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IN DEFENCE OF DEFENCE: CANADIAN ARCTIC SOVEREIGNTY AND SECURITY

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ABSTRACT

The regional importance of Canada's Arctic has been traditionally anchored in its resource base while its remoteness has both hindered resource development and provided a security buffer to southern Canada and North America. Since the mid-19th Century, Canadian military activity in the Arctic has oscillated between intense and moderate periods and is now once again on the rise. Due to the inherent characteristics of experience, training, capacity, presence, resources, and timeliness of response, this research paper argues that the Canadian Forces is most appropriately leading the Government of Canada's response to existing and emerging Arctic security and sovereignty challenges. In doing so, the paper examines the history of Canada's Arctic presence and establishes its regional importance to the nation. Exploration then turns to what security and sovereignty mean to the nation, focussing on those threats that challenge Canada both today and in the future. Discussion next turns to why the military is the logical arm of government to ensure Canada remains secure and sovereign, allowing development of its Arctic people and resources to flourish. Lastly, recommendations are presented to enhance Canada's current response to those security and sovereignty challenges presented.

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CHAPTER 1: INTRODUCTION

Post-World War Two (WWII), Canada's military was often the most prominent federal organization in the occupation and use of the Canadian Arctic. During this time economic development in the region came in fits and starts, hindered by its remoteness and the lack of any long-term industry base. Yet today the Arctic's resource potential, fuelled by innovative technological advances to access remote deposits, has created a requirement for infrastructure development. New opportunities in Canada's Arctic have, in turn, influenced a growing young population and their need for increased social development. Simultaneously, this fragile environment has become a global focal point as the reality of climate change is accepted, diplomatically drawing together circumpolar nations as they attempt to address common issues. Thus Canada is witnessing a cycle of four major components of governance, defence, development, and diplomacy that is continuing into this century.

A unipolar world order developed with the geopolitical imbalance caused by the fall of the Soviet Union. This left the world's sole superpower, the United States (US), and its allies facing increased regional power struggles, international terrorism, and trans-national crime. Given the combination of tremendous growth in the developing world, its appetite for commodities, and the accessibility to resource-rich polar regions that climate change is rapidly expanding, Canada faces security and sovereignty issues that are both left over from the Cold War era and also newly emerging.

The response to these challenges has been a resurgence of military initiatives that is once again empowering Canadian security and sovereignty in the region. Defence-based initiatives are more responsive than diplomatic and developmental programs which are frequently slow to develop, non-governmentally driven, and cumbersome when dealing in a multi-lateral organizational framework that includes territories, the Federal Government, and seven other circumpolar nations. Therefore, due to its inherent characteristics of experience, training, capacity, presence, resources, and timeliness of response, the Canadian Forces (CF) is suitably leading the Government of Canada's response to existing and emerging Arctic security and sovereignty challenges.

This paper briefly examines the history of Canada's Arctic presence and establishes its regional importance to the nation. Exploration then turns to what security and sovereignty mean to Canada, focussing on threats that challenge Canada today and in the future. Discussion next turns to why Canada's military is the logical arm of government that will ensure Canada remains secure and sovereign to allow development of its Arctic people and its resources to flourish. Lastly some basic recommendations are presented to enhance Canada's current response.

CHAPTER 2: BACKGROUND

Canada's Arctic region is vitally important to the nation's vitality and viability. To paint an adequate picture of the region before examining any matter of its security or sovereignty, it is worthwhile to discuss its composition.

GEOGRAPHY

Canada owns the world's longest coastline, six times longer than equator. It has the fifth largest Economic Exclusive Zone, second largest continental shelf, and has a Maritime estate approximately 70% the size of its landmass. With potentially successful future claims in the Arctic under the United Nations Convention of the Law of the Sea (UNCLOS), Canada's Maritime estate could roughly equal Canada's landmass. No wonder, then, that Canada can be said to be a Maritime nation with crucial links between the protection and management of its marine resources and its survival.

Canada's four million Arctic kilometers[2] (km), comprising 40% of Canada's land mass, is bounded to the south by the 60th northern parallel,[1] to the west by the Yukon-Alaskan border, and to the east by the northern Atlantic Ocean and Greenland;

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[1]The southern boundary is not definitive. It can also be defined to be north of the Arctic circle (66° 33'N); inclusive or exclusive of Hudson Bay or Ungava Bay; the waters off Nunavut, the Northwest Territories and Yukon, including or excluding northern Quebec and/or northern Labrador; north of the 10° C July isotherm; north of the continuous permafrost line; or the continuous tree line. Transport Canada, "Seaway and Domestic Shipping Policy: Canadian Arctic Shipping Assessment," http://old.pame.is/sidur/uploads/CASA%20Scoping%20Study-amsa.pdf; Internet; accessed 11 March 2008.

approximately 64% of that coastline is along the Arctic Ocean.[2] It also encompasses a sizeable portion of the 14 million km^2 of the Arctic Ocean and Beaufort Sea, which are predominantly ice-covered year-round. Seasonal fluctuations of its southern sea ice boundary improve navigation in the summer months. Canada's western and eastern coasts are bridged by the Arctic Ocean and the North West Passage (NWP). The NWP encompasses approximately 5,000 km of waterways that reduce European-Asian shipping routes by 8,000 km[3] and east coast North American-Asian routes by 7,000 km[4] over the standard Panama Canal route, as depicted in Figure 1. Through its deep-draft route, the NWP is able to handle vessels in excess of the Panama Canal's maximum draft,[5] although suitability of the route is limited by summer ice conditions and hull strength.

Figure 1: Shipping Routes via the NWP
Source: Morris Maduro, "Northern Shortcut: The Temptation of One Warming Line Through the Arctic," http://www.canadiangeographic.ca/Magazine/ND00/maduro.asp; Internet; accessed 11 March 2008.

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[2]Ed Wiken, "Canada's Marine Areas: Integrating the Boundaries of Politics and Nature," http://www.whc.org/documents/MarineAreasMapText.doc; Internet; accessed 11 March 2008.

[3]Morris Maduro, "Northern Shortcut: The Temptation of One Warming Line Through the Arctic," http://www.canadiangeographic.ca/Magazine/ND00/maduro.asp; Internet; accessed 11 March 2008.

[4]Michael Byers, "Build an Arctic Gateway to the World," *Globe and Mail*, 26 November 2007, http://www.uofaweb.ualberta.ca/govrel/news.cfm?story=69605; Internet; accessed 18 March 2008.

[5]Autoridad del Canal de Panama, "MR Notice to Shipping no. N-1-2005," http://www.pancanal.com/eng/maritime/notices/n01-05.pdf; Internet; accessed 11 March 2008.

Vegetation is varied with slow-growth boreal forests in the sub-Arctic giving way to low scrub, mosses, and lichens in the Low Arctic tundra and eventually barren rock and ice in the High Arctic. Wildlife is also varied and includes, most significantly, large migratory caribou herds and water fowl on land and seals, whales, and polar bears in the Arctic Ocean supported by an as yet to be fully mapped fishery. Supporting this wildlife are regions of mountains, coastal plains, forests, and tundra. Given the harsh winter climate, the short summer growth period, and the resultant slow regeneration time of flora and fauna, the Arctic ecology is very susceptible to external man-made stressors. Its large expanse of almost 3% of the world's land surface area makes it an important component of the word's ecosystem.

RESOURCES

Canada's Arctic geography includes a vast repository of resources, the bulk of which remain undeveloped. Upwards of 50% of the world's undiscovered hydrocarbons are estimated to lie in the Arctic[6] while Canada's northern mines already supply one third of the world's diamonds.[7] Fresh water and fish stocks are also significant. This resource base, coupled with rapidly advancing technology, has drawn much attention to all Arctic regions. The international race to stake claims against these resources highlights the need

[6]Library of Parliament, *Canadian Arctic Sovereignty*, http://www.parl.gc.ca/information/library/PRBpubs/prb0561-e.htm; Internet; accessed 4 March 2008; 5.

[7]George Werniuk, "Canada Now Ranks Third in Diamond Production," *Investor's Digest of Canada* 38, no. 5 (3 March 2006): 131.

for careful management practices, especially against the backdrop of climate change which is shaping both the environment and the peoples of the Arctic.

POPULATION

Canada's Arctic includes the territories of the Yukon, the Northwest Territories (NWT), and Nunavut, and the regions of Nunavik in Northern Quebec and Nunatsiavut in northern Labrador. It is home to a total population of approximately 101310 spread across some 99 communities;[8] the three main population centres, Whitehorse, Yellowknife, and Iqaluit, have city status while the remaining communities are small towns and villages. Most communities are situated near access routes along traditional water transport routes. Of the indigenous population of 49,000, 41,000 are of Inuit origin. As Canada in general becomes more of an aged population, the demographics of its North reveal a very different trend: 50% of the population is under the age of 15.[9] This fact alone will make future social development of the North a difficult task for the Canadian and territorial governments.

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[8]Statistics Canada, "Population and Dwelling Counts for Canada: Provinces and Territories, 2006 and 2001 Censuses," http://www12.statcan.ca/english/census06/data/popdwell/Table.cfm?T=101; Internet; accessed 11 March 2008.

[9]Indian and Northern Affairs Canada, "A Snapshot of the Canadian Arctic," http://www.ainc-inac.gc.ca/pr/pub/indigen/sna_e.html; Internet; accessed 11 March 2008.

POLITICS

The lead Federal Government agency responsible for Canada's North is Indian and Northern Affairs Canada (INAC), though there are many departments that maintain northern interests. The three territories govern largely with powers of responsibility similar to Canada's ten provinces. They are not, however, empowered to control, most importantly, natural resources, although devolution discussions to repatriate province-like responsibilities are ongoing. Similarly, Canada's Northern peoples have maintained their right to self-governance, making significant progress over the past 30 years.

On the international scene, the circumpolar nations of Denmark, Finland, Iceland, Norway, Russia, Sweden, and the US, all share with Canada the common Arctic Ocean environment and similar economic and environmental concerns such as resource development and climate change. Therefore the trend for ever-increasing multilateralism amongst the circumpolar peoples and governments is a natural one to augment Canadian efforts in the Arctic.

HISTORIC RELEVANCE TO CANADA

The Japanese occupation of the Alaskan Aleutian Islands during WWII shattered the geographic security of North America. No longer could the remoteness of the northern reaches of the continent guarantee continental security; as a result, both Canada and the US scrambled to exert control over the region.

The Cold War was born out of WWII and with it came the perception of the Arctic as a physical buffer against the new threat of Soviet aggression. Consequently, major development of the region remained almost exclusively militarily driven until the downfall of the Soviet Union in the early 1990's. This reduction of threat was paralleled by significant reductions to the Canadian military's ability to monitor and patrol effectively its most northern regions. Simultaneously, the issue of Canadian sovereignty over the NWP remained unresolved.

A BRIEF HISTORY OF CANADIAN ARCTIC SOVEREIGNTY AND SECURITY

First exploration of the Arctic began in the last decade of the 15th century with Columbus' and Cabot's search for the route to the Orient.[10] However, it was not until the formation of the Hudson's Bay Company in 1670 that expansion into the Arctic to support its fur trade was fuelled. With the identification of a viable whaling industry in northern waters in the 19th century, the economic interests of Canadian Arctic commerce improved, though the Arctic remained only a small contributor to the Canadian economy at that time.[11]

In 1880, Great Britain ceded its rights to the Arctic Islands to the Dominion of Canada. The first real military presence in Canada's Arctic was established with the Yukon Field Force 18 years later. The Force was assembled to aid the North West

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[10]Bob Edwards, "A Brief History of Arctic Exploration," http://geography.about.com/library/misc/ucarctic.htm; Internet; accessed 11 March 2008.

[11]*Chronicle of Canada*, ed. Elizabeth Abbott (Montreal: Chronicle Publications, 1990), 227, 264.

Mounted Police to maintain law and order during the Goldrush,[12] a brief era that saw an ingress of people to Canada's North never since witnessed.

The conquest of the NWP in 1906 by the Norwegian explorer Roald Amundson was a significant a feat of exploration that put to rest the 400 year quest to cross from the Atlantic to the Pacific. As revolutionary as it was, Amundson's success foretold of future challenges that Canada would come to face in its Northern backyard: others would play there, frequently without permission.

By 1940, the Royal Canadian Mounted Police (RCMP) vessel St Roch made the second ever transit of the NWP, asserting Canadian sovereignty over its North. However, with the start of WWII, this quickly became overshadowed as the Lend Lease Program required the building of the Northwest Staging Route and the Alaska Highway to support aircraft flying from North America to Russia and China; this was facilitated by the Canol Road and pipeline, which cut a swath through the forests of the Yukon and the NWT. In the eastern Arctic, the Crimson Route was built to facilitate supply of Britain and France, resulting in airports and communities such as Goose Bay and Iqaluit along the way. Though Canada was at war, the infrastructure built in Canada's North would not have been possible without American assistance. However, the impact on the region was not light. Lackenbauer and Farish describe projects that "radically transformed the human

[12]Peter Gizewski and Andrew B. Godefroy, "Force Requirements (Land)," in *Defence Requirements for Canada's Arctic*, ed. Brian MacDonald (Ottawa: Conference of Defence Associations Institute, 2007), 99.

and physical geography of the North."[13] This theme of exploitation would continue for several decades.

The 1940 Ogdensburg Agreement established the Permanent Joint Board on Defense, creating for the first time a combined American-Canadian body responsible for North American defence.[14] This significant step laid the foundation for the cooperative strategy on defence that both countries have since continued. Additionally, the establishment of the PJBD cemented Canadian and American policy, a relationship that has benefited Canada without a doubt, albeit at a cost to Canadian identity and, critics argue, sovereignty.

After the close of WWII, the first real strategic interest expressed by Canada in its Arctic was building the Joint Arctic Weather Station system, at request by the US, completing the first of five outposts in early 1947.[15] Concurrent with that was the stand up of the Canadian Rangers in 1947 to serve as the 'eyes and ears' of the north.[16]

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[13]P. Whitney Lackenbauer and Mathew Farish, "The Cold War on Canadian Soil: Militarizing a Northern Environment," *Environmental History* 12 (October 2007): 925.

[14]Department of National Defence, "Backgrounder: The Permanent Joint Board on Defense;" http://www.dnd.ca/site/Newsroom/view_news_e.asp?id=298; Internet; accessed 11 March 2008.

[15]R.W. Rae, "Joint Arctic Weather," *Arctic* 4, no. 1 (May 1951), 18-26; http://pubs.aina.ucalgary.ca/arctic/Arctic4-1-18.pdf; Internet; accessed 11 March 2008.

[16]P. Whitney Lackenbauer, "Canada's Northern Defenders: Aboriginal Peoples in the Canadian Rangers, 1947-2005," in *Aboriginal Peoples and the Canadian Military: Historical Perspectives*, ed. P. Whitney Lackenbauer and Craig Leslie Mantle, 171-208 (Winnipeg: Canadian Defence Academy Press, 2007), 171.

The 1948 Advisory Committee on Northern Development called for a report on Arctic sovereignty. It was the first formal assessment of Canada's Arctic region and it highlighted the need for Canada to consider more closely the status of its far North. In its vagueness, however, it did little to advance Canadian sovereignty in the region.[17]

The intent to expand Canadian presence in the Arctic evolved with the 1949 concept of an Eastern Arctic Patrol supported by Canada's first modern icebreaker, Her Majesty's Canadian Ship (HMCS) Labrador.[18] The intent to surveille northern waters while resupplying communities and weather station sites was admirable. Labrador was "a significant part of the Canadian government's massive investment in sovereignty operations in the High Arctic,"[19] and, in 1954, it became the first Canadian military vessel to transit the NWP. Although it conducted significant Arctic research, with no ability to address the growing Russian submarine threat it was transferred to the Department of Transport in 1957, a victim of military budget cuts.

To counter the growing Soviet nuclear and bomber threat, building of the Distant Early Warning (DEW) Line began in 1955. Its 42 sites across the 66th parallel from

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[17]Elizabeth B. Elliot-Meisel, "Still Unresolved after Fifty Years: The Northwest Passage in Canadian-American Relation, 1946-1998," *The American Review of Canadian Studies* 29, Iss. 3 (Fall 1999), http://proquest.umi.com/pqdweb?did=384982441&Fmt=7&clientId=65345&RQT=309&VName=PQD; accessed 11 March 2008, 4.

[18]Department of Foreign Affairs and International Trade, *Documents on Canadian External Relations* Vol. 15, no. 875, http://www.dfait-maeci.gc.ca/hist/dcer/details-en.asp?intRefid=9488; Internet; accessed 11 March 2008.

[19]Charmion Chaplin-Thomas, "The Navy Goes North," *The Maple Leaf* 8, no. 26 (13 July 2005), http://www.forces.gc.ca/site/community/mapleleaf/article_e.asp?id=2825; Internet; accessed 11 March 2008.

Baffin Island to Alaska gouged once again into the tundra, affecting both the wildlife and livelihood of Northern peoples. Just as Canadian-US military Arctic exercises during the 1950's had done, the DEW Line further united "…Canada and the United States in the event of northern warfare, and thus in the planning for this potential combat."[20]

The late 1950's also saw numerous American incursions into Canadian territory. In 1957, the US Coast Guard Ship (CGS) Storis made the fourth transit of the NWP, followed by the US Submarine (USS) Nautilus' distinction as the first submarine to do so in 1958. In response to the build up of the Soviet nuclear submarine and long-range bomber threat,[21] that same year the CF established a station at Alert as "the most northern permanently inhabited settlement in the world."[22] Furthering Canada's presence in its North was timely as shortly thereafter the USS Sea Dragon became the first submarine to transit to and surface at the North Pole in 1960, followed by the first Russian submarine, Leninsky Komsomol, in 1962. No wonder the 1961 Brock Report highlighted the need for a "'three oceans' strategy if it were to exercise its sovereignty over the whole of the area it claimed, and even more so to enhance that claim."[23] Admiral Brock's call for a "renewal of RCN activity in the Arctic archipelago as an urgent task"[24] would remain

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[20]Lackenbauer and Farish, "The Cold War on Canadian Soil…, 928.

[21]Rob Huebert, "The Rise and Fall (and Rise?) of Canadian Arctic Security," in *Defence Requirements for Canada's Arctic*, ed. Brian MacDonald (Ottawa: Conference of Defence Associations Institute, 2007), 10.

[22]Department of National Defence, "Backgrounder: CFS Alert," http://www.forces.gc.ca/site/Newsroom/view_news_e.asp?id=625; Internet; accessed 5 September 2007.

[23]LCol Douglas Bland, "Continuity in Canadian Naval Policy, 1961-1987," *Canadian Defence Quarterly* (April 1989), http://centreforforeignpolicystudies.dal.ca/cdq/Bland%20April%201989.PDF; Internet; accessed 11 March 2008; 30.

[24]*Ibid*., 30.

unanswered for several decades as Canada's population continued to fail to understand the significance of not having the ability to control its North.

It was not until the US oil tanker Manhattan's Northwest Passage transits in 1969 and 1970 that Canada's Arctic public awareness was kindled.[25] Despite much public attention, the only concrete Canadian response was the 1970 Arctic Waters Pollution Prevention Act (AWPPA) that created a 100 nautical mile (nm) pollution control zone extending seaward from Canada's Arctic coastlines.[26] The 1971 *White Paper on Defence* clearly articulated the importance of Canada's North and that sovereignty challenges could arise from "territorial violations or infringements of Canadian laws."[27] It is worth noting that the US informed but did not seek Canadian permission for the Manhattan's transits, though Canada welcomed and in fact supported the voyages with escort by the Canadian CGS J.A. Macdonald.

The Canadian position on the sovereignty of its North was again furthered by the 1973 and 1975 proclamations that the NWP was an internal, historic waterway. Additionally, similar to its lack of recognition for the 100 nm zone established by the AWPPA, the US did not recognize the NWP as Canadian internal waters and argued instead that it was an international strait.

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[25]Gordon Jones and Bruce Rogers, "Sunday Magazine: This is our Country," Canadian Broadcasting Corporation Radio, http://archives.cbc.ca/IDC-1-73-2349-13652/politics_economy/northwest_passage/clip6; Internet; accessed 4 September 2007.

[26]Library of Parliament, *Canadian Arctic Sovereignty*…, 4.

[27]Department of National Defence, 1971 Defence White Paper (Ottawa: Information Canada, 1971), http://www.forces.gc.ca/admpol/downloads/Defence%20in%20the%2070s.pdf; Internet; accessed 11 March 2008; p 8.

During the United Nations (UN) Third Law of the Sea Conference (UNCLOS), from 1973 to 1982, a significant global shift in recognition of maritime boundaries occurred: both the US and Soviet Union conceded the limit of territorial seas from three nm to the 12 nm already claimed by many nations. Additionally, UNCLOS recognized more than one dozen archipelagic states and introduced the "right of transit passage" which, unlike the "right of innocent passage," allowed submarines to pass through the designated waters while remaining submerged. One consequence of this left the governing state's sole control of the waterway relegated to environmental concerns.[28]

Subsequently, the USCGS Polar Sea sailed the NWP from Greenland to Alaska in 1985. Canada was notified and provided unsolicited permission. This established a relationship in which the issue of Canadian sovereignty of its Arctic did not obscure or hinder the Canadian-US bilateral relationship. In essence the position taken by both sides concerning access to Canada's Arctic can be summed by paraphrasing David Collenette, the former Minister of National Defence: do not ask for permission and we will never refuse.[29] The reason why this relationship works for the US is that in the event that permission were sought and subsequently denied, a precedent-setting scenario applicable to other contentious waterways, such as within the Gulf of Arabia, would be created.[30]

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[28]Though the US and Canada did not initially ratify UNCLOS, Canada did so in 2003 while the US has yet to do so.

[29]House of Commons Debates 133, no. 225 (6 November 1995), (Ottawa: Queens Printer for Canada 1995), 16245.

[30]For example, Canada respects Iranian designation of straight baseline calculations of its territorial waters whereas the US does not. Elliot-Meisel, "Still Unresolved after Fifty Years…, 5.

However, Canadian public opinion was again strongly against what was seen as American insensitivity towards Canadian sovereignty.

Later that year, Prime Minister Mulroney clearly articulated that Canada's national identity was linked with both its sovereignty, over the land, water, and ice of the Arctic, and its security.[31] The following year straight baseline calculations for enclosing "Canada's historical internal waters" were implemented and a Polar 8 Icebreaker Program, designed to exert Canada's influence over its Arctic waters, was announced.

The 1987 *White Paper on Defence* promised significant steps to enhance Canada's northern security through the planned procurement of a nuclear submarine fleet and additional maritime aircraft to patrol Brock's 'three-ocean frontier.'[32] Further requirements were articulated for an underwater sonar surveillance system and the replacement of the Sea King anti-submarine helicopter fleet. Nonetheless, military presence declined in the Arctic. As it bore out, program cancellations were numerous: the submarines in 1989, the Polar 8 icebreaker in 1990, the Sea King replacement in 1993, and the underwater surveillance system in 1996; the Tracker patrol aircraft was phased out in 1991. The Oberon submarine fleet retired in 2000, leaving the status of Canada's submarine fleet very tenuous with only one partially operational Victoria Class submarine operating at the time of writing. The 1991 fall of the Berlin Wall and the

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[31]House of Commons Debates (10 September 1985), (Ottawa: Queens Printer for Canada 1985), 6463.

[32]Department of National Defence, *1987 Defence White Paper* (Ottawa: Canada Communications Group, 1987), http://www.forces.gc.ca/admpol/downloads/Challenge%20and%20Commitment%201987.pdf; Internet; accessed 11 March 2008, 53, 57.

evaporation of the traditional Cold War threat caused much of the 1987 White Paper's sinking. The rationalization for these expensive platforms disappeared.[33] More importantly though, Canada's ability to increase its northern presence also diminished.

Overshadowed by the threat of "the steady growth of public sector debt,"[34] the 1994 *White Paper on Defence* called for significant personnel reductions to 60,000 while still maintaining the need to "demonstrate, on a regular basis, the capability to monitor and control activity within Canada's territory, airspace, and maritime areas of jurisdiction."[35] With no "direct immediate threat to Canada," the "thousands of flying hours over the Arctic archipelago"[36] by patrol aircraft in the 1970's had shrunk to only four patrols by 2000.[37] Additionally, the frequent exercises of the 1950s and 1970s, which forged the Canadian Army into winter warfare experts, had also disappeared. Though the Rangers continued to function, their patrols were limited in numbers.

In 2000, Canada charted a course to reinvigorate interest in its Arctic with the publication of *The Northern Dimension of Canada's Foreign Policy*, which sought to

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[33]Desmond Morton, "Defence Policy," in *The Canadian Encyclopedia, Historica Foundation of Canada,* http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=A1ARTA0002205; Internet; accessed 11 March 2008.

[34]Department of National Defence, *1994 Defence White Paper*, Chap 2, (Ottawa: Canada Communications Group, 1994), http://www.forces.gc.ca/admpol/content.asp?id={D48C96FF-4673-463D-9E77-3DB9771AD1ED; Internet; accessed 11 March 2008.

[35]Department of National Defence, *1994 Defence White Paper*, Chap 4, (Ottawa: Canada Communications Group, 1994), http://www.forces.gc.ca/admpol/content.asp?id={DE88E50B-41E5-4A6F-8102-FABE7AAAD0C9; Internet; accessed 11 March 2008.

[36]Lackenbauer and Farish, "The Cold War on Canadian Soil…, 935.

[37]Department of National Defence, *Arctic Capabilities Study*, (Ottawa: Director General Strategic Plans, 2000), 9.

"assert and ensure preservation of Canada's sovereignty in the north."[38] The RCMP Vessel Naddon, renamed St Roch II, symbolically transited the NWP that year and by 2005, the *Defence Policy Statement* clearly indicated Canada's north to be a "vital region of the country."[39] With the 2007 announcements of an expanded Ranger force, the establishment of a military Arctic training center at Resolute Bay, the Arctic/Offshore Patrol Vessel (AOPV) program, and the decision to build an Arctic deepwater port at Nanisivik, Canada's commitment to "maintain a federal presence in Canada's Arctic waters"[40] re-emerged. With the recent $720 million commitment to build a CCG Polar Class icebreaker, this presence appears to be on track to continue well into the future.

To summarize, as WWII and the Cold War have both come and gone, so to have Canada's military interests in the Arctic flowed and ebbed. Canada's Arctic, once the battleground of the Cold War, has now become the scene of a rush to develop its resource potential. Unresolved, however, are the results of a long-term commitment to protect the region, both militarily and environmentally, and issues of the sovereignty of a few key areas. This paves the way for Canadian federal policy to develop and implement tools for long-lasting success in this region.

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[38]Department of Foreign Affairs and International Trade, *The Northern Dimension of Canada's Foreign Policy* (Ottawa: Department of Foreign Affairs and International Trade, 2000).

[39]Department of National Defence, *Defence Policy Statement* (Ottawa: Department of National Defence, 2005), http://www.forces.gc.ca/site/reports/dps/pdf/dps_e.pdf; Internet; accessed 12 March 2008, 8.

[40]Office of the Prime Minister of Canada, "Backgrounder - Expanding Canadian Forces Operations in the Arctic," http://www.pm.gc.ca/eng/media.asp?id=1785; Internet; accessed 5 September 2007.

CHAPTER 3: CANADIAN SECURITY AND SOVEREIGNTY DEFINED

To provide clarity before continuing, insight to what security and sovereignty are and what they mean to Canada is warranted. It is worthwhile to point out the intentional prioritization of security over sovereignty, though they are intertwined, because without the former there is no hope of exercising the later.

The *Oxford Dictionary* defines security, applied in the international sense, as the ability of a state to protect against the aggression of another.[41] Recognizing that the raising and support of armed forces to protect a nation is a costly endeavour, states turn to alliances to gain synergies of effort through collective defence. NATO continues to be possibly the most successful example of such an alliance in history as it is doubtful that any one country, save the US, could protect itself without the aid of its allies. For Canada, this introduces the idea that political sovereignty may not be wholly achievable if it is to meet all its security needs, requiring then to relinquish some autonomy in favour of preserving alliances and relationships supporting security.

WHAT DOES ARCTIC SECURITY MEAN TO CANADA?

> Canadians have always felt secure in the knowledge that the Arctic was its own defence by virtue of an inhospitable climate, the huge distances involved, and terrain that would surely discourage any serious thought of invasion.[42]

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[41] *Pocket Oxford English Dictionary*, ed. Catherine Sloane, Ninth ed. (Oxford, New York: Oxford University Press, 2002), 816.

[42] Paul Manson, "Forward," in *Defence Requirements for Canada's Arctic*, ed. Brian MacDonald (Ottawa: Conference of Defence Associations Institute, 2007), 1.

General Paul Manson's words set the stage for the perception of security that Canadians hold about their Arctic. Perception is not necessarily linked to physical security, though physical security likely enhances it. A perception of security, in this context, has developed over time as Canada's security focus has emphasized non-North American theatres, countering the threat through actions abroad in Europe and Asia. As a result, Manson's quote highlights how Canadians have seldom needed to look north to their own backyard. Despite initial military interest brought about by WWII and the Cold War, the Arctic's physical and temporal separation from the majority of Canadians' minds, coupled with the fortress-like nature of North America, have propagated a perception of security. However, as climate change advances and its impact on the Arctic is understood by more people, the need for physical security will rise.

Physical security is a product of protecting people from a threat and preserving their way of life. Borne out of the temporary, albeit shocking, Japanese occupation of the Aleutian islands of Attu and Kiska, attention was first drawn to Arctic security in WWII. Then, during the Cold War, the Arctic became the battleground for both American and Soviet intercontinental and submarine launched ballistic and cruise missile forces. The dramatic and rapid paradigm shift from Cold War to global War on Terror underscores the unpredictable nature of modern threats. All three events have highlighted the vulnerability of Canada's Arctic security, tempered as it is by the knowledge that Canadians have historically exercised little control over the security of this region.

With increased exploration of remote Arctic areas supported by developing technologies to find and exploit remote mineral and energy resources, economic security is an essential component of the overarching concept of physical security. Economic security stems from the ability to market goods and services without interruption. As a result, it requires responsiveness to known and emerging scenarios which can be disruptive; therefore, economic security needs a government able to monitor and respond expeditiously to traditional and non-traditional threats.

Though the economies of Canada's Arctic territories are small in relation to the rest of the country, they are vital to the survival of the people that live there. Additionally, the impact of the Arctic's as-of-yet untapped and uncharted resource wealth has not been fully identified. Therefore unpredictability makes defining threats to both physical and economic security difficult yet essential.

Additionally, physical security has an environmental component, as the environment is the framework that encompasses the people who inhabit the land and their prosperity and culture. In the Arctic, protection of the environment and the ability to prevent damage to it has evolved as a key issue to the survival of its residents, especially for the basics such as water, food, and health. Furthermore, as shown with the Manhattan's transit, there is additionally a psychological component to security that must be assuaged.

In sum, physical security from military, economic, or environmental threats is about understanding and possessing the capability to react to them in order to ensure the viability of the people who live there. Given the size of its geography and its relatively small population base, Canada's relationship with the US demonstrates that a nation need only have access to the means to ensure its security rather than own it outright. However, competing demands and limited resources are influencing Canada to increase its capabilities.

WHAT IS SOVEREIGNTY?

The *Oxford Dictionary* defines sovereignty as "complete power or authority."[43] For Canada as a state, this implies freedom from interference by other states; freedom of action within its territory; freedom to impose its rule of law and governance over its territory; and the ability to maintain a presence on that territory to exert its authority. In short, sovereignty is the ability to use and influence its territory and its people. In the Library of Parliament's 2006 report *Canadian Arctic Sovereignty*, Daniel Phillpot describes that:

> Sovereignty is supreme legitimate authority within a territory… supreme authority within the territory implies both undisputed supremacy over the lands inhabitants and independence from unwanted intervention by an outside territory.[44]

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[43] *Pocket Oxford English Dictionary...*, 1083.

[44] Library of Parliament, *Canadian Arctic Sovereignty*…, 2.

Franklyn Griffiths and Douglas Johnston suggest that sovereignty can be broken into two components.[45] Legal sovereignty refers to a state's right to impose exclusive jurisdiction over an area, thus allowing it to enforce its laws. This would be akin to Harriet Critchley's "functional jurisdiction" as described by Elizabeth Elliot-Meisel.[46] In the political context, sovereignty refers to the ability to be free from control by outside states in the governance of an area. Canada has degrees of each. Canada is taking strides to preserve the legal sovereignty of its north and, since the repatriation of its constitution in 1982, it has been politically autonomous. However, given that Canada has become so serious about its northern dimension in recent years and that it has been inextricably joined to the US hip by history, culture, and trade, it could also be lacking both components.

WHAT DOES ARCTIC SOVEREIGNTY MEAN TO CANADA?

Canadian Arctic Sovereignty suggests that sovereignty is increasingly looked upon as a state's responsibility to exert control over its territory.[47] This takes on a broader definition as it encompasses stewardship, environmental protection, and resource management rather than just border definition. Former Minister of National Defence Bill Graham stated, "Sovereignty is a question of exercising, actively, your responsibilities in

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[45]Franklyn Griffiths, "The Northwest Passage in Transit," *International Journal* 54, no. 2 (Spring, 1999), http://proquest.umi.com/pqdweb?did=413567471&Fmt=7&clientId=65345&RQT=309&VName=PQD; Internet; accessed 12 March 2008 and Douglas M. Johnston, "The Northwest Passage Revisited," *Ocean Development and International Law* 33, no. 2, (April 2002): 146-147.

[46]Elliot-Meisel, "Still Unresolved after Fifty Years…, 5.

[47]Library of Parliament, *Canadian Arctic Sovereignty*…, 2.

an area."[48] If Graham's ideas such as "use and occupancy"[49] enter into the sovereignty equation, then the importance of maintaining a presence on the land or water becomes essential as its lacking allows in-roads to be made by others.[50]

For Canada, sovereignty means that it can act to govern over and respond to threats and actions against its territory. Northern sovereignty as defined by the Arctic Security Interdepartmental Working Group (ASIWG) is:

> . . . a recognized right, ability and will to exercise exclusive jurisdiction within a geographical area (with a defined border, people within it and some form of government).[51]

Key to exercising jurisdiction is the capability to act against a threat, a notion that is articulated in the Department of National Defence's (DND) 1994 *The Naval Vision*: national sovereignty is built upon the "capability for surveillance, patrol, and response."[52]

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[48]Graeme Smith, "Graham Focuses on Arctic During Visit to Russia," *Globe and Mail,* 3 September 2005, http://proquest.umi.com/pqdweb?index=0&did=1054842591&SrchMode=1&sid=1&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1201457355&clientId=1711&cfc=1; Internet; accessed 15 March 2008; A5.

[49]Jose A. Kusugak, "Stewards of the Northwest Passage," *National Post,* 3 February 2006, http://proquest.umi.com/pqdweb?index=0&did=981379541&SrchMode=1&sid=7&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1203285886&clientId=1711; Internet; accessed 15 March 2008; A18.

[50]Though not discussed in this paper, 'use and occupancy' or stewardship of the land focuses more on development and governance aspects of sovereignty.

[51]Governments of Northwest Territories, Nunavut, Yukon, *Developing a New Framework for Sovereignty and Security in the North*, http://www.gov.nt.ca/research/publications/pdfs/sovereignty_and_security_in_the_north.pdf; Internet; accessed 28 February 2008; 4.

[52]Department of National Defence, *The Naval Vision: Charting the Course for Canada's Maritime Forces into the Next Century* (Halifax: Canada Communications Group, 1994), 12.

With most Canadians living within 300 km of the US border,[53] Canada's sovereignty over its southern regions is unchallenged. Where the component parts of sovereignty lose clarity is in Canada's Arctic where its ability to exert its sovereignty is weaker.

As the effects of climate change and globalization take hold, the relevance of the Arctic becomes more important to Canada, its circumpolar neighbours, and others. In July 2007, Prime Minister Harper was quite explicit:

> As oil, gas and minerals of this frontier become more valuable, northern-resource development will grow ever more critical…The need to assert our sovereignty and protect our territorial integrity in the Arctic on our terms has never been more urgent.[54]

Without necessarily being able to enforce its sovereignty throughout its land, Canada has recognized the need to act.

SECURITY AND SOVERIEGNTY ENMESHED

Rob Huebert's comment that, "To most Canadians the dispute over the Northwest Passage is simply about sovereignty for its own sake,"[55] identifies the naïve

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[53]Environment Canada, "How Much Fresh Water Does Canada Have?" *Envirozone* 1, (18 December 2001), http://www.ec.gc.ca/envirozine/english/issues/01/any_questions_e.cfm; Internet; accessed 12 March 2008.

[54]Kelly Howard, "Tories Plan Icebreaker," Victoria News, 11 July 2007; http://www.martinfrost.ws/htmlfiles/july2007/canada_ice.html; Internet, accessed 12 March 2008.

[55]Rob Huebert, "Northern Interests and Canadian Foreign Policy" (Calgary: University of Calgary Centre for Military and Strategic Studies Paper, 2002), http://www.cdfai.org/PDF/NORTHERN%20INTERESTS%20AND%20CANADIAN%20FOREIGN%20POLICY.pdf; Internet; accessed 12 March 2008, 5.

understanding that Canadians have about their vital Northern frontier. In other words, Canadians are concerned about waving the flag over their land without a real appreciation for what flag waving means. Just as Griffiths' political and legal components of sovereignty are intertwined, so to are sovereignty and security. Canada must have both the governance mechanisms and the means to govern over its territory; without them control over the environment, the resources therein, and the safety of its inhabitants can be threatened, risking their livelihood and the economy that allows them to prosper and live on the land and seas.

CHAPTER 4: CANADIAN ARCTIC SECURITY: THE THREAT DEFINED

> "There can be no greater role, no more important obligation for a government, than the protection and safety of its citizens."[56]

With a clear understanding of both security and sovereignty it is possible to identify threats to both. Though there are numerous potential challenges to face, not all of them are immediate. Conversely, there remain some challenges that may seem temporally benign. Nonetheless, without an underlying foundation to respond to them, Canada may not be in a position to respond adequately to these threats if or when they arise.

THREATS TO SECURITY

Security is a more immediate and fundamental entity than sovereignty; without ensuring the security of its territory, a nation cannot hope to exercise sovereign rule over it. Where this does not hold true there is no threat and thus no need for security. However, there are different manifestations of threat, military being only one example. With respect to Canada's Arctic, security seems to be a re-emerging national concern. On the other hand, regional environmental, economic, and social security remain ever-present in the background; though only recently, with significant climate change effects and development occurring, have they been given greater consideration. Cumulatively,

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[56]Privy Council Office, *Securing an Open Society: Canada's National Security Policy* (Ottawa: Privy Council Office, 2004), http://www.pco-bcp.gc.ca/default.asp?Language=E&Page=informationresources&Sub=publications&Doc=natsecurnat/natsecurnat_e.htm; Internet; accessed 14 March 2008; viii.

threats to challenge Canada's Arctic exist; some are present today whereas others will emerge in the future.

Canada eyes the importance of the Arctic differently from the US. In both its 1999 report *Transforming Defense – National Security in the 21st Century*[57] and its 2008 *Annual Threat Assessment of the Director of National Intelligence*[58] the US fails to mention the Arctic as a national security concern, omitting comment on its hydrocarbon reliance and substantial Alaskan reserves.[59] The similarity between American and Canadian Arctic regions, both in terms of societies and the importance on their resource-based economies, are significant, leaving one to consider if Canada's position should necessarily reflect threats to American security.[60]

The current Canadian government is taking a pragmatic approach towards the Arctic. Its 2005 *Policy Declaration* articulated a 'Canada-First' defence policy in which domestic defence "includes commitments to provide improved security of our

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[57]Jessie C. Carman, "Economic and Strategic Implications of Ice-Free Arctic Seas," in *Globalization and Maritime Power*, ed. Sam J. Tangredi (Washington, DC: National Defence University Press, 2002), 182.

[58]Michael J. McConnell, *Annual Threat Assessment of the Director of National Intelligence for the Senate Select Committee on Intelligence*, (Washington, DC: Director of National Intelligence, 2008), http://www.tsa.gov/assets/pdf/02052008_dni_testimony.pdf; Internet; accessed 2 March 2008.

[59]Alaska provides approximately 5% of daily US oil requirements. See the US Energy Information Administration at http://www.eia.doe.gov.

[60]The Canadian Beaufort Basin alone holds recoverable reserves of one billion barrels of oil and nine terra cubic feet of natural gas, enough to supply 1.3 and 2.6 years of domestic consumption, respectively. For comprehensive details, see the Beaufort-MacKenzie Mineral Development Area website at http://www.bmmda.nt.ca/background.htm and the Index Mundi website at http://www.indexmundi.com/canada/natural_gas_consumption.html.

territory."[61] Perhaps this difference is out of necessity because the US has always taken measures to ensure the security of its Arctic interests, or at least it has the capability to do so, whereas Canadian security of its North has relied, often heavily, on US support.

Canada identified generic national security threats in 2005,[62] having previously alluded to vague terms such as the 2000 *Northern Dimension of Canada's Foreign Policy* statement to "assert and assure the preservation of Canada's sovereignty in the North."[63] Accordingly, military training such as Exercise Narwhal and Operation Kigliqaqvik occurred in the early part of this decade, but these were token efforts and did not represent a coherent Arctic security strategy. Although the Conservative Party's 2006 Federal Election Platform was vague on specific threats to Arctic security,[64] what is refreshingly unique about the current government's proclamation of intent to improve northern security is that it acknowledges that new challenges have emerged. What those challenges are remain to be fully developed and articulated to the public. However,

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[61]Conservative Party of Canada, *Policy Declaration, 19 March 2005*, http://www.conservative.ca/media/20050319-POLICY%20DECLARATION.pdf; Internet; accessed 2 March 2008, 40.

[62]Threats were grouped as terrorism, proliferation of weapons of mass destruction, failed and failing states, foreign espionage, natural disasters, critical infrastructure vulnerability, organized crime, and pandemics. Privy Council Office, *Securing an Open Society*…, 8, 9.

[63]Department of Foreign Affairs and International Trade, *The Northern Dimension of Canada's Foreign Policy* (Ottawa: Department of Foreign Affairs and International Trade, 2000), http://www.international.gc.ca/foreign_policy/circumpolar_clf1/ndfp_rpt-en.asp; Internet; accessed 5 September 2007, 2.

[64]Conservative Party of Canada, *Stand Up for Canada: Federal Election Platform 2006*, http://www.conservative.ca/media/20060113-Platform.pdf; Internet; accessed 2 March 2008, 9.

Canada has taken "immediate moves to increase equipment and resources to exercise Canada's sovereignty [and security] in the Arctic."[65]

The bipolar global system of the Cold War brought about a stability and certainty of who or what the threat was and how Canada would respond to it. Today's reality is that the global system has changed and continues to do so. No longer is it static or symmetrical, but it is fluid and non-bipolar as the developing world seeks to catch-up to the West's quality of life and level of influence. Just what those challenges to Canadian security are and their validity will be discussed in an effort to determine if Canada' response is adequate.

PHYSICAL SECURITY

In 2004, Canada articulated its *National Security Policy* and defined its top national security interest as "protecting Canada and the safety and security of Canadians at home and abroad."[66] Then, in 2005, the *Defence Policy Statement* articulated the most critical security issue as the Government's "[in]ability to conduct surveillance of our vast territory, airspace, and maritime approaches."[67] When one looks at the make up of the Arctic, it is clear to see that, despite its land mass and vast ice-locked area akin to land, it is a coastal and archipelagic region with distinct maritime qualities. It follows that the

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[65]Conservative Party of Canada, *Policy Declaration*…, 41.

[66]Privy Council Office, *Securing an Open Society*…, 7.

[67]Department of National Defence, *Defence Policy Statement*…, 2.

physical security of Canada's Arctic is about maritime security. In his book *The Characteristics of a Modern Navy*, historian Harold Kearsley describes the penetrable nature of sea frontiers.[68] With 64% of Canada's coastline in the Arctic and a demonstrated limited ability to guard it, this frontier is penetrable and vulnerable.

Canada has never been able to defend itself from a conventional state-on-state attack and nor will it be able to in the future. It relies on a collective defence through NATO and specifically with the US for protection: "Our bilateral cooperation continues to provide us with a degree of security that we could never achieve on our own."[69] However, in reading into its defence policy, Canada relies on its ability to affect sufficient surveillance of its territory to detect threats and engage its collective defence strategy. In its southern littoral, the interface between Canadian territory and the rest of the world, Canada has sufficient infrastructure in place to fulfill its surveillance requirements. However, it is unable to do so in its Arctic. Security or defence of the Arctic relies on surveillance.

Canada's North was the northern edge of the underwater standoff between the US and the former Soviet Union during the Cold War. The Russian threat, though diminished, has not altogether disappeared: its defence spending has quadrupled from

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[68]Harold J. Kearsley, *Maritime Power and the Twenty-First Century* (Aldershot, Hants: Dartmouth Publishing, 1992), 15.

[69]Department of National Defence, "The Canada-U.S. Defence Relationship in a Changing World," *Defence Policy Statement* (Ottawa: Department of National Defence, 2005) http://www.dnd.ca/site/Reports/dps/main/04_e.asp; Internet; accessed 30 March 2008.

2000 to 2006 with an estimated additional 30% increase in 2007.[70] Closer to home, Russian Bear bombers have increased their frequency of Arctic patrols in 2007, requiring an increased Canadian fighter escort response, while its submarine fleet remains potent. All this Russian activity is fuelled by revenue generated by the recent boom in commodity prices, most notably oil and gas.[71]

Mixed signals in the NATO-Russia relationship give credence to the unpredictable nature of the evolving Russian threat to Canada and North America. In 1996, after speaking to the Russian and Norwegian Defence Ministers, the US Secretary for Defence, William Perry, stated, "NATO is not a threat to Russia, any more than Russia is a threat to NATO."[72] Then in 2003, at the meeting of the NATO-Russia Council, NATO Secretary General, Lord Robertson, spoke of a "future in which the relationship between NATO Allies and Russia would be defined not by rivalry and mutual suspicion, but by a spirit of genuine partnership."[73] However, political rhetoric aside, tension remains. Russian President Putin was deliberate in his 2007 remark that he would target European cities in the event that NATO deploys a missile shield system to

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[70]Global Security.Org, "Russian Military Spending," http://www.globalsecurity.org/military/world/russia/mo-budget.htm; Internet; accessed 8 March 2008.

[71]Charlie Szrom and Thomas Brugato, "Liquid Courage: When Oil Prices Rise, So Does Russia's Foreign Policy Aggression," *The American Magazine* 22 February 2008, http://www.american.com/archive/2008/february-02-08/liquid-courage; Internet; accessed 18 April 2008.

[72]United States Department of Defense, "New Russian Defense Chief Meets Western Counterparts," http://www.defenselink.mil/news/newsarticle.aspx?id=40690; Internet; accessed 8 March 2008.

[73]Lord George Robertson, "Opening Statement by NATO Secretary General, Lord Robertson, at the NATO-Russia Council Meeting of Foreign Ministers, Madrid, 4 June 2003," http://www.nato-russia-council.info/htm/EN/documents04jun03_2.shtml; Internet; accessed 12 March 2008.

prevent terrorist missile attacks against allied countries.[74] Recently, in response to Kosovo's succession, which is being heralded as a victory for democracy by the West, Russia's NATO envoy, Dmitry Rogozin, announced, "In order to be respected, we must use brute force, in other words armed force."[75] Russian state-on-state aggression against North America is not realistic. However, despite significant Western collaboration with Russia on the international stage working on issues such as terrorism and peacekeeping, and as much as Russia has made progress to implement democratic reforms, its history of aggression towards the West cannot be forgotten.

Despite the collapse of the Soviet Union and massive decommissioning of its submarine fleet,[76] Russia still retains a significant polar ice capability with 38 nuclear submarines.[77] Additionally, as Russia benefits from historically high oil and gas commodity prices, it has been able to afford a resurgence of military activity such as the 2007 resumption of Tupelov bomber flights into the Beaufort Sea Basin. Who is to say that because today NATO and Russia enjoy workable relationships, they will not sour in the future? In the summer of 2007 the Russian Navy was able to freely operate a team of patrol boats from Murmansk across the top of Russia in the Beaufort Sea without the

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[74]TimesOnline, "Russian Missile Threat to Europe Raises Cold War Fear Over US Shield," TimesOnline 5 July 2007, http://www.timesonline.co.uk/tol/news/world/europe/article2028710.ece; Internet; accessed 12 March 2008.

[75]Steven Edwards, "Russia Warns it Will Use Force to Back Serbia," *National Post*, 23 February 2008.

[76]In 1999 over 110 nuclear submarines were awaiting reactor dismantling. James Clay Moltz and Tamara C. Robinson, "Dismantling Russia's Nuclear Submarines: New Challenges to Proliferation," http://www.armscontrol.org/act/1999_06/subjun99.asp; Internet; accessed 12 March 2008.

[77]"Submarines" in *Janes Underwater Warfare Systems* 16th ed., ed. Anthony J. Watts (Alexandria, Virginia: Janes Info Group, 2005).

escort of ice-hardened vessels.[78] The upshot of this is the demonstration that as the impact of climate change expands, so to does the military access to and the exploitability of the Arctic's changing environment.

The submarine threat is not limited to Russia alone; there has been unauthorized usage of Canadian Arctic waters by other nations as well. China has reportedly conducted submarine penetrations of Canadian Arctic waters.[79] A French submarine was sighted in 1999 near Iqaluit during President Jacques Chirac's visit to Nunavut.[80] Additionally, it has been long suspected that British submarines have transited Canadian waters without permission enroute to the North Pole. Finally, as recent as 2005, the USS Charlotte was believed to have transited Canadian waters without permission as it voyaged from Hawaii to the East Coast.[81] The accuracy of these suspicions remains unknown because Canada has neither the resources to detect submarines in its Northern reaches nor the water space management relationships to follow who is using its waters and for what purposes.

An assessment of the world's submarine fleets done by the CF's Director of Maritime Strategy in 2007 highlighted the extent of this weapon platform's proliferation:

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[78]Alan Bailey, "U.S. Must Boost Arctic Presence," *Petroleum News* 12, no. 43 (28 October 2007), http://www.petroleumnews.com/pntruncate/368670822.shtml; Internet; accessed 12 March 2008.

[79]CdnMilitary.ca, "Arctic/Offshore Patrol Ship," http://www.cdnmilitary.ca/?p=28; Internet; accessed 12 March 2008.

[80]Alanna Mitchell, "The Northwest Passage Thawed," *Globe and Mail*, 5 January 2000, http://www.carc.org/whatsnew/writings/amitchell.html; Internet; accessed 15 March 2008, A9.

[81]Dianne Demille and Stephen Priestly, "Stephan Harper Announces the New Defence Policy as Put Forward by the Conservative Party," *Canadian American Strategic Review,* http://www.sfu.ca/casr/ft-harper1-3.htm; Internet; accessed 12 March 2008.

Russia, China, and 29 other non-NATO countries operated 56, 67 (seven nuclear), and 170 submarines respectively.[82] The nuclear club will also expand in the future as both Brazil and India have indigenous SSN programmes that could yield boats by 2010.[83]

Less developed nations continue the trend of ever-increasing regional influence as the numbers of submarine operators expanded from 16 to 22 during the 1990's, increasing fleet numbers by 50%. This metric alone is not significant but for the advances in air independent propulsion (AIP) systems and the relative affordability for even small nations to acquire a basic subsurface capability. Amplifying this point is the 2006 statistic of world-wide diesel submarine orders totalling approximately 45, the majority with AIP systems that provide the ability to operate under an ice-covered surface for up to several weeks at a time.[84] Though a less developed nation's submarine capability is obviously not a threat to Canada's Arctic, it does speak to the intent of regional players to exert their influence to the extent that is possible. It also speaks to the proliferation and affordability of this technology, and the future use of these platforms in non-traditional roles, given that the mere suspicion of a submarine threat requires considerable effort to counter.[85]

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[82]Cdr Nicolas Leak, *Submarine Threat*, (Ottawa: Department of National Defence, DMARSTRAT, 2007), 2 and "Submarines" in *Janes Underwater Warfare Systems.*

[83]While less developed nations are procuring modern submarines, they also need to gain experience to operate them. This inexperience is offset by technologies that provide substantial capabilities even to crews who are less trained and experienced. Leak, *Submarine Threat*…, 2.

[84]*Ibid*., 2.

[85]"The possible presence of a single submarine ties down numerous opposing naval forces and restricts their freedom of operations. It is just this type of deterrent value which, in the end, makes the submarine an appealing platform for less developed nations. By 2025, with total purchase packages including training as well as equipment, some of these navies could possess a significant open ocean operational capability, and certainly will have a well-developed capability to operate in coastal regions.

Trans-national crime is a potential threat to a secure nation. Given the proliferation of illegal drugs,[86] even submarines have been known to facilitate narco trafficking.[87] The suggestion that a narco submarine would be used today to ferry drugs into Canadian waters from typical sources in the Caribbean or South America is far-fetched, but so was consideration of a 9/11-style attack on the World Trade Center on 9/10. While there is no urgent need to respond to a scenario like this, planning for it should not be dismissed altogether.[88]

Trans-national crime affects Canada's major ports. The RCMP estimate that between 2.5 to four million people cross the border illegally every year;[89] though targeted entry points are generally in southern Canada, rural areas become more attractive when enforcement in population centers is increased. As enforcement in southern areas evolves, innovation and boldness will drive smugglers further north to drop off their human cargoes: witness the rescue of 150 Sri Lankan immigrants off of the

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For most nations, the acquisition of at least the four submarines required to maintain a ready force of two is within economic reach." Director General Intelligence, *Threat to Canadian Maritime Forces: A Look to 2025*, in Leak, *Submarine Threat*…, 2.

[86]In 2006, the United Nations estimated that the worldwide illegal drug trade a $322 billion activity. Sheryl Ubelacker, "$332-Billion Illicit Drug Trade Fuelling HIV Infections Around World: Expert," http://www.unodc.org/pdf/brazil/word_midia/15082006cbc.doc; Internet; accessed 12 March 2008.

[87]In 2000, a 100' long submarine was discovered under construction in Columbia. It was estimated to have been able to carry 150 tons of cocaine. CNN.com, "Submarine Found in Columbian Andes," http://archives.cnn.com/2000/WORLD/americas/09/07/colombia.sub/; Internet; accessed 12 March 2008.

[88]The author's discussion with personnel involved in pre-9/11 contingency planning indicated that, against the backdrop of its 1993 bombing, a passenger jet 'missile' attack was considered to be a possible terrorist action against the World Trade Center. However, it was dismissed as unlikely to occur and the possibility of multiple and simultaneous 'missiles' was not considered.

[89]Royal Canadian Mounted Police, "Human Smuggling Fact Sheet," http://www.rcmp-grc.gc.ca/imm_pass/fact_human_smug_e.htm; Internet; accessed 12 March 2008.

Newfoundland coast in 1986,[90] the 1987 illegal landing of 174 Sikhs in a rocky cove on the southern coast of Nova Scotia,[91] and the 1999 dropping of smuggled Chinese at the remote Gilbert Bay in the Queen Charlotte Islands.[92] Incredibly, a Romanian sailed into Grise Fjord in 2006 attempting to enter Canada via Greenland.[93] Therefore, surveillance of remote coastal areas remains important. Two High Frequency Surface Wave Radar sites, both in Newfoundland, can track surface vessels as far out as 170 nm; however, they monitor only a small portion of Canada's coastline.

The south, a populous and target-rich environment, is relatively well organized to deal with terrorist actions. Emergency and disaster response plans exist and are sometimes exercised using available resources and infrastructure. What of a terrorist event in the Arctic? Certainly it would likely be less catastrophic to life than an attack in the south, but terrorist actions need not be violent. As Devine and Rafalko explain, they must establish only a level fear, a psychological phenomenon.[94] As such, a limited terrorist operation even in a remote area of Canada would have a profound and lasting

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[90]Katherine Wright, "Sri Lankan Migrants Rescued Off Newfoundland," *The National* (11 August 1986), http://archives.cbc.ca/on_this_day/08/11/; Internet; accessed 13 March 2008.

[91]John F. Burns, "Canada Seizes Freighter Believed to Have Put 174 Sikhs on Shore," New York Times (14 June 1987), http://query.nytimes.com/gst/fullpage.html?res=9B0DEED61138F937A25754C0A961948260; Internet; accessed 12 March 2008.

[92]Tom Fennel, "Immigration/Refugee Controversy," *Maclean's Magazine* (23 August 1999), http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=M1SEC704435; Internet; accessed 12 March 2008.

[93]RCMP Cpl Jimmy Akavak, discussion with the author, 5 March 2008, Iqaluit.

[94]Philip E. Devine and Robert J. Rafalko, "On Terror," *Annals of the American Academy of Political and Social Science*, Vol. 463, International Terrorism (September 1982), http://www.jstor.org/cgi-bin/jstor/printpage/00027162/ap030616/03a00040/0-150.pdf?backcontext=page&dowhat=Acrobat&config=jstor&userID=c6e74704@cfc.dnd.ca/01c0a84874d8db1181557bb9a&0-150.pdf; Internet; accessed 15 March 2008, 41.

disruptive impact on society. For example, the majority of the thousands of kilometres of oil and gas pipeline infrastructure is unguarded. A simple attack against any distribution line, such as that flowing south from Norman Wells or against distribution pads servicing the planned Mackenzie Gas Project near Tuktoyaktuk, would have a deleterious impact on the fragile Arctic environment. Despite the improving ability to monitor the southern borders of 'fortress' North America, the far reaches of the Arctic still remain an Achilles Heel.

Over 10,000 nuclear scientists and 60,000 biological weapon industry employees have lost their jobs in the former Soviet Union since the end of the Cold War,[95] many of them with low or no employment opportunities. Coupled with over 1,000 tons of fissile material in storage, the potential for a terrorist organization to exploit disaffected and unemployed scientists to provide both the knowledge and material to construct rudimentary WMD exists. The Northern Sea Route from Russia around the pole provides one avenue of approach to North America that is currently viable. The massive Murmansk shipyards could provide transportation to an organized terrorist outfit. The US identifies its biggest present threat as the spread of an infectious pathogen to its shores.[96] Entry to North America of such a WMD could be via an Arctic port and, given internal transportation infrastructure, travel into central North America would be possible. What Canada cannot afford is to have another border crossing incident such as

[95]Brian D. Finlay, "Russian Roulette: Canada's Role in the Race to Secure Loose Nuclear, Biological and Chemical Weapons," International Journal Vol 61 (Spring 2006), http://proquest.umi.com/pqdweb?did=1079325821&sid=3&Fmt=3&clientId=1711&RQT=309&VName=PQD; Internet; accessed 15 March 2008.

[96]McConnell, *Annual Threat Assessment of the Director of National Intelligence*…, 44.

the 1999 case of Ahmed Ressam, the "millennium bomber,"[97] as its relationship with the US relies upon the trust that Canada does its part to prevent it from becoming a base for threats to its allies.[98]

Therefore physical security finds its origins in the knowledge of what threats are approaching Canada's frontiers. To this end, surveillance of its coastlines is an essential capability upon which organic Canadian measures or bi- or multi-lateral measures can be relied upon for response.

ENVIRONMENTAL SECURITY

Environmental security involves consideration of several factors, the most significant of which is climate change and how Canada will adapt. Reports of climate change have been highlighted in the media for some time now. Appropriately, some discussion to identify both its credibility and its impact on the Arctic is merited to better understand how the Arctic's environment fits into a Canadian-designed Arctic-specific governance architecture.

Climate change is not a new concept. In 1896, the Swedish Chemist Svente Arrhenius first predicted a global warming effect caused by the trapping of airborne

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[97]Ian MacLeod, "U.S. Security Chief Raises Spectre of Extremists Crossing the Border From Canada," *The Gazette,* 12 February 2008, http://www.canada.com/montrealgazette/news/story.html?id=05e9db1e-135c-43fc-8715-c64348ac8c45&k=15284; Internet; accessed 13 March 2008.

[98]Privy Council Office, *Securing an Open Society*…, Chap. 2.

particulate matter in the atmosphere as a result of a coal-fired society.[99] Now in the 21st Century, the Intergovernmental Panel on Climate Change (IPCC) 2007 Report notes that the "warming of the climate system is unequivocal;"[100] global warming is an irrefutable phenomenon that has gained world-wide acceptance. Of the 75 studies that involve more than 29,000 observational data series spanning at least 20 years since 1990, 89% are consistent with showing significant change in physical and biological systems as a response to warming.[101]

Climate Change is a result of man's footprint on the environment, specifically green house gas emissions (GHG). The IPCC projects an increase of global GHG emissions by 25-90% between 2000 and 2030.[102] Things will get worse thereafter: Princeton University data shows an increase of at least 110% by 2057.[103] This means a continued trend of global temperature increases whose effects will be amplified in the world's colder climates.

A 2004 study by the Arctic Council and the International Arctic Science Committee identified that summer month sea-ice had declined by 15-20% over the past three decades. The National Snow and Ice Data Center reported in September 2007 that

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[99]Roy Woodbridge, *The Next World War: Tribes, Cities, Nations, and Ecological Decline* (Toronto: University of Toronto Press, 2004), 170.

[100]*Arctic Climate Impact Assessment: Key Findings* (Cambridge: Cambridge University Press, 2004), http://amap.no/acia/; Internet; accessed 10 February 2008, 1.

[101]*Ibid*., 3.

[102]*Ibid*., 6.

[103]Bill McKibben, "Carbon's New Math," *National Geographic Magazine,* October 2007, 37.

the Arctic sea ice extent dropped to 4.13 million km^2, 38% below the 30 year average and 24% below the previous 2005 level.[104] The University of Illinois has charted Arctic sea ice coverage since 1900. Its data reveals that 2007 summer ice coverage was half of what it was in 1910.[105] The alarming point is that the European Space Agency identified the average annual drop to be 100,000 km^2, a fraction of last summer's decline; this hugely accelerated melt rate was not predicted. Additionally, 41% of the perennial ice has disappeared over the past 23 years.[106] What does this mean to Canada? A US navy report predicted in 2001 that within five to 10 years the NWP will be open to non-strengthened vessels for at least in one month each summer.[107] In 2008 we have seen that prediction come to pass.

In 1905 Roald Amundson took two and a half years to complete the first transit of the NWP. For the first time in its history, the NWP was free and navigable for 36 consecutive days in 2007, allowing a commercial vessel ample time to transit it.[108] The upshot of this is that for the first time, non-sea ice capable vessels were able to transit the

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[104]"Arctic Sea Ice Minimum Shatters all-Time Record Low, Report Scientists," *Science Daily* (21 September 2007), http://www.sciencedaily.com/releases/2007/09/070920160226.htm; Internet; accessed 1 March 2008.

[105]William Chapman, "Northern Hemisphere Sea Ice Extent," University of Illinois, http://arctic.atmos.uiuc.edu/cryosphere/IMAGES/seasonal.extent.updated.jpg; Internet; accessed 1 March 2008.

[106]Perennial ice is the thick, hard, multiyear ice that forms the majority of the polar ice cap. Scott G. Borgerson, "Arctic Meltdown: The Economic and Security Implications of Global Warming," *Foreign Affairs* 87, no. 2 (March/April, 2008), http://www.foreignaffairs.org/20080301faessay87206/scott-g-borgerson/arctic-meltdown.html; Internet; accessed 1 March 2008, 1.

[107]Whitney, Bradley & Brown Inc., *Naval Operations in an Ice Free Arctic* (Washington, DC: US Navy, 2001), http://www.natice.noaa.gov/icefree/FinalArcticReport.pdf; Internet; accessed 1 March 2008, 12.

[108]This occurred between 14 August and 18 September 2007. "Arctic Sea Ice Minimum Shatters all-Time ….

NWP unhindered.[109] This validated the idea that routine shipping could transit between European, western North American, and Asian markets expeditiously and at a lower *theoretical* cost than traditional routing via the Panama Canal.[110]

According to Dr Jeff Masters from the University of Michigan, the earth's atmosphere may have reached the tipping point in the "ice-albedo feedback,"[111] the point at which the reduction in Arctic ice coverage begins to increase dramatically because of increasing expanses of open water. Open ocean acts as a black body absorber capturing the sun's energy instead of it being reflected by the white icecap's surface. This energy absorption has led to the collapse of the Antarctic Ross Sea Ice Shelf in January 2002, the calving from Baffin Island's Ayles Ice Shelf of a 45 meter-thick iceberg the size of

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[109]Transit data for the 2007 NWP shipping was unknown at the time of writing. Michael Byers reports that "According to the Canadian Coast Guard, 86 ships entered Canada's Arctic waters last year, including research vessels from Denmark, Germany and Russia. There were 11 transits of the Northwest Passage, five of them by cruise ships." Michael Byers, "Sovereignty Will Solve the Northwest Passage Dispute," http://www.pugwashgroup.ca/events/documents/2007/2007.08.11-Byers_article.pdf; Internet; accessed 18 April 2008.

[110]Franklyn Griffiths deconstructs today's associated costs burdening the shipping industry on transit routes through the NWP today. However, given the non-linear impact of climate change and the rate of innovation that developed nations exhibit, too many variables exist to preclude future routine NWP transits as unviable. Franklyn Griffiths, "Pathetic Fallacy: That Canada's Arctic Sovereignty is on Thinning Ice," *Canadian Foreign Policy* (Spring 2004), http://proquest.umi.com/pqdweb?index=0&did=816946531&SrchMode=1&sid=2&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1205710095&clientId=1711; Internet; accessed 16 March 2008.

[111]Dr Jeff Masters, "Fabled Northwest Passage Begins to Re-Freeze," http://www.wunderground.com/blog/JeffMasters/comment.html?entrynum=826&tstamp=200710; Internet; accessed 10 February 2008.

Manhattan Island in August 2005,[112] and the collapse of a Montreal Island-sized chunk of the Antarctic's Wilkins Ice Shelf in March 2008.[113]

Climate Change and Canada's Arctic

The first-order impact of global warming on the Arctic is temperature change. Surface temperatures in the Arctic will increase from 7-10°C by 2100.[114] Figure 2 depicts the 2007 open water extent of both the NWP and the Northern Sea Route while Figure 3 depicts the future open water extent of those waterways. Subsequent second-order effects will be significant and numerous: accelerated sea-ice melt, precipitation increase by upwards of 30%, changed ocean currents accelerating heat transfer north, and rising sea levels. However, from the Government of Canada's perspective, the most pressing issue to address will be the sea-ice melt that will open up previously un-navigable waterways or increase the navigability of existing ones such as the NWP.

[112]CBC.ca, "Researchers to Track Movement of Arctic Ice Island," http://www.cbc.ca/technology/story/2007/05/22/science-ayles-ice.html; Internet; accessed 1 March 2008.

[113]British Antarctic Survey, "Antarctic Ice shelf Hangs by a Thread," Press Release 10/2008 (25 March 2008), http://www.antarctica.ac.uk/press/press_releases/press_release.php?id=376; Internet; accessed 30 March 2008.

[114]*Arctic Climate Impact Assessment*…, 27.

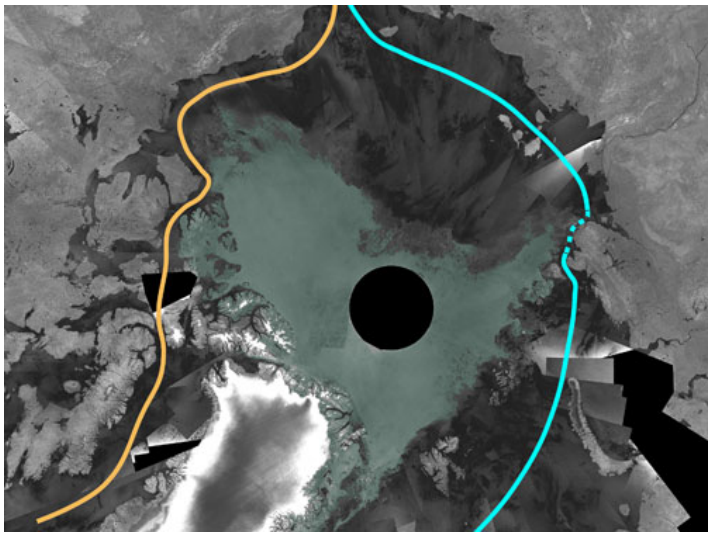

Figure 2: 2007 Envisat Mosaic of Arctic Ocean
Source: European Space Agency, "Satellites Witness Lowest Arctic Ice Coverage in History," http://www.esa.int/esaCP/SEMYTC13J6F_index_1.html; Internet; accessed 1 March 2008.

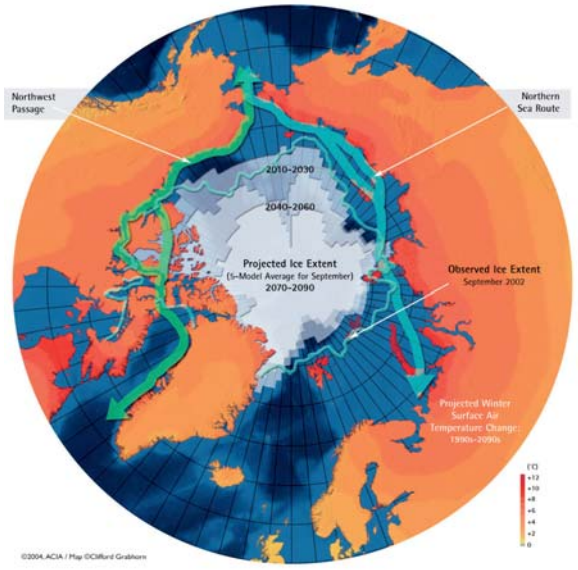

Figure 3: Future Impact of Global Warming on Ice in the Northwest Passage
Source: *Arctic Climate Impact Assessment: Key Findings* (Cambridge: Cambridge University Press, 2004), http://amap.no/acia/; Internet; accessed 10 February 2008.

Third-order effects of global warming will disrupt the Arctic's inter-connected natural habitats. Increased erosion will eat away waterfowl breeding grounds in low lying coastal areas, as already occurs in Northern Alaska. Polar bear populations will

decline as they drown, exhausted from swimming tens of miles to reach their traditional ice pack hunting grounds. Seal predation will subsequently decline as a result of fewer polar bears, thus causing increased seal numbers to stress their Arctic Ocean biomass food source.[115]

Coastal erosion, which is most significant in Alaska and parts of the Russian Arctic, will be accelerated by melting permafrost and increased storm ferocity due to the opening of previously ice-covered ocean areas; this is directly linked to the US Army Corps of Engineers' estimate that the village of Shishmaref will require relocation in 10-15 years.[116] Additionally, erosion in Tuktoyaktuk threatens both cultural and archaeological sites and has forced the abandonment of an elementary school, housing, and other buildings.[117]

Additionally, impediments to economic development will be realized. As changes to the permafrost occur, they must be compensated for as pipelines, structural foundations, bridges, roads, airports, and built up areas are impacted by sink. Already liquefaction of surface ground layers has resulted in mudflows blocking roads. Similarly, the dependency on winter ice roads and summer water routes will experience stress as

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[115]The US Department of the Interior estimates a 2/3 reduction of polar bear population by 2050. Mike Gauldin and Karen Wood, "Future Retreat of Arctic Sea Ice Will Lower Polar Bear Populations and Limit their Distribution," http://www.usgs.gov/newsroom/article.asp?ID=1773; Internet; accessed 10 February 2008.

[116]Debborah Williams, "Policies of Change: Adapting to a Warming Arctic," http://www.chinadialogue.net/article/show/single/en/1489-Policies-of-change-adapting-to-a-warming-Arctic; Internet; accessed 10 February 2008 and US Army Corps of Engineers, *Shishmaref Relocation and Collocation Study*, 2004, http://www.poa.usace.army.mil/en/cw/shishmaref/relocation.pdf; Internet; accessed 10 February 2008.

[117]*Arctic Climate Impact Assessment*…, 940.

roads become impassable and river flow rates increase with elevated precipitation and melt rates.[118] As permafrost deterioration continues, infrastructure degradation will force an increasing reliance on domestic shipping to supply and service Arctic communities and particularly Arctic-based resource development.

Climate change will potentially draw human migration to Canada as sea levels rise. The IPCC estimates that by 2100 sea levels will rise between 0.2-0.6 meters[119] while other projections indicate a rise of up to 7 meters if the Greenland ice shelf melts entirely.[120] Sea level rise will impact coastal populations severely and will eventually result in significant population migrations. Take, for example, Bangladesh: a one meter rise in sea level would inundate 17% of Bangladesh and displace tens of millions of its 152 million population.[121] Integrated across the world's low-lying areas including North America, the projected rise in sea levels during this century could force huge numbers of people to seek safety of higher ground. This will place strains on arable land as more of it becomes flooded; global food supplies will be stressed; and coastal fresh water sources will become contaminated, forcing a migration to safer regions that could potentially stir conflict.

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[118]Carman, "Economic and Strategic Implications of Ice-Free Arctic Seas…, 178.

[119]Lenny Bernstein, et al, *Intergovernmental Panel on Climate Change - Fourth Assessment Draft Report, Climate Change*, 2007, http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf; Internet; accessed 1 March 2008); 7.

[120]The science used in the simulation and modelling projections is sound; however, the issue is the relatively small data window from which projections can be made as the rate of impact of GHG emissions is still being studied. The rate of warming since the Industrial Revolution is not constant, but rather, continually accelerating. McKibben, "Carbon's New Math…, 36-37.

[121]J.G. Titus, "Greenhouse Effect, Sea Level Rise and Land Use," *Land Use Policy* 2, Vol 7 (April 1990), http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BURAD/$File/landuse.pdf; Internet; accessed 16 March 2008, 2.

Driving home the importance of population migration, consider for a moment the most basic of commodities necessary to human survival: fresh water. With 7-9% of the world's renewable fresh water, Canada is rich in this resource.[122] However, approximately half of this total volume drains into Arctic basins and is not tapped for consumption.[123] How important is water relative to the huge hydrocarbon deposits found in the Arctic region? At the time of writing, one litre of water dispensed from a vending machine cost approximately $2 whereas a litre of gasoline cost $1, demonstrating a non-intuitive weighting of the most basic of human needs.[124] The conclusion is that, against the historical backdrop of many a conflict based on the struggle for control of oil and gas, the future will see an increase in water-based conflict. Though regional at first, the potential for wider conflict may develop over time.[125]

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[122]With fresh water becoming an increasingly important commodity, even icebergs have become a viable fresh water source. Loukacheva identifies that "according to some estimates, a 50-million-tonne iceberg can provide about $3 million worth of fresh water." Approximately four cubic miles of icebergs calve each year in the Arctic, with the majority of it from Ice Fjord near Ilulissat on Greenland's west coast. Drifting into Baffin Bay, Davis Strait, and southward, they could present Arctic Communities, such as Pangnirtung, a future opportunity to harvest and assist the world's increasingly drought-ridden middle equatorial belt. Patrick G. Quilty, "Icebergs as a Water Source," Australian Academy of Technological Sciences and Engineering, 2001, http://www.atse.org.au/index.php?sectionid=338; Internet; accessed September 5, 2007; Natalia Loukacheva, *Legal Challenges in the Arctic,* (Oulo, Finland: Munk Centre for International Studies, University of Toronto, 2006), http://www.nrf.is/Open%20Meetings/Oulu%20Lulea%202006/Position%20Papers/Leukacheva_4th%20NRF%20PP.pdf; Internet; accessed 2 March 2008; and Jack Williams, "Ice Fjord is Greenland's Major Iceberg Source," *USA Today.Com*, 12 June 2001, http://www.usatoday.com/news/science/cold-science/greenland-2001/places-jacobshaven.htm; Internet; accessed 2 March 2008.

[123]Environment Canada, "How Much Fresh Water Does Canada Have?....

[124]The human dimension of water is outlined by Jacques Leslie: 1.2 billion people in the world lack access to clean drinking water, three billion live without sanitation, and five million people every year die from preventable waterborne diseases. Jacques Leslie, "Running Dry," *Harper's Magazine* 301, no. 1802 (July 2000), http://proquest.umi.com/pqdweb?did=55277761&Fmt=7&clientId=65345&RQT=309&VName=PQD; Internet; accessed 10 March 2008.

[125]There are many regions in the world where inter-state tensions have developed over fresh water. Leslie describes how "Jordan's King Hussein said in 1990 that water was the only issue that could prompt a war between Jordan and Israel." and how "World Bank vice president Ismail Serageldin declared in 1995, 'The wars of the next century will be over water.'" Additionally, Turkey and Iraq and Syria, Ethiopia and

The net result of climate change will eventually affect Canada and its Arctic environment and its habitats. Though impact will be slow at first, it will be unrelenting. Additionally, effects could manifest in cultural and community endangerment as migration from rural areas to urban hubs occurs; some loss of Inuit languages and heritage would certainly follow. Sheila Watt-Cloutier, the Chair of the Inuit Circumpolar Conference, described in 2002 how the changing Arctic was already making it "increasingly difficult for Inuvialuit [people] to 'read' the land, to follow the seasons, and to travel safely."[126] Ultimately, climate change will test Canada's resolve to secure its borders, enforce the sovereignty over its sparsely settled areas, and manage the global impact of the unrelenting and dramatic challenge that it will bring.

Other Environmental Threats to Canada's Arctic

Canada's North acts as a "sink for atmospheric toxic substances."[127] Pesticides, industrial chemicals, and by-products make up this group known as persistent organic

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Egypt, and Syria and Israel provide examples of regional water struggles. Finally, Leslie describes how China, with 22% of the world's population and only 7% of the world's fresh water sources, will become increasingly thirsty as it experiences its industrial revolution into the next century. Demand for fresh water is ever-increasing here in North America as well. American exploitation of the Colorado River has significantly impeded water flow to Mexico, a water-challenged state. With a continued drought in California, which has a population equal to Canada's, and continued calls for the sale of water to the US, Canada's water resources will no doubt continue to be looked at with an enviable eye. Sylvain Comeau, "The Coming Water Wars," *McGill Reporter* 2, Vol 33 (21 September 2000), http://www.mcgill.ca/reporter/33/02/water/; Internet; accessed 16 March 2008.

[126]Sheila Watt-Cloutier, "Presentation to the Harvard Club," (Ottawa, 4 February 2002), http://www.inuitcircumpolar.com/index.php?ID=78&Lang=En; Internet; accessed 2 March 2008.

[127]Governments of Northwest Territories, Nunavut, Yukon, *Developing a New Framework*…, 42.

pollutants. These pollutants most frequently enter Arctic ecosystems via long-range transport systems such as wind, precipitation, and ocean currents.[128]

Crane, deFur, and Pfirman reported in the early 1990's that PCBs, DDT, heavy metals, and viral contaminants pollute more than 50% of the former Soviet Union's rivers, which then contaminate the coastal regions into which they empty.[129] Russian radioactive dumping in the Kara Sea has been significant over the years. Since 1965, twenty nuclear reactors, most with their fuel rods still inside, were dumped from nuclear submarines and an icebreaker into the Arctic Ocean north of Russia. In 1994 the Oslo-based Bellona Foundation estimated that radioactive dumping in the Kara Sea north of Western Siberia and adjacent waters constituted two-thirds of all the radioactive materials that ever have entered the world's oceans.[130]

Furthermore, Rob Huebert reports on a litany of Soviet nuclear submarine accidents,[131] though accidents involving those Allies suspected to frequent Canadian Arctic territorial waters (TTW) do occur. Soviet radiological contamination has

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[128]Pollutants include DDT, chlordane, toxaphene, mirex, aldrin, dieldrin, endrin and heptachlor, PCBs, hexachlorobenzene, dioxins and furins. Parks Canada, "Airborne Pollutants: Our Chemical Heritage," http://www.pc.gc.ca/pn-np/bc/YOHO/natcul/natcul17_E.asp; Internet; accessed 2 March 2008.

[129]Kathleen Crane, Peter deFur and Stephanie Pfirman, "Arctic Contaminant Distribution," Canadian Arctic Resource Committee, http://www.carc.org/pubs/v21no4/contamin.htm; Internet; accessed 2 March 2000.

[130]CountryStudies.us, "Russia: Environmental Problems," http://countrystudies.us/russia/25.htm; Internet; accessed 2 March 2007.

[131]Rob Huebert, "Canadian Arctic Security Issues: Transformation in the Post-Cold War Era," *International Journal* 54, no. 2 (Spring 1999), http://proquest.umi.com/pqdweb?did=413567451&Fmt=7&clientId=65345&RQT=309&VName=PQD; Internet; accessed 16 March 2008.

penetrated the trans-polar drift current, which flows around Greenland, and can be seen circulating into Baffin Bay. Long-term effects on both Arctic flora and fauna and coastal communities are not yet fully understood.

With $1 billion committed to the Global Partnership Program, Canadian work alongside its Allies to disarm WMD and their technologies remains essential to building a bridge with Russia and the former Soviet republics.[132] This program ensures not only secure destruction of weapon capabilities, preventing them from appropriation by non-state actors, but also it ensures that WMD contaminants do not enter and disperse within the Arctic environment. Canada's participation in this program is an example of indirect investment in Canadian security with direct impact on the Canadian Arctic environment.

Threats to Canada's Arctic have not been altogether externally sourced. Post-war military development "traced a series of scars across the region"[133] leaving significant parts of the landscape torn up and ecologies damaged and contaminated by industrial wastes. For example, millions of litres of petroleum products have leached into the ground around 5 Wing Goose Bay, contaminating some water sources while PCB contamination of DEW Line sites has been well documented.[134] The result: PCBs in

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[132]Graham Allison, "Is Nuclear Terrorism a Threat to Canada's National Security?" *International Journal* 60, no. 3 (Summer 2005), http://proquest.umi.com/pqdweb?did=931226221&Fmt=7&clientId=65345&RQT=309&VName=PQD; Internet; accessed 16 March 2008.

[133] Lackenbauer and Farish, "The Cold War on Canadian Soil…, 927.

[134]*Ibid*., 941 and Department of National Defence, "Backgrounder: Goose Bay Clean-Up Strategy," Department of National Defence, http://www.forceaerienne.forces.gc.ca/5wing/news/releases_e.asp?cat=35&id=581; Internet; accessed 2 March 2008.

polar bears, DDT in beluga whales, and lead, cadmium, other heavy metals in other flora and fauna.[135] It is likely that subsistence hunting has also introduced toxins into the Inuit food chain.

The potential to endanger the Arctic lies within Canadian industry as well. From 1985 to the late 1990's, oil was drilled on Cameron Island, north of Resolute, and transported to market in Montreal.[136] Though only two or three voyages were made annually, this demonstrated that tanker operations in Arctic waterways are viable on a routine basis rather than just the singular Manhattan and Polar events. Given today's price of oil and natural gas, which have increased to $110/barrel and $9/million BTU, the economics of maritime transport are even more compelling than before; industry will not wait. The private sector is already building ice-capable ships to meet expected requirements for Arctic-capable oil tankers: 262 ice-capable ships were operating in 2005 with 234 more on order.[137] Nonetheless, the 1989 Exxon Valdez's 11 million gallon oil spill demonstrated that any accident involving hydrocarbon transport would be catastrophic to the Arctic environment.[138] As the 1944 Cleveland East Ohio Gas Explosion demonstrated, the effects from a liquefied natural gas tanker explosion would

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[135]Crane, deFur and Pfirman, "Arctic Contaminant Distribution….

[136]G. R. Morrell, *et al*, *Petroleum Exploration in Northern Canada* (Ottawa: Department of Indian and Northern Affairs, 1995), http://www.ainc-inac.gc.ca/oil/Pdf/chapter1.pdf; Internet; accessed 2 March 2008); 3.

[137]Borgerson, "Arctic Meltdown." It is interesting to note that apart from six CCG icebreakers, Canada only has one Arctic-capable icebreaker in its merchant marine, the MV Arctic.

[138]Industry will likely continue to push ahead with expanding the Arctic shipping route envelope and self-imposing regulations to avoid expenses like the Valdez's $3.4 billion clean up cost and $2.5 billion fine. MSNBC.com, "Supreme Court to Review Exxon Valdez Case," http://www.msnbc.msn.com/id/21528042/; Internet; accessed 16 March 2008.

be equally catastrophic to local infrastructure and the environment, though long-term effects outside of populated Arctic areas are not fully understood.[139]

Additionally, access to Canada's Arctic could be cause for environmental concern as non-tanker and non-ice-strengthened shipping operators also capitalize on the NWP. Already ecotourism operators have taken root in the Arctic, albeit not yet in large numbers. As has been seen in southern coastal regions, invasive species infestations have occurred as a result of the marine industry's practice of pumping bilge tanks, though prohibited by statutes such as the AWPPA and others. Though regulated, carriers potentially could introduce new species to Arctic marine ecology that could impact food chains by competition or disease.

Though other environmental threats exist, the message is clear that threats to Canada's Arctic environment are many. Their identification is the first step towards being able to effectively strategize how to deal with them today and in the future. However, as the pace of climate change increases, Canada's response to it will have to become more aggressive the longer it delays action.

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[139]The effects from an LNG tanker accident would be short-term in nature and limited to a localized intense heat as LNG vaporizes and explodes. Ray Lemberg calculated the probability of an Arctic LNG accident as 1/10000. The LNG Shipping newsletter identifies that as of 2006, over 47000 LNG tanker transits have been conducted world-wide: "there has never been a major spill of LNG; no LNG containment system has been breached; and no crew member has ever been killed as a result of a cargo incident." Similarly, given increased regulation and safety standards for Arctic oil tanker operations, the probability of an accident is 3/10000. Ray Lemberg, "Hydrocarbon Transport Risk Assessment," in *The Challenge of Arctic Shipping*, ed. David L. VanderZwaag and Cynthia Lamson, 191-210 (Montreal & Kingston: McGill-Queens University Press, 1990), 197,198 and LNGShipping.com, "47,000 Successful Voyages and Counting," http://www.lngworldshipping.com/content/news/compNews224.htm; Internet; accessed 30 March 2008.

PSYCHOLOGICAL SECURITY

The mention of Canadian 'sovereignty,' Donald McRae suggests, "conjures up images of Canada losing its national heritage in the north" as the US asserts its rights to NWP access over Canada's own claims to it; this is a message that "resonates powerfully" with the Canadian public.[140] The notion of psychological security exists in the sense of national identity and the belonging of the Arctic to Canadians, their history and heritage and to the Inuit peoples that inhabit the region.

The Manhattan's NWP transits stirred up national outcries against a perceived violation of Canadian sovereignty. That two Canadian Coast Guard captains were aboard the Manhattan while a CF DC4 aircraft photographed ice density and the CCG icebreaker Macdonald assisted when the Manhattan became ice-bound were missed by the public at large.[141] However, in 1985 Canadian sentiment was again fuelled by rumours that the USCGC Polar Star was armed and conducting military research during its NWP transit.[142]

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[140]Donald McRae, "Arctic Sovereignty? What is at Stake?" *Behind the Headlines* 64, no. 1 (January 2007), http://proquest.umi.com/pqdweb?did=1214341531&Fmt=7&clientId=65345&RQT=309&VName=PQD; Interned; accessed 10 February 2008, 1.

[141]"The Manhattan's Epic Voyage," *Time Magazine* 26 September 1969, http://www.time.com/time/magazine/article/0,9171,844952,00.html; Internet; accessed 13 March 2008. The 1970 Manhattan transit of the NWP proceeded with very strict limitations imposed by Canada on Humble Oil, the operator of the Manhattan. Andrea Charron, "The Northwest Passage in Context," *Canadian Military Journal* (Winter 2005-2006): 43.

[142]Peter Jull, "Inuit Concerns and Environmental Assessment," in *The Challenge of Arctic Shipping*, ed. David L. VanderZwaag and Cynthia Lamson, 139-153 (Montreal & Kingston: McGill-Queens University Press, 1990), 139.

In modern times, psychological security of Canada's Arctic can be summed up as follows: "45% of Canadians believe Canada will lose some of its sovereignty or control over its Arctic territory to the U.S. over the next 25 years."[143] The main focus of a perceived loss of psychological security in the Arctic is obviously NWP-centric; nonetheless, other issues arise as well. As the status of the NWP in the international arena remains in limbo, an eventual increase in foreign traffic could arise. As the Arctic Ocean ice pack recedes northward, greater international fishing stress could build. Without Canadian-established, internationally accepted shipping and environmental policies in place to govern the area, Canadian littoral waters could well suffer the influence of increased maritime traffic. All of this equals a perceived loss of control over what could happen in Canada's backyard, which is one reason why the current federal Arctic policy is a step in the right direction.

ECONOMIC SECURITY

Canada is a maritime nation that relies on the unrestricted freedom of the world's maritime commerce routes. Approximately 80% of Canada's foreign trade is with the US and 40% of that trade is by sea; the Association of Canadian Port Authorities reports that $100 billion, one fifth of Canada's total foreign trade, is handled annually by Canadian ports.[144] The trend of globalization, facilitated by technology, has opened up once local

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[143]Public Opinion Poll conducted October 2002 by the Centre for Research and Information on Canada, as reported by JTFN presentation to Assistant Deputy Minister (Policy) July 2005. LCdr Ivan Russell, JTFN HQ, email to author, 24 October 2007.

[144]Association of Canadian Port Authorities, "About ACPA," http://www.acpa-ports.net/about/index.html; Internet; accessed 13 March 2008.

and regional economies to what can be called today a truly global market that has limited restrictions to accessibility.

Figure 4 identifies that at any given time approximately 120,000 vessels ply international waters. National interests revolve around economic viability and sustainability, therefore this snapshot of daily maritime traffic brings home the importance to Canada of maritime trade and trade routes. Any impediments to the flow of these goods, either in or out, would have crippling long-term effects on the Canadian economy, as already demonstrated by the 2005 British Columbia trucker's union strike which cost the provincial economy $75 million per day.[145]

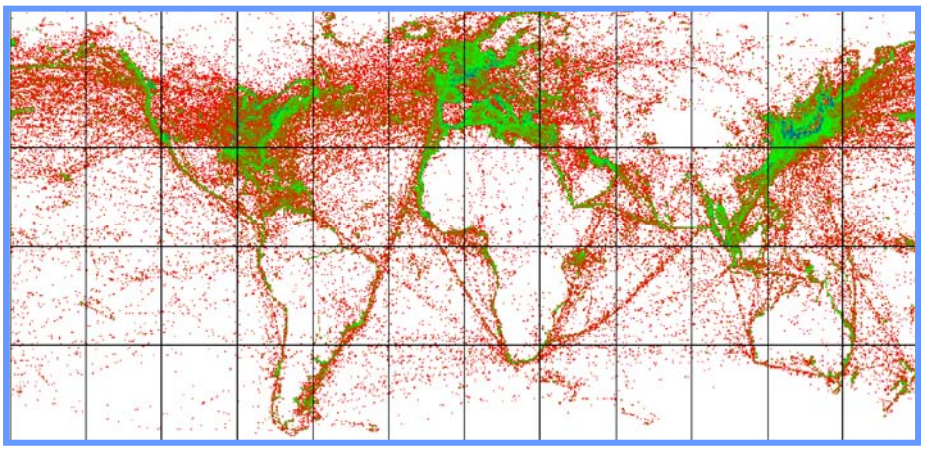

Figure 4: Satellite-Sourced Maritime Electronic Signals of World's Maritime Traffic
Source: Commodore Kelly Williams, "The Navy: Taking the Fight to the Far Edges of the World," briefing to Canadian Forces College 24 January 2008.

In 1999, a report from the US Commission on National Security in the 21st Century stated, "The national security of all advanced states will be increasingly affected

[145]CBC.ca, "Ottawa Urged to End BC Truckers Strike," http://www.cbc.ca/canada/story/2005/07/26/truckers-050726.html; Internet; accessed 13 March 2008.

by the vulnerabilities of the evolving global economic infrastructure."[146] That the trade equivalent of 90% of the global GDP traverses the world's oceans annually is testimony to the commission's idea of vulnerability.[147] Lurking somewhere amongst that trade, US intelligence officials have identified about 15 freighters that they believe are controlled by al-Qaeda or could be used by a terrorist network to ferry operatives, bombs, money or commodities.[148]

From this one can discuss the potential for global economic disruption if roadblocks, such as terrorist actions or regional strong-arming, to maritime highways crop up. For example, numerous choke points exist around the world (the straits of Gibraltar, Hormuz, and Malacca; the Panama and Suez canals; the Red Sea; the Cape of Good Hope; and the Horn of India) that are vulnerable to either collision, mines, terrorist acts, or piracy.[149] In fact, since 2002, NATO vessels have escorted merchant shipping through the Straits of Gibraltar to protect against such events.[150] The closure of any one

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[146]The United States Commission on National Security in the 21st Century, *New World Coming: American Security in the 21st Century*, http://govinfo.library.unt.edu/nssg/Reports/NWC.pdf; Internet; accessed 13 March 2008, 4.

[147]Geoffrey Till, *Sea Power: A Guide for the Twenty-First Century* (Abingdon, UK: Frank Cass Publishers, 2006), 352.

[148]John Mintz, "15 Freighters Believed Linked to Al Qadea," WashingtonPost.com (31 December 2002), http://www.washingtonpost.com/ac2/wp-dyn/A56442-2002Dec30?language=printer; Internet; accessed 13 March 2008. Some estimates identify up to 50 vessels under terrorist control plying the world's oceans. Colin Robinson, "Al Qadea's 'Navy' - How Much of a Threat?" http://www.cdi.org/friendlyversion/printversion.cfm?documentID=1644%2; Internet; accessed 13 March 2008.

[149]258 pirate attacks were reported in the Straits of Malacca alone in the past five years. Peter Gwin, "The Strait of Malacca: Dark Passage," *National Geographic Magazine*, October 2007, 134.

[150]"JFC Naples Fact Sheet," http://www.afsouth.nato.int/organization/CC_MAR_Naples/Factsheets/SNMG2.htm; Internet; accessed 13 March 2008.

of these points could cause a huge shift in trade route usage that would be felt worldwide. This bears on the future development of the NWP as an alternative trade route.

Economic security is closely linked with sovereignty when it comes to discussing energy security. With the bulk of world oil shipments made by sea,[151] the Senate Select Committee on Intelligence aptly observed in February 2008 that "Geopolitical uncertainties and tensions heighten the risk of a major oil supply disruption and the attendant negative repercussions for the global economy."[152] Given the huge hydrocarbon resource potential of the Beaufort Sea basin and the unresolved nature of the Alaska/NWT boundary dispute,[153] the stakes are high if Canada does not retain effective control of its interests.

Foresight tells us that the rationale exists to take a proactive stance in planning sovereignty (infrastructure and governance) and security requirements today so that they can be in place in the next 25-50 years when needed. Unfortunately, hindsight tells us that the opportunity to initiate action before it is actually required happens rarely.

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[151]The US, India, and China import by sea between 90-95% of their total annual oil imports; Japan is wholly reliant on sea import of oil. Dennis Blair and Kenneth Lieberthal, "Smooth Sailing: The Worlds Shipping Lanes are Safe," *Foreign Affairs* 86, no. 3 (May/June 2007), http://proquest.umi.com/pqdweb?index=0&did=816946531&SrchMode=1&sid=2&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1205710095&clientId=1711; Internet; accessed 16 March 2008.

[152] McConnell, *Annual Threat Assessment of the Director of National Intelligence*…, 42.

[153]Huebert, "Northern Interests and Canadian Foreign Policy…, 8.

SECURITY IN CLOSING

'Alarmist,' 'extreme,' and 'not likely' are qualifiers that might be used to describe those scenarios presented above. The point of this discussion, however, is to identify that as a result of the inevitable and increasing consequences of climate change, some of these scenarios can and likely will be acted upon by a determined organization not today, or tomorrow, but at some point in the future. As Kyle Christensen articulates:

> . . . the Arctic exhibits some of the harshest conditions on the planet, and the likelihood of any potential adversary entering Canada in this way and posing a credible threat is considered remote and unlikely.[154]

When modern threats are analyzed using the principles, characteristics, and tenets of war, it is precisely Christensen's sentiment that opens an adversary to the notion of exploiting that which Canada deems unlikely.

In the end, an exhaustive list of possible threats to Canadian security is impossible to compile. Today's militaries do not plan to fight yesterday's battles; they attempt to apply yesterday's lessons to the battle next anticipated tomorrow.

On 9/11, Al Qaeda demonstrated the characteristic of asymmetricity, having carried out an attack at a time and place and with an effect never previously anticipated. The difficulty Canada faces with respect to securing its Arctic can be summed by Horn and Reshke who cite two Chinese strategists who warn that "there is no means which can

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[154]Kyle D. Christensen, *Arctic Maritime Security and Defence: Canadian Northern Security Opportunities and Challenges* (Ottawa: Defence R&D Canada, 2005), 45.

not be used in war and there is no territory or method which can not be used in combination."[155] Canada cannot fully comprehend when, where, and how future challenges will appear. Underscoring that point, one need only recall Canadian Arctic history as previously described.

With the static nature and longevity of the Cold War, CF personnel stationed in Europe could scarcely believe the collapse the Soviet Union in 1989, let alone the rapid transition to a large-scale conventional war against a new and unforeseen enemy in Iraq only two years later.[156] It is, therefore, essential that Canada continues to consolidate its presence in the Arctic, taking advantage of this period in history when North America remains relatively free from direct threat.

That Canada's numerous policy documents identify the Arctic a priority for defence is not in dispute, they contrast thinking early last decade. The 1994 *Defence White Paper* and the 1998 *Military Assessment* by the Director General Strategic Plans identified then that there was "no immediate direct military threat to Canada."[157] However, the international landscape changed on 9/11. With Afghanistan and the War on Terror featuring in the headlines almost daily since, Canadian military activities

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[155]LCol Bernd Horn and Regan G. Reshke, "Defying Definition: The Future Battlespace," in *Towards the Brave New World: Canada's Army in the 21st Century*, ed. LCol Bernd Horn and Peter Gizewski (Kinston, ON: Directorate of Land Strategic Concepts, 2003), 93.

[156]LCol Neil McDermid, a former CF18 pilot stationed in CFB Lahr, Germany, discussion with the author on the changing nature of warfare, 31 January 2008.

[157]Department of National Defence, *1994 Defence White Paper*, Highlights Chap. 3, (Ottawa: Canada Communications Group, 1994), http://www.forces.gc.ca/admpol/content.asp?id=%7BD5385C59-1660-4E38-8C3B-684158B534CB%7D; Internet; accessed 11 March 2008.

outside Canada receive significant attention; this is interesting considering that Canada's activities in support of the defence of the nation and North America remain its foremost official priorities. Though national and continental defence are essentially a singular issue, recent developments in Canadian military initiatives in the Arctic will make significant progress towards meeting both of those priorities.

CHAPTER 5: CANADIAN ARCTIC SOVEREINGTY: THE THREAT DEFINED

> ". . . the arctic is about to become the scene of jockeying among world powers for influence and access."[158]

The sanctity a state's sovereignty over its land is universally held in firm belief. Kearsley describes that, with regard to the 1967 Israeli occupation of the Arab territories, "Israel still has no right, in the eyes of most of the international community, to annex these lands."[159] In contrast, "The idea of sea boundaries has never received such solid support in comparison to their land counterparts."[160] This is particularly true for Canadian sovereignty of its territory. Specifically, with the exception of the Strait of Juan de Fuca and Machias Seal Island,[161] talk of Canadian sovereignty revolves exclusively around its maritime Arctic borders.

What complicates Canadian sovereignty over its Arctic waters is the historic use of ice-locked areas as if they were an extension of the land itself. As climate change progresses, previously ice-bound regions will become increasingly ice-free, leaving their use by maritime traffic a possibility and adding fuel to the debate about the status of their ownership. The Canadian point of view is made clear by Sheila Watt-Cloutier, then

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[158]LCdr Guy Killaby, "Great Game in a Cold Climate: Canada's Arctic Sovereignty in Question," *Canadian Military Journal* 6, no. 4 (Winter 2005-2006): 32.

[159]Kearsley, *Maritime Power and the Twenty-First Century*…, 14.

[160]*Ibid*., 14.

[161]The specific sovereignty of both these regions remains in dispute with the US. Central Intelligence Agency, "The World Fact Book," https://www.cia.gov/library/publications/the-world-factbook/geos/ca.html; Internet; accessed 17 March 2008.

President of the Inuit Circumpolar Conference, who in 2002 repeated former Foreign Affairs Minister Joe Clark's words from 1985:

> Canada's sovereignty in the Arctic is indivisible. It embraces land, sea and ice. It extends without interruption to the sea-ward facing coasts of the Arctic islands. These Islands are joined and not divided by the waters between them. They are bridged for most of the year by ice. From time immemorial Canada's Inuit people have used and occupied the ice as they have used and occupied the land.[162]

Huebert reflects upon six areas that scholars identify as challenges to Canadian Arctic sovereignty.[163] These challenges are mainly legal in nature, although through discussion it will be shown that components of political sovereignty also come to light. It will also become obvious that undertones of both physical and economic security come into play, exemplifying the interrelated relationship between security and sovereignty.

AMERICAN/CANADIAN/EUROPEAN DISPUTE OVER THE NWP STATUS

The status of the NWP is the most important sovereignty issue to Canada. There are seven charted shipping routes through the NWP as depicted in Figure 5.[164] The US, the European Community, and even Japan maintain that the NWP is an international strait connecting the Arctic and Atlantic Oceans, thus permitting right of both innocent passage and transit passage.[165]

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[162]Joe Clark, 1985, quoted in Sheila Watt-Cloutier, "Inuit, Climate Change, Sovereignty, and Security in the Canadian Arctic," 25 January 2002, http://www.inuitcircumpolar.com/index.php?ID=91&Lang=En; Internet; accessed 17 March 2008.

[163]Huebert, "Northern Interests and Canadian Foreign Policy…, 2-12.

[165]Innocent passage means navigation through a territorial sea for the purpose of traversing it without entering internal waters or calling at port outside internal. It is interesting that right of innocent passage also includes the right of aircraft to transit over the waterways. Though this right is maintained by

Figure 5: Main routes of the Northwest Passage
Source: Donat Pharand, *Canada's Arctic Waters in International Law* (New York: Cambridge University Press, 1988), 189.

Canada's position is that, since the 1970 increase of Canadian TTW from three to 12 nm, the NWP, in particular the most northerly route connecting the Beaufort Sea with Baffin Bay via M'Clure Strait and Parry Channel, is an internal waterway. Therefore,

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the international community, it is not known to ever be acted upon. In reality, it would seem to be impractical given the NWP's great isolation from any airfield that could support foreign air operations through the passage. Additionally, the numerous air corridors that traverse the Arctic already provide the utility of overflight for commercial purposes with the oversight of Nav Canada and Transport Canada. Transit passage, on the other hand, applies more specifically to straits which are used for international navigation between one part of the high seas or an exclusive economic zone and another. All ships and aircraft enjoy the right of transit passage. United Nations, "Convention on the Law of the Sea, Part II, Articles 18 and 38," http://www.un.org/Depts/los/convention_agreements/texts/unclos/closindx.htm; Internet; accessed 30 March 2008.

Canada has legal title and full control over it.[166] In fact, the NWP is now referred to by the CF's Joint Task Force North as "Canadian Internal Waters."[167]

In 1973, Canada for the first time officially claimed historic title to all the waters encompassed within the Arctic Archipelago, the rationale for which is adeptly communicated by Watt-Cloutier's comments. Norway, Denmark, the US, and Russia have also used this approach to lay claim to historic waters in their respective regions.

Additionally, the strait baseline approach to defining the perimeter of the Canadian Arctic Archipelago was established effective 1 January 1986.[168] This effectively enclosed the entire NWP within Canadian TTW in accordance with the landmark 1951 Fisheries Case, the International Court of Justice's (ICJ) ruling in favour of Norwegian application of the strait baseline system.[169] The implication of this, Canada maintains, is that UNCLOS' geographic criterion is met by the TTW limit,

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[166]It is interesting to note that the TTW expansion to 12 NM and the introduction of the AWPPA was in a large part Prime Minister Pierre Trudeau's response to the significant Canadian public outcry generated by the Manhattan's 1969 transit rather than in response to Government foresight. Ivan Head and Pierre Trudeau, *The Canadian Way: Shaping Canada's Foreign Policy, 1968-1984* (Toronto: McLelland & Stewart Inc., 1995), 55.

[167]LCol Drew Artus in Nathan VanderKlippe, "Northwest Passage Gets Political Name Change," *Edmonton Journal* 9 April 2006, http://www.canada.com/edmontonjournal/news/story.html?id=6d4815ac-4fdb-4cf3-a8a6-4225a8bd08df&k=73925&p=1; Internet; accessed 17 March 2008.

[168]Donat Pharand, *Canada's Arctic Waters in International Law* (New York: Cambridge University Press, 1988), 155.

[169]*Ibid*., 141.

historic title, and the strait baseline system; therefore, neither transit passage nor innocent passage exists for foreign traffic.[170]

The essence of Canada's dispute with the international community over the NWP relates to the applicability of the UNCLOS functional criterion that establishes the NWP as an international strait by virtue of its use as a route by international marine traffic.[171] The ICJ's 1949 watershed decision on the Corfu Channel Case appears to rule against Canada's application of the UNCLOS functional criterion.[172] The question is what defines usage sufficient by international shipping to claim an international strait? In the 102 years since Amundson completed his crossing, approximately 100 vessels have transited the NWP.[173] Is this a sufficient number to justify international usage? It would seem not, given the modern precedents of the Corfu Channel and the Straits of Malacca where, for example, *daily* commercial transit volumes are 17[174] and 138.[175]

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[170]"Canada's claim to sovereignty over the internal waters within its Arctic Archipelago, including the Northwest Passage, is solid, despite protests from the US and certain European countries." "The Legal Opinion on the Northwest Passage, Appendix XVII," in *Managing Turmoil, 2006 An Interim Report of the Standing Senate Committee on National Security and Defence*, http://www.parl.gc.ca/39/1/parlbus/commbus/senate/com-e/defe-e/rep-e/RepOct06-e.pdf; Internet; accessed 30 March 2008, 217.

[171]Pharand, *Canada's Arctic Waters in International Law*…, 224.

[172]International Court of Justice, Corfu Channel Case (Merits) *United Kingdom v.* Albania (1949) ICJ Rep 4, quoted in Huebert, "Northern Interests and Canadian Foreign Policy…, 6.

[173]Christensen identifies 62 transits from 1903-2005 whereas Pharand identifies 69 and JTFN estimates 100; of those 100, JTFN identifies 40 vessels of foreign registry. Christensen, *Arctic Maritime Security and Defence*…62-65; Donat Pharand, "The Arctic Waters and Northwest Passage: A Final Revisit," *Ocean Development and International Law* 38, no. 1, (January 2007): 31-33; and LCdr Ivan Russell, JTFN HQ, email to author 25 February 2008.

[174]Author's telephone inquiry with the Corfu Port Authority, 21 January 2008.

[175]Energy Information Administration, "World Energy Transit Chokepoints," http://www.eia.doe.gov/cabs/World_Oil_Transit_Chokepoints/Full.html; Internet; accessed 30 March 2008.

Why it is crucial for Canada to establish the NWP as internal waters as opposed to an international strait has already been alluded to. In essence, Canada needs to retain the right and the authority to control how this waterway is used and also who uses it. As internal waters, unauthorized foreign passage is precluded. As an international waterway, all the world's nations have the right of transit passage through Canada's 'roof.'

The potential impact is that, as Huebert states:

> . . . rules governing ship construction, safety and environmental standards will be determined by the relevant international organizations - primarily, the International Maritime Organization (IMO).[176]

Though the AWPPA is the strongest legislation regulating the actions of maritime traffic in Arctic waters, with little Canadian presence in a vast region it is a reactive rather than a proactive measure.[177] It is not certain if this act will stand up to an expanding shipping industry and climate change. More importantly, the potential for a non-Canadian body, like the IMO, to regulate activities within Canadian territory violates sovereign governance over the region.

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[176]Rob Huebert, "The Shipping News Part II: How Canada's Arctic Sovereignty is on Thinning Ice," *International Journal* 58, no. 3 (Summer 2003), http://proquest.umi.com/pqdweb?index=0&did=545429251&SrchMode=1&sid=1&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1206918229&clientId=1711; Internet; accessed 30 March 2008.

[177]Transport Canada, *Arctic Waters Pollution Prevention Act*, http://www.tc.gc.ca/acts-regulations/GENERAL/a/awppa/act/awppa.htm; Internet; accessed 30 March 2008.

AMERICAN/CANADIAN/DANISH/RUSSIAN DISPUTE OVER INTERNATIOAL BOUNDARIES AT THE POLAR CONFLUENCE OF CONTINENTAL PLATES

The Arctic Oceans Commons, Figure 6, describes the central portion of the Arctic Ocean, covering an area of approximately two million km^2, that is both outside the Exclusive Economic Zones (EEZ) agreed upon within the UN and is not controlled by the surrounding nations of Canada, Denmark, Norway, Russia, and the US.[178]

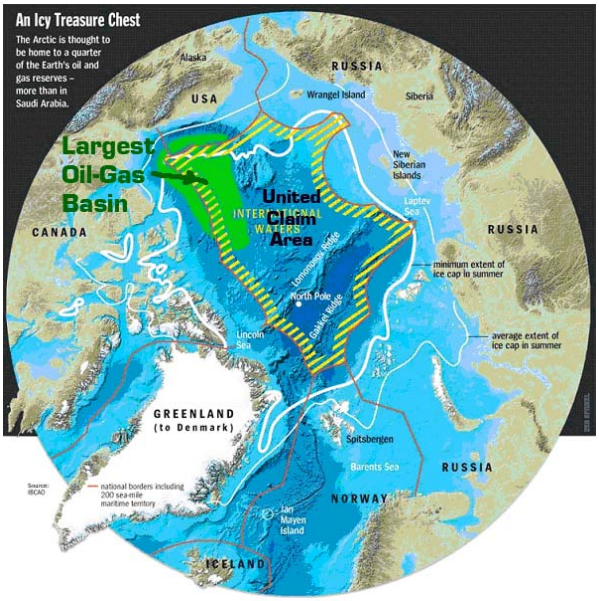

Figure 6: Disputed Arctic Ocean Commons
Source: United Oil and Gas Consortium Management Group, http://www.unoilgas.com/arctic-claim-map-07.jpg; Internet; accessed 30 March 2008.

Pascal Poirier first proposed to Canada, in 1907, the notion of the sector principle to claim territory of these Commons to the North Pole.[179] Canada then laid claim to this slice of the Arctic Ocean and Archipelago, including the NWP, in 1925; a claim that

[178]Arctic Oil and Gas, "Arctic Oil and Gas Plans to Venture into this Area," http://www.arctic-oil-gas.com/index.php/about/arctic-plan; Internet; accessed 31 March 30, 2008.

[179]G.S. Graham, review of Les Problemes politiques du Nord Canadien le Canada et Le Groenland A Qui appartient L'Archipel Arctique? (These de doctorate) by Yvon Beriault, International Affairs 24, no. 2 (April 1948): 272-273, http://www.jstor.org/cgi-bin/jstor/printpage/00205850/di012316/01p1270f/0-150.pdf?backcontext=page&dowhat=Acrobat&config=jstor&userID=c6e74704@cfc.dnd.ca/01c0a848670050c48e0&0-150.pdf; Internet; accessed 30 March 2008.

stretches approximately 420 nautical miles from the northern tip of Ellesmere Island to the North Pole.[180] This claim has never been universally accepted and conflicts with US and Russian claims.

The crux of this issue is the determination of the continental extension of the undersea Lomonosov Ridge. At stake is access to the estimated "ten billion tons of gas and oil deposits and significant sources of diamonds, gold, tin, manganese, nickel, lead and platinum" in the area.[181] All three countries claim the area as their own with assertions that it extends from their respective continental shelves; however, only Russia, which ratified UNCLOS in 1997, has completed hydrographic surveying of the extent of its shelf regions.[182]

In 2001, Russia initially submitted to the UN Commission on the Limits of the Continental Shelf its claim on the Arctic Ocean in accordance with UNCLOS Article 76,[183] yet further refinement of its surveying was required. Russia continued with its undersea research, completing it with the fanfare of the planting of a titanium flag on the

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[180]UNCLOS allows an extension of 350 NM based upon the maximum baseline extension. United Nations, "Convention on the Law of the Sea…, Part VI, para. 5.

[181]"Putin's Arctic Invasion: Russia Lays Claim to the North Pole - and All Its Gas, Oil, and Diamonds," *Daily Mail* 29 June 2007, http://www.dailymail.co.uk/pages/live/articles/news/worldnews.html?in_article_id=464921&in_page_id=1811; Internet; accessed 30 March 2008.

[182]UNCLOS provides a state with a 10 year window, from the time of becoming a signatory, to map the extent of their continental shelf limits, specifically the areas where the ocean depth drops to 2500 meters and also the foot of the continental shelf extending from a state's landmass. United Nations, "Convention on the Law of the Sea…, Part VI, para. 4, 5.

[183]United Nations, "Submissions to the Commission on the Limits of the Continental Shelf: Russian Submission," http://www.un.org/depts/los/clcs_new/submissions_files/submission_rus.htm; Internet; accessed 30 March 2008.

North Pole's sea bed in August 2007.[184] This symbolic act amplified the necessity for both Canada, which has until 2013 to complete its surveying for UNCLOS submission, and the US, which has not ratified UNCLOS, to accelerate their survey programs. Ominously, Eric Posner, a University of Chicago international law specialist, believes the flag planting signifies Russia's intent to claim this area regardless of how the UN Commission rules in the future.[185] Incredibly, with discussion in 2003 about development of under-ice transport of oil, gas, and nickel using a Typhoon nuclear submarine, Russia seems to be serious about its intent.[186]

Denmark's claim to the North Pole rests with its acquisition of Western Greenland from the US back in 1916. The Lominosov Ridge, the Danes maintain, is an extension of the Greenland shelf. Though its undersea mapping has yet to complete, Denmark understands the link to potential undersea oil and gas reserves in this area.[187]

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[184]Editorial, "The Great Arctic Oil Rush," *The New York Times*, 12 August 2007, http://proquest.umi.com/pqdweb?index=0&did=1319566731&SrchMode=5&Fmt=3&retrieveGroup=0&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1189018903&clientId=1711; Internet; accessed 5 September 2007.

[185]Andrew Chung, "The Arctic Cold War," *The Star.Com,* August 12, 2007, http://www.thestar.com/sciencetech/Ideas/article/245440; Internet; accessed 15 September 2007.

[186]Igor Kudrik, "Typhoon Subs to Ship Oil and Gas," http://www.bellona.no/bellona.org/english_import_area/international/russia/navy/northern_fleet/vessels/29577; Internet; accessed 30 March 2008 and Thomas Nilsen, "Navy Sub for Metal Transport in Arctic," http://www.bellona.no/bellona.org/english_import_area/international/russia/navy/northern_fleet/general/17841; Internet; accessed 30 March 2008.

[187]Canada has an outstanding claim to 33 Km^2 of sea in the Lincoln Sea region that is contested by Denmark and the US; however, all three countries recognize that no economic gain correlates to this area and therefore it remains a "symbolic dispute." Rodney Neufeld, Lawyer for Department of Foreign Affairs and International Trade, in discussion with the author, 5 March 2008, Iqaluit.

On the other hand, for the past four years the US has been quietly collecting hydrographic data in the Beaufort Sea and Arctic Ocean.[188] The likely American approach is to capture sufficient data to allow it to simultaneously ratify UNCLOS and submit data supporting its claim. With estimates of potential US oil and gas resources of about $1.3 trillion, the stakes are high. This avenue of a swift decisive strike to claims in its national interest is interesting in that it downplays the urgency and importance of its claims. By not being vocal, the US does not antagonize other nations to race to stake their own claims that could "extend 150 miles farther into the Arctic Ocean than today's maps show."[189]

This is, of course, antithetical to Canada's game plan of loudly proclaiming its claims without initiating significant efforts to support them. Rob Byers describes that Canadian mapping efforts in the basin west of Ellesmere Island to the Beaufort Sea would likely take a minimum of four summers of activity supported by two icebreakers.[190] Unfortunately Canada has only one aging icebreaker available and the $70 million allocated to this task by the 2004 Liberal budget appears to be a half-hearted effort to support this job. Canada has some lessons to learn from both the Russian and American examples.

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[188]Center for Coastal and Ocean Mapping Joint Hydrographic Center, "Law of the Sea Mapping Program," http://www.ccom-jhc.unh.edu/index.php?page=unclos/data.php&p=39&page=law_of_the_sea.php; Internet; accessed 30 March 2008.

[189]"Redefining the Borders of Every Country of the Worlkd [sic] with a Seacoast," http://insidethebottle.blogspot.com/2008/01/redefining-borders-of-every-country-of.html; Internet; accessed 30 March 2008.

[190]Michael Byers, "Our Next Frontier: The Arctic Ocean," http://www.oceantrackingnetwork.org/news/pdf/globe_frontier.pdf; Internet; accessed 30 March 2008.

One interesting aspect of the race to validate national claims is Byers' assertion that the US has utilized nuclear submarines to map undersea portions of the Arctic sea floor.[191] Not surprisingly the US does not claim to have data within 200 nautical miles of any other state for obvious sovereignty reasons. It remains nonetheless ironic that Canada could, through diplomatic channels in the spirit of military and national cooperation, solicit US assistance to acquire sea floor data within its EEZ. This would be consistent with efforts Canada has made with Denmark.

To hasten Canada's efforts in the Arctic one could reflect upon the notion that 'he who acts firsts, acts with the eventual support of convention.' Jon Waterman describes how, in 1945, President Truman unilaterally extended TTW to the edge of the American continental shelf.[192] Follow-on support from the international community resulted in UNCLOS recognition of this limit with the conclusion of the third UNCLOS in 1982. From its actions, it is clear that Russia has taken the lead in today's race. From this two points emerge. First, Canadian efforts, despite recent admirable capital project announcements, may be too little too late to support High Arctic claims by the end of the 10 year UNCLOS window in 2013. Secondly, with only virginal usage of the NWP, Canada still has time to act with resolve to assert its claim to internal waters in the ICJ.

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[191] *Ibid*.

[192] "Redefining the Borders of Every Country….

AMERICAN/CANADIAN DISPUTE OVER INTERNATIONAL BOUNDARIES IN THE BEAUFORT SEA

Canada asserts that its border with the US extends northward along the 141st meridian into the Beaufort Sea. The US disputes this assertion and maintains that the Yukon/Alaska border extends following a perpendicular line of equidistance from the coast that cuts eastward into 16,187 km^2 of Canadian-claimed TTW.[193] At issue is the right to a greater portion of the estimated recoverable 12 billion barrels of oil and between 13 and 63 trillion cubic feet of natural gas;[194] the link to Canada's economic security and the development of its Arctic cannot be more clear.

The day after the Prime Minister promised to build up to eight new ice-strengthened vessels to patrol the Arctic, US Navy Rear Admiral Timothy McGee "pledged to increase its fleet of ships and other craft in the Arctic."[195] Though the AOPV and several other Arctic projects are positive steps to embolden Arctic sovereignty, it appears that, as with Russian and US undersea mapping efforts, Canada is in an Arctic real estate race. Furthermore, the US continues to match Canadian initiatives. The USCG intends to build a new station in Barrow, Alaska, in an effort to increase American presence and surveillance in the Beaufort Sea area, regulate ocean usage, and fulfill an

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[193]"The Legal Opinion on the Northwest Passage, Appendix XVII," in *Managing*..., 226.

[194]Todd Wilkinson, "Alaskan Oil Battle May Shift Offshore," *Christian Science Monitor* 6 May 2003, http://www.csmonitor.com/2003/0506/p01s01-ussc.html; Internet; accessed 30 March 2008.

[195]Hugo Miller, "U.S. Bolster Presence to Aid Commercial Ships," http://www.bloomberg.com/apps/news?pid=20601082&sid=aK9JSBhBiJMg&refer=canada; Internet; accessed 30 March 2008.

increasing need for search and rescue.[196] Eight months later these seemingly back and forth antics now appear unwittingly by design: the recent Canada/US Model Negotiations on Northern Waters identified nine recommendations, half of which have military undertones including the acceleration of icebreaker acquisitions, to improve regulation of northern waters.[197]

CANADIAN/DANISH DIPSUTE OVER HANS ISLAND AND CONTINENTAL SHELF LIMITS

Canada's claim to Hans Island, the tiny 1.3 km^2 rock outcropping in Kennedy Channel between Ellesmere Island and Greenland, dates back to the transfer of British possessions in the Arctic to Canada in 1880. Hans Island was originally discovered by the American explorer Francis Hall on the Polaris expedition in 1875 before becoming a Danish possession after the US sold its parcel of Northern Greenland in 1916.[198] Today, both Canada and Denmark claim historic title to the island with reports that their ancestral Inuit peoples have used it.

Public recognition of the island's Canadian lineage came about in 1967 after it appeared on a map of Canada for the first time. Then in 1973 the question of its sovereignty was discussed during negotiations on continental shelf limits with Denmark,

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[196]Rachel D'Oro, "Coast Guard Plans to Set Up Arctic Base," *USA Today* 25 October 2007, http://www.usatoday.com/money/topstories/2007-10-25-1199101700_x.htm; Internet; accessed 30 March 2008.

[197]Michael Byers and Paul Cellucci et al, "Model Negotiation on Northern Waters," www.igloo.org/ciia/download-nocache/Calendar/modelnegot; Internet; accessed 30 March 2008.

[198]Kenn Harper, "Hans' History," http://www.canadiangeographic.ca/hansIsland/background.asp; Internet; accessed 30 March 2008.

but since neither country has acknowledged the other's claim to the island its sovereignty remains unresolved.

Though previously it received little attention, national muscle flexing by both countries increased dramatically after August 2001 when a Canadian geologist flew to the island. Between 2003 and 2005, warships and politicians from both countries visited Hans Island to reaffirm their possession of it. Nonetheless, both countries have refrained from further inflammatory rhetoric, such as flag raisings, and have agreed to disagree. UN resolution to this dispute seems eventual although not urgently required because, as Foreign Affairs official position is that Hans Island has actually opened greater dialogue with Denmark, thus improving relations.[199]

Does Canada need to assert its sovereignty over this small, desolate island? Though it lies within the national interest of both nations to extend their respective boundaries, without the science to back up its relevance this question will remain hard to answer. In the mean time, Canada and Denmark are working collaboratively to chart the continental shelf area in the Hans Island region after signing a Memorandum of Understanding in 2005.[200] Is this a pressing issue with significant impact on Canada? Rob Huebert seems to think so.

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[199]Rodney Neufeld, Lawyer for Department of Foreign Affairs and International Trade, in discussion with the author, 5 March 2008, Iqaluit.

[200]Denmark, Ministry of Science and Technology and Innovation, "LORITA-1 (Lomonosov Ridge Test of Appurtenance)," http://a76.dk/expeditions_uk/lorita-1_uk/; Internet; accessed 30 March 2008.

Without identifying why, Huebert offers the opinion that Canada's losing claim to the island would establish a "dangerous precedent."[201] With three other complex Arctic sovereignty disputes in the international scene Canada needs to remain steadfast in its resolve to exert its sovereignty. An UNCLOS ruling on Hans Island could be an expeditious affair given the situation. However, if settled out of Canada's favour it could prompt other challengers to Canada's Arctic to lodge formal contest under UNCLOS. Therefore it would seem prudent for Canada to continue with its course that the "issue can be resolved within the excellent bilateral relationship that Canada and Denmark have cultivated over 60 years."[202] Canada might not push for an expeditious resolution instead consolidating its Arctic sovereignty in other cases.

CANADIAN/DANISH DISPUTE OVER ILLEGAL FISHING IN THE GREENLAND/FAEROES ISLAND AREA

In 2002 Huebert discussed with a CCG official the suspected incursions into Canadian waters by Greenland and the Faeroe Islands fishing vessels in search of shrimp and turbot.[203] He believes this interdiction of fish to be on the rise; however, supporting evidence is fleeting as Canada has lacked the ability to verify offshore international fishing activities due to maritime surveillance capabilities that have atrophied since the end of the Cold War.

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[201]Huebert, "Northern Interests and Canadian Foreign Policy…, 12.

[202]Foreign Affairs and International Trade Canada, "Canada and Denmark Issue Statement on Hans Island," http://w01.international.gc.ca/MinPub/Publication.aspx?isRedirect=True&publication_id=383048&Language=E; Internet; accessed 30 March 2008.

[203]Huebert, "Northern Interests and Canadian Foreign Policy…, 13.

In the aftermath of Operation Apollo, the Navy's surface fleet fuel budget was slashed until recently; the submarine fleet's operability remains abysmal even today. Similarly, the Air Force has been unable to routinely patrol due to significant maintenance programs affecting both the Sea King and the Aurora.[204] The Department of Fisheries and Oceans vessels and contracted civilian aircraft do patrol beyond Canada's 200 nm EEZ, however, their presence is limited.

Is this illegal fishing a threat to Canadian sovereignty? With the 1995 Spanish 'Turbot War' on the Nose of the Grand Banks as the only real parallel, the current issue is of a much smaller magnitude. Because multiple layers of governance initiatives already exist within international frameworks such as The North Atlantic Fisheries Organization and the 2005 *National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing*, there does not appear to be a significant challenge to Canadian sovereignty in this matter. Though the Canadian Chamber of Commerce reported in 2005 that, with respect to fisheries enforcement, "Canada's efforts to date have been largely ineffective, and there is little to suggest these actions alone will sufficiently curb foreign over fishing,"[205] Canada's autonomy over this region is established; diplomacy and enforcement need to be relied upon and expanded.

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[204]All Aurora Arctic sovereignty flights were cancelled for a six month period beginning in late 2007. CBC.ca, "Canada's Air Force Cancels Surveillance Flights to Arctic for Winter," http://www.cbc.ca/canada/story/2007/11/13/arctic-surveillance.html; Internet; accessed 30 March 2008.

[205]Canadian Chamber of Commerce, "International Affairs 2005: Canadian Custodial Management of Internal Waters," http://www.chamber.ca/cmslib/general/IA059.pdf; Internet; accessed 30 March 2008, 3.

SUBMARINE ACTIVITY IN ARCTIC WATERS

Foreign submarine activity in Canadian Arctic waters remains uncontrolled. This is unlike preceding sovereignty issues in that unauthorized and submerged entry into a state's TTW is universally accepted as a hostile act. Though one could argue that what Canada does not know can not be detrimental to its integrity as a nation, this is false. In fact, the opposite holds true: if Canada is unaware of what occurs in its own TTW, it could neither assert sovereignty over transgressions against it nor could it ensure the security of its territory.

Early US submarine transits through Canadian Arctic TTW were conducted under the auspices of Canadian-US defence.[206] However, today it remains strongly suspected that British, Chinese, French, Russian, and US submarines transit under ice-covered Arctic waters without Canadian permission. Recall that territorial control has been discussed as a component of the ability for a state to exercise sovereignty over its lands and waters. Griffiths presents a 'Catch-22' situation: if it had the information to prove these unauthorized transits, Canada would have to admit that it did not have the means to control or limit them.[207] Thus it would give credibility to the notion that, in particular, the NWP has long been used as an international strait, a factor that would weigh heavily in any decision by the ICJ.

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[206]Pharand, *Canada's Arctic Waters in International Law*…, 225.

[207]Griffiths, "The Northwest Passage in Transit….

Similarly, the ICJ would look even less favourably upon Canada if Canada had known about unauthorized transits without doing anything about them, such as lodging formal diplomatic protests. Huebert questions Canada's actions in the event that it did locate the submarine reported by Inuit in Baffin Island's Cumberland Sound in 1999.[208] Canada's response would have been straightforward in the event it were determined to be a Russian one, but much more serious a diplomatic incident were it found to be an allied one! Canada would have to act and be seen internationally to protect its sovereignty, but could it really publicly lodge a protest against, for example, its closest ally without significantly straining the Canada-US relationship? Not likely given the current government's emphasis on fostering harmonious relations. That unannounced incursions into Canadian territorial waters have occurred in the past and continue today is indicative of the need for Canada to be able to enforce sovereignty over its Arctic territory.

SOVEREIGNTY IN CLOSING

There exist four significant challenges to Canadian sovereignty in the Arctic. The NWP remains a waterway that sees little annual usage, and the majority of that is Canadian.[209] Though one initially suspects no imperative to establish the NWP as an internal waterway, future impact of climate change will likely bring about a rapid requirement for an established and recognized resolution of this issue. The time to resolve it is before the need.

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[208]Huebert, "Northern Interests and Canadian Foreign Policy…, 10.

[209]Of the approximately 100 NWP transits from 1906 to 2005, 40 of them have been by foreign vessels: a combination of military, coast guard, research, commercial, and cruise vessels and pleasure craft. LCdr Ivan Russell, JTFN HQ, email to author 25 February 2008.

Both the Lomonosov Ridge and the Beaufort Sea issues are similar in nature with equally significant economic components. As climate change advances and technology improves, both at increasing rates, accessibility to untapped resources will increase accordingly. As with the NWP, the time to solidify Canadian positions in the international arena is in advance of when their lack of resolution impedes economic growth.

Lastly, albeit a suspected infrequent occurrence, unauthorized underwater transits through Canadian TTW remain a significant challenge to Canadian sovereignty. These transits also pose an obvious threat to national security; a threat shared by every sovereign state when trespassed against by another.

CHAPTER 6: CANADA'S MILTIARY: LEADING THE CHARGE NORTH

WHY THE MILITARY WILL BE AT THE FOREFRONT OF SECURITY AND SOVEREIGNTY ISSUES

Numerous threats to both Canadian security and sovereignty exist. Canada does not demonstrate a responsible level of Arctic security measures commensurate with its sovereign reign over the region. This is changing. Driven largely by the CF's Directorate of Policy Development, Canada's military is addressing a recognized lack of coherent and consistent security policy towards the region bounded by Canada's third ocean frontier. This effort appears to be another swing of the defence policy pendulum, one that hopefully stands the test of future changing governments and public opinion.

A significant part of Canada's foreign policy is dominated by efforts in failed and failing states. As such, a '3D' approach involving defence, diplomacy, and development is embraced. Internal to Canada, this approach translates into a 'whole-of-government' approach, led by INAC, in which ideally departments across all three levels of government are integrated to maximize effort while minimizing duplication and inefficiency. However, defence initiatives often seem to come to the forefront. Why then turn to DND to lead Canada's Arctic policy development?

The underlying foundation that allows INAC to carry out its responsibility as "the principal federal department responsible for meeting the federal government's

constitutional, political and legal responsibilities in the North"[210] is the established security of the North. As discussed, security involves freedom from physical, environmental, economic, and psychological threats. Thus it is not solely a military responsibility, but just as DND has led the way in the past, it will shape the future because it ideally has the capability, the budgetary funding, and the manpower to identify, assesses, synthesize, and act upon the threats within the framework of Government policy. INAC provides only a framework for social governance.

Development of Canada's Arctic is industry-driven. Its remoteness results in lengthy build times for human, financial, environmental, and physical infrastructure development. Development equates to economic prosperity, and this cannot fully bloom without addressing the physical, environmental, and economic components of security previously discussed.

On the other hand, diplomacy enforcing Canada's sovereignty of the Arctic is also a slow and cumbersome effort. Albeit, as with Canadian-Danish cooperation on undersea mapping, diplomatic efforts succeed, diplomacy is generally consensus-based and in organizations such as the Inuit Circumpolar Conference and the Arctic Council, progress addressing Arctic-centric issues often is slow. Additionally, since the first internationally visible claims of Canadian sovereignty of the Arctic in 1967 (Hans Island) and the NWP (Manhattan), not much concrete action has occurred and no submissions to the ICJ have ever been made.

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[210]Indian and Northern Affairs Canada, "Mandate, Roles and Responsibilities," http://www.ainc-inac.gc.ca/ai/mrr-eng.asp; Internet; accessed 30 March 2008.

Though close collaboration with US and NATO allies was borne out of World War II, today's 'Canada-First' defence policy is just one layer of American defence policy.[211] With the collective defence of North America, Canada has adopted a strategy that is smart, though dependent on the US: Canada does not have the resources to ensure its own security in the event of a direct threat and it never will have either. This is the one feature that characterizes all alliances: the subordinate party participates because it is advantageous to do so, although it incurs the sacrifice of total independence.

Gary Rice, in *Defence Requirements for Canada's Arctic*, identifies four broad scenarios requiring significant government response to the Arctic: a major rescue and evacuation, a terrorist act, a sovereignty challenge, and civil unrest and sabotage.[212] It is demonstrative that DND is the only department that remains involved in Canada's response at the tactical, operational, and strategic levels to handle such challenges, whereas INAC plays no role whatsoever.[213]

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[211]American active layered defence establishes an outer ring abroad by taking the fight to the enemy, interdicting him prior to closing North America; the Global War on Terror and Al Qaeda are evidence of this. The middle ring or continental defensive perimeter around North America is overseen by NORAD, including Canada's shared responsibility for northern continental approaches. The innermost ring is forged on a secure American border ensured by the Department of Homeland Security. United States Department of Defense, *The National Defense Strategy of the United States of America*, http://www.defenselink.mil/news/Apr2005/d20050408strategy.pdf; Internet; accessed 30 March 2008.

[212]Gary Rice, "Four Selected Intrusion Scenarios," in *Defence Requirements for Canada's Arctic*, ed. Brian MacDonald (Ottawa: Conference of Defence Associations Institute, 2007), 67.

[213]The PCO is also included, however it provides only essential advice and support to the Prime Minister and Cabinet.

In January 1978, the CF commenced Operation Morning Light, responding to the Cosmos 954 satellite crash in the NWT.[214] The response entailed the rapid deployment of 266 personnel to recover 110 pounds of $Uranium_{235}$ spread out over 199,429 Arctic km^2, capturing the essence of why the military's efforts in the Arctic are the most potent form of exercising security and sovereignty over the region. The military is responsive, it has the personnel, it has the expertise and training, and it represents an openly visible display of government control.

Lastly, development and diplomatic efforts are no doubt integral components to an overall governance structure of the Arctic, but it seems that military response may in the future be imposed on Canada by external forces rather than by internal domestic ones. Canada has the ability to choose to be proactive, rather than reactive; current federal initiatives demonstrate this resolve which will likely continue at least until the security and sovereignty of its Arctic are assured.

CURRENT MILITARY CAPABILITY SUPPORTING SECURITY AND SOVEREINGTY

To understand the Arctic from a military perspective requires awareness of what is occurring on and over Arctic lands and on and under its waters. So what capability does Canada's military currently hold to facilitate its Arctic awareness, Common Operating Picture, or Maritime Domain Awareness? In essence, its efforts are largely limited to the Air Force and the Army despite the Arctic's maritime qualities.

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[214]Quentin Bristow, Geological Survey of Canada, "Radiation Geophysics: Operation Morning Light – A Personal Account," http://gsc.nrcan.gc.ca/gamma/ml_e.php; Internet, accessed 30 March 2008.

The bi-national North American Aerospace Defence (NORAD) agreement with the US monitors northern airspace via 41 North Warning System (NWS) radar sites. In response to Russian long-range bomber patrols, Hornet fighter aircraft are vectored to intercept them. The response to air threats thus remains reactive rather than proactive; the system also "leaves vast areas of the North without coverage."[215] Staging out of forward operating locations (FOL) was reduced during the late 1990's to only a few annual deployments, whereas now that the Russian Air Force has increased operations, FOL deployments have also increased significantly.[216] 440 Squadron operates four Twin Otter aircraft out of Yellowknife, NWT, supporting mainly Ranger activities, but it is not a primary surveillance platform. On the other hand, the Aurora long-range patrol aircraft conducts sovereignty flights. Post-Cold War they have been rare: two taskings completed in 1999, none in 2000, two in 2006, and six in early 2007.[217] Overall, the Air Force remains responsive, though in small numbers, to airborne security and sovereignty challenges. Nonetheless, it is the nature of future challenges arriving via other mediums that will cause concern.

To facilitate terrain awareness the Canadian Rangers conduct annual patrols, but they are mostly by snowmobile and thus cover limited areas. The frequency of military training has increased since 2000, albeit exercises such as Operation Narwhal in 2007 are

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[215]Department of National Defence, *Arctic Capabilities Study…*, 9.

[216]The CF18 can be operated out of Inuvik, NWT; Alert, NWT; Iqaluit, Nunavut; and Goose Bay, Labrador. Though an FOL exists at Rankin Inlet in Nunavut, it has never been utilized.

[217]Chris Wattie, "U.S. Sub May Have Toured Canadian Arctic Zone," *National Post* 19 December 2005, http://www.nationalpost.com/story.html?id=fb21432a-1d28-415e-b323-ceb22d477732&k=69493; Internet; accessed 30 March 2008 and LCdr Ivan Russell, JTFN HQ, email to author, 24 October 2007.

transient surges representing no lasting military presence. Like the Air Force, this also leaves the Army with a small Arctic footprint.

Lastly, even if it were to venture there routinely with its surface and sub-surface combatants and Maritime Coastal Defence Vessels, the Navy retains a patrol capability only in ice-free waters.[218] The Navy's most continuous northern surveillance effort is coordinated by the two Maritime Security Operations Centres (MSOC) that are building the capability to become "focal points for the collection, analysis, fusion and exchange of intelligence, surveillance and reconnaissance information in support of domestic marine security issues."[219] Although a positive initiative, the MSOCs still lack an essential continuous information source feed from Canada's Arctic.[220] For example, vessel information from the maritime Automatic Information System is dependent on infrequent satellite coverage in northern latitudes and it can be turned off by the ship's crew.

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[218]Though the Navy identifies a brash ice capability for its destroyers/frigates and a Lloyd's Register Ice Class 3 capability for its replenishment/coastal defence vessels, the navy does not navigate through these waters. This renders effective naval presence in Canada's Arctic regions limited to ice-free periods. Kyle D. Christensen, "The Navy in Canada's Northern Archipelago," in *Defence Requirements for Canada's Arctic*, ed. Brian MacDonald (Ottawa: Conference of Defence Associations Institute, 2007), 82; and LCdr Lorne Hartell, MARS command-qualified officer, in discussion with the author, 3 March 2008.

[219]Vice-Admiral Bruce MacLean, "What Canadian Military and Security Forces in the Future World? A Maritime Perspective," http://centreforforeignpolicystudies.dal.ca/pdf/msc2005/msc2005maclean.pdf; Internet; accessed 30 March 2008, 3.

[220]The MSOCs, situated in Victoria and Halifax, will bring together a plethora of inter-agency players such as Fisheries and Oceans Canada, Transport Canada, the Canadian Coast Guard, the RCMP, Canadian Border Services Agency, and elements of Public Safety and Emergency Preparedness Canada. *Ibid*., 3.

That the Navy can only operate in the very southern reaches of the Arctic environment and with only limited permanence is indicative of decades of underestimation of the Arctic's regional importance to Canada. A 1970 Defence Research Analysis Establishment (DREA) memorandum articulated:

> There is no obvious need for maritime forces in the arctic today for military purposes but this situation may alter in the future as new weapons systems develop or as the area's resources assume strategic importance.[221]

Nearly four decades later, Canada has realized DREA's 'strategic importance.' Nonetheless, Canada continues to remain partially Arctic-blind across the nation's third coast. Even so, it appears that since release of the 2004 *National Security Policy* and the 2005 *International Policy Statement* and *Defence Policy Statement*, the Federal Government has developed an appreciation for the risks of remaining ignorant of existing and emerging threats to its Arctic. In so doing, it has provided new guidance and direction for Canada's military.

WHAT HAS DRIVVEN THIS NEW GUIDANCE?

Other than the recognition of threats and the emergence of potential threats to Canada's security and sovereignty, Canada's present-day Arctic focus is reflected in early work during the Symposium on Arctic Security Issues, held at CF Northern Area Headquarters (now Joint Task Force North (JTFN)) in early 1999. One outcome from this symposium was the recognized need for an interdepartmental working group to

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[221]Major R.K. MacDonald, *DRAE Memorandum M20, A Note on Canada's Maritime Interests in the Arctic 1970-1990* (Ottawa: Defence Research Analysis Establishment, Directorate of Maritime Operational Research, 1970), ii.

"better co-ordinate the efforts of the various federal departments/agencies involved in security in the North;"[222] this led to the Arctic Security Inter-departmental Working Group (ASIWG) that stood up in end-1999.[223]

The ASIWG has been instrumental in bringing together those elements of government with responsibilities for defence of Canada's North and creating a unified focus of their efforts; components of intra-governmental diplomacy exist for sure, but are nonetheless led by DND. ASIWG was the genesis for a comprehensive study of current governmental capabilities. Though the 2000 *Arctic Capabilities Study* (ACS) made numerous recommendations to enhance specific military capabilities, the one particular requirement that emerged from the study was the need for a long-term northern surveillance capability.[224] Many short- and medium-term ACS initiatives have moved ahead successfully,[225] but future CF capital acquisitions will have the most impact in the Arctic. Additionally, long-term ACS surveillance solutions will be crucial to a successful defence strategy in the Arctic. Without continual domain awareness, any response to security and sovereignty challenges will remain haphazard at best.

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[222]Department of National Defence, *Arctic Capabilities Study*…, 2.

[223]Federal departments represented on the ASIWG other than DND include Canada Customs and Revenue Agency, Canadian Coast Guard, Canadian Security and Intelligence Service, Citizenship and Immigration, Environment Canada, Foreign Affairs and International Trade, Indian Affairs and Northern Development, RCMP, and Transport Canada. *Ibid*., 5.

[224]*Ibid*., 12, 17.

[225]Department of National Defence, *Arctic Capabilities Study Sitrep*, (Yellowknife: Canadian Forces Northern Area HQ, 2002), 1.

DEVELOPING CAPABILITY TO SUPPORT SECURITY AND SOVEREIGNTY

Canada's Air Force is increasing its capability at a rate not seen since the early 1950's.[226] Though still thin in total airframe numbers, the Air Force is positioning to operate in Canada's far northern reaches.

The Aurora modernization programme will take the patrol aircraft fleet into the 2020's. With only 10 upgraded airframes, eight will be retired by 2015, availability for multiple taskings will degrade; however, its sensor package and communications suite will make it a more effective surveillance platform when tasked to the Arctic. On the other hand, when the upgraded Aurora is combined with the modernizations that the Hornet fighter is undergoing, Arctic revisit rates could increase. Additionally, the introduction to service of five Globemaster transports and 17 modern Hercules transports will greatly improve strategic airlift into the Arctic and response to both national and regional emergencies. To facilitate this capability the Air Force is examining lengthening FOL runways by 3,000' to support Globemaster operations in addition to installing a de-icing capability to expand the operations envelope.[227] With the establishment of a deep water port at Nanisivik, consideration should also be given to upgrading the 6400' runway there to allow Globemaster operations to support operations east of Resolute. Lastly, the Sea King's replacement, the Cyclone, is planned to enter service in 2012 with

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[226]A detailed overview of the Royal Canadian Air Force's personnel training and fleet acquisitions during the late 1940's and 1950's is provided by DND. Department of National Defence, "Timeline: The Modern Era," http://www.airforce.forces.gc.ca/site/hist/modern_e.asp; Internet; accessed 18 April 2008.

[227]Major General J.M. Duval, Commander 1 Canadian Air Division briefing to Canadian Forces College, 19 February 2008.

a medium icing capability. Though at present it appears the attainment of an initial operating capability will be delayed until 2015, the Cyclone will be able to operate in much harsher environmental conditions than the Sea King is able to. It would be prudent for naval planners to incorporate Cyclone operations into the AOPV design rather than opt for a cheaper less-capable organic helicopter capability like the Griffon.

The Land Force's central thrust in the Arctic resides in the Ranger force. Their validity as the 'eyes and ears' of the North is not disputed as their ability to work in its extremely harsh environment is a huge wealth of knowledge surely to be captured in the Arctic Training Centre to be built in Resolute.[228] The $29 million dollar annual Ranger program, which will see an expansion by 900 to a total of 5,000, is integral to an overall Arctic CF capability,[229] though development of other CF surveillance capabilities would provide greater measures of influence in the region.[230] Lastly, the Arctic training Center at Resolute, with the ability to house 100 personnel year-round, will advance pan-governmental operational expertise in the Arctic by training not only Land Force

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[228]Ranger efficacy as the 'eyes and ears' of the North has been demonstrated in the past by, for example, the 1999 sighting of a submarine in Baffin Island's Cumberland Sound. Huebert, "Northern Interests and Canadian Foreign Policy…, 10. Additionally, Ranger lore of a submarine sighting that was reported to Ottawa and amplified by the qualifier that "bullets don't bounce off a submarine," lends credence to the Ranger' presence in the Arctic. Colin Campbell, "Canada's Ragtag Arctic Airforces," *Maclean's* 28 August 2006, http://proquest.umi.com/pqdweb?index=0&did=1117601401&SrchMode=1&sid=3&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1206928313&clientId=1711; Internet; accessed 30 March 2008.

[229]Office of the Prime Minister of Canada, "Backgrounder….

[230]There are four Canadian Ranger Patrol Groups (CPRG) across Canada. 1 CPRG, responsible for the four million Km^2 of Canada's Arctic, is smaller than the impression given by the media. Specifically, only 1311 Rangers were paid for duty in 2007. The majority of the approximately 4000 Canadian Rangers work in the northern reaches of Canada's western and central provinces. Captain Conrad Schubert, Deputy Commanding Officer CRPG1 discussion with the author, 7 March 2007, Iqaluit, Nunavut.

personnel, but also other CF elements and Other Governmental Departments (OGD). Furthermore, situated on the northern shore of the 'Canadian Internal Waters,' it will also provide further resolve in Canada's ownership and use of the land, key arguments in its case for sovereignty of this area.

An essential capability not often mentioned is that of command and control (C2). JTFN is the establishment responsible for coordinating any military operations in the North and it exercises this capability on a regular basis;[231] however, as the ACS stated, it "has essentially no intelligence collection or analysis capability."[232] This remains valid today as no permanent surveillance infrastructure exists beyond the NWS, albeit Defence Research Development Canada (DRDC) is in the process of developing test beds to develop this requirement.

Canada's maritime force should feature prominently in the Arctic's future considering the potential for the NWP to allow access through the heart of Canada's Arctic. In reference to the penetrable nature of maritime frontiers Kearsely makes the case for a naval warfighting capability to protect those frontiers:

[231]Military training in the Arctic is on the rise. In 2008 JTFN has scheduled three events: Exercise Nunalivut, in the High Arctic, to conduct a reconnaissance of WWII-era airfields, conduct sovereignty operations, and to conduct a population verification; Operation Nunakput, in the western Arctic area, to monitor Beaufort Sea shipping and to conduct joint training with the RCMP; and Operation Nanook, in the eastern Arctic, to conduct a sovereignty patrol, coordination training with other governmental departments, and to respond to a simulated cruise ship grounding scenario. Commander JTFN, Brigadier General Christine Whitecross, discussion with the author, 7 March 2007, Iqaluit, Nunavut.

[232]Department of National Defence, *Arctic Capabilities Study*…, 11.

> Warships…are ideally suited to take advantage of this penetrability…the fact is that naval force utilization will still be attractive because it operates in a far more flexible medium: the sea.[233]

However, the future Navy will not exploit the penetrable characteristic of the sea as well as it could.

Steps to acquire a naval ice-breaking capacity are positive and in line with the ACS surveillance theme. However, the AOPV fleet will be able to operate only in medium first year or Polar Class 5 ice.[234] This means that Canada is acquiring an ice-breaking capability that will not allow "year-round access to locations such as Iqaluit, or to transit the Northwest Passage, [which] requires a vessel of not less than Polar Class 3."[235] Looking beyond today's fleet, as Christensen articulates, neither the Joint Support Ship nor the Single Class Surface Combatant plans to have any greater ice capability over the replenishment ships and combatants that they will replace.[236]

With a deep water port in Nanisivik, a forward operating location capable of supporting naval operations will be created; however, even with a Polar Class 3 vessel, the navy would require additional replenishment support to transit to the central Arctic. In 2006 HMCS Montreal required a fuelling stop in Greenland enroute to Lancaster

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[233]Kearsley, *Maritime Power and the Twenty-First Century*…, 15.

[234]Department of National Defence, "Proposed Ship Capabilities," http://www.forces.gc.ca/admmat/dgmpd/aops/capability_e.asp; Internet; accessed 30 March 2008.

[235]Christensen, "The Navy in Canada's Northern Archipelago…, 85.

[236]*Ibid*., 87.

Sound.[237] It is not a logical position to be in, relying on a foreign state's support of a national sovereignty exercise. As seemingly simple logistics are, Montreal's fuel detour demonstrated that only hands-on experience in the region is instructive, something that can only be gained by owning platforms able to operate there.

HMCS Fredericton's deployment to the eastern Arctic in 2005 and again in 2007 provided a huge learning opportunity for the Navy but it did not address a core capability required for long-term presence: ice navigation. Rather than develop the Navy's ice capability in the AOPV, LCol Moore argues in his research on Arctic capabilities that the CCG should retain any new icebreaker capability in order to affect sovereignty missions in the far north.[238] Resident expertise to conduct year-round icebreaker operations exists within the CCG, thus as with any complex new system, training and gaining the expertise to operate in ice-packed waters would take the Navy many years to develop. Additionally, even though it may seem appropriate to second Naval officers to the CCG in an effort to gain ice navigation experience, this know-how is an institutional attribute. Capturing this knowledge requires years of exposure during all phases of training and operations on a fleet-wide basis, not just with a few chosen individuals. Therefore, even with the limited ice ability that the AOPV brings, the Navy is unlikely to become adept in any form of ice operations, bolstering the requirement for other means to maintain a watchful eye over the North.

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[237]Blake Patterson, "CF Capability Key to Canada's Arctic Sovereignty," *Trident*, 10 March 2008, 3.

[238]LCol S.W. Moore, "Defending Canadian Arctic Sovereignty: An Examiination of Prime Minister Harper's Arctic Initiatives" (Toronto: Canadian Forces College Command and Staff Course New Horizons Paper, 2007), 31.

With the advances of air-independent propulsion, many submarine fleets have incorporated this technology into their operations. Canada has in the past conducted research into the both the technology and its application to the current submarine fleet; nonetheless, as desirable as it would be to provide some Arctic permanence, it is not practicable to retrofit Canada's subsurface fleet with it.[239] After HMCS Cornerbrook's deployment to the eastern Arctic last year, Huebert made the point that "Sending a sub up to northern waters has significant [positive] ramifications for our ability to know what's going on."[240] What Huebert referred to is not only the ability to sense and respond to incursions but also the network of water space management that Allied submarines require to operate without risk of collision; subsurface incursions into Canadian TTW would have to cease. Thus both today's Navy and the Navy of 2020, as articulated in *Leadmark*,[241] remain without an 'eyes and ears' capability in the Arctic.

Probably the most prudent maritime measure DND has undertaken to enhance its maritime 'eyes and ears' was the High Frequency Surface Wave Radar (HFSWR). The two Newfoundland operating stations were able to track even small vessels as far out as

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[239]Dalhousie University's Centre for Foreign Policy provides a succinct synopsis of past and present AIP efforts in Canada. Dalhousie University Centre for Foreign Policy, "Backgrounder: Victoria Class Submarines, Northern Operations & Air Independent Propulsion," http://naval.review.cfps.dal.ca/pdf/AIP_Backgrounder.pdf; Internet; accessed 30 March 2008.

[240]Bob Weber, "Canadian Submarine Heading to the Arctic," *The Gazette,* 28 June 2007, http://www.canada.com/montrealgazette/story.html?id=b8758397-ea59-49e2-89a6-254dff1cf651; Internet; accessed 30 March 2008.

[241]Department of National Defence, *Leadmark: The Navy's Strategy for 2020*, (Ottawa: Chief of Maritime Staff, 2001).

170 nm.[242] The system with its 25 additional proposed sites for all three coasts was specially suited to detect vessels not in compliance with automatic tracking systems yet it was cancelled in January 2008 despite its capability. However, recognizing HFSWR is crucial to the 'Canada First' strategy, the government affected a rare turnaround by reinstating the system in March 2008. Once fully developed and installed, the 27 sites will be provide an unparalleled real-time recognized maritime surface picture across the roof of North America.

DRDC and the CF Experimentation Centre (CFEC) are two additional DND organizations committed to developing key components of Canada's Arctic domain awareness. In more than half a century of research, DRDC and its predecessors have demonstrated an ability to conduct scientific field operations in the Canadian Arctic. Not only have long-term arctic science operations shown ownership and use of the land, but DRDC has also been the one military component consistently present in the Arctic. The 1971 *White Paper on Defence* identified the requirement for a "subsurface perimeter surveillance" located in Canada's Arctic.[243] Accordingly, one very notable DRDC success was its significant progress in under-ice detection and tracking of both surface and sub-surface vessels, demonstrated by the Theseus unmanned underwater vehicle and the Spinnaker underwater acoustic array projects, both of which were cancelled by 1999

[242]Captain (N) Peter Avis, "Surveillance and Canadian Domestic Maritime Security," http://www.navy.forces.gc.ca/cms_strat/strat-issues_e.asp?category=25&id=287; Internet, accessed 30 March 2008, 6.

[243]Department of National Defence, 1971 Defence White Paper…, 18.

due to budget restraints.[244] However, these projects were insightful as DRDC demonstrated that underwater detection systems and their shore-based support structures were viable to operate and maintain in the far North. Underwater sensors are what Maj Michel Ouellet describes as a "transit management" capability to monitor and control shipping in the NWP and to alert authorities about their presence.[245] Perhaps, as with the HFSWR, this capability will be resurrected; nonetheless, until further capital action is progressed, the question critics would then ask, 'what good is an Arctic underwater surveillance system if no enforcement capability is present?' remains unanswered.

DRDC has been involved with the Intra-departmental Northern Science and Technology Working Group tasked with developing a strategic roadmap to guide Arctic research and development.[246] The most developed product from this working group, in conjunction with CFEC, was the 2004 Arctic Littoral Intelligence, Surveillance, and Reconnaissance Experiment (ALIX). This experiment demonstrated a C4ISR[247] capability in a domestic emergency scenario on southern Baffin Island using the Altair unmanned air vehicle (UAV);[248] Figure 7 shows the experiment's footprint. Additionally

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[244]Mark Tunnicliffe and Jon Thorleifson, *Exploration, Research, and Development – Enduring Themes in Canada's Arctic* (Ottawa: DRDC, 2007), 7.

[245]Major Michel Oullet, "Sovereignty and Security of the Canadian Arctic: A Canadian Defence Policy Perspective" (Toronto: Canadian Forces College Command and Staff Course New Horizons Paper, 2005), 7.

[246]Chief Force Development, JTF (North) and Chief of Maritime Staff are also partners in this working group.

[247]C4ISR refers to command, control, communications, computers, intelligence, surveillance, and reconnaissance. ALIX was a follow-on experiment to the Pacific Littoral ISR Experiment (PLIX) in 2003.

[248]Department of National Defence, "Backgrounder: Atlantic Littoral ISR Experiment (ALIX)," http://www.dnd.ca/site/newsroom/view_news_e.asp?id=1432; Internet; accessed 30 March 2008.

ALIX highlighted a data fusion capability that facilitated dissemination of real-time information to the Halifax MSOC and the UAV remote operating center in Ottawa. This importance is registered in the capability to include multiple headquarters in a military operation. Though a promising capability outlined within the Air Force's capability structure, UAV C2 systems are immature and require further development, particularly as they are effective only in Low Arctic regions.[249]

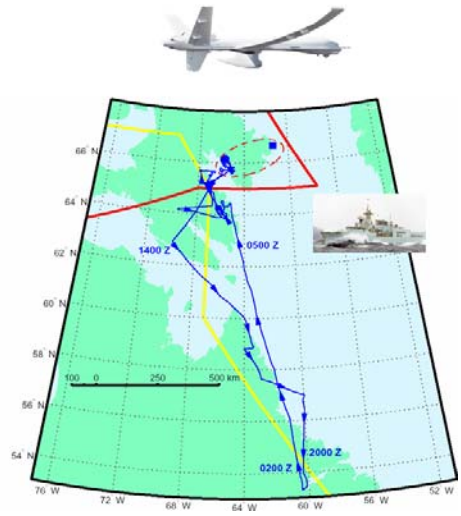

Figure 7: ALIX Showing the Altair UAV Route to Pangnirtung
Source: Mark Tunnicliffe and Jon Thorleifson, *Exploration, Research, and Development – Enduring Themes in Canada's Arctic* (Ottawa: DRDC, 2007), 9.

The ability to know what foreign vessels are operating in Canadian TTW is the first step in being able to flex sovereignty and act upon that information. The

[249]Due to the earth's curvature, geosynchronous satellites provide reliable coverage for UAV C2 in the Low Arctic only, up to 57°-62° North. UAV C2 in the High Arctic requires either a polar satellite or a ground-based relay system, a capability Canada does not have. Continuous Arctic satellite coverage is currently only available via the commercially operated Iridium system which is outside of the Canadian Space Agency's control; this system has sufficient bandwidth for only UAV control and not sensor information download. The CF's Director of Space is researching a project to provide molniya satellite coverage for a comprehensive Arctic UAV surveillance system. The period of a Molniya satellite orbit is 12 hours, thus requiring two satellites to provide 24/7 coverage for UAV C2. Maj Pat MacNamara, former Director of Air Requirements 7 (UAV), discussion with the author, 1 April 2008; and Phil W. Somers, Tom J. Racey and John D. de Boer, "Tracking Molniya Satellites," http://www.rmc.ca/academic/csr/molniya/reports/index_e.html; Internet; accessed 1 April 2008.

government has stated that "the need for an Arctic undersea surveillance capability remains, given that effective surveillance is an important component of sovereignty."[250] Today Arctic surveillance research is once again moving ahead with apparently ever-increasing importance. The centrepiece of current DRDC study focuses on the 2007 Northern Watch Technology Demonstrator. The project is a $9.6 million undertaking to capitalize on previous undersea detection knowledge and to "conduct field demonstrations of sensor performance, data communications and data fusion at the Barrow Strait chokepoint off Gascoyne inlet [sic]."[251]

DRDC's Arctic-focused initiatives appear to be imbued with lasting intent. With the recent Speech from the Throne, Canada indicated further lasting commitment to occupying and researching its northern-most region. By participating in the Federal Northern Strategy's Arctic Research Station, DRDC will gain a permanent facility from which its research and development initiatives will be conducted.[252]

OTHER GOVERNMENTAL DEPARTMENTS

There are numerous OGD that retain responsibility for enforcing Canadian rule of law in the Arctic. Ironically, though, their ability to affect legal sovereignty over the land

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[250]"Government of Canada Response to the Report of the Standing Committee On Foreign Affairs and International Trade 'Canada and the Circumpolar World: Meeting the Challenges of Cooperation into the Twenty-First Century,'" quoted in Griffiths, "The Northwest Passage in Transit….

[251]Tunnicliffe and Thorleifson, *Exploration, Research, and Development*…, 9.

[252]Michaëlle Jean, Governor General of Canada, "Strong Leadership. A Better Canada. The Speech from the Throne," http://www.sft-ddt.gc.ca/grfx/docs/sftddt-e.pdf; Internet; accessed 30 March 2008, 4.

is minimal as they lack either the platforms, expertise, intelligence, or personnel to respond in the remote North.

With about 60 detachments and 400 members in the territories, the RCMP performs a constabulary role, enforcing all three levels of governmental rule of law in the region. The RCMP recognizes its importance in the Arctic. As Senior Analyst Angus Smith indicated, "The RCMP is sovereignty in the Arctic," and therefore it is seeking to increase staffing and visibility on the ground.[253] One problem is that "the RCMP requires a clearer understanding of the criminal threats and risks in the North."[254] The CF has both a larger intelligence system of Allied sources and a much broader domestic surveillance network to tap into. Even though the CF is only empowered to support governmental departments that retain domestic jurisdiction for such traditional border security issues as human trafficking, illegal drug trade, and the smuggling of goods and weapons, the CF becomes the key enabler concerning Canadian security and sovereignty measures.

The Canadian Security Intelligence Service (CSIS), on the other hand, has no real interest in the far North. Incredibly, given the multi-departmental consideration of threats to Canada's Arctic and the stand-up of ASIWG, "Arctic surveillance and sovereignty is

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[253]Angus Smith, RCMP Officer in Charge, Alternative Analysis Intelligence Requirements and Strategic Integration National Security Criminal Investigations, in telephone conversation with the author, 20 December 2007.

[254]Constable Patricia Flood, RCMP Media Relations Officer, email to the author, 12 December 2007.

beyond the CSIS mandate."[255] Additionally, the establishment of CSIS' Integrated Threat Assessment Center (ITAC) has no real Arctic focus. Despite its mandate to "produce comprehensive threat assessments, which are distributed within the intelligence community and to first-line responders,"[256] and despite the fact that ITAC is well integrated into multiple layers of national and regional organizations similar to ASIWG, CSIS lacks current vision northward.

The Canadian Border Security Agency (CBSA), Canada Customs and Revenue Agency, and Ports Canada are largely responsive organizations involved primarily at the interface of entry points to Canada. These organizations do not have extensive surveillance networks beyond Canada's borders but instead rely on information from other departments such as DND and the RCMP. With only Tuktoyaktuk, Inuvik, and Iqaluit as the sole Arctic maritime points of entry, for example, CBSA has very little footprint in Canada's Arctic security scheme.[257]

Similarly, Transport Canada's Arctic presence is limited. Although its FLIR-equipped Dash 7 aircraft are ably suited to conduct surveillance/sovereignty missions, only East and West Coast pollution patrols are routinely conducted. Though the intention

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[255]Giovanni Cotroneo, CSIS Public Liaison and Outreach Program Spokesperson, telephone conversation with the author, 10 October 2007.

[256]CSIS, "Backgrounder 13: The Integrated Threat Assessment Centre," http://www.csis.gc.ca/en/newsroom/backgrounders/backgrounder13.asp; Internet; accessed 30 March 2008.

[257]CBSA, "Directory of CBSA Offices," http://www.cbsa-asfc.gc.ca/contact/listing/offices/office521-e.html; Internet; accessed 30 March 2008.

is to expand the operating envelope of the National Aerial Surveillance Program into the Arctic, this has not yet occurred.[258]

Though it has some jurisdiction in the Arctic concerning the Environmental Protection Act, Environment Canada also has limited resources in that region. Its Canadian Ice Service uses satellite imagery from multiple external sources for maritime navigation purposes; however, this imagery is not suitable for surveillance and security measures.

On the other hand, the Canadian Space Agency and the CF are working collaboratively on Project Polar Epsilon to supply military commanders with imagery from MacDonald Dettwiler's Radarsat II satellite, launched in December 2007.[259] Because of its sun-synchronous orbit, it will frequent Canada's polar regions every 101 minutes, providing near-real-time surveillance coverage sufficient to track surface vessels but without the ability to control an Arctic UAV patrol. Once Polar Epsilon is fully implemented by 2011, surface surveillance and cueing of military assets for interdiction as well as environmental monitoring will be greatly enhanced. However, the CF states that its three metre resolution will not provide a small surface vessel or subsurface monitoring capability.[260] This will require other initiatives to fill the breach.

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[258]EcoAction, "Health of the Oceans Initiative at Transport Canada," http://www.ecoaction.gc.ca/news-nouvelles/20071005-1-eng.cfm; Internet; accessed 30 March 2008.

[259]MacDonald Dettwiler and Associates, "About Radarsat II," http://www.radarsat2.info/about/mission.asp; Internet; accessed 30 March 2008.

[260]Department of National Defence, "Backgrounder: Polar Epsilon Project," http://www.mdn.ca/site/newsroom/view_news_e.asp?id=2546; Internet; accessed 30 March 2008.

Lastly, perhaps the only federal department other than DND with significant capacity for security and sovereignty response in the Arctic is CCG/Department of Fisheries (DFO). CCG conducts Arctic operations during the June-November timeframe with its two heavy Arctic and four Arctic icebreakers. CCG icebreakers provide escort and routing services to US Sealift Command tankers re-supplying NORAD's NWS[261] while also aiding regional civilian vessel traffic that has increased from 78 in 2005 to 132 in 2007.[262]

The recent Federal budget announcement of a $720 million project to replace one of the existing heavy Arctic icebreakers is a positive step towards maintaining Canadian Arctic presence.[263] However, in 2017 it will only replace the CCGS St Laurent, a Polar Class 3 ship, and will not expand upon current capability despite Huebert's belief that "we're talking about getting anywhere in the Canadian Arctic at any time of year."[264] Only Polar Class 1 icebreakers have a year-round pan-Arctic reach.

An important extension of any maritime asset is an organic helicopter. The current CCG icebreakers have the ability to operate light helicopters, such as the BO-15 or Bell 212; without any surveillance sensors onboard, their range is limited only to

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[261]Department of Fisheries and Oceans, "Icebreaking," http://www.ccg-gcc.gc.ca/cen-arc/ice-glace/index_e.htm; Internet; accessed 30 March 2008.

[262]Bob Weber, Canadian Press, "Budget's 'Anywhere, Anytime' Icebreaker Welcomed, If It Gets Built: Experts," http://ca.news.yahoo.com/s/capress/080227/national/fedbudget_sovereignty_icebreaker; Internet; accessed 30 March 2008.

[263]Department of Finance, *Budget 2008, Chapter 4: Leadership at Home and Abroad*, http://www.budget.gc.ca/2008/plan/chap4a-eng.asp; Internet; accessed 30 March 2008.

[264]Weber, "Budget's 'Anywhere, Anytime' Icebreaker….

visual horizons. In order to capitalize on the persistent characteristic that an icebreaker brings, the future one should be able to accommodate the CF's Cyclone for an enhanced ISR capability, especially since the Navy's presence in the Arctic will not expand.

In sum, at the federal level several departments maintain varying degrees of interest in Canada's Arctic. When layered with DND, they represent a whole of government approach towards the Arctic even though their capabilities are at best very limited. This short evaluation therefore highlights that Canada's military is in reality the only organization with a spectrum of capabilities across the land-sea-air-space environments to ensure both security and sovereignty of the North. When considering the military alone, it must be recognized that it does have shortcomings that OGD can minimize, like a lacking naval presence that CCG augments.

POTENTIAL MILITARY EFFORTS TO STRENGTHEN CANADIAN ARCTIC SECURITY AND SOVEREIGNTY

Canada's military currently has a capability base to ensure limited security and sovereignty of its Arctic. It also has numerous promising technologies in the development mill that could greatly enhance future security and sovereignty requirements if they develop into capital acquisitions. Nonetheless, there are other points worthy of consideration as well.

One underlying theme of this paper is that surveillance is an essential component of understanding challenges to security and sovereignty so that an appropriate response

can be crafted, a point made by Griffiths.[265] In this light, the following should be considered by DND to enhance responsiveness to these Arctic challenges:

a. increase the AOPV statement of requirements beyond just a Polar Class 5 ice designation that limits operations to the near-ice environment;

b. increase the CCG icebreaker replacement statement of requirements beyond a Polar Class 3 ice designation;

c. ensure that both the CCG icebreaker replacement and the AOPV have the ability to operate the Cyclone;

d. ice-strengthen designated vessels already in existing Navy inventory to allow exploitation of the penetrable characteristic of the Arctic Archipelago;

e. ensure that the follow-on to the Victoria Class submarine incorporates AIP technology to permit under-ice operations;

f. create an integrated air/surface/subsurface ISR network based upon the existing technologies of commercial off-the shelf UAVs, the capable HFSWR, and DRDC initiatives like the Northern Watch project;

g. create a 'Combined Arctic Command' to coordinate JTFN and US Northern Command Arctic surveillance and response efforts with an efficient C2 structure that maximizes both nation's strengths in the region;

h. establish a formal Canada-US operations agreement in which Canadian liaison and exchange personnel augment US Navy submarine patrols in the Arctic

[265]Griffiths, "The Northwest Passage in Transit…, 3.

for both North American security and undersea charting (similar to Canadian-Danish cooperation) operations;

i. formalize exchange duties with the CCG to allow Navy personnel to gain experience in Arctic navigation and ice-breaking operations; and

j. with regard to addressing the dramatic effects that climate change will assuredly impose, create a body to map out both those Canada-specific security and sovereignty issues that will arise and their potential solutions so that Canada can adapt in advance.

THE WRAP UP TO CANADA'S MILITARY IN THE ARCTIC

Canada's military is the one federal organization that has the capacity to affect a national response to any security or sovereignty challenge in Canada's far north. The irony is that, apart from response to confrontation by a foreign military, Canada's military is subordinate to national authorities that hold ultimate jurisdiction for upholding the rule of law and sovereignty, like the RCMP and CCG. The military is the main supporting actor that facilitates or enables the RCMP and the CCG to exercise their authority in the Arctic; this is done by providing the intelligence, the planning, and the means for authorities to arrive on scene and exercise, perhaps by only one or two individuals, that national jurisdiction.

Though there are gaps in DND's ability to meet tomorrow's Arctic challenges, its total capability package is developing and demonstrates firm commitment by the current

Government of Canada to preservation of a ‘Canada-First’ strategy towards national security and sovereignty. Of all the capital projects that DND has in the works, Air Force projects appear to be more advanced over those of its sister services. Additionally, it owns platforms that are most responsive and near-all-weather operable concerning the notion of arctic surveillance and response. Though the Navy lacks the presence that the Army is trying to regain, it also has the potential to become a much larger player in future Arctic operations. As climate change advances, so too will the emphasis on maritime trade routes, requiring the Navy’s presence to monitor. Given the long lead times to bring any major project to fruition, be it acquiring a new platform or retrofitting an existing one, hopefully the Navy will correctly anticipate the demand for its role in the future of Canada’s Internal Waters.

CHAPTER 7: CONCLUSION

This paper contends that Canada's military is leading the national response to existing and emerging security and sovereignty challenges that face the Canadian Arctic. The history of Canada's Arctic is deeply founded on military presence, something that has facilitated national and continental security while keeping challenges to Arctic sovereignty relatively quiet until the later stages of the past century.[266] As a result of many factors, a resurgence of military activity has once again responded to meet these challenges.

Technological advances have facilitated increased access to remote Arctic regions flush with substantial natural resources. Additionally, as the rate of climate change accelerates, access to the Arctic will continue to expand. The result is that Canada faces a range of security threats that are physical, environmental, economic, and psychological in nature. Similarly, several sovereignty challenges have the potential to be resolved in favour of foreign states should Canada not act with resolve to seek positive resolution.

Canada seeks balanced solutions to solving domestic and international problems using multiple branches of governance. With respect to the Arctic, the Prime Minister's 'use it or lose it' approach is more than just empty policy speak. Due to its inherent characteristics of experience, training, capacity, presence, resources, timeliness of response, and spectrum of capabilities across the land-sea-air-space elements, the CF *is*

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[266]Ken Coates et al, *Arctic Front: Defending Canadian Interests in the Far North* (Toronto: Thomas Allen & Son Ltd., forthcoming 2008).

leading Canada's charge to address security and sovereignty issues, heeding Admiral Brock's 'three-ocean strategy.'

Canada needs to prepare for future conflicts, not past ones. But the challenge lies in accurately foreseeing those future challenges and responding to them before they manifest into unwieldy situations that find the nation unprepared to act. In this regard, Canadian public opinion and policy need to remain receptive to the notion that paradigms have changed, leaving Canada's far North no longer the security buffer it once was. As a maritime nation with three penetrable coastlines and a vast Arctic Archipelago, Canada's future lies in ensuring the maritime commerce routes that intersect its territory remain open. Therefore, the security and sovereignty of these routes must be ensured for the future.

The collective assembly of the individual threats presented in this paper paints a picture of significant challenge. Though not all are immediate, the problem is one of trying to sufficiently plan to meet their eventuality. Despite some limitations to current and future capabilities, Canada's military is planning for the future. In answer to the question, 'how far does Canada need to go to protect its sovereignty?' former Minister of National Defence Perrin Beatty sums up by quoting Canadian Vice-Admiral Charles Thomas: "You can have as much sovereignty as you're willing to pay for."[267] It seems that today Canada has earmarked the funding for greater autonomy, prosperity,

[267]Keith Spicer, "Canada's Arctic Claims," *Ottawa Citizen,* 10 September 2007, http://www.canada.com/ottawacitizen/story.html?id=06b557bc-bbc0-4543-90e3-4da70001bef6&p=2; Internet; accessed 30 March 2008.

sovereignty, and security of its Arctic. Nonetheless, just as the cover of the 2007 *Speech from the Throne* shows a boy standing on a beach optimistically looking seaward to the future while waving the flag,[268] Canada must now ensure that its historic on-again/off-again cycle of influence in the Arctic remains on today and tomorrow.

[268]Jean, "Strong Leadership. A Better Canada. The Speech from the Throne….

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