

Cryo-politics: Environmental Security and the Future of Arctic Navigation

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THE EMERGENT GEOPOLITICS OF ARCTIC navigation revolve around three fundamental sets of issues: international interests in Arctic mineral resources, changing sea-ice patterns in response to climate change, and the environmental security of Arctic peoples. As the leaders of the world's developed and developing economies search for secure alternatives to Middle East transport routes, the Arctic is shedding its cold war associations and is now increasingly perceived as a viable and politically relevant transportation environment. Since the cold war, our understanding of human security has broadened beyond strictly military thinking to incorporate a range of other political and environmental issues. In this context the Arctic is no longer a mere buffer zone between the superpowers, but a complex and valuable region in its own right.¹ In this article I set out to examine this complexity and explore what we might expect over the next several decades from the changing meaning and relevance of Arctic navigation.

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The dominant paradigm for framing Arctic security is climate science. With so much attention recently focused on the thresholds of demonstration and proof necessary to establish anthropogenically-induced global warming as scientific fact, speculation about new opportunities for shipping routes is couched in terms of the discourse of the changing climate. Unsurprisingly, the scientific tools used to predict new transportation opportunities overlap closely with those tracking the diminishing annual concentrations of sea ice. While few dispute the hazards of global climate change, melting Arctic sea ice may in fact have the benefit of improving navigation in Arctic waters: the season may

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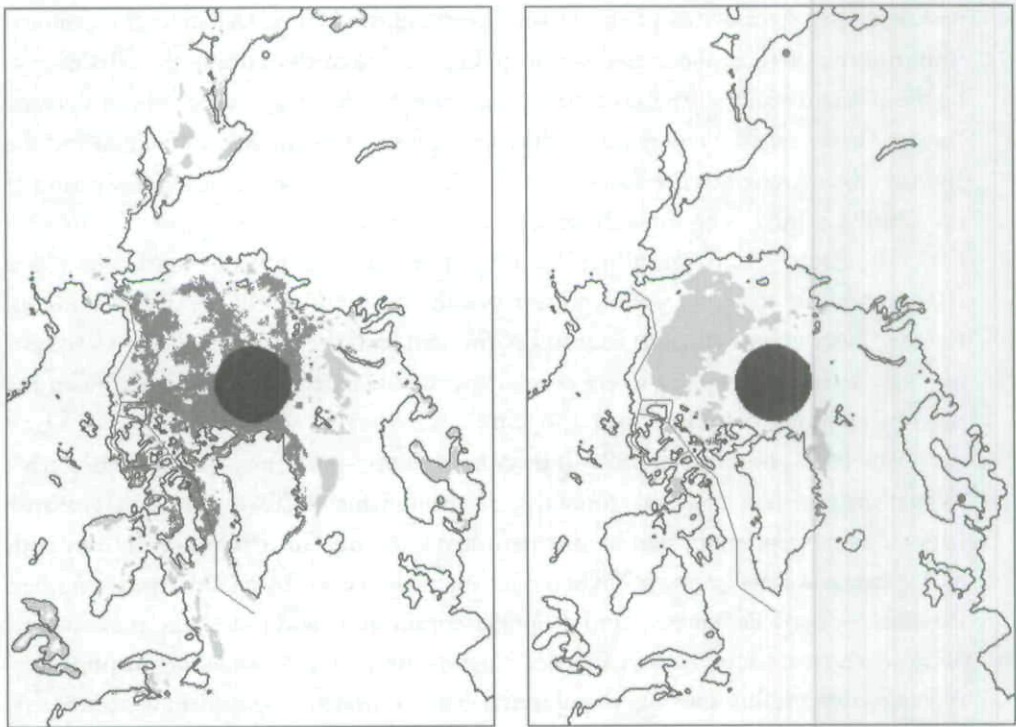
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be longer, the waters safer, the economic potential greater, and G8 security enhanced. While these optimistic forecasts are partially grounded in the scientific facts of climate change, they assume an unwarranted environmental determinism. There is more to twenty-first century Arctic politics than melting ice, navigable sea routes, and *mare liberum*, the freedom of the seas.

Anyone seeking to understand the future of Arctic navigation should start with the *Arctic Climate Impact Assessment*.² This scientific report, comprising eighteen densely analytic chapters, has an accompanying policy document outlining 10 key findings. Among the most notable results are that the "Arctic climate is now warming rapidly and much larger changes are projected . . ." and that "reduced sea ice is very likely to increase marine transport and access to resources."³ The study of sea ice is one area where geophysics has progressed rapidly: our understanding of the basic processes of sea ice formation, melting, and movement are now reasonably advanced.⁴ The technologies for mapping sea ice using satellites are sufficient to distinguish ice from water over large areas, and submarines equipped with radars offer reliable measurements of ice thickness from below. Even accounting for the margin of error inherent in mapping the changing location and varying thickness of sea ice across the entire Arctic basin, a substantial reduction in Arctic sea ice has already been observed over the past twenty years.

206 Experts in geocryology—the science of frozen states of earth matter—conclude that the effect of the warming atmosphere on sea ice is non-linear: as the total area of sea ice is reduced, less sunlight is reflected back into the atmosphere, which accelerates global warming and accordingly, the melting of ice. If we think of Arctic navigation as applied ice science, then the following three facts tell most of the story about the Arctic as a whole: the polar sea ice is thinning quickly, sea ice coverage as a percentage of the total surface of the polar basin is diminishing quickly though unevenly, and the number of ice-free navigation days is increasing. However, the complete picture is much more complex, as what is true for the Arctic as an aggregate may not necessarily be true in all parts of the Arctic individually. My colleague Gareth Rees and I have collaborated on an analysis of passive microwave data from Cavalieri, et al. on the Northwest Passage, as an example of this complexity.⁵

As a whole, the Arctic shows unambiguous, highly significant downward trends in total ice-covered area in both winter and summer. But, the trends are complex and not spatially uniform. The maps below show trends in sea-ice concentration from 1979 to 2004, separated into winter (left) and summer (right). Dark gray represents increasing ice and light gray represents decrease. The black circles correspond to areas from which satellite data could not be collected throughout the period investigated, and the thin lines to three variants of the Northwest Passage.



In the winter, a complex pattern of trends is apparent, with some areas paradoxically showing increasing ice concentration over time. In summer the situation is simpler, since the trend in all areas where it is statistically significant is in the direction of decreasing ice concentrations.

As shown in our maps, the route of the Northwest Passage largely avoids those regions of the Arctic Ocean in which significant trends in ice cover are observed. Further analysis of the passive microwave satellite data shows that although the average ice concentration along the Northwest Passage decreases every month of the year, the trend has low significance during the months of August and September—just when the ice concentration is lowest and hence when the Northwest Passage is most feasible for navigation. Thus although one may say that the data suggest that the summer navigability of the Northwest Passage is increasing, the statement can't be made with much confidence. The downward trends in other months, particularly April to July, have greater statistical significance but the ice concentrations in these months are still too high for effective navigability.⁶

Since public perceptions of sea-ice loss in the Northwest Passage are not entirely in accordance with the actual physical trends revealed in our analysis, we need to move beyond the current preoccupation with physical explanations alone to understand the importance of ice within geopolitical discourse about changing Arctic security. My

colleague and I term this phenomenon "cryo-politics." To understand the political importance as well as the limits of cryo-politics, we need to examine the relationship between science and governance. Take, for example, the origin of the *Arctic Climate Impact Assessment*. The report was jointly commissioned by the Arctic Council and the International Arctic Science Committee (IASC) at the Barrow Ministerial Meeting of the Arctic Council in October 2000.

The Arctic Council is a high-level intergovernmental forum founded in 1996. Its members are the eight sovereign states of the Arctic: Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States. In addition to these nations there are also six permanent members representing circumpolar indigenous political organizations.

The IASC, founded in 1991, is by contrast a non-governmental organization affiliated with the International Council of Scientific Unions (ICSU). It has 18 member nations whose representatives are distinguished scientists "bringing together physical, biological, and social sciences." When selecting projects, the IASC aims to "strengthen the dialogue between scientists and the policy community" and to address "the concerns of those who live in and near the Arctic."⁷ It contributes to policy-making by providing expert knowledge, but stays out of political debates. This may help explain why the *Arctic Climate Impact Assessment* is structured in terms of physical causes and social impacts. Member nations' social obligations are defined as mitigation (prevention) or adaptation (response) to the impacts of climate change. In this neo-Larmarckian framework, economic activity such as Arctic shipping is classified as an adaptive response to an environmental change, an ecological opportunity with inherent dangers and rewards. The IASC recommends to Arctic Council Ministers that they advise member states to:

*Recognize that opportunities related to climate change, such as increased navigability of sea routes and access to resources, should be developed and managed in a sustainable manner, including through the consideration of environmental and social impacts and taking appropriate measures to protect the environment, local residents and communities.*⁸

The *Arctic Climate Impact Assessment* demonstrates the prevalence and importance of cryo-politics. The Northern Sea Route over the north of Russia has been open since 1991, providing a route from the Atlantic to the Pacific that is 40 percent shorter than via the Suez Canal.⁹ There is increasing speculation that diminished sea ice coverage in the Northwest Passage of the Canadian Arctic archipelago could lead to faster transportation, but may make shipping more dangerous and less viable. This shows that sea ice coverage alone is not an index of future shipping. Even if a new conduit between continents represents more wishful thinking than practical planning, the prospect of

growth in regional shipping is much more realistic. For example, Russian icebreakers can keep shipping lanes open between the North Atlantic Ocean and the White Sea. Also, in the Northwest Passage, it is the variable behavior of ice rather than the actual rate of its melting that may prove decisive, but even if the Northwest Passage is not viable, those same seas may soon serve a growing demand to transport minerals such as diamonds and gold from new northern mining ports to southern markets.

Just as global changes have local and regional impacts, the reverse is also true. Recent environmental politics surrounding the Alaska National Wildlife Refuge (ANWR) for example, teach us that regional environmental issues have global impacts. Although the people who have actually seen the caribou herd probably number in the tens of thousands, the number of readers able to follow the debate through media, conservation

magazines, investment reports, and debates in Congress number in the millions. Even if relatively few people can give a detailed account of the debate, the label ANWR resonates with unusual power for an awkward

acronym. It now epitomizes the struggle between an alliance of oil and gas interests on the one hand, and conservationists on the other.

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Beneath the surface of twenty-first century Arctic geopolitics, we can anticipate vociferous indigenous participation in debates about environmental and economic security. Like ANWR, these debates will resonate well beyond state institutions, as the connectivity associated with globalization links local events to regional and global markets.¹⁰ Environmental disasters like oil spills will be reported and viewed in real-time in boardrooms and homes around the world. There is no better example than the oil tanker *USS Exxon Valdez* in 1989 breaking up in Prince William Sound off the coast of Alaska of how an environmental disaster can become a permanent public marker of the environmental risks facing these fragile ecosystems. Only 15 years later, advances in satellite and aerial monitoring technologies would today ensure much more graphic and penetrating coverage of such an event. There is therefore a strong likelihood that the seemingly unglamorous subject of Arctic mining and transport will contribute new unforgettable names like *Exxon Valdez* and ANWR to the international language of environmental debates. If ANWR is a contested environmental brand, what equivalent label might emerge to signify a looming battle between transportation interests and marine ecology along the Arctic's continental shelves? Will the next *USS Exxon Valdez* be remembered by the ship's name or the environmental habitat? As melting sea ice eventually enables new Arctic shipping routes, the corresponding environmental politics will be more complex and less predictable.

Another important way to transcend environmental determinism in thinking about the future of Arctic navigation is to consider historical context. The current headlines about melting polar ice and anxiety about our global climate are only the latest chapter in the much older story of the impact of ice on navigation and trade. The international scientific project behind our knowledge of climate is approximately 200 years old.

For as long as Arctic research has been conducted, its findings have shaped public debate. When grain failed to ripen across large areas of North America and Europe in 1816—we now know this corresponded to a “Little Ice Age” event—leading research schools hotly and publicly debated over the role of polar ice as the primary cause.¹¹ Today, the importance of polar sea ice in the global climate system and its feedback mechanisms is by comparison hardly contested at all in the scientific community. Debates are now far more about the timing and positioning of political decisions required to manage unprecedented carbon emission levels and to create mechanisms to share responsibility between nations equitably. Historically though, the region has been discussed almost exclusively in terms of northern countries’ national interests. Scientific platforms like field camps and laboratories served their nations as micro-rituals, helping to secure possession. Consequently, the canon of historical accounts of the Arctic, written within segregated national traditions, is exploration-centered and neglects many other important historical forces and connections.

What do these historical nuances tell us about the Arctic in the twenty-first century? Beneath the surface of geopolitics and perennial Canadian–U.S. sensitivities about Arctic sovereignty, we can anticipate unprecedented, vociferous indigenous and settler participation in debates about environmental and economic security. Like ANWR, these debates will resonate well beyond state institutions and will galvanize opinion across a range of human rights and conservation constituencies. If the current trend of information technology restructuring the media persists in the direction of meeting the

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demands of smaller, more specialized markets, the diverse public and NGO constituencies who have a stake in monitoring the condition of the Arctic environment will have near-instant access to information of a quality that scientists now only dream of. If nanotechnology fulfils its promise in terms comparable to

the revolution in silicon-based semiconductors, demand for accessing and managing knowledge about distant environments may intensify. The arrival of weather events like Hurricane Katrina striking American coastal cities will soon be watched in real-time in boardrooms and homes around the world.

As citizens, we may be on the verge of rediscovering our obligations as stewards to the world's oceans in terms that force us to rethink personal responsibility and accountability for the global commons. Yet the spotlight of environmental research, monitoring, and debate will continue to fall on the Arctic. As one of the most sensitive indicators of the health of the planet as a whole, it will maintain its role in public debate for the foreseeable future.

The experience of the Inuit also helps contextualize current developments in the Arctic, and might help indicate what is to come. The Arctic captured public imaginations not long ago when Greenpeace disseminated jarring photographs of Newfoundland seal pups being clubbed to death as part of a campaign to ban the seal fur trade. As a result, the mainstay of the Inuit economy, the traditional fur trade in seal pelts, was dismantled by a European ban on the importation of seal furs in 1983. Though the Inuit never clubbed seals and Greenpeace eventually apologized (but without an offer of compensation), the Inuit lost their best opportunity to industrialize their traditional subsistence skills; their experience showed the behavior of their distant markets to be complex—even fickle. They faced an unenviable choice: they would either have to depend on large-scale mineral extraction on their territories for labor and royalties or rely on government transfer payments. This taught the Inuit two key lessons about their survival in a globalizing world. First, they would need to exercise maximum control over representations of the Arctic landscape, their way of life, and public perceptions of tradition. Second, they could, on some issues, choose to bypass the federal government, and instead reach international audiences by working through transnational institutions.

The Inuit Circumpolar Conference (ICC, f.1977), a pan-Inuit political organization whose leadership rotates every two years, has an impressive record of effectively solving problems and publicizing environmental issues. The best known success has been its battle to reduce the level of persistent organic pollutants (POPs) that originate from distant southern parts of the world.

Following atmospheric wind flows, the Arctic Monitoring and Assessment Programme states that “these compounds accumulate in Arctic environments and ecosystems, in some cases reaching very high concentrations in biota and humans.”¹² As the contaminants move up the food web from one chain to another their concentration increases, a process scientists term “bioaccumulation” or “biomagnification.” By the time the toxins enter the human food chain, their levels in Inuit mothers’ milk are dangerously high.¹³ Seeking a creative response, the Inuit worked with international institutions to take analyses of trace isotope content to the sources of the contaminants, and mediated reductions without the intervention of states. Since then, they have also participated in negotiations for the 2001 Stockholm Convention on Persistent Organic

Pollutants.¹⁴

In a new and telling chapter in cryo-politics, the Inuit Circumpolar Conference has explicitly linked the loss of Arctic sea ice to the U. S. government's refusal to ratify the Kyoto Protocol by filing a petition against it at the Inter-American Commission of Human Rights (IACHR) stating:

Inuit villages have been badly damaged by the retreat of sea ice and thawing of permafrost caused by global warming As sea ice retreats and ecosystems shift, access to vital resources becomes more and more difficult. Weather becomes unpredictable and the ice itself becomes hard to read, even for the most experienced hunters. To gather the resources they need, hunters must increasingly put their own safety at risk.¹⁵

The petition is the result of a collaboration between the Inuit Circumpolar Conference the Center for International Environmental Law (CIEL), and Earthjustice, a non-public interest, environmental law NGO. The petition asks the Inter-American Commission on Human Rights to investigate the harm caused to the Inuit by global warming, and to declare the United States "in violation of rights affirmed in the 1948 American Declaration of the Rights and Duties of Man and other instruments of international law." This reads like a David and Goliath story. Although a decision from the IAHRC linking climate change to human rights would not be legally binding, it would "prepare a report with recommendations and a deadline by which the United States must report on the measures adopted to comply."

What might be the repercussions given that the U.S. government would presumably treat the petition with considerable skepticism? The significance lies in the creativity of the ICC in taking a step towards making global warming an indigenous human rights issue. The ICC believes that the "moral and political force" of a judgment "finding that climate change results in human rights violations would help bring a rights-based approach to climate change discussions." This "likely would encourage the parties to negotiate a solution," raise public awareness concerning the human rights implications of climate change, and provide governments and individuals with a valuable case to cite in future debates. However this is played out in practice, the petition illustrates how indigenous groups are able to pursue cryo-politics in different public spheres with considerable sophistication.

Indigenous peoples will likely take a range of positions on new Arctic shipping opportunities, with aggressive development at one end of the spectrum and fortress conservation at the other. Some groups will embrace the prospect of economic development—jobs, royalties, infrastructure. Attitudes toward technological development and industry roughly follow an ethnogeographical gradient between Alaska and Greenland. Indigenous groups in the western Arctic, situated closer to oil and gas reserves (around


Tuktoyuktuk, for example), have in recent years shown strong signs of wanting to involve themselves in the petroleum, gas, and mining industries. Further to the east, communities, though in many respects "techno-philic," are not situated near major oil or gas fields, and accordingly have more cautious attitudes toward the extractive industries. That may change, however, if mining companies show interest in investing in port facilities in a northern town on the Atlantic coast. Quite plausibly, the Canadian Federal Government may select Iqaluit, the capital of Nunavut, to become the Atlantic gateway to the North American Arctic.¹⁶ Besides signifying major changes to the physical landscape of the largest town in Nunavut, that decision could change the economic geography of Nunavut by bringing in external investment. The balance of interests between subsistence marine mammal hunting and industrial development remains strongly rooted in traditional subsistence for the time being. Mineral extraction will not automatically yield a tax base for Nunavut's economy, so some will oppose the merits of this form of economic development, even if the current status quo of federal subsidies is the only serious alternative.

The construction of a northern port could bring northern settlements as many problems as it could solve. For a start, the Alaska Native Claims Settlement Act (ANCSA) and the Canadian Land Claims settlements defined native title in terms of ownership and rights over packages of land, not the sea. This might seem odd given that the Inuit are a maritime culture whose subsistence through much of the year depends upon hunting marine mammals from the edge of the ice floe or from boats in the open sea. Maritime rights were to some extent negotiated in the Nunavut Land Claim Agreement (NLCA) through the establishment of joint federal-territorial management boards, but discussion of actual ownership of maritime resources was excluded from the agreement. Indigenous groups will therefore have very limited power to act as gatekeepers over use of shipping lanes and will probably have very little say alongside the more powerful federal state, which will control port facilities.

Port facilities could provide some limited employment, but they would more likely pose risks to the local ecosystems, and in particular the health of animal populations. Given the importance of fish, seal, walrus, and whale populations in the local food chains, shipping can be expected to indirectly affect indigenous food security. Press releases will quote Inuit Elders describing the taste of chemicals in the fish or meat, the behavior of frightened animals disturbed by shipping, and damage to coastal ecosystems. This is where indigenous groups may turn to the international stage to argue that the impact of shipping on their way of life constitutes a human rights issue that, in moral terms, is as important as legal arguments about freedom of navigation and sovereignty over internal waters. They may receive support from the ICC and environmental NGOs like the WWF, which increasingly recognize that sustainable livelihoods provide the

key to conservation and participatory development.

What does this tell us regarding the "big picture" prospects of future Arctic navigation? Reporting on Arctic shipping will for some time be couched in the language of physical determinism and geopolitics: will the changing patterns of sea ice thickness and distribution be the cause of a new era of Arctic shipping? Will sea routes be sufficiently viable to contribute to the security of the G8? What implications will this have for each nation's sovereignty over its northern waters? These will continue to be important questions, but the traditional geopolitics of shipping lanes will not monopolize debate in the public sphere to the same extent to which we have been accustomed. Photographs of ships in open Arctic waters are already starting to lose their poignancy. After all, the absence of sea ice can only make a visual impact as long as ice is expected. Images of the Inuit and marine mammals however provide a much richer and more durable visual vocabulary. Damage to the traditional indigenous practices of hunting marine mammals will take the spotlight. Governments, indigenous groups, and NGOs will undertake long-term monitoring of environmental damage, ensuring that the continuing long-term toxic effects resulting from accidents are observed, measured, visualized, and reported.

A larger group of interested stakeholders, including northern peoples and environmental groups, will define the debate in much more visceral terms around issues of environmental security, food security, and human rights. These stakeholders may form temporary or long-lasting coalitions around these issues, but they will not represent a single perspective. While some native groups will align their interests with those of large-scale economic development, others will see commercial shipping as a further consequence of the impact of global warming and melting ice. The Arctic will become an increasingly contested political ground, and arguments using evocative images of ships, pollution, and Arctic sea mammals will circulate and inform audiences around the world. 

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NOTES

1. *Arctic Human Development Report (AHDR)*, ed. N. Einarsson, J.N. Larsen, A. Nilsson, and O. R. Young (Akureyri, Iceland: Stefansson Arctic Institute, 2004).

2. ACIA, *Impacts of a Warming Arctic: Arctic Climate Impact Assessment* (Cambridge: Cambridge University Press, 2004), <http://www.acia.uaf.edu> (accessed 7 August 2006).

3. *Ibid.*, 10–11.

4. There are a range of measures of the maturity of scientific sub-disciplines such as journal impacts, learned society memberships, or prominence and frequency in journals like *Nature*. One measure of a subject's success is pedagogical. Textbooks about sea ice are a recent phenomenon. See for example Peter Wadhams, *Ice in the Ocean* (Australia: Gordon and Breach, 2000).
5. D. Cavalieri, C. Parkinson, P. Gloersen, and H.J. Zwally, *Sea Ice Concentrations from Nimbus-7 SMMR and DMSP SSM/I Passive Microwave Data, June to September 2001* (Boulder, CO: National Snow and Ice Data Center, 2005).
6. Similar remarks apply to the Northern Sea Route, although the trends are generally more significant for Russian Arctic waters than for those of Canada.
7. These IASC goals are cited from their project selection criteria in the *IASC Project Catalogue 2005*. Researchers are invited to propose to IASC for approval and funding multidisciplinary, international, collaborative projects that meet these criteria.
8. Fourth Arctic Council Ministerial Meeting Reykjavik, *ACIA Policy Document* (November 2004): 6.
9. ACIA, *Impacts of a Warming Arctic*, 83.
10. Manuel Castells, *The Information Age: Economy, Society and Culture* (Oxford: Blackwell, 1996).
11. For a history of Little Ice Age events, see Jean M. Grove, *Little Ice Ages: Ancient and Modern* (London: Routledge, 2004). The anxieties and arguments surrounding the cold summer of 1816 are discussed in Brian M. Fagan, *The Little Ice Age: How Climate Made History 1300-1850* (Boulder, CO: Basic Books, 2000).
12. "Factsheet: Persistent Organic Pollutants—Old and New," Arctic Monitoring and Assessment Programme (October 2002), <http://www.amap.no> (accessed 7 August 2006).
13. Ibid. Bioaccumulation and biomagnification have been documented by the Arctic Monitoring and Assessment Programme (AMAP).
14. A world map showing signatories and parties to the Stockholm Convention is available at <http://www.pops.int/documents/signature>.
15. "An Inuit Petition to the Inter-American Commission on Human Rights for Dangerous Impacts of Climate Change" (December 2004). The full petition is "Petition to the Inter American Commission on Human Rights seeking Relief from Violations Resulting from Global Warming caused by Acts and Omissions of the United States," *LACHR* 4 (December 2005).
16. The construction of an Arctic port has been actively discussed but Canada's current administration has yet to announce a formal plan or commitment.

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