A Case Against Significant Military Expenditure in the Arctic

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14. ABSTRACT

Year after year summer sea-ice coverage in the Arctic continues to decline, uncovering untold amounts of natural resources and the potential for new shipping routes across the Arctic to further connect Europe and Asia. As these economic opportunities emerge, so does the possibility of conflict as competitors seek to stake their claim in this previously untouched region. However, the Arctic remains cold, inhospitable, and difficult to access most of the year. Though summer sea-ice retreats further every year, the extent of winter sea-ice has only marginally decreased. U.S. Maritime Strategy has argued for an increased military presence in the Arctic in order to not cede influence to America's rivals. This paper explores counterpoints to stated U.S. Maritime Strategy in the Arctic, the possibility that many of the Arctic's economic opportunities will not be economically viable for many years to come, and that the U.S. will not cede ground by taking a more cautious approach expanding into the Arctic.

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Introduction

In recent years, the Arctic Region has received increasing attention as sea-ice and permafrost retreat, opening new trans-Arctic shipping lanes and new resources for extraction. Russia has started to capitalize on the opportunities exposed by the thawing Arctic and the exposed Northern Sea Route by building significant Arctic infrastructure to include numerous air bases, ports, and the world's largest fleet of icebreakers. Russia's Arctic expansion, coupled with China's stated interest in the Arctic, has caused many U.S. National Security and Naval Strategy pundits to argue for increased American military presence in the Arctic to counter the Arctic ambitions of America near peer competitors. These sentiments are prominently featured in the 2020 U.S. Maritime Strategy, arguing for increased U.S. military presence in the Arctic:

> "We cannot cede influence in areas of emerging day-to-day competition, including U.S. regional waters and the Arctic. The coming decades will bring changes to the Arctic region that will have a significant impact on the global economy, given its abundance of natural resources and strategic location. China views this region as a critical link in their One Belt One Road initiative. Arctic nations are reopening old bases, moving forces, and reinvigorating regional exercises. These trends will persist in the decades ahead. We must continue to operate forward and posture our forces appropriately."[1]

However, the U.S. Navy should avoid overcommitting forces to the Arctic because, the Arctic's economic importance is overhyped as Arctic transportation and resource extraction is of marginal economic feasibility, China's interest in the Arctic is economic and does not conflict with or threaten any U.S. interests, Russia's military buildup in the Arctic does not significantly enhance Russia's ability to project power against America, and it is tactically unsound for the Navy's surface combatants and aircraft carriers to fight in ice-covered areas. A shift of U.S. Naval forces North of the Bering Straits will do little to promote U.S. national interest and is

[1] Department of the Navy. *Advantage at Sea, U.S. Maritime Strategy.* December 2020.

therefore a poor allocation of limited military and economic resources. Such a shift would not only be extraneous to America's national interests, it could further heighten tensions in a historically peaceful and cooperative region.

Economic Importance of the Arctic

The Arctic's present and near-future economic potential has been exaggerated barring unforeseen extreme rises in either shipping rates or natural resource prices, as operations are cost effective on only a limited basis in this harsh environment. Despite the continuing decrease in summer sea-ice coverage, the range of winter sea-ice coverage has only diminished slightly over the last 30 years.[2] Even as the range of summer sea-ice diminishes, sea-ice begins to reform at the end of September every year, leaving a limited window where economic activity can occur unhindered by ice, never mind the occasional iceberg or ice-flow which can be hazards to navigation year-round. The Arctic will continue to be cold, harsh, remote, and covered in ice for much of the year, making transportation and offshore resource extraction difficult and expensive.[3]

While tremendous deposits of oil, gas, and mineral resources have been found in the vastly unexplored seabeds of the Arctic, these resources are simply not cost effective to explore. Every major Arctic offshore project in the last decade has been abandoned due to lack of feasibility. Exxon-Mobil abandoned its Greenland offshore oil leases in 2013.[4] After spending 7 billion USD on exploration, Shell Oil abandoned its Chukchi Sea oil and gas leases in 2015.[5]

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[2] National Snow & Ice Data Center. *State of the Cryosphere: Sea-Ice.* 12 Nov 2020.
[3] Svend Aage Christensen. "Are the Northern Sea Routes Really the Shortest?," Danish Institute for International Studies, Mar 2009. Pg. 3.
[4] Steve Marshall. "ExxonMobil Set for Greenland Exit," Upstream: Global Oil and Gas News, 13 December 2013. https://www.upstreamonline.com/online/exxonmobil-set-for-greenland-exit/1-1-1139866
[5] Terry Macalister. "Shell Abandons Alaska Arctic Drilling," The Guardian, 28 September 2015.

Russian oil giant Gazprom walked away from the Shtokman gas field in 2019,[6] having invested 20 billion USD in development the field's oil and gas potential.[7] These companies discovered enormous deposits of oil and gas, but abandoned their investments because Arctic offshore oil and gas is not economically viable to extract. Infrastructure and logistics for offshore oil is difficult and expensive in the best of climates. Crude oil coagulates at low-temperatures, making Arctic oil extraction difficult, technically complex, and extremely expensive. Since modern hydraulic-fracturing became standard practice in the oil industry, oil prices have been too low for Arctic offshore oil to be cost effective. As the world's demand for oil appears to have plateaued, oil will likely remain cheap and Arctic offshore oil economically unfeasible.[8]

Despite the current hype over the Northern Sea Route and Northwest Passage, maritime operations in the Arctic are difficult, expensive, and not as feasible as commonly believed. Both Arctic routes save considerable distance over some routes, fuel costs are increased and speed is reduced during an ice transit, minimizing savings in time and fuel, while requiring expensive and specifically designed ice-capable hulls. This is because merchant ships are typically much wider than their icebreaker escorts, requiring them to widen the icebreaker's initial channel. Ice-capable merchant vessels can only effectively travel through year old ice, further increasing the difficulty of this transit.[9] As such, any ice transit requires sophisticated monitoring of ice-flows. Should a merchant ship become trapped in the ice, through machinery failure, fire or other

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https://www.theguardian.com/business/2015/sep/28/shell-ceases-alaska-arctic-drilling-exploratory-well-oil-gas-disappoints

[6] Atle Staalesen. "No more Shtokman Development," The Barents Observer, 21 June 2019. https://thebarentsobserver.com/en/industry-and-energy/2019/06/no-more-shtokman-development

[7] Stephen Carmel. "The Cold, Hard Realities of Arctic Shipping." U.S. Naval Institute Proceedings, vol.139, no. 7, July 2013, p. 38-41.

[8] U.S. Energy Information Administration, Short-Term Energy Outlook. 6 Apr 2021. https://www.eia.gov/outlooks/steo/report/global_oil.php

[9] Malte Humpert. "A New Dawn for Arctic Shipping – Winter Transits on the Northern Sea Route," High North News, 19 Jan 2021. https://www.highnorthnews.com/en/new-dawn-arctic-shipping-winter-transits-northern-sea-route

casualty, or simply from attempting to pass through too thick of ice, help could potentially be well over a week and hundreds if not over a thousand nautical miles away. The world's largest shipping companies appear to agree that winter operations for most cargoes at present shipping rates are not feasible. As stated by Arctic shipping expert Frederic Lasserre, "Using ice-capable vessels for containers could be done from a technical point of view, but the cost is high; and it is still not sure they could guarantee just-in-time delivery. Low freight rates preclude the profitability of such a route."[10] The Northern Sea Route and Northwest Passage are only accessible to vessels not specifically designed for the Arctic environment during a brief window of time at the end of summer, and this is likely not advisable due to the potential hazard of ice-flows and icebergs. Despite Russia's massive investment in developing the Northern Sea Route, the Northern Sea Route has proved economically feasible primarily for oil and gas shipments originating in the Russian Arctic.[11]

Despite President Putin's claim that "The Arctic is the shortcut between the largest markets of Europe and the Asia-Pacific region,"[12] the Northern Sea Route and Northwest Passage only appreciably reduce distance over several common shipping routes, as displayed in Table 1. For example, the shortest route from Rotterdam to Los Angeles is via the Panama Canal, while the shortest route from Rotterdam to Singapore is via the Suez Canal and Straits of Malacca. The New York to Shanghai route saves 2,076 nautical miles by sailing the Northwest Passage rather than taking the Panama Canal. The average container ship travels at 24 knots,[13]

[10] Malte Humpert. "A New Dawn for Arctic Shipping – Winter Transits on the Northern Sea Route."
[11] Malte Humpert. "A New Dawn for Arctic Shipping – Winter Transits on the Northern Sea Route."
[12] Malte Humpert. "A New Dawn for Arctic Shipping – Winter Transits on the Northern Sea Route."

[13] Jean-Paul Rodrigue. *The Geography of Transport Systems* (New York: Routledge, 2020), Chapter 4, Fuel Consumption by Containership Size and Speed. https://transportgeography.org/contents/chapter4/transportation-and-energy/fuel-consumption-containerships/

making 576 nautical miles per day, thus notionally saving roughly 3 ½ days. However, a shorter route does not necessarily translate to less transit time.

Ice still covers the region for all but several months of the year, necessitating slow and fuel intense travel by the merchant, not to mention icebreaker's cost. The USCG's icebreaker Polar Star, the world's most powerful non-nuclear icebreaker, breaks 6-foot-thick ice at a speed of 3 knots,[14] while the latest Russian nuclear icebreakers transit through 6-foot-ice ice at nearly 8 knots.[15] However, most merchant vessels will not exceed 5-6 knots in ice.[16] Decreased ship speeds and increased fuel burn in ice make non-Arctic routes faster and more desirable than Arctic routes. Changing ice coverage and thickness makes Arctic transit times unpredictable for most of the year. This is ill-suited to today's just-in-time shipping market. Even in summer months, drift ice and icebergs present hazards to navigation. Ice-capable hulls are expensive, as are Arctic insurance rates.

While Arctic ice is no doubt melting, the ice returns at the summer's end. According to the Danish Institute for International Studies, "No research and no simulations indicate that the Arctic Ocean is not going to be covered by ice the rest of this century."[17] Arctic shipping routes are only seasonally viable for certain routes with specially built ships. The Arctic Institute's Malte Humbert states, "Canadian and American maritime experts say two percent of global shipping could be diverted to the Arctic by 2030, reaching 5 percent by 2050."[18] Pierre Leblanc,

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[14] United States Coast Guard. "Coast Guard Assets, Polar Class." https://www.uscg.mil/Assets/Article/1822547/399-foot-polar-class/

[15] Royal Institution of Naval Architects. "Fast sailing in ice- the new goal of model studies," *The Naval Architect*, (January 2018). https://www.rina.org.uk/Fast_Sailing_in_Ice.html

[16] Royal Institution of Naval Architects. "Fast sailing in ice- the new goal of model studies."

[17] Svend Aage Christensen. "Are the Northern Sea Routes Really the Shortest?," Danish Institute for International Studies, Mar 2009. Pg. 3.

[18] Malte Humpert. "A New Dawn for Arctic Shipping – Winter Transits on the Northern Sea Route."

former commander of Canadian Forces Northern Area, wrote, "Traffic over the Northeast Passage, which follows along the Russian coast line, has seen a modest increase, but has not met any of the aggressive targets set by Russian President Vladimir Putin. Much of that traffic has been destinational in support of the oil and gas industry."[19] Despite the rosy outlook painted by certain pundits, politicians, and government officials, most shipping companies express little interest in Arctic shipping routes. Arctic shipping routes have limited economic value for the near future, at least until such a time that trans-Arctic shipping becomes more economically viable.[20]

Are the northern sea routes really the shortest?

Distance in km between harbours using various southern and northern routes

Route	Panama Canal	Northwest Passage	Northeast Passage	Suez and Malacca
London - Yokohama	23.300	15.930	13.841	21.200
Marseilles - Yokohama	24.030	16.720	17.954	17.800
Marseilles - Singapore	29.484	21.600	23.672	12.420
Marseilles - Shanghai	26.038	19.160	19.718	16.460
Rotterdam - Singapore	28.994	19.900	19.641	15.750
Rotterdam - Shanghai	25.588	17.570	15.793	19.550
Hamburg - Seattle	17.110	15.270	13.459	29.780
Rotterdam - Vancouver	16.350	14.330	13.445	28.400
Rotterdam - Los Angeles	14.490	15.790	15.252	29.750
Gioia Tauro (Italy) - Hongkong	25.934	24.071	21.556	14.093
Barcelona - Hongkong	25.044	23.179	20.686	14.693
New York - Shanghai	20.880	17.030	19.893	22.930
New York - Hongkong	21.260	18.140	20.982	21.570
New York - Singapore	23.580	20.310	23.121	18.770

Marginally longer route | Shortest route

All numbers calculated by Frédéric Lasserre in SIG Mapinfo, except the numbers for the Northeast Passage through the Kara Strait south of Novaya Zemlya which have been calculated in Google Earth by Svend Aage Christensen.

Table 1[21]

[19] Pierre LeBlanc. "A Less Attractive Northwest Passage is Good for Canada," The Maritime Executive, 13 Nov 2021. https://www.maritime-executive.com/editorials/op-ed-a-less-attractive-northwest-passage-is-good-for-canada
[20] Svend Aage Christensen. "Are the Northern Sea Routes Really the Shortest?," Pg. 4.
[21] Svend Aage Christensen. "Are the Northern Sea Routes Really the Shortest?." Pg. 2.

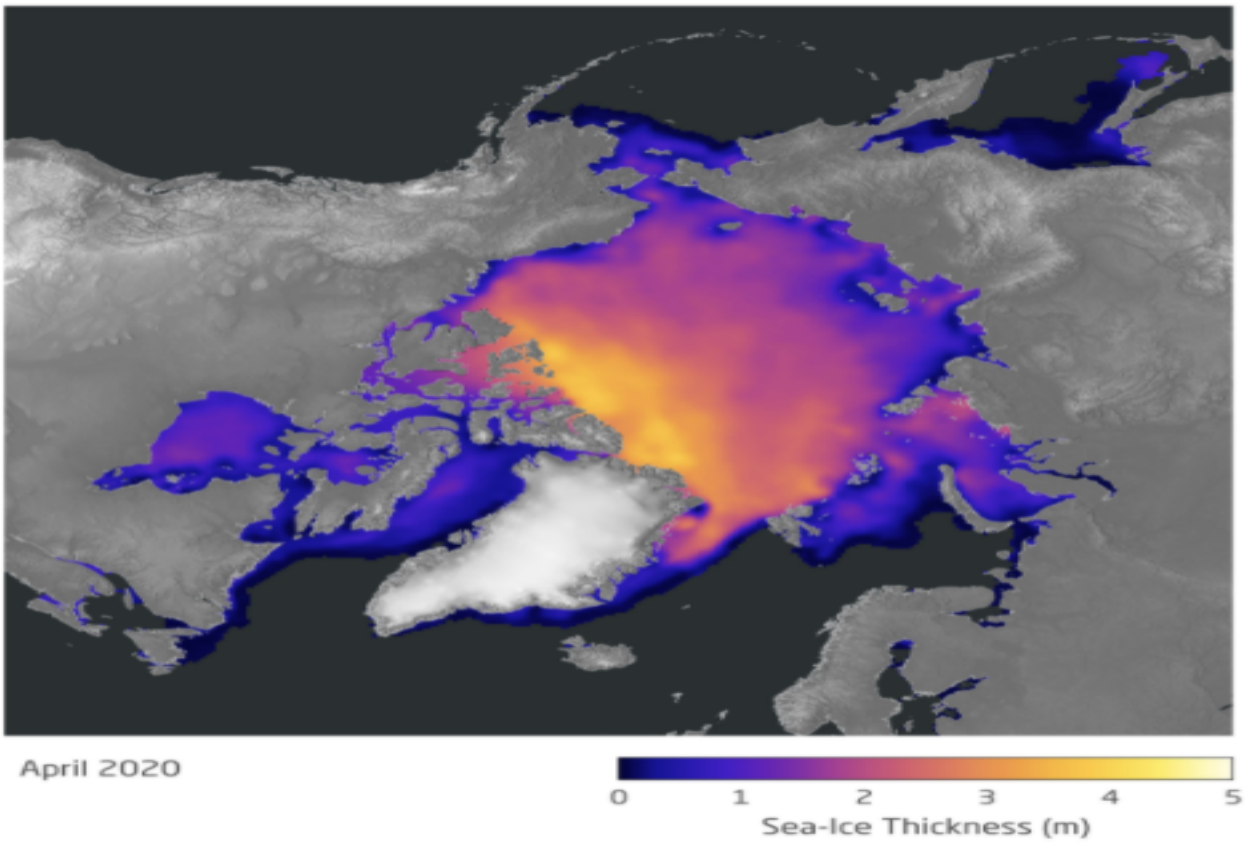

Table 2[22]

China and the Arctic

China should not be viewed as an Arctic competitor. Though China has displayed an active interest in the Arctic, it has no territory from which to base military operations. Of the five nations with territorial claims in the high-Arctic, Canada, Norway, Denmark, and the United States are longstanding allies, and Russia, though seeking mutual economic benefit with China, is extremely protective of its Arctic territories and suspicious of China's long-term intensions.[23] None of the five high-Arctic nations are likely to give China a territorial foothold in the Arctic, limiting Chinese interest in the region to capital investment and trans-Arctic transportation,

[22] NOAA. "Sea-Ice." Accessed 30 Apr 2021. https://arctic.noaa.gov/Report-Card/Report-Card-2020/ArtMID/7975/ArticleID/891/Sea-Ice

[23] Camilla Sørensen and Ekaterina Klimenko. *Emerging Chinese–Russian Cooperation in The Arctic* (Stockholm International Peace Research Institute, Jun 2017), 41-43.

which is not likely to become economically feasible, except for a 2-3 month window, for many decades to come. Most evidence points to China's Arctic interests being purely economic in nature.[24] China's interests in the Arctic will remain economic in nature as long as China lacks a strategic partner in the region.

Current fears that China's limited cooperation with Russia may develop into a Sino-Russo alliance are exaggerated. Fu Ying, Chair of the National People's Congress Foreign Affairs Committee has stated, "China has no interest in a formal alliance with Russia, nor in forming an anti-US or anti-Western bloc of any kind."[25] Furthermore, China's own Arctic scholars are skeptical of the durability of current Chinese–Russian partnerships, expecting Russia will turn towards European partnerships and markets as soon as sanctions are lifted.[26] Russia is equally skeptical and distrustful of its Chinese partners. In 2015 Russia's Defense Minister Sergey Shoigu expressed irritation at non-Arctic states that, "obstinately strive for the Arctic,"[27] after China expressed the stance that the Northern Sea Route was an international strait. Shoigu's comments coincided with Russia fortifying its Arctic defenses. Russia has prevented any Chinese interest from acquiring a majority stake in any Russian energy project or company. In turn, China has taken advantage of western sanctions to buy Russian resources at below market prices and provide loans to Russia and Russian companies at above market rates. Russia sees these practices as predatory and not in the spirit of partnership.[28] Russia and China are partners of convenience and regional rivals, not friends.

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[24] Lyle Goldstein. "China is Building Nuclear Icebreakers to Seek Out a "Polar Silk Road."" The National Interest, 16 Mar 2020. https://nationalinterest.org/blog/buzz/china-building-nuclear-icebreakers-seek-out-polar-silk-road-132417

[25] Camilla Sørensen and Ekaterina Klimenko. *Emerging Chinese–Russian Cooperation in The Arctic.* 24.

[26] Camilla Sørensen and Ekaterina Klimenko. *Emerging Chinese–Russian Cooperation in The Arctic*. 42.

[27] Camilla Sørensen and Ekaterina Klimenko. *Emerging Chinese–Russian Cooperation in The Arctic*. 38.

[28] Camilla Sørensen and Ekaterina Klimenko. *Emerging Chinese–Russian Cooperation in The Arctic*. 41.

In the unlikely event that China begins to threaten U.S. interests in the Arctic, U.S. owned strategic chokepoints could be leveraged to cut-off China's access to the Arctic. All trans-Arctic traffic passes the Bering Strait within anti-ship cruise missile range of U.S. territory, both in the straits and again when passing St. Lawrence Island to the south. Sea-mines or mobile anti-ship cruise missile batteries, such as the U.S. Marine Corps' new Rogue Fires System,[29] could effectively close the strait to maritime traffic. Anti-ship cruise missile launchers and mobile air defense batteries could work intraoperatively with U.S. Naval and Air Force assets to achieve local air and sea control surrounding this choke point. Additionally, the waters from St. Laurence Island, through the Bering Strait, and well into the Chukchi Sea are extremely shallow, with an average depth of less than 150 feet.[30] With this depth restriction, it would be difficult for submarines to operate below periscope depth, evade detection by surface and air assets, and navigate minefields.[31] Minimal expansion to America's present Arctic footprint would allow the U.S. to completely deny access through the Bering Straits, creating an effective counter to China and other competitors should they threaten U.S. interests in the future.

Russia and the Arctic

Russia's Arctic expansion should not be prematurely viewed as adversarial to the United States and its interests. Russia contains 23,397 miles of Arctic coastline,[32] approximately 53% of the world's Arctic coastline, and more than 22 times America's 1,060 miles of Arctic coastline.[33]

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[29] Xavier Vavasseur. "USMC Tested a Naval Strike Missile from a JLTV-Based Mobile Launch Platform," Naval News, 8 Feb 2021. https://www.navalnews.com/naval-news/2021/02/usmc-tested-a-naval-strike-missile-from-a-jltv-based-mobile-launch-platform/

[30] NOAA. "Chart 16003: Artic Coast, Chart 514: Bering Sea Northern Part."

[31] Orlogskaptein Stian Sandloek, Norwegian Submarine Captain, interview by LCDR Nicholas Carr, 7 May 2020.

[32] Arctic Institute. "Russia Facts and Figures." Accessed 22 Apr 2021. https://www.thearcticinstitute.org/countries/russia/

[33] Arctic Institute. "U.S. Facts and Figures." Accessed 22 Apr 2021. https://www.thearcticinstitute.org/countries/united-states/

Russia is also home to approximately half of the world's Arctic population.[34] Russian national interest is intrinsically attached to the Arctic in a way that American national interest is not. As Arctic sea-lanes open, Russia has the opportunity to connect its vast and isolated Arctic regions with the rest of the country, where over 2 million of its citizens reside. In comparison, the U.S. has less than 18,000 residents living North of the Bering Straits, most living in isolated villages. It is simply not feasible to connect Alaska's Arctic regions with the rest of the U.S. as this is prohibited by both geography and population density. In this light, Russia's Arctic expansion should not be prematurely viewed as adversarial to the United States and its interests.

Russia's military buildup in the Arctic does not significantly enhance Russia's ability to project power outside of its EEZ. Russia has reopened numerous retired Arctic bases from Soviet times, is constructing several new bases, has committed significant resources to the region. "Completion of… military infrastructures, particularly in the Arctic,"[35] is listed as a priority in Russia's National Security Strategy. To a domestic audience, Northern Fleet Commander Admiral Nikolai Yevmenov described this ring of Arctic bases as a "protective dome" of anti-aircraft missile to defend the Russian Arctic.[36] This statement appears true. Russia has considerably expanded its already extensive air-defense perimeter into the Arctic, constructing several new airfields, establishing multiple radar stations, and positioning several state-of-the-art S-400 air defense systems. However, the newly constructed runways are too short to accommodate Russia's long-range aircraft, no new air defense systems have been positioned near U.S. territory and none of newly positioned systems are able to shoot past Russia's EEZ,

[34] Arctic Institute. "Russia Facts and Figures."
[35] President Vladimir Putin. "Russian Federation Presidential Edict 683, Russian Federation's National Security Strategy." 31 Dec 2015.
[36] Matthew Melino, Heather Conley, and Joseph Bermudez. *Ice Curtain: Why Is There a New Russian Military Facility 300 Miles from Alaska?* (Center for Strategic & International Studies, 24 Mar 2020), 3.

and the new early warning radars are, "likely designed to supplement Russia's strategic early warning radar network."[37] While the warning radar on Wrangel Island is capable of tracking U.S. aircraft that proceed directly north of the Bering Straits, potentially allowing Russia to gain insight into U.S. flight patterns in the area, this is the limit of the radar's horizon, preventing it from seeing aircraft past this point.[38] While there is no doubt that Russia has fortified its Arctic coastline, its fortifications so far appear defensive in nature.

Despite the defensive nature of Russia's Arctic military expansion, this construction is likely designed to exert uncontested control within its Arctic EEZ. Russia has evoked *United Nations Convention on the Law of the Sea, Article 234, Section 8, Ice-Covered Areas* as license to regulate traffic within its EEZ. The U.S. and China disagree with this interpretation. By hardening defenses along the Northern Sea Route, Russia is dissuading any nation from challenging its status-quo control over the Northern Sea Route. Though contrary to U.S. interpretation of international law, until the Northern Sea Route proves economically viable there is nothing to be gained through direct confrontation.

Tactical Considerations for Ships in Ice-Bound Regions

The U.S. should avoid deploying surface combatants and aircraft carriers to contested ice-bound regions, as ship operations in thick ice are tactically unsound. Icebreaking operations are loud and likely detectable by submarines.[39] Ships in ice are defenseless against submarine attack, as torpedo evasion maneuvers, countermeasures, and counterfires will not be able to be effectively employed, if employed at all. Torpedoes launched over the side will land on ice rather

[37] Matthew Melino, Heather Conley, and Joseph Bermudez. *Ice Curtain: Why Is There a New Russian Military Facility 300 Miles from Alaska?*. 4.
[38] Matthew Melino, Heather Conley, and Joseph Bermudez. *Ice Curtain: Why Is There a New Russian Military Facility 300 Miles from Alaska?*. 3-4.
[39] LCDR Robert Rockwell, U.S. Submariner, interview by LCDR Nicholas Carr, 6 May 2020.

than water, as will torpedoes dropped by helicopter or aircraft, exhausting all standard methods of attacking a submarine. For other warfare areas, lack of maneuverability would prevent ships from optimizing decoy deployments, illuminator coverage areas, and weapons cut-out zones to deal with an incoming threat. Reduction of maneuverability will similarly reduce aircraft carriers' ability to launch and recover aircraft. Ships in the ice are not able to fight effectively and are at severe tactical disadvantage. The Navy should not expand ship operations into ice-covered areas, as to do so would be tactically unsound. Furthermore, efficiently placed land and air assets are sufficient to defend U.S. interests in the Arctic as U.S. Arctic interests are almost exclusively located in close proximity to land.

Conclusions & Recommendations

The U.S. Navy should avoid overcommitting forces to the Arctic while the Arctic's economic potential is still only theoretical. While offshore resource extraction is technically possible, in the Arctic it is not economically feasible and will remain economically unfeasible for the foreseeable future. Similarly, trans-Arctic sea routes remain largely impractical until transport along them becomes both predictable and faster than other routes. Though the U.S. disagrees with Russia's application of *UNCLOS Article 234, Section 8*, until the Northern Sea Route becomes viable, physically contesting Russia's claims is impractical and risks increasing tensions in this historically peaceful and cooperative region. Russia's military expansion in the Arctic, while excessive by western standards, appears defensive in nature and consistent with Russia's defenses in other regions. As Russia's ability to project power against the U.S. has been only minimally enhanced by their Arctic expansion, this expansion should not by itself be viewed as threatening to the U.S. Chinese interest in the Arctic should also not be viewed as threatening to U.S. interests, as long as China's interests in the Arctic continue to be economic in

nature and consistent with international maritime law. China and the U.S. have no reason for dispute unless conflict spills over from another region. Should such a conflict present itself, minimal force commitments at key chokepoints are enough to secure U.S. access to the Arctic and to deny Bering Strait access to China. Severing China's single access point to the Arctic through any combination of air power, mines, and submarines would not require a significantly greater military footprint in the Arctic than exists today. As it is tactically unsound for the Navy's surface combatants and aircraft carriers to fight in ice-covered areas, a shift of U.S. naval forces north of the Bering Straits will do little to promote U.S. national interest and is therefore a poor allocation of limited military and economic resources. Such a shift would not only be extraneous to America's national interests, it could further heighten tensions in a historically peaceful and cooperative region.

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