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# THE EFFECTS OF CLIMATE CHANGE ON THE ARCTIC IMPLICATION AND CHALLENGE FOR THE CANADIAN DEFENCE STRATEGY

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# ABSTRACT

Climate change is affecting the extreme climate conditions and will change the Arctic physically. Enabled by the effects of climate change, primarily the melting ice in Canadian Arctic waters there are increasing activities in the Arctic to exploit potential opportunities. Increased maritime traffic and resource exploitation constitute new defence strategic challenges for the Government of Canada.

This persuasive essay will examine the maritime aspects of climate change on the Arctic, the increased strategic importance and its main implication and challenge for the Canadian Defence Strategy. It will argue that the main implication is the increased need for maritime sovereignty in Canada's North. Subsequently, to elaborate the challenge for the Canadian Defence Strategy, the significance and assimilation of this implication in the Canadian Arctic Defence Strategy will be examined first. Finding the implication assimilated in the 2008 Canada First Defence Strategy, the essay will, based on this stated policy, analyze its military implementation. Finally, it will recommend that the challenge for the future Canadian Defence Strategy is to close the gap between stated policy and its implementation by pro-active planning and timely allocation of resources in order to strengthen its ability to exercise maritime sovereignty in the Arctic.

# I. INTRODUCTION

Canada's Defence Strategy defines the strategic aim of its defence mission as the responsibility to "provide strategic defence and security advice to the Government of Canada [and] conduct surveillance and control of Canada's territory, airspace and maritime areas of jurisdiction."[1] Over 40% of Canadian territory and two- thirds of its coastline is comprised by Canada's 'true North' – the Arctic. Major challenges of the Arctic are its extreme climate and the vast size. This region has traditionally been icebound and inhospitable to humans most of the year. Parts of the Arctic region have only limited access for one or two month annually.[2] These extreme weather conditions make every endeavour in this environment extreme expensive and complex.

What makes the Arctic interesting from an economic perspective are potential opportunities for the use of seaways and the exploitation of mineral and natural resources.[3] Besides large diamond deposits on the Arctic landmass there are believed to be significant amounts of exploitable oil and gas resources in the Arctic region.[4] There are

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[1]Department of National Defence. *Shaping the Future of the Canadian Forces: A Strategy for 2020* (Ottawa: 1999), 2.

[2]Department of National Defence, Joint Task Force Pacific, *Arctic Environment within JTFP AOR* (Ottawa: 2008), 1.

[3]Mineral resources: Diamond deposits, mainly situated in the North West Territories, are mentioned to be the 3rd largest findings after Botswana and Russia. See Rob Huebert, "The Great White North: Renaissance in Canadian Arctic Security?" *Canadian Military Journal* 6, no.4 (Winter 2005-2006): 28; available from http://www.ccc.nps.navy.mil/rsepResources/ArcticSecurityRenaissance-Huebert-04-North1_e.pdf; Internet; accessed 22 November 2008.

[4]Natural resources: The detailed predicted amounts of oil and gas differ according to diverse sources, but in general it is said that the Arctic region supposed to hold 100 till 200 billion barrels of recoverable oil and 2000 trillion $ft^3$ of natural gas. 50 million barrels of oil may be found in the North American Arctic. Alone the Beaufort Sea there are estimated four till twelve billon barrels of commercial

"strong indications that between 25 and 40% of the world's oil and natural gas deposits lay within the Arctic region."[5] But because of the adverse climate and sea-ice only a few spots of natural resources could be exploited – up to now.

Climate change, whether caused by Global Warming or naturally occurring oscillations in the earth's geothermic state is affecting the extreme climate conditions and will change the Arctic physically within the next twenty years. Enabled by the effects of climate change, primarily the melting ice and the associated opening of the Canadian Arctic waters there are increasing activities in the Arctic to exploit the potential opportunities. Increased maritime traffic and resource exploration and exploitation constitute new strategic challenges for the Government of Canada. In order to fulfil obligations to the overall Canadian Defence Strategy, the defence mission needs to more comprehensively address security of the northern border, control and regulation of shipping, protection of natural resources, environmental degradation as well as the protection of northern inhabitants.

To examine the whole of Government approach to the Arctic Defence Issue would presuppose to analyze the tasks and responsibilities of multiple actors like Other Governmental Departments (OGD) which are combined in the Arctic Security

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recoverable oil and 13 to 63 trillion $ft^3$ of gas. In comparison, the petroleum reserves in the Mackenzie Delta and Beaufort Sea together represent 10% of Canada's total reserves. See Guy Killaby, "The Great Game in a Cold Climate: Canada's Arctic Sovereignty in Question," *Canadian Military Journal* 6, no.4 (Winter 2005-2006): 33, available from http://www.journal.forces.gc.ca/vo6/no4/north-nord-01-eng.asp; Internet; accessed 10 January 2009. See as well CNN, "Arctic thaw raises security concerns for NATO," http://www.cnn.com/2009 /WORLD/europe/01/29/arctic.global.warming.security/index.html; Internet; accessed 29 January 2009.

[5]Department of National Defence, Joint Task Force Pacific, *Arctic Environment within JTFP AOR*…, 1.

Interdepartmental Working Group (ASIWG).[6] This analysis would overcharge the limits of this paper. Nor will this paper address some of the legal challenges associated with the determination of Canada's internal and or external waterways but assumes them to be Canadian waters.[7] Consequently the deduced implications from the effects of climate change will be analysed in context to the Canadian Forces (CF) only. Moreover, the timeframe of this essay will encompass the next 20 years in order to exclude international considerations for the exploitation of the entire Arctic Ocean with the melting ice cap at the North Pole.[8] Given the projected environmental impacts of climate change on the Canadian Arctic landmass this paper will focus on the maritime impacts to the Canadian Defence Strategy.

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[6]Essential OGD in ASIWG are Environment Canada (EC: enforcement and environmental emergencies), Royal Canadian Mounted Police (RCMP: police services), Canadian Coast Guard (CCG: SAR response, icebreaking, e.a.), Transport Canada (TC: safe shipping in conformity to the Arctic Waters Pollution Prevention Act, e.a.), and Foreign Affairs and International Trade (DFAIT: northern policy objectives) just to mention a few.

[7]Fully aware that there is an ongoing discussion between Canada and other states like the U.S. whether the NWP is an International Strait used for international navigation or the various waterways of the NWP are internal waters of Canada by virtue of historic title. To meet the Definition of an international strait, the NWP has to comply with two criteria. First, the NWP has to connect two bodies of the high seas, in this case the Pacific and the Atlantic. Second, the NWP has to be an useful route navigation, and must have experienced a sufficient number of transits. The single sails of the U.S. ships "S.S. Manhattan" in 1969-1970 and "CGS Polar Bear" in 1985 are not considered to represent "international navigation". However, this paper is not to drive that discussion and further assumes the NWP as Canadian internal waters which embed the Arctic Islands given by the British Government to Canada in 1880. See Matthew Carnaghan and Allison Goody, *Canadian Arctic Sovereignty* (Ottawa, ON: Library of Parliament, 26 January 2006), 7, available from http://www.parl.gc.ca/information/library/PRBpubs/prb0561-e.htm; Internet; accessed 10 January 2009.

[8]According to current estimations the North Pole will be ice-free year round in 2100 and ice-free in summer by 2030, dependent on the speed on the Arctic ice. With respect to the exploitation of the pole region (transit and natural resource), it seems to be needful to create international treaties (granted by the UN) to align the different perceptions of the involved nations. See Scott Borgerson, "Arctic Meltdown: The Economic and Security Implications of Global Warming," *Foreign Affairs* 87, iss.2 (March/April 2008): 75, available from http://www.foreignaffairs.org/20080301faessay87206/scott-g-borgerson/arctic-meltdown.html: Internet; accessed 26 December 2008.

This essay will argue that the main implication from the effects of climate change on the Arctic is the increased need for maritime sovereignty in Canada's North. Based on this finding it will furthermore recommend that the challenge for the future Canadian Defence Strategy is to close the gap between stated policy and its implementation by pro-active planning and timely allocation of resources in order to strengthen its ability to exercise maritime sovereignty.

Looking first at the maritime aspects of climate change on the Arctic, the increased strategic importance and its main implication on the Canadian Defence Strategy will be analyzed. Subsequently, it will examine the significance and assimilation of the deduced implication in the Canadian Arctic Defence Strategy. Finally, by comparison of the latest defence papers and its military implementation this essay will define the essential challenge for the future Canadian Defence Strategy.

# II. DISCUSSION

## MARITIME ASPECTS OF CLIMATE CHANGE IN THE ARCTIC

The geographical scope of this paper will be limited to the Canadian component of the northernmost area of the globe, officially described as the Arctic.[9] Thus the focus will primarily be on the Canadian maritime territory north of 66° 33'40'' latitude, including the internal waterways surrounding the Canadian Archipelago as well as the external waters, defined by the 200nm Exclusive Economic Zone (EEZ). The described Canadian maritime territory will further be referred to as Canadian Arctic waters.

According to the Arctic Climate Impact Assessment (ACIA) the melting of the sea-ice is occurring at an alarming rate. In the last 50 years the Arctic ice was reduced by one million square-miles.[10] Such climate change impacts the sea-ice in many complex and interconnected ways which leads to an unpredicted acceleration of the melting process.[11] The factor of acceleration becomes apparent by looking at statistics from 1990 which stated that the Arctic ice was losing approximately three percent of its volume per decade whereas in reality the Canadian Arctic "lost, on average, three percent of its sea-ice every year for the past 30 years … Not long ago, scientists predicted the Arctic Ocean would be ice-free

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[9]According to the official definition, the Arctic is described as the region around the earth's north pole, including the Arctic Oceans and parts of Canada, Denmark (Greenland), Russia, United States (Alaska), Iceland, Norway, Sweden and Finland which means the region north of the 66° 33' 40'' latitude north. See Guy Killaby, "The Great Game in a Cold Climate…", 32.

[10]In the last 23 years 41% of the sea-ice vanished. Solely in the years 2004 until 2005 the Arctic lost 14% of its perennial ice. See Scott Borgerson, "Arctic Meltdown…", 66.

[11]The surface air temperature in the Arctic increased over the past 50 years by 3.6 °F. It is projected that the mean annual surface air temperature over the Arctic region will increase by another 3.6 °F by 2050 and by 8 °F by 2100. See Department of National Defence, Joint Task Force Pacific, *Arctic Environment within JTFP AOR*…, 1.

in summer by 2100. Now it could be 2030 or sooner."[12] Today, taking to account the acceleration of melting, the North West Passage (NWP) is estimated to be open for trans-Arctic voyages possibly from 2013 on and may be ice-free year round by 2050, possibly sooner.[13]

Consequently, in terms of the Defence Strategy the immediate maritime effects of the melting ice of the Canadian Arctic waters within in the next 20 years are immediate: already there is more international shipping through the Arctic as well as more resource explorations and exploitations. The resulting effects of climate change and their implications for defence strategy will be analyzed in the next chapter.

## MILITARY DEFENCE STRATEGIC IMPLICATIONS

The effects of climate change on the Arctic, besides a new awareness of vulnerability of the North American continent, are the fundamental basis of the "renaissance of the strategic importance of the Arctic" which arose with the dawn of the 21st century.[14] Enabled by the melting ice, factors like the effects of opening of Canadian

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[12]Accelerating effect: The increasing temperature in the Arctic melts the ice and additionally more warm water from the Atlantic Ocean is migrating to the Arctic. Additionally the increasing sea water absorbs more heat from the sun than ice does which additionally accelerates the melt. Consequently, 2007 was the northern hemisphere's warmest year since record-keeping began in 1880. Arctic Ocean ice was 39% smaller in that year than the previous 20-year-average. See Lisa Gregoire, "Cold Warriors,"…, 44-46.

[13]Within 5 to 10 years [calculated from 2001], the NWP will be open to non-ice-strengthened vessels for at least 1 month each summer. See Matthew Carnaghan and Allison Goody, *Canadian Arctic Sovereignty*…, 6.

[14]There is a new threat perception and perception of vulnerability of North America following the attacks at the world trade center on 11th September 2001. The U.S. reaction in closing the border underlined

Arctic seaways, the increasing exploitability of natural resources and some related international incidents show the beginning identification of potential opportunities in the Canadian Arctic. By examining the factors, the defence implication – the increasing need for Arctic sovereignty - will be deduced.

First of all, the melting ice has significant effects on the opening of the Canadian Arctic seaways in the next 20 years. The use of northern seaways like the NWP becomes most important if considering the potential economies in operating expenses and time.[15] For example, a merchant vessel which sails on its way from the Atlantic to the Pacific through the NWP instead of the Panama Channel saves 25% of its sea-way which means an economy of 2.000nm. In summary there is economic potential of tens of millions U.S. Dollar per ferry for passages in the ice-free summer from 2013 on with an expanding annual timeframe.[16] Supported by an historic property claim of the Arctic seaways, the Government of Canada demonstrated the resolve to exercise full sovereignty for the first time by establishing straight baselines around the Archipelago during the Cold War in 1985.[17] Since then efforts have been taken to establish maritime surveillance and

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the Canadian necessity to keep a clean record of immigrants in order to encounter the threat of asymmetric subjects to invade to North American territory over the northern border.Thus the more moderate climate conditions make the northern waters accessible for foreigners who create new threats like smuggling, and illegal immigration including terrorists. See Michael Byers, "Unfrozen Sea: Sailing the Northwest Passage," *Policy Options* 28, no. 5 (May 2007): 31, available from http://www.irpp.org/po/archive/may07/byers.pdf; Internet; accessed 10 January 2009.

[15]The use of the Northern Sea Route (NSR) will be equally important after the set timeframe of this essay.

[16]The length of the sea-route from Rotterdam to Seattle using the Panama Canal is approximately about 9.000nm whereas the length would decrease using the passage through the NWP to 7.000nm. This means financial savings of 20% equals up to 17 million U.S. Dollar for a large container ship. See Scott Borgerson, "Arctic Meltdown…", 68. See as well Michael Mifflin, "Arctic Sovereignty: A View from the North," *Policy Options* 28, no.5 (May 2007): 55.

shipping control in order to manage the Canadian Arctic seaways. Thus the defence implication of the accelerated opening of Canadian Arctic waters caused by the effects of climate change settles on the above historic efforts of the Government of Canada to exercise full sovereignty in Canadian Arctic seaways.

The second factor for the increased strategic importance of the Arctic, the increasing exploration and exploitation of natural resources, is as well enabled by the effects of climate change. The melting ice provides the opportunity to explore the sea-bed of the Arctic Ocean, beyond the Mackenzie River Delta, in order to exploit the anticipated deposits of oil and gas in this region.[18] The major contemporary concern of the Government of Canada in this issue is to define the continental shelf and thus clarify the different claims by northern states prior to the 2013 deadline.[19] Once the continental shelf and the expanded EEZ are set, the future defence priority is the protection of seaborne natural resources. Thus the defence implication of the then re-defined Canadian Arctic waters is comparable to that of the Canadian Arctic seaway: exercising sovereignty.

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[17]Guy Killaby, "The Great Game in a Cold Climate…", 35.

[18]The continental shelf of the Arctic Ocean, which occupies slightly more than half of the Arctic Ocean area, is made of sedimentary rocks that contain vast deposits of oil and gas. The Arctic Archipelago, situated over an area of 1.3 million $km^2$ is only a part of it. The territorial belongings of this part are not exactly defined yet. Whereas the legal framework for the expansion of the Exclusive Economic Zone (EEZ) is set by the United Nations Convention of the Sea (UNCLOS) the research of the continental shelf and its "carving" is going on. See *Ibid*., 33-35.

[19]According to UNCLOS, northern states are requested to define and evidence their claim in order to enlarge their EEZ of 200nm by another 150nm or more. This evidence is done by scientific and political means and in cooperation with the neighbouring countries. UNCLOS delivers the necessary set of laws to regulate the possessions. But in order to adjust the application of the given rules and laws, cooperation on the international level, i.e. by the Arctic Council seems to be necessary. See Scott Borgerson, "Arctic Meltdown…", 75.

The third factor which influences the strategic importance of the Arctic are international incidents over territorial claims. The hoist of the Russian flag on the seafloor of the north pole to claim property of the Lomonosow Ridge, and Danish claims of underwater regions in the Lincoln Sea, as well as U.S. claims in the Beaufort Sea are all issues of the above mentioned 'carving' of the continental shelf in order to define each other's borders and the accordant EEZ.[20]

In total, looking at the three factors for the renaissance of the strategic importance of the Arctic, all of them are enabled by the effects of climate change. Considering the next twenty years, which is the roughly estimated timeframe of the opening of Canadian Arctic waters, there is mainly one common implication arising for the Defence Strategy: the increased need for surveillance and control of the opening Canadian Arctic waters and thus the increased need for maritime sovereignty in the North.

**The Increased Need for Maritime Sovereignty**

As deduced above, the effects of melting ice of the Arctic are the enabler for the use of the Arctic seaways and the exploitation of the Arctic sea. In both instances it is first a question of property and finally, when this question is answered it remains a governmental responsibility to create and maintain the "ability of a state to be able to make and enforce laws and regulations within a given geographic area", which means – sovereignty by definition.[21]

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[20]Except for the incident of Hans Island, which may be seen as a case of precedence, the ownership of the islands, assigned to Canada by Great Britain in 1880, are not questioned. See Guy Killaby, "The Great Game in a Cold Climate…", 33.

[21]Rob Huebert, "The Great White North…", 21.

> To be sovereign at sea a state must be able to control whatever takes place in the waters under this jurisdiction. This applies to the territorial waters within 12 nautical miles of the shore, to the waters of the 200nm exclusive economic zone (EEZ), and to the adjoining areas of the continental shelf.[22]

According to this definition of sovereignty a state should create and maintain the capability to control any activities in the owned waters. To control what happens in waters under national jurisdiction three criteria must be met:

- It must be known exactly who is using those waters and for what purpose;
- An unequivocal expression of government authority in those waters must be maintained; and
- The state must be able to respond quickly and effectively to violations of the law or threats to national security.[23]

Thus, considering the three points above, to act sovereign in the increased ice-free Canadian Arctic waters there is an increased need for surveillance to maintain situational awareness, and an increased need for governmental sustained presence to express authority and react to security and other threats. Those demands, exacerbated by the effects of climate change and the environmental characteristics of the colossal Arctic region makes the Arctic a strategic theatre. Thus, if „Canada will assume responsibility … over an additional half-million km$^2$ of the Arctic Ocean, [Canada] certainly need to put more civil and military resources into the North […].”[24]

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[22]Peter T. Haydon, “Strategic Concepts for the 21st Century: Back to the Future?” in *Sea Power and Maritime Strategy in the 21st Century: A ‘Medium’ Power Perspective* (Halifax: Dalhousie University, 2000), 50.

[23]*Ibid*., 50.

[24]J. L. Granatstein, “Does the Northwest Passage still matter?” *Globe and Mail*, January 12, 2009, available from http://www.theglobeandmail.com/servlet/story/RTGAM.20090109.wcoarctic12/BNStory/specialComment/home; Internet; accessed 20 February 2009.

There are theorists who argue that sovereignty over Canadian Arctic Waters, the NWP for example, is only a transitory problem because the "ice is melting faster than anyone predicted" and the North Pole may be ice free in 15 years, opening a much shorter route for Cargo vessels.[25] This may be true but, their argument is only valid reflecting the aspect of sovereignty of the seaways; second, that argument is only valid after the period in question in this paper; and third, exercising sovereignty is a general governmental task within its territory of jurisdiction.

Undoubtedly, the effort to implement sovereignty is related to the contemporary threat perception. Thus the actual threat perception, the adaption of the increased need for sovereignty by the Canadian Defence Strategy and its implementation will be analyzed in the next chapter.

## NORTHERN DEFENCE STRATEGY AND ITS IMPLEMENATION

Having deduced the need for increased sovereignty of Canadian Arctic waters as the defence requirement, resulting from the effects of climate change and derived from the definition of sovereignty, the purpose of this section is to analyse to what extent this implication is recognized in the Canadian Defence Strategy. Further, by comparing the Canadian Defence Strategy intent with its implementation, the actual and planned engagement of the CF in maritime surveillance and presence in the Arctic the essential challenge for the future Canadian Defence Strategy will be elaborated.

First in order to justify a change in Arctic Defence Strategy due to the effects of climate change, it is worth while looking briefly at the historic development of the

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[25] *Ibid*.

strategic importance of the Arctic. Whereas the Arctic security threat always was complex in history, the strategic importance of the Arctic was changing due to the imminence of the threat. Starting at the World War II there was a medium threat perception, mainly caused by the Japanese attack on the Aleutian Islands in 1941.[26] The combined reaction of the Canadian and U.S. government in terms of defence was the construction of the Alaska Highway 1942 in order to transport personnel and ammunition. Despite the fact that approximately 86% of the total highway length was built on Canadian soil, the U.S. accepted the bulk of the funding.[27] With the end of the World War II the Arctic became the main area of interest of the Cold War, and the strategic importance changed from medium to high in accord with the new threats. Those were mainly the use of the Arctic aerospace to deliver nuclear weapons by the Soviet Union via long-range bomber or ballistic missiles. Consequently the governmental reaction, again U.S. and Canadians combined, was to establish surveillance and protection of the North American aerospace. This was first done by the construction of radar sites on the northernmost land boundary from Western Alaska to Greenland, called the Distant Early Warning (DEW).[28] Additionally the North America Defence Command (NORAD, later called North America Aerospace Defence Command) was founded in 1958. Thus NORAD and the NWS served the U.S. and Canadian security requirements

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[26]The aim of this attack was mainly the deception from the planned Japanese attacks on Pearl Harbour and the Midways. The Japanese Forces were defeated in Alaska by U.S. and Canadian Forces in 1943. See Rob Huebert, "The Great White North…", 18.

[27]From the total length of 2288km, only 324km were built on U.S. soil. The residual 1964km were built on Canadian territory. See *Ibid*., 18.

[28]The DEW was modernized in 1985 and is now called the North Warning System (NWS). See *Ibid*., 22.

and successfully contributed to the state of deterrence during the Cold War. In both organizations Canada and the U.S. acted as politically equals, but again the U.S. provided the bulk on finances and technology.

Moreover, to ensure surveillance and protection, the Navy sent warships in the Arctic waters and waterways (Northern Employment, NORPLOY), the Air Force conducted sovereignty over-flights and patrol flights (Northern Patrol, NORPAT; Search and Rescue, SAR; as well as transportation) and operated on four Forward Operation Locations (FOL), and the Army contributed with exercised predominantly in combination with the Rangers and U.S. troops (Northern Exercise, NOREX).[29]

According to the high threat perception during the Cold War, more CF engagement in the Arctic were planned in order to fulfill the defence mission against aggressors coming from the north. Procurement was focused on the construction of underwater listening devices, and the acquisition of Polar Class 8 ice-breakers and submarines.[30] But with the collapse of the Soviet Union, the Cold War ended and the immediate threat vanished. Procurement projects were cancelled, Canada entrusted the North American undersea security to the U.S., and the northern engagement of the Canadian Forces were drastically reduced. The strategic importance of the Arctic decreased commensurately with the low threat perception.

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[29]The FOL's in Inuvik, Iqaluit, Yellowknife, and Rankin Inlet were operating bases for fighter aircraft. See *Ibid*., 20.

[30]The 1987 White Paper on Defence announced plans to purchase 10-12 nuclear-powered submarines and "polar-class 8" icebreakers. See Matthew Carnaghan and Allison Goody, *Canadian Arctic Sovereignty*…, 10. See as well Rob Huebert, "The Great White North…", 22.

In summary of this brief historical abstract, the Canadian Defence Strategy in the Arctic has always been reactive to the threat perception. The implementation of the Defence Strategy, like U.S. combined projects or CF engagements has always been characterised by a minimized effort due to budgetary constraints.[31] These are symptoms which will be observed later on.

After the Cold War, most of the official papers on Canadian Defence Strategy only parenthetically discuss the aspects of the northern defence. The 1994 White Paper for example stated that "CF will be capable of mounting effective responses to emerging situations in our maritime areas of jurisdiction, our airspace, or within our territory, including in the North."[32] The deduced defence objectives (DO) in this paper just generally speak of the CF capabilities to provide strategic defence and security information to the Government (DO1) and conduct surveillance and control of Canada's territory, airspace, and maritime areas of jurisdiction (DO2), and announce that, in order to meet those DO in the north, the Arctic Security Inter-departmental Working Group (ASIWG) act as the interdepartmental coordinating element. Although the need for surveillance and control assets was generally mentioned, in the end there is no reaction yet on defence implications caused by climate change.

Five years later, the 1999 Defence Strategy 2020 was the strategic framework for Defence planning and decision-making in order "to help guide the institution well into

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[31]Rob Huebert, "The Great White North…", 21.

[32]Department of National Defence. Joint Task Force North. *Arctic Capabilities Study* (Ottawa: 2000), 3, available from http://www.natice.noaa.gov/icefree/Arctic%20Study%20Final%20%20Canada1.pdf; Internet; accessed 20 November 2008.

the next century."[33] This paper, based on the assessment of Canada's current strategic environment, was meant to identify both "the challenges and opportunities facing the Department and the CF as they adapt to change in a rapidly evolving, complex and unpredictable world" and "provide a roadmap on how best to implement Canada's Defence Policy in light of current emerging defence challenges."[34] But examined more closely (and regardless of the contemporary knowledge of climate change) the defense objectives are identical to those of the 1994 White Paper (DO1 and DO2). Still, there are no concrete aspects dedicated to the northern defence, although the strategic objective # 3, modernization would be well applicable to some aging assets in the north like the CCG icebreaker-fleet or the Twin Otters of the Air Force.

The melting ice and its implications on Canada's Defence Strategy are first recognized in the Arctic Strategy of the 2005 Canada's International Policy Statement. There, the Government of Canada accepted that it had neglected the Canadian Arctic Security and that it would now concentrate on the north, because of "the growing economic security, and the open up of Arctic waters to commercial traffic".[35]

Obviously inspired by the Governments 2004 Northern Strategy, the 2008 Canada First Defence Strategy became more concrete and "puts forward clear roles and missions

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[33]Defining strategic imperatives like to set and maintain a coherent strategy for the future by identifying priorities, key long-term strategic objectives, and shorter-term goals and targets, the 1999 Defence Strategy 2020 claims to achieve a defence vision for the next twenty years according to the procurement lead time of up to two decades. See Department of National Defence. *Shaping the Future of the Canadian Forces: A Strategy for 2020…*, 5.

[34]*Ibid*., 1.

[35]Government of Canada, *The Northern Strategy* (Ottawa: 2005), foreword.

for the armed forces" in the north.[36] For the northern security these missions are surveillance and presence at sea for the Navy and surveillance, control and SAR for the Air Force with assets like the CP-140, UAV's and Satellites.[37] The stated need for surveillance and presence in the Arctic is very closely aligned with chapter one "Exercising Arctic Sovereignty" of the Northern Strategy.[38] Defining the strategic environment, the 2008 Canada First Defence Strategy finally fully acknowledges the defence implications of climate change in the Arctic:

> In Canada's Arctic region, changing weather patterns are altering the environment, making it more accessible to sea traffic and economic activity. Retreating ice cover has opened the way for increased shipping, tourism and resource exploitation, and new transportation routes are being considered, including through the NWP. While this promises substantial economic benefits for Canada, it has also brought new challenges from other shore. These changes in the Arctic could also spark an increase in illegal activity, with important implications for Canadian sovereignty and security and a potential requirement for additional military support.[39]

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[36]Department of National Defence, *Canada First Defence Strategy* (Ottawa: 2008), 2.

[37]Unfortunately the latest Government statement, the Speech of the Throne from 2009 did not mention the increased importance of northern sovereignty. Dedicated to the CF it was just mentioned that there will be a renewal of all major air, sea and surface fleets over the next two decades. A promise made earlier in more detail. The increased importance of the north is mentioned only from the economic side as an effect of global warming; to exploit the natural resources, a pipeline-network will be built into north, which will have to be protected. See Government of Canada, *Speech from the Throne: Protecting Canada's Future* (Ottawa: 19 November 2009), available from http://www.sft-ddt.gc.ca/eng/media.asp?id=1364; Internet; accessed 27 January 2009.

[38]2004 Northern Strategy, Chapter 1 includes maritime sovereignty proposals like:
- order of new Arctic/Offshore Patrol vessels to monitor and respond
- commitment to build a deep water Arctic docking and refuelling facility in Nanisivik, Nunavut
- launch of RadarSat-2 to provide enhanced surveillance and data gathering capabilities
- commitment to complete the mapping of the underwater continental shelf to meet 2013 UN Commission on the Limits of the Continental Shelf deadline
- commitment to the construction of a polar class icebreaker to increase Canadian presence in the Arctic
See Indian and Northern Affairs Canada, *Fact Sheet: Northern Strategy* (Ottawa: 2004), available from http://www.ainc-inac.gc.ca/ai/mr/is/n-strat-eng.asp; Internet; accessed 29 January 2009.

[39]Department of National Defence, *Canada First Defence Strategy*…, 6.

Combined with the stated need for "constant monitoring of Canada's … maritime approaches, including in the Arctic" the contemporary Canadian Defence Strategy generally strives for the identical aspects of sovereignty: surveillance and presence in the north, not least for economic reasons to inhibit "foreign encroachments on Canada's natural resources".[40] Recognizing the abilities of the CF the Canada First Defence Strategy points out unequivocally:

> […] The CF must have the capacity to exercise control over and defend Canada's sovereignty in the Arctic. […] The military will play an increasingly vital role in demonstrating a visible Canadian presence in this potentially resource-rich region, and in helping other government agencies such as the Coast Guard respond to any threats that may arise.[41]

Thus the role of the CF in the Canadian Arctic waters is defined to "help exercise Canada's sovereignty" even if "other government departments and agencies will have leadership responsibilities."[42] This statement is consistent with the general shift of naval tasks towards the constabulary role of Navies in order to exercise sovereignty in maritime areas of interest.[43]

In summary the 2008 Canada First Defence Strategy as the latest Canada Defence Strategy is absolutely in line with the argument of this essay from a defence strategy perspective. It acknowledges an increased requirement for northern sovereignty as a

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[40]*Ibid*., 6-7.

[41]*Ibid*., 8.

[42]*Ibid*., 7.

[43]For the greater majority of modern navies, sea control will be their principal mission in peace and in war. To be able to control one's own waterspace effectively is the fundamental statement of sovereignty by a state to the rest of the world. For that reason, sea control is also the foundation upon which the maritime dimension of national security is maintained. See Peter T. Haydon, "Strategic Concepts for the 21st Century: Back to the Future?"…, 50.

direct implication of the effects of climate change. Moreover the increased strategic importance of the Arctic is acknowledged, in accord with the increased threat perception and economic opportunities. Subsequently the implementation of this policy into the engagement and capabilities of the CF in order to increase maritime sovereignty in the Canadian Arctic will be analyzed.

**Allocation of Resources for Maritime Sovereignty**

As evidenced above, the recognition of the impacts of climate change in the latest Defence Policy Statement is realised and no longer a challenge. This section will examine the alignment of the Canadian Defence Strategy with the actual allocation of resource and the engagement of the CF in the North. In doing so, it will elaborate the remaining challenge for the future Canadian Defence Strategy in terms of maritime Arctic sovereignty.

As derived from the definition of sovereignty, the main tasks in Arctic maritime sovereignty are: surveillance to achieve situational awareness, and establishing a presence to be able to respond and control. To analyze the allocation of military resources and their effectiveness for increased maritime surveillance and presence the already implemented assets mentioned in the historical abstract will illustrate the baseline. Looking at the task of surveillance first, the existing aerial surveillance by the NWS and NORAD was amended with a maritime warning function by an update of NORAD in May 2006.[44] Furthermore, as proposed by the Northern Strategy and stated in the Canada First Defence Strategy "defence will also look at acquiring radars and satellites to

[44]Department of National Defence, *Canada First Defence Strategy*…, 8.

improve surveillance capabilities, especially in the Arctic."[45] Accordingly, Canada started to operate its RadarSat-2, called Project Polar Epsilon in early 2009. With this space-based asset Canada intended to improve the ability for Arctic land surveillance as well the surveillance of Canada's maritime approaches through near real-time ship detection. But in contrast to the above quotation from the Canada First Defence Strategy, DND is not the owner of this satellite and consequently does not have exclusive access to this asset, instead "Environment Canada has indicated that this radar capability would be available for DND when not used by the Canadian Ice Service."[46] Thus the intended effect of improved surveillance is only partly achieved by now.

A further contribution to maritime surveillance is intended to come from the Air Force. According to the procurement plans of the Defence Strategy, maritime sovereignty will be supported by up to 12 Maritime Patrol Aircrafts to replace the Aurora-fleet and "to keep Canada's maritime approaches safe and secure, including in the Arctic."[47] Considering the drastically decreased sovereignty over-flights since the end of the Cold War (four patrols in 2000), the actual operating grade, the project lead time in the procurement process following the absent decision for the purchase, and the necessary preparation time for the in-phase of this potentially new aircraft to reach the Initial Operating Capability (IOC), it seems to be at least questionable, if this asset will be able to support maritime surveillance in time by 2013. Finally, despite of improved distant-assets for the surveillance of the Canadian Arctic waters, and in comparison with the

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[45]*Ibid*., 18.

[46]Department of National Defence. Joint Task Force North. *Arctic Capabilities Study*…, 5.

[47]Department of National Defence, *Canada First Defence Strategy*…, 4.

existing capabilities and resources on the Atlantic and Pacific coasts, "there is [still] no equivalent to the 'Recognized Maritime Picture' for the North."[48]

Whereas there is a slight improvement for the surveillance of the Arctic waters, there is still a lack of assets concerning the maritime presence in order to respond or control within the Arctic region. To affect shipping control and management of Arctic seaways, Canada implemented ship reporting to the Northern Canada Traffic Regulation System (NORDREG) for vessels destined for Canadian Arctic Waters. But up to now, transiting vessels only report voluntarily.[49] Besides the fact that NORDREG of the CCG needs a mandatory requirement to report to become effective, there is still a lack of in-theatre assets to control and react to the sea-traffic on both sides CCG and CF.[50] The Canada First Defence Strategy reacted to this fact, assimilating assets in the procurement planning process. At present, the actual procurement objectives include three Auxiliary Oil and Replenishment Vessels (AOR) and up to eight Arctic/offshore patrol ships with limited ice-capabilities designed "to help the Forces operate in our northern waters."[51] The registration as procurement objectives of the three AOR which already were promised by the Prime Minister in 2005 is progress.[52] But again, considering the ongoing

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[48]Department of National Defence. Joint Task Force North. *Arctic Capabilities Study*…, 11.

[49]Rob Huebert, "Reinforcing Sovereignty, National Security and Circumpolar Cooperation," *Northern Perspectives* 30, no.1 (Winter 2006): 10.

[50]The Canadian Coast Guard is actually unable to re-vitalize their aging ice-breaking fleet. Those five ships are between 17 and 39 years old and actually operate only in summertime. See Rob Huebert, "The Great White North: Renaissance in Canadian Arctic Security?"…, 27.

[51]Department of National Defence, *Canada First Defence Strategy*…, 3.

discussions about a Canadian ship-building industry, it seems to be questionable that those important sustainment and control assets will be available during the opening of Arctic waters and waterways from 2013 on. Moreover, and until the earlier promised sustainment objective of a refueling station and deepwaterport in Nanisivik is being built, the infrequent operating CF vessels in the region still have to use the aging CCG ice-breakers as refueling stations and still husband with their eight days fuel reserve.[53]

Consequently there is still room for improvement and recommendations for the CF maritime capabilities for surveillance and presence in the North in order to defend Arctic maritime sovereignty. Already in 2000, the Arctic Capabilities Study recommended that there is a need for more assets to perform surveillance and presence tasks, which were not implemented.[54] On the surveillance side, the Arctic Capabilities Study proposed a Joint (Maritime) Intelligence and Surveillance Concept, amongst others by the use of High Altitude Long Endurance Unmanned Aerial Vehicle (HALE UAV). UAV were not implemented because of the lacking satellite coverage at that time which is needed to rapidly exploit the surveillance data. Moreover, the effective surveillance and response capability of ice-capable maritime ships was pointed out broadly, but its implementation was abandoned due to high costs and low profit, because the implications

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[52]Prime Minister Harper promised in 2005 the building of 3 large icebreakers and the construction of a deep water docking facility in the Eastern Arctic. See Michael Byers, "Unfrozen Sea: Sailing the Northwest Passage,"…, 33 and Rob Huebert, "Reinforcing Sovereignty, National Security and Circumpolar Cooperation,"…, 7.

[53]Michael Byers, "Unfrozen Sea…", 33.

[54]Department of National Defence. Joint Task Force North. *Arctic Capabilities Study*…, 16-26.

of the effects of climate change were not incorporated in the Defence Policy. Furthermore, the study mentioned an inexpensive rapidly deployable underwater acoustic surveillance system which would provide an undersea surveillance capability. This system was not implemented because of the contemporary relative inability to respond to under-ice contacts, for Arctic waters were covered with ice up to eleven month.[55] With respect to the melting ice, this asset would now effectively contribute to a maritime picture. An alternative undersea surveillance and control capability could be implemented referring to the historical cooperation with the U.S. in submarine operations and exercises in the Arctic.

With respect to presence, there is no real alternative than the mentioned procurement of ice-capable vessels which therefore is the primary reasonable recommendation. Additionally, in order to increase the presence of the DND to safeguard control and response it seems to be worth while considering a littoral, on-water capability of the Ranger. Integration of the Inuit-Ranger could well contribute to compensation of the declined sustainment of the Inuit due to the environmental effects of climate change on the land-mass.[56]

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[55]*Ibid*., 25.

[56]Environmental effects on the landmass are for example: Increased phytoplankton circle sets free more carbon-dioxide in the air; Increased amount of natural mercury in the food-chain; Melting ice disrupts migration i.e. of the caribou from the winter home and their calving ground and thus diminishes not only the hunting grounds of polar bears but as well of the Inuit. “Marine mammals are a critical part of the Inuit diet. […] Many rely on seal, beluga, narwhal, musk-ox, ptarmigan, Arctic char, hare, caribou, and polar bear for food and skin.” The Inuit use the sea-ice for traveling and hunting and are increasingly restricted due to the unpredictability and disappearance of the ice. Thus, combined with increasing problems of fresh water supply in devastated ice-free regions, the Inuit becoming more dependent on transport of food and supply in order to keep their sustainability. See Lisa Gregoire, “Cold Warriors,”…, 38-41.

In summary, policy papers like the 2004 Northern Strategy, the 2005 Canada's International Policy Statement, and especially the 2008 Canada First Defence Strategy recognized the effects of climate change and reacted to its implication of increased maritime sovereignty. But even the seminal Canada First Defence Strategy's implementation scratches only the surface of maritime sovereignty and leaves a gap between the coherent goals of northern sovereignty and the timely allocation of resources. The main reason for this gap had already come across in the historic abstract and seems to be valid today. Historically, the allocation of resources for Arctic sovereignty is the result of a balance between the immense costs for deployment and sustainment of assets in this vast and adverse environment and the estimated benefit, which is mainly affected by the threat perception. Unchanged, Canada tries to reduce its always reactive effort in the Arctic to a minimum due to costs and competing obligations.[57] But in contrast to former competing threats, today "there is no immediate direct military threat to Canada."[58] Consequently today, it seems to be more the "lack of national consensus on the importance of the North" and its economic opportunities.[59] The resulting reactive planning and delayed allocation leads to the existing Arctic sovereignty capability gap defined by "inadequate numbers of … resources assigned for

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[57]Historical competing obligations were to fight the Japanese and German threat in World War II, and to fight the Russian threat during the Cold War. See Rob Huebert, "The Great White North: Renaissance in Canadian Arctic Security?"…, 18.

[58]Department of National Defence. Joint Task Force North. *Arctic Capabilities Study*…, 9 and Department of National Defence. *Shaping the Future of the Canadian Forces: A Strategy for 2020*…, 2.

[59]National Symposium on the North, *Changing Times, Challenging Agendas* (Ottawa: Canadian Arctic Resources Committee Publishing Programme, 1988), 114.

surveillance, inadequate number of assets for surveillance, no control of maritime traffic" as far as the CF are concerned.[60] Closing this gap between the stated policy of Canada's Defence Strategy and its implementation by timely allocation of resources in order to strengthen Canada's ability to exercise maritime sovereignty in the Arctic is the remaining challenge for the Canadian Defence Strategy.

[60]Major Bowerman, "Arctic Sovereignty" (Toronto: Canadian Forces College Command and Staff Course New Horizons Paper, 2002), 24-25.

# III. CONCLUSION

The maritime aspects of climate change in the Arctic, like the accelerated melting of the ice and the resulting opening Canadian Arctic waters lead to an increased strategic importance of the Arctic mainly because of economic opportunities such as more efficient international shipping and increased exploitation of natural resources. By investigation of the maritime aspects of climate change, the increased need for maritime sovereignty of Canadian Arctic waters was deduced as the main implication for the Canadian Defence Strategy. The significance of this finding led to the conclusion that at least the 2008 Canada Defence Strategy acknowledges the increased requirement for northern sovereignty as a direct implication from the effects of climate change and approved the increased strategic importance of the Arctic according to the increased threat perception and economic opportunities. Likewise the task to exercise sovereignty is assigned to the CF because of their potential capabilities, regardless of the fact that sovereignty is not exclusively a military role. Thus it could be reasoned that the implications of climate change in the Arctic are assimilated in the actual Canadian Defence Strategy.

Based on this important fact, the 2008 Canada First Defence Strategy could be considered to be a benchmark for the further analysis of the implementation of the stated policy in order to elaborate the remaining challenge. Consequently allocation of resources for Arctic maritime sovereignty were analysed in order to define the remaining challenge for the Canadian Defence Strategy. It was evidenced that even the seminal Canada First Defence Strategy's implementation scratches only on the surface of maritime sovereignty and leaves a gap between the coherent goals of northern sovereignty and the timely

allocation of resources. Recommendations were made, how to increase the maritime surveillance capabilities of the CF in the Arctic. But the reason for the gap may be found in Canada's historic intent to reduce its always reactive effort in the Arctic to a minimum due to costs and competing obligations. Ultimately, consensus-based pro-active planning and funding in order to timely allocate task-related assets is the remaining challenge for Canadian Defence Strategy for the Arctic.

Beyond the timeframe of this paper and with respect to increasing exploration and exploitation of natural resources in the entire Arctic Ocean, Canada must strengthen its ability of northern sovereignty to stay relevant as an economic player in the Arctic; as a Canadian ice-hockey legend pointed out: "We need to skate to where the puck is going to be, not to where it has been."

## Bibliography


Arctic Council and the International Arctic Science Committee, *Impacts of a Warming Arctic: Arctic Climate Impact Assessment*, Cambridge University Press, Cambridge, 2004. http://amap.no/acia/; Internet; accessed

Borgerson, Scott. "Arctic Meltdown: The Economic and Security Implications of Global Warming." *Foreign Affairs* 87, iss.2 (March/April 2008): 63-77. Available from http://www.foreignaffairs.org/20080301faessay87206/scott-g-borgerson/arctic-meltdown.html: Internet; accessed 26 December 2008.

Bowerman, Major. "Arctic Sovereignty." Toronto: Canadian Forces College Command and Staff Course New Horizons Paper, 2002.

Byers, Michael. "Unfrozen Sea: Sailing the Northwest Passage." *Policy Options* 28, no. 5 (May 2007): 30-33. Available from http://www.irpp.org/po/archive/may07/byers.pdf; Internet; accessed 10 January 2009.

Canada. Department of National Defence. *Canada First Defence Strategy*. Ottawa: 2008.

Canada. Department of National Defence. *Canada's International Policy Statement: A Role of Pride and Influence in the World Defence*. Ottawa: 2005.

Canada. Department of National Defence. Joint Task Force North. *Arctic Capabilities Study*. Ottawa: 2000. Available from http://www.natice.noaa.gov/icefree/Arctic%20Study%20Final%20%20Canada1.pdf; Internet; accessed 20 November 2008.

Canada. Department of National Defence. Joint Task Force Pacific. *Arctic Environment within JTFP AOR*. Ottawa: 2008.

Canada. Department of National Defence. Office of Naval Research. Naval Ice Center. Oceanographer of the Navy, and the Arctic Research Commission. "Naval Operations in an ice-free Arctic." Symposium. April 2001. http://www.natice.gov/icefree/FinalArcticReport.pdf; Internet; accessed 20 November 2008.

Canada. Department of National Defence. *Shaping the Future of the Canadian Forces: A Strategy for 2020*. Ottawa: 1999.

Canada. Foreign Affairs Canada. Government of Canada. *Canada's International Policy Statement: A Role of Pride and Influence in the World Defence.* Ottawa: 2005.

Canada. Foreign Affairs Canada. Government of Canada. *Canada's International Policy Statement: A Role of Pride and Influence in the World Overview*. Ottawa: 2005.

Canada. Foreign Affairs Canada. *The Northern Dimension of Canada's Foreign Policy*. Ottawa: 2000. Available from http://www.international.gc.ca/polar-polaire/ndpfvnpel.aspx?lang=en; Internet; accessed 10 January 2009.

Canada. Government of Canada. *Speech from the Throne: Protecting Canada's Future*. Ottawa: 19 November 2009. Available from http://www.sft-ddt.gc.ca/eng/media.asp?id=1364; Internet; accessed 27 January 2009.

Canada. Government of Canada. *The Northern Strategy*. Ottawa: 2005.

Canada. Indian and Northern Affairs Canada. *Fact Sheet: Northern Strategy*. Ottawa: 2004. Available from http://www.ainc-inac.gc.ca/ai/mr/is/n-strat-eng.asp; Internet; accessed 29 January 2009.

Canada. National Symposium on the North. *Changing Times, Challenging Agendas*. Ottawa: Canadian Arctic Resources Committee Publishing Programme, 1988.

Carnaghan, Matthew and Allison Goody. *Canadian Arctic Sovereignty*. Ottawa, ON: Library of Parliament, 26 January 2006. Available from http://www.parl.gc.ca/information/library/PRBpubs/prb0561-e.htm; Internet; accessed 10 January 2009.

CNN. "Arctic thaw raises security concerns for NATO." http://www.cnn.com/2009/WORLD/europe/01/29/arctic.global.warming.security/index.html; Internet; accessed 29 January 2009.

Granatstein, J. L. "Does the Northwest Passage still matter?" *Globe and Mail*, January 12, 2009. Available from http://www.theglobeandmail.com/servlet/story/RTGAM.20090109.wcoarctic12/BNStory/specialComment/home; Internet; accessed 20 February 2009.

Gregoire, Lisa. "Cold Warriors." *Canadian Geographic* 128, no.5 (October 2008): 34-50.

Haydon, Peter T, "Strategic Concepts for the 21st Century: Back to the Future?" in *Sea Power and Maritime Strategy in the 21st Century: A 'Medium' Power Perspective.* Halifax: Dalhousie University, 2000.

Huebert, Rob. "Reinforcing Sovereignty, National Security and Circumpolar Cooperation." *Northern Perspectives* 30, no.1 (Winter 2006): 7-10.

Huebert, Rob. "The Great White North: Renaissance in Canadian Arctic Security?" *Canadian Military Journal* 6, no.4 (Winter 2005-2006): 17-29. Available from http://www.ccc.nps.navy.mil/rsepResources/ArcticSecurityRenaissance-Huebert-04-North1_e.pdf; Internet; accessed 20 November 2008.

Killaby, Lieutenant-Commander Guy. “The Great Game in a Cold Climate: Canada’s Arctic Sovereignty in Question.” *Canadian Military Journal* 6, no.4 (Winter 2005-2006): 31-40. Available from http://www.journal.forces.gc.ca/vo6/no4/north-nord-01-eng.asp; Internet; accessed 10 January 2009.

Mifflin, Michael. “Arctic Sovereignty: A View from the North.” *Policy Options* 28, no.5 (May 2007): 55-58.

Simon, Mary. “Sovereignty from the North.” *Walrus* 4, no.9 (November 2007): 32-34.