

January 2020

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Recommended Citation

Karl Fisher, *Foundation and Development of the Economic Interest of the United States in the Arctic Ocean in the Age of Global Warming*, 25 *Ocean & Coastal L.J.* 164 (2020).

Available at: <https://digitalcommons.maine.edu/oclj/vol25/iss1/5>

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FOUNDATION AND DEVELOPMENT OF THE
ECONOMIC INTEREST OF THE UNITED STATES IN
THE ARCTIC OCEAN IN THE AGE OF GLOBAL
WARMING

Karl Fisher

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FOUNDATION AND DEVELOPMENT OF THE
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*Karl Fisher*¹

Abstract

The United States' sustained economic and geopolitical interest in the Arctic is dependent on Congressional funding and Executive support for icebreaking vessels and improved infrastructure in United States arctic territory. The United States has an interest in the Arctic and it is demonstrated by The Arctic Research and Policy Act of 1984 (amended 1990). Through the Act, the United States initiated research and policy development, with the supposition of potential economic benefits in the future. Due to verifiable and anticipated changes in ice density in the Arctic, the region is accessible like never before, and international competition for natural resources and commercial shipping lanes in the Arctic offer enormous economic benefits. The United States is woefully behind its international competitors due to a small and decrepit fleet of icebreaking vessels and crumbling arctic infrastructure. In examining The Arctic Research and Policy Act of 1984 and multiple Arctic Strategy Plans that were published by federal agencies operating in the Arctic, it is clear —attention from Congress and the Executive must be redirected towards advancement. The first step to advancing the United States interest in the Arctic is by funding and procuring icebreaking vessels and improving arctic territory infrastructure.

*“The nature of maritime activity in the Arctic is indeed evolving from exploration and scientific research to resource extraction, commercial shipping, and a broad array of other pursuits.”*²

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² THE UNITED STATES COAST GUARD, ARCTIC STRATEGY, 7 (2013).

I. INTRODUCTION

The Transpolar Passage, Northwest Passage (NWP), and Northeast Passage, also known as the Northern Sea Route (NSR), are oceanic waterways that traverse the Arctic Ocean.³ These Arctic maritime routes are affected by the global trend in warming temperatures, which is likely to continue for decades, consequently reducing ice coverage.⁴ Although predictions vary with respect to how soon Arctic waters will be ice-free, researchers agree that between the years 2050 and 2060, ice coverage will be significantly reduced to the extent that commercial shipping lanes will be more accessible and navigable.⁵ Transnational commercial shipping through Arctic maritime routes will become viable alternatives to current Panama and Suez Canal routes. ⁶ The distance from source to terminal will be materially shorter,⁷ and the channels deeper, thereby accommodating ships of greater storage capacity. In addition, huge quantities of oil, natural gas, and natural gas liquids, together with the world's largest deposits of nickel, coal and zinc, are in the Arctic seabed and will become accessible for extraction.⁸

³ Malte Humpert, *The Future of the Northern Sea Route- A "Golden Waterway" or a Niche Trade Route*, The Arctic Inst. (Sep. 15, 2011), <https://www.thearcticinstitute.org/future-northern-sea-route-golden-waterway-niche/>, [<https://perma.cc/AB9U-LJAR>]; *See also* Appendix 1.

⁴ Scott R. Stephenson & Laurence C. Smith, *Influence of Climate Model Variability on Projected Arctic Shipping Futures*, 3 *Earth's Future* 331, 331 (2015), <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2015EF000317>, [<https://perma.cc/RG4G-CKTS>]; Jugal K. Patel & Henry Fountain, *As Arctic Ice Vanishes, New Shipping Routes Open*, N.Y. Times (May 3, 2017), <https://www.nytimes.com/interactive/2017/05/03/science/earth/arctic-shipping.html>, [<https://perma.cc/63VS-TQ67>]; Garret W. Brass, U.S. ARCTIC RESEARCH COMM'N, THE ARCTIC OCEAN AND CLIMATE CHANGE: A SCENARIO FOR THE U.S. NAVY 1 (2002).

⁵ *See generally* Stephenson & Smith *supra* note 3 at 331; *see also* Patel & Fountain, *supra* note 3; *see also* U.S. ARCTIC RESEARCH COMM'N, *supra* note 3 at 1.

⁶ Huiru Liu, *Arctic Marine Insurance: Towards a New Risk Coverage Regiment*, 47 *J. Mar. L. & Com.* 77, 77 (2016); Alexander Proelss & Till Müller, *The Legal Regime of the Arctic Ocean*, 68 *Heidelberg J. Int'l L.* 651, 653 (2008).

⁷ Liu, *supra* note 5, at 77.

⁸ James Kraska, *From Pariah To Partner—Russian-American Security Cooperation in the Arctic Ocean*, 16 *ILSA J. Int'l & Comp. L.* 517, 523 (2010).

The relationship between the Arctic region and the U.S. arose, in many ways, from an initial interest in establishing and cultivating U.S. presence and interest in the Arctic through research and policy development, with the supposition of potential economic benefits in the future.⁹ This intent was codified in The Arctic Research and Policy Act of 1984 (amended 1990) (hereinafter referred to as the “Act”). When the Act was proposed in the mid 1980’s, the extent to which the Arctic would be impacted by global warming was, for the most part, unaccounted for by Congress. Today, there is significant research to substantiate the effects of global warming in the Arctic.¹⁰ As a result, the data from which Congress acted upon when drafting the Act is much different than what Congress knows now. Due to anticipated changes in ice density in the Arctic and the affect it will have on commercial activity in the Arctic region, the continued efficacy of the Act depends on two factors. First, Congress should ensure that the three icebreaking vessels planned for construction are built on schedule,¹¹ and they should also begin the processes of procuring additional icebreakers. Second, Congress, along with administrative agencies, and the States of Alaska and Maine, should work collaboratively to construct new and improved infrastructure to accommodate the anticipated commercial activity in the Arctic region.¹²

⁹ S. REP. NO. 98-159, at 2 (1983) (Conf. Rep.)

¹⁰ Charles H. Norchi & Paul A. Mayewski, *The Arctic: Science, Law, and Policy*, 22 *The Ocean and Coastal L. J.* 97, 100 (2017).

¹¹ See generally U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-18-600, COAST GUARD ACQUISITIONS POLAR ICEBREAKER PROGRAM NEEDS TO ADDRESS RISKS BEFORE COMMITTING RESOURCES (2018).

¹² U.S. ARCTIC RESEARCH COMM’N, REPORT ON THE GOALS AND OBJECTIVES FOR ARCTIC RESEARCH 2017-2018 FOR THE U.S. ARCTIC RESEARCH PROGRAMM PLAN 8 (2017),

https://storage.googleapis.com/arcticgov-static/publications/goals/usarc_goals_2017-2018_version_2.pdf, [https://perma.cc/5T8X-U99V] (Infrastructure includes “ports, harbors, and places of refuge, aids to navigation, systems for search and rescue and for spill response, ice navigation training, navigation charts, communication systems, icebreakers, and ice centers.”).

Without additional vessels and infrastructure improvements, U.S. activity in the Arctic, and consequently, any interest the U.S. intended to gain in the Arctic economy, will be severely impaired. The following sections expand on this assertion. The beginning section examines the increasing financial and geopolitical opportunities in the Arctic region. Any U.S. interest in the Arctic economy is already in direct competition with other world powers; therefore, attention from Congress and the Executive must be redirected towards advancement. The next section analyzes the Act and its accompanying research and policy, which, at this point, is no longer sufficient to properly compete on a world-scale. While research and policy were significant components to the U.S. interest in the Arctic during the mid-1980s and early 1990s, it is clear that that will not create economic advancement. The next step to U.S. economic advancement in the Arctic is in the form of new icebreaking vessels and improved Arctic infrastructure. The final section addresses the, albeit, costly process for acquiring and initiating this development. While policy and research are important, we are moving into an era of documented and visible changes. The U.S. must effectively participate in the Arctic economy and the manner in which to begin is by constructing icebreaking vessels and Arctic infrastructure.

II. BACKGROUND OF THE ARCTIC OCEAN & COMMERCIAL SHIPPING

The Arctic Ocean is strategically important to the world for at least three reasons. First, the passageways (Transpolar, NWP, and NSR) that flow through the Arctic Ocean connect the eastern and western hemispheres;¹³ second, the natural resources located within the Arctic seabed are abundant;¹⁴ third, the region offers financial and geopolitical advantages to nations or private entities within those nations that can best leverage the shipping channels and natural resources of the Arctic. The three important elements are discussed in the following section.

¹³ See Appendix 1.

¹⁴ Kraska, *supra* note 7, at 523.

A. Geography and Geopolitics in the Arctic

The NWP runs above Canada, the NSR runs above Russia, and the Transpolar Sea Route runs directly through the center of the Arctic Ocean.¹⁵ The countries that have territory within the Arctic Circle include Canada, Denmark via Greenland, Norway, Russia, and the United States via Alaska.¹⁶ While not central to this comment, there are multiples legal disputes among Arctic countries that stem from claims of territorial ownership within Arctic waters.¹⁷ These unsettled conflicts exacerbates the geopolitical complexities that surround the Arctic region and the sovereign Arctic border countries because territorial ownership equates to exclusive control and use of resources therein. The governing law regarding the Arctic Ocean derives from the United Nations Convention on the Law of the Sea (UNCLOS). Although UNCLOS has not been ratified by the U.S., the U.S. does recognize international customary law.¹⁸ Customary law is essentially a tenant of international law and is a result of consistent practices of nation states which influences conduct and behavior due a sense of legal obligation to coordinate uniform behavior.¹⁹ As the U.S. Navy noted, despite not having ratified UNCLOS, the U.S. has a sense of obligation to conform to the rules that pertain to territoriality of the seas, which are defined therein.²⁰ Territorial seas are important to the countries that border the Arctic because, under UNCLOS, a territorial sea “basically functions as a continuation of the country’s land territory[.]” essentially affording full sovereignty.²¹ However, UNCLOS codifies the right of innocent passage for all ships to travel through the territorial seas of a coastal state so long as it is “peaceful,

¹⁵ *Id.*; Humpert, *supra* note 2.

¹⁶ Stephanie Holmes, *Breaking the Ice: Emerging Legal Issues in Arctic Sovereignty*, 9 *Chicago J. of Int’l L.* 323, 326 (2008).

¹⁷ *See generally* Proelss & Müller, *supra* note 5, at 655.

¹⁸ Navy Task Force Climate Change, U.S. Navy Arctic Roadmap 2014-2030 3, 13 (2014).

¹⁹ *Customary Law*, BLACK’S LAW DICTIONARY (10th ed. 2014).

²⁰ *See* United Nations Convention on the Law of the Sea, Part II § 1-2 art. 2-3, Dec. 10, 1982 [hereinafter UNCLOS].

²¹ Holmes, *supra* note 14, at 326.

continuous, and expedient.”²² Those nations that may eventually gain exclusive control of additional territory in the Arctic, or the private entities of those nations, will likely realize benefits in the Arctic economy.

B. The Arctic Economy

The Arctic economy is comprised of an abundance of natural resources, the commercial benefits and cost savings of maritime Arctic commerce, and foreign investment by countries like China and Russia, which have already begun to invest in the Arctic’s future.²³

1. Natural Resources

The U.S. Geological Survey estimates that “the Arctic holds about thirteen (13) percent of the world’s undiscovered oil, thirty (30) percent of the undiscovered natural gas and twenty (20) percent of the undiscovered natural gas liquids.”²⁴ That is approximately ninety (90) billion barrels of oil and forty-seven (47) trillion cubic meters of natural gas.²⁵ The Arctic seabed also contains some of the

²² *Id.* at 334. See UNCLOS, *supra* note 18, at Part II § 3 art. 17-19. See generally Ed Struzik, *Full Speed Ahead Shipping Plans Grow as Arctic Ice Fades*, YALE 360 (Nov. 17, 2016),

https://e360.yale.edu/features/cargo_shipping_in_the_arctic_declining_sea_ice, [<https://perma.cc/TT8M-N27F>]; Caitlin O’Leary, Note/Comment, *The New Ice Age: The Dawn of the Arctic Shipping and Canada’s Fight for Sovereignty over the Northwest Passage*, 46 U. Miami Inter-Am. L. Rev. 117, 119-20 (2014-2015) (Russia, due to its geography, has an advantageous claim to territory in the Northeast Passage which gives it greater exclusive control over the NSR. While Canada claims the NWP as its sovereign territory, it is contested by the U.S. and China, which argue the NWP is an international strait. This debate is beyond the scope of this comment, but helpful when thinking about the geopolitics of the Arctic region that stem from territorial disputes.).

²³ Proelss & Müller, *supra* note 5, at 653; Clay Dillow, *Russia and China vie to Beat the U.S. in the Trillion-Dollar Race to Control the Arctic*, CNBC (Feb. 6, 2018), <https://www.cnbc.com/2018/02/06/russia-and-china-battle-us-in-race-to-control-arctic.html>, [<https://perma.cc/FC89-37CE>].

²⁴ Kraska, *supra* note 7, at 523; Frank Ulmer, *Alaska and the Arctic*, 31 Alaska L. Rev. 161, 163 (2014).

²⁵ Kraska, *supra* note 7, at 523.

world's largest nickel, coal, and zinc deposits.²⁶ In addition to natural minerals, the Arctic region also offers a fishing economy that will also develop as ice density is reduced.²⁷ The natural commodities located in the Arctic are substantial to say the least.

2. *Commercial Shipping*

The driving forces of the Arctic economy can be attributed not only to its natural resources,²⁸ but also to its geography, which lends itself to advantageous commercial shipping because of shorter and deep water shipping routes by way of the NWP, NSR, and Transpolar Passage.²⁹ Approximately ninety percent of all goods are shipped by sea.³⁰ That is because shipping is “the cheapest form of transport[,]” and there is no indication that that will change in the near future.³¹ Moreover, because the “vast majority of active industrial production in the world . . . is concentrated . . . north of the [thirtieth] parallel[,] and about [seventy percent] of the world's urban metropolitan areas are located north of the [twenty-third] parallel in the northern hemisphere[,]” the Arctic region is well-situated to advance the world's supply and demand chain.³²

Illustrative of the economy of shipping in the Arctic is the case of the Nordic Orion, which, in 2013, was the first commercial bulk carrier to sail through the Northwest Passage.³³ By traveling

²⁶ Kraska, *supra* note 7, at 523; Dillow, *supra* note 21 (“[A] range of mineable minerals, including gold, silver, diamond, copper, titanium, graphite, uranium and other valuable rare earth elements” are “increasingly within reach” as ice melts).

²⁷ U.S. Arctic Research Comm'n, *supra* note 3, at 1, 5.

²⁸ Dillow, *supra* note 21 (“The ultimate goal: to have offshore Arctic oil account for between 20 and 30 percent of Russian production by 2050.”).

²⁹ *Id.* See also Liu, *supra* note 5, at 77.

³⁰ Bruce G. Paulsen, *What the General Litigator Needs to Know about Handling a Maritime Case*, 41 *Litigation J.* 1, 1 (2015), https://www.americanbar.org/content/dam/aba/publications/litigation_journal/spring2015/handling-maritime-cases.authcheckdam.pdf, [<https://perma.cc/284J-B2Q8>].

³¹ *Id.*

³² Liu, *supra* note 5, at 77.

³³ Wendy Stueck, *Groundbreaking Northwest Passage voyage almost foundered over insurance*, *The Globe and Mail*

through the Northwest Passage, as opposed to the Panama Canal, the Nordic Orion saved eighty thousand dollars in fuel cost, traveled one thousand nautical miles less, and the ship could carry about twenty-five percent more coal because the water was not as shallow as the Panama Canal.³⁴ The Northwest Passage proved to be both advantageous and cost-effective.

3. *Investing Countries*

As previously noted, Russia and China are beating “the U.S. in the [t]rillion-[d]ollar [r]ace to [c]ontrol the Arctic.”³⁵ Despite significant investment by other countries, such as Canada and some Nordic countries, Russia and China are the clear leaders.³⁶ Russia has conducted commercial Arctic shipping since the first half of the twentieth century through the NSR as a way of connecting Russia’s isolated north to the rest of the country.³⁷ Now, the NSR is “experiencing a renaissance.”³⁸ This is in part because of China, which predicted that fifteen percent of its “annual trade would travel along Russia’s Northern Sea Route by 2020.”³⁹ Given China’s rhetoric,⁴⁰ and the fact that it is currently constructing an icebreaking vessel,⁴¹ there is no doubt that China will utilize the NSR.

<https://www.theglobeandmail.com/news/british-columbia/groundbreaking-northern-voyage-almost-foundered-over-insurance/article14649393/>, [<https://perma.cc/DV4P-G4VX>] (last updated May, 11, 2018).

³⁴ *Id.*

³⁵ Dillow, *supra* note 21.

³⁶ Ásgeir Sigfússon, *Getting into the Game: America’s Arctic Diplomacy*, *The Foreign Serv. J.* Nov. 2015, http://www.afsa.org/sites/default/files/flipping_book/1115/files/assets/basic-html/page-23.html, [<https://perma.cc/4BSA-EPJ3>].

³⁷ Kraska, *supra* note 7, at 529.

³⁸ *Id.*

³⁹ Ryan Kilpatrick, *China’s Plan for the Arctic—And A Shipping Centre to Rival Singapore*, *SOUTH CHINA MORNING POST* (Nov. 15, 2016), <https://www.scmp.com/week-asia/business/article/2046117/chinas-plan-arctic-and-shipping-centre-rival-singapore>, [<https://perma.cc/NLD3-HHDT>].

⁴⁰ *Id.*

⁴¹ U.S.C.G. OFFICE OF WATERWAYS & OCEAN POLICY, *MAJOR ICEBREAKERS OF THE WORLD* (2017) [<https://perma.cc/3VKJ-4NK2>].

Despite China's investment, which includes the new icebreaker, Russia is the world leader in icebreaker capability and subsequently, access to the Arctic Ocean.⁴² In Russia, icebreakers are used for many purposes, one of which is commercial. Russia has a fleet large enough "to reliably escort other [ships] through still periodically frozen waters, and that gives it massive influence over regional shipping patterns."⁴³ Russia also installed and revitalized ports along its NSR.⁴⁴ In fact, Russia invested three hundred billion dollars "in potential projects either completed, in motion or proposed, [which makes] Russia . . . the clear leader in Arctic infrastructure development."⁴⁵

China, even without a territorial claim in the Arctic, is also heavily invested in the Arctic Ocean's economic future. China's president, Xi Jinping, announced China's "ambitions to develop a 'Polar Silk Road' through the region as warming global temperatures open up new sea lanes and economic opportunities at the top of the world."⁴⁶ China is using its economic strength to influence the region by "underwriting Arctic development projects."⁴⁷ Xi Jinping's rhetoric indicates that China has "a keen interest in what the Arctic has to offer in terms of global shipping, fishing stocks, energy security and other mineral resources."⁴⁸ By incorporating the Arctic into their Belt and Road initiative, the Chinese government has taken "what is arguably the longest view in the region, using its financial might to secure access to resources it cannot obtain through territorial claims."⁴⁹

⁴² See U.S.C.G. OFFICE OF WATERWAYS & OCEAN POLICY, MAJOR ICEBREAKERS OF THE WORLD (2017) [<https://perma.cc/3VKJ-4NK2>]; Kraska, *supra* note 7, at 529.

⁴³ Peter Apps, *Commentary: The U.S. Risks Losing an Arctic Cold War*, Reuters (Jan. 30, 2018), <https://in.reuters.com/article/us-apps-arctic-commentary/commentary-the-us-risks-losing-an-arctic-cold-war-idINKBN1FJ2DM>, [<https://perma.cc/93DH-VDKC>].

⁴⁴ Sigfússon, *supra* note 34; Dillow, *supra* note 21.

⁴⁵ Dillow, *supra* note 21.

⁴⁶ *Id.*; Struzki, *supra* 20, at 2.

⁴⁷ Dillow, *supra* note 21.

⁴⁸ *Id.*

⁴⁹ *Id.*

Based upon aforementioned developments in the Arctic region, the Arctic is a focus of financial investment and anticipated returns.⁵⁰ The Arctic Ocean is poised for a flurry of new activity in the coming decades because natural resources, which were not available thirty to forty years ago, can now be extracted; ⁵¹ additionally, commercial shipping and international competition are at the forefront of the Arctic economy in a manner that is drastically different than when the Act was passed. As one of the great nations of the world, the U.S. should have a significant role in the Arctic.⁵² The economic prospects offered in the Arctic should encourage Congress to advance U.S. interest in the Arctic economy. This is especially true because increasing commercial activity will only strain the already minimal resources the U.S. has available in the Arctic.⁵³

⁵⁰ *Id.* (“An inventory of planned, in-progress, completed, or canceled Arctic infrastructure projects compiled by global financial firm Guggenheim Partners tallies roughly 900 projects, requiring a total of \$ 1trillion in investment, some of which is already on the way.”).

⁵¹ Proelss & Müller, *supra* note 5, at 653; Ulmer, *supra* note 22 at 163 (“fishing . . . or oil and gas”).

⁵² Ulmer, *supra* note 22, at 161(While outside the scope of this comment, but somewhat related to economic advancement, the U.S. should be concerned about mitigating risk in the Arctic region. Insurance management for Arctic shipping is another reason for the U.S. to be involved in the Arctic region, especially because regional economies in states like Alaska and Maine could be impacted by oil spills; *See* Liu, *supra* note 5, at 78 (“The Arctic is full of risks . . . Risk distribution among ships and shipowners is a key factor in the economic sustainability of world shipping.”); Struzik, *supra* note 20 (State economies, like that of Maine, which, due to its location, stand to benefit from Arctic shipping because it is the first port on the U.S. East Coast for ships traveling the shorter route from Asia to Europe. By using the Arctic Ocean, ships could save about ten days. Maine is in the process of improving its port, which is already home to Icelandic shipping company, Eimskip).

⁵³ U.S. ARCTIC RESEARCH COMM’N, REPORT ON THE GOALS AND OBJECTIVES FOR ARCTIC RESEARCH 2017-2018 FOR THE U.S. ARCTIC RESEARCH PROGRAM PLAN 8, 15 (2017).

https://storage.googleapis.com/arcticgov-static/publications/goals/usarc_goals_2017-2018_version_2.pdf, [https://perma.cc/ESA2-5JCP] (“U.S. vessels are aging and dwindling in number . . . Only one heavy icebreaker, USCG *Polar Star*, commissioned [forty] years ago, remains operational. USCG *Healy*, a medium icebreaker commissioned in

Before the Act came to fruition, Congress intended to create a comprehensive:

national Arctic research policy in concert with a *sustained* research effort [to] allow the Nation to continue to develop the vast renewable and nonrenewable resources of the Arctic in an expeditious but responsible manner. A comprehensive Arctic research policy and a *sustained* research effort is also important to stated U.S. national security objectives . . . Research is important to the responsible development of Arctic resources, the meeting of important national security objectives, and the creation of a broad data base helpful to the resolution of a wide variety of *current* and *future* problems.⁵⁴

The Act envisioned a sustainable long-term approach to the Arctic region through research, data collection, and policy development. Now is the time for Congress to capitalize on these earlier efforts and recognize that the U.S. has an interest in the financial and geopolitical advancement of the Arctic region. However, without icebreaking vessels and improved infrastructure, the goals set out in the Act, which harken to sustainability and mitigation of long-term challenges, will not be achieved. The Act even acknowledges that the U.S. is inadequately equipped compared to other Arctic nations.⁵⁵ While it was urgent for Congress to enact legislation pertaining to the Arctic in 1984, it is considerably more urgent that Congress reinvigorate U.S. interest in the Arctic.

III. THE ARCTIC RESEARCH AND POLICY ACT OF 1984 (AMENDED 1990)

The purpose of the Act, among other things, is to delineate policy initiatives,⁵⁶ centralize research and data collection,⁵⁷ and

1999, continues to operate successfully in the Arctic, effectively supporting a broad range of scientific missions.”).

⁵⁴ S. REP. NO. 98-159, at 2 (1983) (Conf. Rep.) (emphasis added).

⁵⁵ 15 U.S.C. § 4101(a)(10) (“most Arctic-rim countries possess Arctic technologies far more advanced than those currently available in the United States[.]”).

⁵⁶ 15 U.S.C. §§ 4101-11.

⁵⁷ S. REP. NO. 98-159, *supra* note 52, at 14.

promote burden sharing in order to have more sustainable long-term development.⁵⁸ The Act delineates several reasons for which Arctic interest is important, including the Arctic's onshore and offshore energy resources; national defense; commercial assets; "security[;] economic[;] and environmental interests."⁵⁹ Essentially, the Act identifies the financial and geopolitical significance of the Arctic region.

The import of the Act is belied in the collective efforts of federal agencies working toward a common interest of research and policy in the Arctic. The Act sets-out objectives for many U.S. agencies that operate in the Arctic.⁶⁰ The Act established information sharing processes and collaboration through "an Arctic Research Commission [that] promote[s] [and recommends] Arctic research and . . . policy . . . [and] an Interagency Arctic Research Policy Committee [led by the National Science Foundation] to develop a national Arctic research policy and a five year plan to implement that policy."⁶¹ The Act was followed by an Executive Order signed by president Reagan that aligned the executive's interest in the Arctic with the legislature's interest.⁶²

As prescribed by the Act, the Interagency Committee's five-year plan is the result of a collaborative effort made by the many agencies which function within the Arctic.⁶³ The Plan is a tangible deliverable that is prepared for Congress and the Executive so that together, the U.S. government may continuously prepare future plans for U.S. involvement in the Arctic, which should now include

⁵⁸ See generally *Id.* at 2-20.

⁵⁹ 15 U.S.C. § 4101(a)(1)-(3), (9).

⁶⁰ 15 U.S.C. § 4106(b)(2)(A)-(L).. (The Interagency Committee is comprised of the National Science Foundation; The Departments of Commerce, Defense, Energy, the Interior, State, Transportation, and Health and Human Services; The National Aeronautics and Space Administration; Environmental Protection Agency; Office of Science and Technology Policy; and "any other Executive agency that the Director of the National Science Foundation shall deem appropriate."); see also Proclamation No. 12501, 50 Fed. Reg. 4191 (Jan. 28, 1985).

⁶¹ 15 U.S.C. § 4101(b)(1)-(3)

⁶² Proclamation No. 12501, 50 Fed. Reg. 4191 (Jan. 28, 1985) (The purpose was to "develop and recommend an integrated national Arctic research policy.").

⁶³ See *supra* note 56; 15 U.S.C. § 4106(b)(2)(A)-(L).

an adequate fleet of icebreaking vessels and adequate infrastructure and personnel to service the increasing Arctic activity.

Icebreaking vessels and port development serve two purposes that pertain to the Act and its reason for being. First, they allow the agencies who have congressionally defined duties to physically operate in the Arctic. The policies and data collected from those operations are incorporated into the Interagency Plan, which informs Congress and the Executive. The second purpose is to promote long-term development in the Arctic which can be realized by icebreakers and port development because they afford an opportunity to capitalize on both natural resources and maritime commerce in the Arctic, which should promote long-term growth in the region, if carried out sustainably.

While the next section addresses the Interagency Plan that was created pursuant to the Act, the analysis does not lie in the substance of *what* the goals are but rather *how* they can be achieved. The Plan makes it clear that for research to continue and long-term development plans to be achieved, icebreakers and port development are critical to the operations of federal agencies in the Arctic.

A. Analyzing the Arctic Research Plan Fiscal Year 2017-2021

The most recent Arctic Plan comes at a time when the climatic and commercial changes in the Arctic are imposing challenges to federal agencies carrying out congressionally mandated operations in the Arctic.⁶⁴ The Plan is a comprehensive report built upon research and data collected by many federal organizations from the Interagency Committee.⁶⁵ The current Plan

⁶⁴ INTERAGENCY ARCTIC RESEARCH POL'Y COMMITTEE OF THE NAT'L SCI. AND TECH. COUNCIL, ARCTIC RESEARCH PLAN FY2017-2021 i-ii (2016).

https://www.iarpccollaborations.org/uploads/cms/documents/iarpc_arctic_research_plan_2017-2021.pdf, [<https://perma.cc/5Y72-AD8Q>].

⁶⁵ *Id.* at i-vi.

identifies challenges, and poses steps to alleviate those barriers in the form of goals, which are listed below.

- Research Goal 1: Enhance understanding of health determinants and improve the well-being of Arctic residents.
- Research Goal 2: Advance process and systems understanding of the changing Arctic atmospheric composition and dynamics and the resulting changes to surface energy budgets.
- Research Goal 3: Enhance understanding and improve predictions of the changing Arctic sea ice cover.
- Research Goal 4: Increase understanding of the structure and function of Arctic marine ecosystems and their role in the climate system and advance predictive capabilities.
- Research Goal 5: Understand and project the mass balance of glaciers, ice caps, and the Greenland ice sheet and their consequences for sea level rise.
- Research Goal 6: Advance understanding of process controlling permafrost dynamics and the impacts on ecosystems, infrastructure, and climate feedbacks.
- Research Goal 7: Advance an integrated, landscape-scale understanding of Arctic terrestrial and freshwater ecosystems and the potential for future change.
- Research Goal 8: Strengthen coastal community resilience and advances stewardship of coastal natural and cultural resources by engaging in research related to the interconnections of people, natural, and built environments.
- Research Goal 9: Enhance frameworks for environmental intelligence gathering, interpretation, and application toward decision support.⁶⁶

⁶⁶ *Id.* at 1.

If unable to satisfy these goals, Arctic operations may be inhibited, which would limit sustained research and policy development, essentially rendering the Act ineffective. The Act highlights the importance of adapting in parallel to the identified changes to allow agencies to continue operating effectively. In other words, agencies must continuously adapt. An example of adaptation is through vessel and infrastructure construction which will allow for continued operations in the wake of new environmental challenges, which are currently inhibiting long-term, sustained, operations. Explicit in the Plan is that a “complete understanding of the Arctic System must include the human component.”⁶⁷ Inherent in the human component is the Arctic economy.

Each of the nine goals are affected by the increase in commercialization and human activity.⁶⁸ The challenge in accomplishing these goals and performance elements is exacerbated by “commercial shipping, resource extraction and tourism[,]” which come as a result of “diminishing sea ice.”⁶⁹ In fact, the ability to meet the Plan’s goals is arguably contingent on icebreakers, which are currently operating at reduced capacity in the U.S.,⁷⁰ and port development because as commercialization continues in the Arctic, there will be continuous challenges that inhibit sustainable development and long-term interest in the Arctic, which could leave the U.S. in a state loss when compared to countries like Russia and China.

The Plan finds that an effort to meet the challenges brought on by commercialization is crucial because it directly impacts U.S. territory.⁷¹ For instance, diminishing sea ice may impact the people and the States of Alaska and Maine⁷² because of their geographic

⁶⁷ *Id.* at 4.

⁶⁸ *See generally Id.* at 4.

⁶⁹ *Id.* at ii.

⁷⁰; *see also* U.S.C.G. OFFICE OF WATERWAYS & OCEAN POLICY, MAJOR ICEBREAKERS OF THE WORLD (2017); NATIONAL RESEARCH COUNCIL, POLAR ICEBREAKERS IN A CHANGING WORLD 2 (2007).

⁷¹ INTERAGENCY ARCTIC RESEARCH POL’Y COMMITTEE OF THE NAT’L SCI. AND TECH. COUNCIL, *supra* note 62, at 3, n.5 (“About 30 percent of Alaska lies within the Arctic Circle.”).

⁷² Struzik, *supra* note 20.

proximity to the Arctic. This could also mean, as discussed in the prior section, “new opportunities for commercial and industrial development”⁷³ in the form of “increased ship traffic for cargo and tourism.”⁷⁴ The Plan’s goals recognize the challenges in the Arctic that are arising from the changing environment and commercialization of the region, and that infrastructure in the Arctic is no longer suitable.⁷⁵ The challenges can be mitigated, however, by managing and influencing the influx of Arctic maritime traffic through research and policy, and by enabling greater access to the Arctic Ocean to enable exploration and commercial shipping traffic.⁷⁶ The need for icebreaking vessels that can navigate the Arctic Ocean in all conditions is necessary. Moreover, as U.S. agencies begin to utilize new icebreakers to perform their operations, and modern infrastructure is developed to accommodate commercial activity in the harsh climate,⁷⁷ more opportunity will be available to utilize U.S. Arctic territory, and neighboring territory, in ways that are similar to Russia.⁷⁸

The Plan essentially concludes that while research and policy are key to its purpose, the “human component” in the Arctic requires advancement in new resources, such as icebreakers and infrastructure. Not only does the Plan support this notion, but so too do the U.S. agencies who operate in the Arctic, each of which developed their own Arctic plans that are unique to the prerogatives of that agency. The following sub-sections analyze four independent plans for the Arctic. The plans were produced by the U.S. Arctic Research Commission, the U.S. Navy, the Department of Defense, and the U.S. Coast Guard. Each of these organizations play an active role in the Interagency Arctic Research Committee. The individual plans permit us to better understand that each of these agencies

⁷³ INTERAGENCY ARCTIC RESEARCH POL’Y COMMITTEE OF THE NAT’L SCI. AND TECH. COUNCIL, *supra* note 62, at 8.

⁷⁴ *Id.* at 19.

⁷⁵ *Id.* at 33 (“permafrost warming, degradation, and thaw subsidence can have significant implications for . . . infrastructure.”).

⁷⁶ *See generally id.* at 19-20.

⁷⁷ *See generally id.* at 33.

⁷⁸ Apps, *supra* note 41; Kraska, *supra* note 7, at 529.

contribute to the broader Plan and are interconnected by their Arctic operations.

*1. The US. Arctic Research Commission Report*⁷⁹

The role of the U.S. Arctic Research Commission is defined in the Act.⁸⁰ The Commission is “composed of seven members appointed by the President, with the Director of the National Science Foundation serving as a nonvoting, *ex officio* member.”⁸¹ Membership includes four individuals with academic or research expertise in the Arctic, one member who is an indigenous resident of the Arctic, and two representatives from private interest groups.⁸² The terms are limited to a maximum of four years and vacancies are staggered,⁸³ which allows for consistency between new and old members. Additionally, representatives of federal agencies involved in the Interagency Committee may be appointed to the Commission as observers to “report . . . and advise the Commission on the activities relating to Arctic research of their agencies.”⁸⁴ The composition of the Commission leads to a multifaceted perspective, which allows for comprehensive reports and recommendations. The Commission makes recommendations through a report to Congress and the President, as directed by the Act, and cooperates with the State of Alaska to improve, facilitate, and manage the logistics of disseminating research plans and information.⁸⁵ The Commission may also collect data and reports from other agencies, and may request assistance from the heads of the those agencies. All “Federal agencies shall consult with the Commission before undertaking

⁷⁹ U.S. ARCTIC RESEARCH COMM’N, REPORT ON THE GOALS AND OBJECTIVES FOR ARCTIC RESEARCH 2017-2018 FOR THE U.S. ARCTIC RESEARCH PROGRAMM PLAN (2017), https://storage.googleapis.com/arcticgov-static/publications/goals/usarc_goals_2017-2018_version_2.pdf, [https://perma.cc/F3L3-ZNEN].

⁸⁰ 15 U.S.C. § 4103.

⁸¹ 15 U.S.C. § 4102(b)(1).

⁸² 15 U.S.C. § 4102(b).

⁸³ 15 U.S.C. § 4102(c)(2)(A)-(C).

⁸⁴ 15 U.S.C. § 4102(d)(3).

⁸⁵ 15 U.S.C § 4103.

major Federal actions relating to Arctic research.”⁸⁶ The Commission, together with the Interagency Arctic Research Policy Committee shall prepare and submit an Arctic research plan to the President, who then transmits it to Congress.⁸⁷ The plan “shall be revised biennially.”⁸⁸ While the Commission significantly contributes to the Plan, the Commission also produces its own Arctic report.

The Commission’s report is centered on the economic impact of the changing Arctic Ocean, and possible strategies that can be employed to induce positive environmental, ecological, and financial outcomes.⁸⁹ In one regard, the report concludes that the Arctic is changing and the U.S. needs to engage in the Arctic in parallel with that change.⁹⁰ A second conclusion is that because the Arctic is “rapidly and dramatically changing,”⁹¹ there are new challenges that are identified as potential barriers to effectuating effective research and policy initiatives. A base-level solution to dealing with the change is to ensure icebreakers and infrastructure are developed.⁹²

The report identified several challenges that specifically implicate port infrastructure and access to the Arctic Ocean by means of icebreaking vessels. The report found that “[c]ompromised infrastructure increases risks to human health, safety, and well-being and results in economic impacts on the scale of billions of dollars in Alaska alone.”⁹³ The Commission refers to this type of

⁸⁶ 15 U.S.C. § 41014 (c).

⁸⁷ 15 U.S.C. § 4108.

⁸⁸ 15 U.S.C. § 4108.

⁸⁹ See generally U.S. ARCTIC RESEARCH COMM’N, *supra* note 77 at 1-16.

⁹⁰ *Id.* at 1.

[T]he Arctic region is rapidly and dramatically changing, redefining life for people and communities, animals and plants, ecosystem functions, and landscapes. The present doesn’t look like the past, and the future will not look like the present, which makes it challenging for people to make choices about managing development and transportation, as well as land and water uses.

⁹¹ *Id.*

⁹² *Id.* at 8, 15.

⁹³ *Id.* at 8.

infrastructure as a “built environment,” (i.e. “a social science term that refers to the human-made surroundings and infrastructure that provide the setting for human activity, ranging in scale from buildings to cities and including supporting systems . . . for water, sewage, energy, communications, and transportation.”)⁹⁴ Considering all of the variables and requirements that are expected to ripple out from the increased commercial activity in the Arctic Ocean, updated and increased infrastructure is necessary if the U.S. is to accommodate commercial shipping in the Arctic region. If unable to accommodate the challenges, the U.S. will fail to realize the monetary benefits that narrowly accompany such accommodation.⁹⁵

The Commission also identified several ways that the U.S. can support increasing maritime commerce in the Arctic, which includes implementation and enforcement of the International Maritime Organization’s Polar Code.⁹⁶ Another way is to develop “adequate infrastructure, such as ports, harbors, and places of refuge, aids to navigation, systems for search and rescue and for spill response, ice navigation training, navigation charts, communication systems, icebreakers, and ice centers.”⁹⁷ The U.S. icebreaking fleet and port infrastructure is currently undersized and outdated.⁹⁸ A correlation with the lack of icebreaking vessels is perhaps an

⁹⁴ *Id.*

⁹⁵ Consider the earlier discussion regarding the advances that Russia has undertaken in the Arctic compared to those of the U.S. As the Arctic Ocean continues to experience reduced ice-coverage, the NWP and Transpolar Passage will be utilized more in Arctic shipping regimes, thus competing with Russia’s NSR, which is currently utilized more than other Arctic shipping routes because there is less ice coverage for longer periods of time. Russia is developing and revitalizing its own infrastructure to capitalize on the Arctic economy. As the Commission’s plan noted, new environmental challenges will expose outdated infrastructure.

⁹⁶ THE UNITED STATES COAST GUARD, ARCTIC STRATEGY 17 (2013).

⁹⁷ U.S. ARCTIC RESEARCH COMM’N, *supra* note 77, at 8.

⁹⁸ U.S. ARCTIC RESEARCH COMM’N, REPORT ON THE GOALS AND OBJECTIVES FOR ARCTIC RESEARCH 2017-2018 FOR THE U.S. ARCTIC RESEARCH PROGRAMM PLAN 15 (2017) (“U.S. vessels are aging and dwindling in number . . . Only one heavy icebreaker, USCG *Polar Star*, commissioned [forty] years ago, remains operational. USCG *Healy*, a medium icebreaker commissioned in 1999, continues to operate successfully in the Arctic, effectively supporting a broad range of scientific missions.”).

explanation as to why there is inadequate mapping of the Arctic Ocean region. In fact, “less than [five percent] of U.S. Arctic maritime waters (those within [two hundred] nautical miles of Alaska shorelines in the Bering, Chukchi, and Beaufort Seas) have been mapped by modern methods.”⁹⁹ Additionally, “[i]cebreaking vessels are essential to conducting world-class research in the Arctic Ocean. Without that capacity, the ability to answer challenging scientific questions becomes impossible.”¹⁰⁰ The need for icebreakers and improved infrastructure is readily apparent to the Arctic Commission. The Commission also recognized that “the time required to design, build, and commission a vessel can take years, if not a decade.”¹⁰¹ This makes the timing of procuring these vessels even more crucial.

The Commission identified the importance of revitalized infrastructure and icebreaking vessels as significant components to enhancing economic and human opportunities in the Arctic. The Commission’s efficacy is also dependent on these improvements because without improved infrastructure and icebreakers, the statutorily defined duties of the Commission become increasingly difficult to achieve.¹⁰² While the Commission’s report was prepared for, and utilized by, other actors with Arctic interests, the Commission has legally binding responsibilities. Without improved infrastructure and icebreaking vessels, the commission cannot carry out its duties and the Act becomes ineffective. the purpose of the Commission and the Act are likely to be ineffective. The next section examines the challenges the Arctic poses to the U.S. Navy’s duties in the Arctic, and the ways in which icebreakers and infrastructure can mitigate those challenges.

2. *The U.S. Navy Arctic Plan (2014-2030)*

The Navy, which is organized under the Department of Defense (“DOD”), also produced an Arctic plan, and the DOD is

⁹⁹ U.S. ARCTIC RESEARCH COMM’N, *supra* note 77, at 8.

¹⁰⁰ *Id.* at 15.

¹⁰¹ *Id.*

¹⁰² *Id.* at 17.

also a party to the Interagency Committee.¹⁰³ The Navy's perspective on the Arctic is different from the Commission's because the Navy's objectives are focused on maritime defense and security. The Navy's strategic plan includes a long-term impact assessment of the environmental challenges in the Arctic region, the increased commercial and human activity in the Arctic and its geopolitical landscape. While the Navy's objectives in the Arctic differ from the objectives of the Commission, the Navy would also benefit from icebreaking capabilities and enhanced port infrastructure to service its maritime activity in the Arctic.

The Navy's mandated objectives in the Arctic are, in part, to "[e]nsure United States Arctic sovereignty and provide homeland defense; [p]rovide ready naval forces to respond to crisis [*sic*] and contingencies; [p]reserve freedom of the seas; and [p]romote partnerships within the United States Government and with international allies and partners."¹⁰⁴

However, as a result of "retreat[ing] . . . sea ice[.]" new challenges, such as increased navigability and use by both Arctic and non-Arctic nations because of the "abundant resources and trade routes,"¹⁰⁵ impede efforts to satisfy the Navy's objectives.¹⁰⁶ The Navy's objectives include:

a global responsibility to protect vital sea lanes and operating areas, including defending the Nation's maritime borders and [Exclusive Economic Zones]. The geostrategic importance of the Bering Strait will increase as resource extraction, shipping, fishing, and tourism increases. The Navy will be forward deployed and prepared to protect United States' maritime access and interests as the Arctic Ocean sea lanes begin to open.¹⁰⁷

¹⁰³ 15 U.S.C.S. § 4106(b)(2)(A)-(L) (LEXIS through Pub. L. No. 115-243).

¹⁰⁴ NAVY TASK FORCE CLIMATE CHANCE, U.S. NAVY ARCTIC ROADMAP 2014-2030, 3 (2014).

¹⁰⁵ *Id.* at 3.

¹⁰⁶ *Id.* at 3. (see comment above)

¹⁰⁷ *Id.* at 17.

According to the Navy, the Arctic Ocean's overall navigability is effected when more entities, whether public or private, utilize shorter shipping lanes to exploit or extract resources. As a result, there is more pressure on the Navy. Moreover, the extraction and exploitation of "oil and gas development, fishing, tourism, and mineral mining could alter the region's strategic importance as Arctic and non-Arctic nations make investments."¹⁰⁸ This competition could be a divisive factor in international relations. The Navy, which has global responsibility to peaceably facilitate this interaction, especially when it affects U.S. territory, will need to enhance operations to protect and secure U.S. territory.¹⁰⁹

Other challenges to the Navy's objectives include the sheer size of the Arctic region, which "covers an area of about 5.4 million square miles, almost 1.5 times the size of the United States."¹¹⁰ This geographic challenge requires enhanced monitoring, enforcement, and preparation. There is also the challenge posed by "a harsh climate . . . and little infrastructure[.]" all of which inhibits the Navy's ability to operate successfully in the Arctic region.¹¹¹

While the Navy is not specifically referenced in the Act, its connection to the Arctic region is clear, and the policy and research carried out by the Navy was specifically considered in the Interagency Plan.¹¹² The Navy, while not acting pursuant to the Act, is nonetheless influential in contributing to research and policy in the Arctic. Furthermore, the Navy's conduct in the Arctic "[t]hrough ongoing exercises, such as Ice Exercise . . . and Scientific Ice Expeditions . . . research, and transits through the region"¹¹³ coincides with the conduct carried out by other U.S. agencies acting in direct accordance with the Act. The Navy's ability to meet its objectives is challenged by the increased commercial activity, which ultimately affects international relations. Similar to the research

¹⁰⁸ *Id.* at 3.

¹⁰⁹ *Id.* at 17.

¹¹⁰ *Id.* at 6.

¹¹¹ *Id.* at 3.

¹¹² INTERAGENCY ARCTIC RESEARCH POL'Y COMMITTEE OF THE NAT'L SCI. AND TECH. COUNCIL, *supra* note 62, at 15.

¹¹³ Navy Task Force Climate Change, *supra* note 16, at 18.

conducted by the Commission, the Navy's research and policy indicates that icebreaking vessels and improved arctic infrastructure are necessary for the Navy to meet its ongoing objectives and protect U.S. interests in the Arctic.

3. *Department of Defense ("DOD") Arctic Plan*

The DOD's operations extend to the Arctic Ocean not only because they are a member of the Interagency Committee,¹¹⁴ but also because, like the Navy, the DOD, through its agents, is tasked with defending and securing the U.S. A significant challenge the DOD faces due to the changing Arctic icescape includes maintaining "[a]dequate domain awareness[,]” which is an essential component of protecting maritime commerce, critical infrastructure, and key resources.”¹¹⁵ Due to the ongoing and rapid changes in maritime commerce, which is spurred by reduced ice coverage, providing enhanced security and defense have become challenged by the “broad spectrum of activities, ranging from resource extraction and trade to activities supporting safe commercial and scientific operations to national defense.”¹¹⁶ The DOD's mission to defend and secure is complicated by an expanding region due to ice melt and expanded human activity that is accompanying commercial opportunities. While the DOD is taking a fiscally conservative approach in its Arctic Plan, in terms of restraint towards new infrastructure development¹¹⁷ and premature investment in new technologies,¹¹⁸ the challenges that DOD identified could nonetheless be alleviated by new infrastructure and icebreaking vessels, despite the cost.

The physical presence of icebreakers and infrastructure in the Arctic, while perhaps not identified as critical to accomplish the

¹¹⁴ 15 U.S.C.S. § 4106(b)(2)(A)-(L) (LEXIS through Pub. L. No. 115-243).

¹¹⁵ DEPARTMENT OF DEFENSE, ARCTIC STRATEGY, 9 (2013).

¹¹⁶ *Id.*

¹¹⁷ *Id.* at 10 (“solutions for associated supporting infrastructure requirements should seek to leverage existing U.S. Government, commercial, and international facilities to the maximum extent possible in order to mitigate the high cost and extended timelines associated with the development of Arctic infrastructure.”).

¹¹⁸ *Id.* at 12.

DOD's security objectives, would certainly ease their ability to do so, would also reduce reliance on foreign countries who have greater Arctic capabilities;¹¹⁹ and would also further the objectives described in the Act. As the Arctic changes, and invariably new challenges confront the U.S., the pressure on DOD to meet its own objectives, while also assisting other U.S. agencies, will increase. Although DOD's objectives in the Arctic region differ from the goals described in the Interagency plan, there is a long-term mutual benefit that can be realized if the Plan's goals are fulfilled because it will enhance and stabilize U.S. interest in the Arctic, which can ease pressure on the DOD.

4. *U.S. Coast Guard Arctic Strategy*

Although the Coast Guard is not specifically mentioned in the Act, it is represented in the U.S. Interagency Plan through the Department of Homeland Security,¹²⁰ which subsumes the U.S. Coast Guard.¹²¹ While the Coast Guard's objectives are similar to those of the DOD, and the U.S. Navy, they also differ. The Coast Guard's statutorily defined objectives include "search and rescue operations, securing the maritime border, collecting critical intelligence, responding to potential disasters and protecting the marine environment."¹²² The Coast Guard, similar to DOD and the U.S. Navy, anticipates a variety of challenges to its ability to carry out its objectives due to the Arctic Ocean's reduced ice coverage.¹²³ The Coast Guard's Arctic Plan offers a thorough analysis of the many challenges it faces because of increased commercial activity. Moreover, the Coast Guard offers the most compelling evidence in

¹¹⁹ *Id.* at 10 ("Security cooperation activities and other military-to-military forms of engagement establish, shape, and maintain international relations and the partnerships necessary to meet security challenges and reduce the potential for friction.").

¹²⁰ INTERAGENCY ARCTIC RESEARCH POL'Y COMMITTEE OF THE NAT'L SCI. AND TECH. COUNCIL, *supra* note 62, at v.

¹²¹ U.S. GOV'T ACCOUNTABILITY OFF., *supra* note 10, at 1.

¹²² THE UNITED STATES COASTGUARD, ARCTIC STRATEGY, 9 (2013).

¹²³ *Id.* at 34 ("[O]il and gas, shipping, fishing, mining, logging, adventure tourism, and renewable energy . . . [are] increasing human activity in the Arctic. As these activities increase there will be a corresponding demand for the Coast Guard to exercise all of its mission sets in the region.").

support of icebreaker procurement and port development in the Arctic. The Coast Guard's emphatic call for investment and vessel rehabilitation perhaps lies in the fact that the current heavy icebreaking fleet is owned and operated by the Coast Guard itself.¹²⁴ Arctic research and policy is dependent on functioning icebreakers and infrastructure.¹²⁵ The Coast Guard's pivotal role in the Arctic makes it a critical organization whose own ability to fulfill their objectives causes a significant effect to the objectives of the Act.

The Coast Guard identified multiple driving factors that impact its ability to carry out its objectives. The first challenge comes in the form of "trans-shipment of cargo through the Arctic region[.]" which has already increased.¹²⁶ Increased shipping in the coming years due to reduced ice density allows for longer periods of time in which commercial shipping through the Arctic is viable.¹²⁷ Longer thawing periods and warmer temperatures equate to "[e]conomic development, in the forms of resource extraction, adventure tourism, and trans-Arctic shipping."¹²⁸ The global commercial investment in the Arctic region, specifically Chukchi and Beaufort Sea, totaled \$3.7 billion since 2005.¹²⁹ With more investment and infrastructure, the more maritime activity there will be.¹³⁰ The Coast Guard must adapt to meet new challenges within the Arctic region in order to carry out its objectives among the multitude of other players.

Increased maritime activity will also affect the safe passage of commercial vessels. In regard to ensuring safe maritime passage in the Arctic, the Coast Guard is particularly concerned with the risks to ships and their crews because of "[e]xtensive distances, extreme weather, and scarcity of physical infrastructure [which] present logistical challenges [that] . . . accentuate the challenges of routine operations or response to major contingencies in the

¹²⁴ NATIONAL RESEARCH COUNCIL, *supra* note 68, at 1.

¹²⁵ THE UNITED STATES COASTGUARD, *supra* note 121, at 35.

¹²⁶ *Id.* at 7.

¹²⁷ *Id.* at 9.

¹²⁸ *Id.*

¹²⁹ *Id.* at 13.

¹³⁰ *Id.* at 17.

Arctic.”¹³¹ The lack of infrastructure in the Arctic, and the increasing human activity from commercial shipping creates more safety risks, and generates concern surrounding the ability to carry out search and rescue operations in the region, thereby potentially jeopardizing human lives.¹³²

The Coast Guard is also tasked with ensuring safety and cleanliness in the Arctic environment. “Expanding maritime activities in the Arctic require increased presence, oversight, regulatory enforcement, and contingency response.”¹³³ Regulations must be enforced, and the Coast Guard must be equipped with resources to clean-up after, what is almost inevitable, environmental disasters. This is critical in the Arctic region because “more than 50 percent of America’s fish stock comes from the Nation’s Exclusive Economic Zone (EEZ) off [the coast] of Alaska.”¹³⁴ Pollution in the Arctic has the potential to cripple a significant U.S. economy. Pollution or harm to the environment is not limited to oil spills but can also arise because of “efforts to discover and exploit offshore oil and gas reserves.”¹³⁵

Preserving the environment for its own sake is important, but it is doubly so when there is a significant economy attached to its health. “The Bering Sea remains home to one of the world’s richest biomasses and is currently the only sustainable fishery in U.S. Arctic waters . . . If fish stocks begin to migrate north, commercial fishing interest will surely follow, which could lead to increased foreign incursions into the U.S. EEZ in the Arctic Ocean .”¹³⁶ The Coast Guard is tasked with difficult objectives, and the harsh conditions create more challenges that make it difficult for the Coast Guard to be effective, if not given the appropriate resources. The Coast Guard’s identification of these challenges indicates that there are also likely to be areas where further research and policy

¹³¹ *Id.* at 14.

¹³² *Id.* at 14, 20.

¹³³ *Id.* at 21.

¹³⁴ *Id.* at 7.

¹³⁵ *Id.* at 22 (“[T]he energy industry will deploy oil rigs, offshore supply vessels, barges, and tankers in Arctic waters” all of which has hazardous risks to environmental safety.).

¹³⁶ *Id.* at 28.

development will be necessary until they are no longer considered challenges.

Another challenge that arises from the changing environment and commercialization of the region is the issue of enforcement of international or multilateral treaties and agreements that govern conduct in the Arctic. This challenge is exacerbated by the “number of non-Arctic nations and non-state organizations [that plan to] . . . engage in Arctic maritime activity.”¹³⁷ As more private and public organizations utilize the Arctic Ocean for their own purposes the more of a strain on, but need for, diplomatic relations in the Arctic Ocean. The Coast Guard, as a law enforcement entity with a physical presence in the Arctic Ocean will play a significant role when it comes to enforcing international treaties and agreements.

Some of the important international treaties, declarations, and organizations that the U.S. abides by, which are enforced by the Coast Guard, include United Nations Convention on the Law of the Sea (“UNCLOS”),¹³⁸ The Illulissat Declaration,¹³⁹ The Ottawa Declaration of 1996 (which established the Arctic Council),¹⁴⁰ and the International Maritime Organization.¹⁴¹ With respect to

¹³⁷ *Id.* at 17.

¹³⁸ *Id.* at 14 (“The United States is not a party to [UNCLOS] but accepts and acts in accordance with the provisions of the Convention relating to traditional uses of the oceans – such as navigation and overflight – as reflective of customary international law and practice.”).

¹³⁹ *Id.* at 14 (The Illulissat Declaration states in part: “‘the law of the sea provides for important rights and obligations concerning the delineation of the outer limits of the continental shelf, the protection of the marine environment, including ice-covered areas, freedom of navigation, marine scientific research, and other uses of the sea.’ Also, signatory nations remain committed to this legal framework and see no need to develop a new comprehensive international legal regime to govern the Arctic Ocean.”).

¹⁴⁰ *Id.* at 14 (“The Ottawa Declaration of 1996 established the Arctic Council as a high-level, consensus-based intergovernmental forum for cooperation in the Arctic. While not a governing body, the Arctic Council provides the primary institutional framework for international Arctic issues.”).

¹⁴¹ *Id.* at 14-15

The International Maritime Organization (IMO) is a United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships. All Arctic

maritime governance, the Coast Guard has vital responsibilities to maintain international governance and represent U.S. interest in shaping maritime governance and policy in the Arctic region, all of which will affect the U.S. and its ability to capitalize on the Arctic economy.

Challenges to Arctic policy development is influenced by international cooperation. The Coast Guard must have the ability to contribute to international efforts in order to contribute to Arctic policy. Now, “[l]imited operational resources and expanding maritime risks underline the need for increasing collaboration in the region.”¹⁴² The Coast Guard must have the ability to maintain U.S.’s commitments to maritime governance as laid out in and by the treaties and governing organizations. To maintain mutually beneficial relationships that are “essential for mission success” in the Arctic economy.¹⁴³ Mutually beneficial international collaboration is exemplified by the Coast Guard’s ability to “[l]everag[e] international information-sharing arrangements.”¹⁴⁴

The Coast Guard’s Arctic strategy for the coming years involves an effort to make-up for shortfalls, which include, among other things “the need for additional icebreakers and long-range patrol vessels. . . [as well as] infrastructure investments.¹⁴⁵ These resources are critical to the Coast Guard’s success in the Arctic because they afford the Coast Guard an opportunity to effectively satisfy the long-term objectives in the Arctic, which has an ancillary impact on research and policy initiatives. As the Act so highlighted, U.S. interest in the Arctic was to have a long-term view on sustainable practices, the Coast Guard has identified adequate vessels and infrastructure as key resources that allow the Coast Guard to navigate the huge territory and carry-out its missions effectively over the course of the current and distant future.

States are members of the IMO. In 2009, the IMO agreed to develop a mandatory Polar Code that would offer construction, operating, and environmental guidelines for shipping through polar waters.

¹⁴² *Id.* at 22.

¹⁴³ *Id.*

¹⁴⁴ *Id.* at 24.

¹⁴⁵ *Id.* at 36.

Congress should approve funding for vessels and infrastructure because “[e]ffective maritime presence is essential to improving awareness and ensuring safe, secure, and environmentally responsible maritime activity in Arctic waters . . . Presence also enable adequate enforcement of vessel routing regimes and compliance with safety, security, and environmental laws and treaties.”¹⁴⁶ Moreover, these resources will ensure continued future success for U.S. agencies operating in the Arctic.

A. Consequential Results of Inaction

The Arctic serves as a vital region to advance U.S. economic and geopolitical interest. This was realized when the Act was first considered, and, is in part, the reason for its enactment. The Arctic economy is ripe for engagement, and the U.S. must act before other world powers establish control and leave the U.S. in a position in which it cannot benefit. While research and policy were necessary and critical components to the U.S. interest in the Arctic region when the Act was initially considered and enacted, the current atmosphere is significantly different. If U.S. interest is to advance, the U.S. must set-out new initiatives, which must include icebreaking vessels and improved arctic infrastructure. These resources can overcome the many challenges that are illustrated in the Interagency Plan, as well as the additional individual Arctic policy plans produced by the U.S. Arctic Commission, Navy, DOD, and Coast Guard. Without additional icebreakers and improved arctic infrastructure, Congress cedes U.S. interest in the Arctic economy to the rest of the world because the U.S. agencies will simply be unable to compete and fulfill their responsibilities effectively.

IV. NEXT STEPS FOR ICEBREAKERS AND INFRASTRUCTURE

Fortunately, the U.S. Congress is making the appropriate steps to advance U.S. interest in the Arctic economy into the future by appropriating spending money to the Department of Homeland

¹⁴⁶ *Id.* at 26.

Security and the Navy to begin the acquisition of three Heavy Polar Icebreakers.¹⁴⁷ Additionally, Senator Lisa Murkowski sponsored a Bill, entitled the Shipping and Environmental Arctic Leadership Act, S. 3740, 115th Cong. (2017-2018), which proposes actionable initiatives to develop sustainable infrastructure in the Arctic region. The proposed Bill seeks to accommodate the increasing maritime navigation in the Arctic region.¹⁴⁸ Senator Murkowski's legislation is also noteworthy because it is financially sustainable and uses infrastructure to benefit the U.S. economy.¹⁴⁹ Although the Bill has not gained the necessary support to advance through the Senate, there is at least progression in acquiring three new heavy polar icebreakers.

A. Heavy Polar Icebreaker Acquisition

Although not mentioned in the Commission's report, the U.S.'s position in the world when it comes to an icebreaking fleet is outranked by countries like Russia, Canada, Finland and Sweden. The U.S. has eight icebreakers of varying classes, however, three of those eight are only planned, another is entirely inoperable, yet still counted, and another one is not owned by a U.S. agency, but a private company that leases to the NSF.¹⁵⁰ Russia comes in first with forty-six icebreaking vessels of varying size and capability (eleven of which are under construction and four of which are

¹⁴⁷ See generally U.S. GOV'T ACCOUNTABILITY OFF., GAO-18-600, COAST GUARD ACQUISITIONS POLAR ICEBREAKER PROGRAM NEEDS TO ADDRESS RISKS BEFORE COMMITTING RESOURCES (2018).

¹⁴⁸ Shipping and Environmental Arctic Leadership Act, S. 3740, 115th Cong. §2(4) (2017-2018) ("investment in infrastructure for shipping routes, ice breaker service and refuge, ports, spill prevention and response, salvage, and LNG [Liquefied Natural Gas] bunkering, would be collectively beneficial for all associated states, the environment, and global commerce.").

¹⁴⁹ *Id.* at § 2(13). Shipping and Environmental Arctic Leadership Act, S. 3740, 115th Cong.

¹⁵⁰ RONALD O'ROURKE, CONG. RESEARCH SERV., RL34391, COAST GUARD POLAR ICEBREAKER PROGRAM: BACKGROUND AND ISSUES FOR CONGRESS 6 (2018); see generally U.S.C.G. OFFICE OF WATERWAYS & OCEAN POLICY, MAJOR ICEBREAKERS OF THE WORLD (2017).

¹⁵¹ U.S.C.G. OFFICE OF WATERWAYS & OCEAN POLICY, MAJOR ICEBREAKERS OF THE WORLD (2017).

planned);¹⁵² and ending in a six-way tie for last, are six countries with one icebreaker of varying size.¹⁵³ The class size of an icebreaker indicates the vessels ability to break through varying degrees of dense ice.¹⁵⁴ When it comes to the current acquisition process in the U.S., the three icebreakers are to be “heavy polar icebreakers,”¹⁵⁵ which afford navigating through the most dense ice.

Having this icebreaking capability is crucial to carrying out U.S. interest in the Arctic region. The responsibilities of U.S. polar icebreakers are immense. They are summarized here:

Conduct[] and support[] scientific research in the Arctic and Antarctic; defending U.S. sovereignty in the Arctic by helping to maintain a U.S. presence in U.S. territorial waters in the region; defending other U.S. interests in polar regions, including economic interests in waters that are within the U.S. exclusive economic zone (EEZ) north of Alaska; monitoring sea traffic in the Arctic, including ships bound for the United States; and conducting other typical Coast Guard missions (such as search and rescue, law enforcement, and protection of marine resources) in Arctic waters, including U.S. territorial waters north of Alaska.¹⁵⁶

Congress was essentially forced to decide to either advance U.S. interest in the Arctic or not. The decision to appropriate money from the apparent challenges generate by increased commercial

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ NATIONAL RESEARCH COUNCIL, *supra* note 68, at 57. Class classification can vary in different countries because the class is based on a regulatory scheme common to that country. *See Id.* The Polar Code recently published by the IMO is an effort to bring some uniformity to this process when it comes to maritime navigation in the Arctic. *See generally* IMO, INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS (POLAR CODE) (2017).

¹⁵⁵ U.S. GOV'T ACCOUNTABILITY OFF., GAO-18-600, *Supra* note 7, at 1.

¹⁵⁶ RONALD O'ROURKE, *supra* note 134, at 1-2.

navigation in the Arctic, which will require some level of support from U.S. icebreakers;¹⁵⁷ as well as “the Coast Guard’s [questionable] ability to ensure year-round access to the Arctic . . . with the current fleet [which could negatively] . . . affect U.S. economic, maritime, and national security interests in these regions.”¹⁵⁸

Due to the overall expected cost of the icebreaker program, which includes the lifecycle of the three planned polar icebreakers, the money could obviously not all be appropriated in one budget cycle. The total lifecycle cost estimated by the Department of Homeland Security, the Coast Guard, and the Navy was \$9.8 billion, however, according to the Government Accountability Office, this number may increase.¹⁵⁹ Since this acquisition process is so expensive, “[t]he Coast Guard and the Navy established the IPO [Integrated Program Office] to collaborate and develop a management approach to acquire three HPIBs [Heavy Polar Ice Breaker].”¹⁶⁰ The IPO allows the Coast Guard and Navy, two federal agencies that are likely to be most reliant on icebreakers because of their duties, to combine funds to jointly purchase the icebreakers. “The IPO has responsibility for managing and executing the HPIB’s acquisition schedule, acquisition oversight reviews, budget and communications, and interagency coordination.”¹⁶¹ The IPO is spearheading the acquisition process using appropriations earmarked for the icebreaker program, which was initiated by the

¹⁵⁷ *Id.* at 2.

¹⁵⁸ U.S. GOV’T ACCOUNTABILITY OFF., GAO-18-600, *supra* note 7, at 1.

¹⁵⁹ *Id.* at “GAO Highlights” Page.

¹⁶⁰ *Id.* at 7.

¹⁶¹ *Id.*; see also RONALD O’ROURKE, CONG. RESEARCH SERV., RL34391, COAST GUARD POLAR ICEBREAKER PROGRAM: BACKGROUND AND ISSUES FOR CONGRESS, 12 n.32 (2018).

These agreements [between the Navy and CG] state that the program will follow DHS acquisition policies with DHS leadership serving as the acquisition decision authority for program milestones. However, the navy will review and approve acquisition documents before the program seeks DHS approval. These agreements also state that the program’s contracting actions could be funded by either USCG or Navy appropriations, and the source of the appropriations will award the contract.

Coast Guard in their FY2013 budget.¹⁶² The Coast Guard was subsequently “authorized to use incremental funding for the HPIB. This authorization is reflected in the Coast Guard’s January 2018 affordability certification memo.”¹⁶³

The acquisition process for the first heavy polar icebreaker is currently underway.¹⁶⁴ “In March 2018, the Navy released the solicitation for a contract to design and construct up to three HPIBs. The Navy indicated that it anticipates awarding the contract in the third quarter of fiscal year 2019 with \$270 million in Navy funding that Congress has appropriated for the program.”¹⁶⁵ In conjunction with the Coast Guard’s FY2019 budget,¹⁶⁶ the goal is to have the first heavy polar icebreaker “enter service in 2023.”¹⁶⁷ While this is the first step, there are many variables that can impede this process and increase the cost.¹⁶⁸ The ultimate goal, which “envisages the acquisition of three new heavy polar icebreakers, to be followed years from now by the acquisition of up to three new medium polar icebreakers”¹⁶⁹ is still in the distant undefined future.

¹⁶² RONALD O’ROURKE, *supra* note 134, at 11.

¹⁶³ U.S. GOV’T ACCOUNTABILITY OFF., GAO-18-600, *supra* note 7, at 47; *see also* Coast Guard Authorization Act of 2015, Pub. L. No. 114-120, § 207 (Feb. 8, 2016).

¹⁶⁴ U.S. GOV’T ACCOUNTABILITY OFF., GAO-18-600, *supra* note 7, at 46 (“The National Defense Authorization Act for Fiscal Year 2018 authorized procurement of one Coast Guard heavy polar icebreaker vessel.” *See* Pub. L. No. 115-91, § 122(a), (b).).

¹⁶⁵ U.S. GOV’T ACCOUNTABILITY OFF., GAO-18-600, *supra* note 7, at 1; *See also* Consolidated Appropriations Act 2018, Pub. L. No. 115-141, Div. C, Title III (Mar. 23, 2018); Consolidated Appropriations Act 2017, Pub. L. 115-31, Div. C., Title III (May 5, 2017).

¹⁶⁶ U.S. GOV’T ACCOUNTABILITY OFF., GAO-18-600, *supra* note 7, at 46 (The Coast Guard originally requested \$30 million, but “[s]ubsequently, after discretionary budget caps were relaxed by Congress, the Administration’s fiscal year 2019 budget addendum requested an additional \$720 million in fiscal year 2019 Coast Guard appropriations for the program.”).

¹⁶⁷ RONALD O’ROURKE, *supra* note 134, at 11.

¹⁶⁸ *See generally* U.S. GOV’T ACCOUNTABILITY OFF., GAO-18-600, *supra* note 7. (“unplanned changes to the [IPO’s] scope and any corresponding funding requests for unanticipated cost growth would require discussions and agreements with both Coast Guard and Navy leadership.” *Id.* at 49.).

¹⁶⁹ RONALD O’ROURKE, *supra* note 134, at 11.

V. CONCLUSION

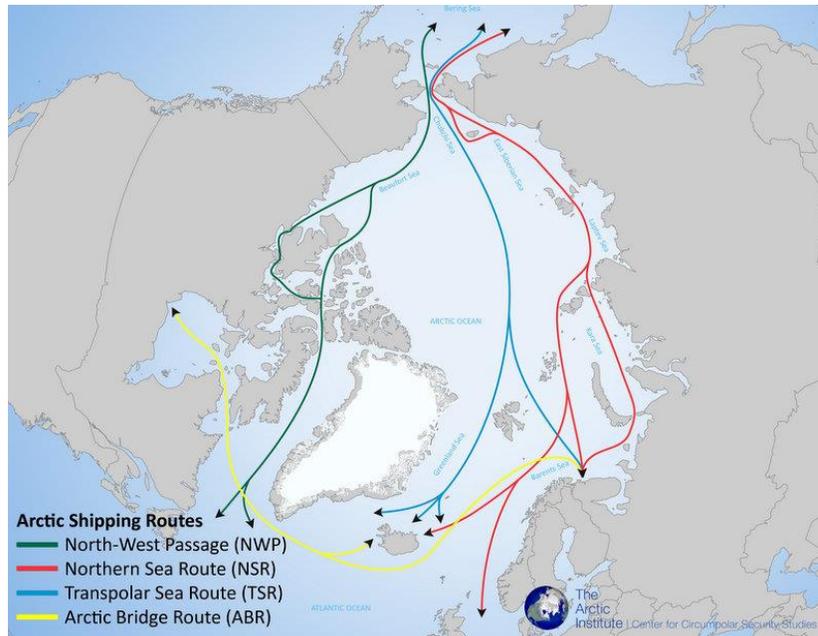
There is undisputed evidence that global warming is deleteriously effecting ice coverage in the Arctic Ocean. As a result of this environmental cataclysm, the Arctic economy is expanding. Natural resources that were once unavailable are now accessible, and commercial shipping through the Arctic Ocean's three main routes is more viable and more cost effective than traditional commercial maritime routes. Because the Arctic economy promises economic advantages, the Arctic is seeing billions of dollars in investment money. It is important that the U.S. contribute to the Arctic economy, but currently, however, U.S. involvement is limited.

The U.S. interest in the Arctic was codified in the Arctic Research and Policy Act, which focused on long-term development in the Arctic, with the intention of realizing an economic benefit therein. The Act mandated continuous research and policy initiatives through a network of federal agencies. That research and policy culminates in a regularly produced plan that includes goals that further advance U.S. interest in the Arctic. The degree in which the Arctic environment has changed since the Act was implemented is immense, and the opportunities presented by the Arctic economy seem to be greater than what Congress originally envisioned. The U.S. is now in a position where it cannot adequately compete with other countries that are investing in the Arctic economy because U.S. agencies are not equipped with the necessary resources. The U.S. only has one fully operational heavy polar icebreaker and the infrastructure in its Arctic territory is deficient. These resources will continue to be stressed because of increasing human activity in the Arctic, which is a result of the expanding Arctic economy. This assertion is substantiated by data from both the Plan, and the four federal agencies examined above. The human activity is a challenge to maintaining effective and essential operations in the Arctic. There is now an immediate need for icebreaking vessels and improved infrastructure to not only support operations, but to reinvigorate sustained U.S. interest in the Arctic region.

Congress must act now if the U.S. is to compete with other world powers such as China and Russia, which are expanding their interests in the Arctic economy at a rapid pace. While acquisition of the three heavy polar icebreakers is a crucial first-step, more must be done. Congress should initiate the procurement of additional icebreakers, and begin infrastructure improvement projects as identified in Senator Murkowski's proposed legislation. These steps are necessary if the U.S. is to capture the original intent of the Act, which is long-term, sustained, development for the purpose of capturing economic benefits in the Arctic.

Appendix

1.



https://e360.yale.edu/assets/site/ArcticShippingRoutes_TheArcticInstitute.jpg,
[<https://perma.cc/47SC-MXFW>].