Maritime Futures
The Arctic and the Bering Strait Region

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A Report of the CSIS EUROPE PROGRAM

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The authors of this report set out to analyze and outline the current trends and dynamics of Arctic shipping through the Northern Sea Route (NSR) and the Bering Strait region as a steady diminishment of Arctic sea ice increases commercial access to Arctic waters. We sought to test the proposition that the Bering Strait, an extremely narrow passage shared by Russia and the United States, could become a maritime passage of the future. As such, it is vital that the United States, Russia, and other Arctic nations enhance Arctic maritime safety and stewardship in this region, which includes implementing international search-and-rescue and oil spill response agreements, addressing gaps in maritime domain awareness and readiness, and identifying pragmatic approaches to creating norms and regulations to guide future maritime transportation.

Unfortunately, there is a dearth of information specifically related to this region and general subject matter. So we did what think tanks do every day: We combed through highly specific and detailed research materials and information, sought out colleagues with great knowledge and experience on the subject, and thought long and hard about what it all meant in the furtherance of protecting the United States and the American people. This task would not have been possible without the tireless dedication and stalwart efforts of CSIS Europe Program staff who worked closely with very talented CSIS research interns Andrew Thvedt, Max Fogdell, and Sara Sandström. The authors also wish to profusely thank Dr. Lawson W. Brigham, one of the most knowledgeable individuals in the United States on this particular subject matter, for his valuable insights and guidance throughout the writing of this report. The authors would also like to thank those who participated in an expert workshop in October 2016, particularly Captain Ed Page, executive director of the Marine Exchange of Alaska (MXAK), whose efforts to promote safe, secure, efficient, and environmentally responsible maritime operations in this region cannot be appreciated enough. Our colleagues at the U.S. Coast Guard also deserve special recognition and enormous gratitude for their service to our country as they provide for our nation’s maritime safety, security, and stewardship. Our Coast Guard colleagues helped us understand more clearly the current and future state of Arctic shipping in the Bering Strait region. We would like to especially thank former CSIS military fellow Captain Thomas Cooper, who helped us get our “sea legs” in understanding

Acknowledgments
Coast Guard operations and provided a valuable link between the Center’s research team and Coast Guard headquarters. The salience of this study derives from the in-depth local knowledge, expertise, and perspective that Dr. Brigham, the workshop participants, the Coast Guard, and Captain Cooper injected into our findings. And finally, the authors would like to thank the Ministry of Foreign Affairs of Norway for making this research and report possible as well as the constant and helpful guidance of our program manager Tommy Flakk.

The authors hope this report illuminates the challenges and realities of Arctic shipping and animates U.S. policymakers to respond to the growing maritime exigencies of the Bering Strait region.
As the world’s greatest sea power and an Arctic coastal nation, one could assume that the United States would play a significant and visible role in ensuring that the Arctic remains a safe, secure, and well-stewarded maritime space. But this would be a false assumption. Although significant diminishment of the Arctic ice cap is rapidly propelling the advent of a new, blue-water ocean and, with it, new commercial and economic opportunities, the United States has been reluctant to prioritize and appropriate resource-enhanced maritime infrastructure and emergency response capabilities. The Russian Federation, on the other hand, has been focused on increasing its Arctic maritime capabilities. Abundant natural and mineral resources, as well as rich fishing stocks, encourage Arctic and non-Arctic nations to explore these resources through the enhanced use of Arctic maritime transportation routes that seek to connect geographically distant economies more directly. As a result, Arctic shipping routes—via the NSR, the Northwest Passage, and the Transpolar Sea Route (TSR), which were once considered dangerous and noncommercial—are evolving into potential future maritime passages. The NSR stands out as one such potential future maritime passage.

An increasingly ice-free NSR represents a potentially shorter transportation route between Europe and Asia, providing greater and quicker access to economies and reduced costs for shipping companies. Asian-based vessels must traverse the narrow Bering Strait, which also represents the maritime border between the United States and Russia, to reach the NSR, as do vessels traveling through the NSR to Asian markets. As the shipping season through the NSR continues to lengthen, traffic patterns are shifting. In 2011, a total of 41 ships traversed the passage, 25 internal and 16 international (trans-Arctic). The majority traveled east through the passage, carrying resources including gas condensate, oil, iron-ore concentrate, and ballast from Russian ports to destinations in eastern Russia or Asia. Traffic through the NSR increased during the following years, reaching its peak in 2013, when there were 71 transits, 43 internal and 28 international (trans-Arctic). Since

2013, traffic has decreased, with only 19 recorded transits in 2016. In the data from 2011 to 2015, the number of international or trans-Arctic transits slightly increased, while internal transits fluctuated. Despite these anemic figures, Russia actively promotes the NSR as a source of future economic growth. Over the last decade, the Russian government has allocated trillions of rubles to developing this Arctic waterway and the surrounding region. This includes initiating over 150 development projects covering economic development and infrastructure projects. The headline initiative that is expected to have the greatest impact on maritime traffic is the Yamal LNG (liquefied natural gas) megaproject, a $27 billion integrated project for natural gas production, liquefaction, and marketing. Once the Yamal LNG project begins production, domestic freight could grow up to 50 million tonnes by 2020. Russia clearly expects the Yamal LNG project to significantly increase infrastructure activity throughout the region to include an international airport, port harbor and approach channels, vessel traffic management systems, navigational support aids, and marine service buildings.

Initiatives and policies to develop the Russian Arctic have included infrastructure to improve maritime domain awareness such as the planned construction of 10 search-and-rescue stations along the NSR, to complement existing Marine Rescue Coordination Centers, Marine Rescue Sub-Centers, hydrographic bases, and navigational equipment. Russia has also invested heavily in its icebreaking capabilities. In 2016 alone Russia floated three new icebreakers, the diesel-electric Polaris (January 2016), the diesel-electric Ilya Muromets (June 2016), and the nuclear-powered Arktika (June 2016), which is expected to become the world’s largest icebreaker when completed in December 2017.

DIVERGING ARCTIC STRATEGIES

A high level of ambition from the Russian government and a great deal of funding and planning have gone into the process of making the NSR a potential major new shipping route. This stands in stark contrast to very minimal policy and budgetary focus by the United States for a region where a significant portion of future Arctic shipping will pass en route to or from the NSR. The Bering Strait represents (1) a critical link between the resources of the Arctic and consumers in rapidly growing Asian markets; (2) a vital passage for local, barge, and seasonal destination traffic for

5. B. Brunstad, ed., Arctic Shipping 2030: From Russia with Oil; Stormy Passage, or Arctic Great Game? (Oslo: Econ Poyry, 2007), 14.
Alaska; and (3) the maritime demarcation border between the United States and Russia. The Bering Strait region is also surrounded by indigenous communities with a highly productive ecosystem and an abundance of animal species. Frozen for more than half the year, and with a shipping season that lasts approximately five months (July–November), transits of the Bering Strait have been inconsistent but steadily increasing. In 2008, there were 220 transits; in 2010, there were 410; in 2012, there were 480; and in 2014 and 2015, there were 340 and 540, respectively. The increase in traffic is predominately on the Russian side of the Bering Strait and is represented by a diverse range of vessels including tankers, cargo, tug, towing, passenger, fishing, search and rescue, military, and law enforcement.

Despite the Coast Guard’s identifying the Bering Strait as a priority area where maritime safety, security, and environmental responsibility must be enhanced, maritime domain awareness remains limited. While the Russian development strategy for the NSR is well documented, the U.S. strategies for the Bering Sea, Bering Strait, and Chukchi Sea are lacking. Vessel traffic through the Bering Strait is subject to such variables such as commodity prices, insurance costs, and environmental regulations—just as it is in the NSR. However, the necessary infrastructure to accommodate an increase in traffic is lagging far behind. The nearest permanent Coast Guard facility is on Kodiak Island, Alaska, over 1,000 miles from the Bering Sea region by sea. The nearest U.S. deepwater port is Dutch Harbor in the Aleutians, over 800 miles from the Bering Strait. Thus, the state of readiness and needed infrastructure to address either a mass casualty or an environmental incident are limited. Plans to develop infrastructure in the Bering Strait are simply that: plans or a series of studies.

The Bering Strait region is a microcosm of the divergent strategies the United States and Russia have for their respective Arctic regions. The Russian government places a premium on promoting Russian economic and military advances in the Russian Arctic, while recent U.S. administrations have prioritized environmental protection, scientific research and understanding, mitigation of the effects of climate change, and addressing the needs of northern populations.

**BUT A CONVERGENCE OF INTEREST: THE BERING STRAIT**

The two divergent economic and security strategies for the Arctic converge in the narrow Bering Strait, which will increasingly become a strategic corridor to and from the Arctic. The lack of hydrographic data, marine charts, complete and adequate coverage of communications, environmental monitoring of changing weather patterns and ice networks, search-and-rescue capability, environmental response capacity, ship monitoring and tracking, and aids to navigation hinders national and international response to life-threatening incidents or oil spills. Developing these

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capabilities—nationally, bilaterally, and potentially multilaterally—will greatly improve Arctic maritime safety. Relations between the United States and Russia in the Arctic have been largely positive, despite a significant diminishment of the bilateral relationship, in part due to the lack of prioritization of the Arctic by the United States and the functional need for broad international cooperation in the pursuit of science, environmental protection, and safety, which have been the tenets of U.S. Arctic policy. For Russia to fully realize its Arctic economic ambitions, however, the Arctic must continue to be a stable and benign political, economic, and security environment. Clearly there is opportunity for cooperation as well as a recent track record of success.

Russian and American bilateral cooperation was instrumental in the passing of two legally binding agreements: the 2011 Agreement on Cooperation and Aeronautical and Maritime Search and Rescue in the Arctic, and the 2013 Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. The Coast Guard and its Russian counterparts have also cultivated bilateral ties through two Coast Guard forums: the North Pacific Coast Guard Forum, established in 2000, which focuses on maritime security, illegal trafficking, combined operations, emergency response, fisheries enforcement, and information exchange, and the Arctic Coast Guard Forum, established in 2015, which seeks to improve coordination related to shipping, search-and-rescue operations, and scientific research. Cooperation between the United States and Russia is also evident within the International Maritime Organization (IMO), where in 2014, the organization adopted a mandatory Polar Code which recently came into force (January 2017). U.S.-Russian efforts also led to several rounds of negotiation culminating in a nonbinding declaration11 to preventatively place a moratorium on fishing in the central Arctic Ocean until further studies of conditions and fish stocks are complete.

While progress in setting international shipping standards and best practices for Arctic maritime safety is encouraging and notable, U.S.-Russian bilateral success in the Arctic has been very narrowly constructed and incremental. There has been specific focus on cultural, environmental, and fisheries protection highlighted by the Shared Beringian Heritage Program of 1991. The most successful bilateral interaction in the Bering Strait is between the Coast Guard District 17 in Alaska and its Russian Federal Security Bureau (FSB) counterpart in the Russian Far East. Both agencies share common goals of maritime safety and fisheries law enforcement. Channels of communication between the FSB and the Coast Guard are open, and contact occurs as both countries address illegal, unreported, and unregulated (IUU) fishing activity in the Bering Sea and the northern Pacific Ocean. Their operational partnership also extends to law enforcement activities along the U.S.-Russian Maritime Boundary Line (MBL) in the Bering Sea, responses to distress calls at sea, and protection of the maritime environment. There have been a number of studies and practical proposals put forward regarding measures to regulate vessel traffic in the Bering Strait, but unfortunately no concrete steps have yet been developed other than the Port Access Route Study (PARS). There is a lack of formal bilateral information exchange and coordination between the

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United States and Russia to develop a system of surveillance and domain awareness. In light of an increase in vessel traffic and considering the economic and strategic value Russia places on increased use of the NSR, this situation is untenable, and improving domain awareness in the Bering Strait must be a priority of future bilateral cooperation.

RECOMMENDATIONS

The future of destination and trans-Arctic shipping through the NSR and the Bering Sea region remains unclear and largely dependent on global commodity prices and lack of regional infrastructure, which drives transport costs. Despite these rational economic realities, state-driven economic development of the region combined with Asian markets hungry for new energy and mineral resources will continue to test usage of the NSR, necessitating improvements in safety and domain awareness in the Bering Strait. What is required is the political will to prioritize regional maritime investments, sufficiently budget for those investments, and implement enhanced safety measures that are responsive to current and future economic and transport conditions.

The process of investment prioritization for a long-term, evolving maritime passage is the most challenging for policymakers, but the following lists essential needs for the Bering Strait region.

- **Increase and update U.S. icebreaking capabilities.** The United States’ extremely limited and aging icebreaker fleet underscores the complete lack of past investment in the American Arctic. However, as geopolitical developments and human and commercial activity in the region increased, the debate over whether to construct new U.S. icebreakers ended with the decision by President Obama in August 2015 to accelerate the acquisition process and the Trump administration’s support of this procurement. An icebreaker can perform a multitude of tasks such as search-and-rescue operations, collecting and integrating data and information during a crisis, being a platform for scientific research, and offering resupply services to remote communities—all activities that increase national capabilities in the Arctic.

- **Implement a vessel traffic management system now.** The U.S. government efforts appear to be centered on the development of—at a minimum—a two-way vessel traffic scheme for the Bering Strait or maximally a vessel traffic management schedule with a full complement of navigation aids and Automatic Identification Systems (AIS). Once the findings of the Coast Guard’s PARS are released, discussion with the Russian government on the recommended route, information sharing, and potentially joint oversight of vessel traffic through the Chukchi Sea, Bering Sea, and Bering Strait should begin.

- **Focus on expanding AIS technology.** The remoteness and infrastructure limitations of the Bering Strait region make adequate tracking of and reporting on vessel activity difficult. The United States must prioritize investments in AIS, which monitors a vessel’s position, speed, cargo, destination, and other information that can be relayed to authorities like the Coast

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Guard in partnership with local communities, nongovernmental organizations (NGOs), and regional, state, and national authorities. The MXAK in Juneau is one such NGO that can serve as a central point for data collection, integration, and dissemination in the Bering Strait region. The MXAK has a network of contacts in private industry as well as local and national authorities. Could there be an opportunity to incorporate Russian vessel data into either the Marine Exchange itself or create a subset of the Marine Exchange where such joint information sharing could occur?

- **Support research centers like the Arctic Domain Awareness Center (ADAC) at the University of Alaska.** These centers infuse and enhance the capacity of DHS and the Coast Guard to respond to and prepare for emergencies in a challenging Arctic environment. They also offer educational opportunities in the fields of science, technology, engineering, and mathematics and promote opportunities in Arctic modeling data, fusion, and navigation simulation—key components of improving domain awareness in the Bering, Beaufort, and Chukchi Seas.

- **Enhancing communication and satellite capabilities is key.** Communications in the Arctic is a challenge. High altitude prevents the repositioning of geosynchronous satellites, the leasing of commercial satellite transponders, and the linking to fiber networks that would improve capability. Established U.S. military requirements for communications support for submarines, aircraft, other platforms, and forces operating in the high northern latitudes exist, but these requirements do not take into account increased Coast Guard operation as a result of accelerated Arctic melting. While the justification for developing new systems may not be present, it is worth considering the expansion of current commercial satellite communication networks already in place.

- **Promote pragmatic and confidence-building cooperation in the Arctic with Russia.** Although U.S.–Russian relations have dropped to Cold War lows, despite similar tensions in the past, Moscow and Washington have historically collaborated to improve stewardship in the Arctic. The 1972 Agreement on Cooperation in the Field of Environmental Protection and the Agreement on Cooperation in Combating Pollution in the Bering and Chukchi Seas represent cooperation that transcended larger geopolitical developments. Can the United States and Russia return to a pattern of bilateral cooperation in the

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15. Ibid.


Bering Sea Region? Building this cooperation in the Bering Sea region should begin with joint enforcement of the IMO Polar Code. Dialogue over the Coast Guard’s PARS study should be the impetus for an expanded discussion on approving a vessel traffic management system and the creation of a more robust network of shared data and information from AIS that can be readily shared and available for both governments, law enforcement agencies, and vessels. The two sides should also discuss protocols for search-and-rescue operations, IUU fishing, and oil spill response capabilities in the Bering Strait. These protocols could range from an exchange of contacts and information to simulations with local response teams from both countries as well as joint inventory of infrastructure capabilities located at regional stations with greater air and sea capabilities that could be at their disposal during an incident response. These bilateral discussions could occur on the margins of a meeting of the Arctic Coast Guard Forum. In March 2017, President Putin supported such discussions, reiterating U.S. and Russian interest in ensuring safe shipping as traffic increases in the Bering Sea region. He stated, “So there are specific regional issues that both sides have an interest in seeing resolved. Take the Bering Straits, for example, the shipping volumes and the intensity of navigation has increased dramatically. So, both the United States and Russia have an interest to ensure the safety and security of shipping in these waters.”

Although rapidly closing, there exists a brief bilateral window of opportunity to develop the needed infrastructure and protocols to jointly manage increased vessel traffic in a way that enhances safety and security and realizes the benefits of increased economic opportunity in the Bering Strait region. A slow yet steady increase in global demand for natural, mineral, and fisheries resources will likely see the NSR and Bering Strait experience a modest yet consistent increase in maritime traffic. Not only would these steps improve Arctic readiness and domain awareness across this region, but they would provide some needed stability to a deteriorating U.S.-Russian relationship.

Maritime Futures: The Arctic and the Bering Strait Region

A NEW OCEAN

Significant diminishment of the Arctic ice cap is propelling the advent of a new, blue-water ocean and, with it, new commercial and economic opportunities. Abundant natural and mineral resources, as well as rich fishing stocks, encourage Arctic and non-Arctic nations to explore these resources through the enhanced use of Arctic maritime transportation routes that seek to connect geographically distant economies more directly. As a result, the evolving commercial dynamics of Arctic international shipping—both destination and trans-Arctic—are beginning to change. Once considered dangerous and noncommercial, Arctic shipping routes—via the Northern Sea Route (NSR), the Northwest Passage, or the Transpolar Sea Route (TSR)—are increasingly scrutinized as potential economical alternatives to some of the world’s most popular maritime passages.

Today, one of the most closely scrutinized Arctic maritime routes is the NSR, a multitude of passageways along the Russian Arctic covering the Kara Sea, the Laptev Sea, the East Siberian Sea, and the Chukchi Sea. It is more specifically defined as “the water area adjacent to the Northern coast of the Russian Federation, comprising the internal sea waters, the territorial sea, the adjacent zone and the exclusive economic zone of the Russian Federation and confined in the East with the Line of Maritime Demarcation with the United States of America and Cape Dezhnev parallel in Bering Strait, with the meridian of Cape Mys Zhelania to the Novaya Zemlya Archipelago in the West, with the eastern coastline of the Novaya Zemlya Archipelago and the western borders of Matochkin Strait, Kara Strait and Yugorski Shar.”

Transit through the nearly 3,000-mile-long passage can take multiple forms. Vessels can begin in northern Europe, traverse eastward, and travel south through the Bering Strait before reaching markets in East Asia. Transit can also begin from Asia and the Pacific, travel northward through the Bering Strait, and either navigate the NSR or travel beyond the 200-nautical-mile exclusive

economic zone (EEZ) through the TSR to markets in Europe or North America on seasonal voyages. Vessel actively also occurs internally. Asia-Pacific-originating transit can be simply destinational—traveling northward to reach Russia’s Yamal Peninsula, then returning to Asian markets. The navigability of the NSR is in constant flux. Vessels traversing its waters are subject to varying and potentially dangerous conditions, giving the NSR a reputation as a compelling yet perilous route.

The Northern Sea Route: Reality and Myth

A shorter transportation route between Europe and Asia is an attractive possibility for European and Asian states seeking greater and quicker access to economies, as well as for shipping companies looking to reduce costs. While traveling at a constant speed, an increasingly ice-free Arctic will significantly reduce the length of transportation from western Europe to East Asia. It is important to note, however, that several realities limit the route’s potential. First, the NSR is ice free only during the summer months (June to September), resulting in a short shipping season. Second, the harsh operating environment places limitations on the types of vessels using the route. The Polar Code requires ships intending to operate in the Arctic to apply for a Polar Ship Certificate, which would classify the vessel (Category A, Category B, or Category C) based on the ship’s design, construction, and equipment, taking into account the anticipated range of operating conditions and hazards in polar waters. Ships carrying bulk cargo, like coal or oil, could benefit from a shorter trip; however, container shipping, which operates on tight delivery schedules, would see limited value due to the challenging shipping environment and resulting risks. Finally, a shorter trade route would be of value for ships traveling between northern Europe and East Asia, but would not be of value to other regions, reducing the global impact of the route. While China is expected to be the primary destination for trade through the NSR, its current level of trade with northern Europe is a very small percentage of its overall trade portfolio. For example, exports to Finland, Norway, Sweden, and Denmark totaled approximately $25.7 billion, representing roughly 1.08 percent of China’s entire exports in 2015. That same year, China imported approximately $16.57 billion of goods from the four northern European countries, representing only 1.3 percent of total imports. As China continues to seek new global markets, the value of trade with northern Europe will be quite modest in comparison with Southeast Asia and Africa, which diminishes the potential economic impact of the NSR.

The understandable skepticism surrounding the NSR’s use—now and in the future—is reflected in the number of transits over the past six years. In 2011, a total of 41 ships traversed the passage, 25 internal and 16 international (trans-Arctic). The majority of these traveled east through the passage, carrying resources including gas condensate, oil, iron-ore concentrate, and ballast from Russian ports to destinations in eastern Russia or Asia. Traffic through the NSR increased during the following years, reaching its peak in 2013 when there were 71 transits, 43 internal and 28 international (trans-Arctic). Since 2013, traffic has decreased, with only 19 recorded transits in 2016.

In the data from 2011 to 2015, the number of international or trans-Arctic transits slightly increased, while internal transits fluctuated.\textsuperscript{8}

Analysts suggest that the 2016 decline in internal and international vessel traffic is likely due to both depressed commodity prices and the realization by Asian customers that the risks and costs of utilizing the NSR are too high unless Russia upgrades and maintains its aging infrastructure.\textsuperscript{9} For comparison’s sake, an estimated 17,000–18,000 vessels transit through the Suez Canal annually, making the NSR a possible seasonal supplement to the Suez but not a replacement.

RUSSIA’S NORTHERN SEA ROUTE AMBITIONS

Proactive Policy Reinforced by Ambitious Financial Investments

Despite these sobering economic realities, in 2011 then Russian prime minister and now president Vladimir Putin announced that the NSR would be a rival to the Suez Canal, as the NSR reduces East-West or West-East transit by 35 percent and fuel costs by hundreds of thousands of dollars, based on the price of fuel and ice conditions.\textsuperscript{10} For example, a trip between Hamburg, Germany, and Yokohama, Japan, is 7,000 km shorter than using the Suez Canal, and the NSR would reduce the length of the trip from 22 to 15 days. In August 2017, the Christophe de Margerie, a Russian-built tanker operated by Novatek, became the first ship to complete the NSR without the aid of additional icebreaking vessels. It completed its journey from Norway to South Korea in 19 days. In an attempt to promote the route, the Russian government has allocated trillions of rubles to developing this Arctic waterway and the surrounding region and has initiated over 150 development projects over the past decade.\textsuperscript{11}

In 2008, Russia released its Transport Strategy of the Russian Federation up to 2030, which “emphasizes the need to develop the Northern Sea Route, the shipping along it, and the infrastructure on its shores.”\textsuperscript{12} Then in 2011, the Russian government announced that it would invest over 21 billion rubles to develop and secure the NSR, including the creation of monitoring and communications systems. Heavy investment plans led to lofty expectations. By the year 2020, the Atomflot chief of naval operations, Vladimir Arutyunyan, estimates the volume of transit goods on the NSR will grow to 15 million tons per year, while the Russian Ministry of Transport expects the volume of cargo transportation to reach 40 million tons by 2020 and 70 million tons by 2030.

\textsuperscript{8} Brigham, “Realities and Challenges of Russia’s Northern Sea Route.”


These estimates support Russia’s belief that the NSR will be a viable, nearly essential, international shipping route as Russia seeks to export its Arctic natural resources to global markets.13

In June 2015, the Russian government released the Integrated Development Plan for the Northern Sea Route 2015–2030. Broadly speaking, the plan emphasizes the need to provide safer and more reliable navigation for maritime export of Russian natural resource materials in addition to the strategic importance of the NSR for Russian national security.14 It also calls for an increase in transit cargo transportation along the route—particularly from East Asian nations—from roughly 4 million tonnes today to 80 million tonnes by 2030. Russia sees transport through the NSR as a virtuous economic circle. Revenue raised from the leasing of Russian icebreakers to escort vessels through the NSR as well as fees paid to Russia when ships sail through its EEZ are important revenue sources that sustain its economic model for NSR-specific infrastructure, as well as the operational costs of the Northern Sea Route Administration. However, recent budget constraints and the construction of new ice breaking carriers that can operate independent of ice breakers are changing this dynamic.

In its most recent declaration, in February 2017, the Russian government announced it would spend 209 billion rubles over the next three years to boost the country’s Arctic regions, which includes building a new nuclear icebreaker, supporting indigenous communities, and environmental monitoring.15 Russia’s ambitious investments in the Arctic centers on the Yamal LNG (liquefied natural gas) megaproject on the Yamal Peninsula surrounded by the Kara Sea. In 2014, the Russian state-owned energy firm Rosneft received approval to begin construction of two shipbuilding facilities, one at Roslyakovo and the other at Zvezda, to produce seagoing vessels and platforms for Arctic offshore development. Construction at Roslyakovo will begin in two years, while Zvezda will be operational by 2020.16,17

**Infrastructure**

Russia recognizes that to make the NSR an international transit route and functioning route for destination voyages, greater infrastructure is required. In 2009, Russia allocated 910 million rubles (approximately €20.6 million) to construct 10 search-and-rescue centers from Murmansk to

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Provideniya. In 2012, the Russian Duma adopted a new law regarding shipping along the NSR that stipulates that ships entering the NSR must use a Russian icebreaker escort or a pilot specialized in operating in icy conditions. This was followed by a declaration by Regional Development Minister Igor Slyuniaev in October 2013, which stated that the government intends to spend approximately $63 billion by 2020 to develop the region. An August 2015 announcement by Maxim Kochetkov, director of the department for shipbuilding and maritime technologies with the Ministry of Industry and Trade, outlined that Russia would invest nearly $91 billion to construct more than 1,200 ships, vessels, and maritime units by 2030. Russia has also invested in substantial administrative processes, such as the Northern Sea Route Administration, which became operational in March 2013. Despite these updates, the lack of sustained state financing as well as adequate external funding will challenge future plans to update Russia’s icebreaker fleet.

Upgrades to the Russian icebreaker fleet are ongoing and are a constant pillar of Russia’s Arctic policy. Currently Russia has over 40 publicly and privately owned icebreakers, including six nuclear-powered icebreakers, four Arktika-class heavy icebreakers (only two in service), and two smaller icebreakers of the Taimyr class, which are large, shallow draft icebreakers. Plans to construct nuclear and conventional icebreakers have been announced over the years, but uncertainty over the financing and investment in these projects raises doubt over their eventual completion. In 2016, Russia floated three new icebreakers: the diesel-electric Polaris (January 2016), the diesel-electric Ilya Muromets (June 2016), and the nuclear-powered Arktika (June 2016), which is expected to become the world’s largest icebreaker when completed in December 2017. Despite these updates, the lack of sustained state financing as well as adequate external funding will challenge future plans to update Russia’s icebreaker fleet.

Of the 10 proposed search-and-rescue centers, four are established today, including Naryan-Mar, Dudinka, Arkhangelsk, and Murmansk, and the additional six are set to be completed by 2020. There are also two Marine Rescue Coordination Centers (MRCCs) in Murmansk and Dikson, and

two Marine Rescue Sub-Centers (MRSCs) in Tiksi and Pevek. The NSR is also home to eight hydrographic bases, 1,240 coastal visual sights, and 300 floating marks. There are also 234 units of operational navigational equipment located along the NSR including coastal navigational text messages or navigational telex (NAVTEX) stations, as well as coastal stations and ports with satellite communication systems. Finally, the Russian Ministry of Transport recently proposed redesigning the Northern Sea Route Administration into an integrated logistics operator in the Arctic. This would include responsibility for regional hydrography, emergency, rescue, and preparedness, as well as the management of Russia’s nuclear-powered icebreakers.

Energy Resources: The Driving Force behind Current and Future Vessel Traffic

Today, the NSR is actively used by major oil and gas corporations as well as mining and shipping companies including Norilsk Nickel, Lukoil, Gazprom, Rosneft, Rosshelf, and Novatek to ship products and supplies to and from their plants, mines, and oil and gas fields. It is also a major route for Russia’s “Northern supply,” which delivers food, consumer goods, and fuel to the northernmost Russian settlements, such as Norilsk, with its estimated population of over 175,000. The crown jewel of Russia’s investment in the NSR is the Yamal LNG project based in the Sabetta port, located along the eastern coast of the Yamal Peninsula. Yamal LNG is an integrated project for natural gas production, liquefaction, and marketing. As of January 2017, investment in the $27 billion project totals $23.4 billion, and it is hoped that the investment will yield an estimated 926 billion cubic meters of liquefied natural gas from the South Tambe Field. Although Western sanctions prevent Russian companies from borrowing from the European Union, from U.S. banks, and on markets for more than 30 days, which limits long-term fund-raising for the Yamal project, China has become an alternative investor, financing approximately $12 billion. Two Chinese banks, the Export-Import Bank of China and the China Development Bank Corp, signed two 15-year credit lines for €9.34 billion ($10.7 billion) and 9.76 billion Rmb ($1.5 billion), respectively. China’s Silk Road Fund has also provided €700 million in exchange for a 9.9 percent stake in the project. The Yamal facility will have three production lines, each with an annual capacity of 5.5 million tonnes of LNG.

31. Ibid., 67.
Although most of the current vessel traffic along the Russian Arctic coast travels between Murmansk and Dudinka as well as along the Norwegian coast and the Barents Sea, forecasts predict that transportation of oil from Russian ports on the Barents Sea, particularly Murmansk, could increase by 50 percent by 2020.34 Once the Yamal LNG project begins production, domestic freight could grow up to an estimated 50 million tonnes by 2020.35 Russia clearly expects the Yamal LNG project to significantly increase infrastructure activity throughout the region to include an international airport, a port harbor and approach channels, vessel traffic management systems, navigational support aids, and marine service buildings.36

The eastern portion of the Russian Arctic will likely see less vessel traffic, although further plans to develop the Russian Arctic and its natural resources will lead to more bulk and LNG carriers traveling from Yamal to Asian markets through the Bering Strait. In January 2017, Russia announced that two emergency search-and-rescue centers located in Pevek and Anadyr in the Chukotka region are moving forward, with plans to construct a third center in Tiksi. All three centers located in the east section of the Northern Sea Route will operate under a common system for Arctic emergency response.37

At its annual Arctic Territory of Dialogue Forum held in Arkhangelsk in March 2017, President Putin reiterated Russia’s investment in the NSR, noting that the period of navigation along the route is expanding and inviting foreign nations to “make active use of the opportunities offered by the Northern Sea Route, which will cut transportation costs and delivery time for goods between Europe and Asia.”38 President Putin estimated that following the completion of the Yamal LNG project by the end of 2017, the volume of shipments via the NSR will immediately quadruple, as the Kremlin clearly places a high premium on the NSR’s development and its viability as a major trade route of the future.39 What is unclear is whether these shipping increases will materialize.

THE MISSING ARCTIC MARITIME LINK: THE BERING STRAIT REGION

Clearly, a high level of ambition from the Russian government and a great deal of funding and planning have gone into the process of making the NSR a potential major new shipping route. However, this stands in stark contrast to very minimal policy and budgetary focus by the United States for a region where a significant portion of future Arctic shipping will pass en route to or from the NSR: the narrow Bering Strait and the shared maritime border with Russia. While the

34. B. Brunstad, ed., Arctic Shipping 2030: From Russia with Oil; Stormy Passage, or Arctic Great Game? (Oslo: Econ Poyry, 2007), 14.
35. Ibid.
36. “Yamal LNG infrastructure.”
38. “Arctic: Territory of Dialogue.”
39. Ibid.
economic benefit for Alaska and the United States is limited, focus should be on governance where U.S. efforts have been more significant.

The Bering Strait represents (1) a critical link between the resources of the Arctic and consumers in rapidly growing Asian markets; (2) a vital passage for local, barge, and seasonal destination traffic for Alaska; and (3) the maritime demarcation border between the United States and Russia. The Bering Strait region is surrounded by indigenous communities with a highly productive ecosystem and an abundance of animal species.
In its Arctic Strategy, the U.S. Coast Guard identified the Bering Strait as a priority area where maritime safety, security, and environmental responsibility must be enhanced. Although there is currently minimal and seasonally dependent transit through the Bering Strait, there are well-documented challenges and shortcomings to ensuring safe shipping. A 2005 report by the Coast Guard highlighted the limited maritime domain awareness, defined as “an effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment of the United States and identifying threats as early and as distant from our shores as possible,” and a lack of preparedness in the Bering Strait, which included infrastructure for sensing, collecting, fusing, analyzing, and disseminating information to respond to contingencies and appropriate presence to monitor, regulate, and respond to threats and hazards. In the 12 years since, maritime domain awareness has improved, with local Automatic Identification System (AIS)-based tracking systems, increasing infrastructure to collect, analyze, and share information, and points of access including airports in Nome and Kotzebue. There remains, however, a lack of deepwater ports, vessel traffic management systems, and accurate hydrographic mapping, and communication systems are weak.

The Bering Strait also serves as a maritime boundary separating Russia and the United States, making bilateral cooperation to ensure safe and secure shipping, as well as enhancing response and readiness protocols for maritime incidents, absolutely essential and a prerequisite for greater maritime use. Regional leaders and government officials have held numerous discussions to exchange information and establish norms to regulate vessel traffic, but there has been little concrete action thus far. There is new urgency to this task with the mandatory implementation of the International Maritime Organization’s Polar Code.

One cannot dispute that in general the Bering Strait region has received insufficient policy attention. While the Russian development strategy for the NSR is well documented, beyond fisheries issues the U.S. strategies for the Bering Sea, Bering Strait, and Chukchi Sea are lacking. At less than 82 km, or 51 miles, wide, the Bering Strait has been described as a strategic choke point which military strategists routinely fail to recognize. What the region is missing is an established vessel routing system.

Frozen for more than half the year, and with a shipping season that lasts approximately five months (July–November), transits of the Bering Strait have been inconsistent but steadily increasing. In 2008, there were 220 transits; in 2010, there were 410; in 2012, there were 480; and in 2014 and 2015, there were 340 and 540, respectively. The increase in traffic is predominately on the Russian side of the Bering Strait and is represented by a diverse range of vessels from tanker, cargo, tug, towing, passenger, fishing, search and rescue, military, and law enforcement. While

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42. Ellis and Brigham, Arctic Marine Shipping Assessment 2009 Report, 5.
demonstrable increases in vessel traffic through the Bering Strait are subject to variables such as commodity prices, insurance costs, and environmental regulations, an increase in demand for natural and mineral resources will result in an uptick in destination shipping, which supports and serves mines, oilfields, and other industries in northern Alaska, northwestern Canada, and north-eastern Russia.44 Two particularly important mines in the Arctic are the Alaskan Red Dog zinc mine (located about 80 miles north of Kotzebue in the Northwest Arctic Borough) and the Russian Norilsk Nickel mining complex. The Red Dog Mine is one of the world’s largest zinc mines, with activity first documented in the 1950s. Today, an average of 9,800 tons of ore (zinc and lead) are extracted per day.45 The mine is also critical to the livelihood and vitality of the local community. Operations employ 715 people, contributing close to $160 million annually in goods and services from Alaska-based suppliers and local communities. Since mining began, about $140 million has been provided to the Northwest Arctic Borough (NAB), over $800 million to state government agencies, and over $695 million to federal government agencies. Furthermore, over the past four years, the Red Dog Mine has contributed $2.8 million in community investment and donations in the region.46 Vessel traffic to and from the Red Dog Mine typically lasts for three months and includes approximately 20 to 25 large bulk carriers. NANA Regional Corporation, the owner of the land on which the Red Dog Mine is located, currently has no plans to increase production or vessel traffic, envisioning production stability for the foreseeable future. There is therefore a minimal need for enhanced infrastructure and domain awareness capabilities in the surrounding area.

In the central and western Russian Arctic, the industrial city of Norilsk—250 miles north of the Arctic Circle—is home to the Norilsk mining complex that is serviced using a rail system to the port of Dudinka on the Yenisey River. The complex is one of the world’s largest producers of nickel and palladium. It yields 17 percent and 41 percent of the world’s production, respectively, representing approximately 2 percent of the Russian GDP.47 The mine represents 4.3 percent of all Russian exports, and 2.8 percent of total industrial output.48 Norilsk Nickel maintains a cargo fleet of five reinforced ice-class vessels and one tanker that provides year-round cargo service between seaports including Dudinka, Murmansk, Rotterdam, and Hamburg. In 2010, the company shipped 10,000 metric tonnes of metal and coal to Asia and planned to double its shipments by 2016, but


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Norilsk likely missed this target due to a reduction in Chinese demand for industrial metals in 2016.49 In 2011, Norilsk vessels made 54 voyages carrying 1.104 million tonnes of cargo. Many of these vessels traveled from the mine through the Bering Strait on their way to ports in Asia. In September–October 2011, the company’s Arctic-class container ship, Zapolarnyy, made a direct voyage from Murmansk to Dudinka to Shanghai, the shortest route connecting Norilsk Nickel production sites to customers in Southeast Asia. The voyage took approximately 20 days to reach Shanghai from Dudinka, roughly 45 fewer days than the traditional route through the Suez Canal.50 If, as expected, investment in the mine continues, the Bering Strait will receive an increase in vessel traffic.

While the Red Dog and Norilsk Nickel Mines are two commercial examples that contribute to current and future vessel traffic flows through the Bering Strait, future traffic patterns are difficult to predict. Factors that will increase accessibility and usage through the Bering Strait will be influenced by weather and hydrographic mapping such as sea ice extent and ice floes. The cost of insurance coverage and commodity prices also affect future investment decisions.51 There are currently plans under consideration to develop two new mines in the American Arctic—a copper mine in the Ambler Mining District, located 180 miles southeast of the Red Dog Mine, and a coal mine on the North Slope south of Point Lay in Alaska.52 If these two mines are developed, vessel traffic through the Bering Strait will increase in volume and diversity of vessels. Increased employment, the need for additional housing, and services such as hospitals, communication networks, and transportation routes will be required. Among the most important infrastructure projects will be ports that can accommodate large cargo ships, resupply, and passenger vessels, as well as roads.

While the present volume of traffic through the Bering Strait is very modest compared with other regional ports or transit areas such as the Aleutian Islands, commercial vessels using the strait operate in an ecologically rich area, among communities and animal populations with little experience with large-scale vessel traffic, and far from assistance or support.53 For example, the nearest permanent Coast Guard facility is on Kodiak Island, Alaska, over 1,000 miles from the Bering Sea region by sea.54 The nearest U.S. deepwater port is Dutch Harbor in the Aleutians, over 800 miles from the Bering Strait. Thus, the state of readiness and needed infrastructure to address either a mass casualty or an environmental incident are limited. The definitive 2009 Arctic Council-mandated Arctic Maritime Shipping Assessment noted that a lack of infrastructure will be a limiting reality for future Arctic marine operations, with the exception of the more developed northwest coasts of Norway and Russia.

52. Ibid., 27.
DIVERGENT POLICIES AND A LACK OF INFRASTRUCTURE IN THE BERING STRAIT REGION

Plans to develop infrastructure in the Bering Strait region are simply that: plans or a series of studies of the plans. This state of play is reflective of the divergent economic development and environmental protection strategies Russia and the United States have for their respective Arctic regions. Russian activity in the Arctic region has focused on economic development of the NSR and its natural resources, the protection of sovereignty and the projection of military strength, particularly of its nuclear deterrent based on the Kola Peninsula. The Russian government has clearly stated its development and military priorities in such documents as the Russian Strategy of the Development of the Arctic Zone and the Provision of National Security until 2020, which details substantial expansion of infrastructure in the Russian Arctic to include airfields, search-and-rescue stations, deepwater ports, and air defense radar stations. The Russian government places a premium on promoting Russian economic, military, and scientific advances in the Russian Arctic, and President Putin has invested his personal prestige and interest in showcasing Russia’s growing power and presence in the Arctic. This was evident during President Putin’s March 2017 visit to inaugurate the opening of its new Arctic military outpost, Trefoil.

In contrast, when it comes to U.S. Arctic policy, recent U.S. administrations have prioritized scientific research and understanding, mitigation of the effects of climate change, enhancing environmental protection, and addressing the needs of northern populations with passing reference to U.S. national security interests and infrastructure needs in the region. These goals are outlined in the 2013 U.S. National Strategy for the Arctic Region and the 2015 Arctic Implementation Plan, and largely executed by the National Science Foundation, among others, which requested approximately $450 million in funding for FY 2016 for its Division of Polar Programs for research, education, and infrastructure in both the Arctic and Antarctic. Despite its unquestionable role as a science power in the Arctic, the United States, with limited population and infrastructure in the American Arctic, has never developed a detailed, forward-looking, and resourced agenda to sustainably develop the American Arctic. If anything, U.S. economic engagement in the American Arctic has swung widely from prohibiting offshore and onshore exploration leases in the American Arctic and increasing marine protected areas to renewing offshore and onshore leasing options. Royal Dutch Shell’s decision to end its Arctic offshore exploration activities in the Chukchi Sea in 2016 was a further blow to the future development of the region. U.S. efforts to develop the

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necessary infrastructure to accommodate greater shipping activity have not gone beyond the discussion phase.

Although the Trump administration has yet to formally outline its Arctic policy or name key personnel, early indications are that the U.S. Arctic is gearing up for a new wave of economic investment. The White House rescinded the previous administration’s executive order, thus withdrawing hundreds of millions of acres of federally owned land from offshore oil and gas drilling and preventing economic development in America’s Arctic. The Trump administration’s executive order instructs the Interior Department to revise the current five-year Outer Continental Shelf Oil and Gas Leasing Program. The Trump administration recently reopened the possibility of companies bidding on U.S. offshore Arctic blocks in the Chukchi Sea as well as potentially reopening onshore exploration in the Alaskan National Wildlife Refuge (ANWR). The Interior Department is also reviewing changes to Arctic drilling regulations. Despite these policy shifts, depressed oil prices mean new ventures are unlikely during the next decade. It is also unclear whether federal funds will be used to enhance Arctic infrastructure needs, although the state of Alaska has provided the White House with its infrastructure “wish list” as have other states.

**U.S. Assets in the Bering Strait Region**

As the maritime component of the U.S. Department of Homeland Security, the Coast Guard maintains specific statutory responsibilities in the American Arctic in addition to a fleet of cutters which regularly patrol the Bering Sea, boats, aircraft, shore infrastructure, and communication capabilities. In its May 2013 Arctic Strategy, the Coast Guard identified the need to improve maritime domain awareness in the Arctic as one of its three strategic objectives over the next ten years. Maritime domain awareness impacts the security, safety, environment, and economy of the surrounding mainland and is aided by real-time exchange of information and reporting from sensors, analysis tools, technologies, and partnerships. However, there is simply a paucity of air and sea infrastructure along Alaska’s western and northern shores with which the Coast Guard can work. Although Nome, Alaska, has a small, modern harbor with a 175-foot pier, it has a depth of only 21 feet, which is too shallow to accommodate large vessels. There is a pier and loading facility north of the Bering Strait designed to support mining operations with barges, but deep-draft vessels must anchor offshore. There is a commercial airport in Nome, but two other airports in Barrow and Deadhorse Prudhoe Bay are hours away via air.\(^{59}\)

Within the state of Alaska, the Coast Guard’s District 17 maintains a physical presence in numerous cities ranging from the southeast tip of Ketchikan to Cordova and Kodiak in the south and as far inland as Fairbanks. However, the Coast Guard’s most critical posts for operating in the Bering Strait are based in Kodiak, Unalaska in the Aleutian Islands, Kotzebue, and Sitka. Significant amounts of the Coast Guard’s assets are stationed at Base Kodiak in Kodiak, Alaska. The base is equipped with an air station including multiple hangars that house HC-130Hs, MH-60Ts, and MH-65Ds used for critical response missions. The helicopters complement three cutters—the U.S. Coast Guard cutter (USCGC) *Munro*, USCGC *Spar*, and USCGC *Alex Haley*. The base is also home to an Aids to Navigation Team (ANT) which is responsible for the operation of 71 beacons

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throughout Alaska that mark navigable channels, waterways, and hazardous obstructions. Air Station Kodiak also supplies assets for seasonal Forward Operating Locations (FOLs) in Cold Bay, Barrow, Cordova, and Deadhorse. FOLs are critical in extending the Coast Guard’s operational reach and its presence in isolated areas and often contain key infrastructure such as airports and hangars. Cold Bay Airport has one of the longest runways in the state and one of the few in western Alaska that can accommodate major aircraft. There are also two hangars that house MH-60T helicopters, increasing the Coast Guard’s access to Bristol Bay, the Bering Sea, and the Aleutian Islands. Barrow is the northernmost city in the United States, situated north of the Arctic Circle. The FOL in Barrow consists of two MH-60 Jayhawk helicopters with supporting air, ground, and communications crew. FOLs at Cordova and Deadhorse are also equipped with hangars for MH-60 Jayhawk helicopters. These FOLs enhance the Coast Guard’s capabilities and reduce travel time during the summer months when maritime traffic increases and incidents at sea are more likely.

In addition to the FOLs, there are several current and potential Coast Guard posts—Unalaska, Kotzebue, Port Clarence, and St. Paul Island—whose close proximity to the Bering Sea increases the Coast Guard’s search-and-rescue capabilities. Unalaska, the largest city in the Aleutian Island chain, is home to Dutch Harbor, the Unalaska Marine Center, and the Coast Guard dock. In 2016, the Coast Guard established a seasonal base in Kotzebue that houses two MH-60 Jayhawk helicopters from July 1 through October 31. Facilitating the facility at Kotzebue allows the Coast Guard increased access to the Bering Sea when conducting search-and-rescue missions while reducing the distance between the body of water and the service’s more permanent bases. The hanger has previously been used by the Coast Guard as part of Operation Arctic Shield, an exercise designed to improve awareness and promote U.S. interests in the Arctic. Port Clarence is located approximately 80 miles northwest of Nome, 75 miles south of the Arctic Circle, and 85 miles east of Siberia. It is the closest Coast Guard installation to the Bering Strait. The U.S. government–owned airport is primarily used for resupply purposes. In the early 1960s the Coast Guard commissioned the construction of a Loran-C tower, a navigation system used to guide mariners and aviators during World War II. The system was decommissioned in 2010 as Global Positioning Systems (GPSs) began to proliferate, rendering Loran-C obsolete. Located on St. Paul Island is a Coast Guard forward-operating base dating back to World War II. It is located more than 650 miles from Coast Guard Air Station Kodiak, and transit to the base from the air station takes about seven hours including a refueling stop. Although the Loran Station was shut down in 2010, the port’s strategic proximity to the Bering Strait makes it valuable for future operations. The Coast Guard has thus been hesitant to divest the property.

The Coast Guard’s most significant presence is a pair of cutters that are on continuous patrol of the Bering Sea, including the Alex Haley. Coast Guard patrols in this region date back to the 1940s. Additional support is provided by the Coast Guard’s Fixed Wing aircraft, which can conduct search and rescue missions in support of the Sea Dog Line and other vessels in the region. In recent years, the Coast Guard has increased its presence in the Bering Sea to address issues related to illegal fishing and drug smuggling. The increased presence has resulted in more successful interdictions and seizures of illegal fishing vessels. Overall, the Coast Guard’s presence in the Bering Sea is critical to ensuring maritime safety and security in this region.
Second World War. The USCGC Alex Haley’s primary objectives are to enforce fishery laws and commercial fishing vessel safety. The Alex Haley’s operational capabilities are enhanced by its ability to deploy an MH-65 Dolphin helicopter crew to respond to search-and-rescue missions.63

Deficiencies in Bering Strait Region Capabilities and Domain Awareness

Despite these assets, there are still gaps in critical infrastructure. One vital deficiency is the lack of U.S. icebreaking capabilities. The United States has only two functional polar icebreakers that must serve U.S. national security requirements for both the Arctic and Antarctica: one heavy icebreaker, the Polar Star, commissioned in 1976, reactivated in 2012, and taken out of dry dock to extend its service for approximately ten years; and the Healy, a medium-strength icebreaker commissioned in 2000 and mostly used for scientific research. The United States has a third, heavy icebreaker, the Polar Sea, which will not return to service and has been cannibalized for parts.64 Icebreakers are multipurpose in function to include defending national sovereignty, securing access to remote areas, and providing assistance to non-ice-hardened vessels including general traffic and search-and-rescue missions.

The Obama administration announced in September 2015 that the United States would accelerate the acquisition of new Coast Guard icebreakers by two years, with construction set to begin in 2020. Congress has appropriated $1 billion for the purchase of one new heavy icebreaker; however, the Coast Guard’s FY17 budget saw an increase of $150 million in its icebreaker acquisition budget. In February 2017, the Coast Guard determined that its second heavy icebreaker—the Polar Sea, which has been dry docked—was beyond repair and too costly to refurbish. That same month, the Coast Guard initiated the first step in the acquisition process by awarding five firm fixed-price contracts for heavy polar icebreaker design studies and analysis worth a total value of approximately $20 million. The studies are expected to take 12 months to complete before a draft request for proposal (RFP) for detail design and construction is issued by the end of FY 2017. The final RFP will be released in FY 2018, and a single contract for design and construction of the heavy icebreaker will be awarded in 2019. If this timeline holds, construction will tentatively begin in the last quarter of 2019 or in 2020.65 Barring any delays, the icebreaker should be delivered by 2023, although there is some optimism that the icebreaker could be tested by 2022. In September 2017, the U.S. Senate passed a $692 billion National Defense Authorization Act (NDAA) that approved the construction of up to six Arctic icebreakers and allowed the Coast Guard to enter into contracts with the Navy for the procurement of new icebreakers.66 Despite this momentum, the Coast Guard does not have an interim plan between 2017 and 2023 to enhance U.S. icebreaking capabilities, which is a significant vulnerability, or any heavy icebreaking capacity should the

64. Heather A. Conley, “To Build or Not to Build an Icebreaker? That Is the $1 Billion Funding Question,” CSIS Commentary, September 1, 2015, https://www.csis.org/analysis/build-or-not-build-icebreaker-1-billion-funding-question.
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Polar Star experience a catastrophic mechanical failure that would cause it to no longer be seaworthy. However, in front of congressional leaders on the House Subcommittee on Coast Guard and Maritime Transportation in June 2017, Vice Admiral Charles Ray noted that the Coast Guard would be interested in sending representatives to observe an ice trial of the private vessel Aivik. Aivik was originally built to support Shell’s offshore Arctic drilling, but Shell’s departure left the owners open to leasing the vessel. A challenge the Coast Guard has confronted for decades, and continues to grapple with today, is the size of its acquisition, construction, and improvements account. Given the range of cutter, aircraft, and shoreside assets that require renewal and replacement, partial funding identified for a polar icebreaker cannot be easily accommodated.

Beyond physical infrastructure, Arctic operations require reliable command, control, communications, computers, and information technology (C4IT) capabilities. The high latitude of the Arctic presents challenges for the propagation of radio signals, geomagnetic interference, and limited satellite coverage and bandwidth. Some communities in the Arctic have cellular phone networks, but with limited—although improving—broadband coverage, capacity, and reliability. Arctic states including Norway, the United States, Russia, and others are increasingly using and developing satellite networks to track and monitor maritime traffic. The Canadian Armed Forces, the United States, Denmark, and Norway are engaged in a cooperative program known as the Enhanced Satcom Project that will use a satellite or satellites to provide 24/7 communications in the High North. The project is expected to be launched around 2024. Canada is also preparing for the launch of a new series of surveillance satellites, the Radarsat Constellation Mission, which uses three radar-imaging satellites to conduct maritime and Arctic surveillance. In 2010, Norway launched the AISSat-1 satellite to improve domain awareness along its coast and in the High North. The AIS system engages AIS transponders on vessels greater than 300 gross tons that broadcast data such as vessel speed and course. The information is shared among the Norwegian military and the Norwegian Coastal Administration. AISSat-2, a second satellite, was launched in 2014 and allows for further monitoring of fisheries, oil spills, and maritime traffic. A third satellite, AISSat-3, is scheduled to launch in 2017. Combined with other AIS tracking systems, including the Norwegian Automatic Identification System (NOR AIS-2), the ability to monitor maritime activity in the Norwegian High North is greatly enhanced. In 2016, the Norwegian Coast Guard along with the Norwegian Cyber Defense Force and the Ministry of Defense established broadband communication as far north as the North Pole using an old Skynet 4B geostationary satellite.

The National Aeronautics and Space Administration (NASA) and the Norwegian Mapping Authority are partnering to develop a satellite laser-ranging station in Ny-Ålesund, Svalbard, 650 miles from

the North Pole. The station will monitor the changing environmental conditions in the Arctic including changes in ice sheets to improve marine transportation. The aim is to have all systems operational by 2022.72 Within the United States, NASA and the National Oceanic and Atmospheric Administration (NOAA) have partnered on the Joint Polar Satellite System (JPSS) project. JPSS is a series of polar-orbiting environmental satellites that monitor atmospheric, terrestrial, and oceanic conditions. The first satellite in the constellation was launched in October 2011. Four additional satellites are scheduled to launch between October 2017 and 2031.73 The system provides information on weather and environmental conditions. Furthermore, the National Geospatial-Intelligence Agency continuously monitors developments in the Arctic through its numerous satellite programs. This past February, the agency, along with the National Science Foundation’s Polar Geospatial Center and Esri (a mapping and special analytics firm) announced that its ongoing Arctic Digital Elevation Model (ArcticDEM) program mapped an additional 7.5 million square kilometers of the Arctic. The project has now mapped more than 65 percent of the region, and it hopes to complete total coverage of the Arctic landmass by December.74 Russia has also developed a plan to use satellites to improve domain awareness in its Arctic territory. The Arktika, a proposed system composed of 10 satellites in four different constellations, is designed to improve communications, meteorology, and surveillance in the polar regions and the Arctic Ocean. The first satellite is set to launch in 2018. The Russian Federal Space Agency is also developing an Arctic component to its GLONASS (global navigation satellite system) capabilities, a system that will improve Arctic navigation.

Hydrographic charting is very limited in the Arctic. An estimated 4.7 percent of the U.S. maritime Arctic is charted to modern international navigation standards. This presents an increasing concern as maritime traffic increases across the region. Charting the U.S. Arctic to proper standards is a catch-22—the vastness, remoteness, and unpredictable seasonal ice conditions result in shorter hydrographic survey seasons and present challenges for ongoing survey operations.75 Further complicating the task is a lack of geospatial and oceanographic infrastructure to support nautical charting and accurate positioning services along the coasts of the Chukchi and Beaufort Seas. Gaps in geodetic coverage, tides and currents, hydrographic surveys, and shoreline mapping, some of the building blocks of nautical charts, pose an additional challenge.76

76. Ibid.
Efforts to improve domain awareness are ongoing. Sixteen different U.S. federal agencies, departments, and offices implement a variety of scientific monitoring and research programs that track ongoing meteorological and environmental change in the Bering Strait region. The Commerce Department’s NOAA operates space-based satellites. Specifically, the satellites monitor ice and atmosphere properties that allow NOAA to forecast and warn of events such as rapid sea ice formation and emerging storms. NASA operates multiple aircrafts, including the P-3, HU-25C Guardian Falcon, and ER-2, to study Arctic sea ice. The Guardian Falcon is equipped with a laser instrument that measures changes in ice elevation and a high camera system to map land ice. The ER-2 is NASA’s high-altitude aircraft equipped with the Multiple Altimeter Beam Experimental Lidar (MABEL), which uses lasers and photon detectors to take measurements of sea ice, glaciers, the open ocean, and the atmosphere. In March, NASA took part in the Operation IceBridge program currently maintains 105 reporting buoys in the Arctic Ocean, and plans are underway to deploy additional buoys to remote parts of the Bering Sea. The data collected informs sea ice forecasting, which is critical for the summer months when ship traffic in the region increases. However, these assets, and most importantly their data, present an incomplete picture that falls short of providing the maritime domain awareness needed for safe shipping through the Bering Strait. Even if there were sufficient integrated data, however, limited networks of information and

inaccurate GPS readings due to high altitudes weaken signals and make current technology less effective. There are no immediate solutions to this lack of maritime domain awareness.

One way to mitigate the challenges of minimal domain awareness could be the deployment of operational ocean observing platforms (OOP). These platforms collect data on various ocean and biological conditions and serve as field laboratories for scientists. They vary in design and include such things as ships, buoys, Argo floats, surface drifters, remotely operated vehicles, autonomous underwater vehicles, satellites, aircraft, unmanned aerial vehicles, high frequency (HF) radar, or drilling platforms. Other forms of physical presence include FOLs, which are designed to reinforce permanent infrastructure in remote areas. The Coast Guard uses FOLs during the summer and winter, allowing for greater access and shorter response times to maritime accidents. FOLs have been placed in Kotzebue, Barrow, Cold Bay, Deadhorse, Cordova, St. Paul Island, and Nome. However, the possibility of a permanently manned FOL response base near the Bering Strait by 2020 is very limited.

Finally, one of the most significant shortcomings in the region is simply the lack of deepwater ports, of which there are few in U.S. or Russian waters, near the Bering Strait. The closest U.S. deepwater port is Dutch Harbor in the southern Bering Sea, which is over 800 miles from the Bering Strait. Surrounding the strait, there are three ports in Alaska that actively service vessel traffic: Nome, Kotzebue, and the DeLong Mountain Transportation System (DMTS) port serving the Red Dog Mine. However, the water depth at these ports does not exceed 10 meters, severely restricting the number and type of vessels able to dock. Similarly, the nearest deepwater port on the Russian side is Provideniya, which is approximately 170 miles from the strait. Russia does, however, have smaller ports surround the strait, which include Egvekinot, Anadyr, and Beringovsky, but without the ability to service larger vessels, these ports will not be able to accommodate the larger oil tankers and LNG carriers that are expected to traverse the strait on their way from Arctic oil fields to Asian markets.

Limited infrastructure, capabilities, and domain awareness pose significant navigational challenges in the Bering Strait. Recent analysis shows there are no federally maintained navigation aids along the northern coast of Alaska, and only nine fixed aids exist north of the Bering Strait. This lack of U.S. infrastructure and modern communication for such a narrow strait is sobering.

A PROPOSED BERING STRAIT VESSEL TRAFFIC MANAGEMENT SYSTEM

The United States and Russia implement dramatically different economic development strategies and infrastructure investment plans for the Arctic. These two divergent economic paths meet in the narrow Bering Strait, which will increasingly become a strategic corridor to and from the Arctic. The lack of hydrographic data, marine charts, complete and adequate coverage of communications, environmental monitoring of changing weather patterns and ice networks, search-and-rescue capability, environmental response capacity, ship monitoring and tracking, and aids to navigation, hinders national and international response to life-threatening incidents or oil spills. Developing these capabilities—nationally, bilaterally, and potentially multilaterally—will greatly improve Arctic maritime safety. It is thus essential to develop safety protocols to handle an increase in vessel traffic through the Bering Strait region and establish a formal vessel-traffic management scheme.

Having recognized the dangers of increased vessel traffic and a deficiency in domain awareness infrastructure in the Bering Strait region, the Coast Guard initiated a Port Access Route Study for the Bering Strait in 2010 to increase the efficiency and safety of vessel traffic in the region. At the conclusion of the study, the Coast Guard proposed a four-mile-wide, two-way shipping route that starts at Unimak Pass in the Aleutian Islands, wraps around Nunivak Island, and travels north through the strait. By proposing such a route, commercial fishing areas and environmentally sensitive areas are avoided. Six years after the study’s commission, a 1,700-passenger cruise ship, the Crystal Serenity, traversed the Northwest Passage and through the Bering Strait with key concerns being a lack of updated nautical charts, minimal navigation aids, poor communication systems, and a lack of infrastructure. The implementation of the now seven-year-old commissioned study’s recommendations is unclear. In December 2016, President Obama issued an executive order requiring the Coast Guard to relay its conclusions of the study to the IMO to facilitate development of the new measures by 2018.

A complement to a traffic management scheme is the development of a vessel-tracking system that uses terrestrial-based stations for real-time updates as well as satellite receivers for intermittent updates to promote safe and secure maritime operations. The system would include an updated inventory of vessel activities, compilation of risk assessments, implementation of risk reduction measures, monitor compliance, and aid in effective response by locating response vessels and assists with command and control of emergency response assets. A vital element of such a vessel-tracking system is the development of comprehensive AIS, which monitors vessel position, speed, cargo, destination, and other information that can be relayed to authorities such as the Coast Guard. The Bering Strait does not enjoy such a comprehensive vessel-tracking system. Instead, the Coast Guard relies on partnerships with NGOs and local knowledge. One

such NGO is the Marine Exchange of Alaska (MXAK), a nonprofit, public-private partnership based in Juneau, Alaska, that currently operates over 95 AIS receivers along Alaska’s coast, spanning Prudhoe Bay in the north to Adak in southern Alaska. MXAK maintains a robust network of partners including the Coast Guard, operators from the fishing and cruise industries, and oil spill response organizations. Unfortunately, vessels are not required to subscribe to MXAK’s database or communication system, and MXAK can access position reports and display data only with written permission of the vessel owner or operator.

U.S.-RUSSIAN RELATIONS IN THE BERING STRAIT REGION

Relations between the United States and Russia in the Arctic have been relatively immune to increasing bilateral tensions. This immunity is due in part to the lack of prioritization of the Arctic by the United States and the functional need for broad international cooperation in the pursuit of science and environmental protection, which are the priorities of U.S. Arctic policy. For Russia to realize its Arctic economic ambitions, it requires a stable and benign political and economic environment, although this has been disturbed since the 2014 imposition of Arctic-specific U.S. and EU sanctions that prohibited European companies from engaging in the sale, supply, transfer, or export of technology that could be used in offshore oil exploration north of the Arctic Circle or shale projects closer to the Russian coastline. Multilateral governance structures, such as the Arctic Council, the Arctic Coast Guard Forum, and the IMO, also help ameliorate bilateral frictions. As Arctic coastal states and members of the Arctic Council premier international body that governs activity in the Arctic, Russia and the United States were instrumental in the passing of two legally binding agreements—the 2011 Agreement on Cooperation and Aeronautical and Maritime Search and Rescue in the Arctic and the 2013 Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. The Coast Guard and its Russian counterparts have also cultivated bilateral ties through two Coast Guard Forums: the North Pacific Coast Guard Forum, established in 2000, which focuses on maritime security, illegal trafficking, combined operations, emergency response, fisheries enforcement, and information exchange; and the Arctic Coast Guard Forum, established in 2015, which seeks to improve coordination related to shipping, search-and-rescue operations, and scientific research.

Cooperation between the United States and Russia is also evident within the International Maritime Organization (IMO), where in 2014, the organization adopted a mandatory Polar Code, which recently came into force (January 2017). The Polar Code sets mandatory standards for ships operating in the polar regions that are designed to protect surrounding ecosystems as well as vessels traversing harsh and remote waters. Regulations build off two existing conventions promoting safety and environmental standards: the International Convention for the Safety of Life at Sea (SOLAS) and

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the International Convention for the Prevention of Pollution from Ships (MARPOL).91 SOLAS specifies minimum standards for the construction, equipment, and operation of ships at sea, while MARPOL addresses pollution prevention in sensitive marine environments and includes regulations controlling toxic discharges from ships. Amendments have been added to both conventions in recent years to further enhance safety for both seafarers and passengers in unpredictable environments.

In 2015, initial U.S.-Russia agreement led to several rounds of negotiations culminating in a nonbinding declaration92 to preventatively place a moratorium on fishing in the central Arctic Ocean until further studies of conditions and fish stocks are complete. The declaration spurred broader discussions to include states outside the five littoral nations and organizations such as

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the Pew Charitable Trusts. In addition to the five Arctic coastal states—the United States, Canada, Russia, Norway, and Denmark—Iceland and increasingly active non-Arctic states such as China, Japan, South Korea, and the European Union participated. Negotiations are ongoing, and several issues remain, including exploratory fishing as well as the potential establishment of one or more regional fisheries management organizations or agreements for the central Arctic Ocean.93

Contrastingly, bilateral initiatives between the United States and Russia are few and far between. There has been little progress in developing shared bathymetric data of the Bering Strait, although current maps of the U.S. side are considered "adequate for understanding the general structure of the seabed and the shoals in the vicinity of St. Matthew, St. Lawrence, King, and the Diomede Islands, Fairway Rock and extending north of Cape Prince of Wales."94 Chart coverage is considered poor for the Bering Sea Northern with the only modern harbor chart available at Nome, Alaska, and deep-draft navigation information at the port at the Red Dog Dock. All other navigation in the area is based on local knowledge and experience.95 The shoreline of the Bering Strait, to include the islands of St. Matthew and St. Lawrence, are mapped and maintained from analog data as derived from U.S. mapping efforts from 1949–1952, with an update only to the south shore of Kotzebue Sound. Norton Sound and the Yukon delta remain unmapped.96 Information on the Russian side is inadequate.

U.S.–Russian bilateral successes in the Bering have been very narrowly constructed and incremental. Focus has centered on cultural, environmental, and fisheries protection highlighted by the Shared Beringian Heritage Program of 1991, which increases links between indigenous populations and preserves shared cultures on both sides of the Bering Strait. The program is the result of efforts to expand cooperation between the United States and the then Soviet Union in environmental protection and the study of global change. Recent projects include work on marine mammals, sea ice patterns, reindeer herding, and documentation of local traditions, language, and culture.97 In 2012, then U.S. secretary of state Hillary Clinton and Russian foreign minister Sergey Lavrov signed an agreement to work toward a proposed Transboundary Area of Beringia, a specially protected natural territory that would link the Beringia National Park in Chukotka, Russia, with the Bering Land Bridge National Preserve and Cape Krusenstern National Monument in Alaska.98 Despite a published draft Memorandum of Understanding, the agreement was shelved, and ultimately it unraveled due to opposition to the proposed agreement and Russia’s 2014 annexation of Crimea. There also have been bilateral discussions related to fisheries beginning with the 1988

95. Ibid.
96. Ibid., 7.
agreement between the United States and the Soviet Union on mutual fisheries relations. The agreement established the Intergovernmental Consultative Committee (ICC), which holds regular consultations on fisheries and marine conservation issues. It also promotes cooperative scientific research and exchanges, reciprocal allocation of surplus fish resources, cooperation in the establishment of fishery joint ventures, and cooperation to address illegal or unregulated fishing activities in the North Pacific Ocean and Bering Sea. Originally established in 1988 and periodically reviewed, the current agreement expires on December 31, 2018. As part of the ongoing ICC dialogue, in 2011, President Obama and then president Medvedev released a joint statement of cooperation between the two countries in the Bering Strait region. This included, among other things, recognizing the cultural and natural significance of the Bering Strait region, noting that the region is important to the economies of both countries, confirming the mutual interest of both countries to deepen cooperation and strengthen ties in the Bering Strait, and the importance of effective strategies for sustainable development in the Arctic regions of the two countries. More recently, in September 2015, Russia and the United States signed a bilateral Agreement to Combat Illegal, Unreported, and Unregulated (IUU) Fishing in the Bering Sea. As part of the agreement, the Coast Guard and its Russian counterpart will share information on suspect vessels and vessel operations with previous violations.

The strongest bilateral relationship in the Bering Strait is between the Coast Guard District 17 in Alaska and its Russian FSB counterpart in the Russian Far East. Both agencies share common goals of maritime safety and fisheries law enforcement. Channels of communication between the FSB and the Coast Guard are open as both countries address IUU fishing activity in the Bering Sea and the northern Pacific Ocean. Their operational partnership also extends to law enforcement activities along the U.S.-Russian Maritime Boundary Line (MBL) in the Bering Sea, responses to distress calls at sea, and protection of the maritime environment. For example, in November 2014, a combination of Russian search-and-rescue vessels, Coast Guard assets, and the South Korean government engaged in a joint search-and-rescue mission for a South Korean–flagged fishing vessel, the 501 Oryong, that was flooded and slowly sinking. Despite the incident, Captain Charles Cashin III, chief of staff of Coast Guard District 17, announced that “the fact the 501 Oryong had an operational emergency locator beacon and that the international community came together and

adopted a common search-and-rescue alerting system is likely the reason we have seven survivors."103

Cooperation designed to address increases in regional shipping activity in the Bering Strait, however, remains nascent. Recognizing the increase in activity in and around the Bering Strait, the Coast Guard initiated an academic workshop to address best management practices in trans-boundary waterways. The Russian Ministry of Transport (MoT) sent an official delegation to this conference, which was titled “Governing across the Waves,” held at Bowdoin College in September 2016. Mr. Mike Emerson, the Coast Guard’s director of maritime transportation systems, met with his Russian counterparts on the sidelines of that workshop for an informal discussion of traffic management and routing in the Bering Strait, including the Coast Guard PARS initiative. Both sides agreed on the importance of holding bilateral talks to formalize cooperative measures. Following the conference, in December 2016, the Russian MoT sent a letter inviting Mr. Emerson and his team to Moscow to meet on a broad set of Bering Strait issues. Due to a change of U.S. administration, there was a pause in communication as the Coast Guard waited for the new administration to set policy direction. In late June–July, the Coast Guard received approval to further engage its Russian counterpart on this issue. Direct lines of communication between the two are currently open, and efforts to schedule a meeting in the near future are ongoing. This would allow time for the discussion and potential drafting of a joint IMO proposal ahead of the next Maritime Safety Committee meeting.

While there is an informal, pragmatic exchange between the two sides, there is a lack of formal bilateral information exchange and coordination between the United States and Russia to develop a system of surveillance and domain awareness.104 In light of an increase in vessel traffic and considering the economic and strategic value Russia places on increased use of the NSR, this situation is untenable, and improving domain awareness in the Bering Strait must be a priority of future cooperation in the Arctic.

RECOMMENDATIONS

The future of destination and trans-Arctic shipping through the NSR and the Bering Sea region remains unclear and largely dependent on global commodity prices and lack of regional infrastructure which drives transport costs. Despite these rational economic realities, state-driven economic development of the region combined with Asian markets hungry for new energy and mineral resources will continue to test usage of the NSR, necessitating greater improvements in safety and domain awareness in the Bering Strait. Many of these measures should be undertaken as a matter of implementation of the mandatory IMO Polar Code. Calls for greater investment as


well as studies, assessments, and independent reports on the need for infrastructure are numer-
ous. What is required now is the political will to prioritize investments, sufficiently budget for those
investments, and implement safety measures in a manner that is suitable for future economic and
transport conditions.

The process of investment prioritization may be the most challenging for policymakers.
When there is such a scarcity of infrastructure and navigation aids for the region, where does one
begin? The needs read like a laundry list of items and range in size and ambition: invest in ice-
breaker capacity; implement a vessel traffic management system; expand AIS technology; improve
communication systems; construct a deepwater port in Alaska; increase navigation aids such as
lighthouses, signs, or buoys along the coasts of Alaska and Russia as vessels approach the Bering
Strait and then organize and integrate information on personnel, cargo, and vessels; and update
the charting of the ocean floor to international standards through the use of hydraulic surveys,
shoreline surveys, and geodetic referencing.105

Increase and Update U.S. Icebreaking Capabilities
The U.S. government has chosen to prioritize its infrastructure investment in the construction of a
new heavy icebreaker with the aspiration that over time, the United States will construct in total
three heavy and three medium icebreakers. The United States’ extremely limited and aging ice-
breaker fleet underscores the complete lack of past investment in the American Arctic. However,
as geopolitical developments and human and commercial activity in the region increased, the
debate over whether to construct new U.S. icebreakers ended with the decision by President
Obama in August 2015 to “accelerate the acquisition of new Coast Guard icebreakers . . . to
maintain capacity for year-round access to greater expanses within the Polar Regions.” Since this
announcement and with bipartisan congressional support, Congress has approved $150 million to
begin the design and award phase for the construction of a heavy icebreaker. In February 2017, the
Coast Guard awarded five fixed-price contracts, worth a total value of $20 million, for design
studies and analysis of new heavy icebreakers. It is hoped that the process can be accelerated
further to eventually begin sea trials for the new icebreaker by 2022. Unfortunately, the United
States must hope that the extended life of the Polar Star and the medium icebreaker Healy will
have no major mechanical failures for the next five years, as there are currently no plans for in-
terim icebreaking capabilities other than leasing capabilities from other countries or purchasing
existing private capabilities. The recent approval of the construction of up to six Arctic icebreakers
described in the September NDAA is a positive step toward increasing icebreaking capabilities and
replacing the outdated vessels.

Because ice in the Chukchi and Bering Seas can grow to thicknesses greater than four feet and
move at a speed of 27 nautical miles per day, a heavy icebreaker, if located in the Bering Strait
region at the time of a mass casualty incident or oil spill recovery, would be uniquely able to
perform search-and-rescue operations. Its mobility allows the Coast Guard to extend its presence

-Alaska-to-Ramp-Up-Arctic-Infrastructure/.
in icy waters and serve as a command-and-control center for incident response. A heavy icebreaker will also allow the Coast Guard to have greater assets—including smaller boats and various aviation capabilities—closer to the scene in the event of a crisis. An icebreaker could also conduct oceanographic observations, including mapping surveys and bathymetric measurements. In other words, an icebreaker provides important rescue, resupply, and scientific capabilities, but it is not a substitute for permanent infrastructure.

**Implement a Vessel Traffic Management System**

The second priority of the U.S. government appears to be centered around the development of—at a minimum—a two-way vessel traffic management system for the Bering Strait or maximumly a system that includes two-way routes as well as other regulations including precautionary areas or Areas to Be Avoided (ATBAs). The system should be based upon the conclusions of the 2010 Coast Guard–initiated PARS of the Chukchi Sea, the Bering Strait, and the Bering Sea. This seven-year study has had multiple iterations, and rounds of public comments (including from Russian counterparts) and should be due out shortly with the Coast Guard’s preliminary findings.

It proposed a recommendatory two-way vessel route on the U.S. side and for the designation of several ATBAs designed to minimize risk of environmental damage to highly sensitive areas, ensure safety when a vessel deviates from a recommended route, and prevent disruption of substantive activities. The recommendatory two-way route and ATBAs were developed as the most direct routes with input from indigenous communities and the public, although there was no significant alteration of the proposed route. NOAA has confirmed that the proposed route is free of hazards and shoals to a depth of 60 feet. These proposals are not controversy free. Some experts and environmentalists contend that there should not be a two-way route but a complete separation of north–south vessel traffic. Others also contend that there is not complete support for stated routes by all affected indigenous communities.

Once the findings are released, a broader discussion about the recommended route should be an impetus for a dialogue with the Russian government. The two sides should focus on information sharing and potentially joint oversight of vessel traffic through the Chukchi Sea, the Bering Sea, and the Bering Strait. Such a discussion will be challenging, however, without the consideration of additional tracking systems, particularly AIS.

**Expand AIS Technology**

Given the remoteness and infrastructure limitations of the Bering Strait region, adequate tracking of and reporting on vessel activity can be difficult. High altitudes as well as harsh weather conditions pose several challenges in obtaining and communicating vital information including weather and evolving environmental conditions, charting, traffic patterns of other ships, and accurate location of vessels requiring search-and-rescue operations or potential salvaging operations. The United States must prioritize investments in and an expansion of AIS, which monitors a vessel’s

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position, speed, cargo, destination, and other information that can be relayed to authorities like the Coast Guard.\textsuperscript{108} While international treaty requires most larger commercial vessels over 300 gross tons to be equipped with AIS, domestic trade vessels operating in U.S. waters not managed by a Coast Guard Vessel Traffic Service, such as the Bering Strait, are not required to have AIS.\textsuperscript{109} Such an expansion can include partnerships with local communities, NGOs, and regional, state, and national authorities. The MXAK in Juneau is one such NGO that can serve as a central point for data collection, integration, and dissemination in the Bering Strait region. It has a network of contacts in private industry as well as among local and national authorities. Could there be an opportunity to either incorporate Russian vessel data into the MXAK itself or create a subset of the Marine Exchange where such joint information sharing could occur?

**Support Research Centers Like the Arctic Domain Awareness Center (ADAC) at the University of Alaska**

In November 2015, the U.S. Department of Homeland Security (DHS) Science and Technology Directorate officially launched the Arctic Domain Awareness Center (ADAC) at the University of Alaska Anchorage.\textsuperscript{110} The center infuses and enhances the capacity of DHS and the Coast Guard to respond to and prepare for emergencies in a challenging Arctic environment.\textsuperscript{111} The center also provides educational opportunities in the fields of science, technology, engineering, and mathematics and promotes opportunities in arctic modeling, data fusion, and navigation simulation—key components of improving domain awareness. ADAC harnesses a spectrum of expertise from universities and government organizations such as NOAA, the Alaska Ocean Observing System (AOOS), and the National Science Foundation (NSF), as well as the Canadian entities and Alaskan native villages. Efforts to further strengthen and integrate Arctic observations and data sharing was a major theme of the White House Arctic Science Ministerial in September 2016, and support for such multisectoral institutions needs to continue. The strength behind such a partnership is the array of knowledge and resources it draws from, resulting in a more complete understanding of emerging environmental challenges. Its work will prove critical as the Coast Guard increases and extends its operations in the Bering, Beaufort, and Chukchi Seas.

**Enhance Communication and Satellite Capabilities**

Communications in the Arctic is a challenge. High altitude prevents the repositioning of geosynchronous satellites, the leasing of commercial satellite transponders, and the linking to fiber


\textsuperscript{110} Arctic Domain Awareness Center: A Department of Homeland Security Center of Excellence, University of Alaska Anchorage, http://adac.uaa.alaska.edu/.


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networks that would improve capability. Established U.S. military requirements for communications support for submarines, aircraft, other platforms, and forces operating in the high northern latitudes exist, but these requirements do not take into account increased Coast Guard operations as a result of accelerated Arctic melting. Russia maintains a robust network of satellites in the Arctic, many of which follow Molniya orbits, allowing for greater visibility and data collection in its Arctic territory. In 2017, Russia will launch the first satellite of its Arktika satellite network designed to monitor weather and ice patterns, broadcast communications, and relay data from Arctic buoys and automated weather stations. Given that U.S. territory in the Arctic is less substantial, its satellite systems are comparatively underdeveloped. While the justification for developing new systems may not be present, it is worth considering the expansion of current commercial satellite communication networks already in place. This includes Iridium Satellite, a commercial satellite communications service available in the Arctic that is used by the U.S. Air Force.

Promote Pragmatic Bilateral Cooperation in the Arctic with Russia

Since Russia’s annexation of Crimea, its military interventions in eastern Ukraine and Syria, its interference in the 2016 U.S. presidential election, and the imposition of sanctions and counter-sanctions, U.S. and Russian bilateral relations are increasingly fraught. This doesn’t mean exploring areas of cooperation in the Arctic should cease. In the aftermath of the Cold War, the United States and Moscow signed a 1995 memorandum of understanding to collaborate on search and rescue and maritime law enforcement. In multilateral settings, the two countries have led efforts to secure agreements in the Arctic Council, on search and rescue (2011), oil pollution preparedness and response (2013), the formation of the Arctic Coast Guard Forum, and the recently implemented Polar Code at the IMO. And despite similar tensions in the past, Moscow and Washington have historically collaborated to improve stewardship in the Arctic. The 1972 Agreement on Cooperation in the Field of Environmental Protection and the Agreement on Cooperation in Combating Pollution in the Bering and Chukchi Seas represent diplomatic breakthroughs that transcended larger geopolitical developments. Can the United States and Russia return to a pattern of bilateral cooperation in the Bering Sea region?

Building this cooperation in the Bering Sea region should begin where cooperation is at its strongest—within the IMO, and with enforcement of the Polar Code. This code sets out mandatory


113. Ibid.

114. Ibid.


standards to protect the polar environment and increase the safety of seafarers and passengers. It addresses a range of issues including ship design, construction, equipment, operational, training, and environmental protection matters. Fully implementing the Polar Code will require a greater level of coordination between the Coast Guard and its Russian counterparts.

To do so, however, requires the necessary infrastructure and “on the ground” professional relationships. Dialogue over the Coast Guard’s PARS study should be the impetus for an expanded discussion on approving a vessel traffic management system or a vessel reporting system and the creation of a more robust network of shared data and information from AIS that can be readily available for both the U.S. and Russian governments, law enforcement agencies, and vessels. The two sides should also discuss protocols for search-and-rescue operations, IUU fisheries, and oil spill response capabilities in the Bering Strait. These protocols could range from an exchange of contacts and information to simulations with local response teams from both countries, as well as joint inventory of infrastructure capabilities located at regional stations with greater air and sea capabilities that could be at their disposal during an incident at sea. These bilateral discussions could occur on the margins of a meeting of the Arctic Coast Guard Forum. In March, President Putin supported such discussions, reiterating U.S. and Russian interest in ensuring safe shipping as traffic increases in the Bering Sea region. He stated, “So there are specific regional issues that both sides have an interest in seeing resolved. Take the Bering Straits, for example, the shipping volumes and the intensity of navigation have increased dramatically. So both the United States and Russia have an interest to ensure the safety and security of shipping in these waters.”

Importantly, agreements and protocols should also be put into action in the form of exercises. It has been over 18 years since the last bilateral functional oil spill exercise. While pushing for greater bilateral ties, the United States should seek inspiration from Norwegian-Russian relations in the Barents Sea. Similar to the Bering Strait region, the Barents has witnessed an increase in economic activity and vessel traffic. Rights over fertile fishing grounds as well as deposits of natural resources led to the 2010 joint maritime border agreement between Norway and Russia, an agreement lauded as a model for future Arctic cooperation. Since its signing, both sides have embraced the uptick in maritime activity and subsequently increased efforts to improve maritime preparedness and response mechanisms. In 1994, they signed an oil spill agreement including plans and procedures in the event of a spill. The agreement was re-signed in 2014, and an additional attachment outlining a detailed joint emergency preparedness plan was implemented. Included in the agreement are annual meetings between coastal authorities, as well as regular exchanges of information. To improve safety measures, Vardø Vessel Traffic Service and its


Russian counterpart in Murmansk implemented, in 2013, an agreement on sharing information on high-risk traffic between Murmansk and the North Norwegian Coast. Also in 2013, and with the approval of the IMO, the two countries initiated a reporting system named Barents SRS (Ship Reporting System) designed to enhance information exchange and cooperation on identifying high-risk maritime traffic in the Barents Sea. These areas of cooperation and evolving joint initiatives between Norway and Russia exist despite broader geopolitical conditions. As both embrace the challenges and opportunities presented by a transforming Arctic region, their approach to preparedness and safety can serve as a rubric for other Arctic nations to follow. (Please see the appendix for a complete case study of maritime preparedness and response in the Norwegian Arctic.)

CONCLUSION

Today, the Bering Strait region represents a tale of two starkly different economic visions converging on one narrow passage: the Bering Strait. Russia’s ambitious Arctic economic pursuits stand in stark contrast to the United States’ general stance of environmental protection and preference for economic development moratoriums despite recent signals that the Trump administration seeks a more proactive Alaskan energy development policy. Despite these differences, there is a brief window of opportunity to develop the needed infrastructure and protocols to jointly manage increased maritime activity in the Bering Strait region in a way that minimizes the negative impacts, enhances safety and security, and realizes the benefits of increased economic opportunity. A slow yet steady increase in global demand for natural and mineral resources and fisheries will likely see the NSR and Bering Strait experience a modest yet consistent increase in maritime traffic. Therefore, it is both a policy imperative and an opportune moment to construct the necessary infrastructure to improve readiness and domain awareness in the Bering Strait to safely accommodate a more diverse range of seagoing vessels, and as an opportunity to strengthen U.S.-Russian cooperation in the Arctic.

Both the United States and Russia must effectively co-manage the Bering Strait and their maritime boundary. Historically, the Russian Federal Security Bureau (FSB) and the Coast Guard District 17 (Alaska) have had a strong and pragmatic working relationship in the region, which could be strengthened with joint initiatives to improve regional maritime domain awareness and exercise joint operations, particularly in light of required implementation of the IMO Polar Code. Proposals have been suggested, but action has, to date, been limited. Past proposals should be revisited and dialogue intensified to establish a system that both promotes shared domain awareness and enhances maritime safety as well as environmental stewardship either bilaterally or through a multilateral forum. Ultimately, while promoting new economic ventures in the region (a cornerstone of Russia’s Arctic policy) and working toward higher standards of safety and environmental stewardship (a pillar of U.S. Arctic policy), the greater Bering Strait region can become an encouraging example of Arctic maritime cooperation and a “win-win” for U.S.-Russian cooperation.
Appendix. Maritime Preparedness and Response in the Norwegian Arctic

Andreas Østhagen

THE NORWEGIAN ARCTIC

Approximately 80 percent of all maritime traffic in the Arctic passes through the Norwegian maritime zones at one point.1 Climatic conditions are less harsh than in the North American Arctic, and population density is consequently higher. With almost a half million inhabitants, North Norway is more populated than all the North American parts of the Arctic combined, and thus confers a higher basic level of maritime activity.

The Barents Sea

The Barents Sea is located north of the Norwegian and Russian mainland, just off the Arctic Ocean itself. The sea is named after the Dutch explorer Willem Barentsz, who ventured northward in search of a sea route to Asia via the Northern Hemisphere in the late sixteenth century. The maritime area covers approximately 540,000 square miles (1.4 million square kilometers), with boundaries set by the Svalbard archipelago (Norway) to the west, Franz Josef Land (Russia) to the north, Novaya Zemlya (Russia) to the east, and the European continent (mainland Norway and Russia) to the south.

When Norway and Russia established their 200-nautical-mile exclusive economic zones (EEZs), in 1976 and 1977, respectively, a dispute concerning the maritime boundary between the two countries in the Barents Sea arose. The size of the disputed area was approximately 67,500 square miles (175,000 square kilometers). An agreement concerning the disputed area, the so-called Grey Zone Agreement, was signed in 1978 and was renewed annually until 2010. The agreement recognized the countries’ rights to fisheries in the area, without tackling the boundary dispute in itself.

In 2010—after four decades of negotiations—Norway and Russia agreed on a joint maritime border, more or less dividing the disputed area in half. The delimitation agreement established a 1,087-mile (1,750-kilometer)-long maritime border between Norway and Russia. It was hailed as a sign of the new era of cooperation between the two neighbors, as well as a symbol of how

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territorial disputes in the Arctic could be solved through cooperation. The delimitation agreement was signed in 2011 and subsequently ratified by both the Norwegian (Stortinget) and the Russian (State Duma) parlaments.

Examining the drivers of the maritime dispute agreement, there are a number of factors that can help explain why settlement occurred in 2010. The obvious relates to the potential for oil and gas exploration and production in the disputed area of the Barents Sea. Moe et al., however, argue that a Russian desire in affirming the primacy of the United Nations Convention on the Law of the Sea regime, as well as a Russian push to “tidy up its spatial fringes,” are more relevant factors explaining the 2010 settlement. In its aftermath, there have been voices in Russia arguing that the delimitation agreement is in disfavor of Russian interests, cheating Russian fishermen from access to historically important fishing grounds. Yet, so far both countries have enforced the agreement through their respective coast guards, as well as initiating joint cooperation to move forward with exploration of the hydrocarbon potential in the area.

In terms of economic activity, the Barents Sea is the breeding and nurturing place for the largest cod stock in the world, the Northeast Arctic cod, which has been one of the main reasons for subsistence along the North Norwegian and Northwest Russian coasts. The Barents Sea is also rich in a number of other marine species that have fostered economic activity, like shrimp, whale, seal, and of late, king and snow crab. Since 1979, seismic surveying and exploratory drillings have also taken place in the Norwegian part of the Barents Sea. Throughout the 1980s, a number of exploratory wells were drilled and both oil and gas were discovered. Yet the low price levels for these resources and the related cost of development hindered production at the time. At the turn of the millennium, however, prospects had improved, and a number of projects were being realized. On the Norwegian side, Statoil has produced LNG from the Snøhvit gas field since 2006. The Italian company ENI spent a decade developing its Goliat offshore oil field, which finally started producing in 2016. Activity on the Russian side has been at a lower level, as there are more easily accessible commercial resources to extract onshore and near offshore in the Yamal-Nenets region farther east.

In sum, fisheries and local and national transport constitute much of the maritime activity along the North Norwegian coast. Along the coast of the mainland, there is considerable industry-related shipping going to and from industrial hubs in North Norway and Northwest Russia. Some of this activity is directly linked to the petroleum industry, operating in the Barents Sea and

5. Hønneland, Hvordan Skal Putin Ta Barentshavet Tilbake?
stretching northward in the Norwegian Sea. A large number of the vessels also come from or are going to Murmansk, as a hub for much of the regional maritime transport in the Russian Arctic. However, maritime traffic patterns are somewhat divided between vessel activity along the mainland (North Norway) and the traffic around the Svalbard Archipelago farther north.

**The Svalbard Archipelago**

Norway was granted sovereignty over the Svalbard Archipelago with the Svalbard Treaty, signed in 1920 in Paris, which came into effect in 1925. The treaty gives nationals from the signatory countries the right to live and work on the islands, while it places some limitations on Norway’s ability to levy taxes on Svalbard and use Svalbard for military purposes. The latter restriction complicates the use of military equipment, yet not when the military is performing civilian tasks. The Norwegian Coast Guard makes use of Longyearbyen for bunkering and other civilian purposes. Similarly, although the Norwegian government has restricted the use of Longyearbyen Airport to only civilian aviation, military aircraft can use it when performing civilian tasks such as search and rescue and oil spill response.9

In 1977, as Norway established its EEZ in the Barents Sea, it decided to establish a Fisheries Protection Zone (FPZ) around the Svalbard Archipelago. Norway claims that the 200-mile zone around Svalbard is part of the Norwegian EEZ. Others countries, however, have claimed that the principles of the treaty should apply to the 200-mile zone as well, although this innovation in maritime law did not exist when the treaty was formalized in 1920. This would grant all signatories equal rights to economic activity in the water column around Svalbard. To avoid an outright challenge to the Norwegian claim and to protect and manage what is the central nursery area for the Northeast Arctic cod stock, the Norwegian government established an FPZ, only allowing limited fisheries in the area. The other treaty signatories have so far accepted this, although Russia and Iceland in particular have been outspokenly critical of what they perceive to be discrimination of foreign fishing vessels in the area by the Norwegian Coast Guard.10 Similarly, Norway claims that Svalbard does not have a continental shelf in its own right, and that the continental shelf around Svalbard is solely under Norwegian jurisdiction. Although other countries dispute this as well, it has never been tried before an international court. In 2015, the Norwegian government launched the 23rd licensing round for oil and gas exploration and production, which included some blocks in what would be Svalbard's continental shelf (if it has one). Russia delivered a diplomatic protest, and so far, no activity has commenced in these blocks.11

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Compared with the coast of the mainland, maritime traffic patterns are somewhat different around Svalbard. The archipelago has a population of only 2,600, with around 2,100 residing in Longyearbyen. Even in an Arctic context, the population on Svalbard is sparse. Most reside in Longyearbyen (the Norwegian settlement) or Barentsburg (the Russian settlement), with a few located in Ny-Ålesund (a research settlement). The amount of local traffic is consequently at low levels. The number of cruise ships, however, has been increasing slightly over the last decades, whereas the number of cruise ship passengers has almost tripled since 1997. In recent years, the number of vessels has stabilized, but their size keeps increasing. Svalbard is unique in an Arctic context, as it is the only place large cruise vessels can reach as far as 80 degrees north without ice-classification. Fisheries around Svalbard have also been increasing, and constitute around 70 percent of all maritime activity. The movement of stocks has similarly led to more complex patterns of trawlers, especially concerning shrimp fisheries to the north and east of the archipelago.

In sum, patterns of maritime traffic in the Norwegian Arctic are generally at higher levels than in most other parts of the Arctic. Around Svalbard, however, the level of maritime activity is lower. Yet activity in waters around Svalbard has changed and become more complex, as a larger number of both cruise ship passengers and fishing vessels venture northward.

Maritime Preparedness and Response

An increase in maritime traffic has the potential to increase the number of incidents that require engagement from public assets, as well as increasing the risk of a severe emergency at sea. In Norway, there are a number of different agencies and public institutions responsible for managing a potential incident along the coast. We thus have to separate between those tasked with saving lives—hereunder search and rescue—and those tasked with environmental protection. An additional separation is between prevention measures taken to decrease the chance of an incident occurring in the first place, like vessel traffic schemes and double hull ships, and preparedness and response measures, such as pre-positioning of oil spill equipment and investments in search-and-rescue helicopters.

When an emergency incident in Norway in the maritime occurs, the first point of contact is the Joint Rescue Coordination Centres (JRCCs). Under the jurisdiction of the Norwegian Ministry of Justice and Public Security, these are divided between the north and the south. It is thus the Joint Rescue Coordination Centre of Northern Norway (JRCC North), located in Bodø, that holds the responsibility for the Norwegian Arctic. Around 80 percent of the total Norwegian area of responsibility falls to JRCC North. In 2012, JRCC North had more than 3,000 incidents to manage.

15. Norwegian Ministry of Foreign Affairs, Norway’s Arctic Policy.
Figure A2. Activity in the Norwegian Arctic


covering both land and sea, and from 2013 to 2014, the total number of emergency response incidents in the Norwegian Arctic rose by 10.5 percent.16

The Norwegian armed forces provide additional capacities and information relevant to response efforts. The armed forces’ Joint Headquarters is located at Reitan, just outside the city of Bodø in North Norway, whereas the different branches of the military are located at various locations in North Norway. The Norwegian Coast Guard (Kystvakten) is often the first public institution tasked with handling a maritime incident, whether it be a sinking vessel or an oil spill. The Coast Guard is a part of the Royal Norwegian Navy, yet separated from the regular navy (Kysteskadren) with a specific law regulating its mandate and responsibilities. Its headquarters are in Sortland, a small coastal town in the Norwegian Arctic.

The Norwegian Coastal Administration (Kystverket—NCA) is the government agency with the main responsibility for marine pollution preparedness and response, under the Norwegian Ministry for Trade, Industry and Fisheries. In the case of an environmental incident at sea in the Norwegian Arctic, it coordinates with JRCC North and the armed forces to utilize relevant resources. It operates the emergency towing vessels, four in total, located all along the coast of the Norwegian mainland. They are privately operated vessels which are on standby and leased by the NCA, although there has been some controversy over whether or not this task should be transferred to the Coast

16. Ibid.
Guard for cost-efficiency purposes. The NCA also operates a number of oil spill equipment depots along the coast of the Norwegian Arctic and have signed agreements with local fishing vessels to prepare, certify, and train them to operate such equipment in the case of a large-scale spill.

Oil spill response at large is separated between the private operating companies responsible for the activity itself, municipal governments, and the national government (the Norwegian Coastal Administration). The petroleum industry has established the Norwegian Clean Seas Association for Operating Companies (NOFO), to ensure the oil spill recovery response when needed. NOFO is owned and operated by the oil and gas companies operating on the Norwegian continental shelf. Currently, however, the only operating platform in the Barents Sea is the Italian oil company ENI’s Goliat platform, whereas Statoil has subsea production from its Snøhvit field. As ENI started production in the Barents Sea, the license holders (ENI and Statoil) together with NOFO established two depots in the north for storing cleanup and response equipment to be used in near-shore areas. They also established a “Coastal Work Group” (InnsatsGruppekyst) through NOFO to involve fishing vessels in the local areas should an oil spill go toward the open sea. Around 30 vessels and more than 100 fishermen participate, according to ENI. Through education and training of local fishermen, combined with remuneration and salary, their vessels are adapted to handle oil recovery equipment.

Again, we have to separate between traffic along the Norwegian mainland and in waters around Svalbard. Around the Svalbard Archipelago, it is reckoned that heavy-bunker oil spills from vessels are the main environmental concern. The overarching responsibility for emergency preparedness and response on Svalbard lies with the governor of Svalbard, acting on behalf of the Norwegian government. The governor’s office also has its own state-of-the-art multipurpose vessel, Polarsyssel, which it received in 2014. Additionally, Lufttransport AS provides search and rescue (SAR) services through two Super Puma helicopters, leased in 2014. Given a large-scale incident in the maritime domain, the local emergency response center on Svalbard will contact the JRCC located in Bodø, North Norway, which in turn can call on the armed forces’ Joint Headquarters.

The governor’s office and the Norwegian Coastal Administration also jointly manage an oil spill response depot in Longyearbyen and smaller equipment in Ny-Ålesund. The vessel Polarsyssel constitutes a core element of the environmental response around Svalbard. Yet the Norwegian government highlights that studies have shown the need for more local personnel and equipment. On land, Det Store Norske, the Norwegian state-owned coal company which has been one of the pillars of Longyearbyen throughout its history, rents helicopter services during the summer.

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21. Ibid., 103.
months. On a regular basis, the efforts provided by the various companies and institutions on Svalbard are organized under the “committee against acute pollution” (utvalg mot akutt forurensing), which is led by the governor of Svalbard. The largest public and private companies participate and convene annually or when in demand, to advise the governor on how to best combat maritime pollution. Det Store Norske contributes with 10 people to the depot force on its own, in combination with smaller contributions from other actors.22

Finally, the Norwegian government has also dedicated up to 200 million Norwegian kroner by 2023 to upgrade and build a new harbor in Longyearbyen, to serve the whole range of demands that are arising with the increased activity in waters around Svalbard.23 Yet, more than 95 percent of Svalbard’s residents are located around Isfjorden, the main fjord cutting across Svalbard from the west. This entails long response times to most areas outside the immediate proximity of Isfjorden. The Norwegian government reckons that responding to an oil spill from a vessel along the east coast of Svalbard might take as long as one to two days.24

Traffic Management Schemes

From around 2002, transport of oil and other industrial materials to and from Northwest Russia (Murmansk and Arkhangelsk in particular) to Rotterdam and Amsterdam increased along the North Norwegian coast. Risks concerning a potential oil spill—similar to the Exxon Valdez in Alaska (1989), or Erika (1999) and Prestige (2002) in European waters—came on the agenda in Norway.25 In response, the NCA established Vardø Vessel Traffic Service (VTS) in 2007, a service to improve safety at sea and protect the environment. The maritime traffic control center prevents incidents and accidents by monitoring and regulating ship traffic in specified areas along the Norwegian coast. Following concerns in the early 2000s, tugboat capacity was developed and, with the approval of the IMO, new lanes of vessel traffic farther from the cost were introduced in 2006.

Today, Vardø VTS covers the area from the Russian border to Lofoten, as well as administrating the tugboat capacity in North Norway and monitoring all tankers and other hazardous traffic along the entire coast and the sea around Svalbard.26 Approximately 1,500 vessels are deemed as high risk27 annually. It is expected that the number will increase as petroleum exploration and production further develop in the region over the next decade.28 Other specific measures have also been introduced in particularly fragile areas. From October 1, 2015, vessels transporting particularly hazardous cargo and vessels longer than 150 meters must request sailing clearance before using a VTS area along parts of the North Norwegian coast. The NCA notes that the level of high-risk vessels has remained more or less stable in recent years, whereas almost all vessels have double

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22. Governor of Svalbard, Beredskapsplan Mot Akutt Forurensing På Svalbard (Longyearbyen, 2010), 7.
23. Norwegian Ministry of Foreign Affairs, Norway’s Arctic Policy.
25. Vold et al., Økt Skipsfart i Polhavet, 22.
27. Vessels above 5,000 tons, or transporting radioactive or other pollutive materials.
28. Vold et al., Økt Skipsfart i Polhavet, 22.
hulls and are fairly modern. By 2018, Vardø VTS will also be upgraded with a new information system that integrates various layers into one seamless situational awareness system with automatic sensors and alarms.

Another highly relevant tool advanced to improve communications and information concerning maritime activity in the Arctic was launched in 2012, named BarentsWatch. It consists of an online platform open to the public, as well as a physical center and a closed information system, dedicated to better coordination between public actors in Norway, such as the police, the NCA, the armed forces, and the Customs Authority. It relies on two satellites dedicated to the Arctic. In 2010, Norway launched the AISSat-1 satellite, followed by AISSat-2 in 2014. Both satellites enable the monitoring and surveillance of vessel traffic in the Arctic, an ability that was nonexistent before 2010. Every vessel above 300 tons is mandated to have the system onboard. The Coastal Administration is also establishing up to 14 land-based AIS stations in Svalbard, to improve the system when the satellites are out of range.

Waters around Svalbard are also subject to stricter regulation than those off the coast of North Norway. To limit the use of heavy bunker oil, requirements on the quality of fuel have banned its usage for vessels sailing in the natural reservoirs and national parks on the west and east coasts. Currently, 65 percent of Svalbard is protected as natural parks, and the Norwegian government is working on further advancing this protection. To manage the growing interest in cruise ship tourism around the archipelago, a public piloting service was established in 2012, and in 2015 it was made mandatory for any vessel longer than 70 meters (50 meters if it is a passenger vessel) in Svalbard.

There has also been a strong push in Norway for further banning the use of heavy oil in vessels operating in parts of the Norwegian Arctic. Discussions concerning establishing a so-called Emission Control Area under the IMO in parts of the Arctic Ocean have led to debates in Arctic Council working groups and beyond. Yet it still remains to be seen how these measures will be implemented. Another debate on the agenda in Norway has been the replacement of heavy fuel oils used in shipping with LNG. This could dramatically reduce the sulfur oxide (SOx), nitrogen oxide (NOx), and soot emissions in northern waters. Already, a number of ferries operating along the coast of Norway utilize this fuel type. Yet there are barriers to overcome. There is a lack of bunker facilities for LNG in North Norway and on Svalbard, whereas LNG tanks onboard ships often require considerable space. Finally, the price for LNG at the moment is not competitive compared with that of heavy oil.

32. Norwegian Ministry of Foreign Affairs, Norway’s Arctic Policy.
33. Vold et al., Økt Skipsfart i Polhavet, 53.
34. Ibid.
COOPERATION WITH RUSSIA

In the 1970s, cooperation between Norway and Russia in the Barents Sea developed pragmatically in response to the establishment of the Exclusive Economic Zones (EEZs) and the subsequent maritime boundary dispute that arose. An agreement between Norway and the former USSR on fisheries in the Barents Sea was completed in 1975, and the first Joint Fisheries Commission between the two countries convened in 1976. The commission’s emphasis was on scientific research to ensure sustainable management of the stocks.\(^{35}\) Yet it was not until the end of the Cold War that cooperation expanded considerably.

With an increase in northern maritime traffic at the beginning of the new millennium, both Norway and Russia have been forced to devote more resources to handling potential maritime incidents. As fisheries have grown in volume, so has the demand for fisheries inspections conducted by the coast guards on behalf of their national authorities. Similarly, the demand for aid to navigation and tailored schemes to manage high-risk shipping has increased.\(^ {36}\) These challenges have further fueled the desire to explore mutually beneficial arrangements bilaterally between Norway and Russia.

As petroleum exploration in the Barents Sea expanded and the Cold War ended, Russia and Norway agreed on an oil spill agreement in 1994. The agreement included developing joint contingency plans and procedures for notification in the event of an oil spill.\(^ {37}\) This agreement still constitutes the core of the bilateral cooperation on preventing and managing oil spills. In 2014, the agreement was re-signed and an attachment outlining a detailed joint emergency preparedness plan was implemented. It is the Norwegian Coastal Administration (Kystverket) and the Russian State Maritime Rescue Services (Gosmorspassluzhba) that are the agencies tasked with operationalizing this cooperation.

The oil spill agreement also includes annual meetings between the two countries’ coastal authorities, as well as regular exchange of information. Beyond this, the Norwegian government has initiated a number of projects to help implement the 1994 agreement, as well as a further increase in cooperation. Such projects are particularly concerned with training of personnel in advance of an oil spill through tabletop and live exercises. An area currently in focus is how to manage the cleanup of an oil spill along the Barents shoreline, stretching from North Norway into Northwest Russia. It is reckoned that most oil spills will drift eastward due to the currents in the Barents Sea, and an oil spill in the Norwegian part is therefore likely to end up on the Russian shoreline. Joint

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exercises have been initiated, in which the crossing of borders by personnel constitutes a core element.38

Another area of bilateral cooperation developed with the growth of maritime traffic has been the exchange of information between the various vessel traffic centrals. In 2006, Norway and Russia agreed on strengthening maritime safety measures. Based on this, Vardø VTS and its Russian counterpart in Murmansk signed an agreement on mutual sharing of information concerning high-risk traffic venturing between Murmansk and along the North Norwegian coast, implemented in 2013.39 Information on high-risk vessels passing through or proceeding to and from ports and anchorages within the Barents area are shared through a joint traffic management information system, named Barents VTMIS. The vessel traffic centers in Vardø and Murmansk function as key information nodes for ship traffic in the north.40

Related, a Norwegian-Russian system named Barents SRS (Ship Reporting System) was implemented in 2013. It requires high-risk vessels to register when sailing in waters stretching from Lofoten in North Norway to Murmansk in Russia.41 This regulation implements bilateral definitions of high-risk vessels, in addition to specifications concerning vessel types. The system consequently improves the awareness and control of high-risk maritime traffic in the Barents Sea, while also enhancing information exchange and cooperation between Norway and Russia.42 Given that any system that interferes with maritime traffic is subject to the approval of the IMO, Russia and Norway jointly pursued recognition and approval of the Barents SRS in the organization in 2012, leading to its adoption.43

Search-and-rescue cooperation was initially based on an agreement from 1956, which was renewed in 1988 and 1995.44 As with oil spill prevention and response, the bilateral cooperation entails sharing of information and mechanisms for support in the case of a request from the other country. Related, practical cooperation between Norway’s and Russia’s coast guards did not expand until the 1990s.45 After the Soviet Union collapsed, fishing vessels started overexploiting

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39. Ibid.
42. Ibid.
the Barents cod stock, and in 1992 the Joint Fisheries Commission expanded its mandate to include control measures. Routines for sharing information on catches and quotas were subsequently established.\footnote{Hønneland, Hvordan Skal Putin Ta Barentshavet Tilbake?, 38.} By 2000, cooperation had further developed and a Memorandum of Understanding (MoU) outlining a number of cooperative measures was signed between the countries and their coast guards. The MoU has been revised several times. It draws up a range of areas where the countries can share information, concerning illegal activity, fisheries inspections, quotas, and practical experiences.\footnote{Norwegian Directorate of Fisheries, “Memorandum Om Samarbeidsordninger Om Kontroll Mellom Det Norske Fiskeridirektoratet, Den Norske Kystvakten, Rosrybolovstvos Territorile Administrasjon for Barentshavet Og Kvitsjøen Og Grensedirektoratet I Russlands Federale Sikkerhetstjeneste I Murmansk,” 2013.} An additional—and substantial—part of the coast guard cooperation involves the mutual exchange of fisheries inspectors and operational personnel. Coast guard personnel thus meet with their Russian or Norwegian counterparts to learn procedures, exchange experiences, and establish personal relations.

These various measures of relatively in-depth cooperation have derived from the need to jointly manage the fish stocks in the Barents Sea, to the benefit of both Norway and Russia. As such, maritime cooperation has expanded to deal with a growing number of challenges: initially the increase in unregulated fisheries and subsequently a wide range of tasks relating to search and rescue, oil spill prevention and response, and management of marine resources, as maritime activity levels in northern waters are increasing. The Joint Fisheries Commission in particular is a highly relevant tool for managing fisheries affairs between the two countries, and is often described as the backbone of the bilateral cooperation in the Barents Sea.\footnote{Geir Hønneland, “Norsk-Russisk Miljø- Og Ressursforvaltning I Nordområdene,” Nordlit 29 (2012), http://septentrio.uit.no/index.php/nordlit/article/view/2303/2134; Olav Schram Stokke, “International Environmental Governance and Arctic Security,” in Geopolitics and Security in the Arctic, ed. Rolf Tamnes and Kristine Offerdal (London: Routledge, 2014), 121–146; Tore Henriksen and Geir Ulfstein, “Maritime Delimitation in the Arctic: The Barents Sea Treaty,” Ocean Development & International Law 42, nos. 1–2 (2010): 1–21.} Norway and Russia have also pursued cooperation on matters of the North East Atlantic Fisheries Commission, the organization set to manage quotas and rights to conduct fisheries in the northeastern Atlantic international waters.\footnote{Norwegian Directorate of Fisheries, “Memorandum.”}

In spite of this, complete harmony does not prevail between Norway and Russia in the Barents Sea. The Russian Coast Guard has, on occasion, suggested that Norway and Russia conduct joint fisheries inspections in the Fisheries Protection Zone (FPZ) around Svalbard.\footnote{Ibid.} Such cooperation would challenge Norwegian sovereignty and authority in the FPZ, and the Norwegian government has firmly declined all such proposals.\footnote{Østhagen, “Coastguards in Peril,” 7–8.} Russian fishing vessels inspected by the Norwegian Coast Guard in the FPZ also refuse to sign the inspection documents as a symbolic gesture to highlight how Russia does not recognize Norwegian authority in the zone around Svalbard—although it allows the Norwegian Coast Guard to perform inspections of the vessels. After the maritime boundary delimitation agreement in 2010, there have also been voices in Russia claiming the deal

\[46.\] Hønneland, Hvordan Skal Putin Ta Barentshavet Tilbake?, 38.
\[47.\] Norwegian Directorate of Fisheries, “Memorandum Om Samarbeidsordninger Om Kontroll Mellom Det Norske Fiskeridirektoratet, Den Norske Kystvakten, Rosrybolovstvos Territorile Administrasjon for Barentshavet Og Kvitsjøen Og Grensedirektoratet I Russlands Federale Sikkerhetstjeneste I Murmansk,” 2013.
\[49.\] Norwegian Directorate of Fisheries, “Memorandum.”
\[50.\] Ibid.
is too favorable to Norway. These sentiments have, however, yet to lead to a marked change in the bilateral relationship between Norway and Russia in the Barents Sea.\textsuperscript{52}

**MULTILATERAL COOPERATION**

There has been a considerable focus on preparing for increased Arctic shipping among public authorities and companies alike, to alleviate some of this pressure. Modified equipment and higher operating standards (such as compulsory pilotage) are mitigation measures, as are international frameworks for collaboration under the auspices of organizations like the IMO and the Arctic Council. Several frameworks have been developed in recent years to address the increasing amount of activity in the Arctic.

**The Arctic Council**

In 2009, the Arctic Council published the Arctic Marine Shipping Assessment Report, which outlines some recommendations around shipping policies in the region.\textsuperscript{53} In a follow-up, the council’s members agreed to a legally binding search-and-rescue agreement at its ministerial meeting in Nuuk in 2011. The official agreement, titled “Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic,” established measures for better collaboration between Arctic countries should an Arctic state request international assistance.\textsuperscript{54} In addition, it divides the Arctic into clearer zones of responsibility.

At the Arctic Council Ministerial meeting in Kiruna, Sweden, in 2013, another agreement, the “Agreement on Cooperation on Marine Oil Pollution, Preparedness and Response in the Arctic,” was adopted, putting in place the same mechanisms for potential oil spill preparedness and response as was done for search and rescue.\textsuperscript{55} Yet these agreements do not automatically improve each state’s capacities in its Arctic region, and have thus been criticized for being more symbolic than anything else.\textsuperscript{56}

**The Arctic Coast Guard Forum**

In 2011, CSIS proposed establishing a dedicated forum for Arctic coast guards.\textsuperscript{57} Modeled on already existing forums for the North Pacific and the North Atlantic, American and Russian officials

\textsuperscript{52} Hønneland, Hvordan Skal Putin Ta Barentshavet Tilbake?
subsequently took the first steps toward the establishment of the Arctic Coast Guard Forum. The Russian actions in Ukraine in 2014 halted the process, as representatives from Russia were not included in two experts’ meetings hosted by Canada in Sydney, Nova Scotia. It was, however, decided that the chair of the forum should follow the chairmanships of the Arctic Council. The next experts’ meeting in March 2015 was therefore held in Washington, DC, and this time the Russian Coast Guard was present. The eight countries decided to push ahead, and the Arctic Coast Guard Forum (ACGF) was formally established on October 30, 2015, at the U.S. Coast Guard Academy in New London, Connecticut.58

The structure of the forum is quite simple. It has a rotating chair, currently held by Finland, in tandem with the chair of the Arctic Council. The heads of the coast guards convene annually, whereas working groups meet more frequently when needed. Aiming to avoid a heavy bureaucracy, there are currently only two working groups, namely, a secretariat and the “combined operations” group. The latter is concerned with tasks such as joint operations, asset sharing, and increased focus on exercises.

The stated purpose of the forum is to develop relationships between the Arctic states on a practical level to form a community focused on operational activities. Particularly the sharing of information and identification of so-called best practice are areas of focus for the forum. Improving maritime situational and domain awareness and sharing information are also particularly relevant. The ACGF can also act as a platform to initiate cross-border exercises, implementing the circumpolar agreements from 2011 and 2013.59 This work must subsequently also be done in coordination with the Arctic Council Emergency Prevention, Preparedness & Response working group. Joint contingency exercises in the Arctic have increased slightly in frequency, but a leading organization is necessary for long-term strategic planning. In the long term, the forum will also be able to contribute further by providing strategic direction to emerging issues within the coast guard arena, in tandem with the overall work that takes place under umbrellas such as the Arctic Council and IMO.

Looking forward, there are some concepts that might be interesting for the forum. Pooling of resources can have applicability for coast guards, if the capacity created has relevance to more than one Arctic state. An example of pooling would be the establishment of search-and-rescue centers at geographically relevant locations in the Arctic. One such center could be a search-and-rescue unit in Keflavik, Iceland, to rapidly conduct operations along the east coast of Greenland, north of the Faroe Islands, and in Norwegian waters around Jan Mayen, in addition to Icelandic waters. Another example would be an oil spill response unit on Svalbard, responding to a potential spill off the coast of East Greenland (should drilling commence) or in the Barents Sea. For tasks that require immediate response, such as oil spill response or search and rescue, pooling of coast guard resources could hold value and be orchestrated by the ACGF.60

60. Østhagen, “Coastguards in Peril,” 11.
In addition, practical cooperation on procurement of equipment seems to be an area with great potential. Here, the defense sector itself still has a long way to go, as witnessed by the voluminous literature calling for more streamlined and effective procurement policies across NATO and EU member states. In the Arctic, potential is great among the Nordic countries, as they are already collaborating under the umbrella of NORDEFCO (Nordic Defence Cooperation). The same goes for the United States and Canada, which already have a closely integrated bilateral defense cooperation under the NORAD (North American Aerospace Defense Command) framework. Cooperation on this level with Russia will have its limitations, although there could arguably be room for expansion when dealing with civilian capabilities and ice-related technology.

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62. Håkon Lunde Saxi, Nordic Defence Cooperation after the Cold War, Oslo Files (Oslo: Norwegian Institute for Defence Studies, March 2011); Thorvald Stoltenberg, "Nordic Cooperation in Foreign and Security Policy, Proposals Presented to the Extraordinary Meeting of Nordic Foreign Ministers" (proposals presented to the extraordinary meeting of Nordic foreign ministers, Oslo February 9, 2009).

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