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Changes in the Arctic: Background and Issues for Congress

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Summary

The diminishment of Arctic sea ice has led to increased human activities in the Arctic, and has heightened interest in, and concerns about, the region's future. The United States, by virtue of Alaska, is an Arctic country and has substantial interests in the region. The seven other Arctic states are Canada, Iceland, Norway, Sweden, Finland, Denmark (by virtue of Greenland), and Russia.

The Arctic Research and Policy Act (ARPA) of 1984 (Title I of P.L. 98-373 of July 31, 1984) "provide[s] for a comprehensive national policy dealing with national research needs and objectives in the Arctic." The National Science Foundation (NSF) is the lead federal agency for implementing Arctic research policy. The Arctic Council, created in 1996, is the leading international forum for addressing issues relating to the Arctic. The United Nations Convention on the Law of the Sea (UNCLOS) sets forth a comprehensive regime of law and order in the world's oceans, including the Arctic Ocean. The United States is not a party to UNCLOS.

Record low extents of Arctic sea ice over the past decade have focused scientific and policy attention on links to global climate change and projected ice-free seasons in the Arctic within decades. These changes have potential consequences for weather in the United States, access to mineral and biological resources in the Arctic, the economies and cultures of peoples in the region, and national security.

The geopolitical environment for the Arctic has been substantially affected by the renewal of great power competition. Although there continues to be significant international cooperation on Arctic issues, the Arctic is increasingly viewed as an arena for geopolitical competition among the United States, Russia, and China.

The Department of Defense (DOD) and the Coast Guard are devoting increased attention to the Arctic in their planning and operations. Whether DOD and the Coast Guard are devoting sufficient resources to the Arctic and taking sufficient actions for defending U.S. interests in the region has emerged as a topic of congressional oversight. The Coast Guard has two operational polar icebreakers and has received funding for the procurement of two of at least three planned new polar icebreakers.

The diminishment of Arctic ice could lead in coming years to increased commercial shipping on two trans-Arctic sea routes—the Northern Sea Route close to Russia, and the Northwest Passage close to Alaska and through the Canadian archipelago—though the rate of increase in the use of these routes might not be as great as sometimes anticipated in press accounts. International guidelines for ships operating in Arctic waters have been recently updated.

Changes to the Arctic brought about by warming temperatures will likely allow more exploration for oil, gas, and minerals. Warming that causes permafrost to melt could pose challenges to onshore exploration activities. Increased oil and gas exploration and tourism (cruise ships) in the Arctic increase the risk of pollution in the region. Cleaning up oil spills in ice-covered waters will be more difficult than in other areas, primarily because effective strategies for cleaning up oil spills in ice-covered waters have yet to be developed.

Large commercial fisheries exist in the Arctic. The United States is working with other countries regarding the management of Arctic fish stocks. Changes in the Arctic could affect threatened and endangered species, and could result in migration of fish stocks to new waters. Under the Endangered Species Act, the polar bear was listed as threatened on May 15, 2008. Arctic climate change is also expected to affect the economies, health, and cultures of Arctic indigenous peoples.

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Introduction

The diminishment of Arctic sea ice has led to increased human activities in the Arctic, and has heightened interest in, and concerns about, the region's future. Issues such as geopolitical competition in the region between the United States, Russia, and China; increased military operations in the region by the United States, Russia, and other Arctic countries; growth in commercial shipping through the Arctic; and oil, gas, and mineral exploration in the Arctic could cause the region in coming years to become an arena of international cooperation, tension, and/or competition.

The United States, by virtue of Alaska, is an Arctic country and has substantial political, economic, energy, environmental, and other interests in the region. Decisions that Congress makes on Arctic-related issues could significantly affect these interests.

This report provides an overview of Arctic-related issues for Congress, and refers readers to more in-depth CRS reports on specific Arctic-related issues. Congressional readers with questions about an issue discussed in this report should contact the author or authors of the section of the report discussing that issue. The authors are identified by footnote at the start of each section.

This report does not track legislation on specific Arctic-related issues. For tracking of legislative activity, see the CRS reports relating to specific Arctic-related issues that are listed at the end of this report, just prior to **Appendix A**.

Background[1]

Definitions of Arctic

There are multiple definitions of the Arctic that result in differing descriptions of the land and sea areas encompassed by the term. Policy discussions of the Arctic can employ varying definitions of the region, and readers should bear in mind that the definition used in one discussion may differ from that used in another. This CRS report does not rely on any one definition.

Arctic Circle Definition

The most common and basic definition of the Arctic defines the region as the land and sea area north of the Arctic Circle (a circle of latitude at about 66º 34' North). For surface locations within this zone, the sun is generally above the horizon for 24 continuous hours at least once per year (at the summer solstice) and below the horizon for 24 continuous hours at least once per year (at the winter solstice). The Arctic Circle definition includes the northernmost third or so of Alaska, as well as the Chukchi Sea, which separates that part of Alaska from Russia, and U.S. territorial and Exclusive Economic Zone (EEZ) waters north of Alaska. It does not include the lower two-thirds or so of Alaska or the Bering Sea, which separates that lower part of the state from Russia. The area within the Arctic Circle is about 8.14 million square miles,[2] which is about 4.1% (or between

[1] Except for the subsection on the Arctic and the U.N. Convention on the Law of the Sea, this section was prepared by Ronald O'Rourke, Specialist in Naval Affairs, Foreign Affairs, Defense, and Trade Division.

[2] Source: Figure provided to CRS by Geography and Map Division of Library of Congress, May 12, 2020, in consultation with the National Geodetic Survey (NGS) of National Oceanic and Atmospheric Administration (NOAA).

1/24th and 1/25th) of the Earth's surface, and more than twice the land area of the United States, which is about 3.5 million square miles.

Definition in Arctic Research and Policy Act (ARPA) of 1984

Section 112 of the Arctic Research and Policy Act (ARPA) of 1984 (Title I of P.L. 98-373 of July 31, 1984)[3] defines the Arctic as follows:

> As used in this title, the term "Arctic" means all United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers [in Alaska]; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian chain.

This definition, which is codified at 15 U.S.C. 4111,[4] includes certain parts of Alaska below the Arctic Circle, including the Aleutian Islands and portions of central and western mainland Alaska, such as the Seward Peninsula and the Yukon Delta. The U.S. Coast Guard states that "The U.S. Arctic encompasses some 2,521 miles of shoreline, an international strait adjacent to the Russian Federation, and 647 miles of land border with Canada above the Arctic Circle. The U.S. Exclusive Economic Zone (EEZ) in the Arctic contains approximately 889,000 square miles of ocean."[5] **Figure 1** below shows the Arctic area of Alaska as defined by ARPA; **Figure 2** shows the entire Arctic area as defined by ARPA.

Other Definitions

Other definitions of the Arctic are based on factors such as average temperature, the northern tree line, the extent of permafrost on land, the extent of sea ice on the ocean, or jurisdictional or administrative boundaries. The 10º C isotherm definition of the Arctic, for example, defines the region as the land and sea area in the northern hemisphere where the average temperature for the warmest month (July) is below 10º Celsius, or 50º Fahrenheit. This definition results in an irregularly shaped Arctic region that excludes some land and sea areas north of the Arctic Circle but includes some land and sea areas south of the Arctic Circle. This definition currently excludes all of Finland and Sweden, as well as some of Alaska above the Arctic Circle, while including virtually all of the Bering Sea and Alaska's Aleutian Islands.

As another example, the definition of the Arctic adopted by the Arctic Monitoring and Assessment Programme (AMAP)—a working group of the Arctic Council—"essentially includes the terrestrial and marine areas north of the Arctic Circle (66°32' N), and north of 62° N in Asia and 60° N in North America, modified to include the marine areas north of the Aleutian chain, Hudson Bay, and parts of the North Atlantic, including the Labrador Sea."[6] A definition based on a climate-related factor could circumscribe differing areas over time as a result of climate change.

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[3] Title II of P.L. 98-373 is the National Critical Materials Act of 1984.

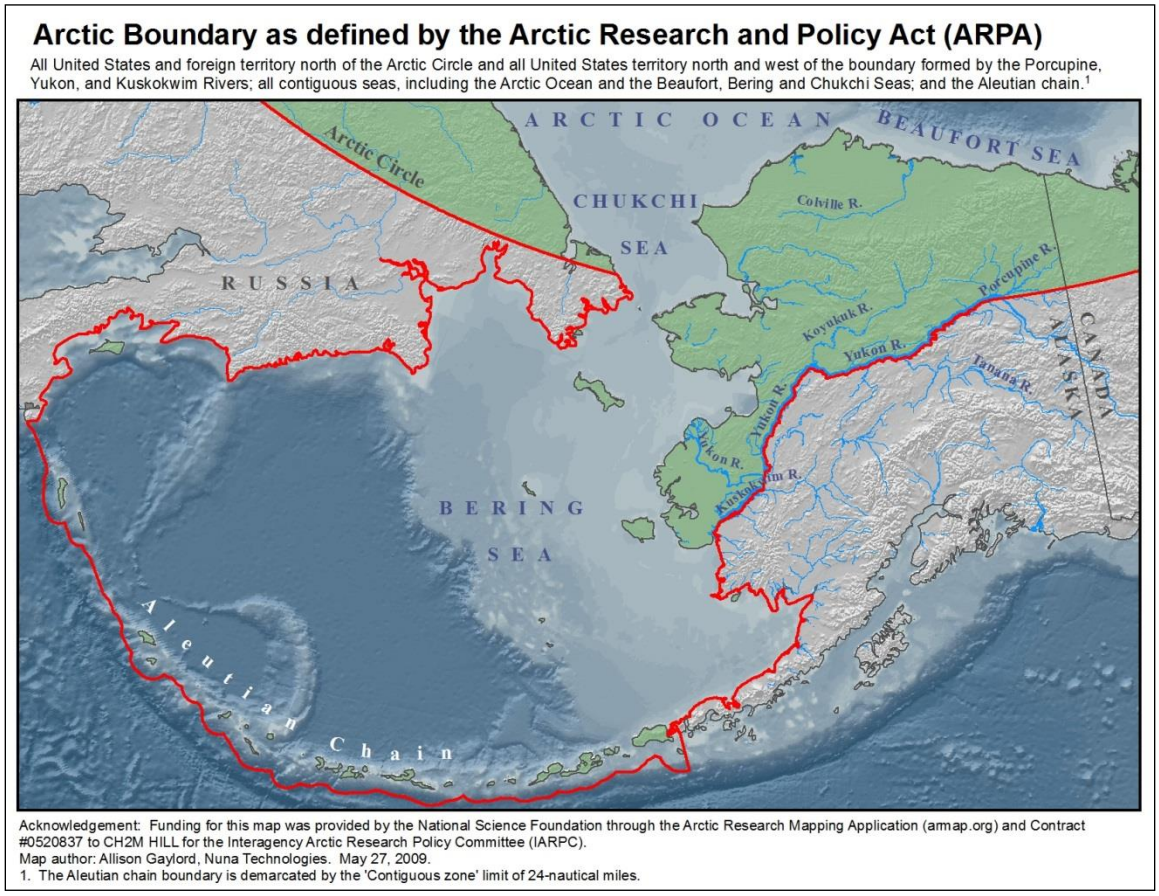
[4] As codified, the definition reads, "As used in this chapter.... "

[5] Coast Guard, *Arctic Strategic Outlook*, April 2019, p. 11.

[6] For examples of maps of the Arctic reflecting various definitions of the Arctic, see the collection of maps posted at "Arctic Definitions," Arctic Portal, accessed April 8, 2021, at https://arcticportal.org/maps/download/arctic-definitions. See also "Definitions of the Arctic," UN Environment Programme, accessed April 8, 2021, at https://www.grida.no/resources/7010; "Arctic Definition Map," Arctic Portal Library, accessed April 8, 2021, at http://library.arcticportal.org/1492/; "Definitions of the Arctic Region," Arctic Centre of the University of Lapland, accessed April 8, 2021, at https://www.arcticcentre.org/EN/arcticregion/Maps/definitions#ac-wg; and the map of the geographic areas described in Annex 1 of the May 2017 Agreement on Enhancing International Arctic Scientific

Some observers use the term "high north" as a way of referring to the Arctic. Some observers make a distinction between the "high Arctic"—meaning, in general, the colder portions of the Arctic that are closer to the North Pole—and other areas of the Arctic that are generally less cold and further away from the North Pole, which are sometimes described as the low Arctic or the subarctic.

Figure 1. Arctic Area of Alaska as Defined by ARPA



Source: U.S. Arctic Research Commission (https://www.arctic.gov/uploads/assets/ARPA_Alaska_only_150dpi.jpg, accessed April 8, 2021).

Population of Arctic

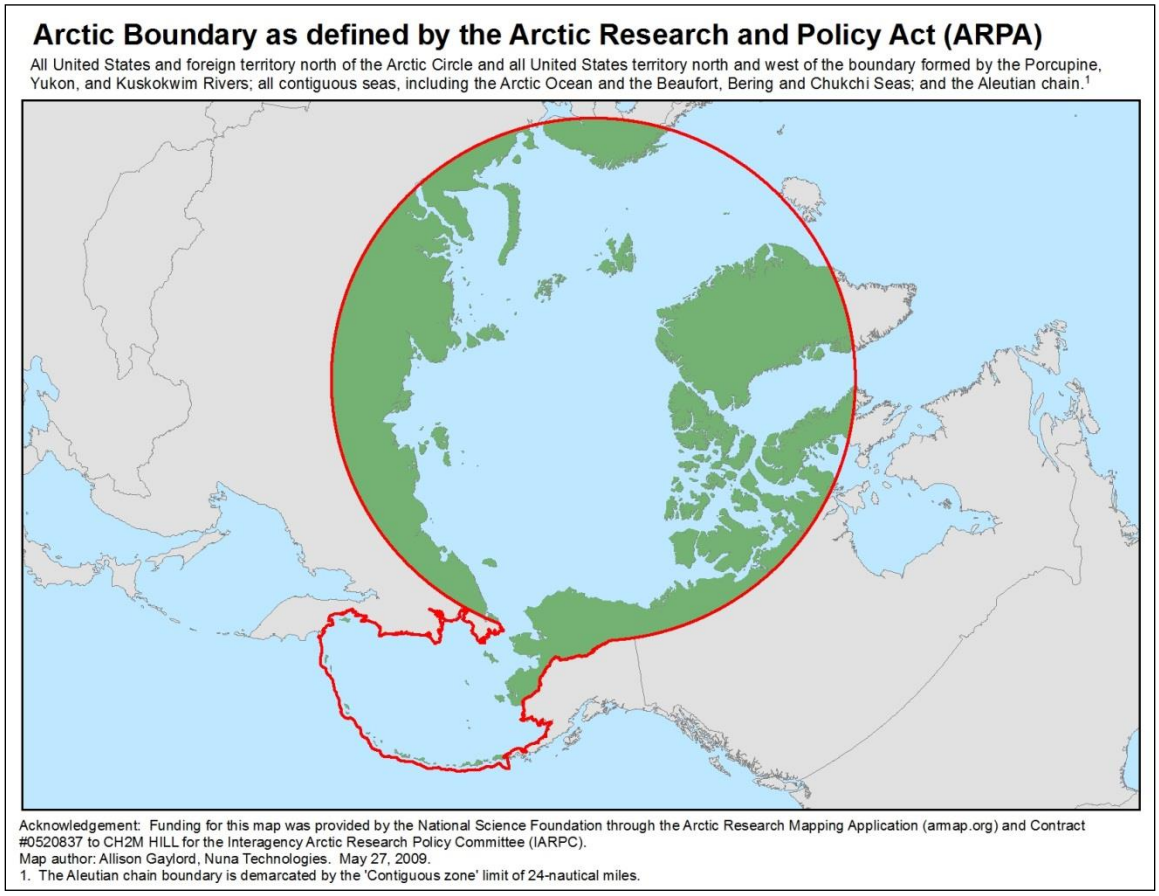
According to one estimate, about 4 million people, or about 0.05% of the world's population, live in the Arctic, of which roughly half (roughly 2 million) live in Russia's part of the Arctic,[7] and

Cooperation, accessed April 8, 2021, at both "Arctic Region," State Department, https://www.state.gov/key-topics-office-of-ocean-and-polar-affairs/arctic/, and "Maps," U.S. Arctic Research Commission, https://www.arctic.gov/uploads/assets/arctic-sci-agree-150dpi-color.jpg.

[7] Sources: "Arctic Peoples," Arctic Council, accessed April 8, 2021, at https://arctic-council.org/en/explore/topics/arctic-peoples/; National Snow & Ice Data Center, "Arctic People," accessed April 8, 2021, at https://nsidc.org/cryosphere/arctic-meteorology/arctic-people.html; United Kingdom, House of Commons, Defence Committee, On Thin Ice: UK Defence in the Arctic, Twelfth Report of Session 2017–19, August 15, 2018 (Ordered by the House of Commons to be printed 19 July 2018), p. 6; "Arctic Indigenous Peoples," Arctic Centre, accessed April 8, 2021, at

roughly 500,000 belong to Indigenous peoples.[8] Another source states: "Approximately two and a half million of Russia's inhabitants live in Arctic territory, accounting for nearly half of the population living in the Arctic worldwide."[9] Another source, using a broader definition of the Arctic, concluded that just over 10 million people live in the Arctic, including 7 million in Russia's Arctic.[10]

Figure 2. Entire Arctic Area as Defined by ARPA



Source: U.S. Arctic Research Commission (https://www.arctic.gov/uploads/assets/ARPA_Polar_150dpi.jpg, accessed April 8, 2021).

https://www.arcticcentre.org/EN/arcticregion/Arctic-Indigenous-Peoples.

[8] Source: "Permanent Participants," Arctic Council, accessed April 8, 2021, at https://arctic-council.org/en/about/permanent-participants/.

[9] "The Russian Federation," Arctic Council, accessed May 13, 2021, at https://arctic-council.org/en/about/states/russian-federation/.

[10] Timothy Heleniak, "The Future of Arctic Populations," *Polar Geography*, January 3, 2020. Another source states that "using more broad definition, according to the University of the Arctic Atlas, there are approximately 13.1 million people living in the area of the circumpolar North" ("Arctic Indigenous Peoples," Arctic Centre, accessed April 8, 2021, at https://www.arcticcentre.org/EN/arcticregion/Arctic-Indigenous-Peoples).

Eight Arctic States, Including Five Arctic Coastal States

Eight countries have territory north of the Arctic Circle: the United States (Alaska), Canada, Russia, Norway, Denmark (by virtue of Greenland, a member country of the Kingdom of Denmark), Finland, Sweden, and Iceland. These eight countries are often referred to as the Arctic countries or Arctic States, and they are the member states of the Arctic Council, which is discussed further below.

A subset of the eight Arctic countries are the five countries that are considered Arctic coastal states because they have mainland coasts that front onto waters north of the Arctic Circle: the United States, Canada, Russia, Norway, and Denmark (by virtue of Greenland).[11]

U.S. Identity as an Arctic Nation

As mentioned earlier, the United States, by virtue of Alaska, is an Arctic country and has substantial political, economic, energy, environmental, and other interests in the region. Even so, Alaska is geographically separated and somewhat distant from the other 49 states, and relatively few Americans—fewer than 68,000 as of July 1, 2017—live in the Arctic part of Alaska as shown in **Figure 2**.[12] A March 6, 2020, research paper on the Arctic in U.S. national identity, based on data collected in online surveys conducted in October-December 2019, stated the following:

> We found that Americans continue to mildly disagree with the assertion that the United States is an Arctic nation with broad and fundamental interests in the region. On a scale from 1 to 7, with higher numbers indicating stronger agreement, Americans' average rating was 3.40, down slightly from 3.51 in 2017. A plurality of respondents (29%) answered with a score of one, indicating the strongest disagreement. As in previous years, men and older Americans showed greater inclination to agree with the combined assertion of Arctic identity and interests than women or younger respondents. Asking separately about Arctic identity and interests this year revealed stronger disagreement with an Arctic identity, but a slight inclination to agree with the existence of American interests in the region….
>
> We also asked for associations with Alaska and found that while Americans dominantly associate Alaska with cold, snow, and ice, they also associate a greater diversity of other concepts with the state than with the Arctic. In particular, Americans more readily associate animals and wilderness with Alaska than with the Arctic.[13]

[11] The northern coast of mainland Iceland is just south of the Arctic Circle. The Arctic Circle passes through Grimsey Island, a small offshore island of Iceland that is about 25 miles north of the northern coast of mainland Iceland. See "Is Iceland in the Arctic Circle?" Iceland Unlimited, January 2017, accessed April 8, 2021, at https://icelandunlimited.is/blog/is-iceland-in-the-arctic-circle/.

[12] Source for figure of fewer than 68,000: CRS analysis of data presented in Table 3.1, entitled Alaska Population by Region, Borough, and Census Area, 2017 to 2045, in Alaska Department of Labor and Workforce Development, Research and Analysis Section, *Alaska Population Projections: 2017 to 2045*, June 2018, p. 26. The table shows that of Alaska's estimated population as of July 1, 2017 of 737,080, a total of 589,680, of about 80%, resided in the Anchorage/Matanuska-Susitna region (401,649), the Fairbanks North Star Borough (97,738), the Kenai Peninsula Borough (58,024), and Juneau (32,269).

[13] Zachary D. Hamilla, *The Arctic in U.S. National Identity (2019)*, Arctic Studio, March 6, 2020, p. 1. See also Rodger Baker, "Remapping the American Arctic," *Stratfor*, July 28, 2020.

U.S. Arctic Research

Arctic Research and Policy Act (ARPA) of 1984, As Amended

The Arctic Research and Policy Act (ARPA) of 1984 (Title I of P.L. 98-373 of July 31, 1984)[14] "provide[s] for a comprehensive national policy dealing with national research needs and objectives in the Arctic."[15] The act, among other things

- made a series of findings concerning the importance of the Arctic and Arctic research;
- established the U.S. Arctic Research Commission (USARC) to promote Arctic research and recommend Arctic research policy;
- designated the National Science Foundation (NSF) as the lead federal agency for implementing Arctic research policy;
- established the Interagency Arctic Research Policy Committee (IARPC) to develop a national Arctic research policy and a five-year plan to implement that policy, and designated the NSF representative on the IARPC as its chairperson;[16] and
- defined the term "Arctic" for purposes of the act.

The Arctic Research and Policy Act of 1984 was amended by P.L. 101-609 of November 16, 1990. For the texts of the Arctic Research and Policy Act of 1984 and P.L. 101-609, see **Appendix A** and **Appendix B**, respectively.

FY2021 NSF Budget Request for Arctic Research

Office of Polar Programs (OPP)

NSF—the lead federal agency for implementing Arctic research policy—carries out Arctic research activities through its Office of Polar Programs (OPP), which operates as part of NSF's Directorate for Geosciences (GEO). NSF requested a total of $419.8 million for OPP for FY2021, which represented a decrease of 14.1% from the $488.7 million actual for FY2019. (Actuals for FY2020 were not available when NSF's FY2021 budget book was prepared.)

Navigating the New Arctic (NNA)

NSF states in the overview of its FY2021 budget request that "in 2021, NSF will continue to invest in its Big Ideas and the Convergence Accelerator, which support bold inquiries into the frontiers of science and engineering. These efforts endeavor to break down the silos of conventional scientific research funded by NSF to embrace the cross-disciplinary and dynamic nature of the science of the future. The Big Ideas represent unique opportunities for the U.S. to define and push the frontiers of global science and engineering leadership and to invest in

[14] Title II of P.L. 98-373 is the National Critical Materials Act of 1984.

[15] These words are taken from the official title of P.L. 98-373. (Arctic Research and Policy Act of 1984 is the short title of Title I of P.L. 98-373.) The remainder of P.L. 98-373's official title relates to Title II of the act, the short title of which is the National Critical Materials Act of 1984.

[16] The IARPC currently includes more than a dozen federal agencies, departments, and offices. Additional information on the IARPC is available at http://www.nsf.gov/od/opp/arctic/iarpc/start.jsp.

fundamental research. This research will advance the Nation's economic competitiveness, security, and prestige on the global stage. For more information, see the NSF-Wide Investments chapter."[17] Among the six research Big Ideas, NSF states in its overview that number four is

> **Navigating the New Arctic (NNA)** ($30.0 million): Establishing an observing network of mobile and fixed platforms and tools, including cyber tools, across the Arctic to document and understand the Arctic's rapid biological, physical, chemical, and social changes, in partnership with other agencies, countries, and native populations.[18]

NSF's requested $40.8 million for NNA for FY2021, including $30.0 million (noted above) for stewardship activities and $10.8 million for foundational activities.[19]

For additional information on proposed FY2021 funding and efforts for OPP and NNA, see **Appendix C**.

Major U.S. Policy Documents Relating to Arctic

Overview

The executive branch in recent years has issued a number of policy documents concerning the Arctic, including those mentioned briefly below. For excerpts from most of the documents mentioned below, see **Appendix D**.

Specific Documents

January 2009 Arctic Policy Directive (NSPD 66/HSPD 25)

On January 12, 2009 (i.e., eight days before its final day in office), the George W. Bush Administration released a presidential directive establishing a new U.S. policy for the Arctic region. The directive, dated January 9, 2009, was issued as National Security Presidential Directive 66/Homeland Security Presidential Directive 25 (NSPD 66/HSPD 25). The directive was the result of an interagency review, and it superseded for the Arctic (but not the Antarctic) a 1994 presidential directive on Arctic and Antarctic policy. The directive, among other things

- states that the United States is an Arctic nation, with varied and compelling interests in the region;
- sets forth a six-element overall U.S. policy for the region;
- describes U.S. national security and homeland security interests in the Arctic; and
- discusses a number of issues as they relate to the Arctic, including international governance; the extended continental shelf and boundary issues; promotion of international scientific cooperation; maritime transportation; economic issues, including energy; and environmental protection and conservation of natural resources.

[17] National Science Foundation, *FY 2021 Budget Request to Congress*, February 10, 2020, p. Overview-9.

[18] National Science Foundation, *FY 2021 Budget Request to Congress*, February 10, 2020, p. Overview-9. Emphasis as in original.

[19] National Science Foundation, *FY 2021 Budget Request to Congress*, February 10, 2020, p. NSF-Wide Investments-11.

May 2013 National Strategy for Arctic Region

On May 10, 2013, the Obama Administration released a document entitled *National Strategy for the Arctic Region*.[20] The document appears to supplement rather than supersede the January 2009 Arctic policy directive (NSPD 66/HSPD 25) discussed above.[21] The document states that the strategy is built on three lines of effort:

- advancing U.S. security interests,
- pursuing responsible Arctic region stewardship, and
- strengthening international cooperation.

Actions taken under the strategy, the document states, will be informed by four guiding principles:

- safeguarding peace and stability,
- making decisions using the best available information,
- pursuing innovative arrangements, and
- consulting and coordinating with Alaska natives.

January 2014 Implementation Plan for National Strategy for Arctic Region

On January 30, 2014, the Obama Administration released an implementation plan for the May 2013 national strategy for the Arctic region.[22] The plan outlines about 36 specific initiatives.

January 2015 Executive Order for Enhancing Coordination of Arctic Efforts

On January 21, 2015, then-President Obama issued Executive Order 13689, entitled "Enhancing Coordination of National Efforts in the Arctic." The order established an Arctic Executive Steering Committee is to provide guidance to executive departments and agencies and enhance coordination of Federal Arctic policies across agencies and offices, and, where applicable, with State, local, and Alaska Native tribal governments and similar Alaska Native organizations, academic and research institutions, and the private and nonprofit sectors."

December 2017 National Security Strategy Document

A National Security Strategy document released by the Trump Administration in December 2017 mentions the term Arctic once, stating that that "A range of international institutions establishes the rules for how states, businesses, and individuals interact with each other, across land and sea,

[20] *National Strategy for the Arctic Region*, May 2013, 11 pp.

[21] *National Strategy for the Arctic Region* states on page 6 that the "lines of effort" it describes are to be undertaken "[t]o meet the challenges and opportunities in the Arctic region, and in furtherance of established Arctic Region Policy," at which point there is a footnote referencing the January 2009 Arctic policy directive.

[22] *Implementation Plan for The National Strategy for the Arctic Region*, January 2014, 32 pp. The news release announcing the implementation plan is posted at http://www.whitehouse.gov/blog/2014/01/30/white-house-releases-implementation-plan-national-strategy-arctic-region. The document itself is posted at https://obamawhitehouse.archives.gov/sites/default/files/docs/implementation_plan_for_the_national_strategy_for_the_arctic_region_-_fi....pdf.

the Arctic, outer space, and the digital realm. It is vital to U.S. prosperity and security that these institutions uphold the rules that help keep these common domains open and free."[23]

March 2021 Interim National Security Strategic Guidance Document

An Interim National Security Strategic Guidance document released by the Biden Administration in March 2021[24] does not include the term Arctic.

U.S. Coordinator for Arctic Region

On July 16, 2014, then-Secretary of State John Kerry announced the appointment of retired Coast Guard Admiral Robert J. Papp Jr., who served as Commandant of the Coast Guard from May 2010 to May 2014, as the first U.S. Special Representative for the Arctic.[25] Papp served as the U.S. Special Representative until January 20, 2017, the final day of the Obama Administration and the first day of the Trump Administration. The position remained unfilled from that date through July 29, 2020, when it was effectively replaced by the newly created position of the U.S. coordinator for the Arctic region. On July 29, 2020, the Trump Administration announced that career diplomat James (Jim) DeHart would be the first U.S. coordinator for the Arctic region; DeHart began his work in the position that day.[26]

H.R. 3361, the United States Ambassador at Large for Arctic Affairs Act of 2021, and H.R. 3433, the Arctic Diplomacy Act of 2021, would each establish a position of United States Ambassador at Large for Arctic Affairs.[27]

Arctic Council

The Arctic Council, created in 1996, is the leading international forum for addressing issues relating to the Arctic. Its founding document is the Ottawa Declaration of September 19, 1996, a joint declaration (not a treaty) signed by representatives of the eight Arctic states. The State Department describes the council as "the preeminent intergovernmental forum for addressing issues related to the Arctic Region. …The Arctic Council is not a treaty-based international organization but rather an international forum that operates on the basis of consensus, echoing the peaceful and cooperative nature of the Arctic Region."[28]

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[23] *National Security Strategy of the United States of America*, December 2017, p. 40.

[24] White House, *Interim National Security Strategic Guida*nce, March 2021, released on March 3, 2021, 23 pp.

[25] See "Retired Admiral Robert Papp to Serve as U.S. Special Representative for the Arctic," Press Statement, John Kerry, Secretary of State, Washington, DC, July 16, 2014.

[26] See Department of State, "Appointment of U.S. Coordinator for the Arctic Region," Media Note, Office of the Spokesperson, July 29, 2020. See also Matthew Lee, "US Names New Arctic Envoy in Push to Expand Reach in Region," *Associated Press*, July 29, 2020; Timothy Gardner, "U.S. Appoints Coordinator for Arctic Policy As Mineral Race Heats Up," *Reuters*, July 29, 2020; Courtney McBride, "New Cold War: U.S. Names Arctic Policy Czar to Keep Tabs on China, Russia," *Wall Street Journal*, July 29, 2020; Melody Schreiber, "The Trump Administration Appoints a New State Department Arctic Coordinator," *ArcticToday*, July 29, 2020; Levon Sevunts (Radio Canada International), "Appointment of U.S. Arctic Co-ordinator May Signal More Muscular American Policy," *CBC*, July 31, 2020.

[27] For a press report discussing legislative proposals for establishing a U.S. Ambassador at Large for Arctic Affairs, see Hilde-Gunn Bye, "Top Lawmakers Want to Establish a US Ambassador-at-Large for Arctic Affairs," *High North News*, May 28, 2021.

[28] "Arctic Region," State Department, accessed April 8, 2021, at https://www.state.gov/key-topics-office-of-ocean-and-polar-affairs/arctic/.

The Arctic Council's membership consists of the eight Arctic states. All decisions of the Arctic Council and its subsidiary bodies are by consensus of the eight Arctic states. In addition to the eight member states, six organizations representing Arctic indigenous peoples have status as Permanent Participants. Thirteen non-Arctic states, 13 intergovernmental and interparliamentary organizations, and 12 nongovernmental organizations have been approved as observers, making for a total of 38 observer states and organizations.[29]

The council has a two-year chairmanship that rotates among the eight member states. The United States held the chairmanship from April 24, 2015, to May 11, 2017, and will next hold it in 2031-2033. In May 2021, the chairmanship was transferred from Iceland to Russia.

Thematic areas of work addressed by the council include environment and climate, biodiversity, oceans, Arctic peoples, and agreements on Arctic scientific cooperation, cooperation on marine oil pollution preparedness and response in the Arctic, and cooperation on aeronautical and maritime search and rescue in the Arctic. The Ottawa Declaration states explicitly that "The Arctic Council should not deal with matters related to military security."

The eight Arctic states have signed three legally binding agreements negotiated under the auspices of the Arctic Council: a May 2011 agreement on cooperation on aeronautical and maritime search and rescue (SAR) in the Arctic, a May 2013 agreement on cooperation on marine oil pollution preparedness and response in the Arctic, and a May 2017 agreement on enhancing international Arctic scientific cooperation.[30]

For additional background information on the Arctic Council, see **Appendix E**.

Arctic and U.N. Convention on Law of the Sea (UNCLOS)[31]

The United Nations Convention on the Law of the Sea (UNCLOS) "lays down a comprehensive regime of law and order in the world's oceans and seas[,] establishing rules governing all uses of the oceans and their resources."[32] UNCLOS was adopted in 1982, and modified in 1994 by an agreement relating to the implementation of Part XI of the treaty, which relates to the seabed and ocean floor and subsoil thereof that are beyond the limits of national jurisdiction. UNCLOS entered into force in November 1994. As of April 8, 2021 168 parties (167 states and the European Union) were party to the treaty.[33]

The United States is not a party to UNCLOS.[34] The 1982 treaty and the 1994 agreement were transmitted to the Senate on October 6, 1994, during the 103rd Congress, becoming Treaty

[29] For list of the 38 observers and when they were approved for observer status, see "Who We Are" in Arctic Council, "Arctic Council," accessed April 8, 2021, at https://arctic-council.org/en/.

[30] For brief summaries of these three agreements and links to the texts of these agreements, see "Arctic Region," State Department, accessed April 8, 2021, at https://www.state.gov/key-topics-office-of-ocean-and-polar-affairs/arctic/.

[31] Parts of this section were prepared by Marjorie Ann Browne, who was a Specialist in International Relations, Foreign Affairs, Defense, and Trade Division until her retirement from CRS on October 10, 2015.

[32] United Nations, "United Nations Convention on the Law of the Sea of 10 December 1982, Overview and full text," updated February 11, 2020, accessed April 8, 2021, at https://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm.

[33] Chronological lists of ratifications of, accessions and successions to the Convention and the related Agreements as of March 9, 2020, accessed April 8, 2021, at http://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm. The list shows that most recent state to become a party to the treaty is Azerbaijan, which became a party on June 16, 2016.

[34] The United States is not a signatory to the treaty. On July 29, 1994, the United States became a signatory to the 1994 agreement relating to the implementation of Part XI of the treaty. The United States has not ratified either the treaty or

Document 103-39. The full Senate to date has not voted on the question of whether to give its advice and consent to ratification of Treaty Document 103-39. Although the United States is not a party to UNCLOS, the United States accepts and acts in accordance with the nonseabed mining provisions of the treaty, such as those relating to navigation and overflight, which the United States views as reflecting customary international law of the sea.[35]

Part VI of UNCLOS (consisting of Articles 76 through 85), which covers the continental shelf, and Annex II to the treaty, which established a Commission on the Limits of the Continental Shelf, are particularly pertinent to the Arctic, because Article 77 states that "The coastal State exercises over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources," and that these natural resources include, among other things, "mineral and other nonliving resources of the seabed and subsoil," including oil and gas deposits.[36]

Article 76 states that "the coastal State shall establish the outer edge of the continental margin wherever the margin extends beyond 200 nautical miles," and that "Information on the limits of the continental shelf beyond 200 nautical miles... shall be submitted by the coastal State to the Commission on the Limits of the Continental Shelf set up under Annex II.... The Commission shall make recommendations to coastal States on matters related to the establishment of the outer limits of their continental shelf. The limits of the shelf established by a coastal State on the basis of these recommendations shall be final and binding."

For additional background information on UNCLOS, particularly as it relates to the Arctic, see **Appendix F**. For information on extended continental shelf submissions to the Commission, see **Appendix H**.

House and Senate Arctic Member Organizations

In the House, a congressional Arctic Working Group Caucus is co-chaired by Representative Rick Larsen and Representative Don Young.[37] In the Senate, Senator Lisa Murkowski and Senator Angus King announced on March 4 and 5, 2015, the formation of a Senate Arctic Caucus.[38]

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the 1994 agreement.

[35] In a March 10, 1983, statement on U.S. oceans policy, President Reagan stated, that "the United States is prepared to accept and act in accordance with the [treaty's] balance of interests relating to traditional uses of the oceans—such as navigation and overflight. In this respect, the United States will recognize the rights of other states in the waters off their coasts, as reflected in the Convention, so long as the rights and freedoms of the United States and others under international law are recognized by such coastal states." (Ronald Reagan Presidential Library & Museum, "Statement on United States Oceans Policy," undated, accessed April 8, 2021, at https://www.reaganlibrary.gov/research/speeches/31083c.)

[36] Other parts of UNCLOS relevant to the Arctic include those relating to navigation and high-seas freedoms, fisheries, and exclusive economic zones.

[37] Source: United States House of Representatives, Committee on House Administration, *Congressional Member Organizations (CMOs)*, 117th Cong., revised March 2021, p. 5, accessed April 8, 2021, at https://cha.house.gov/sites/democrats.cha.house.gov/files/2021_117th%20CMOs_3-22.pdf. See also 'Congressional Arctic Working Group," accessed April 8, 2021, at https://congressionalarcticworkinggroup-larsen.house.gov/.

[38] Press release from the office of Senator Angus King, "King, Murkowski Announce U.S. Senate Arctic Caucus," March 4, 2015, accessed April 8, 2021, at http://www.king.senate.gov/newsroom/press-releases/king-murkowski-announce-us-senate-arctic-caucus. See also press release from the office of Senator Lisa Murkowski, "Senators Murkowski, King Announce U.S. Senate Arctic Caucus," March 5, 2015, accessed April 8, 2021, at http://www.murkowski.senate.gov/public/index.cfm/pressreleases?ID=1ce5edcb-540d-4c43-b264-56bdbb570755, which includes a similar phrase.

Issues for Congress

Climate Change and Loss of Arctic Sea Ice[39]

Record low extents of Arctic sea ice in 2012 and 2007 have focused scientific and policy attention on climate changes in the high north, and on the implications of projected ice-free[40] seasons in the Arctic within decades. The Arctic has been projected by several scientists to be ice-free in most late summers as soon as the 2030s.[41] This opens opportunities for transport through the Northwest Passage and the Northern Sea Route, extraction of potential oil and gas resources, and expanded fishing and tourism (**Figure 3**).

More broadly, physical changes in the Arctic include warming ocean, soil, and air temperatures; melting permafrost; shifting vegetation and animal abundances; and altered characteristics of Arctic cyclones. All these changes are expected to affect traditional livelihoods and cultures in the region and survival of polar bear and other animal populations, and raise risks of pollution, food supply, safety, cultural losses, and national security. Moreover, linkages ("teleconnections") between warming Arctic conditions and extreme events in the mid-latitude continents are increasingly evident, identified in such extreme events as the heat waves and fires in Russia in 2010; severe winters in the eastern United States and Europe in 2009/2010 and in Europe in 2011/2012;[42] and Indian summer monsoons and droughts. Hence, changing climate in the Arctic suggests important implications both locally and across the Hemisphere.

[39] This section prepared by Jane Leggett, Specialist in Energy and Environmental Policy, Resources, Science, and Industry Division.

[40] In scientific analyses, "ice-free" does not necessarily mean "no ice." The definition of "ice-free" or sea ice "extent" or "area" varies across studies. Sea ice "extent" is one common measure, equal to the sum of the area of grid cells that have ice concentration of less than a set percentage—frequently 15%. For more information, see the National Snow and Ice Data Center, http://nsidc.org/seaice/data/terminology.html.

[41] Muyin Wang and James E. Overland, "A Sea Ice Free Summer Arctic within 30 Years?," *Geophysical Research Letters* 36, no. L07502 (April 3, 2009): 10.1029/2009GL037820; Marika Holland, Cecilia M. Bitz, and Bruno Tremblay, "Future abrupt reductions in the summer Arctic sea ice," *Geophysical Research Letters* 33, no. L23503 (2006); But see also Julien Boé, Alex Hall, and Xin Qu, "Sources of spread in simulations of Arctic sea ice loss over the twenty-first century," *Climatic Change* 99, no. 3 (April 1, 2010): 637-645; I. Eisenman and J. S. Wettlaufer, "Nonlinear threshold behavior during the loss of Arctic sea ice," *Proceedings of the National Academy of Sciences* 106, no. 1 (January 6, 2009): 28-32; Dirk Notz, "The Future of Ice Sheets and Sea Ice: Between Reversible Retreat and Unstoppable Loss," *Proceedings of the National Academy of Sciences* 106, no. 49 (December 8, 2009): 20590-20595.

[42] Overland et al. state that "a warm Arctic-cold continent pattern represents a paradox of recent global warming: there is not a uniform pattern of temperature increases" due to a set of newly recognized processes described in Overland, J. E, K. R Wood, and M. Wang. "Warm Arctic-cold Continents: Climate Impacts of the Newly Open Arctic Sea." *Polar Research* 30 (2011). The authors raise a critical, unanswered question, "Is the observed severe mid-latitude weather in two adjacent years simply due to an extreme in chaotic processes alone, or do they included a partial but important Arctic forcing and connection due to recent changing conditions?" In other words, are recent patterns random anomalies, or might we expect more of the same?; among other examples, see also Lim, Young-Kwon, and Siegfried D. Schubert. "The Impact of ENSO and the Arctic Oscillation on Winter Temperature Extremes in the Southeast United States." *Geophysical Research Letters* 38, no. 15 (August 11, 2011): L15706.

Figure 3. Arctic Sea Ice Extent in September 2008, Compared with Prospective Shipping Routes and Oil and Gas Resources

Source: Graphic by Stephen Rountree at *U.S. News and World Report*, http://www.usnews.com/articles/news/world/2008/10/09/global-warming-triggers-an-international-race-for-the-artic/photos/#1.

Like the rest of the globe, temperatures in the Arctic have varied[43] but show a significant warming trend since the 1970s, and particularly since 1995.[44] The annual average temperature for the Arctic region (from 60° to 90° N) is now about 1.8° F warmer than the "climate normal" (the average from 1961 to 1990). Temperatures in October-November are now about 9° F above the seasonal normal. Scientists have concluded that most of the *global* warming of the last three decades is very likely caused by human-related emissions of greenhouse gases (GHG, mostly carbon dioxide); they expect the GHG-induced warming to continue for decades, even if, and after, GHG concentrations in the atmosphere have been stabilized. The extra heat in the Arctic is amplified by processes there (the "polar amplification") and may result in irreversible changes on human timescales.

The observed warmer temperatures along with rising cyclone size and strength in the Arctic have reduced sea ice extent, thickness, and ice that persists year-round ("perennial ice"); natural climate variability has likely contributed to the record low ice extents of 2007 and 2012. The 2007 minimum sea ice extent was influenced by warm Arctic temperatures and warm, moist winds blowing from the North Pacific into the central Arctic, contributing to melting and pushing ice toward and into the Atlantic past Greenland. Warm winds did not account for the near-record sea ice minimum in 2008.[45] In early August 2012, an unusually large storm with low pressure developed over the Arctic, helping to disperse the already weak ice into warmer waters and accelerating its melt rate. By August 24, 2012, sea ice extent had shrunk below the previous observed minimum of late September 2007.[46]

Modeling of GHG-induced climate change is particularly challenging for the Arctic, but it consistently projects warming through the 21st century, with annual average Arctic temperature increases ranging from +1° to +9.0° C (+2° to +19.0° F), depending on the GHG scenario and model used. While such warming is projected by most models throughout the Arctic, some models project slight cooling localized in the North Atlantic Ocean just south of Greenland and Iceland. Most warming would occur in autumn and winter, "with very little temperature change projected over the Arctic Ocean" in summer months.[47]

Due to observed and projected climate change, scientists have concluded that the Arctic will have changed from an ice-covered environment to a recurrent ice-free[48] ocean (in summers) as soon as the late 2030s. The character of ice cover is expected to change as well, with the ice being

[43] There was a regionally warm period in the Arctic from the mid-1920s to around 1940, which scientists have assessed to have been driven by natural climate variability. They have found that period to be distinctly different from the recent multi-decadal warming, in part because the early 20th century warming was concentrated in the northern high latitudes. See, for example, Figure 2, upper left graphic, in Geophysical Fluid Dynamics Laboratory, "Simulatoin of Early 20th Century Warming," at http://www.gfdl.noaa.gov/early-20th-century-global-warming.

[44] Steele, Michael, Wendy Ermold, and Jinlun Zhang. "Arctic Ocean Surface Warming Trends over the Past 100 Years." *Geophysical Research Letters* 35, no. 2 (January 29, 2008): L02614.

[45] J. Overland, J. Walsh, and M. Wang, *Arctic Report Card—Atmosphere* (NOAA Arctic Research Program, October 6, 2008), ftp://ftp.oar.noaa.gov/arctic/documents/ArcticReportCard_full_report2008.pdf.

[46] National Snow and Ice Data Center, "Arctic sea ice extent breaks 2007 record low" (August 27, 2012); Japanese Aerospace Exploration Agency, "A new record minimum of the Arctic sea ice extent was set on 24 August 2012"; Arctic ROOS (Norway), "Daily Updated Time series of Arctic sea ice area and extent derived from SSMI data provided by NERSC," at http://arctic-roos.org/observations/satellite-data/sea-ice/ice-area-and-extent-in-arctic.

[47] William L. Chapman and John E. Walsh, "Simulations of Arctic Temperature and Pressure by Global Coupled Models," *Journal of Climate* 20, no. 4 (February 1, 2007): 609-632.

[48] See footnote 40. Also, although one Canadian scientist has predicted that recurrent ice-free summers may begin sometime between 2013 and 2020, this is not consistent with other climate models' projections.

thinner, more fragile, and more regionally variable. The variability in recent years of both ice quantity and location could be expected to continue.

Geopolitical Environment[49]

Renewed Great Power Competition

Overview

A principal factor affecting the geopolitical environment for the Arctic is the renewal of great power competition, including challenges by Russia, China, and other countries to elements of the U.S.-led international order that has operated since World War II.[50] This development, combined with the diminishment of Arctic ice and the resulting increase in human activities in the Arctic, has several potential implications for the geopolitical environment for the Arctic, which are discussed in the following sections.[51]

Arctic Tradition of Cooperation and Low Tensions

The renewal of great power competition has raised a basic question as to whether the Arctic in coming years will be a region generally characterized by cooperation and low tensions, as it was during the post-Cold War era, or instead be a region characterized at least in part by competition and increased tensions, as it was during the Cold War. Although there continues to be significant international cooperation on Arctic issues, the Arctic is increasingly viewed as an arena for geopolitical competition among the United States, Russia, and China.[52] In this regard, the renewal

[49] This section was prepared by Ronald O'Rourke, Specialist in Naval Affairs, Foreign Affairs, Defense, and Trade Division. It incorporates material prepared by Kristin Archick, Specialist in European Affairs, Foreign Affairs, Defense, and Trade Division, and Derek E. Mix, Analyst in European Affairs, Foreign Affairs, Defense, and Trade Division.

[50] For more on the renewal of great power competition, see CRS Report R43838, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, by Ronald O'Rourke.

[51] For discussions that emphasize climate change as a factor affecting national security in the Arctic, see, for example, Sharon E. Burke, "The Arctic Threat That Must Not be Named," *War on the Rocks*," January 28, 2021; Melody Schreiber, "New US Arctic Strategies Ignore Climate Risks in Focus on Geopolitics, Experts Say," *ArcticToday*, January 20, 2021; Sherri Goodman et al., *Climate Change and Security in the Arctic*, Center for Climate and Security, Council on Strategic Risks, and Norwegian Institute of International Affairs, January 2021, 22 pp.

[52] See, for example, Haley Zaremba, "A New Geopolitical Conflict Is Looming Over The Arctic," *OilPrice.com*, September 2, 201; June Teufel Dreyer, "The Arctic: Global Warming and Heated Politics," Foreign Policy Research Institute, August 17, 2021; Jonathan Jordan, "Russia's Coercive Diplomacy in the Arctic," Arctic Institute, July 6, 2021; Kazunari Hanawa, "Unfrozen World: Arctic Thaw Becomes Major Source of Global Risk," *Nikkei Asia*, June 28, 2021; Thomas Grove, "Melting Arctic Ice Pits Russia Against U.S. and China for Control of New Shipping Route," *Wall Street Journal*, June 23, 2021; Atle Staalesen, "National Security Chief Says Russia Must Bolster its Arctic Military," *Barents Observer*, June 23, 2021; K. M. Seethi, "Russia, US And The Churning Arctic Geopolitics – Analysis," *Eurasia Review*, June 18, 2021; Economist, "Who Controls the North,?" *Economist*, June 14, 2021; Laura Millan Lombrana, "Tensions Over Arctic Resource Rights Grow as Russia Takes Leadership Role," *World Oil*, May 23, 2021; Robbie Gramer and Jack Detsch, "Biden's Arctic Power Plays, With Russia and China Staking Claims, Can Diplomacy Stave Off a Militarization of the Far North?" *Foreign Policy*, May 20, 2021; Tony Barber, "Arctic Rivalry Heats Up among the Great Powers," *Financial Times*, May 19, 2021; Yohei Ishikawa, Ryo Nakamura, and Tsukasa Hadano, "US, Russia and China Seek Edge as Battle for Arctic Heats Up," *Nikkei Asia*, May 19, 2021; Mark Magnier, "A More Accessible Arctic Becomes Proving Ground for US-China Military Jockeying," *South China Morning Post*, May 3, 2021; Sharon E. Burke, "No One Will Win the Competition in the High North," *Defense News*, April 11, 2021; Robert C. O'Brien and Ryan Tully, "How the United States Can Win in the Arctic," *National Interest*, March 8, 2021; Jariel Arvin, "The Latest Consequence of Climate Change: The Arctic Is Now Open for Business Year-Round, Global

of great power competition poses a potential challenge to the tradition of cooperation, low tensions, peaceful resolution of disputes, and respect for international law—sometimes referred to as the "Arctic spirit"—that has characterized the approach used by the Arctic states, particularly since the founding of the Arctic Council in 1996, for managing Arctic issues.[53]

Some observers argue that the Arctic states and other Arctic stakeholders should attempt to maintain the region's tradition of cooperation and low tensions, and work to prevent the competition and tensions that have emerged in Europe, Asia, and elsewhere in recent years from crossing over into the Arctic. These observers argue that security issues and the competitive aspects of Arctic relations have been overemphasized and can hinder cooperation on shared concerns such as climate change, that the Arctic tradition of cooperation and low tensions has proven successful in promoting the interests of the Arctic states and other Arctic stakeholders on a range of issues, that it has served as a useful model for other parts of the world to follow, and that in light of tensions and competition elsewhere in the world, this model is needed more now than ever.[54]

Other observers could argue that, notwithstanding the efforts of Arctic states and other Arctic stakeholders to maintain the Arctic as a region of cooperation and low tensions, it is unreasonable to expect that the Arctic can be kept fully isolated from competition and tensions that have arisen in other parts of the world. As a consequence, these observers could argue, the Arctic states and other Arctic stakeholders should take steps to manage increased competition and higher tensions in the Arctic, precisely so that Arctic issues can continue to be resolved as successfully as conditions may permit, even in a situation of competition and increased tensions. From a U.S. standpoint, one way of expressing this perspective is to state that in the Arctic, the United States should cooperate where it can, but compete where it must.[55]

Competition in the Arctic Is Heating Up as the Year-Round Sea Ice Retreats," *Vox*, February 22, 2021; Andrew A. Latham, "Great Power Rivalry in the Arctic Circle is Heating Up," *National Interest*, February 16, 2021.

[53] See, for example, Diana Stancy Correll, "Arctic Will Become 'Contested' Without US Presence and Partnerships, 2nd Fleet CO Warns," *Navy Times*, August 2, 2021; Joshua Tallis, "As 'Arctic Exceptionalism' Melts Away, the US Isn't Sure What It Wants Next," *Defense One*, January 22, 2020; Timo Koivurova, "How US Policy Threatens Existing Arctic Governance," *ArcticToday*, January 17, 2020; Melody Schreiber, "As the Arctic Changes, International Cooperation May Be Put to the Test," *ArcticToday*, July 25, 2018; Stephanie Pezard, Abbie Tingstad, and Alexandria Hall, *The Future of Arctic Cooperation in a Changing Strategic Environment*, RAND Europe (PE-268RC), 2018, 18 pp.; Geoff Ziezulewicz, "As Arctic Waters Open, Nations Plant Their Flags," *Navy Times*, April 8, 2018; James Stavridis, "Avoiding a Cold War in the High North," *Bloomberg*, May 4, 2018; Kristina Spohr, "The Race to Conquer the Arctic—the World's Final Frontier," *New Statesman*, March 12, 2018.

[54] See, for example, Tatiana Belousova, "Climate Change, a Catalyst for Arctic Cooperation," *The Hindu*, August 25, 2021; Lawson W. Brigham, "Reflections on the Arctic Council's Recent Message to the Globe: Peace, Stability and Cooperation," *Polar Points* (Wilson Center), July 23, 2021; Luke Patey, "Managing US-China Rivalry in the Arctic, Small States Can Be Players in Great Power Competition," Dansk Institut for Internationale Studier, October 9, 2020; Editorial, "Arctic Science Cannot Afford a New Cold War," *Nature*, September 30, 2020; Eilís Quinn, "Are Potential Arctic Security Threats Eclipsing Urgent Action on Climate? A New Study Makes Its Case," *Eye on the Arctic (Radio Canada International)*, September 10, 2020; Paul Taylor, *After the Ice, The Arctic and European Security*, Friends of Europe, Autumn 2020 (September 2020), 113 pp.; Agence France-Presse, "Iceland Wants To Preserve Arctic From US-China Tensions: PM," *Barrons*, July 30, 2020; Thomas Graham and Amy Myers Jaffe, "There Is No Scramble for the Arctic, Climate Change Demands Cooperation, Not Competition, in the Far North," *Foreign Affairs*, July 27, 2020; Jeremy Tasch, "Why the Talk of an 'Artic Cold War' Is Exaggeration," Valdai Discussion Club, July 7, 2020.

[55] Referring to the Coast Guard's April 2019 Arctic strategy document (see **Appendix G**), for example, one observer stated: "The way the Arctic is defined in the new strategy is, cooperate where we can but compete where we must." (Sherri Goodman, as quoted in Melody Schreiber, "The US Coast Guard's New Arctic Strategy Highlights Geopolitics and Security," *ArcticToday*, April 23, 2019.) DOD's June 2019 Arctic strategy document (see **Appendix G**) states on page 6 that DOD will "compete when necessary to maintain favorable regional balances of power" in the Arctic.

Still other observers might argue that a policy of attempting to maintain the Arctic as a region of cooperation and low tensions, though well-intentioned, could actually help encourage aggressive behavior by Russia or China in other parts of the world by giving those two countries confidence that their aggressive behavior in other parts of the world would not result in punitive costs being imposed on them in the Arctic. These observers might argue that maintaining the Arctic as a region of cooperation and low tensions in spite of aggressive Russian or Chinese actions elsewhere could help legitimize those aggressive actions and provide little support to peaceful countries elsewhere that might be attempting to resist them. This, they could argue, could facilitate a divide-and-conquer strategy by Russia or China in their relations with other countries, which in the long run could leave Arctic states with fewer allies and partners in other parts of the world for resisting unwanted Russian or Chinese actions in the Arctic.

Still others might argue that there is merit in some or all of the above perspectives, and that the challenge is to devise an approach that best mixes the potential strengths of each perspective.

In a May 6, 2019, speech in Finland that was given prior to the start of formal discussions at an Arctic Council ministerial meeting, then-Secretary of State Michael Pompeo emphasized the competitive dimension of Arctic affairs.[56] On April 23, 2020, a senior State Department official provided a background on the Trump Administration's strategy for the Arctic.[57]

Arctic and World Order

One potential implication for the Arctic of the renewal of great power competition concerns associated challenges to elements of the U.S.-led international order that has operated since World War II. One element of the U.S.-led international order that has come under challenge is the principle that force or threat of force should not be used as a routine or first-resort measure for settling disputes between countries. Another is the principle of freedom of the seas (i.e., that the world's oceans are to be treated as an international commons).[58] If either of these elements of the U.S.-led international order is weakened or overturned, it could have potentially major implications for the future of the Arctic, given the Arctic's tradition of peaceful resolution of disputes and respect for international law and the nature of the Arctic as a region with an ocean at its center that washes up against most of the Arctic states.

More broadly, some observers assess that the U.S.-led international order in general may be eroding or collapsing, and that the nature of the successor international order that could emerge in its wake is uncertain. An erosion or collapse of the U.S.-led international order, and its replacement by a new international order of some kind, could have significant implications for the Arctic, since the Arctic's tradition of cooperation and low tensions, and the Arctic Council itself, can be viewed as outgrowths of the U.S.-led order.[59]

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[56] State Department, "Looking North: Sharpening America's Arctic Focus, Remarks, Michael R. Pompeo, Secretary of State, Rovaniemi, Finland, May 6, 2019." See also Associated Press, "Pompeo Says US to Expand Arctic Role to Deter Russia, China," *Associated Press*, July 22, 2020.

[57] State Department, Briefing on the Administration's Arctic Strategy, Special Briefing, Office of the Spokesperson, April 23, 2020. See also Sarah Cammarata, "POLITICO Pro Q&A: James DeHart, State Department Coordinator for the Arctic," *Politico Pro*, January 15, 2021.

[58] For additional discussion, see CRS Report R43838, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, and, regarding the principle of freedom of the seas, CRS Report R42784, *U.S.-China Strategic Competition in South and East China Seas: Background and Issues for Congress*.

[59] See, for example, Andreas Raspotnik and Andreas Østhagen, "A Global Arctic Order Under Threat? An Agenda for American Leadership in the North," *Polar Points (Wilson Center Polar Institute)*, March 10, 2021.

Arctic Governance

Spotlight on Arctic Governance and Limits of Arctic Council

The renewal of great power competition has put more of a spotlight on the issue of Arctic governance and the limits of the Arctic Council as a governing body.[60] As noted earlier in this report, regarding the limits of the Arctic Council as a governing body, the council states that "The Arctic Council does not and cannot implement or enforce its guidelines, assessments or recommendations. That responsibility belongs to each individual Arctic State. The Arctic Council's mandate, as articulated in the Ottawa Declaration, explicitly excludes military security."[61]

During the post-Cold War era—the period when the Arctic Council was established and began operating—the limits of the Arctic Council as a governing body may have been less evident or problematic, due to the post-Cold War era's general situation of lower tensions and reduced overt competition between the great powers. With the renewal of great power competition, however, it is possible that these limits could become more evident or problematic, particularly with regard to addressing Arctic-related security issues.

If the limits of the Arctic Council as a governing body are judged as having become more evident or problematic, one option might be to amend the rules of the council to provide for some mechanism for enforcing its guidelines, assessments, or recommendations. Another option might be to expand the council's mandate to include an ability to address military security issues.

Supporters of such options might argue that they could help the council adapt to the major change in the Arctic's geopolitical environment brought about the shift in the international security environment, and thereby help maintain the council's continued relevance in coming years. They might also argue that continuing to exclude military security from the council's mandate risks either leaving Arctic military security issues unaddressed, or shifting them to a different forum

[60] See, for example, Benjamin J. Sacks et al., *Exploring Gaps in Arctic Governance, Identifying Potential Sources of Conflict and Mitigating Measures*, RAND, 2021, 29 pp. (report RRA1007.1); Clara Ferreira Marques, "As the Arctic Heats Up, How to Keep the Peace," *Bloomberg*, May 22, 2021; James Foggo and Rachael A. Gosnell, "Building a Trans-Polar Bridge," Center for European Policy Analysis (CEPA), May 21, 2021; Ian Birdwell, "Arctic Governance: Keeping The Arctic Council On Target," Center for International Maritime Security (CIMSEC), July 29, 2020; Benjamin Chiacchia, "The Case for an Arctic Treaty," *U.S. Naval Institute Proceedings*, May 2020; Rashmi Ramesh, "Changing Geopolitics of the Arctic: Challenges for Governance," *IndraStra*, April 9, 2020; Angus Parker, "Looking North: How Should the Arctic Be Governed?" *Geographical (UK)*, March 17, 2020; Kevin McGwin, "An Arctic Treaty Has Been Rejected by the Region's Leaders. Again; Academics Will Tell You the Idea of an Arctic Treaty Sounds Terribly Exciting. Diplomats Think It Is Just Terrible.: *ArcticToday*, February 12, 2020; Marc Lanteigne, "So You Want to Write an Arctic Treaty?" *Over the Circle*, February 10, 2020; Roman Chuffart, "Is the Arctic Council a Paper Polar bear?" *High North News*, November 29, 2019; David Balton and Fran Ulmer, *A Strategic Plan for the Arctic Council: Recommendations for Moving Forward*, The Arctic Initiative (Belfer Center for Science and International Affairs, Harvard Kennedy School) and The Polar Institute (Woodrow Wilson International Center for Scholars), June 2019, 15 pp.; Mckenna Coffey, "Concerns Rise Over Governance Gap in Arctic," *New Security Beat (Wilson Center)*, August 5, 2019; Melody Schreiber, "Will the Arctic Council Begin Addressing National Security?" *ArcticToday*, May 17, 2019; Arne O. Holm, "Does the Arctic Council Have Enough Power in It to Keep the Arctic a Peaceful Region?" High North News, April 27, 2019; Gosia Smieszek, "Costs and Reality of Reforming the Arctic Council," *Arctic Institute*, April 9, 2019.

See also Ebru Caymaz, "Rethinking Governance in Time of Pandemics in the Arctic," Arctic Institute, January 14, 2021.

[61] Arctic Council, "About the Arctic Council," accessed April 8, 2021, at https://arctic-council.org/en/about/.

that might have traditions weaker than those of the Arctic Council for resolving disputes peacefully and with respect for international law.

Opponents of such options might argue that they could put at risk council's ability to continue addressing successfully nonmilitary security issues pertaining to the Arctic. They might argue that there is little evidence to date that the council's limits as a governing body have become problematic, and that in light of the council's successes since its founding, the council should be viewed as an example of the admonition, "if it isn't broke, don't fix it."[62] Arctic security issues, they might argue, can or are being addressed through existing mechanisms, such as the Arctic Security Forces Roundtable (ASFR) and the Arctic Chiefs of Defense (ACHOD) Forum.[63]

China and Arctic Governance

China—which is not one of the eight Arctic states and consequently does not have a decisionmaking role in the Arctic Council—has raised questions as to whether the Arctic Council as currently constituted and the current broader legal framework for the Arctic should continue to be the principal means for addressing issues relating to the Arctic, and has begun to use other

[62] See, for example, Trine Jonassen, "Researcher Refutes Myth about the Wild North, Despite Increased Military Activity," *High North News*, August 20, 2021.

[63] Regarding the question of how to address security issues, see Jane George, "Russia Wants to Revive Military Meetings Among Arctic Council Members," *Nunatsiaq News*, May 20, 2021; Jacob Gronholt-Pedersen, "Russia Calls for Military Meetings between Arctic States as Tensions Rise," *Reuters*, May 20, 2021; Trine Jonassen, "Russia on Arctic Council Chairmanship: Wants to Revive the Military Dialogue Between Arctic States," *High North News*, May 20 (updated May 21), 2021; Matthew Lee, "US, Russia At Odds over Military Activity in the Arctic," *Associated Press*, May 20, 2021; Radio Free Europe/Radio Liberty, "Washington Rallies Support Over Arctic Buildup; Moscow Worried Over Deployments In Norway," *Radio Free Europe/Radio Liberty*, May 20, 2021; Hilde-Gunn Bye, "Arctic Council, EU, NATO on Agenda as Military Leaders Addressed Arctic Security Issues," *High North News*, May 12 (updated May 14), 2021; EU Reporter Correspondent, "Military Leaders Address Collective Arctic Security Issues," *Eureporter*, May 11, 2021; Anita Parlow, "Trust and Paradox: The United States and Russia in the Arctic," *Barents Observer*, May 11, 2021; Sherri Goodman, Marisol Maddox, and Kate Guy, "We Need Renewed Dialogue Among Security Forces in the Arctic," *ArcticToday*, March 11, 2021; Mathieu Boulègue and Duncan Depledge, *Arctic Hard Security Taskforce: Summary of the 10 December Expert Workshop*, North American and Arctic Defence and Security Network, Activity Report, March 10, 2021, 8 pp.; Walter Berbrick, Rachael Gosnell, Lars Saunes, and Mary Thompson-Jones, "Preventing Conflict in the Arctic with Russia Starts with Dialogue," *National Interest*, March 8, 2021; Hilde-Gunn Bye, "Russia Should Be Invited Back to Arctic Security Forums, New Report Suggests," *High North News*, January 26 (updated January 27), 2021; Walter Berbrick and Lars Saunes, Project Directors, *Conflict Prevention and Security Cooperation in the Arctic Region Frameworks of the Future*, U.S. Naval War College, Newport Scholars Arctic Initiative, Report No. 1, September 2020, 82 pp.; Joshua Tallis, "NATO is the Right Forum for Security Dialogue in the High North," *Defense News*, July 28, 2020; Kevin McGwin, "Denmark Should Support an Arctic Military Forum, a Danish Think-Tank Says," *ArcticToday*, June 12, 2020; Abbie Tingstad, "Today's Arctic Diplomacy Can't Handle Tomorrow's Problems," *Defense One*, January 29, 2020; Siri Gulliksen Tømmerbakke, "Why Finland and Iceland Want Security Politics in the Arctic Council," *ArcticToday*, October 25, 2019. See also Depledge and P. Whitney Lackenbauer, editors, *On Thin Ice? Perspectives on Arctic Security*, North American and Arctic Defence and Security Network (NAADSN), Trent University, Peterborough, Ontario, Canada, 2021, 201 pp.; Andreas Østhagen, "The Arctic Security Region: Misconceptions and Contradictions," *Polar Geography*, Vol. 44, No. 1 (2021), published online February 28, 2021: 55-74.

For a general discussion of the limits of the Arctic Council and what, if anything, to do about it, see, for example, Heather Exner-Pirot et al., "Form and Function: The Future of the Arctic Council," *Arctic Institute*, February 5, 2019. See also Marc Lanteigne, "The Growing Role of 'Track II' Organisations in the Arctic," *Over the Circle*, May 23, 2018. See also Sabrina Shankman, "How the Trump Administration's Climate Denial Left its Mark on the Arctic Council," *ArcticToday*, January 19, 2021.

approaches for influencing Arctic governance.[64] In May 2019, a U.S. official stated that the United States "reject[s] attempts by non-Arctic states to claim a role" in Arctic governance.[65]

Relative Priority of Arctic in U.S. Policymaking

The renewal of great power competition has raised a question concerning the priority that should be given to the Arctic in overall U.S. policymaking. During the post-Cold War era, when the Arctic was generally a region of cooperation and low tensions, there may have been less need to devote U.S. policymaker attention and resources to the Arctic. Given how renewed great power competition and challenges to elements of the U.S.-led international order might be expressed in the Arctic in terms of issues like resource exploration, disputes over sovereignty and navigation rights, and military forces and operations, it might be argued that there is now, other things held equal, more need for devoting U.S. policymaker attention and resources to the Arctic.[66] In August 2020, James DeHart, the U.S. Coordinator for the Arctic, reportedly stated that "if you look at what is happening in our system over the last couple of months, you will see that we are launching a comprehensive and an integrated diplomatic approach and engagement in the Arctic region," and that "in a few years, people will look back at this summer [of 2020] and see it as an important pivot point, a turning point, with a more sustained and enduring attention by the United States to the Arctic region."[67]

On the other hand, renewed great power competition and challenges to elements of the U.S.-led international order are also being expressed in Europe, the Middle East, the Indo-Pacific, Africa, and Latin America. As a consequence, it might be argued, some or all these other regions might similarly be in need of increased U.S. policymaker attention and resources. In a situation of constraints on total U.S. policymaker attention and resources, the Arctic competes against these other regions for U.S. policymaker attention and resources. As one expression of this issue, it was reported in January 2020 that 3,000 of a planned force of about 10,500 U.S. military personnel scheduled to participate in a cold-weather exercise in Norway in March 2020 were to be diverted to perform missions elsewhere.[68] Some observers have expressed concern that the United States is not allocating sufficient attention or resources to defend and promote its interests in the Arctic.[69]

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[64] See, for example, Pan Yixuan, "Global Governance Needed for Arctic Affairs," *China Daily*, May 10, 2019; Zhang Yao, "Ice Silk Road Framework Welcomed by Countries, Sets New Direction for Arctic Cooperation," *Global Times*, April 7, 2019; Liu Caiyu, "China's Role in Arctic Governance 'Cannot Be Ignored,'" *Global Times*, November 22, 2018; Harriet Moynihan, "China Expands Its Global Governance Ambitions in the Arctic," Chatham House, October 15, 2018; Sydney J. Freedberg Jr., "China & Russia In The Arctic: Axis Of Ambivalence," *Breaking Defense*, July 6, 2018; Nengye Liu and Michelle Lim, "How Arctic Governance Could Become a Testing Ground for Sino-US Relations," *The Conversation*, March 29, 2017.

[65] Reuters, "US Rejects Interference by Non-Arctic Countries in Polar Region: Official," *ArcticToday*, May 3, 2019.

[66] For an article bearing on this issue, see Heather A. Conley and Matthew Melino, *The Implications of U.S. Policy Stagnation toward the Arctic Region*, Center for Strategic and International Studies (CSIS), May 2019, 5 pp.

[67] As quoted in Hilde-Gunn Bye, "The U.S. Is Launching a Comprehensive Diplomatic Approach in the Arctic Region, Says Top-Level Official," *High North News*, August 6 (updated August 7), 2020. See also Hilde-Gunn Bye, "USA Steps Up Diplomatic Efforts in the Arctic," *High North News*, September 29 (updated September 30), 2020; Levon Sevunts, "U.S. Wants to Keep the Arctic An Area of Low Tensions, [Says] Top Official," *Barents Observer*, August 6, 2020.

[68] John Vandiver, "US Troops Slated for Big Arctic Exercise Get Shifted to Other Missions," *Stars and Stripes*, January 17, 2020; Alte Staalesen, "American Forces Withdraw from Allied Exercise in Arctic Norway," *ArcticToday*, January 17, 2020.

[69] See, for example, Tyler Olson, "Biden Admin Faces Lack of Icebreakers, Increasing Russian and Chinese Threats in Arctic," *Fox News*, May 9, 2021; Rockford Weitz, "Competition Heats Up in the Melting Arctic, and the US Isn't Prepared to Counter Russia," *The Conversation*, April 19, 2021; John Rossomando, "Will Joe Biden Lose the Arctic to

U.S., Canadian, and Nordic Relations with Russia in the Arctic

Overview

The renewal of great power competition raises a question for U.S., Canadian, and Nordic policymakers regarding the mix of cooperation and competition to pursue (or expect to experience) with Russia in the Arctic. In considering this question, points that can be noted include the following:

- As noted earlier in this report, Russia in May 2021 assumed the chairmanship of the Arctic Council. Russian officials have stated that sustainable development, economic growth, and national security concerns will be a priority for Russia during its two-year chairmanship period.[70]
- Geographically, Russia is the most prominent of the eight Arctic states. According to one assessment, Russia "has at least half of the Arctic in terms of area, coastline, population and probably mineral wealth."[71] About 20% of Russia's land mass is north of the Arctic Circle.[72] Russia has numerous cities and towns in its Arctic, uses its coastal Arctic waters as a maritime highway for supporting its Arctic communities, is promoting the Northern Sea Route that runs along Russia's Arctic coast for use by others, and is keen to capitalize on natural resource development in the region, both onshore and offshore. A substantial fraction of Russia's oil and gas production and reserves are in the Arctic. In this sense, of all the Arctic states, Russia might have the most at stake in the Arctic in absolute terms.[73]
- The Arctic is a top strategic priority for Russia. In 2008, 2013, 2014, 2017, and most recently in 2020, the Russian government adopted strategy documents outlining plans to bolster the country's Arctic military capabilities, strengthen territorial sovereignty, and develop the region's resources and infrastructure.[74]

Russia or China?" *National Interest*, April 18, 2021; The Wallace Institute, "It's Bigger Than Icebreakers: America's Path Forward in the Arctic," *Defense Post*, October 23, 2020.

[70] Alina Bykova, "Russian Arctic Council Chairmanship: 'Will Welcome More Active Engagement of the Observer States,'" *High North News*, March 8 (updated March 12), 2021; Atle Staalesen, "Moscow Signals It Will Make National Security a Priority as Russia Prepares to Chair the Arctic Council," *ArcticToday*, October 15, 2020. See also Paul Goble, "As Arctic Warms, Moscow Increasingly Shifts Focus There From Trade to Security," *Eurasia Daily Monitor*, October 20, 2020.

[71] "The Arctic: Special Report," *The Economist*, June 16, 2012, p. 11. The Arctic Council states that "Russia stretches over 53 percent of the Arctic Ocean coastline. Approximately two and a half million of Russia's inhabitants live in Arctic territory, accounting for nearly half of the population living in the Arctic worldwide." ("The Russian Federation," Arctic Council, accessed May 13, 2021, at https://arctic-council.org/en/about/states/russian-federation/.)

[72] Testimony of Admiral Charles W. Ray, Coast Guard Vice Commandant, on "Expanding Opportunities, Challenges, and Threats in the Arctic: a Focus on the U.S. Coast Guard Arctic Strategic Outlook" before the Senate Commerce, Science, & Transportation Security Subcommittee, December 12, 2019, p. 3.

[73] See also Sergey Sukhankin, "Russia's LNG Strategy: Foreign Competition and the Role of the Arctic Region," *Eurasia Daily Monitor*, July 21, 2021; Eugene Rumer, Richard Sokolsky, and Paul Stronski, *Russia in the Arctic—A Critical Examination*, Carnegie Endowment for International Peace, March 2021, 23 pp.; Gabriella Gricius, "Russian Ambitions In The Arctic: What To Expect," *Global Security Review*, October 4, 2020; Stephanie Pezard, *The New Geopolitics of the Arctic, Russia's and China's Evolving Role in the Region*, RAND (Testimony presented before the Standing Committee on Foreign Affairs and International Development of the Canadian House of Commons on November 26, 2018), pp. 1-2.

[74] Regarding the 2020 document, see, for example, Atle Staalesen, "Behind Putin's New Arctic Strategy Lies a Rude Quest for Natural Resources," *Barents Observer*, October 20, 2020; Elizabeth Buchanan, "Russia's Updated Arctic

Over the past several years, Russia has invested in the construction of ports and search-and-rescue facilities, some of which are referred to as dual use (civilian-military) facilities. Russia also has reactivated and modernized Arctic military bases that fell into disuse with the end of the Cold War, assigned new forces to those bases, and increased military exercises and training operations in the Arctic.

- Arctic ice is diminishing more rapidly or fully on the Russian side of the Arctic than it is on the Canadian side. Consequently, the Northern Sea Route along Russia's coast is opening up more quickly for trans-Arctic shipping than is the Northwest Passage through the Canadian archipelago.

On the one hand, the United States, Canada, and the Nordic countries continue to cooperate with Russia on a range of issues in the Arctic, including, for example, search and rescue (SAR) under the May 2011 Arctic Council agreement on Arctic SAR"). More recently, the United States and Russia in 2018 cooperated in creating a scheme for managing two-way shipping traffic through the Bering Strait and Bering Sea,[75] and in February 2021, the U.S. Coast Guard and Russia's Marine Rescue Service signed an agreement updating a 1989 bilateral joint contingency plan for responding to transboundary maritime pollution incidents.[76] An August 2021 press report stated that "the U.S., China, Japan and Russia are among the countries planning to conduct joint research in the Arctic Ocean in a step toward preventing overfishing in the region.… Representatives from nine countries and the European Union aim to meet in South Korea early next year to discuss exploratory fishing based on similar treaties covering other regions."[77]

Strategy: New Strategic Planning Document Approved," *High North News*, October 28, 2020; Atle Staalesen, "Putin Signs Arctic Master Plan," *Barents Observer*, March 6, 2020; United Press International, "Putin Signs 15-Year Plan to Invest in Arctic with Jobs, Military Upgrades," *Oil & Gas 360*, March 6, 2020; Charles Digges, "Putin Unveils More Plans to Boost Northern Sea Route," *Maritime Executive*, March 7, 2020; Alexandra Brzozowski, "Russia Significantly Steps Up Arctic Engagement with New Strategy," *Euractiv*, March 9, 2020. See also Hilde-Gunn Bye, "Putin Approves Russia's Updated Arctic Development Strategy," *ArcticToday*, October 28, 2020; Elizabeth Buchanan, "Putin's Real Arctic Playbook: Demography, Development, and Defense," *National Interest*, October 27, 2020; Ekaterina Klimenko, "Russia's New Arctic Policy Document Signals Continuity Rather Than Change—Analysis," *Eurasia Review*, April 20, 2020; Marc Lanteigne, "The Best-Laid Plans? Russia's New Arctic Strategies Face Many Hurdles," *Over the Circle*, March 12, 2020; Sergey Sukhankin, "Russia Steps up Efforts to Dominate Arctic Region," *Eurasia Daily Monitor*, February 24, 2020; Jamestown Foundation, "Russia Doubles Down On Its Arctic Ambitions," *OilPrice.com*, February 15, 2020; Rachel Menosky, "Russia's Plan to Move on the Arctic," Heritage Foundation, January 29, 2020. See also Nazrin Mehdiyeva, *Russia's Arctic Papers: The Evolution of Strategic Thinking on the High North*, NATO Defense College, November 19, 2018. See also Thomas Nilsen, "Ambassador Vasiliev Lists Russia's New Arctic Priorities with Focus on Fossil Fuels and Positive Effects of Climate Changes," *Barents Observer*, January 27, 2021.

[75] See, for example, U.S. Coast Guard, "U.S., Russia Propose Bering Strait Ship Traffic Routing Measures," January 25, 2018; Amy Midgett, "U.S., Russia Jointly Propose Bering Strait Routing Measures," *Coast Guard Maritime Commons*, January 25, 2018; Amy Midgett, "IMO Approves U.S.-Russian Federation Proposal for Bering Strait Routing Measures," *Coast Guard Maritime Commons*, May 25, 2018; Yereth Rosen, "With Marine Traffic Growing, International Shipping Agency Approves US-Russia Plan for Bering Strait Shipping Lanes," *ArcticToday*, May 26, 2018; Associated Press, "Maritime Organization Approves Two-Way Shipping Routes in Bering Strait," *CBC*, May 27, 2018; "U.S., Russia Propose Bering Strait Traffic Routing," *Maritime Executive*, May 27, 2018; Margaret Kriz Hobson, "Amid Ice Melt, New Shipping Lanes Are Drawn Up off Alaska," *E&E News (Scientific American)*, May 29, 2018.

[76] See Melody Schreiber, "U.S. and Russia Sign New Maritime Pollution Agreement, Conduct Joint Bering Sea Patrol," *ArcticToday*, February 10, 2021.

[77] Miki Okuyama, "International Research Planned to Manage Arctic Fish Stocks," *Nikkei Asia*, August 1, 2021. See also Peter B. Danilov, "US, China and Russia Plan Joint Research in Order to Regulate Arctic Fishing," *High North News*, August 2, 2021.

Some observers see possibilities for further U.S., Canadian, and Nordic cooperation with Russia in the Arctic.[78] On the other hand, as discussed later in this report, a significant increase in Russian military capabilities and operations in the Arctic in recent years has prompted growing concerns among U.S., Canadian, and Nordic observers that the Arctic might once again become a region of military tension and competition, as well as concerns about whether the United States, Canada, and the Nordic countries are adequately prepared militarily to defend their interests in the region.

In February 2020, a disagreement between Norway and Russia arose regarding Russia's access to the Norwegian archipelago of Svalbard under the terms of the Svalbard Treaty of 1920.[79]

Russian actions outside the Arctic could affect relations between Russia and the other Arctic states. For example, in protest of Russia's forcible occupation and annexation of Crimea and its actions elsewhere in Ukraine, Canada announced that it would not participate in an April 2014 working-level-group Arctic Council meeting in Moscow.[80] Economic sanctions that the United States imposed on Russia in response to Russian actions in Ukraine could affect Russian Arctic offshore oil exploration.[81]

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[78] See, for example, Mark Piesing, "International Competition is Heating Up in the Arctic. These Norwegian Islands Show How It Can Be Managed.," *Barron's*, August 26, 2021; Kari Roberts, "How Canada Should Deal with Russia in the Arctic," *iPolitics*, August 23, 2021; Autumn Gonzales, "Towards a US-Russia Partnership in the Arctic," *Modern Diplomacy*, August 11, 2021; Melody Schreiber and Krestia DeGeorge, "What the Biden-Putin Summit Means—and Doesn't Mean—for Arctic Cooperation," *ArcticToday*, June 18, 2021; Hilde-Gunn Bye, "Plenty of Ground for Cooperation in the Arctic, Putin Says," *High North News*, June 17 (updated June 18), 2021; Malgorzata (Gosia) Smieszek, "US-Russia Cooperation on an Arctic Methane Agreement Could Improve Relations—and Slow Climate Change," *ArcticToday*, June 14, 2021; Paul Arthur Berkman, "Cooperation in the Arctic Offers a Model for US-Russia Cooperation Elsewhere," *ArcticToday*, June 11, 2021; Thomas Rotnem, "The Arctic Council Power Flex that Could Prove Prosperous—for America," *National Interest*, May 31, 2021; Tom Balmforth and Humeyra Pamuk, "Russia, U.S. Tout Cooperation Ahead of Arctic Council Meeting," *Reuters*, May 18, 2021; Heather A. Conley and Colin Wall, "U.S.-Russian Arctic Relations: A Change in Climate?" Center for Strategic and International Studies (CSIS), March 31, 2021; Sherri Goodman, Marisol Maddox, and Kate Guy, "We Need Renewed Dialogue Among Security Forces in the Arctic," *ArcticToday*, March 11, 2021; Agence France-Presse, "Russia To Cooperate With US On Arctic, Forests: Report," *Barron's*, March 9, 2021; Mathieu Boulègue and Duncan Depledge, *Arctic Hard Security Taskforce: Summary of the 10 December Expert Workshop*, North American and Arctic Defence and Security Network, Activity Report, March 10, 2021, 8 pp.; Walter Berbrick, Rachael Gosnell, Lars Saunes, and Mary Thompson-Jones, "Preventing Conflict in the Arctic with Russia Starts with Dialogue," *National Interest*, March 8, 2021.

[79] See, for example, Atle Staalesen, "Norway's Celebration of Svalbard Treaty Was Followed by Ardent and Coordinated Response from Moscow Media," *Barents Observer*, July 2, 2020; Megan Eckstein, "Foggo: Changing Conditions Require New Arctic Strategy, International Code of Conduct," *USNI News*, June 26, 2020; Nerijus Adomaitis, "Norway Rejects Moscow's Claim It Violated Svalbard Treaty," *Reuters*, February 21, 2020; Luke Coffey, "Russia's and China's Interest in Cold Svalbard Heats Up," *National Interest*, February 13, 2020; Pavel K. Baev, "Moscow Plays Hard Ball in the High North," *Eurasia Daily Monitor*, February 10, 2020; Brett Davis, "Russia Has Always Challenged Norway on Svalbard. This Time Parts of Its Criticism is [sic] Different," *High North News*, February 10, 2020; Jennifer Alvarez, "As Russia Returns to Svalbard," *KXAN Daily News*, February 9, 2020; Marc Lanteigne, "Norway, Russia, and a Changing Svalbard," *Over the Circle*, February 7, 2020; Arme O. Holm, "If Russia Wants More Power on Svalbard, There Is A Far More Efficient Method," *High North N*ews, February 6, 2020; Atle Staalesen, "Amid Jubilant Celebration at Svalbard, Norway Sends Strong Signal It Will Not Accept Encroachment on Sovereignty," *Barents Observer*, February 9, 2020; Amund Trtellevik, "Russia With Stern Svalbard Warning to Norway," *High North N*ews, February 5, 2020; Tom Balmforth and Nerijus Adomaitis, "Russia Accuses Norway of Restricting Its Activities on Arctic Islands," *Reuters*, February 4, 2020.

[80] For additional discussion of Canadian-Russian relations regarding the Arctic, see Sergey Sukhankin, "Russia's Arctic Agenda and the Role of Canada," *Eurasia Daily Monitor*, April 15, 2020.

[81] See, for example, Reuters staff, "Expanded U.S. Sanctions May Affect Russia's Foreign Expansion in Oil and Gas" *Reuters*, November 19, 2017.

Northern Sea Route

Another concern for U.S. policymakers in connection with Russia in the Arctic relates to the Northern Sea Route (NSR)—the Arctic shipping route linking Europe and Asia via waters running along Russia's Arctic coast. Russia considers certain parts of the NSR to be internal Russian waters and has asserted a right to regulate commercial shipping passing through these waters[82]—a position that creates a source of tension with the United States, which considers those waters to be international waters.[83] The U.S.-Russian dispute over this issue could have implications not only for U.S.-Russian relations and the Arctic, but for other countries and other parts of the world as well, since international law is universal in its application, and a successful challenge to international waters in one part of the world can serve as a precedent for challenging it in other parts of the world.

The issue of the U.S.-Russian dispute over the international legal status of the NSR was largely dormant for many years. In March 2019, however, Russia announced that

> The Russian government has elaborated a set of rules for foreign naval vessels' sailing on the Northern Sea Route, [the Russian newspaper] Izvestia informs. The newspaper has obtained a copy of the document that states that all vessels are obliged to comply.
>
> The foreign state must send a notification about the voyage at least 45 days ahead of its start. Included will have to be the name of the ship, its objective, route and period of sailing, as well as ship characteristics such as length, width, deadweight, draft and type of engine power. Also the name of the ship captain must be listed.
>
> The ships must also have on board a Russian maritime pilot.
>
> In case the voyage is not conducted in line with the regulations, Russia will have the right to take extraordinary measures including its forced halt, arrest and in extreme cases elimination, Izvestia writes.[84]

In September 2019, it was reported that Russia had used military commandos to board a Russian-flag commercial ship operating in the NSR that Russian authorities suspected of violating certain regulations.[85]

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[82] See, for example, James Foggo III, "Russia, China Offer Challenges in the Arctic," *Defense One*, July 10, 2019; Dmitry Sudakov, "Russia Closes Northern Sea Route for Foreign Warships," *Pravda Report*, May 30, 2019; Nastassia Astrasheuskaya and Henry Foy, "Polar Powers: Russia's Bid for Supremacy in the Arctic Ocean," *Financial Times*, April 27, 2019; James R. Holmes, "Don't Let Russia Create a 'Caribbean' in the Arctic," *The Hill*, March 28, 2019; Marex (Maritime Executive), "Russia Tightens Control Over Northern Sea Route," *Maritime Executive*, March 8, 2019; Atle Staalesen, "Russia Sets Out Stringent New Rules for Foreign Ships on the Northern Sea Route," *Barents Observer*, March 8, 2019; Will Stewart, "Moscow Threatens to Sink Foreign Ships Using Arctic Sea Route That Links Atlantic to the Pacific Unless It Is Given 45 Days Notice of Voyages and Vessels Take a Russian Pilot on Board," *Daily Mail*, March 6, 2019; "Russia Will Restrict Foreign Warships in Arctic Ocean, Defense Official Says," *Moscow Times*, November 30, 2018.

[83] See, for example, Peter B. Danilov, "Russia has Advanced Unlawful Maritime Claims in the Arctic, Says Antony Blinken," *High North News*, May 19, 2021; Nikolaj Skydsgaard and Humeyra Pamuk, "Blinken Says Russia Has Advanced Unlawful Maritime Claims in the Arctic," *Reuters*, May 18, 2021.

[84] Atle Staalesen, "Izvestia: This Is What Awaits Foreign Military Vessels on Northern Sea Route," *Barents Observer*, March 7, 2019. (A similar version published as Atle Staalesen, "Russia Sets Out Stringent New Rules for Foreign Ships on the Northern Sea Route," *ArcticToday*, March 8, 2019.) See also Maritime Executive, "Russia Tightens Control Over Northern Sea Route," *Maritime Executive*, March 8, 2019; Will Stewart, "Russia Warning: Moscow Could Sink or Detain Foreign Ships in Arctic Waters under New Rules," Express (UK), March 6, 2019.

[85] See Atle Staalesen, "Navy Commandos Board Cargo vessel on Northern Sea Route," *Barents Observer*, September 13, 2019. See also Luke Coffey, "Cold truth about Russia's Arctic ambitions and Northern Sea Route," *Arab News*, March 14, 2020. The United States believes that the part of the Northwest Passage that runs through the Canadian

The issue of the NSR was reportedly discussed in detail at the June 2021 U.S.-Russian summit meeting in Geneva.[86]

NATO and European Union in the Arctic

NATO

Five of the eight Arctic states—the United States, Canada, Denmark, Iceland, and Norway—are members of NATO. The renewal of great power competition has led to a renewal of NATO interest in NATO's more northerly areas.

During the Cold War, NATO member Norway and its adjacent sea areas were considered to be the northern flank of NATO's defensive line against potential aggression by the Soviet-led Warsaw Pact alliance. With the end of the Cold War and the shift to the post-Cold War era, NATO planning efforts shifted away from defending against potential aggression by Russia, which was considered highly unlikely, and toward other concerns, such as the question of how NATO countries might be able to contribute to their own security and that of other countries by participating in out-of-area operations, meaning operations in areas outside Europe.

With the renewal of great power competition, NATO is now once again focusing more on the question of how to deter potential Russian aggression against NATO countries, including in the Arctic.[87] As one consequence of that, Norway and its adjacent sea areas are once again receiving

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archipelago is an international strait; Canada believes it is internal Canadian waters. In 1985, the use of the waterway by a U.S. polar icebreaker led to a diplomatic dispute between the United States and Canada. In January 1988, the two countries signed an agreement under which, observers, say, the two sides essentially agreed to disagree on the issue. The agreement—formally called Agreement Between the Government of Canada and the Government of the United States of America on Arctic Cooperation—states in part that "the Government of the United States pledges that all navigation by U.S. icebreakers within waters claimed by Canada to be internal will be undertaken with the consent of the Government of Canada," and that "nothing in this agreement of cooperative endeavour between Arctic neighbours and friends nor any practice thereunder affects the respective positions of the Governments of the United States and of Canada on the Law of the Sea in this or other maritime areas or their respective positions regarding third parties." The text of the agreement as posted by the Canadian government is available at https://www.treaty-accord.gc.ca/text-texte.aspx?id=101701. An August 26, 2021, press report states that "A U.S. Coast Guard icebreaker embarked Wednesday [August 25, 2021] on a long Arctic mission that includes a rare transit of the Northwest Passage, conducting scientific research and a joint exercise with Canada in Arctic waters. The cutter Healy, one of two operational U.S. Coast Guard icebreakers, departed Wednesday from Seward, Alaska, for the three-week journey to Nuuk, Greenland.... Healy last transited the passage in 2005. In 2017, the U.S. cutter Maple ([WLB-207], a seagoing buoy tender] navigated the Northwest Passage from west to east together with the Canadian icebreaker Terry Fox to conduct research in a joint exercise with Canada.... U.S. vessels may travel through the passage if they are conducting research, according to a 1988 agreement with Canada.... The invocation of the 1988 agreement on Arctic cooperation means Canadian-U.S. relations are "returning back to normality," Rob Huebert, assistant professor at the University of Calgary, told *ArcticToday*.... The Coast Guard first approached Canada to request consent in summer 2020, [Jason Kung, a spokesperson for Global Affairs Canada] said, and Canadian and U.S. agencies have worked together closely on the trip." (Melody Schreiber, "US icebreaker Departs on a Voyage that Will Transit the Northwest Passage," *ArcticToday*, August 26, 2021.)

[86] Atle Staalesen, "On Putin-Biden agenda: the Northern Sea Route," *Barents Observer*, June 17, 2021.

[87] See, for example, Candace Huntington, "NATO Needs Unity as Russia's Arctic Presence Grows," Center for European Policy Analysis (CEPA), May 19, 2021; Christopher Woody, "Russian and NATO Militaries Are Getting More Active in the Arctic, but Neither Is Sure About What the Other Is Doing," *Business Insider*, July 21, 2020; Colin Barnard, "Why NATO Needs a Standing Maritime Group in the Arctic," Center for International Maritime Security, May 15, 2020; "NATO is facing up to Russia in the Arctic Circle," *Economist*, May 14, 2020; Sebastian Sprenger, "NATO's Camille Grand on the Alliance's Arctic Tack," *Defense News*, May 12, 2020; Rebecca Pincus, "NATO North? Building a Role for NATO in the Arctic," *War on the Rocks*, November 6, 2019; Anna Wieslander, "It's Time for NATO to Engage in the Arctic," *Defense One*, September 16, 2019; Tyler Cross, "The NATO Alliance's Role in

more attention in NATO planning.[88] For example, a NATO exercise called Trident Juncture 18 that was held from October 25 to November 7, 2018, in Norway and adjacent waters of the Baltic and the Norwegian Sea, with participation by all 29 NATO members plus Sweden and Finland, was described as NATO's largest exercise to that point since the Cold War, and featured a strong Arctic element, including the first deployment of a U.S. Navy aircraft carrier above the Arctic Circle since 1991.[89]

In September 2020, NATO established a new Atlantic Command in Norfolk, VA, called Joint Force Command Norfolk, as NATO's first command dedicated to the Atlantic since 2003. Co-located with the U.S. Navy's reestablished 2nd Fleet for the Atlantic, Joint Force Command Norfolk "will provide coherent command arrangements for Allied forces, maintain situational awareness, conduct exercises, and draw up operational plans covering vast geographic areas, from the US East Coast, past the Greenland-Iceland-U.K. gap and into the Arctic."[90]

The question of NATO's overall involvement in the Arctic has been a matter of debate within NATO and among other observers.[91] Russia has expressed opposition to the idea of NATO becoming more involved in the Arctic.[92]

European Union

Three of the eight Arctic states—Denmark, Finland, and Sweden—are members of the European Union (EU), and two other Arctic states—Iceland and Norway—have close ties to the EU as members of the European Economic Area. The EU is showing increased interest in the Arctic,[93]

Arctic Security," *Maritime Executive*, July 19, 2019. See also Gozde Bayar, "Turkey striving to become polar power: Analysts," *Anadolu Agency*, May 21, 2020.

[88] See, for example, Teri Schultz, "NATO and Washington Worry About Russian Subs in the High North," *Deutsche Welle*, April 26, 2018.

[89] See, for example, Christopher Woody, "'We Can Do Better': The Navy's Newest Fleet Commander Says US Ships and Sailors Got 'Beat Up' During NATO's Biggest Exercise Since the Cold War," *Business Insider*, December 4, 2018; Levon Sevunts, "NATO's Arctic Dilemma; Two Visions of the Arctic Collide as NATO and Russia Flex Muscles," *Radio Canada International*, December 3, 2018; Megan Eckstein, "Truman CSG: Arctic Strike Group Operations Required Focus on Logistics, Safety," *USNI News*, November 6, 2018; Mary Thompson-Jones, "NATO's Arctic Exercise is a Good Start to Standing Up to Russian Militarization of the High North," *National Interest*, November 6, 2018; Pierre-Henry Deshayes, "Antifreeze and Balaclavas: NATO Troops in cold War Games," *Military.com*, November 2, 2018; Vasco Cotovio and Frederik Pleitgen, "Submarines a Centerpiece of Russia's Navy," *CNN*, November 19, 2018; Shawn Snow, "The Corps' Armor Makes a Big Showing in Norway as Marines Test Future Force," *Marine Corps Times*, October 25, 2018; Terje Solsvik, "As Winter Comes, NATO Kicks Off Largest Maneuvers Since Cold War," *Reuters*, October 25, 2018; Kyle Rempfer, "US Breaches the Arctic with Marines, Fighter Jets and Aircraft Carriers," *Military Times*, October 23, 2018; Megan Eckstein, "Truman Carrier Strike Group Operating North of Arctic Circle; First Time for US Navy Since 1991," *USNI News*, October 19, 2018; Thomas Gooley, "HST Strike Group Enters Arctic Circle, Prepares for NATO Exercise," *DVIDS (Defense Visual Information Distribution Service)*, October 19, 2018; Thomas Nilsen, "US Marines Launch Exercise in Northern Norway Ahead of Trident Juncture," *Barents Observer*, October 15, 2018.

[90] NATO headquarters news release, "NATO's New Atlantic Command Declared Operational," September 18, 2020. See also Levon Sevunts, "NATO's New Atlantic Command to Keep Watch over the European Arctic," *Eye on the Arctic (Radio Canada International)*, September 18, 2020.

[91] See, for example, David Auerswald, "NATO in the Arctic: Keep Its Role Limited, for Now," *War on the Rocks*, October 12, 2020; Luke Coffey and Daniel Kochis, "Brussels NATO Summit 2018: Time to Get Serious About the Arctic," Heritage Foundation, June 27, 2018 (Issue Brief 4875), p. 1.

[92] Peter Bakkemo Danilov, "Russia Warns Against Pulling NATO into the Arctic," *High North News*, June 17, 2020.

[93] See, for example, Kevin McGwin, "EU Lawmakers Push for More Visibility in the Arctic—and a Stronger Response to Russia and China," *ArcticToday*, July 6, 2021; European Interest, "Arctic: MEPs Call for Peace and Reduced Tension in the Region," *European Interest*, July 1, 2021; Timo Koivurova et al., *Overview of EU Actions in the Arctic*

and the European Parliament (EP) supports an active EU role in the Arctic.[94] The EU is considered an "observer in principle" to the Arctic Council, but to date has been denied full observer status at the council, alternately by Canada (because of Canadian Inuit objections to the EU's ban on the import of seal products) and Russia (following heightened EU-Russian tensions since Russia's 2014 invasion of Ukraine).[95]

In 2016, the European Commission (the EU's executive) and the EU's High Representative for Foreign Affairs and Security Policy issued a joint communication (or policy paper), *An Integrated European Union Policy for the Arctic*, that states that a "safe, stable, sustainable, and prosperous Arctic" is important for the region, the EU, and the world, and that "the EU has a strategic interest in playing a key role in the Arctic region."[96] The policy outlined in the document seeks to boost the EU's profile in the region and focuses on three broad themes—climate change and safeguarding the environment, sustainable development in the Arctic, and international cooperation on Arctic issues.

In 2017, the EU appointed its first Ambassador-at-Large for the Arctic, and in October 2019, the EU held its first-ever Arctic Forum, a high-level conference in northern Sweden focused on promoting EU efforts in the Arctic.[97] The EU is also a major financial contributor to Arctic research, providing around €200 million in the past decade under the Horizon 2020 Research and Innovation Program.[98] Some analysts contend, however, that the EU's policy statements on the Arctic have yet to coalesce into a clearly defined narrative with concrete goals; the European Commission's in-house think tank argues that the EU must develop a more comprehensive

and Their Impact, Final Report, June 2021, 172 pp., (report prepared for European Commission by EPRD Office for Economic Policy and Regional Development Ltd., Kielce, Poland); Andreas Raspotnik, "A Quantum of Possibilities, The Strategic Spectrum of the EU's Arctic Policy," Centre for European Policy Studies (CEPS), December 17, 2020; Atle Staalesen, "Member of the European Parliament Comes to Barents Coast Calls for Stronger EU Engagement in Arctic," *Barents Observer*, February 13, 2020; Romain Chuffart and Andreas Raspotnik, "The EU and Its Arctic Spirit: Solving Arctic Climate Change from Home?" European View, Vol. 18, No. 2, 2019: 156-162; Kevin McGwin, "The EU Moves Toward a New Arctic Strategy—and a More Independent Role in the Region," *ArcticToday*, December 11, 2019; Kevin McGwin, "The EU Is Poised to Take a Broader—and More Proactive—Role in the Arctic," *ArcticToday*, November 27, 2019; Adam Stepien and Andreas Raspotnik, "Can the EU's Arctic Policy Find True North?" Centre for European Policy Studies (CEPS), September 11, 2019; Wesley Morgan, "Politico Pro Q&A: EU Ambassador at Large for the Arctic Marie-Anne Coninsx," *Politico Pro*, August 6, 2019; Adam Stepien and Andreas Raspotnik, "The EU's Arctic Policy: Between Vision and Reality," *College of Europe Policy Brief*, August 2019, 5 pp.; Martin Breum, "Spurred by Chinese and Russian Activity, EU President Juncker Is Making the Arctic More Central to EU Policy," *ArcticToday*, February 20, 2019. See also Natalia Skripnikova and Andreas Raspotnik, "Has Russia Heard about the European Union's Arcticness? The EU's Arctic Steps As Seen from Russia," *Polar Record (Cambridge University Press)*, March 26, 2020.

[94] In March 2017, the EP adopted a resolution largely endorsing the 2016 joint communication on an integrated EU policy for the Arctic (by 483 votes to 100, with 37 abstentions). (European Parliament, *Resolution on An Integrated EU Policy for the Arctic*, P8_TA(2017)0093, March 16, 2017.) The resolution advocated keeping the Arctic a low-tension area, recognized the important role of the Arctic Council in maintaining constructive cooperation and stability in the region, and called upon the EU to develop a more concrete EU Arctic strategy and action plan.

[95] Kamrul Hossain, "EU Engagement in the Arctic: Do the Policy Responses from the Arctic States Represent the EU as a Legitimate Stakeholder?," *Arctic Review on Law and Politics*, Vol. 6, No. 2, November 2015.

[96] European Commission and High Representative of the Union for Foreign Affairs and Security Policy, Joint Communication to the European Parliament and the Council, *An Integrated European Union Policy for the Arctic*, April 27, 2016, p. 2.

[97] Martin Breum, "EU Plays Catch-up with US, China, Russia in Arctic," EUObserver.com, October 3, 2019.

[98] European Commission and High Representative of the Union for Foreign Affairs and Security Policy, Joint Communication to the European Parliament and the Council, *An Integrated European Union Policy for the Arctic*, April 27, 2016, p. 2.

strategy that balances protecting the Arctic environment with facilitating the sustainable economic and social development of the region.[99]

In July 2020, the European Commission and the European External Action Service jointly launched a public consultation on a way forward for the EU's Arctic policy.[100] In April 2021, the European Parliament released a draft report on the Arctic.[101] One observer states that the draft report "proposes taking a middle road that acknowledges geopolitical competitive realities in the High North while also opening a pathway for cooperation on transnational issues that affect all Arctic stakeholders, such as climate change, pollution, and coming to agreements on key questions of fishing."[102]

China in the Arctic

China's Growing Activities in the Arctic

China's diplomatic, economic, and scientific activities in the Arctic have grown steadily in recent years, and have emerged as a major topic of focus for the Arctic in a context of renewed great power competition.

In 2013, China was one of six non-Arctic states that were approved for observer status by the Arctic Council.[103] In January 2018, China released a white paper on China's Arctic policy that refers to China as a "near-Arctic state."[104] (China's northernmost territory, northeast of Mongolia,

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[99] European Political Strategy Centre/European Commission, *Walking on Thin Ice: A Balanced Arctic Strategy for the EU*, July 2019; Adam Stepien and Andreas Raspotnik, "The EU's Arctic Policy: Between Vision and Reality," College of Europe Policy Brief, August 2019.

[100] New Europe Online, "EU Reflects on the Future of Arctic Policy," *New Europe*, July 20, 2020. See also Kevin McGwin, "For the EU's New Arctic Envoy, Low Tension Is Job No. 1," *ArcticToday*, September 14, 2020.

[101] European Parliament, Committee on Foreign Affairs, Draft Report on the Arctic: Opportunities, Concerns and Security Challenges (2020/2112(INI)), Rapporteur: Anna Fotyga, April 19, 2021, 8 pp., accessed September 23, 2021, at https://www.europarl.europa.eu/doceo/document/AFET-PR-680907_EN.pdf

[102] Gabriella Gricius, "The EU's Draft Report on the Arctic: Cooperation over Competition?" European Leadership Network, September 20, 2021.

[103] The other five were India, Italy, Japan, Singapore, and South Korea. For a list of the observer states and when they were approved for observer status, see Arctic Council, "Non-Arctic States," accessed April 8, 2021, at https://arctic-council.org/en/about/observers/non-arctic-states/.

[104] "Full Text: China's Arctic Policy," *Xinhua*, January 26, 2018. The white paper states that "China is an important stakeholder in Arctic affairs. Geographically, China is a 'Near-Arctic State', one of the continental States that are closest to the Arctic Circle. The natural conditions of the Arctic and their changes have a direct impact on China's climate system and ecological environment, and, in turn, on its economic interests in agriculture, forestry, fishery, marine industry and other sectors. China is also closely involved in the trans-regional and global issues in the Arctic, especially in such areas as climate change, environment, scientific research, utilization of shipping routes, resource exploration and exploitation, security, and global governance. These issues are vital to the existence and development of all countries and humanity, and directly affect the interests of non-Arctic States including China."

Somewhat similarly, France's June 2016 national roadmap for the Arctic refers to France as a "polar nation." (Republique Francaise, Ministere des Affaires Etrangeres et du Developpement International, *The Great Challenge of the Arctic, National Roadmap for the Arctic*, June 2016, 60 pp.) The document states on page 9 that "France has established itself over the last three centuries as a polar nation, with a strong tradition of expeditions and exploration, and permanent research bases at the poles," and on page 17 that "[b]uilding on its long-standing tradition of exploration and expeditions in high latitudes, France has carved out its place as a polar nation over the last three centuries. France has permanent scientific bases in the Arctic and in Antarctica." It can also be noted that the northernmost part of mainland France, next to Belgium and across the Strait of Dover from England, is almost as far north as the more southerly parts of the Aleutian Islands.

Also somewhat similarly, a November 2018 UK parliamentary report refers to the UK as a "near-Arctic neighbour."

is at about the same latitude as the Aleutian Islands in Alaska, which, as noted earlier in this report, the United States includes in its definition of the Arctic for purposes of U.S. law.) The white paper refers to trans-Arctic shipping routes as the Polar Silk Road, and identifies these routes as a third major transportation corridor for the Belt and Road Initiative (BRI), China's major geopolitical initiative, first announced by China in 2013, to knit Eurasia and other regions together in a Chinese-anchored or Chinese-led infrastructure and economic network.[105] The polar regions (both the Arctic and Antarctic) are included in China's 14th Five-Year Plan, covering the period 2021-2025.[106]

China has a Ukrainian-built polar-capable icebreaker, *Xue Long* (Snow Dragon), that in recent years has made several transits of Arctic waters—operations that China describes as research expeditions.[107] A second polar-capable icebreaker (the first that China has built domestically), named *Xue Long 2*, entered service in 2019.[108] China in 2018 announced an intention to build a 30,000-ton (or possibly 40,000-ton) nuclear-powered icebreaker,[109] which would make China only the second country (following Russia) to operate a nuclear-powered icebreaker. In December 2019, it was reported that China's third polar-capable icebreaker might instead be built as a 26,000-ton, conventionally powered ship.[110] (By way of comparison, the new polar icebreakers being built for the U.S. Coast Guard are to displace 22,900 tons each.)

The report states the following: "While the UK is not an Arctic state, it is a near-Arctic neighbour. The UK's weather system is profoundly affected by changes in the Arctic's climate and sea currents. The UK has been an Observer to the Arctic Council since 1998." (United Kingdom, House of Commons, Environmental Audit Committee, *The Changing Arctic, Twelfth Report of Session 2017-19,* November 29, 2018, p. 3. [Report, together with formal minutes relating to the report, Ordered by the House of Commons to be printed November 6, 2018]. See also pp. 6, 29, and 32.)

See also Eva Dou, "A New Cold War? China Declares Itself a 'Near-Arctic State,' *Wall Street Journal,* January 26, 2018; Grant Newsham, "China As A 'Near Arctic State'—Chutzpah Overcoming Geography," *Asia Times,* January 30, 2018.

[105] See, for example, Maria Shagina and Elizabeth Buchanan, "China Enters the Arctic Digitization Race," *National Interest,* January 17, 2021; Nima Khorrami, "Data Hunting in Subzero Temperatures: The Arctic as a New Frontier in Beijing's Push for Digital Connectivity," Arctic Institute, August 4, 2020; Marc Lanteigne, "The Twists and Turns of the Polar Silk Road," *Over the Circle*, March 15, 2020; Zhang Chun, "China's 'Arctic Silk Road,'" *Maritime Executive*, January 10, 2020; Sabena Siddiqui, "Arctic Ambition: Beijing Eyes the Polar Silk Road," *Asia Times,* October 25, 2018. The BRI's other two main corridors, which were announced at the outset of the BRI, are a land corridor that runs east to west across the middle of Eurasia—the "belt" in BRI—and a sea corridor called the Maritime Silk Road that passes through the South China Sea and the Indian Ocean to the Persian Gulf and the Mediterranean Sea—the "road" in BRI. For more on the BRI, see CRS In Focus IF10273, *China's "One Belt, One Road,"* by Susan V. Lawrence and Gabriel M. Nelson. See also Atle Staalesen, "Chinese Money for Northern Sea Route," *Barents Observer,* June 12, 2018. See also Lin Boqiang, "China Can Support Arctic Development as Part of B&R," *Global Times,* August 9, 2018.

[106] See, for example, Marc Lanteigne, "The Polar Policies in China's New Five-Year Plan," *Diplomat,* March 12, 2021.

[107] See, for example, "Icebreaker Sets Sail on China's 9th Arctic Research Expedition," *Xinhua*, July 20, 2018; "China Begins 9th Arctic Expedition to Help Build 'Polar Silk Road,'" *Global Times,* July 20, 2018.

[108] "China Delivers First Self-Built Icebreaking Research Vessel," *People's Daily Online,* July 12, 2019; Kamaran Malik, "China Launches First Locally-made Icebreaker," *Asia Times,* July 11, 2019.

[109] See Trym Aleksander Eiterjord, "Checking in on China's Nuclear Icebreaker," *Diplomat,* September 5, 2019; Thomas Nilsen, "Details of China's Nuclear-Powered Icebreaker Revealed," *Barents Observer,* March 21, 2019; Zhao Yusha, "China One Step Closer to Nuke-Powered Aircraft Carrier with Cutting-Edge Icebreaker Comes on Stream," ChinaMil.com, June 23, 2018; China Daily, "China's 1st Nuclear-Powered Icebreaker in the Pipeline," *People's Daily Online*, June 25, 2018; Kyle Mizokami, "China Is Planning a Nuclear-Powered Icebreaker," *Popular Mechanics,* June 25, 2018; *China Military Online*, "Why Is China Building a 30,000-Ton Nuclear-Powered Icebreaker?" ChinaMil.com, June 30, 2018.

[110] Malte Humpert, "China Reveals Details of a Newly Designed Heavy Icebreaker," *ArcticToday,* December 17, 2019.

China in recent years has engaged in growing diplomatic activities with the Nordic countries, and has increased the size of its diplomatic presences in some of them. China has also engaged in growing economic discussions with Iceland and also with Greenland, a territory of Denmark that might be moving toward eventual independence.[111] China's engagement with Greenland appears related in significant part to Greenland's deposits of rare earth elements. Like several other nations, China has established a research station in the Svalbard archipelago. China maintains a second research station in Iceland.

China appears to be interested in using the NSR to shorten commercial shipping times between Europe and China[112] and perhaps also to reduce China's dependence on southern sea routes (including those going to the Persian Gulf) that pass through the Strait of Malacca—a maritime choke point that China appears to regard as vulnerable to being closed off by other parties (such as the United States) in time of crisis or conflict.[113] China reportedly reached an agreement with Russia on July 4, 2017, to create an "Ice Silk Road,"[114] and in June 2018, China and Russia agreed to a credit agreement between Russia's Vnesheconombank (VEB) and the China Development Bank that could provide up to $9.5 billion in Chinese funds for the construction of select infrastructure projects, including in particular projects along the NSR.[115] In September 2013, the *Yong Shen, a* Chinese cargo ship, became the first commercial vessel to complete the voyage from Asia to Rotterdam via the NSR.[116]

China has made significant investments in Russia's Arctic oil and gas industry, particularly the Yamal natural gas megaproject located on Russia's Yamal Peninsula in the Arctic.[117] China is also interested in mining opportunities in the Arctic seabed, in Greenland, and in the Canadian Arctic.[118] Given Greenland's very small population, China may view Greenland as an entity that

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[111] See, for example, Marc Lanteigne, "Greenland's Widening World," *Over the Circle*, March 28, 2020; Marco Volpe, "The Tortuous Path of China's Win-Win Strategy in Greenland," Arctic Institute, March 24, 2020; Marc Lanteigne, "Stumbling Block: China-Iceland Oil Exploration Reaches an Impasse," *Over the Circle*, January 24, 2018. "Greenland Plans Office in Beijing to Boost Trade Ties with China," *Reuters*, July 18, 2018.

[112] See, for example, Eduardo Baptista, "China 'More Than Other States' Looks to Future Sea Route Through Resource-Rich Arctic, Study Says," *South China Morning Post*, September 22, 2020.

[113] See, for example, Jonathan Hall, "Arctic Enterprise: The China Dream Goes North," *Journal of Political Risk*, September 2019. See also Andrew Latham, "China Looks to the Arctic to Avoid Another Suez Slowdown," *National Interest*, April 2, 2021.

[114] Xinhua, "China, Russia agree to jointly build 'Ice Silk Road,'" *Xinhuanet*, July 4, 2017.

[115] Atle Staalesen, Chinese Money for Northern Sea Route," *Barents Observer*, June 12, 2018. See also Xie Wenwen (Caixin Globus), "For Chinese Companies, Investment I Arctic Infrastructure Offers Both Opportunities and Challenges," *ArcticToday*, June 17, 2019.

[116] "Chinese Make First Successful North Sea Route Voyage," *The Arctic Journal*, September 12, 2013. See also Malte Humpert, "Chinese Shipping Company COSCO To Send Record Number of Ships Through Arctic," *High North News*, June 13, 2019; Marex (Maritime Executive), "Russia and China Sign Arctic Deal," *Maritime Executive*, June 8, 2019.

[117] See, for example, Malte Humpert (High North News), "China Acquires 20 Percent Stake in Novatek's Arctic LNG 2 Project," *ArcticToday*, April 30, 2019; Ernesto Gallo and Giovanni Biava, "A New Energy Frontier Called 'Polar Silk Road,'" *China Daily*, April 12, 2019.

[118] See, for example, Robert Fife and Steven Chase, "Top Defence Official Says China is a Threat to Canadian Arctic," *Globe and Mail (Canada)*, March 10 (updated March 11), 2021; Marc Montgomery, "China's Effort to Buy an Arctic Gold Mine Raises Many Concerns," *Radio Canada International*, August 10 (updated August 11), 2020; Vipal Monga, "China's Move to Buy Arctic Gold Mine Draws Fire in Canada," *Wall Street Journal*, July 26, 2020; Mingming Shi and Marc Lanteigne, "A Cold Arena? Greenland as a Focus of Arctic Competition," Diplomat, June 10, 2019; Nadia Schadlow, "Why Greenland Is Really About China," *The Hill*, August 28, 2019; Marc Lanteigne and Mingming Shi, "China Steps up Its Mining Interests in Greenland," *Diplomat*, February 12, 2019; John Simpson, "How Greenland Could Become China's Arctic Base," *BBC*, December 18, 2018; Marc Lanteigne, "Do Oil and Water Mix? Emerging China-Greenland Resource Cooperation," *Over the Circle*, November 2, 2018; Martin Breum, "China and the US Both Have Strategic Designs for Greenland," *ArcticToday*, October 17, 2018; Mia Bennett, "The Controversy over

China can seek to engage using an approach similar to ones that China has used for engaging with small Pacific and Indian Ocean island states.[119] China may also be interested in Arctic fishing grounds.

China's growing activities in the Arctic may also reflect a view that as a major world power, China should, like other major world powers, be active in the polar regions for conducting research and other purposes. (Along with its growing activities in the Arctic, China has recently increased the number of research stations in maintains in the Antarctic.[120])

Particularly since China published its Arctic white paper in January 2018, observers have expressed curiosity or concern about China's exact mix of motivations for its growing activities in the Arctic, and about what China's ultimate goals for the Arctic might be.[121]

Arctic States' Response

The renewal of great power competition underscores a question for the Arctic states regarding whether and how to respond to China's growing activities in the Arctic. China's growing activities in the Arctic could create new opportunities for cooperation between China and the

Greenland Airports Shows China Isn't Fully Welcome in the Arctic—Yet," *ArcticToday*, September 13, 2018; Mingming Shi and Marc lanteigne, "The (Many0 Roles of Greenland in china's Developing Arctic Policy," *Diplomat*, March 30, 2018; Miguel Martin, "China in Greenland: Mines, Science, and Nods to Independence," *China Brief*, March 12, 2018.

[119] For further discussion of China-Greenland relations, see Kevin McGwin, "Greenland Lawmakers Will Consider Opening an East Asia Office," *ArcticToday*, April 6, 2020.

[120] For additional discussion, see CRS Report R46708, *Antarctica: Overview of Geopolitical and Environmental Issues*, by Pervaze A. Sheikh, Bruce Vaughn, and Kezee Procita. See also Alexander B. Gray, "China's Next Geopolitical Goal: Dominate Antarctica," *National Interest*, March 20, 2021.

[121] See, for example, Bala Chauhan, "China's Growing Arctic Footprint May Hit India's Security and Climate Interests: Experts," *New Indian Express*, August 13, 2021; Emil Avdaliani, "China Seeks To Boost Role In The Arctic—Analysis," *Eurasia Review*, May 26, 2021; Abigail Ng, "Tensions Will Likely Grow as China Seeks Bigger Role in the Arctic," *CNBC*, May 20 (updated May 22), 2021; Rush Doshi, Alexis Dale-Huang, and Gaoqi Zhang, *Northern Expedition, China's Arctic Activities and Ambitions*, Brookings Institution, April 2021, 69 pp.; Nengye Liu, "Why China Needs an Arctic Policy 2.0, It Is Time for China to Shed Light on Which Kind of Order It Would Like to Construct in the Arctic Using Its Rising Power," *Diploma*t, October 22, 2020; Mary Kay Magistad, "China's Arctic Ambitions Have Revived US Interest in the Region," *The World*, October 12, 2020; Thomas Ayres, "Op-ed | China's Arctic Gambit a Concern for U.S. Air and Space Forces," *Space News*, October 5, 2020; Marco Giannangeli, "China Expanding into Melting Arctic in Major Military Threat to West," Express (UK), August 2, 2020; Joel Gehrke, "China Aims to Control Ports and Shipping Lanes in Europe and the Arctic," *Washington Examiner*, July 1, 2020; Ties Dams, Louise van Schaik, and Adaja Stoetman, *Presence Before Power, China's Strategy in Iceland and Greenland*, Netherlands Institute of International Relations (Clingendael), June 2020; Trine Jonassen, "Rejects Notion that China is a Threat to the Arctic," *High North News*, May 27, 2020 (which reports remarks by State Secretary Audun Halvorsen of the Norwegian Ministry of Foreign Affairs); Swee Lean Collin Koh, "China's Strategic Interest in the Arctic Goes Beyond Economics," *Defense News*, May 12, 2020; Marc Lanteigne, "Identity and Relationship-Building in China's Arctic Diplomacy," Arctic Institute, April 28, 2020; Nick Solheim, "Time to Crush China's Arctic Influence," *Spectator*, April 20, 2020; Yun Sun, "Defining the Chinese Threat in the Arctic," *Arctic Institute*, April 7, 2020; Sanna Kopra, "China and its Arctic Trajectories: The Arctic Institute's China Series 2020," Arctic Institute, March 17, 2020; Atle Staalesen, "China's Ambassador Brushes Off Allegations His Country Is Threat in Arctic," *Barents Observer*, February 16, 2020; Luke Coffey, "China's Increasing Role in the Arctic," Heritage Foundation, February 11, 2020; Jacquelyn Chorush, "Is China Really Threatening Conquest in the Arctic?" *High North News*, January 6, 2020.

Arctic states.[122] They also, however, have the potential for posing challenges to the Arctic states in terms of defending their own interests in the Arctic.[123]

For U.S. policymakers, a general question is how to integrate China's activities in the Arctic into the overall equation of U.S.-China relations, and whether and how, in U.S. policymaking, to link China's activities in the Arctic to its activities in other parts of the world. Some observers see potential areas for U.S.-Chinese cooperation in the Arctic.[124] As noted earlier, an August 2021 press report stated that "the U.S., China, Japan and Russia are among the countries planning to conduct joint research in the Arctic Ocean in a step toward preventing overfishing in the region.… Representatives from nine countries and the European Union aim to meet in South Korea early next year to discuss exploratory fishing based on similar treaties covering other regions."[125] Other observers view the Arctic as emerging arena of U.S.-China strategic competition.[126] Still other observers view the Arctic as a mixed situation involving potential elements of cooperation and competition.[127]

A specific question could be whether to impose punitive costs on China in the Arctic for unwanted actions that China takes elsewhere. As one potential example of such a cost-imposing action, U.S. policymakers could consider moving to suspend China's observer status on the Arctic

[122] See, for example, Nong Hong, "How Cooperation on Climate Change, Polar Research Can Help Thaw US-China Relations," Institute for China-America Studies (ICAS), May 3, 2021; Ellis Quinn, "Iceland Welcomes 'Peaceful, Low-Tension Cooperation' with China in Arctic, Says Foreign Minister," *Eye on the Arctic (Radio Canada International)*, February 15, 2021; Atle Staalesen, "As Arctic Talks Move to China, Leaders Downplay Divides," *Barents Observer*, May 11, 2019; Thomas Nilsen, "China Seeks a More Active Role in the Arctic," *Barents Observer*, May 11, 2019; Nathan Vanderklippe, "Agreeing on the Arctic: Amid Dispute, Canada Sides with China over the U.S. on How to Manage the North," *Globe and Mail*, May 10, 2019; "China and Finland: The Ice Road Cometh?" *Over the Circle*, March 17, 2020; Nong Hong, "Arctic Ambitions of China, Russia—and Now the US—Need Not Spark a Cold War," *South China Morning Post*, March 11, 2019.

[123] See, for example, David Pugliese, "Canada Calls Out China, Climate Change as Growing Concerns in Arctic," *Defense News*, April 11, 2021; Sanna Kopra and Matti Puranen, "China's Arctic Ambitions Face Increasing Headwinds in Finland," *Diplomat*, March 18, 2021; Thomas Nilsen, "China Wanted to Buy Airport in Lapland for North Pole Climate Research Flights, The Finnish Defence Forces Spurned an Offer by the Chinese Polar Research Institute to Buy or Rent Kemijärvi Airport over Security Reasons," *Barents Observer*, March 4, 2021; Mingming Shi and Marc Lanteigne, "China's Central Role in Denmark's Arctic Security Policies," *Diplomat*, December 08, 2019; Humphrey Hawksley, "Nordic Nations Can Stand Up to China in the Arctic," *Nikkei Asian Review*, June 13, 2019; Thomas Nilsen, "'We Must Be Prepared for Clearer Chinese Presence in Our Neighborhood'; Chief of Norway's Military Intelligence Service, Lieutenant General Morten Haga Lunde, Highlighted Chinese, Russian Arctic Cooperations in His Annual Focus Report," *Barents Observer*, February 11, 2019.

[124] See, for example, Sarah Keisler, "Arctic Balancing: Biden Should Ally with China before Russia Does," *National Interest*, August 9, 2021; Pavel Devyatkin, "Science Cooperation with the Snow Dragon: Can the U.S. and China Work Together on the Arctic Climate Crisis?" Arctic Institute, April 15, 2021; James Stavridis, "Can the U.S. and China Cooperate? Sure," *Bloomberg*, July 31, 2020; Stephen Delaney, "The United States Must Work with China to Ensure Freedom of Navigation in the Arctic," *Global Security Review*, September 6, 2019; Alison McFarland, "Arctic Options: Why America Should Invest in a Future with China," *National Interest*, September 30, 2018.

[125] Miki Okuyama, "International Research Planned to Manage Arctic Fish Stocks," *Nikkei Asia*, August 1, 2021. See also Peter B. Danilov, "US, China and Russia Plan Joint Research in Order to Regulate Arctic Fishing," *High North News*, August 2, 2021.

[126] See, for example, Michael Krull, "The Arctic: China Wants It; We Need to Deny Them," *American Military News*, September 8, 2020; Simone McCarthy, "Trade, tech … and Now the Arctic? The Next Frontier in the China-US Struggle for Global Control," *South China Morning Post*, January 14, 2020 (ellipsis as in the article's title); Chen Zinan, "To Keep Hegemony, US Trying to Obstruct China's Rights in Arctic," Global Times, December 25, 2019.

[127] See, for example, Laura Zhou, "US Admiral Warns of Risk of 'Bogus' Chinese Claims in Arctic," *South China Morning Post*, June 28 (updated June 29), 2020.

Council[128] as a punitive cost-imposing measure for unwanted Chinese actions in the South China Sea.[129] In a May 6, 2019, speech in Finland, Secretary of State Pompeo stated (emphasis added)

> The United States is a believer in free markets. We know from experience that free and fair competition, open, by the rule of law, produces the best outcomes.
>
> But all the parties in the marketplace have to play by those same rules. Those who violate those rules should lose their rights to participate in that marketplace. Respect and transparency are the price of admission.
>
> And let's talk about China for a moment. **China has observer status in the Arctic Council, but that status is contingent upon its respect for the sovereign rights of Arctic states.** The U.S. wants China to meet that condition and contribute responsibly in the region. But China's words and actions raise doubts about its intentions.[130]

China's interest in Greenland, particularly as a potential site for mining rare earth elements, is a matter of concern for U.S. policymakers.[131] In February 2019, it was reported that the United

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[128] Paragraph 37 of the Arctic Council's rules of procedure states the following:

> Once observer status has been granted, Observers shall be invited to the meetings and other activities of the Arctic Council unless SAOs [Senior Arctic Officials] decide otherwise. Observer status shall continue for such time as consensus exists among Ministers. Any Observer that engages in activities which are at odds with the Council's [Ottawa] Declaration [of September 19, 1996, establishing the Council] or these Rules of Procedure shall have its status as an Observer suspended.

Paragraph 5 of Annex II of the Arctic Council's rules of procedure—an annex regarding the accreditation and review of observers—states the following:

> Every four years, from the date of being granted Observer status, Observers should state affirmatively their continued interest in Observer status. Not later than 120 days before a Ministerial meeting where Observers will be reviewed, the Chairmanship shall circulate to the Arctic States and Permanent Participants a list of all accredited Observers and up-to-date information on their activities relevant to the work of the Arctic Council.
>
> (Arctic Council, *Arctic Council Rules of Procedure*, p. 9. The document was accessed April 8, 2021, at https://oaarchive.arctic-council.org/handle/11374/940.

Paragraph 4.3 of the Arctic Council's observer manual for subsidiary bodies states in part

> Observer status continues for such time as consensus exists among Ministers. Any Observer that engages in activities which are at odds with the Ottawa Declaration or with the Rules of Procedure will have its status as an Observer suspended.
>
> (Arctic Council. *Observer Manual for Subsidiary Bodies*, p. 5. The document was accessed April 8, 2021, at https://oaarchive.arctic-council.org/handle/11374/939.)

See also Alyson JK Bailes, "Understanding The Arctic Council: A 'Sub-Regional' Perspective," *Journal of Military and Strategic Studies*, Vol. 15, Issue 2, 2013: 48; Brianna Wodiske, "Preventing the Melting of the Arctic Council: China as a Permanent Observer and What It Means for the Council and the Environment," *Loyola of Los Angeles International and Comparative Law Review*, Vol. 315, Issue 2, 2014 (November 1, 2014): 320; Sebastian Knecht, "New Observers Queuing Up: Why the Arctic Council Should Expand—And Expel," Arctic Institute, April 20, 2015; Evan Bloom, "Establishment of the Arctic Council," undated; accessed April 8, 2021, at https://2009-2017.state.gov/e/oes/ocns/opa/arc/ac/establishmentarcticcouncil/index.htm, which states "The following paper was authored by Evan Bloom in July 1999 when serving as an attorney in the Office of the Legal Adviser at the U.S. Department of State. Mr. Bloom is now the Director of the Office of Oceans and Polar Affairs for the Bureau of Oceans and International Environmental and Scientific Affairs at the U.S. Department of State." See also Kevin McGwin, "After 20 years, the Arctic Council Reconsiders the Role of Observers," *ArcticToday*, October 24, 2018.

[129] For more on China's actions in the South China Sea and their potential implications for U.S. interests, see CRS Report R42784, *U.S.-China Strategic Competition in South and East China Seas: Background and Issues for Congress*.

[130] State Department, "Looking North: Sharpening America's Arctic Focus, Remarks, Michael R. Pompeo, Secretary of State, Rovaniemi, Finland, May 6, 2019."

[131] See, for example, Robinson Meyer, "Greenland's Rare-Earth Election," *Atlantic*, May 3, 2021; Liselotte Odgaard,

States in 2018 had urged Denmark to finance the construction of airports that China had offered to build in Greenland, so as to counter China's attempts to increase its presence and influence there.[132] In May 2019, the State Department announced plan for establishing a permanent diplomatic presence in Greenland,[133] and on June 2020, the State Department formally announced the reopening of the U.S. consulate in Greenland's capital of Nuuk.[134] In April 2020, the U.S. government announced $12.1 million economic aid package for Greenland that the Trump Administration presented as a U.S. action done in a context of Chinese and Russian actions aimed at increasing their presence and influence in Greenland.[135] In September 2021, it was reported that Greenland had agreed to a follow-on $10 million U.S. economic aid package focused on

"Greenland's National Election and the US-China Tech Competition: The Rare Earth Challenge," Hudson Institute, April 9, 2021; Antonia Noori Farzan, "How an Election in Greenland Could Affect China—and the Rare-Earth Minerals in Your Cellphone," *Washington Post*, April 8, 2021; Stacy Meichtry and Drew Hinshaw, "China's Greenland Ambitions Run Into Local Politics, U.S. Influence," *Wall Street Journal*, April 8, 2021; Agence France-Presse, "Greenland Gears Up for Election Sparked by Debate over Chinese-Backed Rare Earths Mining," *South China Morning Post*, April 4, 2021; Sam Dunning, "56,000 Greenlanders Could Shape the Future of Rare Earths, Washington and Beijing Are Watching a Snap Election on the Huge Island Closely," *Foreign Policy*, March 10, 2021; Mary Kay Magistad, "How China's Belt and Road and an Australian Mining Company Could be the Deciding Issues in the Greenland Election," *ABC [Australian Broadcasting Corporation] News*, March 6 (updated March 14), 2021; Eric Onstad, "Five Eyes Alliance Urged to Forge Ties with Greenland to Secure Minerals," *Reuters*, March 4, 2021; Jacob Gronholt-Pedersen and Eric Onstad, "Mining Magnets: Arctic Island Finds Green Power Can Be a Curse," *Reuters*, March 1, 2021; Per Kalvig and Hans Lucht, "Greenland's Minerals to Consolidate China's Rare Earth Dominance?" Dansk Institut for Internationale Studier (DIIS), February 25, 2021.

[132] Drew Hinshaw and Jeremy Page, "How the Pentagon Countered China's Designs on Greenland; Washington Urged Denmark to Finance Airports that Chinese Aimed to Build on North America's Doorstep," *Wall Street Journal*, February 10, 2019. See also Marc Lanteigne, "Greenland's Airport Saga: Enter the US?" *Over the Circle*, September 18, 2018; Marc Lanteigne, "Greenland's Airports: A Balance between China and Denmark?" *Over the Circle*, June 15, 2018; Arne Finne (translated by Elisabeth Bergquist), "Intense Airport Debate in Greenland," *High North News*, May 30, 2018.

[133] State Department, "Secretary Pompeo Postpones Travel to Greenland," Press Statement, Morgan Ortagus, Department Spokesperson, May 9, 2019. See also Krestia DeGeorge, "US State Department Announces Plans for a Diplomatic Presence in Greenland," *ArcticToday*, May 9, 2019; Morten Soendergaard Larsen and Robbie Gramer, "Trump Puts Down New Roots in Greenland," *Foreign Policy*, November 8, 2019.

[134] See, for example, Eavan Cull, "Setting Up Shop in Nuuk," *Foreign Service Journal*, May 2021; Lauren Meier and Guy Taylor, "U.S. Reopens Consulate in Greenland Amid Race for Arctic Supremacy," *Washington Times*, June 10, 2020.

[135] For State Department briefings about the economic aid package, see State Department, Briefing On the Road to Nuuk: Economic Cooperation, Special Briefing, Michael J. Murphy, Deputy Assistant Secretary, Bureau of European and Eurasian Affairs, Francis R. Fannon, Assistant Secretary, Bureau of Energy Resources, Jonathan Moore, Principal Deputy Assistant Secretary, Bureau of Oceans and International Environmental and Scientific Affairs, Gretchen Birkle, USAID Deputy Assistant Administrator, May 15, 2020; and State Department, Briefing on the Administration's Arctic Strategy, Special Briefing, Office of the Spokesperson, April 23, 2020.

For press reports about the economic aid package, see, for example, Jessica Donati, "U.S. Offers Aid to Greenland to Counter China, Russia," *Wall Street Journal*, April 23, 2020; Carol Morello, "U.S. to Give Aid to Greenland, Open Consulate in Bid to Counter Russia and China," *Washington Post*, April 23, 2020; Jacob Gronholt-Pedersen and Humeyra Pamuk, "US Extends Economic Aid to Greenland to Counter China, Russia in Arctic," *Reuters*, April 23, 2020; Laura Kelly, "US Announces New Funding for Greenland in Push for Stronger Arctic Presence," *The Hill*, April 23, 2020; Paul McCleary, "Battle For The Arctic: Russia Plans Nuke Icebreaker, US Counters China In Greenland," *Breaking Defense*, April 23, 2020; Katrina Manson and Richard Milne, "US Financial Aid for Greenland Sparks Outrage in Denmark," *Financial Times*, April 23, 2020; Alex Fang, "US Rejects China's 'Near-Arctic State' Claim in New Cold War; Washington to Open Consulate in Greenland and Give Economic Aid," *Nikkei Asian Review*, April 24 (updated April 26), 2020; Martin Breum, "The US Aid Package to Greenland Marks a New Chapter in a Long, Complex Relationship," *ArcticToday*, April 29, 2020; Malte Humpert, "U.S. Says Arctic No Longer Immune from Geopolitics As It Invests $12m in Greenland," *High North News*, April 29, 2020; Tom Parfitt, "US, China and Russia Wrestle for Influence in Greenland and the Arctic Circle," *Times (UK)*, May 1, 2020.

developing Greenland's mining sector, tourism, and education.[136] Some observers argue that a desire to preclude China (or Russia) from increasing its presence and influence in Greenland may have been one of the reasons why President Trump in August 2019 expressed an interest in the idea of buying Greenland from Denmark.[137] In May 2021, Secretary of State Antony Blinken made a stop in Greenland while returning to the United States from an Arctic Council ministerial meeting in Reykjavik. During the stop, he was accompanied by Greenland's prime minister, Greenland's foreign minister, and Denmark's foreign minister.[138]

For Russia, the question of whether and how to respond to China's activities in the Arctic may pose particular complexities. On the one hand, Russia is promoting the NSR for use by others, in part because Russia sees significant economic opportunities in offering icebreaker escorts, refueling posts, and supplies to the commercial ships that will ply the waterway. In that regard, Russia presumably would welcome increased use of the route by ships moving between Europe and China. More broadly, Russia and China have increased their cooperation on security and other issues in recent years, in no small part as a means of balancing or countering the United States in international affairs, and Russian-Chinese cooperation in the Arctic (including China's investment in Russia's Arctic oil and gas industry) can both reflect and contribute to that cooperation.[139] The U.S. Department of Defense stated in 2020 that China's "expanding Arctic

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[136] Jacob Gronholt-pedersen, "In Arctic push, US extends new economic aid package to Greenland," *Reuters*, September 15, 2021.

[137] See, for example, Marc Lanteigne and Mingming Shi, "'No Sale': How Talk of a US Purchase of Greenland Reflected Arctic Anxieties," *Over the Circle*, September 17, 2020; Stuart Lau, "Did China's Growing Presence in Arctic Prompt Donald Trump's Offer to Buy Greenland?" *South China Morning Post*, September 1, 2019; Nadia Schadlow, "Why Greenland Is Really About China," *The Hill*, August 28, 2019; Daniel Lippman, "Trump's Greenland Gambit Finds Allies Inside Government," *Politico*, August 24, 2019; Seth Borenstein (Associated Press), "Icy Arctic Becomes Hot Property for Rival Powers," *Navy Times*, August 22, 2019; Ragnhild Grønning, "Why Trump Is Looking to Buy Greenland—Even If It's Not for Sale," *High North News*, August 19, 2019. See also Caitlin Hu and Stephen Collinson, "Why Exactly Is the US So Interested in Greenland?" *CNN*, July 23, 2020. See also Tarisai Ngangura, "Ex-Staffer: Trump Wanted to Trade 'Dirty' Puerto Rico for Greenland," *Vanity Fair*, August 19, 2020; Jacob Gronholt-Pedersen, "As the Arctic's Attractions Mount, Greenland is a Security Black Hole," *Reuters*, October 20, 2020; Gordon Lubold, "U.S. Holds Talks Over Economic, Security Arrangements With Greenland," *Wall Street Journal*, October 28, 2020

[138] Kevin McGwin, "Blinken's Stop-Over in Greenland Highlights Its Importance to the US," *ArcticToday*, May 21, 2021. See also Rebecca Beitsch, "Blinken Confirms US No Longer Seeking to Purchase Greenland," *The Hill*, May 21, 2021.

[139] See, for example, Andrea Kendall-Taylor and David Shullman, "China and Russia's Dangerous Convergence," *Foreign Affai*rs, May 3, 2021; Sherri Goodman and Yun Sun, "What You May Not Know About Sino-Russian Cooperation in the Arctic and Why it Matters," *Diplomat*, August 13, 2020; Sarah Cammarata, "Russia and China Should Be Viewed as 'One Alliance' in the Arctic, U.K. Defense Official Warns," *Politico*, June 6, 2020; Owen Matthews, "Putin Needs Xi More than China Needs Russia," *Spectator USA*, May 25, 2020; Ken Moriyasu, "US Awakens to Risk of China-Russia Alliance in the Arctic," *Nikkei Asian Review*, May 24, 2020; Christopher Weidacher Hsiung, "The Emergence of a Sino-Russian Economic Partnership in the Arctic?" Arctic Institute, May 19, 2020; Mario Giagnorio, "A Cold Relation: Russia, China and Science in the Arctic," *New Eastern Europe*, March 25, 2020 (interview with Rasmus Gjedssø Bertelsen and Mariia Kobzeva); Alana Monteiro, "Strategic Partnership, Arctic-Style: How Russia and China Play the Game," *Modern Diplomacy*, March 14, 2020; Matteo Giovannini, "China and Russia Strengthen Strategic Partnership Along 'Polar Silk Road,'" *China Daily*, December 6, 2019; "Russia Reinforces its Arctic Policies (With China Alongside)," *Over the Circle*, April 19, 2019: Melody Schreiber, "US Has 'Vital National Interests' at Stake in Russia-China Relationship in the Arctic, Expert Says," *ArcticToday*, April 2, 2019; Rebecca Pincus, China and Russia in the Arctic, Testimony before the U.S.-China Economic and Security Review Commission Hearing on "An Emerging China-Russia Axis? Implications for the United States in an Era of Strategic Competition," March 21, 2019; Liz Ruskin, "China, Russia Find Common Cause in Arctic," *Alaska Public Media*, March 21, 2019; Olga Alexeeva and Frederic Lasserre, "An Analysis of Sino-Russian Cooperation in the Arctic in the BRI Era," *Advances in Polar Science*, December 2018: 269-282; Marc Lanteigne, "Northern Crossroads, Sino-Russian Cooperation in the Arctic," *National Bureau of Asian Research*, March 2018, 6 pp.

engagement has created new opportunities for engagement between China and Russia. In April 2019, China and Russia established the Sino-Russian Arctic Research Center. In 2020, China and Russia plan to use this center to conduct a joint expedition to the Arctic to research optimal routes of the Northern Sea Route and the effects of climate change. The PRC will cover 75 percent of the expedition's expenses."[140]

On the other hand, Russian officials are said to be wary of China's continued growth in wealth and power, and of how that might eventually lead to China becoming the dominant power in Eurasia, and to Russia being relegated to a secondary or subordinate status in Eurasian affairs relative to China. Increased use by China of the NSR could accelerate the realization of that scenario: As noted above, the NSR forms part of China's geopolitical Belt and Road Initiative (BRI). Some observers argue that actual levels of Sino-Russian cooperation in the Arctic are not as great as Chinese or Russian announcements about such cooperation might suggest.[141]

Linkages Between Arctic and South China Sea

Another potential implication of the renewal of great power competition is a linkage that is sometimes made between the Arctic and the South China Sea relating to international law of the sea or the general issue of international cooperation and competition.[142] One aspect of this linkage relates to whether China's degree of compliance with international law of the sea in the South China Sea has any implications for understanding potential Chinese behavior regarding its compliance with international law of the sea (and international law generally) in the Arctic.

Nicholas Groffman, "Why China-Russia Relations Are Warming Up in the Arctic," *South China Morning Post*, February 17, 2018.

[140] Department of Defense, *Military and Security Developments Involving the People's Republic of China 2020, Annual Report to Congress*, generated August 21, 2020, released September 1, 2020, p. 133.

[141] For additional discussion, see, for example, Jim Townsend and Andrea Kendall-Taylor, *Partners, Competitors, or a Little of Both? Russia and China in the Arctic*, Center for a New American Security (CNAS), March 2021, 17 pp.; Duncan Depledge, "Why We Must Watch Sino-Russia Relations in the Arctic," *Sunday Guardian*, November 28, 2020; Elizabeth Buchanan, "Russia and China in the Arctic: Assumptions and Realities," Australian Strategic Policy Institute, September 25, 2020; Maria Shagina and Benno Zogg, "Arctic Matters: Sino-Russian Dynamics," Center for Security Studies (CSS) at ETH Zurich, September 2020, 4 pp.; Elizabeth Buchanan, "There Is No Arctic Axis, Russia and China's Partnership in the North is Primarily Driven by Business, Not Politics," *Foreign Policy*, July 21, 2020; Mariia Kobzeva, "A Framework for Sino-Russian Relations in the Arctic," Arctic Institute, May 5, 2020; Ling Guo and Steven Lloyd Wilson, "China, Russia, and Arctic Geopolitics," *Diplomat*, March 29, 2020; James Foggo III, "Russia, China Offer Challenges in the Arctic," *Defense One*, July 10, 2019; Anita Parlow, "Does a Russia-China Alignment in the Arctic Have Staying Power?" *ArcticToday*, June 27, 2019; Marc Lanteigne, "Scenes from a Northern Crossroad: China and Russia in the Arctic," *Over the Circle*, February 20, 2019; Marc Lanteigne, "No Borderline: A Norway-Russia Frontier Festival Connects with China," *Over the Circle*, February 16, 2019; Atle Staalesen, "Beijing Finds a Chinatown on NoRway's Arctic Coast,; The Asian Superpower Looks towards the Arctic and Finds a Home in This Year's Barents Spektakel Winter Festival," *Barents Observer*, February 12, 2019; Elizabeth Wishnick, "Russia and the Arctic in China's Quest for Great-Power Status," in Ashley J. Tellis, Alison Szalwinski, and Michael Wills, editors, *Strategic Asia 2019, China's Expanding Strategic Ambitions*, National Bureau of Asian Research, Seattle and Washington, DC, pp. 64-75.

[142] See, for example, Nong Hong, "Weighing the Sources of International Law: The Arctic, Antarctica and the South China Sea," Institute for China-America Studies (ICAS), December 11, 2020; Robinson Meyer, "The Next 'South China Sea' Is Covered in Ice," *Atlantic*, May 15, 2019; Justin D. Nankivell, "The Role of History and Law in the South China Sea and Arctic Ocean," *Maritime Awareness Project*, August 7, 2017; Sydney J. Freedberg, "Is The Arctic The next South China Sea? Not Likely," *Breaking Defense*, August 4, 2017; Caroline Houck, "The Arctic Could Be the Next South China Sea, Says Coast guard Commandant," *Defense One*, August 1, 2017; Daniel Thomassen, "Lessons from the Arctic for the South China Sea," Center for International Maritime Security, April 4, 2017. For a different perspective, see Elizabeth Buchanan and Bec Strating, "Why the Arctic Is Not the 'Next' South China Sea," *War on the Rocks*, November 5, 2020.

A second aspect of this linkage, mentioned earlier, is whether the United States should consider the option of moving to suspend China's observer status on the Arctic Council as a punitive cost-imposing measure for unwanted Chinese actions in the South China Sea.

A third aspect of this linkage concerns the question of whether the United States should become a party to UNCLOS: Discussions of that issue sometimes mention both the situation in the South China Sea[143] and the extended continental shelf issue in the Arctic.[144]

Extended Continental Shelf Submissions, Territorial Disputes, Sovereignty Issues

For additional background information on extended continental shelf submissions, territorial disputes, and sovereignty issues in the Arctic, see **Appendix H**.

U.S. Military Forces and Operations[145]

Overview

During the Cold War, the Arctic was an arena of military competition between the United States and the Soviet Union, with both countries, for example, operating long-range bombers, tactical combat aircraft, maritime patrol aircraft, nuclear-powered submarines, surface warships, and ground forces in the region. The end of the Cold War and the collapse of most elements of the Russian military establishment following the dissolution of the Soviet Union in December 1991 greatly reduced this competition, leading to a post-Cold War period of reduced emphasis on the Arctic in U.S. military planning. In more recent years, the return of great power competition and a significant increase in Russian military capabilities and operations in the Arctic has led to growing concerns among U.S. officials and other observers that the Arctic is once again becoming a region of military tension and competition,[146] and to a renewed focus on the Arctic in U.S. military planning. Department of Defense (DOD) officials have stated that U.S. military operations in the Alaska can play a role in countering China's activities in the Arctic and the Indo-Pacific region.[147]

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[143] For further discussion of this situation, see CRS Report R42784, *U.S.-China Strategic Competition in South and East China Seas: Background and Issues for Congress*.

[144] See, for example, Ben Werner, "Zukunft: U.S. Presence in Arctic Won't Stop Chinese, Russia Encroachment Without Law of the Sea Ratification," *USNI News*, August 1, 2017.

[145] This section prepared by Ronald O'Rourke, Specialist in Naval Affairs, Foreign Affairs, Defense, and Trade Division.

[146] See, for example, Tyler Rogoway, "Massive Expansion Underway At Russia's Northernmost Arctic Air Base (Updated)," *The Drive*, August 23, 2021; Hercules Reyes, "Russia Launches New Arctic Military Drills," *The Defense Post*, August 6, 2021; Nancy Teeple, "The Impact of the Post-Arms Control Context and Great Power Competition in the Arctic," *Arctic Institute*, June 22, 2021; Christopher Woody, "As Militaries Get Busier in the Arctic, the US and Russia Are Running Out of Ways to Solve Problems There," *Business Insider*, May 26, 2021; Kris Osborn, "Russia vs. U.S. Navy: How a Warming Arctic Is Heating up Military Competition," *National Interest*, January 12, 2021; Rebecca Hersman, Eric Brewer, and Maxwell Simon, *Strategic Stability and Competition in the Arctic*, Center for Strategic and International Studies (CSIS), January 2021, 11 pp.; Christopher Woody, "As Trump Shakes Up the Military Footprint in Europe, the US and Russia Are Making Moves in the High North," *Business Insider*, August 30, 2020; Anya Gorodentsev, "Will the Arctic Become the Next South China Sea?" *National Interest*, May 17, 2020; "America and Britain Play Cold-War Games with Russia in the Arctic," *Economist*, May 10, 2020. See also "Arctic Military Activity Tracker," Center for Strategic and International Studies (CSIS).

[147] See, for example, Hilde-Gunn Bye, "US Secretary of Defense Highlights the Importance of Alaska," *High North*

As noted earlier, Russia since 2008 has adopted a series of strategy documents outlining plans that call for, among other things, bolstering the country's Arctic military capabilities. Among other actions, Russia has established a new Arctic Joint Strategic Command at Severomorsk (the home of the Russian navy's Northern Fleet), reactivated and modernized Arctic military bases that fell into disuse with the end of the Cold War, assigned new forces to those bases, and increased military exercises and training operations in the Arctic.[148] Some observers have expressed growing concern at these developments. Other observers have noted the continued cooperative aspects of relations among the Arctic states, including Russia, and argue that the competitive aspects of the situation have been overstated.[149] Some observers argue that Russia's recent military investment in the Arctic is sometimes exaggerated, reflects normal modernization of aging capabilities, or is intended partly for domestic Russian consumption.[150]

News, August 2 (updated August 3), 2021; Robert Delaney, "Arctic Is Key Region in Countering China's Aggression, US Air Force Officials Say," *South China Morning Post*, July 28, 2021; Carla Babb, "Alaska Seen as Strategic US Military Asset Against China, Russia," *Voice of America*, July 25, 2021.

[148] Regarding increased Russian military capabilities and operations in the Arctic, see, for example, Jyri Lavikainen, *Strengthening Russia's Nuclear Forces in the Arctic, The Case of the Kinzhal Missile*, Center for Strategic and International Studies (CSIS), September 2021, 7 pp. (posted online September 14, 2021); Atle Staalesen, "How to Ambush an Arctic Seaport. Russian Marines Stage a Show," *Barents Observer*, September 10, 2021; Andrew E. Kramer, "In the Russian Arctic, the First Stirrings of a Very Cold War," *New York Times*, May 22, 2021; Sarah Rainsford, "Russia Flexes Muscles in Challenge for Arctic Control," *BBC News*, May 20, 2021; Kostya Manenkov and Vladimir Isachenkov, "Russia's Northernmost Base Projects Its Power Across Arctic," *Associated Press*, May 18, 2021; John Grady, "Panel Warns of Economic and Military Impacts from Russia's Plans for Arctic," *USNI News*, May 11, 2021; Sebastian Sprenger, "Russian Military Buildup in the Arctic Has Northern NATO Members Uneasy," *Defense News*, April 12, 2021; Alexander Bratersky, "Russia's Arctic Activity to Increase with Fresh Strategy and More Capability Tests," *Defense News*, April 11, 2021; Kris Osborn, "Why Did Russia Send More S-400 Missile Defense Systems to the Arctic?" *National Interest*, April 7, 2021; C. Todd Lopez, "DOD Closely Monitoring Russian Activities in Arctic," *DOD News*, April 5, 2021; Abraham Mahshie, "Russia Threatens US Interests in Arctic with Military Buildup," *Washington Examiner*, April 5, 2021; Ellen Mitchell, "Satellite Images Show Large Russian Military Build Up in Arctic: Report," *The Hill*, April 5, 2021; Stephen Silver, "Danger Ahead: Russia Is Increasing Its Military Presence in the Arctic," *National Interest*, April 5, 2021; Nick Paton Walsh, "Satellite Images Show Huge Russian Military Buildup in the Arctic," *CNN*, April 5, 2021; Christopher Woody, "The US Military Wants to Get Ahead of 'More Complex' Russian Operations, Top North American Commander Says," *Business Insider*, April 1, 2021.

See also Heather A. Conley and Joseph S. Bermudez Jr., *Ice Curtain: Tiksi Airbase—Many Russian Announcements, Little Equipment*, Center for Strategic and International Studies (CSIS), March 2020, 9 pp.; Heather A. Conley and Joseph S. Bermudez Jr., *Ice Curtain: Why Is There a New Russian Military Facility 300 Miles from Alaska*? Center for Strategic and International Studies (CSIS), March 2020, 6 pp.; Matthew Melino, Heather A. Conley, and Joseph S. Bermudez Jr., *Modernization on the Kola Peninsul*a, Center for Strategic and International Studies (CSIS), March 2020, 15 pp.; Matthew Melino and Heather A. Conley, "The Ice Curtain: Russia's Arctic Military Presence," Center for Strategic and International Studies (CSIS), March 26, 2020.

[149] See, for example, Robert David English and Morgan Grant Gardner, "Phantom Peril in the Arctic, Russia Doesn't Threaten the United States in the Far North—But Climate Change Does," *Foreign Affairs*, September 29, 2020; Mia Bennett, "U.S. Rhetoric About the Strategic Importance of the Arctic Is Out of Step with Its Spending Priorities," *ArcticToday*, July 26, 2019; "Arctic Conflict With Russia 'Not Likely In The Short-Term', Analyst Says," *Forces*, January 30, 2019; Danita Catherine Burke, "Why the New Arctic 'Cold War' Is a Dangerous Myth," *The Conversation*, December 13, 2018; Martin Breum, "Why Russia Is Likely to Remain Cooperative in the Arctic," *ArcticToday*, November 22, 2018; John Grady, "Panel: Cooperation, Not Conflict Key to Future of the Arctic," *USNI News*, April 8, 2018; Levon Sevunts," NATO Wants to Keep the Arctic An Area of Low Tensions, Stoltenberg," *Radio Canada International*, April 4, 2018; Levon Sevunts, "Arctic Nations Develop Coast Guard Co-operation," *Independent Barents Observer*, March 13, 2018.

[150] See, for example, Hilde-Gunn Bye, "Russia Pays Considerable Attention to Improve Arctic Infrastructure, Says Defence Minister," *High North News*, April 14, 2021; Lyle Goldstein, "Washington Should Chill Out over Russia's Arctic Ambitions," *Defense News*, November 13, 2020; Robert D. English, "Why an Arctic Arms Race Would Be a Mistake," *ArcticToday*, June 18, 2020; Marc Montgomery, "Russia's Military Feat in Arctic, Spectacular, But No Real

With the return of great power competition, DOD and the Coast Guard (which is part of the Department of Homeland Security [DHS]) are devoting increased attention to the Arctic in their planning and operations. DOD as a whole, the Army, the Navy and Marine Corps, the Air Force, and the Coast Guard have each issued Arctic strategy documents in recent years (see **Appendix G** for excerpts from these documents, as well as DOD and Coast Guard testimony on their Arctic strategies and operations). All U.S. military services are conducting increased exercises and training operations in the region, some in conjunction with forces from NATO allies and non-NATO Nordic countries, that are aimed at

- reacquainting U.S. forces with—and responding to changes in—operating conditions in the region,
- rebuilding Arctic-specific warfighting skills that eroded during the post-Cold War era,
- strengthening interoperability with allied forces in the region,
- identifying Arctic military capability gaps,
- testing the performance of equipment under Arctic conditions, and
- sending Russia and China signals of resolve and commitment regarding the Arctic.[151]

Threat to West," *Radio Canada International*, May 12, 2020; Elizabeth Buchanan and Mathieu Boulègue, "Russia's Military Exercises in the Arctic Have More Bark Than Bite," *Foreign Policy*, May 20, 2019; Arne F. Finne, "Russia Is a Responsible Actor in the Arctic," *High North News*, January 22, 2019; Stephanie Pezard, *The New Geopolitics of the Arctic, Russia's and China's Evolving Role in the Region*, RAND (Testimony presented before the Standing Committee on Foreign Affairs and International Development of the Canadian House of Commons on November 26, 2018), pp. 2-4 (which presents comments on both sides of the issue of whether other countries should be concerned by Russia's Arctic military capabilities); Thomas Nilsen, "New Weapons Testing Is Worrying, But Does Not Raise Tensions in the North, [Norway's] Defense Minister Says," *Barents Observer*, August 26, 2018. See also Hilde-Gunn Bye, "From Norway to North America: Differing Views On New Russian Weapon Systems," *High North News*, February 24, 2020.

[151] See, for example, Christopher Woody, "With Another Historic Trip to Iceland, US Stealth Bombers Are Building 'Muscle memory' as the Arctic Heats Up," *Business Insider*, September 22, 2021; David Axe, "U.S. Air Force B-2s Arrive In Iceland To Practice Arctic Stealth-Bombing," *Forbes*, August 25, 2021; Caitlin M. Kenney, "In the Newly Noisy Arctic, Underwater Operations Are Getting Harder," *Defense One*, August 2, 2021; Theresa Hitchens, "Air Force Plans Wargames, Tech Experiments To Flesh Out Arctic Strategy," *Breaking Defense*, July 27, 2021; Courtney Mabeus, "The Navy Sent Another Carrier on a Rare Trip to the High North. Here's How Sailors Kept It Going in Harsh Conditions Around Alaska," *Business Insider*, July 25, 2021; Immanuel Johnson, "Fires Shock Artillery Drills End in the Arctic as US Army Launches Rockets in Norway," *Stars and Stripes*, June 11, 2021; Philip Athey, "A Marine Fight in the Arctic May Look Like This," *Marine Corps Times*, June 4, 2021; John Harper, "Cold Front: Special Operations Forces Bracing for Arctic Missions," *National Defense*, May 14, 2021; USS Theodore Roosevelt Public Affairs, "U.S. Theodore Roosevelt Carrier Strike Group Begins Exercise Northern Edge 2021," U.S. Navy, May 4, 2021; Stavros Atlamazoglou, "How Delta, Rangers, and the Green Berets' Unique Training Would Pay Off in an Arctic War with Russia," *Business Insider*, April 15, 2021; Christen McCurdy, "U.S. Marines, Norwegian Military Hold Arctic Training Exercise," *United Press Internationa*l, April 8, 2021; Thomas Nilsen, "U.S. Special Operation Forces Exercise Winter Combat in Northern Sweden," *Barents Observer*, April 8, 2021; Rachel S. Cohen, "'Northern Edge' Brings Firepower to Alaska, with an Eye on Arctic Jockeying," *Air Force Times*, April 1, 2021; Sam LaGrone, "Carrier Strike Group, 15th Marine Expeditionary Unit Will Join Air Force in Massive Alaska Exercise," *USNI News*, March 31, 2021; Brian W. Everstine, "U.S., Canadian Aircraft Train to Protect Arctic Airspace," *Air Force Magazine*, March 26, 2021; Ed Adamczyk, "B-2 bomber, Norwegian F-35s Integrate in Arctic Circle Exercise," *United Press International*, March 22, 2021; Nunatsiaq News, "NORAD Exercise Takes to the Arctic Skies," *Nunatsiaq News*, March 22, 2021; Brian W. Everstine, "B-1s, B-2s Fly Together Near Iceland, Highlighting Importance of Arctic Ops," *Air Force Magazine*, March 17, 2021; David Axe, "U.S. Air Force Bomber Crews Brave The Cold As The Pentagon Expands Its Arctic Options," *Forbes*, March 10, 2021; Christen McCurdy, "B-1B Conducts Bomber Task Force Mission in Norway and Sweden," *United Press International*, March 9, 2021; Thomas Nilsen, "U.S. B-1 Bomber Makes First Landing Inside Norway's Arctic Circle," *Barents Observer*, March 9, 2021; Brian W. Everstine, "First B-1 Deployment to Norway

A July 28, 2021 press report stated:

> US military leaders said on Tuesday [July 27] that they see Arctic operations as a deterrent to China, which has staked a claim to the region as part of its Belt and Road Initiative, and increasingly as a base for operations in the Indo-Pacific.
>
> Panellists including US Air Force officials Kelli Seybolt and Lieutenant General Clinton Hinote discussed the strengthening of what Seybolt called defence relationships with "six of the seven other Arctic nations providing key strategic advantages", excluding Russia….
>
> While Russia's military activities in the Arctic are understandable given that it has an interest in oil and gas from its deposits in the region, and the US would be open to including Moscow in discussions among Arctic nations in the long-term if relations were to improve, Seybolt said, China's claim in 2018 to be a near-Arctic nation was a "kind of mind-boggling statement"….
>
> Also on the panel was William Liquori, a lieutenant general serving in the new United States Space Force….
>
> While promoting integration with the Arctic forces of Canada, Finland, Norway and other US allies as a way to counter objectionable activities by China, the panellists said military installations in Alaska were becoming crucial as bases for operations in the Indo-Pacific, where Washington is working more closely with regional partners to check Beijing's expansive maritime claims.
>
> "You could also think of military power that is stationed in the high north, and especially in Alaska, as being forward positioned in two major theatres, the Indo-Pacific and in Europe, and in essence you could conceivably do power projection sorties out of Alaska to both of those areas," Hinote said.
>
> "What we have seen in our war gaming is that it's an incredibly effective place to base air operations out of," he added. "And so this gets into the reason why we are investing so much in places like [Anchorage and Fairbanks], and what we've got going on with the extended operations.[152]

In addition to these increased exercises and training operations, the Coast Guard, as a major new acquisition project, is procuring new polar icebreakers called Polar Security Cutters (PSCs) to replace its aging heavy polar icebreakers. (For further discussion, see the following section of this report on polar icebreaking.)

Canada, the UK, and the Nordic countries are taking steps to increase their own military presence and operations in the region, and as noted above, have participated alongside U.S. military forces in certain Arctic exercises.[153] As mentioned earlier, a NATO exercise called Trident Juncture 18

Shows Importance of Arctic, Cold-Weather Ops," *Air Force Magazine*, March 5, 2021; Paul McLeary, "No 'New Cold War' As US Bombers Move Into Norwegian Base," *Breaking Defense*, March 5, 2021; Marcy Sanchez, "FinnsTteach American Soldiers How to Fight a 'Winter War,'" *Audacy*, March 1, 2021.

[152] Robert Delaney, "Arctic Is Key Region in Countering China's Aggression, US Air Force Officials Say," *South China Morning Post*, July 28, 2021. See also Jim Garamone, "Austin Says Alaska Is Strategic Hotspot for Indo-Pacific, Arctic Operations," *DOD News*, July 25, 2021.

[153] See, for example, Andrew Eversden, "7 Allies Sign onto Polar Research Project," *C4ISRNet*, April 11, 2021; Larry Luxner, "How Russia, China, and Climate Change Are Shaking Up the Arctic," Atlantic Council, March 23, 2021; John Grady, "Norwegian Officials: Russian Arctic Expansion Making Security Landscape 'Difficult,'" *USNI News*, March 22, 2021; Ed Adamczyk, "NORAD Readies for Arctic Air Defense Exercises," *United Press International*, March 17, 2021; Larisa Brown, "Royal Navy to Defend Arctic Trade as Ice Melts," *Times (UK)*, March 10, 2021; Secretary of the Air Force Public Affairs, "Acting SecAF, Nordic Ministers of Defense Sign Letter of Intent Strengthening US-Nordic Defense Ties," U.S. Air Force, February 18, 2021; Richard Milne, "Denmark Raises Investment in Arctic Surveillance to Counter Russian Build-up," *Financial Times*, February 14, 2021; Jacob Gronholt-

that was held from October 25 to November 7, 2018, in Norway and adjacent waters of the Baltic and the Norwegian Sea, with participation by all 29 NATO members plus Sweden and Finland, was described as NATO's largest exercise to that point since the Cold War, and featured a strong Arctic element, including the first deployment of a U.S. Navy aircraft carrier above the Arctic Circle since 1991.[154]

An exercise to be held in Norway in 2022, called Cold Response 2022, reportedly will be largest military exercise inside the Arctic Circle in Norway since the 1980s.[155]

Some observers have expressed concern about whether the United States is doing enough militarily to defend its interests in the Arctic, and in some cases have offered their recommendations for doing more.[156] Whether DOD and the Coast Guard are devoting sufficient resources to the Arctic and taking sufficient actions for defending U.S. interests in the region has emerged as a topic of congressional oversight. Those who argue that DOD and the Coast Guard are not devoting sufficient resources and taking sufficient actions argue, for example, that DOD and the Coast Guard should build ice-hardened surface ships other than icebreakers for deployment to the Arctic and/or establish a strategic port in Alaska's north to better support DOD and Coast Guard operations in the Arctic.[157] A June 17, 2021, press report states:

Pedersen, "Denmark to Spend More on Arctic Defence as Melting Sea Ice Prompts Jostle for Control," *Reuters*, February 11, 2021; Patricia Kime, "Nordic Allies Help Navy Improve Ship Ops in Icy Waterways as Arctic Competition Heats Up," *Military.com*, February 4, 2021.

[154] See, for example, Christopher Woody, "'We Can Do Better': The Navy's Newest Fleet Commander Says US Ships and Sailors Got 'Beat Up' During NATO's Biggest Exercise Since the Cold War," *Business Insider*, December 4, 2018; Levon Sevunts, "NATO's Arctic Dilemma; Two Visions of the Arctic Collide as NATO and Russia Flex Muscles," *Radio Canada International*, December 3, 2018; Megan Eckstein, "Truman CSG: Arctic Strike Group Operations Required Focus on Logistics, Safety," *USNI News*, November 6, 2018; Mary Thompson-Jones, "NATO's Arctic Exercise is a Good Start to Standing Up to Russian Militarization of the High North," *National Interest*, November 6, 2018; Pierre-Henry Deshayes, "Antifreeze and Balaclavas: NATO Troops in cold War Games," *Military.com*, November 2, 2018; Vasco Cotovio and Frederik Pleitgen, "Submarines a Centerpiece of Russia's Navy," *CNN*, November 19, 2018; Shawn Snow, "The Corps' Armor Makes a Big Showing in Norway as Marines Test Future Force," *Marine Corps Times*, October 25, 2018; Terje Solsvik, "As Winter Comes, NATO Kicks Off Largest Maneuvers Since Cold War," *Reuters*, October 25, 2018; Kyle Rempfer, "US Breaches the Arctic with Marines, Fighter Jets and Aircraft Carriers," *Military Times*, October 23, 2018; Megan Eckstein, "Truman Carrier Strike Group Operating North of Arctic Circle; First Time for US Navy Since 1991," *USNI News*, October 19, 2018; Thomas Gooley, "HST Strike Group Enters Arctic Circle, Prepares for NATO Exercise," *DVIDS (Defense Visual Information Distribution Service)*, October 19, 2018; Thomas Nilsen, "US Marines Launch Exercise in Northern Norway Ahead of Trident Juncture," *Barents Observer*, October 15, 2018.

[155] Thomas Nilsen, "Norway to Host Biggest Exercise Inside Arctic Circle Since Cold War," *Barents Observer*, April 14, 2021.

[156] See, for example, Noel Williams, "Send the Marines to Alaska," *War on the Rocks*, August 17, 2021; David Auerswald, "A U.S. Security Strategy for the Arctic," *War on the Rocks*, May 27, 2021; Thomas Grove, "Russian Military Seeks to Outmuscle U.S. in Arctic," *Wall Street Journal*, May 25, 2021; Timothy Greenhaw, Daniel L. Magruder Jr., Rodrick H. McHaty, and Michael Sinclair, *US Military Options To Enhance Arctic Defense*, Brookings Institution, May 2021, 15 pp.; Mark Magnier, "A More Accessible Arctic Becomes Proving Ground for US-China Military Jockeying," South China Morning Post, May 3, 2021; C. Todd Lopez, "U.S. Must Get 'On the Field' in Arctic to Defend National Interests There," *DOD News*, April 15, 2021; Christen McCurdy, "NORTHCOM says U.S. must defend interests in the Arctic," *United Press International*, April 15, 2021; John Grady, "Panel: NATO Needs to Take Russian Offensive, Defensive Advances in Arctic Seriously," *USNI News*, July 1, 2020; Jerry Hendrix, "The United States Must Defend Open Seas in the Arctic," *National Review*, May 13, 2020; Mathieu Boulegue, "Military Assets in the Arctic: A Russia-West Correlation of Forces," *Russia Matters*, January 22, 2020.

[157] See, for example, Dermot Cole, "The US Writes, But Does Not Implement, Arctic Strategies," *ArcticToday*, January 13, 2020; John M. Doyle, "U.S. Lacks Ice Hardened Ships, Repair and Refueling Ports for Arctic Ops," *Seapower*, March 4, 2020; Ben Werner, "Navy, Marines Tell Congress Emphasis on Arctic is Growing," *USNI News*, March 5, 2020.

> The Pentagon's 2022 budget is light on funding for defending the Arctic, but Defense Department officials expect future funding requests to rise with the region's growing importance.
>
> Defense Secretary Lloyd J. Austin III, testifying before the Senate Appropriations defense subcommittee June 17, said the current fiscal 2022 request provides only "some capability" for the Arctic, adding, "We have to better resource our Arctic efforts in the future."
>
> The Pentagon is hashing out a new National Defense Strategy, he said, and "my goal is to make sure that our efforts in the Arctic, our requirements in the Arctic, are reflected in the new National Defense Strategy."
>
> U.S. Northern Command boss Gen. Glen D. VanHerck testified to the Senate Armed Services Committee June 9 that the Arctic region is not getting the funding it needs. "Senator, I think when I look at the FY22 budget, I see an inching along in all of the services, he said. "I'm encouraged: They all have strategies now, and the department has a strategy, and my strategy heavily relies on the Arctic," the Air Force four-star said. "But we didn't move the ball very far down the field this year in the budget."…
>
> Chairman of the Joint Chiefs of Staff Gen. Mark A. Milley, appearing alongside Austin, said the 2022 budget request provides adequate investment "for right now." But he said the region will become "increasingly important geostrategically" and that DOD has little choice but to "increase resourcing in the Arctic."[158]

March 2021 Interim National Security Strategic Guidance Document

As mentioned earlier, an Interim National Security Strategic Guidance document released by the Biden Administration in March 2021[159] does not specifically mention the Arctic.

January 2018 National Defense Strategy Document

An unclassified summary of the National Defense Strategy released by the Trump Administration in January 2018[160] does not specifically mention the Arctic.

U.S. and Canada Plan to Update Warning Radars in Arctic

An August 18, 2021, press report states:

> Military leaders in Canada and the United States plan to work together to modernize the North American Aerospace Defense Command, jointly investing in new sensing and command and control capabilities to protect the continent from new ballistic missile threats.
>
> "To meet our security and defense objectives, both countries must be secure within our shared North American continent. The stronger and safer we are at home, the more we are capable of engaging and acting together in the wider world, in support of a strong, rules-based international order," the Minister of National Defence of Canada Harjit Sajjan and U.S. Secretary of Defense Lloyd Austin in a joint statement....
>
> The statement commits both countries to "modernize, improve, and better integrate the capabilities required for NORAD to maintain persistent awareness and understanding of

[158] Brian W. Everstine, "DOD Leaders Want More Arctic Funding, But Not Right Now," *Air Force Magazine*, June 17, 2021. See also Greg Hadley, "VanHerck: Services 'Didn't Move the Ball Very Far' With Arctic Spending in 2022," *Air Force Magazine*, June 10, 2021.

[159] White House, *Interim National Security Strategic Guida*nce, March 2021, released on March 3, 2021, 23 pp.

[160] Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge*, January 2018, 11 pp.

> potential threats to North America in the aerospace and maritime domains, to deter acts of aggression against North America, to respond to aerospace threats quickly and decisively when required, and to provide maritime warning consistent with the NORAD Agreement."
>
> That includes replacing NORAD's main sensors with new advanced ones located in all domains — from under the sea to on orbit — that can detect threats as small as a cruise missile or even a small drone. The countries also need to conduct joint research and establish new command and control systems that enable a common operating picture.[161]

April 2021 Agreement Regarding Bases in Norway

An April 19, 2021, press report states:

> American and NATO ships, submarines, and aircraft will soon come calling at a handful of new ports and airfields in the Norwegian Arctic, thanks to a major new pact signed Friday [April 16].
>
> The Supplementary Defense Cooperation Agreement will allow the US to build infrastructure at three air bases and a navy facility along the Norwegian coast to bolster American and NATO allied operations in the Arctic and North Atlantic….
>
> Once it's approved, the US will be able to start building new facilities at the Rygge, Sola, and Evenes airfields, along with the Ramsund navy base, while rotating troops and contractors to those bases to maintain facilities and service US aircraft and ships.
>
> The Ramsund facilities would mark the second base where American submarines and ships can regularly resupply along Norway's North Atlantic coast, following the expected opening of the Tromso port even further north to American submarines in the coming weeks after undergoing a major expansion effort last year….
>
> The new work is likely to include facilities for P-8 surveillance planes and B-1 bombers, which would use the bases as a launching pad to monitor Russian submarines sailing from Northern Fleet's main base on Kola peninsula, hard up against the Norwegian border.
>
> The US government will pay for all facilities it builds on Norwegian soil, and won't permanently base any troops there, officials in Oslo were quick to point out. It's a point the Norwegian government has long stressed when talking about US Marine rotations to the country for training.[162]

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[161] Nathan Strout, "US and Canada Want to Collaborate on NORAD Modernization," *C4ISRNet*, August 18, 2021. For the text of the statement, see Department of Defense, "Joint Statement on NORAD Modernization," news release, August 17, 2021. See also Jason Sherman, "U.S., Canada Set New Framework for NORAD Modernization, Guide for Future Investments," *Inside Defense*, August 18, 2021; Economist, "North America's Arctic Radar Shield Is Due for an Upgrade," *Economist*, July 31, 2021; Frank Wolfe, "Modernization of North Warning System for Arctic Needed, Hinote Says," *Defense Daily*, July 27, 2021; Tom Yun, "Threats from Russia, China Underscore Need to Modernize Norad: Expert," *CTV News (Canada)*, March 30, 2021; Hilde-Gunn Bye, "NORAD, NORTHCOM Strategy Highlights Changing Strategic Environment in the Arctic," *High North News*, March 18, 2021; Vipal Monga and Paul Vieira, "Cold War-Era Defense System to Get Upgrade to Counter Russia, China," *Wall Street Journal*, February 27, 2021; Hilde-Gunn Bye, "USA and Canada Agree to Modernize NORAD," *High North News*, February 24, 2021; Levon Sevunts, "NORAD Modernization to Dominate Agenda of Canada-U.S. Defence Relations, Experts Say," *Eye on the Arctic (Radio Canada International)*, February 5 (updated February 6), 2021.

[162] Paul McLeary, "Norway, US Bolster Russian Sub Watching With New Bases," *Breaking Defense*, April 19, 2021. See also Chad Garland, "US Can Build Military Facilities in Norway Under New Defense Cooperation Pact," *Stars and Stripes*, April 16, 2021; Thomas Nilsen, "U.S. Navy Will Build Airport Infrastructure in Northern Norway to Meet Upped Russian Submarine Presence," *Barents Observer*, April 16, 2021; Terje Solsvik and Nerijus Adomaitis, "Norway to Allow U.S. Military to Build on Its Soil in New Accord," *Reuters*, April 16, 2021.

August 2020 Press Report About Marines in Norway

In August 2020, it was reported that a force of about 700 U.S. Marines that had been stationed in Norway on a rotational basis since 2017 would be withdrawn, leaving only 20 Marines permanently stationed there, and that in the future Marines would visit Norway in larger numbers only in connection with exercises.[163]

Surveillance and Reconnaissance, Domain Awareness, and Communications

DOD and Coast Guard officials have stated that recent U.S. military operations in the Arctic have highlighted a need for improved capabilities for conducting surveillance and reconnaissance in the region, so as to support improved domain awareness (i.e., real-time or near-real-time awareness of military and other activities taking place across the region), and for improved communication abilities, because existing U.S. military communications systems were designed to support operations in lower latitudes rather than in the polar regions. An August 25, 2021, press report, for example, stated:

> The biggest focus of collaboration between US Northern Command and US Space Command will be on secure communication capabilities in the Arctic, according to the leader of NORTHCOM/NORAD.
>
> Responding to a question as the annual Space and Missile Defense conference in Huntsville, Ala., earlier this month about how his team and SPACECOM are integrating, Gen. Glen VanHerck noted that secure comms will be particularly vital for the Arctic area — itself becoming a more prominent part of the NORTHCOM/NORAD mission to defense the homeland.
>
> "Limited communications north of 65 latitude, and the ability to command and control in our homeland — when you're under attack in the electromagnetic spectrum secure, reliable communications will be something that we have to maintain," VanHerck said, noting he's "working with SPACECOM on that."
>
> The general noted that proliferated Low Earth Orbit (below 2,000 kilometers in altitude) constellations will be "crucial" for the future mission — something he previewed earlier in the year, when he discussed a series of tests being run through Air Force Research Laboratory.[164]

U.S. military services are starting to take actions to address the need for improved surveillance and reconnaissance, domain awareness, and communications in the Arctic.[165]

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[163] See, for example, Atle Staalesen, "Most US Marines Based in Norway Will Leave This Fall," *ArcticToday*, August 6, 2020.

[164] Aaron Mehta and Theresa Hitchens, "NORTHCOM Needs Help In Space For Arctic Communications," *Breaking Defense*, August 25, 2021. See also David B. Larter, "The Arctic Is a Strategic Hot Spot, but Western Allies Lack Good Intel," *Defense News*, September 21, 2020.

[165] See, for example, Bill Liquori and Iris Ferguson, "How the US Space Force Plans to Improve Arctic Communication," *C4ISRNet*, July 14, 2021; William McCormick, "NORTHCOM, NORAD Request $80M Budget for Testing of Arctic Communication Satellites," *ExecutiveBiz*, June 11, 2021; Nathan Strout, "NORAD, NORTHCOM Want $80 Million to Test SpaceX and OneWeb in the Arctic," *C4ISRNet*, June 10, 2021; Frank Wolfe, "10 Starlink Satellites to Enhance Arctic Communications for NORTHCOM," *Defense Daily*, April 15, 2021; Theresa Hitchens, "AFRL, NORTHCOM Eye Commercial Internet Sats For Arctic," *Breaking Defense*, March 3, 2021; Frank Wolfe, "Air Force Envisions Improved Communications and Sensor Capabilities for Arctic," *Defense Daily*, October 5, 2020; Joseph Trevithick, "The Navy Is Building A Network Of Drone Submarines And Sensor Buoys In The Arctic," *The Drive*, October 1, 2020.

Impact of Warmer Temperatures on U.S. Military Bases in Alaska

An August 9, 2020, press report about the impact of warmer temperatures on U.S. military bases in Alaska stated

> When warming temperatures melted the frozen ground under the munitions repair facility here [Eielson Air Force Base] years ago, the foundation shifted, causing deep cracks to spread across the thick concrete walls.
>
> Over time, the repair bay for missiles and other explosives began to separate from the floor, forcing the 12-foot blast-proof doors out of alignment so they could not be properly closed, according to Defense Department documents and interviews with base construction officials.
>
> Then the entire facility, built on a sloping hillside and hidden in a patch of dense trees, started slowly sliding toward the base of 10,000 people working and living below….
>
> The detrimental effect of global warming is pushing up the cost of ongoing operations at three of Alaska's four major U.S. military bases: Eielson [Air Force Base], Fort Wainwright and Clear Air Force Base. All are located in the warming south-central swath of Alaska where patchwork or "discontinuous" permafrost exists and is prone to melting.
>
> Military planners have requested more than $1 billion over five years to fund construction needed to keep the three bases operational and to support the employees and families who work and live on them, according to a Howard Center for Investigative Journalism analysis of military service construction requests submitted to Congress from fiscal year 2015-2020. While only a portion of that spending was for climate-related work, that portion is expected to grow.[166]

June 2021 DOD Creation of Ted Stevens Center for Arctic Security Studies

A June 9, 2021, DOD News article states:

> The Defense Department announced today the creation of a new DOD center to focus on issues related to the Arctic.
>
> The Ted Stevens Center for Arctic Security Studies will be the sixth such regional center for the department, Pentagon Press Secretary John F. Kirby said during a briefing today at the Pentagon.
>
> "The Ted Stevens Center will provide a new venue to collaborate across the U.S. government and with our allies and partners to advance shared interests for a peaceful and prosperous Arctic," Kirby said. "Defense Department regional centers are international academic venues for bilateral and multilateral research, communication and training, with the goal of building strong, sustainable, international networks of security leaders."[167]

[166] Sara Karlovitch, Luciana Perez-Uribe, Julia Lerner, and Lindsey Collins, "Global Warming Is Having a Costly, and Dangerous, Impact on Key Military Bases in Alaska," *Seattle Times*, August 9, 2020. See also Brian W. Everstine, "Climate Change Will Guide How the Air Force Builds Arctic Infrastructure," *Air Force Magazine*, November 20, 2020; Rhemi Marlatt, "The Intersection of U.S. Military Infrastructure & Alaskan Permafrost Through the 21st Century," Arctic Institute, October 27, 2020.

[167] Department of Defense news release, "DOD Announces Center to Collaborate on, Advance Shared Interests in Arctic Region," *DOD News*, June 9, 2021. See also Department of Defense, "The Department of Defense Announces Establishment of Arctic Regional Center," June 9, 2021.

FY2021 National Defense Authorization Act (H.R. 6395/P.L. 116-283)

The FY2021 National Defense Authorization Act (H.R. 6395/P.L. 116-283 of January 1, 2021; conference report H.Rept. 116-617 of December 3, 2020) includes a number of provisions relating to the Arctic, including the following:

- **Section 905**, which directs the Assistant Secretary of Defense for International Security Affairs to assign responsibility for the Arctic region to the Deputy Assistant Secretary of Defense for the Western Hemisphere or any other Deputy Assistant Secretary of Defense the Secretary of Defense considers appropriate.
- **Section 1045**, which directs the Secretary of Defense and the Chairman of the Joint Chiefs of Staff to continue assessing potential multidomain risks in the Arctic, identifying capability and capacity gaps in the current and projected force, and planning for and implementing the training, equipping, and doctrine requirements necessary to mitigate such risks and gaps, and authorizes the Secretary to conduct research and development on the current and future requirements and needs of the Armed Forces for operations in the Arctic.
- **Section 1089**, which directs the Secretary of Defense, in coordination, with the Secretary of State, to submit a plan to establish a DOD Regional Center for Security Studies for the Arctic, and authorizes the Secretary, subject to the availability of appropriations, to establish and administer such a center, to be known as the Ted Stevens Center for Arctic Security Studies.
- **Section 1208**, which directs the Secretary of Defense, in coordination with the Secretary of State, to submit, within 90 days of enactment of the FY2021 National Defense Authorization Act, a plan to establish a Department of Defense Regional Center for Security Studies for the Arctic, and authorizes the Secretary of Defense, not earlier than 30 days after the plan is submitted, and subject to the availability of appropriations, to establish and administer a Department of Defense Regional Center for Security Studies for the Arctic, to be known as the "Ted Stevens Center for Arctic Security Studies."

Division G of H.R. 6395/P.L. 116-283 is the Elijah E. Cummings Coast Guard Authorization Act of 2020, which includes the following additional provisions relating to the Arctic:

- **Section 8421**, which makes a number of findings regarding the strategic importance of the Arctic and expresses the sense of the Congress regarding the strategic importance of the Arctic and on actions the Coast Guard should take to better align its mission prioritization and development of capabilities to meet the growing array of challenges in the region.
- **Section 8422**, which directs the Coast Guard to engage directly with local coastal whaling and fishing communities in the Arctic region when conducting the Alaskan Arctic Coast Port Access Route Study.
- **Section 8424**, which directs the Coast Guard to shall submit a report setting forth the results of a study on the Arctic capabilities of the Armed Forces, and to enter into a contract with an appropriate federally funded research and development center for the conduct of the study.
- **Section 8425**, which directs the Coast Guard to submit a report on the Coast Guard's search and rescue capabilities in Arctic coastal communities.

H.R. 4135 and S. 2294 of 117th Congress

- H.R. 4135 and S. 2294 of 117th Congress, referred to as the Arctic Security Initiative Act of 2021, would "requir[e] the Department of Defense (DOD) to conduct a security assessment of the Arctic region and establish an Arctic Security Initiative (ASI) with a five-year plan to fully resource the DOD and individual service-specific strategies for the Arctic that have been released over the past several years. U.S. Northern Command (USNORTHCOM) would lead the independent assessment in coordination with U.S. Indo-Pacific Command (USINDOPACOM) and U.S. European Command USEUCOM)."[168]

Navy and Coast Guard

Overview

The Navy has increased deployments of attack submarines and surface ships to the Arctic for exercises and other operations.[169] Many of the Navy's attack submarines are ice-hardened and capable of surfacing through thinner Arctic ice. The Coast Guard annually deploys a polar icebreaker, other cutters, and aircraft into the region to perform various Coast Guard missions and to better understand the implications of operating such units there.[170] Key points relating to the Navy and Coast Guard in the Arctic that have emerged in recent years include the following:

- The diminishment of Arctic ice is creating new operating areas in the Arctic for Navy surface ships and Coast Guard cutters.[171]
- U.S. national security interests in the Arctic include "such matters as missile defense and early warning; deployment of sea and air systems for strategic sealift, strategic deterrence, maritime presence, and maritime security operations; and ensuring freedom of navigation and overflight."[172]
- Search and rescue (SAR) in the Arctic is a mission of increasing importance, particularly for the Coast Guard, and one that poses potentially significant operational challenges;

[168] The bill's title of the Arctic Security Initiative Act of 2021 and the quoted summary of what the bill wold require are taken from Office of Senator Dan Sullivan, "Sullivan, King, Gallagher & Luria Launch Arctic Security Initiative Act," press release dated June 24, 2021, accessed July 16, 2021, at https://www.sullivan.senate.gov/newsroom/press-releases/sullivan-king-gallagher-and-luria-launch-arctic-security-initiative-act.

[169] See, for example, Diana Stancy Correll, "Destroyer Ross Treks into the Barents Sea's Arctic Waters—Again," *Navy Times*, October 21, 2020; Thomas Nilsen, "U.S. Warship Returns to Barents Sea," *Barents Observer*, October 20, 2020; John Vandiver, "For the Third Time This Year, a Navy Destroyer Enters the Barents Sea," *Stars and Stripes*, October 20, 2020; Caleb Larson, "The U.S. Navy Wants to Make Sure It Can Take on Russia in the Arctic," *National Interest*, October 7, 2020; Christopher Woody, "A US Navy Destroyer Teamed Up with Canada's Navy to Learn How to Operate in Harsh Arctic Conditions," *Business Insider*, September 17, 2020; Caitlin M. Kenney, "US Participates in Arctic Exercise as Region Sees Increased Military Activity from Russia and China," *Military.com*, August 4, 2020; Christopher Woody, "With Russia Keeping Watch, US Navy Subs Ventured Back to the High North to Train Where There's 'No Safe Haven,'" *Business Insider*, June 10, 2020.

[170] See, for example, Seapower Staff, "U.S. Coast Guard Completes Operation Nanook 2021," *Seapower*, August 18, 2021.

[171] See, for example, Sonoko Kuhara, "What the 'Blue Arctic' Means for the US Pacific Military Presence," *Diplomat*, August 21, 2021; Seapower Staff, "U.S. Coast Guard Cutters Patrol the U.S. Arctic," *Seapower*, August 13, 2021.

[172] NSPD 66/HSPD 25, Section III B.

- Navy officials have stated that they do not see a strong near-term need for building ice-hardened surface ships and deploying them into the Atlantic, but acknowledge that such a need might emerge in the longer run.[173]
- More complete and detailed information on the Arctic as an operating area is needed to more properly support expanded Navy and Coast Guard ship and aircraft operations in the region.
- The Navy and the Coast Guard currently have limited infrastructure in place in the Arctic to support expanded ship and aircraft operations in the Arctic.[174]
- Cooperation with other Arctic countries will be valuable in achieving defense and homeland security goals.

2018 Reestablishment of 2nd Fleet for North Atlantic and Arctic

In May 2018, the Navy announced that it would reestablish the 2nd Fleet, which was the Navy's fleet during the Cold War for countering Soviet naval forces in the North Atlantic. The fleet's formal reestablishment occurred in August 2018. The 2nd Fleet was created in 1950 and disestablished in September 2011. In its newly reestablished form, it is described as focusing on countering Russian naval forces not only in the North Atlantic but in the Arctic as well.[175]

2019 Announcement of Potential Freedom of Navigation (FON) Operation

In January 2019, the Navy announced that "in coming months" it would send a Navy warship through Arctic waters on a freedom of navigation (FON) operation to assert U.S. navigational rights under international law in Arctic waters.[176] The U.S. government's FON program was established in 1979 and annually includes multiple U.S. Navy FON operations conducted in various parts of the world.[177] The announced FON operation in the Arctic, however, would

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[173] See, for example, Ben Werner, "Arleigh Burke Destroyers Are More Viable Option for Near-Term Navy Presence in Arctic," *USNI News*, September 18, 2019; Megan Eckstein, "CNO: Arctic Operations Limited Now, But Future Ship Designs Should Consider Environment," *USNI News,* September 12, 2016.

[174] See, for example, Christopher Woody, "The Navy Is Putting 'The Proper Equipment' Back on Its Ships to Operate in Harsh Arctic Conditions," *Business Insider,* August 8, 2020; Andrew Eversden, "Failure to Communicate: US Navy Seeks Faster Data Transfers amid Arctic Ice," *Defense News*, May 12, 2020; Nathan Strout, "SpaceX Could Fill the US Military's Arctic Communications Gap by the End of This Year," *C4ISRNet,* May 4, 2020; Geoff Ziezulewicz, "Welcome to the Arctic: Degraded Radios, Poor Satellite Geometry and Sea Charts Dating Back to Capt. Cook," *Navy Times,* September 19, 2019.

[175] See, for example, Christopher Woody, "The US Navy's Newest Fleet Is Bulking Up for 'Leaner, Agile' Operations to Counter Russia in the Atlantic and the Arctic," *Business Insider,* January 18, 2019; Patricia Kime, "The Navy Isd gearing Up for 'Leaner, Agile' Operations in Arctic, North Atlantic," *Military.com*, January 16, 2019; Rich Abott, "2nd Fleet To Be Fully Operational in 2019, Sees Real Russian Threat," *Defense Daily,* December 3, 2018; Sam LaGrone, "U.S. 2nd Fleet Racing Toward a 2019 Operational Capability," USNI News, November 29, 2018; Paul McLeary, "New Second Fleet To Stay Lean, Unpredictable, Commander Says; & Watching China," *Breaking Defense,* November 29, 2018; Sam LaGrone, "CNO: New 2nd Fleet Boundary Will Extend North to the Edge of Russian Waters," *USNI News,* August 24, 2018.

[176] See, for example, Ben Kesling, "Cold War Games: U.S. Is Preparing to Test the Waters in Icy Arctic," *Wall Street Journal*, January 11, 2019; Samuel Osborne, "US Navy to Sail Warship Through Arctic Waters in Show of Strength to Russia and China," *Independent (UK)*, January 14, 2019. See also Megan Eckstein "Navy May Deploy Surface Ships to Arctic This Summer as Shipping Lanes Open Up," *USNI News,* January 8, 2019; Malte Humpert, "U.S. Navy Plans to Send Surface Vessels Through Arctic," *High North News,* March 11, 2019.

[177] For background information on the FON program, see the section entitled "Freedom of Navigation (FON) Program" in CRS Report R42784, *U.S.-China Strategic Competition in South and East China Seas: Background and Issues for Congress*.

reportedly be the Navy's first ever FON operation in the Arctic. Some observers have expressed concern about a potential increase in regional tensions that could result from the United States conducting an FON operation in Arctic waters.[178]

Polar Icebreaking[179]

Polar Icebreaker Operations and Current Polar Icebreaker Fleet

Within the U.S. government, the Coast Guard is the U.S. agency responsible for polar icebreaking. U.S. polar ice operations conducted in large part by the Coast Guard's polar icebreakers support 9 of the Coast Guard's 11 statutory missions.[180] The roles of U.S. polar icebreakers can be summarized as follows:

- conducting and supporting scientific research in the Arctic and Antarctic;
- defending U.S. sovereignty in the Arctic by helping to maintain a U.S. presence in U.S. territorial waters in the region;
- defending other U.S. interests in polar regions, including economic interests in waters that are within the U.S. exclusive economic zone (EEZ) north of Alaska;
- monitoring sea traffic in the Arctic, including ships bound for the United States; and
- conducting other typical Coast Guard missions (such as search and rescue, law enforcement, and protection of marine resources) in Arctic waters, including U.S. territorial waters north of Alaska.[181]

The Coast Guard's large icebreakers are called polar icebreakers rather than Arctic icebreakers because they perform missions in both the Arctic and Antarctic. Operations to support National Science Foundation (NSF) research activities in both polar regions account for a significant portion of U.S. polar icebreaker operations.

The operational U.S. polar icebreaking fleet currently consists of one heavy polar icebreaker, *Polar Star*, and one medium polar icebreaker, *Healy*. In addition to *Polar Star*, the Coast Guard has a second heavy polar icebreaker, *Polar Sea*. *Polar Sea*, however, suffered an engine casualty in June 2010 and has been nonoperational since then. *Polar Star* and *Polar Sea* entered service in 1976 and 1978, respectively, and are now well beyond their originally intended 30-year service

[178] See, for example, Rebecca Pincus, "Rushing Navy Ships into the Arctic for a FONOP is Dangerous," *U.S. Naval Institute Proceedings*, January 2019; Hilde-Gunn Bye, "U.S. Freedom of Navigation Operation in the Arctic: 'Would Be a High-Risk Gesture with Unpredictable Consequences,'" *High North News*, September 11, 2020.

[179] This section prepared by Ronald O'Rourke, Specialist in Naval Affairs, Foreign Affairs, Defense, and Trade Division. For more on the Coast Guard's polar icebreakers, see CRS Report RL34391, *Coast Guard Polar Security Cutter (Polar Icebreaker) Program: Background and Issues for Congress*.

[180] The nine missions supported by polar ice operations are search and rescue; maritime safety; aids to navigation; ice operations; marine environmental protection; living marine resources; other law enforcement (protect the exclusive economic zone [EEZ]); ports, waterways and costal security; and defense readiness. The two missions not supported by polar ice operations are illegal drug interdiction and undocumented migrant interdiction. (Department of Homeland Security, *Polar Icebreaking Recapitalization Project Mission Need Statement, Version 1.0*, approved by DHS June 28, 2013, p. 10.)

[181] This passage, beginning with "The roles of …," originated in an earlier iteration of this CRS report and was later transferred by the Government Accountability Office (GAO) with minor changes to Government Accountability Office, *Coast Guard[:]Efforts to Identify Arctic Requirements Are Ongoing, but More Communication about Agency Planning Efforts Would Be Beneficial*, GAO-10-870, September 2010, p. 53.

lives. The Coast Guard in recent years has used *Polar Sea* as a source of spare parts for keeping *Polar Star* operational.

Providing support for NSF's research in the Antarctic focuses on performing an annual mission, called Operation Deep Freeze (ODF), to break through Antarctic sea ice so as to reach and resupply McMurdo Station, the large U.S. Antarctic research station located on the shore of McMurdo Sound, near the Ross Ice Shelf. The Coast Guard states that *Polar Star*, the Coast Guard's only currently operational heavy polar icebreaker, "spends the [northern hemisphere] winter [i.e., the southern hemisphere summer] breaking ice near Antarctica in order to refuel and resupply McMurdo Station. When the mission is complete, the *Polar Star* returns to dry dock [in Seattle] in order to complete critical maintenance and prepare it for the next ODF mission. Once out of dry dock, it's back to Antarctica, and the cycle repeats itself."[182] In terms of the maximum thickness of the ice to be broken, the annual McMurdo resupply mission generally poses the greatest icebreaking challenge for U.S. polar icebreakers, though Arctic ice can frequently pose its own significant icebreaking challenges for U.S. polar icebreakers. The Coast Guard's medium polar icebreaker, *Healy*, spends most of its operational time in the Arctic supporting NSF research activities and performing other operations.

Although polar ice is diminishing due to climate change, observers generally expect that this development will not eliminate the need for U.S. polar icebreakers, and in some respects might increase mission demands for them. Even with the diminishment of polar ice, there are still significant ice-covered areas in the polar regions, and diminishment of polar ice could lead in coming years to increased commercial cargo ship, cruise ship, research ship, and naval surface ship operations, as well as increased exploration for oil and other resources, in the Arctic—activities that could require increased levels of support from polar icebreakers, particularly since waters described as "ice free" can actually still have some amount of ice.[183] Changing ice conditions in Antarctic waters have made the McMurdo resupply mission more challenging since 2000.[184]

Polar Security Cutter (PSC) Program

A Department of Homeland Security (DHS) Mission Need Statement (MNS) approved in June 2013 states that "current requirements and future projections ... indicate the Coast Guard will need to expand its icebreaking capacity, potentially requiring a fleet of up to six icebreakers (3 heavy and 3 medium) to adequately meet mission demands in the high latitudes.... "[185]

The Coast Guard in its FY2013 budget initiated a program to acquire three new heavy polar icebreakers, to be followed years from now by the acquisition of up to three new medium polar icebreakers. The program was originally referred to as the polar icebreaker program but is now referred to as the Polar Security Cutter (PSC) program.

The Coast Guard estimates the total procurement costs of the new three heavy PSCs as $1,039 million (i.e., about $1.0 billion) for the first ship, $792 million for the second ship, and $788

[182] NyxoLyno Cangemi, "Coast Guard Icebreaker Crew Completes Second Arctic Mission; U.S. Interests in Arctic Domain Depends [sic] on Fleet Recapitalization," *DVIDS (Defense Visual Information Distribution System)*, October 19, 2018.

[183] For more on changes in the Arctic due to diminishment of Arctic ice, see CRS Report R41153, *Changes in the Arctic: Background and Issues for Congress*.

[184] National Research Council, *Polar Icebreakers in a Changing World, An Assessment of U.S. Needs*, Washington, 2007, pp. 6-7, 14, 63.

[185] Department of Homeland Security, *Polar Icebreaking Recapitalization Project Mission Need Statement, Version 1.0*, approved by DHS June 28, 2013, p. 9.

million for the third ship, for a combined estimated cost of $2,619 million (i.e., about $2.6 billion). The first ship will cost more than the other two because it will incorporate design costs for the class and be at the start of the production learning curve for the class.

The PSC program has received a total of $1,754.6 million (i.e., about $1.8 billion) in procurement funding through FY2021. With the funding the program has received through FY2021, the first two PSCs are now fully funded.

Search and Rescue (SAR)[186]

Overview

Increasing sea and air traffic through Arctic waters has increased concerns regarding Arctic-area search and rescue (SAR) capabilities.[187] **Table 1** presents figures on ship casualties in Arctic Circle waters from 2005 to 2019. As shown in the table, the number of ship casualties in Arctic waters since 2009 has ranged between about 40 and 70, most of which are caused by damage to or failure of ship machinery, the wrecking or stranding (grounding) of ships, or fires or explosions on ships.

Table 1. Ship Casualties in Arctic Circle Waters, 2005-2019

(Ships of 100 gross tons or more)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Machinery damage/failure	2	3	5	13	14	16	12	13	20	27	45	32	46	23	14
Wrecked/ stranded	1	4	10	11	14	9	9	8	10	14	6	11	9	7	6
Fire/explosion	0	0	3	1	2	6	6	1	4	2	4	1	3	6	8
Collision	0	0	0	1	4	10	4	4	2	0	3	2	4	2	3
Contact (e.g., harbor wall)	0	0	1	1	2	4	1	3	6	4	5	1	1	0	1
Hull damage	0	1	3	1	6	2	2	1	2	1	1	2	2	0	0
Foundered (i.e., sunk or submerged)	0	0	1	1	2	0	3	1	1	2	0	1	0	1	1
Labor dispute	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Miscellaneous	0	0	5	1	4	4	2	6	5	5	6	4	6	4	8
Total	**3**	**8**	**28**	**30**	**48**	**51**	**39**	**37**	**50**	**55**	**70**	**55**	**71**	**43**	**41**

[186] This section prepared by Ronald O'Rourke, Specialist in Naval Affairs, Foreign Affairs, Defense, and Trade Division.

[187] See, for example, Romain Chuffart, "French and Danish Navies Hold Joint SAR Exercises in Greenland's Waters," *High North News*, September 6, 2019; "Arctic Search and Rescue May Face Challenges," *Cruise Industry News*, June 27, 2019; Robbie Gramer, "Stretched Thin on Thin Ice; With the Arctic Melting and Norther Coast Guards Struggling to Keep Up, the Next Disaster Is a Matter of When, Not If," *Foreign Policy*, September 12, 2018; Edward Struzik, "As Ice Recedes, the Arctic Isn't Prepared for More Shipping Traffic," phys.org, September 5, 2018; Derek Minemyer, "Arctic Council Members Say Alaska Needs Search and Rescue in the Arctic, Now," *KTUU*, August 16, 2018; Timothy William James Smith, *Search and Rescue in the Arctic: Is the U.S. Prepared?* RAND Corporation, 2017, 148 pp. (Dissertation report RGSD-382.)

Sources: Allianz Global Corporate & Specialty, *Safety and Shipping Review 2015*, p. 28. (Table entitled "Arctic Circle Waters—All Casualties including Total Losses 2005–2014."); Allianz Global Corporate & Specialty, *Safety and Shipping Review 2018*, p. 29. (Table entitled "Arctic Circle Waters—Causes of Casualties (Shipping Incidents) 2008-2017."): Allianz Global Corporate & Specialty, *Safety and Shipping Review 2020*, p. 33. (Table entitled "Incidents In Arctic Circle Waters.") The tables include similar source notes; the one for the third source states "Source: Lloyd's List Intelligence Casualty Statistics; Data Analysis & Graphic: Allianz Global Corporate & Specialty.")

Given the location of current U.S. Coast Guard operating bases, it could take Coast Guard aircraft several hours, and Coast Guard cutters days or even weeks, to reach a ship in distress or a downed aircraft in Arctic waters. The Coast Guard states that "the closest Coast Guard Air Station to the Arctic is located in Kodiak, AK, approximately 820 nautical miles south of Utqiagvik, AK, which is nearly the same distance as from Boston, MA, to Miami, FL."[188] In addition to such long distances, the harsh climate complicates SAR operations in the region.

A 2017 survey of Arctic SAR capabilities conducted as part of the Finnish Border Guard's Arctic Maritime Safety Cooperation project in cooperation with the Arctic Coast Guard Forum stated the following:

> The key challenges for Arctic search and rescue identified in this survey include long distances, severe weather, ice and cold conditions, a poor communications network, lack of infrastructure and lack of resource presence in the region. In addition, the capacity to host patients, achieving situational awareness, and unsuitable evacuation and survival equipment pose major challenges for maritime safety and SAR in the Arctic.
>
> The Arctic SAR authorities have recognized a need to further develop advanced information sharing between coast guards, emergency authorities, and other stakeholders involved in SAR operations. In addition, joint training and systematic sharing of lessons learned, as well as technological innovation in communications networks and connections, navigation, survival and rescue equipment, and healthcare services are being called for in order to improve SAR capabilities in the Arctic.
>
> The survey recommends enhancing practical cooperation between various stakeholders involved in Arctic SAR such as coast guards, rescue centers, other authorities, industry groups, private operators, academia and volunteer organizations. It encourages further information sharing on infrastructure projects and resource assets, Automatic Identification System and weather data, emergency plans and standard operating procedures, as well as exercises and lessons learned via a common database. Furthermore, developing joint courses specifically intended for Arctic SAR and establishing a working group that examines new innovations and technological developments, are recommended as potential initiatives for improving practical international cooperation.[189]

Particular concern has been expressed about cruise ships carrying large numbers of civilian passengers that may experience problems and need assistance.[190] There have already been incidents of this kind with cruise ships in recent years in waters off Antarctica, and a Russian-

[188] Coast Guard, *Arctic Strategic Outlook*, April 2019, p. 11.

[189] Emmi Ikonen, *Arctic Search and Rescue Capabilities Survey: Enhancing International Cooperation 2017*, Finnish Border Guard, Arctic Maritime Safety Cooperation (SARC) project, August 2017, p. iv. See also Finnish Red Cross, *Red Cross Arctic Disaster Management Study*, August 2018, 71 pp.

[190] See, for example, Ken Potter, "Passenger Vessels and the Canadian Arctic: A Risky Combination?" *Maritime Executive*, June 9, 2021; Jane George, "Exercise Held to Prepare for Arctic Cruise Ship Mishap," *Nunatsiaq News*, April 15, 2019; Brian Castner, "How to Rescue a Cruise Ship in the Northwest Passage," *Motherboard (Vice)*, October 24, 2017; Henry Fountain, "With More Ships in the Arctic, Fears of Disaster Rise," *New York Times*, July 23, 2017; Gwladys Fouche, "Uncharted Waters: Mega-Cruise Ships Sail the Arctic," *Reuters*, October 10, 2016; Abbie Tingstad and Timothy Smith, "Being Safer in the Arctic," *National Interest*, October 3, 2016.

flagged passenger ship with 162 people on board ran aground on Canada's Northwest Passage on August 24, 2018.[191] A 2020 report from Allianz Global Corporate & Specialty (AGCS) states:

> Last year's [2019's] engine failure incident involving the cruise ship demonstrates how such events could quickly turn into a major disaster, particularly if they occur in remote waters such as the Arctic, where a growing number of such vessels are expected to operate in future.
>
> In March 2019, the Viking Sky cruise ship suffered engine failure with 1,373 people on board when sailing from Tromsø to Stavanger in Norway when it hit bad weather. The vessel, which narrowly avoided grounding, was left without power or propulsion and had to rely on rescue helicopters to evacuate passengers as sea conditions did not allow for the use of lifeboats or tugs….
>
> "The incident with the Viking Sky clearly shows how a problem with engines or fuel could quickly turn into a major disaster," says Captain Rahul Khanna, Global Head of Marine Risk Consulting at AGCS. "This incident is a reminder of the importance to have the right amount of fuel and lubrication oil on board and that it is not impacted by the running of the vessel in heavy weather. Otherwise the consequences can be dire, including grounding, sinking or foundering."
>
> The incident is also a wake-up call for cruise ships operating in polar waters, raising questions for emergency response capabilities. Had such an incident happened in the Arctic, a rapid rescue response would most likely not have been possible.[192]

Coast Guard officials have noted the long times that would be needed to respond to potential emergency situations in certain parts the Arctic. The Coast Guard is participating in exercises focused on improving Arctic SAR capabilities.[193] Increasing U.S. Coast Guard SAR capabilities for the Arctic could require one or more of the following: enhancing or creating new Coast Guard operating bases in the region; procuring additional Arctic-capable aircraft, cutters, and rescue boats for the Coast Guard; and adding systems to improve Arctic maritime communications, navigation, and domain awareness.[194] It may also entail enhanced forms of cooperation with navies and coast guards of other Arctic countries.

May 2011 Arctic Council Agreement on Arctic SAR

On May 12, 2011, representatives from the member states of the Arctic Council, meeting in Nuuk, Greenland, signed an agreement on cooperation on aeronautical and maritime SAR in the Arctic. Key features of the agreement include the following:

- Article 3 and the associated Annex to the agreement essentially divide the Arctic into SAR areas within which each party has primary responsibility for

[191] Malte Humpert, "A Cruise Ship Runs Aground in Canada's Arctic Waters; The Akademik Ioffe's Sister Ship Was Nearby, and Together with Canadian Coast guard Ships, Was Able to Rescue All Passengers," *ArcticToday*, August 28, 2018.

[192] Allianz Global Corporate & Specialty, *Safety and Shipping Review 2020*, p. 32.

[193] See, for example, Melody Schreiber, "US, Canada Conduct a Joint Arctic Search-and-Rescue Exercise in Nunavut," *Arctic Today*, September 9, 2021; Jane George, "Arctic Reps Practise Response to Maritime Emergency," *Nunatsiaq News*, April 17, 2021; Eilís Quinn, "Arctic Guardian Exercise 2021 Underway to Test Joint Emergency Marine Response," *Barents Observer*, April 13, 2021; Melody Schreiber, "Arctic Disaster Responders Train Together in a First-of-Its-Kind Joint Exercise," *ArcticToday*, April 15, 2021. See also "Results from Virtual Joint Arctic Search and Rescue Exercise Published," *Cruise Industry News*, August 13, 2021.

[194] For a report assessing certain emergency scenarios in the Arctic, including search and rescue scenarios, see *Opening the Arctic Seas, Envisioning Disasters and Framing Solutions*, Coastal Response and Research Center, University of New Hampshire, report of January 2009, based on conference held March 18-20, 2008, at Durham, NH.

conducting SAR operations, stating that "the delimitation of search and rescue regions is not related to and shall not prejudice the delimitation of any boundary between States or their sovereignty, sovereign rights or jurisdiction," and that "each Party shall promote the establishment, operation and maintenance of an adequate and effective search and rescue capability within its area."

- Article 4 and the associated Appendix I to the agreement identify the competent authority for each party. For the United States, the competent authority is the Coast Guard.
- Article 5 and the associated Appendix II to the agreement identify the agencies responsible for aeronautical and maritime SAR for each party. For the United States, those agencies are the Coast Guard and the Department of Defense.
- Article 6 and the associated Appendix III to the agreement identify the aeronautical and/or maritime rescue coordination centers (RCCs) for each party. For the United States, the RCCs are Joint Rescue Coordination Center Juneau (JRCC Juneau) and Aviation Rescue Coordination Center Elmendorf (ARCC Elmendorf).
- Article 12 states that "unless otherwise agreed, each Party shall bear its own costs deriving from its implementation of this Agreement," and that "implementation of this Agreement shall be subject to the availability of relevant resources."[195]

Figure 4 shows a map of the national areas of SAR responsibility based on the geographic coordinates listed in the Annex to the agreement.

An October 12, 2015, press report states the following:

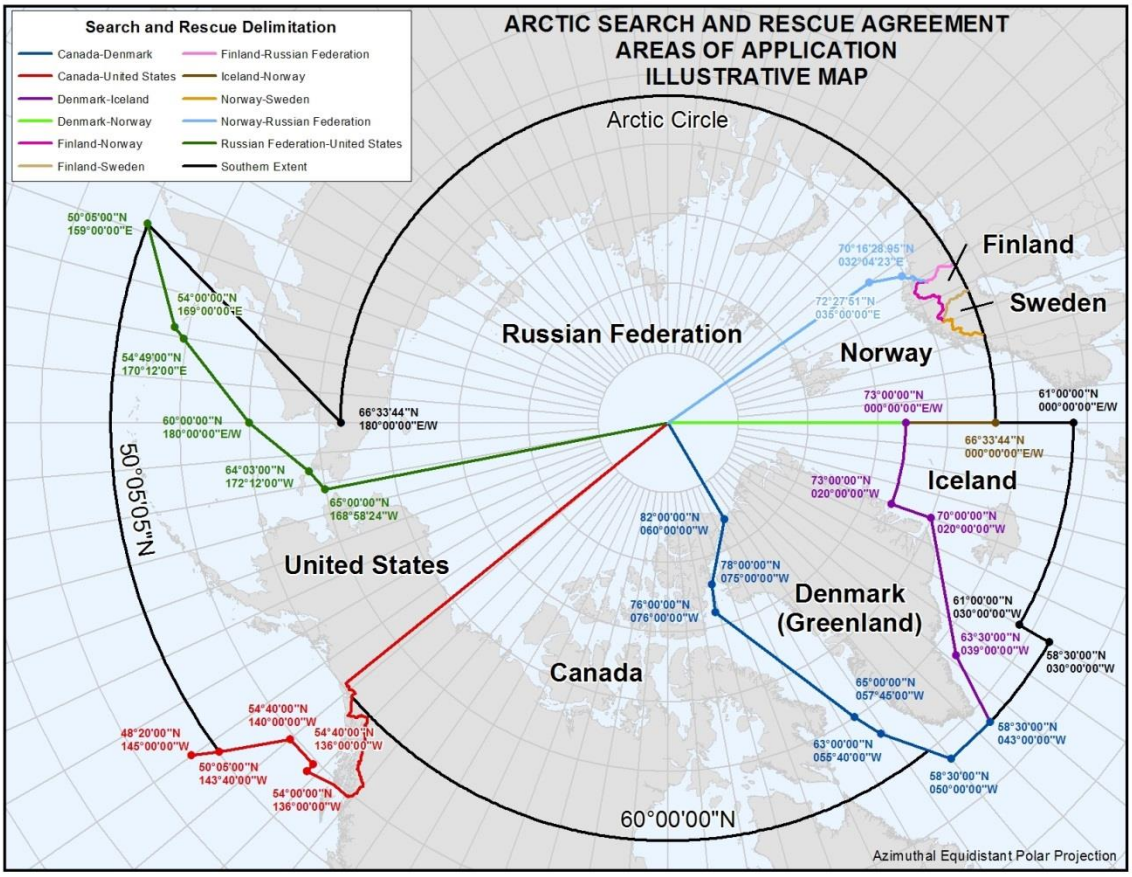
> More people are wishing to explore icy environments, says Peter Hellberg, manager responsible for the SAR process at the Swedish Maritime Administration. Hellberg is part of an IMO/International Civil Aviation Organization (ICAO) working group that is re-evaluating search and rescue (SAR) operations in Polar waters as a result of this push.
>
> The working group includes both a maritime and aeronautical perspective, and it has identified a need for more detailed guidance for SAR organizations which will be achieved through an update of the International Aeronautical and Maritime Search and Rescue Manual (IAMSAR) planned for 2019.
>
> While the IAMSAR manual is not mandatory, it is followed by most SAR organizations around the world. It provides the framework for setting up a multi-national SAR, giving different parties guidance on the necessary arrangements for Arctic areas.
>
> The guidance will be expanded on based on the Polar Code and other recent IMO regulatory updates, and from an aeronautical perspective, from lessons learned after the disappearance of Malaysian Airlines' MH370.[196]

[195] Source: Text of final version of agreement made ready for signing and dated April 21, 2011, accessed April 8, 2021, at https://oaarchive.arctic-council.org/bitstream/handle/11374/531/EDOCS-1910-v1-ACMMDK07_Nuuk_2011_Arctic_SAR_Agreement_unsigned_EN.PDF?sequence=8&isAllowed=y. For a State Department fact sheet on the agreement, see "Secretary Clinton Signs the Arctic Search and Rescue Agreement with Other Arctic Nations," May 12, 2011, accessed April 8, 2021, at https://2009-2017.state.gov/r/pa/prs/ps/2011/05/163285.htm.

[196] Wendy Laursen, "MH370, Polar Code Spark SAR Rethink," *Maritime Executive*, October 12, 2015.

Figure 4. Arctic SAR Areas in Arctic SAR Agreement

(Based on geographic coordinates listed in the agreement)



Source: Map posted at "Arctic Region," State Department, accessed April 8, 2021 at https://www.state.gov/key-topics-office-of-ocean-and-polar-affairs/arctic/.

Commercial Sea Transportation[197]

Background

The search for a shorter route from the Atlantic to Asia has been the quest of maritime powers since the Middle Ages. The melting of Arctic ice raises the possibility of saving several thousands of miles and several days of sailing between major trading blocs.[198] If the Arctic were to become a viable shipping route, the ramifications could extend far beyond the Arctic. For example, lower shipping costs could be advantageous for China (at least its northeast region), Japan, and South Korea because their manufactured products exported to Europe or North America could become

[197] This section prepared by John Frittelli, Specialist in Transportation Policy, Resources, Science, and Industry Division.

[198] Extended daylight hours in the Arctic during the summer may also be an advantage.

less expensive relative to other emerging manufacturing centers in Southeast Asia, such as India.[199] Melting ice could potentially open up two trans-Arctic routes (see **Figure 3**):[200]

- **The Northern Sea Route** (NSR, a.k.a. the "Northeast Passage"), along Russia's northern border from Murmansk to Provideniya, is about 2,600 nautical miles in length. It was opened by the Soviet Union to domestic shipping in 1931 and to transit by foreign vessels in 1991. This route would be applicable for trade between northeast Asia (north of Singapore) and northern Europe. In recent summers, less than a handful of large, non-Russian-flagged cargo ships have transited the NSR.[201] Russia reportedly seeks to reserve carriage of oil and gas extracted along the NSR to Russian-flagged ships.[202]
- **The Northwest Passage** (NWP) runs through the Canadian Arctic Islands. The NWP actually consists of several potential routes. The southern route is through Peel Sound in Nunavut, which has been open in recent summers and contains mostly one-year ice. However, this route is circuitous, contains some narrow channels, and is shallow enough to impose draft restrictions on ships. The more northern route, through McClure Strait from Baffin Bay to the Beaufort Sea north of Alaska, is much more direct and therefore more appealing to ocean carriers, but more prone to ice blockage.[203] The NWP is potentially applicable for trade between northeast Asia (north of Shanghai) and the northeast of North America, but it is less commercially viable than the NSR.[204] Cargo ship transits have been extremely rare but cruise vessel excursions and research vessels are more common.

Destination Traffic, Not Trans-Arctic Traffic

Most cargo ship activity currently taking place in the Arctic is to transport natural resources from the Arctic or to deliver general cargo and supplies to communities and natural resource extraction facilities. Thus, cargo ship traffic in the Arctic presently is mostly regional, not trans-Arctic. While there has been a recent uptick in Arctic shipping activity, this activity has more to do with a spike in commodity prices than it does with the melting of Arctic ice. Even so, fewer ships ply the Arctic seas now than in the past. The NSR continues to account for the bulk of Arctic shipping activity.

[199] Presentation by Stephen Carmel, Senior Vice President, Maersk Line Ltd., Halifax International Security Forum, *Arctic Security: The New Great Game?* November 21, 2009, available at http://fora.tv/.

[200] A third but more remote possibility is a route directly over the North Pole.

[201] Northern Sea Route Information Office; http://www.arctic-lio.com/.

[202] The Independent Barents Observer, "Icebreaking Tankers Have Course for Russia's New Arctic LNG Plant, And They All Carry Foreign Flags," December 11, 2017; https://thebarentsobserver.com/en/industry-and-energy/2017/12/icebreaking-tankers-have-course-russias-new-arctic-lng-plant-and-they.

[203] This was the route pioneered by the *SS Manhattan*, an oil tanker modified for ice breaking in 1969 to carry Alaskan North Slope oil to the Atlantic. This was the first commercial passage through the NWP, but the building of the Alaskan pipeline was found to be the more economical means of transporting oil from the North Slope to the lower 48 states.

[204] Although the NWP is often compared to the alternative route through the Panama Canal in terms of distance and sailing days from Asia to the U.S. east coast, another alternative to consider is the shorter and faster transcontinental rail route across Canada or the United States.

Unpredictable Ice Conditions Hinder Trans-Arctic Shipping

Arctic waters do not necessarily have to be ice free to be open to shipping. Multiyear ice can be over 10 feet thick and problematic even for icebreakers, but one-year ice is typically 3 feet thick or less. This thinner ice can be more readily broken up by icebreakers or ice-class ships (cargo ships with reinforced hulls and other features for navigating in ice-infested waters). However, more open water in the Arctic has resulted in another potential obstacle to shipping: unpredictable ice flows. In the NWP, melting ice and the opening of waters that were once covered with one-year ice has allowed blocks of multiyear ice from farther north and icebergs from Greenland to flow into potential sea lanes. The source of this multiyear ice is not predicted to dissipate in spite of climate change. Moreover, the flow patterns of these ice blocks are very difficult to forecast.[205] Thus, the lack of ice in potential sea lanes during the summer months can add even greater unpredictability to Arctic shipping. This is in addition to the extent of ice versus open water, which is also highly variable from one year to the next and seasonally.

The unpredictability of ice conditions is a major hindrance for trans-Arctic shipping in general, but can be more of a concern for some types of ships than it is for others. For instance, it would be less of a concern for cruise ships, which may have the objective of merely visiting the Arctic rather than passing through and could change their route and itinerary depending on ice conditions. On the other hand, unpredictability is of the utmost concern for container ships that carry thousands of containers from hundreds of different customers, all of whom expect to unload or load their cargo upon the ship's arrival at various ports as indicated on the ship's advertised schedule. The presence of even small blocks of ice or icebergs from a melting Greenland ice sheet requires slow sailing and could play havoc with schedules. Ships carrying a single commodity in bulk from one port to another for just one customer have more flexibility in terms of delivery windows, but would not likely risk an Arctic passage under prevailing conditions.

Ice is not the sole impediment to Arctic shipping. The region frequently experiences adverse weather, including not only severe storms, but also intense cold, which can impair deck machinery. During the summer months when sea lanes are open, heavy fog is common in the Arctic.

Commercial ships would face higher operating costs on Arctic routes than elsewhere. Ship size is an important factor in reducing freight costs. Many ships currently used in other waters would require two icebreakers to break a path wide enough for them to sail through; ship owners could reduce that cost by using smaller vessels in the Arctic, but this would raise the cost per container or per ton of freight.[206] Also, icebreakers or ice-class cargo vessels burn more fuel than ships designed for more temperate waters and would have to sail at slower speeds. The shipping season in the Arctic only lasts for a few weeks, so icebreakers and other special required equipment would sit idle the remainder of the year. None of these impediments by themselves may be enough to discourage Arctic passage but they do raise costs, perhaps enough to negate the savings of a shorter route. Thus, from the perspective of a shipper or a ship owner, shorter via the Arctic does not necessarily mean cheaper and faster.[207]

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[205] S.E.L. Howell and J.J. Yackel, "A Vessel Transit Assessment of Sea Ice Variability in the Western Arctic, 1969-2002: Implications for Ship Navigation," *Canadian Journal of Remote Sensing*, vol. 30, no. 2, 2004.

[206] "Arctic Unlikely to See Major Shipping Growth," *New Zealand Transport and Logistics Business Week*, April 24, 2008.

[207] Stephen M. Carmel, Senior Vice President, Maersk Line Ltd., "The Cold, Hard Realities of Arctic Shipping," *United States Naval Institute, Proceedings*; July 2013, pp. 38-41.

Basic Navigation Infrastructure Is Lacking

Considerable investment in navigation-related infrastructure would be required if trans-Arctic shipping were to become a reality. Channel marking buoys and other floating visual aids are not possible in Arctic waters because moving ice sheets will continuously shift their positions. Therefore, vessel captains would need to rely on marine surveys and ice charts. For some areas in the Arctic, however, these surveys and charts are out of date or not sufficiently accurate.[208] To remedy this problem, aviation reconnaissance of ice conditions and satellite images would need to become readily available for ship operators.[209] Ship-to-shore communication infrastructure would need to be installed where possible. Refueling stations may be needed, as well as, perhaps, transshipment ports where cargo could be transferred to and from ice-capable vessels at both ends of Arctic routes. Shipping lines would need to develop a larger pool of mariners with ice navigation experience. Marine insurers would need to calculate the proper level of risk premium for polar routes, which would require more detailed information about Arctic accidents and incidents in the past.

The U.S. Army Corps of Engineers, along with the state of Alaska, has studied the feasibility of a "deep-draft" port in the Arctic (accommodating ships with a draft of up to 35 feet). The northern and northwestern coastlines of Alaska are exceptionally shallow, generally limiting harbor and near-shore traffic to shallow-draft barges. Coast Guard cutters and icebreakers have drafts of 35 to 40 feet while NOAA research vessels have drafts of 16 to 28 feet, so at present these vessels are based outside the Arctic and must sail considerable distances to reach Arctic duty stations. Supply vessels supporting offshore oil rigs typically have drafts over 20 feet. A deep-draft port could serve as a base of operations for larger vessels, facilitating commercial maritime traffic in the Arctic.[210] The study concluded that the existing harbors of Nome or Port Clarence on Alaska's west coast may be the most suitable for deepening because of their proximity to the Bering Strait and deeper water.[211] However, at a July 2016 hearing, the Coast Guard indicated its preferred strategy was to rely on mobile assets (vessels and aircraft) and seasonal bases of operation rather than pursue a permanent port in the Arctic.[212]

The U.S. Committee on the Marine Transportation System, a Cabinet-level committee of federal agencies with responsibilities for marine transportation, identified a list of infrastructure improvements for Arctic navigation in a 2013 report.[213] The report prioritizes improvements to information infrastructure (weather forecasting, nautical charting, ship tracking) and emergency response capabilities for ships in distress.

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[208] In July and August 2010, NOAA surveyed the Bering Straits area in order to update its charts but stated that it will take more than 25 years to map the prioritized areas of navigational significance in U.S. Arctic waters. See http://www.noaanews.noaa.gov/stories2010/20100720_fairweather.html.

[209] Ice reporting that currently exists is intended for scientists not mariners.

[210] For further information, see http://www.poa.usace.army.mil/en/cw/AKPortsStudy.htm, and FY2013 USACE Budget Justification, p. POD-5.

[211] *Alaska Deep-Draft Arctic Port System Study*, March 2013; http://www.poa.usace.army.mil/Library/ReportsandStudies/AlaskaRegionalPortsStudy.aspx. The navigation channel at Nome presently ranges from 10 to 20 feet in depth. Much of the harbor at Port Clarence has a natural depth of 35 to 40 feet; http://www.charts.noaa.gov/OnLineViewer/AlaskaViewerTable.shtml.

[212] Oral testimony of Admiral Charles D. Michel, Coast Guard Vice Commandant, House Committee on Transportation and Infrastructure, Subcommittee on Coast Guard and Maritime Transportation, *Coast Guard Arctic Implementation Capabilities*, July 12, 2016.

[213] U.S. Committee on the Marine Transportation System, *U.S. Arctic Marine Transportation System: Overview and Priorities for Action*, 2013; http://www.cmts.gov/downloads/CMTS_Arctic_MTS_Report_Narrative.pdf.

Regulation of Arctic Shipping

Due to the international nature of the shipping industry, maritime trading nations have adopted international treaties that establish standards for ocean carriers in terms of safety, pollution prevention, and security. These standards are agreed upon by shipping nations through the International Maritime Organization (IMO), a United Nations agency that first met in 1959.[214]

Key conventions that the 168 IMO member nations have adopted include the Safety of Life at Sea Convention (SOLAS), which was originally adopted in response to the *Titanic* disaster in 1912 but has since been revised several times; the Prevention of Pollution from Ships (MARPOL), which was adopted in 1973 and modified in 1978; and the Standards for Training, Certification, and Watchkeeping for Seafarers (SCTW), which was adopted in 1978 and amended in 1995. It is up to ratifying nations to enforce these standards. The United States is a party to these conventions, and the U.S. Coast Guard enforces them when it boards and inspects ships and crews arriving at U.S. ports and the very few ships engaged in international trade that sail under the U.S. flag.

Like the United States, most of the other major maritime trading nations lack the ability to enforce these regulations as a "flag state" because much of the world's merchant fleet is registered under so-called "flags of convenience." While most ship owners and operators are headquartered in major economies, they often register their ships in Panama, Liberia, the Bahamas, the Marshall Islands, Malta, and Cyprus, among other "open registries," because these nations offer more attractive tax and employment regulatory regimes. Because of this development, most maritime trading nations enforce shipping regulations under a "port state control" regime—that is, they require compliance with these regulations as a condition of calling at their ports. The fragmented nature of ship ownership and operation can be a further hurdle to regulatory enforcement. It is common for cargo ships to be owned by one company, operated by a second company (which markets the ship's space), and managed by a third (which may supply the crew and other services a ship requires to sail), each of which could be headquartered in different countries.

New Arctic Polar Code

While SOLAS and other IMO conventions include provisions regarding the operation of ships in ice-infested waters, they were not specific to the polar regions. To supplement these requirements, a new IMO polar code went into effect on January 1, 2017.[215] The code applies to passenger and cargo ships of 500 gross tons or more engaged in international voyages. It does not apply to fishing vessels, military vessels, pleasure yachts, or smaller cargo ships. The polar requirements are intended to improve safety and prevent pollution in the Arctic, and they include provisions on ship construction, ship equipment related to navigation, and crew training and ship operation. The code requires ships to carry fully or partially enclosed lifeboats. The code requires that the crew have training in ice navigation. Nations can enforce additional requirements on ships arriving at their ports or sailing through their coastal waters. For instance, U.S. Coast Guard regulations largely follow IMO conventions but mandate additional requirements in some areas. U.S. coastal states can require ships calling at their ports to take additional safety and pollution prevention safeguards.[216] Canada and Russia have additional pollution regulations for Arctic waters

[214] See http://www.imo.org/ for more information.

[215] http://www.imo.org/en/MediaCentre/HotTopics/polar/Pages/default.aspx.

[216] For example, see Alaska State Legislature, HJR 19, Arctic Marine Safety Agreements; http://www.akleg.gov/basis/

exceeding MARPOL. The U.S. Coast Guard has studied and has recommended a specific vessel traffic separation scheme for the Bering Strait between Alaska and Russia, which experiences over 400 transits per year.[217] The U.S. Coast Guard is seeking IMO approval of this routing scheme.

Oil, Gas, and Mineral Exploration[218]

Decreases in summer polar ice may alter options for oil, gas, and mineral exploration in Arctic offshore and onshore areas. Offshore of Alaska, the U.S. outer continental shelf (OCS) covers more than 1 billion acres,[219] including some areas with high oil and gas potential. Even with warmer temperatures, exploration and development in the Arctic are still subject to harsh conditions, especially in winter. This makes it costly and challenging to develop the infrastructure necessary to produce, store, and transport oil, gas, and minerals from newly discovered deposits. Severe weather poses challenges to several ongoing offshore operations as well as to new exploration.

Offshore oil and gas exploration is affected by efforts to map the margins of the U.S. OCS. Shrinking sea ice cover in the Arctic has intensified interest in surveying and mapping the continental margins of multiple countries with lands in the Arctic. Delineating the extent of the continental margins beyond the 200 nautical mile Exclusive Economic Zone (EEZ) could lead to consideration of development on substantial amounts of submerged lands. Mapping projects are underway, by individual countries and through cooperative government studies, to support submissions to the Commission on the Limits of the Continental Shelf, including for areas that may contain large amounts of oil, natural gas, methane hydrates, or minerals.

With respect to onshore energy and mineral development, warming temperatures result in thawing permafrost and can result in higher transportation and infrastructure costs. Warming temperatures could potentially reduce sea ice to a level that allows sea access to remote development sites.

Offshore Oil and Gas Exploration

The shrinking Arctic ice cap, or conversely, the growing amount of ice-free ocean in the summertime, has increased interest in exploring for offshore oil and gas in the Arctic. Reduced sea ice in the summer means that ships towing seismic arrays[220] can explore regions of the Arctic Ocean, Chukchi Sea, Beaufort Sea, and other offshore regions for longer periods of time with less risk of colliding with floating sea ice. Less sea ice over longer periods compared to previous decades also means that the seasonal window for offshore Arctic drilling remains open longer in the summer, increasing the chances for making a discovery.

Bill/Detail/30?Root=HJR%2019.

[217] 82 *Federal Register* 11935, February 27, 2017.

[218] This section prepared by Laura Comay, Specialist in Natural Resources Policy, Resources, Science, and Industry Division; Caitlin Keating-Bitonti, Analyst in Natural Resources Policy, Resources, Science, and Industry Division; and Brandon Tracy, Analyst in Energy Policy, Resources, Science, and Industry Division.

[219] This region includes some areas within the Arctic boundary as defined by the ARPA (15 U.S.C. 4111; see **Figure 1**), such as the Beaufort and Chukchi Seas, and some areas outside that boundary, such as Cook Inlet.

[220] A seismic array is typically a long string or streamer of geophones—acoustic devices used for recording seismic signals—towed behind a ship while the ship traverses a prospective oil and gas-bearing portion of the seafloor. The seismic signals are processed and interpreted to give a cross-section or three-dimensional image of the subsurface.

In addition to the improved access to larger portions of the Arctic afforded by shrinking sea ice, interest in Arctic oil and gas was fueled by a 2008 U.S. Geological Survey (USGS) appraisal of undiscovered oil and gas north of the Arctic Circle.[221] The USGS stated that the "extensive Arctic continental shelves may constitute the geographically largest unexplored prospective area for petroleum remaining on Earth."[222] In the report, the USGS estimated that 90 billion barrels of oil, nearly 1,700 trillion cubic feet of natural gas, and 44 billion barrels of natural gas liquids may remain to be discovered in the Arctic (including both U.S. and international resources north of the Arctic Circle).[223] This would constitute approximately 13% of the world's undiscovered conventional oil resources and 30% of natural gas, according the U.S. Energy Information Administration.[224] In terms of U.S. resources specifically, DOI's Bureau of Ocean Energy Management (BOEM) estimated in 2021 that the Alaska portions of the U.S. OCS contain undiscovered, technically recoverable resources of approximately 25 billion barrels of oil and 124 trillion cubic feet of natural gas (although not all of these resources may be economically viable to recover).[225]

Despite the warming trend in the Arctic, severe weather and sea ice continue to pose challenges to exploration. In addition, any discovery of new oil and gas deposits far from existing storage, pipelines, and shipping facilities could not be developed until infrastructure is built to extract and transport the petroleum.

Some have expressed interest in expanding America's ocean energy portfolio in the region. Currently, among 15 federal planning areas in the region, the Beaufort Sea and Cook Inlet are the only two areas with active federal leases,[226] and only the Beaufort Sea has any producing wells in federal waters (from a joint federal-state unit).[227] The Trump Administration had stated its interest in promoting offshore development in the region, and had issued a draft five-year offshore oil and gas leasing program for 2019-2024 that would have scheduled lease sales in all 15 Alaska planning areas, including three sales in the Beaufort Sea and three in the Chukchi Sea.[228] The draft program did not advance further in the Trump Administration, and the Biden Administration has not released a five-year offshore program proposal. Current lease sales on the Alaska OCS are

[221] See USGS Fact Sheet 2008-3049, *Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle*, at http://pubs.usgs.gov/fs/2008/3049/, hereinafter referred to as "USGS 2008 Fact Sheet."

[222] USGS 2008 Fact Sheet.

[223] USGS 2008 Fact Sheet, p. 1.

[224] U.S. Energy Information Administration, "Today in Energy: Arctic Oil and Natural Gas Resources," January 20, 2012, at http://www.eia.gov/todayinenergy/detail.cfm?id=4650.

[225] Bureau of Ocean Energy Management, "Assessment of Undiscovered Technically Recoverable Oil and Gas Resources of the Nation's Outer Continental Shelf, 2021," at https://www.boem.gov/sites/default/files/documents/oil-gas-energy/resource-evaluation/2021_National_Assessment_Map_BTU.pdf. BOEM defines *technically recoverable resources* as "oil and gas that could be produced as a consequence of natural pressure, artificial lift, pressure maintenance, or other secondary recovery methods, but without any consideration of economic viability" (BOEM, "Assessment of Undiscovered Oil and Gas Resources of the Nation's Outer Continental Shelf, 2021," at https://www.boem.gov/sites/default/files/documents/oil-gas-energy/resource-evaluation/2021%20Fact%20Sheet.pdf). BOEM's *2019-2024 Outer Continental Shelf Oil and Gas Leasing Draft Proposed Program* (January 2015, chapter 5, at https://www.boem.gov/NP-Draft-Proposed-Program-2019-2024/, hereinafter cited as "BOEM 2019-2024 Draft Proposed Program") estimates a range of resources that would be economically recoverable under various oil and gas price points and cost conditions.

[226] Although part of BOEM's Alaska region, Cook Inlet lies outside the Arctic boundary as defined by the ARPA (15 U.S.C. 4111; see **Figure 1**).

[227] Bureau of Ocean Energy Management, "BP Exploration (Alaska) (BPXA)—Northstar," at http://www.boem.gov/About-BOEM/BOEM-Regions/Alaska-Region/Leasing-and-Plans/Plans/BP-North-Star.aspx.

[228] BOEM 2019-2024 Draft Proposed Program, p. 8.

governed by the Obama Administration's leasing program for 2017-2022, which included one lease sale in the Cook Inlet (scheduled for 2021) and none in other Alaska planning areas.[229] In August 2021, the Department of the Interior announced that it would proceed with environmental review of the scheduled Cook Inlet lease sale, after work on this sale had been halted in response to President Biden's Executive Order 14008, which directed a pause and review of the federal oil and gas leasing program broadly.[230]

Offshore oil and gas activities in the region have fluctuated as industry weighs changing oil prices, development costs, and regulations. For example, in 2015, Shell Oil Company announced its decision to cease exploration in offshore Alaska for the foreseeable future. Shell cited several reasons for the decision, including insufficient indications of oil and gas at its Burger J well in the Chukchi Sea, the high costs associated with Arctic exploration, and the "challenging and unpredictable" federal regulatory environment.[231] BOEM also reported that, between February and November 2016, companies relinquished more than 90% of leases they had held in the Beaufort and Chukchi Sea planning areas, in the midst of a slump in oil prices.[232] While there were 450 active leases in the Chukchi Sea planning area at the end of 2015, as of August 2021 there were none.[233] In the Beaufort Sea, active leases dropped from 77 at the end of 2015 to 19 in August 2021.[234]

Despite these changes, some activities have indicated ongoing industry interest in the region. For example, in November 2017, the Trump Administration approved an application for permit to drill (APD) on a lease in the Beaufort Sea held by the Eni U.S. Operating Company.[235] In October 2018, BOEM issued conditional approval to Hilcorp Alaska LLC for an oil and gas development and production plan in the Beaufort Sea, which would be the region's first production facility entirely in federal waters; however, the approval was vacated in December 2020 by the U.S.

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[229] Bureau of Ocean Energy Management, *2017-2022 Outer Continental Shelf Oil and Gas Leasing Proposed Final Program*, November 2016, at https://www.boem.gov/2017-2022-OCS-Oil-and-Gas-Leasing-PFP/, hereinafter cited as "BOEM 2017-2022 Proposed Final Program."

[230] President Joseph Biden, Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021, 86 *Federal Register* 7619, at https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad. On February 4, 2021, BOEM had canceled public meetings and a public comment period related to the Cook Inlet sale as a result of the executive order (BOEM, "BOEM Cancels Comment Period, Virtual Meetings for Proposed Lease Sale Offshore Alaska," press release, February 4, 2021, at https://www.boem.gov/boem-cancels-comment-period-virtual-meetings-proposed-lease-sale-offshore). On August 16, 2021, DOI announced that BOEM would now issue and take comments on a draft environmental impact statement analyzing the Cook Inlet sale (DOI, "Interior Department Files Court Brief Outlining Next Steps in Leasing Program," August 24, 2021, at https://www.doi.gov/pressreleases/interior-department-files-court-brief-outlining-next-steps-leasing-program").

[231] Royal Dutch Shell, PLC, "Shell Updates on Alaska Exploration," press release, September 28, 2015, at http://www.shell.com/global/aboutshell/media/news-and-media-releases/2015/shell-updates-on-alaska-exploration.html.

[232] BOEM 2017-2022 Proposed Final Program, p. S-3.

[233] For 2015 data, see BOEM, "Combined Leasing Report, as of January 1, 2016," at https://www.boem.gov/Combined-Leasing-Reports-2016/. For August 2021 data, see BOEM, "Combined Leasing Report, as of August 1, 2021," at https://www.boem.gov/sites/default/files/documents/regions/pacific-ocs-region/Lease%20stats%208-1-21.pdf.

[234] Ibid.

[235] Bureau of Safety and Environmental Enforcement (BSEE), "BSEE Approves New Drilling Operations in Arctic," press release, November 28, 2017, at https://www.bsee.gov/newsroom/latest-news/statements-and-releases/press-releases/bsee-approves-new-drilling-operations-in. The BSEE Director stated in the press release that "responsible resource development in the Arctic is a critical component to achieving American energy dominance."

Court of Appeals for the Ninth Circuit.[236] Recent discoveries onshore and in state waters on Alaska's North Slope also have contributed to ongoing interest in the region.

The evolving federal regulatory environment for Arctic offshore activities has been shaped by concerns about industry's ability to respond to potential oil spills, given the region's remoteness and harsh conditions. The section of this report on "Oil Pollution Implications of Arctic Change" discusses this issue in greater detail. In July 2016, BOEM and the Bureau of Safety and Environmental Enforcement (BSEE) released final safety regulations for Arctic exploratory drilling that include multiple requirements for companies to reduce the risks of potential oil spills—for example, the requirement that companies have a separate rig available at drill sites to drill a relief well in case of a loss of well control.[237] Some Members of Congress and industry stakeholders opposed the regulations as overly prescriptive and unnecessarily burdensome, while other Members and environmental organizations asserted that the rules did not go far enough in protecting the region from potential environmental damage and addressing the potential contributions of Arctic oil and gas activities to climate change.[238] Legislation was introduced in the 115th Congress both to repeal the Arctic rule and, conversely, to codify it in law.[239] In December 2020, the Trump Administration published a proposed revision to the rule,[240] but in June 2021 the Biden Administration withdrew the proposed revision.[241]

Concerns about the impacts of oil and gas activities have led in the past to bans by both Congress and the President on leasing in certain Arctic Ocean areas deemed especially sensitive.[242] For example, congressional and presidential moratoria since the 1980s effectively banned federally regulated planning and permitting in the Bristol Bay area of the North Aleutian Basin. Congress allowed most statutory bans in the region to expire in 2004.[243] President Obama reinstated the

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[236] Concerning the approval, see Department of the Interior press release, "Interior Approves Long-Awaited First Oil Production Facility in Federal Waters Offshore Alaska," October 24, 2018, at https://www.doi.gov/pressreleases/interior-approves-long-awaited-first-oil-production-facility-federal-waters-offshore. On May 29, 2019, NOAA's National Marine Fisheries Service issued a proposed rule to govern the taking of marine mammals incidental to the construction and operation of the project's drilling and production island (84 Federal Register 24926). Public comments were accepted through July 31, 2019 (84 Federal Register 32697). For the December 2020 decision of the Ninth Circuit Court of Appeals vacating the approval, see https://legacy-assets.eenews.net/open_files/assets/2020/12/08/document_ew_02.pdf.

[237] Department of the Interior, "Requirements for Exploratory Drilling on the Arctic Outer Continental Shelf," 81 *Federal Register* 46477, July 15, 2016.

[238] For differing congressional viewpoints, see, e.g., U.S. Congress, House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources, hearing on Arctic Resources and American Competitiveness, 114th Cong., 1st sess., June 16, 2015, at http://naturalresources.house.gov/calendar/eventsingle.aspx?EventID=398713.

[239] For example, in the 115th Congress, H.R. 4239, the SECURE American Energy Act, would have provided that the Arctic rule would have no force or effect. Conversely, S. 2720, the Clean Coasts Act, would have enacted the regulation into law. These measures were not enacted, and no similar legislation was introduced in the 116th Congress or to date in the 117th Congress.

[240] BSEE, "Oil and Gas and Sulfur Operations on the Outer Continental Shelf—Revisions to the Requirements for Exploratory Drilling on the Arctic Outer Continental Shelf," 85 *Federal Register* 79266, December 9, 2020.

[241] BSEE, "Oil and Gas and Sulfur Operations on the Outer Continental Shelf—Revisions to the Requirements for Exploratory Drilling on the Arctic Outer Continental Shelf," 86 Federal Register 34172, June 29, 2021.

[242] Section 12(a) of the Outer Continental Shelf Lands Act (43 U.S.C. §1341(a)) authorizes the President to, "from time to time, withdraw from disposition any of the unleased lands of the outer Continental Shelf."

[243] FY2004 DOI Appropriations (P.L. 108-108). Furthermore, the Continuing Appropriations Resolution 2009 (P.L. 110-329) did not extend the annual congressional moratorium on oil and gas leasing activities in the lower 48 states. On March 11, 2009, the Omnibus Appropriations Act, 2009 (P.L. 111-8) was enacted without moratorium provisions, confirming that the congressional oil and gas development bans in federal waters along the Atlantic and Pacific coasts, parts of Alaska, and the Gulf of Mexico that had been in place since 1982 had not been restored in 2009 appropriations

moratorium in the North Aleutian Basin, indefinitely withdrawing acreage located in Bristol Bay from eligibility for oil and gas leasing.[244] Also, in December 2016, President Obama indefinitely withdrew from leasing disposition other large portions of the U.S. Arctic, including the entire Chukchi Sea planning area and almost all of the Beaufort Sea planning area.[245] President Obama separately withdrew from leasing consideration planning areas in the North Bering Sea.[246] In April 2017, President Trump issued Executive Order 13795, which modified President Obama's withdrawals so as to open all of these areas for leasing consideration except for the North Aleutian Basin.[247] However, in a March 2019 court decision, the U.S. District Court for the District of Alaska vacated this provision in President Trump's executive order, ruling that the Outer Continental Shelf Lands Act gives the President the authority to make withdrawals, but not to revoke prior presidential withdrawals.[248] Additionally, in January 2021, President Biden issued Executive Order 13990, reinstating President Obama's Arctic withdrawals in their original form.[249]

Extent of the Continental Margin

Increased interest in developing offshore resources in the Arctic has sparked efforts by Arctic coastal states to map the extent of their continental margins beyond the 200-mile EEZ limit. As discussed earlier, under Article 76 of UNCLOS, nations can make a submission to the Commission on the Limits of the Continental Shelf (hereinafter referred to as the Commission) concerning the extent of their continental shelves. Under Article 76, the extent of the continental margin beyond the 200-mile limit depends on the position of the foot of the continental slope, the thickness of sediments, and the depth of water. Also, the continental margin could include geologic features that extend from the continent out to sea, which may include undersea ridges continuing for hundreds of miles offshore. The three major Arctic Ocean ridge systems are the Alpha-Mendeleev Ridge, the Lomonosov Ridge, and the Gakkel Ridge. Disputes over maritime boundaries involving these ridge systems or other regions of the Arctic seafloor (e.g., extended continental shelf submissions) must be resolved between the nations involved in the disagreement

measures.

[244] Presidential Memorandum, "Withdrawal of Certain Areas of the United States Outer Continental Shelf from Leasing Disposition," December 16, 2014, at http://www.whitehouse.gov/the-press-office/2014/12/16/presidential-memorandum-withdrawal-certain-areas-united-states-outer-con. Earlier, President Obama had withdrawn the area from leasing for a time-limited period. Presidential Memorandum, "Withdrawal of Certain Areas of the United States Outer Continental Shelf from Leasing Disposition," March 31, 2010, at http://www.doi.gov/whatwedo/energy/ocs/upload/2010alaska-mem-rel.pdf.

[245] Presidential Memorandum, "Withdrawal of Certain Portions of the United States Arctic Outer Continental Shelf from Mineral Leasing," December 20, 2016, at https://www.whitehouse.gov/the-press-office/2016/12/20/presidential-memorandum-withdrawal-certain-portions-united-states-arctic. Earlier, President Obama had indefinitely withdrawn from leasing disposition certain smaller areas in the Beaufort and Chukchi Seas, including the Hanna Shoal region of the Chukchi Sea and other areas. Presidential Memorandum, "Withdrawal of Certain Areas of the United States Outer Continental Shelf Offshore Alaska from Leasing Disposition," January 27, 2015, at http://www.whitehouse.gov/the-press-office/2015/01/27/presidential-memorandum-withdrawal-certain-areas-united-states-outer-con.

[246] Executive Order 13754, "North Bering Sea Climate Resilience," December 9, 2016, at https://www.gpo.gov/fdsys/pkg/FR-2016-12-14/pdf/2016-30277.pdf.

[247] Executive Order 13795, "Implementing an America-First Offshore Energy Strategy," April 28, 2017, at https://www.gpo.gov/fdsys/pkg/FR-2017-05-03/pdf/2017-09087.pdf. For additional discussion, see CRS Legal Sidebar WSLG1799, *Trump's Executive Order on Offshore Energy: Can a Withdrawal be Withdrawn?*

[248] League of Conservation Voters v. Trump, 363 F.Supp.3d 1013 (D.Alaska 2019). The President's withdrawal authority is contained in Section 12(a) of the Outer Continental Shelf Lands Act (43 U.S.C. Section 1341(a)).

[249] Executive Order 13990, "Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis," January 20, 2021, at https://www.govinfo.gov/content/pkg/FR-2021-01-25/pdf/2021-01765.pdf.

because the Commission has no mandate to establish boundaries or resolve disputes and cannot prejudice the resolution of boundary disputes.

Arctic coastal states have conducted complex investigations needed to support submissions to the Commission for an extended continental shelf (ECS) in the Arctic. All Arctic coastal states except for the United States, which is a non-party to the UNCLOS, have made submissions to the Commission. Arctic coastal states with submissions yet to receive an action from the Commission include Canada, the Kingdom of Denmark (Greenland), and the Russian Federation.[250]

Russia's initial 2001 UNCLOS submission included the Lomonosov Ridge, an undersea feature spanning the Arctic from Russia to Canada, as an extension of its continental margin. The submission demonstrated Russia's bid to extend political activities and potentially establish security infrastructure in Arctic regions. The Commission found the Russian Federation's 2001 submission to have insufficient scientific evidence. The Russian Federation presented a revised submission in 2015 to the Commission that included not only the Lomonosov Ridge but also the Mendeleev Rise and Chukchi Plateau—additional subsea features claimed by Russia to be natural parts of its continental margin.[251] The United States communicated no objections to the Division of Ocean Affairs and the Law of the Sea regarding Russia's 2015 revised submission.[252] In late March 2021, the Russian Federation submitted two addenda to its 2015 revised submission, presenting evidence for the Gakkel Ridge and the Nansen and Amundsen Basins to be components of the extended Russian continental shelf.[253] In total, Russia's ECS submission would capture approximately 70% of the Arctic Ocean beyond its EEZ, extending into both Canada's and Greenland's EEZs.[254] Thus far, no country has submitted a formal response to the Commission regarding Russia's 2021 addenda. The Commission has not rendered a decision on the Russian Federation submission as of August 2021.

In December 2014, the Kingdom of Denmark with the Government of Greenland submitted a recommendation on the Northern Continental Shelf of Greenland to the Commission.[255] Their submission presented data suggesting that the Lomonosov Ridge, the Gakkel Ridge, the Alpha-Mendeleev ridge complex, and the Chukchi Borderland are morphologically continuous with the

[250] Iceland, though not an Arctic coastal state, has filed a submission regarding waters in the vicinity of the Arctic Circle. Source: United Nations, Division for Ocean Affairs and the Law of the Sea, "Submissions, through the Secretary-General of the United Nations, to the Commission on the Limits of the Continental Shelf, pursuant to article 76, paragraph 8, of the United Nations Convention on the Law of the Sea of 10 December 1982," updated April 1, 2021, at https://www.un.org/Depts/los/clcs_new/commission_submissions.htm. See also Department of State, "Frequently Asked Questions—U.S. Extended Continental Shelf Project," at https://www.state.gov/frequently-asked-questions-u-s-extended-continental-shelf-project/. For additional information, see **Appendix H**.

[251] United Nations, "Partial Revised Submission of the Russian Federation to the Commission on the Limits of the Continental Shelf in Respect of the Continental Shelf of the Russian Federation in the Arctic Ocean," 2015, at http://www.un.org/Depts/los/clcs_new/submissions_files/rus01_rev15/2015_08_03_Exec_Summary_English.pdf.

[252] Department of State, "Receipt of the Partial Revised Submission made by the Russian Federation to the Commission on the Limits of the Continental Shelf," at https://www.un.org/depts/los/clcs_new/submissions_files/rus01_rev15/2015_11_02_US_NV_RUS_001_en.pdf.

[253] UN, "Addendum to the Partial Revised Submission of the Russian Federation to the Commission on the Limits of the Continental Shelf in the Area of the Gakkel Ridge, Nansen and Amundsen Basins," 2021, at https://www.un.org/depts/los/clcs_new/submissions_files/rus01_rev15/Addendum_1_2021_Executive_Summary_Gakkel_Ridge_English.pdf.

[254] *Arctic Today*, "Russia Extends Its Claim to the Arctic Ocean Seabed" April 4, 2021, at https://www.arctictoday.com/russia-extends-its-claim-to-the-arctic-ocean-seabed/?wallit_nosession=1.

[255] UN, "Partial Submission of the Government of the Kingdom of Denmark together with the Government of Greenland to the Commission on the Limits of the Continental Shelf The Northern Continental Shelf of Greenland," 2014, at https://www.un.org/depts/los/clcs_new/submissions_files/dnk76_14/dnk2014_es.pdf.

land mass of Greenland. As of August 2021, the Commission has not rendered a decision for this submission.

In 2019, Canada made a partial submission to the Commission for the consideration of areas of the Central Arctic Plateau, which included the Lomonosov Ridge, Alpha Ridge, and Mendeleev Rise, providing evidence that these areas are natural components of its continental margin.[256] Canada's submission includes potentially overlapping areas with the United States' continental shelf in the Arctic Ocean. Through regular consultations, the United States does not object to the consideration of Canada's submission on the Arctic Ocean and communicated such to the Division of Ocean Affairs and the Law of the Sea on August 28, 2019.[257] The Commission has not rendered a decision on the partial submission of Canada as of August 2021. (For additional information on ECS submissions by Canada, the Kingdom of Denmark, and the Russian Federation to the Commission, see **Appendix H**.)

The United States has started to gather and analyze data to determine the extent of its continental shelf through a U.S. federal initiative called the U.S. Extended Continental Shelf Project that is consistent with international law.[258] The U.S. ECS Project has also assisted more than 30 countries with their efforts to delineate their extended continental shelves worldwide.[259] Canada and the United States share overlapping regions of the seabed as part of the extended continental margin of both nations. Much of the data to delineate the ECS for both countries was collected in a two-ship operation involving the U.S. Coast Guard Cutter *Healy* and the Canadian Coast Guard ship *Louis S. Saint Laurent*.[260] The two-ship operation collected more than 13,000 linear kilometers (about 8,078 miles) of seismic data over four field seasons in the Arctic beginning in 2007. The data collected will help each country delineate the extent of its own ECS, which should then enable the countries to determine the amount of overlap in the seabed and ultimately establish a maritime boundary in the Arctic.[261]

The United States also has potentially overlapping ECS areas with Russia. Russia (then the Soviet Union) and the United States agreed to a maritime boundary in 1990, and so far Russia has not asserted its ECS in any areas that might be considered part of the U.S. ECS.[262]

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[256] UN, "Partial Submission of Canada to the Commission on the Limits of the Continental Shelf regarding its Continental Shelf in the Arctic Ocean," 2019, at https://www.un.org/depts/los/clcs_new/submissions_files/can1_84_2019/CDA_ARC_ES_EN_secured.pdf.

[257] Department of State, "Receipt of the Partial Submission Made by Canada to the Commission on the Limits of the Continental Shelf," at https://www.un.org/depts/los/clcs_new/submissions_files/can1_84_2019/2019_08_28_USA_NV_UN_001.pdf.

[258] The purpose of the U.S. Extended Continental Shelf (ECS) Project is to establish the full extent of the continental shelf of the United States, consistent with international law. The work to delineate the ECS is coordinated by the ECS Task Force, located at the National Oceanic and Atmospheric Administration's (NOAA's) National Centers for Environmental Information in Boulder, CO. The Department of State, U.S. Geological Survey (USGS), and NOAA conduct the majority of work on the project. NOAA has the lead in collecting bathymetric data. USGS has the lead in collecting seismic data. For more information, see the project's website at https://www.state.gov/u-s-extended-continental-shelf-project/.

[259] U.S. ECS Project, https://www.state.gov/international-support-and-cooperation-u-s-extended-continental-shelf-project/.

[260] Ibid.

[261] Ibid.

[262] The Senate gave advice and consent to ratify the maritime boundary agreement in 1991. Although the Russian Duma has not approved the agreement, both countries continue to provisionally apply the boundary agreement. See U.S. Extended Continental Shelf Project, https://www.state.gov/frequently-asked-questions-u-s-extended-continental-shelf-project/.

Onshore Energy and Mineral Development

A warming Arctic means new opportunities and challenges for energy and mineral exploration and development onshore.[263] Longer summers could extend exploration seasons for areas that are only accessible for ground surveys during the warmer months.

Many factors affect the economic viability of an onshore energy or mineral development; one key factor is transportation costs. Onshore energy and mineral developments require transportation access to deliver machinery and supplies, and to transport the product to market. Generally, onshore developments in temperate climates can be accessed by roads; the rugged terrain and harsh climate in parts of the Arctic can result in sites being inaccessible by permanent roads. Some responses to these unusual transportation challenges include the use of sea transport and seasonal roads.

In some parts of the Arctic, less sea ice could allow ships to transport heavy equipment to remote locations, and to transport ore from mines to markets. Such potential improvements in access would be limited by the onshore development's proximity to a suitable sea harbor. Current infrastructure in the Arctic that supports energy and mineral development includes the construction and use of ice roads, which are built and used when temperatures fall and remain below a threshold. As temperatures rise, the roads weaken, ultimately to a point at which they can no longer be used. Warmer Arctic temperatures are shortening the ice road transport season and creating transportation challenges, while changes in the technologies employed to build and manage ice roads are acting to extend the ice road season.[264]

Another factor that could affect onshore energy and mineral developments is the thawing of the permafrost. Permafrost, which is ground, soil, rock, or other material that remains frozen from year to year, has historically served as a solid foundation base for infrastructure, including roads. Thawing permafrost creates many challenges, as roads, buildings, and other infrastructure can become unstable and collapse. These changes can result in higher costs to onshore energy and mineral developments, potentially leading existing developments to close, or rendering new projects unfeasible to pursue.

Oil Pollution and Pollution Response[265]

Oil Pollution Implications of Arctic Change

Climate change impacts in the Arctic, particularly the decline of sea ice and retreating glaciers, has led to increased human activities in the region, some of which have the potential to create oil pollution.[266] A primary concern is the threat of a large oil spill in the area. Although a major oil spill has not occurred in the Arctic, potential economic activity, such as tourism (cruise ships), oil and gas exploration, and cargo transportation, increases the risk of oil pollution (and other kinds

[263] For information on the oil and gas program for the Arctic National Wildlife Refuge and related issues, see CRS Report RL33872, *Arctic National Wildlife Refuge (ANWR): An Overview*.

[264] See National Oceanic and Atmospheric Administration, "Arctic Change," at https://www.pmel.noaa.gov/arctic-zone/detect/land-road.shtml.

[265] This section prepared by Jonathan L. Ramseur, Specialist in Environmental Policy, Resources, Science, and Industry Division.

[266] For further discussion of issues relating to oil spills in general, see CRS Report RL33705, *Oil Spills: Background and Governance*.

of pollution) in the Arctic.[267] Significant spills in high northern latitudes (e.g., the 1989 *Exxon Valdez* spill on the southern coast of Alaska and spills in the North Sea) suggest that the "potential impacts of an Arctic spill are likely to be severe for Arctic species and ecosystems."[268]

Risk of Oil Pollution in the Arctic

A primary factor determining the risk of oil pollution in the Arctic is the level and type of human activity conducted in the region. Although changes to the Arctic climate are expected to increase access to natural resources and shipping lanes, the region will continue to present logistical challenges that may hinder human activity in the region. For example, unpredictable ice conditions may discourage trans-Arctic shipping. If trans-Arctic shipping were to occur frequently, it would likely represent a considerable portion of the overall oil pollution risk in the region. In recent decades, many of the world's largest oil spills have been from oil tankers, which can carry millions of gallons of oil.[269]

Offshore oil exploration and extraction activities in the Arctic may present a risk of oil pollution. Interest in these activities in the region has fluctuated in recent years. Historically, oil well blowouts from offshore oil operations have been a source of major oil spills, eclipsing the largest tanker spills. The largest unintentional oil spill in recent history was from the 2010 *Deepwater Horizon* incident in the Gulf of Mexico.[270] During that incident, the uncontrolled well released (over an 87-day period) approximately 200 million gallons of crude oil.[271] The second-largest unintentional oil spill in recent history—the *IXTOC I*, estimated at 140 million gallons—was due to an oil well blowout in Mexican Gulf Coast waters in 1979.[272]

Until the 2010 *Deepwater Horizon* incident, the spill record for offshore platforms in U.S. federal waters had shown improvement from prior years.[273] A 2003 National Research Council (NRC) study of oil and gas activities on Alaska's North Slope stated "blowouts that result in large spills are unlikely."[274] Similar conclusions were made in federal agency documents regarding deepwater drilling in the Gulf of Mexico before the 2010 *Deepwater Horizon* event.[275] Some would likely

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[267] Arctic Council, Emergency Prevention, Preparedness and Response Working Group, *Guide to Oil Spill Response in Snow and Ice Conditions*, 2015, at https://oaarchive.arctic-council.org/handle/11374/403; see also Brian Dunn, "Report on 12th Arctic Shipping Summit, Montreal, February 21-22," *Canadian Sailings*, March 12, 2018, pp. 34-36.

[268] Arctic Monitoring and Assessment Programme (AMAP), Arctic Oil and Gas 2007, 2008.

[269] For example, the *Exxon Valdez* spilled approximately 11 million gallons of oil, but its carrying capacity was approximately 60 million gallons.

[270] Larger oil spills occurred during the 1991 Iraq War, but many of those spills were deliberate. A 1910-1911 onshore oil blowout in the California San Joaquin Valley is reported to have spilled 9.4 million barrels of crude oil (almost 400 million gallons).

[271] An estimated 17% of this oil did not enter the Gulf environment but was directly recovered from the wellhead by the responsible party (British Petroleum, BP). See the Federal Interagency Solutions Group, Oil Budget Calculator Science and Engineering Team, *Oil Budget Calculator: Deepwater Horizon-Technical Documentation*, November 2010; and CRS Report R42942, *Deepwater Horizon Oil Spill: Recent Activities and Ongoing Developments*.

[272] National Research Council (NRC) of the National Academies of Science, *Oil in the Sea III: Inputs, Fates, and Effects*, 2003.

[273] See CRS Report RL33705, *Oil Spills: Background and Governance*; and Dagmar Etkin (Environmental Research Consulting), Analysis of U.S. Oil Spillage, Prepared for American Petroleum Institute, August 2009.

[274] National Research Council of the National Academies of Science, *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope*, 2003.

[275] See, for example, Minerals Management Service (MMS), Outer Continental Shelf Oil & Gas Leasing Program: 2007-2012, Final Environmental Impact Statement, 2007, chapter 4; MMS, Proposed Gulf of Mexico OCS Oil and Gas Lease Sale 206, Central Planning Area, Environmental Assessment, 2007.

contend that the underlying analyses behind these conclusions should be adjusted to account for the 2010 Gulf oil spill. However, others may argue that any activities in U.S. Arctic waters present less risk of an oil well blowout than was encountered by the *Deepwater Horizon* drill rig, because the proposed U.S. Arctic operations would be in shallower waters (150 feet) than the deepwater well (approximately 5,000 feet) that was involved in the 2010 Gulf oil spill. In addition, some have pointed out that the pressures in the Chukchi Sea would be two to three times less than they were in the well involved in the 2010 Gulf oil spill.[276] Regardless of these differences, even under the most stringent control systems, oil exploration and extraction activities would present some level of oil spill risk in the region, as some accidents are likely to occur from equipment failure or human error. In addition, as discussed below, an oil spill in the Arctic would present unique response and cleanup challenges.

Potential Impacts

No oil spill is entirely benign. Even a relatively minor spill, depending on the timing and location, can cause significant harm to individual organisms and entire populations. Regarding aquatic spills, marine mammals, birds, bottom-dwelling and intertidal species, and organisms in early developmental stages—eggs or larvae—are especially vulnerable. However, the effects of oil spills can vary greatly. Oil spills can cause impacts over a range of time scales, from only a few days to several years, or even decades in some cases.

Conditions in the Arctic may have implications for oil spill impacts that are less understood than in the more temperate regions.[277] According to a 2016 study, "oil spill science in ice-covered waters is at an ad hoc level."[278] For example, information on the long-term effects of oil and its environmental persistence within the Arctic is limited.[279] In addition, the historical data for the region do not provide reliable baselines to assess current environmental or ecosystem states,[280] presenting challenges to those tasked with measuring impacts.

Response and Cleanup Challenges in the Arctic

Conditions in the Arctic impose unique challenges for personnel charged with (1) oil spill response, which is the process of getting people and equipment to the incident, and (2) cleanup duties, either recovering the spilled oil or mitigating the contamination so that it poses less harm to the ecosystem. These challenges may play a role in policy development for economic activities in the Arctic.

Spill Response Challenges

Response time is a critical factor for oil spill recovery. With each hour, spilled oil becomes more difficult to track, contain, and recover, particularly in icy conditions, where oil can migrate under

[276] Letter from Marvin E. Odum, President, Shell Oil Company to S. Elizabeth Birnbaum, Minerals Management Service (May 14, 2010). Cited in a staff paper from the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling ("The Challenges of Oil Spill Response in the Arctic," 2011).

[277] National Research Council (NRC) of the National Academies of Science, *Responding to Oil Spills in the U.S. Arctic Marine Environment*, 2014 (hereinafter, NRC Report, 2014).

[278] Mawuli Afenyo, "A State-of-the-Art Review of Fate and Transport of Oil Spills in Open and Ice-Covered Water," *Ocean Engineering*, 2016.

[279] NRC Report, 2014.

[280] Ibid.

or mix with surrounding ice.[281] Most response techniques call for quick action, which may pose logistical challenges in areas without prior staging equipment or trained response professionals. Many stakeholders are concerned about a "response gap" for oil spills in the Arctic.[282] A response gap is a period of time in which oil spill response activities would be unsafe or infeasible. A 2016 study (prepared for the Bureau of Safety and Environmental Enforcement) estimated response gaps for two locations in the U.S. Beaufort and Chukchi Seas during the summer and winter seasons, and for the year overall.[283] The study found that during the summer months (July-October), open water oil recovery would not be "favorable" approximately 33% of the time.[284] By comparison, that estimate increases to 75% and 95% for the year overall and for the winter months (November-June), respectively. The response gap for the northern Arctic latitudes is likely to be extremely high compared to other regions.[285]

In the event of an oil spill, the Coast Guard has response authority in the coastal zone.[286] A Coast Guard official would serve as the On-Scene Coordinator with the authority to perform cleanup immediately using federal resources, monitor the response efforts of the spiller, or direct the spiller's cleanup activities. According to a 2014 National Research Council (NRC) report, "the lack of infrastructure in the Arctic would be a significant liability in the event of a large oil spill."[287] The logistics in the Arctic were described as a "tyranny of distance" by the Vice Commandant of the Coast Guard.[288]

The Coast Guard has no designated air stations north of Kodiak, AK, which is almost 1,000 miles from the northernmost point of land along the Alaskan coast in Point Barrow, AK.[289] Although some of the communities have airstrips capable of landing cargo planes, no roads connect these Arctic communities to the main highway systems or large communities in Alaska.[290] Vessel infrastructure is also limited. The nearest major port is in the Aleutian Islands, approximately 1,300 miles from Point Barrow.

A 2010 Government Accountability Office (GAO) report identified further logistical obstacles that would hinder an oil spill response in the region, including "inadequate" ocean and weather

[281] World Wildlife Fund, *Oil Spill: Response Challenges in Arctic Waters* (2007).

[282] Coastal Response Research Center, *Opening the Arctic Seas: Envisioning Disasters and Framing Solutions* (2009), partnership between the National Oceanic and Atmospheric Administration and the University of New Hampshire.

[283] Nuka Research and Planning Group, *Estimating an Oil Spill Response Gap for the U.S. Arctic Ocean*, 2016; study funded by the Department of the Interior's Bureau of Safety and Environmental Enforcement.

[284] A 2017 study stated that most of the marine activities in the Arctic region occur during the summer months. See Jeremy Wilkinson, et al., "Oil Spill Response Capabilities and Technologies for Ice-Covered Arctic Marine Waters: A Review of Recent Developments and Established Practices," *Ambio*, 2017.

[285] A 2007 estimate of Prince William Sound (PWS) also may be instructive. A 2007 study found a response gap for PWS of 38% for the time of the study period (65% during the winter season). Note that PWS has existing infrastructure for response, while the more remote Arctic areas do not. Nuka Research and Planning Group, LLC, *Response Gap Estimate for Two Operating Areas in Prince William Sound, Alaska* (2007), Report to Prince William Sound Regional Citizens' Advisory Council.

[286] For more details, see CRS Report RL33705, *Oil Spills: Background and Governance*.

[287] NRC Report, 2014.

[288] Admiral Ray Charles, Vice Commandant of the Coast Guard, Testimony before the Senate Committee on Commerce, Science, and Transportation, December 12, 2019, https://www.commerce.senate.gov/2019/12/expanding-opportunities-challenges-and-threats-in-the-arctic-a-focus-on-the-u-s-coast-guard-arctic-strategic-outlook.

[289] G.M. Sulmasy and A.P. Wood, U.S. Coast Guard Academy, "U.S. Coast Guard Activity in the Arctic Region," Law of the Sea Institute, Occasional Paper #6, 2014; and U.S. Coast Guard, *Report to Congress: U.S. Coast Guard Polar Operations*, 2008.

[290] NRC Report, 2014.

information for the Arctic and technological problems with communications.[291] A 2014 GAO report highlighted steps taken by some groups (e.g., the National Oceanic and Atmospheric Administration) to improve some of these logistical elements.[292] The U.S. Coast Guard includes an initiative to "strengthen marine environmental response in the Arctic" as part of its Arctic Strategy Implementation Plan.[293] A 2016 GAO Report provided an initial assessment of these efforts.[294] In 2019, the Coast Guard issued its Arctic Strategic Outlook, which stated one of its objectives was to "enhance capability to operate effectively in a dynamic Arctic."[295]

In addition, the Department of the Interior's BOEM and BSEE issued a final rule in 2016 requiring certain safety measures for drilling operations in the Arctic, but, as discussed above, the status of that rulemaking is uncertain.[296]

The costs of an oil spill response would likely be significantly higher than a similar incident in lower latitude locations of comparable remoteness. This could place a relatively larger burden on the oil spill liability and compensation framework.[297] Pursuant to the Oil Pollution Act (OPA),[298] parties responsible for an oil spill may be liable for cleanup costs, natural resource damages, and specific economic damages.[299] OPA provided both limited defenses from liability and conditional liability limits for cleanup costs and other eligible damages.[300] The Oil Spill Liability Trust Fund (OSLTF) provides an immediate source of funds for federal responses to oil spills and compensation for certain damages.[301] The OSLTF can be used if a responsible party's liability limit is reached, but the fund can only provide $1 billion per incident.[302]

Oil Spill Cleanup Challenges

The history of oil spill response in the Aleutian Islands highlights the challenges and concerns for potential spills in the Arctic:

> The past 20 years of data on response to spills in the Aleutians has also shown that almost no oil has been recovered during events where attempts have been made by the responsible parties or government agencies, and that in many cases, weather and other conditions have prevented any response at all.[303]

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[291] Government Accountability Office, *Coast Guard: Efforts to Identify Arctic Requirements Are Ongoing, but More Communication about Agency Planning Efforts Would Be Beneficial*, GAO-10-870, 2010.

[292] Government Accountability Office, *Key Issues Related to Commercial Activity in the U.S. Arctic over the Next Decade*, GAO-14-299, 2014.

[293] U.S. Coast Guard, *Arctic Strategy Implementation Plan*, 2015, https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5pw/Arctic%20Policy/CGAS%20IPlan%20Final%20Signed.pdf?ver=2017-08-25-075935-927.

[294] Government Accountability Office, *Arctic Strategy Is Underway, but Agency Could Better Assess How Its Actions Mitigate Known Arctic Capability Gaps*, GAO-16-453, 2016.

[295] U.S. Coast Guard, Arctic Strategic Outlook, 2019, https://www.uscg.mil/Portals/0/Images/arctic/Arctic_Strategic_Outlook_APR_2019.pdf.

[296] See the section above titled "Offshore Oil and Gas Exploration."

[297] For more information on this framework, see CRS Report RL33705, *Oil Spills: Background and Governance*.

[298] P.L. 101-380, primarily codified at 33 U.S.C. §2701 et seq.

[299] 33 U.S.C. §2702.

[300] 33 U.S.C. §2703 and §2704.

[301] 33 U.S.C. §2712.

[302] 26 U.S.C. §9509.

[303] Transportation Research Board of the National Academy of Sciences, *Risk of Vessel Accidents and Spills in the Aleutian Islands: Designing a Comprehensive Risk Assessment* (2008), Special Report 293, National Academies Press.

The behavior of oil spills in cold and icy waters is not as well understood as oil spills in more temperate climates.[304] In addition, in the summer months, the sea ice zone is a particularly challenging environment because the concentration of ice floes within a region is continuously changing.[305] The 2014 NRC report highlights some recent advancements in understanding oil spill behavior in the Arctic climate. At the same time, the report recommends further study on a range of related issues.

The 2014 NRC report states that in colder water temperatures or sea ice, "the processes that control oil weathering—such as spreading, evaporation, photo-oxidation, emulsification, and natural dispersion—are slowed down or eliminated for extended periods of time."[306] In some respects, the slower weathering processes may provide more time for response strategies, such as in situ burning or skimming. On the other hand, the longer the oil remains in an ecosystem, the more opportunity there is for exposure to humans and other species in the ecosystem.

In addition, the 2014 report states the following:

> Arctic conditions impose many challenges for oil spill response—low temperatures and extended periods of darkness in the winter, oil that is encapsulated under ice or trapped in ridges and leads, oil spreading due to sea ice drift and surface currents, reduced effectiveness of conventional containment and recovery systems in measurable ice concentrations, and issues of life and safety of responders.

Oil Spill Policy–Regional Framework

The existing framework for international governance of maritime operations in the Arctic combines broader maritime agreements and agreements that focus on the geographic region. In terms of broader frameworks, the Safety of Life at Sea Convention (SOLAS) and other International Maritime Organization (IMO) conventions include provisions regarding ships in icy waters, but the provisions are not specific to the polar regions.

The IMO's International Code for Ships Operating in Polar Waters (Polar Code) entered into force in 2017 and is mandatory under SOLAS and the International Convention for the Prevention of Pollution from Ships (known as MARPOL).[307] The Polar Code addresses a range of issues, including environmental protection.

In 2013, the member states of the Arctic Council signed an Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic.[308] The agreement's objective is to "strengthen cooperation, coordination, and mutual assistance ... on oil pollution preparedness and response in the Arctic." The agreement entered force in 2016.[309] A 2018 Coast Guard document describes the agreement as "binding."[310] The agreement includes multiple requirements for the

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Washington, DC.

[304] NRC Report, 2014.

[305] Jeremy Wilkinson, et al., "Oil Spill Response Capabilities and Technologies for Ice-Covered Arctic Marine Waters: A Review of Recent Developments and Established Practices," *Ambio*, 2017.

[306] NRC Report, 2014.

[307] See the above section titled "Regulation of Arctic Shipping."

[308] Available at http://www.arctic-council.org. The agreement is sometimes described as the Agreement on Cooperation on Marine Oil Spill Preparedness and Response in the Arctic (MOSPA).

[309] Arctic Council, *Status of ratification of Agreements negotiated under the auspices of the Arctic Council*, 2016.

[310] U.S. Coast Guard, Marine Environmental Response and Preparedness Manual, 2018, https://media.defense.gov/2018/Oct/01/2002046527/-1/-1/0/CIM_16000_14A.PDF.

parties, including oil spill notification, a process for requesting assistance and seeking reimbursement for costs, and joint preparation activities. Pursuant to the agreement the Arctic nations have conducted several joint training exercises.[311]

In addition, the United States has separate bilateral agreements with Canada and Russia that address oil spill response operations. The agreement with Canada was established in 1974 for the Great Lakes and has been amended several times to add more geographic areas, including Arctic waters.[312] According to the 2014 NRC report: "formal contingency planning and exercises with Canada have enabled both the United States and Canada to refine procedures and legal requirements for cross-border movement of technical experts and equipment in the event of an emergency."

The U.S.-Russian agreement was made in 1989 and applies to oil spill-related activities in Arctic waters. The 2014 NRC report asserted that the agreement has not been tested to the same extent as the U.S.-Canada agreement. In 2018, officials from both nations reportedly held a tabletop exercise for an oil spill scenario in the Bering Strait.[313]

Fisheries[314]

The effects of climate change such as increasing sea surface temperatures and decreasing permanent sea ice are altering the composition of marine ecosystems in the Arctic. Climate change is likely to affect the ranges and productivity of living marine resources including species that support marine fisheries. In addition, ocean acidification is occurring as the increasing concentration of carbon dioxide (CO_2) in the atmosphere leads to greater absorption of CO_2 in the world's oceans. The increase in CO_2 absorption changes ocean chemistry and makes ocean waters more acidic (decreases the pH). Ocean acidification is more pronounced at higher latitudes and is likely to affect marine organisms and ecosystems in the Arctic region.

As a greater portion of the waters in the central Arctic Ocean become open for longer periods, the region's resources will become more accessible to commercial fishing. Large commercial fisheries already exist in the Arctic, including in the Barents and Norwegian Seas north of Europe, the Central North Atlantic off Greenland and Iceland, the Bering Sea off Russia and the United States (Alaska), and the Newfoundland and Labrador Seas off northeastern Canada.[315] As climate changes and ocean acidification increases, fishery managers will be challenged to adjust management measures for existing fisheries. Uncertainties related to these changes and potential new fisheries in the central Arctic Ocean have prompted many fishery managers to support precautionary approaches to fisheries management in the region. Currently, there is no

[311] See Arctic Council, Emergency Prevention Preparedness and Response Working Group, Planning Guidance for MOSPA Exercises, 2019; see also Michael LeVine et al., "Oil Spill Response in the North American Arctic," in *Managing the Risks of Offshore Oil and Gas Accidents: The International Legal Dimension*, edited by Gunther Handl and Kristoffer Svendsen, 2019.

[312] For more information, see U.S. Department of the Interior, Bureau of Ocean Energy Management, *Oil Spill Preparedness, Prevention, and Response on the Alaska OCS*, 2019.

[313] World Wildlife Federation, "Russia and the United States Hold Joint Exercises to Respond to Oil Spills in the Bering Strait," November 2018, https://wwf.ru/en/resources/news/bioraznoobrazie/rossiya-i-ssha-proveli-sovmestnye-ucheniya-po-reagirovaniyu-na-razlivy-nefti-v-beringovom-prolive/.

[314] This section was prepared by Harold Upton, Analyst in Natural Resources Policy, Resources, Science, and Industry Division.

[315] Erik J. Molenaar and Robert Corell, *Arctic Fisheries*, Arctic Transform, February 9, 2009; available at http://arctic-transform.org/download/FishBP.pdf.

commercial fishing in central Arctic Ocean and it is questionable whether existing fisheries resources could sustain a fishery.

For waters under U.S. jurisdiction, in 2009, the National Marine Fisheries Service in the Department of Commerce's National Oceanic and Atmospheric Administration implemented the North Pacific Fishery Management Council's (NPFMC) Fishery Management Plan for Fish Resources of the Arctic Management Area (Arctic plan).[316] The management area includes marine waters in the U.S. Exclusive Economic Zone (EEZ) of the Chukchi and Beaufort Seas.[317] The Arctic plan addresses concerns that inadequately regulated commercial fisheries in the U.S. EEZ off Alaska could harm marine resources such as commercial fish populations, fish habitat, and other marine populations. The Arctic plan prohibits commercial fishing in the Arctic Management Area and moves the northern boundary of the Bering Sea/Aleutian Islands king and tanner crab fishery management plan out of the Arctic Management Area south to the Bering Strait. The plan takes a precautionary approach by requiring the collection of more information before developing commercial fisheries in the region. The NPFMC recently developed a discussion paper that examines exploratory fishing undertaken by regional fishery management organizations and potential application of these efforts to the Arctic Ocean.[318]

The United States also has been active in promoting international approaches to management of stocks in the Arctic Ocean. International cooperation is necessary to manage Arctic resources because fish stocks are shared to some degree among the five adjacent jurisdictional zones of the Arctic rim nations. Further, a large portion of the central Arctic Ocean is a high seas area roughly the size of the Mediterranean Sea (2.8 million square kilometers) that lies outside the EEZs of these nations. Ideally, regional management would recognize the need to coordinate management for those fish populations that move among these national jurisdictional zones and the high seas.

On June 1, 2008, Congress passed a joint resolution (P.L. 110-243) that directed "the United States to initiate international discussions and take necessary steps with other nations to negotiate an agreement for managing migratory and transboundary fish stocks in the Arctic Ocean." The joint resolution also supported establishment of a new international fisheries management organization or organizations for the region. On July 16, 2015, the five nations that surround the Arctic Ocean signed a nonbinding declaration to prevent unregulated commercial fishing in the high seas portion of the central Arctic Ocean.[319] The five nations agreed that a precautionary approach to fishing is needed because there is limited scientific knowledge of marine resources in the central Arctic Ocean. The declaration also recognized the interests of indigenous peoples and the need to encourage other countries such as major fishing nations to take actions that are consistent with the interim measures.

The declaration was followed by negotiations among officials from the five nations that surround the Arctic Ocean, four major fishing nations, and the European Union.[320] On October 3, 2018, the

[316] 74 *Federal Register* 56734-56746, November 3, 2009.

[317] The state of Alaska has jurisdiction over waters from 0-3 nautical miles from the baseline. The baseline generally follows the shoreline.

[318] Steve MacLean, *Exploratory Fishing in Global Regional Fishery Management Organizations*, North Pacific Fishery Management Council, Anchorage, AK, February 2018.

[319] The five Arctic rim nations include Canada, Denmark (Faroe Islands and Greenland), Norway, the Russian Federation, and the United States. See https://www.regjeringen.no/globalassets/departementene/ud/vedlegg/folkerett/declaration-on-arctic-fisheries-16-july-2015.pdf.

[320] The agreement includes Arctic indigenous peoples as participants in meetings and as a source of scientific information and local knowledge.

parties signed a legally binding international accord to prevent unregulated high seas fisheries in the central Arctic Ocean.[321] The objective of the accord, as stated in its preamble, is

> to prevent unregulated fishing in the high seas portion of the central Arctic Ocean through the application of precautionary conservation and management measures as part of a long-term strategy to safeguard healthy marine ecosystems and to ensure the conservation and sustainable use of fish stocks.[322]

The parties agreed that no commercial fisheries will be conducted in the Arctic high seas before an international management regime is put in place to regulate commercial fishing. The ban on unregulated commercial fishing will remain in force for 16 years and for successive 5-year increments unless any party presents a formal objection to extension of the agreement. The agreement also established a joint scientific program to conduct research and monitor the region's marine ecosystem. The parties are required to meet every two years to share and review scientific information. The agreement is seen as the first step toward establishing one or more regional fisheries management organizations for the Arctic Ocean. On May 17, 2020, Norway become the seventh of the 10 signatories, including the United States, to ratify the agreement.[323] The agreement will enter into force when all 10 parties ratify. However, it remains an open question whether an Arctic Ocean regional fishery management organization will be established, which countries would be included in such an arrangement, and if sustainable commercial fisheries can be developed in the central Arctic Ocean.

Protected Species[324]

Concern over development of the Arctic relates to how such development might affect threatened and endangered species. Under the Endangered Species Act (ESA, 16 U.S.C. §§1531-1543), the polar bear was listed as threatened on May 15, 2008. The failure by the Fish and Wildlife Service (FWS) to make a 90-day finding on a 2008 petition to list Pacific walrus led to submission of 60-days' notice of a future citizen suit. However, eventually walruses were listed as candidate species under ESA;[325] this status means that federal agencies carrying out actions that may affect the species must confer with FWS though they are not necessarily obliged to modify their actions. Both polar bears and walruses are heavily dependent during their life cycles on thick sea ice, making them especially susceptible to the shrinking Arctic ice cap.

On December 30, 2008, the National Marine Fisheries Service (NMFS) determined that a listing of ribbon seal as threatened or endangered was not warranted.[326] On October 22, 2010, NMFS listed the southern distinct population segment (DPS) of spotted seals as threatened.[327] Listing of

[321] The four major fishing nations include Iceland, Japan, South Korea, and the People's Republic of China.

[322] Fisheries and Oceans Canada, *Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean*, October 3, 2018, https://www.dfo-mpo.gc.ca/international/agreement-accord-eng.htm.

[323] Atle Staalesen, "Norway ratifies a landmark agreement to protect Arctic fish stocks," *The Independent Barents Observer*, May 23, 2020. As of June 1, 2020, China, Iceland, and Demark have not ratified the agreement.

[324] Prepared by Lynne Corn and Eugene Buck, Specialists in Natural Resources Policy, Resources, Science, and Industry Division.

[325] Fish and Wildlife Service, "Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Proposed Rule," 76 *Federal Register* 66370-66439, October 26, 2001.

[326] 73 *Federal Register* 79822-79828.

[327] 75 *Federal Register* 65239-65248.

two other DPS (Okhotsk and Bering Sea) had earlier been determined to not be warranted.[328] On December 10, 2010, NMFS proposed that (1) four subspecies of ringed seal be listed as threatened,[329] and (2) that two DPS of one subspecies of bearded seal be listed as threatened.[330]

In either terrestrial or marine environments, the extreme pace of change makes a biological response many times more difficult. For species with adaptations for a specific optimum temperature for egg development, or production of young timed to match the availability of a favored prey species, or seed dispersal in predictable fire regimes, etc., evolutionary responses may well not keep pace with the rate of change.[331] While species of plants and animals farther south might migrate, drift, or be transplanted from warming habitats to more northerly sites that may continue to be suitable,[332] once a terrestrial species reaches the Arctic Ocean, it is very literally at the end of the line. No more northern or colder habitat is available.

The Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361 et seq.) protects whales, seals, walruses, and polar bears. The MMPA established a moratorium on the "taking" of marine mammals in U.S. waters and by U.S. nationals on the high seas, including the Arctic. The MMPA protects marine mammals from "clubbing, mutilation, poisoning, capture in nets, and other human actions that lead to extinction." Under the MMPA, the Secretary of Commerce, acting through National Marine Fisheries Service, is responsible for the conservation and management of whales and seals. The Secretary of the Interior, acting through the Fish and Wildlife Service, is responsible for walruses and polar bears.[333] Despite the MMPA's general moratorium on taking, the MMPA allows U.S. citizens to apply for and obtain authorization for taking small numbers of mammals incidental to activities other than commercial fishing (e.g., offshore oil and gas exploration and development) if the taking would have only a negligible impact on any marine mammal species or stock, provided that monitoring requirements and other conditions are met.

Indigenous People Living in Arctic[334]

People have been living in the Arctic for thousands of years, and indigenous peoples developed highly specialized cultures and economies based on the physical and biological conditions of the long-isolated region. However, with trade, the influx of additional populations especially since the 19th century, and ongoing physical changes in the Arctic, indigenous populations have already experienced substantial change in their lifestyles and economies. Over the past two decades,

[328] 74 *Federal Register* 53683-58696, October 20, 2009.

[329] 75 *Federal Register* 77476-77495.

[330] 75 *Federal Register* 77496-77515.

[331] Among biologists, it is traditionally said that a species faced with extreme change can respond in three basic ways: "migrate, mutate, or die." When change is rapid enough, mutation (accompanied by natural selection of individuals within the population more suited to the changed environment) may not be able to occur fast enough, leaving migration and death as the only options. The problem of response rate is more severe for species that reproduce slowly (e.g., polar bears) and less severe for species that reproduce rapidly (e.g., algae).

[332] The efficacy and the effect of this tactic is often questioned, since natural migration is unlikely to involve the entire suite of species in an ecosystem (e.g., host plants might not move north (or up) as fast as their moth herbivores, nor as fast as the birds that depend on the moths). Moreover, the southerners will not find a land of sterile bare dirt—the species that are already there may be threatened themselves by the competition from the new arrivals, perhaps tipping the balance and pushing still more species toward extinction.

[333] Under the MMPA, both NMFS and FWS have responsibility for additional marine mammal species (e.g., manatees, sea otters, dolphins) which are not currently found in the Arctic.

[334] This section was originally prepared by Roger Walke, who was a Specialist in American Indian Policy, Domestic Social Policy Division, until his retirement from CRS in October 2010. It has been updated by Jane A. Leggett, Specialist in Environmental and Energy Policy in CRS's Resources, Science and Industry Division.

greater political organization across indigenous populations has increased their demands for international recognition and broader rights, as well as attention to the economic, health, and safety implications of climate change in the North.

Background

Seven of the eight Arctic nations have indigenous peoples,[335] whose predecessors were present in parts of the Arctic over 10,000 years ago, well before the arrival of peoples with European backgrounds.[336] Current Arctic indigenous peoples comprise dozens of diverse cultures and speak dozens of languages from eight or more non-Indo-European language families.[337]

Before the arrival of Europeans, Arctic indigenous peoples lived in economies that were chiefly dependent, in varying proportions, on hunting land and marine mammals, catching salt- and fresh-water fish, herding reindeer (in Eurasia), and gathering, for their food, clothing, and other products.[338] Indigenous peoples' interaction with and knowledge of Arctic wildlife and environments has developed over millennia and is the foundation of their cultures.[339]

The length of time that Arctic indigenous peoples were in contact with Europeans varied across the Arctic. As recorded by Europeans, contact began as early as the 9th century CE, if not before, in Fennoscandia[340] and northwestern Russia, chiefly for reasons of commerce (especially furs); it progressed mostly west-to-east across northern Asia, reaching northeastern Arctic Asia by the 17th century.[341] North American Arctic indigenous peoples' contact with Europeans started in Labrador in the 16th century and in Alaska in the 18th century, and was not completed until the early 20th century.[342] Greenland's indigenous peoples first saw European-origin peoples in the late 10th century, but those Europeans died out during the 15th or 16th century and Europeans did not return permanently until the 18th century.[343]

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[335] *Arctic Human Development Report*, ed. Joan Nymand Larsen et al. (Akureyri, Iceland: Stefansson Arctic Institute, 2004), p. 47; this report is subsequently cited in this section as *AHDR*. The seven countries are Canada, Denmark-Greenland, Finland, Norway, Russia, Sweden, and the United States.

[336] John F. Hoffecker, *A Prehistory of the North: Human Settlement of the Higher Latitudes* (New Brunswick, NJ: Rutgers University Press, 2005), pp. 8, 81, 112-115.

[337] *AHDR*, pp. 47, 53; David Crystal, *Cambridge Encyclopedia of Language*, 2nd ed. (Cambridge: Cambridge University Press, 1997), chap. 50; *Ethnologue: Languages of the World*, 16th ed., ed. M. Paul Lewis (Dallas: SIL International, 2009), available at http://www.ethnologue.com/. The number of languages and language families varies not only with definitions of the Arctic but with definitions of languages and language families.

[338] Jim Berner et al., *Arctic Climate Impact Assessment* (Cambridge: Cambridge University Press, 2005), chapter 12; this report is subsequently cited in this section as *ACIA*.

[339] *ACIA*, pp. 654-655.

[340] Fennoscandia refers to the Scandinavian Peninsula, Finland, the Kola Peninsula of Russia, and certain parts of Russia bordering on Finland.

[341] Janet Martin, *Treasure in the Land of Darkness: The Fur Trade and Its Significance for Medieval Russia* (Cambridge: Cambridge University Press, 1986), pp. 41-42; James Forsyth, *A History of the Peoples of Siberia: Russia's North Asian Colony, 1581-1990* (Cambridge: Cambridge University Press, 1992), pp. 69-83, 102; Lassi K. Heininen, "Different Images of the Arctic and the Circumpolar North in World Politics," in *Knowledge and Power in the Arctic*, Proceedings at a Conference in Rovaniemi, April 16-18, 2007, Arctic Centre Reports 48, ed. Paula Kankaanpaa et al. (Rovaniemi, Finland: University of Lapland, Arctic Centre, 2007), p. 125.

[342] James W. VanStone, "Exploration and Contact History of Western Alaska," and David Damas, "Copper Eskimo," and J. Garth Taylor, "Historical Ethnography of the Labrador Coast," in *Handbook of North American Indian: Vol. 5, Arctic*, vol. ed. David Damas, gen. ed. William C. Sturtevant (Washington: Smithsonian, 1984), pp. 149-155, 408, 509-510.

[343] Inge Kleivan, "History of Norse Greenland," in *Handbook, Vol. 5, Arctic*, op. cit., pp. 549-555; Finn Gad, "Danish Greenland Policies," in *Handbook of North American Indians: Vol. 4, History of Indian-White Relations*, vol. ed.

Contact led to significant changes in Arctic indigenous economies, political structures, foods, cultures, and populations, starting especially in the 20th century. For example, life expectancy among Alaska Natives has increased from 47 years in 1950 to over 69 years in 2000 (though it still lags behind that of U.S. residents overall, at 77 years).[344]

Also, at present, most Arctic indigenous peoples have become minorities in their countries' Arctic areas, except in Greenland and Canada. (One source estimates that, around 2003, about 10% of an estimated 3.7 million people in the Arctic were indigenous.)[345] While many Arctic indigenous communities remain heavily dependent on hunting, fishing, and herding and are more likely to depend on traditional foods than nonindigenous Arctic inhabitants,[346] there is much variation. Most Arctic indigenous people may no longer consume traditional foods as their chief sources of energy and nutrition.[347] Major economic change is also relatively recent but ongoing.[348] Many Arctic indigenous communities have developed a mixture of traditional economic activities and wage employment.[349] The economics of subsistence and globalization will be key factors in the effects of climate change on Arctic indigenous peoples, and on their reactions to Arctic climate change.

Arctic indigenous peoples' current political structures vary, as do their relationships with their national governments. Some indigenous groups govern their own unique land areas within the national structure, as in the United States and Canada; others have special representative bodies, such as the Saami parliaments in Norway, Finland, and Sweden;[350] a few areas have general governments with indigenous majorities, such as Greenland (a member country of Denmark), Nunavut territory in Canada, and the North Slope and Northwest Arctic boroughs in Alaska.[351] Control of land, through claims and ownership, also varies among Arctic indigenous peoples, as do rights to fishing, hunting, and resources.[352] Arctic indigenous peoples' political relationships to their national and local governments, and their ownership or claims regarding land, are also significant factors in the responses to Arctic climate change by the indigenous peoples and by Arctic nations' governments.

Wilcomb E. Washburn, gen. ed. William C. Sturtevant (Washington: Smithsonian, 1988), p. 110.

[344] Parkinson, Alan J. The Arctic Human Health Initiative. Washington, DC: U.S. Department of Health and Human Services, 2006.

[345] *AHDR*, pp. 19, 29. Estimates of Arctic indigenous populations are complicated by varying definitions not only of the Arctic but also of indigenous peoples; for instance, Russia does not count some non-European Arctic ethnic groups, such as the Yakut, as "indigenous minorities" (see "Peoples of the Arctic: Characteristics of Human Populations Relevant to Pollution Issues," in *AMAP Assessment Report: Arctic Pollution Issues*, ed. Simon J. Wilson et al. (Oslo: Arctic Monitoring and Assessment Programme, 1998), pp. 167-169; this report is subsequently cited in this section as *AMAP 1998*.

[346] *AMAP 1998*, chapter 5; see also Birger Poppel et al., *SLiCA Results*, Survey of Living Conditions in the Arctic (Anchorage: Institute of Social and Economic Research, University of Alaska Anchorage, 2007), pp. 4-7, http://www.arcticlivingconditions.org.

[347] Annika E. Nilson and Henry P. Huntington, *Arctic Pollution 2009* (Oslo: Arctic Monitoring and Assessment Programme, 2009), pp. 39-41; this report is subsequently cited in this section as *AMAP 2009*.

[348] *ACIA*, p. 1000.

[349] *SLiCA Results*, op. cit., pp. v, 4-8.

[350] *AHDR*, p. 232.

[351] *AHDR*, chapter 4, and pp. 232-233.

[352] *AHDR*, chapters 6-7, and pp. 232-233.

Effects of Climate Change

Arctic climate change is expected to affect the economies, population, subsistence, health, infrastructure, societies, and cultures of Arctic indigenous peoples. Changes in sea ice and sea level, permafrost, tundra, weather, and vegetation distributions, as well as increased commercial shipping, mineral extraction, and tourism, will affect the distribution of land and sea mammals, of freshwater and marine fish, and of forage for reindeer. These will in turn affect traditional subsistence activities and related indigenous lifestyles.[353] Arctic indigenous peoples' harvesting of animals is likely to become riskier and less predictable, which may increase food insecurity, change diets, and increase dependency on outside, nontraditional foods.[354] Food cellars in many locations have thawed during summers, threatening food safety. Related health risks of diabetes, obesity, and mental illness have been associated with these changes.[355]

Sea, shoreline ice, and permafrost changes have damaged infrastructure and increased coastal and inland erosion, especially in Alaska, where GAO found in 2003 that "coastal villages are becoming more susceptible to flooding and erosion caused in part by rising temperatures."[356] In response, Congress funded the U.S. Army Corps of Engineers to conduct a Baseline Erosion Assessment that identified and prioritized among the 178 communities identified at risk from erosion.[357] (Risks from flooding were not examined.) GAO concluded in 2009 that many Native villages must relocate, but even those facing imminent threats have been impeded by various barriers, including difficulties identifying appropriate new sites, piecemeal programs for state and federal assistance, and obstacles to eligibility for certain federal programs.[358] The Alaska Federation of Natives placed among its 2010 federal priorities a request to Congress to mitigate flooding and erosion in Alaska Native villages and to fund relocation of villages where necessary.[359] However, "the cost is extraordinary," acknowledges Senator Lisa Murkowski.[360]

Oil, gas, and mineral exploration and development are expected to increase, as are other economic activities, such as forestry and tourism, and these are expected to increase economic

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[353] *ACIA*, pp. 1000-1001, 1004.

[354] *ACIA*, pp. 1000-1001, 1004.

[355] Parkinson, Alan J. *The Arctic Human Health Initiative*. Washington, DC: U.S. Department of Health and Human Services, 2006; Brubaker, Michael, James Berner, Raj Chavan, and John Warren. "Climate Change and Health Effects in Northwest Alaska." *Global Health Action* 4 (October 18, 2011).

[356] U.S. Government Accountability Office (GAO), *Alaska Native Villages: Villages Affected by Flooding and Erosion Have Difficulty Qualifying for Federal Assistance*, GAO-04-895T, June 29, 2004, p. i, http://www.gao.gov/new.items/d04895t.pdf. See also, Government Accountability Office, *Alaska Native Villages: Most Are Affected by Flooding and Erosion, but Few Qualify for Federal Assistance*, GAO-04-142, December 12, 2003, http://www.gao.gov/new.items/d04142.pdf.

[357] U.S. Army Corps of Engineers. Alaska Baseline Erosion Assessment (BEA), March 2009.

[358] GAO, *Alaska Native Villages: Limited Progress Has Been Made on Relocating Villages Threatened by Flooding and Erosion*, June 3, 2009.

[359] Alaska Federation of Natives, Human Resources Committee, *2010 Federal Priorities* (Anchorage: Alaska Federation of Natives, 2010), pp. 22-23, available at https://www.nativefederation.org/wp-content/uploads/2018/07/2010-afn-federal-priorities.pdf. See also, Government Accountability Office, *Alaska Native Villages: Limited Progress Has Been Made on Relocating Villages Threatened by Flooding and Erosion*, GAO-09-551, June 3, 2009, http://www.gao.gov/new.items/d09551.pdf. For a more detailed anecdote, see a 2012 interview with Brice Eningowuk, Shishmaref Erosion and Relocation Committee member at Shearer, Christine. "Climate Crisis: Alaskan Village Shishmaref Sinking Into the Sea." *Imagined Magazine*, July 8, 2012, http://imaginedmag.com/2012/07/climate-crisis-alaskan-village-shishmaref-sinking-into-the-sea/.

[360] Press Office of Senator Lisa Murkowski. "Murkowski Urges Greater Tribal Consultation from Administration; Senator Spotlights 'Monumental' Climate Struggles Faced by Alaska Natives, Coastal Communities," July 19, 2012.

opportunities for all Arctic residents, including indigenous peoples.[361] Pressures to increase participation in the wage economy, however, may speed up changes in indigenous cultures. Increased economic opportunities may also lead to a rise in the nonindigenous population, which may further change the circumstances of indigenous cultures. Some representatives of Arctic indigenous people have related a "conflicting desire between combating climate change and embracing the potential for economic growth through foreign investment."[362]

Although important advances in public health have occurred in indigenous communities over past decades, some health problems may increase with continued Arctic climate change. Economic development may exacerbate Arctic pollution problems, including higher exposure to mercury, air pollution, and food contamination. The influx and redistribution of contaminants in the air, oceans, and land may change in ways that are now poorly understood.[363] Warmer temperatures and longer warm seasons may increase insect- and wildlife-borne diseases.[364] Climate change may lead to damage to water and sanitation systems, reducing protection against waterborne diseases.[365] Changes in Arctic indigenous cultures may increase mental stress and behavioral problems.[366]

The response to climate change by Arctic indigenous peoples has included international activities by Arctic indigenous organizations and advocacy before their national governments. As one report noted, "the rise of solidarity among indigenous peoples organizations in the region is surely a development to be reckoned with by all those interested in policy issues in the Arctic."[367] Six national or international indigenous organizations are permanent participants of the Arctic Council, the regional intergovernmental forum.[368] Due in part to advocacy by Arctic indigenous people, the United Nations General Assembly adopted in 2007 the Declaration on the Rights of Indigenous Peoples.[369] In April 2009, the Inuit Circumpolar Council (an organization of Inuit in the Arctic regions of Alaska, Canada, Greenland, and Russia) hosted in Alaska the worldwide "Indigenous Peoples Global Summit on Climate Change."[370] The conference report, forwarded to the Copenhagen Conference of the Parties of the U.N. Framework Convention on Climate Change (December 2009), noted "accelerating" climate change caused by "unsustainable

[361] *ACIA*, pp. 1001, 1004.

[362] Aqqaluk Lynge, Chair, Inuit Circumpolar Council, quoted in Stephanie McFeeters, "Lynge talks future of Inuit people," *The Dartmouth*, February 8, 2012.

[363] See, for example, "Health: Increased Bacterial Loads in Potable Water Could Have Significant Health Effects on Indigenous People From the Arctic to Uganda, Says Vanier Scholar." National Aboriginal Health Organization (NAHO), February 17, 2012. http://www.naho.ca/blog/2012/02/17/health-increased-bacterial-loads-in-potable-water-could-have-significant-health-effects-on-indigenous-people-from-the-arctic-to-uganda-says-vanier-scholar/; or, Kallenborn et al., *Combined Effects of Selected Pollutants and Climate Change in the Arctic Environment*. Oslo, Norway: Arctic Monitoring and Assessment Programme (AMAP), Arctic Council, 2011.

[364] *AMAP Assessment 2009: Human Health in the Arctic*, ed. Simon J. Wilson and Carolyn Symon (Oslo: Arctic Monitoring and Assessment Programme, 2009), pp. 4-6, 143.

[365] Brubaker, Michael, James Berner, Raj Chavan, and John Warren. "Climate Change and Health Effects in Northwest Alaska." *Global Health Action* 4 (October 18, 2011); John Warren, "Climate change could affect human health," *Mukluk Telegraph*, January/February 2005, pp. 5-6.

[366] John Warren, "Climate change could affect human health," *Mukluk Telegraph*, January/February 2005, pp. 5-6.

[367] *AHDR*, p. 235.

[368] See http://www.arctic-council.org/. The six organizations are the Aleut International Association, Arctic Athabaskan Council, Gwich'in Council International, Inuit Circumpolar Council, RAIPON (Russian Association of Indigenous Peoples of the North), and Saami Council.

[369] United Nations, Declaration on the Rights of Indigenous Peoples, Resolution A/RES/61/295, at http://www.un-documents.net/a61r295.htm.

[370] See http://www.indigenoussummit.com/servlet/content/home.html.

development" and, among several recommendations, called for a greater indigenous role in national and international decisions on climate change, including a greater role for indigenous knowledge in climate change research, monitoring, and mitigation.[371]

CRS Reports on Specific Arctic-Related Issues

CRS In Focus IF10740, *The Nordic Countries and U.S. Relations*, by Kristin Archick

CRS Insight IN11161, *Greenland, Denmark, and U.S. Relations*, by Kristin Archick

CRS Report RL34391, *Coast Guard Polar Security Cutter (Polar Icebreaker) Program: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report RL33872, *Arctic National Wildlife Refuge (ANWR): An Overview*, by M. Lynne Corn, Michael Ratner, and Laura B. Comay

CRS Report RL32838, *Arctic National Wildlife Refuge (ANWR): Votes and Legislative Actions, 96th-114th Congresses*, by Laura B. Comay

CRS Report R45192, *Oil and Gas Activities Within the National Wildlife Refuge System*, by R. Eliot Crafton, Laura B. Comay, and Marc Humphries

CRS Report RL33705, *Oil Spills: Background and Governance*, by Jonathan L. Ramseur

[371] K. Galloway-McLean et al., *Report of the Indigenous Peoples' Global Summit on Climate Change: 20-24 April 2009, Anchorage, Alaska* (Darwin, Australia: United Nations University—Traditional Knowledge Initiative, 2009), pp. 5-7; available at http://www.indigenoussummit.com/servlet/content/home.html.

Appendix A. Arctic Research and Policy Act (ARPA) of 1984 (Title I of P.L. 98-373)

The text of the Arctic Research and Policy Act (ARPA) of 1984 (Title I of P.L. 98-373 of July 31, 1984)[372] is as follows:

TITLE I – ARCTIC RESEARCH AND POLICY

SHORT TITLE

SEC. 101. This title may be cited as the "Arctic Research and Policy Act of 1984".

FINDINGS AND PURPOSES

SEC. 102. (a) The Congress finds and declares that-

(1) the Arctic, onshore and offshore, contains vital energy resources that can reduce the Nation's dependence on foreign oil and improve the national balance of payments;

(2) as the Nation's only common border with the Soviet Union, the Arctic is critical to national defense;

(3) the renewable resources of the Arctic, specifically fish and other seafood, represent one of the Nation's greatest commercial assets;

(4) Arctic conditions directly affect global weather patterns and must be understood in order to promote better agricultural management throughout the United States;

(5) industrial pollution not originating in the Arctic region collects in the polar air mass, has the potential to disrupt global weather patterns, and must be controlled through international cooperation and consultation;

(6) the Arctic is a natural laboratory for research into human health and adaptation, physical and psychological, to climates of extreme cold and isolation and may provide information crucial for future defense needs;

(7) atmospheric conditions peculiar to the Arctic make the Arctic a unique testing ground for research into high latitude communications, which is likely to be crucial for future defense needs;

(8) Arctic marine technology is critical to cost-effective recovery and transportation of energy resources and to the national defense;

(9) the United States has important security, economic, and environmental interests in developing and maintaining a fleet of icebreaking vessels capable of operating effectively in the heavy ice regions of the Arctic;

(10) most Arctic-rim countries, particularly the Soviet Union, possess Arctic technologies far more advanced than those currently available in the United States;

(11) Federal Arctic research is fragmented and uncoordinated at the present time, leading to the neglect of certain areas of research and to unnecessary duplication of effort in other areas of research;

(12) improved logistical coordination and support for Arctic research and better dissemination of research data and information is necessary to increase the efficiency and utility of national Arctic research efforts;

[372] Title II of P.L. 98-373 is the National Critical Materials Act of 1984.

(13) a comprehensive national policy and program plan to organize and fund currently neglected scientific research with respect to the Arctic is necessary to fulfill national objectives in Arctic research;

(14) the Federal Government, in cooperation with State and local governments, should focus its efforts on the collection and characterization of basic data related to biological, materials, geophysical, social, and behavioral phenomena in the Arctic;

(15) research into the long-range health, environmental, and social effects of development in the Arctic is necessary to mitigate the adverse consequences of that development to the land and its residents;

(16) Arctic research expands knowledge of the Arctic, which can enhance the lives of Arctic residents, increase opportunities for international cooperation among Arctic-rim countries, and facilitate the formulation of national policy for the Arctic; and

(17) the Alaskan Arctic provides an essential habitat for marine mammals, migratory waterfowl, and other forms of wildlife which are important to the Nation and which are essential to Arctic residents.

(b) The purposes of this title are-

(1) to establish national policy, priorities, and goals and to provide a Federal program plan for basic and applied scientific research with respect to the Arctic, including natural resources and materials, physical, biological and health sciences, and social and behavioral sciences;

(2) to establish an Arctic Research Commission to promote Arctic research and to recommend Arctic research policy;

(3) to designate the National Science Foundation as the lead agency responsible for implementing Arctic research policy; and

(4) to establish an Interagency Arctic Research Policy Committee to develop a national Arctic research policy and a five year plan to implement that policy.

ARCTIC RESEARCH COMMISSION

SEC. 103. (a) The President shall establish an Arctic Research Commission (hereafter referred to as the "Commission").

(b)(1) The Commission shall be composed of five members appointed by the President, with the Director of the National Science Foundation serving as a nonvoting, ex officio member. The members appointed by the President shall include-

(A) three members appointed from among individuals from academic or other research institutions with expertise in areas of research relating to the Arctic, including the physical, biological, health, environmental, social, and behavioral sciences;

(B) one member appointed from among indigenous residents of the Arctic who are representative of the needs and interests of Arctic residents and who live in areas directly affected by Arctic resource development; and

(C) one member appointed from among individuals familiar with the Arctic and representative of the needs and interests of private industry undertaking resource development in the Arctic.

(2) The President shall designate one of the appointed members of the Commission to be chairperson of the Commission.

(c)(1) Except as provided in paragraph (2) of this subsection, the term of office of each member of the Commission appointed under subsection (b)(1) shall be four years.

(2) Of the members of the Commission originally appointed under subsection (b)(1)-

(A) one shall be appointed for a term of two years;

(B) two shall be appointed for a term of three years; and

(C) two shall be appointed for a term of four years.

(3) Any vacancy occurring in the membership of the Commission shall be filled, after notice of the vacancy is published in the Federal Register, in the manner provided by the preceding provisions of this section, for the remainder of the unexpired term.

(4) A member may serve after the expiration of the member's term of office until the President appoints a successor.

(5) A member may serve consecutive terms beyond the member's original appointment.

(d)(1) Members of the Commission may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5, United States Code. A member of the Commission not presently employed for compensation shall be compensated at a rate equal to the daily equivalent of the rate for GS-16 of the General Schedule under section 5332 of title 5, United States Code, for each day the member is engaged in the actual performance of his duties as a member of the Commission, not to exceed 90 days of service each year. Except for the purposes of chapter 81 of title 5 (relating to compensation for work injuries) and chapter 171 of title 28 (relating to tort claims), a member of the Commission shall not be considered an employee of the United States for any purpose.

(2) The Commission shall meet at the call of its Chairman or a majority of its members.

(3) Each Federal agency referred to in section 107(b) may designate a representative to participate as an observer with the Commission.

These representatives shall report to and advise the Commission on the activities relating to Arctic research of their agencies.

(4) The Commission shall conduct at least one public meeting in the State of Alaska annually.

DUTIES OF COMMISSION

SEC. 104. (a) The Commission shall-

(1) develop and recommend an integrated national Arctic research policy;

(2) in cooperation with the Interagency Arctic Research Policy Committee established under section 107, assist in establishing a national Arctic research program plan to implement the Arctic research policy;

(3) facilitate cooperation between the Federal Government and State and local governments with respect to Arctic research;

(4) review Federal research programs in the Arctic and suggest improvements in coordination among programs;

(5) recommend methods to improve logistical planning and support for Arctic research as may be appropriate and in accordance with the findings and purposes of this title;

(6) suggest methods for improving efficient sharing and dissemination of data and information on the Arctic among interested public and private institutions;

(7) offer other recommendations and advice to the Interagency Committee established under section 107 as it may find appropriate; and

(8) cooperate with the Governor of the State of Alaska and with agencies and organizations of that State which the Governor may designate with respect to the formulation of Arctic research policy.

(b) Not later than January 31 of each year, the Commission shall-

(1) publish a statement of goals and objectives with respect to Arctic research to guide the Interagency Committee established under section 107 in the performance of its duties; and

(2) submit to the President and to the Congress a report describing the activities and accomplishments of the Commission during the immediately preceding fiscal year.

COOPERATION WITH THE COMMISSION

SEC. 105. (a)(1) The Commission may acquire from the head of any Federal agency unclassified data, reports, and other nonproprietary information with respect to Arctic research in the possession of the agency which the Commission considers useful in the discharge of its duties.

(2) Each agency shall cooperate with the Commission and furnish all data, reports, and other information requested by the Commission to the extent permitted by law; except that no agency need furnish any information which it is permitted to withhold under section 552 of title 5, United States Code.

(b) With the consent of the appropriate agency head, the Commission may utilize the facilities and services of any Federal agency to the extent that the facilities and services are needed for the establishment and development of an Arctic research policy, upon reimbursement to be agreed upon by the Commission and the agency head and taking every feasible step to avoid duplication of effort.

(c) All Federal agencies shall consult with the Commission before undertaking major Federal actions relating to Arctic research.

ADMINISTRATION OF THE COMMISSION

SEC. 106. The Commission may-

(1) in accordance with the civil service laws and subchapter III of chapter 53 of title 5, United States Code, appoint and fix the compensation of an Executive Director and necessary additional staff personnel, but not to exceed a total of seven compensated personnel;

(2) procure temporary and intermittent services as authorized by section 3109 of title 5, United States Code;

(3) enter into contracts and procure supplies, services, and personal property; and

(4) enter into agreements with the General Services Administration for the procurement of necessary financial and administrative services, for which payment shall be made by reimbursement from funds of the Commission in amounts to be agreed upon by the Commission and the Administrator of the General Services Administration.

LEAD AGENCY AND INTERAGENCY ARCTIC RESEARCH POLICY COMMITTEE

SEC. 107. (a) The National Science Foundation is designated as the lead agency responsible for implementing Arctic research policy, and the Director of the National Science Foundation shall insure that the requirements of section 108 are fulfilled.

(b)(1) The President shall establish an Interagency Arctic Research Policy Committee (hereinafter referred to as the "Interagency Committee").

(2) The Interagency Committee shall be composed of representatives of the following Federal agencies or offices:

(A) the National Science Foundation;

(B) the Department of Commerce;

(C) the Department of Defense;

(D) the Department of Energy;

(E) the Department of the Interior;

(F) the Department of State;

(G) the Department of Transportation;

(H) the Department of Health and Human Services;

(I) the National Aeronautics and Space Administration;

(J) the Environmental Protection Agency; and

(K) any other agency or office deemed appropriate.

(3) The representative of the National Science Foundation shall serve as the Chairperson of the Interagency Committee.

DUTIES OF THE INTERAGENCY COMMITTEE

SEC. 108. (a) The Interagency Committee shall-

(1) survey Arctic research conducted by Federal, State, and local agencies, universities, and other public and private institutions to help determine priorities for future Arctic research, including natural resources and materials, physical and biological sciences, and social and behavioral sciences;

(2) work with the Commission to develop and establish an integrated national Arctic research policy that will guide Federal agencies in developing and implementing their research programs in the Arctic;

(3) consult with the Commission on-

(A) the development of the national Arctic research policy and the 5-year plan implementing the policy;

(B) Arctic research programs of Federal agencies;

(C) recommendations of the Commission on future Arctic research; and

(D) guidelines for Federal agencies for awarding and administering Arctic research grants;

(4) develop a 5-year plan to implement the national policy, as provided for in section 109;

(5) provide the necessary coordination, data, and assistance for the preparation of a single integrated, coherent, and multiagency budget request for Arctic research as provided for in section 110;

(6) facilitate cooperation between the Federal Government and State and local governments in Arctic research, and recommend the undertaking of neglected areas of research in accordance with the findings and purposes of this title;

(7) coordinate and promote cooperative Arctic scientific research programs with other nations, subject to the foreign policy guidance of the Secretary of State;

(8) cooperate with the Governor of the State of Alaska in fulfilling its responsibilities under this title;

(9) promote Federal interagency coordination of all Arctic research activities, including-

(A) logistical planning and coordination; and

(B) the sharing of data and information associated with Arctic research, subject to section 552 of title 5, United States Code; and

(10) provide public notice of its meetings and an opportunity for the public to participate in the development and implementation of national Arctic research policy.

(b) Not later than January 31, 1986, and biennially thereafter, the Interagency Committee shall submit to the Congress through the President, a brief, concise report containing-

(1) a statement of the activities and accomplishments of the Interagency Committee since its last report; and

(2) a description of the activities of the Commission, detailing with particularity the recommendations of the Commission with respect to Federal activities in Arctic research.

5-YEAR ARCTIC RESEARCH PLAN

SEC. 109. (a) The Interagency Committee, in consultation with the Commission, the Governor of the State of Alaska, the residents of the Arctic, the private sector, and public interest groups, shall prepare a comprehensive 5-year program plan (hereinafter referred to as the "Plan") for the overall Federal effort in Arctic research. The Plan shall be prepared and submitted to the President for transmittal to the Congress within one year after the enactment of this Act and shall be revised biennially thereafter.

(b) The Plan shall contain but need not be limited to the following elements:

(1) an assessment of national needs and problems regarding the Arctic and the research necessary to address those needs or problems;

(2) a statement of the goals and objectives of the Interagency Committee for national Arctic research;

(3) a detailed listing of all existing Federal programs relating to Arctic research, including the existing goals, funding levels for each of the 5 following fiscal years, and the funds currently being expended to conduct the programs;

(4) recommendations for necessary program changes and other proposals to meet the requirements of the policy and goals as set forth by the Commission and in the Plan as currently in effect; and

(5) a description of the actions taken by the Interagency Committee to coordinate the budget review process in order to ensure interagency coordination and cooperation in (A) carrying out Federal Arctic research programs, and (B) eliminating unnecessary duplication of effort among these programs.

COORDINATION AND REVIEW OF BUDGET REQUESTS

SEC. 110. (a) The Office of Science and Technology Policy shall-

(1) review all agency and department budget requests related to the Arctic transmitted pursuant to section 108(a)(5), in accordance with the national Arctic research policy and the 5-year program under section 108(a)(2) and section 109, respectively; and

(2) consult closely with the Interagency Committee and the Commission to guide the Office of Science and Technology Policy's efforts.

(b)(1) The Office of Management and Budget shall consider all Federal agency requests for research related to the Arctic as one integrated, coherent, and multiagency request which shall be reviewed by the Office of Management and Budget prior to submission of the President's annual budget request for its adherence to the Plan. The Commission shall, after submission of the President's annual budget request, review the request and report to Congress on adherence to the Plan.

(2) The Office of Management and Budget shall seek to facilitate planning for the design, procurement, maintenance, deployment, and operations of icebreakers needed to provide a platform for Arctic research by allocating all funds necessary to support icebreaking

operations, except for recurring incremental costs associated with specific projects, to the Coast Guard.

AUTHORIZATION OF APPROPRIATIONS; NEW SPENDING AUTHORITY

SEC. 111. (a) There are authorized to be appropriated such sums as may be necessary for carrying out this title.

(b) Any new spending authority (within the meaning of section 401 of the Congressional Budget Act of 1974) which is provided under this title shall be effective for any fiscal year only to such extent or in such amounts as may be provided in appropriation Acts.

DEFINITION

SEC. 112. As used in this title, the term "Arctic" means all United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian chain.

Appendix B. P.L. 101-609 of 1990, Amending ARPA

The Arctic Research and Policy Act (ARPA) of 1984 (see **Appendix A**) was amended by P.L. 101-609 of November 16, 1990. The text of P.L. 101-609 is as follows:

SECTION 1. Except as specifically provided in this Act, whenever in this Act an amendment or repeal is expressed as an amendment to, or repeal of a provision, the reference shall be deemed to be made to the Arctic Research and Policy Act of 1984.

SEC. 2. Section 103(b)(1) (15 U.S.C. 4102(b)(1)) is amended—

(1) in the text above clause (A), by striking out 'five' and inserting in lieu thereof 'seven';

(2) in clause (A), by striking out 'three' and inserting in lieu thereof 'four'; and

(3) in clause (C), by striking out 'one member' and inserting in lieu thereof 'two members'.

SEC. 3. Section 103(d)(1) (15 U.S.C. 4102(d)(1)) is amended by striking out 'GS-16' and inserting in lieu thereof 'GS-18'.

SEC. 4. (a) Section 104(a) (15 U.S.C. 4102(a)) is amended—

(1) in paragraph (4), by striking out `suggest' and inserting in lieu thereof `recommend';

(2) in paragraph (6), by striking out `suggest' and inserting in lieu thereof `recommend';

(3) in paragraph (7), by striking out `and' at the end thereof;

(4) in paragraph (8), by striking out the period and inserting in lieu thereof a semicolon; and

(5) by adding at the end thereof the following new paragraphs:

'(9) recommend to the Interagency Committee the means for developing international scientific cooperation in the Arctic; and

'(10) not later than January 31, 1991, and every 2 years thereafter, publish a statement of goals and objectives with respect to Arctic research to guide the Interagency Committee established under section 107 in the performance of its duties.'.

(b) Section 104(b) is amended to read as follows:

'(b) Not later than January 31 of each year, the Commission shall submit to the President and to the Congress a report describing the activities and accomplishments of the Commission during the immediately preceding fiscal year.'.

SEC. 5. Section 106 (15 U.S.C. 4105) is amended—

(1) in paragraph (3), by striking out 'and' at the end thereof;

(2) in paragraph (4), by striking out the period at the end thereof and inserting in lieu thereof; and'; and

(3) by adding at the end thereof the following new paragraph:

'(5) appoint, and accept without compensation the services of, scientists and engineering specialists to be advisors to the Commission. Each advisor may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5, United States Code. Except for the purposes of chapter 81 of title 5 (relating to compensation for work injuries) and chapter 171 of title 28 (relating to tort claims) of the United States Code, an advisor appointed under this paragraph shall not be considered an employee of the United States for any purpose.'

SEC. 6. Subsection (b)(2) of section 108 (15 U.S.C. 4107(b)(2)) is amended to read as follows:

‘(2) a statement detailing with particularity the recommendations of the Commission with respect to Federal interagency activities in Arctic research and the disposition and responses to those recommendations.’

Appendix C. FY2021 NSF Budget Request for Arctic Research

Office of Polar Programs (OPP)

NSF—the lead federal agency for implementing Arctic research policy—carries out Arctic research activities through its Office of Polar Programs (OPP), which operates as part of NSF's Directorate for Geosciences (GEO). NSF is requesting a total of $419.8 million for OPP for FY2021, a decrease of 14.1% from the $488.7 million actual for FY2019. (Actuals for FY2020 were not available when NSF's FY2021 budget book was prepared.) Within the $419.8 million requested for OPP for FY2021 is $101.3 million requested for research in both the Arctic and Antarctic, a decrease of 17.7% from the $123.1 million actual for FY2019. Also within the $419.8 million requested for OPP for FY2021 is $40.5 million requested for Arctic research and support logistics, a decrease of 19.2% from the $50.2 million actual for FY2019.[373] Regarding its FY2021 budget request for OPP, NSF states that

> OPP invests in polar scientific research and education as well as provides research support and logistics including infrastructure, such as permanent stations and temporary field camps, in the Antarctic and the Arctic. OPP's FY 2021 Request is influenced by three key priorities: (1) maintaining strong disciplinary programs that provide the basis for investments in cross-disciplinary system science programs; (2) supporting critical facilities that enable research in the Earth's polar regions; and (3) supporting the construction phase of the Antarctic Infrastructure Modernization for Science (AIMS) project which was awarded to Leidos Corporation in May 2019. These priorities reflect opportunities for fundamental scientific discovery uniquely accessible in polar regions, as well as studies to investigate the causes and future trajectory of environmental, biological, and human system changes now being observed in the polar regions that have possible global implications.
>
> OPP is the primary U.S. supporter of fundamental research in the polar regions. In the Arctic, NSF helps coordinate research planning as directed by the Arctic Research Policy Act of 1984, and the NSF Director chairs the Interagency Arctic Research Policy Committee (IARPC) created for this purpose.…
>
> In addition to shared cross-directorate basic research objectives, OPP investments will be guided by recent sponsored studies to identify priority areas and ensure effective polar research programs:
>
> • For the Arctic, IARPC's Arctic Research Plan: FY 2017-2021 and the World Meteorological Organization's Year of Polar Prediction Implementation Plan 2 inform science investment priorities. Efforts to build an integrated research capacity to address the potential opportunities and challenges of Arctic change for the Nation's security and economics and well-being of Arctic residents will continue….
>
> Major Investments…
>
> • Arctic programs will continue to focus on integrating sustained observations, process studies, theory, and modeling of the natural and social systems to understand and improve predictions of the changing Arctic and its role in the Earth system. This has, in prior years and will in FY 2021, include investments in polar cyberinfrastructure, data analytics, and software. A major FY 2019 investment was made in the Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC),4 an international study of the

[373] National Science Foundation, *FY 2021 Budget Request to Congress*, February 10, 2020, p. OPP-1. The dollar figures in this paragraph have been rounded to the nearest tenth of a million.

> formation and melt of sea-ice in the central Arctic Ocean with a year-round field presence that extends into FY 2020. NSF will continue to invest in this effort as the project transitions from field work to analysis of the data generated by the observations. Arctic programs will continue to invest in the Navigating the New Arctic NSF-wide Big Idea that will support research needed to inform the economy, security, and resilience of the Nation, the larger region, and the globe in the face of a rapidly changing Arctic.[374]

Navigating the New Arctic (NNA)

NSF states in the overview of its FY2021 budget request that "in 2021, NSF will continue to invest in its Big Ideas and the Convergence Accelerator, which support bold inquiries into the frontiers of science and engineering. These efforts endeavor to break down the silos of conventional scientific research funded by NSF to embrace the cross-disciplinary and dynamic nature of the science of the future. The Big Ideas represent unique opportunities for the U.S. to define and push the frontiers of global science and engineering leadership and to invest in fundamental research. This research will advance the Nation's economic competitiveness, security, and prestige on the global stage. For more information, see the NSF-Wide Investments chapter."[375] Among the six research Big Ideas, NSF states in its overview that number four is

> **Navigating the New Arctic (NNA)** ($30.0 million): Establishing an observing network of mobile and fixed platforms and tools, including cyber tools, across the Arctic to document and understand the Arctic's rapid biological, physical, chemical, and social changes, in partnership with other agencies, countries, and native populations.[376]

NSF's is requesting $40.8 million for NNA for FY2021, including $30.0 million (noted above) for stewardship activities and $10.8 million for foundational activities.[377] NSF's discussion of NNA states:

> **Overview**
>
> Arctic temperatures are rising faster than nearly everywhere else on Earth. The rapid and wide-scale changes occurring in response to this warming portend new opportunities and risks to natural systems; social and cultural systems; economic, political, and legal systems; and infrastructure and other engineered systems of the Arctic and across the globe. Gaps in scientific observations and the prevalence of interdependent social, natural, and built systems in the Arctic make it challenging to predict the region's future. Understanding and adapting to a changing Arctic will require creative new directions for Arctic-specific research, education, workforce development, and leveraging of science, engineering, and technology advances from outside the Arctic.
>
> NNA, one of NSF's Big Ideas, embodies the Foundation's forward-looking response to these profound challenges. NNA seeks innovations in Arctic observational networks and fundamental convergence research across engineering and the social, natural, environmental, and computing and information sciences, that address the interactions or connections between natural and built environments and social systems and how these connections inform our understanding of Arctic change and its local and global effects. NNA empowers new research communities; diversifies the next generation of Arctic researchers; integrates the co-production of knowledge with local and Indigenous people

[374] National Science Foundation, *FY 2021 Budget Request to Congress*, February 10, 2020, pp. OPP-1 to OPP-2.

[375] National Science Foundation, *FY 2021 Budget Request to Congress*, February 10, 2020, p. Overview-9.

[376] National Science Foundation, *FY 2021 Budget Request to Congress*, February 10, 2020, p. Overview-9. Emphasis as in original.

[377] National Science Foundation, *FY 2021 Budget Request to Congress*, February 10, 2020, p. NSF-Wide Investments-11.

and organizations; and engages with interdisciplinary, interagency, and international partners to further pan-Arctic and Arctic-global perspectives.

With respect to observational research, NNA will address key gaps in the existing array of observation, communication, computation and data systems. Strong coupling of observation, communication, and computation and data, including the theoretical foundations underlying these, will be supported to ensure progress. NNA will leverage resources with the Mid-scale RI and HDR Big Ideas as appropriate.

NNA also strongly encourages projects with components that advance STEM education; that deepen public understanding of the changing Arctic to benefit both citizens and policy makers; and that advance workforce-development objectives. NNA will build on NSF's STEM investments and the NSF INCLUDES Big Idea to encourage innovative and appropriately evaluated education and public engagement efforts that leverage exciting NNA science and inspire diverse participation in STEM.

By drawing upon expertise from across the agency, NNA investments will accelerate research needed to inform decisions regarding the national security, economic development, and societal well-being of the U.S. as an Arctic nation and enable resilient, sustainable Arctic communities. NSF plans to invest in NNA through FY 2023.

Goals

1. Improved understanding of Arctic change and its local and global effects that capitalizes on: innovative and optimized observation infrastructure; advances in understanding of fundamental processes; and new approaches to modeling interactions among the natural environment, built environment, and social systems.

2. New and enhanced research communities that are diverse, integrative, and well-positioned to carry out productive research on the interactions or connections between Arctic natural and built environments and social systems and how these connections inform our understanding of Arctic change and its local and global effects.

3. Research outcomes that inform U.S. national security, economic development, and societal well-being and enable resilient, sustainable Arctic communities.

4. Enhanced efforts in formal and informal education that focus on the multi-scale impacts of Arctic change on natural and built environments and social systems and broadly disseminate research outcomes.

In FY 2017, NSF issued a Dear Colleague letter (DCL) on the Growing Convergence Research Big Idea (NSF 17-065)1 to explore convergence approaches within four of the research-focused NSF Big Ideas, including NNA. This DCL requested proposals for Research Coordination Networks (RCNs), workshops, and activities to enhance Arctic observational systems. In FY 2018, NSF issued a DCL on Stimulating Research Related to NNA (NSF 18-048),2 requesting research proposals building on the FY 2017 awards, as well as proposals for workshops and RCNs. NSF awarded 25 new projects under these two DCLs and related opportunities with budgets ranging from $50,000 to $1.50 million lasting up to 60 months. In FY 2019, NSF issued a solicitation for NNA (NSF 19-511)3 and made 13 awards to support research projects, and eight awards to support planning projects that will develop convergence research teams, with budgets ranging from $13,000 to $3.0 million lasting up to 60 months.

FY 2021 Investments

NSF's NNA activities in FY 2021 will focus on enabling advances in priority areas, which will be developed by building on outcomes from FY 2017 to FY 2020 activities. In FY 2020, NNA is focusing on convergent social/built/natural environment systems science; advances in observation, communication, and computation and data systems; and

community-coordination activities. In FY 2021, NSF will continue support for NNA, and expects to issue another solicitation.

NSF will continue to coordinate and leverage NNA-related activities with external stakeholders, including:

• other federal agencies through the Interagency Arctic Research Policy Committee chaired by the NSF Director;

• local residents and indigenous peoples through state and local governance structures of Alaska; and

• international partners through fora such as the biannual International Arctic Science Ministerial.

The portfolio of FY 2021 NNA activities will support the goals listed above.[378]

August 2020 Memorandum on FY2022 Research and Development Priorities

An August 14, 2020, memorandum from the Executive Office of the President on the Administration's FY2022 research and development budget priorities and cross-cutting actions included the following references to the Arctic:

4. American Energy and Environmental Leadership

Advancing energy technologies to assure a secure and abundant energy supply, understanding our unexplored ocean and expanding use of ocean data, improving our Earth system prediction capabilities, and the Arctic are Administration priorities that will enhance the Nation's economic vitality, national security, and environmental quality and are critical to the well-being and prosperity of all Americans….

Arctic: The United States is an Arctic nation, and the rapidly changing conditions in the Arctic have national security, commerce, and transportation implications that other nations are already addressing. Departments and agencies should prioritize research investments that enhance our ability to observe, understand, and predict the physical, biological, and socio-economic processes of the Arctic to protect and advance American interests.[379]

[378] National Science Foundation, *FY 2021 Budget Request to Congress*, February 10, 2020, pp. NSF-Wide Investments–11 to NSF-Wide Investments–12.

[379] Executive Office of the President, Memorandum for the Heads of Executive Departments and Agencies, Subject: Fiscal Year (FY) 2022 Administration Research and Development Budget Priorities and Cross-cutting Actions, August 14, 2020, pp. 6, 7.

Appendix D. Major U.S. Policy Documents Relating to Arctic

January 2009 Arctic Policy Directive (NSPD 66/HSPD 25)

On January 12, 2009, the George W. Bush Administration released a presidential directive establishing a new U.S. policy for the Arctic region. The directive, dated January 9, 2009, was issued as National Security Presidential Directive 66/Homeland Security Presidential Directive 25 (NSPD 66/HSPD 25). The text of NSPD 66/HSPD 25 is as follows:

> SUBJECT: Arctic Region Policy
>
> I. PURPOSE
>
> A. This directive establishes the policy of the United States with respect to the Arctic region and directs related implementation actions. This directive supersedes Presidential Decision Directive/NSC-26 (PDD-26; issued 1994) with respect to Arctic policy but not Antarctic policy; PDD-26 remains in effect for Antarctic policy only.
>
> B. This directive shall be implemented in a manner consistent with the Constitution and laws of the United States, with the obligations of the United States under the treaties and other international agreements to which the United States is a party, and with customary international law as recognized by the United States, including with respect to the law of the sea.
>
> II. BACKGROUND
>
> A. The United States is an Arctic nation, with varied and compelling interests in that region. This directive takes into account several developments, including, among others:
>
> 1. Altered national policies on homeland security and defense;
>
> 2. The effects of climate change and increasing human activity in the Arctic region;
>
> 3. The establishment and ongoing work of the Arctic Council; and
>
> 4. A growing awareness that the Arctic region is both fragile and rich in resources.
>
> III. POLICY
>
> A. It is the policy of the United States to:
>
> 1. Meet national security and homeland security needs relevant to the Arctic region;
>
> 2. Protect the Arctic environment and conserve its biological resources;
>
> 3. Ensure that natural resource management and economic development in the region are environmentally sustainable;
>
> 4. Strengthen institutions for cooperation among the eight Arctic nations (the United States, Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, and Sweden);
>
> 5. Involve the Arctic's indigenous communities in decisions that affect them; and
>
> 6. Enhance scientific monitoring and research into local, regional, and global environmental issues.
>
> B. National Security and Homeland Security Interests in the Arctic
>
> 1. The United States has broad and fundamental national security interests in the Arctic region and is prepared to operate either independently or in conjunction with other states to safeguard these interests. These interests include such matters as missile defense and

early warning; deployment of sea and air systems for strategic sealift, strategic deterrence, maritime presence, and maritime security operations; and ensuring freedom of navigation and overflight.

2. The United States also has fundamental homeland security interests in preventing terrorist attacks and mitigating those criminal or hostile acts that could increase the United States vulnerability to terrorism in the Arctic region.

3. The Arctic region is primarily a maritime domain; as such, existing policies and authorities relating to maritime areas continue to apply, including those relating to law enforcement.[1] Human activity in the Arctic region is increasing and is projected to increase further in coming years. This requires the United States to assert a more active and influential national presence to protect its Arctic interests and to project sea power throughout the region.

4. The United States exercises authority in accordance with lawful claims of United States sovereignty, sovereign rights, and jurisdiction in the Arctic region, including sovereignty within the territorial sea, sovereign rights and jurisdiction within the United States exclusive economic zone and on the continental shelf, and appropriate control in the United States contiguous zone.

5. Freedom of the seas is a top national priority. The Northwest Passage is a strait used for international navigation, and the Northern Sea Route includes straits used for international navigation; the regime of transit passage applies to passage through those straits. Preserving the rights and duties relating to navigation and overflight in the Arctic region supports our ability to exercise these rights throughout the world, including through strategic straits.

6. Implementation: In carrying out this policy as it relates to national security and homeland security interests in the Arctic, the Secretaries of State, Defense, and Homeland Security, in coordination with heads of other relevant executive departments and agencies, shall:

a. Develop greater capabilities and capacity, as necessary, to protect United States air, land, and sea borders in the Arctic region;

b. Increase Arctic maritime domain awareness in order to protect maritime commerce, critical infrastructure, and key resources;

c. Preserve the global mobility of United States military and civilian vessels and aircraft throughout the Arctic region;

d. Project a sovereign United States maritime presence in the Arctic in support of essential United States interests; and

e. Encourage the peaceful resolution of disputes in the Arctic region.

C. International Governance

1. The United States participates in a variety of fora, international organizations, and bilateral contacts that promote United States interests in the Arctic. These include the Arctic Council, the International Maritime Organization (IMO), wildlife conservation and management agreements, and many other mechanisms. As the Arctic changes and human activity in the region increases, the United States and other governments should consider, as appropriate, new international arrangements or enhancements to existing arrangements.

2. The Arctic Council has produced positive results for the United States by working within its limited mandate of environmental protection and sustainable development. Its subsidiary bodies, with help from many United States agencies, have developed and undertaken projects on a wide range of topics. The Council also provides a beneficial venue for interaction with indigenous groups. It is the position of the United States that the Arctic Council should remain a high-level forum devoted to issues within its current mandate and

not be transformed into a formal international organization, particularly one with assessed contributions. The United States is nevertheless open to updating the structure of the Council, including consolidation of, or making operational changes to, its subsidiary bodies, to the extent such changes can clearly improve the Council's work and are consistent with the general mandate of the Council.

3. The geopolitical circumstances of the Arctic region differ sufficiently from those of the Antarctic region such that an "Arctic Treaty" of broad scope—along the lines of the Antarctic Treaty—is not appropriate or necessary.

4. The Senate should act favorably on U.S. accession to the U.N. Convention on the Law of the Sea promptly, to protect and advance U.S. interests, including with respect to the Arctic. Joining will serve the national security interests of the United States, including the maritime mobility of our Armed Forces worldwide. It will secure U.S. sovereign rights over extensive marine areas, including the valuable natural resources they contain. Accession will promote U.S. interests in the environmental health of the oceans. And it will give the United States a seat at the table when the rights that are vital to our interests are debated and interpreted.

5. Implementation: In carrying out this policy as it relates to international governance, the Secretary of State, in coordination with heads of other relevant executive departments and agencies, shall:

a. Continue to cooperate with other countries on Arctic issues through the United Nations (U.N.) and its specialized agencies, as well as through treaties such as the U.N. Framework Convention on Climate Change, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Long Range Transboundary Air Pollution and its protocols, and the Montreal Protocol on Substances that Deplete the Ozone Layer;

b. Consider, as appropriate, new or enhanced international arrangements for the Arctic to address issues likely to arise from expected increases in human activity in that region, including shipping, local development and subsistence, exploitation of living marine resources, development of energy and other resources, and tourism;

c. Review Arctic Council policy recommendations developed within the ambit of the Council's scientific reviews and ensure the policy recommendations are subject to review by Arctic governments; and

d. Continue to seek advice and consent of the United States Senate to accede to the 1982 Law of the Sea Convention.

D. Extended Continental Shelf and Boundary Issues

1. Defining with certainty the area of the Arctic seabed and subsoil in which the United States may exercise its sovereign rights over natural resources such as oil, natural gas, methane hydrates, minerals, and living marine species is critical to our national interests in energy security, resource management, and environmental protection. The most effective way to achieve international recognition and legal certainty for our extended continental shelf is through the procedure available to States Parties to the U.N. Convention on the Law of the Sea.

2. The United States and Canada have an unresolved boundary in the Beaufort Sea. United States policy recognizes a boundary in this area based on equidistance. The United States recognizes that the boundary area may contain oil, natural gas, and other resources.

3. The United States and Russia are abiding by the terms of a maritime boundary treaty concluded in 1990, pending its entry into force. The United States is prepared to enter the agreement into force once ratified by the Russian Federation.

4. Implementation: In carrying out this policy as it relates to extended continental shelf and boundary issues, the Secretary of State, in coordination with heads of other relevant executive departments and agencies, shall:

a. Take all actions necessary to establish the outer limit of the continental shelf appertaining to the United States, in the Arctic and in other regions, to the fullest extent permitted under international law;

b. Consider the conservation and management of natural resources during the process of delimiting the extended continental shelf; and

c. Continue to urge the Russian Federation to ratify the 1990 United States-Russia maritime boundary agreement.

E. Promoting International Scientific Cooperation

1. Scientific research is vital for the promotion of United States interests in the Arctic region. Successful conduct of U.S. research in the Arctic region requires access throughout the Arctic Ocean and to terrestrial sites, as well as viable international mechanisms for sharing access to research platforms and timely exchange of samples, data, and analyses. Better coordination with the Russian Federation, facilitating access to its domain, is particularly important.

2. The United States promotes the sharing of Arctic research platforms with other countries in support of collaborative research that advances fundamental understanding of the Arctic region in general and potential Arctic change in particular. This could include collaboration with bodies such as the Nordic Council and the European Polar Consortium, as well as with individual nations.

3. Accurate prediction of future environmental and climate change on a regional basis, and the delivery of near real-time information to end-users, requires obtaining, analyzing, and disseminating accurate data from the entire Arctic region, including both paleoclimatic data and observational data. The United States has made significant investments in the infrastructure needed to collect environmental data in the Arctic region, including the establishment of portions of an Arctic circumpolar observing network through a partnership among United States agencies, academic collaborators, and Arctic residents. The United States promotes active involvement of all Arctic nations in these efforts in order to advance scientific understanding that could provide the basis for assessing future impacts and proposed response strategies.

4. United States platforms capable of supporting forefront research in the Arctic Ocean, including portions expected to be ice-covered for the foreseeable future, as well as seasonally ice-free regions, should work with those of other nations through the establishment of an Arctic circumpolar observing network. All Arctic nations are members of the Group on Earth Observations partnership, which provides a framework for organizing an international approach to environmental observations in the region. In addition, the United States recognizes that academic and research institutions are vital partners in promoting and conducting Arctic research.

5. Implementation: In carrying out this policy as it relates to promoting scientific international cooperation, the Secretaries of State, the Interior, and Commerce and the Director of the National Science Foundation, in coordination with heads of other relevant executive departments and agencies, shall:

a. Continue to play a leadership role in research throughout the Arctic region;

b. Actively promote full and appropriate access by scientists to Arctic research sites through bilateral and multilateral measures and by other means;

c. Lead the effort to establish an effective Arctic circumpolar observing network with broad partnership from other relevant nations;

d. Promote regular meetings of Arctic science ministers or research council heads to share information concerning scientific research opportunities and to improve coordination of international Arctic research programs;

e. Work with the Interagency Arctic Research Policy Committee (IARPC) to promote research that is strategically linked to U.S. policies articulated in this directive, with input from the Arctic Research Commission; and

f. Strengthen partnerships with academic and research institutions and build upon the relationships these institutions have with their counterparts in other nations.

F. Maritime Transportation in the Arctic Region

1. The United States priorities for maritime transportation in the Arctic region are:

a. To facilitate safe, secure, and reliable navigation;

b. To protect maritime commerce; and

c. To protect the environment.

2. Safe, secure, and environmentally sound maritime commerce in the Arctic region depends on infrastructure to support shipping activity, search and rescue capabilities, short- and long-range aids to navigation, high-risk area vessel-traffic management, iceberg warnings and other sea ice information, effective shipping standards, and measures to protect the marine environment. In addition, effective search and rescue in the Arctic will require local, State, Federal, tribal, commercial, volunteer, scientific, and multinational cooperation.

3. Working through the International Maritime Organization (IMO), the United States promotes strengthening existing measures and, as necessary, developing new measures to improve the safety and security of maritime transportation, as well as to protect the marine environment in the Arctic region. These measures may include ship routing and reporting systems, such as traffic separation and vessel traffic management schemes in Arctic chokepoints; updating and strengthening of the Guidelines for Ships Operating in Arctic Ice-Covered Waters; underwater noise standards for commercial shipping; a review of shipping insurance issues; oil and other hazardous material pollution response agreements; and environmental standards.

4. Implementation: In carrying out this policy as it relates to maritime transportation in the Arctic region, the Secretaries of State, Defense, Transportation, Commerce, and Homeland Security, in coordination with heads of other relevant executive departments and agencies, shall:

a. Develop additional measures, in cooperation with other nations, to address issues that are likely to arise from expected increases in shipping into, out of, and through the Arctic region;

b. Commensurate with the level of human activity in the region, establish a risk-based capability to address hazards in the Arctic environment. Such efforts shall advance work on pollution prevention and response standards; determine basing and logistics support requirements, including necessary airlift and icebreaking capabilities; and improve plans and cooperative agreements for search and rescue;

c. Develop Arctic waterways management regimes in accordance with accepted international standards, including vessel traffic-monitoring and routing; safe navigation standards; accurate and standardized charts; and accurate and timely environmental and navigational information; and

d. Evaluate the feasibility of using access through the Arctic for strategic sealift and humanitarian aid and disaster relief.

G. Economic Issues, Including Energy

1. Sustainable development in the Arctic region poses particular challenges. Stakeholder input will inform key decisions as the United States seeks to promote economic and energy security. Climate change and other factors are significantly affecting the lives of Arctic inhabitants, particularly indigenous communities. The United States affirms the importance to Arctic communities of adapting to climate change, given their particular vulnerabilities.

2. Energy development in the Arctic region will play an important role in meeting growing global energy demand as the area is thought to contain a substantial portion of the world's undiscovered energy resources. The United States seeks to ensure that energy development throughout the Arctic occurs in an environmentally sound manner, taking into account the interests of indigenous and local communities, as well as open and transparent market principles. The United States seeks to balance access to, and development of, energy and other natural resources with the protection of the Arctic environment by ensuring that continental shelf resources are managed in a responsible manner and by continuing to work closely with other Arctic nations.

3. The United States recognizes the value and effectiveness of existing fora, such as the Arctic Council, the International Regulators Forum, and the International Standards Organization.

4. Implementation: In carrying out this policy as it relates to economic issues, including energy, the Secretaries of State, the Interior, Commerce, and Energy, in coordination with heads of other relevant executive departments and agencies, shall:

a. Seek to increase efforts, including those in the Arctic Council, to study changing climate conditions, with a view to preserving and enhancing economic opportunity in the Arctic region. Such efforts shall include inventories and assessments of villages, indigenous communities, subsistence opportunities, public facilities, infrastructure, oil and gas development projects, alternative energy development opportunities, forestry, cultural and other sites, living marine resources, and other elements of the Arctic's socioeconomic composition;

b. Work with other Arctic nations to ensure that hydrocarbon and other development in the Arctic region is carried out in accordance with accepted best practices and internationally recognized standards and the 2006 Group of Eight (G-8) Global Energy Security Principles;

c. Consult with other Arctic nations to discuss issues related to exploration, production, environmental and socioeconomic impacts, including drilling conduct, facility sharing, the sharing of environmental data, impact assessments, compatible monitoring programs, and reservoir management in areas with potentially shared resources;

d. Protect United States interests with respect to hydrocarbon reservoirs that may overlap boundaries to mitigate adverse environmental and economic consequences related to their development;

e. Identify opportunities for international cooperation on methane hydrate issues, North Slope hydrology, and other matters;

f. Explore whether there is a need for additional fora for informing decisions on hydrocarbon leasing, exploration, development, production, and transportation, as well as shared support activities, including infrastructure projects; and

g. Continue to emphasize cooperative mechanisms with nations operating in the region to address shared concerns, recognizing that most known Arctic oil and gas resources are located outside of United States jurisdiction.

H. Environmental Protection and Conservation of Natural Resources

1. The Arctic environment is unique and changing. Increased human activity is expected to bring additional stressors to the Arctic environment, with potentially serious consequences for Arctic communities and ecosystems.

2. Despite a growing body of research, the Arctic environment remains poorly understood. Sea ice and glaciers are in retreat. Permafrost is thawing and coasts are eroding. Pollutants from within and outside the Arctic are contaminating the region. Basic data are lacking in many fields. High levels of uncertainty remain concerning the effects of climate change and increased human activity in the Arctic. Given the need for decisions to be based on sound scientific and socioeconomic information, Arctic environmental research, monitoring, and vulnerability assessments are top priorities. For example, an understanding of the probable consequences of global climate variability and change on Arctic ecosystems is essential to guide the effective long-term management of Arctic natural resources and to address socioeconomic impacts of changing patterns in the use of natural resources.

3. Taking into account the limitations in existing data, United States efforts to protect the Arctic environment and to conserve its natural resources must be risk-based and proceed on the basis of the best available information.

4. The United States supports the application in the Arctic region of the general principles of international fisheries management outlined in the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of December 10, 1982, relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks and similar instruments. The United States endorses the protection of vulnerable marine ecosystems in the Arctic from destructive fishing practices and seeks to ensure an adequate enforcement presence to safeguard Arctic living marine resources.

5. With temperature increases in the Arctic region, contaminants currently locked in the ice and soils will be released into the air, water, and land. This trend, along with increased human activity within and below the Arctic, will result in increased introduction of contaminants into the Arctic, including both persistent pollutants (e.g., persistent organic pollutants and mercury) and airborne pollutants (e.g., soot).

6. Implementation: In carrying out this policy as it relates to environmental protection and conservation of natural resources, the Secretaries of State, the Interior, Commerce, and Homeland Security and the Administrator of the Environmental Protection Agency, in coordination with heads of other relevant executive departments and agencies, shall:

a. In cooperation with other nations, respond effectively to increased pollutants and other environmental challenges;

b. Continue to identify ways to conserve, protect, and sustainably manage Arctic species and ensure adequate enforcement presence to safeguard living marine resources, taking account of the changing ranges or distribution of some species in the Arctic. For species whose range includes areas both within and beyond United States jurisdiction, the United States shall continue to collaborate with other governments to ensure effective conservation and management;

c. Seek to develop ways to address changing and expanding commercial fisheries in the Arctic, including through consideration of international agreements or organizations to govern future Arctic fisheries;

d. Pursue marine ecosystem-based management in the Arctic; and

e. Intensify efforts to develop scientific information on the adverse effects of pollutants on human health and the environment and work with other nations to reduce the introduction of key pollutants into the Arctic.

IV. Resources and Assets

A. Implementing a number of the policy elements directed above will require appropriate resources and assets. These elements shall be implemented consistent with applicable law and authorities of agencies, or heads of agencies, vested by law, and subject to the availability of appropriations. The heads of executive departments and agencies with responsibilities relating to the Arctic region shall work to identify future budget, administrative, personnel, or legislative proposal requirements to implement the elements of this directive.

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[1] These policies and authorities include Freedom of Navigation (PDD/NSC-32), the U.S. Policy on Protecting the Ocean Environment (PDD/NSC-36), Maritime Security Policy (NSPD-41/HSPD-13), and the National Strategy for Maritime Security (NSMS).[380]

May 2013 National Strategy for Arctic Region

On May 10, 2013, the Obama Administration released a document entitled *National Strategy for the Arctic Region*.[381] The document appears to supplement rather than supersede the January 2009 Arctic policy directive (NSPD 66/HSPD 25) discussed above.[382] The executive summary of *National Strategy for the Arctic Region* states the following:

> The *National Strategy for the Arctic Region* sets forth the United States Government's strategic priorities for the Arctic region. This strategy is intended to position the United States to respond effectively to challenges and emerging opportunities arising from significant increases in Arctic activity due to the diminishment of sea ice and the emergence of a new Arctic environment. It defines U.S. national security interests in the Arctic region and identifies prioritized lines of effort, building upon existing initiatives by Federal, state, local, and tribal authorities, the private sector, and international partners, and aims to focus efforts where opportunities exist and action is needed. It is designed to meet the reality of a changing Arctic environment, while we simultaneously pursue our global objective of combating the climatic changes that are driving these environmental conditions. Our strategy is built on three lines of effort:
>
> 1. **Advance United States Security Interests** – We will enable our vessels and aircraft to operate, consistent with international law, through, under, and over the airspace and waters of the Arctic, support lawful commerce, achieve a greater awareness of activity in the region, and intelligently evolve our Arctic infrastructure and capabilities, including ice-capable platforms as needed. U.S. security in the Arctic encompasses a broad spectrum of activities, ranging from those supporting safe commercial and scientific operations to national defense.
>
> 2. **Pursue Responsible Arctic Region Stewardship** – We will continue to protect the Arctic environment and conserve its resources; establish and institutionalize an integrated Arctic management framework; chart the Arctic region; and employ scientific research and traditional knowledge to increase understanding of the Arctic.

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[380] Source for text: http://fas.org/irp/offdocs/nspd/nspd-66.htm. The text is also available at http://www.nsf.gov/od/opp/opp_advisory/briefings/may2009/nspd66_hspd25.pdf.

[381] *National Strategy for the Arctic Region*, May 2013, 11 pp. The document includes a cover letter from President Obama dated May 10, 2013.

[382] *National Strategy for the Arctic Region* states on page 6 that the "lines of effort" it describes are to be undertaken "[t]o meet the challenges and opportunities in the Arctic region, and in furtherance of established Arctic Region Policy," at which point there is a footnote referencing the January 2009 Arctic policy directive.

> 3. **Strengthen International Cooperation** – Working through bilateral relationships and multilateral bodies, including the Arctic Council, we will pursue arrangements that advance collective interests, promote shared Arctic state prosperity, protect the Arctic environment, and enhance regional security, and we will work toward U.S. accession to the United Nations Convention on the Law of the Sea (Law of the Sea Convention).
>
> Our approach will be informed by the following guiding principles:
>
> • **Safeguard Peace and Stability** – Seek to maintain and preserve the Arctic region as an area free of conflict, acting in concert with allies, partners, and other interested parties. Support and preserve: international legal principles of freedom of navigation and overflight and other uses of the sea and airspace related to these freedoms, unimpeded lawful commerce, and the peaceful resolution of disputes for all nations.
>
> • **Make Decisions Using the Best Available Information** – Across all lines of effort, decisions need to be based on the most current science and traditional knowledge.[383]
>
> • **Pursue Innovative Arrangements** – Foster partnerships with the state of Alaska, Arctic states, other international partners, and the private sector to more efficiently develop, resource, and manage capabilities, where appropriate and feasible, to better advance our strategic priorities in this austere fiscal environment.
>
> • **Consult and Coordinate with Alaska Natives** – Engage in a consultation process with Alaska Natives, recognizing tribal governments' unique legal relationship with the United States and providing for meaningful and timely opportunity to inform Federal policy affecting Alaskan Native communities.[384]

January 2014 Implementation Plan for National Strategy for Arctic Region

On January 30, 2014, the Obama Administration released an implementation plan for the May 2013 national strategy for the Arctic region.[385] The plan states that it

> complements and builds upon existing initiatives by Federal, State, local, and tribal authorities, the private sector, and international partners, and focuses efforts where opportunities exist and action is most needed. The Implementation Plan reflects the reality of a changing Arctic environment and upholds national interests in safety, security, and environmental protection, and works with international partners to pursue global objectives of addressing climatic changes.
>
> This Implementation Plan follows the structure and objectives of the Strategy's three lines of effort and is consistent with the guiding principles. The lines of effort of the Strategy and the Implementation Plan are as follows:
>
> • Advance United States Security Interests
>
> • Pursue Responsible Arctic Region Stewardship

[383] A footnote in the document at this point states the following: "Traditional knowledge refers to a body of evolving practical knowledge based on observations and personal experience of indigenous communities over an extensive, multigenerational time period." (BOEM Ocean Science, Vol. 9, Issue 2, May/April/June 2012, page 4).

[384] *National Strategy for the Arctic Region*, May 2013, pp. 2-3.

[385] *Implementation Plan for The National Strategy for the Arctic Region*, January 2014, 32 pp. The news release announcing the implementation plan is posted at http://www.whitehouse.gov/blog/2014/01/30/white-house-releases-implementation-plan-national-strategy-arctic-region. The document itself is posted at https://obamawhitehouse.archives.gov/sites/default/files/docs/implementation_plan_for_the_national_strategy_for_the_arctic_region_-_fi....pdf.

> • Strengthen International Cooperation
>
> These lines of effort and guiding principles are meant to be implemented as a coherent whole.[386]

The plan also states the following:

> Climate change is already affecting the entire global population, and Alaska residents are experiencing the impacts in the Arctic. To ensure a cohesive Federal approach, implementation activities must be aligned with the Executive Order on Preparing the United States for the Impacts of Climate Change[387] while executing the Strategy. In addition to the guiding principles, the following approaches are important in implementing the activities across all of the lines of effort:
>
> • Foster Partnerships with Arctic Stakeholders. As outlined in the Strategy, all lines of effort must involve Arctic partners, particularly the State of Alaska and Alaska Natives in the Arctic region. Federal agencies, the State of Alaska, tribal communities, local governments, and academia will work with other nations, industry stakeholders, non-governmental organizations, and research partners to address emerging challenges and opportunities in the Arctic environment. The Federal Government should strive to maintain the free flow of communication and cooperation with the State of Alaska to support national priorities.
>
> • Coordinate and Integrate Activities across the Federal Government. Multiple Federal bodies currently have authority for Arctic policy (e.g., the National Ocean Council (NOC), Arctic Policy Group, and Interagency Arctic Research Policy Committee (IARPC)). The National Security Council Staff will develop an Executive Order through the interagency process to maximize efficiency, align interagency initiatives, and create unity of effort among all Federal entities conducting activities in the Arctic.[388]

The plan outlines about 36 specific initiatives. For each, it presents a brief statement of the objective, a list of next steps to be taken, a brief statement about measuring progress in achieving the objective, and the names of the lead and supporting federal agencies to be involved.

On March 9, 2016, the Obama Administration released three documents discussing the implementation of the national strategy for the Arctic:[389] (1) a report entitled *2015 Year in Review—Progress Report on the Implementation of the National Strategy for the Arctic Region*;[390] (2) an appendix to that report entitled *Appendix A, Implementation Framework for the National Strategy for the Arctic Region*:[391] and (3) another appendix to that report entitled *Appendix B,*

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[386] *Implementation Plan for The National Strategy for the Arctic Region*, January 2014, p. 1.

[387] The passage contains a footnote at this point stating that this executive order was signed by the President on November 1, 2013. It is Executive Order 13653. The text of the order is posted at http://www.gpo.gov/fdsys/pkg/FR-2013-11-06/pdf/2013-26785.pdf and http://www.whitehouse.gov/the-press-office/2013/11/01/executive-order-preparing-united-states-impacts-climate-change. A fact sheet about it is posted at http://www.whitehouse.gov/the-press-office/2013/11/01/fact-sheet-executive-order-climate-preparedness.

[388] *Implementation Plan for The National Strategy for the Arctic Region*, January 2014, p. 4.

[389] For the text of the Obama Administration's announcement releasing these documents, see "Advancing Implementation of the National Strategy for the Arctic Region," March 9, 2016, accessed April 8, 2021, at https://obamawhitehouse.archives.gov/blog/2016/03/09/advancing-implementation-national-strategy-arctic-region.

[390] *2015 Year in Review—Progress Report on the Implementation of the National Strategy for the Arctic Region*, Prepared by the Arctic Executive Steering Committee, March 2016, 35 pp., accessed April 8, 2021, at https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/Progress%20Report%20on%20the%20Implementation%20of%20the%20National%20Strategy%20for%20the%20Arctic%20Region.pdf.

[391] *Appendix A, Implementation Framework for the National Strategy for the Arctic Region*, March 2016, 33 pp., accessed April 8, 2021, at https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/

Interagency Arctic Research Policy Committee 5-Year Plan Collaboration Teams: 2015 Summary of Accomplishments and 2016 Priorities.[392]

January 2015 Executive Order for Enhancing Coordination of Arctic Efforts

On January 21, 2015, then-President Obama issued Executive Order 13689, entitled "Enhancing Coordination of National Efforts in the Arctic." The order states the following in part:

> As the United States assumes the Chairmanship of the Arctic Council, it is more important than ever that we have a coordinated national effort that takes advantage of our combined expertise and efforts in the Arctic region to promote our shared values and priorities.
>
> As the Arctic has changed, the number of Federal working groups created to address the growing strategic importance and accessibility of this critical region has increased. Although these groups have made significant progress and achieved important milestones, managing the broad range of interagency activity in the Arctic requires coordinated planning by the Federal Government, with input by partners and stakeholders, to facilitate Federal, State, local, and Alaska Native tribal government and similar Alaska Native organization, as well as private and nonprofit sector, efforts in the Arctic....
>
> There is established an Arctic Executive Steering Committee (Steering Committee), which shall provide guidance to executive departments and agencies (agencies) and enhance coordination of Federal Arctic policies across agencies and offices, and, where applicable, with State, local, and Alaska Native tribal governments and similar Alaska Native organizations, academic and research institutions, and the private and nonprofit sectors....
>
> ... the Steering Committee will meet quarterly, or as appropriate, to shape priorities, establish strategic direction, oversee implementation, and ensure coordination of Federal activities in the Arctic....
>
> The Steering Committee, in coordination with the heads of relevant agencies and under the direction of the Chair, shall:
>
> (a) provide guidance and coordinate efforts to implement the priorities, objectives, activities, and responsibilities identified in National Security Presidential Directive 66/Homeland Security Presidential Directive 25, Arctic Region Policy, the National Strategy for the Arctic Region and its Implementation Plan, and related agency plans;
>
> (b) provide guidance on prioritizing Federal activities, consistent with agency authorities, while the United States is Chair of the Arctic Council, including, where appropriate, recommendations for resources to use in carrying out those activities; and
>
> (c) establish a working group to provide a report to the Steering Committee by May 1, 2015, that:
>
> (i) identifies potential areas of overlap between and within agencies with respect to implementation of Arctic policy and strategic priorities and provides recommendations to increase coordination and reduce any duplication of effort, which may include ways to increase the effectiveness of existing groups; and

National%20Strategy%20for%20the%20Arctic%20Region%20Implementation%20Framework%20%28Appendix%20A%29%20Final.pdf.

[392] *Appendix B, Interagency Arctic Research Policy Committee 5-Year Plan Collaboration Teams: 2015 Summary of Accomplishments and 2016 Priorities*, undated, 13 pp., accessed April 8, 2021, at https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/Appendix%20B%20IARPC%202015%20Annual%20Report.pdf.

> (ii) provides recommendations to address any potential gaps in implementation....
>
> It is in the best interest of the Nation for the Federal Government to maximize transparency and promote collaboration where possible with the State of Alaska, Alaska Native tribal governments and similar Alaska Native organizations, and local, private-sector, and nonprofit-sector stakeholders. To facilitate consultation and partnerships with the State of Alaska and Alaska Native tribal governments and similar Alaska Native organizations, the Steering Committee shall:
>
> (a) develop a process to improve coordination and the sharing of information and knowledge among Federal, State, local, and Alaska Native tribal governments and similar Alaska Native organizations, and private-sector and nonprofit-sector groups on Arctic issues;
>
> (b) establish a process to ensure tribal consultation and collaboration, consistent with my memorandum of November 5, 2009 (Tribal Consultation). This process shall ensure meaningful consultation and collaboration with Alaska Native tribal governments and similar Alaska Native organizations in the development of Federal policies that have Alaska Native implications, as applicable, and provide feedback and recommendations to the Steering Committee;
>
> (c) identify an appropriate Federal entity to be the point of contact for Arctic matters with the State of Alaska and with Alaska Native tribal governments and similar Alaska Native organizations to support collaboration and communication; and
>
> (d) invite members of State, local, and Alaska Native tribal governments and similar Alaska Native organizations, and academic and research institutions to consult on issues or participate in discussions, as appropriate and consistent with applicable law.[393]

As stated in the above-quoted passage, Executive Order 13689, among other things, established an Arctic Executive Steering Committee (AESC) to "provide guidance to executive departments and agencies (agencies) and enhance coordination of Federal Arctic policies across agencies and offices, and, where applicable, with State, local, and Alaska Native tribal governments and similar Alaska Native organizations, academic and research institutions, and the private and nonprofit sectors." Regarding the AESC, a February 28, 2019, press report states the following: "Although the [executive] order has not been rescinded, the Trump administration has left the committee dormant for the past two years."[394]

[393] Executive order, "Enhancing Coordination of National Efforts in the Arctic," January 21, 2015, accessed April 8, 2021, at https://obamawhitehouse.archives.gov/the-press-office/2015/01/21/executive-order-enhancing-coordination-national-efforts-arctic.

[394] Melody Schreiber, "Two U.S. Bills Could Advance American Presence in the Arctic," *ArcticToday*, February 28, 2019.

Appendix E. Arctic Council

This appendix provides additional background information on the Arctic Council.

Overview

The Arctic Council is the leading international forum for addressing issues relating to the Arctic. It was created in September 1996, following a series of meetings initiated by Finland in 1989.[395] Its founding document is the Ottawa Declaration of September 19, 1996, a joint declaration (not a treaty) signed by representatives of the eight Arctic states. The declaration states that the council "is established as a high level forum to," among other things, "provide a means for promoting cooperation, coordination and interaction among the Arctic States, with the involvement of the Arctic indigenous communities and other Arctic inhabitants on common Arctic issues, in particular issues of sustainable development and environmental protection in the Arctic…."[396]

The council describes itself on its website as "the leading intergovernmental forum promoting cooperation, coordination and interaction among the Arctic States, Arctic Indigenous peoples and other Arctic inhabitants on common Arctic issues, in particular on issues of sustainable development and environmental protection in the Arctic."[397] The State Department describes the council as "the preeminent intergovernmental forum for addressing issues related to the Arctic Region…. The Arctic Council is not a treaty-based international organization but rather an international forum that operates on the basis of consensus, echoing the peaceful and cooperative nature of the Arctic Region.[398]

Areas of focus addressed by the council include Arctic peoples, safeguarding Arctic biodiversity, the Arctic in a changing climate, cooperation for a sustainable Arctic Ocean, addressing pollution, and preventing and responding to emergencies.[399] The Ottawa Declaration states explicitly that "The Arctic Council should not deal with matters related to military security."

Organization and Operations

Eight Member States and Their Senior Arctic Officials (SAOs)

The Arctic Council's membership consists of the eight Arctic states. Each member state is represented by a Senior Arctic Official (SAO), who is usually drawn from that country's foreign ministry. SAOs meet at least twice per year.[400]

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[395] The council states, "The establishment of the Arctic Council was preceded by the Arctic Environmental Protection Strategy (June 1991), a declaration on the protection of the Arctic environment." (Arctic Council, "Frequently Asked Questions," updated May 7, 2015, accessed April 8, 2021, at https://arctic-council.org/en/news/frequently-asked-questions/.)

[396] Arctic Council, "Ottawa Declaration (1996)," accessed April 8, 2021, at https://oaarchive.arctic-council.org/handle/11374/85.

[397] Arctic Council, "The Arctic Council: A Backgrounder," updated September 13, 2018, accessed April 8, 2021, at https://arctic-council.org/en/about/.

[398] State Department, "Arctic Region," undated, accessed April 8, 2021, at https://www.state.gov/key-topics-office-of-ocean-and-polar-affairs/arctic/.

[399] See "Where We Focus" in Arctic Council, "Arctic Council," accessed April 8, 2021, at https://arctic-council.org/en/.

[400] Arctic Council, "Frequently Asked Questions," updated May 7, 2015, accessed April 8, 2021, at https://arctic-council.org/en/news/frequently-asked-questions/.

Indigenous Permanent Participants

In addition to the council's eight member states, six organizations representing Arctic indigenous peoples have status as Permanent Participants: the Aleut International Association, the Arctic Athabaskan Council, the Gwich'in Council International, the Inuit Circumpolar Council, the Russian Association of Indigenous Peoples of the North, and the Saami Council. The Permanent Participants "have full consultation rights in connection with the Council's negotiations and decisions. The Permanent Participants represent a unique feature of the Arctic Council, and they make valuable contributions to its activities in all areas."[401]

Observers

Thirteen non-Arctic states have been approved as observers to the council: Germany, the Netherlands, Poland, and the United Kingdom (approved in 1998); France (2000); Spain (2006); China, India, Italy, Japan, Singapore, and South Korea (2013); and Switzerland (2017). A November 22, 2019, press report states that "in 2015, uncertainty about their role led to a hiatus in observers being admitted."[402] In addition to state observers, 13 intergovernmental and interparliamentary organizations and 12 nongovernmental organizations have been approved as observers, making for a total of 38 observer states and organizations.[403] The most recently added observer was the International Maritime Organization (IMO), which was added to the list of intergovernmental and interparliamentary observer organizations in 2019.

Working Groups

The council's work is carried out primarily in six working groups that focus on Arctic contaminants; Arctic monitoring and assessment; conservation of Arctic flora and fauna; emergency prevention, preparedness and response; protection of the Arctic marine environment; and sustainable development.[404] The council may also establish task forces or expert groups for specific projects.

Secretariat

The council's standing Secretariat formally became operational in June 2013 in Tromsø, Norway.[405]

Chairmanship

The council has a two-year chairmanship that rotates among the eight member states. The United States held the chairmanship from April 24, 2015, to May 11, 2017, a period which began during

[401] Arctic Council, "Permanent Participants," accessed April 8, 2021, at https://arctic-council.org/en/about/permanent-participants/.

[402] Kevin McGwin, "Iceland Begins Its Arctic Council Chairmanship with a Focus on Observers," *ArcticToday*, November 22, 2019.

[403] For list of the 38 observers and when they were approved for observer status, see "Who We Are" in Arctic Council, "Arctic Council," accessed April 8, 2021, at https://arctic-council.org/en/.

[404] For more on the working groups, see "Working Groups" in "Arctic Council," Arctic Council, accessed April 8, 2021, at https://arctic-council.org/en/.

[405] For more on the Secretariat, see "Arctic Council Secretariat," Arctic Council, accessed April 8, 2021, at https://arctic-council.org/en/about/secretariat/.

the Obama Administration and continued into the first 16 weeks of the Trump Administration.[406] The United States will next hold the chairmanship in 2031-2033. On May 11, 2017, the chairmanship was transferred from the United States to Finland. On May 7, 2019, it was transferred from Finland to Iceland, which held the position until May 2021, when it was transferred to Russia.[407]

Decisionmaking

The council states that "All decisions of the Arctic Council and its subsidiary bodies are by consensus of the eight Arctic Member States."[408] More specifically, the council states that "Decisions at all levels in the Arctic Council are the exclusive right and responsibility of the eight Arctic States with the involvement of the Permanent Participants,"[409] and that "Arctic Council assessments and recommendations are the result of analysis and efforts undertaken by the Working Groups. Decisions of the Arctic Council are taken by consensus among the eight Arctic Council States, with full consultation and involvement of the Permanent Participants."[410]

Limits of Arctic Council as a Governing Body

Regarding the limits of the Arctic Council as a governing body, the council states that

> The Arctic Council is a forum; it has no programming budget. All projects or initiatives are sponsored by one or more Arctic States. Some projects also receive support from other entities.
>
> The Arctic Council does not and cannot implement or enforce its guidelines, assessments or recommendations. That responsibility belongs to individual Arctic States or international bodies.
>
> The Arctic Council's mandate, as articulated in the Ottawa Declaration, explicitly excludes military security.[411]

[406] See, for example, Yereth Rosen, "US Ends Arctic Council Chairmanship With Reluctance on Climate Action," *Alaska Dispatch News*, May 11, 2017.

[407] See Arctic Council, "Arctic Council Ministers meet, pass Chairmanship from Finland to Iceland, Arctic States Conclude Arctic Council Ministerial Meeting by Signing a Joint Statement," May 7, 2019, accessed April 8, 2021, at https://arctic-council.org/en/news/arctic-council-ministers-meet-pass-chairmanship-from-finland-to-iceland-arctic-states-conclude-arctic-council-ministerial-mee/. The council states, "The theme of the Arctic Council Chairmanship program for 2019-2021 reflects Iceland's commitment to the principle of sustainable development and refers to the necessity of close cooperation between the states and peoples of the region and beyond. With sustainable development as an overarching theme, Iceland will highlight four priorities: The Arctic Marine Environment, Climate and Green Energy Solutions, People and Communities of the Arctic, and a Stronger Arctic Council." (Arctic Council, "Icelandic Chairmanship," accessed April 8, 2021, at https://arctic-council.org/en/about/chairmanship/.)

[408] Arctic Council, "Working Groups," accessed April 8, 2021, at https://arctic-council.org/en/about/working-groups/.

[409] Arctic Council, "Observers," accessed April 8, 2021, at https://arctic-council.org/en/about/observers/.

[410] Arctic Council, "How We Work," accessed April 8, 2021, at https://arctic-council.org/en/explore/work/.

[411] Arctic Council, "About the Arctic Council," accessed April 8, 2021, at https://arctic-council.org/en/about/.

Appendix F. Arctic and U.N. Convention on Law of the Sea (UNCLOS)[412]

This appendix provides additional background information on the U.N. Convention on the Law of the Sea (UNCLOS), particularly as it relates to the Arctic.

Overview of UNCLOS

The United Nations Convention on the Law of the Sea (UNCLOS) "lays down a comprehensive regime of law and order in the world's oceans and seas[,] establishing rules governing all uses of the oceans and their resources."[413] It builds on four 1958 law of the sea conventions to which the United States, following Senate consent to ratification, became a party in 1961, and which entered force between 1962 and 1966.[414] All four treaties remain in force for the United States.[415] UNCLOS was adopted in 1982 as the "culmination of more than 14 years of work involving participation by more than 150 countries representing all regions of the world, all legal and political systems and the spectrum of socio/economic development."[416] The treaty was modified in 1994 by an agreement relating to the implementation of Part XI of the treaty, which relates to the seabed and ocean floor and subsoil thereof that are beyond the limits of national jurisdiction. UNCLOS entered into force in November 1994. As of April 8, 2019, 168 nations were party to the treaty.[417] As discussed later in more detail, the United States is not a party to the treaty.

[412] Parts of this section were prepared by Marjorie Ann Browne, who was a Specialist in International Relations, Foreign Affairs, Defense, and Trade Division until her retirement from CRS on October 10, 2015.

[413] United Nations, "United Nations Convention on the Law of the Sea of 10 December 1982, Overview and full text," updated February 11, 2020, accessed April 8, 2021, at https://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm.

[414] These are the Convention on the Territorial Sea and Contiguous Zone, which entered into force on September 10, 1964, the Convention on the Continental Shelf, which entered into force on 10 June 10, 1964, the Convention on the High Seas, which entered into force on September 30, 1962, and the Convention on Fishing and Conservation of Living Resources of the High Seas, which entered into force on March 20, 1966. The four 1958 treaties resulted from the first Conference on the Law of the Sea (UNCLOS I), which took place in 1958. (For additional discussion, see United Nations, "United Nations Conference on the Law of the Sea," accessed April 8, 2021, at http://legal.un.org/diplomaticconferences/1958_los/, and United Nations, "1958 Geneva Conventions on the Law of the Sea," accessed April 8, 2021, at http://legal.un.org/avl/ha/gclos/gclos.html.)

[415] See Department of State, *Treaties in Force, Section 2, Multilateral Treaties in Force as of January 1, 2019*, pp. 526, 501, 525, and 516, respectively.

[416] United Nations, "United Nations Convention on the Law of the Sea of 10 December 1982, Overview and full text," updated February 11, 2020, accessed April 8, 2021, at https://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm. More specifically, the treaty resulted from the Third United Nations Conference on the Law of the Sea (UNCLOS III), which took place between 1973 and 1982. For additional discussion, see United Nations, "Third United Nations Conference on the Law of the Sea," accessed April 8, 2021, at http://legal.un.org/diplomaticconferences/1973_los/.

[417] Chronological lists of ratifications of, accessions and successions to the Convention and the related Agreements as of March 9, 2020, accessed April 8, 2021, at http://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm.

Part VI of UNCLOS and Commission on Limits of Continental Shelf

Part VI of UNCLOS (consisting of Articles 76 through 85), which covers the continental shelf, and Annex II to the treaty, which established a Commission on the Limits of the Continental Shelf, are particularly pertinent to the Arctic, because Article 77 states that "The coastal State exercises over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources," and that these natural resources include, among other things, "mineral and other nonliving resources of the seabed and subsoil," including oil and gas deposits.[418]

Article 76 states that "The continental shelf of a coastal State comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles" if the outer edge of the continental margin does not extend up to that distance. Article 76 states that "the coastal State shall establish the outer edge of the continental margin wherever the margin extends beyond 200 nautical miles," and that "Information on the limits of the continental shelf beyond 200 nautical miles... shall be submitted by the coastal State to the Commission on the Limits of the Continental Shelf set up under Annex II.... The Commission shall make recommendations to coastal States on matters related to the establishment of the outer limits of their continental shelf. The limits of the shelf established by a coastal State on the basis of these recommendations shall be final and binding."

Under Annex II, the commission reviews the information submitted by a coastal state and, by a two-thirds majority, approves its recommendations to the submitting state. If the submitting state disagrees with the commission's recommendations, it "shall, within a reasonable time, make a revised or new submission to the Commission." (For information on extended continental shelf submissions to the Commission, see **Appendix H**.)

U.S. Not a Party to UNCLOS

As noted earlier, the United States is not a party to UNCLOS.[419] Although the United States is not a party to UNCLOS, the United States accepts and acts in accordance with the nonseabed mining provisions of the treaty, such as those relating to navigation and overflight, which the United States views as reflecting customary international law of the sea.[420]

The United States did not sign UNCLOS when it was adopted in 1982 because the United States objected to the seabed mining provisions of Part XI of the treaty. Certain other countries also expressed concerns about these provisions.[421] The United Nations states that "To address certain

[418] Other parts of UNCLOS relevant to the Arctic include those relating to navigation and high-seas freedoms, fisheries, and exclusive economic zones.

[419] The United States is not a signatory to the treaty. On July 29, 1994, the United States became a signatory to the 1994 agreement relating to the implementation of Part XI of the treaty. The United States has not ratified either the treaty or the 1994 agreement.

[420] In a March 10, 1983, statement on U.S. oceans policy, President Reagan stated, that "the United States is prepared to accept and act in accordance with the [treaty's] balance of interests relating to traditional uses of the oceans—such as navigation and overflight. In this respect, the United States will recognize the rights of other states in the waters off their coasts, as reflected in the Convention, so long as the rights and freedoms of the United States and others under international law are recognized by such coastal states." (Ronald Reagan Presidential Library & Museum, "Statement on United States Oceans Policy," accessed April 8, 2021, at https://www.reaganlibrary.gov/research/speeches/31083c.)

[421] In a March 10, 1983, statement on U.S. oceans policy, President Reagan stated, "Last July, I announced that the United States will not sign the United Nations Law of the Sea Convention that was opened for signature on December

difficulties with the seabed mining provisions contained in Part XI of the Convention, which had been raised, primarily by the industrialized countries, the Secretary-General convened in July 1990 a series of informal consultations which culminated in the adoption, on 28 July 1994, of the Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982. The Agreement entered into force on 28 July 1996."[422]

The United States signed the 1994 agreement on July 29, 1994, and U.S. administrations since then have supported the United States becoming a party to UNCLOS. The United Nations includes the United States on a list of countries for which the 1994 agreement is in a status of "provisional application," as of November 16, 1994, by virtue of its signature.[423]

The 1982 treaty and the 1994 agreement were transmitted to the Senate on October 6, 1994, during the 103rd Congress, becoming Treaty Document 103-39. Subsequent Senate action on Treaty Document 103-39, as presented at Congress.gov,[424] can be summarized as follows:

- In 2004, during the 108th Congress, the Senate Foreign Relations Committee held hearings on Treaty Document 103-39 and reported it favorably with a resolution of advice and consent to ratification with declarations and understandings. No further action was taken during the 108th Congress, and the matter was re-referred to the committee at the sine die adjournment of the 108th Congress.
- In 2007, during the 110th Congress, the committee held hearings on Treaty Document 103-39 and reported it favorably with a resolution of advice and consent to ratification with declarations, understandings, and conditions. No further action was taken during the 110th Congress, and the matter was re-referred to the committee at the sine die adjournment of the 110th Congress.
- In 2012, during the 112th Congress, the committee held hearings on Treaty Document 103-39. No further action was taken during the 112th Congress.

The full Senate to date has not voted on the question of whether to give its advice and consent to ratification of Treaty Document 103-39. The latest Senate action regarding Treaty Document 103-39 recorded at Congress.gov is a hearing held by the Senate Foreign Relations Committee on June 28, 2012.

10. We have taken this step because several major problems in the Convention's deep seabed mining provisions are contrary to the interests and principles of industrialized nations and would not help attain the aspirations of developing countries. The United States does not stand alone in those concerns. Some important allies and friends have not signed the convention. Even some signatory states have raised concerns about these problems." (Ronald Reagan Presidential Library & Museum, "Statement on United States Oceans Policy," accessed April 8, 2021, at https://www.reaganlibrary.gov/research/speeches/31083c.)

[422] United Nations, "Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982," September 2, 2016, accessed April 8, 2021, at https://www.un.org/depts/los/convention_agreements/convention_overview_part_xi.htm.

[423] United Nations, "Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982," status as of April 8, 2021, accessed April 8, 2021, at https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXI-6-a&chapter=21&clang=_en.

[424] United Nations Convention on the Law of the Sea, Senate Consideration of Treaty Document 103-39, accessed April 8, 2021, at https://www.congress.gov/treaty-document/103rd-congress/39. For a timeline of selected key events relating to the treaty, see Department of State, "Law of the Sea Convention," accessed April 8, 2021, at https://www.state.gov/law-of-the-sea-convention/. In addition to the timeline, the website presents a list of 60 "organizations and companies that have expressed support for U.S. accession" to UNCLOS as modified by the 1994 agreement.

Supporters of the United States becoming a party to UNCLOS argue in connection with the Arctic that changing circumstances in the Arctic strengthen the case for the United States becoming a party, on the grounds that it would improve the ability of the United States to protect its interests in the Arctic, particularly in relation to navigation rights and the continental shelf.[425] Opponents of the United States becoming a party to UNCLOS argue in connection with the Arctic that "The U.S. does not need to join the convention in order to access oil and gas resources on its extended continental shelf, in the Arctic, or in the Gulf of Mexico. To the extent necessary, the U.S. can and should negotiate bilateral treaties with neighboring nations to demarcate the limits of its maritime and continental shelf boundaries…. The U.S. has successfully protected its interests in the Arctic since it acquired Alaska in 1867 and has done so during the more than 30 years that the convention has existed. The harm that would be caused by the convention's controversial provisions far outweighs any intangible benefit that allegedly would result from U.S. accession."[426]

The Obama Administration's January 2014 implementation plan for its national strategy for the Arctic region (see earlier section) included, as one of its 36 or so initiatives, one entitled "Accede to the Law of the Sea Convention." Under this initiative, the State Department and other federal agencies are to "continue to seek the Senate's advice and consent to accede to the Law of the Sea Convention." The document states that "the [Obama] Administration is committed, like the last three Administrations, to pursuing accession to the Convention on the Law of the Sea and will continue to place a priority on attaining Senate advice and consent to accession."[427]

The State Department's web page for UNCLOS provides a timeline of events relating to the law of the sea from 1958 through 2012, and a list 60 organizations and companies that have expressed support for the United States becoming a party to UNCLOS.[428]

Potential Alternatives or Supplements to UNCLOS

Some observers over the years have occasionally suggested that a separate international legal regime be negotiated to address the changing circumstances in the Arctic. They argue that these changing circumstances were not envisioned at the time UNCLOS was negotiated. Other observers have occasionally suggested that the Arctic region above a certain parallel be designated a wilderness area. As precedent, they cite Article 4 of the Antarctic Treaty, under which any current claims to sovereign territory are frozen and

> No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.

[425] See, for example, Dermot Cole, "Scare Tactics on Sea Treaty Put US Arctic Interests at Risk," *ArcticToday*, June 17, 2019; Steve Haycox, "Why Signing the Law of the Sea Treaty Would Mean a Tougher U.S. Position in the Arctic," *Anchorage Daily News*, March 22, 2018; Ben Werner, "Zukunft: U.S. Presence in Arctic Won't Stop Chinese, Russian Encroachment Without Law of the Sea Ratification," *USNI News*, August 1, 2017; John Grady, "Senators Renew Call to Ratify Law of the Sea Treaty to Help Chart Future of the Arctic," *USNI News*, July 19, 2017.

[426] Theodore R. Bromund, James Jay Carafano, and Brett D. Schaefer, "7 Reasons U.S. Should Not Ratify UN Convention on the Law of the Sea," Heritage Foundation, June 4, 2018. See also Steven Groves, "This Senate May Smile on Faulty Law of the Sea Treaty," Heritage Foundation, March 19, 2021.

[427] *Implementation Plan for The National Strategy for the Arctic Region*, January 2014, p. 29.

[428] Department of State, "Law of the Sea Convention," accessed April 8, 2021, at https://www.state.gov/law-of-the-sea-convention/.

Appendix G. DOD and Coast Guard Testimony and Strategy Documents

This appendix reprints the texts of prepared statements form DOD and Coast Guard witnesses at hearings held in February and March 2020 on DOD and Coast Guard Arctic capabilities, and excerpts from Navy, Coast Guard, and Air Force strategy documents for the Arctic.

Testimony

DOD Testimony (March 3, 2020)

At a March 3, 2020, hearing before the Readiness and Management Support subcommittee of the Senate Armed Services Committee on U.S. policy and posture in support of Arctic readiness, James H. Anderson, currently Performing the Duties of Under Secretary of Defense for Policy, testified as follows:

> The 2019 DoD Arctic Strategy is anchored in the priorities of the National Defense Strategy (NDS), focusing on great power competition as the principal challenge to long-term U.S. security and prosperity. It describes the Department's desired end-state for the Arctic as "a secure and stable region where U.S. national interests are safeguarded, the U.S. homeland is defended, and nations work cooperatively to address shared challenges."
>
> Strategic competitors are seeking to take advantage of the increasing accessibility of the Arctic to expand their activities in the region. Russia and China are both increasingly active in the region, although in different ways, for different reasons, and with different implications for U.S. national security. Russia's military investments in the Arctic contribute to its territorial defense, but may result in greater operational risk to forces that access the region. China is seeking a role in Arctic governance, despite the fact that it does not have territory claims in the region. There is also a distinct risk that China may repeat the predatory economic behavior in the Arctic that it has exhibited in other regions to further its strategic ambitions.
>
> DoD's focus, however, is on achieving our defense objectives, rather than seeking to duplicate the capabilities or approaches of our competitors—since doing so plays to their strengths and fails to gain full value from our key advantages. To this end, the DoD Arctic Strategy establishes three defense objectives that guide the Department's approach to addressing strategic competition in the Arctic.
>
> 1) Defend the homeland;
>
> 2) Compete when necessary to maintain favorable regional balances of power; and
>
> 3) Ensure common domains remain free and open.
>
> Competition in the Arctic must be considered in the context of the relationship between the Arctic and key regions identified in the NDS. The Arctic is a potential avenue for expanded great power competition and aggression, since it is located between the two key NDS regions (the Indo-Pacific and Europe) and the U.S. homeland. The Arctic is a region through which the United States may project power to advance favorable balances of power in these key regions. For example, the Greenland-Iceland-UK (GIUK) Gap illustrates the close relationship between the Arctic and the regional balance of power in Europe. Furthermore, competitors may be tempted to use malign or coercive activities in the Arctic in an attempt to advance their objectives in other regions.
>
> The Department, both independently and in cooperation with allies and partners, is taking steps to enhance the Joint Force's ability to operate in the Arctic and project power through

> and beyond the region. For example, we are pursuing enhanced domain awareness, regular exercises and training, interoperable supporting infrastructure, and extreme cold weather resilience with allies and partners. Of special note, our cooperation with Canada through the North American Air Defense Command (NORAD), a long-standing bi-national organization, is vital for homeland defense.
>
> More broadly, our network of allies and partners is the cornerstone of the Department's approach to the Arctic region and represents a strategic advantage for the United States, which China and Russia do not possess. Six of the seven other Arctic nations are either NATO Allies or are NATO Enhanced Opportunities Partners. Our allies and partners are highly capable and proficient in the Arctic region's operating conditions, and they share the United States' interest in maintaining and strengthening the international rules-based order—including in the Arctic. Defense cooperation with allies and partners complements broader U.S. Government cooperation in other forums, such as the Arctic Council (which excludes matters related to military and security from its mandate).
>
> The Joint Force must have the proficiency to respond to regional contingencies, both independently and in cooperation with allies and partners. This will require agile and capable forces that are able to conduct operations flexibly in the region. We recognize that this task has implications for the Joint Force's capabilities, given that operations in the harsh Arctic environment place unique demands on the Joint Force.
>
> The Department assesses global posture needs based on strategic priorities, the Joint Force's operational capability needs, and other factors. The Department balances the mission demands of a particular region like the Arctic against other global demands, in a manner consistent with the NDS. In accordance with DoD's Arctic Strategy, and consistent with Section 1752 of the National Defense Authorization Act for FY 2020, the Department is assessing infrastructure needs in the Arctic to support operational flexibility and power projection. The Department regularly re-evaluates its capability and infrastructure needs as conditions, opportunities, and risks related to U.S. national security evolve. The Department is reviewing potential strategic port sites in the Arctic within the broader context of NDS priorities.
>
> Although the Arctic presents unique challenges to the Department, we believe the Department has the right strategic approach, and a strong network of allies and partners, to navigate the region in an era of strategic competition.[429]

At the same hearing, Air Force General Terrence O'SHAUGHNESSY, Commander, U.S. Northern Command and North American Aerospace Defense Command (NORAD), testified as follows:

> Chairman Sullivan, Ranking Member Kaine, and distinguished members of the Subcommittee: I am honored to appear before you today and to serve as the Commander of U.S. Northern Commarid (USNORTHCOM) and North American Aerospace Defense Command (NORAD). I would like to begin by thanking the Subcommittee for your steadfast support of our commands' shared homeland defense mission and for the opportunity to discuss the significant challenges associated with operating in the Arctic.
>
> USNORTHCOM and NORAD are driven by a single unyielding priority: defending the homeland. In the years following the Cold War, our nation enjoyed the benefits of military dominance as well as geographic barriers that kept our homeland beyond the reach of most conventional threats. Our power projection capabilities and technological overmatch allowed us to fight forward, focusing our energy on the conduct of operations overseas.

[429] Statement for the Record before the Senate Armed Services Committee, Subcommittee on Readiness and Management Support, on U.S. Policy and Posture in Support of Arctic Readiness, March 3, 2020, 4 pp.

However, our key adversaries watched and learned, invested in capabilities to offset our strengths while exploiting our weaknesses, and have demonstrated patterns of behavior that indicate they currently have the capability, capacity, and intent to hold our homeland at significant risk below the threshold of nuclear war. Eroding military advantage is undermining our ability to detect threats, defeat attacks, and therefore deter aggression against the homeland.

This is emboldening competitors and adversaries to challenge us at home, holding at risk our people, our critical infrastructure, and our ability to project power forward. The threats facing the United States and Canada are real and significant. The Arctic is no longer a fortress wall, and our oceans are no longer protective moats; they are now avenues of approach for advanced conventional weapons and the platforms that carry them. Our adversaries' capability to directly attack the homeland has leapt forward, and they are engaged in overt, concerted efforts to weaken our national technological, economic, and strategic advantage. To address this reality, our two distinct but complementary commands are taking significant, vigorous steps to ensure our homeland defense enterprise is ready to deter, detect, and defeat threats now and well into the future.

Throughout 2019, Russia continued to expand its military infrastructure in the Arctic. Throughout the year, Russia lengthened existing runways and built new ones at multiple airfields in the high north. In September, Russia deployed a Bastion coastal defense cruise missile unit to the Chukotka Peninsula, opposite the Bering Sea from Alaska, for a first-ever training launch from that region. The missile successfully struck a sea-based target more than 200 kilometers away, according to the Russian Defense Ministry. When deployed to the Russian northeast, this system has the capability not only to control access to the Arctic through the Bering Strait, but also to strike land targets in parts of Alaska with little to no warning.

Like the Russians, China also continues to invest heavily in the Arctic, determined to exploit the region's economic and strategic potential as a self-proclaimed "near Arctic" nation. In the last few years, Chinese survey vessels have conducted several deployments to the Bering and Chukchi Seas, providing familiarity and experience that could eventually translate to Chinese naval operations in the region.

The Arctic is the new frontline of our homeland defense as it provides our adversaries with a direct avenue of approach to the homeland and is representative of the changing strategic environment in our area of responsibility. More consistently navigable waters, mounting demand for natural resources, and Russia's military buildup in the region make the Arctic an immediate challenge for USNORTHCOM, NORAD, our northern allies, and our neighboring geographic combatant commands, U.S. European Command and U.S. Indo-Pacific Command.

By fielding advanced, long-range cruise missiles–to include land attack missiles capable of striking the United States and Canada from Russian territory–and expanding its military presence in the region, Russia has left us with no choice but to improve our homeland defense capability and capacity. In the meantime, China has taken a number of incremental steps toward expanding its own Arctic presence. In tum, USNORTHCOM and NORAD are strengthening the four pillars of our defenses in the high north: domain awareness, communications, infrastructure improvement, and sustainable presence in our own Arctic territory.

I want reiterate my thanks to the subcommittee for your constant support as USNORTHCOM and NORAD have met our homeland defense challenges in the Arctic head-on. There are no easy solutions to the challenges presented by the extreme climate, terrain, and distances inherent in Arctic operations. However, due in no small measure to your continued attention and advocacy for our commands' requirements, we have seen significant attention, expertise, and resources brought to bear on the homeland defense mission in the Arctic from throughout the Department of Defense.

Over the last year, our commands have worked alongside the military Services and the Office of the Secretary of Defense to ensure that our warfighting requirements are met, with particular emphasis on improving joint domain awareness and communications. In order to reclaim our strategic advantage in the high north, it is critical that we improve our ability to detect and track surface vessels and aircraft in our Arctic approaches and establish more reliable secure communications for our joint force warfighters operating in the higher latitudes. This focus is now apparent in the 2019 DOD Arctic Strategy, which reflects my command priorities and makes it clear that DOD must defend the homeland against threats emanating from our northern approaches.

As stated in the National Defense Strategy, a core Department of Defense objective is to ensure that common domains remain open and free. In pursuit of that objective, USNORTHCOM and NORAD are very proud of our work with allies and partners to improve our shared presence and interoperability in the region and update our information sharing agreements with our Arctic allies and partners. Of note in the last year, USNORTHCOM and NORAD leaders also conducted engagements with the Danish Joint Arctic Command in Greenland and joined the United Kingdom Ministry of Defense in direct staff talks. These collaborative efforts help to reaffirm our commitment to our international partners while enhancing USNORTHCOM and NORAD's defense capability.

We are leveraging the on-the-ground experience and expertise of our warfighters in USNORTHCOM's Alaska Command along with leaders, planners, and combatants from USINDOPACOM and USEUCOM as we prepare for ARCTIC EDGE 20- the nation's premier Arctic exercise. ARCTIC EDGE 20 will take full advantage of the unsurpassed capabilities of the Joint Pacific Alaska Range Complex (JP ARC) and allow us to test our capability to fight, communicate, and win in the harsh terrain and climate of the high north. I am personally placing significant emphasis on this important exercise, as the lessons we learn from ARCTIC EDGE 20 will play an important role in validating the requirements that will allow us to deter, detect, and defeat potential adversaries along the front line of our nation's defenses.

Our adversaries have the ability to threaten our homeland in multiple domains and from numerous avenues of approach- and our commands are especially focused on improving our ability to defend our northern approaches. We cannot deter what we cannot defeat, and we cannot defeat that which we cannot detect. In order to effectively defend the homeland, USNORTHCOM and NORAD have developed a Homeland Defense Design (HDD) consisting of three main elements: a layered sensing grid for domain awareness, an adaptive architecture for joint all-domain command and control (JADC2), and new defeat mechanisms for advanced threats. These three elements are vital to deterring and defeating advanced threats to the homeland, and USNORTHCOM and NORAD are moving with a sense of profound urgency to bring these capabilities into the fight.

Our need to improve our domain awareness begins with developing and integrating advanced sensors capable of detecting and tracking threats no matter where they originate. These sensors must be able to detect, track, and discriminate advanced cruise missiles, ballistic missiles, hypersonics, and small unmanned aerial systems at the full ranges from which they are employed. The sensors must also detect and track the platforms–aircraft, ships, and submarines–that carry those weapons. A robust and resilient space layer is increasingly critical to provide the earliest possible detection and fidelity of data required.

Stovepiped transmission of data from non-compatible sensors presents a significant impediment to our ability to defend against advanced threats. To overcome this issue, we need a robust architecture for JADC2 to effectively gather data from a myriad of sensors across all domains and share it seamlessly. The architecture must facilitate rapid data fusion, processing, and analytics to feed decision makers at all levels with accurate, decision-quality information at the speed of relevance. Data from any sensor should feed

any defeat mechanism, and rapid data fusion and analysis should provide faster, more precise solutions to all shooters. This architecture will facilitate high-tempo decision cycles for agile, resilient, redundant, and joint command and control. By leveraging a cloud architecture, big data analytics, edge computing, artificial intelligence, and machine learning, this network should sense a threat from one node and engage it precisely and expeditiously from another across vast distances and across all domains.

Finally, we require new defeat mechanisms for advance threat systems- to include the advanced cruise missiles capable of striking the homeland from launch boxes in the Arctic. As adversary threat systems, employment doctrine, and operational competencies become more numerous, multi-modal, and complex, our current defeat mechanisms will become increasingly challenged. Additionally, the cost ratio of adversary threat missiles to our missile defeat mechanisms is not in our favor. We must flip the cost ratio back in our favor with deep magazine, rapid fire, and low-cost defeat mechanisms.

While these capabilities will play a critical role throughout the USNORTHCOM and NORAD areas of responsibility, they will be especially vital in our northern approaches. As diminishing Arctic ice creates opportunities for increased international commercial and military presence, our adversaries will continue their efforts to exploit the vast distances and inherent complexity of operating in the high north. Our commands are working closely with tech and defense industry partners to rapidly overcome our most pressing challenges in the region.

Specifically, our commands are collaborating with large and small companies from the commercial tech sector in order to leverage emerging technologies and digital-age approaches with potential homeland defense applications. Under this iterative approach, our commands and our commercial partners have developed a common understanding of our shared challenges and opportunities over time. In tum, we are allowing our nation's innovators to apply their expertise and propose advanced, innovative solutions using new but proven technology that can be rapidly incorporated into the homeland defense ecosystem in order to improve our domain awareness, JADC2 architecture, and defeat mechanisms.

We are also adapting and evolving how we work with traditional U.S. defense industry. Rather than prescribing specific materiel solutions to the challenges facing our commands, USNORTHCOM and NORAD are engaged in ongoing two-way dialogue with defense industry innovators to share our perspective on the changing strategic environment, emerging threats to the homeland, and operational requirements. We are working with our industry partners to ensure they understand our specific challenges and needs. In tum, our partners are identifying ways to bring new and existing systems into the homeland defense architecture and provide tailored solutions to our unique challenges.

This approach has already shown game-changing potential. Over the last several months, USNORTHCOM and NORAD have collaborated with the defense industry, commercial tech partners, and the military Services on successful field demonstrations of emerging sensor, information fusion, and satellite communications technologies. For example, the same technology that is capable of delivering high-speed internet and voice communications to remote indigenous communities for the first time has the clear potential to bridge some of the gaps in military communications in the same region. I am excited and encouraged by the results of these demonstrations, and we will continue to lead these experiments and to solicit innovative proposals from established defense industry and emerging tech partners.

There are no routine operations in the Arctic, but USNORTHCOM and NORAD are firmly committed to defending our homeland. Thanks in no small measure to your support, the innovative spirit of our industry and interagency partners, and the deep commitment of the men and women I am proud to lead, I have no doubt that we will continue to deter and

defeat the threats facing our homeland- to include those originating in the Arctic. We Have the Watch.[430]

Coast Guard Testimony (December 8, 2020)

At a December 8, 2020, hearing before the Security subcommittee of the Senate Commerce, Science, and Transportation Committee on Coast Guard Arctic operations, Admiral Charles Ray, Vice Commandant of the Coast Guard, testified as follows:

Introduction

Good afternoon Mr. Chairman, Ranking Member, and distinguished Members of the Subcommittee. It is my pleasure to be here today to discuss the Coast Guard's role and activities to advance national security priorities across the Arctic Region. This effort includes safeguarding U.S. sovereignty and executing our national responsibilities while effecting safe, secure, and environmentally responsible maritime activity.

The U.S. Arctic remains particularly dynamic, evolving environmentally, operationally, and strategically. Environmental changes, combined with the tyranny of distance and limited infrastructure, exacerbate the harshness of the operating environment. The types and levels of commercial activity are also transforming, from a surge in oil and gas exploration a few years ago to increases in vessel transits and expansion of environmental tourism. These alterations in types and location of activity, along with the changes in the physical environment, coincide with the reemergence of great power competition across the globe which are exemplified in the Arctic. The importance of, and demand signal for, Coast Guard's services and leadership have never been greater as these dynamic challenges magnify U.S. national security interests across the Arctic.

National Security Drivers Across the Arctic

The actions and intentions of Arctic and non-Arctic nation states continue to shape the security environment and stability of the region. The geopolitical environment is evolving as state and non-state actors seek to advance their own interests in the Arctic. Allies, partners, and competitors increasingly contend for diplomatic, economic, and strategic advantage and influence. Russia and China exemplify that competition. Both have declared the Arctic a strategic priority; both have made significant investments in new or refurbished capabilities; and both are exerting direct or indirect influence across the region.

Russia's expansive Arctic has the potential to support naval fleets readily deployable between the Atlantic and Pacific Oceans. This region also represents significant economic opportunities, such as oil and gas extraction and development and attempted control of the Northern Sea Route for trans-Arctic shipping. As such, Russia continues to plan and expand its capabilities and capacity to influence and surge throughout the Arctic. This year, Russia launched the first in a new class of nuclear-powered icebreakers, which they sailed to the North Pole. In addition to continuing the expansion of its extensive icebreaker fleet, its renewed capabilities include air bases, ports, weapons systems, domain awareness tools, and search-and-rescue stations. Furthermore, Russia recently established an inter-agency commission of the Russian Security Council focused on ensuring Russian national security interests in the Arctic. Finally, Russia recently completed Exercise Ocean Shield 2020, a multi-theater exercise involving participation by both its Pacific and Northern Fleets and including maneuvers in the Northern Bering Sea and Arctic approaches. Through this exercise, Russia extended its operations into the U.S. exclusive economic zone and

[430] Statement of General Terrence J. O'Shaughnessy, United States Air Force, Commander, United States Northern Command and North American Aerospace Defense Command, before the Senate Armed Services Committee Subcommittee on Readiness and Management Support, March 3, 2020, 7 pp.

interferred with the safety and sovereignty of the U.S. fishing fleet, indicating a willingness to push the boundaries of acceptable, responsible behavior and governance.

China continues to aspire to assert influence across the Arctic including pursuit of economic investments in key strategic areas such as rare-earth elements, oil and gas development, air and sea ports, railways, and infrastructure to further its strategic objectives. Last year, China launched its first domestically-built icebreaking vessel, the Motor Vessel XUE LONG 2, which operated in the Arctic this year, including taking a sediment core sample while operating on the waters over the United States' extended continental shelf. China is also designing an even more powerful polar icebreaker expected to have twice the icebreaking capability of XUE LONG 2. With three icebreakers, China could outpace U.S. icebreaker capacity and polar access by 2024. The primary concern with Chinese activities in the Arctic is the potential to disrupt the cooperation, stability, and governance in the region for both Arctic and non-Arctic states.

Coast Guard Leadership in the Arctic

The Coast Guard has shaped and influenced national security in the Arctic for over 150 years. This effort includes asserting the Nation's sovereign rights, upholding our sovereign responsibilities from the strategic to the tactical level, and countering malign influence that is contrary to U.S. values and international rules and norms. The Service's missions have evolved along with the evolution of the physical, operational, and strategic environments.

As the only U.S. Armed Force with both military and law enforcement authorities, combined with membership in the Intelligence Community, the Coast Guard seamlessly shifts between mission sets utilizing multi-mission personnel and assets. Specifically, the Coast Guard's constabulary functions and broad authorities serve as a critical bridge between the hard-power lethality of the Department of Defense (DoD) and soft-power diplomacy of the State Department. These characteristics enable the Service to cultivate strong international relationships and build coalitions among Arctic partners based on mutual interests and values that strengthen national security and regional stability while enhancing safety, maritime governance, and prosperity across the region.

Where strategic goals align, the Coast Guard works closely with the DoD to ensure efficient operations. The Coast Guard is a member of the Arctic Security Forces Roundtable, a EUCOM-sponsored multi-national group concerned with Arctic security issues, including maritime domain awareness. We work closely with NORTHCOM through the Arctic Capabilities Assessment Working Group, which was created to identify potential collaborative efforts to enhance Arctic capabilities in communications, maritime domain awareness, and presence. The Service's role as a member of the Intelligence Community offers a natural nexus for broad intelligence and information sharing, as appropriate, to counter nefarious actions in the Arctic and throughout the world. These efforts are only a few examples of partnerships between the Coast Guard and DoD.

This year, Arctic operations and engagements have faced unique challenges and interruptions, mostly due to the global pandemic of COVID-19. However, because of these challenges and the growing strategic imperatives across the Arctic, the Service has adapted operations to meet the Nation's mission demands. The following highlights some of these initiatives that have particular impacts on the Nation's readiness as well as national and international security.

Advancing Safety and Security in the U.S. Arctic

Operation ARCTIC SHIELD is the Coast Guard's year-round planning and operations effort that incorporates an expeditionary approach for deploying resources and conducting integrated operations to meet statutory mission demands, buys-down maritime risk, and advances national security objectives through maritime operations in the United States Arctic. ARCTIC SHIELD 2020 objectives included advancing national and Coast Guard strategic goals; enhancing capabilities to operate effectively in a dynamic Arctic;

strengthening the rules-based order; and innovating and adapting to promote safety, resilience, and prosperity. An emergent priority was to protect Arctic residents by not transmitting or contracting COVID-19 while conducting missions. The pandemic imposed challenges on engagements and presence, both in communities and across the maritime domain, but has also presented other opportunities to broaden Arctic experience, training, and operational readiness to safeguard the U.S. Arctic.

The Coast Guard conducted additional, unscheduled patrols in Arctic waters this season with CGC HEALY, CGC ALEX HALEY, and CGC MUNRO. With these patrols, the Service monitored foreign maritime activity, including the Arctic deployment of the XUE LONG 2; enhanced monitoring and enforcement of maritime activities including commercial fishing in the United States exclusive economic zone and along the maritime boundary line with Russia; supported other U.S. marine scientific research; and protected U.S. sovereign interests. This activity included a joint patrol with a Russian Border Guard vessel along the U.S. / Russian maritime border that highlighted the Coast Guard's continued focus on regional cooperation to combat trans-Arctic threats such as illegal fisheries. Additionally, aircrews trained with CGC HEALY and CGC MUNRO as they patrolled in the Chukchi Sea and Bering Strait region, recertifying aircrews in shipboard landings in order to extend the operational reach of the Coast Guard into the higher latitudes.

As in the past few seasons, the Coast Guard deployed two MH-60 helicopters to Kotzebue, Alaska for four months to enhance response capabilities and provide direct support to communities in the U.S. Arctic region.

These helicopters have flown over 390 flight hours, and executed eight long range search and rescue missions. Additionally, they provided critical support to the National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, the Office of Naval Research, the Alaska Department of Fish and Game, and the University of Washington in multiple missions to include assisting scientific research studying marine mammals plus Arctic ice and environmental conditions. Coast Guard HC-130 and MH-60 aircrews also conducted regular Maritime Domain Awareness flights, establishing a U.S. Government presence over U.S. Arctic waters, protecting U.S. sovereign interests, and executing U.S. responsibilities.

Because of pandemic concerns in Antarctica, the National Science Foundation informed the Service that it will not use CGC POLAR STAR to support the McMurdo Station resupply mission this year. This change affords the Coast Guard the unique opportunity to conduct maritime operations in the U.S. Arctic during the winter. From December 2020 to February 2021, POLAR STAR will project power throughout the Arctic and defend American sovereignty along the U.S. and Russia maritime boundary line. This opportunity enhances Coast Guard readiness by increasing Arctic ice navigation proficiency and informs operations of the future Polar Security Cutters.

Building Arctic Capacity

The ability for the U.S. to lead in the Arctic, both strategically and operationally, hinges on physical presence to protect U.S. national sovereignty and safeguard our homeland security interests. The foundation of the Coast Guard's operational presence and influence is U.S. icebreakers, whose purpose is to provide assured, year-round access to the polar regions for executing not only Coast Guard missions but also national missions in the high latitudes.

I'd like to take this opportunity to thank Congress for its continued support of the Coast Guard's Polar Security Cutter program, which awarded a contract for the detail design and construction of the first ship in 2019. This program is efficiently managed through the joint Navy-Coast Guard Integrated Program Office, which was established to accelerate the project and leverage best practices from each Services' shipbuilding programs. Because of

Congress's support and this partnership, the Nation is as close as we have been in over 40 years to recapitalizing our icebreaking fleet. Continued investment is key to meeting our Nation's growing needs in the rapidly evolving and dynamic polar regions.

Until the delivery of Polar Security Cutters, the Coast Guard must maintain cutters POLAR STAR and HEALY, the nation's only operational icebreakers. Robust planning efforts for a service life extension on POLAR STAR are already underway, and initial work for this project will begin in 2021, with phased industrial work occurring annually through 2023. The end goal of this process will be to extend the vessel's service life until delivery of at least the second new Polar Security Cutter. The recent casualty to CGC HEALY, our only medium icebreaker, underscores the importance of this effort. It also highlights the Nation's limited bench strength for this particular mission set, and the importance of devoting sufficient resources for maintenance and repair activities to aging assets.

On June 9th of this year, the Administration released a Presidential Memorandum on Safeguarding U.S. National Interests in the Arctic and Antarctic Regions that directed a review of requirements for a polar security icebreaking fleet acquisition program that supports our national interests in the Arctic and Antarctic regions. This memorandum highlights the Administration's priority for securing national interests in the Arctic and for recapitalizing the Nation's icebreaker fleet. The Coast Guard will continue to work within the Department of Homeland Security, with the Department of Defense, and with other Departments in responding to the Nation's need in the Arctic.

The Coast Guard must continue to evaluate options to advance U.S. interests in the region, which extend beyond the provision of icebreakers. As outlined in the Coast Guard's 2019 Arctic Strategic Outlook, in order to respond to crises in the Arctic, our Nation must also muster adequate personnel, aviation, and logistics resources in the region. To meet the challenges of the Arctic as a strategically competitive space, the Coast Guard must also expand its means to shape the security environment and respond to, intercept, and collect information on activities and intentions of those operating in the Arctic region.

Advancing Strategic Leadership and National Security Across the Arctic

As many nations and other stakeholders across the world aspire to expand their roles and activities in the Arctic, the Coast Guard continues to be a leader across the region, expanding collaboration, cooperation, and interoperability.

The Service exercises leadership through engagement in Arctic Council activities including representation on a variety of working groups. As Chair of the Marine Environmental Response Experts Group, the Coast Guard engaged with Russia during the response to the June 2020 Arctic oil spill in Siberia, the worst ever in the region, and continues to work with partners to identify and apply lessons-learned from the spill to reduce risks in the United States. As a member of the Shipping Experts Group, the Coast Guard supports projects such as mitigation of risks associated with the use and carriage of heavy fuel oil by vessels in the Arctic. The Coast Guard also chairs the Council's Search and Rescue Experts Group, served on the Council's Task Force on Arctic Marine Cooperation, and has been active in other task forces that established the 2011 Arctic Search and Rescue Agreement, the 2013 Oil Spill Prevention and Response Agreement, and the 2015 Framework for Oil Pollution Prevention.

Additionally, the Arctic Coast Guard Forum (ACGF) continues to be a bridge between diplomacy and operations. Formally established in October 2015, the ACGF operationalizes all of the elements of the Service's Arctic strategy, as well as the objectives of the Arctic Council. It is a unique, action-oriented maritime governance forum where the Coast Guard and peer agencies from the other seven Arctic nations strengthen relationships, identify lessons learned, share best practices, carry out exercises, conduct combined operations, and coordinate emergency response missions. In April 2019, the ACGF conducted its second live exercise, POLARIS, which incorporated six ships and

five aircraft from ACGF member nations to respond to a simulated cruise ship in distress near Finland.

The exercise was a successful demonstration of combined operations, and highlights the criticality of coordination preparedness for maritime environmental response and search and rescue. In April 2021, the ACGF will hold its third live exercise off the coast of Iceland.

When Russia assumes chairmanship of the Arctic Council and the ACGF in Summer 2021, the Coast Guard will continue to encourage advancement of shared ACGF objectives, including more collaboration with operational Arctic entities and increasing joint response capability for both search and rescue and marine environmental response cases.

The Coast Guard has also supported Arctic safety through other international bodies such as the International Maritime Organization (IMO). The Coast Guard was instrumental in the IMO's development and adoption of the International Code for Ships Operating in Polar Waters (Polar Code), which is mandatory under both the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution of Ships (MARPOL).

The Polar Code covers the full range of design, construction, equipment, operational, training, search and rescue, and environmental protection matters relevant to ships operating in the inhospitable waters surrounding the two polar regions. Additionally, in November 2017, the Coast Guard collaborated with the Russian Federation to jointly develop and submit a proposal to the IMO to establish a system of two-way routes in the Bering Strait and Bering Sea, with the objective of advancing the maritime transportation system in the region; promoting the safe, responsible flow of commerce; and de-conflicting commercial uses of the waterways with subsistence activities.

The Coast Guard continues to work to expand the Service's influence across the Arctic. From July through September of this year, the Coast Guard deployed CGC CAMPBELL and CGC TAHOMA in the North Atlantic region to participate in joint military and Search and Rescue exercises. This included engagements with the Danish Joint Arctic Command, Canada, and France. These operations demonstrate the Service's strong relationships with international partners across the globe.

Improving Critical Communications in the U.S. Arctic

Perhaps one of the biggest challenges in the Arctic is simply communicating. Out of necessity, the Coast Guard uses a variety of solutions to communicate in the Arctic, which minimally satisfies current operational requirements. The Service is undertaking multiple connectivity and communications efforts to support and improve operations in the Region and will partner with the Department of Defense and other partners when possible. These efforts include recapitalizing our military satellite communications terminals, upgrading high-speed data "Cutter Connectivity" solutions with emerging polar satellite services, replacing all Coast Guard cutter High Frequency (HF) radios, and reegineering the terrestrial HF network. These efforts will dramatically improve the Service's Arctic communications and operations in the Arctic.

Additionally, the Coast Guard is working with the Department of Homeland Security Science and Technology (S&T) Directorate to execute a comprehensive review of mariner communications and connectivity needs with the broader Federal, State, local, and industry communities of interest in the Arctic. We have also engaged the DHS S&T Arctic Domain Awareness Center of Excellence (ADAC) at the University of Alaska, Anchorage, to conduct relevant research. The intent is to identify areas of possible collaboration in a whole of government approach and potential public-private partnerships to address shared communication and connectivity gaps and needs.

Conclusion

> The Coast Guard's value proposition in the Arctic includes upholding freedom of navigation and the rules-based order by setting and enforcing standards of behavior in the maritime domain. The Coast Guard's role in our whole-of-government approach to securing our national interests in the polar regions is using our experience, leadership, and ability to both influence and compete below the level of armed conflict. Leveraging the Service to set the example for maritime governance in the Arctic positions the United States to be the preferred partner of other Arctic allies and stakeholders to positively shape the security environment across the region. The Coast Guard, and the Nation, must remain committed and agile in the rapidly evolving geopolitical and operational Arctic environments.
>
> The Administration's and Congress' continued support for a modernized and capable polar fleet and Arctic infrastructure will posture not only the Coast Guard, but the Nation, to lead across the national and international landscape to build a coalition of like-minded partners in order to shape the Arctic domain as a continued area of low tension and great cooperation while preserving our national interests and rights. We understand the significant investment required to secure the Arctic, and we appreciate the trust the Nation has placed in the Service. Thank you for the opportunity to testify before you today and for all you do for the men and women of the Coast Guard. I look forward to answering your questions.[431]

Strategy Documents[432]

June 2019 DOD Arctic Strategy

In June 2019, DOD released an Arctic Strategy document as the successor to DOD's 2013 and 2016 Arctic strategies. The June 2019 document states that it

> articulates the Department of Defense's (DoD) strategy for the Arctic region in an era of strategic competition. It is informed by the 2017 National Security Strategy and anchored in the priorities of the 2018 National Defense Strategy (NDS) and its focus on competition with China and Russia as the principal challenge to long-term U.S. security and prosperity. This strategy supersedes the 2016 DoD Arctic strategy.
>
> DoD's desired end-state for the Arctic is a secure and stable region where U.S. national interests are safeguarded, the U.S. homeland is defended, and nations work cooperatively to address shared challenges. This strategy sets forth DoD's assessment of the Arctic security environment, risks posed to U.S. national security interests, DoD Arctic objectives, and the strategic approach by which DoD will achieve these objectives.
>
> A secure and stable Arctic region benefits the United States and necessitates a rules-based order, reflecting Arctic nations' respect for national sovereignty and constructive engagement to address shared challenges. The network of U.S. allies and partners with shared national interests in this rules-based order is the United States' greatest strategic advantage in the Arctic region, and thus the cornerstone of DoD's Arctic strategy. DoD cooperation with Arctic allies and partners strengthens our shared approach to regional security and helps deter strategic competitors from seeking to unilaterally change the existing rules-based order.
>
> NDS goals and priorities guide DoD's strategic approach to the Arctic. The Joint Force must be able to deter, and if necessary, defeat great power aggression. DoD must prioritize efforts to address the central problem the NDS identifies—i.e., the Joint Force's eroding competitive edge against China and Russia, and the NDS imperative to ensure favorable

[431] Testimony of Admiral Charles W. Ray, Coast Guard Vice Commandant, On "Coast Guard Arctic Operations" Before the Senate Commerce, Science, & Transportation Security Subcommittee, December 8, 2020, 7 pp.

[432] See also Joshua Tallis, "Focusing the Military Services' Arctic Strategies," *War on the Rocks*, January 20, 2021.

> regional balances of power in the Indo-Pacific and Europe. Developing a more lethal, resilient, agile, and ready Joint Force will ensure that our military sustains its competitive advantages, not only for these key regions of strategic competition, but globally as well. Maintaining a credible deterrent for the Arctic region requires DoD to understand and shape the Arctic's geo-strategic landscape for future operations and to respond effectively to contingencies in the Arctic region, both independently and in cooperation with others. DoD's strategic approach seeks to do so by implementing three ways in support of the desired Arctic end-state (each described in detail in this document):
>
> • Building Arctic awareness;
>
> • Enhancing Arctic operations; and
>
> • Strengthening the rules-based order in the Arctic.[433]

January 2021 Army Arctic Strategy Document (Released March 2021)

The Army's Arctic strategy document—dated January 19, 2021, and released March 16, 2021—notes that the Army "has had a nearly continuous presence in Alaska since the United States purchased the territory from Russia in 1867,"[434] and states:

> For the Army, the Arctic poses two challenges—as a place and an environment. It serves as a place where the Army, as part of the joint force, confronts our adversaries around the globe in competition. This requires us to adapt our posture to employ calibrated forces able to conduct multi-domain operations. As an environment, it poses additional challenge from extreme temperature and terrain.
>
> The Army will regain cold-weather and high-altitude dominance by adapting how the Army generates, postures, trains, and equips our forces to execute extended, multidomain operations in extreme conditions. Restoring dominance also mandates an inherently multi-component approach with significant contributions for the Army Reserve and National Guard. The Army will implement integrated solutions that emphasis readiness for operations in extreme cold and mountainous environments and bolsters the resiliency of our people and our installations. The Army is committed to a Total Army approach to meeting Joint warfighter requirements in Arctic conditions around the globe. This restored dominance provides options to the Joint Force Commander to employ decisive land capabilities in support of operations.
>
> This strategy lays out a strategic and operational approach for Army forces operating in the Arctic as part of the joint force and in conjunction with allies and partners. This is due to the efforts of great power competitors to build their capabilities in a region that is increasingly open for exploitation. However, reacting to challenges is not the only reason for reexamining how Army forces operate in the Arctic. The adoption of multi-domain operations provides an opportunity the Army needs to exploit.
>
> The tenets of multi-domain operations are the start point for examining how Army forces might operate in the Arctic in the future. Multidomain formations, particularly those with

[433] Department of Defense, Office of the Under Secretary of Defense for Policy, Report to Congress, Department of Defense Arctic Strategy, As required by Section 1071 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (P.L. 115-232), June 2019, p. 2. For press reports regarding the document, see Connie Lee, "Great Power Competition Extends to Arctic," *National Defense Magazine*, August 12, 2019; Hal Brands, "America Is Losing the Battle of the Arctic," *Bloomberg*, July 30, 2019; Melody Schreiber, "U.S. Arctic Defense Strategy Ramps Up Rhetoric Without Committing Resources, Experts Say," *ArcticToday*, June 11, 2019; Malte Humpert, "New U.S. Department of Defense Arctic Strategy Sees Growing Uncertainty and Tension in Region," *High North News*, June 7, 2019.

[434] United States Army, *Regaining Arctic Dominance, The U.S. Army in the Arctic*, January 19, 2021 (released March 16, 2021), p. 5.

extended ranges such as the Multi-Domain Task Force (MDTF), have clear potential in the Arctic—an area of operations characterized by vast distances and where air and naval avenues of approach are critical. MDTFs have significant potential to create anti-access/ area denial challenges for competitors. For that potential to be realized, however, multidomain formations must be able to converge their effects with the rest of the joint force and allies and partners. This is particularly difficult in the Arctic for both organizational and technical reasons. The Arctic and sub-arctic incorporates portions of three combatant command areas of responsibility and network integration is difficult in extreme cold environments, high latitudes, and areas with little commercial infrastructure. Similarly, the exceptional logistical challenges posed by a remote, poorly developed, and extreme environment make calibrated force posture essential. The Army's decision to place an MDTF in Alaska is the first step in setting the conditions for success. In Alaska, it will have the ability to take advantage of world-class training facilities and the presence of significant U.S. Air Force and U.S. Navy forces to experiment and train multi-domain operations….

The United States is an Arctic nation. As such, the Army is responsible for providing Arctic-capable forces to support joint all-domain operations in defense from the region's threats. The Army must also be able to provide and sustain Arctic-capable forces for employment outside of the region as necessary. The Army is an essential key to ensuring land dominance in support of the joint force in the all-domain environment. The Army's ability to compete in the region delivers dilemmas to adversaries seeking an advantage in the Arctic. Working together with allies and partners, the Army supports the region's stability to achieve the nation's objectives.

The changes in the geopolitical environment and actions of great power competitors, combined with the evolving physical environment, require the Army to refocus and analyze options to rebuild our Arctic capabilities. This strategy, through identifying the strategic and operational framework, focuses our efforts along lines of effort that will allow the Army to regain our ability to generate Arctic-capable forces ready to win in the Arctic, extreme cold weather, high-altitude, and mountainous environments.

This strategy communicates the need to support competition in the region while also rapidly organizing and responding to conduct operational maneuver in support of strategic movement. To do this, the Army will examine the posture, composition, and readiness of the force and seek improvements. The first step is to develop a full DOTMILPF[435] definition of what is required for a unit to be Arctic-capable.

Additionally, the Army will adapt in order to win in Arctic and other challenging conditions. The actions and areas of analysis identified in this strategy lay out a plan to begin that effort. The examination and implementation of this plan will allow leaders to balance risk and make informed decisions to improve the Army's ability to operate and compete in the region.[436]

[435] DOTMLPF is an acronym, usually pronounced "dot mil p f," that stands for doctrine, organization, training, materiel, leadership and education, personnel, and facilities. It is usually spelled DOTMLPF, but is sometimes spelled DOTMILPF. In another version, DOTMLPF-P, the final P stands for policy.

[436] United States Army, *Regaining Arctic Dominance, The U.S. Army in the Arctic*, January 19, 2021 (released March 16, 2021), pp. 20-21, 47-48. See also Matthew Beinart, "Army's New Arctic Strategy Details Capability Needs For The Region," *Defense Dai*ly, March 16, 2021; Jaspreet Gill, "New Arctic Strategy Establishes MDTF in Alaska, Key Lines of Effort," *Inside Defense*, March 16, 2021; Jen Judson, "New Strategy Sets Up Army to Operate in Increasingly Relevant Arctic," *Defense News*, March 16, 2021; Caitlin M. Kenney, "Army Focuses on Defending and Fighting in Arctic Region with New Strategy," *Stars and Stripes*, March 16, 2021; Meredith Roaten, "Breaking: Army Releases New Arctic Strategy," *National Defense*, March 16, 2021; Kyle Rempfer, "Army's New Arctic Strategy Aims to Build Expeditionary Capability," *Army Time*s, March 17, 2021; Liz Ruskin, "Army Wants to Find Snow-Loving Soldiers as It Commits to 'Arctic dominance,'" *Alaska Public Media*, March 24, 2021; Melody Schreiber, "US Army's First Arctic

January 2021 Navy-Marine Corps Strategic Blueprint for Arctic

The Navy in recent years has issued a series of strategy and roadmap documents for the Arctic. The latest of these is a Department of the Navy (i.e., Navy and Marine Corps) strategic blueprint for the Arctic released in January 2021, which states (emphasis as in original):

> The United States is a maritime nation. We are also an Arctic nation. Our security, prosperity, and vital interests in the Arctic are increasingly linked to those of other nations in and out of the region. America's interests are best served by fostering compliance with existing rules to assure a peaceful and prosperous Arctic Region – stretching from Maine in the North Atlantic across the Arctic Ocean through the Bering Strait and Alaska in the North Pacific to the southern tip of the Aleutian Island chain.
>
> *In the decades ahead, rapidly melting sea ice and increasingly navigable Arctic waters –* ***a Blue Arctic*** – will create new challenges and opportunities off our northern shores. Without sustained American naval presence and partnerships in the Arctic Region, peace and prosperity will be increasingly challenged by Russia and China, whose interests and values differ dramatically from ours.
>
> Competing views of how to control increasingly accessible marine resources and sea routes, unintended military accidents and conflict, and spill-over of major power competition in the Arctic all have the potential to threaten U.S. interests and prosperity. These challenges are compounded by increasing risk of environmental degradation and disasters, accidents at sea, and displacement of people and wildlife as human activity increases in the region.
>
> *Despite containing the world's smallest ocean, the Arctic Region has the potential to connect nearly 75% of the world's population*—as melting sea ice increases access to shorter maritime trade routes linking Asia, Europe and North America. Today, 90% of all trade travels across the world's oceans – with seaborne trade expected to double over the next 15 years. Arctic waters will see increasing transits of cargo and natural resources to global markets along with military activity, regional maritime traffic, tourism, and legitimate/illegitimate global fishing fleets. The Beaufort, Chukchi, and Bering Seas are experiencing rapid sea ice loss, enabling greater access to waters off America's Alaskan shores. An opening Arctic brings the United States closer to our northern neighbors to provide mutual assistance in times of need, while also enabling likeminded nations to defend the homeland, deter aggression and coercion, and protect Sea Lines of Communication.
>
> The regional challenges facing the United States in the Arctic Region – from the changing physical environment and greater access to sea routes and resources, to increased military activity by China and Russia, including attempts to alter Arctic governance – have grown more complex and more urgent, while the rapid advance of authoritarianism and revisionists approaches in the maritime environment undermine our ability to collectively meet them. ***Peace and prosperity in the Arctic requires enhanced naval presence and partnerships.***
>
> U.S. Naval forces must operate more assertively across the Arctic Region to prevail in day-to-day competition as we protect the homeland, keep Arctic seas free and open, and deter coercive behavior and conventional aggression. Our challenge is to apply naval power through day-to-day competition in a way that protects vital national interests and preserves regional security without undermining trust and triggering conflict.

Strategy Looks to "Regain Dominance" in Extreme Cold Conditions," *ArcticToday*, March 26, 2021; Christopher Woody, "The US Army Wants to Regain 'Dominance' in the Arctic, and It's Looking All over the World for Help," *Business Insider*, April 27, 2021.

These challenges create a unique – but limited – window of opportunity to chart a new course for American naval power in the Arctic Region. A Blue Arctic requires a new approach by the Navy-Marine Corps team to modernize the future naval force to preserve our advantage at sea and advance U.S. interests in the region.

To do so, we will build on our long history of presence and partnerships in the Arctic Region. Over 150 years ago, *USS Jamestown* stood our northern watch as the U.S. flag was raised over Alaska. Since then, our Sailors and submarines were the first to reach the North Pole, departing from our shores and those of our allies and partners. Our Marines have long trained and operated in the Arctic. During the Aleutian campaign in World War II, our naval forces bravely fought alongside our joint and allied partners to repel the enemy's attack. It was the proficiency and forward presence of American naval power in the Arctic Region that helped bring a peaceful end to the Cold War.

This regional blueprint is guided by the objectives articulated in the *National Security Strategy, National Defense Strategy, Department of Defense Arctic Strategy, and Advantage at Sea: Prevailing in Integrated All-Domain Naval Power; supported by the U.S. Navy Strategic Outlook for the Arctic and informed by the U.S. Coast Guard's Arctic Strategic Outlook*. Our naval forces will operate across the full range of military missions to deter aggression and discourage malign behavior; ensure strategic access and freedom of the seas; strengthen existing and emerging alliances and partnerships; and defend the United States from attack.

Naval forces will preserve peace and build confidence among nations through collective deterrence and security efforts that focus on common threats and mutual interests in a Blue Arctic. This requires an unprecedented level of critical thinking, planning, integration, and interoperability among our joint forces and international partners, along with greater cooperation among U.S. interagency, state, local, and indigenous communities.

In the decades ahead, the Department will maintain enhanced presence, strengthen cooperative partnerships, and adapt our naval forces for a Blue Arctic. We will work closely with partners – especially the U.S. Coast Guard, while building new partnerships, particularly in our Alaskan Arctic and the shores of our northern states. In doing so, we will provide our Sailors, Marines, and Civilians with the education, training, and equipment necessary to preserve peace and respond to crises in the region.

The United States will always seek peace in the Arctic. History, however, demonstrates that peace comes through strength. In this new era, the Navy-Marine Corps team, steadfast with our joint forces, interagency teammates, allies and partners, will be that strength….

An increasingly accessible and navigable Arctic operating environment will place new demands on our naval forces. The scope and pace of our competitors' and adversaries' ambitions and capabilities in a Blue Arctic requires new ways of applying naval power. The Arctic Region is a vast maneuver space and this regional blueprint recognizes the rising importance of enhanced naval presence and partnerships in the region. Flexible, scalable, and agile naval forces provide an inherent advantage in a Blue Arctic, but it is necessary to enhance our presence, cooperation, and capabilities. Concurrently, we will find new ways to integrate and apply naval power with existing forces while investing in new capabilities that may not be fully realized and integrated into the force for at least a decade.

We will achieve our enduring national security interests in a Blue Arctic by pursuing these objectives:

» Maintain Enhanced Presence;

» Strengthen Cooperative Partnerships; and

» Build a More Capable Arctic Naval Force.

Maintain Enhanced Presence

This regional blueprint underscores the use of naval power to influence actions and events at sea and ashore. Left uncontested, incremental gains from increased aggression and malign activities could result in a fait accompli, with long-term strategic benefits for our competitors. The U.S. Navy currently has routine presence on, under, and above Arctic waters, and we will continue to train and exercise to maximize this capability. ***The Department will maintain an enhanced presence in the Arctic Region by regionally posturing our forces, conducting exercises and operations, integrating Navy-Marine Corps-Coast Guard capabilities, and synchronizing our Fleets….***

Strengthen Cooperative Partnerships

Mutually beneficial alliances and partnerships, are foundational to this regional blueprint. Competitors seeking to disrupt the international rules-based order in the Arctic must be met with a firm commitment of likeminded naval forces and nations to address shared challenges and uphold regional interests and responsibilities. When we pool resources, leverage our comparative advantage, and share responsibility for our common defense, our collective security burden becomes lighter. We will cooperatively identify ways to generate synergies from each other's postures and capabilities to confront shared regional threats. Allied and partner naval forces must jointly assess threats, define roles and missions, deepen defense industrial cooperation, and develop and exercise new concepts of operations for the Arctic Region. Equitable burden sharing is necessary and will take time, but the process of doing so will strengthen our collective capabilities.

We will strengthen existing partnerships and attract new partners to meet shared challenges, opportunities, and responsibilities in the Arctic. Together we will enhance our awareness, expand collaborative planning, and improve interoperability. In doing so, enhanced and predictable cooperative activities enable naval forces to maintain credible presence and deter malicious activity. Naval forces are stronger when we operate jointly and together with allies and partners….

Build a More Capable Arctic Naval Force

Following the Cold War, the Navy-Marine Corps capabilities and operational expertise in the Arctic diminished. Recent efforts to increase our capabilities have improved operational readiness, which is required regardless of ice conditions and time of year. Though we routinely patrol on, above, and below Arctic waters, the Department must be prepared and postured to meet the demands of an increasingly accessible Arctic operating environment.[437]

[437] Department of the Navy, *A Blue Arctic: A Strategic Blueprint for the Arctic*, undated, released January 5, 2021, pp. 2-6, 10-11, 14. See also Megan Eckstein, "New Arctic Strategy Calls for Regular Presence as a Way to Compete With Russia, China," *USNI News*, January 5, 2021; Caitlin M. Kenney, "New Arctic Strategy Calls for More Navy Activity in the Region as Competition from Russia, China Increases," *Stars and Stripes*, January 5, 2021; Paul McLeary, "Navy Secretary: US Plans Patrols Near Russian Arctic Bases," *Breaking Defense*, January 5, 2021; Associated Press, "Navy Rolls Out New Strategy for Expanding Arctic Operations," *Associated Press*, January 11, 2021. For an article providing one observer's perspective on the document, see Joshua Tallis, "A New Arctic Strategy for an Emerging Maritime Domain," Center for International Maritime Security (CIMSEC), January 13, 2021; Mia Bennett, "Breaking Down the US Navy's Blueprint for a Blue Arctic," *Maritime Executive*, February 5, 2021; Katarzyna Zysk, "Predictable Unpredictability? U.S. Arctic Strategy and Ways of Doing Business in the Region," *War on the Rocks*, March 11, 2021.

July 2020 Air Force Strategy for Arctic

On July 21, 2020, the Air Force released an Arctic strategy document.[438] The executive summary of the document states in part:

> The Arctic's increasing strategic importance, coupled with the Services' significant regional investment, requires the Department [of the Air Force] to have a unified, deliberate, and forward-looking approach, ensuring the Air and Space Forces can compete and defend the nation's interests in the Arctic region.
>
> Residing at the intersection between the U.S. homeland and two critical theaters, Indo-Pacific and Europe, the Arctic is an increasingly vital region for U.S. national security interests. The Arctic's capacity as a strategic buffer is eroding, making it an avenue of threat to the homeland, due to advancements by great power competitors. Additionally, it hosts critical launch points for global power projection and increasingly accessible natural resources. While the DoD analyzes the immediate prospect of conflict in the Arctic as low, the confluence of activities in the region by great power competitors with increased physical access due to receding land ice and sea ice, yields the potential for intensified regional competition as well as opportunities for cooperative endeavors with allies and partners.
>
> The Department of the Air Force contributions to U.S. national security in the Arctic are large, but relatively unknown. Given the Arctic's vast distances and challenges to surface operations, air and space capabilities have long been essential to gain rapid access and provide all-domain awareness, early warning, satellite command and control, and effective deterrence. Offering a solid foundation on which to build and project power across the region, the Department of the Air Force is the most active and invested U.S. military department in the Arctic.
>
> The strategy identifies the Arctic as a region of strategic opportunity for the Air and Space Forces, Joint Force, allies, and partners….
>
> The Department approaches the Arctic with four main lines of effort: Vigilance, Power Projection, Cooperation, and Preparation….
>
> First, through investments in missile warning and defense, as well as command, control, communications, intelligence, surveillance, and reconnaissance (C3ISR), the Air and Space Forces will defend the homeland by maintaining vigilance.
>
> Second, the Air and Space Forces will utilize unique positioning afforded by bases in locations like Alaska and Greenland to project combat-credible, all-domain air and space power. Infrastructure, focused on thermal efficiency and durability, will be combined with fifth generation aircraft and lethal capabilities to ensure the Air and Space Forces remain agile and capable in the future.
>
> Third, strong alliances and partnerships in the Arctic are a strategic advantage for the United States. The strategy outlines ways to enhance cooperation as well as interoperability, operations, and exercises between the United States and its Arctic partners. To uphold the international rules-based order in the Arctic, the Air and Space Forces must leverage the strong defense relationships among Arctic nations and work closely with regional and joint partners.
>
> Finally, the strategy outlines essential training and preparation for operations within this unique environment. To meet this challenge, the Department will renew focus on training,

[438] Department of the Air Force, *Arctic Strategy, Ensuring a Stable Arctic Through Vigilance, Power Projection, Cooperation, and Preparation*, undated, with transmission letter dated July 21, 2020, 14 pp.

research, and development for Arctic operations, while leveraging the Arctic expertise of the Total Force.[439]

April 2019 Coast Guard Arctic Strategic Outlook[440]

The Coast Guard, like the Navy, has released a series of Arctic-related studies and strategy documents in recent years. In April 2019, the Coast Guard released an Arctic strategic outlook document as the successor to its previous 2013 Arctic strategy document. The April 2019 strategic outlook document states

> The United States is an Arctic Nation, and the United States Coast Guard has served as the lead federal agency for homeland security, safety, and environmental stewardship in the Arctic region for over 150 years. Since Revenue Cutters first sailed to Alaska in 1867 to establish U.S. sovereignty, the Service's role has expanded, including representing American interests as a leader in the international bodies governing navigation, search and rescue, vessel safety, fisheries enforcement, and pollution response across the entire Arctic. As the region continues to open and strategic competition drives more actors to look to the Arctic for economic and geopolitical advantages, the demand for Coast Guard leadership and presence will continue to grow.
>
> Since the release of the Coast Guard Arctic Strategy in 2013, the resurgence of nation-state competition has coincided with dramatic changes in the physical environment of the Arctic, which has elevated the region's prominence as a strategically competitive space. America's two nearest-peer powers, Russia and China, have both declared the region a national priority and made corresponding investments in capability and capacity to expand their influence in the region. Russia and China's persistent challenges to the rules-based international order around the globe cause concern of similar infringement to the continued peaceful stability of the Arctic region. As the only U.S. Service that combines both military and civil authorities, the Coast Guard is uniquely suited to address the interjurisdictional challenges of today's strategic environment by modeling acceptable behavior, building regional capacity, and strengthening organizations that foster transparency and good governance across the Arctic.
>
> The Arctic's role in geostrategic competition is growing, in large part because reductions in permanent sea ice have exposed coastal borders and facilitated increased human and economic activity. The warming of the Arctic has led to longer and larger windows of reduced ice conditions. From 2006 to 2018, satellite imagery observed the 12 lowest Arctic ice extents on record. This has led to greater access through Arctic shipping routes. While

[439] Department of the Air Force, *Arctic Strategy, Ensuring a Stable Arctic Through Vigilance, Power Projection, Cooperation, and Preparation*, undated, with transmission letter dated July 21, 2020, pp. 2-3. See also C. Todd Lopez, "Air Force Reveals Cold Facts on New Arctic Strategy," *DOD News*, July 21, 2020; Secretary of the Air Force Public Affairs, "Department of the Air Force introduces Arctic Strategy," *Air Force News Service*, July 21, 2020; Barbara Barrett, Dave Goldfein and John W. Raymond, "US Air Force, Space Force: Here Is Your New Arctic Strategy," *Defense One*, July 21, 2020; Sandra Erwin, "Raymond: Space Force to Play Key Role in Military Operations in the Arctic," *Space News*, July 21, 2020; Theresa Hitchens, "New Air Force Arctic Strategy May Update Planes For Polar Ops," *Breaking Defense*, July 21, 2020; Valerie Insinna, "Armed with a New Arctic Strategy, the Air Force Seeks Increased Connectivity in the Region," *Defense News*, July 21, 2020; Oriana Pawlyk, "The Air Force Is Gearing Up for More Action in the Arctic," *Military.com*, July 22, 2020; Patrick Tucker, "Expect More Wargames, Attention & Allies in the Arctic, Say Air and Space Force Chiefs," *Defense One*, July 21, 2020; James Holmes, "Grading the U.S. Air Force's Arctic Strategy," *National Interest*, August 2, 2020.

[440] In addition to the April 2019 Coast Guard Arctic Strategic Outlook document, the Department of Homeland Security (the Coast Guard's parent department in mid-January 2021—that is, in the final days of the Trump Administration) released an Arctic Strategy Document that mentions the Coast Guard several times: *Department of Homeland Security*, Strategic Approach for Arctic Homeland Security, foreword dated January 11, 2021, 24 pp. See also Hilde-Gunn Bye, "The DHS' First-Ever Arctic Strategy Emphasizes the Strategic Environment in the Region," *High North News*, January 15, 2021.

the near-term future of these routes is uncertain, a polar route has the potential to reduce transit times of traditional shipping routes by up to two weeks. Russia's establishment of a Northern Sea Route Administration, along with the use of high ice-class Liquefied Natural Gas (LNG) tankers built specifically to export natural gas from its Yamal LNG facility, have contributed significantly to the increase in commercial shipping traffic in the Arctic. In addition, opportunities for potential resource extraction and expanding Arctic tourism offer new prospects for some of the Nation's most isolated communities and broader benefits to America. However, changing terrain and subsistence food patterns, as well as the impacts of increasingly frequent and intense winter storms, continue to challenge the communities and increase risk in the maritime domain.

The Coast Guard will adhere to the following principles as it manages these risks and seizes the opportunities created by these changes:

Partnership. The Arctic is an exceptional place that demands collaboration across national boundaries. The Coast Guard will partner with the Arctic Nations, as well as partners and allies with Arctic interests, to contribute to keeping the Arctic a conflict-free region. The Service will continue to dedicate resources to forums, such as the Arctic Council, and to combined operations and exercises to safeguard and secure the Arctic domain.

The unique and valuable relationship the Coast Guard has established with tribal entities builds mutual trust and improves mission capacity and readiness. We will continue to incorporate lessons-learned from engagements with Alaska Native communities, as well as industry and other Arctic residents, in the development and implementation of policy and strategy.

Unity of Effort. The Coast Guard will advance the Nation's strategic goals and priorities in the Arctic and exercise leadership across the Arctic community of federal, state, and local agencies. As a military Service, the Coast Guard will strengthen interoperability with the Department of Defense and complement the capabilities of the other military services to support the National Security Strategy and the National Military Strategy.

A Culture of Continuous Innovation. The Coast Guard cannot meet the challenges of tomorrow's Arctic with today's paradigms. Rapid technological advancements within the maritime industry, combined with robust investments by strategic competitors, have raised the stakes. The Service must take this opportunity to leverage transformative technology and lead the employment of innovative policies to solve complex problems.

While the strategic context has changed, Coast Guard missions in the Arctic are enduring. The Coast Guard will protect the Nation's vital interests by upholding the rules-based order in the maritime domain while cooperating to reduce conflict and risk. We will help safeguard the Nation's Arctic communities, environment, and economy. The Service will pursue these ends through three complementary lines of effort:

Line of Effort 1: Enhance Capability to Operate Effectively in a Dynamic Arctic

In order to prosecute its missions in the Arctic, the Coast Guard must fully understand and operate freely in this vast and unforgiving environment. Effective capability requires sufficient heavy icebreaking vessels, reliable high-latitude communications, and comprehensive Maritime Domain Awareness. In order to respond to crises in the Arctic, our Nation must also muster adequate personnel, aviation, and logistics resources in the region. The Coast Guard is the sole provider and operator of the U.S. polar capable fleet but currently does not have the capability or capacity to assure access in the high latitudes. Closing the gap requires persistent investment in capabilities and capacity for polar operations, including the Polar Security Cutter. The Coast Guard will pursue this line of effort through three sub-objectives.

- Fill Gaps in the Coast Guard's Arctic Operational Capability and Capacity
- Establish Persistent Awareness and Understanding of the Arctic Domain

• Close the Critical Communications Gap in the Arctic

Line of Effort 2: Strengthen the Rules-Based Order

Actions by strategic competitors will challenge the long-standing norms that have made the Arctic an area of peace and low tension. The institutions contributing to a conflict-free Arctic will face new challenges requiring active and committed American leadership. The Coast Guard is uniquely positioned to provide this leadership in the maritime domain. The Coast Guard is dedicated to strengthening institutions–such as the Arctic Council, the Arctic Coast Guard Forum (ACGF), and the International Maritime Organization (IMO)–and partnerships which reinforce the rules-based order and foster transparency.

Rules and norms endure when nations demonstrate a commitment to upholding them. Working closely with allies and partners, the Coast Guard will deter threats to international maritime norms and America's national interests by conducting operations and exercises along the full spectrum of competition. Working in partnership with the Department of Defense, the Coast Guard will continue to support to the Nation's defense priorities in the Arctic. The Coast Guard will work closely with joint and international partners to build capability and demonstrate resolve in the Arctic.

The Coast Guard will pursue this line of effort through two sub-objectives.

• Strengthen Partnerships and Lead International Forums

• Counter Challenges to the International Rules-Based Order in the Maritime Domain

Line of Effort 3: Innovate and Adapt to Promote Resilience and Prosperity

The tyranny of distance and the harsh Arctic climate pose significant challenges to agencies charged with providing maritime safety and security to all Americans, including the hundreds of villages and thousands of seasonal workers in the U.S. Arctic. Search and rescue, law enforcement, marine safety, waterways management, and other Coast Guard missions are complicated by the Arctic's dynamic and remote operating environment. The Coast Guard will collaborate with stakeholders to develop new practices and technology to serve the maritime community and manage risk in the region.

As the Nation's maritime first responder, the Coast Guard will lead and participate in planning and exercises that include federal, state, tribal, local, international, non-governmental and industry partners to test preparedness and adaptability. During a crisis in the Arctic's maritime domain, the Service will lead an effective, unified response. The Coast Guard will pursue this line of effort through three sub-objectives.

• Support Regional Resilience and Lead in Crisis Response

• Address Emerging Demands in the Maritime Law Enforcement Mission

• Advance and Modernize the Arctic Marine Transportation System

Conclusion. Increased accessibility and activity will create more demand for Coast Guard services in the Arctic maritime domain. While long-term trends point to a more consistently navigable and competitive region, other environmental and economic factors make it difficult to predict the scope and pace of change. Near-term variability in the physical environment exposes mariners and communities to unpredictable levels of risk. As the region attracts increasing attention from both partner and competitor states, America's economic and security interests will become even more closely tied to the Arctic. Each development is significant on its own, but in combination, these trends create a new risk landscape for the Nation and the Coast Guard. This updated strategic outlook reflects a

recognition of these realities and outlines the Service's lines of effort to succeed in the new Arctic.[441]

[441] Coast Guard, *Arctic Strategic Outlook*, April 2019, Executive Summary (pp. 4-7). For press reports about the strategy, see, for example, Ragnhild Grønning, "Strategic Competition in Focus in US Coast Guard Arctic Strategy," *High North News*, May 2, 2019; Dermot Cole, "The Coast Guard's New Arctic Strategic Vision Downplays a Big Problem: Budget Constraints," *ArcticToday*, April 29, 2019; Kyle Rempfer, "Great Powers on Ice: Coast Guard Drops Arctic Manifesto," *Military Times*, April 25, 2019; Dan Lamothe, "New Coast Guard Strategy for the Arctic Calls for 'Projecting Sovereignty' to Contest China and Russia," *Washington Post*, April 22, 2019.

Appendix H. Extended Continental Shelf Submissions, Territorial Disputes, and Sovereignty Issues[442]

This appendix presents background information on extended continental shelf submissions, territorial disputes, and sovereignty issues.

Extended Continental Shelf Submissions

Motivated in part by a desire to exercise sovereign control over the Arctic region's increasingly accessible oil and gas reserves (see "Oil, Gas, and Mineral Exploration"), the four Arctic coastal states other than the United States—Canada, Russia, Norway, and Denmark (of which Greenland is a territory)—have filed submissions to the Commission on the Limits of the Continental Shelf regarding the outer limits of their extended continental shelves.[443] A fifth country, Iceland, though not an Arctic coastal state, has filed a submission regarding waters in the vicinity of the Arctic Circle. The submissions are as follows:

- Norway filed a submission regarding the Northeast Atlantic and the Arctic on November 27, 2006. The Commission adopted its recommendations regarding this submission on March 27, 2009.
- Denmark filed a submission regarding an area north of the Faroe Islands on April 29, 2009. The Commission adopted its recommendations regarding this submission on March 11, 2014.
- Iceland filed a submission regarding the Ægir Basin area to the east and northeast of Iceland, and the western and southern parts of Reykjanes Ridge to southwest of Iceland, on April 29, 2009. The Commission adopted its recommendations regarding this submission on March 10, 2016.
- Denmark filed a submission regarding the southern continental shelf of Greenland on June 14, 2012, a submission regarding the northeastern continental shelf of Greenland on November 26, 2013, and submission regarding the northern continental shelf of Greenland on December 15, 2014.
- Russia filed a partial revised submission regarding the Arctic Ocean on August 3, 2015. (Russia's December 20, 2001, submission regarding the Arctic and Pacific Oceans was rejected by the Commission as insufficiently documented.)
- Canada filed a submission regarding the Arctic Ocean on May 23, 2019.
- Iceland filed a partial revised submission regarding the western, southern and south-eastern parts of the Reykjanes Ridge on March 31, 2021.

[442] This section was prepared by Carl Ek, who was a Specialist in International Relations, Foreign Affairs, Defense, and Trade Division, until his retirement on April 30, 2014. It was revised to include the information about the submissions made to the Commission by Ronald O'Rourke, Specialist in Naval Affairs, Foreign Affairs, Defense, and Trade Division. For questions relating to this section, congressional clients may contact Derek E. Mix, Analyst in European Affairs, Foreign Affairs, Defense, and Trade Division.

[443] For a discussion of extended continental shelf process, see Cornell Overfield, "An Off-the-Shelf Guide to Extended Continental Shelves and the Arctic," *Lawfare*, April 21, 2021.

- Russia filed two addenda to its 2015 partial revised submission on March 31, 2021.[444]

An April 4, 2021, press report stated:

> Russia has formally enlarged its claim to the seabed in the Arctic Ocean all the way to Canada's and Greenland's exclusive economic zones. The claim is enlarged by two extensions that were filed on Wednesday, stretching from points near the North Pole to Greenland's and Canada's exclusive economic zones.
>
> Noticeably, Russia has not extended its claim into waters north of Alaska that are known to be part of the U.S. sphere of interests, even though Russian vessels appear to have collected data about the seabed in these waters in 2020.
>
> Philip Steinberg, professor of political geography and director of the Centre for Border Research at the University of Durham in the U.K., estimated on Saturday that Russia is enlarging its claim by approximately 705,000 square kilometers.
>
> The Russian claim now covers some 70 percent of the seabed in the central parts of the Arctic Ocean outside the EEZs of the Arctic coastal states, Steinberg explained.
>
> The Russian enlargement will significantly increase the overlap between Russia's claim to the Arctic seabed and the claims filed by Canada and the Kingdom of Denmark.
>
> Those three claims already overlap at the North Pole. The Russian claim now overlaps with the Danish claim with approximately 800,000 square kilometers, up from some 600,000 square kilometers, according to one expert in Denmark, speaking on condition of anonymity because the estimate is unofficial.
>
> Russia filed its enlargement to the UN Commission on the Limits of the Continental Shelf in New York in the form of two so-called addenda. According to the rules of the UN Convention of the Law of the Sea, the enlargement described by the two documents will be dealt with as part of Russia's existing claim and is not expected to delay the process….
>
> According to the publicly available summary of the two documents, the enlargement is based on new data collected after 2015. Most recently, between August and October last year, a Russian nuclear icebreaker 50 Let Pobedy broke sea ice between the North Pole and Greenland and Canada, including at points only about 60 nautical miles from Greenland's EEZ.…
>
> The icebreaker cleared tracks for the Akademik Fedorov, a research vessel with a multibeam echosounder embedded in the hull. This vessel has previously been used by Russia to collect data about the seabed in the Arctic Ocean….
>
> Most experts expect the process to continue peacefully, as the states involved seem determined to follow the rules of the UN. The two Russian documents are written in strict

[444] Source for dates of submissions and Commission actions: United Nations, Division for Ocean Affairs and the Law of the Sea, "Submissions, through the Secretary-General of the United Nations, to the Commission on the Limits of the Continental Shelf, pursuant to article 76, paragraph 8, of the United Nations Convention on the Law of the Sea of 10 December 1982," updated July 6, 2021, accessed September 23, 2021, at https://www.un.org/Depts/los/clcs_new/commission_submissions.htm. The two addenda filed by Russia on March 31, 2021, are addenda to the revised submission regarding the Arctic Ocean that Russia filed on August 3, 2015. (See United Nations, Division for Ocean Affairs and the Law of the Sea, "Commission on the Limits of the Continental Shelf (CLCS) Outer limits of the continental shelf beyond 200 nautical miles from the baselines: Submissions to the Commission: Partial revised Submission by the Russian Federation," updated August 3, 2021, accessed September 23, 2021, at https://www.un.org/Depts/los/clcs_new/submissions_files/submission_rus_rev1.htm.

> accordance with established procedures and no comments from either Ottawa, Copenhagen or Nuuk have been forthcoming since Wednesday [March 31]….
>
> When I spoke to various experts in January, before the expanded claimed was filed, most suggested that such an expansion didn't run the risk of inflaming tensions between Russia and other Arctic states, so long as the process continued to play out under UNCLOS rules….
>
> According to the UN Convention on the Law of the Sea the claims, formally known as submissions, can be extended if new data becomes available.[445]

In support of its submissions to the Commission, Russia has been charting the Arctic Ocean's enormous underwater Lomonosov Ridge, which runs across the middle of the Arctic Ocean, somewhat like the seam of a baseball, from a location north of Russia's New Siberian Islands to a location north of Greenland's northern coast, passing about midpoint almost directly through the North Pole. Russia is attempting to show that this ridge is connected to Russia's known extended continental shelf. A determination that the ridge is part of Russia's extended continental shelf could create an extension of Russia's extended continental shelf running across the central part of the Arctic Ocean to an area north of Greenland. Canada views a portion of the ridge as part of its own continental shelf,[446] and Denmark's December 15, 2014, submission regarding the northern continental shelf of Greenland may include part of the ridge.[447]

In August 2007, a Russian submersible on a research expedition deposited an encased Russian Federation flag on the seabed of the presumed site of the North Pole. The action captured worldwide attention, but analysts noted that it did not constitute an official claim to the Arctic seabed or the waters above it, that it has no legal effect, and that it therefore was a purely symbolic act.

At a May 2008 meeting in Ilulissat, Greenland, the five Arctic coastal states reaffirmed their commitment to the UNCLOS legal framework for the establishment of extended continental shelf limits in the Arctic.[448] (For further discussion, see "Extent of the Continental Margin" in "Oil, Gas, and Mineral Exploration.")

Territorial Disputes and Sovereignty Issues

Aside from the extended continental shelf process, there are four unresolved Arctic territorial disputes:

- Canada maintains that the part of the Northwest Passage that runs through the Canadian archipelago is an inland waterway, and therefore sovereign Canadian territory subject to Ottawa's surveillance, regulation, and control. The United States, the European Union, and others maintain that these waters constitute an international strait between two high seas.

[445] Martin Breum, "Russia Extends Its Claim to the Arctic Ocean Seabed," *ArcticToday*, April 4, 2021. See also Emma Tranter, "'You Cannot Claim Any More:' Russia Seeks Bigger Piece of Arctic," *CBC News*, April 12, 2021. See also Martin Breum, "Russia Considers Extended Claim to the Arctic Seabed," *High North News*, February 1 (updated February 8), 2021.

[446] "Russia, Canada Make Competing Claims To Arctic Resources," *The Canadian Press*, September 16, 2010.

[447] See, for example, Martha Henriques, "The Rush to Claim An Undersea Mountain Range," *BBC News*, July 22, 2020.

[448] "5 Countries Agree To Talk, Not Compete, Over the Arctic," *New York Times*, May 29, 2008.

- The United States and Canada have differing positions regarding their mutual maritime boundary in the Beaufort Sea part of the Arctic Ocean, north of the land border separating Alaska from Canada.[449]
- In June 1990, the United States and Soviet Union (now Russia) signed an agreement—the U.S./USSR Maritime Boundary Agreement—regarding the delimitation of the U.S.-Soviet (now U.S.-Russian) maritime boundary in the Bering Sea. The U.S. Senate consented to the ratification of the pact on December 16, 1991.[450] The Russian *Duma* has yet to approve the accord. The United States and Russia are applying the treaty on a provisional basis, pending its ratification by Russia.[451]
- Denmark and Canada in 2018 agreed to begin working to resolve a disagreement between the two countries over the status of Hans Island, a tiny, barren piece of rock between Greenland and Canada's Ellesmere Island.[452]

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[449] For additional (but unofficial and unverified) information on this issue, see the section entitled "Border Dispute" in "Beaufort Sea," Wikipedia, accessed April 8, 2021, at https://en.wikipedia.org/wiki/Beaufort_Sea.

[450] Treaty Document 101-22, see https://www.congress.gov/treaty-document/101st-congress/22.

[451] The State Department states:

> No negotiations regarding the U.S.-Russia maritime boundary have occurred since 1990, when the U.S.-USSR Maritime Boundary Agreement was signed. The negotiations that led to that agreement did not address the status of Wrangel Island, Herald Island, Bennett Island, Jeannette Island, or Henrietta Island, all of which lie off Russia's Arctic coast, or Mednyy (Copper) Island or rocks off the coast of Mednyy Island in the Bering Sea. None of the islands or rocks above were included in the U.S. purchase of Alaska from Russia in 1867, and they have never been claimed by the United States, although Americans were involved in the discovery and exploration of some of them.
>
> The U.S.-USSR Maritime Boundary Agreement, signed by the United States and the Soviet Union on June 1, 1990, defines our maritime boundary in the Arctic Ocean, Bering Sea, and northern Pacific Ocean. The U.S.-USSR Maritime Boundary Agreement is a treaty that requires ratification by both parties before it formally enters into force. The treaty was made public at the time of its signing. In a separate exchange of diplomatic notes, the two countries agreed to apply the agreement provisionally. The United States Senate gave its advice and consent to ratification of the U.S.-USSR Maritime Boundary Agreement on September 16, 1991.
>
> The Russian Federation informed the United States Government by diplomatic note dated January 13, 1992, that it "continues to perform the rights and fulfill the obligations flowing from the international agreements" signed by the Soviet Union. The United States and the Russian Federation, which is considered to be the sole successor state to the treaty rights and obligations of the former Soviet Union for the purposes of the U.S.-USSR Maritime Boundary Agreement, are applying the treaty on a provisional basis, pending its ratification by the Russian Federation.
>
> The United States regularly holds discussions with Russia on Bering Sea issues, but these discussions do not affect the placement of the U.S.-Russia boundary or the jurisdiction over any territory or the sovereignty of any territory. The U.S. has no intention of reopening discussion of the 1990 Maritime Boundary Treaty.
>
> (U.S. Department of State, Archives, "Status of Wrangel and Other Arctic Islands," Fact Sheet, Bureau of European and Eurasian Affairs, May 20, 2003, accessed April 8, 2021, at https://2001-2009.state.gov/p/eur/rls/fs/20922.htm.)

[452] A May 24, 2018, press report states:

> A long-standing dispute over what is essentially a large rock between Nunavut and Greenland may soon find its end after representatives from Denmark and Canada announced on Wednesday [May 23, 2018] that they would begin looking into ways to resolve their outstanding border issues in the Arctic.
>
> The status of Tartupaluk Island (known as Hans Island in English and Hans Ø in Danish) has been unresolved since 1973, when Danish and Greenlandic officials drew up the 1,670-mile (2,685-

In addition to these disputes, Norway and Russia had been at odds for decades over the boundary between the two in the so-called "Grey Zone" in the Barents Sea, an area believed to hold rich undersea deposits of petroleum. On September 15, 2010, Norwegian Prime Minister Jens Stoltenberg and Russian President Dmitry Medvedev signed an agreement in Murmansk, a Russian city near the Norwegian border. The accord awards roughly half of the 175,000-square-kilometer area to each country; it spells out fishing rights, and provides for the joint development of future oil and gas finds that straddle the boundary line. Some observers believe it is noteworthy that Russia would concede sovereignty over such a large, resource-rich area to a small, neighboring country. But others have noted that Moscow may be hoping for Norwegian cooperation in developing offshore resources, and eventually in winning approval when Russia makes its Article 76 UNCLOS submission.[453]

In August 2010, Canadian Foreign Minister Lawrence Cannon announced a new "Statement of Canada's Arctic Policy," which reaffirmed the government's commitment to Canada's sovereignty in the region, to economic and social development, to environmental protection, and to empowerment of the peoples in the north. The statement also emphasized the government's intention to negotiate settlements to its disputes with the United States over the Beaufort Sea boundary, and with Denmark over Hans Island. Minister Cannon declared that "making progress on outstanding boundary issues will be a top priority."[454] Also, despite their dispute over Hans

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kilometer) maritime border Greenland and Umingmak Nuna (Ellesmere Island).

While determining the location of most of the border was a simple matter of identifying a center line, agreeing to the status of Tartupaluk has proved more difficult, given its position in middle of the Kennedy Channel, part of a system of waterways linking Baffin Bay to the Arctic Ocean.

That has led both countries to steadfastly lay claim to the 320-acre (1.3-square kilometer) bean-shaped island.

Although most exchanges over Tartupaluk are in keeping with the friendly relations between Canada and Denmark—including occasional tit-for-tat visits beginning in the 1980s that are most memorable for involving cabinet members from both countries leaving bottles of alcohol for each other—when it comes to seeking a solution to the dispute, there has been little room for compromise.

The announcement of the renewed efforts to resolve the status of Tartupaluk, which was likely first used by the Inuit as hunting grounds and as a landmark when navigating, comes after the two countries agreed in 2005 to base a resolution on the island's status on geological surveys and, if necessary, by asking the International Court of Justice to resolve the claims.

It also comes after Danish and Canadian academics, in 2016, called for the island to be shared equally between the two countries, with the border drawn down the middle, connecting the borders that exist on either end.

In addition to the status of Tartupaluk, the Danish-Canadian task-force on boundary issues established on Wednesday will seek to resolve a disagreement over the maritime border between the two countries in the Lincoln Sea, as well as overlapping their overlapping continental-shelf claims in the Labrador Sea.

(Kevin McGwin, "Denmark, Canada Agree to Settle Hans Island Dispute," *ArcticToday*, May 24, 2018.)

For earlier press reports, see Dan Levin, "Canada and Denmark Fight Over Island With Whisky and Schnapps," *New York Times*, November 7, 2016; and Jeremy Bender, "2 Countries Have Been Fighting Over An Uninhabited Island by Leaving Each Other Bottles of Alcohol for Over 3 Decades," *Business Insider*, January 10,l 2016.

[453] "Russia, Norway Sign Deal On Barents Sea Border, Seek More Development in Mineral-rich Arctic," *Associated Press*, September 15, 2010.

[454] Cannon quoted in "Canada Seeks To Settle Arctic Borders," *Agence France Presse*, August 20, 2010. For additional information concerning Canada's August statement on Arctic policy, see "Statement on Canada's Arctic foreign policy: Exercising sovereignty and promoting Canada's Northern Strategy abroad," Foreign Affairs and International Trade

Canada website, http://www.international.gc.ca/polar-polaire/canada_arctic_foreign_policy-la_politique_etrangere_du_canada_pour_arctique.aspx?lang=eng.

Island, Canada and Denmark have been working together on Arctic issues. In May 2010, the two countries' military chiefs of staffs signed a memorandum of understanding on Arctic Defense, Security, and Operational Cooperation, committing the two countries to "enhanced consultation, information exchange, visits, and exercises."[455]

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[455] "Canada and Denmark Sign Arctic Cooperation Arrangement," *Targeted News Service*, May 17, 2010.