Icebreakers as a Tool for American Power Projection in the Alaskan Arctic

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There are two kinds of Arctic problems, the imaginary and the real. Of the two, the imaginary are the most real.

—Vilhjalmur Stefansson, *The Arctic in Fact and Fable*
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Abstract

The Arctic environment is changing. In the era of great-power competition, China, Russia, the United States, and others are expanding their capabilities to operate in the Alaskan Arctic. Key among the tools used to do this are icebreakers, vessels capable of cutting through thick ice sheets that blanket Arctic waters for most of the year. The United States’ relatively small and outdated icebreaker fleet is a frequent topic of discussion within political, policymaking, and military circles but there exists little analysis on why icebreakers are important for facilitating American activities in the Alaskan Arctic and if the neglected nature of the United States’ icebreaker fleet is legitimate cause for concern. Drawing on interviews with key personnel across the public and private sectors and domestic and international literature, this thesis contributes to a growing understanding of the role icebreakers play in facilitating American power projection in the Alaskan Arctic both as a symbol and as a tool to fulfill practical defense, homeland security, and economic missions. This thesis seeks to understand to what degree the United States is truly deficient in its icebreaking capabilities.
Definitions

- **Arctic:** The Arctic is most commonly defined as the region north of an imaginary line that circles the globe at approximately 66° 34’ N.¹

- **Climate Change:** According to NASA, climate change, also known as global warming, is “a long-term change in the average weather patterns that have come to define Earth’s local, regional and global climates” that is “primarily driven by human activities, particularly fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth’s atmosphere, raising Earth’s average surface temperature.”²

- **Icebreaker:** Icebreakers are special-purpose vessels defined by their ability to access the Arctic and Antarctic regions in all months by breaking and maneuvering in ice, though the exact extent to which they are capable of doing this is dependent on the vessel’s exact construction specifications. Icebreakers are considered capable of navigating in the Arctic and Antarctic when non-icebreaking vessels are not. “Icebreakers are classified and certified by only 10 of the more than 50 existing organizations worldwide that classify sea-going vessels,” and each organization classifies these icebreakers in different manners, meaning there is no standard classification for icebreakers.³ Generally, “to be categorized as a polar icebreaker by the U.S. Coast Guard, an icebreaker must have propulsion power greater than 10,000 horsepower and a minimum displacement of 6,000 tons.”⁴
  - **Ice-capable Vessel:** Ice-capable vessels are capable of traveling in moderate ice conditions. Unlike icebreakers, ice-capable vessels cannot access the Arctic and Antarctic regions year-round and cannot navigate heavy ice conditions.

- **Exclusive Economic Zone:** The Exclusive Economic Zone is a concept defined in the 1982 United Nations Conference on the Law of the Sea where a coastal state assumes control over a region that extends for 200 nautical miles from the shoreline. This gives the country, according to the United Nations,
  - **Sovereign rights for the purpose of exploring, exploiting, conserving and managing natural resources, whether living and nonliving, of the seabed and subsoil and the superjacent waters and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds;**
  - **Jurisdiction as provided for in international and domestic laws with regard to the establishment and use of artificial islands, installations, and structures, marine

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⁴ Transportation Research Board and National Research Council, “The U.S. Coast Guard Icebreaker Fleet.”
scientific research, and the protection and preservation of the marine environment; and

- Other rights and duties provided for under international and domestic laws.\(^5\)

- **Near-Peer Competitor**: A peer competitor “is a state or collection of challengers with the power and motivation to confront the United States on a global scale in a sustained way and to a sufficient level where the ultimate outcome of a conflict is in doubt even if the United States marshals its resources in an effective and timely manner.”\(^6\) Thus, a peer competitor is a state with “smaller, technologically weaker, with older and less capable systems” than a peer competitor where, in a conflict, it is likely the United States (U.S.) would win if it were to marshal its resources in an effective and timely manner.\(^7\)

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Introduction

Complex, interrelated warming trends are rewriting the Arctic landscape. For the last ten years, sea ice concentrations have measured below the long-term mean, falling more than 30% below this mean in 2007, 2008, 2009, 2011, and 2012. As sea ice coverage has declined, the variability of its yearly coverage has doubled since the 1980s. In the 1980s, “sea ice concentration was 60-87%;” in the previous decade, that range fell to 5-56%. Today, there are roughly “67 days with ice concentrations below 50%” annually; in the 1980s, there were none. Arctic sea ice is also thinning. Sea ice thickness “in the Beaufort/Chukchi at the end of the melting season declined by 57%.” Both as a result of and contributing to decreased ice coverage, there are increasing heat stores at the surface and at “50-80 meter depths in the central Arctic.”

Some of this stored marine heat is transferred to the air, where it contributes to atmospheric warming. There, it is expected to cause increases in storm frequency and force. These strong winds likely contribute to a northward migration of freshwater from southern Pacific waters. This fresher water is associated with warmer ocean temperatures. These factors interact to create drastic warming effects on the marine Arctic region. Experts project the Arctic will be ice-free during most of the summer by between 2035 and 2040.

It would be wrong to claim these changes are consistently opening the Arctic. More than anything, these climatic changes are increasing the volatility of the region’s environment. Melting sea ice often “refreezes in large, uneven chunks that create navigation hazards,” increasing the need for icebreaking ships despite decreasing sea ice coverage trends. Mike Emerson of the United States Coast Guard (USCG) explains that “for a large part of the season...if there is ice that is melting or receding, there is going to be a change in the fast ice,” forming moving icebergs that could harm non-icebreaking vessels. Storms are increasing in strength and volatility, and therefore contributing to this ice breakup.

In this context, the Arctic is becoming a hotspot for geopolitical competition. As climate change minimizes the extent and thickness of sea ice, Arctic waters are becoming increasingly navigable, opening the region to new economic and political interests. In 2008, the United States Geological Survey estimated there to be an undeveloped “90 billion barrels of oil, 1,669 trillion

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cubic feet of natural gas, and 44 billion barrels of natural gas liquids” in the Alaskan Arctic, 84 percent of which is expected to be located in offshore reserves. In 2018, USCG Admiral Zukunft said “the Arctic is believed to contain 13 percent of the world’s untapped oil deposits, one-third of its natural gas and a host of rare minerals on the seabed.” As climate change severely reduces Arctic sea ice concentrations, these reserves could become increasingly available for exploitation. That many are divided by Exclusive Economic Zone (EEZ) boundaries could make their development a matter of geopolitical competition.

Commercial shipping traffic and tourist cruise activity are also expected to increase in the Arctic. Moreover, as weather systems increase in severity, communities in the Arctic could face increasingly tenuous living conditions. These factors convergence to paint a picture of a rapidly changing region.

Already, Russia and China appear intent on making the Arctic a cornerstone of their global strategy. In a January 2018 white paper, China declared itself an “important stakeholder in Arctic affairs” as a “near-Arctic” state, signaling its intent to claim partial ownership to the region. China cited the region’s “strategic” and “economic” importance, building economic and diplomatic ties to gain legitimacy in the region. It is now the “main source of foreign direct investment in the Arctic.” To back its moves, it launched its second icebreaker, the 20,115-horsepower Xue Long 2, that same year. It has announced plans for a third, high-powered heavy icebreaker. Russia has capitalized on its extensive Arctic coastline to justify the creation of an icebreaker fleet that is now more than 40 vessels strong, seven of which are nuclear-powered. Russia boasts the world’s largest icebreaker, the Arktika, 75,000-horsepower nuclear-powered vessel, though it has been beset by technical difficulties.

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The U.S.’ icebreaker fleet, by comparison, is outdated and frequently in a state of disrepair. Historically, the U.S.’ icebreakers have operated under the purview of the USCG. Currently, this fleet consists of two icebreakers, the Polar Star and the Healy. The Healy, due to a recent onboard fire, is currently out of commission, leaving the U.S. with one government-owned operational icebreaker.

This disparity in the condition of America’s icebreaker fleet relative to those of its near-peer competitors has become a cause for concern within many defense and national security circles. The status of the U.S.’ icebreaker fleet is often cited as representative of what many perceive as a lethargic and reactionary American strategy in the Arctic. In recent years, the American national security establishment has tried to remedy this. The Pentagon has produced two Arctic strategies since 2016, though both lack specific policy prescriptions. President Donald Trump approved an order appropriating nearly $2 billion towards the construction of three heavy icebreakers, the next generation of USCG icebreaking vessels the organization calls Polar Security Cutters.

This paper seeks to understand icebreakers from a geopolitical competition, national needs, and national identity perspective. In doing this, this paper will examine the international distribution of icebreakers among the U.S. and its near-peer competitors, examine the current and future uses of icebreakers, analyze why, exactly, the U.S. needs icebreakers to pursue its interest in the Arctic, assess the importance of icebreakers in the larger geopolitical situation in the Arctic, and attempt to assess whether or not it is accurate to use them as a statistic to explain why the U.S. is failing in the Arctic. Budgetary considerations aside, this paper will also attempt to analyze how many icebreakers the U.S. actually needs. Finally, this paper will provide policy recommendations.

Fundamentally, icebreakers are only part of the larger economic, military, and diplomatic strategy in the Arctic. Icebreakers are seen by many as the ante for participation in Arctic affairs. How many icebreakers the U.S. needs is dependent on what missions must be fulfilled by icebreakers and how the U.S. desires to interact with and shape its identity with regards to the Arctic. This thesis will explore the practical government and commercial uses for icebreakers as well as the importance of icebreakers in defining the U.S. as a legitimate Arctic state.

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21 Rodman, “Iceberg Dead Ahead!”
The Department of Defense 2019 Arctic Strategy explains that the U.S. seeks to “defend the homeland,” “compete when necessary to maintain favorable regional balances of power,” and “ensure common domains remain free and open.”\(^\text{22}\) It does not advocate for dominance in the region. While it advocates for increased Arctic capabilities, it lacks specifics. Calls for increased American icebreaking capabilities are noticeably absent from the document, save for one footnote.

What, exactly, defines and differentiates icebreakers is uncertain. The standard USCG classification system for icebreakers is measured by horsepower. According to this system, heavy icebreakers have at least 45,000 brake horsepower (BHP). Medium icebreakers have between 20,000 and 45,000 BHP. Light icebreakers have between 10,000 and 20,000 BHP. Standard USCG classifications for icebreakers have been found by third-party researchers to be mostly arbitrary and inadequate to describe a vessel’s performance capability in variable sea ice and other environmental conditions. Unfortunately, this classification system pervades most sources relating to icebreakers. Though it is beyond the scope of this paper to rewrite the icebreaker classification system, readers should take into consideration that the difference between icebreaker classifications is somewhat arbitrary and irrepresentative of a ship's complete icebreaking and polar navigation capabilities.

Due to confusion over the icebreaker classification system and incomplete intelligence, the information regarding what countries possess what icebreakers is somewhat murky. Different sources claim different sizes of each country’s fleet. A USCG chart compiled in mid-2017 provides the most accurate, though now outdated, picture of the major governmental and non-governmental icebreakers possessed by the icebreaking states of the world. This paper will use this chart, due to its official nature and thoroughness, as a foundation to summarize the noteworthy icebreakers of the world.

• **Russia:** The number of icebreakers owned and operated by the Russians is a number of great contention. Estimates range from fourteen icebreakers to over fifty. Russia, as of the time of publication in 2017, has 46 completed icebreakers, plus 11 under construction, and four planned. Russia possessed six heavy icebreakers, all of which were nuclear-powered and operated by the Russian government. Two are currently out of commission. Since publication, Russia completed the Arktika, a government-operated, nuclear-powered icebreaker with engines capable of producing 80,000 BHP. Russia possessed 25 medium icebreakers, 16 of which are operated by the government, and 15 light icebreakers, all operated by the government. All are operational. Since publication, Russia launched the Viktor Chernomyrdin capable of producing 33,600 BHP. Seven are operated by the government. All were operational. Russia is constructing two Project 23550 class of multipurpose patrol icebreakers for use by the Russian Navy. The vessels will be powered by two electric motors capable of producing more than 8,000 BHP and will be armed with one AK-176MA automatic artillery naval gun system, four Kalibr-NK anti-ship/submarine/land cruise missiles, and tube-launched, optically tracked, wire-guided surface-to-air missile launchers. The vessels will also be equipped with a flight deck and hangar to “support the operations of a single Ka-27PS anti-submarine helicopter or a Ka-27PL search-and-rescue helicopter or an unmanned aerial vehicle.” This is a warship and demonstrates Russia’s intent to prepare marine military assets for deployment to the Arctic.

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24 USCG Office of Waterways and Ocean Policy, “Major Icebreakers of the World.”


26 USCG Office of Waterways and Ocean Policy, “Major Icebreakers of the World.”

27 USCG Office of Waterways and Ocean Policy, “Major Icebreakers of the World.”


**China:** China announced plans to establish a “Polar Silk Road,” a series of established shipping routes in the Arctic.\(^{30}\) China identifies the Arctic Ocean as one of three vital “blue economic passages” that would support the country’s Belt and Road Initiative.\(^{31}\) To access and exploit the Arctic Ocean, China must possess icebreaking capabilities. China, as of 2017, possessed three icebreakers, all operated by the government. Since publication, it has successfully constructed and launched its fourth, the Xue Long 2, owned and operated by the Chinese Polar Institute, an organization affiliated with the Chinese government.\(^{32}\)

**Northern Europe:** Sweden, at the time of publication, had seven icebreakers and three planned. Four of these were medium and three were light.\(^{33}\) Finland, at the time of publication, had ten icebreakers in total. Seven of these were medium and three were light.\(^{34}\)

**Canada:** As of 2017, Canada had seven icebreakers. Two are medium and five are light. Five more icebreakers are planned. Two additional icebreakers are under construction and will be delivered shortly.

**U.S.:** As of 2017, the U.S. possessed five icebreakers in total. One was out of commission. The Polar Star is the U.S.’ single heavy icebreaker. It is operated by the USCG. The Healy and the Aiviq are the U.S.’ two medium icebreakers. The Healy is operated by the USCG while the Aiviq is a commercial vessel intended for servicing offshore oil drilling rigs. A fire aboard the Healy in late 2020 makes the Polar Star the only American military icebreaker currently in operation.\(^{35}\) The Nathaniel B Palmer is the U.S.’ single light icebreaker.\(^{36}\) It is chartered by the National Science Foundation for scientific expeditions to Antarctica.

This is changing. In 2019, the Trump administration appropriated an initial $745M to VT Halter Marine Inc. for the construction of one of the USCG’s next-generation of heavy icebreakers, called the Polar Security Cutter (PSC), as part of the Coast Guard Reauthorization...
Act, a part of the National Defense Authorization Act passed by Congress in Fiscal Year 2021. The contract, representing a total value of $1.9 billion that could fund the construction of two additional heavy PSCs, provides for the acquisition of materials and construction equipment. While the contract is an important step forward in bolstering America’s icebreaking capabilities, it does not fulfill the USCG’s request for three heavy and three medium icebreakers. It is also slated to complete the construction of the first PSC by 2024, a date that today remains three years away. The Biden administration will face the question of whether or not to fund the USCG’s request for three additional medium icebreakers, whether the six icebreakers requested by the USCG meet American needs, and whether the U.S. can afford to wait until the three PSCs are completed farther down the line.

There is little literature that backs the USCG’s requested quantity. Literature certainly exists that argues for increasing America’s icebreaking capabilities, but much of it is steeped in Cold-War-style, illogical arms race fears that fail to properly assess America’s icebreaking needs. The icebreaker gap, America’s apparent failure to keep pace with Russian and Chinese icebreaker construction projects, is a concept often cited by American lawmakers, military figures, and government analysts alike. Lindsay Rodham explains that, when comparing strategic competition in the Arctic, the most commonly-cited example is the U.S.’ relatively small number of icebreakers. Writing for The Drive, Joseph Trevithick states “even with 10 more icebreakers, the U.S. would trail significantly behind Russia in total fleet size.” Indeed, but why would the U.S. need more than ten icebreakers? Or even ten? What would the U.S. do with them? Most would agree that the U.S. does not need the often-cited figure of Russia’s more than forty icebreakers. But then, how many does the U.S. really need?

This question has been approached by multiple institutions in the past. A 2010 High Latitude Region Mission Analysis “prepared by ABS Consulting for the Coast Guard determined that the service needs three heavy and three medium icebreakers to fulfill its statutory duties,” simultaneously concluding in the same study that “the Coast Guard would need six heavy and four medium icebreakers” to complete the “continuous, one-vessel year-round presence called for by the Naval Operations Concept.” Later, a report by “the National Academies of Sciences, Engineering and Medicine charged with assessing alternative strategies for minimizing the life-cycle costs of procuring and operating heavy Polar icebreakers” recommended four Polar class icebreakers.

Fundamentally, understanding how many icebreakers the U.S. needs begins with understanding what they will be used for. While public literature on the importance of

38 Sam LaGrone, “UPDATED: VT Halter Marine to Build New Coast Guard Icebreaker.,”
39 Rodman, “Iceberg Dead Ahead!”
icebreakers exists, most of it fails to definitively and realistically explain in what capacity icebreakers would be used, save for the public version of the ABS report. Even then, the public ABS report lacks specifics in explaining how increased icebreaking capabilities would allow the USCG to meet its statutory mission obligations. Though it does a thorough analysis of USCG missions in the Arctic, it does not articulate how it concluded that the USCG requires three heavy and three medium icebreakers to fulfill its obligations.⁴³

This paper seeks to resolve confusion about what roles icebreakers will play in serving American interests and fulfilling national needs. In doing so, it hopes to assess whether the USCG request for three heavy and three medium icebreakers is realistic and properly addresses American needs.

Also lacking is literature relating to the symbolic power of icebreakers in shaping American national identity in relation to the Arctic. Icebreakers are more than tools to achieve practical missions. They are also symbols of investment and dedication to the Arctic. This thesis seeks to expand qualitative assessments of national security issues.

Methodology

The national security realm is saturated with quantitative analyses that analyze components of national strength with economics and numerical force structures. This thesis takes a different approach, examining the issue of icebreakers in the Arctic through a qualitative lens. Because so much of national security research is based on quantitative assessments, this thesis seeks to assess the cultural and social considerations at hand, perspectives often absent from national security analyses. Much of the importance of icebreakers is derived from the qualitative context in which they are owned and operated. This is why, within American audiences, Chinese and Russian icebreakers garner a great deal of media and political attention but Finnish and Swedish icebreakers do not. Icebreakers are platforms for achieving practical missions as well as platforms for signaling to audiences. In this sense, this project attempts to examine icebreakers in the American context through a phenomenological lens.

This project organized its research according to the analytic framework presented below. The era of accelerating near-peer competition heavily influences each state’s national security goals for the Arctic region. These goals, for the most part, can be divided into those that seek to fulfill statutory USCG missions and those designed to enhance international presence and national symbolism. These national security goals define the roles assigned to icebreakers in the Alaskan Arctic, as icebreakers are seen by states as tools to accomplish goals. The roles assigned to icebreakers determine the number of icebreakers required by states. Two additional variables worthy of consideration are, first, the infrastructure that supports, enables, and enhances the operational capabilities of icebreakers and, second, the class makeup of the fleet of icebreakers possessed by a state.

This thesis engages in qualitative interviews with multiple individuals across the private and public sectors. These individuals represented
backgrounds from think tanks like the Brookings Institution, the Center for Strategic and International Studies, and the Hudson Institute, policy institutes like the Arctic Domain Awareness Center, universities like the Virginia Polytechnic Institute and State University and Georgetown University, the USCG, the United States Navy, media corporations, and private companies specializing in ship-building. Individuals were identified and targeted for interviews based on their demonstrated knowledge relating to icebreakers and the Arctic domain.

These qualitative interviews sought to analyze the practical and symbolic need for icebreakers at the state, national, and international level, seeking to gain a holistic understanding of how the American military, national security, scientific, and foreign policy communities perceive icebreakers as a tool to achieve and support American missions in the Alaskan Arctic and as an emblem to convey messages to the domestic and international audiences.

This thesis is exploratory and therefore lacking a hypothesis. The data collected for this thesis was primarily in the form of words and thoughts of individuals with high levels of knowledge and experience relating to the Alaskan Arctic and icebreakers operating in this region. Interviews were conducted using a foundational set of questions but often wandered as I explored different ideas in varying depth. This data was supplemented by words and thoughts collected from official government documents, news reports, and journal articles. Together, these data provide a holistic perspective of icebreakers as both a practical and symbolic item to organizations like the USCG and generally the U.S. national security community as it enters an era of increasing near-peer competition.

Typically, qualitative research would be performed in the field and the data collected for this paper would be compiled in varying physical locations from a greater variety of sources. In normal times, qualitative research would be supplemented by personal observations made during the process of data collection that provide minor but important insights. These, of course, are not normal times. The COVID-19 pandemic hindered this method of data collection to some degree. I was unable to meet interviewees in person, nor travel to the region in question.

I conducted a total of 13 interviews over Zoom or the phone. Some interviewees requested that they not be recorded. Other interviews I was unable to record due to technical hurdles. For these interviews, I took notes. For those interviews I was able to record, I converted each recording into a transcript, which I then used to identify relevant themes. Some interview subjects are quoted in this paper and others are not due to aforementioned reasons and requests for anonymity due to political, business, and/or personal privacy concerns. Some ideas were repeated by multiple or most sources utilized during research and cannot be attributed to a single individual, piece of writing, or organization.
Research: Practical Uses of Icebreakers

Supporting Government Needs

Icebreakers are owned and operated by the USCG and therefore an examination of the roles of icebreakers in supporting government missions entails an analysis of the USCG’s missions. Shannon Jenkins, Senior Arctic Policy Advisor for the USCG explains that, overall, the USCG’s primary missions in the Arctic are “safety, sovereignty, and stewardship.” Of the USCG’s eleven statutory missions, Search and Rescue, Defense Readiness, Ports & Waterways Security, and Marine Environmental Protection are relevant to this paper.

Multiple, often contrasting USCG statutory missions apply to the question of icebreakers because they are expected to fulfill multiple functions “like a Swiss Army knife” says one Arctic researcher in the Washington area. Kelsey Frazier of the Arctic Domain Awareness Center agrees, stating that the era of vessels solely dedicated to icebreaking is ending. In the future, she argues, vessels with other primary purposes will also be icebreaking, meaning the U.S. will see the characteristic of icebreaking become a secondary trait.

The USCG defines its readiness for any mission in three tiers: Fully Mission Capable (FMC), Partially Mission Capable (PMC), Not Mission Capable (NMC).[^1]

- **FMC**: Able to operate and meet all requirements of the defined mission for the prescribed duration.
- **PMC**: Limited ability to operate, either only able to meet some aspects of the defined mission, or only able to meet mission requirements for a portion of the prescribed duration.

• NMC: Unable to operate in any capacity, unable to meet the requirements of the defined mission, or unable to operate for sufficient duration to justify deployment.45

The elements of readiness used to determine the USCG’s overall mission readiness are personnel readiness, material element readiness, and governance element readiness. The need for icebreakers touches on the latter two. Personnel readiness is “determined by the Coast Guard having the right people, with the right competencies and experience, in the right place, at the right time,” which partially overlaps with material readiness, defined as “the availability and capability of our capital assets, maintenance effectiveness, stocking levels of parts and consumables, and the availability of funds.”46

To properly train personnel for Arctic operations, equipment needs to be used repeatedly in training conditions in the environment it is expected to be deployed. With only one operational icebreaker, the U.S. cannot simultaneously train personnel inexperienced in Arctic icebreaking operations and execute missions.

Search & Rescue

The Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic defines a region to which the U.S. is responsible for providing search and rescue capabilities. Current USCG capabilities in the Arctic are meager, meaning a crisis could occur in the Arctic to which the USCG could not properly respond.

With private and commercial vessel traffic increasing in the Arctic through the Northern Sea Route, the magnitude and the severity of search and rescue needs could outpace the USCG’s capabilities. Increasing the USCG’s icebreaking capabilities would be key to ensuring its capacity to uphold its responsibilities as defined in this agreement because, during winter months, only icebreakers could reliably access certain areas if vessels were to become stranded.

Exercise Arctic Chinook, a joint exercise between the USCG, Alaska National Guard, state and local agencies, tribal organizations, and Royal Canadian Air Force, demonstrated the ability of these organizations to respond to an approximately 200-person search and rescue event in the Arctic. But it was staged off of the coast of Kotzebue, Alaska, a location just north of the Arctic Circle, in summer months, when conditions are relatively benign.47 Many search and rescue scenarios would present significantly more challenging circumstances. A winter search and rescue event requiring icebreaking capabilities that occurred while the Polar Star serviced a resupply mission to the southern pole would present challenges. The U.S. would be unable to fulfill its responsibilities as defined by the Agreement, requiring it to rely on foreign icebreaking

46 Ray, “READINESS,” https://media.defense.gov/2020/Mar/31/2002272813/-1/-1/0/CI_3501_80.PDF, 4
capabilities. This would be an embarrassment that would expose weaknesses in the USCG and the nation as a whole.

Considering the above, the USCG is currently only PMC in its ability to fulfill its statutory search and rescue obligations.

Ports & Waterways Security

One of the USCG’s primary missions is to protect marine resources and maritime commerce, as well as those who live, work, or recreate on the water. According to one naval defense reporter, this primarily entails ensuring freedom of navigation which is currently the largest geopolitical issue in the Alaskan Arctic as Russia begins to treat its North Sea route as a toll road.

One of the USCG’s responsibilities under this mission includes “attaining and sustaining an effective understanding and awareness of the maritime domain.”\textsuperscript{48} To do this, the USCG must have the capability to continually collect sufficient intelligence on the U.S.’ marine domain individually and in coordination with its allies in line with its role in contributing to the work of the National Intelligence Community.\textsuperscript{49}

The Arctic is becoming increasingly militarized as Russia creates a large marine, land, and air force capable of conducting missions in the Arctic. Russia “formed the Northern Fleet Joint Strategic Command in December 2014 to coordinate renewed emphasis on the Arctic.”\textsuperscript{50} As Russia expands its Arctic forces and therefore its operations in the region, having assets capable of collecting intelligence on these forces and their operations will be of increasing importance. The USCG sees the incoming class of icebreakers as “real-time intelligence assets,” according to USCG Director for Marine Transportation Systems and Senior Arctic Policy Advisor Mike Emerson.

Considering the above, the USCG is currently PMC in its ability to fulfill its statutory ports and waterways security obligations.

Marine Environmental Protection

One of the USCG’s missions is to protect the environment in its statutory domains. In the Arctic, the greatest environmental threat is an oil spill. In the event of an Arctic oil spill, the

\textsuperscript{50} Office of the Under Secretary of Defense for Policy, \textit{Report to Congress: Department of Defense Arctic Strategy}. 
USCG and the United States Environmental Protection Agency would be the primary organizations responsible for mitigating damage and cleaning it up.\(^{51}\)

Despite no major plans to expand offshore oil and gas production in the Arctic, North Star Island, Endicott Island, Duck Island, Oooguruk Island Alaska, and the Polar Pioneer drilling rig, among other offshore drilling locations, are actively drilling oil off of the northern shore of Alaska.\(^{52}\) Additionally, the increased commercial traffic in the region poses risks of environmental contingencies. “Keeping oil out of the water will not be purely a function of sound drilling practices, but of sound vessel traffic management.”\(^{53}\) Having the infrastructure to both manage traffic and respond to environmentally damaging events, like oil spills, will be key to mitigating environmental harm. In a 2014 report entitled *Responding to Oil Spills in the U.S. Arctic Marine Environment*, the National Academy of Sciences (NAS) identifies seven scenarios that could result in oil spills in the Arctic: a passenger cruise or research ship accident; a large oil tanker accident; a bulk carrier driven ashore; a barge separated from its tow; a subsea pipeline break; a well blowout; and a land-based oil tank spill.\(^{54}\)

There are two prongs to mitigating environmental harm from any of the above scenarios. The first is prevention. The second is response. In terms of prevention, “to cope with changing traffic patterns in the Arctic, significant investments in infrastructure and capabilities, such as navigational aids, charting, communications, real-time traffic monitoring, ice forecasting, ship repair, and salvage capabilities, are needed.”\(^{55}\) Icebreakers would lend to most of these infrastructure and capability needs.

In terms of response, the foundation of mounting an oil spill response is having access to the location of the spill. High-consequence oil spills that occur as a result of oil drilling will happen closer to shore and therefore will be more easily accessible. Lower-consequence spills that occur as a result of shipping traffic will likely occur farther from shore, potentially beyond the U.S.’ EEZ, and could be more difficult to access. In the Arctic, due to unpredictable weather conditions and ice coverage, access is not guaranteed and, given current capabilities, the


\(^{54}\) National Research Council, *Oil Spills*, 69.

\(^{55}\) National Research Council, *Oil Spills*, 105.
government’s “movement of response equipment to the scene of the spill will likely be difficult and time consuming.”

Though the USCG “maintains agreements with several spill response companies in Alaska to respond to an oil spill if the responsible party cannot be identified or cannot respond appropriately,” it has no “spill response equipment prestaged in the Arctic regions of Alaska.”

Commercial equipment, even in combination with federal, state, and local assets, “does not provide capabilities for all possible spills.”

Having an icebreaking vessel reliably and readily available would greatly bolster the ability of the USCG to access and address an oil spill. It would allow the USCG to supplement existing resources so that combined assets could respond to any oil spill, regardless of its size, location, and timing. Current capabilities simply do not allow for the flexibility of response needed.

Considering the above, the USCG is currently PMC in its ability to fulfill its marine environmental protection obligations.

Defense Readiness

Military confrontations in the Arctic are unlikely, according to multiple sources interviewed for this paper, but it would be irresponsible to claim they are impossible. If military confrontations took place in a location where there is heavy ice coverage, the USCG would have only the Polar Star, a non-militarized vessel, to contribute to the fight. If the USCG sees itself as the primary American marine fighting force in the Arctic, it should seek to acquire warships that have icebreaking capabilities. Some, like one defense reporter, argue that militarily enforcing rules in the Arctic domain will be done in the future by the United States Navy, not the USCG. But for now, the Navy has minimal presence in the Arctic, leaving the USCG as the only significant American actor in the region with the capability to use force to back the rules-based order.

One subsection of this statutory mission is maritime interception operations. In the Arctic, an emerging domain with a minimal history of activity, national borders are less well-defined and therefore more easily breached for commercial or government interests.

Securing borders requires having the capabilities to establish a presence to enforce them, according to Shannon Jenkins of the USCG. In the Arctic, the only submarine and aerial forces can patrol borders, but with minimal visibility and less of a forcible presence. Icebreakers are the only piece of equipment that is capable of establishing a highly visible, long-lasting presence as a means of emphasizing national borders and intercepting Russian assets that are sent to test those boundaries.

Russia’s practice of regularly sending military aircraft, including nuclear-capable bombers, close to Alaskan airspace to test American air defense systems indicates Russia is

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56 National Research Council, *Oil Spills*, 121.
57 National Research Council, *Oil Spills*, 121.
58 National Research Council, *Oil Spills*, 121.
likely to attempt, if they have not already, similar tactics in the Arctic maritime space. Just as the U.S. has F-22s capable of intercepting these aircraft, the U.S. must have marine military assets capable of intercepting Russian assets that attempt to test the credibility of the US’ national boundaries.

Considering the above, the USCG is currently NMC in its ability to fulfill its defense readiness obligations.

Supporting Commercial Needs

Natural Resource Extraction

The contribution of icebreakers to natural resource extraction capabilities is worth examining as a facet of national security. Because climate change promises to open the Arctic to natural resource exploitation, and because many indicate this exploitation is likely to be geopolitically contentious, some claim icebreakers are needed to support natural resource extraction. In 2008, the United States Geological Survey estimated there to be an undeveloped “90 billion barrels of oil, 1,669 trillion cubic feet of natural gas, and 44 billion barrels of natural gas liquids” in the Arctic, 84 percent of which is expected to be located in offshore reserves. If these resources are to be exploited, icebreakers will be needed to service offshore infrastructure construction and maintenance and protect resource reserves and the infrastructure that supports it from exploitation by rival nations. Admiral Zukunft cited natural resources as a rationale for a strengthened focus on the Arctic and a reason to invest more heavily in icebreaking capabilities.

Does this rationale hold up under scrutiny? Will natural resource extraction define the future of the Arctic? In light of current events, this appears doubtful. Natural resource extraction often no longer makes financial sense given the challenges, the political climate, and the accelerating global transition towards renewable energy sources.

One Arctic researcher in the Washington area argues that “the demand is disappearing” globally for oil and gas in the Arctic. In early 2021, President Donal Trump opened the Arctic National Wildlife Refuge (ANWR) to leasing for oil and natural gas extraction. ANWR, a tract of land defined by a 40-year fight over oil and gas drilling rights, is expected to hold the potential to support the production of 3.4 billion barrels of crude oil from 2031 to 2050. Despite its production potential, half the leases offered on ANWR land received no bids, and the ones that did attracted a total of three bidders, none of which included any major oil and gas companies. The sale produced a fraction of the projected revenue.

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60 Kenneth J. Bird et al, “Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle.”
62 Tegan Hanlon and Nat Herz, “Major Oil Companies Take A Pass On Controversial Lease Sale In Arctic Refuge,” National Public Radio, January 6, 2021,
As a result of low global oil prices, political pressure by oil and gas drilling opponents, and the refusal to finance oil drilling projects in the Arctic by Morgan Stanley, Wells Fargo, Goldman Sachs, JP Morgan Chase, and Citigroup, oil and gas extraction in the Arctic is becoming increasingly less attractive. In the context of a shifting global energy market, companies are less interested in accessing expensive offshore resource reserves. The expected return on investment is no longer high enough to justify operations.

Other obstacles confront any resource extraction effort, not just oil and gas drilling. Climate change has significantly reshaped the Arctic environment, but the region still experiences extreme temperatures, severe weather, and a host of other conditions that significantly increase the cost and risk of industrial operations. Infrastructure to support such operations is practically nonexistent, meaning any company that hoped to launch a large-scale effort to extract any natural resources from the region would first have to invest heavily in the infrastructure needed to access the area, making costs to entry high.

Even if corporations were interested in engaging in large-scale natural resource extraction in the region, any icebreaking capabilities that were to be contributed would necessarily be commercial. Michael Emerson of the USCG explains that the USCG’s definition of security is “very comprehensive” and “includes economic security, environmental security, human, water, food security, and national defense.” Still, the USCG is an entity that serves the President of the U.S. and therefore is uninterested in serving commercial interests unless otherwise directed by the President.

**Natural Resource Transportation**

Natural resource transportation needs, especially those of liquid natural gas (LNG), provide more opportunities for icebreaking vessels. “Recent developments in Arctic LNG technology allowing natural gas to be transported directly from the North Slope of Alaska” to markets provides opportunities for icebreaking vessels to minimize the time and cost of LNG transportation to markets in Eastern Asia and Europe through the North Sea route. Qilak LNG, an Alaska-based startup, seeks to establish a fleet of icebreaking LNG tankers to transport Alaskan LNG directly to markets, following the Russian model of melding icebreaking capabilities with shipping capabilities. Qilak LNG, according to Kelsey Frazier of the Arctic Domain Awareness Center, could take the lead in establishing the U.S.’ first commercial icebreaker fleet.

On-shore mineral deposits in the Arctic present some opportunities for icebreaking transportation. Red Dog Mine, located near Kotzebue, Alaska, is the largest zinc mine in the world. The port through which Red Dog Mine exports minerals “currently is available only a few months of the year.” An increase in commercial icebreaking capabilities could change that,


64 Max Cacas, “Coast Guard Prepares as Arctic Heats Up.”
facilitating increased resource extraction operations there. However, it is unlikely Red Dog Mine’s offseason needs justify the expense of an icebreaker alone.
Research: Symbolism of Icebreakers

Presence & International Appearances

Icebreakers are an interesting platform to study because there appears to be something special about their place in the international consciousness. When comparing strategic competition in the Arctic, the most commonly-cited example is the U.S.’ relatively small number of icebreakers.\(^{65}\) Submarines, aircraft, and infrastructure all play vital roles in establishing power projection capabilities in the Arctic. But all receive far less attention than icebreakers do in the media and the political realm.

This is because icebreakers are seen as the “bare minimum” for serious participation in the Arctic region, argues one Arctic researcher in the Washington area. Within the American policy community, icebreakers are seen as the ante to establishing a legitimate claim to the region.

Some, like one prominent member of a national security think tank in Washington, argue icebreakers are simply unimportant from national security and international relations perspectives. This analyst argues that the U.S. national security schema is sufficiently supported by the presence of submarines in the Arctic. In interviews with members of the USCG, however, “having presence” was of the highest priority, more so than fully fulfilling statutory missions. Shannon Jenkins of the USCG said that “it’s to our favor to start with presence” and build from there, indicating the USCG views presence as the foundational goal to be accomplished by icebreaking vessels. Mr. Jenkins acknowledged the presence of several U.S. fast-attack (SSN) and guided-missile (SSGN) submarines operated by the United States Navy as a U.S. military presence in the Arctic but argued these assets, alone, were insufficient to represent an American presence in the region. For the vast majority of the time, submarines operate beneath the water and are invisible to both domestic and international audiences. He argued vessels capable of a constant presence above the water were needed. “You have to show the flag,” said Mr. Jenkins, “to enforce your own sovereignty and protect freedom of navigation.”

As demonstrated by China’s rise as an Arctic state, appearances do matter. China, as a non-arctic state, did not need icebreakers. Rather, China intentionally produced them and intentionally deployed them to the Arctic to support its claim to being an Arctic state and signal to the international community that it intended to associate itself with the Arctic. In essence, China recognized the symbolic power of icebreakers and has been exploiting this power. For China, icebreakers were an integral part of their overall strategy of Arctic identification. It is one thing to declare oneself a near-Arctic state, gain membership in the appropriate international bodies, and announce plans for the construction of a Polar Silk Road.\(^{66}\) It is another to utilize icebreakers to establish a presence in the Arctic to demonstrate the capacity to follow through with these claims.

\(^{65}\) Rodman, “Iceberg Dead Ahead!”

\(^{66}\) Marc Lanteigne, “The Twists and Turns of the Polar Silk Road.”
The presence argument holds for national security matters. National security is largely a question of perception. In geostrategic competition with Russia, the U.S.’ northern maritime region will be more secure if the Russians perceive them to be so.

A marine presence in the Arctic extends beyond near-peer competition defense purposes. In the international arena, there are three possible classifications of the identity of the U.S. as an Arctic nation. The first manner in which the U.S. could engage the Arctic is as an inactive participant. Such engagement with the Arctic would entail behavior and capabilities such as a lack of means to engage, access, and command the Arctic. This would mean that, even if the U.S. desired to send civilian and military personnel into the Arctic, they could not. This would entail a lack of icebreaking capabilities among domestic naval forces. It would also include a lack of internationally articulated intent to engage, access, and command the Arctic.

The second manner in which the U.S. could engage with the Arctic is as an active participant. Such engagement with the Arctic would involve having the capabilities to access the Arctic, but not making the Arctic a strategic priority. In this scenario, the U.S. would regularly engage with international bodies designed to govern the Arctic but fail to lead them.

The third manner in which the U.S. could engage with the Arctic is as a leader. Such engagement would entail having the most or nearly the most advanced and capable means of accessing and commanding the U.S.’ Arctic region. It would entail leadership in international Arctic governance forums.

Currently, the U.S. is barely an active participant. While policymakers have articulated the importance of the Arctic as a current and future strategic domain, the U.S. is sorely lacking in capabilities to access and command the Arctic. The U.S.’ icebreaker fleet is small and outdated in comparison to the U.S.’ near-peer competitors and most Arctic allied states. The infrastructure to service commercial activity, the needs of Arctic communities, and the demands of potential military engagements in the Arctic is sorely lacking. If the U.S. is to be a leader in the Arctic, it must invest in Arctic capabilities to, first, demonstrate a commitment to the region and, second, gain the ability to perform basic tasks in the region by increasing icebreaking capabilities.

How icebreakers are structured and marketed to the international community matters, too. Governments make conscious decisions with regards to the capabilities of each nation’s icebreaker platform. Governments can choose to militarize icebreakers or maintain them as purely economic, scientific, and commercial platforms. Regardless of capabilities, how a government speaks about an icebreaker largely impacts how that platform is perceived by domestic and international audiences. How governments navigate these two choices is largely representative of the countries in the region.

Chinese icebreakers, for example, are portrayed by the Chinese as purely scientific research vessels. They are non-militarized and the Chinese government ensures the platforms are portrayed as such. Icebreakers, according to the 2018 Chinese Arctic whitepaper, are built exclusively “for scientific purposes.” Chinese icebreakers are postured in this way because Chinese goals in the region are for the most economic.

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67 The State Council Information Office of the People’s Republic of China, “China’s Arctic Policy.”
In contrast, the next generation of American icebreakers is clearly and intentionally defined as “warships” by the USCG as the U.S. seeks to counter what it perceives to be a growing Russian military threat in the region. Russia icebreakers are very much militarized and the U.S. seeks to respond to this posturing in both endowing its next generation of icebreakers with combat capabilities and defining them as warships.
Research: Infrastructure

Icebreakers cannot be considered as individual, isolated platforms. Most icebreakers enjoy the capability of remaining at sea for months. The Polar Star recently made a 78-day voyage to the Arctic. However, they are necessarily supported by ports that provide refueling, servicing, and personnel exchange services.

Current USCG icebreakers are serviced and supported in Seattle, Washington. The U.S. had no significant Arctic ports that could sustain and assist marine operations in the Arctic.

From a practical perspective, a port base established on the northern coasts of Alaska would massively increase the effectiveness and presence of icebreakers deployed to the Alaskan Arctic. Having access to an Arctic base in Alaska would allow icebreakers to remain for longer periods of time in the Arctic by decreasing the distance they would need to travel to access refueling, servicing, and personnel exchange services. This would a) increase the ability of icebreakers to establish a presence in the Arctic; b) lessen the risks associated with Arctic deployments; and c) contribute to the U.S.’ posturing as an Arctic state. By decreasing travel requirements to Seattle, icebreakers could spend more time in the Arctic, maximizing the effectiveness of Arctic deployments. Moreover, having access to a base capable of servicing icebreakers that is substantially closer than the base located in Seattle could decrease the risk of Arctic deployments for icebreakers. Should an icebreaker become incapacitated and need immediate repairs, it would be helpful to have a location where the icebreaker could be serviced close to its location of deployment. Finally, the construction of a deep-water port in the Arctic would likely necessitate the construction of additional infrastructure in the Arctic, indirectly increasing general capabilities and development in the region to progress American posturing as an Arctic state.

There are several obstacles and downsides to constructing such a base. First is the high cost. Infrastructure in the region is minimal. Thus, constructing a deep-water port capable of servicing icebreakers would be costly and logistically demanding.

This presents a challenge but also an opportunity to remedy the fact that infrastructure in the Arctic is lacking. In 2016, Nome was forced to rely on a Russian icebreaking fuel tanker for additional fuel when it ran low on reserves during winter months. A lack of domestic infrastructure meant that American supply chains were capable of satiating the community’s fuel needs. That American community was forced to rely on a foreign power, rather than the U.S., for energy due to a lack of infrastructure is embarrassing and demonstrative of the need for icebreakers.

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A second challenge to constructing an Arctic base capable of servicing icebreakers is the challenging personnel deployment. For those unaccustomed to the region, northern Alaska can present significant lifestyle challenges. There are no major shopping installations, minimal restaurant options, and few other recreation opportunities. During the winter months, daylight is fleeting. During the summer months, it is almost constant. Nome is accessible exclusively by plane and boat, meaning travel outside of the community is impracticable. For these reasons, maintaining morale among USCG personnel deployed to an Arctic base could prove an additional challenge. The wellbeing and happiness of Coast Guardsmen are important and likely a reason a base in Nome “won’t happen anytime soon,” argues one Arctic researcher in the Washington area.

One solution employed by oil and gas companies operating on the Alaskan North Slope is the two weeks on, two weeks off system, in which workers spend two weeks working full-time on the North Slope and two weeks off in Anchorage, Alaska’s primary population center. Rotational employment strategies like these could make deployment to Arctic bases more bearable for those unaccustomed to the region.

A benefit of such a base is its power as a symbol of dedication to the Arctic. Increasing America’s icebreaking power is a vital move if it hopes to demonstrate commitment to the region. Supplementing such power with increased infrastructure in the Arctic would increase the power and practicality of increased icebreaking capabilities and would also facilitate the expansion of capabilities in the Arctic in the future.

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The Quantity Question

While this paper acknowledges budgetary concerns are of preeminent importance while assessing expensive platforms like icebreakers, a budgetary constraints analysis is beyond the scope of this paper. Rather, this paper seeks to analyze how many icebreakers the U.S. needs to meet its interests in the Arctic at a bare minimum, budgetary considerations aside.

A third-party ABS analysis concluded that the USCG requires six, domestically-produced icebreakers called Polar Security Cutters, three of which are classified as heavy and three of which are classified as medium. Because the full-length analysis is classified, non-cleared members of the public cannot access this document. An additional problem with applying this document to the focus of this paper is that ABS’ quantity analysis is performed for USCG icebreaking needs globally, rather than exclusively in the Alaskan Arctic. Thus, this paper will perform its own abbreviated analysis with a more focused and appropriate scope.

Several factors must be considered to answer the quantity question. The question of how many icebreakers the U.S. needs is highly dependent on its goals in the Arctic, as nearly everyone interviewed for this project has explained. How the U.S. is attempting to position itself in the Arctic influences the number and the specifications of icebreakers needed. Put simply, “the challenge with how many icebreakers is enough icebreakers is how you intend to use them,” according to Kelsey Frazier of the Alaska-based Arctic Domain Awareness Center.

U.S. posturing in the Arctic is a matter of debate. One Arctic researcher in the Washington area argues that the U.S. should not seek to dominate the Arctic but, in its current state, should seek to acquire minimum capabilities to access and operate within the region without excessively militarizing it. Russia has already invested heavily in Arctic infrastructure and currently is the dominant power in the region. To achieve this posturing, this interviewee argues the U.S. still must expand its icebreaker fleet, but not to the degree needed to dominate the region. This interviewee argues the U.S. should acquire a mixture of military and civilian icebreakers, a mixture that would maintain icebreakers as a non-militarized platform.

The USCG articulates different goals, as explicated above. It argues that the U.S. should seek to be a leader in the region and be prepared for military confrontations in the Arctic. If this is to be the U.S.’ goal for the region, more icebreakers with an increased emphasis on military capabilities are needed. It calls its next generation of icebreakers “warships,” a signal to indicate how it intends to posture itself with regards to the Arctic.

The USCG identifies the need to “enhance capability to operate effectively,” “establish and maintain situational awareness and understanding in the Arctic,” “counter challenges to the international rules-based order in the maritime domain,” and “lead international forums.” Simply put, the USCG cannot legitimately lead international Arctic forums if it cannot lead in its own Arctic arena. Nor can it deter significant, militarized threats to the rules-based order with the minimal assets it has in the Arctic. To improve this situation, the USCG “will invest in ice-breaking ships, such as the Polar Security Cutter” and personnel “capable of operating in the

71 United States Coast Guard, Arctic Strategic Outlook, 24-32.
austere and remote Arctic environment.”

The USCG argues the U.S. “needs a modern, flexible, and innovative Coast Guard to meet the challenge of providing holistic security in the novel and dynamic Arctic maritime domain.” If this is the goal, icebreakers will necessarily be a part of this new USCG.

Though the USCG has historically been considered the primary owner and operator of non-research government icebreakers, Admiral Zukunft argues that the new generation of icebreakers must be seen as flexible in ownership to paint them as national, not just USCG, assets. Admiral Zukunft argues that, for the next generation of icebreakers, “it’s not just Coast Guard, it’s the National Science Foundation, the Arctic Research Council, the Department of the Interior, Transportation, Defense Department, Commerce, a number of others, that have equities in heavy icebreakers.”

Taking all of this into consideration, one can begin to quantify the U.S.’ government-operated icebreaker needs. One medium icebreaker should be reserved for training purposes, first and foremost for USCG personnel and secondarily for individuals from other agencies, as articulated by Admiral Zukunft. This icebreaker should be combat-capable to train personnel for combat situations in the Arctic. Two heavy, multi-capability icebreakers should be permanently stationed in the Alaskan Arctic region to provide full-time service to fulfill the USCG’s Search and Rescue, Ports & Waterways Security, Marine Environmental Protection, and Defense Readiness missions. Two are necessary if the USCG hopes to maintain a permanent presence in the region. One can stay while the other navigates to port in Seattle, Washington for refueling and crew rest and relaxation. An additional medium icebreaker should be deployed to the Arctic to service the needs of remote Alaskan communities, evidenced by Nome’s 2016 fuel crisis, and the needs of scientific communities. Thus, for the Alaskan Arctic region, including training requirements, two heavy icebreakers and two medium icebreakers are needed to satisfactorily fulfill the USCG’s and generally the U.S.’ minimum current requirements. Together, these four icebreakers should present a sufficiently large fleet to fulfill mission requirements and other needs even in the event one icebreaker is taken temporarily out of commission for mechanical repairs. Mechanical failures should always be factored into quantity assessments, argues one national security academic researcher, adhering to the military mantra that reminds platform users that they need three or four platforms if they hope to have one functional platform at all times. These findings are summarized below in the included table.

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72 United States Coast Guard, *Arctic Strategic Outlook*, 26.
73 United States Coast Guard, *Arctic Strategic Outlook*, 42.
**Icebreaker Quantity Needs for the Alaskan Arctic**

<table>
<thead>
<tr>
<th>Icebreaker class (multi-use, flexible platform)</th>
<th>Uses</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Medium (combat-capable)</td>
<td>- Full-time training</td>
<td></td>
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<tr>
<td>Heavy (combat-capable)</td>
<td>- Presence</td>
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<td>- USCG statutory missions</td>
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<tr>
<td>Heavy (combat-capable)</td>
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<td>- USCG statutory missions</td>
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<tr>
<td>Medium</td>
<td>- Servicing Alaskan communities in Arctic (goods transportation, infrastructure construction, emergency transportation)</td>
<td></td>
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<tr>
<td></td>
<td>- Serving scientific needs</td>
<td></td>
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2 Medium (one combat-capable, one non-combat-capable)

2 Heavy (both combat capable)

**Acquisition Options**

**Short Term Lease/Purchase**

Many bring up the possibility of leasing or purchasing icebreakers for use by the USCG from allies as a way of reducing the cost and the time frame associated with domestically producing three heavy icebreakers. According to Finnish diplomat Stefan Lindstrom, Finnish shipyards can “build and deliver a polar-class icebreaker within 24 months after a contract is signed” at a cost of around $235 to 258 million, an acquisition timeframe much shorter and a
cost much lower than those related to the domestic production of icebreakers.\textsuperscript{75} He argues that if estimates putting the first domestically-produced icebreakers at completion in 2024 are correct and eliminating America’s icebreaker deficiency is an immediate and time-sensitive priority, efforts should be made to acquire Finnish icebreakers through purchasing or leasing routes.

Despite support for this idea, there are several problems with this proposal. First, legality. Under 10 U.S.C. 7309 and 7310, contracts to build ships “for any of the armed forces” or “a major component of the hull or superstructure of a vessel for any of the armed forces” cannot be awarded to foreign shipyards. However, there are ways to circumvent this restriction. Icebreakers that were already constructed under non-U.S. contracts could theoretically be purchased by the U.S. for use by the USCG. However, this could present additional pitfalls.

The Jones Act, part of the 1920 Merchant Marine Act, “requires merchandise being transported by water between U.S. points, even by way of foreign ports, to be shipped aboard vessels that are 1) U.S.-built 2) U.S.-citizen owned and 3) registered in the U.S.”\textsuperscript{76} In the event a USCG icebreaker was needed to perform a rescue mission to provide a remote, Arctic Alaskan community with a needed good, the USCG could encounter legality problems transporting that good to those communities due to the Jones Act. There are, however, waivers that could be acquired to exempt foreign-built icebreakers from the Jones Act. The Jones Act can be waived under 46 U.S.C. § 501 (a) for entities under the command of the Secretary of Defense if such a waiver is “necessary in the interest of national defense.” These requests are submitted to the Secretary of Defense and forwarded for approval to the Secretary of Homeland Security.\textsuperscript{77} It would need to be ensured that such a waiver would be approved before the purchase of a foreign icebreaker could proceed.

A substantial obstacle to this solution is a general lack of interest within the USCG. In interviews with multiple USCG sources, they expressed that the USCG was more interested in waiting for a platform built to their exact specifications rather than acquiring a platform that is only partially useful immediately. One defense acquisition expert argues that the process of icebreaker acquisitions is a long term game and therefore it is worth waiting for a better product. Admiral Zukunft has argued that leasing an icebreaker would not “provide us an optimal return on investment for a platform that quite honestly we’ve proven that we can maintain these for 35 or 40-plus years.”\textsuperscript{78} Michael Emerson of the USCG described the new class of icebreakers currently in production as “warships.” If these PSC are indeed intended to be combat-capable, foreign acquisitions would likely be less useful than domestically produced icebreakers.

There are also political reasons why the U.S. does not acquire icebreakers from foreign actors. Icebreakers are expensive, and Congress is less likely to allocate money for their

\textsuperscript{77} “Domestic Shipping.” U.S. Department of Transportation.
acquisition if the process does not create American jobs and/or contribute to the American economy, according to one Arctic researcher in the Washington area.

**Long Term Domestic Production of Icebreakers**

There are several downsides to acquiring icebreakers from allies. First, there is the national security aspect of domestic production capability. In the event of a conflict, having the capacity to domestically produce icebreakers would reduce the U.S.’ reliance on foreign entities, increasing the reliability with which the U.S. could procure an icebreaker. Dependency on foreign entities for equipment needed to meet the missions required of national security institutions is undesirable.

Second, appearances matter. If the U.S. intends to lead in the Arctic, having the ability to produce its own icebreakers could be a signal of intent, responsibility, and capability. China, a non-Arctic state, has domestically produced two icebreakers. If the U.S. intends to assert itself as an Arctic state in the international arena, having the domestic capability to produce icebreakers would be a much-needed signal of intent, commitment, and responsibility.

Because the USCG foresees the next generation of icebreakers as multi-department assets to be shared between military and civilian organizations, the platforms must be flexible and alterable to meet varying mission requirements as defined by each agency now and in the future. Icebreakers that are domestically produced will likely meet USCG specifications more accurately and therefore increase the utility and therefore the lifespan of these platforms.  

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79 Liz Ruskin, “Short $1B, Icebreaker Advocates Consider Leasing, Sharing.”
Recommendations

Clarify Arctic Goals

The Department of Defense’s 2019 Arctic Strategy is lacking in detail. While the USCG’s Arctic Strategy provides greater detail on capacity gaps and better articulates national security goals for the region, the U.S. national security and defense communities must collaborate more effectively to produce realistic and ambitious Arctic strategies to achieve coordinated goals. Specifically, does the U.S. seek to participate or lead in the Arctic? How does it plan to accomplish this?

Part of this necessarily means defining the roles to be played by icebreakers. Icebreakers, as this paper has sought to explain, can take on many roles. Clarifying which roles the U.S. wants icebreakers to fulfill will, in the future, allow icebreakers to be more tailored to specific mission needs, increasing the platform's effectiveness.

Clarifying Arctic goals will allow the U.S. to invest in non-icebreaking capabilities, like Arctic infrastructure or other military platforms that could also increase the ability of the U.S. to access and operate in the Arctic.

Invest in Icebreakers & USCG Generally

At present, the USCG fails to achieve FMC status regarding any of its statutory missions in the Arctic. This necessitates change. Primarily, the USCG should immediately pursue additional icebreaker acquisitions in accordance with the quantity assessment provided in this paper to improve USCG capabilities to be able to be FMC to fulfill its statutory responsibilities in the region.

The decision to fund three heavy icebreakers under the Trump administration makes progress. Unfortunately, these icebreakers will be forced to execute missions in the Alaskan Arctic region, the Antarctic region, and the European Arctic region. The USCG must acquire two heavy, combat-capable and two medium icebreakers dedicated to the Alaskan Arctic before it can satisfactorily meet current mission demands. In the future, these needs will grow as commercial, civilian, and military activity in the Alaskan Arctic increases and necessitates an increased icebreaking presence.

But icebreakers are only one part of the larger strategic picture in the Alaskan Arctic. Historically, the USCG has been a relatively minor military branch in terms of size, budget, and capabilities. One source emphasized the USCG’s small size. With roughly 40,000 members, it has a personnel population roughly the same size as the New York Police Department. As competition and activity in the Alaskan Arctic increases, the USCG will become increasingly overstretched. The USCG will serve as the frontline force in the Arctic for the foreseeable future. Preemptively investing in the USCG will allow the U.S. to better shape the evolving Arctic in its favor. Beyond icebreakers, the USCG manages air, land, and additional marine assets that
supplement the effectiveness of icebreakers. Investing in the service and its capabilities as a whole will increase the effectiveness of icebreakers.

Invest in Infrastructure

“Icebreakers are part of the larger strategic struggle to shape the order in the Arctic,” according to one source. Icebreakers should be thought of as one piece in a larger puzzle of investments needed to increase American capabilities, support American operations, and increase American presence in the region. As explored, one of the best ways to do this is to invest in infrastructure in the Alaskan Arctic that will increase the effectiveness of icebreaker deployments to the region and signal the importance of the Arctic to the U.S. Investments in the region’s infrastructure will also serve to better the lives of Alaskans in rural communities.

Leverage the Canadian Alliance

Canada, with seven operational icebreakers and two planned, currently enjoys greater icebreaking capabilities than the U.S., making it a valuable and useful ally. Canada, in turn, views the U.S. as its “‘premier partner’” in the region.80 Currently, territorial claims in the East Chukchi Sea pose an moderate obstacle to advancing U.S.-Canada cooperation. Though the “Agreement Between the Government of Canada and the Government of the United States of America on Arctic Cooperation” provides a foundation for this cooperation, progress should be made to continually deepen ties and jointly uphold the rules-base order to hedge against increased Russian and Chinese activity in the region.81 Specifically, military cooperation with Canada could significantly increase the effectiveness of American early warning systems and ease the burden on both countries in maintaining a constant presence in the region.82 Cooperation between American and Canadian icebreakers could facilitate more effective year-round presence in the region. Sources indicate both sides are eager to increase cooperation. What remains now is the brunt work of expounding how that cooperation should unfold.

82 Charles Jacoby and Tom Lawson, “US-Canadian disengagement was never on the ballot,” MilitaryTimes, December 5, 2020, https://www.militarytimes.com/opinion/commentary/2020/12/05/us-canadian-disengagement-was-never-on-the-ballot/.
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