

# Security Considerations for a Warming Arctic

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**2012 Draft Working Paper**

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Working Papers are drafts distributed by the National Defense University Center for Technology and National Security Policy, Fort Lesley J. McNair, Washington, DC. CTNSP publications are available at <http://www.ndu.edu/ctnsp/publications.html>.

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## Summary

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Three powerful trends are poised to affect the strategic importance of the Arctic over the next several decades. First, the accelerating effects of climate change. Second, the exponential growth in global energy demands. Finally, rising levels of world trade and demand for consumer goods.<sup>1</sup> These converging realities have already begun to impact the region and its peoples.

### Climate Change

Rising temperatures and retreating ice packs have serious implications for local populations affected by environmental degradation and increased human traffic. Climatic changes have also sparked a wave of commercial interest among resource extractive industries (hydrocarbons, mining, timber, fishing, etc) that view the region as a rich source of new raw materials.

### Energy

As a potential source of energy, the Arctic represents a relatively untapped frontier. Over the next 25 years, energy companies around the world are poised to invest roughly \$40 trillion dollars to meet increasing consumer energy demand.<sup>2</sup> A major focus of their effort will be devoted to exploiting new sources of undiscovered Arctic oil (13 percent of world totals) and natural gas (30 percent of existing totals) predicted to lie under the region's warming waters.<sup>3</sup>

### Trade

Rising temperatures are also revealing, for the first time in human history, at least three potential Arctic 'shortcuts' for transit over the top of the world. More than 90 percent of goods are carried by sea, and the demand for efficient transport has ballooned in recent years with the rapid expansion of world trade—due in part to rising middle class populations in emerging BRIC (Brazil, Russia, India, China) economies. Maritime trade patterns have important implications for global prosperity and international security, creating fresh opportunities for economic development and innovation.

But such wide-ranging political and environmental adjustments also bring with them the possibility of serious regional disputes. International tensions during the summer of 2007 aptly illustrate the potential for friction.

As a record breaking polar thaw combined with precipitous, year-long spikes in the cost of crude oil, the Russian Federation moved to assert its claim over a vast new slice of Arctic terrain. On August 2, 2007, an undersea expedition led by Russian parliamentarian and Arctic explorer Artur Chilingarov planted the Russian flag on a previously

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<sup>1</sup> Most notably opening the Northern Sea Route as a major transportation alternative .

<sup>2</sup> Wan, Kwok, "World Needs \$38 Trillion Energy Investment," *Petroleum Economist*, October 18, 2011. Available at < <http://www.petroleum-economist.com/Article/2919494/Corporate-and-markets/World-needs-38-trillion-energy-investment.html>>

<sup>3</sup> "90 Billion Barrels of Oil and 1,670 Trillion Cubic Feet of Natural Gas Assessed in the Arctic," *USGS Newsroom*, July 23, 2008, available at <[www.usgs.gov/newsroom/article.asp?ID=1980](http://www.usgs.gov/newsroom/article.asp?ID=1980)>.

inaccessible deep sea bed beneath the North Pole, symbolically staking Russia's sovereign jurisdiction. Though legal experts dismissed the provocative gesture as a media stunt, the act succeeded in sending an unambiguous message; Russia intended to project its influence over disputed territory in the high northern latitudes.<sup>4</sup>

The purpose of this report is to examine the state of changes in the high north and assess their implications for American territorial and geopolitical interests. Part one will serve as a primer for understanding the region and introducing the reasons it is likely to play an increasingly large role in world affairs. Part two will address the security implications of climate change for U.S. interests, both domestically and internationally.

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<sup>4</sup> C.J. Chivers, "Russians Plant Flag on the Arctic Seabed," *The New York Times*, August 3, 2007, available at <[www.nytimes.com/2007/08/03/world/europe/03arctic.html?\\_r=0](http://www.nytimes.com/2007/08/03/world/europe/03arctic.html?_r=0)>.

## Part 1: Arctic Rising

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The Arctic is a frozen ocean surrounded by continents at the northernmost extremity of Earth.<sup>5</sup> Circumscribed on its southern border by a poorly defined latitude called the “Arctic Circle,” the region straddles 24 time zones and is home to roughly 4 million permanent inhabitants, the majority of whom are Russian.<sup>6</sup> Statistically, residents inhabit relatively small, geographically isolated coastal settlements.<sup>7</sup>

North of the Arctic Circle, daylight waxes and wanes in exaggerated cycles throughout the year. In many places, light conditions remain virtually static for months at a time, plunging residents into prolonged darkness or subjecting them to periods of near constant daylight. Those living north of the Arctic Circle—roughly 66°33' 39" latitude—experience at least one 24 hour period of light and darkness annually. Freezing temperatures, though not uniform, are generally harsh.

These extreme conditions can freeze ground soil to a depth of 500 feet or more, creating a host of problems for civil and municipal infrastructure. During the summer months, the topmost layer of permafrost thaws, producing soggy tundra sprinkled with bogs, lakes, and marshes. The softened topsoil is easily damaged. Man-made structures built on permafrost frequently sink and tilt as the underlying soil warms, compresses, and resettles.<sup>8</sup> When the soil freezes again during the winter months, it swells and heaves, damaging roads, pipelines, and other industrial structures. As a consequence, the Arctic has few permanent highways. Juneau, Alaska’s State Capital, is not accessible by road.

Paradoxically, overland mobility improves during the region’s 8-12 months of winter.<sup>9</sup> When seasonal temperatures drop, Arctic residents can rely on winter “ice roads” for re-supply and transport over frozen lakes, rivers, and marshlands. However, rising temperatures are shortening the seasonal lifespan of these frozen overland routes. Historical data indicate the tundra travel season on the North Slope of Alaska has been cut in half since the early 1970s; a pattern which can be attributed to dramatic environmental changes.<sup>10</sup>

In some areas, maritime traffic is possible during the short summer months when retreating Arctic sea ice exposes open water bays and inlets, allowing for the possibility of some commercial shipping. The vast majority of these natural access points, however,

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<sup>5</sup> Its polar opposite, the Antarctic, is commonly thought of as a continent surrounded by oceans.

<sup>6</sup> Dmitry Bogoyavlenskiy and Andy Siggner, “Arctic Demography,” in *Arctic Human Development Report* (Akureyri: Stefansson Arctic Institute, 2004), 38.

<sup>7</sup> Dmitry Bogoyavlenskiy and Andy Siggner, “Arctic Demography,” in *Arctic Human Development Report* (Akureyri: Stefansson Arctic Institute, 2004), 30; Hugo Ahlenius, Kathrine Johnsen, Christian Nellemann, ed., *Vital Arctic Graphics: People and Global Heritage on Our Last Shores* (Arendal, Norway: United Nations Environment Program, February 2005), 4.

<sup>8</sup> Seppo Saarelainen, “Arctic Roads,” *Northern Dimension Forum*, June 17-18, 2002, available at <[http://arcticcentre.ulapland.fi/pohjoinen\\_ulottuvuus/kajaani\\_docs/Saarelainen\\_1.pdf](http://arcticcentre.ulapland.fi/pohjoinen_ulottuvuus/kajaani_docs/Saarelainen_1.pdf)>.

<sup>9</sup> Ahlenius, et. al., *Vital Arctic Graphics: People and Global Heritage on Our Last Shores*, 8.

<sup>10</sup> Arne Instanes, “Infrastructure: Buildings, Support Systems,” in *Arctic Climate Impact Assessment* (NY: Cambridge University Press, 2005), 934.

lie undeveloped.<sup>11</sup> In Alaska, roughly half the state’s coastline has no maritime infrastructure, and there are no deepwater ports.<sup>12</sup>

For the Arctic’s coastal communities, global warming poses an increasingly complex problem. Permafrost melt, coastal erosion, glacial retreat, species migration, and violent weather events all contribute to the destruction of vital resources. Roughly a dozen Alaskan towns have been forced to craft relocation plans, and government officials have identified 31 villages that face “imminent threats” due to changing climactic conditions.<sup>13</sup>

Environmental damage to Alaskan communities is predicted to grow significantly during the next several decades as the effects of global warming grow more severe. Experts forecast the cost of maintaining the state’s public infrastructure will rise 20 percent by 2030, adding as much as \$6 billion to maintenance and replacement costs.<sup>14</sup> Alaska’s most vulnerable structures will be those that provide its most essential services—roads, runways, water, and sewage systems.<sup>15</sup>

### Arctic Peoples

Indigenous peoples constitute roughly one-third of all Arctic residents, and many still embrace traditional, subsistence lifestyles like fishing, reindeer herding, and hunting.<sup>16</sup> Living in poor communities, these native peoples generally suffer from grave disparities in income, education, health, and welfare compared to general populations.<sup>17</sup> Statistically, the Arctic’s indigenous communities experience higher rates of infant mortality and shorter life spans than national averages.<sup>18</sup> The effect of environmental contamination also has disproportionate effects on the health of Arctic

#### The Arctic shares much in common with the third world:

- Modern trends in globalization mingle freely with kinship-based, subsistence economies.
- Rapid urbanization in recent decades has begun challenging ancient cultural identities.
- Central governments invest in “over developed” public expenditures to alleviate local pressures.
- Private sector economy is primarily buoyed by resource extraction on an industrial scale.

<sup>11</sup> National Research Council of the National Academies, *Polar Icebreaker Roles and U.S. Future Needs: A Preliminary Assessment* (Washington, DC: The National Academies Press, 2005), 28.

<sup>12</sup> Arthur E. Brooks, “There is no Dutch Harbor in the Arctic. The only harbor at all is Nome and there is nothing north of Nome,” in *Coast Guard Journal: Arctic Journal-Part 1, United States Coast Guard*, April 7, 2008, available at <[www.uscg.mil/cgjjournal/message.asp?Id=65](http://www.uscg.mil/cgjjournal/message.asp?Id=65)>.

<sup>13</sup> *Polar Icebreaker Roles and U.S. Future Needs: A Preliminary Assessment* (Washington, DC: The National Academies Press, 2005), 14; Alaska Native Villages: *Limited Progress Has Been Made on Relocating Villages Threatened by Flooding and Erosion*, GAO-09-551 (Washington, DC: Government Accounting Office, June 3, 2009), 12.

<sup>14</sup> Peter Larsen and Scott Goldsmith, *How Much Might Climate Change Add to Future Costs for Public Infrastructure*, , UA Research Summary No. 8, (Anchorage, Alaska, Institute of Social and Economic Research, June 2007), 1, available at <[www.iser.uaa.alaska.edu/Publications/Juneclimatefinal.pdf](http://www.iser.uaa.alaska.edu/Publications/Juneclimatefinal.pdf)>.

<sup>15</sup> Ahlenius et. al., *Vital Arctic Graphics: People and Global Heritage on Our Last Shores*, 17.

<sup>16</sup> Ahlenius, et. al., *Vital Arctic Graphics: People and Global Heritage on Our Last Shores*; Brooks, in “There is no Dutch Harbor in the Arctic....”

<sup>17</sup> Ahlenius et. al., *Vital Arctic Graphics: People and Global Heritage on Our Last Shores*, 21.

<sup>18</sup> Ahlenius, et al., *Vital Arctic Graphics: People and Global Heritage on Our Last Shores*, 21; Henry Huntington and Gunter Weller, “An Introduction to the Arctic Climate Impact Assessment,” in Arctic Council, International Arctic Science Committee (IASC), *Arctic Climate Impact Assessment*, 1-20 (New



communities. Water and airborne pollutants traveling from the lower latitudes tend to accumulate and linger at the poles, where they are absorbed by native wildlife and consumed.<sup>19</sup> The presence of these invisible contaminants can be especially damaging to humans that depend on local game for their livelihood. Indigenous Arctic residents have the highest blood concentrations of chemical toxins and heavy metals in the world due to their consumption of fish and fatty mammals.<sup>20</sup>

The risk of ecological contamination remains inextricably linked to the Arctic's economic importance. Its largest potential polluters are also its most profitable business sectors: hydrocarbon, mining, timber, and fishing industries.<sup>21</sup> Economic activity generated by these extractive industries has accelerated the creation of new roads, settlements, and other expensive development projects. Yet, since large sums of investment capital are most often controlled by corporations based elsewhere, revenue naturally flows from the region.<sup>22</sup> Economic and social tensions with poor Arctic communities must be carefully managed for sustained development.

### **A Warming World**

Scientists agree the Arctic is warming faster than the rest of the planet. In Alaska, average temperatures have risen at more than twice the national rate.<sup>23</sup> Environmental "feedback loops" generated by the presence of more dark, warming water and less light reflective ice have created an accelerating cycle of thaw at sea. Ashore, melting permafrost layers have begun releasing large natural reservoirs of greenhouse gasses frozen for aeons in the Arctic soil.<sup>24</sup> Air masses and ocean currents from lower latitudes strongly influence conditions, as well.<sup>25</sup> The net effect has been to raise Arctic temperatures more dramatically than climate models predicted only a few years ago.

In September 2012, thawing sea ice on the Arctic Ocean surpassed all previous records, shrinking to the smallest extent ever recorded. The decline exceeded official predictions by an alarming margin, and some scientists began dramatically revising previous estimates for a seasonally ice free Arctic by as much as 20 years, to a timeframe of

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York, NY: Cambridge University Press, 2004), 14; Dmitry Bogoyavlenskiy and Andy Siggner, "Arctic Demography," in *Arctic Human Development Report*, ed. Niels Einarsson, Joan Nymand Larsen, Annika Nilsson, and Oran R. Young (Akureyri: Stefansson Arctic Institute, 2003), 34-35.

<sup>19</sup> Oran R. Young and Niels Einarsson, "Human Development in the Arctic," in *Arctic Human Development Report* (Akureyri: Stefansson Arctic Institute, 2004), 24; "DDT on Ice," *The New York Times*, June 27, 2008, available at <[www.nytimes.com/2008/06/27/opinion/27fri4.html?\\_r=2](http://www.nytimes.com/2008/06/27/opinion/27fri4.html?_r=2)>.

<sup>20</sup> Ahlenius et. al., *Vital Arctic Graphics: People and Global Heritage on Our Last Shores*, 22.

<sup>21</sup> Mark Nuttall, "Hunting, Herding, Fishing, and Gathering: Indigenous Peoples and Renewable Resource Use in the Arctic," in *Arctic Climate Impact Assessment* (NY: Cambridge University Press, 2005), 649.

<sup>22</sup> Gérard Duhaime, "Economic Systems," in *Arctic Human Development Report* (Akureyri: Stefansson Arctic Institute, 2004), 71-72.

<sup>23</sup> "Climate Assessment Warns of Dire Effects in Alaska," Associated Press, May 6, 2014.

<sup>24</sup> Florida State University. "Permafrost thawing could accelerate global warming." ScienceDaily. ScienceDaily, 7 April 2014. <[www.sciencedaily.com/releases/2014/04/140407153939.htm](http://www.sciencedaily.com/releases/2014/04/140407153939.htm)>.

<sup>25</sup> Huntington and Weller, "An Introduction to the Arctic Climate Impact Assessment," 10.

2020.<sup>26</sup> Though current predictions of a seasonally ice-free arctic vary considerably, commonly repeated conservative models cite the years 2030-2040 to be a tipping point and key period of change.<sup>27</sup>

### **Transit and Trade**

While experts debate the precise timetable for polar melt, there is widespread agreement a thinning Arctic icecap is carving new transit routes across the top of the globe, raising expectations for commercial cost and time savings. Strong “multi-year” ice—more than 6 meters thick in some regions—has decreased by 98 percent over the last two decades.<sup>28</sup> Because this durable ice represents the principal obstacle to maritime traffic in the high north, its disappearance has generated speculation about the development of new and existing waterways, particularly Russia’s Northern Sea Route (which hugs Siberia), the fabled Northwest Passage (a contested Canadian channel), and a Transpolar Route (passing directly over the North Pole). Beginning in 2004, thin seasonal ice became the dominant type in the Arctic.<sup>29</sup> However, the region cannot be judged uniformly.

NASA studies suggest sea ice will remain thickest along Canada and Greenland’s northern margins long after significant melt has diminished ice in the central and eastern regions.<sup>30</sup> Similar observations have confirmed that the Russia’s Northern Sea Route is experiencing significant gains in the length of its navigable season, while trafficability due to melt in the Northwest passage is advancing at a much slower pace.

### **The Great Arctic Shortcuts**

The United States is in many ways a maritime nation, with 95,000 miles of shoreline and 361 commercial ports. It conducts 95 percent of its commercial trade by sea, a figure that underscores the importance of the global commons to America’s economic welfare.<sup>31</sup>

Trans-polar maritime waterways have the potential to dramatically shorten the distance between key shipping locations. A popular benchmark for expressing this savings is by comparing the distance between ports in northern Europe (Hamburg) and Japan (Yokohama). In general, trans-polar waterways offer a distance savings of roughly 40% over conventional routes. However, in recent years many commentators have cited such

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<sup>26</sup> Justin Gillis, “Ending Its Summer Melt, Arctic Sea Ice Sets a New Low That Leads to Warnings,” *The New York Times*, September 19, 2012, available at <[www.nytimes.com/2012/09/20/science/earth/arctic-sea-ice-stops-melting-but-new-record-low-is-set.html](http://www.nytimes.com/2012/09/20/science/earth/arctic-sea-ice-stops-melting-but-new-record-low-is-set.html)>.

<sup>27</sup> Seth Borenstein, “Arctic Sea Ice Gone in Summer Within Five Years?” *National Geographic*, December 12, 2007, available at <<http://news.nationalgeographic.com/news/2007/12/071212-AP-arctic-melt.html>>.

<sup>28</sup> Gordon McBean, “Arctic Climate: Past and Present” in *Arctic Climate Impact Assessment* (NY: Cambridge University Press, 2005), 30.

<sup>29</sup> Marc Kaufman, “Perennial Arctic Ice Cover Diminishing, Officials Say,” *The Washington Post*, March 19, 2008, available at <[www.washingtonpost.com/wp-dyn/content/article/2008/03/18/AR2008031802903.html](http://www.washingtonpost.com/wp-dyn/content/article/2008/03/18/AR2008031802903.html)>; Andrew C. Revkin, “Arctic Melt Unnerves the Experts,” *The New York Times*, October 2, 2007, available at <[www.nytimes.com/2007/10/02/science/earth/02arct.html](http://www.nytimes.com/2007/10/02/science/earth/02arct.html)>.

<sup>30</sup> Malte Humpert and Andreas Raspotnick, *The Future of Arctic Shipping*, Arctic Institute, October 11, 2012, available at <<http://www.thearcticinstitute.org/2012/10/the-future-of-arctic-shipping.html>>

<sup>31</sup> Victor E. Renuart, Jr., and Dane S. Egli, “Closing The Capability Gap: Developing New Solutions to Counter Maritime Threats,” *National War College Review* 61, no. 2 (Spring 2008), 15-24.

statistics as optimistic evidence the shipping industry is likely to be one of climate change's big 'winners,' with benefits to be expected in all sectors from expedited global trade.

### **The Northwest Passage**

The Northwest Passage (NWP) has the potential to become the planet's most efficient new Arctic shortcut. The deep water corridor off the shores of Canada, a traditional American ally, could



someday accommodate ships at least as large as an American aircraft carrier and could be an ideal route for extremely large cargo ships of all kinds.

The NWP has two main navigable branches. These generally skim along the northern Canadian coastline, narrowing in the west at the Bering Strait, and in the east at the funnel-shaped Baffin Bay, which separates Greenland from Canada. Canada claims as sovereign territory the entire Arctic Archipelago, an area that includes roughly 37,000 islands<sup>32</sup> and, more controversially, the Northwest Passage itself.<sup>33</sup>

Despite the significant effects of global warming on the channel and a high demand for its commercial use, Canadian officials have no expectation that the NWP will be used by container ships within the next several decades. Rising temperatures are likely to free the thickest, landlocked ice from northern coastlines, driving solid pieces through the channels on unpredictable wind and ocean currents. Ice-infested lanes are likely to prove a hazard to commercial shipping, and local weather variations will make conditions risky for a transport industry which favors predictability and regular timetables.<sup>34</sup> Many experts have pegged the year 2030 as a convenient marker for commercial navigation of the NWP.<sup>35</sup>

### **U.S.-Canadian Dispute over the NWP**

Canada views the NorthWest Passage as part of its "historic internal waters," a claim not widely recognized by the international community. Legal recognition would secure Ottawa's right to police maritime traffic along the channel, enforce domestic laws and

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<sup>32</sup> *Arctic Marine Shipping Assessment 2009 Report*, 2<sup>nd</sup> print (Akureyri, Iceland: Arctic Council, April 2009), 18.

<sup>33</sup> Robert Dufresne, *Canada's Legal Claims Over Arctic Territory and Waters* (Ottawa, Canada: Parliamentary Information and Research Service of the Library of Parliament, December 6, 2007), available at <[www.parl.gc.ca/information/library/PRBpubs/prb0739-e.htm#sovereignty](http://www.parl.gc.ca/information/library/PRBpubs/prb0739-e.htm#sovereignty)>.

<sup>34</sup> "Marine Traffic in the Arctic: A Report Commissioned by the Norwegian Mapping Authority," *Analyse & Strategi*, August 2011, 8, available at <[www.iho.int/mtg\\_docs/rhc/ArHC/ArHC2/ARHC2-04C\\_Marine\\_Traffic\\_in\\_the\\_Arctic\\_2011.pdf](http://www.iho.int/mtg_docs/rhc/ArHC/ArHC2/ARHC2-04C_Marine_Traffic_in_the_Arctic_2011.pdf)>.

<sup>35</sup> Ronald O'Rourke, *Changes in the Arctic: Background and Issues for Congress* (Washington, DC: Congressional Research Service, May 24, 2013), 12, available at <[www.fas.org/sgp/crs/misc/R41153.pdf](http://www.fas.org/sgp/crs/misc/R41153.pdf)>

regulations over international shipping, and assert other sovereign prerogatives. Though few states have recognized Canada's legal claims, none have contested them more strenuously than the United States, which regards the NWP as an "international strait," and worries legal precedents set over the Canadian claim might be applied elsewhere; such as the strategically located Straits of Malacca and Hormuz.<sup>36</sup> If the U.S. view were to prevail, transiting vessels would be entitled to enjoy nearly unrestricted access through the Passage, and Canada's ability to police, regulate, and maintain the waterway would be significantly blunted.

Tensions between the United States and Canada over the NWP began roughly 40 years ago. In the late 1960s, the Humble Oil & Refining Company (later consolidated into Exxon) —working closely with the U.S. Government—began searching for an economical means of transporting petroleum from newly discovered fields in northern Alaska. The company preferred to use a sea route, if possible, to avoid constructing an expensive and technically challenging trans-Alaskan pipeline. In August 1969, Humble launched its prototype supertanker, the *S.S. Manhattan*, into Canada's Northwest Passage, to test the feasibility of transforming the route into a corridor for regular shipping. The 1,005 foot long supertanker was the largest and most powerful commercial vessel ever constructed in the U.S.,<sup>37</sup> but during the months that followed, the ship survived its harrowing journey only with the assistance of the Canadian icebreaker *John A. McDonald* and the U.S. Coast Guard ship *Staten Island*.<sup>38</sup> The *Manhattan*'s punishing journey represented an operational failure, ending hopes for the possibility of routine navigation through the NWP.

It also marked the beginning of a longstanding legal dispute between the United States and Canada over the jurisdiction of the Passage.<sup>39</sup> Despite Canadian requests, the U.S. Government had pointedly declined to seek Canada's authorization before using the NWP, on the grounds that it represented an international strait.<sup>40</sup> This unresolved legal dispute survives virtually unchanged, and the voyage of the *Manhattan* is remembered in Canada as a provocative act which has left its legacy on U.S.-Canadian regional relations.

In 1985, the United States attempted again to test the legal jurisdiction of the NWP when it announced plans to send one of its heavy icebreakers, the *USCG Polar Sea*, through the straits without requesting Canadian permission. The incident created a diplomatic crisis that only ended when the proposed mission was aborted. Less than a year later, Canada

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<sup>36</sup> Carl Ek and Ian Fergusson, *Canada-U.S. Relations* (Washington, DC: Congressional Research Service, April 5, 2012), 27, <[www.fas.org/sgp/crs/row/96-397.pdf](http://www.fas.org/sgp/crs/row/96-397.pdf)>.

<sup>37</sup> "A \$40 Million Gamble on the Northwest Passage," *Time Magazine* 94, no. 10 (September 5, 1969), available at <[www.time.com/time/magazine/article/0,9171,901369,00.html](http://www.time.com/time/magazine/article/0,9171,901369,00.html)>; Larry Gedney and Merritt Helfferich, "Voyage of the Manhattan," Article #639, *Alaska Science Forum*, December 19, 1983, available at <[www.gi.alaska.edu/ScienceForum/ASF6/639.html](http://www.gi.alaska.edu/ScienceForum/ASF6/639.html)>.

<sup>38</sup> Larry Gedney and Merritt Helfferich, "Voyage of the Manhattan," Article #639, *Alaska Science Forum*, December 19, 1983, available at <[www.gi.alaska.edu/ScienceForum/ASF6/639.html](http://www.gi.alaska.edu/ScienceForum/ASF6/639.html)>.

<sup>39</sup> Donald M. McRae, "Arctic Sovereignty: Loss by Dereliction?" *Northern Perspectives* 22, no. 4 (Winter 1994-95), available at <[www.carc.org/pubs/v22no4/loss.htm](http://www.carc.org/pubs/v22no4/loss.htm)>.

<sup>40</sup> Alicia Zorzetto, "Canadian Sovereignty at the Northwest Passage," *ICE Case Studies*, Number 185, May 2006, available at <[www1.american.edu/ted/ice/northwest-passage.htm](http://www1.american.edu/ted/ice/northwest-passage.htm)>.

tightened its claim over the straits by proclaiming the Northwest Passage would now be considered internal waters through the inclusion of “straight baselines” around the Arctic Archipelago.<sup>41</sup> A deal was brokered in 1988 that eased tensions and granted the U.S. unrestricted access in exchange for adhering to a formal protocol that sought Canadian permission for each individual transit. The “Arctic Co-operation Agreement” managed to neatly defuse political tensions while leaving the root issues intact.<sup>42</sup>

It seems likely that unresolved differences over the status of the NWP will increase as climate change makes the waterway more navigable. The Canadian Arctic Archipelago represents 40 percent of Canada’s land mass, and encompasses the largest of its military regions.<sup>43</sup> In July 2007, Prime Minister Stephen Harper voiced his country’s strong sentiment when he declared, “Canada has a choice when it comes to defending our sovereignty over the Arctic. We either use it or lose it. And make no mistake; this Government intends to use it. Because Canada’s Arctic is central to our national identity as a northern nation.”<sup>44</sup> In August, 2010, the Canadian Government released a formal *Arctic Foreign Policy* statement that, while including a number of development and governance goals for the region, most strongly reiterated the importance of Canadian sovereignty, declaring, “Exercising Canadian sovereignty is our number one Arctic foreign policy priority.”<sup>45</sup>

An important challenge for future U.S.-Canadian relations will be negotiating a durable compromise for jurisdiction over the NWP. The United States has consistently argued the waterway should be considered international waters, while Canada has asserted that since the Passage has essentially been frozen throughout human history, no historical precedent exists which could refute Canada’s territorial claims. This reasonable assertion is nevertheless founded on a crumbling reality. Foreign submarines have, in all probability, been operating in the NWP for decades, and global warming has made the transit increasingly navigable to other international traffic as well.<sup>46</sup> In an Arctic background paper issued in July 2007, Canada’s Ministry of National Defence declared it lacked the capability to effectively patrol its own Arctic territory.<sup>47</sup> As more ships slip through the

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<sup>41</sup> Robert Dufresne, *Controversial Canadian Claims Over Arctic Waters and Maritime Zones*, PRB 07-47E (Ottawa, Canada: Parliamentary Information and Research Service of the Library of Parliament, January 10, 2008), available at <[www.parl.gc.ca/content/LOP/ResearchPublications/prb0747-e.pdf](http://www.parl.gc.ca/content/LOP/ResearchPublications/prb0747-e.pdf)>.

<sup>42</sup> *Agreement Between the Government of Canada and the Government of the United States of America on Arctic Cooperation*, No. 31529, January 11, 1988.

<sup>43</sup> “Government of Canada Launches Arctic Operation,” April 2, 2009, accessed at <[www.forces.gc.ca/site/news-nouvelles/view-news-afficher-nouvelles-eng.asp?id=2935](http://www.forces.gc.ca/site/news-nouvelles/view-news-afficher-nouvelles-eng.asp?id=2935)>.

<sup>44</sup> “Prime Minister Stephen Harper Announces New Arctic Offshore Patrol Ships: Canada’s New Government to move forward with deep water port in the Arctic,” Prime Minister of Canada, Stephen Harper, July 9, 2007, available at <<http://pm.gc.ca/eng/media.asp?id=1742>>.

<sup>45</sup> *Statement on Canada’s Arctic Foreign Policy: Exercising Sovereignty and Promoting Canada’s Northern Strategy Abroad* (Ottawa, Canada: Government of Canada, September 25, 2012), available at <[www.international.gc.ca/polar-polaire/canada\\_arctic\\_foreign\\_policy-la\\_politique\\_etrangere\\_du\\_canada\\_pour\\_arctique.aspx?lang=eng&view=d](http://www.international.gc.ca/polar-polaire/canada_arctic_foreign_policy-la_politique_etrangere_du_canada_pour_arctique.aspx?lang=eng&view=d)>.

<sup>46</sup> “Canada to Monitor Water Traffic in Northwest Passage,” September 24, 2007, *CBC News*, available at <[www.cbc.ca/canada/story/2007/09/24/technology-passage.html](http://www.cbc.ca/canada/story/2007/09/24/technology-passage.html)>

<sup>47</sup> “Arctic/Offshore Patrol Ships,” *Canadian American Strategic Review*, July 10, 2007, available at <[www.casr.ca/doc-dnd-icebreaker.htm](http://www.casr.ca/doc-dnd-icebreaker.htm)>.

NWP unchallenged, Canada's claim to ownership risks being undermined by common practice and its continued limited icebreaker capability.<sup>48</sup>

To effectively prevent the *de facto* international transit zone from becoming an international waterway according to international law, Ottawa will need to enforce access restrictions over the Passage.<sup>49</sup> This effort has already begun. In August 2008, Prime Minister Harper announced new environmental legislation that would require ships transiting the NWP to log their movements with Canadian authorities. "As an environmental matter, as a security matter, and as an economic matter we are making it perfectly clear that not only do we claim jurisdiction over the Canadian Arctic, we are also going to put the full resources of the government of Canada behind enforcing that jurisdiction," Harper said.<sup>50</sup> Registration had previously been conducted only on a voluntary basis.

### **Canadian Build-up & Prospects for Cooperation**

Canadian assertiveness in the Arctic should come as no surprise. The territory is an extremely important symbol of Canadian sovereignty. According to a University of Toronto survey of public opinion conducted in 2011, a majority of Canadians believe the Arctic should be the primary focus of Canada's military and foreign policy. When it comes to military security, the report details, most Canadians would endorse reducing its military presence in other parts of the world to enforce security in the high north.<sup>51</sup>

Consequently, the Canadian government has responded to international interest in the high north by embarking on a host of new security measures to "monitor, patrol, and protect" its Arctic territory. These include the creation of a new winter warfare training center at Resolute Bay,<sup>52</sup> the construction of \$100 million deep water port facilities at Nanisivik (a strategic location along the NWP),<sup>53</sup> the expansion of the region's Canadian Ranger Patrol Groups,<sup>54</sup> the addition of 6–8 armed light icebreakers to its coastal fleet

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<sup>48</sup> "A \$40 Million Gamble on the Northwest Passage," *Time Magazine* 94, no. 10 (September 5, 1969), available at <[www.time.com/time/magazine/article/0,9171,901369,00.html](http://www.time.com/time/magazine/article/0,9171,901369,00.html)>; Larry Gedney and Merritt Helfferich, "Voyage of the Manhattan Article #639," *Alaska Science Forum*, December 19, 1983, available at <[www.gi.alaska.edu/ScienceForum/ASF6/639.html](http://www.gi.alaska.edu/ScienceForum/ASF6/639.html)>.

<sup>49</sup> Franklyn Griffiths, ed., *Politics of the Northwest Passage* (Canada: McGill-Queen's University Press, September 1, 1987).

<sup>50</sup> "Canada Requires Ship Registration in Arctic," *USA Today*, August 27, 2008, available at <[www.usatoday.com/news/world/2008-08-27-3491437195\\_x.htm](http://www.usatoday.com/news/world/2008-08-27-3491437195_x.htm)>.

<sup>51</sup> Ekos Research Associates Inc., *Rethinking the top of the World: Arctic Security Public Opinion Survey* (Munk School of Global Affairs, University of Toronto, January 2011).

<sup>52</sup> "Backgrounder-Expanding Canadian Forces Operations in the Arctic," *Office of the Prime Minister, Canada*, August 10, 2007, available at <[www.pm.gc.ca/eng/media.asp?id=1785](http://www.pm.gc.ca/eng/media.asp?id=1785)>.

<sup>53</sup> "Preliminary Work Underway on High Arctic Naval Port," *CBC News*, August 5, 2008, available at <[www.cbc.ca/canada/north/story/2008/08/05/nanisivik.html](http://www.cbc.ca/canada/north/story/2008/08/05/nanisivik.html)>.

<sup>54</sup> The 4,100 part-time reservists carry Lee Enfield .303 caliber rifles, a weapon first adopted by the British Army in 1895. Most of the Rangers are Inuit natives accustomed to traveling on snowmobile through winter temperatures as cold as -58 F. Canada plans to expand the force to 5,000 members. "The Rangers: Guarding Sovereignty in Remote Coastal, Northern Regions," *CBC News*, April 10, 2007, available at <[www.cbc.ca/news/background/cdnmilitary/rangers.html](http://www.cbc.ca/news/background/cdnmilitary/rangers.html)>.

(the Arctic/Offshore Patrol Ship Project),<sup>55</sup> and building one heavy icebreaker at a cost of \$720 million.<sup>56</sup> In October 2011, the Canadian government concluded bidding on a \$25 billion dollar shipbuilding project that included \$4.4 billion in the construction and maintenance of up to eight Arctic offshore patrol ships.<sup>57</sup>

Plans to enhance Arctic surveillance systems are also underway using Canadian space, coastal, and air assets. Canada's Polar Epsilon Project, a wide-area satellite imagery system used for military and environmental surveying, recently became operational over the Arctic, producing more accurate imagery to military commanders and early detection and tracking of foreign vessels.<sup>58</sup> Canadian coastal forces have begun testing an integrated maritime surveillance system at Devon Island at the western entrance of the Northwest Passage, once a secret Cold War listening station.<sup>59</sup> The facility will allow Canada to more closely monitor traffic through the NWP. Ottawa has also advertised its interest in purchasing a fleet of rugged Unmanned Aerial Vehicles for conducting constant sweeps of the straits from the air.<sup>60</sup> In August 2011, Boeing ScanEagle drones were part of a Canadian military exercise in the far north called, *Operation Nanook*. Canadian Defence Minister Peter MacKay called the machines, "precedent setting," and told reporters, "They are a harbinger of things to come."<sup>61</sup> Maritime situational awareness is only one component of the country's assertive new Arctic strategy, but U.S.-Canadian tensions over developing a disputed territory are not inevitable.

Policymakers may consider the example of the Saint Lawrence Seaway. Roughly 50 years ago, a dispute between the two neighbors arose over the sovereignty of the lucrative waterway project linking the Great Lakes with the Atlantic Ocean. A crisis was amicably averted using a joint investment and management scheme approved by the U.S.

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<sup>55</sup> Carl Ek and Ian F. Fergusson et. al, *Canada-U.S. Relations* (Washington, DC: Congressional Research Service, May 12, 2008), available at <<http://fpc.state.gov/documents/organization/106147.pdf>>; "Arctic/Offshore Patrol Ship (PMO AOPS)", *National Defense and the Canadian Forces*, undated, available at, <[www.materiel.forces.gc.ca/en/aops.page](http://www.materiel.forces.gc.ca/en/aops.page)>.

<sup>56</sup> "PM Announces New Polar Class Icebreaker Project to be Named After Former PM John G. DieFenbaker," *Office of the Prime Minister, Canada*, August 28, 2008, available at <<http://pm.gc.ca/eng/media.asp?id=2251>>.

<sup>57</sup> David Pugliese, "Arctic Patrol Ship Contract to Set Sail by Summer," *The Montreal Gazette*, October 19<sup>th</sup>, 2011, available at <[www.montrealgazette.com/news/arctic%20patrol%20ship%20contract%20sail%20summer/index.html](http://www.montrealgazette.com/news/arctic%20patrol%20ship%20contract%20sail%20summer/index.html)>; Allan Woods, "Two Winners and One Big Loser in Contest to Build Military Ships," *The Star*, October 19, 2011, available at <[www.thestar.com/news/canada/politics/article/1072710--two-winners-and-one-big-loser-in-contest-to-build-military-ships](http://www.thestar.com/news/canada/politics/article/1072710--two-winners-and-one-big-loser-in-contest-to-build-military-ships)>.

<sup>58</sup> "Arctic/Offshore Patrol Ships," *Canadian American Strategic Review*, July 10, 2007, available at <[www.casr.ca/doc-dnd-icebreaker.htm](http://www.casr.ca/doc-dnd-icebreaker.htm)>.

<sup>59</sup> CBC News, "Northwest Passage surveillance tested by Canadian scientists," July 14, 2008, available at <[www.cbc.ca/technology/story/2008/07/14/northern-monitoring.html](http://www.cbc.ca/technology/story/2008/07/14/northern-monitoring.html)>; "Canada's Polar Epsilon Project Delivers Enhanced Arctic Surveillance Capability," *Canadian Forces Canada Command*, July 5, 2010, available at <[www.canadacom.forces.gc.ca/daily/archive-north-eng.asp](http://www.canadacom.forces.gc.ca/daily/archive-north-eng.asp)>.

<sup>60</sup> "Remote-Controlled Aircraft Would Patrol Arctic: Military," *CBC News*, October 24, 2007, available at <[www.cbc.ca/canada/story/2007/10/24/arctic-drones.html](http://www.cbc.ca/canada/story/2007/10/24/arctic-drones.html)>.

<sup>61</sup> Matthew Fisher, "Canada Deploys Unmanned Drones in Arctic Military Exercise," *Calgary Herald*, August 5, 2011, available at <[www2.canada.com/calgaryherald/news/story.html?id=2cef7dbb-e201-47ae-9d08-ed4611d0a353](http://www2.canada.com/calgaryherald/news/story.html?id=2cef7dbb-e201-47ae-9d08-ed4611d0a353)>.

Congress. In 1959, President Eisenhower and Queen Elizabeth inaugurated the completed 2,300 mile canal, hydroelectric, and marine highway system.<sup>62</sup> It now generates \$9 billion in U.S. revenue and is regulated by a bi-national, government-run corporation.<sup>63</sup> The Saint Lawrence Seaway represents an innovative solution for managing an expensive development project in disputed territory and could be replicated as a solution to the NWP issue. Like the Seaway, the management of the NWP will require integrated security and economic cooperation, massive infrastructure improvements, and a coordinated regulatory scheme. As U.S.-Canadian interests in the region are intimately aligned, this type of solution could be relatively easily achieved.

### **Timeline for Use of the NWP**

While the deep waters of the NWP offer unmistakable advantages to maritime shipping, over the next several decades it will likely rank as the most problematic of the three emerging sea routes across the Arctic. First, large chunks of free-floating ice are likely to continue to crowd the channel's constricted straits long after the area's major sheets have retreated, posing unpredictable hazards to thin-skinned cargo vessels. Second, Canadian environmental, cultural, and security sensitivities are likely to constrain operations indefinitely.<sup>64</sup> Finally, scientists predict the NWP will be the last of the three great Arctic shortcuts to thaw. Russia's Northeast Passage, more commonly called the "Northern Sea Route" (NSR), and the theoretical straight-line journey across the top of the world, dubbed the "Transpolar Route" (TPR), are the sea lanes predicted to open first.<sup>65</sup>

### **The Northern Sea Route and Russia**

The Northern Sea Route (NSR) is a 2,450-mile waterway that resembles a braided ribbon lodged between the polar ice cap and the Eurasian continent's northern coastline. The corridor's actual distance is subject to some interpretation, as it includes a multitude of alternate sub-routes through straits, island chains, and open seas. Outsiders have long referred to the waterway as the "Northeast Passage," suggesting the legendary maritime highway that many believed would someday connect Europe and East Asia. More recently, the Russian term "Northern Sea Route" has gained widespread acceptance, implicitly acknowledging the internal character of Russia's national waterway.

Scientists predict the NSR will be the first transpolar passage to open for regular transit. It offers a number of important advantages to ships navigating through the Arctic: a distance savings similar to the NWP, an established infrastructure of maritime services, easier navigation, and less dangerous summer ice conditions.<sup>66</sup> The NSR's major

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<sup>62</sup> "1959: Queen and Eisenhower Open Seaway," On This Day 1950-2005, *BBC News*, available at <[http://news.bbc.co.uk/onthisday/hi/dates/stories/june/26/newsid\\_2988000/2988148.stm](http://news.bbc.co.uk/onthisday/hi/dates/stories/june/26/newsid_2988000/2988148.stm)>.

<sup>63</sup> *Saint Lawrence Seaway Development Corporation: Fiscal Year 2007 Annual Report*, undated, available at <[www.greatlakes-seaway.com/en/pdf/fy2007ar.pdf](http://www.greatlakes-seaway.com/en/pdf/fy2007ar.pdf)>.

<sup>64</sup> A 'nightmare scenario' might include the regular transit of unseaworthy oil tankers through Canada's most environmentally sensitive territories.

<sup>65</sup> Ray Chartier Jr., Presentation during the National Defense University Seminar, "Frozen Treasures," May 13-14, 2008.

<sup>66</sup> Jonathon Seymour and Associates Inc and The Mariport Group, Inc, *Transport Canada Seaway and Domestic Shipping Policy: Canadian Arctic Shipping Assessment: Scoping Study*, Prepared for Transport



drawbacks are likely to be its high user fees and shallow straits, which prohibit the passage of large cargo vessels along some parts of the route.

The United States disputes Russian claims over the NSR by arguing, as in the NWP case, that the passage represents an international strait under the terms of the United Nations Convention on the Law of the Sea. The American argument in this case may be a weak one, as Russia's historical claims are based on its exclusive control of the area since 1917, when the waterway was first closed to foreign vessels. During the Cold War, the Soviet Union maintained its ban on foreign vessels while it developed its high northern infrastructure, constructing Arctic industrial and port facilities, integrating the region into its strategic military plans, and servicing its users with the world's most advanced fleet of ice-hardened vessels.<sup>67</sup>

The NSR was opened to foreign traffic after the collapse of the Soviet Union, but fell almost immediately into a state of serious disrepair. Post-Soviet privatization reforms slashed government subsidies to almost ten million Russians, Ukrainians, Belarussians, and other Soviet peoples who had been lured north by patriotic appeals and enticingly high pay.<sup>68</sup> As local economies collapsed, workers were effectively stranded in blighted conditions. Defunct government incentives from the Soviet-era compounded worsening conditions.

The high-water mark for shipping in the region had arrived in 1987, when the Soviet Union operated 17 icebreakers and roughly 300 transport ships carrying over 6.6 million tons of freight through the NSR. The Kremlin amply funded icebreaking, navigation, hydro-meteorological measurements, communication, port facilities, and search and rescue operations as a means of demonstrating communist commitment to development projects on a grand scale.<sup>69</sup> Arctic food and fuel shipments ranked among the Soviet Union's most subsidized government programs, and workers were enticed to move north by good pay and access to freshly built hospitals, housing, schools, and entertainment complexes.

By the mid-1990s, however, paychecks grew less regular and mandated benefits disappeared. Shipping tonnage through the NSR dropped to barely 1.5 million tons, and the northern economy collapsed.<sup>70</sup> Much of the population grew too impoverished to make the journey home. Within a few years, Russia's thriving subsidized settlements

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Canada, November 19, 2005, available at

<<http://arcticportal.org/uploads/S6/wU/S6wUwsXenytmliT0nmUxHw/CASA-Scoping-Study-amsa.pdf>>.

<sup>67</sup> Claes Lykke Ragner, "The Northern Sea Route," *The Fridtjof Nansens Institute*, 2008, available at <[www.fni.no/doc&pdf/clr-norden-nsr-en.PDF](http://www.fni.no/doc&pdf/clr-norden-nsr-en.PDF)>.

<sup>68</sup> Michael R. Gordon, "Forsaken in Russia's Arctic: 9 Million Stranded Workers," *The New York Times*, January 6, 1999, available at <[www.nytimes.com/1999/01/06/world/forsaken-in-russia-s-arctic-9-million-stranded-workers.html?pagewanted=all&src=pm](http://www.nytimes.com/1999/01/06/world/forsaken-in-russia-s-arctic-9-million-stranded-workers.html?pagewanted=all&src=pm)>.

<sup>69</sup> Claes Lykke Ragner, *The 21<sup>st</sup> Century-Turning Point for the Northern Sea Route?* (Netherlands: Kluwer Academic Publishers, 2000), 25.

<sup>70</sup> Oleg Bukharin, "Russia's Nuclear Icebreaker Fleet," *Science & Global Security* vol. 14, no. 1 (2006), 26.

became dilapidated, famished, and dying communities.<sup>71</sup> Residents cynically compared themselves to the region's original Soviet prison colonists.<sup>72</sup> Russia's coastal infrastructure had sunk into a "critical" condition.<sup>73</sup>

Interest in the NSR began slowly rebounding after 1997, when Russia ratified the United Nations Convention on the Law of the Sea. A year later, at an international transport conference, representatives of European and Asian governments elevated the NSR to the status of an "independent Euro-Asian transportation corridor."<sup>74</sup> The positive moniker nevertheless concealed endemic management and maintenance problems.

In 1999, Russian, Norwegian, and Japanese researchers published a study detailing the NSR's most serious challenges and charting a path towards modernization. Many of the problems identified by the landmark study are still relevant today: ice hardened vessels are expensive but necessary for safe passage in Arctic waters; unavoidable straits are too narrow or shallow for large ships; and icebreaker services are insufficient for regular traffic during the short summer seasons.<sup>75</sup> Perhaps most troublesome of all, from the point of view of the maritime shipping industry, were the shifting ice and weather patterns that made transit times unpredictable. Nevertheless, researchers remained optimistic that a profitable NSR business model could be found.

The region represents a vital part of Russia's long-term economic growth strategy. Currently, 11 percent of the country's GDP is derived from Arctic territories, accounting for the vast portion of its hydrocarbon assets (93 percent of natural gas, 75 percent of oil exports).<sup>76</sup> The Kremlin is hoping output will increase with time, but serious challenges remain, particularly with respect to shipping. "Considering the projected increase in hydrocarbon transport to 40 million tons by 2015," remarked Russian President Vladimir Putin in 2007, "We are going to need to develop our Arctic transportation system."<sup>77</sup> In 2011, Russia acted on its longstanding policy goals by announcing a multi-billion dollar infrastructure plan that included the construction of three additional nuclear and six diesel icebreakers for servicing the NSR.<sup>78</sup>

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<sup>71</sup> Aleksandr Bakin, "Northern Sea Route Awaits Revival," *Barents Observer*, October 5, 2005, available at <[www.barentsobserver.com/?cat=16149&id=279558](http://www.barentsobserver.com/?cat=16149&id=279558)>.

<sup>72</sup> Oleg Bukharin, "Russia's Nuclear Icebreaker Fleet," *Science & Global Security* 14, no. 1 (2006), 26.

<sup>73</sup> Vsevolod Peresypkin, "The Strategy of Development," *New East International Magazine*, May 6, 2000, available at <[http://segodnya.spb.rus.net/5-6-00/eng/17\\_e.htm](http://segodnya.spb.rus.net/5-6-00/eng/17_e.htm)>.

<sup>74</sup> *International Euro-Asian Conference on Transport: Declaration* (St. Petersburg, Russia: United Nations Economic Commission for Europe, May 12-13, 1998), available at <[www.unece.org/trans/main/eatl/docs/1stEATC\\_decl\\_e.pdf](http://www.unece.org/trans/main/eatl/docs/1stEATC_decl_e.pdf)>.

<sup>75</sup> Claes Lykke Ragner, *The 21<sup>st</sup> Century-Turning Point for the Northern Sea Route?* (Netherlands: Kluwer Academic Publishers, 2000), 25.

<sup>76</sup> "Canada and Russia Stress Arctic Economic Development," *CBC News*, January 21, 2013, available at <<http://ca.news.yahoo.com/canada-russia-stress-arctic-economic-development-213554312.html>>.

<sup>77</sup> "Putin Vows to Develop Arctic Transport for Energy, Strategy," *RIA Novosti*, February 5, 2007, available at <<http://en.rian.ru/russia/20070502/64795742.html>>.

<sup>78</sup> Lyubov Pronina and Stephen Bierman, "Putin Orders Icebreakers for Arctic Sea Lane, May Cap Rates," *Bloomberg News*, September 22, 2011, available at, <[www.bloomberg.com/news/2011-09-22/putin-orders-3-nuclear-icebreakers-built-by-2020-to-open-arctic.html](http://www.bloomberg.com/news/2011-09-22/putin-orders-3-nuclear-icebreakers-built-by-2020-to-open-arctic.html)>.

Despite the new commitments, Russia still struggles to implement a successful NSR business model. In 2011, Russia's nuclear icebreaker fleet operated with 40 percent state subsidies and was not projected to return to profitability for the next three years, according to company officials. High user fees collected by the Russian state have generally driven up transit costs and discouraged commercial shipping, though service fees were lowered in 2011.<sup>79</sup> Graft and bureaucratic inefficiencies are also serious challenges for a country widely perceived as one of the most corrupt regimes in the world (ranked 133 out of 176).<sup>80</sup>

For businesses, government bureaucrats, and ordinary Russians, rampant corruption has become a corrosive mainstay of everyday life, an important source of private revenue, and a hindrance to a healthy economy.<sup>81</sup> Many experts believe graft costs Russia between 16-25 percent of its GDP, and some believe the percentage could be even higher.<sup>82</sup> Government control of the oil and gas sector has led to an environment in which opaque price fixing schemes and politically influenced business projects are routine, leaving some experts pessimistic about Russia's ability to attract long-term investment. It is no accident that the state run gas giant Gazprom, whose profits produced 10 percent of Russia's Gross Domestic Product last year (2012),<sup>83</sup> ranked among the least transparent companies in the world.<sup>84</sup>

Despite these internal and external challenges, Russia views the NSR as a major source of revenue and a strategic maritime connection between Europe and Asia. In a 2009 Arctic Strategy document posted on the official Russian Security Council website, Kremlin policy-makers outlined their vision for the route as a nationally integrated transportation asset and top strategic base for natural resources by 2020.<sup>85</sup> More recently, in September 2011, at the Second International Arctic Forum in Novosti, Putin reinforced the dominant role he expected Russia to play in the high north, declaring, "Developing modern infrastructure along the Northern Sea Route is a major objective. We are

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<sup>79</sup> Oleg Bukharin, "Russia's Nuclear Icebreaker Fleet," *Science & Global Security* 14, no. 1 (2006), 26; Nadia Rodova, "Shaping Russia's Northern Sea Route in the Arctic," *Platts McGraw Hill Financial*, December 12, 2011, available at <[www.platts.com/newsfeature/2011/nsr/index](http://www.platts.com/newsfeature/2011/nsr/index)>.

<sup>80</sup> Transparency International, *Corruption By Country/Territory, Data & Research (graphic)*, available at <[www.transparency.org/country#RUS\\_PublicOpinion](http://www.transparency.org/country#RUS_PublicOpinion)>.

<sup>81</sup> Nataliya Vasilyeva, "Bribes Part of Everyday Life in Putin's Russia," *Associated Press*, February 24, 2012, available at <[www.huffingtonpost.com/huff-wires/20120224/eu-russia-living-with-corruption/](http://www.huffingtonpost.com/huff-wires/20120224/eu-russia-living-with-corruption/)>.

<sup>82</sup> "Putin's Phony War on Corruption," *Bloomberg Businessweek*, May 9, 2013, available at <[www.businessweek.com/articles/2013-05-09/bloomberg-view-putins-phony-war-on-corruption](http://www.businessweek.com/articles/2013-05-09/bloomberg-view-putins-phony-war-on-corruption)>; Angus Roxburgh, *The Strongman: Vladimir Putin and the Struggle for Russia*, London: I.B. Tauris & Co. Ltd, 2012), 286.

<sup>83</sup> Ahmed Mehdi, "Putin's Gazprom Problem: How the Kremlin Accidentally Liberalized Russia's Natural Gas Market," *Foreign Affairs*, May 6, 2012, available at <[www.foreignaffairs.com/articles/137615/ahmed-mehdi/putins-gazprom-problem](http://www.foreignaffairs.com/articles/137615/ahmed-mehdi/putins-gazprom-problem)>.

<sup>84</sup> Barbara Kowalczyk-Hoyer, *Transparency in Corporate Reporting: Assessing the World's Largest Companies*, (Berlin: Transparency International, June 2012), 13, available at <[www.transparency.org/whatwedo/pub/transparency\\_in\\_corporate\\_reporting\\_assessing\\_the\\_worlds\\_largest\\_companies](http://www.transparency.org/whatwedo/pub/transparency_in_corporate_reporting_assessing_the_worlds_largest_companies)>.

<sup>85</sup> *The Fundamentals of State Policy of the Russian Federation in the Arctic in the Period up to 2020 and Beyond* (Moscow: Russian Security Council, March 2009), Russian language, available at <[www.scrf.gov.ru/documents/98.html](http://www.scrf.gov.ru/documents/98.html)>.

launching a comprehensive transport project designed to ensure the dynamic development and exploration of our northern territories....”<sup>86</sup> According to Charles Emmerson, an Arctic expert at the British think tank Chatham House, “The Russian state is very keen to develop the Arctic because they see it as key to maintaining exports...For Russia, it is difficult to exaggerate the potential geopolitical and geoeconomic importance of the Arctic.”<sup>87</sup>

### **Untapped Energy Reserves**

The Arctic may be the largest, most promising unexplored area in the world for hydrocarbon resources. A comprehensive survey of the region completed by the USGS estimated the region may hold as much as 90 billion barrels of petroleum and 1,670 trillion cubic feet of recoverable natural gas.<sup>88</sup> This would account for roughly one-fifth of all unrecovered hydrocarbon resources on the planet (not taking into account the potential from hydrocarbon fracturing and tar sands, where productivity and future yields remain uncertain.<sup>89</sup>

Most of this trapped energy exists in the form of natural gas lodged under the Arctic’s forbidding polar waters. Scientists believe there may be roughly three times the amount of natural gas as petroleum deposits, with the largest untapped reserves believed to be located in the West Siberian and East Barents Basins.<sup>90</sup> If current projections are accurate, this would make the Arctic home to as much as 30 percent of the planet’s total remaining gas reserves.

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<sup>86</sup> Vladimir Putin, Speech at the Second International Arctic Forum, Arkhangelsk, Russia, September 23, 2011, available at <<http://arctic.ru/news/2011/09/vladimir-putins-speech-second-international-arctic-forum>>.

<sup>87</sup> Oleg Vukmanovic and Balazs Koranyi, “Russia’s Revival of the Arctic Northern Sea Route at Least 10 Years Away,” *Reuters*, January 25, 2013, available at <[www.thestar.com/business/2013/01/25/russias\\_revival\\_of\\_arctic\\_northern\\_sea\\_route\\_at\\_least\\_10\\_years\\_away.html](http://www.thestar.com/business/2013/01/25/russias_revival_of_arctic_northern_sea_route_at_least_10_years_away.html)>.

<sup>88</sup> “90 Billion Barrels of Oil and 1,670 Trillion Cubic Feet of Natural Gas Assessed in the Arctic,” *USGS Newsroom*, July 23, 2009, available at <[www.usgs.gov/newsroom/article.asp?ID=1980&from=rss\\_home](http://www.usgs.gov/newsroom/article.asp?ID=1980&from=rss_home)>.

<sup>89</sup> No reliable figures currently exist for North American shale oil and gas deposits that might be recoverable under favorable market conditions, and estimates have varied widely. In April 2011, the U.S. Energy Information Administration released an official report estimating the amount of technically recoverable shale gas in North America could amount to as much as 827 trillion cubic feet. A year later, the agency revised its estimates downward by 40 percent. Some experts believe environmental concerns and technological limitations- particularly with regard to the processing of oil shale- make final conclusions uncertain. See *Annual Energy Outlook 2011 with Projections to 2035*, Powerpoint, U.S. Energy Information Administration, Washington, D.C, December 16, 2011, available at <[www.eia.gov/neic/speeches/newell\\_12162010.pdf](http://www.eia.gov/neic/speeches/newell_12162010.pdf)>; *Annual Energy Outlook 2021 with Projections to 2035*, DOE/EIA-0383(2012) (Washington, DC: U.S. Energy Information Administration, June 2012), available at <[www.eia.gov/neic/speeches/newell\\_12162010.pdf](http://www.eia.gov/neic/speeches/newell_12162010.pdf)>; Ian Urbina, “New Report by Agency Lowers Estimates of Natural Gas in U.S.,” *The New York Times*, January 28, 2012, available at <[www.nytimes.com/2012/01/29/us/new-data-not-so-sunny-on-us-natural-gas-supply.html?pagewanted=all](http://www.nytimes.com/2012/01/29/us/new-data-not-so-sunny-on-us-natural-gas-supply.html?pagewanted=all)>.

<sup>90</sup> Kenneth J. Bird, Ronald R. Charpentier, Donald L. Gautier (CARA Project Chief), David W. Houseknecht, Timothy R. Klett, Janet K. Pitman, Thomas E. Moore, Christopher J. Schenk, Marilyn E. Tennyson, and Craig J. Wandrey, *Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle*, United States Geological Survey, Fact Sheet 2008-3049, 2008, available at <<http://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf>>.

The Alaskan Arctic is also emerging as a promising new zone for petroleum development. According to United States Geological Survey estimates, American assets in the region may increase current proven U.S. oil reserves by as much as 40 percent. Taken alone, this would be equivalent to roughly one year of world consumption.<sup>91</sup> At \$100/barrel of oil, the Alaskan Arctic could hold as much as \$3 trillion in U.S. hydrocarbon assets.<sup>92</sup>

### **Conclusion**

In part one of this report, we described the Arctic as a region ‘on the rise,’ with warming temperatures raising interest in new commercial investments, expanding opportunities for global trade, and increasing levels of human traffic into previously inaccessible areas. Conversely, climate change has raised new risks for the Arctic’s fragile ecosystems, created fresh uncertainties for local peoples and native species, and accelerated damage to existing structural and institutional infrastructures. In part two, we will examine how the Arctic’s profile on the world stage is affecting U.S. security interests, with an emphasis on the key issues for policy-makers.

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<sup>91</sup> “Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle,” July 27, 2009, Powerpoint, accessed at <<http://energy.usgs.gov/arctic/>>.

<sup>92</sup> These figures do not account for economic factors, such as the cost of exploration and development.

## Part 2: U.S. Interests

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As the implications of climate change in the Arctic grew at an alarming pace through much of the last decade, U.S. policymakers generally failed to recognize the substantial risks it posed to the nation's public health, environment, economy and national security. Distracted by war abroad and mired in scientific debate at home about the root causes of 'global warming,' the U.S. for years neglected to begin important preparations for safeguarding its national interests during a transformative period. Both the executive and legislative branches of Government share responsibility for important lapses.

In recent years, however, a broader recognition of the dangers posed by environmental change has altered the political landscape, leading to host of new task forces, initiatives, strategy reviews, and official assessment. This effort first began in 2009 during the final days of the George W. Bush administration.

As one of the last official acts of his presidency in January 2009, President George Bush signed a defining Presidential Directive on Arctic Region Policy (National Security Presidential Directive 66).<sup>93</sup> The administration's 'eleventh hour' order emphasized the importance of the region to U.S. maritime and economic security, urged Senate ratification of UNCLOS, and recommended the protection of the environment and rights of indigenous peoples.

In the intervening years, the Obama Administration has followed with more practical steps to monitor climate change in the high north, prepare for future needs, and participate more actively in the region's emerging governing institutions. However, these efforts generally remain under-resourced, due to a number of political and economic and factors. In the second half of our report, we examine these shortfalls in more detail along the following lines of inquiry; Icebreakers; The United Nations Convention on the Law of the Sea (UNCLOS); Militarization and Governance Issues; U.S. Maritime capabilities.

### **The Importance of Ratifying UNCLOS**

The most significant legal framework affecting the sovereign jurisdiction of Arctic States is the *United Nations Convention on the Law of the Sea* (UNCLOS). Among other provisions, the treaty defines the coastal area over which nations can exercise an exclusive right to all natural resources as 200 nautical miles. Under the terms of UNCLOS, the limit of this boundary, or, Exclusive Economic Zone (EEZ), is subject to revision based on a coastal states measured continental shelf.

The zone is critical to Arctic development because it delineates the economic jurisdiction of coastal states; natural resources found in the area belong exclusively to a single

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<sup>93</sup> National Security Presidential Directive 66 and Homeland Security Presidential Directive 25, *Arctic Region Policy*, January 9, 2009, available at <[www.fas.org/irp/offdocs/nspd/nspd-66.htm](http://www.fas.org/irp/offdocs/nspd/nspd-66.htm)>.

country.<sup>94</sup> This UNCLOS provision potentially expands the economic territory of over 30 coastal states, potentially ceding a wealth of maritime and undersea resources.

As of May 2011, 162 nations have ratified the UNCLOS agreement and a number of them have submitted substantial claims to the United Nations reviewing body, called the *Commission on the Limits of the Continental Shelf* (CLCS). Between 2007-2008, Brazil, Australia, and New Zealand were rewarded large swathes of new territory, thanks to their early submissions. However, certification has been a slow process; of the 57 submissions to the CLCS by September 2011, only 14 have resulted in adopted recommendations. Four of the five Arctic states retain unresolved claims in the region and have either formally submitted proposals or are working on collecting new evidence. Among the most controversial claims is a submission made by the Russian Federation, which argued for jurisdiction over the North Pole.<sup>95</sup>

As a party to UNCLOS, the United States could stand to gain over 1.2 million additional square kilometers of territory, an area roughly the size of Alaska. Other states anticipate significant territorial gains, as well, bringing with them potentially vast untapped natural resources. Though the U.S. played a significant role in authoring UNCLOS and fought hard to include provisions favoring American interests, it was never officially adopted by the U.S. Senate. Final ratification has been repeatedly blocked by a minority of congressional opponents who believed UNCLOS risked compromising U.S. sovereignty by making some international disputes subject to third-party arbitration. They also worried the treaty might tie the U.S. to an excessively strict international environmental and humanitarian regime. The treaty was nevertheless signed by President Bill Clinton in 1994 and recognized as part of general international law.

Advocates of the treaty have maintained the agreement is fair-minded and allows the United States to benefit from an arrangement it authored, honors, and has promoted. Most experts believe the failure to ratify UNCLOS and participate in its legal framework has constrained the U.S. from asserting its legitimate claim to new territory and clarify rights over already recognized areas.<sup>96</sup> American intransigence also guarantees the country will not be fairly represented during international negotiations which promote the national interest and chart future development throughout the region.

The U.S. armed services have also strongly supported the ratification of UNCLOS and regard its implementation as an essential element in securing America's long and short term interests. Examples of public letters, statements, and congressional testimony urging ratification of the Convention are included below:<sup>97</sup>

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<sup>94</sup> Importantly, UNCLOS does not prohibit vessels from moving through the area. Transiting ships maintain their "right of innocent passage." This is contained in Article 38, Right of Transit Passage, and includes continuous and expeditious passage between parts of the high seas or exclusive economic zones.

<sup>95</sup> Nathaniel Gronewold, "Rising Seabed Claims Swamp U.N. Commission," *The New York Times*, April 13, 2009, available at <[www.nytimes.com/gwire/2009/04/13/13greenwire-rising-seabed-claims-swamp-un-commission-10511.html](http://www.nytimes.com/gwire/2009/04/13/13greenwire-rising-seabed-claims-swamp-un-commission-10511.html)>.

<sup>96</sup> Gail Harris, "U.S. Must Remove UNCLOS Handcuffs," *The Diplomat*, March 23, 2012, available at <<http://thediplomat.com/2012/03/23/u-s-must-remove-unclos-handcuffs/?all=true>>.

<sup>97</sup> See "The Convention on the Law of the Sea," U.S. Navy Judge Advocate General Corps, website, available at <[www.jag.navy.mil/organization/code\\_10\\_law\\_of\\_the\\_sea.htm](http://www.jag.navy.mil/organization/code_10_law_of_the_sea.htm)>.

<u>Date</u>	<u>From</u>	<u>Excerpt</u>
March 2012	Ray Mabus, Secretary of the Navy, before the Subcommittee of the Committee on Appropriations.	“The convention (UNCLOS) has been approved by nearly every maritime power and all the permanent members of the UN Security Council, except the United States. Our notable absence as a signatory weakens our position with other nations, allowing the introduction of expansive definitions of sovereignty on the high seas that undermine our ability to defend our mineral rights along our own continental shelf and in the Arctic. The Department strongly supports the accession to UNCLOS, an action consistently recommended by my predecessors of both parties.” <sup>98</sup>
March 2011	Admiral Gary Roughead, Chief of Naval Operations (CNO), testimony before the House Armed Services Committee.	“I believe it is essential that the United States become a full Party to the (UNCLOS) treaty.” <sup>99</sup>
May 2010	<i>National Security Strategy of the United States</i>	“As one key effort in the sea domain, for example, we will pursue ratification of the United Nations Convention on the Law of the Sea.” <sup>100</sup>
November 2009	U.S. Navy Arctic Roadmap (CNO directed task force) released by Rear Admiral David Titley, Oceanographer of the Navy.	“This roadmap specifies Navy actions over three phases...(phase 1 includes) ...Advocacy for accession to the United Nations Convention on the Law of the Sea.” <sup>101</sup>
June 2007	Letter from Chairman and Vice Chairman of the Joint Chiefs of Staff to Senator Joseph Biden, Chair of the Committee on Foreign Relations.	“From sustaining forward deployed military forces , to ensuring the security of our ports and waters as well as advancing our most important economic and foreign policy objectives, it is important that the United States become a Party to The Convention (UNCLOS).” <sup>102</sup>
September 2007	Michael Chertoff, Secretary of Homeland Security, letter to Senator Joseph	“I reiterate the strong support that the Department has provided since its inception to the United States becoming a party to the 1982 United Nations Convention on the Law of

<sup>98</sup> Ray Mabus, “Summary Statement of the Honorable Ray Mabus,” Subcommittee of the Committee on Appropriations, Department of Defense Appropriations for Fiscal Year 2013, U.S. Senate, 112<sup>th</sup> Congress, March 7, 2012, available at <[www.gpo.gov/fdsys/pkg/CHRG-112shrg29104503/html/CHRG-112shrg29104503.htm](http://www.gpo.gov/fdsys/pkg/CHRG-112shrg29104503/html/CHRG-112shrg29104503.htm)>

<sup>99</sup> Gary Roughead, “Statement of Admiral Gary Roughead, Chief of Naval Operations before the House Armed Services Committee on FY 2012 Department of Navy Posture,” House Armed Services, March 1 , 2011, available at <[www.navy.mil/navydata/people/cno/Roughead/Testimony/CNO%20Roughead\\_Testimony\\_030111.pdf](http://www.navy.mil/navydata/people/cno/Roughead/Testimony/CNO%20Roughead_Testimony_030111.pdf)>

<sup>100</sup> *National Security Strategy of the United States* (Washington, DC: The White House, May 2010), 50.

<sup>101</sup> *U.S. Navy Arctic Roadmap* (Washington, DC: Task Force Climate Change/Oceanographer of the Navy, October 2009).

<sup>102</sup> Admiral E.P. Giambastiani (USN), General Peter Pace (USMC), Admiral Michael Mullen (USN), General Michael Moseley (USAF), General J.T. Conway (USMC), General George Casey (U.S. Army), letter to *The Honorable Joseph Biden, Jr.*, Chairman Committee on Foreign Relations, June 26, 2007, available at <[www.jag.navy.mil/organization/documents/test24%20star%20ltr.pdf](http://www.jag.navy.mil/organization/documents/test24%20star%20ltr.pdf)>



<u>Date</u>	<u>From</u>	<u>Excerpt</u>
	Biden, Chair of the Committee on Foreign Relations.	the Sea.” <sup>103</sup>
October 2007	Admiral Vern Clark, Former Chief of Naval Operations, testimony before the Committee on Foreign Relations.	“What is significant, I believe, is that every living CNO--and they go back to Admiral Holloway, now, who began his term over 33 years ago as Chief of the Navy in 1974—everyone believes that this treaty is in the best interest of the United States of America.” <sup>104</sup>

## Icebreakers

Icebreakers are essential for providing security and commercial services in tough Arctic conditions, but they represent a significant and burdensome investment. Designed with a service life of 30 years, the ships take a decade to build and cost roughly \$900 million each. Consequently, most of the world’s 50 icebreakers<sup>105</sup> are owned either directly or indirectly by governments, rather than private industry.<sup>106</sup> They are not combat ships, though several (U.S. *Polar Star* and *Polar Sea* and Canada’s *Louis St. Laurent*) have been built to military standards.<sup>107</sup>

The basic principles of breaking maritime ice were established more than a century ago with the introduction of the world’s first seagoing icebreaker, the *Murtaja*, which was built in Sweden in 1890.<sup>108</sup> That ship featured a spoon-shaped prow designed to crush ice rather than ramming it. Forward momentum pushed the hull onto an ice sheet, which broke under the vessel’s weight.<sup>109</sup> A modern icebreaker combines this principle with a robust power plant generating at least 10,000 horsepower, an exceptionally well-armored hull, and the ability to prevent drifting debris from damaging its rear propulsion system.<sup>110</sup> Despite powerful engines, an icebreaker’s weight and blunt shape make it up to 40 percent less fuel-efficient than conventional vessels on the open seas.<sup>111</sup>

<sup>103</sup> Michael Chertoff, *letter to Senator Joseph Biden*, Chairman of the Committee on Foreign Relations, September 26, 2007, available at <[www.oceanlaw.org/downloads/references/government/HomeSec\\_Letter-27Sep07.pdf](http://www.oceanlaw.org/downloads/references/government/HomeSec_Letter-27Sep07.pdf)>.

<sup>104</sup> Vern Clark, statement before the Committee on Foreign Relations, U.S. Senate, 110<sup>th</sup> Congress, September 27 and October 4, 2007, available at <[www.gpo.gov/fdsys/pkg/CHRG-110shrg45282/html/CHRG-110shrg45282.htm](http://www.gpo.gov/fdsys/pkg/CHRG-110shrg45282/html/CHRG-110shrg45282.htm)>.

<sup>105</sup> Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, National Research Council, *Polar Icebreakers in a Changing World: An Assessment of U.S. Needs* (Washington, DC: The National Academies Press, 2007), 53.

<sup>106</sup> *Polar Icebreakers in a Changing World*, 88.

<sup>107</sup> During the Cold War, American and Soviet fleets were routinely armed, but Russia now operates the world’s only armed icebreaker. See *Polar Icebreakers in a Changing World*, 58.

<sup>108</sup> *Polar Icebreakers in a Changing World*, 58.

<sup>109</sup> *Polar Icebreakers in a Changing World*, 58.

<sup>110</sup> *Polar Icebreakers in a Changing World*, 58.

<sup>111</sup> Kimmo Juurmaa, Tom Mattsson, and Göran Wilkman, *The Development of the New Double Acting Ships for Ice Operation*, POAC 2001, OTTAWA 12-17.8.2001 (Helsinki, Finland: Aker Arctic Technology Inc., August 12-17, 2001), 1, available at <[www.akerarctic.fi/publications/pdf/Poac01XNewDAS.pdf](http://www.akerarctic.fi/publications/pdf/Poac01XNewDAS.pdf)>.

Icebreakers typically plow ice-clogged channels on behalf of less capable ships following behind. The path they open is not free from hazards, however, and may close quickly under windy conditions or fill with destructive chunks drifting behind the lead vessel. A collision can puncture or crush an ice-hardened hull, which is typically reinforced in the plating and frame for maximum protection. Even relatively small pieces of ice, called “bergy bits,” are capable of doing severe damage to the hardened vessels. If a ship’s crew suspects ice is in the water, an icebreaker must slow its movement and proceed with caution.

### **America’s Icebreaker Gap**

In 2005 (FY06), the White House shifted budgetary authority for Coast Guard icebreakers to the National Science Foundation (NSF). The move came after an Office of Management and Budget report concluded the United States Coast Guard (USCG) had established a record of icebreaker maintenance deficiencies and operational neglect.<sup>112</sup> Investigators also cited misplaced budgetary responsibilities. According to their review, most U.S. icebreaker missions had been undertaken on behalf of the NSF.<sup>113</sup> Indeed, America’s only full time (185-200 days/year) Arctic icebreaker, the Healy, had been designed primarily for scientific research and was unable to access the deep north during periods of heavy ice cover.<sup>114</sup> Ninety percent of its deployments were devoted to NSF missions.<sup>115</sup> Such statistics led the OMB to conclude the NSF was “driving the costs of the Coast Guard program but not itself bearing them, a market failure that precludes efficiency.”<sup>116</sup>

In candid Congressional testimony before the House Science Committee on March 9, 2005, Arden Bement, Director of the National Science Foundation, explained icebreaker programs had been displaced from the USCG budget because the Bush administration viewed terrorism—not science—as its main priority. “A high-level decision (was) made within the White House...supporting science was not going to be sustained by the Department of Homeland Security.”<sup>117</sup> The transfer of icebreaker authority to the NSF was fraught with political and fiscal ambivalence. Congress ratified the move but under-funded the shifted programs. Approximately \$48 million was removed from the USCG’s budget and given to the NSF to cover icebreaker expenses. That amount represented less than two thirds the

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<sup>112</sup> USCG officials dispute these assessments in interviews. *Polar Icebreaker Roles and U.S. Future Needs*, 10.

<sup>113</sup> *Detailed Information on the Coast Guard: Polar Icebreaking Program Assessment* (Washington, DC: The White House, January 9, 2009), available at <[www.whitehouse.gov/omb/expectmore/detail/10002434.2004.html](http://www.whitehouse.gov/omb/expectmore/detail/10002434.2004.html)>.

<sup>114</sup> Dr. Arden L. Bement, Jr., Testimony Before the House Committee on Transportation and Infrastructure, Subcommittee on Coast Guard and Maritime Transportation, U.S. House of Representatives, 109<sup>th</sup> Congress, September 26, 2006, available at <[www.nsf.gov/od/opp/opp\\_advisory/briefings/oct2006/bement\\_house\\_testimony\\_written\\_final.pdf](http://www.nsf.gov/od/opp/opp_advisory/briefings/oct2006/bement_house_testimony_written_final.pdf)>.

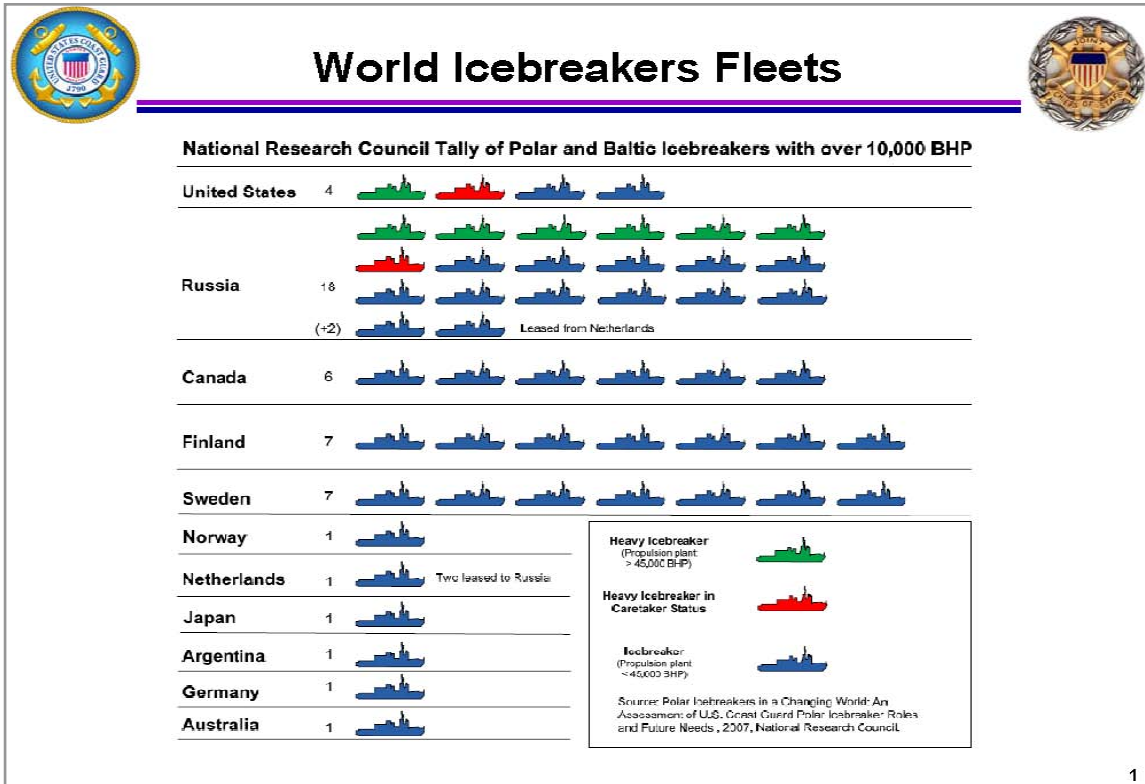
<sup>115</sup> Bement, Jr., “Testimony Before the House Committee, September 26, 2006.

<sup>116</sup> The OMB assessment gave the USCG Polar Icebreaking Program failing marks of 60 percent for “Program Purpose and Design”, 25 percent for “Strategic Planning,” and 8 percent for “Program Results/Accountability.” The only passing grade was 71 percent for “Program Management.” *Detailed Information on the Coast Guard: Polar Icebreaking Program Assessment*

<sup>117</sup> Sherwood L. Boehlert, *National Science Foundation Budget and Management Challenges*, Hearing before the Subcommittee on Research, Committee on Science, House of Representatives, 109<sup>th</sup> Congress, First Session, March 9, 2005, available at <<http://ftp.resource.org/gpo.gov/hearings/109h/99574.txt>>.

actual cost of maintaining the ships.<sup>118</sup> Privately, the Coast Guard opposed the decision, and funding issues continue to trail the ability to maintain the fleet adequately.

The budgetary transfer of polar programs appears to have complicated management challenges without resolving the underlying funding difficulties. In an official National Academies icebreaker assessment study published in 2007, investigators concluded that responsibility for icebreaking programs had been ineffectively distributed among multiple agencies and congressional oversight committees.<sup>119</sup> The report also noted the Bush administration’s decision to transfer budgetary authority had been taken without regard to the non-scientific functions icebreakers perform, “such as law enforcement, marine pollution response, search and rescue, providing a U.S. presence, and defense operations...”<sup>120</sup> The budgetary loss of icebreakers has constrained the USCG from conducting essential missions while giving the NSF fiscal control for security assignments which lie outside that agency’s core expertise.



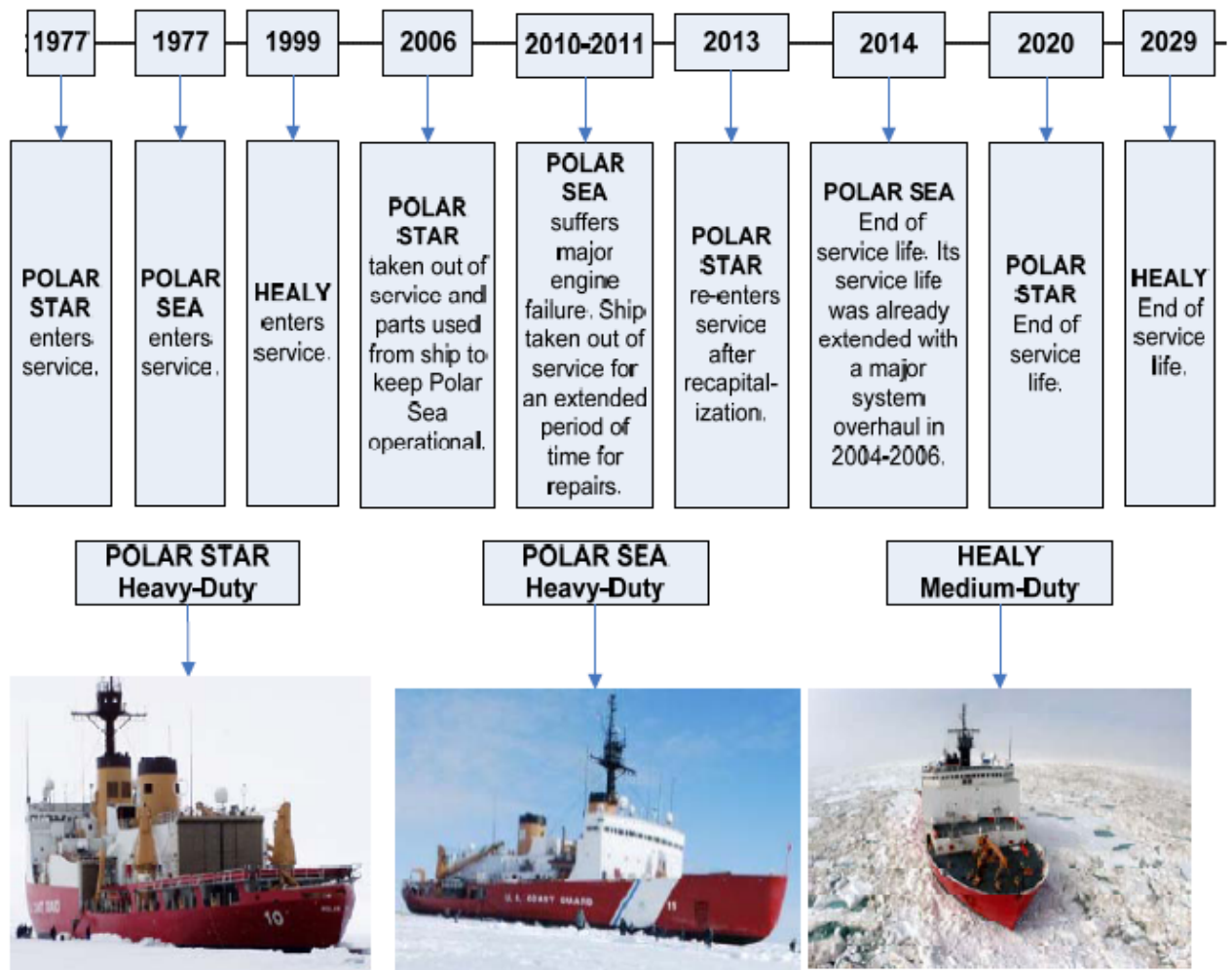
U.S. capabilities in the Arctic lag far behind international competitors and do not reflect the country’s global standing or regional responsibilities. Currently, the United States has a single operational icebreaker dedicated to both the Antarctic and Arctic regions, the USCGC *Healy*. Two additional icebreakers have been sidelined and are in non-working order, having sustained chronic maintenance and breakdown problems after exceeding

<sup>118</sup> *Polar Icebreaker Roles and U.S. Future Needs*, 21.

<sup>119</sup> *Polar Icebreakers in a Changing World*, 10.

<sup>120</sup> *Polar Icebreaker Roles and U.S. Future Needs*, 21.

their intended 30 year service lives. One of these, the *Polar Star*, was placed in caretaker status on July 1, 2006. After four years, work began at Todd Pacific Shipyards in Seattle to reactivate the vessel, at a cost of \$57 million in repairs and upgrades.<sup>121</sup>



Source (Photos): U.S. Coast Guard

The remaining American icebreaker, *Polar Sea*, is likely to be decommissioned in 2012 following a catastrophic “engine casualty” two years earlier (June 2010). The accident followed an unsuccessful attempt to overhaul and upgrade the ship.<sup>122</sup>

<sup>121</sup> “Todd Shipyards contract for USCGC Polar Star,” *MarineLink.com*, January 2011, available at <[www.marinelink.com/news/shipyards-contract-uscg336751.aspx](http://www.marinelink.com/news/shipyards-contract-uscg336751.aspx)>; Jacqueline Klimas, “Coast Guard Asks to buy new Arctic Icebreaker,” *Navy Times*, March 24, 2012, available at <[www.navytimes.com/news/2012/03/navy-coast-guard-arctic-ice-breaker-032412w/](http://www.navytimes.com/news/2012/03/navy-coast-guard-arctic-ice-breaker-032412w/)>; *The Coast Guard’s Polar Icebreaker: Maintenance, Upgrade, and Acquisition Program*, OIG-11-31 (Washington, DC: Department of Homeland Security, January 2011), 4 (table 1).

<sup>122</sup> Ronald O’Rourke, *Changes in the Arctic: Background and Issues for Congress* (Washington, DC: Congressional Research Service, Updated version on August 8, 2010), 38.

According to a pivotal USCG capabilities assessment conducted in 2010, the U.S. will need six heavy and four medium icebreakers to fulfill its statutory obligations and maintain the continuous presence called for by the Naval Operations Concept.<sup>123</sup> While the Coast Guard's proposed FY2013 budget included \$8 million in acquisition funds to begin planning for the construction of a single new polar icebreaker, the timeline is likely to be from 12-15 years for completion, at an estimated cost of more than \$850 million.<sup>124</sup> Commenting on the small initial investment and apparent lack of urgency, Alaska Senator Lisa Murkowski reportedly joked, "8 million dollars will barely buy you a porthole."<sup>125</sup> In an embarrassing admission, the Inspector General of DHS concluded in 2011 that the Coast Guard is unable to meet its current statutory requirements and must depend on foreign nations to perform critical "scientific, logistical and supply activities."

In the absence of deep investments and administrative reforms, the OIG predicted the scenario would only worsen.<sup>126</sup> Coast Guard Commandant Robert Papp summarized his assessment of U.S. Arctic capabilities before a Senate panel by warning, "Right now we've got zero capability to respond in the Arctic...When people ask me what keeps me awake at night, (I say) an oil spill, a collision, a ship sinking in the Arctic keeps me awake at night, because we have nothing to respond. Or if we respond, it's going to take us weeks to get there."<sup>127</sup> With both American heavy ice-breakers currently inoperable, his assessment joins a rising chorus of experts who believed that the U.S. is under-equipped for essential operations in the high northern latitudes.<sup>128</sup>

Climate changes have only amplified U.S. icebreaker program complexities. The retreating icecaps have fundamentally altered the potential for human activity in the Alaskan Arctic, forcing the Coast Guard to provide a wider range of services in an area of operations larger than was previously considered possible. At the same time, the NSF has expressed an increasing reluctance to continue fully funding the remainder of the aging U.S. icebreaker

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<sup>123</sup> ABS Consulting, Potomac Wave Consulting, SPA Inc., *United States Coast Guard High Latitude Region Mission Analysis: Capstone Summary*, Arlington, VA, July 2010, available at <<http://assets.fiercemarkets.com/public/sites/govit/hlssummarycapstone.pdf>>

<sup>124</sup> Ronald O'Rourke, *Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress* (Washington, DC: Congressional Research Service, April 25 2013), Summary.

<sup>125</sup> Lisa Murkowski, "Murkowski Questions DHS Whether Icebreaker is a True Priority," *Lisa Murkowski for Senate*, March 8, 2012, available at

<[www.murkowski.senate.gov/public/index.cfm?p=PressReleases&ContentRecord\\_id=2d43078a-cb3a-4d7f-a6f9-6ba0926caafd&ContentType\\_id=b94acc28-404a-4fc6-b143-a9e15bf92da4&Group\\_id=c01df158-d935-4d7a-895d-f694ddf41624](http://www.murkowski.senate.gov/public/index.cfm?p=PressReleases&ContentRecord_id=2d43078a-cb3a-4d7f-a6f9-6ba0926caafd&ContentType_id=b94acc28-404a-4fc6-b143-a9e15bf92da4&Group_id=c01df158-d935-4d7a-895d-f694ddf41624)>.

<sup>126</sup> *The Coast Guard's Polar Icebreaker: Maintenance, Upgrade, and Acquisition Program*, Department of Homeland Security, Office of the Inspector General, OIG-11-31, January 2011, 1.

<sup>127</sup> David Perera, "Papp: Coast Guard Must Prepare for New Arctic Ocean Mission," *Fierce Homeland Security*, June 26, 2011, available at <[www.fiercephomelandsecurity.com/story/papp-coast-guard-must-prepare-new-arctic-ocean-mission/2011-06-26](http://www.fiercephomelandsecurity.com/story/papp-coast-guard-must-prepare-new-arctic-ocean-mission/2011-06-26)>.

<sup>128</sup> In May 2008, the Commanders of USPACOM, USTRANSCOM, and USNORTHCOM delivered a personal letter to the Chairman of the Joint Chiefs of Staff requesting additional funding for icebreakers. The memorandum cited routine maintenance deficiencies in the current "fleet" and requested the expansion of existing icebreaker programs, increased funding, and the construction of new ships. See Commanders of USPACOM, USTRANSCOM, USNORTHCOM, Memo, "Memorandum for Chairman, Joint Chiefs of Staff: Icebreaker Support," May 21, 2008, available at <[www.arctic.gov/testimony/icebreaker-support.pdf](http://www.arctic.gov/testimony/icebreaker-support.pdf)>.

fleet.<sup>129</sup> According to NSF estimates, operational expenses outpace the cost of leasing or building comparable, non-military research icebreakers.<sup>130</sup>

The current problems associated with the U.S. icebreaker fleet can be traced to traditional notions that the ships serve primarily as platforms for scientific research. In fact, climate change has redefined their role as coastal security assets. During a 2008 interview with Alaska Public Radio, Commandant Allen reflected on the changes, saying, “For about the last 20 years, the conventional view for policymakers in Washington is that any activity in the Arctic and Antarctic is basically related to science... (the new policy) will deal with more issues of sovereignty, security, and presence.”<sup>131</sup>

## Russia’s Icebreaker Problems

The Russian perspective of its icebreaker fleet has been quite different from the shifting American view. In Russia, icebreakers have long been viewed as economic and security assets, and an essential means of clearing northern arctic shipping routes. Russia’s seven nuclear ships were far more powerfully designed than American models, with each vessel capable of breaking through ice nearly twice as thick as its diesel competitor and can operate for extended periods on the open seas.<sup>132</sup>

The Russian Federation operates the largest number of conventionally powered icebreakers in the world and owns the only nuclear fueled fleet. The ships constitute a vital part of the Kremlin’s economic and development plans by providing a lifeline to frozen Arctic settlements, services to the developing Northern Sea Route, and assistance with the export of hydrocarbon, mineral, timber, and other natural resources from the region.<sup>133</sup>

Like much of Russia’s Arctic infrastructure, its icebreaking fleet of approximately 18 ships is recovering from a period of steep decline and will need to attract massive new investment to meet projected goals. Moscow’s criticism of the Murmansk Shipping Company for its slipshod management of the state owned fleet ended in a surprise move when authority for the ships was transferred to the state owned company, Rosatom (now Rosatomflot).<sup>134</sup> It remains unclear whether the new company will be capable of

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<sup>129</sup> Philip Ewing, “CG Steps Up Bid to Rescue Icebreaker Funding,” *Navy Times*, March 24, 2008, available at <[www.navytimes.com/news/2008/03/coastguard\\_icebreakers\\_032408w/](http://www.navytimes.com/news/2008/03/coastguard_icebreakers_032408w/)>.

<sup>130</sup> Dr. Arden L. Bement, Jr., “Testimony Before the House Committee on Transportation and Infrastructure, Subcommittee on Coast Guard and Maritime Transportation,” July 16, 2008, U.S. House of Representatives, 109<sup>th</sup> Congress, available at <[www.nsf.gov/about/congress/110/alb\\_transportation\\_071608.jsp](http://www.nsf.gov/about/congress/110/alb_transportation_071608.jsp)>.

<sup>131</sup> Randy Boswell, “U.S. Coast Guard Plans ‘Sovereignty’ Policy Shift,” *National Post*, August 9, 2008.

<sup>132</sup> These are the Rossiya, Sovetsky Soyuz, Yamal, 50 Let Pobedy, Taymir, Vaygach, and Sevmorput. The Lenin, Sibir, and Arktika are out of commission, as of this writing. See, *Rosatom Flot*, Homepage, available at <[www.rosatomflot.ru/index.php?menuid=5&lang=en](http://www.rosatomflot.ru/index.php?menuid=5&lang=en)>

<sup>133</sup> Oleg Bukharin, “Russia’s Nuclear Icebreaker Fleet,” *Science & Global Security* 14, no. 1 (2006), 26-27.

<sup>134</sup> Anna Kireeva and Rashid Alimov, “Rosatom Takes Over Russia’s Nuclear Powered Icebreaker Fleet,” *The Environmental Foundation Bellona*, August 28, 2008, available at <[www.bellona.org/articles/articles\\_2008/atomflot\\_torosatom](http://www.bellona.org/articles/articles_2008/atomflot_torosatom)>.

renovating operations and boosting goods transport by 700 percent, as it has claimed.<sup>135</sup> Russia's entire diesel icebreaking fleet is at the end of its service life and the ships face decommissioning during the next several years, and federal authorities suffer from a poor record of investment.<sup>136</sup>

Nevertheless, Russian authorities have embarked on an ambitious plan to renovate NSR infrastructure in an effort to turn the Soviet era shipping lane into a maritime link that would one day rival the Suez Canal.<sup>137</sup> In 2011, Russia announced it had committed more than \$500 billion to modernize its icebreaker fleet. The move stood in stark contrast to U.S. icebreaking resources, which one U.S. Navy sponsored report recently concluded, remains "limited...old, obsolete, and under the control of an agency that does not have a national security operational mandate."<sup>138</sup>

### **Military Posture in the Arctic: Background**

The military importance of the Arctic Circle was established during the Cold War when Ballistic Missile Submarines (SSBNs) patrolling under the polar ice pack formed part of a nuclear triad maintained by the U.S. and Soviet Union. The region provided an ideal environment for concealment and evasion. Dangling ice formations distorted sonar, making accurate measurements dangerously difficult and the possibility of freezing in place a constant concern.<sup>139</sup>

In 1981, the Cold War cat-and-mouse game in the high northern latitudes accelerated with the appearance of an advanced weapons system optimized for the region; the Soviet Typhoon Class SSBN. These new submarines were designed to surface quickly under thin ice and fire a rapid volley of ballistic missiles at U.S. targets.<sup>140</sup> By the end of the Cold War, the Soviet fleet had developed a protective strategy called a 'bastion' concept, sheltering their SSBN fleet in relatively small areas under an umbrella of ice pack, surface ships, and air cover.<sup>141</sup>

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<sup>135</sup> "Russia Invests in New Icebreakers," *Barents Observer*, June 16, 2008, available at <[www.barentsobserver.com/russia-invests-in-new-icebreakers.4492350-16175.html](http://www.barentsobserver.com/russia-invests-in-new-icebreakers.4492350-16175.html)>; Murmansk managers had complained much of the company's revenue stream had been the result of shuttling tourists to the North Pole.

<sup>136</sup> Government of the Russian Federation, "Reengineering Russia's Icebreaking Fleet," July 2009, available at <[www.premier.gov.ru/eng/visits/ru/117/info/3283.html](http://www.premier.gov.ru/eng/visits/ru/117/info/3283.html)>.

<sup>137</sup> Gleb Bryanski, "Russia's Putin Says Arctic Trade Route to Rival Suez," *The Associated Press*, September 22, 2011, available at <<http://ca.reuters.com/article/topNews/idCATRE78L5TC20110922>>.

<sup>138</sup> Committee on National Security Implications of Climate Change for U.S. Naval Forces and the National Research Council, *National Security Implications of Climate Change for U.S. Naval Forces* (Washington, DC: The National Academies Press, 2011), S-6.

<sup>139</sup> William J. Broad, "A Cold War Mission, Deep in the Arctic," *The New York Times*, March 18, 2008, available at <[www.nytimes.com/2008/03/18/world/americas/18iht-arctic.1.11210324.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2008/03/18/world/americas/18iht-arctic.1.11210324.html?pagewanted=all&_r=0)>.

<sup>140</sup> David F. Winkler, "The Great White Fleet Returns Home," *Seapower* 52, no. 2 (February 2009), 48, available at <[www.seapower-digital.com/seapower/seapower\\_sample/?pg=51](http://www.seapower-digital.com/seapower/seapower_sample/?pg=51)>.

<sup>141</sup> Jon Bowermaster, "The Last Front of the Cold War," *The Atlantic Online*, November 1993, available at <[www.theatlantic.com/politics/foreign/front.htm](http://www.theatlantic.com/politics/foreign/front.htm)>.

The capability of Russia's SSBN fleet has diminished since the end of the Cold War, and the frequency of Russian submarine patrols has consequently plummeted. According to open source estimates, Russian SSBNs embarked on only three missions in 2007, and ten in 2008.<sup>142</sup> The Soviet Union's Northern Fleet had once risen to prominence as a centerpiece of the Soviet nuclear powered surface and submarine forces.<sup>143</sup> Basing shortages and financial woes followed Russia's economic collapse in the 1990s,<sup>144</sup> and the total number of ships in the Northern Fleet dropped by a precipitous 40 percent.<sup>145</sup> Crews went unpaid, and ships were often sent on patrols without their full complement of qualified officers.

Russia's nuclear submarine forces were hit particularly hard. The vessels were decommissioned at a dizzying pace—faster than Russian yards could safely or affordably dismantle them. As an emergency measure, the Northern Fleet turned to foreign assistance as a means of fulfilling its basic naval obligations.<sup>146</sup> Perhaps the low point for Russia's Arctic command arrived in 1995, when a Victor-III class submarine was used to transport food as a means of earning money. Its missiles had been removed and the empty tubes filled with potatoes in order to carry the maximum possible load.<sup>147</sup>

In recent years, the Kremlin has signaled its intention to rebuild its submarine and surface naval forces. In 2008, Russian defense officials announced an ambitious eight year timetable for the construction of a new generation of nuclear powered ballistic missile and attack submarines, and a fleet of 5-6 aircraft carrier battle groups.<sup>148</sup> Plagued by grave internal problems in the Northern Fleet, the timetable appears extremely optimistic. However, in November 2011, Prime Minister Putin unveiled Russia's multi-billion naval modernization plan, announcing, "This means the naval shipbuilders must brace themselves for mass production of new ships and naval weapons systems."<sup>149</sup> The Fleet will need to work hard to repair its badly damaged reputation and recover from high profile disasters like the 2001 accidental sinking of the nuclear missile submarine Kursk, in which 118 crew members died. Unable to mount a successful rescue attempt, the

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<sup>142</sup> Hans M. Kristensen, "Russian Strategic Submarine Patrols Rebound," *FAS Strategic Security Blog*, February 17, 2009, available at <[www.fas.org/blog/ssp/2009/02/russia.php](http://www.fas.org/blog/ssp/2009/02/russia.php)>.

<sup>143</sup> "Northern Fleet," *Global Security.org*, April 22, 2006, available at <[www.globalsecurity.org/military/world/russia/mf-north.htm](http://www.globalsecurity.org/military/world/russia/mf-north.htm)>.

<sup>144</sup> "Nuclear Submarine Dismantlement," *The Henry L. Stimson Center*, May 30, 2007, accessed at <[www.stimson.org/cnp/?SN=CT200705231268#TalkingPoints](http://www.stimson.org/cnp/?SN=CT200705231268#TalkingPoints)>.

<sup>145</sup> "Northern Fleet," *Global Security.org*, April 22, 2006, available at <[www.globalsecurity.org/military/world/russia/mf-north.htm](http://www.globalsecurity.org/military/world/russia/mf-north.htm)>.

<sup>146</sup> Jon Bowermaster, "The Last Front of the Cold War," *The Atlantic Online*, November 1993, available at <[www.theatlantic.com/politics/foreign/front.htm](http://www.theatlantic.com/politics/foreign/front.htm)>.

<sup>147</sup> Aleksandr Nikitin, Igor Kudrik, Thomas Nilse, *The Russian Northern Fleet: Sources of Radioactive Contamination*, The Bellona Foundation, 1996, available at, <[www.bellona.org/reports/The\\_Russian\\_Northern\\_Fleet\\_report\\_chapters/1175892548.15](http://www.bellona.org/reports/The_Russian_Northern_Fleet_report_chapters/1175892548.15)>; Debra MacKenzie, "Russian Secrecy Could Sink Nuclear Aid," *New Scientist*, Issue 2626, April 20, 1996, available at <[www.newscientist.com/article/mg15020260.300-russian-secrecy-could-sink-nuclear-aid.html](http://www.newscientist.com/article/mg15020260.300-russian-secrecy-could-sink-nuclear-aid.html)>.

<sup>148</sup> "Russian Navy Prioritizes Construction of Nuclear Submarines," *RIA Novosti*, July 25, 2008, available at <<http://en.rian.ru/russia/20080725/114927762.html>>.

<sup>149</sup> Svetlana Andreyeva, "Russian Navy in Modernization Drive," *Voice of Russia*, November 9, 2011, available at <<http://english.ruvr.ru/2011/11/09/60128745.html>>.



Kremlin had been forced to turn to British and Norwegian diving experts for assistance. While the episode represented a high profile embarrassment for the Northern Fleet, appealing to foreign assistance has not been an unusual occurrence.

The Fleet has regularly drawn upon international funds to safely dismantle and dispose of decommissioned nuclear submarines and associated equipment. The United States, Norway, and a dozen other European states maintain significant financial programs designed to store and secure Russia’s vulnerable nuclear submarine materials.<sup>150</sup>

Though the Northern Fleet’s outstanding problems often appear at odds with the Kremlin’s robust rhetoric, in recent years, the Kremlin has moved quickly to re-assert Russian prerogatives around the world. Within four years of ratifying the *United Nations Convention on the Law of the Sea*, Russia claimed jurisdiction over nearly half the Arctic Ocean, including the North Pole.<sup>151</sup> It also initiated a number of high profile military exercises intended to demonstrate its commitment to the region. Senior-level Russian defense officials declared the exercises had been provoked by international objections to the Kremlin’s expansive territorial claims.<sup>152</sup> Its actions have demonstrated Russia’s spirit and strategic ambition.

### Russia’s Assertive Record

Date	Description
November 2011	Russia announces a build-up of Northern Sea Route submarine patrols and Arctic security infrastructure.
September 2011	Prime Minister Putin announces plans for crash naval modernization in the Arctic, with the delivery of three nuclear and six diesel icebreakers.
August 2011	Defense Minister Anatoly Serdyukov announces plans for the formation of two new Arctic brigades.
September 2010	Russia and Norway resolve 40 year Arctic Border dispute in the Barents Sea.
March 2009	Russia declares it will create an Arctic military force, to include new border guard facilities, modernized airfields, and reorganized units from the Pacific and Northern fleets. <sup>153</sup>
February 2009	Canadian Defence Minister Peter MacKay accuses Russia of sending bombers too close to Canadian airspace. <sup>154</sup>
August 2008	Russia successfully launches a ballistic missile from the submerged Delta-3 nuclear submarine Ryazan, of the Northern Fleet. <sup>155</sup>

<sup>150</sup> Richard G. Lugar, *The Nunn-Lugar Scorecard: Destroying Weapons & Materials of Mass Destruction Through Cooperation*, available at <<http://lugar.senate.gov/nunnlugar/scorecard.html>>; “Nuclear Submarine Dismantlement,” The Henry L. Stimson Center, May 30, 2007, available at <[www.stimson.org/cnp/?SN=CT200705231268#TalkingPoints](http://www.stimson.org/cnp/?SN=CT200705231268#TalkingPoints)>.

<sup>151</sup> *Polar Icebreaker Roles and U.S. Future Needs: A Preliminary Assessment*, 25.

<sup>152</sup> “Russia Military to Uphold Arctic Claim,” *International Business Times*, June 24, 2008, accessed at <[www.ibtimes.com/articles/20080624/russia-plans-to-hold-military-exercises-in-arctic.htm](http://www.ibtimes.com/articles/20080624/russia-plans-to-hold-military-exercises-in-arctic.htm)>.

<sup>153</sup> David Pugliese and Gerard O’Dwyer, “Canada, Russia Build Arctic Forces,” *Defense News*, April 6, 2009 available at <[www.defensenews.com/story.php?i=4025065](http://www.defensenews.com/story.php?i=4025065)>.

<sup>154</sup> David Pugliese and Gerard O’Dwyer, “Canada, Russia Build Arctic Forces,” *Defense News*, April 6, 2009 available at <[www.defensenews.com/story.php?i=4025065](http://www.defensenews.com/story.php?i=4025065)>.

<sup>155</sup> “Test launch from Ryazan submarine,” *Russian Strategic Nuclear Forces*, August 1, 2008, available at <[http://russianforces.org/blog/2008/08/test\\_launch\\_from\\_ryazan\\_submar.shtml](http://russianforces.org/blog/2008/08/test_launch_from_ryazan_submar.shtml)>; “Russia Extends It’s

July 2008	Russia declares the goal of upgrading the Northern Fleet's ballistic missile submarine force a high priority for the Navy. A top Navy admiral sets 2016 as completion date. <sup>156</sup>
July 2008	Russia announces it will resume patrolling arctic waters with armed warships for the first time since the breakup of the Soviet Union. <sup>157</sup>
August 2007	President Vladimir Putin and the head of Russia's Air Forces, Alexander Zelin, confirm the resumption of strategic bombing training missions over the Arctic Ocean. <sup>158</sup>
August 2007	Russian Parliamentarian and explorer Artur N. Chilingarov plants the Russian flag on the seabed under the North Pole, symbolically laying claim to the area as an extension of Russia's continental shelf.
August 2007	Russian forces conduct military exercises near the North Pole using anti-submarine and long-range bombers, a provocative gesture in a disputed region believed to hold significant quantities of oil and natural gas. <sup>159</sup>

The United States first recognized the strategic significance of the Arctic in the early days of the Cold War when Soviet long range bombers plotting a course over the top of the world exposed the vulnerability of its northern flank to a surprise attack.<sup>160</sup> As a means of shoring up North America's aerial defense systems, the United States and Canada constructed an elaborate chain of early warning radar stations across Northern Greenland, Canada, Alaska and Iceland. Operations were managed according to a 1958 agreement between the U.S. and Canada which created a joint military command, now called the North American Aerospace Defense Command (NORAD). The completed system provided roughly one hour of warning for inbound strategic bombers and 15 minutes for Intercontinental Ballistic Missiles (ICBMs).<sup>161</sup>

During the closing days of the Cold War, NORAD sought to find new missions to sustain its relevance in an era looking for peace dividends.<sup>162</sup> In 1989, Congress assigned it a prominent role in President George H.W. Bush's "war on drugs," and within a year the

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Arctic Naval Powerhouse," *International Online Defense Magazine*, August 2008, available at <[www.defense-update.com/newscast/0808/070802\\_russian\\_navy\\_in\\_the\\_arctic.html](http://www.defense-update.com/newscast/0808/070802_russian_navy_in_the_arctic.html)>.

<sup>156</sup> "Russia to Upgrade Ballistic Missile Subs by 2016," *NTI*, July 28, 2008, accessed at <[www.nti.org/d\\_newswire/issues/2008/7/28/bd58e236-7a42-428f-beb8-6e54519cc174.html](http://www.nti.org/d_newswire/issues/2008/7/28/bd58e236-7a42-428f-beb8-6e54519cc174.html)>.

<sup>157</sup> "Russia Restarts Cold War Patrols," *BBC News*, August 17, 2007, available at <<http://news.bbc.co.uk/2/hi/europe/6950986.stm>>.

<sup>158</sup> Vladimir Putin, "Press Statement and Responses to Media Questions following the Peace Mission 2007 Counterterrorism Exercises and the Shanghai Cooperation Organisation Summit," *The President of Russia*, August 17, 2007, available at

<[http://president.kremlin.ru/eng/speeches/2007/08/17/2033\\_type82915\\_141812.shtml](http://president.kremlin.ru/eng/speeches/2007/08/17/2033_type82915_141812.shtml)>; "Russian strategic bombers continue Arctic, Atlantic patrols," *RIA Novosti*, September 7, 2008, available at <<http://en.rian.ru/russia/20080709/113588157.html>>.

<sup>159</sup> "Russia Restarts Cold War Patrols," *BBC News*, August 17, 2009, available at <<http://news.bbc.co.uk/2/hi/europe/6950986.stm>>.

<sup>160</sup> Blair Watson, "NORAD: Watching the Skies for 50 Years," *Aviation*, May 12, 2008, available at <[www.aviation.com/technology/080512-norad-50th-birthday.html](http://www.aviation.com/technology/080512-norad-50th-birthday.html)>.

<sup>161</sup> "While Canada Debates Nuclear Warheads and Arctic Defense, Here the U.S. Fights the Coldest War," *Life Magazine*, March 1, 1963, 18-26.

<sup>162</sup> Eric Schmitt, "Built for Cold War, Bunker Shifts its Weaponry to Drug Battle," *The New York Times*, July 18, 1993, available at <[www.nytimes.com/1993/07/18/us/built-for-cold-war-bunker-shifts-its-weaponry-to-drug-battle.html?pagewanted=all&src=pm](http://www.nytimes.com/1993/07/18/us/built-for-cold-war-bunker-shifts-its-weaponry-to-drug-battle.html?pagewanted=all&src=pm)>.

command had diverted 40 percent of worldwide Airborne Warning and Control Systems to the assignment, along with 16 radar-carrying balloons, a variety of high-tech reconnaissance planes, and 44 U.S. and Canadian jet fighter interceptors.<sup>163</sup> Four years later, 50 percent of NORAD's air defense missions were devoted to counter-drug operations, mostly on the American southern border.<sup>164</sup>

Critics complained the command was both cost ineffective and poorly suited to its new task. Their objections exposed some operational limitations of a high-end network applied to a low-end mission; NORAD's ground-based surveillance network had been designed to identify Soviet targets higher than 10,000 feet and were less effective at lower altitudes; military balloons spying on drug routes with downward looking radar frequently had to be lowered because of inclement weather; and supersonic jets often moved too fast to identify and track slow Cessna's, the drug smugglers' airplane of choice.<sup>165</sup> In 1994, a Government Accountability Office report concluded bluntly, "A dedicated continental air defense force is no longer needed..."<sup>166</sup> NORAD had become, in many ways, a command in search of a mission.

If NORAD's role in U.S. defense strategy had diminished in the years between the fall of the Soviet Union and the September 11, 2001, terrorist attacks, the command's relations with Canada had grown just as uncertain. Canada objected to the development of new anti-missile technology which violated the popular Anti-Ballistic Missile treaty, first signed in 1972. Canadians worried that by abrogating the treaty, the U.S. could incite a fresh nuclear arms race and the weaponization of space.<sup>167</sup> They also questioned an important U.S. strategic assumption—that small nuclear states would choose to deliver an atomic weapon via ballistic missile.<sup>168</sup>

U.S. proponents of Ballistic Missile Defense (BMD) have clashed over the implications of Canada's opposition. Some have suggested Canadian objections have no operational impact on BMD programs and pose no additional hazards to bilateral security arrangements.<sup>169</sup> Other officials, like Vice-Admiral Herbert Browne, retired Deputy

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<sup>163</sup> Michael R. Gordon, "U.S. is Stepping Up Efforts to Seize Cargoes of Drugs," *The New York Times*, March 10, 1990, available at <[www.nytimes.com/1990/03/10/world/us-is-stepping-up-efforts-to-seize-cargoes-of-drugs.html](http://www.nytimes.com/1990/03/10/world/us-is-stepping-up-efforts-to-seize-cargoes-of-drugs.html)>.

<sup>164</sup> Eric Schmitt, "Built for Cold War, Bunker Shifts its Weaponry to Drug Battle," *The New York Times*, July 18, 1993, available at <[www.nytimes.com/1993/07/18/us/built-for-cold-war-bunker-shifts-its-weaponry-to-drug-battle.html?pagewanted=all&src=pm](http://www.nytimes.com/1993/07/18/us/built-for-cold-war-bunker-shifts-its-weaponry-to-drug-battle.html?pagewanted=all&src=pm)>.

<sup>165</sup> Eric Schmitt, "Built for Cold War, Bunker Shifts its Weaponry to Drug Battle," *The New York Times*, July 18, 1993, available at <[www.nytimes.com/1993/07/18/us/built-for-cold-war-bunker-shifts-its-weaponry-to-drug-battle.html?pagewanted=all&src=pm](http://www.nytimes.com/1993/07/18/us/built-for-cold-war-bunker-shifts-its-weaponry-to-drug-battle.html?pagewanted=all&src=pm)>.

<sup>166</sup> *Continental Air Defense: A Dedicated Force Is No Longer Needed*, GAO/NSIAD-94-76 (Washington, DC: United States General Accounting Office, May 3, 1994), available at <[www.fas.org/man/gao/gao9476.htm](http://www.fas.org/man/gao/gao9476.htm)>.

<sup>167</sup> Michael E. O'Hanlon, "Don't Blame Canada for Missile-defense Snub," *The Brookings Institution*, March 3, 2005, available at <[www.brookings.edu/opinions/2005/0303defensestrategy\\_ohanlon.aspx](http://www.brookings.edu/opinions/2005/0303defensestrategy_ohanlon.aspx)>.

<sup>168</sup> Doug Struck, "Canada Likely to Face Missile Defense Issue Head-On," *The Washington Post*, November 14, 2004, available at <[www.washingtonpost.com/wp-dyn/articles/A48191-2004Nov13.html](http://www.washingtonpost.com/wp-dyn/articles/A48191-2004Nov13.html)>.

<sup>169</sup> The system is financed and controlled entirely by the U.S., which currently has 30 ground-based BMD interceptors in Alaska and California.

Commander of U.S. Space Command, have voiced frustration with Canada's political intransigence. If Ottawa were attacked and had not lent its support to anti-missile initiatives, he warned reporters, the United States might choose to hold its BMD in reserve. "Detroit would be next, and the United States would be reluctant to say (to its people), Well, we've expended all of our ground-based interceptors protecting Ottawa (even though Canada opposed BMD)."<sup>170</sup>

Canada's rejection of BMD systems raised serious questions about how NORAD could be fully integrated into a U.S. early warning and missile interception network. Should Canadian commanders at NORAD contribute to BMD command and control? Must the U.S. act to defend Canadian cities using technology its leadership opposes? In 2008, NORAD/NORTHCOM Commander, General Gene Renuart, clarified NORAD's position when he announced the command would share BMD early warning information with his Canadian Deputy Commander.<sup>171</sup> It remains unclear, however, how cooperation will evolve as U.S. BMD systems mature, the Obama Administration clarifies its position on national BMD, and Canada's positions evolve. Moreover, recent Russian reaction to U.S. plans for regional BMD deployments are likely to enflame internal and international discussions in the near term.

In the years following the September 11, 2001 terrorist attacks, NORAD experienced a fundamental erosion of authority. The establishment of overlapping national security organizations (NORTHCOM, Canada COM, STRATCOM) and the creation of new domestic agencies (Department of Homeland Security in the United States, Public Safety and Emergency Preparedness Canada) indicated NORAD's chief area of responsibility had been practically diminished. Canadian Lt. Gen. Eric Findley, the former Deputy Commander of NORAD, speculated that NORAD might one day be entirely absorbed into some other security arrangement. "I can see Northern Command, Canada Command and NORAD all becoming one," he told reporters.<sup>172</sup> Currently, the head of NORTHCOM also leads NORAD, and operates out of the same command headquarters in Peterson Air Force Base, Colorado.<sup>173</sup> NORAD's former complex in Cheyenne Mountain is simply maintained as an alternate command center and training site.<sup>174</sup>

While NORAD's main purpose has been diluted by competing civil and military commands performing similar missions, the tempo of its aerospace warning and interdiction operations has increased dramatically. Since 9/11, the command has turned

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<sup>170</sup> James Brooke, "Greenlanders Wary of a New Role in U.S. Defenses," *The New York Times*, September 18, 2000, available at <[www.nytimes.com/2000/09/18/world/18GREE.html?pagewanted=all](http://www.nytimes.com/2000/09/18/world/18GREE.html?pagewanted=all)>; See also the article on the March 2005 snubs from Bush administration following Canada's rejection of BMD, Doug Struck, "U.S.-Canada Relations Seen Growing Chilly," *The Washington Post*, March 4, 2005, A17.

<sup>171</sup> The Ottawa Citizen, "Canada Kept in Loop at NORAD About All Missile threats," *The Canada.com Network*, April 10, 2008, available at <[www.canada.com/ottawacitizen/news/story.html?id=7171bab0-8434-41e2-b9a6-3f5b8470e568](http://www.canada.com/ottawacitizen/news/story.html?id=7171bab0-8434-41e2-b9a6-3f5b8470e568)>.

<sup>172</sup> Bruce Finley, "Fate of Defense Post Iffy," *The Denver Post*, June 11, 2008, available at <[www.denverpost.com/northcom/ci\\_3503161](http://www.denverpost.com/northcom/ci_3503161)>.

<sup>173</sup> Gail Braymen, "NORAD, NorthCom Open Integrated Command Center," *American Forces Press Service*, May 14, 2008, available at <[www.defenselink.mil/news/newsarticle.aspx?id=49865](http://www.defenselink.mil/news/newsarticle.aspx?id=49865)>.

<sup>174</sup> "Cheyenne Mountain Complex," *NORAD, Homepage*, available at <[www.norad.mil/about/cmoc.html](http://www.norad.mil/about/cmoc.html)>.

its attention to potential threats originating from within the domestic United States. Networked with the Federal Aviation Administration, NORAD now tracks passenger airplanes in an ongoing operation called, “Noble Eagle,” that scrambles jet fighter interceptors to investigate suspicious activity tens of thousands of times at a total cost of more than \$28 billion.<sup>175</sup>

NORAD’s operational tempo has increased in the Arctic as well, where the Russian Federation has resumed TU-95 strategic bomber patrols near American airspace after roughly 15 years of inactivity. The missions were “permanently” reinstated in August 2007,<sup>176</sup> and by the end of the year, NORAD fighter jets had scrambled 46 times and recorded 18 Russian incursions.<sup>177</sup> “They didn’t do it to practice alone,” observed Colonel Andre Dupuis, a Canadian NORAD official, “They’re making a point.”<sup>178</sup> By 2012, NORAD officials had reported a total of 54 incursions; more than double the total number recorded since the end of the Cold War (1991).<sup>179</sup>

In 2006, NORAD’s operations also expanded beyond its traditional air surveillance and interdiction mission to include a complex new maritime warning assignment. The command’s additional responsibilities require it to “develop a comprehensive shared understanding of maritime activities to better identify potential maritime threats to North American security.”<sup>180</sup> Most maritime “players” are civilian rather than military, and it remains unclear how NORAD plans to incorporate untested Maritime Domain Awareness (MDA) tools across the profusion of commercial, security, and interagency communities.<sup>181</sup> Indeed, the concept of comprehensive MDA presents a daunting array of virtually unprecedented challenges. “The lack of standardized data, analytic tools, and data-sharing methodologies...among our maritime partners complicates the correlation process,” observed General Victor “Gene” Renuart, Commander of

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<sup>175</sup> Source for patrols: Victor E. Renuart, Jr *Statement Before the House Armed Services Committee Subcommittee on Terrorism, Unconventional Threats and Capabilities*, United States House of Representatives, House Armed Services Committee, 110<sup>th</sup> Congress, March 5, 2008, available at <[http://armedservices.house.gov/pdfs/TUTC030508/Renuart\\_Testimony030508.pdf](http://armedservices.house.gov/pdfs/TUTC030508/Renuart_Testimony030508.pdf)>; Source for cost: Amy Belasco, *The Cost of Iraq, Afghanistan, and Other Global War on Terror Operations Since 9/11* (Washington, DC: Congressional Research Service, July 14, 2008).

<sup>176</sup> “Russia Restores Soviet-Era Strategic Bomber Patrols,” *RIA Novosti*, August, 17, 2007, available at <<http://en.rian.ru/russia/20070817/72189719.html>>.

<sup>177</sup> Bruce Finley, “Russian-Bomber Flights Alarm NORAD,” *The Denver Post*, March 11, 2008, available at <[www.dispatch.com/content/stories/national\\_world/2008/03/11/norad.html](http://www.dispatch.com/content/stories/national_world/2008/03/11/norad.html)>; Rowan Scarborough, “Russian Flights Smack of Cold War: U.S. fighters ID bombers near Alaska,” *The Washington Times*, June 26, 2008, available at <[www.washingtontimes.com/news/2008/jun/26/russian-flights-smack-of-cold-war/?page=all](http://www.washingtontimes.com/news/2008/jun/26/russian-flights-smack-of-cold-war/?page=all)>

<sup>178</sup> Adrian Blomfield, “Moscow 'Unmasks' MI6 Spy,” *The Daily Telegraph*, August 16, 2007, available at <[www.telegraph.co.uk/news/worldnews/1560491/Moscow-unmasks-MI6-spy.html](http://www.telegraph.co.uk/news/worldnews/1560491/Moscow-unmasks-MI6-spy.html)>.

<sup>179</sup> NORAD Public Interview with Authors, June 7, 2012.

<sup>180</sup> *Agreement Between the Government of Canada and the Government of the United States of America on the North American Aerospace Defense Command*, April 28, 2006, available at <[www.treaty-accord.gc.ca/ViewTreaty.asp?Treaty\\_ID=105060](http://www.treaty-accord.gc.ca/ViewTreaty.asp?Treaty_ID=105060)>.

<sup>181</sup> Emelie Rutherford, “NORAD, NORTHCOM Leader Cites Challenges with Maritime Warning Role,” *Defense Daily*, August 21, 2008, available at <[www.defensedaily.com/publications/dd/NORAD-NORTHCOM-Leader-Cites-Challenges-With-Maritime-Warning-Role\\_3726.html](http://www.defensedaily.com/publications/dd/NORAD-NORTHCOM-Leader-Cites-Challenges-With-Maritime-Warning-Role_3726.html)>.

NORTHCOM/NORAD in 2008.<sup>182</sup> NORAD’s comprehensive maritime tracking system is clearly in the early stages of development, and will require significant innovations in technology, interagency coordination, international and tribal cooperation, and public-private partnerships. According to a U.S. Defense Department Arctic operations assessment submitted to Congress in 2011, “The ability to locate, identify, and track surface vessels in the Arctic today is limited, and depends in part on collaboration with partner nations and use of commercial assets. This gap will likely remain significant through the time period of this analysis (through the year 2030), based on projected investments over the Future Years Defense Plan (FYDP).”<sup>183</sup>

### **The Future of Naval and other Military Operations**

The U.S. Navy was not poised to operate in the Arctic in the first years of the 21<sup>st</sup> century and, until 2009, had few if any plans to address the expanding missions previously distributed among the USCG and three U.S. Combatant Commands ((EUCOM, PACOM, NORTHCOM) that met at the Pole.<sup>184</sup> In April, 2011, a new Unified Command Plan shifted responsibilities among the COCOMS, relieving PACOM of its Arctic area of responsibility and narrowing the number of COCOMs to two, with NORTHCOM assuming the lead. A key issue for command authorities will be defining NORTHCOM’s practical role as chief Arctic “advocate” and reconciling its perceived duties with the more established EUCOM. Coordination challenges are likely to remain complex and fraught with fiscal, bureaucratic, and cultural complexities.

Traditional polar tactics, technology, and strategy will be unreliable future guides for military operations in a thawing Arctic. Global warming is fundamentally altering the maritime ‘rules of the road,’ and the effect on U.S. naval operations in the region is likely to grow increasingly pronounced over the next several decades.

Submarine operations in the thawing Arctic will not resemble the Cold War battleground in which nuclear powered ships concealed themselves under thick sheets of ice. The seasonal disappearance of the region’s ice canopy will leave fewer havens and a noisier underwater environment suffused with ambient noise and wind generated waves. As the quiet, echoing Arctic of the past degrades the range and operation of sonar—used for navigation and weapons systems—will more closely resemble temperate climes.<sup>185</sup> Changing environmental conditions are likely to make strategic submarine forces in the region increasingly vulnerable, something that should greatly concern U.S. submariners.

Surface ships will also be expanding their queue of tasks in a widening area of operations. The deterioration of the American polar icebreaking fleet is predicted to open key capability gaps for the U.S. Coast Guard that negatively impact nearly all of its

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<sup>182</sup> Victor E. Renuart, Jr., and Dane S. Egli, “Closing The Capability Gap: Developing New Solutions to Counter Maritime Threats,” *National War College Review* 61, no. 2 (Spring 2008), 19.

<sup>183</sup> *Report to Congress on Arctic Operations and the Northwest Passage* (Washington, DC: Department of Defense, May 2011), 14.

<sup>184</sup> The Navy lacks any double-hulled surface vessels capable of operating in the region, which is not traditional blue water.

<sup>185</sup> Garrett W. Brass, *The Arctic Ocean and Climate Change: A Scenario for the US Navy* (Suitland, MD: National Ice Center, 2002), accessed at <[www.natice.noaa.gov/icefree/NavyArcticPanel.pdf](http://www.natice.noaa.gov/icefree/NavyArcticPanel.pdf)>.

critical missions in the region (see Figure ? below). An official analysis prepared for the agency in 2010 predicted the USCG will be unable to fulfill its statutory obligations without committing to significant—and highly unlikely—new investments.<sup>186</sup> A more recent *Department of Homeland Security (Office of Inspector General)* audit broadened the impact of gaps in U.S. ice-breaker capabilities, asserting that serious deficits are already being felt among agencies as diverse as NASA, National Oceanic and Atmospheric Administration, National Science Foundation, and the Department of Defense.

**The Arctic Poses a Complex Operational Challenge for U.S. Security Operations**

- U.S. Executive Order 13175 mandates consultation and coordination with Indian tribes on a government-to-government basis. Alaska has 229 federally recognized American Indian tribes which exercise sovereign powers over their members and territory.
- Two U.S. Component Commands, Northern Command (NORTHCOM) and European Command (EUCOM) are assigned to the Arctic and operate alongside the U.S. Coast Guard (Department of Homeland Security). NORTHCOM is assigned “advocacy responsibility” for the region.
- Four of the five Arctic states- Canada, Denmark, Norway, Russia, and the United States- have unresolved territorial disputes in the Arctic.
- The international status of two developing maritime passages (Northwest Passage, Northern Sea Route) remains unresolved.

The DOD has been criticized for its sluggish response to projected capability shortfalls in the Arctic that affect four of the Department’s nine Arctic mission areas; maritime domain awareness, sea control, maritime security, and search and rescue. Nevertheless, the Department’s position has generally been that the regions low threat environment makes investment in ice-breakers, deep water ports, and other supporting infrastructure unnecessary for the foreseeable future. In official assessments to Congress, DOD has asserted its existing missions have not been compromised, reporting, “With the low potential for armed conflict in the region in the foreseeable future, the existing defense infrastructure (e.g., bases, ports, and airfields) is adequate to meet near-to mid-term U.S. national security needs.”<sup>187</sup>

Paradoxically, some officials have stated DOD has not yet conducted a mature review of its Arctic requirements, undermining the Department’s assessments.<sup>188</sup> All this suggests the Arctic remains a low priority for the DOD. “It is unclear,” summarized one Government Accountability Office study, “Whether DOD will be in a position to provide needed capabilities in a timely and efficient manner...(because it) has not yet evaluated, selected, or implemented alternatives for prioritizing and addressing near-term Arctic capability needs.”<sup>189</sup> Currently, the U.S. Navy has no ice-hardened surface ships capable of conducting operations in the Arctic.

<sup>186</sup> ABS Consulting, Potomac Wave Consulting, and Systems Planning and Analysis Inc, *United States Coast Guard High Latitude Study Mission Analysis Report Capstone Summary*, prepared for the United States Coast Guard, July 2010, 10.

<sup>187</sup> *Report to Congress on Arctic Operations and the Northwest Passage* (Washington, D.C.: Department of Defense, May 2011), 25.

<sup>188</sup> *Arctic Capabilities: DoD Addressed Many Specified Reporting Elements in its 2011 Arctic Report but Should Take Steps to Meet near and Long-term Needs*, GAO-12-180 (Washington, DC: Government Accountability Office, January 2012), 14.

<sup>189</sup> *DOD Addressed Many Specified Reporting Elements in Its 2011 Arctic Report but Should Take Steps to Meet Near- and Long-term Needs*, GAO-12-180 (Washington, DC: Government Accountability Office, January 13, 2012), 14.

## Part 3. Concluding Remarks

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Something important is happening in the Arctic, and the United States has been neither sufficiently attentive nor equipped to meet the new challenges. American shortfalls compare unfavorably with the commitment other Arctic coastal states and members of the Arctic Council have demonstrated, most notably Russia.

Definitive scientific evidence indicates climate change is affecting the Arctic more dramatically than other parts of the globe. The most visible evidence of this is the rapid shrinking of the “permanent” ice that once defined much of the Arctic landscape. This melting is opening the Arctic for economic development—principally but not limited to energy resources, particularly oil and natural gas. Reasonable estimates point to recoverable amounts that would extend these global fossil fuel supplies another 10-15 years.

Equally important are emerging new transportation routes—the familiar Northwest Passage, a similar Northeast passage above Siberia, and even a possible Trans-Polar Route. These cut in half the distance between many current principal routes. This could potentially provide billions in extra revenue to multiple countries, save time and money on transportation costs. Simultaneously, they also provide a new security problem to be dealt with.

Since Congress has not ratified the UN Convention on the Law of the Sea, the United States cannot participate in one of the most important legal frameworks available for adjudicating the exercise of sovereign jurisdiction and participating in institutions of Arctic governance.

Finally, the sea services are not well-positioned to advance and defend U.S. interests in the Arctic. The U.S. Navy passed this mission to the U.S. Coast Guard years ago and showed no interest in re-claiming a serious role for several decades. It was not until 2009 that the U.S. Navy responded with some sense of urgency with its Arctic Road Map. The Coast Guard today effectively plays with a weak hand; the *Healy*, a modern but unarmed icebreaker, two older generation icebreakers not currently active, and one for St. Lawrence Seaway and the Great Lakes operations. The fleet lacks doubled hulling and other protective measures for safe operations—and the lead time to build a force is 10-20 years. Moreover, the current budget environment will complicate efforts to make the resource commitment necessary to transform the U.S. Navy into an effective force in the Arctic.

Summarizing the situation before a congressional subcommittee in December 2011, Admiral Jeffrey M. Garret, former commander of the 13<sup>th</sup> Coast Guard District, observed, “The most critical-and effective capability the Coast Guard could apply to its expanding Arctic responsibilities is largely missing from the scene...(and the) consequences of icebreaker disinvestment are beginning to emerge...When *Healy* is engaged in dedicated science support, or undergoing maintenance, the Coast Guard has no polar icebreakers for



other Arctic or Antarctic missions or contingencies.”<sup>190</sup> Despite a new focus on the dearth of needed icebreakers, it seems highly unlikely the U.S. can design and construct new ships within the next decade. Policymakers must anticipate the gap between surface capabilities and mission requirements in the region to widen.<sup>191</sup>

The future of U.S. security operations in the Arctic will also depend on how the region’s governing-institutional structures evolve. Will its transition from a relatively barren, frontier to a rich, accessible territory segmented by porous borders lead to international conflict, or cooperation? In a widely quoted report, Arctic Council researchers graphically outlined four possible scenarios, basing their political forecasts on the global demand for Arctic resources and willingness for states to engage in collaborative, rules-based action.<sup>192</sup> The range of potential scenarios - from highly competitive to highly cooperative - illustrates the degree of uncertainty which surrounds the region’s political future.

All possible outcomes, however, will require the U.S. Department of Defense (DOD) to coordinate with a patchwork of territorial, environmental, and regulatory considerations which constrain maritime and aviation missions in the region. Operationally, the United States will need to master the ability to coordinate its activities among a broad range of state, civil, tribal, security and commercial organizations.

Whatever the causes of global warming, its effect on U.S. national security in the northern latitudes represents a serious challenge to American resources and resolve. Thad Allen, former Commandant of the Coast Guard, pragmatically summarized the situation for the U.S. when he observed, “All I know is, there is water where there didn’t used to be, and I’m responsible for dealing with that. I think we’re at a crisis point on making a decision.”<sup>193</sup>

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<sup>190</sup> Jeffrey M. Garrett, *Protecting U.S. Sovereignty: Coast Guard Operations in the Arctic*, Testimony to the House Subcommittee on Coast Guard and Maritime Transportation, U.S. House of Representatives, 112<sup>th</sup> Congress, December 1, 2011, available at <<http://republicans.transportation.house.gov/Media/file/TestimonyCGMT/2011-12-1-Garrett.pdf>>.

<sup>191</sup> “The Future of Arctic Marine Navigation in Mid-Century: Arctic Marine Shipping Assessment of the Arctic Council’s Protection of the Arctic Marine Environment Working Group,” *Global Business Network*, March 2008, available at <<http://arctic-council.org/filearchive/AMSA%20Scenarios%20of%20the%20Future%20-%20Narratives%20Report.pdf>>.

<sup>192</sup> “Arctic Marine Shipping Assessment: Scenarios of the Future,” *Global Business Network*, March 2008, 3, available at <[www.institutenorth.org/assets/images/uploads/articles/AMSA\\_Scenarios\\_Brochure.pdf](http://www.institutenorth.org/assets/images/uploads/articles/AMSA_Scenarios_Brochure.pdf)>.

<sup>193</sup> Andrew C. Revkin, “A Push to Increase Icebreakers in the Arctic,” *The New York Times*, August 16, 2008, available at <[www.nytimes.com/2008/08/17/world/europe/17arctic.html?\\_r=0](http://www.nytimes.com/2008/08/17/world/europe/17arctic.html?_r=0)>.