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TECHNOLOGY FOR SOVEREIGNTY – CANADA'S ARCTIC FUTURE

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TABLE OF CONTENTS

List of Figures

Abstract

Canada's sovereignty has been a subject of debate right from its founding in 1867. The war of 1812, then the United States' Mexican war and the purchase of Alaska from the Russians made Canada feel vulnerable. In response the Government built a railway from sea to sea. Now a third sea is being added thanks to the melting of Arctic ice and sovereignty is once again in the public eye. Using the framework of Dr. Stephen Krasner the sovereignty of Canada can be broken down into four meanings. The first is domestic sovereignty that refers to internal authority and control of affairs of the state. The second is interdependent sovereignty that deals with control of what comes into and leaves the state. The last two govern relations and understandings between states: international law and Westphalian sovereignty. It is the interplay of these four meanings that the sovereignty of Canada is decided; but it is through the expedient of state control and authority that the level of sovereignty is measured. Being recognized as a state does not necessarily grant authority but lack of control can definitely lead to a loss of sovereignty. Since confederations Canada has continued to expand her sovereignty over increasing territory. The latest, is an ambitious expansion of the continental shelf in the arctic and the east coast. Despite a great deal of debate this expansion has been largely successful; but acceptance of Canada's sovereignty is being actively challenged by other nations. Canada has, for the most part, depended on the isolation of the Arctic to protect its interests, with global warming this is no longer an option, Canada must take action to take control of the territory in the north. Inserting technology that can benefit many government departments, the scientific community and the people of the North is the best way to improve Canadian sovereignty claims at a minimum cost.

CHAPTER 1 - INTRODUCTION

Until recently, the Arctic region was of more interest to adventurers and Inuit, than to average Canadians. There have been moments of public interest, such as the voyage of the United States (US) icebreaker *Polar Sea*, when Canadian sovereignty was peripherally tested, but generally the north has suffered from benign neglect.[1] This has changed during the last twenty years: Canadian and global concern about the polar regions of the earth has grown steadily. First, there has been a dawning realization that human activity is having a significant impact on the global ecology with a hole in the ozone layer, and more recently, the dramatic increase of global temperatures and the melting of polar ice. Second, there has been a renaissance in the exploration and exploitation of natural resources in the Arctic including oil, energy, diamonds and the consequent development of the northern economy spurred by record international oil prices. Third, the settlement of the many of Inuit and First Nations land claims in the region has created tremendous opportunities for cooperative development. Before the global warming phenomenon the question of Canadian sovereignty was largely academic. The price of oil is at an all time high while the costs of arctic oil exploration and exploitation are lowering with the melt. This increased accessibility of the north caused by Global Warming increases the pressures on Canadian arctic sovereignty.[2]

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[1] Nathaniel French Caldwell, *Arctic Leverage: Canadian Sovereignty and Security* (New York, Greenwood Publishing Group, Inc., 1990), 56-57.

[2] Susan Joy Hassol, "Arctic Climate Impact Assessment," (Cambridge: Press syndicate of the University of Cambridge, 2004), 1-20, available from http://www.amap.no/acia/; Internet; accessed 26 Feb 2007.

This paper will analyze the question of sovereignty in order to isolate those principles that should be enhanced to improve the Canadian case. Historical background will provide an understanding of how Canada has dealt with similar challenges to her sovereignty in the past. This will be followed by a discussion on the complex arena of the definitions of sovereignty. This limited discussion will prepare an understanding of what specific areas could be addressed to improve the Canadian case for sovereignty, followed by a general discussion of the types of technology that will provide an idea of how various technologies could serve multiple customers or purposes in Canada's bid to maintain its sovereignty. Finally, the ways in which those types of sovereignty can be employed will be examined from space to under the Arctic ice. This last analysis will illuminate how those items could be employed in reality. The scope of this paper permits only a limited analysis of the enormous potential that military and civilian technology can provide in terms of a cost effective enhancement to the sovereignty of the people of Canada. It is the thesis of this paper that sovereignty is not static, a state must constantly assert its sovereignty and in order to keep it. Sovereignty is a right that the state must earn, and it earns that right by demonstrating authority and control over its territory, the international community and its own citizens. Clearly then the question of enhancing sovereignty is not a one-dimensional issue. The purchase of a single piece of equipment will be unlikely to provide a commensurate enhancement of sovereignty. Technology investments must provide a synergistic effect by serving multiple government departments and ideally directly serve the people of the North. To be effective, a program to enhance Canada's sovereignty in the Arctic must address a broad spectrum of issues dealing with a broad definition of sovereignty. This paper does not seek to prove

that specific technology should be purchased; it is intended however, to illustrate how technology could be used in a whole of government approach to enhancing sovereignty in the Canadian North.

For the purposes of this paper, the review of technology will be limited to unmanned or unattended vehicles, various sensors including radar, and sampling technologies. The 1998 Canadian Oxford dictionary defines technology as "the study or use of mechanical arts and applied sciences [and] the application of this [art] to practical tasks in industry."[3] Technology, however is both the device itself and its application to solving pragmatic problems in society.

In summary, a new North is emerging with great potential, and the Canadian Government is turning to Defence to provide enhanced sovereignty and security. While military technology and the application of military power can enhance Canada's sovereignty claims, it can be expensive and it may not address all aspects of the Canadian sovereignty requirement. Therefore, to be fiscally responsible there should be a clear linkage between the benefits that accrue, and the case for northern sovereignty. Defence technology can only play a role if it can do so in a larger context that addresses the more fundamental elements of state territorial sovereignty. The following *Senate* report on the Canadian Arctic put this point quite succinctly:

> The Committee [Standing Senate Committee on National Security and Defence] believes the following three things to be true:

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[3] The Canadian Oxford Dictionary, 1998 ed., s.v. "Technology."

1. The Canadian Arctic is vitally important to Canada's people, natural resources, sovereignty, and to our vision of what this nation is all about.

2. The Canadian Forces are vitally important to defending Canada's citizens, natural resources, sovereignty, and to our vision of what this nation is all about.

3. Nonetheless, the Canadian Forces should NOT be the primary tool used by the Government of Canada to protect and defend our country's Arctic sovereignty.[4]

CHAPTER 2 – BACKGROUND

The fact that the government intends to provide a solution through the enhancement of defensive capabilities is not a new to Canada's history. A defence-oriented solution has successfully addressed past frontier sovereignty threats. In the year 1849 Canadians were looking south at a different neighbour, the war of 1812 was just over and the US / Mexican war had just ended. The US has taken Arizona, California, Nevada, New Mexico, Utah and a portion of Colorado from its southern neighbour, and Canada was feeling justifiably insecure. In that year, Major Robinson of the Royal Engineers issued a report recommending the development of a rail system to connect the colonies in common defence.

> The increasing population and wealth of the United States, and the diffusion of railways over their territory especially in the direction of the Canadian frontier, renders it absolutely necessary to

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[4] House of Commons, Standing Senate Committee on National Security and Defence, *Managing Turmoil: The Need to Upgrade Canadian Foreign Aid and Military Strength to Deal with Massive Change*, October 2006, 88.

> counterbalance, by some corresponding means, their otherwise preponderating power.[5]

The British North America Act (BNA) of 1867, now called the Constitution Act, established the conditions for completion of this railway through Part X, Section 145, "Inasmuch as the Provinces of Canada, Nova Scotia, and New Brunswick have joined in a Declaration that the construction of the intercolonial railway is essential to the Consolidation of the Union of British North America…"[6] The result was to be a rail system that provided excellent east-west communications, significantly enhancing the colonial economy.[7]

The point is that Canada was formed in the crucible of a defence related public works project that responded to threats to sovereignty. The investment in a defensive bulwark to nascent Canadian sovereignty paid for itself many times over in national unity, and in international recognition of Canada's right to exist. However, the inter-colonial railway was not sufficient in itself to maintain that status. When the US purchased Alaska from Russia on October 18, 1867 concerns over the fate of the west and particularly British Columbia seemed to be validated.[8] Over a hundred years later, Canadian statesmen are pondering almost the same question. The answer to date has

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[5] Jay Underwood, *Built for War: Canada's Intercolonial Railway* (Osgoode, Ontario: AGMV Marquis, 2005), 31.

[6] Although repealed in 1893 the original part X[10] of the BNA identified the intercolonial railway as a significant precursor to confederation, see Department of Justice Canada, "Constitution Acts, 1867 to 1982," http://www.laws.justice.gc.ca/en/const/index.html; Internet; accessed 8 April 2007.

[7] Government of Canada, "Canadian Confederation : Intercolonial Railway," Library and archives [online]; available from http://www.collectionscanada.ca/confederation/023001-2979-e.html; Internet; accessed 5 March 2007.

[8] The Harvard Classics, "Alaska purchase American Historical Documents, 1000–1904," Vol. XLIII. (New York: P.F. Collier & Son, 2001) [online book source] available from http://www.bartleby.com/43/43.html; Internet; accessed 31 March 2007.

been to consider Department of National Defence (DND) initiatives such as armed icebreakers plying the ice-covered waters of the North; however, since the world is constantly changing a state cannot remain static; past initiatives cannot be counted upon as proof against future threats to sovereignty. Further states have an obligation to respond to the needs of their citizens and also convince fellow nations that they are indeed sovereign. So if armed icebreakers are insufficient, what future project or projects would best meet Canada's sovereignty needs for the North?

The railway met both military and civilian needs of the time and in fact it continues to move significant freight across Canada. In the recent past there have been attempts by the Government of Canada to improve its Arctic presence. One of the trends from a military perspective is to purchase new military equipment. Take the ill-fated nuclear submarine project of the 80s. This project, while perhaps necessary, took up valuable policy time and was ultimately a failure due to its cost, and it must be admitted, the loss of the Soviet threat. Ironically, the under ice threat in the North now is from US submarines patrolling Canada's declared internal waters. As stated in a *US Naval Post Graduate School* Master's thesis, "…evidence suggests that, for some Canadians, a primary purpose for this submarine program may not be to enhance the security of NATO, but instead, to assert Canada's sovereignty principally against the United States in the Arctic region."[9] Regardless, the problem with these billion dollar mega-projects is that they consume political and staff time and tend to squeeze out smaller projects so that in the end nothing advances. They also have a tremendous impact on the particular

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[9] Theodore Guillory, "Canada: The Decision to Procure Nuclear Attack Submarines and Its Significance for NATO" (Master's thesis, Naval Post Graduate School Monteray CA, 1988), Abstract.

department required to implement it, in this case, Canada's Department of National Defence (DND). Of course it would be wrong to suggest that nothing has happened, but the approach to northern sovereignty tends to be fragmented. The options available for investment in technology go well beyond ribbons of steel or nuclear submarines. What military or civilian technologies would assist in making Canada's case of sovereignty? Perhaps more importantly, what technology would not only assist in defence but also provide for the needs of other government departments and improve Canadian's enjoyment of the North? The answer to these questions will be discussed in greater detail in this paper; however, the answer lies in cooperative technology that permit scientists to measure ocean currents, military personnel to monitor passage of submarines and ships, environmental groups to monitor pollution and others to do tasks that support the Canadian claims to arctic sovereignty. The case will be made that there are many complimentary technologies that can meet the specific needs while bolstering the case for Canadian sovereignty.

There are a number of factors that help to illustrate why sovereignty is at issue in the Arctic. For the purposes of this paper, five factors have been selected to lend a sense of urgency to concerns over sovereignty. First, as of 2006, Statistics Canada estimates that only 104,000 people live in the Yukon, Northwest Territories and Nunavut.[10] As a result of this sparse population, spread over such a vast area, there is an obvious question as to Canada's ownership of the very land itself; in legal terminology, terrae nulius or

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[10] Statistics Canada, "Population by Year, by Province and Territory," [Statistics Canada on-line] available from http://www40.statcan.ca/l01/cst01/demo02a.htm?sdi=population; Internet; accessed 11 Mar 2007.

empty land that will be discussed in more detail later. Second, Canada's northern frontier offers pristine lands that are extremely rich in natural resources and are growing in strategic importance. This importance is made more urgent by the increasing world's population, and the increasing need for raw materials and energy engendered by the rise of the developing world. Third, global warming is opening up waterways and ports even before the Northwest Passage. Churchill for example, is currently open to international trade with Europe, Africa, South America, Russia (Murmansk) and the Middle East as trading destinations.[11] Fourth, there has been an explosion of research and scientific inquiry in the North, which is critical, not only to our ability to understand the nature and extent of global warning, but more generally in terms of discovering new species and for mitigating or adapting to the effects of that warming.[12] Finally, the lack of infrastructure for development and sustainment of the North is a key concern. Nunavut alone represents nearly 50% of the Canadian land mass and yet has only 25 kilometres of roads. Roads are a small aspect of the total infrastructure requirements but they do represent an indication of the state of infrastructure in the North.[13] The government is therefore justifiably concerned about sovereignty and there is a growing sense of urgency to attempting to settle some of these claims. Indeed other nations such as the United States (US) and Denmark are actively disputing Canada's claims and ability to safeguard state

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[11] OmniTRAX Ltd., "Wall Street West, Information Pamphlet on Churchill Manitoba," http://www.omnitrax.com/news/rmnchurchillarticle.pdf; Internet; accessed 4 Feb 2007, 7C.

[12] Alain Hubert, "Polar Science and Investing in Communications," International Polar Foundation (6 July 2005); available from http://www.sciencepoles.org/index.php; Internet; accessed 20 March 2007.

[13] Mary Simon, "The Inuit Challenging World" (Address to, The Empire Club of Canada, Toronto, 15 February 2007); available from http://www.itk.ca/media/2007/press-archive-20070215.php; Internet; accessed 14 April 2007.

rights and obligations to the Arctic are critical to the future prosperity of Canada and to the lives and welfare of the peoples of the north.[14]

CHAPTER 3 – SOVEREIGNTY

> The definition of sovereignty is somewhat elusive, with varying emphasis given to the elements of control, authority, and perception. The concept of state sovereignty is embedded in international law and is one of its central pillars. Traditionally, this definition reflects a state's right to jurisdictional control, territorial integrity, and non-interference by outside states. "Sovereignty is supreme legitimate authority within a territory. … Supreme authority within a territory implies both undisputed supremacy over the land's inhabitants and independence from unwanted intervention by an outside authority."[15]

This quote is from a recently released parliamentary research paper that helps to frame the government's the argument regarding arctic sovereignty. The key point is that sovereignty is an ambiguous term. It is multi-faceted and changes with time and perspective. Perhaps most important it hints that state sovereignty is not a binary function. It is not something that is routinely achieved or lost, there are grey zones and areas where a state might choose voluntarily to give up its sovereignty. The free trade agreement between Canada, Mexico and the US is a case-in-point. Each country has given up part of its sovereignty, that is, the control of the flow of goods across its borders in anticipation of other benefits. Therefore, even the US does not possess complete

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[14] The US and Denmark have pressed various claims to Canadian claimed areas of the Arctic, see Government of Canada, "A Northern Dimension for Canadian Foreign Policy," *Independence and Internationalism*, Chapter Ten, June 1996, 127-135; and Canadian American Strategic Review, "Denmark's Arctic Assets and Canada's Response – Sovereignty and Strategic Resources of the High Arctic," http://www.sfu.ca/casr/id-arcticviking.htm; Internet; accessed 24 March 2007.

[15] Carnaghan, Matthew and Allison Goody, "Canadian Arctic Sovereignty," Political and Social Affairs Division, 26 January 2006; available from http://www.parl.gc.ca/information/library/PRBpubs/prb0561-e.htm#Defining; Internet; accessed 22 March 2007, 2.

sovereignty over its republic. This does not imply a judgement; it merely points out that a search for complete sovereignty is fruitless. Rather, what is sought, is a balance of sovereignty; enough to guarantee safety but not too much so as to threaten freedom. This view of sovereignty also tends to underscore the baseline argument of this paper, that small actions can increase the degree of sovereignty to which a country can claim. Any tendency towards simple "all or nothing" discussions of sovereignty ignores the incremental improvements that can accrue from such basic efforts as the recent patrol to the top of Ellesmere Island.[16]

This chapter will provide a limited discussion of state sovereignty using a model proposed by Stephen Krasner of Stanford University. In his book, *Sovereignty: Organized Hypocris*y, he argues that the standard view of sovereignty proposed in international law and the classic Westphalian sovereignty do not suffice to describe the range of behaviours engaged in by states. Rather than a completely rational and legalistic approach to sovereignty, states often react out of pure self-interest and he found this self-interest model often provided a better explanation of state behaviour. Here again there is the echo of the transient nature of the definition of sovereignty, as state needs change so too does the application of sovereignty. What Krasner argues that sovereignty is really composed of four sometimes contradictory, sometimes complementary meanings: domestic, interdependence, international legal, and Westphalian sovereignty.[17] This

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[16] Department of National Defence, "Canadian Forces Patrol to Confirm Arctic Sovereignty," http://www.forces.gc.ca/site/newsroom/view_news_e.asp?id=2224; Internet; accessed 8 April 2007.

[17] Stephen D. Krasner, *Sovereignty: Organized Hypocrisy* (Chichester: Princeton University Press, 1999), 4-42.

chapter will analyze each separately to extract important elements for comparison against technological solutions. Krasner also introduces the related concepts of authority and control through which states exercise sovereignty and this will provide the rest of the analysis framework. Finally, it is important to understand the differences between the sovereignty issues for land as opposed to the sea and the law of the sea because they are based on different bodies of law.[18] The overall purpose of this chapter then is to develop an overview of what is missing from Canada's sovereignty claims based on sovereignty theory and the history of Canada's presence in the North.

State Authority and Control. A state cannot be said to be exercising sovereignty without a degree of recognized authority and active control. It is therefore very important to understand the distinction between these two terms. Authority is a more subjective term than control. Control can be achieved through force, while authority must be earned or proven. This is distinct from the understanding of an authoritarian regime, for the purposes of this discussion, authority is the right vested voluntarily or legally in a state to control what happens within its territory. Control can be exercised without recognized authority through the use of brute force, and can generate authority over time based on the expedient of being successful. In contrast, a state with a strong vested authority may not need to exercise the more compulsive aspects of control, its populations might comply due to their respect for the authority of the

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[18] In Dr. Krasner's book there is an important discussion of what motivates the behaviour of states. He refers to two logics of consequences and appropriateness, or in another way, cold logic and compassion. The issue of state behaviour does impact sovereignty as discussed, but it is assumed to be somewhat independent of the tools used. That is, technology can be used for rational or irrational purposes, so the way Canada ultimately uses the technology is beyond the scope of this paper and therefore will not be discussed to any great extent. See Stephen D. Krasner, *Sovereignty: Organized…, 5-6*.

government. The interplay between authority and control helps to understand the interrelationships between the four meanings of sovereignty. More will be said of this in the next few paragraphs; however, Westphalian and international legal sovereignty refers to authority, in that they both provide legitimacy to the state, facilitating the actions of that state in the international stage; however, by definition, they do not generally dictate what the state can do domestically [exceptions noted to human rights issues]. Interdependence sovereignty refers exclusively to the control of movement across the state's borders while domestic sovereignty refers to both authority and control. The loss of interdependence sovereignty that would result when ships from other nations traverse arctic internal waters would imply a loss of domestic control and therefore sovereignty, but it would not necessarily mean a loss of domestic authority.[19]

The following chart is intended to provide a visual representation of this dynamic. The implication is that, as authority increases the need for compulsion decreases, as authority decreases, the need for compulsion increases. Admittedly, the dynamics of sovereignty go well beyond this simple depiction, if it were that simple international relations would be much easier to predict. It is, however, indicative of how the meanings of sovereignty work and is useful in showing where the military or other government departments might fit in to improve Canadian sovereignty. It highlights why the government sees the need to enforce interdependence sovereignty and why, alternatively, the international community does not recognize this control as impacting the Westphalian or international law case for Canadian sovereignty in the North. The nuance is that the

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[19] Stephen D. Krasner, *Sovereignty: Organized…,* 5-11

enhancement to authority conferred by having control for a period of time, will increase the degree of perceived authority both domestically and internationally.[20]

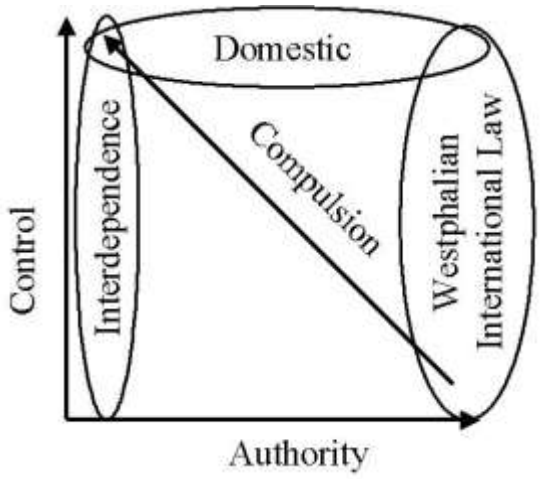

Figure 1: Relationships Between the Meanings of Sovereignty.

Domestic Sovereignty. The concept of state sovereignty has been evolving for many centuries. It began with the desire to demonstrate that rulers had the sovereign right to govern their territories. Early thinkers like Hobbes argued that society would be "solitary, poor, nasty, brutish, and short…" unless individuals surrendered their personal rights to a sovereign authority in whom is vested the right of the absolute right to govern as a "Leviathan".[21] In part, the concept was intended to rationalize the divine right of monarchs to rule, but now refers primarily to the effectiveness of political authorities within the state's own borders. The form of the government is irrelevant to the level of domestic sovereignty exercised, and is to some extent independent of international legal or Westphalian sovereignty. A country may exercise very limited control over drug use

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[20] Stephen D. Krasner, *Sovereignty: Organized…,* 9-10

[21] Ibid., 4-42.

or pornography, and still be recognized as a state with the ability to effectively limit or exclude external actors from interfering in internal affairs. Several states, like the Netherlands, permit significant freedom to their citizens are fully recognized sovereignty rights. Whereas the Taliban rulers of Afghanistan arguably exercised significant domestic sovereignty, yet failed to achieve international recognition. The reasons for the success of one, and the failure of the other, are not important to this argument, Krasner argues that domestic sovereignty is mostly independent of Westphalian and international legal sovereignty. So any impact that domestic sovereignty has on these last two external meanings depends on the nature of the international reaction to a state's treatment of its population, and on the self-interests of those other states. The concept of the "responsibility to protect" argues for an international conscience where states realize the necessity of protecting human dignity and fundamental rights.[22] Although Krasner might argue that the international failure to respond in Darfur, in the same manner that state actors responded in the case of Afghanistan and Iraq, are clear indications of the doctrine of self-interest that governs international relations.

The conclusion therefore, is that people living in a state place their trust in the central government in return for their protection and regulation. They place that trust in the government with the understanding that collectively everyone will benefit. In the case of Canada, the better the government does in providing for the needs of its citizens, the greater the authority that will be inferred and the simpler control will be. While there is not necessarily a linear relationship between increases in domestic sovereignty and

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[22] United Nations General Assembly, *Human Rights Council Resolution 60/251* (New York: UN, 2007), 1-4.

Westphalian and international legal sovereignty, there is a linkage. As a minimum, a country with poor domestic sovereignty can loose legitimacy, particularly if another country can argue that it provides better domestic sovereignty within the same territory. Given the fact that perceptions and legality surrounding sovereignty change over time and the fact that the state, by definition, has control over domestic sovereignty, this is the key area for Canada to concentrate on in terms of increasing its sovereignty.

Interdependence Sovereignty. Quite simply put interdependence sovereignty is concerned with the "flow of goods, persons, pollutants, diseases, and ideas across territorial boundaries."[23] Consider the case of the Google's arrangement with China to restrict search results about sites that the great firewall of China currently blocks.[24] This is obviously a difficult matter to control, with improvements to transportation and communications technology movement of non-material items across borders is difficult to regulate. The ability to control the movement of persons, goods, and diseases is of higher priority for the government. The Toronto SARs epidemic cost Toronto approximately $1 billion dollars, travel advisories from the World Health Organization and the Centre for Disease Control, and unfortunately a human cost of 44 dead.[25] As discussed above, interdependence sovereignty is specifically concerned with control and more specifically, with control across Canadian territorial boundaries. Therefore, technological solutions will need to address movement across those borders. This means

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[23] Stephen D. Krasner, *Sovereignty: Organized…, 12-14*.

[24] Editorial, "Google Censors Itself for China," *BBC News UK edition*, 25 January 2006; http://news.bbc.co.uk/1/hi/technology/4645596.stm; Internet; accessed 15 April 2007.

[25] Gene Matthews, *The Public / Private Response to Sudden Disease Outbreak*, Report prepared for the Alfred P. Sloan Foundation (Atlanta: Centre for Disease Control Foundation, 2005), 4.

that the boundaries surrounding the Arctic archipelago need to be understood and means put in place to ensure that shipping in and through the region can be tracked and if necessary stopped and inspected or other control means introduced to deal with any violations of Canadian interdependence sovereignty. As discussed, failure to take this action will impact domestic sovereignty and as with the SARS outbreak, could result in high costs to the Canada. This is also true of other threats like pollution, disease or indeed a terrorist attack. In fact, a container ship in Halifax had to be searched after intelligence was received that there were people being smuggled into Canada. Ultimately no persons were discovered in the containers; however, facilities to control the flow in the North are lacking and particularly, if ports like Churchill start to operate at greater volumes there is a clear issue with flow across Canada's borders through the North. [26]

International Legal Sovereignty. This meaning of sovereignty is primarily used to establish the authority or legitimacy of a state to act in the international stage. A state that has attained international legal recognition, obtains the right to attend the United Nations (UN), and the ability to enter into treaties with other states. In many ways, this legal meaning of sovereignty is to the state and the international community, as the position of an individual citizen, is in a liberal state.[27] International law is based on international treaties, customs and practices and a generalized understanding of the general principles of law as recognized in civilized society. It could be argued that international law is not really law at all, since there is no true global framework to create

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[26] Meagan Fitzpatrick, "Day defends Vessel Search," *Calgary Herald, 1*2 April 2007, 1.

[27] Stephen D. Krasner, *Sovereignty: Organized…, 14.*

or enforce that law. Such an argument would hold that countries adhere to international law only in cases where self-interest is at stake. This is very consistent with Dr. Krasner's view of sovereignty and international relationships; however, there is evidence that states try to maintain their international legal status because of the cost of losing it. The key consideration in this is that international law is in some ways more changeable than the law of most nations. Rulings of the International Court of Justice (ICJ) are not binding on parties other than those who have not submitted their case to the court. Rulings do form a body of law in the classic sense, but nations cannot be taken to court against their will for issues such as territorial sovereignty.[28] It is perhaps for this reason that Canada has chosen not to submit its northern sovereignty claims to the court for adjudication, as it does not feel ready to win.

The legal definition is in principle quite straightforward. A state is "a person of international law [that] should possess the following qualifications: (a) a permanent population; (b) a defined territory; (c) government; and (d) capacity to enter into relations with other States."[29] Clearly there are a number of grey areas that enter into consideration of the definition of a state. As a member of the UN, Canada, has been recognized as a sovereign state, yet as it will be shown, the exact extent of Canadian territory is not defined or rather the Canadian definition of its territorial limits is not universally accepted. The implication is that control of the territory that Canada defines

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[28] Anthony Aust, *Handbook of International Law* (Cambridge: Cambridge University Press, 2005), 4-5.

[29] William R. Slomanson, *Fundamental Perspectives on International Law* (Toronto, Wadsworth, a division of Thomson Learning Inc., 2003), 55.

as its own would be the key to enhancing international legal sovereignty. How then does a state define its territory?

Generally a state may lay claim to territory in a number of different ways, as defined in the *Cambridge Handbook of International Law*.[30] Many of these have grown less weighty in terms of international legal acceptance over time. "*Discovery*," during the golden age of European discovery, the mere act of finding "previously unknown" land was sufficient for a country to claim ownership. This method of claiming land went out of favour in the 1700s. "*Conquest and annexation*," as noted above, this method of acquiring territory has also gone out of favour, although not completely, as China's annexation of Tibet shows. In fact, the charter of the U.N. itself has declared: "All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state…."[31] So while conquest is still possible, it is less likely to be accepted. "*Cession*," is the acquisition of territory by treaty. This can be involuntary such as the case with Gibraltar, or voluntary as happened with the sale of Alaska to the US. Both methods are considered valid as long as they were based on a treaty. "*Occupation and prescription*," this is the case of "terrae nulius" claiming of unoccupied land. To be unoccupied, a land must not have been occupied "by peoples with a social or political organization…." Therefore, the case made by Inuit leaders that their occupation of the North for thousands of years makes an effective case for Canadian sovereignty claims is true, especially in light of the recent

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[30] Anthony Aust, Handbook of International Law…, 36-40.

[31] United Nations, *Charter of the United Nations, Chapter 1, Article 2 (4)*; available from http://www.un.org/aboutun/charter/chapter1.htm; Internet, accessed 24 March 2007.

settlement of Inuit and First Nations land claim in the North.[32] "*Acquiescence, estoppel and recognition*," there is a fine line to distinguish this from cession, but there is more of a voluntary aspect to it. The example of India's incorporation of former Portuguese colony Goa into India is an example where that incorporation was not contested by Portugal and was accepted by third party nations.[33] On a similar vein should China attempt the same with Taiwan, it is likely there would be considerable discussion regarding mainland China's rights in the matter. In the end though, the international community might deem that war with China is not worth defending the sovereignty of Taiwan and allow the annexation. This makes having the ability to enforce territorial integrity and demonstration of the existence of effective government extremely important. It also points out the benefits of patience to establishing ownership of territory. Were China to present its case for annexation of Taiwan to the ICJ, it may or may not win that case. If it were to simply annex Taiwan somewhat "peacefully" it might be accepted in the same way that India's annexation of Goa was accepted or Tibet's cession was tolerated and eventually accepted. How then do states interpret international law and how do they influence foreign policy?

States, like people in a liberal society, need to get along; but they do not always behave rationally. So individual states decide collectively or with other states that another state's behaviour has gone too far and take action either diplomatically or through direct action. In the case of Canadian Arctic sovereignty, the US argues that

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[32] Mary Simon, "The Inuit Challenging World…, 1-3.

[33] Anthony Aust, *Handbook of International…, 39.*

Canada is behaving outside the bounds of international law, and they do intervene by exercising their right of passage. This particular case will be handled in greater detail later; but the conclusion is that control and authority in domestic sovereignty exercise influence but not control over Westphalian and international law meanings of sovereignty. Exercise of control over a period of time, if shown to be effective, can result in authority being extended or understood. If Canada never goes to the ICJ, but can demonstrate effective control of the Northwest Passage, through regulation of shipping and providing of navigation and search and rescue services it could result in a general acceptance of Canadian international legal sovereignty, notwithstanding the question of international straights. From the technology standpoint, Canada clearly needs to have the means to control her territory. This control would strengthen; though not necessarily make Canada's standing on international legal sovereignty better.

Westphalian Sovereignty. Between 1583 and 1645, the work of Hugo Grotius has provided civilization a useful and moderating framework for the modern state.[34] His work coincided with the "peace of Westphalia" the end of the 30 years war. The most important aspect of Westphalian sovereignty is the issue of the freedom of a state from foreign interference. This prohibition against foreign actors interfering "…imposes a duty of forbearance and confers a right of independence… [but] since states are profoundly unequal in power, the rule is obviously far more constraining for powerful states and far more liberating for weak states."[35] This concept further precludes

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[34] Anthony Aust, Handbook of International Law…, 3

[35] Robert H. Jackson, *Quasi-states: Sovereignty, International Relations, and the Third World* (New York: Cambridge University Press, 1990), 6.

interference in internal and external affairs of other states. This concept favours the weaker states over the more powerful ones and in practice is a source of friction in international relations.[36] This is important, powerful countries like the US must be careful regarding precedence they set regarding international boundaries, because their strategic interests would be greatly affected. This is not a significant issue regarding sovereignty of the arctic landmass but its effects will be apparent in the discussion of sovereignty of the sea.

State Sovereignty – Land

Britain received title over France's North American holdings in the Treaty of Paris in 1763. This transfer included the Arctic holdings, whose titles were subsequently transferred to Canada through two orders in-council in 1870 and 1880. This provides clear title in accordance with international law over the land. One of the first attempts to expand jurisdiction by Canadian politicians occurred in 1907 when Senator Poirier attempted to use sector theory to claim the Arctic land, sea and ice all the way to the North Pole. His declaration in the Senate however, never made its way into the House of Commons. After World War I, the US, Norway and Demark carried out extensive explorations of Ellesmere Island and surrounding areas and all of them made claims of ownership, until the Canadian government began sending yearly expeditions and requiring that foreign explorers apply for permits. The substantive claims to Canada's north were mostly solved in the 1920s and 30s the Danish and US having conceded and

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[36] Stephen D. Krasner, *Sovereignty: Organized…, 20-21*.

the Norwegians for the some of $67,000 for services rendered.[37] This is an instructive episode in that only 80 years ago our closest allies were actively trying to cede Canadian territory, however, at about the same time a landmark decision in the ICJ laid the foundation for Canada to demonstrate its case for sovereignty over the Arctic landmass.

This ICJ decision in question involved eastern Greenland and centred on contested ownership between Norway and Denmark. The ruling was made in April of 1933 and helps to explain why the annual exercises and the requirement for permits was successful in reducing the foreign claims to Canada's north after WWI:

> These acts, coupled with activities of the Danish hunting expeditions which were supported by the Danish government, the increase in the number of scientific expeditions engaged in mapping and exploring the country with the authorization and encouragement of the government, even though the expeditions may have been organized by non-official institutions, the occasions on which the *Godthaab*, a vessel belonging to the state and placed at one time under the command of a naval officer was sent to the east coast on inspection duty, the issue of permits by the Danish authorities under the regulations issue in 1930, to persons visiting the eastern coast of Greenland, show to a sufficient extent—even when separated history of the preceding periods—two elements necessary to establish valid title to sovereignty, namely: the intention and will to exercise such sovereignty and the manifestations of state activity…[38]

This ruling presents a clear methodology for a state to solidify its sovereignty claims over an Arctic landmass. For Canada, it bears repeating part of the last sentence; Canada must demonstrate "…the intention and will to exercise such sovereignty and the manifestations

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[37] Erik Franckx, *Maritime Claims in the Arctic: Canadian and Russian Perspectives* (Dordrecht, the Netherlands: Martinus Hijhof Publisher, 1993), 71-72.

[38] Charles Cheney Hyde, "The Case Concerning the Legal Status of Eastern Greenland," *The American Journal of International Law*, Vol. 27, No. 4. (Oct., 1933): 732-738; available from http://links.jstor.org/sici?sici=0002-9300%28193310%2927%3A4%3C732%3ATCCTLS%3E2.0.CO%3B2-I; Internet; accessed 20 Mar 07.

of state activity…." This corroborates the analysis of the previously discussed sovereignty meanings and emphasizes the need for the Canadian government to be involved directly in those activities. It shows the power of state sponsored manifestations of domestic sovereignty control. For Canada, there remain peripheral issues regarding Hans Island and some neglect of sovereignty patrols.[39] Further, the land is sparsely populated and, as Mary Simon indicated in here speech to the Empire Club, there is a need to increase government presence in the north especially in terms of infrastructure and other services.[40] On the positive side, the strong ties between the Canadian Military and the Northern Rangers and the pending construction of an Arctic training centre potentially in Resolute Bay will help to build the case for sovereignty. Therefore, additional improvements to sovereignty can be achieved by improving government services and according to the 1933 ruling regarding Greenland by sponsoring the other delineator from the definition of a state was the presence of Government enhancing scientific research in the north, all of which is discussed later in the paper. This leaves the question of Canada's claims to the water and ice.

State Sovereignty and International Law – Sea

Canada's claims to sovereignty over Arctic waterways have many competing issues of international law and politics that make seeing a solution difficult. While the primary purpose of this section is to address areas where military and civilian technology

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[39] Hans Island is considered a "rock" by international law standards imparting a lesser definition of sovereignty than a truly habitable island, as such it would provide for some additional territorial waters but no rights to continental shelf or Exclusive Economic Zone (EEZ). See Anthony Aust, Handbook of international law…, 302

[40] Mary Simon, "The Inuit Challenging World…, 1-3.

can enhance sovereignty, the analysis also provides an interesting solution to the larger sovereignty issues facing Canada. It will be argued that, regardless of Canada's claim that the Arctic waterways are internal and not an international strait, a strong case to the contrary will naturally emerge when the ice melts. More importantly, because the Arctic baseline was established using the rules for an archipelagic state that international shipping has the right of archipelagic sea lane passage that is roughly equivalent to the right of transit passage. Further, Canada already has the right to protect and regulate shipping passing through its Arctic Exclusive Economic Zone (EEZ), based on the Canadian Arctic Waters Pollution Protection Act (AWPPA) and Article 234 of the United Nations Convention on the Law of the Sea (*UNCLOS*).[41] Finally, the international community currently recognizes the Canadian declaration of straight baseline to calculate the Arctic pollution enforcement zone, so the straight baseline declaration already has a degree of acceptance. This logic leads to two conclusions: first, that Canada would not lose substantially by either recognizing the archipelagic sea lane passage, or providing enhanced archipelagic transit rights, if she were to gain recognition in return for authority within the Canadian declared internal waters; and second, regardless, Canada must possess the ability to monitor and enforce its rules and regulations if it is to gain authority from the international community. First though, a brief review of the basis for the laws of the sea is in order.

In 1609, Hugo Grotius' anonymously published *Mare Liberum* ostensibly, so he could hone the work based on any feedback from fellow scholars. Notwithstanding the

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[41] Bing Bing Jia, *The Regime of Straits in International Law* (Oxford: Clarenden Press, 1988), 132-133.

fact that this work had originally been prepared as the 12th chapter document entitled "*Commentary on the Law of Prize and Booty*," this work had much broader impact. In fact at the time it was considered a dangerous work by the nations who possessed the greatest sea power at the time: Spain, Portugal, and England. Understanding the origins of *Mare Liberum* helps to understand the basic tenant of the freedom of the seas, though the work was written with a more global scope than the defence of a Dutch Captain accused of illegally seizing a Portuguese ship in the straits of Singapore. The larger issue dealt with in the treatise involved the fundamental difference between sovereignty issues for oceans and waterways as against the same application for land. This reflects the rational for the international community developing a law of the sea.

> Although *Mare Liberum's* influence and importance were—and remain—independent of that larger commentary [*Commentary on the Law of Prize and Booty*] they cannot be fully understood outside the argument of which they formed a part. Grotius defended the Dutch seizure of the Sta. Caarina on the basis of a set of natural laws, which he derived from divine will.[42]

Grotius argued that God gave mankind the earth, he did not give it to any single person. He posited that states had no rights to own the high seas.[43] No matter how powerful a nation's navy might be, it is impossible to completely control the high seas, making them the property of no one. Therefore Grotius concluded: "… and so the intention of the Hollanders is grounded upon the common law, seeing all men confess that all men are permitted to sail in the sea though leave be obtained of no prince…."[44]

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[42] Hugo Grotius, *The Free Sea*, ed. and trans. David Armitage (Indianapolis, Indian: Liberty Fund, 2004), xiii.

[43] Ibid., xix-xx.

[44] Ibid., 37

Conversely, he did argue that elements of territorial waters could be controlled and hence could be considered to be property of a state including any resources that might need to be managed – fisheries being the prime example. There are two competing principles, the right of nations to access the high seas, and the right for nations to control territorial waters. For Grotius, the high seas were inexhaustible, whereas territorial waters were not. Further, even at that time a foreign power's navy could threaten a nation and therefore a threefold interpretation of access to the sea emerged. First, nations have a right to access other trading parties elsewhere in the world and they do so through free passage across the high seas. Second, coastal nations have a right to own "territorial waters" which they are capable of defending or controlling. Third, where there are resources such as fisheries and potentially other natural resources that must be managed, nations have a right to own those as well.[45] At the time, Grotius was arguing for the his own state, Holland, against the more powerful naval states. The dynamic now is that weaker states are arguing for more control of the oceans near to their territories and the more powerful nations are resisting this as they want to be able to project power and protect their interests on a global scale.

> This ubiquitous presence, which makes Navy and Marine Corps forces uniquely valuable, has an additional potential benefit – positively influencing and shaping the global economy. As the U.S. increases its reliance on global trade, the nation's economic vitality is becoming more and more dependent on the stability and growth of the global economy. Thus as the 21st century moves into the era of the global economy, the nation's fundamental interests increasingly are linked to two objectives:

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[45] Lawrence Ivan Schäfer "Legal Aspects of Contemporary Marine Fisheries, Grotius," (Brussels: Rhodes University, 1997); available from http://cdserver2.ru.ac.za/cd/011120_1/aqua/marine%20fisheries/chap2/grotius.htm, Internet; accessed 16 March 2007.

> the promotion of peace and stability and the growth of democracies and market economies. Forward presence of naval forces, especially when enhanced by multi-agency, joint or allied operations, have a fundamental capacity to accomplish both of these 21st Century objectives."[46]

Grotius' argument that free access to the high seas was natural right, did not resonate with more powerful nations of his day; however, it clearly does now. States dependent on trade, want to be able to use the Northwest Passage to shave the 7,000 miles off transit from the Orient to Europe and the western US.[47] Some also wish to be able to project power and influence across the globe by being able to navigate warships close to other nation's territories. States wishing to control greater amounts of coastal waters put this freedom of the seas in jeopardy, two methods of expanding territorial waters are of particular interest: use of the straight baseline method, and the closure of international straits due to the expansion of territorial waters from 3 miles to 12 miles. In 1951 the ICJ ruled in favour of Norway for its establishment of a straight baseline around its highly indented coastline.[48] It took a number of years, but in 1986, Canada belatedly established a straight baseline around its Arctic archipelago by following the guidelines inherent in *UNCLOS* articles 7 (straight baseline), 8 (internal waters), 9 (mouths of rivers), 10 (bays), 11 (ports), and 47 (archipelagic baselines) and publishing official maps

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[46] United States, Department of the Navy, "1999 Posture Statement, /Section I The Navy-Marine Corps Team: America's 21st Century Force," http://www.Navy.mil/navydata/policy/fromsea/pos99/pos-sec1.html; Internet; accessed; 21 April 2007.

[47] Andrea Charron, "The Northwest Passage in Context," *Canadian Military Journal* Volume 6, no. 4 (Winter 2005 – 2006): 41.

[48] Francis Ngantcha, *The Right of Innocent passage and the Evolution of International Law* (London: Pinter Publishers, 1990), 26-27.

and tables to define the baseline in accordance with article 16 *UNCLOS*.[49] Canada did claim that the subsequent internal waters were based on historic title. While this claim may provide more options, it is also not well accepted legally due to the highly stringent test of exclusive authority and lack of formal protests of other states. Since the US has protested Canadian claims and the historic title argument is, at best, weak.[50] At the same time Canada also expanded its territorial waters claim from 3 to 12 miles. Both of these actions had the effect of closing off the Northwest Passage; however, because the passage has been mostly closed off to normal shipping by ice the point has always been moot. Now with the melting of the ice, it is becoming a strategic point of active debate.[51]

To Canada, these waters represent both an important national interest and an historic use of the sea and ice; however, the fact that Canada waited from 1951 to 1986 to claim the straight baseline does tend to weaken the case for internal waters.[52] A recent research paper from the Political and Social Affairs Division of the Parliamentary admits that due to the ICJ's ruling on the strait of Corfu, the Canadian claim to exclusive internal waters for the Northwest Passage will be difficult to maintain legally. The authors of this report do suggest that, "…ensuring control requires a Government of Canada presence in the region, to monitor the passage and ensure compliance with the Canadian sovereign

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[49] Canada, Office of the Judge Advocate General, "United Nations Convention on the Law of the Sea – 1994," In *Collection of Documents on the Law of Armed Conflict*, 2005 ed., Ed. by the Directorate of Law Training (Ottawa: DND, 2005), 264.

[50] Donat Pharand, *Canada's Arctic Waters in International Law,* (Cambridge: Cambridge University Press, 1988), 120-125.

[51] Gerrard Kenney, "The north – Message to America: Get out or our Arctic Way," *Globe and Mail*, [online edition] 09 February 2006; available from http://www.theglobeandmail.com/servlet/story/RTGAM.20060209.wcomment0209/BNStory/National/home; Internet; accessed 28 Mar 2007.

[52] Andrea Charron, "The Northwest Passage…, 44.

claims." It is clear from the forgoing argument that this Canadian Arctic waterway is important both to Canada and to the international community. Further, according to the *UNCLOS*, there are competing requirements at play: the right of a coastal nation to control its territorial waters; and the right of other nations to free access to the high seas, in this case across a strait of water, which is to say the Northwest passage. But what is a strait?

The word strait itself, refers to the geographic description and not the legal one. Not surprisingly, the whole issue of straits is fraught with controversy. The *Corfu Channel* case was a dispute between the United Kingdom (UK) and Albania regarding a little used channel and helps to understand what makes a strait, and how a strait then becomes international. The court held for the UK, that the connection of the Corfu channel was an international strait, primarily because it connected to two regions of high seas. The court also held that the channel had to have been a useful route for international maritime traffic.[53] Based on this case, a strait is: "First, geographically have various widths, whilst international straits have to be narrow…. Secondly, every strait connects two areas of sea, since it is a natural part of the sea.[54] Therefore the Canadian Northwest Passage meets the definition of a strait, but does not currently represent a useful route for international maritime traffic and hence, may not represent an international strait. This increase to the territorial waters has had an impact on how the

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[53] Donat Pharand, *Canada's Arctic…,* 218-219.

[54] Bing Bing Jia, *The Regime…*, 4.

international community views the situation in the North. The question being asked is whether Canada has the ability to manage and defend its new territorial waters.

Advances in both commercial and military sea power have improved a coastal states' ability to control its territorial waters. The original limit set in the 18th Century as the range of a canon shot was increased from 3 to 12 miles and the size of the EEZ was doubled to 200 miles during the 1974 to 1982 *UNCLOS* revision process as a result of these improved capabilities.[55] This change permitted countries to manage industries like fisheries more closely, as Canada did on the Grand Banks when it took the step of cutting of Spanish nets and seizing a fishing trawler during the so-called Turbot War with Spain.[56] One of the consequences of this increase was the closure of as many as 116 narrow straits. This issue was corrected by article 38 of the transit passage provision.[57] A solution proposed by the US and Russia when the Bering strait became the internal waters of both countries. In that solution a strait, which contained an area of high seas prior to 1982 and then was closed due to the increase to the 12-mile territorial limit, is considered open for transit passage. This transit passage is "solely for the purpose of continuous and expeditious transit of the strait between one part of the high seas… and another part of the high seas…."[58] What impact does this have for Canada?

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[55] William R. Slomanson, *Fundamental Perspectives…,* 268-270.

[56] Government of Newfoundland and Labrador, "Province welcomes Canadian Victory in Turbot War Case," News Release, 4 December 1998; available from http://releases.gov.nl.ca/releases/1998/exec/1204n01.htm; Internet; accessed 24 March 2007.

[57] Canada, Office of the Judge Advocate General…, 266.

[58] William R. Slomanson, *Fundamental Perspectives…,* 268-269.

When the increase to the territorial boundaries was being implemented not only were countries around the world implementing the *UNCLOS*; but, there was a grandfather clause, if a strait had not been an international strait prior to the adoption of the new rules that waterway would still be internal waters. The debate has become somewhat fixated on the event of opening the territorial limit from 3 to 12 miles. Was the strait international due to the passage of a few ships? Does the delay in filing the baseline impact the legitimacy of the Canadian claim? Will time make the strait a useful international route and like the *Corfu Case* open the Northwest Passage regardless?

Canada has claimed that the waters within the archipelago are internal by reason of historic title based on the use by the Inuit and by the activities of Canada in the North since that time.[59] The proof required for this assertion is however, quite high. There are a number of tests that must be met, the most important three are: first, the underlying basis for the claim must itself be legal; second, there must be no protest from foreign states; and third, Canada must be able to prove that it has exercised exclusive control and long usage. The first case is very important in the argument of this paper. Canada has used *UNCLOS* rules for archipelagic state territorial waters to establish its baseline. This method is accepted in international law and is therefore legal, although there is some question of whether this method is legal for Canada. This point will be examined in greater detail later in the paper, but for now, the key point to be established is that the method to establish the baseline must be legal for a historic title claim to be valid.

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[59] N.D. Bankes, "Forty Years of Canadian Sovereignty Assertion in the Arctic, 1947-87," *Arctic* Volume 40, no. 4 (December 1987): 289.

Historic title does not in itself mean that a valid delineation of territorial waters has occurred.

> The Court [ICJ] seems to have accepted Norway's argument [in the fisheries case *UK* vs *Norway*, 1952] that she was invoking history not to validate an otherwise illegal situation but rather to confirm the validity of that situation, since it concluded that the straight baseline system used by Norway was not contrary to international law.[60]

Therefore, an historic claim must be based on a legal baseline. There are significant legal ramifications to this conclusion to the interpretation of international passage. Second, other countries have in fact objected to this declaration of historic title based on the question of navigation through the archipelago using the Northwest Passage as an international strait. Therefore the claim of historic title is false as long as these claims remain.[61] Third, Canada has made plans to, but has never really invested sufficient funds to clearly demonstrate, exclusive control of the Arctic.[62] Therefore, the claim to historic title of the Arctic waters is at best weak or is false until the three tests above are met. If Canada's archipelagic claim can be established as valid, Canada could claim title to internal waters within its baseline, but with important differences regarding passage through the waters.

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[60] Donat Pharand, *Canada's Arctic*…, 104.

[61] N.D. Bankes, "Forty Years of Canadian…, 285-291; and Donat Pharand, *Canada's Arctic*…, 121-125.

[62] Canada, through DND, has initiated numerous projects to demonstrate sovereignty in the north. As discussed earlier projects like nuclear submarines were never completed. The main success story in this is the case of the northern rangers; which Canada has invested in and which has shown some benefits to sovereignty claims. On balance though these expenditures have been insufficient to prove control of the North. See Rob Huebert, "Climate Change and Canadian Sovereignty in the Northwest Passage," ISUMA, *the Canadian Journal of Policy Research,* Volume 2 no. 4 (Winger 2001): 4.

Canada's territorial water limits were set using the *UNCLOS* rules governing archipelagic states. Unfortunately, article 47 is intended to apply to an archipelagic state defined as constituted wholly by one or more archipelagos or a grouping of islands surrounded by water.[63] Clearly, Canada is much bigger than this and would not therefore qualify as a pure archipelagic state. The provisions of the *UNCLOS* provide for customary law to adjudicate in cases where the law does not exactly fit the circumstances.[64] The most important tests to prove Canada's straight baseline claim over the archipelago are: the archipelago forms an integral part of the coast and follows its general direction; the ratio of sea to land is less than 9 to 1; and the length from one point of land to another along the baseline does not exceed 100 nautical miles. The Canadian claim fully meets all of these requirements.[65]

The good news then is that Canada can legitimately claim all of the waters out to the 12 mile territorial limit using the straight baseline method for archipelagos. This point has been made in different treaties on the subject; however, the debate then becomes fixated on whether international waters were absorbed into internal waters when the territorial limit was expanded from 3 to 12 miles. This is understandable when the primary focus is on whether the Northwest Passage represents an international strait or not. What if instead, the argument regarding determination of international passage through the Arctic were based on the fact that it is an archipelago. To start, consider the

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[63] Canada, Office of the Judge Advocate General…, 268.

[64] Donat Pharand, *Canada's Arctic*…, 132.

[65] Donat Pharand, *Canada's Arctic*…, 177-179; and Donald Rothwell, *The Polar Regions and the Development of International Law*, (Cambridge: Cambridge University Press, 1996), 274.

differences between innocent and transit passage. *UNCLOS* article 52 – right of innocent passage "…without prejudice to article 50, [Delimitation of internal waters] ships of all states enjoy the right of innocent passage through archipelagic waters…."[66] Next article 53 – right of archipelagic sea-lanes indicates that Canada can "… designate sea-lanes and air routes there above, suitable for the continuous and expeditious passage of foreign ships and aircraft through or over its archipelagic waters and the adjacent territorial sea."[67] Finally, article 49 – legal status of archipelagic waters states that: "The sovereignty of an archipelagic state extends to the waters enclosed by the archipelagic baselines… regardless of their depth or distance from the coast. This sovereignty extends…over the archipelagic waters, as well as to their bed and subsoil and the resources contained therein." [68] Therefore, Canada must allow innocent passage and can, if they so choose, designate sea-lanes to govern that passage. In their response to the US objections to the AWPPA in 1970, the Canadian Government "…reiterated its determination to open up the Northwest Passage to safe navigation for the shipping of all nations…."[69] Therefore, there is a Canadian understanding of the inevitability of shipping in this area and a willingness to work with the US to arrive at a compromise solution. What needs to be clarified is the differences between the types of passage.

On reading the *UNCLOS* articles pertaining to transit and innocent passage there is really very little difference. Both require that the ships or airplanes comply with the

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[66] Canada, Office of the Judge Advocate General…, 268.

[67] Ibid., 268

[68] Ibid., 268

[69] .D. Bankes, "Forty Years of Canadian…, 285-291.

laws of the state bordering the strait. Both require direct and expeditious passage, wherein the vessel refrains from any threat or use of force. Both preclude research and survey activity without authorization from the bordering state. Both permit the bordering state to enact laws to protect their interests like: safety, pollution prevention, fishing, and unloading of commodities or other items or persons without permission. The difference lies in the subtlety of the terms "freedom of navigation and overflight" and "normal modes of transit" used under articles 38 and 39 respectively. The significance for military vessels is that under transit passage a submarine can remain submerged as this is its normal mode of navigation [depending on the depth of the waters and issues related to traffic etc.], and a vessel like an aircraft carrier can have its aircraft in the air. For passage through the Canadian Arctic this may not seem to be a serious consideration. For passage through the Strait of Hormuz during times of tension there might be significant threat of attack, so being submerged, or having aircraft aloft provides an important measure of security. [70] While these two differences are quite obvious, there are other differences such as: transit passage does not require prior authorization from the coastal state, which are less obvious. But there is considerable latitude for interpretation. For example, the right of overflight without prior authorization, granted in article 39, is limited by the requirement to comply with international air safety regulations of the *Chicago Convention on International Civil Aviation*, which in turn requires authorization for overflight of the territory of another state.[71] In this way transit passage provides

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[70] Francis Ngantcha, *The Right of Innocent passage…, 56-60*.

[71] Bing Bing Jia is firm in stating that non-innocent passage, and overflight without authorization are permitted under transit passage. See Bing Bing Jia, *The Regime of Straits…,150-154;* Francis Ngantcha

countries with greater freedom than innocent passage and less than freedom of navigation for the high seas. The benefit is primarily to the secure passage of military vessels, which is to say that they can exercise passage submerged or with aircraft aloft.[72] The point of this line of discussion is that the important difference between innocent passage and transit passage is the military application.

UNCLOS provides for a third type of passage – the right of archipelagic sea-lanes transit. Archipelagic sea-lanes transit is described in, article 53 – "Right of archipelagic sea-lanes passage."[73] This form of passage provides for the right to transit and overfly in the normal mode of operation. There is an inference that this right of archipelagic passage is at the pleasure of the archipelagic state, this comes from the use of the word may in the following, "…an archipelagic state may designate sea-lanes and air routes…." In article 53(12) however, the following statement is made, "…if an archipelagic state does not designate sea-lanes or air routes, the right of archipelagic sea-lanes passage may be exercised through routes normally used for international navigation." The potential argument that this is not the same as transit passage, or that the standard of international strait must be met is mitigated by article 54, which states that the duties of an archipelagic state are applied in the same way that they are for transit passage; specific reference is made to articles 39, 40, 42, and 44. Article 54 goes on to state that they apply equally to archipelagic sea-lanes passage and article 44 states that, "States

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provides an alternate review of these rights, indicating that they are not as straight forward in application. See Francis Ngantcha, *The Right of Innocent…, 59-60*.

[72] Bing Bing Jia, *The Regime of Straits…,150-154*.

[73] Canada, Office of the Judge Advocate General…,268.

bordering straits shall not hamper transit passage…. There shall be no suspension of transit passage." Which implies that there can be no suspension of archipelagic sea-lanes passage either.[74]

There are two other differences between archipelagic sea lane and transit passage. First, in transit passage the term used is "freedom of navigation," while under the archipelagic section the term used is "rights of navigation and over flight." The inference is that the former is akin to "freedom of the high seas" and implies that transit passage is the same "…as if it still contained a slice of high seas in the middle of the navigable channel."[75] Whereas rights of navigation appear to permit lesser rights very likely tied up in the ability of the archipelagic state to change the sea-lanes or traffic separations schemes permitting transit passage. Second, there are restrictions for approach to the shoreline through navigation error that are not provided for in the section on transit passage.

To conclude, Canada has chosen to use the archipelagic argument to extend a straight baseline boundary around the Arctic archipelago. This is a basic prerequisite to establishing historic title. Historic title has not been established because of the two major criteria have not been met: other nations object to this designation, and Canada has failed to demonstrate sufficient control over the region. Regardless, the archipelagic claim itself has made the case for internal waters with all the benefits that are derived from the control of the resources under the seabed and potential harvest of other resources in the

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[74] Francis Ngantcha, *The Right of Innocent passage…, 62.*

[75] William R. Slomanson, *Fundamental Perspectives…, 268-269*.

water. There are consequences to this position however; whereas the case for international strait status for the Northwest Passage is debateable, the status of archipelagic sea-lanes passage is not. In accordance with *UNCLOS,* Canada must grant other nations this passage; however, by designating these sea lanes, Canada could restrict passage to one straight, making it easier to control, monitor and facilitate shipping and navigation.

It is difficult to gauge international reaction to a more holistic archipelagic approach to Arctic sovereignty, given that there is little discussion in the literature; however, as previously mentioned, the US for one, does not accept Canadian claims. Of the countries that take issue with the Canadian position, it can be argued that the US is the most vocal, and most careful to exercise its rights as evidenced by the following statement of policy.

> United States policy is to:
>
> > Accept and act in accordance with the balance of interests relating to traditional uses of the oceans--such as navigation and over flight. In this respect, the United States will recognize the rights of other states in the waters off their coasts, as reflected in the Convention, so long as the rights and freedoms of the United States and others under international law are recognized by such coastal states.
>
> In addition, United States policy is to:
>
> > Exercise and assert its navigation and over flight rights and freedoms on a worldwide basis in a manner that is consistent with the balance of interests reflected in the convention. The United States will not, however, acquiesce in unilateral acts of other states designed to restrict the rights

> and freedoms of the international community in navigation and over flight and other related high seas uses. [76]

Notice that in this policy statement the emphasis is placed on navigation and over flight. When combined with the 1999 US Navy and Marine posture statement quoted earlier, the rationale for this policy is based on projection of military power to protect US interests. The US calls Canada's Arctic claim excessive. "Since 1979, US military ships and aircraft have exercised their rights and freedoms in all oceans against objectionable claims of more than 35 countries [including Canada and Iraq] at the rate of some 30-40 per year."[77] As a global power, the US has compelling reasons for doing this, and while they might wish to accept our claims based on our historic relationship, they are constrained not to, because of the precedent it would set as demonstrated in the following quote: "…our [US] efforts to limit extensions of coastal state sovereignty over the high seas worldwide will be damaged when other nations see that a country -- physically, politically and economically -- as close to the United States as Canada, feels it can undertake such action in the face of United States opposition."[78] In fact, the US has gone to the extreme of taking the State of California to court over that state's declaration of a

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[76] United States Department of State Bureau of Oceans and International Environmental and Scientific Affairs, *Limits of the Seas – No. 112 United States Responses to Excessive National Maritime Claims* (Washington, DC: U.S. Government Printing Office, 1992), 6.

[77] United States Department of State Bureau of Oceans … 7.

[78] In 1970 the Canadian Ambassador Marcel Cadieux informed the US that Canada would enact the AWPPA. See United States Department of State, "Information Memorandum for Mr. Kissinger - The White House: Imminent Canadian Legislation on the Arctic," (Washington: US Department of State, 12 March 1970); available from http://www.state.gov/r/pa/ho/frus/nixon/e1/53180.htm; Internet; accessed 18 April 2007.

straight baseline.[79] So it is unlikely that the US would easily relent on this issue, unless Canada could convince them that using the archipelagic waters provisions of *UNCLOS* provides a legitimate expression of international law and satisfies their need to be able to navigate straits in the normal mode. The US had originally expressed their objection to the archipelagic claims of Indonesia, and the Philippines, but have since admitted recognition of these states provided the tests for an archipelagic straight line boundary delineation described above have been met. They do not admit that non-archipelagic states that happen to have an archipelago, can use a straight baseline; but, do recognize the claims of Yugoslavia, Norway, and Southern Chile to use the straight baseline due to the application of the UK/Norwegian fisheries case.[80] Given the change in the US position on archipelagos, and the Canadian Government's 1970 statement regarding opening the Northwest Passage, it would seem that the US might be more amenable to recognizing Canada's claims. Further, if Canada and the US were to share responsibility for defence, just as they do with NORAD air defence, then the danger of precedence might be mitigated due to the significant freedom of navigation this would provide the US.[81] It might also permit both sides to save on the cost of equipping for exercising sovereignty control and is a relatively simple extension of existing defence arrangements.

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[79] United States, Supreme Court, *Unites States vs California, 381 US 139* (Washington, DC: U.S. Court Forms, 1965); available from http://supreme.justia.com/us/381/139/case.html; Internet, accessed 21 Mar 2007.

[80] Donat Pharand, *Canada's Arctic*…, 152.

[81] United States, Department of Defense, Bi-National Planning Group, *The Final Report on Canada and the United States (CANUS) Enhanced Military Cooperation*, (Peterson AFB: U.S. Government Printing Office, March 13, 2006), G-1.

Figure 2: Polar Region Map.[82]

It is instructive to remember that the Russian Federation has a similar sovereignty issue to Canada's, with the exception of a close relationship with the US. They also do not have the archipelago, but they do have a Northeast Passage that is currently in use and is expected to be open year round within the next ten years.[83] The passage is currently open for 8 weeks of the year and passes a million and a half tons of shipping per year.[84] The Russians have a number of straits which they claim as territorial waters and which the US does not accept. The Russian policy regarding the Arctic is very similar to Canada; however, where Canada appears to be attempting to limit the usage of the Northwest Passage by declaring that the waters do not constitute an international strait,

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[82] Paul Reynolds, "The Arctic's new gold rush," *BBC News*, 25 October 2005; available from http://news.bbc.uk/2/hi/business/4354036.stm; Internet; accessed 10 March 2007.

[83] Julius Strauss, "Polar thaw opens Artic Sea route," *Telegraph United Kingdom*, 4 March 2004.

[84] Peter Tyson, "Future of the Passage," *Nova Science Programming on Air and Online* (February 2007); available from http://www.pbs.org/wgbh/nova/arctic/passage.html; Internet; accessed on 21 March 2002.

the Russians are turning the Northeast Passage into a commercial venture. This started in 1967 under the Soviet regime with few takers; but was successfully resurrected by Mr. Gorbachev in 1987.[85] They also have a fleet of nuclear icebreakers offering a variety of services including cruises to the North Pole. In fact, as part of the International Polar Year, Canadian scientists are attempting to charter their services as the only means for them to carry out research in the high Arctic.[86] The Russian approach has the advantage of increasing Westphalian sovereignty position in a cost effective manner. Further, based on the ICJ ruling on eastern Greenland the combination approach, involving commercial, scientific and military activities also bolsters international legal sovereignty claims and having the presence in the North improves both interdependence and domestic sovereignty.

State Sovereignty – Summary

Hugo Grotius has provided a basis for international law of the sea that continues to evolve today. He postulated that the world's oceans should provide free access to international trade and general navigation. This tenet has been respected in the *UNCLOS*, but it is counterbalanced with the right of nations to own and control territorial seas and EEZ regions, this is the fundamental tension in this debate. What emerges most prominently from the discussion is that for Canada to improve its sovereignty position, the federal government must exercise greater control of the land and much greater control

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[85] Francis Ngantcha, *The Right of Innocent…,* 265.

[86] Peter Calamai, "Canada helps kick off Polar Year: Canadian researches are raring to book time on icebreakers, now that cheques are finally in the mail," *Toronto Star*, 02 March 2007; available from http://www.thestar.com/News/article/187468; Internet; accessed 21 March 2007.

of the sea-lanes in the North. It must foster scientific research and provide good government to the peoples of the North to encourage economic development and to increase its domestic authority. These two activities will enhance interdependent and domestic sovereignty that in turn will improve Westphalian and international law aspects of sovereignty. The strength of Canada's claims to sovereignty have grown steadily from serious challenges in the 20s regarding Ellesmere Island to the point where her sovereignty has been consolidated and expanded over a much greater area through the establishment of an Arctic archipelagic baseline. This expansion though has come with little in the way of increased control.

By ignoring the question of whether the Northwest Passage is an international strait or not, a clear case emerges that Canada has clear title to all the internal waters, but that it must grant archipelagic sea-lanes passage to the international community. The rights inferred are similar to transit passage though slightly more favourable to the archipelagic state in that Canada could designate sea-lanes and rules that would enhance its ability to manage sea traffic. Further, the case for historic title is not currently met and would require the removal of objections to that claim and the establishment of clear control of the area. Canada does not have the means to exercise exclusive control and this weakens its claim to historic waters. So, even if the US and other nations were to withdraw their objections to the historic title claim, Canada would lack the ability to demonstrate exclusive control.

Over the years, Canada has used some highly innovative methods to support or permit it to maintain its claims to Arctic sovereignty but global warming is adding urgency to the Canadian position. We have successfully used the straight baseline to take

the whole area including Hudson's Bay into our internal waters, which means that there is a vast area that must be controlled for Canada to back up its claims to sovereignty. Further, the US feels they cannot acquiesce to our internal waters argument because of the message it would send to other coastal countries which border strategic straits and frankly to permit them to project force around the globe in support of their own national interests. The US has acquiesced to *UNCLOS* delineations for archipelagic states and if Canada and the US were to conclude a joint defence arrangement, other states around the world would only be able to use the case as a precedent in the event that they permitted US warships to enter their waters. This would permit greater latitude to US strategic interests and therefore might provide a less expensive means of Arctic defence for both countries.

Finally, Erik Franckx interprets Canada's lack of consistency in approach to sovereignty claims as being a pragmatic way to advance Canada's sovereignty over ever increasing territory. Canada's policy may in fact be more effective and pragmatic than it appears to be on the surface. He asserts that, in dealing individually with each issue on its own, Canada has slowly but surely built, and significantly broadened, its case for sovereignty through both the passage of time and implementation of policy. He points to the aggressive direct approach taken in Africa and South America that resulted in failure, whereas Canadian claims have gained gradual acceptance. Caution is advised, however, as part of the reason for the failure in the case of African and South American states was their lack of ability to back up their claims with control and hence there authority was negligible.

The purpose of the foregoing discussion was to frame the security question in a way that would provide a focus on what and where military capabilities should be focused to enhance that security and in so doing enhance Canada's claim for Arctic sovereignty. It can be concluded, therefore, that while there are no serious claims to the Canada's northern landmass she must continue to demonstrate her presence and control over the region. To do so it is important for Canada to facilitate scientific, economic, regulatory, military and civilian activities in the North. This is based upon ICJ ruling between Norway and Denmark regarding eastern Greenland that also hinted that government must be involved in sovereignty efforts for them to be effective. In fact, Minister of National Defence, Gordon O'Connor, stated in a recent interview with *Hill Times*: "There are other agencies and the people in the villages in the North who are enforcing our sovereignty, but I'll just give you a military point of view."[87] So the government understands the need to consider sovereignty holistically, but has failed to take the position that was taken for the construction of the railway. At the end of the nineteenth century, public leaders understood that an ambitious approach was necessary to react to a dynamic situation. This scale of grand public work went beyond one government department and in today's context, where society and the economy are so interconnected, it is the scope and budget that surpass the ability of any single federal government department to adequately handle. The remainder of this paper will therefore focus on three aspects of enhancing sovereignty: control, science, and infrastructure.

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[87] Bea Vongdouangchanh, "Cabinet waiting for Defence Department's 10-year Arctic military plan: O'Connor," *The Hill Times,* Eighteenth Year, no. 859, 16 October 2006, 17-19.

CHAPTER 4 – CANADIAN SOVEREIGNTY

Canada has a less than stellar record for following through on attempts to provide Arctic security. There are many good reasons for this, not the least of which is the incredibly difficult task that this represents. The number of program announcements for military equipment to fill the gap in Canada's Arctic capability over the years provides an insight into the problem. There was the ambitious Polar 8 icebreaker, and then nuclear submarine projects that tried and failed to improve Canada's ability to exert control n the North. The *National Post* reported that the Canadian Forces has launched an ambitious patrol over the Ellsemere Island including Canadian Rangers and the RCMP in the high Arctic to strengthen the case legal case this one patrol will cost approximately $1 million.[88] This patrol is an important aspect of maintaining Canadian sovereignty, yet it demonstrates the challenges of maintaining even a small presence in the Arctic. Consider Senartor Forestall's speech to the Senate of Canada:

> **Senator Forrestall:** Honourable senators, all of this, of course, is in tribute to and in honour of how Canada will go about continuing to assert its sovereignty in our Arctic. Had we gone ahead with the Polar 8 a few years ago, we would have done that. There would be no question about Canadian sovereignty today. It would have been Canadian water, on the surface, in the water, and in the ice surrounding it.
>
> In 2001, Canadian scientists spotted an unidentified vessel on the surface of Cumberland Sound, a boat that, according to an anonymous naval source, was almost certainly of French registry. The U.S. and Denmark do not recognize our claim to Arctic waters. Their patrols in the North are commonplace and go unnoticed and unchallenged because, although it is not that the government will not back up our claims, it is that it gives itself no tools, instruments or means to back up our claims.

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[88] Adrian Humphreys, "Arctic Mission most challenging yet: military seeks to assert sovereignty by snowmobile," *National Post,* 13 March 2007.

For years, Canada has been talking about but not actively pursuing solutions to Arctic sovereignty. Minister of National Defence Gordon O'Connor, recently revealed government thinking regarding capabilities for the North; but so far no definitive action has been taken. So while successive Federal Governments have enunciated intentions regarding protection of the North, an official government position is currently lacking. The government policy statement issued in the year 2000 represents a reasonable concept:

> In 2000, the Government of Canada released *The Northern Dimension of Canada's Foreign Policy*. The NDFP lists four objectives:
>
> - to enhance the security and prosperity of Canadians, especially northerners and Aboriginal peoples;
> - to assert and ensure the preservation of Canada's sovereignty in the North;
> - to establish the circumpolar region as a vibrant geopolitical entity integrated into a rules-based international system; and
> - to promote the human security of northerners and the sustainable development of the Arctic. [89]

Grotius considered that a state represented "a complete association of free men, joined together for the enjoyment of rights and for their common interest."[90] This is a common theme regarding sovereignty. It seems reasonable, therefore, that national interests can be defined as those issues that provide for the citizens of a state to freely enjoy rights and freedoms leading to common goals. Survival of the state can therefore

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[89] Matthew Carnaghan and Allison Goody, "Canadian Arctic…, 7.

[90] Hugo Grotius, *On the Law of War and Peace* (Indianapolis: Bobbs-Merrill, 1925), 44.

be said to take on a personal sense, in that, territorial integrity and control represents the interest of the people who live in the region, so sovereignty is one area of national interest and equally foreign relations is another. However, mere sovereignty and good relations with the neighbours is not sufficient, the people have to "enjoy" living within that state or another state might better serve their needs by providing more of what is needed. Therefore, economic and social requirements are also "national interests" of the state. Finally, the North represents a particular challenge to southern Canadians to understand, huddled as they are on the border with the US; but it is also becoming terra incognito for the Inuit and the other residences of the North. As Inuit Elder and former Commissioner for Nunavut, Peter Irniq, puts it, "Inuit are… seeing the destruction of our way of life. Thunderstorms in winter, robins in the summer and ice that freezes later and later every year…."[91] So the government has a two pronged interest in this respect: one is to understand the nature of changes to the world as a whole, and to the North in particular to help develop strategies for the Inuit and residents to adapt, and to try to reduce the impacts of global warming if possible; and we have to protect this changing environment from the encroachments of man. In summary, Canada can enhance its claims to sovereignty by demonstrating control both domestically and through interdependence sovereignty at its borders. This control will bolster the claims of Westphalian and international legal sovereignty but is not sufficient in and of itself. The ICJ ruling regarding Greenland also points to the imperative for the Government to be

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[91] World Wild Life Fund, "Inuit Sound the Alarm in Ottawa over Escalating Arctic Climate Crisis, 5 October 2006," available from http://www.wwf.ca/NewsAndFacts/NewsRoom/default.asp?section=archive&page=display&ID=1508&lang=EN; Internet; accessed 30 March 2007.

involved in regulating and providing services and to conducting scientific study and to fostering that work in the north. It is in the intersection of these interests that technology can play its role in helping multiple interests to achieve their goals

National Interest – Sovereignty

During a speech in August of last year, Prime Minister Harper declared that the Arctic would be a priority for the Conservative Government.[92] In the government's 2006 national party platform the Conservative Party pledged to "Increase the Canadian Forces' capacity to protect Canada's arctic sovereignty and security."[93] Unfortunately, the government has not been able to clarify what will actually be bought to fill this void. This is due in large measure to the fact that the government is in the final process of reviewing a Defence Capabilities Plan, which it received from the Department of National Defence in late 2006. This plan contains all of the new capital procurement for the department and may be unaffordable given the ambitious program of reequipping and rearming that has been undertaken and the limited funds available. O'Conner has indicated that this report would have to be carefully studied before any new procurements were undertaken.[94]

The following paper is somewhat dated but the conclusions remain valid. No significant procurement program has been undertaken within DND since this report was

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[92] Bea Vongdouangchanh, "Cabinet…, 17-19.

[93] Conservative Party of Canada, "Stand up for Canada, Federal Election Platform, 2006," available from http://www.conservative.ca/media/20060113-Platform.pdf; Internet; accessed 22 Mar 2007, 45.

[94] Standing Senate Committee on National Security and Defence, *Issue 1 - Evidence*, (Ottawa: Parliament, May 8, 2006); available from http://www.parl.gc.ca/39/1/parlbus/commbus/senate/com-e/defe-e/01evb-e.htm?Language=E&Parl=39&Ses=1&comm_id=76; Internet; accessed 22 March 2007.

written and its conclusions are very interesting. Particularly when you consider that the government agencies discussed in the report will all need access to basic technological infrastructure.

> It is important to underline that DND/CF's primary role in the Arctic region is not monitoring economic activities, dealing with illegal immigration or preventing pollution and criminal activity. Therefore, there is clearly a need for the government as a whole to examine these issues and decide whether the changing situation in the Arctic over the next ten to twenty years warrants the allocation of more resources to the departments concerned, including DND. [95]

This latter point is extremely important as it looks at the question from a broader perspective. As Rob Heubert, an expert on Arctic issues, working for the Centre for Military and Strategic Studies, states in his article for the Canadian Defence and Foreign Affairs Institute indicates regardless of the approach taken there is: "…we need icebreakers. If there are challenges within the various departments to acquiring and operating these vessels on their own, perhaps now is the time to truly apply a 'whole of Canadian Government' approach and have both the navy and the coastal guard operate them."[96] This represents a general trend in how commentators see the solution to the problem, and also reflects the theoretical view presented earlier of how best to improve sovereignty in general. Heubert's article raises two reasons to procure icebreakers. The first is commercial, and involves providing ice-breaking services to facilitate shipping

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[95] Department of National Defence, 1948-3-CC4C (DGSP) *Arctic Capabilities Study*, (Ottawa: DND Canada, June 2000); available from http://www.natice.noaa.gov/icefree/Arctic%20Study%20Final%20-%20Canada1.pdf; Internet; accessed 22 March 2007, 14.

[96] Rob Huebert, "The Battle for the Control for Canadian Arctic Waters: Icebreakers or Patrol Vessels?," *The Dispatch Newsletter of the Canadian Defence and Foreign Affairs Institute*, Volume V, Issue I (Spring 2007); available from http://www.cdfai.org/newsletters/newsletterisspring 2007.html; Internet, accessed 28 April 2007.

through the straits, carrying out scientific research and general coast guard duties. The ice flows rotate with the earth's rotation and contrary to what intuition might suggest the melting of the Arctic icepack will likely make navigation more unpredictable as large sections break away from the pack ice and move independently. This is particularly a problem with multi-year ice, which is significantly denser than annual ice. In the Antarctic there is a program, coordinated through 25 different countries to collect information on fisheries and regulate harvesting of fish.[97] The Arctic is poised to enter into the same arena as the ice pack recedes and fish either become available or fish like the cod migrate north to more hospitable locations. Clearly what happened to fish stocks off the once thought in-exhaustible grand bank of Newfoundland is a cautionary tale. Fishery will require careful study, surveillance and management.[98] Take the 2004 example of a chase through Antarctic waters of Australian Defence forces after Toothfish poachers,

> Australia's heightened enforcement was spurred on by an incident that began Aug. 7, 2003, when an Australian customs vessel spotted a boat, with its name painted over, allegedly fishing illegally near Heard Island. It chased the Viarsa for 21 days and 3,900 nautical miles, through Antarctic pack ice, the stormy Drake Passage and around icebergs. The patrol vessel finally apprehended the Viarsa 3,335 km west-southwest of Cape Town, with the help of a South African salvage tug, South African icebreaker and a UK fishing vessel.[99]

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[97] Southwest Fisheries Science Center, National Oceanic and Atmospheric Administration (NOAA) Fisheries Service Antarctic Ecosystem Research Division, "Antarctic Ecosystem Research," http://swfsc.noaa.gov/textblock.aspx?id=551&ParentMenuId=42; Internet; accessed 26 Mar 07.

[98] Peter N. Spotts, "New Search for Global Warming at Poles," *The Christian Science Monitor*, 26 Feb 2007; available from http://www.csmonitor.com/2007/0226/p03s03-wogi.htm; Internet; accessed 26 March 2007.

[99] Kristan Hutchison, "Fighting over Fish – Antarctic Research used to Defend Fish in the Southern Ocean," *The Antarctic Sun*, 01 February 2004; available from

Fishing is becoming more of a potential industry with global warming and this could easily be ruined. So the ability of the Canadian coast guard to provide services and control in the arctic is important. The need to have military ice-breakers is not the subject of this paper, the impact of strictly military ice-breakers is intended to demonstrate that the use of technology for the use of only one government department will minimize the impact of the use of that technology. A recent Senate report reiterated this point when it stated: "This policy is going to amount to a hoax if thousands of miles of Canadian coastline is left unguarded."[100] The report went on to suggest that the coast guard should get Unmanned Aerial Vehicles (UAV) to improve surveillance, in fact, the coast guard recently spent 100 hours monitoring shipping in the Arctic using a Dash 7 aircraft. The coast guard listed the following sobering statistics: "In 2005, there were six ships or spills reported…in '04, we had 11. Half of those cases were sort of a mystery, where we could not trace it back to a polluter."[101] If the Northwest Passage does open up and traffic increases, 100 hours flying in one location, over the vast area of the Arctic, is obviously not sufficient to ensure the kind of complete control required for the government to meet the legal test for historic title. Therefore, the conclusion is that Canada needs to consider Arctic sovereignty and the procurement of technology to

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http://antarcticsun.usap.gov/oldissues2003-2004/Sun020104/documents/pdf/020104antarcticsun.pdf; Internet, accessed 14 April 2007, 1.

[100] Senate of Canada, Standing Committee on National Security and Defence, *Canadian Security Guide Book, 2007 Edition – Coasts*, March 2007, 1-11.

[101] CBC News, "Feds to Patrol Arctic Waters for Polluters," Available from http://www.cbc.ca/canada/north/story/2006/08/09/pollution-arctic-surveillance.html; Internet; accessed 12 April 2007.

support that sovereignty from more than just a military perspective. There must be a sharing of responsibilities with other government departments.

It is possible that the government feels compelled to seek the path of least resistance. The choice of the military ice-breaker might reflect the fact that the military has a large discretionary budget and therefore represents the simplest fiscal solution to the problem of paying for Arctic sovereignty.[102] Unfortunately, this makes implementing a coordinated and far reaching sovereignty program difficult or impossible. In June 2000, the Canadian Minister of National Defence commissioned a Canadian Forces study regarding Arctic capabilities.[103] This paper was specifically intended to look at what military and other government departments (OGD) needed to enhance Arctic sovereignty. The Arctic Security Inter-departmental Working Group (ASIWG) identified a number of agencies that had interest in Arctic sovereignty and who had a key role to play in establishing and improving control of the Artic. The following government departments were specifically identified.

- **Environment Canada (EC)** with responsibilities for the environment, ice services, RADARSAT[discussed in chapter 5], and mapping, with just 7 officers;
- **Royal Canadian Mounted Police (RCMP)** is responsible for police services with 57 detachments and 380 personnel especially active in

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[102] Department of National Defence, *2007-2008 Estimates Part I The Government Expense Plan*, (Ottawa: Canada Treasury Board Secretariat, 2007), Part 1-24 [Government on Line]; available from http://www.tbs-sct.gc.ca/est-pre/20072008/me-bd/part1/me-001_e.pdf; Internet, accessed 28 April 2007.

[103] This study has been used as source material for most of the information regarding government department roles in the North. See Department of National Defence, 1948-3-CC4C (DGSP)…, 1-26.

support of diamond mine security and drug awareness and other social programs;

- **Fisheries and Oceans Canada - Canadian Coast Guard (CCG) and the Canadian Hydrographic Service (HDS)**, the CCG is responsible for search and rescue response, ice-breaking, navigation aids, sealift services, radio communications services, Northern Canada Traffic Regulation System (NORDREG), as well as, understandings with Citizenship and Immigration and the territorial governments regarding illegal immigration and oil spill response. The CHS is responsible for digital nautical charts and general underwater services;[104]
- **Citizenship and Immigration (CIC)** while the North is not a normal port of entry for immigrants, of the approximately 200,000 immigrants each year 150 arrive via the north yet CIC has only one full time officer and there is a concern that this vulnerability could be exploited;
- **Canadian Security and Intelligence Service (CSIS)** has no facilities in the North, they are responsible for security clearances for federal employees and while not stated, might retain a need-to-know for intelligence gathered through surveillance activities in the North;

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[104] Fisheries and Oceans Canada, *Nautical Charts Protect Lives, Property and the Marine Environment*, (Ottawa: Canadian Hydrographic Service, 2007); available from http://www.charts.gc.ca/pub/en/default.asp; Internet; accessed 29 April 2007.

- **Transport Canada (TC)** is responsible for AWPPA and safe shipping, responsible for ensuring safe air service and minimization of environmental impacts of transportations accidents;
- **Canada Customs and Revenue Agency (CCRA)** is responsible for posts of entry especially for air traffic refuelling during transit between Europe and North America and for cruise ship activity. The RCMP and military personnel at Alert provide additional support for CCRA;
- **Indian Affairs and Northern Development (DIAND) now Indian and Northern Affairs (INAC)** is mainly focused on development although they do report on suspicious activities as they travel extensively;
- **Natural Resources Canada (NR Can)** carries out extensive research into the Arctic including operation of sensor networks, and
- **Foreign Affairs and International Trade (DFAIT) now known as Foreign Affairs Canada (FAC)** has its main interest is in the Arctic Council and in relations with the US, Denmark and Russia. The policy framework "The Northern Dimension of Canada's Foreign Policy." Offers a number of options for promoting and protecting "…northern interests, starting with the preservation of the fragile ecology of the North.

Surveillance, enforcement of laws and regulations, and the coordination of emergency-preparedness systems will be critical;"[105]

All of these departments are already integrated to some degree in the performance of their duties, with Memoranda of Understanding (MOUs) used to apportion the work to maximize efficiency and avoid duplication. A good example of this is the effort between FAC (previously known as DFAIT), NR Can, and Fisheries and Oceans Canada to define the outer limits of Canada's polar continental shelf. As can be seen from figure 3, the delineation of these additional continental shelves in the Arctic and in the Atlantic Oceans will result in considerable increase to the sea bed, which falls under Canadian jurisdiction. This is also an international effort being carried out in conjunction with Denmark and in accordance with the United Nations Commission on the Limits of the Continental Shelf. Canada's submission is due in 2013.

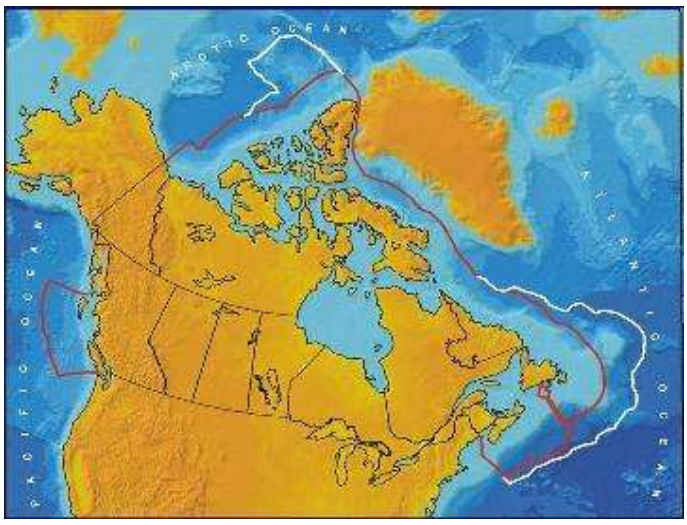

Figure 3: Government of Canada extension to the Continental shelf[106]

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[105] Foreign Affairs and International Trade, *The Northern Dimension of Canada's Foreign Policy,* (Ottawa: DFAIT Canada, 2000), 6-7.

This continental shelf effort has two points of interest. The first has already been mentioned; it is the fact that government departments already work closely together in the North. This is worthy of repetition because it shows that there are not enough resources to permit any single government department to go it alone, and demonstrates that at least a rudimentary pattern of cooperation has already been established, including the formation of the ASIWG. Therefore creating a northern strategy that straddles departments and provides an integrated capital solution to common problems in the Arctic would not be a serious hurdle. The second point is that Canada is quietly adding to the area of water under its control. This highlights the benefits of slowly building the case for sovereignty, but also raises a caution of the potential pitfalls of not demonstrating sufficient control. If Canada were to push too far, without corresponding Westphalian or international legal authority, it is conceivable that the underpinnings might come undone. This would be particularly true in an environment of increased international pressure for resources, always keeping in mind that international law is always changing. It could just as easily change against Canada as it has changed in Canada's favour to date especially if other countries have agendas that are working against us. It is for this reason, that cooperation with the US and Denmark is so important. If they are competing with us and in disagreement, particularly the US then, more than anything else, our positions internationally are weakened due to the perceptions. To draw on the quote from US policy regarding their lack of support for

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[106] Foreign Affairs and International Trade, "Canada in the World: Canadian International Policy: Defining Canada's Extended Continental Shelf," *DFAIT Canada and the World web page*, available from http://geo.international.gc.ca/cip-pic/geo/defining_cs-en.asp; Internet; accessed 28 April 2007.

Canada's Arctic claims if Canada's closest ally who has very similar claims in the Arctic does not agree with us, then other countries, that may wish to exploit offshore resources, will have more grounds for challenge. Here again, control of the northern sea and land is critical to bolstering any claim, whether it is a cooperative defence arrangement with the US or an adversarial relationship with Russia or China.

When Prime Minister Harper announced that three new polar icebreakers would be built, there was a general appreciation that progress would be made. The Federal budget has been doing much better but other priorities have since intervened and there has since been little mention of icebreakers. The same is true of the new Arctic sensor system, or the Iqaluit docking facility, and the promised new aircraft for northern transport and search and rescue has been delayed. There have been no concrete plans to establishing the Arctic Army training centre.[107] As mentioned earlier this is a typical pattern for government solutions to arctic sovereignty in the north, the cost, and the fact that it is not a centrally funded and coordinated, mean that these well intentioned projects are lost in the overall departmental fiscal realities. This was the purpose of discussing the implementation of a national rail system in the 1800s. It was this defence, economic and communications project that knitted Canada together during and after confederation and it is this type of visionary project that is needed in the North.

While it is not the purpose of this paper to rationalize expenditures for sovereignty in the north, a general sense for the purpose of sovereignty helps to guide the understanding of potential uses of technology. Patriotism and national unity are

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[107] Graham Fraser, "Arctic Defense," *Toronto Star,* 19 August 2006.

important concepts, but when it comes to spending money on Arctic icebreakers for the military, the benefit to Canadian society must be balanced against the benefit of health care, or education. It is not the purpose of this paper to make the business case for how much to spend, but as stated earlier even small expenditures, like the $1 million for the Arctic patrol has great impact on sovereignty claims. Of course the fact that a single patrol costs that much is indicative of the potentially huge costs involved. In simple terms the rationale for spending money on sovereignty is the potential for return on investment. Consolidating and expanding Canadian claims in the Arctic would secure Canada's energy and financial future. The US geological survey has estimated that approximately 25% of global oil reserves are located in the Arctic, not all of this is in the Canadian Arctic, but every dollar spent on arctic sovereignty promises to be returned with interest as worldwide demand for oil is expected to surge by as much as 50% over the next 25 years.[108] The Australians spend $100 million on Antarctic sovereignty annually and have a much more competitive environment for sovereignty claims with over 26 countries claiming parts of the subcontinent. They are also much more physically removed from their claims and have similar rationale for defending their oil interests.[109] The speculation in Australia is that $100 million is not enough, how much is enough would be the subject of another thesis.

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[108] Steve Hargreaves, "The Arctic: Oil's Last Frontier," CNNMoney.com, 25 October 2006; available from http://money.cnn.com/2006/09/27/news/economy/arctic_drilling/index.htm; Internet, accessed 5 April 2007.

[109] Sunday Mail, "Australia 'can't defend' Antarctic Oil," 05 April 2007; available from http://www.news.com.au./sundaymail/story/0,,21509033-5003402,00.html; Internet; accessed 28 April 2007.

CHAPTER 5 – TECHNOLOGY REVIEW

At the time of Confederation, the concept of using rail lines for defence was considered cutting edge technology. Interestingly, Canada is poised at a similar point in history. Remote vehicles, advanced sensors are all technologies with tremendous potential as will be discussed in this paper. There are a great many technological solutions that can be applied to the enhancement of Canadian sovereignty. Rather than attempt to analyse everything, a sampling of technology will highlight how the needs of a broad variety of needs can be satisfied by a more finite number of technology areas. Based on the sovereignty analysis, there are three areas where technology can have the most dramatic impact: Control, science, and infrastructure. Further vignettes of how a technology could meet three specific interest areas will demonstrate the impact that technology can have. These vignettes will fall into: space and airborne assets as well as radars, land based technology, and subsurface assets. Surface assets like armed ice breakers will not be covered, as the debate over Arctic icebreakers is mature and has already been commented on above.[110]

The US Navy has carried out a study of requirements for their role in an ice-free Arctic. The various scenarios or vignettes include drug trafficking, maritime interdiction for illegal aliens, missile defence, terrorist activities, conflict with China involving the Chinese disrupting traffic in the Bering sea to prevent passage of US warships. The

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[110] The utility of armed icebreakers used solely for military purposes does not fit the mould of close cooperation that has emerged from this paper. So while sea surface vessels will undoubtedly form part of an arctic sovereignty investment, it will not be dealt with here. See Senate of Canada, Standing Committee on National Security and Defence, *Canadian Security…,* 1-11.

primary conclusion of their study was that while an ice-free Arctic was perhaps decades away, priorities elsewhere in the world could conspire to prevent the build-up and development of sufficient capabilities to deal with the Arctic security environment in the future. The US Navy concluded, "…U.S. Naval operational missions in the Arctic, and related requirements, must be identified in the nearer term to ensure that the necessary operational capabilities exist when the future Arctic missions do present themselves."[111] So even though the US possesses greater resources they recognize two important factors. That there is a relatively urgent need to start addressing the security needs in the arctic, and that it will be challenging to meet the security needs. This lends credence to the hypothesis that the US might be interested in sharing security and control functions in the artic.

It is not intended that this section provide a definitive roadmap for the implementation of a federal capital procurement plan, but when taken within the context of sovereignty claims, it highlights the need to coordinate such procurement to meet the greater needs of state sovereignty and serves to capture and coalesce existing ideas on the sharing of information. An immediate investment in technology will enable Canada to consolidate its claims to the Arctic now and be ready to adapt to changes in the environment when they do happen.

To set the stage for this analysis, recall that there are three areas of sovereignty interest: control, science and infrastructure. These three areas of interest provide

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[111] United States, Department of Defence Office of Naval Research, *Naval Operations in an Ice-free Arctic*, Symposium 17-18 April 2001(Suitland, MD: Whitney, Bradley & Brown, Inc., 2001), 6.

enhancements to domestic and interdependent sovereignty and then by extension enhance international legal and Westphalian sovereignty. Analyzing the effects of global warming is so high on the international scientific agenda that the synergy discussed earlier between Canada and the US to share the costs of controlling Arctic waters could also be achieved in sharing the cost with the international and national scientific and industrial sectors. Consider project Damocles that is intended to provide satellite to ocean floor coverage of changes to the Arctic. The measurement of ocean "fluxes" is critical to understanding the effects of global warming on the European climate. The purpose of figure 5, shown below, is to demonstrate the similarity between this requirement expressed by scientists and the diagram presented by the US Navy in Figure 6. If anything, the scientific model is more ambitious and it is entirely possible that both are developing the same technology to solve what are obviously very similar issues. What is even more interesting is that the scientists identify six "choke points" that permit them to measure the water flowing through the straits.[112] Essentially, by focusing their surveillance in these places, they are able to sample all of the water moving through the Artic Archipelago. The Canadian military would have to do the same thing to make sure it caught all ships moving through the waters.

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[112] H. Melling, "Fluxes Through the Northern Canadian Arctic Archipelago," *Arctic / Subarctic Ocean Fluxes Newsletter*, Issue no. 2 (March 2004), 3-4.

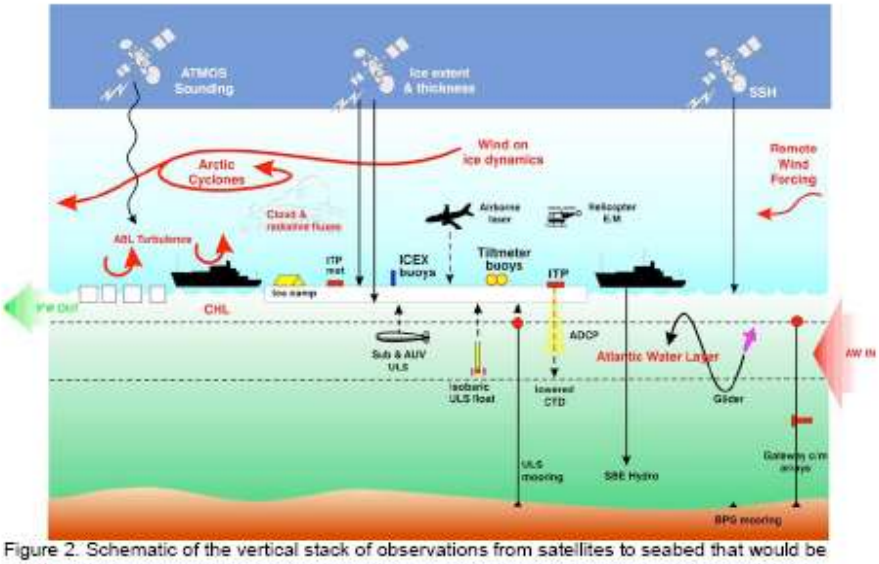

Figure 2. Schematic of the vertical stack of observations from satellites to seabed that would be necessary to inform an iAOOS study focused on the present state and future fate of the Arctic perennial sea-ice.

Figure 4: Vision of Scientific coverage for analysis of climate change.[113]

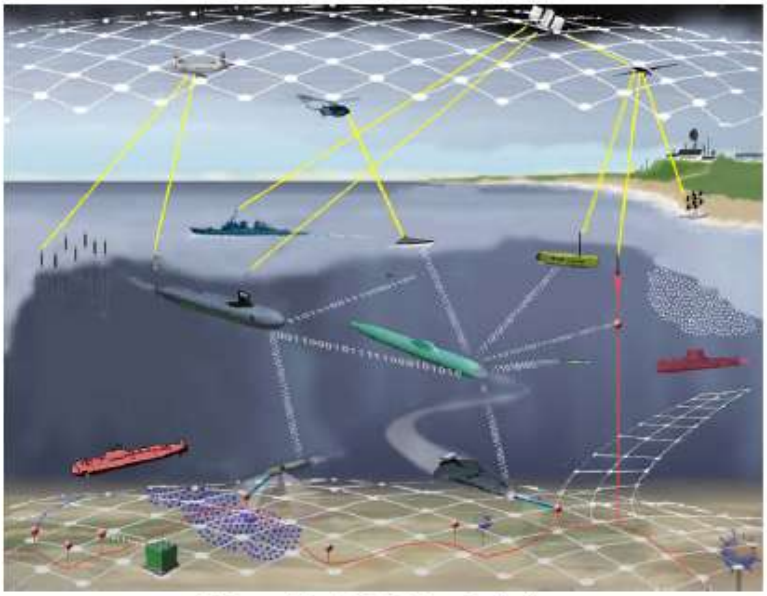

Figure 4-8. FORCEnet in Action

Figure 5: Vision of US Navy coverage for control of the Arctic.[114]

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[113] Arctic / Sub-Arctic Ocean Fluxes (ASOF) International Scientific Steering Group. *Draft Report of the 5th meeting of ASOF* (Villefranche sur mer, France, November 2005), 15-16.

Vignette 1 – Space, Airborne and radar.

Of the problems in the Arctic, communications is perhaps the greatest. The distances are great, most satellites are in a polar orbit and solar flare activities that make northern lights so attractive to tourist, cause problems for normal radio wave communications.[115] Communications is important to the residents of the Arctic but it would also be important for remote sensors that can't transmit their information automatically and must be retrieved. The military must be able to track objects to find people who are lost or in distress, to detect and identify ships that are not in compliance with Canadian regulations. The Canadian radar satellite called RADARSAT 2 recently put into polar orbit, is providing outstanding imagery and information about earth. The Ultra-Fine beam mode (3m resolution) on RADARSAT-2 will improve ship detection and in combination with quad-pol data offers the potential for ship classification. [116] It will also be possible to detect and track moving objects, which has obvious benefits to the military for control of activities in the north.[117] RADARSAT 2 is also involved in disaster planning experiments, helping to detect and track icebergs potentially providing

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[114] United States, Department of Defence Office of Naval Research…, 9.

[115] Institute of the North. *Workshop Report to the Arctic Council Information and Communication Technology (ICT) Conference: Closing the Digital Abyss: Options for Arctic Telecom* (Akureyri, Iceland, October 2003); available from http://www.arctic-council.org/Meetings/SAO/2003%20Sv/InfrastructureCITF071003-FINAL2.pdf; Internet; accessed 20 March 2007; and University of Calgary, "Radio-wave and Alternative Communications in the Arctic," http://pubs.aina.ucalgary.ca/arctic/Arctic15-3-224.pdf; Internet; accessed 5 June 2007.

[116] MacDonald, Dettwiler and Associates Ltd., "RADARSAT 2 Marine Surveillance," http://www.radarsat2.info/application/marine/index.asp; Internet, accessed 22 March 2007.

[117] Ibid.

the ability to assist with transportation and navigation through ice infested waters. A number of years ago a commercial constellation of satellites was launched into polar low earth orbit. The original company went bankrupt when cell phones replaced satellite phones for the provision of ubiquitous wireless coverage in the south. Geostationary satellites do not provide coverage north of 66 degrees due to the curvature of the earth.[118] Iridium solved this by having small satellites in low orbit and permitting them to transmit data one to the other. Like RADARSAT 2, they orbit from pole to pole and so as the earth rotates, they provide global coverage. Currently, as indicated above, there is insufficient numbers to meet the growing needs for the north. Here is a technology that can meet civilian needs and also military and scientific, by permitting constant or near constant communications with remote sensors. A new constellation of satellites to service the north could be put in place using land claims business arrangements further benefiting the governance and hence, authority of the Government.[119] Other agencies and countries are working on systems for monitoring the north for example ICESAT from NASA, a satellite that researchers use to measure and track ice flows in the arctic, but which could be used to assist navigation.[120] Canada and the National Research Council working with Raytheon developed this short range, 500 mile, HF Super Dual Auroral Radar Network. Activating the system would require the government to allocate some of

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[118] Department of National Defence, *Experiment Military Report IISRA 2004-01 Atlantic Littoral ISR Experiment (ALIX)* (Ottawa: Canada Canadian Forces Experimentation Centre, 2004), 135.

[119] National Contingency Planning Group, "Canadian Infrastructures and their Dependencies," (Ottawa: March 2000), 5-6.

[120] United States, National Space Administration, "ICEsat's Lasers Measure Ice, Clouds And Land Elevations," http://www.nasa.gov/centers/goddard/news/topstroty/2003/1209icesat.html; Internet; accessed 13 March 2007.

the HF frequency bands to the radar and away from civilian use, but this would have less impact in the Arctic where there is less use of radio frequencies. It has been successfully implemented in Australia and on the coast of California. These radars operate at low power mainly for study of the ionosphere, the sun's corona and meteorites.[121] They can also measure ocean currents, at the same time as a missile travelling through the ionosphere could be tracked, and obviously the system could be used to track ship traffic.[122]

Canada's National Research Council (NRC) was also working on a high frequency, over the horizon radar with Raytheon. They proposed to combine tethered balloons or near space Unmanned Aerial Vehicles (UAVs) with an Automated Identification System (AIS) transceiver. Installing one of these devises in the UAV used during the DND Atlantic Littoral Experiment (ALIX) trials enabled the exercise to track an phenominal number of ships and focus on the few unknown ships that needed to be intercepted.[123]

A similar type of radar that would be of interest is the Australian Jindalee Operational Radar Network (JORN) over-the-horizon radar that shows promise. It is another HF radar that uses the ionosphere to bounce signals out to over to three

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[121] School of Engineering & Mathematical Sciences, "Tasman International Geospace Environment Radars," http://www.tiger.latrobe.edu.au/; Internet; accessed 15 March 2007.

[122] John F. Vesecky, *HF Radar Instrumentation for Coastal Air-Sea Interaction Measurements*, Prepared for the Electrical Engineering Department, University of California at Santa Cruz; available from http://www.onr.navy.mil/sci_tech/32/reports/docs/po/04/rsvesec3.pdf; Internet; accessed 16 March 2006.

[123] Department of National Defence, *Experiment Military Report IISRA 2004-01 Atlantic Littoral ISR Experiment (ALIX)* (Ottawa: Canada Canadian Forces Experimentation Centre, 2004), 152.

Kilometres long, obviously the Arctic might suit this type of radar quite well.[124] The Australian solution requires up to 80 kms between the transmitter and receiver. The Australian sites are located in remote desert locations, as they need a great deal of space. Allocation of the HF frequency band will not be a comfortable fit for the government but would be in the interest of sovereignty and as shown in figure two sites could cover the majority of the Arctic. A third radar, possibly in Churchill, might provide near complete coverage.

Figure 6: Australian over the horizon radar coverage for Canada.[125]

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[124] Australian Department of Defence, "No. 1 Radar Surveillance Unit," available from http://www.defence.gov.au/raaf/organisation/info_on/units/1_rsu/index.htm; Internet; accessed 12 March 2007.

[125] The map has been modified using Microsoft Power Point and a scaled coverage area indicative of the areas that could be covered by this system. It is important to note that solar flare activity would interfere with the coverage area, but would also provide scientists with the ability to study the flares in much greater detail than ever before. Therefore the coverage for military purposes would be less than perfect. See "*Canada*." Online Map/Still, [Encyclopædia Britannica Online]; available from http://www.britannica.com/ebi/art-62285?articleTypeId=1; Internet, accessed 17 April 2007.

NRC's trials of HF radar used an AIS system proposed for tethered balloons or near space vehicles. The Alfred-Wegener-Institut for Polar research in Potsdam Germany announced that a major survey of Arctic ice will be undertaken using a Zeppelin. This once again shows the great potential for sharing of capabilities and costs not only between sovereignty strengthening functions, government departments and the scientific community but also with other countries and with industry.[126]

Vignette 2 – Land Based.

This vignette postulates the potential use of unmanned surface vehicles and a number of corresponding potential uses. US National Aerospace Administration (NASA) is using the Arctic to carry out training for Mars missions.[127] The cold dry climate and Arctic topography was perfect. At the same time, the European Space agency was considering a Canadian firm to design and build a Martian rover and the Canadian Government decided not to support the initiative.[128] There are greenhouse gases escaping from the tundra "Gas Hydrates, strange ice like substances that trap methane – the

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[126] Alfred Wegner Institute, "By Airship to the North Pole – Zeppelin Expedition will Survey Sea Ice in the Arctic," http://www.awi.de/en/news/press_releases/detail/item/per_luftschiff_zum_nordpol_zeppelinexpedition_soll_meereis_der_arktis_vermessen/; Internet; accessed 10 April 2007.

[127] United States, National Space Administration, "Arctic Mars Analog Svalbard Expedition (AMASE) 2006**,"** http://www.astrobiology.com/news/viewsr.html?pid=21637; Internet; accessed 22 March 2007.

[128] Editorial, Technology and Science, "Ottawa won't back Canadian-built Mars Rover," *CBC News*, 14 December 2006; available from http://www.cbc.ca/technology/story/2006/12/14/mars-rover.html; Internet; accessed 20 March 2007.

primary component of natural gas."[129] As reported on the television show *Nature*, "…as the permafrost melts in Northern Siberia… carbon sequestered and buried there since the Pleistocene era is bubbling up to the surface… and into the atmosphere as methane, a greenhouse gas 20 times more potent than carbon dioxide."[130] These hydrates are in the tundra and they represent a potentially huge source of natural gas, or they may simply melt and escape into the atmosphere resulting in greatly accelerated global warming. Therefore, the scientific value of regular monitoring of the Tundra in the Canadian Arctic would be highly beneficial. Rovers with communications relays for search and rescue or to provide emergency communications is required. They would act to enhance the presence of real patrols by providing a more permanent presence. With the discovery of diamonds in the north, other minerals are being discovered. Mining exploration could also be a lucrative addition to the duties of an Arctic rover or an aerial UAV.[131] There are also various scientific studies requiring soil samples, ice core samples, the list is very long. This would provide Canadian industry with practical experience and the scientific community with valuable data on climate change and providing the Canadian military with the capability of patrolling the Arctic in a cost effective manner. Rover contacts could be interdicted with military aircraft rather than having to conduct patrols on the chance of spotting something. Therefore, if the Government were to invest in Canadian

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[129] Richard A. Lovett, "Deep Sea, Arctic May Hold World's Largest Fuel Supply, Experts Say," *National Geographic News*; available from http://news.national geographic.com.new/2007/03/070307-energy-methane.html; Internet, accessed 7 March 2007.

[130] Science Daily, "Greenhouse Gas Bubbling From Melting Permafrost Feeds Climate Warming," 7 September 2006; http://www.sciencedaily.com/releases/2006/09/060907102808.htm; Internet, accessed 12 April 2006.

[131] Warren Williams and Michael Harris, "Determination of the Operational Effectiveness of UAV's for Mining Exploration," (Mawson Lakes: University of South Australia, 2003), 1-7.

industry to develop unattended Mars style rovers to patrol the Arctic collecting scientific data and assisting northern residences it would have a beneficial effect on sovereignty, through control, science and support to northern citizens.

Vignette 3 – Subsurface.

The Placentia Bay Technology Demonstration Platform, Oceans technology Network was founded to study and implement oceanographic technology.[132] One of the key ways foreign governments have of subtly flaunting Canadian sovereignty in the north is by sailing a nuclear submarine through territorial waters and under the ice. With normal submarine technology, there are few options for engaging such an adversary. The use of unmanned underwater vehicles has been ongoing for some time. The torpedo being but a crude example to emphasize that this technology has been around for some time. Imagine a fleet of underwater vehicles patrolling the Arctic straits in a geometric formation like a school of fish. Mine sweeping duties or gather data or conduct surveillance, this could include the latest information on submarines passing through or it could be used to provide salinity and other information of use to various scientific communities. In exchange information from scientific buoys could be used to support control activities.[133]

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[132] Government of Canada, Fisheries and Oceans Department, "Canada's Oceans Action Plan," available from: http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/oap-pao/page06_e.asp; Internet, accessed on 28 April 2007.

[133] *Science Daily*, "University of Idaho Research Allows Autonomous Vehicles To Team Underwater, On Land And In Sky," 15 October 2004; http://www.sciencedaily.com/releases/2004/10/041014090134.htm; Internet; accessed 12 April 2007.

Areas for Cooperation

The US is spending a great deal of money on Arctic surveillance, especially in the area of underwater vehicles.[134] However, the expenditures in Iraq seem to be limiting how much or how quickly they can build up. Therefore, it is likely that the US could be amenable to an expansion of the cooperative defence arrangements that already exist.

Recently, Canada and Denmark have found reasons to cooperate regarding the north. The first is to finish a study and mapping project of the continental shelf to submit their claims to the newer limits proposed in the *UNCLOS*. Further, on the scientific front Danish and Canadian Scientists are setting up a weather station on Hans Island, which is a prime location to study weather and ice flows; but also represent progress on the diplomatic front to addressing conflicting claims. Cooperation between Canada, the US and Denmark will help in resolving the internationally disputed boundaries before other nations start to press for rights. Pooling of research and resources may also permit an exponential growth in Arctic capabilities and improvements in sovereignty claims.

CONCLUSION

In 2004, Senator Forestall commented in the Senate "When will the government make its presence known in Canadian waters, whatever their state of fluidity may be? When will the government protect the sovereignty of Canada in the North?"[135]

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[134] United States, Department of the Navy, "The Navy Unmanned Undersea Vehicle (UUV) Master Plan," (Washington DC: U.S. Government Printing Office, November 9, 2004) available from http://www.navy.mil/navydata/technology/uuvmp.pdf; Internet, accessed 14 April 2007, 64, 67, 68, 71.

[135] Senate of Canada, Debates of the Senate (Hansard) 1st Session, 38th Parliament, *The Honourable Shirley Maheu Speaker pro tempore*, Volume 142, Issue 17, Tuesday, November 23, 2004;

Sir John A. Macdonald commented on the trans-Canada railway: "Until this great work is complete, our dominion is little more than a geographical expression."[136] This great Canadian statesman recognized that words and intentions are insufficient grounds on which to form a state. Until the railway was in place and physically permitting Canada to function as a state in fact the dominion of Canada was no more that an academic expression on the map. In general terms, the government is making the correct policy moves to enhance and expand sovereignty. What seems to be lacking is a more broad based, focus on control, science and infrastructure. There should be a clear and total linkage across departments as to how various programs impact overall control of Interdependence and Domestic sovereignty. The degree to which Canadian governmental agencies are able to control the flow of persons and ships within and across its borders determines their level of interdependence sovereignty, which in turn influences the other modes of sovereignty. To quote from the *Arctic Capability Study*, "Several government departments and agencies have personnel and conduct tasks throughout the north. There is now no formal means of centrally collecting and collating the information obtained… sharing of information offers the best opportunity to increase awareness of activity in the North." [137]

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available from http://www.parl.gc.ca/38/1/parlbus/chambus/senate/deb-e/017db_2004-11-23-E.htm?Language=E&Parl=38&Ses=1, Internet; accessed 18 March 2006.

[136] CBC news broadcast archives, "Nation Building: The Transnational Railway," 2 April 1978; http://archives.cbc.ca/IDC-1-73-1456-9692/politics_economy/john_a_macdonald/clip5; Internet, accessed 10 March 2007.

[137] Department of National Defence, 1948-3-CC4C (DGSP) …, 12.

The Government has focused its capital procurement efforts on large, single department projects that offer panacea solutions. The armed ice breakers for the military is a prime example. While this is a positive step forward in and of itself, based on past history, there is a good chance that it will not come to fruition and it does not go far enough to express the needs of the spectrum of sovereignty requirements. From the ICJ ruling between Denmark and Norway regarding ownership of Greenland, we know the value of state sponsored control, scientific research, and governance. Based on the fact that federal government departments tend to work together in the North, it may not be difficult to develop a more coordinated approach to sovereignty. This pooling of technology in support of all the departments will have a considerable effect even it if only means that some technology is approved for use, rather than the mode of doomed mega projects like the Polar 8 or the Canadian nuclear submarine project.

Canada's claim of historic title to the Arctic archipelago water causes trouble with its neighbour and prime trading partner. The US cannot agree, or be seen to agree, with Canada in the context of international straits and historic waters due to the precedent that this would set in more troubled areas of the world. However, an analysis of the sovereignty claim revealed that Canada's claim to historic title was not entirely valid or has been significantly contested. Although, it could be strengthened by enhancements to control of the arctic as long as one country disputes that status, it can't be proven. When Canada's claim is examined strictly on the basis of Archipelagic state rights, Canada's claim seems much stronger, although it would be required to grant archipelago sea-lane passage to all nations. This passage right provides only slightly less rights than for transit passage does under international strait status, but more than the basic innocent passage.

The important issue for the US is the ability for military vessels to transit the arctic in the normal mode of operations. Since the US has accepted archipelagic claims in other areas, this arrangement might be appealing. If it were included with an offer to share the burden of extending the NORAD concept to include the sea-lanes, it might help both countries to afford the investment in technology. Finally, the scientific community is investing a great deal of intellectual and monetary capital in monitoring the Arctic Ocean. Both the military and the scientific community have almost identical concepts for how to deliver. Therefore, with the extensive potentials for cooperation and the clear impact that technology can play in any cooperative arrangements there is a great deal of potential to move the case of Canadian sovereignty forward.

Bibliography

Alfred Wegner Institute. "By Airship to the North Pole – Zeppelin Expedition will Survey Sea Ice in the Arctic." http://www.awi.de/en/news/press_releases/detail/item/per_luftschiff_zum_nordpol_zeppelinexpedition_soll_meereis_der_arktis_vermessen/; Internet; accessed 10 April 2007.

Arctic / Sub-Arctic Ocean Fluxes (ASOF) International Scientific Steering Group. *Draft Report of the 5th meeting of ASOF*. Villefranche sur mer, France, November 2005.

Aust, Anthony. *Handbook of International Law*. Cambridge: Cambridge University Press, 2005.

Australian Department of Defence. "No. 1 Radar Surveillance Unit." available from http://www.defence.gov.au/raaf/organisation/info_on/units/1_rsu/index.htm; Internet; accessed 12 March 2007.

Bankes, N.D. "Forty Years of Canadian Sovereignty Assertion in the Arctic, 1947-87." *Arctic* Volume 40, no. 4 (December 1987): 285-291.

Beltrame, J., A. Phillips, B. Came and F. Weir. "Worrying About Missile Defence." *Maclean's Magazine*, March 5, 2001, 28.

Calamai, Peter. "Canada helps kick off Polar Year: Canadian researches are raring to book time on icebreakers, now that cheques are finally in the mail." *Toronto Star*, 02 March 2007; available from http://www.thestar.com/News/article/187468; Internet; accessed 21 March 2007.

Caldwell, Nathaniel French. *Arctic Leverage: Canadian Sovereignty and Security*. New York: Greenwood Publishing Group, Inc., 1990.

Canada. House of Commons. Standing Senate Committee on National Security and Defence. *Managing Turmoil: The Need to Upgrade Canadian Foreign Aid and Military Strength to Deal with Massive Change*. October 2006.

Canada. Office of the Judge Advocate General. "United Nations Convention on the Law of the Sea – 1994." In *Collection of Documents on the Law of Armed Conflict*. 2005 ed. Edited by the Directorate of Law Training 262-280. Ottawa: DND 2005.

"*Canada*." Online Map/Still, [Encyclopædia Britannica Online] available from http://www.britannica.com/ebi/art-62285?articleTypeId=1; Internet, accessed 17 April 2007.

Canadian American Strategic Review. "Denmark's Arctic Assets and Canada's Response – Sovereignty and Strategic Resources of the High Arctic." http://www.sfu.ca/casr/id-arcticviking.htm; Internet; accessed 24 March 2007.

Carnaghan, Matthew and Allison Goody. "Canadian Arctic Sovereignty." Political and Social Affairs Division, 26 January 2006; available from http://www.parl.gc.ca/information/library/PRBpubs/prb0561-e.htm#Defining,; Internet; accessed 22 March 2007.

CBC news broadcast archives. "Nation Building: The Transnational Railway." 2 April 1978; http://archives.cbc.ca/IDC-1-73-1456-9692/politics_economy/john_a_macdonald/clip5; Internet, accessed 10 March 2007.

Charron, Andrea. "The Northwest Passage in Context." *Canadian Military Journal* Volume 6, no. 4 (Winter 2005 – 2006): 41-48.

Conservative Party of Canada. "Stand up for Canada, Federal Election Platform, 2006." available from http://www.conservative.ca/media/20060113-Platform.pdf; Internet; accessed 22 Mar 2007.

Department of Justice Canada. "Constitution Acts, 1867 to 1982." http://www.laws.justice.gc.ca/en/const/index.html; Internet; accessed 8 April 2007.

Department of National Defence. 1948-3-CC4C (DGSP) *Arctic Capabilities Study*. Ottawa: DND Canada, June 2000. available from http://www.natice.noaa.gov/icefree/Arctic%20Study%20Final%20-%20Canada1.pdf; Internet; accessed 22 March 2007.

Department of National Defence. *2007-2008 Estimates Part I The Government Expense Plan*, Ottawa: Canada Treasury Board Secretariat, 2007. Part 1-24 [Government on Line]; available from http://www.tbs-sct.gc.ca/est-pre/20072008/me-bd/part1/me-001_e.pdf; Internet, accessed 28 April 2007.

Department of National Defence. "Canadian Forces Patrol to Confirm Arctic Sovereignty." http://www.forces.gc.ca/site/newsroom/view_news_e.asp?id=2224; Internet; accessed 8 April 2007.

Department of National Defence. *Experiment Military Report IISRA 2004-01 Atlantic Littoral ISR Experiment (ALIX)*. Ottawa: Canada Canadian Forces Experimentation Centre, 2004.

Editorial. "Google Censors Itself for China." *BBC News UK edition*. 25 January 2006; http://news.bbc.co.uk/1/hi/technology/4645596.stm; Internet; accessed 15 April 2007.

Editorial, Technology and Science. "Ottawa won't back Canadian-built Mars Rover." *CBC News*, 14 December 2006; available from http://www.cbc.ca/technology/story/2006/12/14/mars-rover.html; Internet; accessed 20 March 2007.

Fisheries and Oceans Canada. *Nautical Charts Protect Lives, Property and the Marine Environment*. Ottawa: Canadian Hydrographic Service, 2007 available from http://www.charts.gc.ca/pub/en/default.asp; Internet; accessed 29 April 2007.

Fitzpatrick, Meagan. "Day defends Vessel Search." *Calgary Herald*, *1*2 April 2007.

Foreign Affairs and International Trade. "Canada in the World: Canadian International Policy: Defining Canada's Extended Continental Shelf." *DFAIT Canada and the World web page*, available from http://geo.international.gc.ca/cip-pic/geo/defining_cs-en.asp; Internet; accessed 28 April 2007.

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

Franckx, Erik. *Maritime Claims in the Arctic: Canadian and Russian Perspectives*. Dordrecht, the Netherlands: Martinus Hijhof Publisher, (1993): 732-738; available from http://links.jstor.org/sici?sici=0002-9300%28193310%2927%3A4%3C732%3ATCCTLS%3E2.0.CO%3B2-I; Internet; accessed 20 Mar 07.

Fraser, Graham. "Arctic Defense." *Toronto Star*, 19 August 2006.

Government of Canada. "A Northern Dimension for Canadian Foreign Policy." *Independence and Internationalism*, Chapter Ten, June 1996.

Government of Canada. "Canadian Confederation: Intercolonial Railway." Library and archives [online]; available from http://www.collectionscanada.ca/confederation/023001-2979-e.html; Internet; accessed 5 March 2007.

Government of Canada, Fisheries and Oceans Department. "Canada's Oceans Action Plan." available from: http://www.dfo-mpo.gc.ca/oceans-habitat/oceans/oap-pao/page06_e.asp; Internet, accessed on 28 April 2007.

Government of Newfoundland and Labrador. "Province welcomes Canadian Victory in Turbot War Case." News Release, 4 December 1998; available from http://releases.gov.nl.ca/releases/1998/exec/1204n01.htm; Internet; accessed 24 March 2007.

Grotius, Hugo. *The Free Sea*, edited and translated by David Armitage. Indianapolis Indiana: Liberty Fund, 2004.

Grotius, Hugo. *On the Law of War and Peace* (Indianapolis: Bobbs-Merrill, 1925), 44.

Guillory, Theodore. "Canada: The Decision to Procure Nuclear Attack Submarines and Its Significance for NATO." Master's thesis, Naval Post Graduate School Monteray CA, 1988, Abstract.

Hargreaves, Steve. "The Arctic: Oil's Last Frontier." CNNMoney.com, 25 October 2006; available from http://money.cnn.com/2006/09/27/news/economy/arctic_drilling/index.htm; Internet, accessed 5 April 2007.

Harvard Classics, the. "Alaska purchase American Historical Documents, 1000–1904." Vol. XLIII. (New York: P.F. Collier & Son, 2001) [online book source] available from http://www.bartleby.com/43/43.html; Internet; accessed 31 March 2007.

Harvard Classics. "Alaska purchase American Historical Documents, 1000–1904." Vol. XLIII. New York: P.F. Collier & Son 1909–14; Bartleby.com, 2001. On-line book source; available from http://www.bartleby.com/43/43.html; Internet; accessed 31 March 2007.

Hassol, Susan Joy. "Arctic Climate Impact Assessment." Cambridge: Press syndicate of the University of Cambridge, 2004; available from http://www.amap.no/acia/; Internet; accessed 26 Feb 2007.

Huebert, Rob. "Climate Change and Canadian Sovereignty in the Northwest Passage." *ISUMA*, *the Canadian Journal of Policy Research*, Volume 2 no. 4. Winger, 2001.

Huebert, Rob. "The Battle for the Control for Canadian Arctic Waters: Icebreakers or Patrol Vessels?" *The Dispatch Newsletter of the Canadian Defence and Foreign Affairs Institute*, Volume V, Issue I (Spring 2007); available from http://www.cdfai.org/newsletters/newsletterisspring_2007.html; Internet; accessed 28 April 2007.

Hubert, Alain. "Polar Science and investing in communications." International Polar Foundation, (6 July 2005); available from http://www.sciencepoles.org/index.php; Internet; accessed 20 March 2007.

Humphreys, Adrian. "Arctic Mission most challenging yet: military seeks to assert sovereignty by snowmobile." *National Post*, 13 March 2007.

Hutchison, Kristan. "Fighting over Fish – Antarctic Research used to Defend Fish in the Southern Ocean." *The Antarctic Sun*, 01 February 2004; available from http://antarcticsun.usap.gov/oldissues2003-2004/Sun020104/documents/pdf/020104antarcticsun.pdf; Internet, accessed 14 April 2007.

Hyde, Charles Cheney. "The Case Concerning the Legal Status of Eastern Greenland," *The American Journal of International Law*, Vol. 27, No. 4 (Oct., 1933). 732-738; available from http://links.jstor.org/; Internet; accessed 20 Mar 07.

Institute of the North. *Workshop Report to the Arctic Council Information and Communication Technology (ICT) Conference: Closing the Digital Abyss: Options for Arctic Telecom*. Akureyri, Iceland, October 2003; available from http://www.arctic-council.org/Meetings/SAO/2003%20Sv/InfrastructureCITF071003-FINAL2.pdf; Internet; accessed 20 March 2007;

Jackson, Robert H. *Quasi-states: Sovereignty, International Relations, and the Third World*. New York: Cambridge University Press, 1990.

Jia, Bing Bing. *The Regime of Straits in International Law*. Oxford: Clarenden Press, 1988.

Kenney, Gerard. "Message to America: Get out of our Arctic way." *Globe and Mail*, 9 February 2006, available from http://www.theglobeandmail.com/servlet/story/; Internet; accessed 21 March 2007.

Krasner, Stephen D. *Sovereignty: Organized Hypocrisy*. Chichester: Princeton University Press, 1999.

Lovett, Richard A. "Deep Sea, Arctic May Hold World's Largest Fuel Supply, Experts Say." *National Geographic News*; available from http://news.national geographic.com.new/2007/03/070307-energy-methane.html; Internet, accessed 7 March 2007.

MacDonald, Dettwiler and Associates Ltd.. "RADARSAT 2 Marine Surveillance." http://www.radarsat2.info/application/marine/index.asp; Internet, accessed 22 March 2007.

MacDonald, Dettwiler and Associates Ltd., "RADARSAT 2 MDA To Develop Solution That Extracts Information On Moving Objects," http://www.radarsat2.info/outreach/innews/2006/012606_mda.asp, accessed 22 March 2006.

Matthews, Gene. *The Public / Private Response to Sudden Disease Outbreak*, Report prepared for the Alfred P. Sloan Foundation. Atlanta: Centre for Disease Control Foundation, 2005.

Melling, H. "Fluxes Through the Northern Canadian Arctic Archipelago." *Arctic / Subarctic Ocean Fluxes Newsletter*, Issue no. 2 (March 2004).

National Academy of Sciences. "Polar Icebreaker Roles and U.S. Future Needs: A Preliminary Assessment." http://www.icefloe.net/docs/11525.pdf; Internet; accessed 18 April 2007.

National Contingency Planning Group. "Canadian Infrastructures and their Dependencies." (Ottawa: March 2000).

National Defence and the Canadian Forces. "Canadian Forces Patrol to Confirm Arctic Sovereignty." available from http://www.forces.gc.ca/site/newsroom/view_news_e.asp?id=2224; Internet; accessed 8 April 2007.

Ngantcha, Francis. *The Right of Innocent passage and the Evolution of International Law*. London: Pinter Publishers, 1990.

OmniTRAX Ltd. "Wall Street West, Information Pamphlet on Churchill Manitoba." http://www.omnitrax.com/news/rmnchurchillarticle.pdf; Internet; accessed 4 Feb 2007.

Pharand, Donat. *Canada's Arctic Waters in International Law*. Cambridge: Cambridge University Press, 1988.

Reynolds, Paul. "The Arctic's new gold rush," *BBC News*, 25 October 2005; available from http://news.bbc.uk/2/hi/business/4354036.stm; Internet; accessed 10 March 2007.

Rothwell, Donald. *The Polar Regions and the Development of International Law*. Cambridge: Cambridge University Press, 1996.

Schäfer, Lawrence Ivan. "Legal Aspects of Contemporary Marine Fisheries, Grotius." Brussels: Rhodes University, 1997; available from http://cdserver2.ru.ac.za/cd/011120_1/aqua/marine%20fisheries/chap2/grotius.htm, Internet; accessed 16 March 2007.

School of Engineering & Mathematical Sciences. "Tasman International Geospace Environment Radars." http://www.tiger.latrobe.edu.au/; Internet; accessed 15 March 2007.

Science Daily. "Greenhouse Gas Bubbling From Melting Permafrost Feeds Climate Warming." 7 September 2006; http://www.sciencedaily.com/releases/2006/09/060907102808.htm; Internet, accessed 12 April 2006.

Science Daily. "University of Idaho Research Allows Autonomous Vehicles To Team Underwater, On Land And In Sky." 15 October 2004; http://www.sciencedaily.com/releases/2004/10/041014090134.htm; Internet; accessed 12 April 2007.

Senate of Canada, Debates of the Senate (Hansard) 1st Session, 38th Parliament. *The Honourable Shirley Maheu Speaker pro tempore*, Volume 142, Issue 17, Tuesday, November 23, 2004; available from http://www.parl.gc.ca/38/1/parlbus/chambus/senate/deb-e/017db_2004-11-23-E.htm?Language=E&Parl=38&Ses=1, Internet; accessed 18 March 2006.

Senate of Canada, Standing Committee on National Security and Defence. *Canadian Security Guide Book, 2007 Edition – Coasts*. March 2007, 1-11.

Simon, Mary. "The Inuit Challenging World," (Address to, The Empire Club of Canada, Toronto, 15 February 2007); available from http://www.itk.ca/media/2007/press-archive-20070215.php; Internet; accessed 14 April 2007.

Slomanson, William R. *Fundamental Perspectives on International Law*. Toronto, Wadsworth, a division of Thomson Learning Inc., 2003.

Southwest Fisheries Science Center, National Oceanic and Atmospheric Administration (NOAA) Fisheries Service Antarctic Ecosystem Research Division. "Antarctic Ecosystem Research." http://swfsc.noaa.gov/textblock.aspx?id=551&ParentMenuId=42; Internet; accessed 26 Mar 07.

Spotts, Peter N. "New Search for Global Warming at Poles." *The Christian Science Monitor*, 26 Feb 2007; available from http://www.csmonitor.com/2007/0226/p03s03-wogi.htm; Internet; accessed 26 March 2007.

Standing Senate Committee on National Security and Defence. *Issue 1 – Evidence*. Ottawa: Parliament, May 8, 2006; available from http://www.parl.gc.ca/39/1/parlbus/commbus/senate/com-e/defe-e/01evb-e.htm?Language=E&Parl=39&Ses=1&comm_id=76; Internet; accessed 22 March 2007.

Statistics Canada. "Population by Year, by Province and Territory." [Statistics Canada on-line] available from http://www40.statcan.ca/l01/cst01/demo02a.htm?sdi=population; Internet; accessed 11 Mar 2007.

Strauss, Julius. "Polar thaw opens Artic Sea route." *Telegraph United Kingdom*. 4 March 2004.

Tyson, Peter. "Future of the Passage." *Nova Science Programming on Air and Online* (February 2007); available from http://www.pbs.org/wgbh/nova/arctic/passage.html; Internet; accessed on 21 March 2002.

Underwood, Jay. *Built for War: Canada's Intercolonial Railway*. Osgoode, Ontario: AGMV Marquis, 2005.

United Nations. *Charter of the United Nations, Chapter 1, Article 2 (4)*; available from http://www.un.org/aboutun/charter/chapter1.htm; Internet, accessed 24 March 2007.

United Nations General Assembly. *Human Rights Council Resolution 60/251*. New York: UN, 2007.

United States, Department of Defense, Bi-National Planning Group. *The Final Report on Canada and the United States (CANUS) Enhanced Military Cooperation*. Peterson AFB: U.S. Government Printing Office, March 13, 2006.

United States, Department of Defense. "Contract to Develop Autonomous Unmanned Sensor." 28 April, 2007; available from http://www.defenselink.mil/transformation/articles/2006-06/ta062206a.html; Internet; accessed 28 April 2007.

United States, Department of Defence, Office of Naval Research. *Naval Operations in an Ice-free Arctic*, Symposium 17-18 April 2001. Suitland, MD: Whitney, Bradley & Brown, Inc., 2001.

United States, Department of the Navy. "1999 Posture Statement, /Section I The Navy-Marine Corps Team: America's 21st Century Force." http://www.Navy.mil/navydata/policy/fromsea/pos99/pos-sec1.html; Internet; accessed; 21 April 2007.

United States, Department of the Navy. "The Navy Unmanned Undersea Vehicle (UUV) Master Plan." Washington DC: U.S. Government Printing Office, 9 November 2004; available from http://www.navy.mil/navydata/technology/uuvmp.pdf; Internet, accessed 14 April 2007.

United States, Department of State Bureau of Oceans and International Environmental and Scientific Affairs. *Limits of the Seas – No. 112 United States Responses to Excessive National Maritime Claims*. Washington, DC: U.S. Government Printing Office, 1992.

United States, Department of State. "Information Memorandum for Mr. Kissinger - The White House: Imminent Canadian Legislation on the Arctic." Washington: US Department of State, 12 March 1970; available from http://www.state.gov/r/pa/ho/frus/nixon/e1/53180.htm; Internet; accessed 18 April 2007.

United States, National Space Administration. "Arctic Mars Analog Svalbard Expedition (AMASE) 2006." http://www.astrobiology.com/news/viewsr.html?pid=21637; Internet; accessed 22 March 2007.

United States, National Space Administration. "ICEsat's Lasers Measure Ice, Clouds And Land Elevations." http://www.nasa.gov/centers/goddard/news/topstroty/2003/1209icesat.html; Internet; accessed 13 March 2007.

United States, Supreme Court. *Unites States vs California, 381 US 139*. Washington, DC: U.S. Court Forms, 1965; available from http://supreme.justia.com/us/381/139/case.html; Internet, accessed 21 Mar 2007.

University of Calgary. "Radio-wave and Alternative Communications in the Arctic." http://pubs.aina.ucalgary.ca/arctic/Arctic15-3-224.pdf; Internet; accessed 5 June 2007.

Vanderklippe, Nathan. "Crucial arctic map missing Sovereignty issue: Can Canada prove it paid Norwegian for his discovery?" *National Post*, 17 March 2007.

Vesecky, John F. *HF Radar Instrumentation for Coastal Air-Sea Interaction Measurements*. Prepared for the Electrical Engineering Department, University of California at Santa Cruz; available from http://www.onr.navy.mil/sci_tech/32/reports/docs/po/04/rsvesec3.pdf; Internet; accessed 16 March 2006.

Vongdouangchanh, Bea. "Cabinet waiting for Defence Department's 10-year Arctic military plan: O'Connor." *The Hill Times*, Eighteenth Year, no. 859, 16 October 2006.

Williams, Warren and Michael Harris. "Determination of the Operational Effectiveness of UAV's for Mining Exploration." (Mawson Lakes: University of South Australia, 2003), 1-7.

World Wild Life Fund, "Inuit Sound the Alarm in Ottawa over Escalating Arctic Climate Crisis, 5 October 2006," available from http://www.wwf.ca/NewsAndFacts/NewsRoom/default.asp?section=archive&page=display&ID=1508&lang=EN, Internet; accessed 30 March 2007.