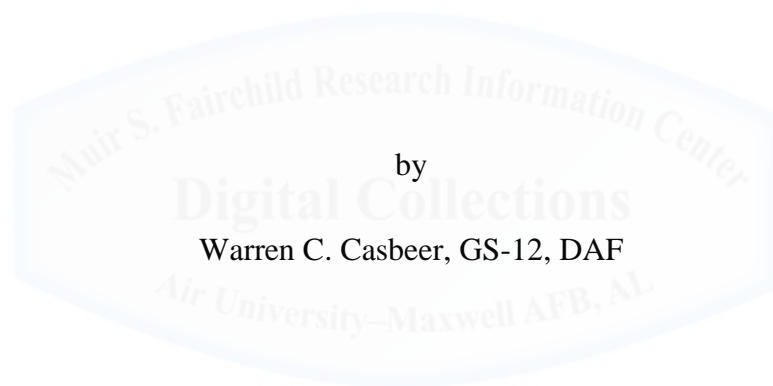


AU/ACSC/2017

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

ARCTIC THAWING AND INCREASED ACCESSIBILITY:  
IMPLICATIONS FOR MILITARY POLICY TODAY



A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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February 2017

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## PREFACE

This paper addresses the impending need to address military matters in the Arctic region of the world. In particular, it reviews how increasing accessibility to Arctic areas may create (or worsen) tensions around the globe as different actors compete for the various resources that will become available. This topic was chosen due to my interest in the Arctic region and resource (including water) rights in general. The opening of Arctic waters, allowing for greater resource exploitation, is highlighting a need to address emerging international issues and differences of opinion. The paper will be of interest to those that follow military strategy and that are interested in Arctic affairs.

In this effort, I counted on the assistance of many people. I remain grateful for the assistance received during this effort, particularly from my RE5610 Research Electives 1 and RE5611 Research Electives II professors, Patricia Lessane and Gregory F. Intoccia. Their deep knowledge of research paper development and of this topic helped strengthen my ability to locate appropriate resources and communicate thoughts in an organized, effective manner. Additionally, my other ACSC professors have all contributed to this effort in various ways by providing knowledge and improving my writing ability. My fellow students have also made many meaningful contributions through their comments on both my proposal and ultimately this research paper. My wife also provided much needed encouragement and assistance during this process.

## **ABSTRACT**

The purpose of this paper is to examine how increased recent Arctic accessibility should affect United States (U.S.) Arctic strategy and military policy. As this region opens for exploration, previously dormant tensions could lead to international conflict. This paper uses the scenario planning framework to select driving forces that could impact Arctic developments and relationships, and then to develop four potential alternative futures. The paper analyzes these alternative futures and explores potential implications for U.S. strategists and military leaders, with a consideration to the probability and risks associated with each scenario. Key findings include the critical need to secure Arctic sea routes, a growing trend of non-Arctic nations to delve into Arctic matters, and the lack of U.S. presence in key Arctic debates. Key recommendations include the need to strengthen international cooperative forums and regulations, develop more accessible and available infrastructure in the region, and improve communication and transport capabilities for Arctic waters. The paper concludes that a greater comprehension of resource distribution in the Arctic is necessary, that non-Arctic matters (e.g., resource availability in other areas) are also important considerations in developing Arctic policy, and that the scenario planning process is effective for preparing for future Arctic developments.

## **I. Introduction**

Warming of the Arctic region in recent years facilitates increased accessibility to this area of the world as sea ice melts. This opening creates a new battleground for traditional Arctic nations and new competitors. Transit opportunities and greater access to the region's minerals and other natural resources, including those providing the raw material for energy-rich fuels, increasingly drive stakeholders to this area. In this rush to exploit prospective economic windfalls, new clashes could erupt. Potential conflicts in this unique battleground will differ from traditional warfare, and strategists should prepare today for this prospect.

United States (U.S.) national strategy has recently begun to address the topic, calling for the promotion of the "safety, security, and stability" of the region while also indicating a need for "routine...maritime exercises" to ensure freedom of the seas.<sup>1</sup> The Department of Defense has initiated actions to support these strategic national security interests in the Arctic. For instance, the 2011 Unified Command Plan (UCP) (classified) assigned Arctic responsibility to U.S. Northern Command (NORTHCOM) and U.S. European Command (EUCOM), with NORTHCOM assigned the role of advocating for Arctic capabilities.<sup>2</sup>

NORTHCOM has recently been mobilizing efforts. The command's 2016 posture statement includes significant discussion about efforts by the Arctic Capabilities Advocacy Working Group, a team set up by the command to specifically address this issue, while the 2015 version made no mention of it at all.<sup>3</sup> Although a positive step, this process needs further analytical support to be effective. A thorough evaluation of potential conflict points must be accomplished to determine priority issues and to develop adequate policies and solutions for problems that represent the most potential likelihood and danger.

To consider this topic, this paper addresses the following questions: Given the evolving nature of the Arctic today, what emerging issues should drive U.S. strategic military policy to ensure continued Arctic security in the best interest of the United States? Based on these issues, what policies and capabilities should the United States pursue to be properly prepared for Arctic developments?

Territorial ambitions, exploration rights, and sea passage claims in the Arctic, particularly from Russia but also from other actors including China, should be addressed directly through world governing bodies. At the same time, the United States should pursue development of its own set of Arctic infrastructure and capabilities. National strategists should more directly involve the military in Arctic matters due to increased potential for security concerns in the region in recent years.

Increased Arctic accessibility creates new and highly lucrative opportunities including transportation corridors and abundant natural resources. This introduces potential security concerns in two ways. First, it drives more actors into the region and thus increases the potential for competition and conflict over new prospects. Second, they rekindle tensions previously ignored simply due to past inaccessibility. Additionally, this opening provides hostile actors the chance to commit piracy on both transport ships and infrastructure built to support resource extraction, as well as to attack northern borders of Arctic nations.

Several nations have already placed claims in the Arctic for the reasons stated above. Some of these claims may be dubious, due to international agreements and perhaps from dishonest or desperate stakeholders, and should be addressed directly. If the United States does not remain adamant that international procedures be followed fairly, then dubious claims will worsen and could lead to greater conflict in the future. Additionally, the military should be prepared to

provide support in this region. Ensuring freedom of navigation for commerce transit and secure access to emerging economic opportunities in the Arctic depends on adequate security, which military presence could offer.

This research uses the scenario planning framework, offering a new perspective on Arctic matters as a literature review identifies no efforts to look at Arctic capability requirements through these means. This paper employs the scenario planning model of Scarse and Fulton, which follows five distinct phases. The first phase, Orient, involves the investigation of a focal issue or challenge facing an organization.<sup>4</sup> In the following two phases, Explore and Synthesize, the researcher identifies “driving forces” (e.g., Arctic warming, global demand) impacting that focal issue and then analyzes the utility of each in terms of importance and uncertainty (e.g., Arctic warming remains strong versus Arctic warming ceases; global demand for goods remains high versus stagnation in demand).<sup>5</sup> These driving forces represent the “emerging issues” identified in the stated research question.

Various combinations of these driving forces (e.g., increased warming accompanied by strong global demand) provide alternative futures which become useful for future planning. Through these steps, the paper develops four plausible scenarios for the Arctic. In the fourth phase, the paper identifies critical actions, policies, and capabilities required to prepare for each potential scenario. Phase five, Monitor, observes future developments to adjust scenarios as needed; this phase is not within the scope of this paper.

After this introduction, the paper takes the following format. The background addresses both traditional Arctic relationships and the changing political relationships there today due to increased opportunities that are both affecting long-established relationships in the region and attracting new players. This discussion serves as the Orient phase of the framework described

above, and also provides critical contextual information to support the following Explore and Synthesize phases. The presentation and discussion of results further address these phases and describe how this research applies the selected methodology. These sections also describe developed scenarios and analyze how each may affect Arctic policy. Recommendations then address the most likely and dangerous scenarios. Recommendations include strengthening international cooperative forums and regulations, developing more accessible and available infrastructure in the region, and developing better communication and transport capabilities for Arctic waters.

## **II. Background**

This paper next reviews relevant literature to identify potential emerging issues that may impact Arctic requirements. The Arctic region has not traditionally been prevalent in U.S. military discussions, but it is rapidly becoming an area of concern that should be addressed. Many potential international issues have been dormant for years due to Arctic inaccessibility. These issues include territorial claim differences, attacks on northern borders of nation-states, and passage through extended international or national waters. As the Arctic opens, these once seemingly dormant conflict points will likely surface and require national attention.

These conflict points could create situations in which the military would need to act. As such, it is important to have a complete understanding of the Arctic situation in order to provide a comprehensive analysis of potential conflict scenarios involving the United States. This section will review traditional Arctic dynamics and relationships among nation stakeholders as well as the changes that are emerging that could affect old relationships and create new ones. This section will also include an overview of U.S. history in the region. Additionally, it will address

the legal context shaping Arctic activity. This background material will be critical to provide an adequate analysis of potential Arctic conflicts.

## **II.A. Traditional Arctic Actors and Relationships**

The Arctic has a number of traditional stakeholders that are important to understand, not only for background information but also because they play a role in shaping current events. A review of these actors provides a historical background of Arctic relationships.

### *II.A.1. The Arctic Council*

The Arctic Council, created by the Ottawa Declaration in 1996, is an international forum of Arctic states and indigenous communities that promotes cooperation and interaction on Arctic matters. The declaration lists all nations with Arctic boundaries as permanent members. These include Canada, Denmark (through Greenland), Finland, Iceland, Norway, Russia, Sweden, and the United States.<sup>6</sup> Additionally, six indigenous organizations were given status as Permanent Participants; these include the Aleut International Association, the Arctic Athabaskan Council, the Russian Association of Indigenous Peoples of the North, the Inuit Circumpolar Council, the Saami Council, and the Gwich'in Council International.<sup>7</sup> The declaration also allows for observer status to be given to non-Arctic states and other organizations provided that the council determines that such can contribute to the council's work.<sup>8</sup>

Traditionally, the forum focuses on issues such as protecting the environment and sustainable development. The council is divided into six separate working groups that monitor developments in these two basic areas. These working groups seek to: reduce contaminant/pollutant emissions; monitor Arctic ecosystems and support efforts to reduce climate change; conserve biodiversity in this region; protect the environment from inadvertent

release of pollutants or radionuclides; protect the marine environment; and promote sustainability and improve Arctic community conditions.<sup>9</sup>

The working groups present analysis to the council for various decisions, which are reached through consensus of the eight member states with consultation of the Permanent Participants. The chairmanship of the council rotates among the eight member states, with each taking on the role for two years. The United States has held chairmanship of the Arctic Council since 2015, and Finland will assume the role later in 2017. During this period, the United States has pursued the same agenda as its predecessors, trying to gain improvements to environmental regulations and sustainability in the region.

The Arctic Council has no power to implement or enforce its recommendations, but rather the Arctic states themselves must do so. The Ottawa Declaration specifically excludes military security from the council's mandate.<sup>10</sup> This organization could help promote orderly and legal use of Arctic resources among the nations but has traditionally only been involved in general cooperative matters.

#### *II.A.2. U.S. History in the Arctic*

An understanding of U.S. history within this region is critical for any Arctic analysis. The United States officially became an Arctic nation upon the purchase of Alaska in 1867 from Russia. Russia had initially made the offer in 1859 with the hope that it would negatively impact Great Britain, Russia's biggest rival in the Pacific at the time.<sup>11</sup> However, the Civil War delayed the sale. Secretary of State William Seward readily accepted a new offer in March of 1867, agreeing to purchase the area for \$7.2 million.<sup>12</sup> The Senate approved the treaty in April, President Andrew Johnson signed it on May 28, and Russia officially transferred the territory to the United States on October 18.<sup>13</sup>

Originally called “Seward’s Folly” by skeptics, the United States essentially ignored the area for about three decades after its purchase, providing minimal governance through military means.<sup>14</sup> However, over time, U.S. leaders recognized the importance of the region as a great resource for the United States, and this fact remains true today. The region provided the major gateway to the Klondike gold fields in the late 1800s, and has also provided access to other natural resources. Additionally, it became an area of significant strategic importance during World War II. The purchase essentially provided the United States access to the Pacific, while simultaneously eliminating Russia’s presence from the North American continent. Alaska became a state in 1959, cementing the area’s relevance in U.S. strategy. This area still remains strategically important to the United States, and the state is host to a number of military bases.

### *II.A.3 Legal Background*

Recent Arctic warming has resulted in opening of Arctic water passageways, creating new opportunities. However, increased Arctic accessibility also complicates international boundaries and national rights. International regulations and laws may need to be enhanced to address these new challenges. This section summarizes existing international organizations and protocol that will impact nations desiring to access newly available resources in this region.

One major legal aspect relates to the United Nations Convention on the Law of the Sea (UNCLOS). The convention provides a legal framework governing the use of oceans and their resources in an orderly manner.<sup>15</sup> The convention was first sent out for signature on December 10, 1982 after more than 14 years of work that involved 150+ nations that represented a broad array of political systems, development, and regions of the world.<sup>16</sup> Per the convention’s article 308, it entered into force on November 16, 1994, 12 months after the sixtieth nation ratified the treaty. The convention governs all aspects of ocean use, including delimitation of areas, scientific

research, commercial activities, and dispute settlement. It is globally recognized today as the standard for legal matters relating to the sea.<sup>17</sup> It is critical to note that the United States is not a participating member of the treaty, a point to be further addressed below.

There are several key components of the convention that are critical to understand as they directly impact Arctic dealings. First, coastal nations have sovereignty over the seas up to but not exceeding 12 nautical miles from their respective shore line; innocent passage by foreign vessels is permitted.<sup>18</sup> The convention lays out specific criteria for passage to be innocent – for example, the passage must be “continuous and expeditious”, must not enter internal waters of the nation, and cannot be “prejudicial to the peace, good order, or security” of the coastal nation.<sup>19</sup> Activities considered prejudicial include use of weapons, fishing, and research activities.<sup>20</sup> Second, these nations also have rights to the natural resources and economic activities available within 200 nautical miles of their coast – this is referred to as exclusive economic zones (EEZs).<sup>21</sup> Other nations have freedom of overflight and navigation within the EEZ and transit passage is allowed through international navigation straits; nations bordering these straits may regulate passage.<sup>22</sup> The high seas are open to all with freedoms of navigation, overflight, fishing, and scientific research.<sup>23</sup>

Other organizations set up under the convention also merit consideration. Nations can submit disputes over interpretation of the convention to the International Tribunal for the Law of the Sea for settlement. This tribunal has complete jurisdiction over deep seabed mining, an activity that is already being solicited by many in the Arctic.<sup>24</sup> It is used for regulation of claims over territories by the various nations seeking to exploit opportunities there. Additionally, the Commission on the Limits of the Continental Shelf considers applications regarding the outer borders of nations’ continental shelves – this demarcation is critical as this can extend the

sovereign area of these nations, allowing for greater economic exploitation.<sup>25</sup> Figure 1 provides a graphic of territorial claims from the Arctic nations.

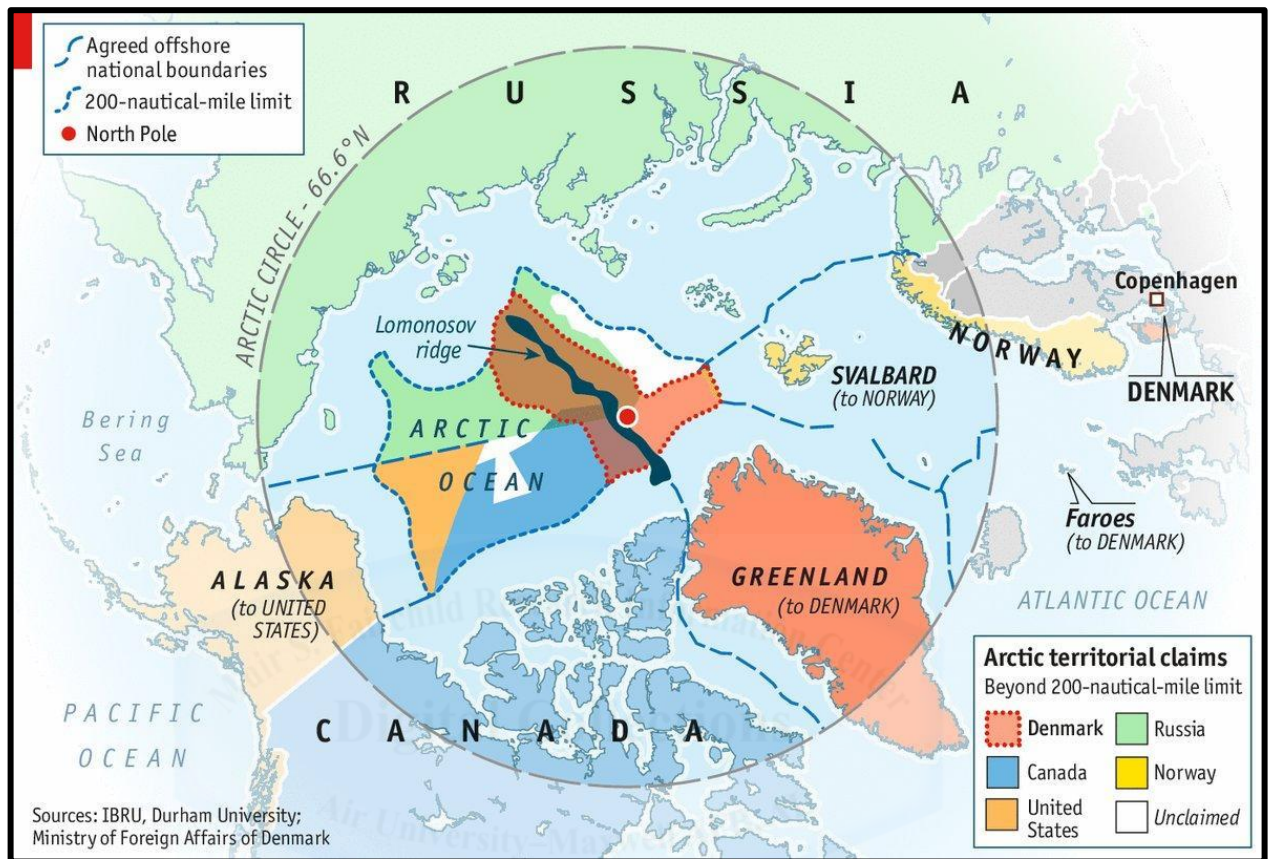


Figure 1. Arctic Territorial Claims. (Reprinted from Jeremy Bender, “Russia’s Arctic pivot is a massive military undertaking,” *Business Insider*, 12 March 2015, <http://uk.businessinsider.com/russias-arctic-pivot-is-a-massive-military-undertaking-2015-3?r=US&IR=T> (accessed 12 April 2016).)

The International Seabed Authority, also established by UNCLOS through a 1994 agreement relating to the implementation of Part XI of the convention, controls the activities (e.g., exploration, deep seabed mining) of parties to the convention in international seabed areas.<sup>26</sup> The 1994 agreement addressed difficulties encountered with provisions regarding seabed mining in Part XI of the original convention.<sup>27</sup> The International Seabed Authority includes 168 member nations – the United States is not one of them.<sup>28</sup> Part of the International Seabed

Authority's work involves regulation of marine mineral exploration and mining in international seabed areas, which is generally referred to as the "mining code."<sup>29</sup> The work of this organization will also likely play a role in Arctic matters going into the future.

The Svalbard Treaty also deserves close examination. Svalbard is a series of islands between the Arctic Ocean and the Barents, Greenland, and Norwegian Seas. Willem Barentsz, a Dutch captain, discovered the archipelago in 1596.<sup>30</sup> Since that time, this area has been visited by hunters, fisherman, mining companies and scientists; substantial amounts of valuable metals and minerals are deposited here.<sup>31</sup> These resources, along with the very northern location of Svalbard and its easy accessibility due to warm ocean currents, have facilitated and driven many explorers to this region.<sup>32</sup>

The Svalbard (or Spitsbergen) Treaty, signed on February 9, 1920 in Paris, granted Norway the rights of sovereignty to govern this archipelago and it officially became part of Norway in 1925.<sup>33</sup> In a highly unique move with possibly significant consequences yet to be realized, the treaty additionally gave other signatory nations equal rights to engage in various activities including industry, fishing, hunting, and mining.<sup>34</sup> Original signatory nations included Russia, the United States, China, and the United Kingdom. It is worth noting that many other nations have acceded to the treaty since original agreement. Recent examples include South Korea (2012) and North Korea (2016). In total, the treaty currently has more than 40 signatories.<sup>35</sup> The treaty also imposes strict limitations on military activities in this archipelago.<sup>36</sup>

As the Arctic becomes more accessible, the idiosyncrasies of the Svalbard Treaty could lead to disagreements. In some cases, there could be conflicts between this treaty and UNCLOS over the demarcation of continental shelves. Rights over territorial waters and access to them are

already being disputed by Russia, Norway and other nations, relying on UNCLOS procedures to pursue claims.<sup>37</sup>

Christopher Rossi, a law professor at the University of Iowa, contends that this split in rights will become more problematic as access to the Arctic increases. Particularly, he considers how the grant of sovereignty to other nations in 1920 applies in the case of the EEZ and continental shelf extensions of Norway resulting from ownership of this archipelago.<sup>38</sup> This is particularly crucial due to recent large oil and gas discoveries on the continental shelf extending from this archipelago.<sup>39</sup> Norway claims full ownership over the continental shelf as it controls Svalbard. Russia, on the other hand, argues that Norway's sovereignty was given by mutual agreement and that the shared rights should be extended to all aspects of Svalbard, including the use of territorial waters off the coast.<sup>40</sup> These disputes have gone on for decades, but the two principal stakeholders, Russia and Norway, have avoided confrontation. The opening of the Arctic could widen disagreement with regards to this important Arctic area.

The United Nations International Maritime Organization (IMO), the first international group dedicated wholly to maritime issues, could also impact Arctic matters. The creation of IMO demonstrated the criticality of international shipping. The United Nations adopted a convention to establish this organization in 1948, and it entered into force in 1958.<sup>41</sup> This group oversees regulations regarding all aspects of international shipping, including standards for passage and use of ports to facilitate maritime traffic, protection from marine pollution, ship design, as well as security issues such as piracy and armed robbery.<sup>42</sup> IMO ensures that these standards are agreed upon in international fora, signed into appropriate laws, and then implemented.

As of 2013, IMO has 170 Member States and three Associate Members.<sup>43</sup> It is composed of the Assembly and the Council, both governing bodies, as well as a number of committees that

address specific maritime issues.<sup>44</sup> For example, the Maritime Safety Committee focuses on shipping safety and security, including the dangers of armed robbery and piracy against vessels.<sup>45</sup> Additionally, the Marine Environment Protection Committee coordinates standards for prevention of environmental pollution from ships.<sup>46</sup> Seven subcommittees address other issues including navigation, communications, search and rescue, ship design, and cargoes and containers.<sup>47</sup> Overall, IMO has promoted 50 conventions and implemented over 1,000 codes that serve the maritime environment and international shipping.<sup>48</sup> Though this organization will likely have an impact on shipping lanes through Arctic waters, a search of its official website included only sparse treatment of how opening of this area could impact existing regulations and conventions.

## **II.B. The Emerging Arctic**

The recent warming of Arctic waters is creating unprecedented access to resources within this region. Though there was always general awareness of such opportunities, the harsh Arctic environment always prevented nations from easily exploiting them. In this section, the paper turns to reviewing the various potential economic impacts originating from Arctic accessibility, and also to providing a general overview of accompanying security concerns that may arise. Understanding these possibilities will be critical to enable our analysis of potential conflict points.

### *II.B.1. Arctic Accessibility*

There has been general observance of reduced Arctic sea ice during summer and autumn months over the last few decades, due in part to warming of the area, and augmented yearly as new ice formed in melt areas is more vulnerable to melting the following year.<sup>49</sup> This has led to a great increase in interest regarding shipping through the Arctic, as this can decrease travel time

and as a result reduce fuel consumption and eliminate costs.<sup>50</sup> Prior to this, high cost investments in icebreakers and Arctic ports were needed to keep these shorter routes active – notably, this was significantly practiced by the Soviet Union in the 1980s for the Northern Sea Route.<sup>51</sup> Russia still controls and regulates this passage. This sea route and the North West Passage are currently the quickest routes between Asian and North Atlantic ports for nonspecialized vessels, but are available only if and when sea ice melt permits passage in the summer months.<sup>52</sup> Transportation along these sea routes has been increasing in recent years. Figure 2 provides a general picture of the sea routes available in Arctic waters.

Melia et al. use global climate model simulations to assess how projected sea ice loss will impact shipping lanes in this area of the world. For purposes of the analysis, they used Rotterdam, Yokohama, and New York as the representative European, East Asian, and North American ports respectively. They determined that by midcentury Europe-Asia routes through the Arctic will be 10 days faster than the current alternative of 30 days through the Suez Canal, while North America-Asia routes would only be improved by 4 days over the current alternative of 25 days through the Panama Canal.<sup>53</sup> It is important to note that the Melia analysis excludes delays and extra time needed to traverse these canals, which could result in even greater time savings. Shipping seasons will double as navigable periods become longer as well.<sup>54</sup> Competition to access and control these critical routes is expected to rise over the coming years.<sup>55</sup> These sea routes will play an important role in economic development for the region, and the paper next turns to this concept.

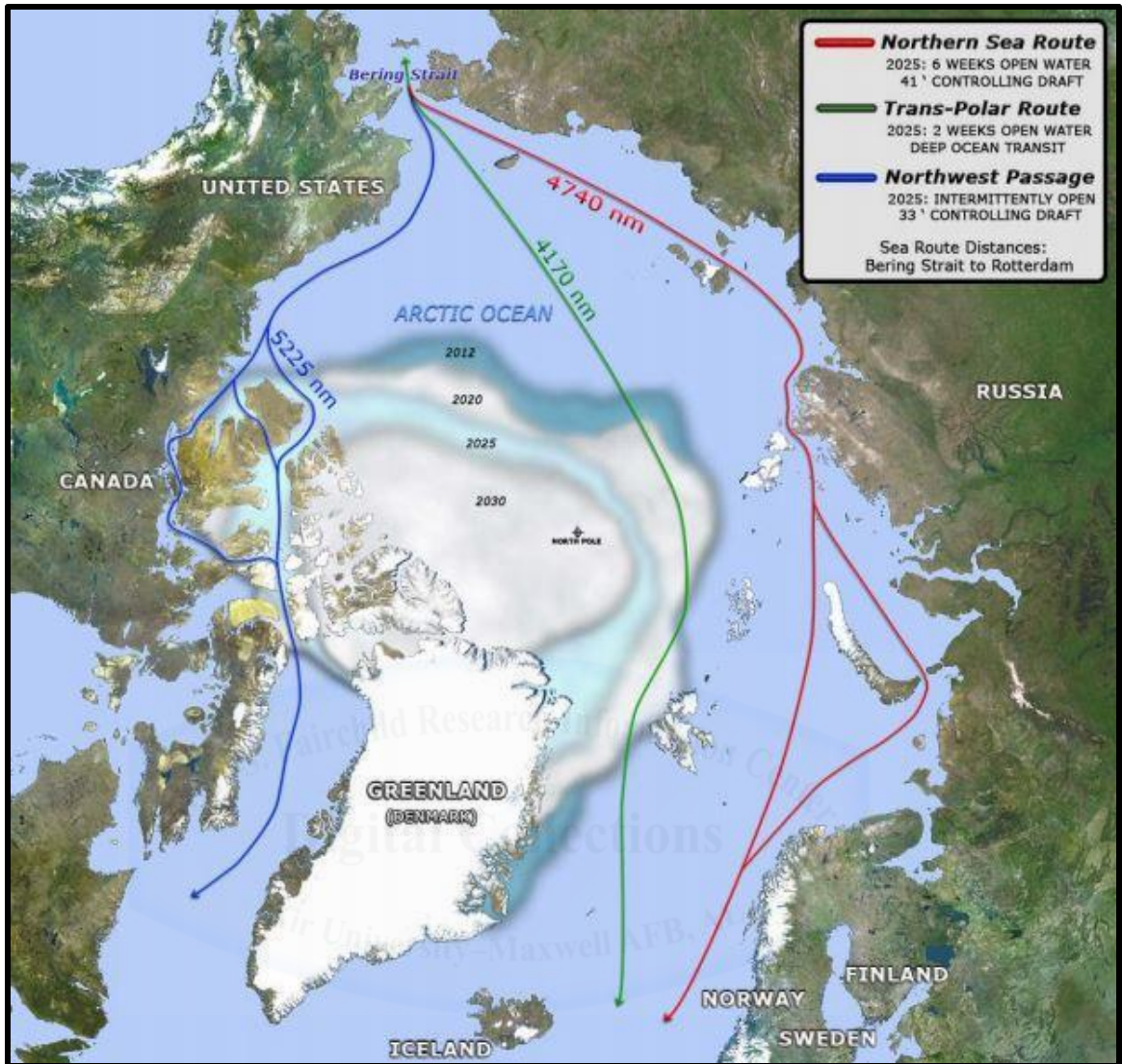


Figure 2. Arctic Shipping Routes and Sea Ice Extents (United States Navy Graphic). (Reprinted from United States Navy, “The United States Navy Arctic Roadmap for 2014 to 2030,” U.S. Navy, February 2014. Available at [http://www.navy.mil/docs/USN\\_arctic\\_roadmap.pdf](http://www.navy.mil/docs/USN_arctic_roadmap.pdf) (accessed 8 February 2017).)

### *II.B.2. Economic Impact*

Opening of Arctic waters is creating opportunities that were not available previously. The Arctic holds great potential but it has always been locked up due to inaccessibility of the area. As accessibility increases, so will the opportunities and potential for economic gain. This could in turn to lead to increased competition and potential conflict among nations.

First, transportation opportunities are expanding and will continue to do so. As water routes open due to Arctic ice melting, shorter routes are available between nations than ever before. This will speed delivery of goods and materials between various parts of the world. However, it could also lead to conflicts over which nation has control over routes, which nation has access to them, and how access is controlled. In addition to these opportunities, tourism in the Arctic will continue to expand as barriers preventing entry are reduced.<sup>56</sup> Other areas of the Arctic have benefitted from tourism (e.g., Alaska due to train access), and a similar process could benefit Arctic nations and natives in other areas gaining accessibility.

Additionally, this region holds abundant natural resources that are important for many stakeholders. These resources include minerals, fish, and energy containing materials such as oil and natural gas.

The United States Geological Survey (USGS) estimated that the unexplored Arctic (north of the Arctic Circle) contains as much as 90 billion barrels of oil, 1,669 trillion cubic feet of natural gas, and 44 billion barrels of natural gas liquids – approximately 84% of these materials are expected in offshore areas.<sup>57</sup> These quantities represent only those materials recoverable through use of technology available in 2008. Other materials are likely present but were not included in this study. These include coal bed methane, gas hydrate, oil shale, and tar sand.

The area north of the Arctic Circle includes about 6 percent of the surface of the Earth; land makes up a large portion of this (3.1 million square miles of 8.2 million square miles) while another significant portion (2.7 million square miles) is located on somewhat shallow continental shelves of less than 500 meters.<sup>58</sup> These are likely the largest unexplored potential areas for petroleum discovery left on Earth.

Based on preliminary data, the USGS study indicated that distribution of materials was not homogenous over the entire Arctic area. For instance, five of 33 areas likely contained greater than 70 percent of undiscovered oil resources and three areas likely hold about 70 percent of undiscovered natural gas.<sup>59</sup> These quantities represent large windfall opportunities for investors, and could lead to competition among the various nations for control of specific Arctic regions.

### *II.B.3. Security Issues*

Overall, opening of this region creates some new challenges for security that will need to be addressed. The United States will not be immune from this, as it itself is an Arctic nation with significant interests in the region.

The increased ability to navigate Arctic waters leads to a set of security concerns. As waters on the northern borders of Arctic nations become accessible, these nations become vulnerable to attack on their northern coasts.<sup>60</sup> Elizabeth Chalecki, a political science professor at the University of Nebraska Omaha, suggests that an increased number of vessels from hostile states as well as non-state actors could obligate Arctic nations to increase military presence in the region.<sup>61</sup> These nations will now need to seek solutions for protecting borders that were once completely ignored. Additionally, increased economic activity in the region will provide further opportunities for piracy to be committed. Attacks could occur on both goods transportation and tourist vessels, or on infrastructure built to support resource extraction. This is especially probable in an area of limited population, where there is not much protective support from security or law enforcement agencies. These new possibilities create a need for international laws and structures to provide safe movement of goods and people through this area.

Increased Arctic traffic raises an important issue regarding search and rescue in the region. Ships could push too fast and too far into this region without sufficient preparation. This area

will remain difficult to transit at first with rough water or ice that present significant danger. Robust search and rescue capabilities will require equipment such as icebreakers, search and rescue boats, and possibly search aircraft. These will be critical to ensure security for any U.S. transit vessels traversing the region.

## **II.C. Evolving Arctic Political Landscape**

Prevalent agreement exists in the literature that opening of the Arctic region will expand contact between disparate areas, but the repercussions from this are still highly debated. The literature shows general consensus that recent Arctic developments will impact world order. Juha K  pyl   and Harri Mikkola, Arctic researchers from Finland, suggest it is becoming a “geopolitically important region” and indicate that governing the region will become more “complicated as ... economic and political stakes are raised.”<sup>62</sup> Sten Rynning, head of the Department of Political Science and Public Management at the University of Southern Denmark, submits that this opening “upsets the ‘old’ geopolitical order.”<sup>63</sup> Chalecki proposed that this change “will thrust policy makers ... into a world that has never existed before.”<sup>64</sup>

The critical need to understand and prepare for Arctic developments is thus established. However, questions still remain regarding whether the emerging Arctic will be an area of cooperation or of mistrust and defensive posturing. Rynning looks at the question from both liberalist and realist perspectives, questioning whether “collective security” (with adequate cooperation between all nations) or “collective defense” (where defensive alliances are set up) will result.<sup>65</sup> Which direction it goes will have direct ramifications on U.S. strategic and military decisions.

This section reviews the current activities and interests of major international players with regard to the Arctic region. These include international organizations and individual nations.

### *II.C.1. A Shifting Arctic Council*

In this discussion, it is constructive to consider the changing role of the Arctic Council. Traditionally, this organization kept to itself and limited discussion to issues such as environmental protection while markedly excluding security and economy from the agenda.<sup>66</sup> However, Käpylä and Mikkola point to two recent (2013) decisions that indicate a shift in this focus.<sup>67</sup> First, the council granted permanent observer status to several non-Arctic nations, including China, India, the European Union (EU), South Korea and Japan. Second, the Kiruna Declaration acknowledged the importance of the economy in this region and advocated cooperation with the business community there to develop the Arctic in a sustainable way. In fact, the council established a new circumpolar business forum at the time.<sup>68</sup>

Rynning also indicates that this organization has the potential to create problems between the original “club of the countries that have access” and the new observers; he indicates that these “fault lines” will become critical as more accessible waters allow for greater resource extraction and crowd up sea routes.<sup>69</sup> Nations such as China are already heavily pursuing Arctic opportunities, a point to be addressed below.

Rynning addresses another potential issue that would be significant as it involves two traditional Arctic Council members - Norway could “harden” its attitude against Russia (in regards to the Svalbard treaty) and utilize NATO’s collective defense agreement to pursue Arctic matters.<sup>70</sup> Interestingly, NATO has no internal consensus on its role in the region with its membership currently divided over the matter.<sup>71</sup> Norway is the leading proponent for NATO involvement in the region while other nations (particularly Canada) voice a dissenting opinion.<sup>72</sup>

### *II.C.2. International Stakeholders*

Many stakeholders, both traditional and new, are involved in the Arctic for various reasons.

Russia has long-standing and significant interests in the region and likely desires “to create a stable investment environment”, while China likely believes cooperation will allow it to “legitimately access Arctic affairs as an outside player.”<sup>73</sup> The EU has also displayed interest along with other nations.<sup>74</sup> The current state of affairs is in flux, and while international cooperation appears to be managing amidst changing circumstances, difficult issues (e.g., status of maritime passages, continental shelf extensions) remain to be solved.<sup>75</sup>

Growing Arctic accessibility is causing many actors (including Russia, Denmark, Canada, and Norway) to make their claims on Arctic areas while the United States lags behind. Borgerson argues that a lack of leadership by the United States to provide diplomatic solutions to competing claims will lead to an “armed mad dash” for resources.<sup>76</sup>

Two nations in particular merit a more thorough review in regards to the Arctic due to their capabilities and interests in the region. These are Russia and China. After discussing the interests of these two nations, current U.S. policy is addressed.

### *II.C.3. Russia*

Russia is arguably the largest and most capable Arctic player. It holds the majority of Arctic area, with a border along the region that exceeds 4,000 miles in length.<sup>77</sup> It controls the Northern Sea Route as well. Proper Arctic analysis requires addressing Russia’s many interests in the region.

Russia has already pursued claims to specific Arctic areas, in one case by planting a flag on the seabed under the North Pole in 2007.<sup>78</sup> Russia claims that the Lomonosov ridge (Figure 1 shows location) is not just a mountain chain within international waters, but rather is an extension of the continental shelf of Siberia.<sup>79</sup> Successfully defending this claim through UNCLOS procedures would allow the nation to assert greater ownership and control over

potentially lucrative Arctic areas. However, other nations, including Canada and Denmark, have also explored the area to secure rights.<sup>80</sup> These disputes may be settled through international bodies, but could also potentially lead to conflict.

Additionally, Russia has been building up military installations along its Arctic border in recent years. This includes reopening old Soviet bases, constructing new ships, and forming a new military command (the Russian Joint Strategic Command North).<sup>81</sup> The nation is also training detachments specifically for warfare in the Arctic.<sup>82</sup> Russia also plans to open 10 search and rescue stations, 13 airfields, 16 deepwater ports, and 10 radar stations for air defense.<sup>83</sup> This includes construction of an airbase capable of year-round use in the New Siberian Islands Archipelago, allowing the use of large, modern bombers.<sup>84</sup> Figure 3 shows Russian Arctic military construction. Additionally, Russia owns the largest and most capable icebreaker fleet in the world.<sup>85</sup> Russia continues the advance even today, having recently (June 2016) finished construction of their largest icebreaker, capable of breaking ice up to 9.5 feet thick.<sup>86</sup> The nation also expects to complete an even larger vessel in 2019.<sup>87</sup>

Elizabeth Buchanan, a Ph.D. candidate in the Centre for European Studies at Australian National University Canberra, indicates that the Arctic is a strategic priority for Russia, even one that could be protected by force.<sup>88</sup> She notes that a particular component of Russia's vision is to once again become a great power in the international arena, and that energy dominance is a major way forward to achieve that.<sup>89</sup> Control of the Arctic would assist Russia in the pursuit of this goal.



Figure 3. Russian Military Buildup in the Arctic. (Reprinted from Office of Senator Dan Sullivan (accessed 8 February 2017).)

#### *II.C.4. China*

Another major stakeholder becoming involved in Arctic affairs is China. This point is particularly interesting given the fact that China is not an Arctic nation. However, China sees numerous opportunities in the region that is driving its interest there. This section will review those interests and the actions China is taking to insert itself into Arctic Affairs. An understanding of the dynamics of how this important, non-Arctic nation becomes integrated into the Arctic region will enable better analysis of future Arctic developments.

China recognizes that it is an outside player looking in, but has taken steps to gain a voice

regardless. Linda Jakobson and Jingchao Peng, researchers at the Stockholm International Peace Research Institute (SIPRI), indicate that the Chinese emphasize the “global” rather than the “regional” aspects of melting ice.<sup>90</sup> China argues that it and other nations, while not directly bordering the Arctic, will nevertheless be affected by the changed environment and as such should have a greater voice in Arctic affairs. China is particularly worried that claims on UNCLOS rights will significantly decrease opportunities for other nations.<sup>91</sup> This could lead other non-Arctic nations to seek further involvement.

Jakobson and Peng indicate that the Chinese have deliberately prepared to protect their perceived key Arctic interests in recent years.<sup>92</sup> First, China is strengthening its ability to effectively respond to potential climate change effects on extreme weather and food production.<sup>93</sup> Second, it has attempted to obtain access to shipping routes in the Arctic.<sup>94</sup> Lastly, the nation has attempted to fortify their ability to access Arctic resources including minerals and fishing rights.<sup>95</sup> China had not published an Arctic strategy as of the time of the Jakobson and Peng publication (November 2012).<sup>96</sup>

A 2014 Wilson Center study indicates that China currently has a number of rights in the region. These include scientific and economic activities at Svalbard, observer status at the Arctic Council, some access to seas for transport, tourism, fishing and scientific research, participation in international decision-making on Arctic matters, cross-Arctic air route access, ability to bid for mineral rights and other opportunities, and to potentially bid for deep sea rights.<sup>97</sup> In particular, China is seeking to reinforce diplomatic ties with Nordic nations to obtain access to this area.<sup>98</sup> This includes a recent free trade agreement with Iceland.<sup>99</sup>

China is well known for its strong polar (both Arctic and Antarctic) programs. Many regard it as having the strongest polar scientific capabilities in the world, and it has conducted

numerous expeditions through the Arctic.<sup>100</sup> One of its icebreakers has navigated the entire Northern Sea Route from the Pacific to the Atlantic Ocean.<sup>101</sup> The nation owns research bases in both Norway (Svalbard) and Iceland.<sup>102</sup> Additionally, it displayed great capability during the 2014 rescue of the *Akademik Shokalskiy*, a Russian research vessel that became trapped in the Antarctic.<sup>103</sup>

## **II.D. Current/Evolving U.S. Arctic Policy**

The paper next looks at how the shifting goals of the United States within the Arctic could create potential points of conflict. This will enable better analysis and determination of whether a renewed focus from the Department of Defense is necessary.

### *II.D.1. Recent U.S. Strategic Documents*

The 2009 presidential security directive released by President Bush started the recently renewed emphasis on Arctic matters for the United States; previous doctrine was from President Clinton in 1994.<sup>104</sup> The Bush directive mostly focused on environmental compliance and sustainability for the region, but also sought to support institutions for cooperation among Arctic nations (including the Arctic Council) and to set as policy the need to meet national and homeland security objectives within the region. In particular, it identified an interest in assuring missile defense and early warning, deployment of systems to support strategic sealift, strategic deterrence, and freedom of the seas for navigation and overflight.<sup>105</sup> The directive also indicated a preference for Congress to act on accession to UNCLOS to secure U.S. rights in the region.<sup>106</sup> The Bush directive also acknowledged an unresolved border dispute with Canada within the Beaufort Sea, and indicated that both the United States and Russia were abiding by a border treaty signed in 1990 (but were still awaiting Russian ratification for the treaty to enter into force).<sup>107</sup>

More recent strategic policy, released by the Obama administration, demonstrates that the United States clearly views the Arctic opening as directly impacting its interests. The recently (2013) published National Arctic Strategy identifies its highest priority as the protection of the American people (including territory and rights), indicating that the United States will “identify, develop, and maintain” necessary capabilities to preserve “safety, security, and stability” for the Arctic.<sup>108</sup> Both security and protection of commerce transport are “central interests.”<sup>109</sup> The United States is clearly willing to work to ensure safety in this northern region. However, the strategy seems to focus on cooperation without additionally considering the alternative in which the United States may need to defend its interests in the region.

The Obama administration’s more recent (2014) implementation plan for the national strategy further developed these ideas and established responsibilities for various federal agencies. A review of this indicates some involvement by the Department of Defense, though it was only established as a lead agency on one activity.<sup>110</sup> However, the document indicates that the U.S. will conduct regular maritime exercises and operations in the Arctic to ensure freedom of the seas.<sup>111</sup>

The implementation plan further states that one objective is “to project a sovereign U.S. maritime presence” by maintaining sufficient icebreaker capacity.<sup>112</sup> Such capability will be critically important going forward if the United States is to compete in the Arctic and protect its interests there. Currently, the United States has only three ships available with this capacity, one with limited service life remaining.<sup>113</sup> The United States remains vulnerable in this capability, as it increasingly has to rely on foreign contract vessels for access in Arctic areas.<sup>114</sup>

The Coast Guard, who owns the icebreakers, has requested funding for an additional 10 vessels in order to fulfill mission requirements and support Navy presence in cold regions.<sup>115</sup> In

2015, President Obama called for accelerating the acquisition of at least one new heavy icebreaker to 2020 (year of funding) and the 2016 budget did allocate some minimal funding to prepare for that effort.<sup>116</sup> Last year, the Coast Guard released icebreaker requirements and held a conference regarding the acquisition effort with industry representatives.<sup>117</sup> The new icebreaker project has received \$15.6 million in funding as of the FY16 budget, and the Coast Guard has requested an additional \$150 million in FY17; the project is estimated at approximately \$1 billion.<sup>118</sup>

These two Obama administration documents strategically outline the U.S. position but while providing a brief suggestion of military involvement do not directly address how the military should be involved. The Department of Defense role in these efforts needs to be considered. This could involve a number of items, ranging from protection of sea routes and resource extraction infrastructure to fighting off actors trying to make illegitimate claims on Arctic waters or territories.

#### *II.D.2. Department of Defense Arctic Strategy*

The Department of Defense has taken notice; the 2011 UCP (classified) assigned Arctic responsibility to NORTHCOM and EUCOM, with NORTHCOM assigned the role of advocating for Arctic capabilities.<sup>119</sup> “Routine” exercises may not be enough to prepare the U.S. military for potential conflicts here. NORTHCOM is now taking an active role in the matter of exploring needed Arctic capabilities. The command’s 2016 posture statement includes significant discussion about efforts by the Arctic Capabilities Advocacy Working Group while the 2015 version made no mention of it at all.<sup>120</sup> It will be interesting to see if this effort is further reported on in the upcoming 2017 posture statement, which is likely to occur soon after this report’s finalization.

Over the past few years, Congressional interest in Arctic affairs and the Department of Defense role there has increased. House Report 111-491 instructed the Department of Defense to develop a report on Arctic matters that specifically addressed five elements.<sup>121</sup> These include an assessment of strategic national security objectives and restrictions, an assessment of the mission capabilities needed to support those objectives and a timeline to obtain such, an assessment of an amended UCP to address continuity of effort by a single combatant commander, an assessment of base infrastructure (including deepwater ports) needed to support objectives, and an assessment of the need for (including minimum and optimal numbers of) icebreakers in supporting security objectives.<sup>122</sup> The Department of Defense submitted the report to the House on May 31, 2011, and the House (through report 112-78) directed the Government Accountability Office (GAO) to review that Arctic report.<sup>123</sup> The GAO submitted their review in November of the same year.<sup>124</sup> It made a couple recommendations to the Department of Defense, which in turn partially concurred with those recommendations.<sup>125</sup>

This conversation has since continued. After release of this report, the Department of Defense released a new Arctic Strategy in 2013. This report recognizes three strategic objectives: protection of the homeland, international cooperation for addressing challenges, and maintenance of a “secure and stable” region allowing for safeguarding of U.S. national interests.<sup>126</sup> The 2013 Arctic Strategy also addresses the continued need for identifying and pursuing Arctic capabilities, including improvement to monitoring and domain awareness, as well as infrastructure.<sup>127</sup> Finally, it identifies a number of risks for the strategic objectives. These include potential inaccuracy of Arctic access projections, delay of capability investments due to fiscal constraints, aggressive militarization leading to an arms race, and potential for clashes to erupt over disputes.<sup>128</sup>

Since that time, Congress has continued attempts to spur the Department of Defense to further action. This has resulted in a new unclassified Arctic report just released for public viewing; interestingly, this new strategy is also accompanied by a classified annex.<sup>129</sup> This new strategy retains the 2013 Arctic Strategy's objectives. Differing from the previous strategy, it directly addresses claims, strategies, and friction points of and between the various Arctic and non-Arctic stakeholders.<sup>130</sup> The strategy also indicates that key capability challenges persist from the 2013 Strategy. These include remote sensing capabilities, weather forecasting, ice prediction, lack of navigational aids, difficulties with electronic communications in high-latitude environments, and lack of vessels and infrastructure ready for this setting.<sup>131</sup>

Congressional interest remains high today, as evidenced by very recent pressure on the White House from Representative Duncan Hunter (R – California), chairman of the House Subcommittee on Coast Guard and Maritime Transportation.<sup>132</sup> Congress will likely continue this conversation with the Department of Defense in the coming years.

### *II.D.3. Arctic Debates*

One of the main current debates in U.S. policy is whether to agree to UNCLOS.<sup>133</sup> Though supposedly a top priority, the United States has not yet acceded to this treaty, even though there has been broad support from actors including presidents of both political parties, other politicians, military leaders, as well as environmental and business groups. However, some still believe that the benefits do not outweigh the costs. Arguments against the treaty include the transfer of royalties from hydrocarbon production to developing or landlocked countries, vulnerability to lawsuits for even minor infractions, and potential conflicts with existing treaties.<sup>134</sup> To date, these arguments have been successful in preventing treaty ratification.

In 2012, Secretary of State Clinton made the case for ratifying the treaty. She recognized a robust opposition, but indicated that the opposition was not based on facts or evidence. Secretary of Defense Panetta and General Dempsey, Chairman of the Joint Chiefs of Staff, also were in agreement with her evaluation of the situation.<sup>135</sup>

Secretary Clinton argued that the United States would benefit greatly (likely more than most other nations) from ratifying UNCLOS due to U.S. maritime power and its long coastline. The benefits include “favorable freedom of navigation provisions,” extension of our continental shelf and the accompanying oil and gas rights, and mobility for commercial ships.<sup>136</sup>

The secretary outlined four reasons that make joining the treaty increasingly urgent.<sup>137</sup> First, U.S. companies now have the technological capability to benefit from the provision allowing nations to extend their continental shelves. However, without legal certainty regarding their rights to exploration they will not make substantial investments. These investments could lead to substantial job creation.

Second, companies are now more capable of deep seabed mining, an activity that is beyond any country’s jurisdiction. The right to explore a site, a critical prerequisite for companies to feel secure in the expensive investments needed to do so, is uniquely offered through the convention and can only be exercised by a party that has acceded to the treaty. Other nations, including Russia and China, are already receiving licenses for mining in this fashion for valuable rare earth elements and metals.

Third, the convention offers the international framework for accessing the new opportunities (e.g., fishing, resource exploration and extraction, tourism, shipping) available as the Arctic opens. The United States is the only Arctic nation that is not a part of the convention. As such, the U.S. case for claiming its interests in the region is weakened. Other nations are already

pushing forward their claims for extended continental shelves while the United States remains outside the convention.

Finally, the convention's bodies are already actively considering applications for extension of continental shelves from more than 40 nations. Additionally, rules governing deep seabed mining are being developed. Both of these activities should be important to the United States, but currently the nation has no representation in either of these discussions as it remains outside the convention.

Secretary Clinton also claimed that our security interests would be improved by the freedom of navigation principle of the convention. The Armed Forces rely on such navigational freedoms to access combat areas, ensure logistical processes run smoothly in wartime, and to return home. This debate will continue, especially as the Arctic frontier becomes available for development opportunities.

### **III. Results and Discussion**

After having provided essential background material, this paper next turns to the development and analysis of potential future Arctic scenarios. This section briefly describes the methodology used to develop them, then describes developed scenarios and offers an analysis of each. Finally, it provides potential policies to address these possible future alternatives.

#### **III.A. Scenario Development**

To adequately address the question at hand, this paper uses the scenario planning framework using qualitative modalities. This section first describes scenario planning in general and then employs it to develop scenarios for the Arctic to later be used to analyze potential future security needs.

### *III.A.1. Scenario Planning Background*

Scenario planning suits this topic well. First, it is beneficial for predicting future concerns where forecasts are complicated by manifold factors (as is the case for the Arctic situation).<sup>138</sup> Second, it forces the researcher to look beyond near-term concerns and delve into plausible alternative futures (which aids analysis).<sup>139</sup> This research also aims to set strategic direction and avoid obsolete Arctic strategy – these are key applications and strengths of scenario planning.<sup>140</sup>

Schwartz pioneered the process to properly develop and select scenarios, a critical component for successful use of this framework.<sup>141</sup> This method includes identifying focal issues, listing key factors and driving forces, and ranking these based on importance and risk. The researcher then develops procedures and policies that can be used to best prepare for these alternative future scenarios.

This paper develops scenarios based on the pattern outlined by Scearce and Fulton, which generally involves the same steps as Schwartz but breaks them up into five distinct phases. Figure 4 illustrates this process. In the first (Orient), the researcher investigates the focal issue or challenge facing an organization and identifies any assumptions held by decision-makers of that organization in order to determine a main research question.<sup>142</sup> The second phase (Explore) involves identifying “driving forces” inside and outside of the organization that directly impact the focal issue; some elements may be predetermined (known with relative certainty to hold steady) while others may be uncertain.<sup>143</sup> Afterwards, the third phase (Synthesize) analyzes the utility of each of the driving forces by looking at both the importance of it to the focal issue, and at the uncertainty of it.<sup>144</sup> Greater importance and higher uncertainty flesh out the most critical driving forces, which are then used as priorities to develop possible future environments by

combining various driving forces at different areas along uncertainty axes (e.g., more versus less, weak versus strong).<sup>145</sup>

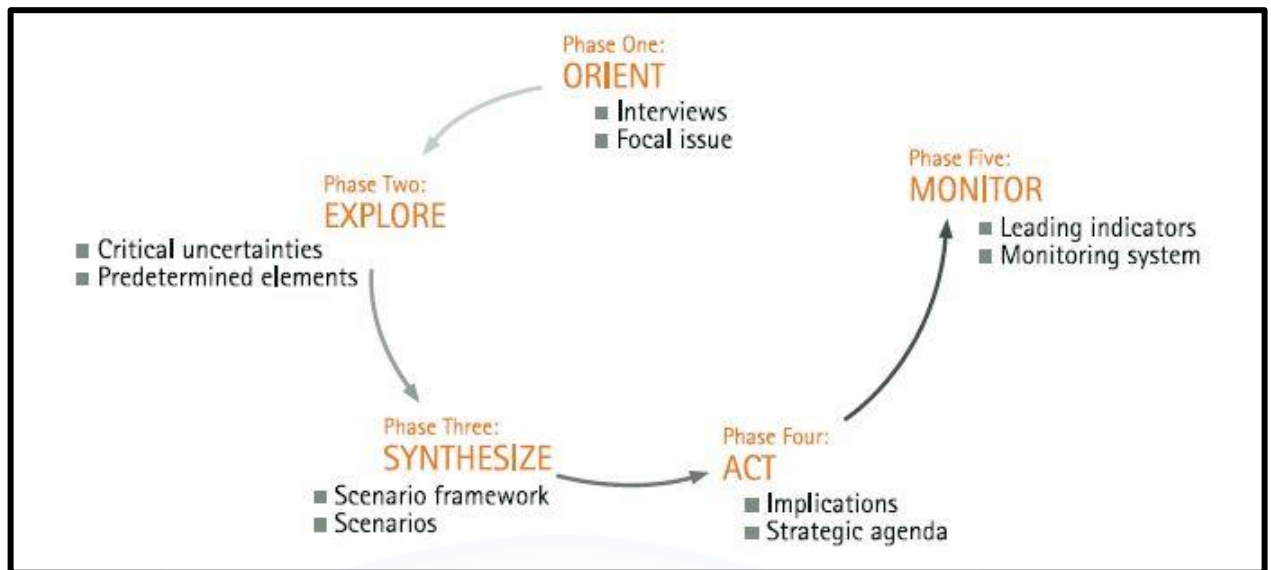


Figure 4. The Five Phase Scenario Thinking Process. (Reprinted from Diana Searce and Katherine Fulton, *What If? The Art of Scenario Thinking for Non-profits* (Emeryville, CA: Global Business Network, 2004).)

The first three phases involve the development of scenarios, while the final two relate to later actions to analyze implications of those scenarios if they were to occur in the future, and to observe how future events align with the selected scenarios. Phase four (Act) involves the application of developed scenarios to explore potential consequences of each and to develop contingency plans for likely issues. Phase five (Monitor) involves the long-term observation of developments to examine how well they play out in comparison to the scenario analysis conducted. This phase lies outside the scope of this paper, but is briefly addressed in future recommendations. The paper now develops Arctic scenarios using the first three phases as described above.

### *III.A.2. Arctic Scenarios: Identifying and Analyzing Driving Forces*

First, the wide variety of research undertaken and addressed within this paper served as the Orient phase of the scenario thinking process. The literature review crystallized the focal issue of Arctic accessibility effects from multiple perspectives, and prepared the way for the rest of the scenario planning analysis.

Second, the Explore process reviewed significant findings from the research to determine the driving forces that could impact future decision-making in Arctic defense matters. This exposed a number of critical considerations, many of which are indeterminate. Finding such uncertain factors is a critical component of scenario development. Driving forces identified include technological changes, Arctic warming patterns, U.S. attitudes toward world affairs, environmental regulations, global economic considerations, and resource availability and accessibility in traditional locations.

Phase three (Synthesize) prioritized each of these driving forces by looking at two specific criteria. First, an assessment of the importance of the particular driving force to the focal issue was accomplished. Second, each driving force was examined in regards to the uncertainty regarding it. Each was ranked on a scale from 1 to 5, with a 5 being the most important or the most uncertain; Table 1 summarizes the rankings, and additionally provides a description of each extreme along the uncertainty axis for the specific driving force. The following discussion outlines reasons for selecting each of the driving forces; selection was made with consideration of the research presented here. The top four (in terms of combined importance and uncertainty; uncertainty prevails in event of a tie) are then used to develop scenarios.

The first driving force involves the availability and accessibility of minerals, fuels, and other resources in traditional parts of the world. This is another important issue, as high demand

without availability in other areas could drive stakeholders to the Arctic. Perhaps areas where these goods are available become unstable due to weak governments or terrorist and criminal organizations. This has the potential of major uncertainty (ranking of 5) and it is likely quite important (ranking of 4). If so, Arctic resources could become the preferred choice for stakeholders.

Arctic warming patterns may also contribute uncertainty to the question. Though warming is expected to increase, a sudden reversal could surprise national strategists. If warming continues, more stakeholders will become aware of the significant prospects in the region and interest in Arctic development will expand. On the other hand, the warming trend could slow down or even reverse itself in future years. This would likely lead to decreased interest in the area and limit the need for defense considerations. This aspect is quite important (as it could directly impact Arctic development), and is assigned a ranking of 5. Scientific research seems to indicate that warming will continue so there is likely low uncertainty (ranking of 2) in this regard.

Attitudes emanating from the United States toward the world also hold great potential to impact this issue. If the United States becomes more isolationist and protectionist, it could lead toward a more polarized world that could have implications for the Arctic. However, if the United States sustains a leading and cooperative role in world affairs, it would lead to a completely different situation for the Arctic. This could be impacted by decisions such as the continuation of avoiding UNCLOS ratification versus acceding to the treaty. If the United States remains in the status quo, other nations may look askance at U.S. desires to exploit Arctic development opportunities. This has a medium degree of importance (ranking of 3) and likely a medium to high degree of uncertainty (ranking of 3).

| <b>Driving Force</b>                         | <b>Importance Rating</b> | <b>Uncertainty Rating</b> | <b>Uncertainty Low</b>                    | <b>Uncertainty High</b>                 |
|--|--------------------------|---------------------------|---|---|
| Global Resource Availability & Accessibility | 5                        | 4                         | Difficult Access / Availability Decreases | Easy Access / Availability Remains High |
| Arctic Warming Patterns                      | 5                        | 2                         | Warming Ceases                            | Continual Rapid Warming                 |
| U.S. Attitude Toward Global Affairs          | 3                        | 3                         | Isolationist / Protectionist              | Active Leader                           |
| Global Economy                               | 4                        | 2                         | Demand Ceases                             | Demand Remains High                     |
| Technological Change                         | 4                        | 2                         | Cease in Development                      | Continual Rapid Development             |
| Environmental Regulations                    | 3                        | 2                         | Relaxation of Standards                   | New Stringent Standards                 |

Table 1. Summary of Ratings of the Various Arctic Driving Forces and Presentation of Uncertainty Extremes. Driving forces are ordered by highest combined rating, from top to bottom. Ties are further discussed in the narrative.

Regarding global economic considerations, the demand for various products requiring various minerals will likely impact the desire to extract resources from the Arctic. Technical electronic equipment such as televisions, mobile phones, and tablets rely on precious metals that may not always be available from traditional locations. Regarding this desire for products, this paper will assume this as a constant for many years to come. It is an important consideration (as the drive to mine in the Arctic is motivated by it) (ranking of 4) but it holds relatively low uncertainty (ranking of 2).

Regarding technological changes, much of the research assumes that technological developments will continue to improve so as to allow greater access to resources in the Arctic region. Over the past few years, technological improvements have been realized and this has increased stakeholders' desires to reach Arctic resources, as they now have greater capacity to do so. This is a highly important factor (ranking 4) for businesses that are making decisions in regards to Arctic development. As technological gains improve possibilities for successful

development while eliminating risk, the greater the likelihood that extraction projects will commence and continue. On the other hand, if technological improvements cease, perhaps the growth in desire will reach a plateau. Uncertainty in this regard is likely minimal (ranking 2); this paper assumes that this trend will continue.

Regarding environmental regulations, shifts in social values may also influence Arctic matters. For instance, if a nation's population prioritizes protection of natural resources over commercial interests, it could impact the ability of the nation to proceed with Arctic exploration for exploitative purposes. In the United States (and through international organizations or accords such as the Arctic Council and UNCLOS), stringent environmental regulations could hinder development.<sup>146</sup> This factor is likely of medium importance (ranking of 3) and somewhat low uncertainty (ranking of 2).

The synthesize phase determined the top driving force priorities for this analysis. These include global resource availability and accessibility, arctic warming patterns, U.S. attitudes, global economy, and technological change. Figures 5, 6 and 7 display three scenario matrices, each of which combines two uncertainty axes from the top driving forces. Combining two driving forces along their uncertainty axes creates a quadrant, resulting in four potential alternative futures. With three separate combinations, there is a total of twelve distinct alternative futures. This paper now briefly looks at each of these alternative futures and from them selects four to further analyze. Scenario section is primarily based on likelihood of significant impact to U.S. strategy.

### *III.A.3. Scenario Descriptions*

In Scenario #1, the world witnesses continual rapid warming accompanied by a decrease in accessibility and availability of resources. Continual rapid warming would make the Arctic

easily available. A combination of this with decreased availability, perhaps as a result of instability or depletion of resources in other areas, could easily drive changes in the Arctic. This scenario will be retained for consideration due to the likelihood that it could impact Arctic developments.

Scenario #2 involves continual rapid warming which is now complemented by continual ease of access and high availability of needed resources in other parts of the world. Though this scenario could increase attraction toward development in the Arctic, the high availability of resources in other areas would likely limit motivation to do so. This scenario will not be retained for further consideration due to this probable limited incentive.

Scenario #3 involves the opposite situation. Warming has now surprisingly ceased, at least halting increased access to the region and perhaps even reducing it. At the same time, other areas have become depleted of materials or they are more difficult to access. This could be a much stronger motivator for Arctic access, and result in increased competition for the limited accessibility in the region. This scenario will be retained for further consideration due to the significant potential for stakeholders to be driven to the Arctic at a time when access there may be limited.

In scenario #4, the world retains easy accessibility to resources highly available in other areas of the world. At the same time, warming ceases. Both of these situations likely decrease the incentive for stakeholders to compete in the Arctic region, as goods are available elsewhere and accessibility in the Arctic stagnates. This scenario will not be retained for further consideration due to the insignificant potential for stakeholder interest.

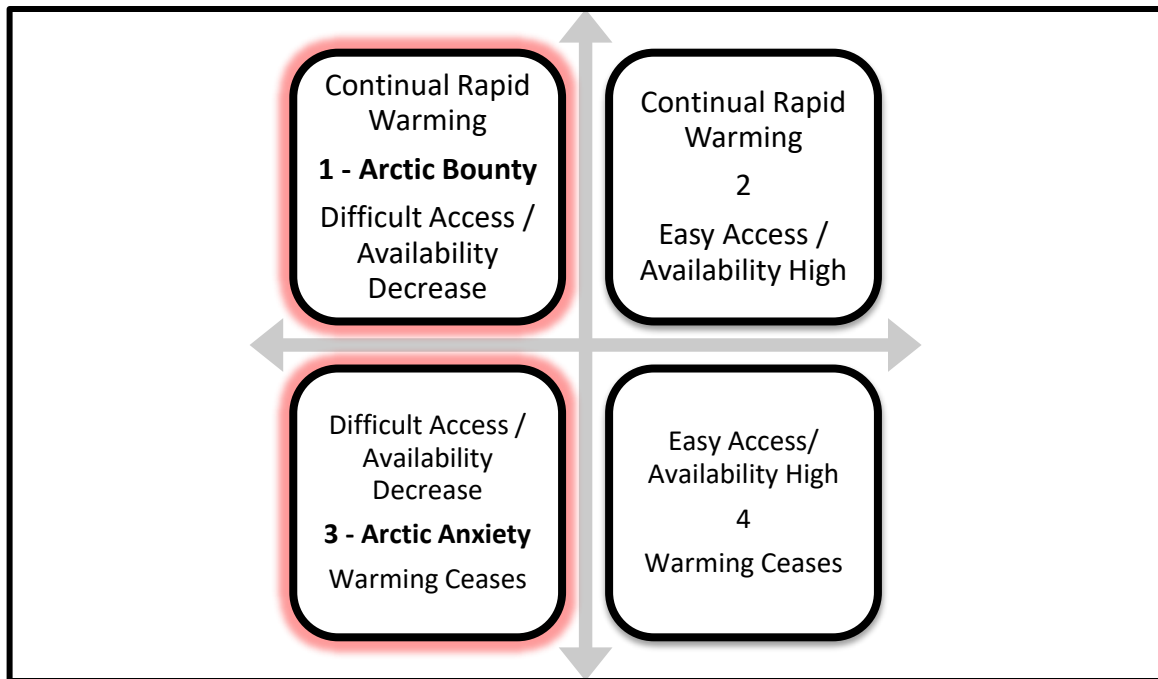


Figure 5. Scenario Matrix 1. Global Resource Availability & Accessibility Shown on Horizontal Axis and Arctic Warming Patterns Shown on Vertical Axis. This combines the top two scoring driving forces. The quadrant provides a total of four potential scenarios. Red highlighted scenarios were selected for further consideration. The numbers indicated within each quadrant will be used for reference within the narrative. Chosen scenarios are also named within their respective quadrants.

Turning to the second matrix, Scenario #5 combines difficult access and low availability with a United States active in global affairs. Difficulty obtaining resources in traditional locations will likely drive more activity toward the Arctic. However, in this scenario, the leadership of the United States allows this activity to be governed through international organizations that are already in place. This paper assumes that U.S. leadership promotes international cooperation and thus does not consider the potential that Russia or China could become more aggressive due to an active United States. This scenario will not be retained for further analysis as this paper assumes that cooperative international arrangements will remain strong.

Scenario #6 retains the United States as a global leader, but now access and availability to resources remains high. Easy access to needed resources from traditional sources likely would inhibit desires to seek out those same resources in a perhaps (depending on other factors such as warming and technologies) more difficult Arctic environment. The leadership of the United States probably would not play a major factor here. Overall, significant resource availability in other areas would likely preclude many stakeholders from greatly accessing Arctic waters. This would limit any potential clashes with established nations such as Russia. This scenario will not be further considered as high availability elsewhere likely precludes significant stakeholder interest here.

In Scenario #7, the United States has turned to protectionism and isolationism. This is accompanied by a dearth in other available resources in other parts of the globe, which will drive more stakeholders to the Arctic region in search of new means. With the United States in retreat from global affairs, emerging powers rise and compete for influence in a more polarized world, weakening international organizations and subsequently their ability to manage the Arctic. In such an environment, perhaps tensions over scant resources in the Arctic flare up into competitive and even combative differences. This scenario is retained for further consideration due to the significant potential for stakeholder polarization in a resource-restricted world.

Scenario #8 still retains an uninterested United States but now involves a world where goods are easily accessible and highly available from traditional locations. Easily obtainable resources will likely preclude a great rush to reach the Arctic, and activity would likely not increase significantly in the area. Due to limited Arctic activity, this scenario will not be retained for further consideration.

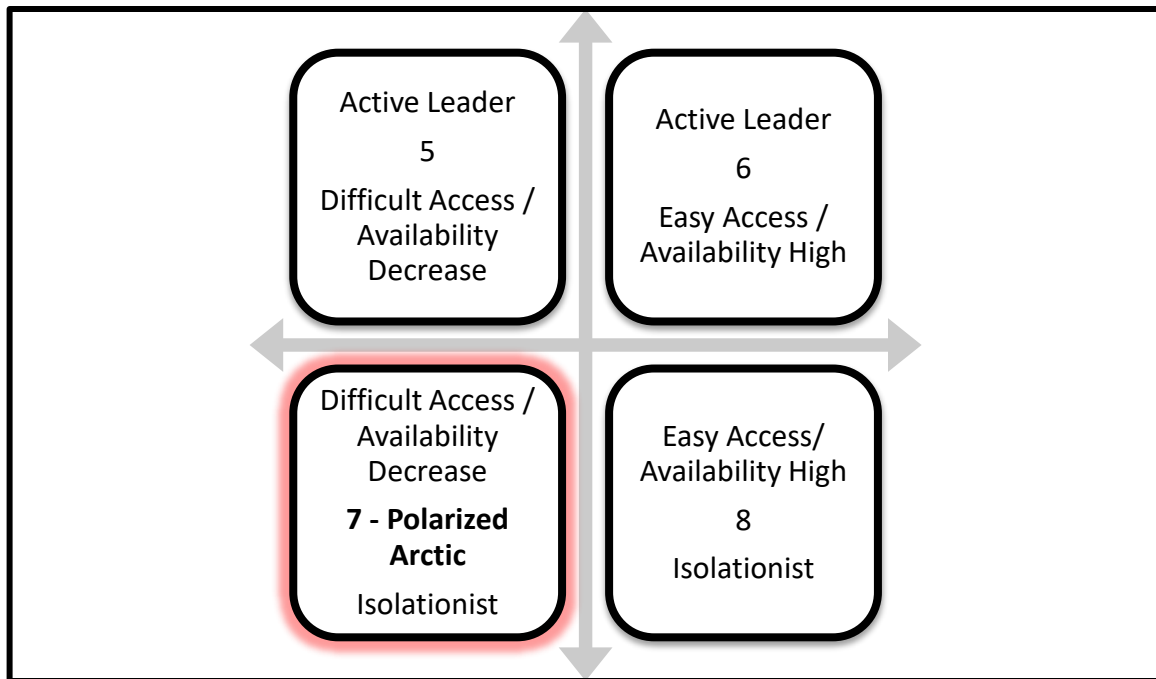


Figure 6. Scenario Matrix 2. Global Resource Availability & Accessibility Shown on Horizontal Axis and U.S. Attitudes Shown on Vertical Axis. This combines the first and third highest scoring driving forces. The quadrant provides a total of four potential scenarios. Red highlighted scenarios were selected for further consideration. The numbers indicated within each quadrant will be used for reference within the narrative. Chosen scenarios are also named within their respective quadrants.

Moving to the third matrix, Scenario #9 contemplates a world where demand is high yet the availability of goods from traditional locations has dwindled significantly. This scenario would drive interest toward the Arctic arena, resulting in much greater activity there. This could easily create tensions among stakeholder seeking to obtain resources. As such, this scenario is retained for further consideration.

Scenario #10 sees a world where demand remains strong and in which needed resources are still very easy to access from traditional locations. If required resources are still greatly available in other locations, there would not be much incentive for actors to look to new sources, especially ones that may not be readily obtainable. Though there could be a few stakeholders willing to pursue these areas (especially if technologies were available or warming continued

strong), this scenario is not likely to present too much activity in the Arctic region that could create tensions. As such, it will not be retained for further consideration.

In Scenario #11, though traditional resource locations have been depleted or are otherwise inaccessible, demand for goods has deteriorated through world markets. Without any demand for goods, there are likely few nations that would be willing to attempt to extract from Arctic locations. This would also tend to lessen the transit needs of nations, thus likely decreasing Arctic traffic. Overall, this scenario does not seem likely to increase activity in the Arctic. It will not be considered for further consideration due to this limited potential for strong Arctic development.

Scenario #12 involves a world where accessibility and availability of resources from traditional locations remains high. Surprisingly, however, demand for products that use these goods drops; this perhaps could occur if the economy drops off significantly. This second fact alone seems to disqualify this scenario from further consideration, as a main reason for accessing Arctic areas is to obtain resources or provide transit for movement of goods. Insignificant demand definitely reduces the need for such, and this paper does not consider this scenario further as it has very limited potential for significant Arctic interest.

Summarizing, this paper selects Scenarios 1, 3, 7, and 9 for further analysis. These scenarios represent the most potential for impacts in Arctic affairs. For ease of reference, these scenarios are respectively named: Arctic Bounty, Arctic Anxiety, Polarized Arctic, and Arctic Desperation. In the next section, these scenarios are examined in more detail, addressing how each may impact the motivations and actions of other Arctic stakeholders.

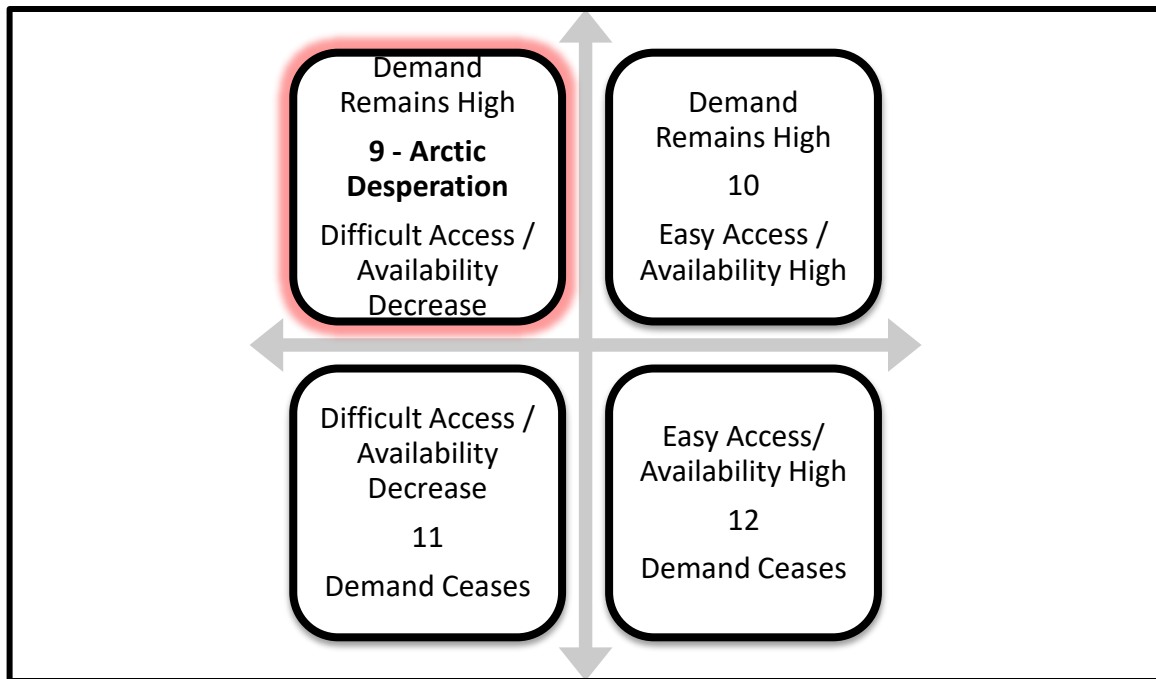


Figure 7. Scenario Matrix 3. Global Resource Availability & Accessibility Shown on Horizontal Axis and Global Economy Shown on Vertical Axis. This combines the first and fourth highest scoring driving forces. The quadrant provides a total of four potential scenarios. Red highlighted scenarios were selected for further consideration. The numbers indicated within each quadrant will be used for reference within the narrative. Chosen scenarios are also named within their respective quadrants.

### III.B. Scenario Analysis

Each of the above scenarios is analyzed in detail here to determine two distinct pieces of information. First, the paper addresses the likelihood of the scenario in future years, both in the short- as well as long-term. Second, it also assesses the inherent risks and dangers for U.S. security from each particular scenario. This information is then used to develop strategies and policies to prepare for these alternative futures.

This analysis will utilize the fourth phase (Act) of the Scarce model. In this step, scenarios are utilized to inform decision-making for the future. Scarce indicates that this analysis essentially means imagining that the scenario has become reality (*i.e.*, that we are living in it),

and then deciding how to face and prepare for that reality.<sup>147</sup> This phase enables the researcher to explore the implications of potential future scenarios on current day policies and strategies. The paper now addresses each selected scenario.

### *III.B.1. Arctic Bounty*

In Arctic Bounty (Scenario #1), both factors tend to increase Arctic activity. The opening of the Arctic due to increased warming and ice melt provides a larger area to explore, develop, and extract resources and fuels. Simultaneously, these same goods are becoming more difficult to obtain in areas routinely used for previous development and extraction. Both of these factors will incentivize further Arctic activity.

As activity increases in this region, there will be greater potential for clashes to ensue. Whether they do so will likely depend on other factors. In this situation, the great opening of the Arctic could lead to clashes in areas where rights are disputed. Particularly, Russia has staked claims to areas that are disputed by many other nations. Additionally, the Svalbard situation could complicate issues between Norway and Russia. This could result in clashes as other nations (perhaps from NATO) take sides in these disputes.

The potential for clashes could be tempered somewhat as more area is available for development (compared to Arctic Anxiety). One issue that could complicate this is the USGS study which indicated that distribution of natural resources (representing potential economic profits) was not homogenous through the Arctic, but rather that some areas held significantly greater amounts while other areas were essentially void of them. Depending on how this plays out, there may be more significant competition to control these particular areas.

China may also appear as an emerging Arctic foe in this environment. China is aggressively advancing their interests in the Arctic. Though not completely related, its ambitions in the South

China Seas (also a maritime environment) could (and actually have started to) provoke other nations to defend their interests in routes through international waters and in accessing Arctic resources.

### *III.B.2. Arctic Anxiety*

Arctic Anxiety (Scenario #3), in a distinct way, perhaps represents a situation worse than the previous scenario. Only one of the components, the lack of resource availability elsewhere, on its own would incentivize further Arctic development. However, this is a significant stimulus. Assuming that demand (the “Global Economy” driving force) remains constant and strong, which is very likely, this could motivate many to seek resources in the limited Arctic area available.

Arctic Anxiety also represents significant surprise, in the fact that warming is not expected to decrease. This results in a smaller area available for exploration and exploitation. As more competitors attempt to exploit a limited area, existing and established Arctic stakeholders may become more defensive seeking to protect their previous claims. Russia is uniquely prepared for this possibility. Not only has it built a significant military establishment in the Arctic arena, it also holds the greatest capacity in terms of accessing an ice-covered area due to its noteworthy icebreaker fleet (which also provides it with great experience in these waters). In an Arctic that is limited, Russia would still be able to exploit other areas with this capacity.

These facts likely give Russia the advantage in any Arctic battles. At the very least, they would allow Russia to dictate and control movements through the region (especially along the Northern Sea Route). This could become highly advantageous to Russia, especially if the lost accessibility was due to instability in other world regions versus depletion of resources. This could also lead to loss of the current major sea route connecting Europe and Asia. Restrictions to

the Suez Canal could force all such transports to traverse through Russian-controlled waters, giving it further power in the region.

Russian dealings with other nations could come to an armed clash in the region. Russia has demonstrated strong resolve and even arrogance in some of their efforts to make claims there (including the seabed flag episode). Russia has the greatest access to this area with its long coastline, and additionally owns the most seaworthy vessels (including critical icebreakers) for Arctic conditions.

### *III.B.3. Polarized Arctic*

Turning toward Polarized Arctic (Scenario #7), resources traditionally available for extraction and use are no longer easily accessible or have been significantly depleted. This will drive many stakeholders to the Arctic region, perhaps one of the few areas left where needed resources have not been exhausted. In this scenario, the United States no longer plays a significant role in world affairs, preferring an isolationist and protectionist stance.

If the United States becomes a non-participant in world affairs, this could have driven other nations to do the same. Perhaps the breakup of Europe could continue what Brexit started as differences arise between the various nations. International organizations, not only the Arctic ones discussed earlier, but others, including NATO, could play a diminished role in the world. Every nation would likely only pursue their own interests, and would be more inclined to seek out their own solutions rather than rely on shared decisions. Even if international organizations still had regulations, such polarized nations would be inclined to ignore them. Clashes could easily erupt, and they would not necessarily be limited to only Arctic nations as policies such as UNCLOS may not govern action.

In such a world, the United States would have great need to defend its interests in the region. Security would be lessened in such a world, and businesses contemplating development in the Arctic for resource extraction would need greater surety against losses. Other nations, especially Russia, are currently much more prepared to control developments in the region. To prepare for this scenario, the United States would need to seriously look at what other nations are doing to prepare themselves for Arctic warfare. The United States would need to do this as soon as possible due to long time delays in procuring vessels and equipment capable of Arctic exertions.

As in Arctic Anxiety, the Russians are operating from and strengthening an advantageous position. The same problem of transport perpetuates here – if this new world has created difficulty along current transport routes, nations could be forced to go through Arctic waters to deliver goods around the world. This would also tend to favor Russia, who has the capabilities to overcome difficulties there and control activity there.

In considering the opposite approach of an active United States, the situation could be completely improved. For instance, if the United States would offer rapprochement to Russia and Russia accepts such, international cooperation could be strengthened. The new U.S. presidential administration could be moving that way, and Russia may be responding.<sup>148</sup> Perhaps this would drive greater reconciliation and cooperation in the Arctic region through international bodies.

#### *III.B.4. Arctic Desperation*

Lastly, Arctic Desperation (Scenario #9) involves significant strain on resources as demand for goods is high yet the traditionally available ones have either dwindled or are no longer accessible due to other reasons. In looking at this scenario further, it is likely to result essentially in the same outcome as Arctic Bounty or Arctic Anxiety (both of those essentially assume

demand remains high), depending on the “Arctic Warming Patterns” driving force. Due to this reason, the paper refrains from further discussion of this scenario.

Overall, the “Global Economy” driving force does not greatly impact the result of the analysis, though it was initially thought to be important. It has low uncertainty, as demand will surely remain high for years. The driving force with most uncertainty, “Global Resource Availability and Accessibility”, impacted Arctic activity to the greatest extent. Both other driving forces, “Arctic Warming Patterns” and “U.S. Attitudes Toward Global Affairs”, also influence likely activities in the region.

The scenarios analyzed above point to a number of issues that the United States needs to resolve. The next section identifies a number of recommendations for policies and capabilities to pursue in order to be prepared for both likely and dangerous situations that could develop in the Arctic.

#### **IV. Recommendations**

A thorough evaluation of potential conflict points must be accomplished to determine priority issues and to develop adequate policies and solutions for problems that represent the most potential likelihood and danger. This knowledge will directly impact future choices on command and control relationships as well as on capabilities that should be available in this region. This research will benefit military strategists by enabling more adequate choices regarding these relationships and capabilities, as well as needed exercises and drills to prepare for potential combat there. The paper next assesses the likelihood and risks involved with each of the selected scenarios, and uses this to develop recommended policies.

#### **IV.A. Most Likely Scenarios**

To provide adequate recommendations, the paper next determines which scenarios are most likely to occur. Warming in the Arctic is almost certain to remain steady; this provides a significant distinction between Arctic Bounty and Arctic Anxiety, with the first involving continual warming. As such, Arctic Bounty will be considered more likely than Arctic Anxiety.

Regarding the other factor common between these two scenarios, it is difficult to say whether accessibility of resources in traditional areas will remain high or stagnate. The paper assumes this is a possible, but not necessarily a probable, outcome. As all four chosen scenarios incorporate difficult access and accessibility in other parts of the world, this factor becomes irrelevant in this discussion.

Arctic Desperation is also a likely scenario, as demand is sure to continue. However, as mentioned previously, it will essentially become equivalent to either Arctic Bounty or Arctic Anxiety. The other scenario, Polarized Arctic, involves an isolationist United States. This is also a possible, but not necessarily probable, future situation. As such, it involves to possible (but not probable) situations and would be less likely to occur than Arctic Bounty. It would be more likely to occur than Arctic Anxiety, which involves the very unlikely cessation of warming.

Overall, Arctic Bounty is the most likely, followed by Polarized Arctic, and the most unlikely scenario would be Arctic Anxiety. The paper next compares these three in terms of danger to U.S. interests.

#### **IV.B. Most Dangerous Scenarios**

Recommendations should also consider the potential risks associated with each scenario, as strategists need to consider preparation for the most dangerous situations. Both Arctic Bounty and Arctic Anxiety involve lack of resources in traditional areas, incentivizing significant Arctic

development. However, Arctic Anxiety would likely offer a much smaller area within the region to exploit, probably resulting in greater concentration of interest (more actors competing for less space). This situation would represent much more risk for Arctic clashes than does the more open area available in Arctic Bounty. Nations such as Norway and Canada, would be more inclined to protect their respective areas. Russia and China, both of which are capable of Arctic efforts and investing highly in Arctic capabilities, could become much more aggressive in efforts to ensure their continued development.

The third scenario, Polarized Arctic, also involves loss of resource availability throughout the world. This is accompanied by an inactive United States, which presumably would have resulted in a more polarized world where nations no longer desire international cooperation. This situation also present significant risk and danger to security, as nations would only look out for their own interests. When resources are scarce elsewhere, many would be drawn to the Arctic. The polarized world would essentially negate efforts of international cooperative organizations, with the nations not recognizing Arctic standards for the most part held in common today.

It is difficult to determine whether Polarized Arctic or Arctic Anxiety represents the most danger and risk for the United States. Perhaps a combination of the two would represent the gravest danger. This situation would involve a reduction of warming, difficulty of access to other resources, and an isolationist United States. Here, nations would be forced to compete for resources in a limited area, and there would be no incentive for cooperation.

It is interesting that scenario rankings in terms of comparing their respective likelihood versus dangers are essentially reversed. The most likely scenario represents the least risk to U.S. security, while the most dangerous scenarios are less likely. This could have interesting ramifications for policy decisions, and this paper next turns to that point.

#### **IV.C. Policies and Capabilities to Pursue**

The United States faces difficult choices regarding how to proceed in regards to the Arctic. There is a critical need to prepare today, as any needed equipment and infrastructure are difficult to obtain over short-term time periods. Fiscal constraints additionally force decisions that may not be optimal to support full and adequate preparation.

In any event, the United States should at least prepare for the most likely scenario. Arctic Bounty is a world where the Arctic is the major key for continued economic development and viability, as resources would not be easily accessible or available elsewhere. In this world, the United States would need significant infrastructure and supporting capabilities in areas with easy access to Arctic waters. The United States needs to change course in regards to this region, and invest today in needed capabilities.

First, the United States should invest in Arctic infrastructure including deepwater ports, radar stations, and search and rescue stations. This should be done for a number of reasons. Increased warming would open up the nation's northern borders, creating a new vulnerability. The more open waters also allow for expanded and improved sea routes for shipping, some (especially the Northwest Passage) of which could traverse near U.S. borders. Critical transportation vessels, including U.S. ships, could become subject to piracy attacks if the region affords no protective capabilities. Problems could also occur as struggles ensue for control of and access to these shipping lanes. Additionally, increased competition for resources could drive conflict in the region, adding to the need for increased defense capabilities there. Radar stations would enable air defense and deepwater ports would allow for naval presence for defense and security purposes. The United States should act now to prepare against these probable upcoming security and defense issues.

Second, the United States needs to take steps to strengthen its Arctic maritime capabilities beyond just the mentioned infrastructure. If the nation is to provide security and defense for the same reasons as stated above, it should prepare for potential difficulties in the region. The nation needs to invest in new Arctic-worthy sea vessels that are able to survive longer and in more difficult environments. If the Arctic completely opens, icebreakers will no longer be needed. However, some icebreaker capacity should be available in the short to medium term to help the United States prepare for later developments. Vessel development should include consideration of current weaknesses, in particular the difficulties with communications capabilities in the Arctic region mentioned in recent Arctic strategy documents. Inability to relay messages will harm the military's ability to effectively operate in the region; the United States must continue to research methods for improving these abilities. Additionally, the United States should expand efforts to map Arctic waters and passageways. The United States also needs to examine personnel preparation activities. Other nations, including Russia in particular, are purposefully developing their militaries for Arctic warfare; the United States may not be doing enough in this regard. Without all of these additional efforts, the United States and its military will not be properly equipped or ready for potential future clashes.

Third, the United States should make stronger commitments to international organizations and conventions. In particular, it should accede to UNCLOS and join the International Seabed Authority. This will help the United States in defending its interests. Currently, the United States has no voice in some Arctic matters as it has not joined UNCLOS. For instance, it is not able to seek continental shelf extensions as many other nations are doing so, and it is unable to participate in ongoing decisional discussions regarding deep seabed mining. The nation could easily lose critical resource opportunities and may later decide to act unilaterally to explore

certain areas, potentially provoking other actors. Additionally, most other Arctic stakeholders, including potential challengers China and Russia, are significantly involved in these organizations. Both Russia and China rely on and use UNCLOS procedures to pursue claims, and demonstrate a desire to cooperate through international bodies. The United States should view this in a positive light and support their efforts and participation.

U.S. involvement in these conventions would signal a commitment to all Arctic stakeholders and strengthen these international organizations. This would assist in retaining Chinese and Russian participation as well, and could help avoid potential for conflict. The research here additionally identified the fact that the International Maritime Organization, which regulates many shipping matters, has not addressed how its current regulations and standards may be impacted with increased Arctic accessibility. Increased involvement by the United States with this organization could move this discussion forward.

Preparing for Arctic Bounty also would provide the basics for Arctic Anxiety, but the likelihood that clashes would evolve is greater in this second scenario. Arctic Anxiety is less likely than Arctic Bounty but represents a riskier situation as interest in the region is concentrated on a smaller area. In this world, defensive capabilities (deepwater ports, search and rescue stations, radar stations) would be needed for the same reasons listed above but would prove even more critical due to stronger competition. In particular, icebreakers would be required to a much greater extent here, as there would be greater constraints on available Arctic area. The United States should immediately act on the Coast Guard request for additional icebreakers. Once made available, these would enable better preparation for U.S. military in the region.

To avoid the difficulties of Polarized Arctic, the other highly dangerous scenario, the United States should continue active support for international organizations such as the Arctic Council, the International Seabed Authority, and the International Maritime Organization. It should also accede to UNCLOS. These efforts should be made for the same reasons mentioned above in regards to Arctic Bounty. International organizations have been successful at achieving international cooperation in the Arctic, even from nations such as Russia and China. Maintenance of the status quo will assist in avoiding the potential difficulties of Polarized Arctic. If Polarized Arctic became a reality, it would require the same defensive capabilities as mentioned above, as nations would be more inclined to conflict.

Overall, this paper recommends strengthening international regulations and standards through support of international organizations. This will help avoid the difficulties of Polarized Arctic, but also will assist with retaining high interest in international cooperation which would in turn limit potential conflict. The paper also recommends that the United States pursue greater efforts to prepare infrastructure and develop and build new capabilities appropriate for Arctic waters. These efforts will ensure that the United States is prepared for the potential difficulties of both Arctic Bounty and Arctic Anxiety, but also will help the nation to secure access to resources in the region.

## **V. Conclusion**

This paper began by highlighting increased Arctic accessibility in recent years. The paper's purpose was to examine this issue in terms of emerging issues that could affect U.S. strategy and military policy for the region, and to identify needed capabilities to prepare for potential future events and conflicts there. It has taken the position that both U.S. national strategists and military

leaders are just beginning to lay out the policies and capabilities needed for potential future predicaments in the region.

To identify these issues and capabilities, the paper has provided an extensive review of background material to understand this complex topic. It reviewed available resources in the region, Arctic stakeholders, U.S. debates and interests, and legal requirements constraining Arctic matters, among other matters. This effort exposed a number of critical considerations for strategists to ponder in their decision-making. These include improved and improving Arctic shipping sea routes, the growing trend for non-Arctic nations to become involved in Arctic matters, the non-homogeneous distribution of resources in the Arctic, increased Russian militarization in the region, and lack of U.S. presence in many Arctic debates.

Based on this background, the paper then used the scenario planning framework to develop four alternative futures for the Arctic. It identified and ranked six driving forces, including global resource availability and accessibility, arctic warming patterns, U.S. attitudes, and the global economy. Each was scored in terms of importance (to the Arctic region debate) and uncertainty, and the highest scoring forces were used to develop a number of scenarios. Four of these scenarios were chosen for further analysis, based on highest potential to impact Arctic matters. By examining what each of these alternative worlds would look like, the paper identified the most highly needed policies and capabilities to pursue today.

The paper has identified a number of conclusions. First, not all emerging issues (driving forces) are equal; some do not merit as much consideration as others in terms of developing scenarios and identifying needed capabilities. Low uncertainty may be tied to forces that are not critical for consideration. For instance, the “Global Economy” driving force is highly certain as demand is unlikely to significantly decline, but it tended to have little impact on developed

scenarios. The United States should focus on the driving forces that tend to impact Arctic developments to a greater extent. Perhaps low uncertainty indicates driving forces not worth focusing on in Arctic monitoring.

Second, it is not only Arctic matters that drive potential Arctic issues. The driving force that seemed to make the greatest difference for the Arctic was “Global Resource Availability and Accessibility.” This driving force is also one that displays high uncertainty; this could lend credence to the point above (low uncertainty factors are not critical to focus on as factors with higher uncertainty display more potential for affecting outcomes). Perhaps one side of the uncertainty scale indicates greater potential for impact – it is interesting to note that all selected scenarios were on the same side of this driving force’s uncertainty scale (low accessibility and availability of resources). Armed with the knowledge that difficult accessibility in other regions could drive greater interest in the Arctic, the United States could take measures to better defend and secure existing sources to avoid such a situation. These first two conclusions drive the point that it matters what the strategic and defense establishment focuses on as they monitor and prepare for developments in the Arctic.

Third, resource distribution through the Arctic is critical and merits further investigation. The USGS study reviewed in the literature indicated that resource distribution was non-homogeneous, but did not provide many details on the actual distribution over Arctic areas. More efforts are required to understand this distribution, as it could delineate areas worthy of consideration and identify areas where resources are unlikely available. A knowledge of this distribution could prove highly useful in the years to come, especially if highly contested areas happen to align with areas having significant concentrations of resources.

Fourth, the United States should take measures to avoid potential conflicts with non-Arctic nations. This is closely related to the third recommendation above, as organizations and conventions may focus these nations on international cooperation. China is the largest non-Arctic Actor, and is currently pursuing international means for Arctic access. If it continues to do so, it will set the pattern for other nations to follow. This will mitigate the potential for clashes in the region.

The other recommendations presented above are also intended to assist the United States in overcoming potential future problems, and merit careful consideration. In order to ensure continued access to the Arctic for the United States, national strategists need to look years into the future and plan for possible contingencies. The scenario planning used here assists with identifying potential circumstances that could be encountered, and enables identification of needed capabilities for those situations. Development and acquisition of needed infrastructure and equipment, as identified in the recommendations above, will prepare the United States for both likely and risky future conditions. If not properly done now, the United States could find itself lagging other major nations in terms of Arctic strategy and also in terms of capabilities to access resources.

Fifth, the scenario planning framework has proven its worth as a tool for analyzing, identifying, and developing capabilities for future Arctic developments. This tool could be used for several purposes moving forward as the United States makes plans for future scenarios, even outside of the Arctic. As mentioned previously, the Monitor phase of the scenario planning framework involves setting up methods for tracking how closely the future aligns with the developed scenarios. To do this, Scarce recommends identifying and tracking indicators that will inform the researcher of changes that may or may not match scenario expectations.<sup>149</sup> As the

future develops, it may reveal uncertainties that become fixed or stable factors that become uncertain. If such were the case, scenarios would need to be reviewed anew. Future work could involve an examination of the driving forces identified here to determine whether such hold true, and may also detect other factors that need consideration. Additionally, future efforts could use other driving forces identified here to look at other potential scenarios. In particular, “Technological Change” (not used in scenario development here) could impact Arctic matters and is worthy of consideration. It would also be interesting to determine if there are other non-Arctic factors that impact Arctic developments (per this paper’s second conclusion).

Overall, there is a great need for the United States to consider Arctic capabilities. Though ignored to some extent in previous years, there is a growing recognition and acknowledgment of this requirement. In particular, Congress has motivated much discussion and action in military circles. The Arctic Capabilities Working Group working under NORTHCOM, which has direct responsibility to advocate for needed Arctic resources, It will be interesting to see if and how the command’s next posture statement to Congress, likely to occur soon after the completion of this research initiative, addresses and develops the effort to identify needed resources for Arctic battles. This paper hopes to further stimulate the discussion regarding necessary capabilities, and to offer a useful framework in which to consider future alternatives that could help isolate the most critical of these abilities.

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<sup>19</sup> United Nations, *United Nations Convention on the Law of the Sea*, Part II, Section 3, Subsection A. Articles 17-19 (p 30-31). Available for download at [http://www.un.org/Depts/los/convention\\_agreements/convention\\_overview\\_convention.htm](http://www.un.org/Depts/los/convention_agreements/convention_overview_convention.htm) (accessed 18 January 2017).

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