

CLIMATE CHANGE IMPACT ON ARCTIC ACTIVITIES AND BEHAVIORS

by
Karina V. Touzinsky

A research study submitted to Johns Hopkins University in conformity with the requirements for
the degree of Master of Arts in Global Security Studies

Baltimore, Maryland
May 2020

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ABSTRACT

This research study assesses how water navigability affects Arctic Circle security cooperation through the question: *how does the increase in Arctic navigability affect security cooperation in the region?* Several publications are discussing why countries should increase their activities, whether military or diplomatic, but they do not address how security cooperation has shifted over the last several years due to the increase in navigable waters.

Previous works fail to address how countries should behave with one another in the Arctic region and why they should or should not work with one another. This research addresses the fundamental issue of ice-shrinkage, leading to a surge in navigable waters, which could lead to the need for countries to work with one another to establish security cooperation in the region. This study incorporates data from non-governmental organizations, governmental organizations, press conferences, and other published documents that discuss Arctic activities.

Russia, China, and the United States are all interested in the Arctic Circle for different strategic purposes. With the rise of navigable waters, security cooperation could play an essential role in establishing dominancy in the region, playing into the larger global topic: great power competition. The United States should view it as an opportunity to exert leadership in a mostly uncharted region. The United States is limiting itself by not investing more resources in an ice-breaker fleet, and it will not be seen as a strategic partner to others if it cannot operate independently in the region, effectively rendering the United States impotent in the Arctic.

Primary Reader and Advisor: Professor Sarah Clark

Secondary Reader: Ms. Debra Cagan, Professor Will Rogers

PREFACE AND ACKNOWLEDGMENTS

I would like to thank my fiancé, David Pesce, for his patience and understanding through my participation in the Johns Hopkins University's (JHU) Global Security Studies program. I would like to thank my father and mother for their continuous support and being soundboards for my project. Thank you to my family, friends, colleagues, and fellow JHU students that offered their expertise and guidance to assist in shaping my research study.

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INTRODUCTION

The Arctic Circle is an inhospitable and nearly inaccessible region due to ice sheets and extreme cold weather; however, recent studies project that the Arctic Circle will not have ice by 2050.¹

The region is an ever-changing ice mass that creates austere conditions for navigation.

Therefore, most Arctic countries have not attempted to exploit this uncharted territory to gain commercial access or emphasized the military importance of protecting vulnerable coastlines.

Other countries, such as China, are focusing on the benefits of the Arctic region. The increase in climate change is causing a topographic shift in the Arctic. With fewer ice sheets in the Arctic,

there are now navigable waters providing the ability to extract natural resources, support

commerce, and encourage tourism. This is ever more so important in today's world where the

fight for great power competition continues to rise. The threat of outside nations entering the

region could force Arctic countries to consider increasing their military presence. This could lead

to a potential arms race in the Arctic and a gap in U.S. capability to defend coastlines if the

United States is unprepared to handle such a threat. As the United States includes the Alaskan

coastline, it is even more critical to ensure there are no security threats and to assess the

historical and current Alaskan shoreline to gain an understanding of its vulnerability. There are

several ways of ensuring protection from possible security threats, such as increased U.S.

military presence and political or legal agreements safeguarding commerce and navigation.

An increase in navigable waters offers a new avenue for governmental and non-governmental organizations to utilize this area for transit — in both commercial and official use.

This shift requires further attention to the relationships of countries that are directly impacted by

¹ Notz, Dirk, Jakob Dorr, David Bailey, Ed Blockley, Mitchell Bushuk, Jens Debernard, Evelien Dekker, et al. "Arctic Sea Ice in CMIP6." American Geophysical Union, April 17, 2020. <https://doi.org/https://doi.org/10.1029/2019GL086749>.

this ice melt, including ensuring security in their newly open backyard. Therefore, this research study explores the question: *How does the increase in Arctic navigability affect security*

cooperation in the Arctic?

BACKGROUND

Over the past few decades, there is an increased awareness of the climate shift in the Arctic that attracts global powers to the region. To sustain order, the Arctic Council was established in 1996 as an international body for the region. It facilitates communication, cooperation, and collaboration among the Arctic states to ensure transparency and safety for the countries in the region and the

environment.² The Council is comprised of member states, non-governmental organizations (such as indigenous peoples groups/representatives), and observing states, which focus solely on

FIGURE 1: Arctic Circle Geopolitical Map



FIGURE 1 is derived from “Political Arctic Region.” World FactBook. Central Intelligence Agency, February 1, 2018. <https://www.cia.gov/library/publications/the-world-factbook/docs/refmaps.html>.

² “Declaration on the Establishment of the Arctic Council.” Conclusion date: September 19, 1996. Arctic Council Online Archive. Ottawa, Canada. https://oaarchive.arctic-council.org/bitstream/handle/11374/85/EDOCS-1752-v2-ACMMCA00_Ottawa_1996_Founding_Declaration.PDF?sequence=5&isAllowed=y

environmental protection and ensuring that the development of the Arctic is sustainable.³

However, the Council excludes discussion of military security. The Arctic Council operates on a consensus basis and can establish legally binding agreements.⁴ The chairmanship of the Council rotates biennially among the eight Arctic permanent members, which Iceland currently chairs.⁵

Many studies claim that climate change is the culprit for the ice-loss in the Arctic Circle. However, as the issue of climate change is vast and complex, it will not be discussed in this study.⁶ For this study, climate change is accepted as the reason for Arctic ice-shrinkage as it provides evidence of the dynamic changes in the Arctic that could affect cooperation efforts.

A common question that arises when reviewing past similar situations is: *can the Arctic be handled in the same way that Antarctica is?* Both the Arctic and Antarctica sit at polar ends of the globe and are not frequently accessed. However, the Arctic differs from Antarctica in one substantial way: Antarctica is an independent continent with no natural human population.⁷ As there are no indigenous peoples in Antarctica, there is no native population to lay claim to this unchartered land. Therefore, it is available for outside countries to attempt to lay claim to

³ Member states are comprised of the eight countries that have coastal territory in the Arctic Circle. These countries include the following: the United States of America, Canada, the Russian Federation, Iceland, the Kingdom of Denmark, Finland, Norway, and Sweden. Information found in "About the Arctic Council." Arctic Council. <https://arctic-council.org/en/about/>.

⁴ The Arctic Council currently has three legally-binding agreements: 1) Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic (2011); 2) Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (2013); 3) Agreement on Enhancing International Arctic Scientific Cooperation (2017). Information found in "About the Arctic Council." Arctic Council. <https://arctic-council.org/en/about/>.

⁵ Iceland's chairmanship is from 2019-2021; Russia will chair the next term from 2021-2023. Information found in "About the Arctic Council." Arctic Council. <https://arctic-council.org/en/about/>.

⁶ The United Nations Intergovernmental Panel on Climate Change (IPCC) produced an extensive study of climate change based on research conducted from 1750 onward. The IPCC report states that both polar ends, Antarctica and the Arctic Circle, are experiencing a loss of ice-sheet because of climate change. As global temperature increases, the global average sea level increases. The loss of ice-sheet coverage indicates that there is more waterway, allowing for more navigability in the Arctic Circle. Information found in the "Fourth Assessment Report." United Nations Intergovernmental Panel on Climate Change, September 2007. <https://www.ipcc.ch/assessment-report/ar4/>.

⁷ Dunbar, Brian. "What Is Antarctica?" NASA. May 13, 2015. <https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-antarctica-k4.html>.

portions of Antarctica⁸. No country can lay claim to the Arctic, as the Arctic is not a continent. Instead, it is a region of the world, which makes geopolitics more dynamic in several ways. It contains parts of eight countries, and each country has a claim to the region. Otherwise, it is an area of the world of extreme emptiness and is vulnerable to foreign transit increasing in correlation with the increase of ice melt, which leads to more navigable waters.

RELATED DEFINITIONS AND TERMS

In order to understand common terminology and jargon for issues related to the Arctic, the following terms are defined:

- The “*Arctic*” refers to the landmass north of the Arctic Circle and its adjacent waters; rather than being a continent or country, it is a region that captures eight percent of the earth’s surface.⁹ The Arctic consists of the land territory of eight countries: the United States of America, Canada, the Russian Federation, Iceland, the Kingdom of Denmark, Finland, Norway, and Sweden (hereinafter collectively referred to as the “Arctic nations”). In addition to this landmass, the Arctic possesses a polar cap, which is in danger of disappearing over the next few decades due to the continuous ice melt. The Arctic cap is estimated to be 13.65 million square miles in January 2020. Although this area is still rather large, the Arctic loses about 3.15% of its ice every year. Since 1979, the Arctic lost roughly 1.86 million square miles of ice, which is approximately equivalent to the size of the state of Alaska.¹⁰

⁸ Lintott, Dr. Bryan. “The Coldest Front: The Central Intelligence Agency and American Antarctic Policy & Operations (1947-59).” Johns Hopkins University: Brownbag Intelligence. February 25, 2020.

⁹ *Arctic Research and Policy Act of 1984*, as amended. Public Law 101-609. U.S. Statutes at Large 15 (1984): 4101. <https://uscode.house.gov/statutes/pl/98/373.pdf>; Protection of the Arctic Maritime Environment. “Arctic Marine Shipping Assessment 2009 Report.” The Arctic Council. https://www.pmel.noaa.gov/arctic-zone/detect/documents/AMSA_2009_Report_2nd_print.pdf

¹⁰ 3.15% of the ice melt is roughly the size of the state of New Hampshire per National Snow and Ice Data Center. “NSIDC Arctic News and Analysis RSS.” U.S. National Oceanic and Atmospheric Administration, February 4,

- Non-Arctic countries can obtain an “*observer*” status by which they have limited influence on the meetings but can make statements and proposals.¹¹ In addition to granting this status to countries, the Arctic Council also grants inter-governmental and non-governmental organizations admission as observers.
- China coined the term “*near-Arctic state*” in its publication of its Arctic policy, claiming that although China does not possess landmass in the Arctic region, it deserves input on the regional discussions. China believes that the Arctic and the contiguous waters should be considered a global matter rather than solely discussed among the eight Arctic nations.¹²
- “*Security cooperation*” is understood to be efforts to establish coordination and collaboration among international countries. Security cooperation can be administered either by establishing treaties or agreements or by working towards a partnership with another country.¹³
- “*Navigable waters*” are waters that have been, or can be, used to transport either domestic or foreign commerce.¹⁴

2020. <http://nsidc.org/arcticseaicenews/>; National Snow and Ice Data Center. “NSIDC Arctic News and Analysis RSS.” U.S. National Oceanic and Atmospheric Administration, February 4, 2020. <http://nsidc.org/arcticseaicenews/>.

¹¹ The Arctic Council approved thirteen nations to participate as observers. These countries are not granted to be permanent members and must apply to be an observer. Only once approved, the respective countries can begin to participate in the meetings. The following countries have gained observer status: France (2000); Germany (1998); Italian Republic (2013); Japan (2013); The Netherlands (1998); People's Republic of China (2013); Poland (1998); Republic of India (2013); Republic of Korea (2013); Republic of Singapore (2013); Spain (2006); Switzerland (2017); United Kingdom (1998). Information retained from: “Declaration on the Establishment of the Arctic Council.” Conclusion date: September 19, 1996. Arctic Council Online Archive. Ottawa, Canada. https://oaarchive.arctic-council.org/bitstream/handle/11374/85/EDOCS-1752-v2-ACMMCA00_Ottawa_1996_Founding_Declaration.PDF?sequence=5&isAllowed=y.

¹² The People’s Republic of China. *The State Council Information Office of the People's Republic of China: China's Arctic Policy*. January 2018; First Edition 2018. http://www.xinhuanet.com/english/2018-01/26/c_136926498.htm

¹³ Treaties are known to be legally binding as they must be ratified by Congress, whereas agreements are politically binding as Congress does not ratify them.

¹⁴ 33 CFR § 329.4 - General definition.

LITERATURE REVIEW

This research study intends to gather information from various scholarly sources, in order to understand the past and current U.S. policy of Arctic security cooperation involvement and compare that to other countries. Understanding how this relates to overarching U.S. participation to establish security cooperation is vital, as the future of the Arctic as it currently stands is uncertain.

The American literature published by both governmental and non-governmental organizations is limited in that there is one central theme: The United States should invest more in Arctic security. Although relevant, the literature does not provide the context necessary to understand *why* countries should be involved in Arctic security cooperation. For a holistic approach to comprehend the security dialogue, it is imperative to understand how other countries, both allies and adversaries, intend to engage in the region. Only by comprehending how other countries perceive security cooperation in the Arctic, can the United States be prepared to better plan for its future endeavors in the region. There is a general lack of resources available that address the need for security cooperation as it is linked to the Arctic polar cap melt.

There is a trend in scholarly writing advocating for increased cooperation in the region, but not necessarily explains in what context that cooperation should occur. The Congressional Research Service's publication, "Changes in the Arctic: Background and Issues for Congress," provides a foundation for understanding the current U.S. policy towards the Arctic.¹⁵ It discusses U.S.-led research, policy documents, natural resource exploration, and the geopolitics

¹⁵ O'Rourke, Ronald. *Changes in the Arctic: Background and Issues for Congress*. United States: Congressional Research Service, 2019. <https://fas.org/sgp/crs/misc/R41153.pdf>.

of the region. Although it provides a full understanding of how the United States currently handles its relations, it does not provide any context for future U.S. security cooperation policy.

The Rand Corporation published an article in 2017 that provides an excellent context to why Russia prioritizes its Arctic coastline and its fear of encroachment from the North.¹⁶ The study briefly discusses opportunities for cooperation between Russia and China through natural gas extraction and the establishment of collaboration rather than the two countries competing for resources. However, it does not delve into any detail as to further Russia/China relations and how the two nations' cooperation could grow. Russia is likely to feel threatened by the North Atlantic Treaty Organization's (NATO) military exercises in the Arctic Circle. While the Rand study does mention the need for international cooperation, it fails to address why cooperation is needed (i.e., the surge in navigable waters). It only discusses possibilities of how the United States could work better with Russia but does not explore the current relationships present in the Arctic Circle: Russia and China, and the United States and allies/partners.

In addition, Kathrin Stephen of the Arctic Institute provided an assessment of Arctic shipping.¹⁷ The analysis outlined four key issues to take into consideration: environmental climate (protection), economy (Arctic abundance of natural resources and using the region to transport commerce), people (need for safety regulations and to protect local and indigenous people), and politics (importance of shipping and China's push to recognize the Arctic as a global vs. territorial region). Stephen highlights that no country is trying to restrict shipping in the Arctic, but rather those countries are trying to establish regulations to ensure commerce transit is

¹⁶ Pezard, Stephanie, Abbie Tingstad, Kristin Van Abel, and Scott Stephenson. "How to Maintain Arctic Cooperation with Russia." RAND Corporation, March 2, 2017. https://www.rand.org/pubs/research_reports/RR1731.html.

¹⁷ Stephen, Kathrin. *Sustainability Understandings of Arctic Shipping*. The Arctic Institute, November 20, 2018. <https://www.thearcticinstitute.org/sustainability-understandings-of-arctic-shipping/>.

sustainable. Although the increase in shipping poses risks on the ecological system, Stephen does not provide suggestions for how to establish sustainability. Stephen's piece fails to recognize the region's dynamics outside of the environment or transit issues she addresses. All the above pieces of literature call for more consideration of the ecosystem but do not address the issue of cooperation among the affected states. Security cooperation is required in the region to establish alliances and partnerships to form agreements on these types of regulations.

In June of 2019, the Wilson Center published an assessment of the Arctic Council's operations.¹⁸ *A Strategic Plan for the Arctic Council* recognizes the strength of the international body as the most prominent and able actor to handle Arctic issues. The Arctic Council focuses on cooperation in the region among its member states and observers, explicitly concentrating on environmental protection (climate change) and transportation through sustainable development. The Arctic Council's drive to ensure the safety of both transit and habitat is an essential factor to take into consideration as the authors highlight several challenges surrounding the U.S. Trump Administration's refusal to recognize climate change. There appears to be a sort of vagueness associated with the Arctic Council's published declarations of intentions, which could be attributed to the United States' current sensitivities regarding climate change and the Arctic Council's requirement to work on a consensus basis. The authors emphasized that the Arctic Council's biggest flaw is its inability to establish a strategic plan to support its goals. Although the Arctic Council provides direction to its member states, it does not provide a means to accomplish the intentions it sets in place through its various declaration publications. Without this, there is no way to hold countries accountable for accomplishing the goals of the forum, nor

¹⁸ Balton, David, and Fran Ulmer. *A Strategic Plan for the Arctic Council: Recommendations for Moving Forward*. The Wilson Center Publications. The Arctic Initiative / The Polar Institute, June 2019. https://www.wilsoncenter.org/sites/default/files/media/documents/publication/a_strategic_plan_for_the_arctic_council-recommendations_for_moving_forward.pdf.

can the Arctic Council assess the emerging needs of the Arctic region. To overcome this, the authors argue that the Council should establish working groups on the various goals and topics to create a focus among the countries to improve continuity and establish vigorous internal coordination proceedings. The authors also recommend that the Council conduct bi-annual reports of their Arctic activities, projects, and any future plans in the region. Additional reporting would add a layer of transparency that is not captured under the auspices of the Arctic Council. If countries were required to report on their activities within the Arctic, this would increase accountability and establish a collective trust. The Wilson Center's strategic plan highlights the importance of creating a more cohesive set of goals that can be followed through with actions, which are lacking in the Arctic today.

Although there are several publications on the activities of the Arctic countries, there is limited analysis of the driving factor behind these developments: the increase in navigable waters. The relationship between the surge in navigable waters and the lack of security cooperation has not been explored. This research study encompasses dynamic analysis to understand why countries are interested in the Arctic and what claims they have to the region. This study will analyze these variables to determine if there is a relationship between navigable waters and security cooperation, whether it be military or diplomatic engagements. Navigable waters provide an entirely new avenue for countries to interact with one another in an uncharted area and must be considered to determine the future of security and commerce in the Arctic.

Acknowledgment of Limitations

There are limitations to the information received from various documentation and publications for this study. The sources used are limited to the English language; documents in

other languages were not used as data points as there is no verifiability of accuracy from internet-automated translations. Unless the information is supported through original translations by the company or government, only English-language sources were used. The sources are also limited to unclassified information; all evidence is derived from open-source research. Although additional information regarding Arctic security and cooperation may be available through classified means, this study does not deviate from unclassified information. Initially, the study included the development of naval militaries of the Arctic countries as a variable. However, information regarding foreign naval development and expenditure for specific regions is not readily available to the public. Due to the scarcity of information, this study focuses on information that is available to the public. In addition, as the data is derived from published documents, data research, and speeches, the collected details only reflect information that others believe to be significant enough to publish.

HYPOTHESIS

This study hypothesizes that an increase in navigable waters will create an increase in Arctic activities to include the transport of goods and maritime military activities. Ice sheets cover the Arctic Ocean, which makes the transportation of goods nearly impossible due to its extreme temperatures. Allowing the transportation of goods and services to utilize the open Arctic Ocean would save many countries resources related to their transportation time and costs. Since the Arctic landmass is shifting, due to the increase in climate change (i.e., higher temperatures, decrease in ice-sheet layers, and an increase in sea level), this shift might allow for higher traffic in the Arctic for both commercial and military use. If climate change continues to develop, it is plausible that countries close to the Arctic will utilize the new space to create traffic patterns. Climate warming is changing the Arctic in a way that may allow for transportation that,

just a few short years ago, would have been considered impossible. If climate change impacts the availability of transportation in the Arctic, then transportation is likely to increase in this region.

The increased availability of navigable waters through ice shrinkage could create geopolitical tension in the region. Russia possesses more Arctic Ocean coastline than any other Arctic country. Changes in the ability to navigate the Arctic would affect accessibility to Russia from the north. If there is a relationship between climate change and the movement of Russian cargo shipping, the United States should be made aware. This relationship could be indicative of increased Russian movement and reliance on transportation within the Arctic region. If Russia begins to emphasize its role within the Arctic, this could lead to additional territorial claims, which could then lead to territorial disputes among the other Arctic countries and a potential decrease in security cooperation among the Arctic states. Since Alaska is located within the Arctic Circle, the United States could be directly impacted by an increase in Russian naval operations such as shipping. Therefore, if there is a trend of rising Russian cargo shipping, the United States should plan accordingly by diplomatic engagement to set regulations to protect U.S. and allied assets. The rise in shipping correlating with the surge of navigable waters will determine that there is a plausible relationship between the increase in navigable waters and security cooperation in the region as Russia will attempt to secure its trade in the newly vulnerable waters.

METHODOLOGY

This study uses a pragmatic approach as it incorporates both qualitative and quantitative methods to ensure an understanding of the historical and political implications of the United States' current security cooperation in the Arctic. Pragmatic analysis allows for a flexible

methodology that encompasses different studies deemed necessary by the researcher to accomplish understanding of the research question in both historical and political contexts.¹⁹ There are various ways of researching and analyzing the data, but the pragmatic approach highlights the issue at hand rather than focusing on the methodology needed to answer the research question. Hence, a mixed methodology is best suited for this study to integrate both qualitative and quantitative research methods. Neither qualitative nor quantitative methods alone would provide sufficient evidence to holistically comprehend how navigable waters affect security cooperation in the Arctic.

Qualitative Analysis

Qualitative analysis is necessary for this study in order to understand the nuances of the geopolitical tensions in the region. The qualitative analysis derives information from current publications of Arctic strategies, treaties and agreements, and press conferences. As Arctic security is closely linked with maritime security, this study will also consider current U.S. naval policy. Although there is a strong call for increased U.S. participation in the Arctic, the U.S. Navy funding significantly decreased recently. This juxtaposition is worth exploring as a decrease in naval funding might affect U.S. security cooperation in the Arctic.

This study will also utilize case studies for an in-depth analysis of specific situations highlighting both certain timeframes and activities. This research focuses on case studies of three countries that play dynamic roles in the security atmosphere of the region: the United States, the Russian Federation, and the People's Republic of China. The United States, Russia, and China are used in the case study analysis of security cooperation for specific purposes. This study assumes that the United States would work most closely with its established allies and

¹⁹ Creswell, John W., and J. David. Creswell. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 5th ed. Thousand Oaks, CA: SAGE Publications, Inc., 2018.

partners - most of which comprise the Arctic Council. Russia is the outlying country in the Arctic Council that is not bound to the other countries through alliances and partnerships, such as the United States. This is an important dynamic to understand as Russia is not limited by partnerships with other countries and can act quicker without repercussions. Russia also has the most extensive coastline in the Arctic, which explains its substantial interest in the region. China completes the need for a tertiary case study as it also presents a unique situation as it is not an Arctic country, nor does it have an adjacent coastline to the Arctic Circle. Regardless, China has expressed great interest in the development of the region as its interests are not purely security-focused and will consider economic possibilities and transit routes.

Quantitative Analysis

The quantitative analysis adds validity to the research by providing empirical evidence of climate change, commerce (shipping and industrial fishing), and ice sheet coverage and density. This information is gathered from U.S. governmental organizations, international organizations, and educational institutions' research labs. Quantitative analysis is used to understand the importance of the Arctic by providing evidence of the relationship between climate and security changes. The research study processes this through statistical analysis of correlation using linear regression and residual plots. The use of regression analysis compares elements of climate change (ice density/shrinkage) to the amount of shipping occurring in the Arctic over the last few decades. The ice shrinkage is the independent variable; as seen in Table 1, the ice in the polar cap is steadily decreasing over time. The shipping rate is the dependent variable as it is reliant on the amount of water navigability in the Arctic. There is a rise in water navigability due to ice shrinkage. If there is a causal relationship between the two variables, this will assist in determining that there is also a shift in security concerns. The increases in shipping and

movement in the Arctic could theoretically show that there is a continuous trend, and therefore more regulation is necessary to protect U.S. equities in the region.

This study used data provided by The National Ocean Economics Program (NOEP), a research group that provides information regarding economics, climate change, and ocean resources.²⁰ NOEP collects Russian cargo shipping rate information in the Arctic.²¹ NOEP provides information regarding all Arctic countries' shipping in the region and breaks the information into individual countries. However, NOEP only provides information on Russian cargo shipping data between the years of 2001 and 2014, therefore limiting the scope of this analysis.

The National Aeronautics and Space Administration's (NASA) Global Climate Change bureau provided the data for ice shrinkage in the Arctic.²² NASA provides global and regional data. This research analysis uses the regional specific data as it pertains to the Arctic Circle. Although NASA is a U.S Government agency, it is determined to be an appropriate source of information as it provides verifiable and reliable data.

²⁰ National Ocean Economics Program. Arctic Transport-Shipping Data. Arctic Transport-Shipping Data. https://oceanoeconomics.org/arctic/arctic_transport/ship_search.aspx.

²¹ The California Middlebury Institute of International Studies Center for Blue Economy funds NOEP. As an academic organization funds this information, it is more likely to provide apolitical data. A disclaimer of the NOEP is that the organization is one of the only sources that provide information regarding cargo shipping in the Arctic; therefore, it cannot be verified against other resources.

²² National Aeronautics and Space Administration. Global Climate Change: Arctic Ice Sheets. <https://climate.nasa.gov/vital-signs/ice-sheets/>.

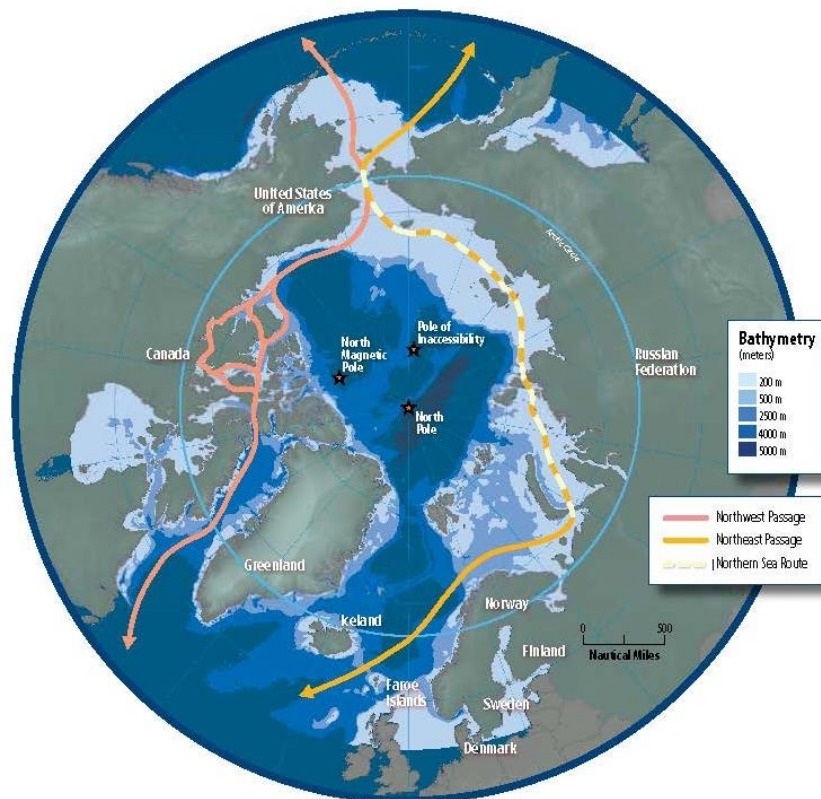
DATA ANALYSIS & ASSESSMENT²³

The “... reduction in sea ice has been dramatic, abrupt, and unrelenting. The dense multi-year ice is giving way to thin layers of seasonal ice, making more of the region navigable all year round.”

- U.S. Secretary of State John Kerry²⁴

Sea Routes

FIGURE 2: Arctic Sea Routes²⁵



²³ The researcher created linear regression and residual plot charts using Microsoft Excel.

²⁴ “Remarks at the Arctic Council Ministerial Session,” Secretary of State John Kerry, Kiruna City Hall, Sweden, May 15, 2013.

²⁵ Map produced by the Arctic Marine Shipping Assessment 2009 Report. Protection of the Arctic Maritime Environment. “Arctic Marine Shipping Assessment 2009 Report.” The Arctic Council.
https://www.pmel.noaa.gov/arctic-zone/detect/documents/AMSA_2009_Report_2nd_print.pdf

There are currently three waterway passages in the Arctic: the Northern Sea Route (NSR), the Northwest Passage (NWP), and the Northeast Passage (NEP).²⁶ However, as the increase in navigable waters continues to climb, there will be more water available for transit that does not fall into one of the three passageways. The NSR follows the Russian coastline in the Arctic and infiltrates Russian island groups. It connects not only Russia with Eurasia, but also the eastern and western portions of the Russian Federation. The NSR offers a mode of transit for international trade, but also a way of connecting opposing Russian geographic locations with one another.²⁷ The NEP can be viewed as a continuation of the NSR as it connects sea routes from the North Cape in Norway to the Bering Strait between Alaska and Russia. The NEP is also the main route that would connect Asia to the rest of the world through a shorter transit to Europe. First utilized in 1903, the NWP follows the Canadian Archipelago coastline of North America between the Atlantic and the Pacific Oceans.²⁸

As portions of the Northern Sea Route (NSR) penetrate the 12 nautical miles (nm) of Russian territorial waters, Russia is able to implement regulations of the passageway to ensure its regulation. Russia is beginning to implement a new requirement for naval military warships to provide a 45-day notice of its intent to use portions of the NSR within the Russian territorial jurisdiction. Outside the scope of providing a notification for intent to utilize the passage, the warships are required to provide information on the vessel's captain, the vessel's specifications,

²⁶ Protection of the Arctic Maritime Environment. "Arctic Marine Shipping Assessment 2009 Report." The Arctic Council. https://www.pmel.noaa.gov/arctic-zone/detect/documents/AMSA_2009_Report_2nd_print.pdf

²⁷ Exploration of the region started in 1917, but the establishment of ports along the route did not begin until the 1930s. As noted in the Protection of the Arctic Maritime Environment. "Arctic Marine Shipping Assessment 2009 Report." The Arctic Council. https://www.pmel.noaa.gov/arctic-zone/detect/documents/AMSA_2009_Report_2nd_print.pdf

²⁸ It is believed that Semyon Dezhnyoz first sailed the NEP in 1648 under the direction of the Russian tsar Peter I the Great. As noted in the Protection of the Arctic Maritime Environment. "Arctic Marine Shipping Assessment 2009 Report." The Arctic Council. https://www.pmel.noaa.gov/arctic-zone/detect/documents/AMSA_2009_Report_2nd_print.pdf

and the need to be monitored by a Russian escort.²⁹ Although Russia signed the United Nations Convention on the Law of the Sea (UNCLOS) and abides by international water privileges, it can legally place these regulations as the passages breach Russian territorial waters.

FIGURE 3: Polar Silk Road



The Economist

Figure 3 depicts the difference in travel for China’s Polar Silk Road initiative.³⁰

China is heavily interested in access to the Arctic Circle, as it will improve its ability to transport commerce. Although China does not directly touch the Arctic region, it intends to use the Northern Sea Route as a new form of transportation. China produced a white paper in 2018 that detailed plans for a “Polar Silk Road” initiative to utilize the Arctic for commerce to connect

²⁹ “Russia Tightens Control Over Northern Sea Route.” The Maritime Executive, March 8, 2019. <https://www.maritime-executive.com/article/russia-tightens-control-over-northern-sea-route>.

³⁰ “What Is the Northern Sea Route?” The Economist. The Economist Newspaper, September 24, 2018. <https://www.economist.com/the-economist-explains/2018/09/24/what-is-the-northern-sea-route>.

China to several destinations with reduced time and cost of transport. In addition to planning for shorter and more cost-effective commerce times, China is engaging with Russia on a series of plans to revitalize Arctic activity and to invest in liquefied natural gas found in the Arctic. As Russia directly controls portions of the NSR, it is in China's interest to establish a mutual understanding with Russia for smooth transport.

Jurisdictional Claims

The United Nations Convention on the Law of the Sea (UNCLOS) governs the Arctic and allows "coastal states" the ability to define and enforce regulations that prevent the pollution of the seas.³¹ UNCLOS, however, does not give the Arctic countries the ability to establish control of maritime activity outside the scope of environmental protection. The regulation does not allow the Arctic countries to monitor shipping, transit, or military activities in the region; instead, it only provides guidance on how to ensure the safety of maritime navigation. However, each member state is authorized to handle their respective port as they deem appropriate to include allowing or not allowing ships to stop. Although the United States signed UNCLOS in 1994, Congress has not ratified the treaty. Therefore, even though the United States may adhere to certain aspects of the agreement, the United States is by no means bound to implement it, although the United States has made public statements that it will act according to the agreement until Congress ratifies it.³² Nonetheless, the remaining members of the Arctic Council signed and ratified UNCLOS, including the emerging regional player: China.³³

³¹ Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397.

³² "Treaties Pending in the Senate - United States Department of State." U.S. Department of State. U.S. Department of State, October 22, 2019. <https://www.state.gov/treaties-pending-in-the-senate/>; Granholm, Niklas, Märta Carlsson, and Kaan Korkmaz. "The Big Three in the Arctic: China's, Russia's and the United States' Strategies for the New Arctic." *Swedish FOI* FOI-R--4296--SE (October 2016).

³³ "Law of the Sea." United Nations Treaty Collection. United Nations, n.d. https://treaties.un.org/pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXI-6&chapter=21&Temp=mtdsg3&lang=en.

The jurisdictional claims of the waters vary among the Arctic member's coastal fronts. Coastal countries, regardless of their location, are entitled to claim the territory of the waters that are within 12 nautical miles (nm) of their coast.³⁴ This jurisdictional claim entails that countries are allowed to operate within the 12 nm as they would for domestic territories, to include conducting military exercises and activities. Otherwise, for vessels outside the 12 nm coastline, they are immune to territorial jurisdictions. In addition, the Freedom of Navigation (FON) under UNCLOS directs that a vessel flying under the flag of a sovereign nation shall not be interfered with by another state in international waters.³⁵

In addition to UNCLOS, there is a separate international entity, the International Maritime Organization (IMO), which established the Polar Code. The Polar Code ensures the safety of both ships and the climate during polar (both Arctic and Antarctic) operations. The Code intends to decrease the number of incidents at sea but does not directly address military activities in the region.³⁶

Arctic Security Activities

The Arctic Council explicitly does not deal with military matters; however, it does emphasize the need for maritime safety. To address this issue, the Arctic Council established the Arctic Coast Guard Forum (ACGF) in 2015. The ACGF is a defensive organization, and the primary goal is to foster coordination among the member states to ensure maritime safety in the region. It does so through joint responsibility for search and rescue missions.³⁷ Rather than monitoring maritime activities in the Arctic, its primary mission appears to be concerned with

³⁴ Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397.

³⁵ Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397.

³⁶ "The Polar Code." International Maritime Organization, 2014.
<http://www.imo.org/en/MediaCentre/HotTopics/polar/Pages/default.aspx>.

³⁷ Arctic Coast Guard Forum. "About the ACGF." *The Arctic Council*.
<https://www.arcticcoastguardforum.com/about-acgf>.

protocol adherence of the member states and to ensure minimal environmental impact and that response teams are in place in cases of emergencies. Otherwise, there is no accountability in the ACGF to ensure transparency among the member states of military activities in the region. Additional transparency measures are required in order to thwart miscommunications and misinterpretations of military movement and activities in the Arctic.

Military exercises must be taken into consideration when determining the activity levels of countries in the Arctic region. The significance of military exercises is that they are required for countries to establish familiarity in different terrains and create interoperability between multiple nations. Exercises employ countries' ability to deploy military forces, often in joint exercises rapidly.³⁸ "Joint" refers to three different options: either that the exercise is conducted with several countries, includes different military services (such as air forces, navies, and armies), or a combination of both. Most large exercises are comprised of multiple participating countries across several domains. The intentions of these exercises are established by national operation requirements and mission priorities, which are mostly to ensure combat readiness and sustainability.³⁹

³⁸ The United States and Russia are members, along with 55 other nations, of the Vienna Document agreement, which is a confidence and security-building measure that allows for notifications of large military exercises in the European theater. However, the Vienna Document zone of application does not expand past the Russian Ural Mountains and therefore does not encompass Russia's entirety. It is also limited to only Europe and does not include Canadian or U.S. territories and associated exercises. Although this agreement is in place, it does not adequately cover the area needed for full transparency. Another shortfall is that the Vienna Document does not include maritime activity and solely focuses on land exercises. There is a very slim possibility of modernizing the Vienna Document, but as it is consensus based, it has failed several times to modernize. The current modernization proposals discussed at the OSCE do not include geographical expansion nor the inclusion of naval activities.

³⁹ "Exercises and Training." SHAPE. NATO. <https://shape.nato.int/exercises>.

FIGURE 4: Russian Military Districts



The Western and Northern Fleet conduct one exercise between the two districts

(ZAPAD); otherwise, each district has its one major exercise. As depicted in the map, all but the Southern district touches the Arctic Circle.

Russia currently accesses the Atlantic Ocean via its northern coastline, and as the polar cap continues to diminish, Russia will be able to access the Atlantic, the Arctic, and the Pacific Oceans.⁴⁰ However, Russia’s availability to these areas also entails that Russia will become vulnerable from adversaries accessing them as well. Russia’s military presence continues to surge as the Northern Fleet establishes bases in Novaya Zemlya and Novosibirskie Islands, both of which are located within the Arctic Circle. In addition to Russia increasing its presence in the

⁴⁰ Pezard, Stephanie, Abbie Tingstad, Kristin Van Abel, and Scott Stephenson. “How to Maintain Arctic Cooperation with Russia.” RAND Corporation, March 2, 2017. https://www.rand.org/pubs/research_reports/RR1731.html.

Arctic, Russia conducts not only large military exercises but also smaller “surprise exercises” to ensure military combat readiness.⁴¹ Russia conducts one major exercise annually in a rotating sequence: VOSTOK (East), ZAPAD (West), TSENTR (Center), and KAVKAZ (South), all of which have increased in size since 2009.⁴² VOSTOK, ZAPAD, and TSENTR all have regions that touch the Arctic Circle and actively use its maritime capability, Northern Fleet, to navigate the Northern Sea Route and exert regional dominance. Recently, Russia began to include China in its military exercises as it did in VOSTOK 2018.⁴³

Most recently, Russia conducted its largest military exercise in 2019, TSENTR. Although focusing mostly on the central military district, TSENTR incorporated Arctic activities as well. These activities included Russian naval Northern Fleet drills surrounding the Russian island waters located in the Northern Sea Route. Russia notably invited China to participate in this exercise for the first time.⁴⁴ These invitations show that Russia is supportive of China’s attempts to operate in and out of the Arctic and could also be an indication of future collaboration of military exercises, to include areas such as the Arctic.

U.S. / Allied Arctic Military Activities

Norway, as the most capable NATO Ally in cold weather operations, hosts a military exercise called COLD RESPONSE roughly every two years with allied and partner nations.⁴⁵

⁴¹ Granholm, Niklas, Märta Carlsson, and Kaan Korkmaz. “The Big Three in the Arctic China’s, Russia’s and the United States’ Strategies for the New Arctic.” *Swedish FOI* FOI-R--4296--SE (October 2016).

⁴² Pezard, Stephanie, Abbie Tingstad, Kristin Van Abel, and Scott Stephenson. “How to Maintain Arctic Cooperation with Russia.” RAND Corporation, March 2, 2017.
https://www.rand.org/pubs/research_reports/RR1731.html.

⁴³ “Breaking Down Russia’s Vostok Exercise.” War on the Rocks, September 25, 2018.
<https://warontherocks.com/2018/09/breaking-down-russias-vostok-exercise/>.

⁴⁴ Staalesen, Atle. “As Russia Launches War Games TSENTR-2019, Arctic Troops Advance on Bolshevik Island.” The Independent Barents Observer, September 16, 2019.
<https://thebarentsobserver.com/en/security/2019/09/revanchist-forces-advance-bolshevik-island>.

⁴⁵ Norway hosted COLD RESPONSE in 2006, 2007, 2009, 2010, 2012, 2014, 2016, and has plans to host in 2020. “More than 15,000 Soldiers from 9 Countries Will Participate in Cold Response 2020 Exercise.” February 2020 Global Defense Security Army News Industry | Defense Security Global News Industry Army 2020 | Archive News year. Army Recognition, February 20, 2020.

The intent behind COLD RESPONSE is to highlight the quick deployment of troops in austere weather conditions for an extended period.⁴⁶ JOINT VIKING 2017 is an Arctic exercise encompassing Norwegian and allied troops practicing defense measures.⁴⁷ TRIDENT JUNCTURE is a NATO exercise that included 31 nations and over 50,000 military troops. The area of operation included Iceland, Norway, Sweden, and Finland, all of which are Arctic countries.⁴⁸ The intention of both of these exercises is to ensure combat readiness from threats coming from the North. These are repeating exercises and continue to grow in number and strength. The United States is also increasing its naval presence in the Arctic. The U.S. carrier strike group, Harry S. Truman, entered north of the Arctic Circle line twice, before and after Norwegian Exercise TRIDENT JUNCTURE in 2018. Separately, the Theodore Roosevelt strike group participated in the U.S. exercise NORTHERN EDGE in Alaska in 2019 marking the first time in over a decade that a U.S. aircraft carrier operated in these waters.⁴⁹

U.S. Navy Fleet and Budget Forecast

The United States reinstated the 2nd Fleet currently in Norfolk, VA, in 2018, which reached full operational capability in December 2019. The 2nd Fleet's primary mission is to be prepared to engage in the Arctic, citing Russia as its principal concern. Its only purpose is military engagement in the region rather than coastguard search and rescue services. The

https://www.armyrecognition.com/february_2020_global_defense_security_army_news_industry/more_than_15000_soldiers_from_9_countries_will_participate_in_cold_response_2020_exercise.html.

⁴⁶ Lopez, C. Todd. "Joint Exercise to Test Tactical Forces in Cold-Weather Environment." Partnerships. U.S. Department of Defense, February 19, 2020. <https://www.defense.gov/Explore/News/Article/Article/2087607/joint-exercise-to-test-tactical-forces-in-cold-weather-environment/>.

⁴⁷ Bergquist, Elisabeth, and Kelsey Lindsey. "Joint Viking Military Exercise Begins in Northern Norway." ArcticToday, March 6, 2017. https://www.arctictoday.com/joint-viking-military-exercise-begins-in-northern-norway/?wallit_nosession=1.

⁴⁸ "Trident Juncture 18 - Media Resources." NATO, November 9, 2018. https://www.nato.int/cps/en/natohq/news_158620.htm.

⁴⁹ Eckstein, Megan. "Roosevelt Strike Group in Alaska for High-End Exercises." U.S. Naval Institute News, May 15, 2019. <https://news.usni.org/2019/05/14/theodore-roosevelt-strike-group-in-alaska-for-high-end-joint-exercise-northern-edge-2019>.

intention is to have the Fleet stationed on the West Coast in order for it to access the Arctic. The 2nd Fleet will also work with U.S allies to partake in Baltic operations and exercises beginning in 2020.⁵⁰

There are several conflicting reports on the importance of increasing U.S. naval capability, both in size and in strategic ability. The Navy's funding does not allow it to increase its fleet to 355 vessels by 2030 and to include new low-yield nuclear weapons capability as initially planned. The Secretary of Defense, Dr. Mark Esper, is adamant about balancing the needs of the Services to ensure that each is receiving the appropriate funding.⁵¹ Dr. Esper is pressing on the U.S. Navy to reshape itself to include smaller vessels instead of large ships to reach the total goal of 355 vessels even with budget cuts looming.⁵² The Pentagon's upcoming budget is estimated to be \$705.4 billion. The Columbia-class submarines, the new U.S. ballistic missile submarines, are an issue for the Navy as they are expensive, and Secretary Esper is adamant that the Navy will not receive additional funding to produce them. There is also a discussion on downsizing the Virginia-class submarines to save money to fund the Columbia-class; however, Dr. Esper refuses to re-budget any of the Department of Defense's (DoD) budget

⁵⁰ Larter, David. "US Navy Declares New Fleet Created to Confront Russia Fully Operational." Defense News. Defense News, December 31, 2019. <https://www.defensenews.com/naval/2019/12/31/us-navy-declares-new-fleet-stood-up-to-confront-russia-fully-operational/>.

⁵¹ "Services" refers to the U.S. Air Force, U.S. Army, and U.S. Navy.; Eckstein, Megan. "SECNAV Modly: Path to 355 Ships Will Rely on New Classes of Warships." U.S. Naval Institute News. February 3, 2020. <https://news.usni.org/2020/02/03/secnav-modly-path-to-355-ships-will-rely-on-new-classes-of-warships>.

⁵² Mehta, Aaron, and David Larter. "Defense Secretary Mark Esper on How the Navy Can Get to 355 Ships." Defense News, February 9, 2020. <https://www.defensenews.com/breaking-news/2020/02/09/defense-secretary-mark-esper-on-how-the-navy-can-get-to-355-ships/>.

to support the inclusion of the Columbia-class submarines.⁵³ The Columbia-class, once in full production, could account for between 38-40 percent of the Navy’s shipbuilding budget.⁵⁴

Part of the desire to include a low-yield nuclear arsenal is to compete with the Russian submarine nuclear capability in an attempt to dissuade Russia from utilizing them (a continuation of nuclear deterrence).⁵⁵ The U.S. National Defense Strategy (NDS) is the Department of Defense’s interpretation of the U.S. National Security Strategy. The NDS views the military as a chess piece in U.S. diplomacy and anticipates that its strength enables the United States to come to the negotiation table from “a position of strength.” The NDS highlights China and Russia as the United States’ biggest adversaries because of their ability to influence the economy, their advanced militaries, and their ability to exert veto powers over other countries in the United Nations.⁵⁶ The NDS focuses on both the nuclear triad and the Great Power Competition. Since the NDS calls for the recapitalization of the nuclear triad, the Fiscal Year (FY) 2021 budget requests full funding for the Columbia-class submarine. The Navy is now looking internally to repurpose ~\$40 billion to fund the submarines.⁵⁷

Quantitative Models

Arctic ice extent is selected as a variable because it indicates whether the polar cap is melting or sustaining its coverage. The increase in ice melt (otherwise known as “ice-

⁵³ Larter, David. “Defense Secretary Esper Says Nuclear Missile Sub Is ‘the Navy’s Bill,’ Setting up a Fight with Congress.” Defense News, February 10, 2020. <https://www.defensenews.com/naval/2020/02/10/defense-secretary-esper-says-new-us-missile-sub-is-the-navys-bill-setting-up-a-fight-with-congress/>.

⁵⁴ Larter, David. “The US Navy Wants More Ships but Can’t Afford Them, Admiral Says.” Defense News, February 10, 2020. <https://www.defensenews.com/naval/2020/02/11/the-us-navy-wants-more-ships-but-cant-afford-them-admiral-says/>.

⁵⁵ Burns, Robert. “U.S. Adds ‘Low Yield’ Nuclear Weapon to Its Submarine Arsenal.” Associated Press. n.d. <https://apnews.com/b910d5f4f2076d558416ae021b511517>.

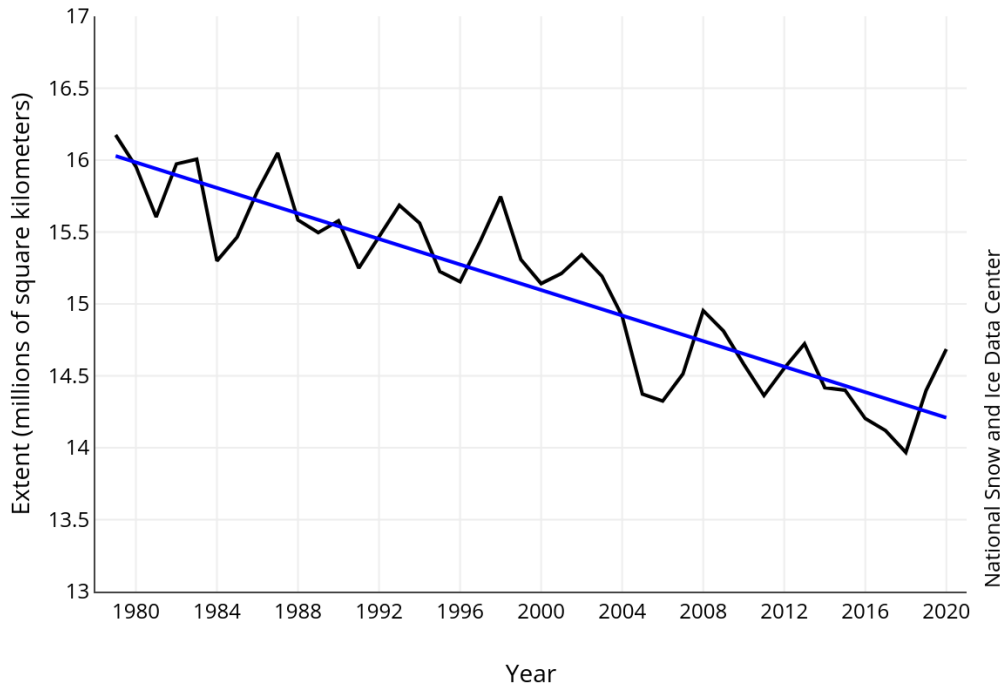
⁵⁶ United States Department of Defense. *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge*. United States, Washington, D.C. (2018).

⁵⁷ Eckstein, Megan, and Ben Werner. “Acting SECNAV Kicks off Navy ‘Night Court’ Cost Savings Drive with Aim to Save \$40 Billion.” U.S. Naval Institute News. February 18, 2020. <https://news.usni.org/2020/02/18/acting-secnav-kicks-off-navy-night-court-cost-savings-drive-with-aim-to-save-40-billion>.

shrinkage”) increases the amount of open water in the region. Open waters increase the navigability in the Arctic, which would allow for additional transit through the region. Theoretically, if there is an increase in ice-melt that opens more navigable waters, and commerce via shipping would surge. This portion of the study intends to show whether there is an increase in Russian shipping in the Arctic when there is an increase in the Arctic ice melt. If there is a positive indication of a correlation, then this could indicate that Russia will continue to have an increasing interest in the region and its equities. The increase in equities could indicate that Russia is willing to invest more in the security of its vessels leading to an upsurge in Russian military presence. Russian shipping is selected for the shipping analysis as it possesses the most coastline in the Arctic, the most port infrastructure in the Arctic, and the Northern Sea Route. If Russia’s change in shipping correlates with ice-shrinkage, more than likely, other countries will follow suit; but this study assumes that Russia would be the first natural country to make changes to its transit as it has the infrastructure in place to do so. The *independent variable* is climate change represented through ice shrinkage, and the *dependent variable* is navigable waters represented through the ability to transport Russian goods.

TABLE 1: Sea Ice Extent over Time

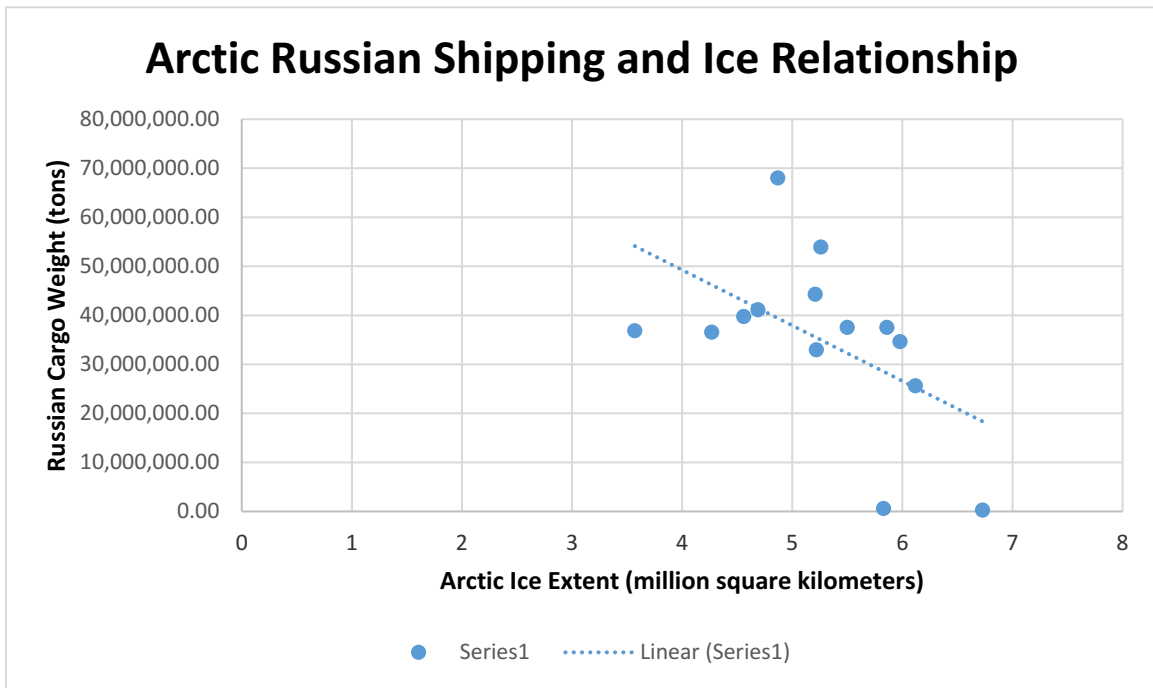
Average Monthly Arctic Sea Ice Extent
February 1979 - 2020



Produced by the National Snow and Ice Data Center, Table 1 depicts the average monthly sea ice extent in the Arctic Circle dating back the last several decades and provides background understanding of how rapidly the polar cap is depleting.⁵⁸ The negative trend shows that the Arctic ice is on a steady decrease, which directly impacts the amount of navigable waters. The following charts analyze how Russian shipping and the extent of the polar cap might be related.

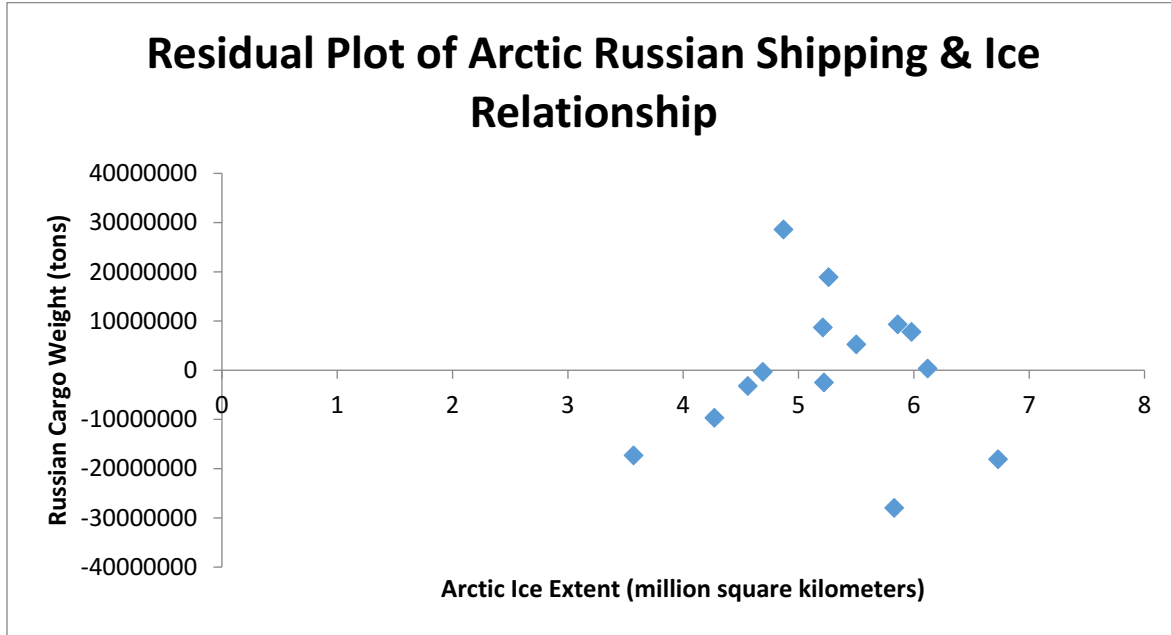
⁵⁸ “A Positively Persistent, Persistently Positive Arctic Oscillation.” NSIDC Arctic News and Analysis RSS. National Snow and Ice Data Center, March 4, 2020. <http://nsidc.org/arcticseaicenews/>.

TABLE 2: Arctic Russian Shipping and Ice



The data ranges between 2001 and 2014 due to the limitation of available Russian shipping information. The cargo information includes goods, oil, and mineral shipping in the aggregate form represented in weight in tons. The Arctic Ice extent is measured in increments of one million square kilometers. Although there appears to be a negative trend in the relationship between the two variables, the Arctic ice is decreasing with time. The chart should be read right to the left rather than left to right. (DISCLAIMER: Although two data points look as though they are approaching zero cargo weight, the Russian cargo weight is 569,600 and 271,269 tons. END DISCLAIMER).

TABLE 3: Residual Plot - Arctic Russian Shipping and Ice



Residual plots assist in determining how accurate the linear regression model is between the observed and expected data. The smaller the distance between the plotted data and the linear regression provides evidence that the regression equation actively represents the data, whereas if the data points stray from the linear regression line equation, there is reason to doubt that the equation represents the data accurately.

The residual plot does not show a significant relationship between the two variables. Since the R-squared value is not significantly close to either +1 or -1 and is closer to zero, the data does not have a strong R-squared correlation between the variables. The residual plot resulted in an R-squared value of 0.28, which means that the ice shrinkage explains 28% of the increase in Russian shipping and the remaining 72% explained by other factors. In order for a fuller understanding of the fluctuation in cargo shipping, the geopolitics of the region must be taken into consideration. Outside influences such as trade wars, embargoes, sanctions, or military engagement could impact the amount of cargo that Russia chose to ship during this period.

Additional quantitative information such as overall Russian economic growth, production of shipping equipment, Russian naval operations and military bases in the Arctic region, and the intention of port construction would provide a more holistic approach to understanding the relationship between Russian Arctic activity and the increase in navigable waters in the Arctic Circle.

DISCUSSION & IMPLICATIONS

“We must hold each other accountable. And we must not allow this forum [the Arctic Council] to fall victim to subversion from Arctic or non-Arctic states.”⁵⁹

- *U.S. Secretary of State Michael Pompeo*

As the Arctic climate changes over time, have the policy positions or behavior of the Arctic states changed? The degree of security cooperation among the Arctic states has changed over the last few decades. There are two types of security cooperation conducted in the Arctic Circle: one form of security cooperation is the overarching insurance of equal access and safety of ships in the region that the Arctic Council and United Nations treaties such as UNCLOS oversee. The other form of security cooperation is the military aspect that is not covered under the auspices of the Arctic Council. The Arctic Circle is conflict-free as there is not enough room for conflict to maneuver. However, as the ice decreases and water navigability increases, the security environment shifts to see an increase in military exercises. Since the Arctic sea-ice minimum in 2007, there has been an increase in military operations in the region, signifying that select countries are allying with one another in security cooperation.⁶⁰ Not only have Arctic

⁵⁹ Pompeo, Michael. “Looking North: Sharpening America's Arctic Focus - United States Department of State.” *U.S. Department of State*, U.S. Department of State, 9 May 2019, www.state.gov/looking-north-sharpening-americas-arctic-focus/.

⁶⁰ “2016 Ties with 2007 for Second Lowest Arctic Sea Ice Minimum.” National Snow and Ice Data Center. ScienceDaily, September 15, 2016. <https://www.sciencedaily.com/releases/2016/09/160915153338.htm>.

countries become wary of the expanding of navigable waters, but also others, such as China, have shown an increasing interest in the Arctic.

Russia, China, and the United States all have equities in the Arctic Circle, but for different reasons. The polar cap offered Russia protection along its northern border, but as the polar cap quickly diminishes, Russia is becoming more vulnerable to an entire coastline. It will continue to strengthen its northern military for its national security.

China is also very interested in access to the Arctic for strategic purposes. As a leader in commerce, access to the Arctic Circle's passages would decrease its shipping time and route by nearly 30%. In order to access the Arctic Circle safely, China needs to work with Russia to gain access to the Northern Sea Route. Most of China's Arctic involvement is initiated through scientific research and economic participating rather than through military arrangements. Therefore, China has started to work closely with Russia in Arctic military exercises to establish an alliance in the region. China and Russia are working with one another to establish a "Polar Silk Road" that would create the foundation of China's Arctic economic access. Russia is an ideal partner as it possesses the most coastline of the Arctic, direct control over some areas of the Northern Sea Route, and has the most equipment in the region to ensure the safety of passage.

The United States' only claim to the Arctic Circle is the state of Alaska, which the United States purchased from Russia in 1867.⁶¹ Due to Alaska's location, the United States has equity in the activity within the Arctic. Although the U.S. Administration's current stance does not acknowledge climate change, the United States has signed several Arctic Council legal

⁶¹ "Purchase of Alaska, 1867." Office of the Historian. U.S. Department of State. <https://history.state.gov/milestones/1866-1898/alaska-purchase>.

documents that discuss the impact of climate change.⁶² Defense Secretary Esper seemingly dismissed the Russian threat by focusing solely on China during the annual security-policy jamboree in Munich, Germany, in early 2020. Dr. Esper notably mentioned the beginning of Chinese naval military exercises conducted in the Baltic region.⁶³ The United States is calling on European countries to work with one another to thwart the Chinese threats to technology advancements, but European leaders seem more worried about physical encroachment versus technological theft. Regardless, U.S. intentions are to continue to counter Russian aggression by continuing its strong alliances with NATO. In this situation, there is an increase in security cooperation, but there are complications with the U.S. policy of considering Russia an adversary as well as an upward trend of NATO exercises as Russian submarine patrol the Arctic Circle.

The United States is currently experiencing funding issues within its naval budget to increase its strategic capabilities to thwart Russian threats. However, the United States increased its ability to respond to threats in the Arctic Circle by establishing the 2nd Fleet. In order to posture the United States in a position of strength, the NDS prioritizes strengthening the lethality of the military force and strengthening alliances. The majority of the NDS discusses the need to focus resources on new domains of potential conflicts, such as space and cyber. However, it also mentions the need to support and sustain the relevancy of U.S. nuclear infrastructure, which the United States has not committed to. The NDS targets specific areas on which the United States and its allies need to focus, but it does not mention the Arctic region as an area of concern for the

⁶² Cole, Dermot. "Pompeo's Bombastic Arctic Council Performance Could Prove an Aberration - or a New Normal." *Arctic Today*, 13 May 2019, www.arctictoday.com/pompeos-bombastic-arctic-council-performance-could-prove-an-aberration-or-a-new-normal/?wallit_nosession=1.

⁶³ "America Urges Europe to Join Forces against China." *The Economist*. The Economist Newspaper, February 16, 2020. <https://www.economist.com/europe/2020/02/16/america-urges-europe-to-join-forces-against-china>.

DoD.⁶⁴ The United States is limiting itself by not investing more resources in an ice-breaker fleet. The United States will not be seen as a strategic partner to others if it cannot operate independently in the region, effectively rendering the United States impotent in the Arctic. With the inclusion of ice-breakers, the United States will have more freedom to implement policies in the Arctic as well as attract allies and partners as a worthy associate in the region.

As each country has equity in the Arctic Circle, and as it continues to become more accessible, Russia, China, and the United States are safeguarding their interests by increasing their security cooperation in the region. This is manifested through the increase in military exercises in the area as the forces would not be able to maneuver the waters if it were not for the rise in navigable waters.

CONCLUSION

TABLE 4: Summation of Data Analysis

	Russian Federation	United States	People’s Republic of China
Arctic Country	Yes	Yes	No (“Near-Arctic”)
Arctic Coastline⁶⁵	24,140 kilometers (km)	1,706 km	0 km
Distance from Arctic	0 km	0 km	1,400 km ⁶⁶
International or Territorial Waters	Territorial	International	International
UNCLOS Signatory	Yes	No	Yes
Arctic Alliances	Yes (China)	Yes (Canada, Iceland, Denmark, Finland, Norway, Sweden)	Yes (Russia)
Arctic Priorities	National Security	Global Hegemony	Economics

⁶⁴ The NDS targets the Indo-Pacific, the Middle East, the Western Hemisphere, and Africa as areas of concern. United States Department of Defense. *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge*. United States, Washington, D.C. (2018).

⁶⁵ Kiprof, Joseph. “Which Countries Have Coastlines On The Arctic Ocean?” WorldAtlas. November 28, 2018. <https://www.worldatlas.com/articles/which-countries-have-coastlines-on-the-arctic-ocean.html>.

⁶⁶ Lanteigne, Marc. “China’s Emerging Arctic Strategies: Economics and Institutions,” *the University of Iceland*. <http://ams.hi.is/wp-content/uploads/2014/10/ChinasEmergingArcticStrategiesPDF.pdf>

Even though there is an increase in security cooperation in the Arctic, underlying threats remain lingering. Nuclear deterrence is the cornerstone of U.S. national security, especially among developed nations that also possess a similar aptitude. Nuclear capability must be taken into consideration as this new geographical location could also be a new area of nuclear engagement that Russia is exploiting through nuclear submarines. Russia and the United States are both experts in nuclear deterrence; however, Russia is far superior in its activities in the Arctic Circle and has surpassed the United States in this capability for several decades. Russia actively engages in the Arctic, whereas China and the United States both react to Russia's policies, making Russia the most powerful player in the region. The United States will most likely continue to rely on its allies and partners of the Arctic Circle for mutual protection. However, until the United States actively invests in military equipment that can operate in the austere polar conditions, the United States will not be the most attractive partner in the region. The United States does not have a direct interest in the region other than its limited Alaskan coast; otherwise, the United States is competing with Russia and China as they have more military cooperation in the region due to Russia's well established military bases, ports, and fleet.

Russia, China, and the United States are increasing their activity levels in the Arctic Circle due to the surge in water navigability. This new and rising navigability opens opportunities for transit that were previously inaccessible. Russia will continue to surge its activities to preserve its national security. China will increase its Arctic participation in anticipation of economic growth/reach. The United States will seek to gain influence in the region to ensure that neither Russia nor China is the regional influencers. Since 2007 (the lowest point of ice), security cooperation increased. China and Russia are working together in the

region by collecting natural resources, establishing transit, and participating in Arctic military exercises. The United States also increased its security cooperation by investing in naval forces specifically designed to operate in the Arctic and is participating in allies / partnered military exercises in the region. Although Russia, China, and the United States are increasing the way they conduct security cooperation: Russia with China, and the United States with allies and partners due to the accessibility of navigable waters allowing for the maneuver in the Arctic Circle. There is no international body that determines how countries should interact with one another nor provides an avenue to address how security cooperation can occur. Without this, Russia, China, and the United States will continue to work independently and with their allies/partners to establish security cooperation.

Suggestions for Future Work

Future work on this topic should include research on outside influences such as trade wars, oil prices, embargoes, sanctions, or military engagement that could affect the amount of cargo that Russia chose to ship during this period. This study does not take into consideration any geopolitics that Russia, China, or the United States were engaged in over the last two decades. Future work on this topic must also include a thorough assessment of Russia, China, and the United States' military capability, size, and investment. This study was limited to only information gathered for the United States as access to similar information on Russia and China's militaries are not readily accessible.

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CURRICULUM VITAE

Karina Touzinsky is the lead analyst for the Conventional Arms Control team for Threat Reduction and Arms Control (TRAC) DoD Treaty Manager, within the office of the Assistant Secretary of Defense for the Nuclear, Chemical and Biological Defense Programs (ASD (NCB)). She is responsible for the implementation of, and compliance with, conventional arms control treaties, agreements, and data exchanges. Ms. Touzinsky began working for the Department of Defense Treaty Manager in November 2017 and worked Conventional Arms Control for the Department of the Air Force for two years prior.

Prior to working for the Department of Defense, Karina Touzinsky worked as a Logistics Specialist for the Department of State in the Secretary of State's Protection Detail within the Bureau of Diplomatic Security. She also served as the lead program analyst for the Department of Homeland Security's Office of Systems Engineering within the Science and Technology Bureau.

Ms. Touzinsky is a candidate for an MA in Global Security Studies concentrating in Strategic Studies from the Johns Hopkins University (anticipated completion May 2020). Ms. Touzinsky currently holds a BA in International Relations from James Madison University.