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Power and the Pole, Shipping Politics Across the Arctic Passage

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Abstract. The Arctic Passage has long been idealized as the Holy Grail of global commerce and navigation. As the Arctic sea ice continues to recede into the mid twenty-first century, trans-polar shipping is fast becoming an enticing economic opportunity. With the polar routes offering significantly decreased travel distance between Asia, Europe, and North America, there arises the potential for trade and conflict between the industrialized exporters in this hitherto inaccessible and disregarded region. Thus, this paper conducts a series of case studies providing a detailed summary of the interplay between the key Arctic stakeholders, and a recommended course of action to mitigate the potential for conflict while maximizing economic returns on investment in Arctic transportation and shipping as the ice-caps continue to melt.

1 Introduction

For centuries, explorers have sought access to a “Northwest Passage” connecting the Atlantic and Pacific oceans more efficient than the existing passage through the Indian Ocean. Roald Amundsen may have found this passage in 1906 when he completed the first circumpolar navigation, but the economic advantages of this passage have remained this far more theoretical than actionable, as for most of the year, much of the Arctic ocean is frozen, rendering timely navigation costly.

Nevertheless, global warming the past century has reduced the volume of northern sea ice alarmingly. In the past 15 years specifically, the Polar ice has shown to recede so substantially that vast swathes of the Arctic Ocean were ice-free for much of the year.¹ While a melting Arctic undoubtedly has untold and far-reaching consequences on marine ecosystems and human geography, this crisis may yet serve as a unique opportunity for economic innovation and growth in the North Polar region owing to the newfound accessibility of natural resources, and, more importantly for this paper, potentially efficient maritime routes. As the region was ostensibly disregarded until recently, national claims to Arctic waters are shaky, and ill-accepted, and as such, there is some uncertainty surrounding the future international politics of this emerging frontier.

Therefore, this paper employs a series of case studies to convey the current realities of Arctic geopolitics and the ambitions of her stakeholders. This paper begins by outlining the political significance of the contested boundaries of national claims to Arctic continental shelves and waters, as well as the atypical case of the disputed island territory of Svalbard. I then provide a case-study on the current military investment and power projection capabilities of the Arctic national stakeholders built from data collected by Markowitz to define a nation’s level of Arctic commitment in the region.²

Resultingly, this paper forecasts that Russia will dominate Arctic maritime activity in the near future, though the rapidly changing Arctic physical geography calls into question her long-term dominance. Critical to this analysis therefore, I include a case study on the geological estimations of Arctic ice in the mid and late twenty-first century, and the related political implications for the power politics of Arctic shipping as the receding ice begins to eliminate dependence on Russian Ice-capable technology for successful navigation. Lastly, I propose the possibility of Russo-Norwegian cooperation in ice-breaker guided transit in the short-term as a means of capitalizing on the potential savings of trans-Arctic shipping before the ice has melted such to allow more international stakeholders to utilize these routes. My forecast provides valuable insight into the power politics and maritime opportunity in the Arctic seas.

¹ Stroeve, J. C., Kattsov, V., Barrett, A., Serreze, M., Pavlova, T., Holland, M., and Meier, W. N. (2012), Trends in Arctic sea ice extent from CMIP5, CMIP3 and observations, *Geophys. Res. Lett.*, 39, L16502,

² Markowitz, Jonathan N.. *Perils of Plenty : Arctic Resource Competition and the Return of the Great Game*, Oxford University Press USA - OSO, 2020. Page 53-55. ProQuest Ebook Central, <http://ebookcentral.proquest.com/lib/claremont/detail.action?docID=6141276>.

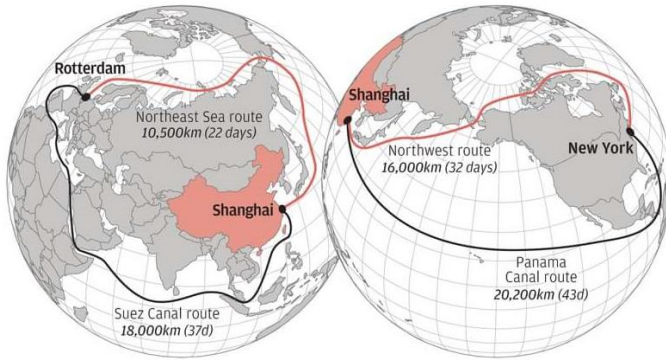


Figure.1 Travel time reductions of the polar routes, the savings are significant.³

2 Literature Review and Background

An ice-free Arctic has been conceptualized as an “industrial Mediterranean,” a vital sea like the Roman *Mare Magnum* linking the world’s highly developed industrial economies to one another. While some innovative scholars such as Markowitz and Hansen et. al⁴ have forecasted political control and economic opportunity surrounding this novel occurrence, to my knowledge, none have looked at specific political opportunities facing Arctic shareholders, specifically Norway and Russia in the short term, a “sweet-spot” of sorts wherein Russian/Norwegian ice-breaker escort is necessary for a portion of the sea travel before the Ice cap melts to the point where Ice-capable technology becomes unnecessary.

Cursory estimates suggest that one can reduce the distance from London to Tokyo by near 38% via an ice-uninhibited Arctic Ocean in comparison to the existing Suez Canal route.⁵ Thinning as the ice caps may be, however, the assistance of proprietary icebreaking equipment is currently necessary for many months of the year, and accordingly, most Arctic endeavors yet require some degree of escort sponsored by an Arctic nation readily equipped with ice-capable vessels.⁶

At this point it is necessary to establish some precise terms and definitions for this paper. As this paper is foremost concerned with maritime shipping between Eurasia and North America, the five key Arctic coastal states examined here include Russia, Norway, Canada, The United States of America, (through the State of Alaska), and Denmark, (through the territory of Greenland). While the nation of Iceland technically inhabits Arctic waters, however, her modest population of fewer than 350,000 and lack of a standing navy to project her interests abroad diminish her Arctic influence significantly.

Also of key importance in this discussion is the distinction of the three theorized passages through the Arctic. These consist of the Northwest Passage, (hereafter titled NWP) the fabled sea route connecting the Bering Strait between Russian and Alaska with the North Atlantic through the Northern Canadian Archipelago and the Davis Strait between Greenland. (shown in green, see figure 1). Alternatively, there is the Northern Sea Route, (formerly Northeast Passage, hereafter labeled NSR). The NSR lies in the Eastern Arctic, following the Russian coastline from the Bering Strait all the way to the Barents Sea North of the Norwegian coastline, there converging into the Atlantic Ocean and into the European quarter of the North Atlantic at the Greenland, Iceland, and UK gap, (GIUK), (shown in red). Finally, there exists the theoretical route spanning across the extreme global North described in figure 1 as the Trans-Polar Passage, a path roughly straight through the Pole itself. (Hereafter titled TPP, shown in blue below). At the time of writing, even at the height of yearly ice recession in September, the TPP is not navigable without extensive ice-breaker escort.⁷ Nevertheless, at the rate at which the ice is receding, by some climate models the TPP could become seasonally viable by the late 21st century.

³ Lopez, A. L. (2015, December 01). INFOGRAPHIC: The race for Arctic domination. Retrieved May 03, 2020, from <https://www.scmp.com/infographics/article/1885387/infographic-race-arctic-domination>

⁴ Hansen, C. Ø., Grønseth, P., Lindstrøm Graversen, C., & Hendriksen, C. (2016). *Arctic Shipping: Commercial Opportunities and Challenges*. Frederiksberg : CBS Maritime.

⁵ Hansen et. al., Pages 26-28.

⁶ Hansen et. al., Page 15-16.

⁷ Wang, M., & Overland, J. E. (n.d.). (2009). A sea ice free summer Arctic within 30 years? Retrieved May 03, 2020, from <https://www.pmel.noaa.gov/pubs/outstand/wang3261/wang3261.shtml>

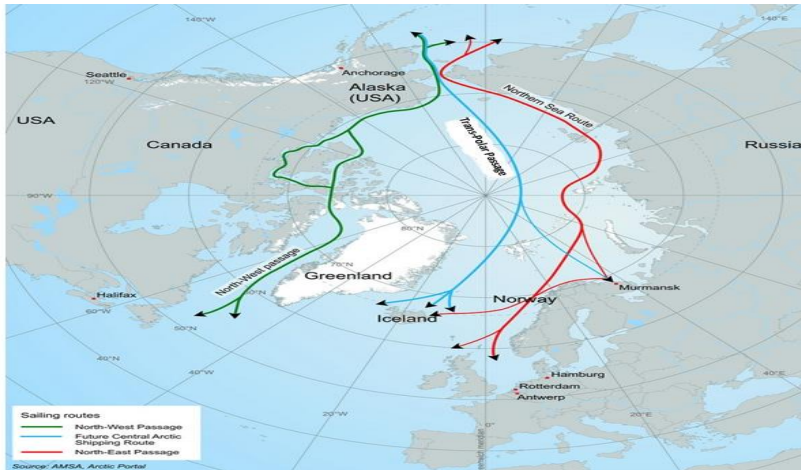


Figure 2. the 3 potential Arctic Passages⁸

Of the three passages listed above, the NSR North of Eurasia is currently the most developed. Generally, the NSR currently has a navigable season of roughly 3 months with minimal icebreaker assistance with optimal weather.⁹ Likewise, NSR has seen the greatest commercial use of the 3 Arctic passages, with Danish and Chinese vessels completing the summer voyage without ice-breaker escorts in the warmest month of September.¹⁰ Theoretically, the NSR could reduce shipping time from Northern Europe to Northeast Asia by thousands of nautical miles given optimal weather conditions compared to the Suez Canal Route during the summer months. (see figure 3.)

Comparatively, the NWP is less viable at the time of writing. For while the NWP has the potential to yield immense fuel savings similar to the NSR with a theoretically decreased travel distance from Eastern North America to Northeast Asia, or from Europe to the Western United States than the established Panama Canal Route, (see Figure 3), shipping through the Canadian Straits is significantly riskier due to the comparatively underdeveloped logistical infrastructure of the Canadian High Arctic.

For example, The Northern Russian coastline, and the Northern Norwegian coastline have far larger population bases with extensive port cities such as Murmansk, Norilsk, and Tromsø than do their North American Counterparts, especially Russia. Large port cities are important factors that logistics planners consider when planning their routes, not only to maximize Container pick-ups and transfers, but also for maintenance and rescue when necessary. In terms of human capital moreover, Eurasia contains numerous high arctic cities with populations well over 10,000 inhabitants, while North American Settlements are extremely remote and sparsely populated. The largest North American Settlements above the Arctic Circle for example are relegated to the small town of Barrow Alaska with roughly 4,000 inhabitants, and Sisimiut in Greenland with roughly 5,000. When viewed in comparison with Eurasia therefore, The North American High Arctic is patently underdeveloped and thus, the NSR is likely to be the dominant Arctic route in the near future.

<i>Departure</i>	<i>Destination</i>	<i>Distance SCR (nm)</i>	<i>Distance NSR (nm)</i>	<i>NSR Distance Reduction (%)</i>
<i>North Western Europe</i>	<i>Tokyo</i>	<i>11,292</i>	<i>6,905</i>	<i>38.85</i>
	<i>Busan</i>	<i>10,827</i>	<i>7,248</i>	<i>33.06</i>
	<i>Shanghai</i>	<i>10,532</i>	<i>7,688</i>	<i>27.00</i>
	<i>Hong Kong</i>	<i>9,753</i>	<i>8,399</i>	<i>13.88</i>
	<i>Singapore</i>	<i>8,343</i>	<i>9,791</i>	<i>-16.64</i>

⁸ Azzara, A. (n.d.). (2013). Arctic sea shipping: Emissions matter more than you might think. Retrieved May 03, 2020, from <https://theicct.org/blog/staff/arctic-sea-shipping-emissions-matter-more-you-might-think>

⁹ Khon, Vyacheslav & Mokhov, I. & Latif, M. & Semenov, V. & Park, W.. (2010). Perspectives of Northern Sea Route and Northwest Passage in the twenty-first century. *ClimaticChange*. 100. 757-768. 10.1007/s10584-009-9683-2.

¹⁰ Hansen et. al. Pages 16-20.

<i>Departure</i>	<i>Destination</i>	<i>Distance SCR (nm)</i>	<i>distance NWP (nm)</i>	<i>NWP Distance Reduction (%)</i>
<i>North Western Europe</i>	<i>Tokyo</i>	<i>11292</i>	<i>7798</i>	<i>30,94</i>
	<i>Busan</i>	<i>10827</i>	<i>8141</i>	<i>24,81</i>
	<i>Shanghai</i>	<i>10532</i>	<i>8581</i>	<i>18,52</i>
	<i>Hong Kong</i>	<i>9753</i>	<i>9292</i>	<i>4,73</i>
	<i>Singapore</i>	<i>8343</i>	<i>10624</i>	<i>-27,34</i>

<i>Departure</i>	<i>Destination</i>	<i>Distance PCR (nm)</i>	<i>distance NWP (nm)</i>	<i>NWP Distance Reduction (%)</i>
<i>NY - NJ - Baltimore</i>	<i>Tokyo</i>	<i>9,623</i>	<i>7,764</i>	<i>19,32</i>
	<i>Busan</i>	<i>10,056</i>	<i>8,107</i>	<i>19,38</i>
	<i>Shanghai</i>	<i>10,577</i>	<i>8,547</i>	<i>19,19</i>
	<i>Hong Kong</i>	<i>11,148</i>	<i>9,258</i>	<i>16,95</i>
	<i>Singapore</i>	<i>12,421</i>	<i>10,590</i>	<i>14,74</i>

Figure 3. As shown about, sea traffic to and from Northeast North America and Northeast Asia, could be made faster with the NSR, and faster still with the NWP. Likewise, freight shipped to and from Europe and Northeast Asia, could see savings regardless of which passage sailed, from Rotterdam as far south as Hong Kong even stand mileage reductions, albeit small, compared to the Suez Canal Route.¹¹

3 National Boundaries

Historically, territorial interest in the Arctic was of little interest due to its inherent inaccessibility, and legal precedent for national claims to the region are insufficient and poorly substantiated. The most widely accepted precedent for coastal territory rights is as defined in the United Nations Convention on the Law of the Sea, or UNCLOS, being that the coastal waters extending 200 nautical miles beyond the Nation’s coast.¹² This precinct establishes a nation’s “exclusive economic zone,” (EEZ), wherein the sovereign states are granted economic rights to the zone, such as fishing, oil/mineral extraction rights, and frequently, control of passage. Nevertheless, with the recent rise to prominence of offshore drilling, the UNCLOS was updated with the provision that a nation’s sovereign access rights could expand beyond the 200 nautical mile “Exclusive Economic Zone” if nations were able to scientifically prove that a the desired sovereign area is a geological expansion of said nation’s continental shelf. While United Nations dictates are hardly binding, most of the Arctic powers have all to various extents submitted claims to the United Nations to solidify access to the high North.

Russian territorial claims to the Arctic extend well into the Arctic Ocean. The Eurasian power has submitted claims to the United Nations claiming the deep-sea ridges of Lomonosov, Alpha, and Mendeleev to be natural protrusions of the Russian Continental shelf. (see figure 3).¹³ Critically, as these ridges run directly through the North Pole and surrounding waters, Russia is in effect claiming the entirety of the North Pole which has implications for the NSR, but also for future traversal of the Trans-Polar Passage, (TPP) should the future ice-melt allow. Additionally, Russia is sovereign over the majority of the Eastern High Arctic archipelagos, such as Wrangel, The New Siberian Islands, Franz Josef Land, Novaya Zemlya and others. These possessions give Russia significant control of the Eurasiatic Coast, and the NSR as a whole. The notable island exception to Russian dominance of the NSR is the disputed Svalbard archipelago currently administered by the Kingdom of Norway, discussed further below. Nevertheless, Russia’s coastal

¹¹ Hansen et. al., 26-28.

¹² CONTINENTAL SHELF - GENERAL DESCRIPTION. (n.d.). Retrieved May 03, 2020, from https://www.un.org/Depts/los/clcs_new/continental_shelf_description.htm

¹³ Russia submits revised claims for extending Arctic shelf to UN. (2016). Retrieved May 03, 2020, from <https://www.rt.com/news/332089-russia-arctic-claim-un/>

extremities grant her substantial leverage over passage and resource extraction along the NSR.¹⁴ And should Russia make good on her disputed continental shelf claims she will have unique leverage over Arctic commercial Maritime Activity in the coming decades.

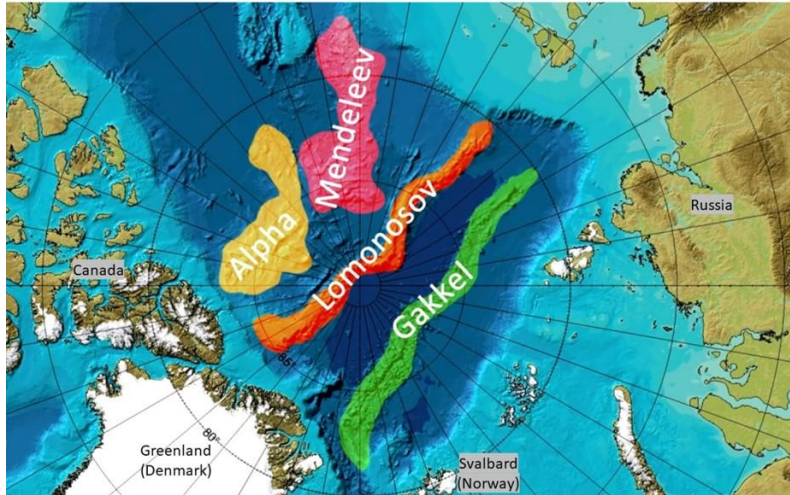


Figure 3. Deep Sea Arctic ridges, with the Lomonosov claimed by Russia, Denmark, and Canada, The Mendeleev claimed by Russia, the Alpha, claimed by Canada and Russia, and the Gakkel, claimed by Norway, but disputed by Russia.¹⁵

Canada

As afore mentioned, Russia is not unchallenged in her Arctic ridge claims. On the Western divide of Arctic Ocean, the Canadian Arctic Archipelago extends across the bulk of the NWP, and the joint American-Canadian Military Base at Alert on the Northernmost extremity of the Canadian Ellesmere Island grants NORAD the northernmost Base in The Arctic, and with it, US-Canadian insight into the NWP and the broader Arctic.¹⁶ Like Russia, Canada claims the Alpha and Lomonosov Ridges, to be protrusions of the North American Continental shelf, and therefore natural extension of Canada.¹⁷ Nevertheless, Canada lacks substantial arctic population centers from which to draw human capital and cultural support for these claims. Strikingly, the vast expanse of the Canadian tundra yields not one city above the Arctic circle. Such to the point that the largest continental North American settlement in the Arctic, Utqiagvik, belongs to the United States in the much geographically smaller Alaskan Arctic. In this regard, despite Canada's theoretically favorable geographic position in the high arctic, the country lacks the human capital to project her interests in the regions to the same extent as the Russians. Further, as noted by Patrick James in his

¹⁴ The Arctic of the Future: Strategic Pursuit or Great Power Miscalculation? (2018) - Panel I. (n.d.). Retrieved May 03, 2020, from <https://www.csis.org/analysis/arctic-future-strategic-pursuit-or-great-power-miscalculation-panel-i>

¹⁵ Neftchi, S. (Director). (2016, November 23). *Putin's Arctic Ambitions* [Video file]. Retrieved May 03, 2020, from <https://www.youtube.com/watch?v=pbrKLnH8wLA>

¹⁶ Johnson, Jr. J. Peter. "The Establishment of Alert, N.W.T., Canada." (1990).

¹⁷ Sevunts, L. (2016, May 18). Canada to submit its Arctic continental shelf claim in 2018. Retrieved May 03, 2020, from <https://www.rcinet.ca/en/2016/05/03/canada-to-submit-its-arctic-continental-shelf-claim-in-2018/>

forecast of future Canadian Arctic Sovereignty, the sheer power imbalance between Canada and her southern neighbor in combination with their already married defense operations in NORAD ultimately point toward Canadian deference to the United States on Arctic Defense Policy should the United States take an interest in Arctic affairs.¹⁸

The United States of America

Theoretically, the United States, as the world's premier superpower is capable of projecting interests into the Arctic, and The United States, like Russia, is in a uniquely advantageous position to monitor East-West Arctic transit through the narrow Behring Strait due to Alaskan geography. Yet the United States like her Canadian counterpart is only loosely present in Arctic affairs. The North American superpower owns and operates a mere two ice breakers, though if needed, The United States maintains elaborate alliance networks NORAD and NATO to help facilitate Arctic endeavors if necessary.

Interestingly, the United States is not a signatory of the United Nations Convention on the Law of the Sea, indicating the desire not to be bound by rules limiting her territory to questions of continental shelves. Fittingly, therefore, the United States has not made explicit any claim to the UN regarding the Deep-sea ridges in the way her NATO and Russian counterparts have. Still, given the aforementioned power imbalance between the United States and Canada, it is reasonable to assume that any future American claims to Arctic waters will carry significant weight. Additionally, the US could potentially utilize its position as a country without any claims to the deep-sea ridges to broker an agreement amongst the other Arctic powers regarding their conflicting claims.

Denmark

Of all of the 5 Arctic Nations, The Danish are perhaps the least actively invested in Arctic pursuits. Denmark's claim to the Arctic comes through the country's military administration of the self-ruled Territory of Greenland. Similarly to Canada, Greenland's Geographic position is unfavorable to Arctic travel and navigation owing to extreme temperatures. Denmark's largest territory is sparsely populated and lacks significant military presence.¹⁹ Nevertheless, the geographic expanse of the World's largest island could well grant the Kingdom of Denmark considerable access to the NWP and the TPP in the future as temperatures continue to rise, and these yet theoretical passages run directly through the Danish EEZ. Likewise, an ice-uninhibited Davis Strait between Canada and Greenland is poised to be the most efficient route between Northeast Asia and Western North America, which could, in theory grant the Kingdom of Denmark unique leverage. Additionally, Like Canada and Russia, Denmark has laid claim to the Lomonosov ridge stretching across the North Pole to be a natural extension of Greenland's continental shelf. Come midcentury, with the likely increase in use of the Arctic as a transit route, Denmark may be in apposition to capitalize on Arctic trade.

¹⁸ Carolyn C. James & Patrick James (2014) Canada, the United States and Arctic Sovereignty: Architecture Without Building?, *American Review of Canadian Studies*, 44:2, 187-204, DOI: [10.1080/02722011.2014.914048](https://doi.org/10.1080/02722011.2014.914048)

¹⁹ Markowitz, Pages 48-52

Norway

Other than Russia, it is the Norwegians who are most heavily invested in the Arctic region. Boasting the second largest Arctic population after their Eastern neighbors, Norway initiates frequent arctic voyages and expeditions, and even houses its military headquarters above the arctic circle, near the city of Bodø, the only country to do so. Likewise, Norway boasts the most advanced Arctic technology save that of the Russians, with an ice breaker fleet of 11, as discussed further below. Hailing back to the days of Viking expeditions across the North Atlantic, the Norwegian Sea trade running across the ice-free Norwegian coastline has been the most traversed Arctic route for bringing supplies to Europe's Northern extremities more cost-effectively than via land routes. Likewise, even today this Norwegian coastline, part of the ice-free GIUK gap, is the most traversed portion of the Arctic Ocean. This corridor holds unique opportunity for Norwegian economic development and diversification, as, until the midcentury, most transArctic airtime activity will necessitate sailing through Norway's EEZ.

Norway, like Russia, is in a unique position with her relatively plentiful ice breakers to facilitate such travel during icier conditions in the near future if need be. It is thus possible that the already intensifying relations between Norway and Russia could grow more competitive as Russian and Norwegian firms compete for Arctic access and toll fees as well as extraction rights.²⁰ It is important to note however, that, for the immediate future, (as discussed below,) all trans-Arctic passage across the NSR must pass by both Norwegian and Russian territories. And as such, Russia and Norway would do well to cooperate on transArctic passage and find a financially optimal and transparent arrangement between themselves so as not to not dissuade potential transit.

Additionally, a handful of geopolitical obstacles stand as key points of contention between Oslo and Moscow in the Arctic. Specifically contentious is the Svalbard archipelago. The dispute over Svalbard ownership stems from the Svalbard Treaty signed in 1920 which established the islands under Norwegian protection with the provision that the Norwegian crown would be prohibited from placing military installations on the islands. The Svalbard Archipelago would instead be open to all of the signatories and those who ratified of the treaty for research and economic activity.²¹ This anomalous treaty has resulted in a nationally diverse island with Norwegian, Russian, Polish and Chinese settlers and researchers.²² The most significant counter-population to the Norwegians however, is that of the Russian coal mining settlement of Barentsburg on the Svalbard Islands, and while Barentsburg currently lags behind the Norwegian settlement of Longyearbyen's near 2,500 inhabitants, the Russian village is similarly longstanding. Moscow hopes to effectively levy this now well-established community of coal miners as evidence for its claim that the archipelago is international territory, outside of the Exclusive Economic Zone, (EEZ) of Norway.²³ In addition to the oil reserves recently discovered off of the Svalbard shelf, the islands also are strategically located such that the 200 nautical mile EEZ from the Norwegian mainland overlaps with the 200 nautical mile EEZ extending south from Svalbard, thus by some legal interpretations of the UNCLOS rendering the entire passage within the Norwegian EEZ (see figure 4 below).

²⁰ The Arctic of the Future: Strategic Pursuit or Great Power Miscalculation? (2018).

²¹ The Svalbard Treaty. (n.d.). Retrieved May 03, 2020, from <https://www.jus.uio.no/english/services/library/treaties/01/1-11/svalbard-treaty.xml>

²² RBTH, S. (2016, March 15). Life in Svalbard: New frontier or the last resting place of the USSR? Retrieved May 03, 2020, from https://www.rbth.com/politics_and_society/2016/03/15/life-in-svalbard-new-frontier-or-the-last-resting-place-of-the-ussr_575963

²³ Nilsen, T. (2017). Kommersant: Russia lists Norway's Svalbard policy as potential risk of war. Retrieved May 03, 2020, from <https://thebarentsobserver.com/en/security/2017/10/kommersant-russia-lists-norways-svalbard-policy-potential-risk-war>

This stretch of ocean, from Norway North to Svalbard even today remains ice-free for most of the year owing to the Jetstream from the Gulf of Mexico, Making this gap of key navigable importance for ships looking to take the NSR from Europe to East Asia, and, should Norway retain sovereignty over this archipelago, The Scandinavian country would theoretically gain control of access in or out of the NSR, regardless of the country's ability to enforce this claim. This would be undesirable for Russia, given that Norway, a NATO member state would yield influence over this essential trade route.

Russia and Norway are thus presented with a valuable window of opportunity here to collaborate on the facilitation of transit along their mutual arctic coasts symbiotically rather than competitively while their ice-breaker technology is still necessary for many months of the year and coming to a peaceful and cooperative solution to their disputes over Svalbard and the deep sea ridges are pertinent to building a lasting solution.

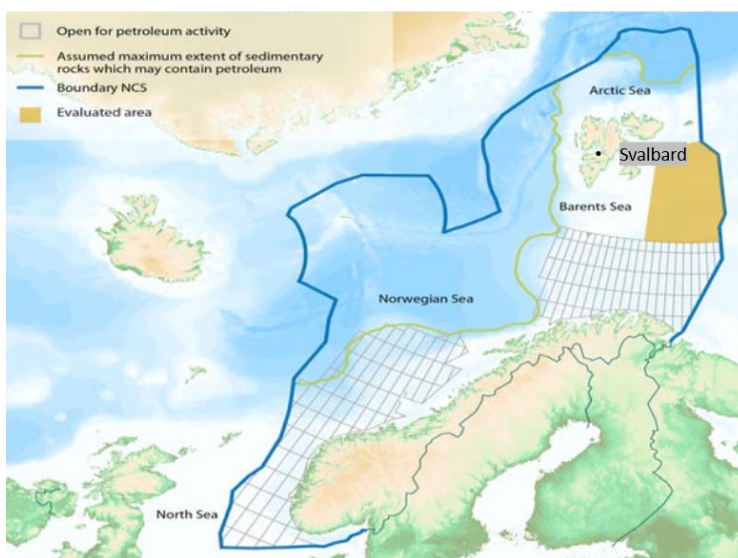


Figure 4. Norwegian EEZ under UNCLOS given Norwegian sovereignty over Svalbard. Notice how Norway would effectively control access to the NSR under the terms of UNCLOS.²⁴

The Question of China

In addition to the Marked Arctic States described above, China, having declared herself a “near-Arctic State” in 2018, is fast becoming an increasingly relevant Arctic shareholder.²⁵ China, along with South Korea and Japan, have been granted permanent seats at the Arctic Council with “Observer Status” despite being located quite geographically far from the Arctic. A further example of Chinese involvement include the frequent Chinese Arctic research expeditions, including the establishment of a Chinese research facility on the afore mentioned island of Svalbard. Moreover, given the export dependence of the Chinese

²⁴ NPD increases estimate of Barents Sea resources. (2017). Retrieved May 03, 2020, from <https://www.offshore-mag.com/regional-reports/article/16801335/npd-increases-estimate-of-barents-sea-resources>

²⁵ Fang, A. (2020, April 25). US rejects China's 'near-Arctic state' claim in new cold war. Retrieved May 03, 2020, from <https://asia.nikkei.com/Politics/International-relations/US-rejects-China-s-near-Arctic-state-claim-in-new-cold-war>

economy, Beijing stands to gain much from a traversable Arctic. The Chinese government is aware of this, and has even crafted the Chinese Icebreaker *Xue Long 2* and completed several missions to the high Arctic.²⁶ As the Polar caps continue to melt and thus necessitate fewer icebreakers for winter transit, China will likely manifest a larger Arctic maritime presence.

4 The Arctic Future

Global warming is often studied at the ice-caps due to their inherent measurability. Not surprisingly, therefore, climate scientists have long labored to forecast the density and reach of Polar ice over the course of the future. Prominent scientist such as Muyin Wang and James Overland forecast an ice-free Arctic summer by mid-century, specifically the year 2037.²⁷ The Atmospheric-Ocean-Ice General Circulation Models employed by Wang and Overland predict with an admittedly large variance, and some of their models predict an ice-free summer as early as 2028. Similarly, most scientific climate estimates predict mid-twenty-first century to be when the Polar ice-melt is sufficient to allow for trans-Arctic passage. Laurence Smith and Scott Stephenson of the UCLA Geography Department employ Climate models specifically for the purpose of estimating the availability of the Arctic for freight transit, and their models similarly indicate an ice-free summer around the year 2040.²⁸ Khon and Mokhov et al predict the opportunity of an ice free summer by mid-century, and, more specifically, the Viability of the NSR for 6 months of the year by the end of the century, (2080-2099), without aid of an icebreaker, and viability of the Colder NWP for 4 months of the year during the same period.²⁹

This is important to note, because an ice-free summer is not the point at which Arctic shipping becomes feasible or even profitable. The Arctic ocean need not be entirely ice-free to be navigable, rather, it is most navigable and more profitable the less the extant of the sea ice, as this would allow vessels to sail further away from the continental shelves and economic zones of national powers, claims to the deep-sea ridges notwithstanding. Thus, the less the extant of sea the more options available to shippers to choose routes with the lowest tolls and fees, shortest distance, and safest conditions.

As the thickness and extant of the ice increases in the fall and winter, the need for icebreaker guidance for portions of the passage becomes necessary if possible at all. This unpredictability, however, makes pre-midcentury Arctic shipping considerably risky, particularly through the NWP. Thus, shipping companies that wish to cut transit costs by shipping through the Arctic would do well to either guide their merchandise with an ice-capable ship along the icier portions of the NSR and NWP.³⁰ Likewise, as noted by Khon and Mokhov, icebreakers may be used for even the TPP by midcentury. While many nations maintain their own ice breakers, this technology is expensive, and requires high levels of training to manufacture. As such, construction is slow and often cost-prohibitive. Thus, I forecast that the Russians' preponderance in this technology makes them poised to dominate Arctic trade until the mid-century when alternate routes become viable and competitive.

²⁶ Eiterjord, T. (2019, September 05). Checking in on China's Nuclear Icebreaker. Retrieved May 03, 2020, from <https://thediplomat.com/2019/09/checking-in-on-chinas-nuclear-icebreaker/>

²⁷ Wang and Overland., (2009).

²⁸ Smith and Stephenson <https://www.pnas.org/content/pnas/110/13/E1191/1.full.pdf>

²⁹ Khon, Vyacheslav & Mokhov, (2010).

³⁰ Wang and Overland, (2009).

5 Power Projection and Capability of the Arctic States

The technology needed to make arctic travel feasible, let alone profitable, is prohibitively expensive, and is therefore, such technological investments are only undertaken by nations already committed to Arctic endeavors. For The purpose of forecasting and predicting future Arctic presence and power projections, this paper utilizes the work of Jonathan Markowitz of the University of Southern California and draws from his Ice- Hardened Warships Data Set and the Arctic Bases Data Set.³¹ These datasets measure the total number of state-controlled ice-breakers of each Arctic nation and the number of said nation's Military and research bases above the arctic circle at 66.3, which serve as a measurable proxy for a nation's vested interest in the region.

Among the five littoral Arctic nations, by far, Russia is the most invested and endowed with the necessary ice-capable technology and Arctic military installments to facilitate transit between Europe and Northeast Asia. Markowitz' data indicates that Russia's heavy ice breaker count totals 61. Russia also maintains the world's first and thus far only nuclear-power ice breaker with another under construction. Additionally, Russia maintains 27 military bases above the Arctic Circle.³² Canada follows Russia in ice breaker count with 15 functional, and a few smaller ice-capable units currently under construction. Nevertheless, all of the Canadian ships were built prior to 1988, and are significant worn, weakening Canada's Arctic presence. Norway closely trails Canada with 11 total ice breakers but with the added advantage that over half of the Norwegian ice-breaker fleet was constructed since 2007, and are thus more advanced and of capable of pulling greater total tonnage than the Canadian vessels. Additionally, Norway unlike Canada has invested significantly in its Arctic military infrastructure. Norway consistently updates its 6 Arctic Military bases, including her Military headquarters above the Arctic Circle. While this is indicative of a clearly Arctic-focused defense strategy, the small NATO state remains significantly behind its larger Russian competitor in Arctic presence.

The Danish follow the Norwegians in numerical terms with 8 older ice breakers, but their Arctic base investment trails with only 1 military base in Greenland outside the Joint USA-Danish Thule base. The United States, perhaps paradoxically, is not particularly prone to Arctic Investment at the time of writing. Currently, the United States Coast Guard operates only 2 functioning ice breakers, both of which operate with significantly dated technology. Given the history of US-Canada alliance and military cooperation, it would not be unreasonable to see joint cooperation and sharing of Ice breakers in the Arctic between the two North American Arctic powers, but the Arctic has hardly been a priority for Washington or Ottawa in the past decades. Certainly, if resources were dedicated to Arctic pursuits the Americans could make a greater impact in the future, but currently, the United States is well behind her greatest Arctic rival, Russia in terms of Arctic presence and investment.

It is worthy of note that all of the Arctic nations are members of NATO with the exception of Russia. Certainly this imbalance has the potential to spill over into a competitive or a combative relationship, but this emerging frontier could also provide the opportunity for cooperation in a physically demanding space wherein coordination prolongs the survival and operation of these countries and permits all players involved to capitalize on the growth of commercial maritime activity in this new front.

6 Conclusion

Most climate scientists project the year 2040 to be a watershed of sorts, a year wherein the ice completely disappears from the Arctic Ocean in the summer. Thus, Russia has a shrinking window of opportunity to

³¹ Markowitz, Jonathan N., Page 63.

³² Markowitz, Jonathan, Page 68-78.

capitalize on this Arctic maritime activity, before the ice caps melt to the point where Russian icebreaker escort starts becoming increasingly superfluous. The territorial disputes between Norway and Russia may pose as a hurdle to Russo-Norwegian cooperation, but both of these oil extraction-dependent nations would do well to diversify their economies, and it behooves them to coordinate and draft a transparent protocol for the safe passage and escort of vessels through their respective waters. In the Western Arctic as the ice continues to melt, the Canadian NWP could perhaps become more viable, and potentially the TPP as well, weakening the geographical and technological constraints that currently restrict Arctic travel to the Russian passages with aid of Russian technology. Until that point in the near future however, no Arctic actor is as geographically and technologically positioned to facilitate this growing enterprise as the Russian Federation.

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