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Coast Guard and Maritime
Transportation, Committee on
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COAST GUARD

Agency Could Better Assess Its Impact on Arctic Capability Gaps and Is Exploring Icebreaker Acquisition Options

Statement of Jennifer Grover, Director, Homeland
Security and Justice

Accessible Version

GAO Highlights

Highlights of [GAO-16-738T](#), a testimony before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

The retreat of polar sea ice in the Arctic, as reported by the U.S. National Snow and Ice Data Center, combined with an expected increase in human activity there, has heightened U.S. and other nations' interests in the Arctic region in recent years. Growth in Arctic activity is expected to increase demand for services such as search and rescue and maritime navigation support, which can be a challenge to provide given the harsh and unpredictable weather and vast distances that responding agencies must travel to reach the Arctic. The Coast Guard plays a significant role in U.S. Arctic policy and issued its Arctic strategy in May 2013.

This statement addresses the extent to which the Coast Guard has (1) assessed its Arctic capabilities and taken actions to mitigate any identified gaps, and (2) reported being able to carry out polar icebreaking operations. This testimony is based on a June 2016 GAO report. GAO reviewed relevant laws and policies and Coast Guard documents that detail Arctic plans, among other things. Detailed information on GAO's scope and methodology can be found in the June 2016 report.

View [GAO-16-738T](#). For more information, contact Jennifer A. Grover at (202) 512-7141 or groverj@gao.gov.

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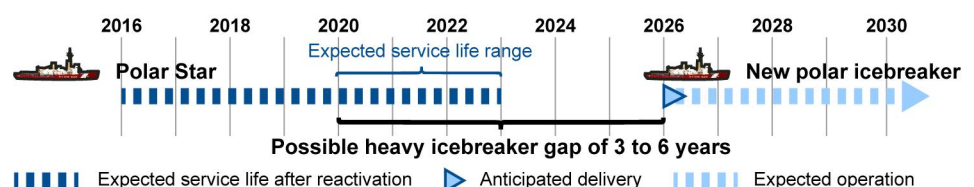
Agency Could Better Assess Its Impact on Arctic Capability Gaps and Is Exploring Icebreaker Acquisition Options

What GAO Found

GAO reported in June 2016 that the U.S. Coast Guard, within the Department of Homeland Security (DHS), had assessed its Arctic capabilities and worked with its Arctic partners—such as other federal agencies—to mitigate Arctic capability gaps, including communications and training. Although Coast Guard officials stated that the agency's actions, such as testing communication equipment in the Arctic and conducting Arctic oil spill response exercises, have helped to mitigate Arctic capability gaps, the Coast Guard has not systematically assessed the impact of its actions on these gaps. GAO recommended in June 2016 that the Coast Guard develop measures, as appropriate, and design and implement a process, for systematically assessing the extent to which its actions have helped mitigate Arctic capability gaps. DHS concurred with GAO's recommendations, and the Coast Guard reported that it planned to develop specific measures for some of its Arctic activities and systematically assess how its actions have helped to mitigate the capability gaps for which the Coast Guard is the lead agency. While officials stated they are unable to unilaterally close capability gaps for which the Coast Guard is not the lead agency, assessing the impact of Coast Guard actions for such capability gaps would better enable the Coast Guard to understand the effectiveness of its actions and the status of all capability gaps, as well as plan its Arctic operations.

GAO's June 2016 report also found that the Coast Guard has been unable to fulfill its polar icebreaking responsibilities with its aging icebreaker fleet, which currently includes two active icebreakers. In 2011 and 2012, the Coast Guard was unable to maintain year-round access to the Arctic and did not meet 4 of 11 requests for polar icebreaking services. With its one active heavy icebreaker—which has greater icebreaking capability—nearing the end of its service life, the Coast Guard initiated a program in 2013 to acquire a new one and is working to determine the optimal acquisition strategy. However, the Coast Guard's efforts to acquire an icebreaker, whether by lease or purchase, will be limited by legal and operational requirements. In addition, current projections show that the Coast Guard is likely to have a 3- to 6-year gap in its heavy icebreaking capability before a new icebreaker becomes operational, as shown below. The Coast Guard is developing a strategy to determine how to address this expected gap.

Coast Guard's Heavy Icebreaker Availability and Expected Capability Gap, Present until 2030



Source: GAO analysis of U.S. Coast Guard documents. | GAO-16-738T

Chairman Hunter, Ranking Member Garamendi, and Members of the Subcommittee:

I am pleased to be here today to discuss our June 2016 report on the Coast Guard's Arctic capabilities—including polar icebreaking—that is being publically released at today's hearing.¹ The retreat of polar sea ice in the Arctic, as reported by the U.S. National Snow and Ice Data Center, combined with an expected increase in human activity there, has heightened U.S. and other nations' interests in the Arctic region in recent years. Diminishing sea ice has made some Arctic waters navigable for longer periods and, as a result, may contribute to new economic opportunities in commercial shipping, tourism, and commercial fishing, among other activities. Growth in Arctic activity is expected to increase demand for services such as search and rescue and maritime navigation support, which can be a challenge to provide given the harsh and unpredictable weather and vast distances that responding agencies must travel to reach the Arctic. U.S. interest in the Arctic was further heightened in anticipation of the United States taking over the chairmanship of the Arctic Council—a voluntary intergovernmental forum—in 2015.²

My statement today summarizes selected findings from our June 2016 report, and addresses the extent to which the Coast Guard has (1) assessed its Arctic capabilities and taken actions to mitigate any identified gaps, and (2) reported being able to carry out polar icebreaking operations.³ To conduct this work, we reviewed relevant laws and

¹GAO, *Coast Guard: Arctic Strategy is Underway but Agency Could Better Assess How Its Actions Mitigate Known Arctic Capability Gaps*, [GAO-16-453](#) (Washington D.C.: June 15, 2016).

²Established by the Ottawa Declaration in 1996, the Arctic Council is the intergovernmental forum for addressing issues related to the Arctic Region and operates on a basis of consensus. The participants of the Arctic Council include the eight Arctic States—Canada, the Kingdom of Denmark (Denmark), Finland, Iceland, Norway, the Russian Federation (Russia), Sweden, and the United States—plus six groups representing the indigenous people of the Arctic. The Council focuses its work on matters related to sustainable development, the environment, and scientific cooperation in the Arctic; its mandate explicitly excludes military security.

³Our June 2016 report also reviewed the progress that the Coast Guard reported toward implementing its Arctic strategy and the factors that affect Coast Guard planning for Arctic operations, see [GAO-16-453](#).

policies, and Coast Guard documents that detail its Arctic plans, and interviewed officials from the Department of Homeland Security (DHS) and the Coast Guard, as well other federal agencies involved in Arctic issues. We also conducted a site visit to Alaska and interviewed officials from the Coast Guard, state and local government entities, native village corporations, and private or nonprofit organizations. These observations are not generalizable, but provided insights on Coast Guard activities. More detailed information on our scope and methodology can be found in our June 2016 report.⁴ Our work was performed in accordance with generally accepted government auditing standards.

With this heightened Arctic focus, various strategies and policies have been released by the White House and other federal entities to supplement long-standing U.S. Arctic policy. For example, the White House issued the *National Strategy for the Arctic Region* in 2013 and its corresponding implementation plan in 2014, and the White House National Ocean Council issued the *National Ocean Policy Implementation Plan* in April 2013 which specifically identifies Arctic issues.⁵ To coordinate the actions of federal entities involved in the Arctic, the White House established the Arctic Executive Steering Committee in January 2015 and tasked it with shaping priorities, providing strategic direction, overseeing implementation of the *National Strategy for the Arctic Region*, and ensuring coordination of federal activities in the Arctic, among other things.⁶

The U.S. Coast Guard, within DHS, plays a significant role in U.S. Arctic policy and issued its corresponding Arctic strategy, which seeks to

⁴[GAO-16-453](#).

⁵White House, *National Strategy for the Arctic Region* (Washington, D.C.: May 10, 2013), and *Implementation Plan for the National Strategy for the Arctic Region* (Washington, D.C.: Jan. 30, 2014). The implementation plan was superseded in March 2016 by the *Implementation Framework for the National Strategy for the Arctic Region*. National Ocean Council, *National Ocean Policy Implementation Plan* (Washington, D.C.: April 2013). The *National Ocean Policy Implementation Plan* was created to translate the *National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes* into on-the-ground actions. See Appendix IV and V of our June 2016 report for more on these national strategies and plans, [GAO-16-453](#).

⁶The Arctic Executive Steering Committee was established under Executive Order 13689, *Enhancing Coordination of National Efforts in the Arctic*. Exec. Order No. 13,689, 80 Fed. Reg. 4191 (Jan. 26, 2015).

support national policy, in May 2013.⁷ According to the Coast Guard, the development of its strategy was guided by the *National Strategy for the Arctic Region* and the *National Ocean Policy Implementation Plan*, as well as key presidential directives, executive orders, and other national strategies. In December 2015, the Coast Guard issued the implementation plan intended to operationalize its Arctic strategy within existing resources.⁸ We reported in June 2016 that the Coast Guard was developing a web-based tool to track the status of its Arctic implementation plan, as well as the status of its Arctic-related responsibilities under other national strategies, presidential directives, and service directives. Coast Guard officials stated that they anticipate finalizing the web-based tool for management approval by October 2016.

Since 2008, the Coast Guard has conducted an annual operation in the Arctic (now known as Operation Arctic Shield).⁹ Coast Guard officials stated that Arctic Shield is a seasonal surge operation designed to help the Coast Guard learn how to operate in this increasingly active region. Arctic Shield is intended to provide the Coast Guard with the opportunity to (a) perform Coast Guard missions and activities, (b) advance maritime domain awareness, (c) broaden partnerships in support of Coast Guard Arctic operations, and (d) enhance and improve preparedness, prevention, and response capabilities in the Arctic. In addition to the aircraft, cutters, and personnel that are deployed for Arctic Shield, the Coast Guard has also carried out the nation's polar icebreaking needs with its fleet of three polar icebreakers—the *Polar Star*, *Polar Sea*, and *Healy*—of which just the *Polar Star* and *Healy* are currently active, as shown in figure 1. The *Polar Star* and the *Polar Sea* are heavy polar

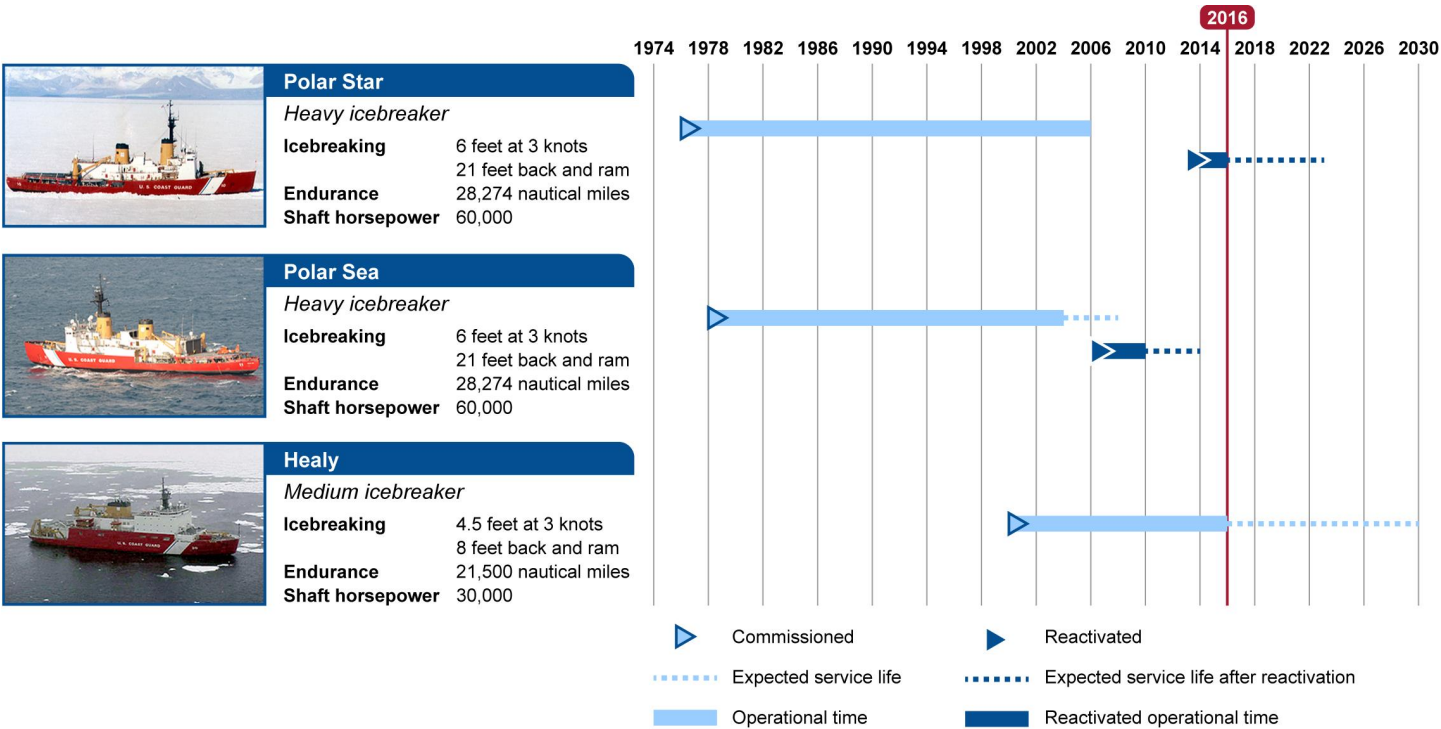
⁷U.S. Coast Guard, *United States Coast Guard Arctic Strategy* (Washington, D.C.: May 2013). Other federal agencies and interagency groups have Arctic responsibilities and these entities are detailed in our June 2016 report, see [GAO-16-453](#).

⁸U.S. Coast Guard, *United States Coast Guard Arctic Strategy Implementation Plan* (Washington, D.C.: December 2015). For more on the Coast Guard's implementation of its Arctic strategy, see our June 2016 report, [GAO-16-453](#).

⁹For more on how the Coast Guard plans for Arctic Shield, see our June 2016 report, [GAO-16-453](#).

icebreakers and the world's most powerful non-nuclear icebreakers.¹⁰ The *Healy* is a medium icebreaker that primarily supports Arctic research. However, the *Healy* cannot operate independently in Antarctic ice conditions or ensure timely access to some Arctic areas in the winter.

Figure 1: U.S. Coast Guard's Polar Icebreaker Fleet



Source: GAO analysis of Coast Guard documents; U.S. Coast Guard (photographs). | GAO-16-738T

Note: The *Polar Sea* went under extensive repair from 2004 to 2006 and was not operational during this time. The repair resulted in an anticipated extension of the *Polar Sea*'s service life until 2014. However, it suffered major engine casualties in June 2010, and has not been active since.

¹⁰The Coast Guard defines a heavy icebreaker as a vessel (generally with at least 45,000 shaft horsepower) that can operate independently in polar environments with the presence of seasonal or multi-year ice. We used this definition for this report. While the Coast Guard's buoy tenders have limited ice breaking capability, only polar icebreakers are equipped to operate independently in existing and expected polar environments.

We reported in June 2016 that various requirements drive the Coast Guard's icebreaking mission responsibilities which are based in statute, presidential directive, strategies, and interagency agreements.¹¹ For example, the goals and activities set forth in the *National Strategy for the Arctic Region* and the 2009 presidential directive on the Arctic region drive the Coast Guard's need to maintain the ability to project a sovereign presence in the Arctic—a standard which requires the use of a polar icebreaker at certain times when seasonal ice covers large portions of the Arctic region.¹² The Coast Guard's icebreaking responsibilities are also derived from interagency agreements that commit it to providing icebreaking services to other departments and agencies in support of various strategic and scientific missions—including national defense.¹³ For example, under a 2010 Memorandum of Agreement between the Coast Guard and the National Science Foundation, the Coast Guard agreed to provide polar icebreaker support to conduct the resupply of McMurdo Station to support the U.S. Antarctic program and to conduct

¹¹Under federal law, the Coast Guard has been responsible for carrying out the nation's polar icebreaking needs since 1965—when it assumed primary responsibility for the nation's polar icebreaking fleet. 14 U.S.C. § 2 establishes that one of the Coast Guard's required primary functions is to maintain icebreaking facilities for use on the high seas and on waters subject to U.S. jurisdiction, as well as, pursuant to international agreements, to maintain icebreaking facilities on waters other than the high seas and on waters not subject to U.S. jurisdiction—specifically, the Antarctic region.

¹²White House, *National Strategy for the Arctic Region* (Washington, D.C.: May 10, 2013); White House, National Security Presidential Directive/NSPD-66 and Homeland Security Presidential Directive/HSPD-25, *Arctic Region Policy* (Jan. 9, 2009). Although record lows for recent summer and early autumn sea ice extent have made seasonal maritime navigation more feasible in the Arctic, the Coast Guard reported that polar icebreakers can still be necessary during these seasons to conduct research or to assist other vessels. Winter sea travel is also still severely limited due to extensive ice coverage across the Arctic region, necessitating heavy icebreaker assistance.

¹³According to the Department of Defense's 2013 Arctic Strategy, "the United States needs assured access to support U.S. national interests in the Arctic. Although this imperative could be met by regular U.S. Government ships in open water up to the marginal ice zone, only ice-capable ships provide assured sovereign presence throughout the region and throughout the year. Assured access in areas of pack ice could also be met by other means, including submarines and aircraft."

research in the Antarctic.¹⁴ Appendix I provides a selection of the laws and policies that are cited as sources for the Coast Guard's need to maintain polar icebreaking capability.

The Coast Guard Has Assessed Its Arctic Capabilities and Taken Actions to Mitigate Gaps but Has Not Systematically Assessed Its Progress

In our June 2016 report, we found that although the Coast Guard had assessed its Arctic capabilities and worked with its Arctic partners—such as other federal agencies—to carry out actions to help mitigate Arctic capability gaps—it had not systematically assessed how its actions have helped to mitigate these gaps. Specifically, we reported that the Coast Guard had assessed its capability to conduct its Arctic missions and had identified various capability gaps, primarily through two key studies.¹⁵ The capability gaps identified in these reports—which Coast Guard officials confirmed remain relevant and highlighted in their Arctic strategy—include (1) communications, (2) Arctic maritime domain awareness,¹⁶ (3) infrastructure, (4) training and exercise opportunities, and (5) icebreaking. These gaps are similar to the ones we identified in 2010.¹⁷

According to Coast Guard officials, through the agency's role in implementing the various Arctic strategies and implementation plans, the

¹⁴The United States Antarctic Program, which is managed by the National Science Foundation, requires an annual delivery of fuel and cargo to McMurdo Station. Because the tanker and cargo ships cannot access McMurdo Station independently, the National Science Foundation has typically relied on the Coast Guard's icebreaker fleet to open a channel for the tanker and cargo ships. The McMurdo Station operation occurs during the austral summer (i.e., in January or February when the ice is thinnest), which coincides with the Arctic winter.

¹⁵U.S. Coast Guard, *High Latitude Study Mission Analysis Report* (Washington, D.C., November 2011). This report was created to inform key decision makers evaluating Coast Guard high-latitude operational requirements, as well as acquisition and sustainment decisions for forward operating locations, aircraft, communications systems, and ice-capable vessels. Another study, issued by the Department of Defense–DHS Arctic Capabilities Assessment Working Group in March 2012, consolidated the needed capabilities identified in various federal agency studies on the Arctic, and is intended to guide both departments' investment priorities.

¹⁶Maritime domain awareness is the effective understanding of anything associated with the global maritime domain that could affect the United States' security, safety, economy, or environment.

¹⁷GAO, *Coast Guard: Efforts to Identify Arctic Requirements Are Ongoing, but More Communication about Agency Planning Efforts Would Be Beneficial*, [GAO-10-870](#) (Washington, D.C.: Sept. 15, 2010).

Coast Guard has taken actions, along with its Arctic partners, that have helped to mitigate capability gaps. For example, the Coast Guard is the lead agency for implementing the strategies' tasks related to enhancing Arctic maritime domain awareness. In addition, Coast Guard officials reported that they utilize the annual Arctic Shield operations as the primary operational method to better understand the agency's Arctic capabilities and associated gaps and to take actions to help mitigate them. For example, during Arctic Shield operations, the Coast Guard tested communications equipment belonging to the Department of Defense—extending communications capabilities further north than previously possible—and conducted Arctic oil spill response exercises.

However, we found in our June 2016 report that the Coast Guard had not systematically tracked the extent to which its actions agency-wide have helped mitigate Arctic capability gaps. Coast Guard officials attributed this, in part, to not being able to unilaterally close the gaps. While fully mitigating these gaps requires joint efforts among Arctic partners, the Coast Guard has taken actions in the Arctic that are specific to its missions and has responsibility for assessing the extent to which these actions have helped to close capability gaps. *Standards for Internal Control in the Federal Government* provide that ongoing monitoring should occur in the course of normal operations and should help ensure that the findings of reviews, such as the capability gaps identified in the previously mentioned reports, are resolved.¹⁸ As a result, we recommended in our June 2016 report that the Coast Guard develop measures, as appropriate, and design and implement a process for systematically assessing the extent to which its actions have helped mitigate Arctic capability gaps.

DHS concurred with our recommendations, and in response, the Coast Guard reported that it planned to develop specific measures for some of its Arctic activities and systematically assess how its actions have helped to mitigate the capability gaps for which the Coast Guard is the lead agency, such as icebreaking capacity. We believe that these actions, if implemented, will help the Coast Guard better understand the status of these capability gaps and better position it to effectively plan its Arctic

¹⁸GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

operations. However, we continue to believe that it is important for the Coast Guard to also systematically assess how its actions affect Arctic capability gaps for which it is not the lead, such as communications. Although the Coast Guard may not be the lead for these gaps, assessing the impact of Coast Guard actions for such capability gaps would better enable the Coast Guard to understand the effectiveness of its actions and the status of all capability gaps. Also, as these gaps may affect its Arctic missions, this knowledge may be helpful to the Coast Guard in planning its operations.

Coast Guard Has Been Unable to Fulfill All Polar Icebreaking Operations and Is Taking Steps to Begin Icebreaker Acquisition

Our June 2016 report found the Coast Guard has been unable to fulfill some of its polar icebreaking responsibilities with its aging polar icebreaking fleet, and had efforts underway to acquire a heavy icebreaker—which has greater icebreaking capability than a medium icebreaker. Specifically, in 2011 and 2012 when its heavy icebreakers were not active, the Coast Guard was unable to maintain assured, year-round access to the Arctic and did not meet 4 of 11 requests for polar icebreaking services. The Coast Guard reported that increased heavy icebreaking capacity is needed to fully meet requirements in the Arctic and Antarctic regions.¹⁹ A 2010 Coast Guard-commissioned study found that at least six icebreakers—three heavy and three medium—would be required to carry out the Coast Guard’s statutory missions, if the Coast Guard were to fully accomplish all of its polar icebreaking responsibilities.²⁰ Recognizing the fiscal challenges posed by such a request, Coast Guard officials have stated that obtaining a minimum of two heavy icebreakers is needed to at least maintain the fleet’s self-rescue capability in the event one vessel became beset in ice—a capability the Coast Guard does not currently have.

We also found that the Coast Guard initiated a program in 2013 to acquire a new heavy icebreaker to maintain polar icebreaking capability after the *Polar Star*’s projected service life ends between 2020 and 2023.

¹⁹The Coast Guard reported that a medium icebreaker, like the *Healy*, can complete many of the Coast Guard’s Arctic missions, but cannot operate independently in the presence of thick ice; only heavy polar icebreakers can provide assured, year-round access to both polar regions.

²⁰ABS Consulting, *United States Coast Guard High Latitude Region Mission Analysis Capstone Summary*, prepared for the United States Coast Guard, (July 2010).

Currently, the Coast Guard is working to determine the optimal acquisition strategy. To move forward with the acquisition process, the Coast Guard would need to receive funding for an icebreaker—which, according to a 2013 preliminary estimate, would be about \$1.09 billion—and ensure that a U.S.-based commercial shipyard would be able to build the vessel.²¹ For many years, the Coast Guard’s annual acquisition budget has been allocated primarily to other projects.²² The President’s fiscal year 2017 budget request outlined plans to accelerate the acquisition process for a heavy icebreaker, so that production activities could commence by 2020.²³

Various factors limit the options available to the Coast Guard to maintain, or increase, its icebreaker capacity. The Coast Guard has reported that the long-term lease of a polar icebreaker is unlikely to result in cost savings when compared with a purchase. Specifically, we reported in June 2016 that two key factors limiting the Coast Guard’s options for acquiring icebreaking capacity are the lack of an available icebreaker that meets agency and legal requirements, and the total cost that would be associated with a long-term lease.

- **Availability.** The Coast Guard reported that no existing heavy icebreakers were available to lease or purchase that met both its legal and operational requirements. Specifically, to meet legal requirements, the Coast Guard would need to either purchase or demise charter the icebreaker,²⁴ as legal requirements associated with several Coast Guard missions prohibit a short-term lease.

²¹According to 14 U.S.C. § 665, no Coast Guard vessel may be constructed in a foreign shipyard, unless the President authorizes an exception when it is in the national security interest of the United States to do so. Coast Guard officials stated that they believe the U.S. private sector has the potential to place competitive bids based on inquiries made during initial acquisition phases.

²²In fiscal year 2016, the Coast Guard’s acquisition budget was \$1.945 billion, approximately 60 percent higher than the prior year.

²³In May 2016, the Senate Committee on Appropriations reported a Department of Defense appropriations bill for fiscal year 2017 that would include \$1 billion for the first ship of the Polar Icebreaker Recapitalization Project. S. 3000 (114th Cong.).

²⁴Under a demise charter, also known as a bareboat charter, the Coast Guard would take responsibility for the crewing, operation, and maintenance of the vessel, as described in 46 C.F.R. § 169.107.

Specifically, under federal law, to be capable of conducting all of its statutory missions, the Coast Guard must use a public vessel, which federal law defines as one that the United States owns or demise charters.²⁵ For example, federal law states that the Coast Guard's Ports, Waterways, and Coastal Security Mission may be carried out with public vessels or private vessels tendered gratuitously for that purpose.²⁶ Further, federal law provides that no Coast Guard vessel may be constructed in a foreign shipyard.²⁷ According to the Coast Guard, besides the *Polar Star* and the *Polar Sea*, the only existing icebreakers powerful enough to meet the Coast Guard's operational requirements were built in and are owned by Russia and would not comply with this legal requirement.

- **Budgeting and Total Cost.** Budget requirements also affect the Coast Guard's ability to acquire an icebreaker. For example, Office of Management and Budget (OMB) guidelines require federal agencies to acquire assets in the manner least costly overall to the government. Specifically, for a large acquisition like a heavy icebreaker, OMB Circular A-94 requires the Coast Guard to conduct a lease-purchase analysis based on total lifecycle costs of the asset.²⁸ To proceed with a lease, the Coast Guard would need to show that leasing is preferable to direct government purchase and ownership. Budget scorekeepers—specifically, OMB, the Congressional Budget Office, and the House and Senate Budget Committees—score purchases and capital leases at the outset of the acquisition.²⁹ A 2011

²⁵46 U.S.C. § 2101(24).

²⁶33 U.S.C. § 1234. Similarly, for the Coast Guard to employ its law enforcement authorities in the conduct of certain missions, the icebreaker would need to operate as a warship, and warships are necessarily sovereign immune, public vessels, according to Coast Guard officials. See 14 U.S.C. § 89; 46 U.S.C. § 2101(47). Under the Law of the Sea Convention, to exercise U.S. immunity on the high seas, a Coast Guard vessel must be a warship or government vessel on noncommercial service. See Law of the Sea Convention, Articles 95, 96. While the United States is not a party to the Convention, according to the *National Strategy for the Arctic Region*, the United States supports and observes principles of established customary international law reflected in the Convention.

²⁷14 U.S.C. § 665.

²⁸Office of Management and Budget Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (1992).

²⁹Based on scoring rules, the long-term lease of a polar icebreaker would not qualify as an operating lease, which is intended for short-term needs and would allow the costs to be recognized over time.

preliminary cost analysis prepared for the Coast Guard indicated that the lease option would be more costly to the federal government over an icebreaker's expected 30-year service life. According to this analysis, the prospective ship owner's profit rate would increase the overall expense as this profit rate is priced into the lease, such that government ownership would be less costly in the long run.³⁰ Moreover, because a demise charter requires the lessee to operate and maintain the vessel, the Coast Guard would not be able to outsource crewing or maintenance activities to reduce its operating costs. Previous GAO work on the question of leasing versus buying an icebreaker identified important assumptions in comparing the costs to the federal government and suggested that outright purchase could be a less costly alternative than a long-term vessel lease.³¹ Assuming that the cost of building and operating the vessel was the same under both the buy and the lease scenarios, the cost advantage to government purchase over leasing in our previous work was based on two factors. First, the costs of private sector financing under a lease arrangement—which were higher than the government's borrowing costs—could be expected to be passed on to the federal government in lease payments, thereby increasing the vessel's financing costs over what they would be under outright government purchase. Second, under a lease arrangement, an additional profit would accrue to the lessor for services related to its retained ownership of the vessel.

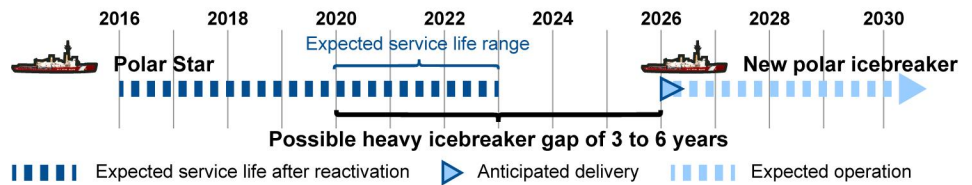
Anticipating a likely gap of 3 to 6 years in heavy icebreaker capability between the expected end of the *Polar Star's* service life between 2020 and 2023 and the deployment of a new icebreaker in 2026, we reported in June 2016 that the Coast Guard is developing a bridging strategy, as

³⁰According to a subsequent 2012 report prepared for the Coast Guard, legal and operational requirements render additional cost-benefit analysis of leasing unnecessary. Nevertheless, Coast Guard officials stated that they will consider leasing as a possible acquisition strategy in a forthcoming report, as directed by language in committee reports accompanying the Coast Guard's fiscal year 2014 appropriations. See S. Rep. No. 113-77, at 88-89 (2013). Coast Guard officials stated that they are evaluating this effort and will determine an estimated completion date for this report in the future.

³¹GAO, *National Science Foundation: Need for Additional Icebreaking Research Vessel Not Demonstrated*, [GAO/RCED-95-77](#) (Washington, D.C.: May 12, 1995).

required by law, to determine how to address this expected gap (see fig. 2).³²

Figure 2: Coast Guard's Heavy Icebreaker Availability and Expected Capability Gap, Present until 2030



Source: GAO analysis of U.S. Coast Guard documents. | GAO-16-738T

Note: This graphic does not incorporate additional acquisition or other proposed activities, such as reactivating the *Polar Sea*.

We reported in June 2016 that the Coast Guard has not determined the cost-effectiveness of reactivating the *Polar Sea*, and that a Bridging Strategy Alternatives Analysis will assess and make recommendations on whether to reactivate the *Polar Sea* and whether to further extend the service life of the *Polar Star*. Coast Guard officials said that they have not established a completion date for this report, but do not anticipate a final decision on the *Polar Sea* before fiscal year 2017, after which they will evaluate the cost-effectiveness of extending the *Polar Star*'s life, if necessary.

In conclusion, the Coast Guard has made progress in assessing its capabilities in the Arctic and taking steps to address identified capability gaps, but the Coast Guard could do more to systematically determine the progress it has made in helping to mitigate these various gaps. Further, several factors exist that affect the Coast Guard's options for acquiring a new icebreaker, including both legal and budgetary considerations that suggest a purchase of an icebreaker may be preferable to a long-term lease. Regardless of the acquisition approach, there is a strong likelihood of a 3 to 6 year gap in heavy icebreaking service, which underscores the need for the Coast Guard to move forward with its bridging strategy.

³²Coast Guard and Maritime Transportation Act of 2012, Pub. L. No. 112-213, § 222, 126 Stat. 1540, 1560-1561, as amended by Howard Coble Coast Guard and Maritime Transportation Act of 2014, Pub. L. No. 113-281, § 505, 128 Stat. 3022, 3059-3060.

Chairman Hunter, Ranking Member Garamendi, and Members of the Subcommittee, this completes my prepared statement. I would be pleased to respond to any questions that you may have at this time.

Contacts and Staff Acknowledgments

If you or your staff have any questions about this testimony, please contact Jennifer Grover at (202) 512-7141 or groverj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. Individuals making key contributions to this testimony include Dawn Hoff (Assistant Director), Tracey Cross (Analyst-in-Charge), Chuck Bausell, Linda Collins, John Crawford, Michele Fejfar, Laurier Fish, Eric Hauswirth, Carol Henn, Susan Hsu, Tracey King, Jan Montgomery, Jillian Schofield, Katherine Trimble, and Eric Warren.

Appendix I: Selected Polar Icebreaking Authorities and Mandates

Federal laws	Description
14 U.S.C. § 2	Requires the Coast Guard to, in part, establish, develop, maintain, and operate icebreaking facilities on, under, and over the high seas and waters subject to the jurisdiction of the United States; and, pursuant to international agreements, requires the Coast Guard to develop, establish, maintain, and operate icebreaking facilities on, under, and over waters other than the high seas and waters subject to the jurisdiction of the United States.
14 U.S.C. § 87	Requires the President to facilitate planning for the design, procurement, maintenance, deployment, and operation of icebreakers as needed to support the statutory missions of the Coast Guard in the polar regions by allocating all funds to support icebreaking operations in such regions, except for recurring incremental costs associated with specific projects, to the Coast Guard.
14 U.S.C. § 93	Authorizes the Coast Guard to maintain icebreaking facilities.
14 U.S.C. § 94	Requires the Coast Guard to conduct such oceanographic research, use such equipment or instruments, and collect and analyze such oceanographic data, in cooperation with other agencies of the government, or not, as may be in the national interest.
14 U.S.C. § 141	Authorizes the Coast Guard to provide and accept personnel and facilities, from other federal and state agencies, to perform any activity for which such personnel and facilities are especially qualified and as may be helpful in the performance of its duties, respectively.
16 U.S.C. § 2431	Congress finds that 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 Antarctica.
16 U.S.C. § 2441	The Department of Homeland Security is required to facilitate planning for the design, procurement, maintenance, deployment, and operation of icebreakers needed to provide a platform for Antarctic research.
15 U.S.C. § 4101	Congress finds that 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.
Strategic policies	Description
<i>Implementation Framework for the National Strategy for the Arctic Region</i> (2016)	The Coast Guard is the lead agency for ensuring the United States maintains icebreaking capability with sufficient capacity to project an assured Arctic maritime access, supports U.S. interests in the polar regions, and facilitates research that advances the fundamental understanding of the Arctic.
National Security Presidential Directive 66/Homeland Security Presidential Directive 25 (NSPD-66/ HSPD-25): Arctic Region Policy (2009)	The Department of Homeland Security and other departments shall “[p]reserve the global mobility of United States military and civilian vessels and aircraft throughout the Arctic region” and “project a sovereign United States maritime presence in the Arctic in support of essential United States interests.”
Presidential Memorandum 6646: United States Antarctic Policy and Programs (1982)	The Departments of Defense and Transportation (now Department of Homeland Security) shall provide logistical support as requested by the National Science Foundation to support the United States Antarctic Program.
Interagency agreements	Description

**Appendix I: Selected Polar Icebreaking
Authorities and Mandates**

Interagency agreements	Description
Memorandum of Agreement between Department of the Navy and Department of the Treasury on the Operation of Icebreakers (1965)	Navy agreed to transfer all icebreakers to the Coast Guard, and the Coast Guard agreed, among other things, to maintain and operate the U.S. icebreaker fleet, to prepare for contingency or wartime operations in polar regions, to assign icebreakers to the Navy's operational control for seasonal polar deployments, and to support scientific programs to the extent possible.
Memorandum of Agreement between Coast Guard and National Science Foundation (2010)	The Coast Guard agreed to provide polar icebreaker support to conduct the resupply of McMurdo Station to support the U.S. Antarctic program and to conduct research in the Antarctic.
Memorandum of Agreement between the Department of Defense and Department of Homeland Security on the Use of U.S. Coast Guard Capabilities and Resources in Support of the National Military Strategy (2008/2010)	In ice-covered and ice-diminished waters, Coast Guard icebreakers are the only means of providing assured surface access in support of the Department of Defense missions.

Source: GAO analysis of relevant laws, policies, and agreements. | GAO-16-738T

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