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**SUB-COMMITTEE
ON
TRANSATLANTIC ECONOMIC RELATIONS**

**ARCTIC ECONOMIC OPPORTUNITIES,
ENVIRONMENTAL OBLIGATIONS AND SECURITY
STAKES**

REPORT

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I. INTRODUCTION: GLOBAL WARMING AND A TRANSFORMING ARCTIC

1. There is no universally accepted definition of the Arctic, and different institutions utilize different definitions. Geographically, the area can be defined as the region north of the Arctic Circle (66° 33'N), but there are also climatic definitions. One is based on the July isotherm – when the average temperature for the warmest month (July) is below 10 °C. Other definitions are based on the extent of permafrost or the distribution of vegetation. Socially and politically, the Arctic region includes eight Northern states: Canada, Russia, Denmark (Greenland), Norway, and the United States – all of which have coastlines bordering the Arctic Sea – as well as Sweden, Finland, and Iceland (United Nations Environment Programme, UNEP , 2012).

2. As a Canadian minister once said, the Arctic represents the global environment's "canary in a coal mine"; rapidly changing conditions there are essentially providing advance warning on the broader phenomenon of climate change and its real impact on the atmosphere, weather patterns, water, soil, flora, fauna and the very manner in which humans interact with the planet (Harrison, 2011). It has been surprising to some scientists that the Arctic has been the first region of the world to manifest in dramatic fashion the impact of climate change. Of course, this is partly an indication of the Arctic's sheer fragility, but it also could be a harbinger of things to come for more temperate regimes where climate change has heretofore been rather more subtle and subject to varying political and scientific interpretation. Change in the Arctic is far less ambiguous. Average temperatures in the region in recent decades have risen at roughly twice the rate of temperature increases for the world as a whole (US Environmental Protection Agency, 2007). According to projections by five models (1981–2000 baseline from the Arctic Climate Impact Assessment, ACIA the increase in mean annual temperature in the Arctic is significantly larger, 3.7 °C, compared to the global mean temperature increase of 1.9 °C (International Arctic Science Committee, 2010).

3. These changes, however, are not without global consequences. Rising temperatures in the High North have triggered rapid ice melt which is having a range of impacts on the region. The summer of 2012 marked an unprecedented degree of ice melt in the high north which scientist claim demand a revision of current thinking about climate change in the region. The Norwegian Polar Institute's Dr. Kim Holman, who met with members of this sub-committee in Svalbard suggests that "It is a greater change than we could even imagine 20 years ago, even 10 years ago. And it has taken us by surprise and we must adjust our understanding of the system and we must adjust our science and we must adjust our feelings for the nature around us." (Shukman, 2012) Coastal regions of the Arctic are currently suffering from rapid erosion as ice recedes, exposing the land surface to wind and water. Contrary to common assumptions, melting ice on the arctic polar ice cap will not trigger rising ocean levels because this is effectively water already situated in the global oceans. Its melting, therefore, has no displacement effects. Melting glaciers on Greenland, however, will be a factor in rising sea levels as this is moving vast amounts of heretofore land-bound frozen water into the seas. But surging water temperatures themselves will be the most important source of rising sea levels as warmer water simply has more volume.

4. Melting arctic ice also provokes the release of methane gas which is a primary greenhouse gas, and these releases are accelerating the warming triggered by the use of carbon fuels. Global warming gases have accumulated in arctic and sub-arctic soils over millions of years and are released when permafrost thaws. This process is occurring at an ever-faster rate, and some scientist fear that it could push the climate system beyond the tipping point, rendering global warming an inexorable process. It is important to recognize that methane's impact as a greenhouse gas is twenty times greater than carbon dioxide (Connor, 2008).

5. Indeed, there are myriad feedback effects that contribute to accelerated melting and warming. Ice and snow reflect sunlight and heat and help keep the arctic cold. When snow turns to darker water, however, the sun's heat is absorbed rather than reflected. This has a catalytic effect,

triggers further warming which, in turn, accelerates the melting processes already underway. When black industrial soot settles on arctic ice it can have a similar effect and thereby also accelerate the melting process (Cook). Obviously in temperate climates, some of these factors—permafrost and pervasive ice—are not apparent factors in local climatic conditions, and this might explain why the impacts of warming seem so much more profound and apparent in the High North than in temperate regions. Still melting ice and arctic warming in general will have global effects. According to a 2001 U.S. Environmental Protection Agency study, for example, rising sea levels predicted in some warming models “would inundate some 22,400 square miles of land along the Atlantic and Gulf coasts of the United States, primarily in Louisiana, Texas, Florida and North Carolina” (Natural Resource Defense Council).

6. Climate scientists and particularly those specializing in the Arctic argue that current models fail to capture the kind of profound changes underway. Data on melting processes are insufficient, and the scientific community must now fill this gap. Predictions about Arctic warming made five years ago seem conservative in retrospect, suggesting how dynamic the situation has become. Indeed, there are five critical challenges confronting climate change research in the Arctic:

- understanding the future of sea ice and terrestrial snow cover;
- the fate of permafrost and terrestrial carbon;
- the polar aspects of ocean circulation and the carbon cycle;
- the role of ice sheet dynamics in sea level rise; and
- the capacity of climate scientist to improve climate models so these dynamic factors are more satisfactorily incorporated into climate projections (Hik).

7. Another means to gather data involves community-based environmental monitoring led by those living in the High North who are most sensitive to the nature of changes underway. There are an estimated 4 million people living in the Arctic. Indigenous people, whose sustenance have long depended on their intimate links to the Arctic habitat, are acutely aware of the small and large changes underway and often understand before the scientific community what the local impact of these changes are. Scientists now consider their observation as fundamental to their understanding of climatic processes underway in the region (Rose Roth Seminar, NATO PA, 2010). The scientific community takes these kinds of observations very seriously but so does the Arctic Council.

8. Climate change is not the only environmental challenge in the High North. Some Russian cities above the Arctic Circle are amongst the most polluted in the world. Norilsk, where one fifth of the world’s nickel is produced and where 1.9 million tons of sulfur dioxide are emitted each year (more than in the entire country of France), is rated as the 7th most polluted city in the world (Walsh, 2007). Nuclear waste poses another serious hazard. Murmansk, once the home of Russia's nuclear submarine fleet, has become one of the country's largest nuclear waste sites. “The Murmansk region has turned into a nuclear waste dump of sorts, and is home to 20,000 fuel rods, 12,000 cubic meters (about 333,360 cubic feet) of nuclear waste and 11,000 containers that the Russian navy has simply dumped into the Barents Sea and the Kara Sea [...] Russia's North Fleet deliberately sank 13 nuclear submarines between the large islands of Novaya Zemlya and Severnaya Zemlya, six of them complete with reactors and fuel rods.” (Wiedemann, 2005). It is worth noting that President Vladimir Putin has launched a campaign to clean up the Arctic but announced campaigns, are never quite the same as actual ones. (Russia Today, 2010) Clean up personnel, however, have started to remove waste materials from the 7670 km² Arctic island of Wrangel, after the Russian government in 2010 allocated a significant sum for the operations.

II. INFLUX OF PEOPLE AND INVESTMENT INTO THE REGION

9. The growing accessibility of the Arctic, increased scientific monitoring there and mounting commercial opportunities have all provoked a more significant human presence in a region that traditionally accommodated very few and widely scattered communities. Those engaged in commercial, military, scientific, and touristic endeavours now inhabit this fragile region alongside indigenous peoples, who have lived in the Arctic for generations in ways that were essentially symbiotic with that environment. The influx of people has become yet another source of change and not insignificant tensions in the region. Indigenous peoples are generally outnumbered in the Arctic except in Greenland. Roughly half of Canada's Arctic population is indigenous while only a small fraction of Russia's Arctic community is. The mix of traditional and modern communities is not always easy and can foment serious tensions over an array of environmental, social, cultural and economic matters. Generally speaking, national governments of Arctic littoral states now see dialogue with indigenous communities as a fundamental obligation of policy makers. These communities have accordingly been extended representation in the Arctic Council as well as various national fora. While this has improved dialogue, it has hardly solved all the tensions and disputes.

10. The traditional arctic economy was subsistence-based and was engaged in activities like reindeer herding, land and sea hunting for mammals and fishing. All are highly sensitive to climate change and environmental degradation. Although the region still seems pristine and, indeed is compared to highly populated regions further south, it nonetheless confronts serious environmental problems related to the fragile ecological balance there and the unique features of the Arctic climate. To take one of many examples, certain pollutants can become highly concentrated in the fat of certain animals in the region and this has an impact across the food chain. Fauna in the high north tends to have a high fat content because this is critical to survival in that particular climate.

11. Growing commercial activity creates a problem of adaptation for people who for centuries have lived in remote regions. The impact of mounting contacts can be devastating to traditional communities and can overwhelm their cultures. On the other hand commercial operations are providing new sources of income and could help pull vulnerable communities out of poverty. This is economically, socially and politically consequential. The unemployment rate among the Inuit people is three times above the national average while the median annual income is 13,699 CAD compared to 22,120 CAD for other Canadians. Similar disparities in other littoral countries are evident. A number of countries are thus working to promote social and economic development for inhabitants of the Arctic, but this priority must be balanced with efforts to minimize damage to the indigenous communities' way of life. This is hardly an easy balance to strike.

12. Growing contact with the outside world has also increased the political consciousness of native peoples and, in important ways, has reinforced their sense of identity. In Canada, this political transformation helped lead to the creation of a new territory, Nunavut, which gave the Inuit greater control over a range of policy matters. Greenland has also established a new political relationship with Denmark. In 2009 Greenland assumed responsibility for self-government on judicial affairs, policing, and natural resources, while Denmark maintains control of foreign affairs and defence matters. Greenlanders were also recognized as a separate people under international law. This followed a referendum in November 2008 where 76% of Greenland voters indicated their preference for self-governance. Under the new self-government agreement, Greenland will receive half of any proceeds from oil or minerals and the other half will go to Denmark. These additional revenues from natural resource exploitation might accelerate the process towards eventual independence from Denmark, which has exercised sovereign control over this immense island since 1721.

13. Climate change is directly affecting the lives and livelihood of these communities. Warming trends have triggered permafrost melt, for example, and this has weakened the foundations of many buildings, pipelines, and roads in the region, complicating the infrastructure challenge there

and making travel over land particularly difficult in summer months (Cook). Changing growing seasons and the appearance of plants and animals that normally only grow in more temperate region is starting to have profound effects across the food change and has already altered migratory patterns, and fundamental conditions for fauna and flora in the region.

14. Finally, the influx of non-native people to the Arctic poses a range of challenges to national authorities who, are increasingly charged with delivering food, water, electricity, heat, transportation, emergency response and healthcare to traditional and new communities alike. It is, for example, terribly difficult to respond to accidents in these climatic and geographic conditions. As the population in the region rises along with the number of visitors, the potential need for such capacities will doubtless increase.

III. ECONOMIC OPPORTUNITIES IN THE ARCTIC

15. Indeed, climate change is rapidly opening the Arctic to increased commercial activity. Long-frozen Arctic seas are now opening up in summer months. When these waterways become ice free, they provide a dramatic potential short cut from Europe to Asia or from the East Coast of North America to Asia. Greater navigability and accessibility additionally opens up the region's vast natural resources to potential exploitation of oil, gas, mineral and fish stocks. A range of international actors now see the Arctic as an economically dynamic region that will generate wealth for those positioned to carve out a presence there. Undoubtedly, commercial and industrial investment and increased traffic in the Arctic will transform the region in myriad ways, some of which are utterly difficult to predict. That so many countries are taking an interest in these matters points to the possibility or perhaps even the likelihood that the Arctic will become an area of strategic rivalry and the object of a new "great game".

16. In many respects, that game is already underway. In the summer of 2007, for example, a Russian submarine planted a flag on the North Pole's seabed. This was generally understood as a symbolic claim on that seabed. No country recognizes Russia's claims that the North Pole sits on Russian territory. Yet, other powers have also begun to stake claims throughout the region and these claims often overlap. This promises to be a source of tension although the littoral countries continues to describe the Arctic as a zone of co-operation and are staking their claims based on specific interpretations of international law rather than relying on overt displays of power.

17. The Russian Federation was the first country in 2001 to submit to the rules based system of peer review under the Law of the Sea Convention. For those who had read Russian claims in 2001, the flag planting was hardly a surprise although it generated significant media coverage. Countries that join the Law of the Sea Convention have ten years to submit documentation on claims. Russia, Norway, Denmark, Greenland, and Canada have all filed. What is unfolding in this process is not a grab for resources as such, but rather a series of legal clarifications. The treaty has so far been ratified by 162 states and the European Union. It creates rules for the use of the oceans and maritime resources and allows countries to exploit the continental shelf, in some cases extending more than 200 miles from shore (Landler, 2012).

18. There are a range of innovative features in the convention. For example countries exploiting mineral resources beyond the 12 km limit have to pay fees to developing countries. Although several US Administrations have supported ratification of the Law of the Sea Convention as well as the US military, and a coalition of U.S. interest groups focused on the oil and gas industries, the environment and national security, a core group of opponents in the US Senate has refused to do so. The Obama Administration is pushing for ratification arguing that US interests would benefit from a system that would settle fishing, pollution and property rights, and assign mining and oil exploration rights beyond existing Exclusive Economic Zones. Opponents in the Senate argue that

ratification would limit US commercial activities and allow international organizations to exercise control over U.S. interests (Block).

19. One key area of dispute is the nature of a particular submarine mountain ridge that the Russians claim as its continental shelf. According to article 76 of the Convention, countries can stake territorial claims from the foot of the continental shelf extending out 16 km. The thickness of the shelf is an issue here, and this is why seismic studies are also an essential part of what is a very complex process. The Danes and the Canadians are challenging elements of the Russian claim (Cook).

20. Arctic policy is not only a matter for littoral states. China, Japan and South Korea, for example, are taking an acute interest in the region and want to be seen as legitimate players in these waters. The sudden interest of non-arctic countries is, for the littoral states, yet another source of concern.

21. There are obvious limits on the degree to which humankind will be positioned to exploit the Arctic region. Even if global warming is changing the region's environment, it will remain a very harsh, inhospitable and expensive place for the conduct of commercial operations. These conditions establish natural limits on commercial exploitation. Global warming itself imposes some of these limits. Permafrost melt, for example, is making it ever more difficult to locate infrastructure like housing and roads in parts of the Arctic region (Hik). The harnessing of economic opportunities such as, oil and gas exploration, mining, hydroelectric and wind power, and tourism will require the creation of new infrastructure that could cause various degrees of habitat destruction. This, in turn, could threaten Arctic biodiversity and ecosystems. Already, caribou and several fish species are under pressure due to present levels of commercial development. Furthermore, commercial transport in the region could significantly increase pollution levels there and upset fragile ecosystems like migratory patterns.

A. ENERGY AND MINING

22. The Arctic is estimated to hold 13% of the world's undiscovered oil, 30% of its gas and 20% of its natural gas liquids. The potential contributions of Arctic reserves to global energy supplies are significant, and efforts are underway to turn that potential into a reality. Eighty four per cent of the estimated energy resources in the Arctic are offshore, and technological breakthroughs are rendering these resources ever-more accessible. (US Geological Survey, 2008). There are, however, also serious concerns about potential oil spills. Those apprehensions were heightened in the wake of the 2010 Deepwater Horizon accident in the Gulf of Mexico, the largest accidental marine oil spill in history. That accident has become a cautionary tale of the dangers of deep water drilling. Since conditions in the Arctic are far less benign than in the coastal waters of the American south, there are demands that very strict regulation be in place before launching on deep water drilling in remote and icy arctic seas.

23. The vast bulk of proven hydrocarbon resources are situated in uncontested territories and Russia is the greatest beneficiary in this regard. The Kara Sea holds enormous gas reserves, while the Yenisey-Khatanga basin contains significant oil reserves. Alaska also possesses impressive reserves of oil while the South Barents Sea is rich in reserves of both oil and gas. Norway, which has recently signed an agreement with Russia delineating borders through long disputed Barents Sea waters, is now positioning itself to exploit substantial additional oil and gas reserves in waters off its northern coast.

24. Harsh climatic conditions in the High North are likely to continue to complicate extraction, transportation, worker housing, health care, pipeline construction, search and rescue operations and importantly environmental protection. Cost is clearly a factor. Building weather resistant infrastructure in the High North is by nature extraordinarily expensive. In most countries in the

region, the regulations for doing so are necessarily onerous; but failure to adhere to high standards can be far more burdensome over the longer run. It can take years to award licenses for production given that firms must jump through myriad hoops to meet these standards, at least in Western countries. There are, however, some concerns about the legal framework and implementation of environmental rules in Russia as well as a history of oil spills along its pipeline routes and the lack of overall policy transparency which is essential to maintaining a culture of environmental accountability (Kireeva).

25. Formidable technical and economic obstacles have not prevented a range of companies from building a presence in the High North. Statoil, Gazprom, Rosneft, Exxon-Mobil, and Total are just a few of the many companies which have embarked upon major projects there. According to the Norwegian Minister of Petroleum and Energy, Ola Borten Moe, 37 companies are now queuing to explore the resources of the Arctic Ocean (Truc). These companies have all confronted legal, technical, regulatory and cost entry barriers, but littoral governments are addressing these problems and opening the door for commercial operations.

26. Norway intends to award drilling licenses for 72 large blocks or partial blocks in the Barents and Norwegian Seas beginning in 2013. Norway is also opening a research facility, jointly funded by industry and the government, to address the many challenges of drilling in these waters. Oil production in Norway has been slowing since 2001 and the production of oil and gas together have been falling since 2004. This is helping to drive the effort to replace mature fields with new ones in the high north. For its part, the United States has indicated that it will extend a number of drilling licenses by 2017 in its own waters in Beaufort Sea north of Alaska and the Chukchi Sea between Russia and Alaska. It is important to recognize, however, that the United States is currently undergoing something of an energy renaissance because of breakthroughs in fracking technology which have allowed it to tap into its vast resources of shale gas. The US Energy Information Administration is forecasting that the United States will become a net exporter of natural gas by 2021 (Molin).

27. The most significant legal advance in recent years has been the Norwegian-Russian maritime border delimitation treaty covering parts of the Barents Sea. The two governments signed the Treaty in 2011 after four decades of talks. It has eliminated a critical source of investor uncertainty. As a result there are intensified research and development efforts underway in those waters including the Skrugard and Havis fields. The agreement eliminates the legal ambiguity that has long held up investors and is opening the way for joint exploration efforts on those fields that cross the new boundary line between Norway and Russia. Russian and Norwegian enterprises have worked cooperatively, for example, in the Stockman gas field, one of the world's largest.

28. Cooperation between these two important Arctic littoral countries was already evident during the Cold War when Norway and the Soviet Union managed to work well together managing fish stocks in the region. This resulted in a system where fishing boats from each country were able to fish in each other's waters at different points in the year. The agreement employed complex calculations of migratory and spawning patterns of key fish species to ensure equity and environmental sustainability. The recent border delineation agreement built on that spirit of cooperation and was designed to create a win-win situation for both countries. The delineation of the border employed a median line drawn to the north. The borderline proved more difficult to negotiate in the south where coastal lines rendered delineation difficult. But further north in the open seas, agreement was easier to achieve and now both countries enjoy a legal foundation for greater economic activity in these waters.

29. Norway's 40 years of experience drilling in the Arctic region and its very high environmental and technological standards make it a natural leader in these areas. It is particularly well positioned to work with Russia - which does not currently possess the technology to drill safely in deep water under extreme climate conditions and which has not always robustly adhered to

standard environmental protection policies. A strong working partnership with Norway should help on both fronts. There is clearly a potential for this economic co-operation to spill over into political and diplomatic realms because when these relations work well, they help build contacts, trust and the habit of co-operation for mutual gain—ends that rank high among the goals of western diplomacy with Russia.

30. Russia's energy deposits in the Kara, Pechora and Barents seas are of great interest to global energy companies but these firms have grown increasingly sceptical of Russia's poor regulatory and judicial climate. They have, for example, strongly suggested that Russia needs to put a long-term oil taxation regime into place before launching further investments in Russia's High North. President Putin has proposed a package of tax breaks to improve that investment climate including the abolition of VAT on imported technology that cannot be sourced in Russia. Exxon Mobile has now entered a partnership with Rosneft to invest up to \$3.2 billion in both the Kara and Black seas. Tax reforms could also remove a persistent barrier to the development of the Shtockman gas fields (Gorst).

31. Finally, the Arctic also has great potential in non-traditional hydrocarbon production. For example, it holds massive deposits of methane gas hydrates which could exceed global supplies of traditional gas. In scientific terms, these are crystalline water-based solids resembling ice but which contain trapped gases like methane. Canada's Mallik gas hydrate field in the Mackenzie Delta of the northwestern Canadian Arctic has vast quantities of gas trapped in the permafrost. The problem is that an economical extraction method has yet to be developed. Japan, India and China are all interested in solving the problem and developing this particular energy source.

32. Ice and snow melt, high world prices across a range of commodities and low political risk are factors driving the quest to further develop mining operations in the High North. Already a primary source of economic activity and income in Russia and in Scandinavia, where the mining sector in the High North is well integrated into a regional transport network, mining will likely become more commercially viable in the future. Recent regulatory and policy changes in several countries are encouraging further mine development in the region and technological change is also making previously costly operations far less expensive (Haley, Szymoniak, Klick, Crow, & Schwoerer). Some of the increased activity has taken on a cross border nature. Large Russian companies like Norilsk, for example, have extended their global reach, buying into operations in the Canadian Arctic, Finland, Alaska, and Greenland (Campbell).

33. The Arctic is endowed with a wide variety of minerals including iron, silver, zinc and copper. The Kvanefjeld site in Greenland is extraordinarily rich in uranium and rare earth oxides. Several important diamond mines have been discovered particularly in the Canadian Arctic, and there is every likelihood that more will be unearthed. In Canada's Northwest Territories, the value of diamond mining has outstripped that of oil and gas extraction (Haley, Szymoniak, Klick, Crow, & Schwoerer). Gold is also present in the Arctic, most notably in Canada's "golden Yukon" and Russia's Kolyma region. Baffin Island is the site of what may be the world's largest iron ore mine. Arctic mined palladium constitutes 40% of global production of an indispensable alloy used in the manufacture of mobile phones.

B. FISHING

34. Arctic waters provide habitat for an extensive variety of fish species and have become important global fishing grounds. Fishing is a traditional source of sustenance for indigenous populations living in the Arctic, but subsistence fishing is challenged by the growing presence of large-scale commercial fishing operations. Fishing rights issues are at the centre of several international disputes. A number of international and inter-governmental organizations including the United Nations Food and Agriculture Organization (FAO) are working to promote sustainable fishing practices in the region, but outstanding questions remain regarding oversight

responsibilities. Questions also persist about the actual stock of fish in these waters and the degree to which over-fishing threatens to decimate these fisheries. According to a recent study by the University of British Columbia, fishing patterns in the Arctic have been persistently and significantly underestimated due to a lack of data and ineffective catch reporting. That study argues that “an estimated 950,000 tons of fish were caught in Russian, Canadian and U.S. Arctic waters between 1950 and 2006, which is 75 times higher than the figure reported by the UN's agency that records catch levels” (Dowd). Since fishing is also the primary source of nutrition for other mammals of the region (seals/polar bears etc.) over-fishing threatens a wide range of species in this fragile, remote and vitally important region. Government regulatory efforts are clearly needed to ensure that Arctic fishing is conducted in ways that do not upset the region's fragile food chain, but this is going to require far more international co-operation. This has become a core agenda item of the Arctic Council where countries are working to co-operate on these issues. The fact that non-littoral fishing fleets are now operating in these waters is making the problem all the more difficult to address.

35. It is important to note that all globally binding and non-legally binding instruments related to fisheries conservation are relevant to conservation and management in Arctic waters. These include the UN Convention on the Sea, the Fish Stocks Agreement, the United Nations FAO Compliance Agreement, the FAO Code of Conduct for Responsible Fisheries, and its Technical Guidelines, International Plans of Action (IPOAs) -, and Resolutions of the United Nations General Assembly (UNGA) on issues like driftnets and destructive fishing practices. The Arctic marine area in principle also falls within the competence of the bodies established by these instruments or that are responsible for adopting them (Molenaar).

36. Generally in ice-free Arctic waters, experts feel that adequate regulatory frameworks are in place. There are far more concerns about those waters that only recently have become ice-free or will soon be. Here new national regulations and agreements would help ensure that fishing in these waters is made sustainable. The US has worked to do this in its waters in the Northern reaches of the Bering Sea. When these fisheries are trans-boundary, international agreements ensure that regulation is meaningful. Some studies suggest that while on the Pacific side of the Arctic fishing stocks will largely remain the responsibilities of littoral states, significant stocks of fish could soon be found in the open waters of the Atlantic side due to ice melt and changing migratory patterns. It is these fisheries that will require extensive international cooperation to manage.

37. More broadly, climate change is rapidly changing the habit of Arctic fish. Thinning ice, increasing acidification and warming waters are altering the ecosystem in ways that are not yet fully understood. Clearly the composition of Arctic marine eco systems will change in terms of species populations and population densities; some waters will see more fish as a result and others less (Erik J. Molenaar, 2009). The growing presence of energy infrastructure and shipping in these waters could also have an impact on fisheries and migratory patterns, and this has already been a source of political tension in countries like Norway (Larsen).

38. Fishing rights issues in the High North have also been a source of tension between the United States and Canada. The two countries had agreed on fishing moratorium in the Beaufort Sea, but Canadian officials have complained that the United States has violated this agreement. This is part of a larger border dispute in that sea. Canada currently claims a maritime boundary along the 141st meridian west, 200 miles out from the Alaska-Yukon land border. The US argues that the boundary lies perpendicular to the coast out to 200 miles following a line equidistant from both coastlines. These are significantly different interpretations and the stakes have risen because of gas reserves below these waters.

C. TOURISM

39. Greater access to the Arctic is also opening the doors to an influx of both conventional and adventure tourists. Industry experts project that the numbers of visitors to the region is slated to rise inexorably. Finland has set the standard for tourism above the Arctic Circle, and for example had 220 000 overnight stays in Finnish Lapland in December 2010. In 2010 there were 400 international charter flights to Finnish Lapland during Christmas and in 2006 and 2007 over 600 charter flights. Committee members learned that similar trends are apparent in Svalbard where in summertime, a single cruise ship docked in Longyearbyen, effectively triggers a very large if nonetheless temporary increase in the archipelago's human population. This invariably has implications on the local natural and man-made infrastructure, economy and potentially on its health and rescue facilities (Cook).

40. Greenland has also become an increasingly popular destination, and 42 cruise ships operated along the Greenland coast in 2010 alone (Arnadottir). In order to enhance maritime safety in these waters, Greenland, for example, is developing and reinforcing the role and responsibilities of the Greenland Command. The Greenland Command is responsible for the military defence of Greenland, maritime and sovereignty maintenance and enforcement, as well as search and rescue. Greenland Command is the Maritime Rescue Coordination Centre (MRCC) for the Greenlandic Search and Rescue Region. It coordinates rescue with all available resources, including naval ships and aircraft, commercial helicopters or any civilian traffic in the area. It is also monitoring commercial activities in the waters off Greenland and co-operates with the Icelandic Coast Guard and MRCC Reykjavik.

41. The rise of an Arctic tourist industry holds out new commercial opportunities but there are clear risks as well. Adventure tourists are attracted to "untouched" nature of the region as well as the art and culture of indigenous communities. Some are hoping to engage in hunting and fishing themselves. But there are deep concerns that the region's environment is far too fragile and the infrastructure far too scarce to accommodate the growing demands of visitors. Several littoral countries, however, are investing in - as well as funding - tourist promotion. This could bring needed resources into the region, but it represents a double-edged sword. Tourism has the potential to boost local economies but oftentimes indigenous peoples are not always positioned to share in the benefits while they are nonetheless the first to pay the price of environmental degradation resulting from the increased presence of people.

42. There are persistent concerns about search and rescue infrastructure in the region. Suffice it to say that a cruise ship disaster in the Arctic similar to Costa Concordia sinking off the Italian coast in late 2011 would likely have led to far more casualties, not only because of the frigid waters, but also because search and rescue infrastructure in the region is simply not geared to handle these kinds of events. The likelihood of a tourist disaster naturally increases as the number of ships visiting the region rises. It may well be necessary to impose new regulations on tourist shipping, for example, by requiring that ships travel in pairs in the event that one vessel encounters difficulties. It may also be sensible to make sure that visits to the region by these large ships are insured in ways that properly correspond to the real hazards. Indeed, traveling in the Arctic has unique risks that ought to be factored in. Longyearbyen in Svalbard, for example, has very limited medical facilities and its inhabitants generally travel to Tromsø for any serious medical interventions, including simple child deliveries. Facilities there would be overwhelmed if a shipping accident occurred nearby. A crash of a Russian commercial plane in 1996 on that island, the so-called Operafjell Accident, utterly overwhelmed the search and rescue capacities of the region, and none of the 141 passengers survived (Cook). Russia itself has announced plans to bolster its search and rescue capabilities and plans on having ten functioning Arctic rescue centres in Murmansk, Arkhangelsk, Naryan-Mar, Vorkuta, Nadym, Tiksi, Pevek, Provideniya and Anadyr by 2015 (Pettersen).

D. COMMERCIAL SHIPPING

43. The melting of Arctic sea ice is opening up new opportunities for international shipping with potentially important commercial implications. The Northern Sea Route (NSR) is currently the most used passageway and stretches along the Russian Arctic littoral. The Northwest Passage (NWP) wends through the northern most regions of the US (Alaska), Canada and Greenland. Both of these routes have recently become navigable in some summer months because of unprecedented ice melts. In 2009, the first two international commercial cargo vessels travelled north of Russia between Europe and Asia. In 2011, 18 ships have made the now mostly ice-free crossing. This is a likely harbinger of what extended ice-free summers in the region could mean for the shipping industry in the High North.

44. These two shipping lanes are particularly consequential as they would reduce the travel distance from Rotterdam to Yokohama (NSR) by 40% and from Rotterdam to Seattle (NWP) by 25%. Using these waterways would thus save significant increments of time and fuel. There is even a security attraction at play here if one considers that the Straits of Malacca and the waters below the Suez Canal are currently prone to piracy and grave political instability. By contrast, the northern routes offer sea lanes remote from piracy, criminal activity and war. It is not surprising that many governments, including that of China, are now looking at the Arctic as a potential trading highway.

45. Despite this interest, regular navigation along these routes is still far from imminent. There are countless barriers to moving goods in a reliable and timely fashion given ice and weather conditions. At best, these waterways would only be open for two months a year. The safest means for plying these waters today is to travel in convoy with icebreakers. Moreover, commercial ships themselves would have to be "ice class" and constructed with an extra layer of steel that would add an estimated 15% to their costs. There are size restrictions for this kind of shipping as well, and these would reduce the opportunities for scale economies. In light of the very unpredictable nature of these seas, the northern routes today are not of great use to shippers conducting "on-time deliveries". It is also important to recognize that Arctic waters are poorly surveyed and ice melt is changing the character of the coastlines in ways that are not always captured in the charts ships are using. This obviously adds to the dangers.

46. All of this means that there are currently few incentives to purchase ships designed for voyages that could only take place two months of the year particularly given that there is already a glut of shipping in today's relatively poor market conditions. For the immediate future, therefore, the prospect of robust commercial shipping in the High North is more hypothetical than imminent. Russia itself is most likely to employ the North-eastern route to move oil, gas, minerals and industrial products from northern Siberia to world markets (Ragner).

47. There are also bureaucratic hurdles to consider. Non-Russian shippers must consult Russian state officials, including its secret services, before entering these waters, and this invariably is a time consuming, uncertain, and costly procedure. Russia's slow moving bureaucracy only discourages further development of the route and, by extension, deprives Russian icebreaker firms and the Russian state of a potential source of revenue (Smith, 2009). Russia would ultimately need to streamline its own bureaucratic procedures to make this route more commercially viable.

48. Russia currently has the world's largest fleet of ice-strengthened ships, many of which were designed to supply settlements in northern Siberia. It also has a very large icebreaker fleet including seven nuclear powered icebreakers. Russian authorities see this fleet as critical both to maintaining links with the Siberian periphery and to exercising sovereignty and control over adjacent Arctic waters. Still this fleet is aging and will have to be modernized in order to keep pace with Russian needs and potential international interests in using these waters (Ragner, 2008). Russia has begun to consider investing in infrastructure along the Northern passage in anticipation of coming ice-free summers. It will also need to expedite procedures for entering these waters. Currently these are onerous and costly (Smith).

49. The United States icebreaker fleet is in much worse condition. This was made evident when US officials were compelled to contract a Russian icebreaker, the Renda, to break through hundreds of miles of ice and bring fuel to Nome, Alaska last winter. That incident highlighted the decline of the US icebreaker fleet, something that until this incident had gone under the radar. Just as the Arctic region is attracting ever greater commercial, environmental and strategic attention, the US Coast Guard is down to one polar icebreaker, the Healy, with two others in repair shops for the next six years. The Healy is designed to pass through ice of only medium thickness and is not equipped to operate in thick ice (Davis). Like the other two icebreakers, it is quickly aging. According to Rear Admiral Thomas Ostebo "The Coast Guard doesn't have any publicly assigned assets (in the Arctic). None. Zero," A recent article on the problem suggested that, as of January 2009, "Russia had a fleet of 25 polar icebreakers, including six heavy icebreakers rated at more than 45,000 break horsepower, all of which are nuclear-powered. Finland and Sweden each had seven and more recent reports have Canada down for 13." (Restino) This deficiency gravely undermines the US capacity to operate in the waters of the High North and certainly impairs its capacity to conduct search and rescue operations as well as commercial and military missions. This might not only undermine the US capacity to rescue ships in distress, it could also weaken its ability to enforce its sovereignty in remote Arctic regions, according to some sources. The Senate's reluctance to ratify the Convention of the Law of the Sea has only reinforced the view that the US is disengaging in the region despite public statements to the contrary.

50. Commercial shipping and insurance firms must also confront the deficiency of search and rescue infrastructure in the event of an incident on the seas. Accidents could lead to oil or chemical spills that could have devastating environmental impacts. Arctic waters are obviously very cold, and an oil spill, for example, would likely persist for decades, something that has apparently not happened in the Gulf of Mexico in the wake of the Deep Water Horizon disaster. Microbes in those warm waters helped break up that massive spill far more quickly than experts had expected. Such microbes do not exist in Arctic waters, and a spill there would prove far more persistent. A more relevant comparison, therefore, might be the catastrophic 1989 Exxon Valdez accident in the shallows of Alaska's Prince William Sound. That event caused the deaths of more than 100,000 seabirds and the destruction of important salmon and herring hatcheries. The effects soon moved up the food chain, stunting growth in the salmon population and reducing the numbers of many species including killer whales. To this day, the Alaskan shoreline has not fully recovered from the spill. For these reasons, extra precautions are essential and must be incorporated into the rules of navigation. International Maritime Organization (IMO) is accordingly developing regulations to which vessels operating in polar waters will have to conform. But provisions for funding clean ups are also essential, and it is far better to work these out before an accident has happened than afterwards.

51. The mandatory code for ships operating in polar waters, known as the 'Polar Code', will supplement relevant regulations, including the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution From Ships (MARPOL). The purpose of the polar code is to address the risks that are specific to operations in polar waters, taking into account the extreme environmental conditions and the remoteness of operations. The Code addresses ship's construction standards, polar safety equipment, and the requirements for a qualified ice navigator operating in the High North. The growing presence of tankers in the High North has sparked international demands for the use of double hulled tankers and other measures to mitigate the risk of spills (Cook). Canada led the initial development of the Polar Code for 15 years, and recently the Norwegian government has become more actively involved

52. Aside from the Polar Code, there are other relevant arrangements under development. Arctic states signed a rescue agreement on 12 May 2011 in Nuuk, Greenland. This initiative is the product of a Russian and US led task force. At present, the Polar Code is not sufficiently articulated to regulate Arctic shipping in a comprehensive fashion, but it represents a significant

advance. Ultimately governments will need to establish international, comprehensive, and non-discriminatory standards for Arctic shipping. Unfortunately, a mandatory code is not expected to be in force before 2015 (Brigham). The maritime safety and environmental regulations in the SOLAS and MARPOL Conventions continue to apply to ships in Arctic waters.

53. Finally, new shipping patterns will also require modern Arctic ports. Spitsbergen (Norway) and Iceland are frequently cited as potential host ports for Arctic shipping in the future. But no major port developments are underway and none is likely until commercial traffic in the Arctic is actually ramped up. The construction of such ports would be very costly, and only increased traffic in these waters would justify the expense.

IV. SECURITY DYNAMICS IN ARCTIC REGIONS

54. Perhaps because of its remoteness and the fact that the world's attention has been drawn toward the Middle East and Asia in recent years, the strategic community and political leaders have been somewhat complacent about matters related to circumpolar defence and security relations. But a geopolitical transformation seems to be underway in the Arctic States and companies are now scrambling to build a presence in the region, particularly at a time when climate change appears to be opening Arctic waterways and making resources long locked below its ice fields more easily accessible. It would be fundamentally mistaken not to think through the national security implications of this transformation.

55. Officially, no government wants to acknowledge fully the latent tensions in the Arctic, and there is a tendency instead to speak in terms of Arctic co-operation rather than conflict. Yet, if one looks more deeply at military expenditure trends, military exercises as well as official statements, a different picture emerges. New actors and organizations are taking part in the politics of the High North, including the European Union and China. The region also appears to be dividing nations in new and unexpected ways. An issue like access to Arctic seaways, for example, is pitting Canada and Russia against the United States and the European Union. This obviously runs counter to the general global alignment in security matters and reveals the degree to which the Arctic has become a strategic theatre rife with surprising geo-political configurations (Huebert).

56. In military terms, the Arctic is hardly pristine. During the Cold War, it was, in fact, an arena of intense strategic and military rivalry. The Greenland-Iceland-United Kingdom gap (GIUK gap) constituted a central break out point for the Soviet navy. Western intelligence gathering stations and other military installations dotted the High North in Greenland, Norway and Canada, and much of this activity was focused on monitoring Soviet submarines heading south as well as detecting potential intercontinental ballistic missile launches. This suggested just how strategically vital the region had become in the nuclear era. Dozens of Soviet and Allied submarines, some bearing nuclear weapons, patrolled those waters and played a central role in the deterrence strategies of both sides. The Soviet Union's Northern Fleet deployed in Arctic waters and had access to the Barents and Norwegian Seas, as well as the Arctic and Atlantic Oceans. The Soviet navy deployed more than 200 submarines ranging from diesel-electric attack to nuclear-powered ballistic missile class submarines (SSBN). Soviet and Allied naval forces played a constant cat and mouse game under and above the ice, and constructed a string of bases, radar and satellite stations along the littoral to provide support and early warning in the event of nuclear or a conventional attack.

57. The end of the Cold War triggered a precipitous decline in military deployments in the Arctic region. Indeed, it seemed to have vanished from the political radar screen, although experts certainly understood its on-going strategic relevance. From a NATO perspective, while the Arctic still represented a critical potential field for the conduct of Article 5 security operations, there was much greater focus elsewhere, for example, on the Baltic region, which had become a more strategically fluid and tense region in the aftermath of the Warsaw Pact's collapse

(Klaus Nauman). The subsequent revival of the Russian economy, its determination to reassert a military presence in the High North, the conduct of large arctic exercises, and the adoption of a more confrontational approach with several of its northern neighbours have marked an end to this interlude (Kramnik). While the region is still peaceful, it has become more militarized in recent years and is generating ever more political attention (Andreyeva).

58. Russia is not the only country that has stepped up its presence in the region. The United States, Canada, and the Nordic Countries have all increased military patrols there. Earlier this year, for example, Norway conducted one of the largest Arctic military manoeuvres ever, Exercise Cold Response, which engaged 16,300 troops training in the High North on issues ranging from terrorist threats to high intensity warfare. Five Norwegian troops died in those exercises when their transport plane crashed in the Swedish mountains (Talmadge). Norway has also announced the creation of a mechanized infantry Arctic battalion partly in response to a similar move by the Russians (EurActiv.com). It is interesting that Norway is beefing up its military presence in the region at the same time that it is deepening cooperation with Russia on oil and gas development in the High North and working to normalize the bilateral relationship (Marshall).

59. In 2009 the US Navy announced a three state strategy to increase readiness for operations in the High North, to build cooperative relations with Arctic nations and identify potential areas of conflict. But naval analysts also note that the United States does not have the capability to operate in the high north in a sustained manner and would have to rely on its allies for support (Talmadge). While it does have a major asset in the nuclear submarine fleet, it lacks ice breakers needed for surface ships to operate in the region. The U.S. Navy has, however, fully recognized that climate change is rapidly altering the strategic stakes in the region.

60. Canadian officials have also recognized the region's growing strategic importance. Their military conducted an operation this past April in Resolute, Nunavut engaging 150 Canadian Rangers and military personnel to game out search and rescue and ground patrol operations. This is one of three military exercises that Canada conducts each year in the High North (News).

61. Although defence spending has been slashed throughout Europe in recent years, the Nordic countries spend relatively more than their neighbours in the South. Norway is the highest per capita defence spender in Europe. Denmark, Finland and Sweden are also relatively high spenders and all are investing in defence capabilities, some with Arctic capabilities. Recognizing the need for scale economies, they are also co-operating on procurement, devising shared support functions and developing common capabilities in training and logistics and in sea surveillance. The Nordic countries conduct much of this co-operation through NORDEFECO (Nordic Defence Cooperation) which helps co-ordinate these efforts and which is designed to help the Nordic members essentially "punch above their weight" (NATO PA Rose Roth Seminar, 2010). This is imperative for these relatively small (in population terms) countries.

62. Although the Nordic states are often seen as working closely together on a range of international challenges, they actually interact in complex ways. The High North is a region of contradiction as well as a theatre of potential conflict. This reality colours relations among the littoral states. The Nordic States enjoy very close relations, and are a critical part of Europe's identity, but they are not institutionally unified, particularly on security matters. These countries have not yet made hard security commitments to each other across the board and lack a common security strategy despite deepening co-operation in a range of security related fields. Yet, the countries of the region do share common foreign policy challenges, even though they deal with these in different ways. Iceland, Denmark and Norway tend to look towards the Atlantic and all have Arctic vocations. Sweden and Finland are oriented to the Baltic as they have no land contiguous to the Arctic seas but do have significant amounts of territory above the Arctic Circle. Neither has formally joined the Western Alliance. Denmark is in the EU but has legal opt-outs, and it is an Arctic state by virtue of its sovereignty over Greenland. Sweden is not in the Eurozone.

Iceland, of course, is a NATO member but not an EU member. Norway is an energy giant in the region, but Denmark could become one if fields in Greenland are developed. Western Nordic states are less concerned by Russia than those countries near its borders (NATO PA Rose Roth Seminar).

63. This diversity, conditioned by history, culture, geography and economics, thus informs a heterogeneity of security perspectives even among these states which, while cultivating very powerful national identities, nonetheless also enjoy close relations with each other—relations that are rooted in shared values and, in most instances, common interests.

64. The organization of military forces in the region constitutes yet another manifestation of this diversity. Finnish forces, for example, are structured for territorial defence; the Danish military is oriented to international crisis management; while Swedish and Norwegian forces have more or less followed the Danish model. For its part, Iceland has no military at all, although it is a NATO member. Growing regional co-operation allows the Nordic countries to punch above their collective weight. The region dedicates a relatively large share of its military spending to defence investment and real capabilities, whereas many continental countries spend a far higher percentage of their defence budget on personnel costs. The Nordic countries collectively have a very large arsenal of advanced fighter aircraft, main battle tanks, armoured personnel carriers and artillery pieces, potentially affording these countries formidable and diplomatically consequential defence capabilities.

65. The Nordic Council has reinforced its members' capacity to work together and, of course, shared democratic values make this somewhat easier. But it is also a natural consequence of the post-Cold War reality, where old concepts like neutrality might be less relevant. Potential challenges from Russia in the High North and elsewhere in the region and the need to husband scarce resources are also driving this process forward. Mounting challenges, such as crime, environmental degradation, proliferation of weapons of mass destruction (WMD), migration, climate change and competition for Arctic resources may ultimately require the Nordic countries to revisit certain long-held assumptions about national foreign and security policies, a process that will likely lead to deeper co-operation among them and new working relations with NATO. One must also recognize that if Finland and Sweden were to join NATO - a decision that neither is prepared to make at this juncture - the security equation in the High North would shift. Russia would clearly not be happy about such a development and its strategists would worry about the implications of their Arctic "encirclement" (Hik).

66. More broadly, it is difficult to speak of a compact Western position on the Arctic because there are also rivalries and disputes among allies and friends in this increasingly fluid region. Border disagreements remain an important source of rivalry. Uncertain maritime jurisdictions and boundaries sometimes pit allies against each other. Although Norway and Russia have settled their border dispute in the Barents Sea, the status of the North West Passage pits Canada against its neighbour the United States. Canada sees the passage as an internal waterway, while the United States and the European Union argue that these are international waterways subject to International Maritime Law not Canadian law. This also has implications for military over-flights which constitute yet another highly sensitive set of issues.

67. Russia has moved quickly to stake its claims in the Arctic. It has claimed 1.2 million km² of the Bering Sea and Arctic Ocean. Russia seeks jurisdiction over the Northern Sea Route based on Article 234 of the UN Convention on the Law of the Sea. This accords littoral states the right to adopt and enforce non-discriminatory laws and environmental regulations in their exclusive economic zones where ice coverage and severe climate conditions endanger navigation and where pollution could upset the ecological balance (Ragner, 2008). As suggested above, Russian rules maintain that all vessels that wish to enter the Northeast Sea Route must notify Russia beforehand, submit an application for guide ships and pay a set fee to use the route. Russia

claims that the straits between the Russian Arctic islands and the mainland are internal waters. The United States challenges this claim and characterizes these waters as international straits and thus open to transit.

68. These claims and counter claims are largely academic as long as these waters are not viable corridors for international commercial transit. But recent studies suggest that within 30 years, these waters could be consistently ice-free for the entire summer. As this happens, and as commercial shipping in these waters rises, these divergent interpretations of international laws could foment a higher level of tension with important commercial and strategic implications. Russia is not the only state laying out claims on Arctic waters; the United States, Canada and Denmark are also seeking to delineate borderlines along and even well beyond the mainland littoral. Naval forces and even scientific communities operating in the High North are now being subtly used to stake out or to challenge such claims.

69. Tensions in the High North could also have important potential consequences for NATO over the long term. NATO's Supreme Allied Commander, Admiral James Stavridis, recently said: "For now, the disputes in the north have been dealt with peacefully, but climate change could alter the equilibrium over the coming years in the race ... (for)... more readily accessible natural resources... The cascading interests and broad implications stemming from the effects of climate change should cause today's global leaders to take stock and unify their efforts to ensure the Arctic remains a zone of co-operation — rather than proceed down the icy slope towards a zone of competition, or worse a zone of conflict" (Mahr).

70. In fact, NATO has long played a role in security matters in the High North and considered the region a front line of defence against the Soviet Union during the Cold War. Today its mission is less certain, but undoubtedly the Alliance must account for the region in its planning. Two non-NATO countries, Sweden and Finland, have allowed NATO to conduct exercises in the High North, and this is yet another indication of the very strong links between the Alliance and these two countries, which both have serious concerns about Russian military overflights in the region as well as the Russian military aggression in Georgia, which has been seen in the region as a deliberate disregard of international law and a flagrant disregard of neighbouring country borders. NATO collaboration with Sweden and Finland is hardly welcome in Russia, which opposes initiatives that could even hypothetically lead to new NATO members on or near its borders.

71. Russia's northern fleet continues to play a central role in national defence calculations. Although the West provided support to help decommission parts of the Soviet Northern Fleet after the Cold War, Russia is now building six missile bearing subs, and in 2007 resumed Arctic military flights which routinely take place without prior notification and which have approached and in several instances violated the airspace of neighbouring countries. In 2009 Russia tested missiles at the North Pole and celebrated the fact that they had done so undetected by the United States—hardly a reassuring gesture. Russia has also redeployed military units to the Arctic in recent years including a new brigade near the Norwegian border. It is nonetheless important to note that Russia essentially respects international laws governing the Arctic.

72. Partly in response to increased Russian military activity in the region, US submarine patrols in the region have also increased and there has been an effort to make more submarines Arctic capable. There is discussion about deploying more US icebreakers to the region, but little has been done on this front (Revkin, 2008). At the same time, the US military has deployed a fleet of F 22's to Alaska. Meanwhile, Canada has deployed 6-8 Arctic off shore patrol vessels and built a refueling facility in the High North. A training facility has been located in Resolute Bay and Canada recently procured a new icebreaker to operate in Arctic waters.

73. Canadian officials have long supported the notion that the Arctic should be a zone of co-operation rather than one of conflict. They maintain that the Law of the Sea offers a

fundamental set of principles to regulate national territorial claims and, like their Russian counterparts, they have engaged in extensive seabed surveys to back these claims. Although Canadian forces have increased their presence in the High North, their numbers are still quite limited. Canadian officials believe that ensuring safety and security are central policy goals for the High North that other countries ought to share. Along these lines, Canadian officials want ships operating in its waters to alert its coast guard of their presence so that it is fully prepared for possible search and rescue missions and, of course, to remind the international community of its sovereign control over these waters (Rose Roth Seminar, NATO PA).

74. Canada also seeks to promote economic and social development in the region, protect the environment, improve governance and conditions for inhabitants of the region while defending the traditional way of life for the Inuit, who comprise roughly half of the Canadians living in the Arctic. Canada is working to delineate its borderlines with Denmark and the United States and sees the resolution of the Norwegian-Russian border as a model others might emulate. Like the United States, Canada sees the Arctic Council as the premier vehicle for international discussions on the region, but it has tended to take a more restrictive view on who should be invited to sit at the table. It, like other Arctic states, is leery of non-Arctic players staking claims in the region.

75. US-Canadian relations in the Arctic are complex, and, at times, even tense, which is striking given the otherwise very close relationship between these neighbouring Allied states. US concerns largely focus on the North West passage and Canada's claim that this is an interior waterway and not an open sea. But there are other challenges. One problem is that the United States has never ratified the Law of the Sea Convention although it does recognize it as a codification of customary international law. Thus the U.S. government may find it difficult to participate in discussions about its application. For example, because it has not ratified the treaty, the US has no peaceful recourse if another non-signatory were to close its straits to navigation except through the Permanent Court of Arbitration. It is also less well-positioned to challenge claims with which it disagrees. It obviously needs to engage with states that have ratified the Convention and made claims based on it.

76. The Canadian Defence and Foreign Affairs Institute has suggested creating a Northwest Passage authority to facilitate dialogue with its southern neighbour on some of these vexing problems. This would "require Canada to set aside, but not give up legally, its claim that most of the passage lies within Canada's internal waters" (Flemming). On the American side, there would have to be a suspension, but not a legal surrender of the US claim that the Passage is an "international strait" under international law. The setting aside of these current claims could herald a renewed 21st century period of co-operation between Canada and the United States."

77. Non-Arctic players are also beginning to carve out an important presence in the High North. China, for example, is undertaking a number of Arctic research projects, is planning several Arctic expeditions to help it develop a comprehensive strategy to the region and building a number of icebreakers. It is seeking permanent observer status on the Arctic Council and calls for a balance between national interests and those of the international community insofar as the Arctic is concerned (Sakhuja, 2011). China has also developed close links with Iceland that involve deeper trading and financial ties, cooperation in fields like new energy research, environmental protection, fishing, ship-building, and polar research. This can be seen as part of a strategy to afford China a degree of access to the Arctic that it might not otherwise enjoy. The Chinese appear to see Iceland as a key potential shipping centre should the Northern Passage open up to commercial navigation. President Olafur Ragnar Grimsson at one point stated that "In my discussions with the leadership of China, it is absolutely clear that they are very keen to co-operate with Iceland and the other countries in the Arctic region on what is happening in the Arctic and the northern regions and also of what are the implications of the northern sea routes opening up over the next few decades" (Sakhuja, 2011). China provided a Euro 400 million-currency swap in 2010, thereby furnishing Iceland with much needed liquidity in the wake of a serious financial crisis in that country.

78. The government welcomed this support, and officials there noted that neither Europe nor the United States had been willing to come to its assistance at that difficult moment. Undoubtedly this relationship has created a certain level of discomfort in Washington and in some European capitals. Some in Iceland view it with some scepticism as well. Indeed the government of Iceland has itself pointed to limits of its relationship with China. One Chinese investor, Huang Nubo, recently sought to make extraordinarily large land purchases in the north of the country, ostensibly to develop a 300 sq. km eco-tourist attraction. Some analysts detected an ulterior motive in this initiative and suggested that it represented a Chinese effort to gain a physical toehold in the region (Ford, 2011). The government of Iceland ultimately rejected this deal suggesting that it contravened foreign land ownership restrictions but a number of municipalities are now considering purchasing the land and leasing it to Mr Nubo (Stothard).

79. India has also begun to develop an Arctic strategy and has conducted a number of Arctic expeditions (Sakhuja, 2012). Non-Arctic Europe is also increasingly engaged in the region as well. The French, for example, have announced future Arctic military deployment and the Ministry of Defence has made it known that French submarines and surface ships are prepared to conduct Arctic missions. France's 27th mountain brigade also has Arctic capabilities. Other countries are moving in similar directions.

80. For obvious reasons the countries of the arctic littoral would generally prefer the rest of the international community to limit their ambitions in the region. International law, the fact that the much of the Arctic is an open ocean and not a private lake and the sheer difficulty of enforcing sovereignty claims in the region reduce the capacity of the Arctic Five to exercise hegemony over these waters.

81. There are also mounting concerns about the potential for non-state actors to build a presence in the region. Piracy is difficult to control even where military and police patrols are relatively extensive. In the Arctic, the state's presence is very limited and littoral countries are beginning to consider the potential implications of the appearance of piracy in these frigid waters. Arctic waters could also become a locus for smuggling operations and provide cover for movement of terrorists, weapons, and material needed to build weapons of mass destruction. These considerations are also shaping strategic calculation in the High North.

V. THE ARCTIC COUNCIL

82. As suggested above, a number of non-Arctic states have sought to deepen their relationship with the Arctic Council, an intergovernmental body established in 1996. Its full members are: Canada, Denmark (Greenland and Faroe Islands), Finland, Iceland, Norway, Russia, Sweden, the United States and the Indigenous communities of the region. The Council seeks to advance co-operation on a range of shared challenges on matters related to sustainable development and environmental protection in the Arctic. It has no regulatory authority and is consultative in nature. The Council has working groups addressing the Arctic Contaminants Action Program (ACAP); Arctic Monitoring and Assessment Programme (AMAP); Conservation of Arctic Flora and Fauna (CAFF); Emergency Prevention, Preparedness and Response (EPPR); Protection of the Arctic Marine Environment (PAME); and Sustainable Development.

83. The Council accords observer status to non-Arctic states and also engages other inter-governmental and inter-parliamentary organizations in some of its activities. The five permanent observers are: France, the Netherlands, Poland, Spain and United Kingdom. There are also four ad hoc observers: China, Italy, the EU and South Korea, but member states must approve their presence for each meeting. The Council has rejected a bid by the ad hoc members to become permanent observers at the Council meetings but have decided to continue discussing the role of

observers in the Arctic Council. China, in particular, has recently demanded recognition as a permanent observer, but because it has frozen relations with Norway after the Nobel Peace Prize was awarded to jailed Chinese dissident Liu Xiabo, Norway has responded in kind and refused to move on China's bid (The Economist, 2012) Russia is also not entirely enthusiastic about a permanent seat for China.

84. China has argued that the Arctic is part of the global commons and the littoral states should not treat it as their exclusive preserve. It has engaged several countries including Iceland, Norway and Canada in bilateral discussions on a range of Arctic matters. As suggested above, Canada, in particular, has been somewhat suspicious of non-Arctic countries showing too much enthusiasm for Arctic affairs. Referring to the European Commission's application for 'permanent observer' status at the Arctic Council, Canada (like Russia) expressed a wariness of "creating an increasingly unwieldy Arctic Council, and questions the motives of some applicants" (Willis). As a result, the European Commission's petition for permanent observer status was not accepted at a ministerial meeting in 2009. Canada has resisted according the EU observer status, in part, because of EU objections to traditional Canadian seal hunting. Nunavut Territory Premier Eva Aariak has said that the European Union should not be allowed to join the Arctic Council, given its proposal to ban the import of seal products (CBC News, 2009). Canada, which will chair the Arctic Council in 2013 and which will be followed by the United States, will preside over the debate about admitting emerging powers like India, China and Brazil as permanent observers in the Arctic Council. Canada's current government has laid particular stress on protecting sovereignty, and this concern seems to lie at the heart of its Northern strategy. Yet a recent report from the Committee on National Defence mentions that initial steps to ensure harmonious and mutually beneficial developments in the Arctic 'would be to expand and strengthen the Arctic Council and to widen its mandate'.

85. The conditions of Arctic ice, shipping regulations, maritime boundaries, search and rescue responsibilities, and negotiating territorial disputes in the Beaufort Sea and the Barents Sea are all issues taken up by the Council (Sakhuja, 2012). The five arctic coastal states have agreed to work to solve their territorial disputes and Russia and Norway have made good on this pledge. Other outstanding conflicts, however, need to be resolved, including a Danish-Canadian border dispute and the Canadian-American dispute over the status of the North-west Passage. Disagreements over the status of the continental shelves could also become a source of tension. It is worth noting finally that Arctic Council members last year signed their first legally binding agreement on search and rescue missions and will be considering another agreement on responding to oil spills (The Economist, 2012).

VI. TENTATIVE CONCLUSIONS

86. For all the attention that the Arctic has received in recent years, there is still much to learn there. Scientists continually lament the lack of data on a wide range of environmental indicators including the dynamics of global warming in the region and its potential long-term effects. Other human impacts are not fully understood. It is, for example, very difficult to gage long-run implications of fishing practices in the region, although there are indications that fishing is being largely underreported and that stocks of fish could be at risk with no protections put in place. The international community accordingly needs to dedicate far more resources to support scientific efforts to understand these divergent but often interlinked phenomena. There is very little instrumentation in the region to measure changes underway and assess their broader impact. More sophisticated models are needed to understand the linkages among diverse phenomena, and data must be generated to test these models. If humankind is destined to increase its presence in the Arctic, it is essential that the scientific and policy community come to grips with what this actually means and what impacts human activity will have. Accordingly, governments

need to provide strong support for those studying these phenomena. The scientific community's work will be fundamental to sound Arctic policymaking.

87. That community is working on a range of challenges in the Arctic including biodiversity, fish stocks, atmospheric conditions, coastal and underwater mapping, as well as permafrost, snow, and ice and water conditions to name a few. But more needs to be done to integrate and co-ordinate these efforts. The Arctic Council has provided support for building Arctic observer networks. This is a good start as information needs to be shared as broadly as possible. At the same time, indigenous communities should be actively engaged in this process as they are highly sensitive to the changes afoot and understand what these changes mean for the habitat.

88. Great strides have been made in moving the Arctic from a legal vacuum to a rule governed region. The UN Convention of the Law of the Sea and the Arctic Council have been very important in this regard. The international community, however, needs to use existing rules where they have been agreed and establish new rules of engagement where they are needed to ensure that conflicts do not break out over resources, boundaries, seabed and navigation right issues. Security in the High North is very much about building upon the agreed legal order governing human activity there. Along these lines, it would be very useful for the United States to ratify the UN Convention of the Law of the Sea as so many key US actors from the military, scientific, commercial and environmental communities have urged.

89. Non-Arctic states see the Arctic as part of a global commons and want to be included in deliberations affecting the region. The Arctic Council could be a forum for a dialogue but not in its present form as there is resistance to extending permanent observer status to a number of countries seeking it. Yet, the international community needs some vehicle to factor in the perspectives of these countries while nonetheless defending the special role of littoral states in the High North. Failure here could inspire unilateral approaches which would only stoke new tensions.

90. It is also essential to ensure greater military transparency throughout the region. The NATO - Russia Council could be one vehicle for exchanging information about the military forces in the region and potential sources of tension. But these kinds of exchanges need to be generalized to avoid conflict and tension in this delicate region. Indeed, every effort should be undertaken to minimize the presence and activities of military forces in the high north. But this will first require a higher degree of trust among interested parties and agreements to manage rivalry in legal rather than military frameworks. That, of course, does not mean that military forces should not be prepared to operate in the High North. There are, of course, contingencies where this might be necessary. But in a climate of trust, their presence can be kept to a minimum and working within existing legal frameworks will do much to build this kind of trust.

91. Retreating ice is making the prospect of deep-sea gas and oil drilling in the Arctic ever more likely. Policy makers and energy companies must approach this opportunity with enormous caution, however, because of the devastation a serious pipeline, transport, or other infrastructure related accidents would provoke. There are nowhere near adequate protections against such an event, and serious infrastructural investments will have to be made if this business is to have any hope of operating safely and in a reasonably sustainable fashion.

92. The limits of search and rescue in the region represent a real inhibitor to economic growth in the Arctic. This is not an entirely negative point at this juncture. Some limits to commercialization of the Arctic may be needed to avoid an environmental catastrophe. Insurance costs accordingly ought to reflect the real risks involved with activities like oil and gas drilling and cruise ships tourism. The potential costs of rescues and clean-ups should be factored into the cost of these activities. These are not matters to be settled after disasters, but rather, governments and other actors ought to plan for these scenarios and ensure that they have the means to cope with them. States can only provide some support here, particularly in light of their real fiscal limitations. It is

therefore up to the private sector to work out systems and insurance structures that will cover the real costs of such accidents. At the same time, the Arctic Council's conclusion of a landmark search and rescue agreement has illustrated how a spirit of regional cooperation can lead to tangible success.

BIBLIOGRAPHY

- Andreyeva, S. (2011, June 30). *Putin: the Arctic needs a clean-up*. Voice of Russia: <http://english.ruvr.ru/2011/06/30/52626732.html>
- Arnadottir, R. (2010). *Security at the top of the world: Is there a NATO Role in the High North?* NATO PA Report 2010: <http://www.nato-pa.int/Default.asp?SHORTCUT=2082>
- Block, B. (n.d.). *U.S. Leaders Support Law of the Sea*. World Watch Webpage: <http://www.worldwatch.org/node/5993>
- Brigham, L. (2012, March 1). *The Polar Code: What does it mean for Arctic Shipping*. DNV Managing Risk: http://www.dnv.com/industry/maritime/publicationsanddownloads/publications/updates/arctic/2011/01_2011/thepolarcodewhatdoesitmeanforarcticshipping.asp
- Campbell, K. (2008, August 15). *Russia's Norilsk Nickel now stretches from Arctic to SA, US to Australia*. Mining weekly.com: <http://www.miningweekly.com/article/russias-norilsk-nickel-now-stretches-from-arctic-to-sa-us-to-australia-2008-08-15>
- CBC News. (2009, April 15). *Nunavut premier wants EU barred from Arctic Council*. <http://www.cbc.ca/news/canada/north/story/2009/04/15/arctic-council.html>
- Connor, S. (2008, September 23). Exclusive: The methane time bomb. *The Independent*. <http://www.independent.co.uk/environment/climate-change/exclusive-the-methane-time-bomb-938932.html>
- Cook, P. H. (n.d.). *Mission report - Joint ESCTER/STCEES visit to Svalbard, Norway - 8-10 May 2012*. NATO PA: <http://www.nato-pa.int/default.asp?SHORTCUT=2870>
- Davis, T. (2011, December 9). The Lone Icebreaker: U.S. Sovereignty in the Arctic. *The Foundry*.
- Dowd, A. (2011, February 4). *Researchers warn Arctic fishing under-reported*. Reuters: <http://uk.reuters.com/article/2011/02/04/us-arctic-fish-idUKTRE71366L20110204>
- EurActiv.com. (2012, April 4). Melting Arctic may redraw global geopolitical map. *Reuters*.
- Flemming, B. (2008, December). Canada-US Relations in the Arctic: A Neighbourly Proposal.
- Ford, P. (2011, November 28). Iceland blocks Chinese Businessman from buying land. *The Christian Science Monitor*.
- Gorst, I. (2012, April 13). Proposed Tax Reforms Promise to Open up Russia's Offshore Arctic Gas Fields. *The Financial Times*.
- Haley, S., Szymoniak, N., Klick, M., Crow, A., & Schwoerer, T. (2011). *Social indicators for Arctic mining*. Alaska: ISER Working Paper.
- Harrison, P. (2011). *Canada's Interests and Strategies in the Arctic*. London: King's College London.
- Hik, D. (11-14 July 2011). Briefing to NATO PA Delegation, NATO PA Visit to Canada. <http://www.nato-pa.int/Default.asp?SHORTCUT=2664>
- Huebert, R. (2009). *Canadian Arctic Sovereignty and Security in a Transforming Circumpolar World*. Toronto: Canadian International Council.
- International Arctic Science Committee. (2010, February 10). *Arctic Climate Impact Assessment (full report)*. The Encyclopedia of Earth: http://www.eoearth.org/article/Arctic_Climate_Impact_Assessment_%28full_report%29
- Kireeva, A., & Digges, C. (2007). *Coordination marée noire*. http://coordination-maree-noire.eu/spip.php?article7501&lang=pl&var_mode=calcul
- Kramnik, I. (2012, April 19). NATO, Russia Stage Arctic War Games. *The Voice of Russia*.
- Landler, M. (2012, May 23). Law of the Sea Treaty is found on Capital Hill Again. *The New York Times*.
- Larsen, N. (2012, March 1). *Oil versus fish in idyllic Norwegian islands*. http://www.google.com/hostednews/afp/article/ALeqM5gtN_88ecZo8IM-apmRR12Gi6JLXQ?docId=CNG.1b823ccfaa1b192c2f2100d29947248f.1e1
- Mahr, K. (2010, October 12). *Is the Arctic Headed for Another Cold War?* Time.com: <http://ecocentric.blogs.time.com/2010/10/12/is-the-arctic-headed-for-another-cold-war/>
- Marshall, S. (2011, November 18). Norway bonding with Russia in North. *Upstream*.

- Molenaar, E., & Corell, R. (2009). *Background Paper Arctic Fisheries*. Arctic Transform.
- Molin, K. M. (2012, June 27). Oil Producers Look to Arctic. *The Wall Street Journal*.
- Natural Resource Defense Council. (n.d.). <http://www.nrdc.org/globalwarming/qthinice.asp>
- Nauman, K. (2010). Presentation. *Northern European Perspectives on Security, Economic and Environmental Challenges*.
- News, C. (2012, April 8). Military operation to start in Resolute Exercise Marks Military's 1st official return since August plane crash.
- Pettersen, T. (2011, November 18). Russia to have ten Arctic rescue centers by 2015. *Barents Observer*.
- Ragner, C. L. (2008). *The Northern Sea Route, published as 'Den norra sjövägen, in In Barents – ett gränsland i Norden*. (T. Hallberg, Ed.) Stockholm. <http://www.fni.no/doc&pdf/clr-no>
- Report, N. P. (11-14 July 2011). Visit to Alberta and British Columbia,. Retrieved from <http://www.nato-pa.int/Default.asp?SHORTCUT=2664>
- Restino, C. (2012, January 13). Ice Breaker Fleet in the US Lags Behind. *The Arctic Sounder*.
- Revkin, A. C. (2008, August 16). A Push to Increase Icebreakers in the Arctic. *New York Times*.
- Rose Roth Seminar, H. 1.-1. (2010). Northern European Perspectives on Security, Economic and Environmental Challenges. <http://www.nato-pa.int/Default.asp?SHORTCUT=2184>
- Russia Today. (2010, April 29). *Russia to clean Arctic from poisonous Soviet heritage*. <http://rt.com/news/putin-cleans-arctic-poisonous/>
- Sakhuja, V. (2011, September). China's Arctic Calculus and Iceland. *Society for the Study of Peace and Conflict Issue Briefs* (No. 3). <http://www.sspconline.org/sites/default/files/IssueBrief3.pdf>
- Sakhuja, V. (2012, March 19). *The Arctic Council: Is There a Case for India?* <http://voiceof.india.com/in-focus/the-arctic-council-is-there-a-case-for-india/996>
- Secretariat, N. P. (2011). Presentation by Robert Huebert, Visit to Alberta and British Colombia, 11-14 July .
- Shukman, D. (2012, September 7). *Arctic ice melting at 'amazing' speed, scientists find*. <http://www.bbc.co.uk/news/world-europe-19508906>
- Smith, A. (2009, September 17). Reopening the Northeast Passage. *Time Magazine*. <http://www.time.com/time/world/article/0,8599,1924410,00.html>
- Stothard, M. (2012, March 6). China Tycoon may yet gain Iceland Foothold. *The Financial Times*.
- Talmadge, E. (2012, April 16). Arctic Climate Change Opening Region to New Military Activity. *Associated Press*.
- The Economist (2012, May 24). The Arctic Council Works Well--Because of the Region's Riches.
- Truc, O. (2012, January 25). La course au Pétrole et au gaz de l'Arctique s'accélère. *Le Monde*.
- UNEP. (2012). http://www.grida.no/graphicslib/detail/definitions-of-the-arctic_12ba
- U.S. Geological Survey. (2008, July 23). *USGC Release: 90 Billion Barrels of Oil and 1,670 Trillion Cubic Feet of Natural Gas Assessed in the Arctic*. <http://www.usgs.gov/newsroom/article.asp?ID=1980>
- US Environmental Protection Agency. (2007). *Temperature changes*. <http://epa.gov/climatechange/science/recenttc.html>
- Walsh, B. (2007). *Norilsk, Russia - The World's Most Polluted Places*. http://www.time.com/time/specials/2007/article/0,28804,1661031_1661028_1661022,00.html
- Wiedemann, E. (2005, December 12). *Cold War Legacies - Nuclear Waste in the Russian Arctic*. <http://www.spiegel.de/international/spiegel/0,1518,390715,00.html>
- Willis, A. (2011, May 13). *EUobserver.com - Foreign Affairs - EU gets cold shoulder in the Arctic*. EUobserver.com: <http://euobserver.com/24/32331>
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