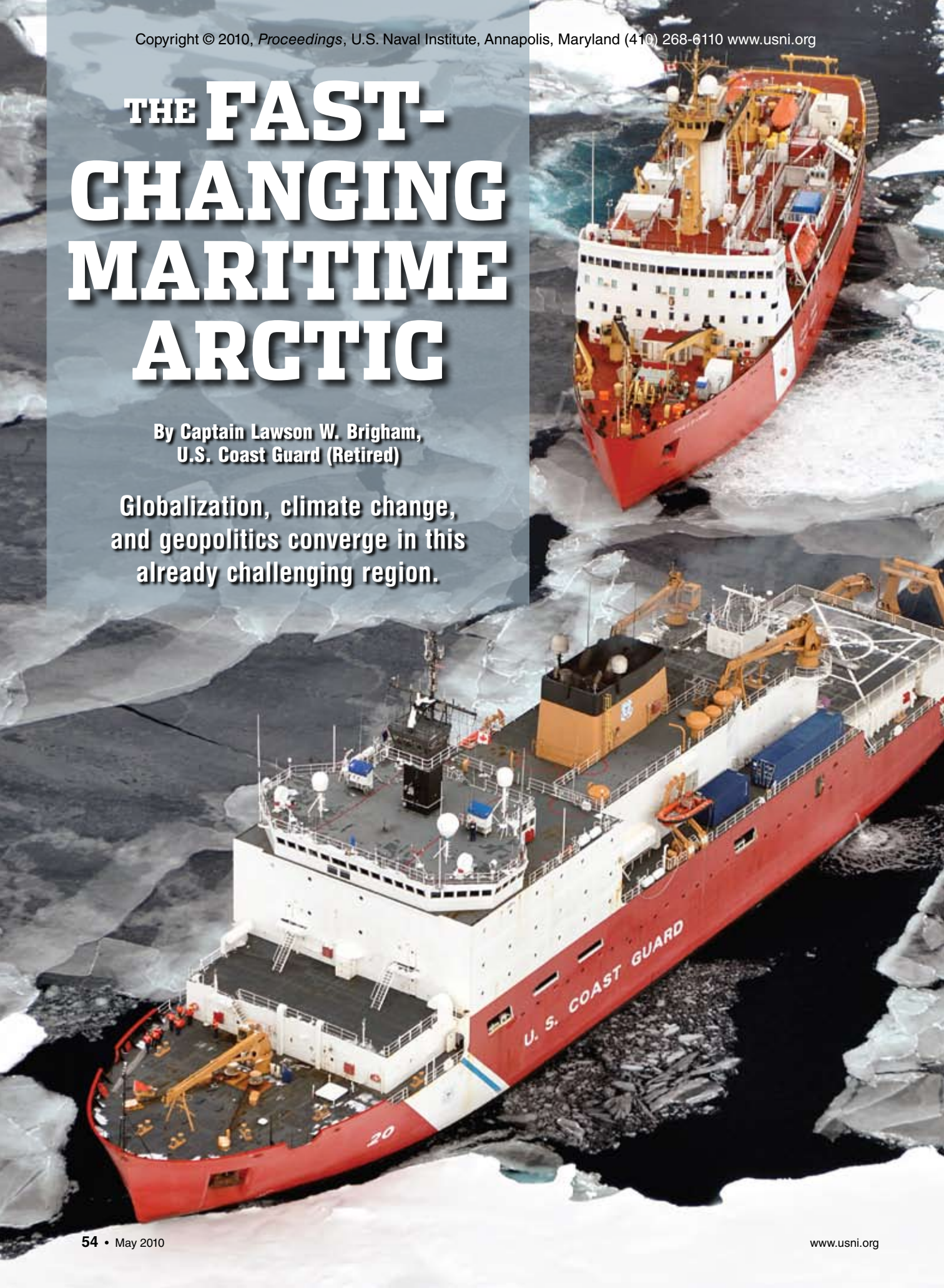
Globalization, climate change, and geopolitics converge in this already challenging region.



U.S. COAST GUARD (PATRICK KELLEY)

In 2009, the U.S. Coast Guard icebreaker *Healy* (WAGB-20, front) and Canadian Coast Guard icebreaker *Louis S. St-Laurent* participated in a multi-year, multi-agency survey to help define the Arctic continental shelf.

The maritime Arctic continues to experience a steady pace of development and expansion of marine operations. During the past year, a record number of vessels transited the Northwest Passage, and several milestone operations occurred in the Russian Arctic. Affecting all commercial and naval operations, and of particular importance to planners of future ventures, is the recent 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 12 September 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 percent each of the past three decades, for a remarkable total decrease of 34 percent.[1]

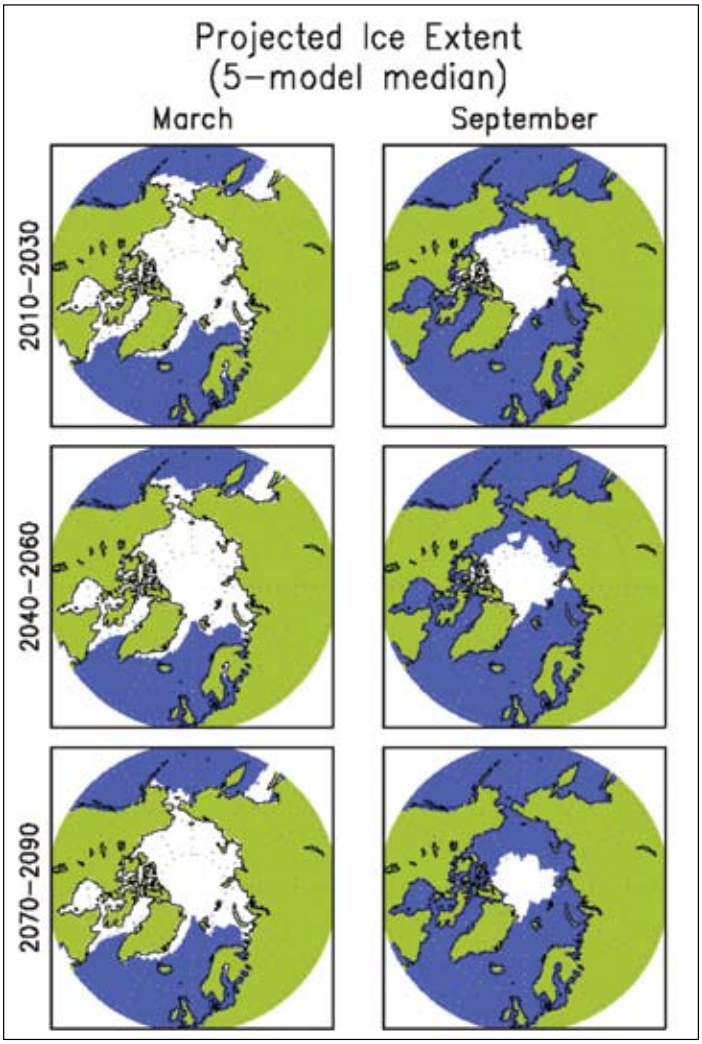
Despite this extraordinary change in coverage and observed thinning of sea ice (estimated from recent satellite measurements compared with declassified sonar measurements from U.S. Navy submarines), much of the Arctic Ocean today remains fully or partially ice-covered for most of the year. This is a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

A Year of Increased 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 44 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.[2]

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



In 2004, the Arctic Climate Impact Assessment projected that year-round sea ice could disappear by the century's end. It is now clear that for a short period in summer, this could happen as early as 2030, making the ocean significantly more navigable.

ISTOCKPHOTO

With sea ice melting and the polar lifestyle threatened, the Arctic Council and International Maritime Organization are studying ways to protect the region's people (Inuit village, above; population distribution, right) and environment.

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 23 August, its sixth visit there since 1991. The ship conducted scientific operations north of Greenland along the Lomonosov Ridge, 31 July though 10 September, 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 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 icebreaking ships used in both of these systems are designed to operate without icebreaker escort. The year 2009 also marked the 50th 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, 13 vessels—11 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 1903–06 (60 voyages since 2000), the 13 vessels represent the highest number of full transits in a single summer season.[3]

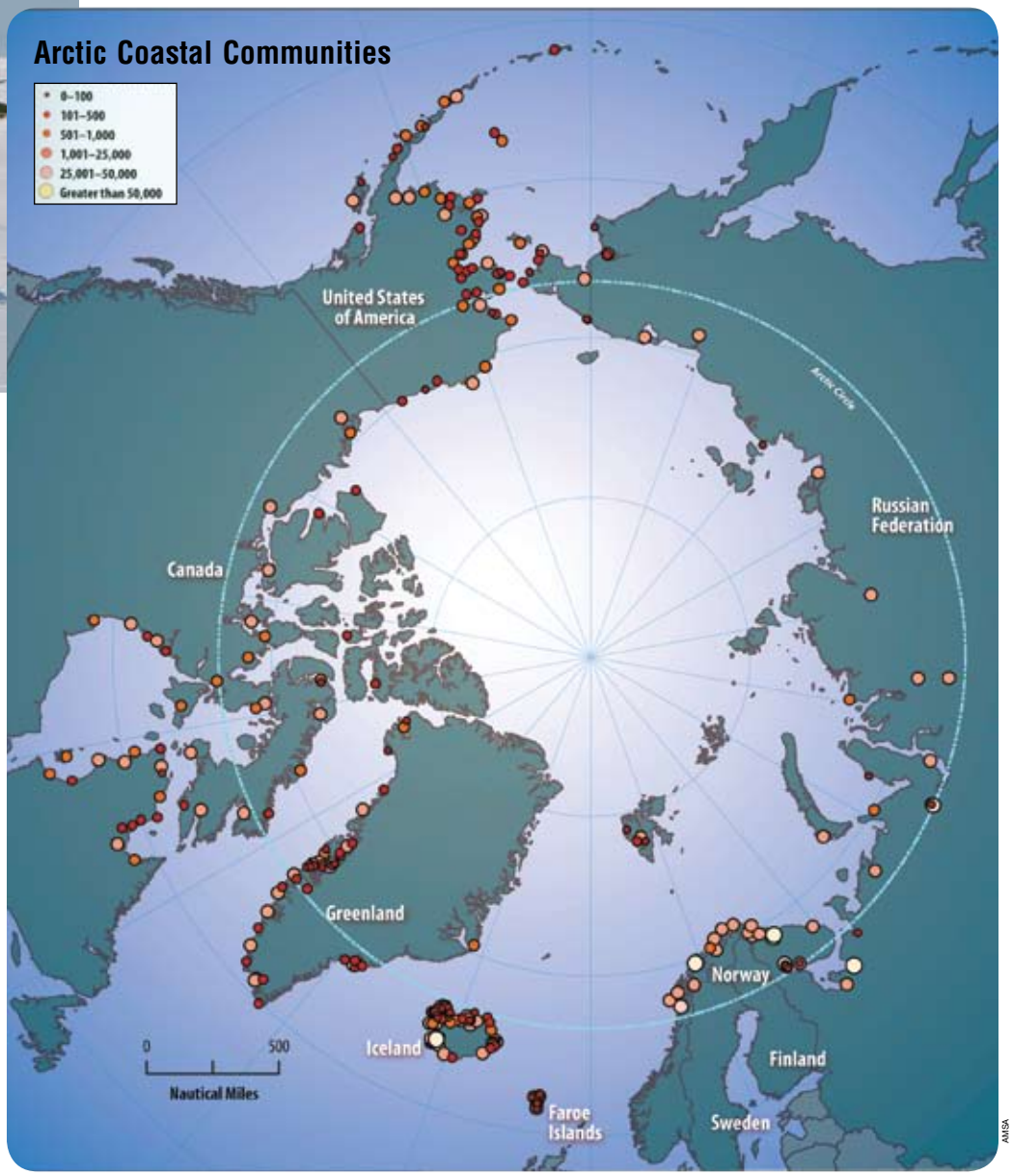
Three notable scientific expeditions were conducted in the central Arctic Ocean, two of which were primarily related to gathering data to support the extended continental shelf claims of several Arctic nations. The *Oden*'s voyage for Denmark and Sweden is described previously. Additionally, the U.S.-Canada Arctic Continental Shelf Survey was conducted 7 August to 16 September 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 29 April 2009 Arctic Council Ministerial Meeting in Tromsö, 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 Orga-



nization (IMO) is the lead and appropriate UN body that can 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 29 March 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.[4] 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 Iluluisaat, where a declaration was signed reaffirming the importance of UNCLOS as the legal framework for addressing issues in the Arctic Ocean.

Arctic Marine Shipping Assessment 2009 Report, Selected Recommendations

- Develop a comprehensive, multi-nation 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 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.[5] 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 33-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.[6] Many others see China's real interests in terms of access to the region's immense natural-resource wealth.

Ships in the Central Arctic Ocean

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 80 icebreaker voyages to the North Pole during 1977–2009, 20 in support of science and the remaining 60 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 10 weeks (July through mid-September).

The first surface ship to reach the North Pole was the Soviet nuclear-powered icebreaker *Arktika* on 17 August 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 14 days at a remarkable speed of 11.5 knots.[7]

The Soviet icebreaker *Sibir* reached the North Pole on 25 May 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 8 May to 19 June 1987.[8]

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.

• 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.

Upcoming Operations

Two exploratory drilling efforts in the Arctic should begin in summer 2010. Shell Oil may gain approval to conduct drilling on its lease sites on the seabed of the Chukchi Sea, off northwest Alaska. Operations in this relatively remote region will require a sizable fleet of on-scene icebreakers and support vessels.

Cairn Energy is poised to drill off Greenland's west coast near Disko Island. A 60,000-ton drillship, the UK-flag *Stena Forth*, has been chartered to conduct this challenging offshore operation. Built in Korea, the ship and an ice-management team of icebreakers will likely contend with drifting icebergs in this operational area of Baffin Bay.[9]

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 2010. Beluga Shipping from Germany may again operate one of its heavy-lift ships along the Northern Sea Route, to link Asian manufacturing suppliers to the Russian Arctic. Sovcomflot, Russia's largest shipping company, also indicated plans in late 2009 to conduct an experimental voyage of an oil tanker sailing from the Varendey offshore terminal east along the Northern Sea Route to Japan.[10] One of Sovcomflot's 70,000-deadweight-ton shuttle tankers normally carrying oil to Murmansk will be used for this international voyage.[11] There have been discussions of a future trial voyage of a liquefied-natural-gas ship from western Siberia to Asia.

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.

1. "Arctic Sea Ice Extent Is third Lowest on Record," NASA, 6 October 2009, www.nasa.gov/topics/earth/features/seaicemin09_prt.htm.
2. "A Shortcut through the Arctic Ocean," *Blue Line Magazine*, Beluga Shipping, Bremen, Germany, February 2010, pp. 10-12.
3. R. Headland, "Transits of the Northwest Passage, 1903–2009," Scott Polar Research Institute, University of Cambridge, United Kingdom, 23 February 2010.
4. Minister of Foreign Affairs of Canada, Chair's Summary of 29 March 2010 Arctic Ocean Foreign Ministers meeting.
5. U.S. Secretary of Commerce press release, 20 August 2009, "Approval of the Arctic Fishery Mangement Plan."
6. L. Jakobson, *China Prepares for an Ice-free Arctic*, Stockholm International Peace Research Institute, Insights on Peace and Security, No. 2010/2, Solna, Sweden.
7. T. Armstrong, "Icebreaker Voyage to the North Pole, 1977," *Polar Record* 19, no. 118, pp. 67–68.
8. I. Frolov, "The 1987 Expedition of the Icebreaker *Sibir* to the North Pole," in L. Brigham, *The Soviet Maritime Arctic* (Annapolis, Md.: Naval Institute Press, 1991), pp. 33–44.
9. Discussions with G. Liljestrom (Stena) and N. Anders (Stena Drilling), Kalmar Maritime Academy, Sweden, 2 March 2010.
10. Sovcomflot press release, 26 December 2009, "Sovcomflot President and CEO Sergey Frank Meets with Prime Minister Vladimir Putin."
11. *Lloyd's List*, 23 February 2010, "SCF to test Northern Sea Route."

Captain Brigham, a distinguished professor of geography and Arctic policy at the University of Alaska Fairbanks, received his PhD from Cambridge University. He served as commanding officer of four Coast Guard cutters including USCGC *Polar Sea* (WAGB-11) on Arctic and Antarctic voyages, and was chair of the Arctic Council's Arctic Marine Shipping Assessment (2005-09).