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Melting sea ice in the Arctic has created two important opportunities: increased access to Arctic resources and improved seafaring and shipping ability. The Northern Sea Route (NSR) is a network of passages north of Russia connecting the Atlantic and Pacific Oceans that Russia claims as internal waters. As such, Russia asserts it right to require shipowners request permission and pay a fee to transit the NSR. The United States and the majority of the international community dispute Russia's territorial NSR claim, yet, currently no state is challenging Russia's claims with freedom of navigation operations (FONOPs) such as the United States does routinely in many other areas of the world. This paper describes the strategic importance of the Arctic and NSR, analyzes the current capability gaps preventing the United States from conducting FONOPs in the NSR, and provides recommendations to mitigate these gaps.

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Paper Abstract

Melting sea ice in the Arctic has created two important opportunities: increased access to Arctic resources and improved seafaring and shipping ability. The Northern Sea Route (NSR) is a network of passages north of Russia connecting the Atlantic and Pacific Oceans that Russia claims as internal waters. As such, Russia asserts it right to require shipowners request permission and pay a fee to transit the NSR. The United States and the majority of the international community dispute Russia's territorial NSR claim, yet, currently no state is challenging Russia's claims with freedom of navigation operations (FONOPs) such as the United States does routinely in many other areas of the world. This paper describes the strategic importance of the Arctic and NSR, analyzes the current capability gaps preventing the United States from conducting FONOPs in the NSR, and provides recommendations to mitigate these gaps.

INTRODUCTION

It "looks eerily familiar to what we're seeing in the East and South China Sea (SCS),"[1] said US Coast Guard Commandant Admiral Paul Zukunft in 2017, referencing Russia's territorial claims of the Northern Sea Route (NSR) and China's strategic interest in the Arctic. The majority of the world, including the United States, considers the NSR an international strait open to universal navigation as defined in the United Nations Convention on the Law of the Sea (UNCLOS).[2,3] The 2013 National Strategy for the Arctic Region articulates the requirement to "preserve Arctic region freedom of the seas."[4] The United States currently conducts freedom of navigation operations (FONOPs) in accordance with international law in the SCS and other areas of the world to ensure the right of international transit passage and to protest excessive maritime claims by other states. The United States FON Program has existed since 1979 in order to preserve "the rights, freedoms, and uses of the sea and airspace guaranteed to all states under [UNCLOS]."[5] However, if the President or Secretary of Defense (SecDef) directed FONOPs in the NSR, the United States currently lacks the platforms, infrastructure, personnel, and command and control (C2) to do so.

Some might argue there is no pressing need to conduct FONOPs in the NSR since the United States has more important geopolitical concerns. Current tensions with Russia and China outside of the Arctic, North Korea, Iran, Syria, and the ongoing violent extremist organization (VEO) threat provide the United States with ample challenges. The argument could also be made that since the NSR is expensive to maintain, it is in America's best interest to concede to Russia's territorial claims, effectively levying on Russia the associated financial burden. These claims discount the growing strategic importance of the Arctic given melting sea ice that allows greater access to resources and shipping routes. The previously discussed

claims also disregard the aforementioned US intention to ensure worldwide FON, including in the Arctic. Given the increasing strategic importance of the Arctic and Russia's interest and investment in the region, the United States must conduct FONOPs in the NSR to ensure lasting international innocent passage.

THE INCREASING STRATEGIC IMPORTANCE OF THE ARCTIC AND NSR

Melting sea ice in the Arctic has created two important opportunities: 1) increased access to Arctic resources, including oil and natural gas, minerals, and sizeable fisheries; and 2) improved seafaring and shipping ability. The 2008 United States Geological Survey concluded the Arctic contains roughly 90 billion barrels of oil, 44 billion barrels of natural gas liquids, and 1,669 trillion cubic feet of natural gas, which represent 14, 21, and 35 percent, respectively, of the world's unexploited oil, natural gas liquid, and natural gas reserves.[6,7] These oil and natural gas reserves are valued as high as $35 trillion.[8] Significant mineral deposits, including zinc, lead, gold, coal, and diamonds, exist in the Arctic and are valued at more than $2 trillion.[9] Commercial fisheries are an important resource for populations near the Arctic. In 2012, Alaska caught 5.4 billion pounds of seafood valued at $1.9 billion, more in volume and value than any other state in the United States.[10] Norway, an Arctic nation, is the world's leading seafood exporter and accounted for $9.7 billion, or 39 percent of the $25 billion global fishing trade in 2016.[11] Increased access to resources has not only piqued the interest of Arctic states, but non-Arctic states as well, including China, Japan, and South Korea. The growing interest in these resources does not mean that conflict in this region is inevitable or probable, but as states compete for access, the likelihood of conflict and the potential for miscommunication or misunderstanding increase.

Increased access to the Arctic has also generated substantial international shipping

interest. This is due, in large part, to the shorter travel routes the Arctic offers. The NSR, for example, significantly decreases the distance between Asian Pacific and European ports. On average, the NSR is 43 percent (6,000 nautical miles (NM)) shorter than traveling around the Cape of Good Hope, 38 percent (5,380 NM) shorter than the Panama Canal route, and 25 percent (2,700 NM) shorter than the Suez Canal route.[12] This means that ships could potentially reduce their voyage by 10-14 days and save more than $300 thousand per trip by utilizing the NSR instead of alternatives.[13] While open-water vessels today can only transit the NSR during summer months, i.e., roughly 90 days per year, some estimates predict that by 2030, this window may be as long as 240 days.[14] Nevertheless, for organizations evaluating the most cost-effective shipping route, reduced travel time and distance are only two of the evaluation criteria. Other factors complicate the business case, such as the cost of reinforcing ship keels and hulls, reduced fuel efficiency due to slower travel speeds, the toll of the harsh climate on the crew, ship, and cargo, and, perhaps most importantly, the cost of icebreaker service to ensure safe passage.[15]

The strategic situation in the Arctic is best summarized by Heather Conley, an Arctic, Europe, and Eurasia expert at the Center for Strategic and International Studies: in the United States, “it’s in no one’s urgent inbox, and there’s no budget behind it…meanwhile, Russia and China’s interest and activity in the Arctic is only increasing.”[16] The United States is not prepared for the increased geopolitical role the Arctic will play in the coming decades, and conducting FONOPs in the NSR is a pragmatic action to facilitate American economic and national security interests in the region.

THE NORTHERN SEA ROUTE SITUATION

The NSR is a network of passages north of Russia connecting the Atlantic and Pacific Oceans. Russia claims its entirety as internal waters based on UNCLOS Article 234, which permits "coastal states to adopt and enforce non-discriminatory laws and regulations for the prevention and monitoring of marine pollution from vessels in ice-covered areas."[17] The United States, European Union, and others dispute Russia's claim and reference UNCLOS Articles 37 and 38, which "applies to straights…used for international navigation…[and says] all ships shall enjoy the right of transit passage, which shall not be impeded [whereby] transit passage means the exercise…of the freedom of navigation and overflight."[18,19] In 1982 and 1983, President Ronald Reagan clarified the US position in National Security Decision Directives (NSDD) 72 and 83, respectively.[20,21] NSDD 72 states, "International straits will be used by both naval ships and aircraft freely and frequently…[and the DoD] will routinely assert U.S. rights against territorial sea claims." Due to substantial Arctic sea ice, however, contention regarding the NSR remained largely philosophical throughout the 20th century.[22] With decreasing sea ice and the fall of the Soviet Union, Russia 'opened' the NSR to international shipping in 1991, and by the mid-2000s many companies assessed that it made sound business sense to utilize the route.

As of 2013, in line with its territorial claims, Russia asserts that the NSR is 'managed' by the Russian NSR Administration (NSRA). The NSRA requires any shipowner seeking to transit the NSR to submit an application at least 15 days prior to entry.[23] The NSRA will accept or deny the application within 12 days and will assess the fee to be paid for icebreaker support, ice pilot assistance, navigation guidance, and port support in the NSR.[24] According to the NSRA, most ships seeking passage require icebreaker support, whereby the ship will be

towed by or travel in convoy with icebreakers and other ships for safety.[25] Ice pilot assistance and 'ice reconnaissance' provide navigation guidance including the most advantageous sailing route and speed, safeguards against accidents, and ensures "the protection of the marine environment in the water of the NSR."[26] The NSRA also provides the traffic control function within the NSR, coordinating traffic flow and icebreaker services, and advising all ships on current conditions.[27] These services are provided in exchange for the tariff the NSRA requires shipowners to pay. At present, it is difficult for open-water ships to pass through the NSR without the NSRA's support.

The support provided by the NSRA is a source of the friction between Russia and the majority of the international community. The fact that Russia, via the NSRA, demands shipowners request permission and pay a fee to travel through the NSR violates UNCLOS Articles 37 and 38, as interpreted by the United States and the majority of the world. It is interesting to note that China, who considers itself a 'near-Arctic state', has largely acquiesced to Russia's position. During a bilateral meeting in November 2017, Russian President Vladimir Putin and Chinese President Xi Jinping agreed to a quid pro quo relationship in which Russia will allow China to utilize the NSR as part of its 'Polar Silk Road' linking with China's $1 trillion Belt and Road Initiative.[28] This is in exchange for China helping finance development projects with Russia in the Arctic, especially the NSR.[29]

Although the United States continues to contest what it views as Russia's excessive maritime claims, it has not actively attempted to enforce its position since the 1960s. In 1963 and 1964, United States military ships *Northwind* and *Burton Island* attempted FONOPs in the NSR without the prior consent of the Soviet Union. Severe weather rendered both attempts unsuccessful.[30] In 1965, in response to the Soviet's harshly-worded letter of reprimand for the

two attempts, the United States declared, "it must be pointed out that there is the right of innocent passage of all ships through straits used for international navigation between two parts of the high seas and that this right cannot be suspended."[31] Attempting to garner support under customary international law, Russia is quick to point out that neither the United States nor any other state, has attempted to conduct FONOPs in the NSR since the 1960s. Russia's desired end state is international support for territorial claims over what it sees as a key strategic throughway as sea ice continues to melt for the coming decades.[32]

THE CASE FOR NSR FONOPs: SOUTH CHINA SEA EXAMPLE

The United States conducts FONOPs in order to ensure the free use of international seas and airspace, assured to all states via UNCLOS, at a time and place of its choosing, and to safeguard the uninhibited flow of trade.[33] It is important to note, however, that although former President Bill Clinton signed UNCLOS on behalf of the United States on July 28, 1994, Congress has yet to ratify the treaty despite former Presidents George W. Bush and Barack Obama urging them to do so.[34] The result of the US government failing to ratify UNCLOS is that America finds itself in the unfavorable position of conducting global FONOPs, in support of a right guaranteed by UNCLOS, without being a party to said treaty.[35]

The failure to ratify UNCLOS is perhaps nowhere more glaring than the situation in the SCS. China claims the majority of the SCS as its Exclusive Economic Zone (EEZ) and claims sovereignty of the Paracel Islands, Spratly Islands, and the Scarborough Shoal based on its historical demarcation of the eleven-dash line in 1947, which it changed to the nine-dash line in 1953.[36] China's claims overlap with claims from the Philippines, Vietnam, Brunei, Indonesia, Malaysia, and Taiwan.[37] It has also built artificial islands in the Paracel and Spratly island chains.[38] For China, the key strategic component of its claims to the SCS

islands, including its artificial islands, is the surrounding 12 NM territorial water boundary that China would enjoy via UNCLOS.

In January 2013, the Philippines sought to diplomatically resolve its dispute with China by filing a claim with the International Tribunal on the Law of the Sea (ITLOS).[39] In July 2016, ITLOS ruled in favor of the Philippines and stated China's historical nine-dash line claims had no legal basis.[40] China rejected the tribunal's ruling and, as a result, the SCS territorial disputes continue.[41] While America and the international community want China to adhere to the ruling of ITLOS, the United States' legal stance is diminished since it is one of the few countries in the world who is not a ratifying member of UNCLOS. Despite Congress failing to ratify UNCLOS, every US President since Reagan has supported the spirit and intent of UNCLOS, to include conducting FONOPs.

China's rejection of the ITLOS ruling and its continued attempts to enforce its nine-dash line claims is part of the reason the United States conducts FONOPs in the SCS several times per year. However, it is important to note US FONOPs, even in the SCS, do not only target China's claims. In fiscal year 2017 (FY17), the United States conducted FONOPs to challenge what it views as excessive maritime claims by no less than 22 countries, including China, India, Indonesia, Malaysia, Philippines, Taiwan, Venezuela, and Vietnam; nine of these claims took place in the SCS.[42] The excessive Chinese maritime claims that the United States challenged via FONOPs in FY17 include, but were not limited to, airspace jurisdiction above the EEZ, requiring prior permission for innocent passage of foreign military ships surrounding the Paracel Islands, and actions and statements indicating a territorial claim surrounding features of the Spratly Islands.[43] In the SCS, the United States also conducted FONOPs challenging Malaysia's attempt to require prior consent for military exercises or

maneuvers in what it sees as its EEZ, as well as Taiwan's and Vietnam's attempt to require prior notification for military or government ships to enter what they each claim as territorial waters.[44] The United States also conducted FONOPs in numerous other areas of the world including, but not limited to the East China Sea (China), Mediterranean Sea (Algeria), Pacific Ocean (Ecuador), Indian Ocean (India, Maldives, Sri Lanka), and Caribbean Sea (Venezuela).[45] Since the United States FONOPs policy is global in scope, it makes logical sense it would extend FONOPs into the NSR.

THE UNITED STATES LACKS CAPABILITY TO CONDUCT FONOPs IN NSR

Compared to its near-peer competitors Russia and China, the United States has invested little to operate in the Arctic. As Alaska Senator Lisa Murkowski describes the Arctic situation, "People can quibble about what we have versus what Russia has versus what China is building. All I can tell you is we are not in the game right now."[46] There are three primary reasons the United States is not capable of conducting FONOPs in the NSR: 1) lack of platforms and infrastructure; 2) lack of trained personnel; and 3) inadequate C2 structure. The most obvious platform deficiency is a lack of icebreakers. As Alaska Senator Dan Sullivan states, "The highways of the Arctic are icebreakers. Russia has superhighways, and we have dirt roads with potholes."[47] Senator Sullivan's analogy is not much of an exaggeration. As of 2017, Russia's Arctic capability included an Arctic Command, four Arctic brigade combat teams, 40 operational icebreakers with 11 more in development, 16 deep-water ports, and 14 operational airfields.[48] China has one icebreaker, which sailed through both the Arctic's NSR and the Northwest Passage in 2017, and China is currently building its second.[49] In the United States, icebreaking responsibility belongs to the United States Coast Guard (USCG) who currently possesses one aging operational Arctic icebreaker; its second icebreaker is non-

operational.[50] From FY16-FY18, Congress funded $359.6 million toward the acquisition of a heavy, $1 billion icebreaker.[51] The USCG's FY19 proposed budget requests $750 million to fund the icebreaker program with the goal of completing one icebreaker by 2023 followed by funding for two additional in the future.[52] Even if the new icebreaker is fully funded and completed on time, it will not increase the size of the icebreaking fleet since the USCG plans merely to replace its one aging platform.[53]

The lack of icebreakers is only part of the US capability gap in the Arctic, however. It also lacks sufficient communication ability and domain awareness as well as physical infrastructure such as ports, bases, and airfields. Most satellite communication (SATCOM) capability, for example, is placed in a geosynchronous (GEO) orbit, which allows it to provide robust communications between approximately 65 degrees north and south latitude. Since the Arctic Circle lies above 66 degrees north latitude, SATCOM is inaccessible. While a small number of polar communications satellites exist today, bandwidth and access are extremely limited. The United States does not possess deep-water ports in the Arctic despite the Army Corps of Engineers' recommended $200 million expansion of Alaska's Port Nome, which could serve as a key supply port for ships passing through the Bering Strait.[54] Finally, with the exception of the limited aircraft, satellites, ships, and submarines in the region, the United States struggles with domain awareness. The Defense Advanced Research Projects Agency is investigating remote sensing technology to drastically improve this capability, but there is no timeline to field it.[55] As these examples highlight, the United States possesses neither the platforms nor infrastructure to conduct FONOPs in the NSR.

Also preventing routine FONOPs in the NSR is the lack of trained US personnel. While the USCG operated for 185 days in the Arctic in 2017 and saved 16 lives, the US Navy

(USN) spends almost no time in the region, with the exception of its submarines.[56] The extent of the USN's Arctic presence is a five-week submarine ice exercise (ICEX) once every two years that requires the Arctic Submarine Laboratory to plan for more than a year "to ensure our Submarine Force is able to conduct dynamic torpedo and under-ice operations in this unique environment."[57] The 2018 ICEX did not include surface ships. It included three submarines: two from the USN and one from the Royal Navy. As the one-year planning requirement for this exercise illustrates, the United States is not prepared to conduct operations in the Arctic on a routine or quick-response basis, especially those including surface ships.

The final capability gap that precludes regular US Arctic FONOPs is inadequate C2. The DoD *Unified Command Plan* (UCP) designates the commander of United States Northern Command (NORTHCOM) as the DoD Advocate for Arctic Capabilities. The UCP assigns NORTHCOM responsibility for a portion of the Arctic, primarily Canada and Alaska, as well as a "subordinate unified command, Alaskan Command, which focuses on planning and execution of USNORTHCOM missions in Alaska and the USNORTHCOM portion of the Arctic."[58] The UCP also assigns the commander of United States European Command (EUCOM) Arctic responsibility "from Greenland across Europe and Russia to the tip of the Chukotka Peninsula in Russia's Far East."[59] The Forces For Unified Command document allocates federal forces stationed in the Arctic to United States Pacific Command (PACOM), except for those specifically assigned to NORTHCOM.[60] This disparate US C2 structure prevents unity of effort in the Arctic writ large.

At the international level, the Arctic Council is largely regarded as a successful venue for collaboration between Arctic states, including Canada, Denmark, Finland, Iceland,

Norway, Russia, Sweden, and the United States.[61] The Arctic Council also includes six indigenous groups as permanent participants, though not voting members. These include the Aleut International Association, Inuit Circumpolar Council, and Russian Association of Indigenous Peoples of the North.[62] Thirteen states are also designated as Arctic Council Observers, which include the United Kingdom, France, Germany, Japan, South Korea, and China.[63] There is one major limitation to the Arctic Council; its 1996 Charter specifically precludes discussions related to military or defense concerns.[64] Moreover, no equivalent military and/or defense venue for the Arctic exists. This lacuna prevents states from discussing military rules of engagement and/or norms of behavior and facilitates potential misunderstandings regarding military and defense intentions.

IS THE ARCTIC AS IMPORTANT AS OTHER REGIONS?

An argument can be made that activities in the Arctic do not present an urgent threat compared to other current US security challenges. The 2017 National Security Strategy (NSS) highlights the ongoing challenges posed by Russia, China, North Korea, Iran, Syria, and VEOs throughout the world.[65] The 2018 National Defense Strategy (NDS) echoes these threats.[66] Moreover, every Geographic Combatant Command posture statement describes myriad national security concerns in its region. Proponents of the argument that activities in the Arctic do not present an urgent threat might contend the Arctic could become a threat to national security in the future, but the plethora of other issues in the world today demands America's full attention, resources, and commitment.

While the above argument is structurally valid, it fails to accept the eventuality that if the United States continues to ignore the Arctic, Russia and China will continue to gain influence there. The two states are likely to continue their investment in the Arctic to the point

that when it does become a concern, the United States will be too far behind to have a reasonable chance of competing. It should be noted that the current threats posed by Russia and China, as described in the NSS and NDS, are not limited to non-Arctic areas. Indeed, the Arctic is highlighted in each of these adversary's grand strategy. As the NDS articulates, "Long-term strategic competitions with China and Russia are the principal priorities for the [DoD], and require both increased and sustained investment, because of the magnitude of the threats they pose to U.S. security and prosperity today, and the potential for those threats to increase in the future."[67] Lastly, if tensions between the United States and Russia escalate to conflict in other areas of the world, Russia could use its significant naval advantage in the Arctic to threaten the homeland with conventional weapons, and as of today, the United States is largely defenseless in the region.

SHOULD THE US ALLOW RUSSIA TO MANAGE THE NSR?

An argument can be made that since it requires significant resources, equipment, and training to manage the NSR, the United States should concede to Russia's territorial claims and allow the NSRA to manage this shipping route as it does today. As stated, most open-water ships require icebreaker support when traversing the NSR. Since the United States has one aging icebreaker at present time and has funded one-third of the $1 billion required to build a replacement, it is in no position to escort its own ships through the NSR much less conduct FONOPs in this area. Additionally, the Arctic Council states have collaborated effectively regarding non-military issues to this point. It might be reasonable to assume that cooperation in the Arctic, including Russia, will continue indefinitely. Furthermore, if the United States begins a rapid military buildup in the Arctic, it could serve to increase tension between the United States and Russia and increase tensions in the region.

While this argument is valid prima facie, allowing the NSRA to approve or deny all ships that wish to pass through the NSR would violate the US policy of ensuring global FON. Much like the present situation in the SCS, if the international community tacitly approves of Russia's excessive NSR claims by not actively challenging them, these claims could eventually prevail as customary international law in a global court. This could pose a significant disadvantage to the United States, both from an economic and defense standpoint, as sea lanes in the Arctic continue to increase the importance of the NSR for the foreseeable future. Furthermore, Russia has displayed increased aggressiveness throughout the world, e.g. Georgia, Ukraine, Libya, and Syria.[68] Twenty percent of Russia's gross domestic product is derived from resources and areas above the Arctic Circle.[69] Given the Arctic's strategic importance to Russia, coupled with its increased aggression throughout the world, it is reasonable and prudent to believe Russia may not continue to be as cooperative in the Arctic as it has been. Russia could attempt to close the NSR to foreign passage.

RECOMMENDATIONS AND CONCLUSIONS

The 2016 DoD Report to Congress on its Arctic Strategy highlights the following primary objective, "preserve freedom of the seas in the Arctic."[70] The United States should make the necessary investments required to compete in the Arctic and to defend its national strategic interests, beginning with the ability to conduct FONOPs in the NSR. It is also important the United States maintain transparency and communication with other Arctic states, especially Russia, to avoid a security dilemma, whereby two or more states engage in a competitive and escalatory military buildup potentially resulting in conflict. The US SecDef, NORTHCOM, and EUCOM should consider the following:

1) Platforms and Infrastructure

As Founding Director of the Center for Solutions to Weather and Climate Risk at Penn State University and Advisory Board member of the Center for Climate and Security, retired Rear Admiral David Titley states, “Icebreaking capacity is a very good hedging strategy, and our capacity is very limited.”[71,72] The United States should acquire or have access to additional icebreaking capability. There are several options to achieve this. Some US allies, including Canada and Norway, have icebreakers. NORTHCOM, as the DoD Advocate for Arctic Capabilities, could champion agreements with these countries to utilize their icebreakers to conduct FONOPs in the NSR if the President or SecDef gave the order to do so. Another option is to acquire icebreakers through the traditional acquisition process, although this will likely be slow and expensive. Cost estimates for icebreakers built in the United States are currently $1 billion each, but could potentially be reduced to $600 million through economies of scale if three or more were ordered at a time.[73]

While perhaps not politically appetizing under the America First policy, the United States could consider purchasing icebreakers from allies who already possess the production acumen, such as Norway, who claims to have built one of the most technologically advanced icebreakers in the world for approximately $170 million.[74] The United States could consider leasing icebreakers from Norway or another allied partner or could consider a hybrid approach of two or more of these options. For example, it could lease icebreakers from Norway while continuing the traditional acquisition process to produce icebreakers made in the United States by 2025-2030.

The USN should also consider retrofitting a limited number of surface combatants to make them capable of operating in the Arctic in conjunction with icebreakers. Ice-

strengthened ships can withstand minor ice encounters. This could be done by reinforcing hulls with thicker steel, adding an additional hull to create a double hull, or applying unique paints.[75] These ships' equipment, systems, and weapons would also need to be retrofitted with the proper materials that ensure functionality in low temperatures.[76]

NORTHCOM should advocate for at least one deep-water port. As previously noted, the Army Corps of Engineers recommended developing Port Nome into a deep-water port. This would likely take years to complete, so it is not something the United States can simply purchase when it decides it is necessary. NORTHCOM should encourage more communication capacity in the Arctic. Specifically, it should request more bandwidth as well as more protected and anti-jam communication capability. NORTHCOM should also continue to champion increased domain awareness capability to provide a more informed understanding of Arctic activities in order to conduct FONOPs in the region.

2) Increased Arctic Training and Exercises

Holding an ICEX every two years with three submarines and requiring a year of planning to do so exemplifies the United States' lack of dedication to the Arctic. NORTHCOM should conduct Arctic exercises at least annually and should broaden exercise participants beyond the two nations. At a minimum, NORTHCOM should invite Canada and Norway, and the exercises should incorporate icebreakers to conduct FON training. This would provide the USN or USCG with some level of icebreaking skill and technical knowledge in the event they are called upon to perform FONOPs. Since, for the foreseeable future, the United States would depend on allied partners to conduct FONOPs in the NSR, training and exercises should identify roles and responsibilities to successfully perform those operations. NORTHCOM should also request training simulators whereby personnel can

acquire basic icebreaking skills and attempt to maintain a modicum of proficiency in a cost-effective manner. Surface combatant operators should have access to simulators to ensure they have an understanding of how to navigate Arctic waters. Simulators will not produce world-class icebreaking or ice-sailing personnel but could serve as a basic hedge in the near-term.

3) Organizational and Command Structure Realignment

Despite the UCP designating the Commander of NORTHCOM as the DoD Advocate for Arctic Capabilities, EUCOM and PACOM also have Arctic responsibilities. This creates a situation in which everyone has responsibility for something, meaning nobody does. Since the Commander of NORTHCOM is also dual-hatted as Commander, North American Aerospace Defense Command (NORAD), a bi-national command between the United States and Canada responsible for "the detection, validation, and warning of attack against North America whether by aircraft, missiles, or space vehicles," it makes sense for the NORTHCOM/NORAD commander to be responsible for the entirety of the Arctic.[77] Alternatively, the SecDef could designate a separate Geographic Combatant Command for the Arctic to ensure the region gets the attention and resources required for the United States to be competitive. Another option is for NORTHCOM to transform Alaskan Command into a Joint Interagency Task Force Arctic (JIATF Arctic) to consolidate resources from DoD, Department of State, the Federal Bureau of Investigations, and other interagency and international partners to be its tactical and operational focal point for the Arctic. The JIATF Arctic commander would be responsible for domain awareness, intelligence, surveillance, and reconnaissance, and law enforcement. The JIATF Arctic commander would also ensure the United States possesses the capability to be an active participant in the Arctic for economic, security, and defense purposes, which include gaining and maintaining Arctic FONOPs

capability. Finally, NORTHCOM should advocate for the Arctic Council Charter to include military discussions to reduce the possibility of misunderstandings in this region.

Conclusion

In his March 10, 1983 speech regarding the United States' Oceans Policy, President Reagan said that the nation "will not…acquiesce in unilateral acts of other states designed to restrict the rights and freedoms of the international community in navigation and overflight."[78] The NSR is a key shipping route in the increasingly important Arctic region. At present time, Russia claims this route as its territorial waters and seeks to obstruct the right to international passage. In order to ensure international passage in the region, the United States must conduct FONOPs in the NSR, and, to be capable of doing so, it should take the aforementioned recommended steps.

NOTES

[1] Caroline Houck, "The Arctic Could Be the Next South China Sea, Says Coast Guard Commandant," *Defense One*, August 1, 2017, https://www.defenseone.com/threats/2017/08/arctic-could-be-next-south-china-sea-top-coast-guard-admiral/139917/.
[2] Heather A. Conley et al., "Arctic Economies in the 21st Century: The Benefits and Costs of Cold," *Center for Strategic & International Studies* (July 2013), 33, https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/130710_Conley_ArcticEconomics_WEB.pdf.
[3] George W. Bush, National Security Presidential Directive 66 and Homeland Security Presidential Directive 25, "Arctic Region Policy," January 9, 2009, https://fas.org/irp/offdocs/nspd/nspd-66.pdf.
[4] Barack Obama, "National Strategy for the Arctic Region," May 2013, https://obamawhitehouse.archives.gov/sites/default/files/docs/nat_arctic_strategy.pdf.
[5] U.S. Department of Defense, "Freedom of Navigation Program Fact Sheet," March 2015, http://policy.defense.gov/Portals/11/Documents/gsa/cwmd/DoD%20FON%20Program%20--%20Fact%20Sheet%20(March%202015).pdf.
[6] Donald L. Gautier et al., "Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle," USGS, 2008, https://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf.
[7] Thomas S. Ahlbrandt, Brenda S. Pierce, and Vito Nuccio, "USGS World Petroleum Assessment 2000," USGS, 2000, https://pubs.usgs.gov/fs/fs-062-03/FS-062-03.pdf.
[8] Clay Dillow, "Russia and China Vie to Beat the U.S. in the Trillion-Dollar Race to Control the Arctic," *CNBC*, February 6, 2018, https://www.cnbc.com/2018/02/06/russia-and-china-battle-us-in-race-to-control-arctic.html.
[9] David Michaud, "After the Ice: Mineral Riches of the Arctic," 911 Metallurgist, May 14, 2014, https://www.911metallurgist.com/blog/mineral-riches-of-the-arctic.
[10] Conley, "Arctic Economies in the 21st Century," 40.
[11] Alexander Simoes, "Non-fillet Fresh Fish," *The Observatory of Economic Complexity*, accessed April 26, 2018, https://atlas.media.mit.edu/en/profile/hs92/0302/.
[12] Yevgeny Aksenov et al., "On the Future Navigability of Arctic Sea Routes: High-resolution Projections of the Arctic Ocean and Sea Ice," *Marine Policy* 75 (2017): 301, doi: 10.1016/j.marpol.2015.12.027.
[13] Andrew E. Kramer, "Warming Revives Dream of Sea Route in Russian Arctic," *The New York Times*, October 17, 2011, https://www.nytimes.com/2011/10/18/business/global/warming-revives-old-dream-of-sea-route-in-russian-arctic.html.
[14] Stephanie Pezard, "Maintaining Arctic Cooperation with Russia: Planning for Regional Change in the Far North," *RAND Corporation*, 2017, 31-33, https://www.rand.org/pubs/research_reports/RR1731.html.
[15] Aksenov et al., "On the Future Navigability of Arctic Sea Routes," 313.
[16] Keith Johnson and Reid Standish, "Arctic Ice Melting Reignites Russia and China Visions of 'Polar Silk Road,'" *National Post*, March 9, 2018, http://nationalpost.com/news/polar-silk-road-arctic-ice-melting-reignites-russia-china-dreams-of-a-shipping-shortcut-across-the-top-of-the-world.
[17] Daria Gritsenko and Tuomas Kiiski, "A Review of Russian Ice-Breaking Tariff Policy on the Northern Sea Route 1991-2014," *Polar Record* 52, no. 263 (2016): 146, doi:10.1017/S0032247415000479.
[18] Ibid.
[19] "United Nations Convention on the Law of the Sea of 10 December 1982," United Nations Division for Ocean Affairs and the Law of the Sea, opened for signature December 10, 1982, entered into force November 16, 1994, accessed April 14, 2018, http://www.un.org/depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm.
[20] Ronald Reagan, National Security Decision Directive 72, "United States Program for the Exercise of Navigation and Overflight Rights at Sea," December 13, 1982,

https://fas.org/irp/offdocs/nsdd/nsdd-72.pdf.
[21] Ronald Reagan, National Security Decision Directive 83, "United States Ocean Policy, Law of the Sea and Exclusive Economic Zone (C)," March 10, 1983, https://www.reaganlibrary.gov/sites/default/files/archives/reference/scanned-nsdds/nsdd83.pdf.
[22] Andrey A. Todorov, "The Russia-USA Legal Dispute Over the Straits of the Northern Sea Route and Similar Case of the Northwest Passage," *Arctic and North* no. 29 (2017): 62, doi: 10.17238/issn2221-2698.2017.29.74.
[23] Northern Sea Route Administration, "Navigating the Northern Sea Route: Status and Guidance," 2013, 8, accessed April 10, 2018, https://ww2.eagle.org/content/dam/eagle/advisories-and-debriefs/ABS_NSR_Advisory.pdf.
[24] Ibid., 9 & 22-23.
[25] Ibid., 9.
[26] Ibid.
[27] Ibid., 10.
[28] Dillow, "Russia and China Vie to Beat the U.S."
[29] Ibid.
[30] Viatcheslav V. Gavrilov, "Legal Status of the Northern Sea Route and Legislation of the Russian Federation: A Note," *Ocean Development & International Law* 43, no. 3 (2015): 259, doi: 10.1080/00908320.2015.1054746.
[31] Ibid.
[32] Dillow, "Russia and China Vie to Beat the U.S."
[33] U.S. Department of Defense, "Freedom of Navigation Program Fact Sheet."
[34] U.S. Department of State, "Law of the Sea Convention Timeline," accessed April 19, 2018, https://www.state.gov/e/oes/lawofthesea/timeline/index.htm.
[35] Ben Cardin, "The South China Sea is the Reason the United States Must Ratify UNCLOS," *Foreign Policy*, July 13, 2016, http://foreignpolicy.com/2016/07/13/the-south-china-sea-is-the-reason-the-united-states-must-ratify-unclos/.
[36] Shen Dingli et al., "China's Maritime Disputes: A CFR InfoGuide Presentation," Council on Foreign Relations, last updated January 2017, https://www.cfr.org/interactives/chinas-maritime-disputes?cid=otr-marketing_use-china_sea_InfoGuide#!/chinas-maritime-disputes?cid=otr-marketing_use-china_sea_InfoGuide.
[37] Ibid.
[38] Ibid.
[39] Cardin, "The South China Sea is the Reason the United States Must Ratify UNCLOS."
[40] Ibid.
[41] Ibid.
[42] Department of Defense, "Annual Freedom of Navigation Report, Fiscal Year 2017," Department of Defense Report to Congress, December 31, 2017, http://policy.defense.gov/Portals/11/FY17%20DOD%20FON%20Report.pdf?ver=2018-01-19-163418-053.
[43] Ibid.
[44] Ibid.
[45] Ibid.
[46] Keith Johnson, "U.S. Falls Behind in Arctic Great Game," *Foreign Policy*, May 24, 2016, http://foreignpolicy.com/2016/05/24/u-s-falls-behind-in-arctic-great-game/.
[47] Robbie Gramer, "Here's What Russia's Military Build-up in the Arctic Looks Like," *Foreign Policy*, January 25, 2017, http://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/.
[48] Ibid.
[49] Dillow, "Russia and China Vie to Beat the U.S."

[50] Gramer, "Here's What Russia's Military Build-up in the Arctic Looks Like."
[51] Ronald O'Rourke, "Coast Guard Polar Icebreaker Program: Background and Issues for Congress," *Congressional Research Service*, April 18, 2018, 13, https://fas.org/sgp/crs/weapons/RL34391.pdf.
[52] Ibid.
[53] Sydney J. Freedberg Jr., "U.S. Yards Can Build Icebreaker for Under $1B: Zukunft," *Breaking Defense*, August 1, 2017, https://breakingdefense.com/2017/08/us-yards-can-build-icebreaker-for-under-1b-zukunft/.
[54] Peter Sopher, "A Deepwater Port in Alaska's Arctic is Essential for U.S. National Security," *Arctic Today*, March 6, 2018, https://www.arctictoday.com/deepwater-port-alaskas-arctic-essential-u-s-national-security/?wallit_nosession=1.
[55] Defense Advanced Research Projects Agency, "Assured Arctic Awareness," DARPA, accessed March 8, 2018, https://www.darpa.mil/program/assured-arctic-awareness.
[56] Andrea Shalal, "U.S. Navy Eyes Greater Presence in Arctic from 2025," *Reuters*, February 27, 2014, https://www.scientificamerican.com/article/us-navy-eyes-greater-presence-in-arctic-from-2025/.
[57] U.S. Department of the Navy, "Navy Kicks Off ICEX 2018," Commander, Submarine Forces, Public Affairs, March 7, 2018, http://www.navy.mil/submit/display.asp?story_id=104633.
[58] U.S. Department of Defense, "Strategy to Protect United States National Security Interests in the Arctic Region," Department of Defense Report to Congress, December 2016, 5, https://www.defense.gov/Portals/1/Documents/pubs/2016-Arctic-Strategy-UNCLAS-cleared-for-release.pdf.
[59] Daniel Kochis and James Di Pane, "Designating EUCOM Lead Combatant Commander in the Arctic Will Better Protect U.S. Interests," *The Heritage Foundation*, December 15, 2017, 5, https://www.heritage.org/global-politics/report/designating-eucom-lead-combatant-command-the-arctic-will-better-protect-us.
[60] Department of Defense, "Strategy to Protect United States National Security Interests in the Arctic Region," 5.
[61] Arctic Council, "The Arctic Council: A Backgrounder," Arctic Council, last updated January 3, 2018, http://www.arctic-council.org/index.php/en/about-us.
[62] Ibid.
[63] Arctic Council, "Observers," Arctic Council, last updated January 17, 2018, http://www.arctic-council.org/index.php/en/about-us/arctic-council/observers.
[64] Pezard, "Maintaining Arctic Cooperation with Russia," 24.
[65] Donald J. Trump, National Security Strategy of the United States of America," December 2017, https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf.
[66] U.S. Department of Defense, "Summary of the 2018 National Defense Strategy of The United States of America: Sharpening the American Military's Edge," 2 & 9, https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf.
[67] Ibid., 4.
[68] NATO Association of Canada, "A Recent History of Russian Aggression," NAOC, accessed May 3, 2018, http://natoassociation.ca/a-timeline-of-russian-aggression/.
[69] Michael Lambert, "Russia's Arctic Ambitions Held Back by Economic Troubles," *Center for International Maritime Security*, February 28, 2018, http://cimsec.org/russias-arctic-ambitions-held-back-economic-troubles/35590.
[70] Department of Defense, "Strategy to Protect United States National Security Interests in the Arctic Region," 2.
[71] "Rear Admiral David W. Titley, USN (Ret)," *The Center for Climate and Security*, accessed May 5, 2018, https://climateandsecurity.org/advisory-board/rear-admiral-david-w-titley-usn-ret/.
[72] Johnson, "U.S. Falls Behind in Arctic Great Game."
[73] O'Rourke, "Coast Guard Polar Icebreaker Program: Background and Issues for Congress," 13.

[74] Thomas Nilsen, "Norway Unveils Most Advanced Research Vessel to Sail the Arctic Ocean," *The Independent Barents Observer*, February 28, 2017, https://thebarentsobserver.com/en/arctic/2017/02/norway-unveils-most-advanced-research-vessel-sail-arctic-ocean.
[75] Paul Ward, "Icebreakers and Ice Strengthened Ships," *Cool Antarctica*, accessed May 9, 2018, https://www.coolantarctica.com/Antarctica%20fact%20file/History/ships/icebreaker.php.
[76] Kaj A. Riska, "Ship – Ice Interaction in Ship Design: Theory and Practice," ILS Oy, Helsinki, Finland and University of Science and Technology, Trondheim, Norway, accessed May 9, 2018, http://www.arctis-search.com/tiki-download_wiki_attachment.php?attId=191.
[77] North American Aerospace Defense Command, "North American Aerospace Defense Command," NORAD, last updated April 25, 2013, http://www.norad.mil/Newsroom/Fact-Sheets/Article-View/Article/578770/north-american-aerospace-defense-command/.
[78] Ronald Reagan, "Statement on United States Oceans Policy," March 10, 1983, online by Gerhard Peters and John T. Woolley, *The American Presidency Project*, accessed May 4, 2018, http://www.presidency.ucsb.edu/ws/index.php?pid=41036.

BIBLIOGRAPHY

Adams, Gordon and Shoon Murray. *Mission Creep: The Militarization of U.S. Foreign Policy*. Georgetown University Press: 2014.

Ahlbrandt, Thomas S., Brenda S. Pierce, and Vito Nuccio. "USGS World Petroleum Assessment 2000." USGS, 2000. https://pubs.usgs.gov/fs/fs-062-03/FS-062-03.pdf.

Aksenov, Yevgeny, Ekaterina E. Popova, Andrew Yool, A.J. George Nurser, Timothy D. Williams, Laurent Bertino, and Jon Bergh. "On the Future Navigability of Arctic Sea Routes: High-resolution Projections of the Arctic Ocean and Sea Ice." *Marine Policy* 75 (2017): 300-317. doi: 10.1016/j.marpol.2015.12.027.

Allison, Graham. *Destined for War, Can America and China Escape Thucydides's Trap?* New York: Houghton Mifflin Harcourt, 2017.

_____. "The Thucydides Trap: When One Great Power Threatens to Displace Another, War is Almost Always the Result – but it Doesn't Have To Be." *Foreign Policy*, June 9, 2017. http://foreignpolicy.com/2017/06/09/the-thucydides-trap/.

American Forces Press Service. "Official Explains DoD's Role in National Arctic Strategy." *United States Northern Command*. May 10, 2013. http://www.northcom.mil/Newsroom/Article/563640/official-explains-dods-role-in-national-arctic-strategy/.

Arctic Council. "The Arctic Council: A Backgrounder." Arctic Council. Last updated January 3, 2018. http://www.arctic-council.org/index.php/en/about-us.

Berbrick, Walter. "Make the Arctic Great Again." *CNN*. December 22, 2016. https://www.cnn.com/2016/12/22/opinions/make-arctic-great-again-berbrick/index.html.

Burke, Danita Catherine. "The Northwest Passage Dispute." *Oxford Research Group*, February 26, 2018. https://sustainablesecurity.org/2018/02/26/the-northwest-passage-dispute/.

Carafano, James, Ariel Cohen, Sally McNamara, and Richard Weitz. "EUCOM Should Lead U.S. Combatant Commands in Defense of National Interests in the Arctic." Backgrounder no. 2536 (2011).

Cardin, Ben. "The South China Sea is the Reason the United States Must Ratify UNCLOS." *Foreign Policy*, July 13, 2016. http://foreignpolicy.com/2016/07/13/the-south-china-sea-is-the-reason-the-united-states-must-ratify-unclos/.

Clausewitz, Carl von. *On War*. Translated and edited by Michael Howard and Peter Paret. Princeton: Princeton University Press, 1976.

Conley, Heather A., David L. Pumphrey, Terence M. Toland, and Mihaela David. "Arctic Economies in the 21st Century: The Benefits and Costs of Cold." *Center for Strategic & International Studies*, July 2013. https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/130710_Conley_ArcticEconomics_WEB.pdf.

Dillow, Clay. "Russia and China Vie to Beat the U.S. in the Trillion-Dollar Race to Control the Arctic." *CNBC*, February 6, 2018. https://www.cnbc.com/2018/02/06/russia-and-china-battle-us-in-race-to-control-arctic.html.

Dingli, Shen, Elizabeth Economy, Richard Haass, Joshua Kurlantzick, Sheila A. Smith, and Simon Tay. "China's Maritime Disputes: A CFR InfoGuide Presentation." Council on Foreign Relations. Last updated January 2017. https://www.cfr.org/interactives/chinas-maritime-disputes?cid=otr-marketing_use-china_sea_InfoGuide#!/chinas-maritime-disputes?cid=otr-marketing_use-china_sea_InfoGuide.

Dobriansky, Paula. "A Cold War in the Arctic Circle." *Wall Street Journal*, January 12, 2018. https://www.wsj.com/articles/a-cold-war-in-the-arctic-circle-1514823379.

Dominguez, Gabriel. "China Lodges Complaint Over U.S. FONOP in South China Sea." *Jane's Defence Weekly*, October 11, 2017. http://www.janes.com/article/74826/china-lodges-complaint-over-us-fonop-in-south-china-sea.

Freedberg Jr., Sydney J. "U.S. Yards Can Build Icebreaker for Under $1B: Zukunft." *Breaking Defense*, August 1, 2017. https://breakingdefense.com/2017/08/us-yards-can-build-icebreaker-for-under-1b-zukunft/.

Gautier, Donald L., Kenneth J. Bird, Ronald R. Charpentier, David W. Houseknecht, Timothy R. Klett, Janet K. Pitman, Thomas E. Moore, Christopher J. Schenk, Marilyn E. Tennyson, and Craig J. Wandrey. "Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle." USGS, 2008. https://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf.

Gavrilov, Viatcheslav V. "Legal Status of the Northern Sea Route and Legislation of the Russian Federation: A Note." *Ocean Development & International Law* 43, no. 3 (2015): 259. doi: 10.1080/00908320.2015.1054746.

Genest, Marc. "Thucydides Insights Into: Man, the State, and the Peloponnesian War." (Presentation, U.S. Naval War College, Newport, RI, November 28, 2017).

Georgescu, Constantin. "Northern Sea Route." Knowledge Horizons – Economics 6, no. 4 (2014): 157-161. http://orizonturi.ucdc.ro/arhiva/2014_khe_6_pdf4/georgescu_1.pdf.

Gramer, Robbie. “Here’s What Russia’s Military Build-up in the Arctic Looks Like.” *Foreign Policy*, January 25, 2017. http://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/.

Gray, Christopher, Leif Bergey, and Walter Berbrick. “Fleet Arctic Operations Game: Game Report.” U.S. Naval War College, November 14, 2011. https://www.hsdl.org/?view&did=746182.

Gritsenko, Daria and Tuomas Kiiski. “A Review of Russian Ice-Breaking Tariff Policy on the Northern Sea Route 1991-2014.” *Polar Record* 52, no. 263 (2016): 144-158. doi:10.1017/S0032247415000479.

Herz, John. “Idealist Internationalism and the Security Dilemma.” World Politics 2, no. 2 (1950): 157- 180.

Hollings, Alex. “Where America’s Military Might Doesn’t Reach: The Threat of Russian Dominance in the Arctic.” *SOFREP News*, February 28, 2018. https://sofrep.com/100235/wheres-americas-military-might-doesnt-reach-the-threat-of-russian-dominance-in-the-arctic/.

Johnson, Keith. “U.S. Falls Behind in Arctic Great Game.” *Foreign Policy*, May 24, 2016. http://foreignpolicy.com/2016/05/24/u-s-falls-behind-in-arctic-great-game/.

Johnson, Keith and Reid Standish. “Arctic Ice Melting Reignites Russia and China Visions of ‘Polar Silk Road.’” *National Post*, March 9, 2018. http://nationalpost.com/news/polar-silk-road-arctic-ice-melting-reignites-russia-china-dreams-of-a-shipping-shortcut-across-the-top-of-the-world.

Klimenko, Ekaterina. “Shipping Along the Arctic’s Northern Sea Route Will Be Determined by Russia-China Cooperation in the Region.” February 7, 2018. https://www.sipri.org/commentary/expert-comment/2018/shipping-along-arctics-northern-sea-route-will-be-determined-russia-china-cooperation-region.

Kochis, Daniel and James Di Pane. “Designating EUCOM Lead Combatant Commander in the Arctic Will Better Protect U.S. Interests.” *The Heritage Foundation*, December 15, 2017. https://www.heritage.org/global-politics/report/designating-eucom-lead-combatant-command-the-arctic-will-better-protect-us.

Kramer, Andrew E. “Warming Revives Dream of Sea Route in Russian Arctic.” *The New York Times*, October 17, 2011. https://www.nytimes.com/2011/10/18/business/global/warming-revives-old-dream-of-sea-route-in-russian-arctic.html.

Lambert, Michael. “Russia’s Arctic Ambitions Held Back by Economic Troubles.” *Center for International Maritime Security*, February 28, 2018. http://cimsec.org/russias-arctic-ambitions-held-back-economic-troubles/35590.

Lee, Kyung Suk and Kyu Young Lee. “U.S. Freedom of Navigation Operations in South China Sea: An Ongoing Riddle Between the United States and China.” *The Korean Journal of Defense Analysis* 29, no. 3 (September 2017): 455-473. http://www.kida.re.kr/kjda.

McLay, James. U.S. Naval War College. Joint Military Operations Department Research Paper. “Joint Interagency Task Forces; The Right Model to Combat Transnational Organized Crime?” Newport, RI: Naval War College, May 18, 2015. http://www.dtic.mil/dtic/tr/fulltext/u2/1001934.pdf.

Michaud, David. “After the Ice: Mineral Riches of the Arctic.” *911 Metallurgist*, May 14, 2014. https://www.911metallurgist.com/blog/mineral-riches-of-the-arctic.

NATO Association of Canada. “A Recent History of Russian Aggression.” NAOC. Accessed May 3, 2018. http://natoassociation.ca/a-timeline-of-russian-aggression/.

Nilsen, Thomas. “Norway Unveils Most Advanced Research Vessel to Sail the Arctic Ocean.” *The Independent Barents Observer*, February 28, 2017. https://thebarentsobserver.com/en/arctic/2017/02/norway-unveils-most-advanced-research-vessel-sail-arctic-ocean.

North American Aerospace Defense Command. “North American Aerospace Defense Command.” NORAD. Last updated April 25, 2013. http://www.norad.mil/Newsroom/Fact-Sheets/Article-View/Article/578770/north-american-aerospace-defense-command/.

Northern Sea Route Administration. “Navigating the Northern Sea Route: Status and Guidance.” 2013. Accessed April 10, 2018. https://ww2.eagle.org/content/dam/eagle/advisories-and-debriefs/ABS_NSR_Advisory.pdf.

O’Rourke, Ronald. “Coast Guard Polar Icebreaker Program: Background and Issues for Congress.” *Congressional Research Service*, April 18, 2018. https://fas.org/sgp/crs/weapons/RL34391.pdf.

Pezard, Stephanie, Abbie Tingstad, Kristin Van Abel, and Scott Stephenson. “Maintaining Arctic Cooperation with Russia.” *RAND Corporation*, 2017. https://www.rand.org/pubs/research_reports/RR1731.html.

President of the United States. *National Security Decision Directive 72*, “United States Program for the Exercise of Navigation and Overflight Rights at Sea.” December 13, 1982. https://fas.org/irp/offdocs/nsdd/nsdd-72.pdf.

_____. *National Security Decision Directive 83*, "United States Ocean Policy, Law of the Sea and Exclusive Economic Zone (C)." March 10, 1983. https://www.reaganlibrary.gov/sites/default/files/archives/reference/scanned-nsdds/nsdd83.pdf.

_____. *National Security Strategy*. December 2017. https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf.

_____. *National Security Strategy*. February 2015. http://nssarchive.us/wp-content/uploads/2015/02/2015.pdf.

_____. *National Security Strategy*. May 2010. http://nssarchive.us/NSSR/2010.pdf.

_____. *National Strategy for the Arctic Region*. May 10, 2013. https://obamawhitehouse.archives.gov/sites/default/files/docs/nat_arctic_strategy.pdf.

Reagan, Ronald. "Statement on United States Oceans Policy." March 10, 1983. Online by Gerhard Peters and John T. Woolley, *The American Presidency Project*. Accessed May 4, 2018. http://www.presidency.ucsb.edu/ws/index.php?pid=41036.

Robinson, Lori. "Statement of General Lori Robinson, United States Air Force, Commander, United States Northern Command and North American Aerospace Defense Command before the Senate Armed Services Committee." February 15, 2018. http://www.northcom.mil/Portals/28/Robinson_02-15-18%20SASC%20Testimony.pdf?ver=2018-02-15-105546-867.

Riska, Kaj A. "Ship – Ice Interaction in Ship Design: Theory and Practice." ILS Oy, Helsinki, Finland and University of Science and Technology, Trondheim, Norway. Accessed May 9, 2018. http://www.arctis-search.com/tiki-download_wiki_attachment.php?attId=191.

Scopelliti, Marzia and Elena Perez. "Defining Security in a Changing Arctic: Helping to Prevent an Arctic Security Dilemma." *Polar Record* 52 no. 267 (2016). doi:10.1017/S0032247416000528.

Shalal, Andrea. "U.S. Navy Eyes Greater Presence in Arctic from 2025." *Reuters*, February 27, 2014. https://www.scientificamerican.com/article/us-navy-eyes-greater-presence-in-arctic-from-2025/.

Simoes, Alexander. "Non-fillet Fresh Fish." *The Observatory of Economic Complexity*. Accessed April 26, 2018. https://atlas.media.mit.edu/en/profile/hs92/0302/.

Sopher, Peter. "A Deepwater Port in Alaska's Arctic is Essential for U.S. National Security." *Arctic Today*, March 6, 2018. https://www.arctictoday.com/deepwater-port-alaskas-arctic-essential-u-s-national-security/?wallit_nosession=1.

Strassler, Robert. ed. *The Landmark Thucydides*. New York: The Free Press, 1996.

The Center for Climate and Security. "Rear Admiral David W. Titley, USN (Ret)," *The Center for Climate and Security.* Accessed May 5, 2018. https://climateandsecurity.org/advisory-board/rear-admiral-david-w-titley-usn-ret/.

The Economist. "Skating on Thin Ice: The Thawing Arctic Threatens an Environmental Catastrophe." April 29, 2017. https://www.economist.com/news/briefing/21721364-commercial-opportunities-are-vastly-outweighed-damage-climate-thawing-arctic.

Todorov, Andrey A. "The Russia-USA Legal Dispute Over the Straits of the Northern Sea Route and Similar Case of the Northwest Passage." *Arctic and North* no. 29 (2017): 62-75. doi: 10.17238/issn2221-2698.2017.29.74.

United Nations. "United Nations Convention on the Law of the Sea of 10 December 1982." United Nations Division for Ocean Affairs and the Law of the Sea. Opened for signature December 10, 1982, entered into force November 16, 1994. http://www.un.org/depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm.

_____. "United Nations Convention on the Law of the Sea." United Nations Treaty Collection. Last updated April 30, 2018. https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=IND&mtdsg_no=XXI-6&chapter=21&Temp=mtdsg3&clang=_en.

U.S. Defense Advanced Research Projects Agency (DARPA). "Assured Arctic Awareness (AAA)." https://www.darpa.mil/program/assured-arctic-awareness.

U.S. Department of Defense. "Arctic Strategy." November 2013. https://www.defense.gov/Portals/1/Documents/pubs/2013_Arctic_Strategy.pdf.

_____. "Report to Congress on Annual Freedom of Navigation, Fiscal Year 2017." December 31, 2017. http://policy.defense.gov/Portals/11/FY17%20DOD%20FON%20Report.pdf?ver=2018-01-19-163418-053.

_____. "Report to Congress on Resourcing the Arctic Strategy." June 2016. https://www.defense.gov/Portals/1/Documents/pubs/Report_to_Congress_on_Resourcing_the_Arctic_Strategy.pdf.

_____. "Strategy to Protect United States National Security Interests in the Arctic Region." Department of Defense Report to Congress, December 2016. https://www.defense.gov/Portals/1/Documents/pubs/2016-Arctic-Strategy-UNCLAS-cleared-for-release.pdf.

_____. “Summary of the 2018 National Defense Strategy of The United States of America: Sharpening the American Military’s Edge.” 2 & 9. https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf.

U.S. Department of Homeland Security. “Assistant Commandant for Capability (CG-7): Office of Cutter Forces (CG-751).” U.S. Coast Guard. Accessed April 29, 2018. https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Capability-CG-7/Office-of-Cutter-Forces-CG-751/Coast-Guard-Cutter-Fleet/.

U.S. Department of State. “Law of the Sea Convention Timeline.” Accessed April 19, 2018. https://www.state.gov/e/oes/lawofthesea/timeline/index.htm.

_____. “Limits in the Seas: United States Responses to Excessive National Maritime Claims, No. 112.” Office of Ocean Affairs Bureau of Oceans and International Environmental and Scientific Affairs. March 9, 1992. https://www.state.gov/documents/organization/58381.pdf.

U.S. Department of the Navy. “Navy Kicks Off ICEX 2018.” Commander, Submarine Forces, Public Affairs. March 7, 2018. http://www.navy.mil/submit/display.asp?story_id=104633.

U.S. Northern Command. “Joint Task Force Alaska.” Last updated May 16, 2013. http://www.northcom.mil/Newsroom/Fact-Sheets/Article-View/Article/563998/joint-task-force-alaska/.

Vego, Milan. *Operational Warfare at Sea, Theory and Practice*. Routledge: 2009.

Ward, Paul. “Icebreakers and Ice Strengthened Ships.” *Cool Antarctica*. Accessed May 9, 2018. https://www.coolantarctica.com/Antarctica%20fact%20file/History/ships/icebreaker.php.

Wright, David Curtis. “The Dragon Eyes the Top of the World: Arctic Policy Debate and Discussion in China.” China Maritime Studies Institute, U.S. Naval War College, August 2011. http://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1007&context=cmsi-red-books.