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LEAD AGENCY OR LAST RESORT?
THE CANADIAN FORCES AND ENVIRONMENTAL THREATS IN THE ARCTIC

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JCSP 39

Master of Defence Studies

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PCEMI 39

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CANADIAN FORCES COLLEGE – COLLÈGE DES FORCES CANADIENNES
JCSP 39 – PCEMI 39
2012 – 2013

MASTER OF DEFENCE STUDIES – MAITRISE EN ÉTUDES DE LA DÉFENSE

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Word Count: 15 876

Compte de mots : 15 876

TABLE OF CONTENTS

LIST OF FIGURES

Figures

Tables

ABSTRACT

The Arctic region has attracted a lot of attention over the past decade due to the impacts that rapid climate changes have brought to its ecosystem. This has originally given the perception that Canadian sovereignty was in jeopardy, but since then it has been determined that the main threat to the area is one of environmental disaster. This paper will describe the growing human presence associated with commercial, tourism and research opportunities deriving from increasing temperatures, melting of ice surface and raising of sea levels. The discussion will cover preventive measures that the Government of Canada has already started implementing, in conjunction with other circumpolar countries, to better forecast and mitigate the identified environmental threats. At home, several government departments and agencies have been attributed specific mandates in that domain, including the Canadian Forces that own unique capabilities to react to environmental disasters, but remain ill-equipped to operate in the harsh conditions of the Arctic. The discussion will culminate in a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis that will pave the way for the development of a stewardship model that will encompass all stakeholders having a vested interest in the Arctic and its environmental safety. This model will offer partnership options for the Canadian Forces to reduce capability gaps by sharing resources with other partners. Finally, the conclusion will address implications of possible broader applications for leadership and collaboration in future operations and suggested areas requiring further investigation.

Canada has a choice when it comes to
the Arctic; either we use it or we lose it.
- Prime Minister Stephen Harper

INTRODUCTION

Fifty five years ago, John George Diefenbaker's "Northern Vision" stimulated the interest that the federal government and Canadians in general demonstrated for the Arctic.[1] Although the former Prime Minister's bold vision was aimed at developing this last Canadian frontier in order to first benefit Canadians, his nation building dream never fully came to fruition. Throughout the years, the Arctic has not always been a priority for Canadian leaders, but most recently, climate change and territorial claims over the region have reenergized the political rhetoric concerning this part of the country. Since Prime Minister Stephen Harper has been in power, he has actively engaged in diplomatic relations with our circumpolar neighbours in order to maintain a leadership role in Arctic debates. This was done in parallel to an increased contribution of internal resources to initiatives that would solidify Canadian sovereignty by bolstering human presence in the North and promoting development projects. The response from Aboriginals regarding these initiatives has been positive in general, although local inhabitants of the North have warned southerners of potential negative impacts resulting from some of the projects. Unfortunately, the Arctic remains misunderstood by most southern Canadians, which limits the nation's overall desire to invest in that region that is still being defined in terms of its territorial limits.

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[1] The Canadian Encyclopedia, "John Diefenbaker," last accessed 9 February 2013, http://www.thecanadianencyclopedia.com/articles/john-diefenbaker.

After ten years of mapping and research, Canada is set to claim a considerable new portion of seabed territory in the Arctic in December 2013.[2] This deadline was established upon ratification of the United Nations Convention on the Law of the Sea (UNCLOS) by Canada on 7 November 2003. As shown at Figure 1, coastal countries are entitled to economic control over their waters that stretch as far as 200 nautical miles from their shores.[3] If a country can prove its continental shelf extends even further, it may be granted control of a greater expanse. Canada gathered scientific evidences to claim roughly 1,75 million square kilometers of seabed, equivalent to 20 per cent of the country's land mass. This will significantly expend the area that Canada will be responsible for in regards to its *Northern Strategy* that consists of exercising sovereignty, protecting the environment, promoting development and improving governance.[4]

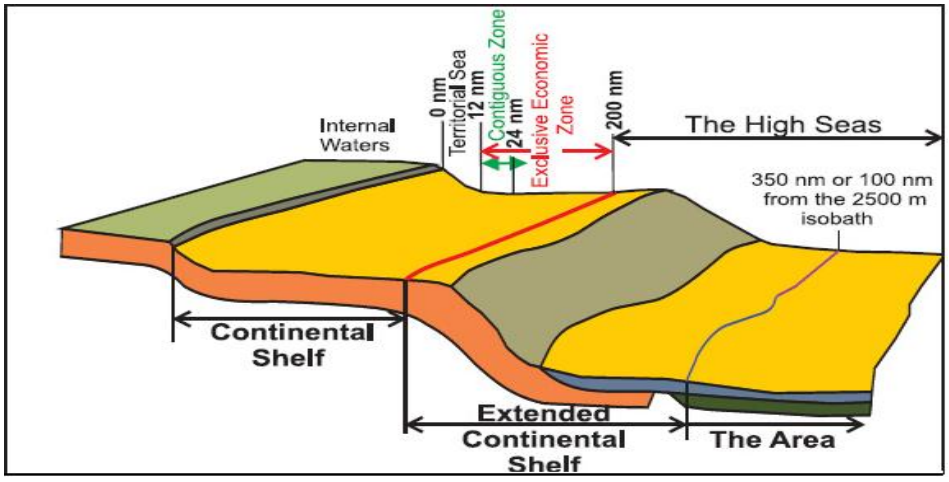

Figure 1 – Extended Continental Shelf Constraint Lines
Source: Geoscience Canada, http://journals.hil.unb.ca/index.php/gc/article/view/18776/20591

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[2] Michelle Zilio, "Shelf watch 2013: Canada set to claim massive new seabed territory," *iPolitics*, 5 January 2013.

[3] United Nations, "Convention on the Law of the Sea of 10 December 1982," last accessed 27 January 2013, http://www.un.org/Depts/los/convention_agreements/texts/unclos/closindx.htm.

[4] Government of Canada, "Canada's Northern Strategy," last accessed 27 January 2013, http://www.northernstrategy.gc.ca/index-eng.asp.

Although sovereignty has been at the forefront of discussions surrounding the Canadian North over the past decade, the level of threat associated with territorial control and security is deemed to be very limited in scope, if not completely absent. In fact, most experts such as P. Whitney Lackenbauer, Associate Professor and Chair of the Department of History at St.Jerome's University, argue that "our sovereignty is not in serious jeopardy, thanks to quiet diplomacy that has historically balanced continental security priorities with national interests."[5] With this realization in mind and continued melting of the polar icecap that is opening new opportunities for economic developments, the narrative about the Arctic is changing. Canadians are getting ever more concerned with the increased usage of the North through its soon to be opened water passages and accessible grounds for natural resources extraction. These situations will both result in an inevitable greater human presence in the Arctic, on land and at sea, with the potential of damaging fallouts on the environment. Frederic Lasserre, Professor at the Department of Geography at University Laval in Quebec, asserts that collaboration amongst all stakeholders will be primordial in the face of future Arctic challenges, especially when it comes to dealing with the impact of climate changes on the environment.[6] Provided that an environmental disaster in the Canadian Arctic is currently the most important threat to that region, the federal government would have to use a "whole-of-government" (WoG) approach to deal with such a crisis. Although normally a last resort amongst government departments, it is highly probable that the Canadian Forces would intervene in such an

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[5] P. Whitney Lackenbauer, *From Polar Race to Polar Saga: An Integrated Strategy for Canada and the Circumpolar World* (Toronto: Canadian International Council, 2009), ii.

[6] Frédéric Lasserre, *Géopolitique d'une région en mutation* (Québec: Presse de l'Université du Québec, 2010), 481.

emergency due to its unique capabilities. Rob Huebert, Professor of Political Science at the University of Calgary, considers that some of these capabilities are either insufficient or inappropriate to deal with the harsh conditions of the North.[7] Yet, in comparison with the other relevant government departments, it is the only mechanism the government employs that has the relevant operational capabilities to intervene. Whether it can mitigate or remove threats to the North is yet untested. This may cause the Canadian Forces to deal inadequately with an environmental crisis or its aftermath, placing the organization in a difficult position where it could be blamed for its actions or inactions. This paper argues that if called upon by lead government departments as a key actor to mitigate the threat of an environmental disaster in the Arctic or manage its consequences that the Canadian Forces are ill-equipped to respond successfully with their current operational capabilities. This argument will be established while taking into consideration the extensive network of partnerships that the Canadian Forces can exploit, both internal and external to Canada.

Since the Arctic region can be defined in several different ways, the first chapter of this paper will serve at situating the circumpolar region and narrowing its territorial, demographical and economic implications for Canada. This will set the stage to analyze potential threats described by politicians, policy writers, scientists and indigenous people who have observed a shift in priority between sovereignty and the current most critical threat to the North that is an environmental disaster caused by natural or anthropogenic factors. Then, policy making and governance roles will be discussed in terms of their

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[7] Rob Huebert, *The Newly Emerging Arctic Security Environment* (Calgary: Canadian Defence & Foreign Affairs Institute, 2010), 7.

growing influence on the international front and national priorities that include a focus on the environment. Considering all of the actors that would be involved in the case of a environmental disaster in the Arctic, it will be established that the Canadian Forces will be called upon to deal with the crisis, even if it is supposed to be kept as a force of last resort. An examination of the Canadian Forces unique capabilities will be provided to demonstrate the gaps in resources and equipment that would be needed to mitigate or respond to an environmental threat. Finally, the results of a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis will pave the way for the development of a stewardship model that will encompass all stakeholders having a vested interest in the Canadian Arctic and its environmental safety. This model will offer partnership options for the Canadian Forces to mitigate capability gaps by sharing resources with other government departments and agencies, as well as circumpolar neighbours and private organizations. Finally, the conclusion will address implications of possible broader applications for leadership and collaboration in future operations and suggested areas requiring further investigation.

CHAPTER 1 - THE ARCTIC

"There are multiple definitions of the Arctic that result in differing descriptions of the land and sea areas encompassed by the term."[8] This first chapter will introduce different definitions of the Arctic region by using various scientific perspectives. The discussion will be structured in three distinct points of interest that are unique to the Canadian North, including its geography, population and natural resources. This

[8] Ronald O'Rourke, *Changes in the Arctic: Background and Issues for Congress* (Washington: Congressional Research Service, 2010), 1.

explorative approach will allow narrowing down on the actual definition of the region that will be used throughout this paper, especially in further analysis of opportunities and threats for Canada and its circumpolar partners.

Geography

The definition used by most astronomers is simply identifying the polar regions as the zone situated north of the Arctic Circle that is of latitude at approximately 66.30^{o} North. The sciences of geography, oceanography and climatology define the Arctic by looking at other aspects of the environment.[9] According to these scientists, the Arctic is the area where the ground is permanently frozen (permafrost) above the tree line, which incorporates oceans and regional rivers north of the Arctic Circle. It is also the region where the summer and winter solstices occur at least once per year and the average temperature during the warmest month is 10^{o}C. It is important to note that a definition that is based mostly on climate-related factors could delineate differing areas as a result of climate change over time. The definition of the Arctic based on the10^{o}C isotherm already excludes some land and sea regions that are north of the Arctic Circle and some countries that are normally included in other definitions.[10]

There is a total of eight countries with territory north of the Arctic Circle: Canada, the United States (Alaska), the Russian Federation, Norway, Denmark (Greenland), Finland, Sweden and Iceland, with only the five first countries on the list being

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[9] Frédéric Lasserre, *Géopolitique d'une région en mutation* (Québec: Presse de l'Université du Québec, 2010), 6.

[10] Ronald O'Rourke, *Changes in the Arctic: Background and Issues for Congress* (Washington: Congressional Research Service, 2010), 2.

considered Arctic coastal states. All of these countries are member states of the *Arctic Council*, an intergovernmental forum established in 1996.[11] One of its working groups called the Arctic Monitoring and Assessment Programme (AMAP) adopted the following definition of the Arctic that will be used for the purpose of this paper:

> essentially (the Arctic) includes the terrestrial and marine areas north of the Arctic Circle (66°32' N), and north of 62° N in Asia and 60° N in North America, modified to include the marine areas north of the Aleutian chain, Hudson Bay, and parts of the North Atlantic, including the Labrador Sea.[12]

The AMAP website provides a map presented at Figure 2 that is showing the Arctic Circle, tree line, 10°C isotherm and AMAP definitions of the Arctic.

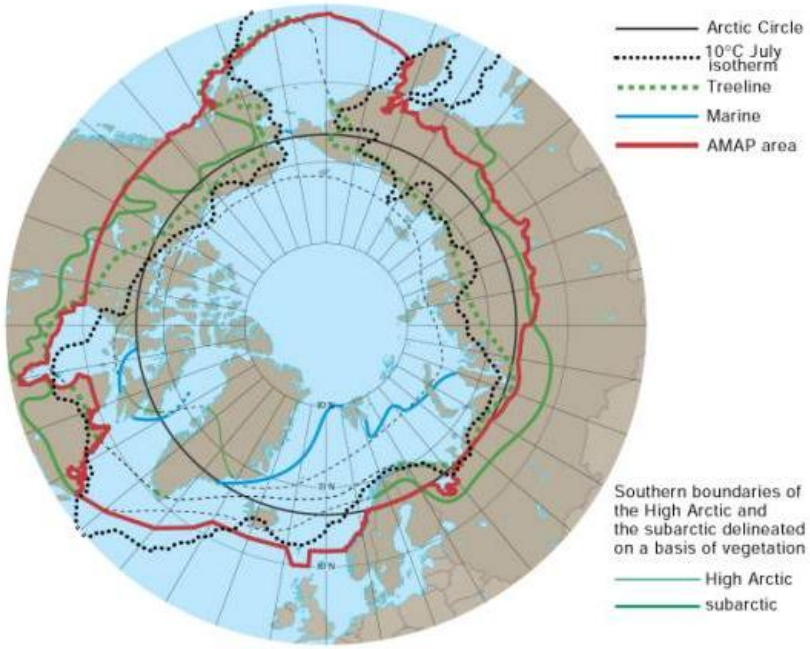

Figure 2 – The Arctic Region
Source: AMAP, Geographical Coverage, www.amap.no

[11] Arctic Council, "Member States," last accessed 20 January 2013, http://www.arctic-council.org/index.php/en/.

[12] Arctic Monitoring and Assessment Programme, "Geographical Coverage," last accessed 19 January 2013, http://www.amap.no/.

The North of Canada comprises the Canadian territories of the Yukon, Northwestern Territories, Nunavut, Nunavik (northern Quebec) and all of Labrador; as well as the marine systems of the Arctic Ocean and its adjacent seas and bays, including Beaufort, Labrador, Hudson and Baffin.[13] There are several longstanding boundary disputes between Canada and other countries regarding territorial claims in the Arctic. A tentative agreement was recently reached with Denmark to address ownership of two small patches of water totalling less than 225 square kilometers in the Lincoln Sea, an area of the Arctic Ocean north of Ellesmere Island and Greenland.[14] This plan demonstrates the willingness of the Harper Government to resolve these ongoing disagreements over competing claims in the North, which is of particular importance with the shrinking of the polar ice cap opening a wealth of economic opportunities in the Arctic. At this stage, the main two outstanding disputes are with Denmark for Hans Island and with the United States for the Beaufort Sea, although Canada is also in disagreement with its southern neighbour on other straits and passages. Hans Island has been at the heart of a dispute since Canada and Denmark negotiated a treaty in 1973 that divided a maritime boundary on which the island directly lays.[15] In 2005, the two countries signed a joint statement committing to continued negotiations and promising to inform one another of any planned activities related to the island. As for the Beaufort Sea, the area disputed is roughly 21,000 square kilometres and shaped in a triangle that extends from the Alaska-Yukon border to the edge of the United States and Canada's

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[13] Foreign Affairs and International Trade Canada, "The Arctic Region," last accessed 19 January 2013, http://www.international.gc.ca/polar-polaire/artic-region-arctique.aspx?view=d.

[14] Mackrael, Kim, "Canada, Denmark closer to settling border dispute," *Globe and Mail*, 29 November 2012.

[15] *Ibid*.

exclusive economic zones (EEZs). The two countries are using different arguments to justify their claims, while still collecting data about the outer limit of their extended continental shelves. Although Hans Island has no direct economic value, the Beaufort Sea is believed to be of great financial significance for its oil and gas deposits. Rob Huebert offers two options to address these disagreements, either through bilateral negotiations or the development of an international regime that would coordinate certain activities in the Arctic.[16] Franklyn Griffiths, Professor of Political Science at the University of Toronto, proposes a stewardship approach that would not only involve Canada and its Arctic partners, but also empower the Aboriginal inhabitants of the North.[17] At the present, there has been no requirement for an overarching entity, such as the Arctic Council, that would be settling claims for disputing parties, but it may come to that if conflicts cannot be agreeably resolved in the future.

Population

The Arctic region can also be defined by analyzing the living habits of populated areas based on factors such as adaptation to harsh climates, local economic activities, restricted public services, limited modes of transportation and general remoteness.[18] The Canadian North comprises about half the area of Canada, but is home to fewer than

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[16] Rob Huebert, *Northern Exposure: Canada and the Changing International Arctic* (Ottawa: Institute for Research on Public Policy, 2008), 103.

[17] France Abele, et *al*., *Northern Exposure: Peoples, Powers and Prospects in Canada's North* (Montreal: The Institute for Research on Public Policy, 2009), 7.

[18] Frédéric Lasserre, *Géopolitique d'une région en mutation* (Québec: Presse de l'Université du Québec, 2010), 6.

1115,000 people.[19] Amongst this northern population, about 45,000 Inuit live in 53 communities occupying four different Inuit regions: Nunavut, Nunatsiavut (Labrador), Nunavik (Quebec) and the Inuvialut Settlement Region of the Northwest Territories.[20]

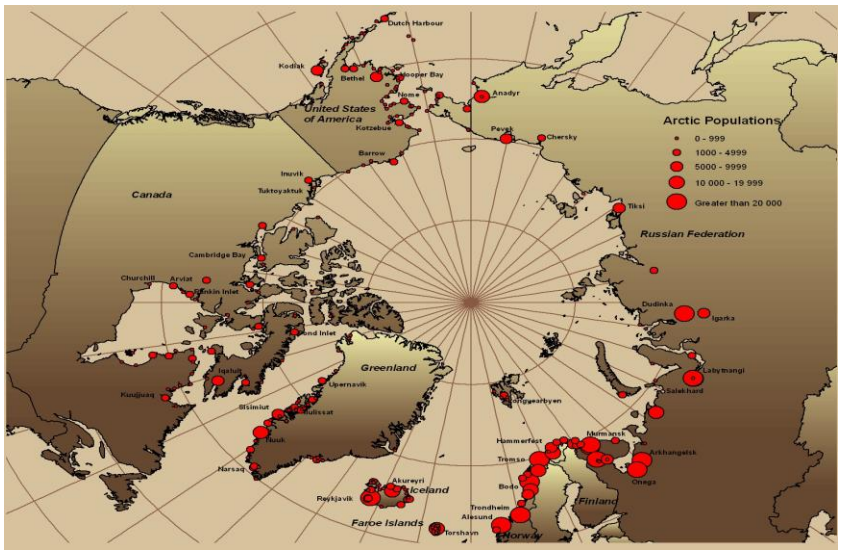

Figure 3 – The Arctic Population
Source: Transport Canada, www.tc.gc.ca

The creation of Nunavut in 1999 resulted from internal land claim negotiations between the Inuit and the federal government. It is the most significant change to Canada's recent political map and now represents a territory that a large part of the Inuit people can call their land. In 2010, the Government of Canada issued a formal apology for its "controversial High Arctic relocation program, in which 87 Inuit were relocated about 1,200 kilometers to Canada's most northerly settlements" in the 1950s.[21] Today, approximately 80% of the Inuit population still hunts and fish for subsistence, but is also

[19] Statistics Canada, "Aboriginal Population Profile 2006 Census," last accessed 20 January 2013, http://www.statcan.gc.ca.

[20] Aboriginal Affairs and Northern Development Canada, "Inuit," last accessed 21 January 2013, http://www.aadnc-aandc.gc.ca.

[21] William Tagoona, "Inuit get federal apology for forced relocation," *CBC News*, 18 August 2010.

using these traditional skills to contribute to the local economy. There are some communities that are suffering from social problems such as alcoholism, drugs and family violence. The federal department of Aboriginal Affairs and Northern Development Canada (AANDC) supports "Aboriginal people and Northerners in their efforts to improve social well-being and economic prosperity."[22] The booming of oil, gas and mining industries in the North has increased employment opportunities in these areas. The future of the Arctic is crucial to the Inuit, who have lived there for millennia. They have the most to gain or lose from future northern policy.

Natural resources

Thomas Homer-Dixon, Professor at the Centre for Environment and Business at the University of Waterloo, anticipates that "in a world of melting and shifting sea ice, more violent Arctic storms, and a surge of icebergs from disintegrating Greenland glaciers" will actually increase the difficulty of exploiting petroleum resources.[23] However, most Arctic experts propose an opposite view, where changes to the region brought about by warming temperatures resulting from climate variation will allow more exploration for oil and gas offshore and deposits of other minerals onshore.[24] The most recent AMAP report notes that climate change will have both positive and negative

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[22] Aboriginal Affairs and Northern Development Canada, "Inuit," last accessed 21 January 2013, http://www.aadnc-aandc.gc.ca.

[23] Thomas Homer-Dixon, "Climate Change, The Arctic, and Canada: Avoiding Yesterday's Analysis of Tomorrow's Crisis," in *Securing Canada's Future in a Climate-Changing World. National Round Table on the Environment and the Economy* (Toronto: Canadian Business Ethics Research Network, 2008), 90.

[24] Ronald O'Rourke, *Changes in the Arctic: Background and Issues for Congress* (Washington: Congressional Research Service, 2010), 16.

effects on oil and gas activities in the Arctic.[25] According to the *United States Geological Survey* published in 2008, the estimated volume of oil and gas in the Arctic region would represent a quarter of the overall undiscovered world energy resources.[26] These reserves could apparently be found along the coast lines and at less than 500 meters under water. Considering the Middle-East political instability and growing requirements of Asian populations, particularly in China and India, it is expected that current oil and gas reserves will diminish rapidly around the world. Therefore, the quest for exploring and exploiting new sources of exhaustible natural resources will inevitably bring the focus on the Arctic region. Potential investors may be discouraged by the unpredictability of ice conditions and other deterring factors including complex regulatory systems, deficient infrastructure, local labour shortages and short drilling seasons. Pierre Alvarez, President of the Canadian Association of Petroleum Producers, states that a sustainable oil and gas industry in northern Canada must meet the same requirements as in other parts of the world.[27] Ultimately, the federal government should continue to implement initiatives to encourage investment and development in the Arctic, such as the 15 percent mineral exploration tax credit to explore new mineral reserves in the North.[28] In fact, the mining industry could greatly profit from iron ore, base metals and diamonds in the Arctic.[29]

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[25] Arctic Council, *Arctic Oil and Gas 2007* (Oslo: Arctic Monitoring and Assessment Programme (AMAP), 2008).

[26] United States Geological Survey World Energy Assessment Team, *Circum-Arctic Resource Appraisal 2008* (Washington: United States Geological Survey, 2008).

[27] Pierre Alvarez, "Renewing the Northern Strategy," *Northern Perspective 30*, no. 1 (2006): 11.

[28] David Ljunggren, "Budget extends tax credit for junior mining firms," *Business News Network*, 21 March 2013.

[29] Frédéric Lasserre, *Géopolitique d'une région en mutation* (Québec: Presse de l'Université du Québec, 2010), 203.

However, several exploration projects were suspended during the 2008 global financial crisis. Since the demand and prices for minerals are dictated by volatile international markets, the North is susceptible to unpredictable development cycles.[30] Unfortunately, natural resources extraction in the Arctic mostly benefits stakeholders outside of the region and leaves the Inuit communities with undesirable remnants, such as pollution and contamination. Mining companies tend to abandon their temporary infrastructure, material and waste once they have completed their exploration activities. The Nunavut territory recently imposed stricter norms to control waste, hire aboriginals and protect animal migrations. When dealing with domestic and international development issues, the federal government is also responsible for the protection of the northern ecosystem, sustainment of aboriginal communities and preservation of their culture. "The bottom line is that Canada's Arctic remains one of the last politically stable places on Earth that has abundant energy resources."[31]

This chapter has portrayed various descriptions of the Arctic region based on its geographical uniqueness, distinct population and untapped natural resources. Regardless of the characterizations that vary from one science to another, the definition adopted for the purpose of this paper will be the one recognized by the Arctic Council. Throughout the follow on discussion the Arctic region will be generally defined as the area north of the Arctic Circle. The next chapter will evaluate the main types of threats that may endanger this fragile region and establish critical challenges that the Government of Canada will have to face in the future.

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[30] P. Whitney Lackenbauer, *From Polar Race to Polar Saga: An Integrated Strategy for Canada and the Circumpolar World* (Toronto: Canadian International Council, 2009), 56.

[31] Roland Floyd, "Arctic Energy Resources Will Be Needed," *Embassy*, 6 November 2008.

CHAPTER 2 - TYPES OF THREATS

This second chapter will demonstrate that concerns about protecting sovereignty in the Canadian Arctic are declining, while public interest is more focused on environmental risks deriving from rapid climate changes and a growing human presence in the North. This shift in priority will be illustrated with results from an analysis on the coverage frequency of key Arctic topics in three major Canadian newspapers over the past five years. This will continue shaping the analysis of national priorities ensuing from critical threats that government departments may face in the future for which the Department of National Defence (DND) and the Canadian Forces will have to be well prepared.

Sovereignty

Over the past decade, the threat to national sovereignty has been at the forefront of most discussions on the Arctic. There was a popular notion that neighbouring countries would be interested in expanding their territories by owning land that is currently recognized as belonging to Canada, especially for those areas that are deemed to hold undiscovered natural resources. The planting of a Russian flag at the bottom of the ocean under the North Pole in 2007 may have been a demonstration of such a desire to claim ownership of that region seafloor.[32] However, most subject matter experts perceived this gesture as purely symbolic with very little serious political or legal ramifications. The main concern remains the accessibility by foreign countries to Canadian waters and land without prior authority granted by national officials. In fact, foreign vessels can sail along

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[32] Richard A. Lovett, "Russian Plants Underwater Flag, Claims Arctic Seafloor," *National Geographic News*, 3 August 2007.

the coast lines without requesting prior permission to do so. The number of intrusions is increasing each year with unannounced vessels coming from various points of origins. Even though there has not been an incident related to the presence of these uninvited guests, there is always the possibility of foreigners debarking on our land without proper control. Prime Minister Stephen Harper has made an effort to visit the Arctic on a regular basis and supported regular Canadian Forces operations and exercises to show a military presence in the North. In 2005, he stated that: "You don't defend national sovereignty with flags, cheap election rhetoric or advertising campaigns. You need forces on the ground, ships in the sea and proper surveillance."[33] It is questionable if this contribution from DND has really been successful in reinforcing sovereignty. In reality, "a conventional military threat to Canada in the near to mid-term is considered unlikely."[34] Most recent references published on the topics of defence and security as they relate to the Arctic also converge to a common conclusion that the threat to the North is minimal. Therefore, if the Canadian sovereignty is not at jeopardy than what would be considered the most important concern for our federal government to focus on in the Arctic?

The Arctic in Canadian Newspapers

The Arctic has received substantial coverage in written media over the past recent years. With the aim of providing an empirical basis for monitoring shifts in public opinion, a "content analysis" was conducted on three major Canadian newspapers: Globe

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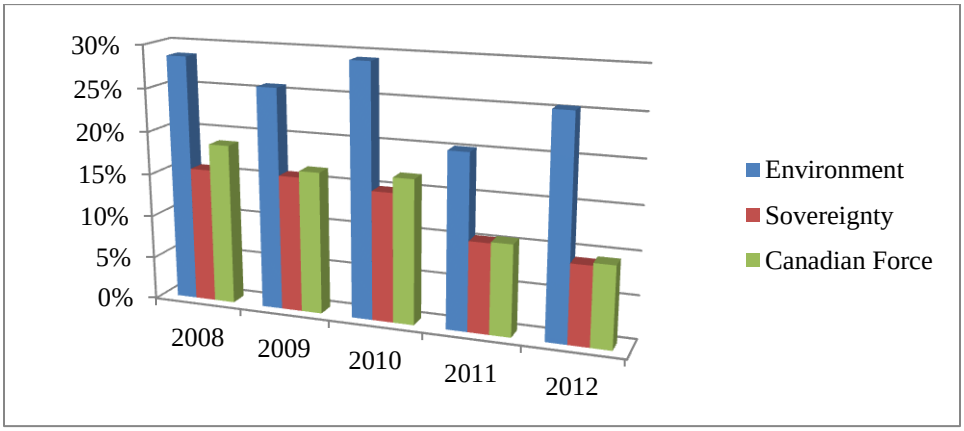
[33] Stephen Harper (speech, 2005 Election Campaign, Ottawa, 22 December 2005).

[34] Department of National Defence. *Standing Operations Order for Domestic Operations* (Ottawa: Canada Command, 2012), 2.

and Mail, National Post and Ottawa Citizen.[35] The data was collected from an electronic library research tool called ProQuest that is designed to support the needs of academic researchers by linking into open sources, as well as database from private, corporate and governmental organizations. Three topics of interest were selected to conduct separate word frequency counts in each newspaper over a period of five years going from 2008 to 2012 inclusively. It was expected that the topic of "sovereignty" would receive declining newspaper coverage over time in opposition to the "environment" topic. The "Canadian Forces" was added as a topic of interest to establish probable statistical dependency with one or both of the other two topics. The search covered the titles and overall content of newspaper articles, while always combining one of the three key topics with the word "Arctic" as a constant figure. The final results were compiled for each separate newspaper, as well as a global percentage per topic of interest.

Table 1 – Coverage of Arctic Topics in Canadian Newspapers



Source: ProQuest Research Library, http://search.proquest.com/

[35] Steve Stemler, "An overview of content analysis," *Practical Assessment, Research & Evaluation 7*, no. 17 (2001), http://pareonline.net/getvn.asp?v=7&n=17.

Overall, the results of the content analysis revealed a grand total of 7,295 articles published in the three Canadian newspapers of interest over the five year period. This overall coverage is generally down by 35% in the two largest national newspapers, as opposed to the Ottawa Citizen that has been sustaining a comparable volume of reporting on this topic. The focus on sovereignty has been progressively decreasing to a proportion of only 9% of all articles discussing the Arctic in 2012. This decline in coverage is almost identical to the proportion of articles discussing the Canadian Forces in the Arctic. In accordance to these results, there seems to be a statistical dependence between the Canadian Forces and sovereignty in the Arctic, which is similarly reflected in most communications coming from the federal government. When looking at the results in isolation from one newspaper from another, it appears that the decline in coverage is more important for the Globe and Mail (45%) and the National Post (32%) than it is for the Ottawa Citizen (only 9%). This may be attributed to the proximity of the Ottawa Citizen base of operation to Parliament Hill and the greater appetite from readers of the National Capital Region for articles on sovereignty in any context.

Over the past five years, the proportion of media coverage on environmental issues has been significant in Canadian newspaper articles related to the Arctic, with an average of 26% of all articles coming from the three aforementioned newspapers. It was expected that the results for this topic would show an ascending trend as opposed to the descending coverage on the other two topics. However, the proportion of yearly coverage has slightly decreased in 2011, but only to reach its median again in 2012. It is determined that environmental issues will remain a priority for the federal government when considering the Arctic and that threats to the environment will become, if not

already are, the main concern for that region. In addition to these results, the highlights of Public Opinion Research Projects between 2009 and 2010 revealed that "96% of Canadians agreed that Canada's military should play a leading role in responding to natural disasters that occur in Canada."[36] Hence, it is a popular belief that any threats to the environment in the Arctic that would result in a catastrophic event would most likely require the assistance of the Department of National Defence, if not as the lead department, certainly as a key player.

The Environment

The impacts of climate variation on the Arctic ecosystem have been extensively documented, including rising temperatures, melting icecaps and glaciers, and changes in flora and fauna. These changes can have adverse effects on food security, physical health and cultural survival of local inhabitants in the North. Unfortunately, Canada is not in a position to take a leadership role in climate change adaptation and mitigation strategies compare to some of its circumpolar neighbours that have developed more sophisticated expertise in these domains.[37] The challenge of dealing with climate change is a critical priority for the international community and necessitates immediate global action. However, environmental threats are not only resulting from natural causes, but can also largely come from an increased human presence in the North. The types and range of effects caused by humans (anthropogenic) have yet to be fully assessed, but will possibly

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[36] Public Works and Government Services Canada (PWGSC), "Archived Annual Report 2009-2010: Highlights of Public Opinion Research Projects," last accessed 16 April 2013, http://www.tpsgc-pwgsc.gc.ca/rop-por/rapports-reports/2009-2010/page-05-eng.html.

[37] P. Whitney Lackenbauer, *From Polar Race to Polar Saga: An Integrated Strategy for Canada and the Circumpolar World* (Toronto: Canadian International Council, 2009), 53.

have profound local, regional and global implications. It is essential to determine how growing fields such as commerce, exploitation, tourism and research in the Arctic will impact on the region. This increased level of activity deriving from climate change, as well as contributing to its evolution in some ways, represents a definite catalyst to potential environmental threats. "The core challenge is that climate change threatens to overburden states and regions which are fragile and conflict prone."[38] Although the Arctic is not subject to conflicts, as previously stated, it is certainly fragile due to the instability of its social and ecological systems.

This chapter validated that media coverage in major Canadian newspapers has been declining on the topic of sovereignty as it relates to the Arctic to offer a greater focus on the environment. This is consistent with most recent arguments from subject matter experts that a threat to Canadian sovereignty in the North is deemed to be minimal. The following discussion will keep the Arctic environment at the core of its analysis, even when security matters are being addressed. As the effects of global warming continue to impact the environment allowing for a greater human presence across the Arctic, it is important to analyze in greater details the environmental issues that are at stake. The next chapter will start exploring several impacts on the Arctic environment that are resulting from natural phenomena that have been tracked by scientists over the past century.

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[38] Council of the European Union (EU), *Climate Change and International Security* (Brussels: The Commission and the Secretary-General/High Representative European Council, 2008), 3.

CHAPTER 3 - ENVIRONMENTAL ISSUES

This third chapter will present environmental issues deriving from global warming, permafrost/ice caps melting and pollution. The discussion will investigate the key impacts on complete ecosystems, which can affect the local population, flora, fauna and marine mammals. The focus will predominantly remain on the effects that natural phenomena have on the Arctic environment, although there will be some aspects that will address second orders of effect ensuing from human actions. However, the most significant anthropogenic issues will be covered in greater details in chapter 4. At the end of this section, "Opportunities" and "Threats" will be introduce to start compiling relevant data that will be used for the SWOT analysis in the last chapter of this paper.

Global warming

There is no place than the Arctic region where global warming is more evident. Surface air temperatures have been recorded since 1880 and the average Arctic autumn-winter temperatures are projected to increase by between 3 and 6^{o}C by 2080.[39] The last assessment report published in 2007 from the Intergovernmental Panel on Climate Change (IPCC) revealed that "average Arctic temperatures have increased at almost twice the global average rate in the past 100 years."[40] The loss of snow and ice contributes to climate warming by increasing absorption of the sun's energy at the surface of the planet. This natural phenomenon can also radically increase emissions of

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[39] Arctic Council, *Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2011 Executive Summary* (Norway: Arctic Monitoring and Assessment Programme (AMAP), 2011), 4.

[40] Intergovernmental Panel on Climate Change (IPCC), "Fourth Assessment Report: Climate Change 2007," last accessed 23 February 2013, http://www.ipcc.ch/index.htm.

carbon dioxide and methane. However, the IPCC largely attributes the increase in global average temperatures to higher concentrations of greenhouse gas (GHG) resulting from human activities. The two primary sources of carbon dioxide emissions are currently coming from electricity generation with the burning of coal and motor transportation with the usage of petroleum. Governments have implemented policies to decrease GHG emissions that include targets at the national and regional levels, promotion of energy efficiency and support of renewable energy. The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) that was adopted in 1997 served to set biding obligations on industrialized countries to reduce emissions of GHG. Prime Minister Stephen Harper was highly criticized for his decision to withdraw from the Kyoto Protocol in 2011, although it appeared that prior commitments were unrealistic.[41] During the United Nation Climate Change Conference in 2011, the Chair of the Arctic Council Carl Bildt urged all countries "to take decisive action to reduce global GHG emissions so as to hold the increase in global average temperature below 2^{o}C above pre-industrial levels."[42]

Melting permafrost/ice caps

"*Cryosphere* is the scientific term for that part of the Earth's surface that is seasonally or perennially frozen."[43] It includes snow, frozen ground, ice sheets, ice caps, ice on rivers and lakes, sea ice and glaciers. Due to global warming, Arctic snowfall and

[41] Bill Curry and Shawn McCarthy, "Canada formally abandons Kyoto Protocol on climate change," *Globe and Mail*, 12 December 2011.

[42] Arctic Council, "Arctic States call for measures to reduce emission," last accessed 24 February 2013, www.arctic-council.org.

[43] *Ibid.*

rain are projected to increase in all seasons, but mostly in the winter, even though the amount and period of snow cover and sea ice have declined across the Arctic because the snow is melting earlier in the spring. Permafrost temperatures have climbed by up to 2°C, increasing the above depth of soil that seasonally thaws each year. The southern limit of permafrost has considerably moved northward in Canada. The most prevalent and permanent bodies of ice that include multi-year sea ice have all been decreasing at a faster rate since 2000. On 26 August 2012, scientists from the National Aeronautics and Space Administration (NASA) and the National Snow and Ice Data Center reported that "the Arctic sea ice dipped to its smallest extent ever recorded in more than three decades of satellite measurements".[44] In fact, it has been determined that in the last 20 years, the melting of polar ice caps has been more significant than in the last 10,000 years.

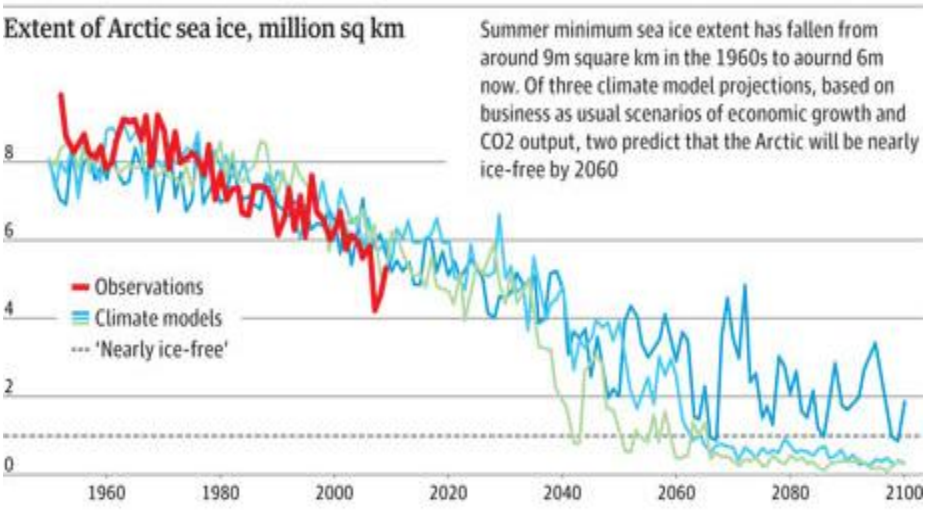

Figure 4 – Extent of Arctic Sea Ice
Source: Datablog, www.guardian.co.uk

[44] NASA, "Arctic Sea Ice Shrinks to New Low in Satellite Era", last accessed 23 February 2013, http://www.nasa.gov/topics/earth/features/arctic-seaice-2012.html.

A nearly ice-free summer is now considered likely for the Arctic Ocean by mid-century. A recent comprehensive satellite study supported by NASA and European Space Agency (ESA) also confirmed that the melting ice caps are raising sea levels at an accelerating rate.[45] Recent models project a rise of as much as one meter or more by the end of this century. All of the main sources of freshwater entering the Arctic Ocean will alter large-scale ocean currents that affect climate changes. More damaging storm surges and risk of inundation will directly impact on millions of people in low-lying coastal flood plains and coastal cities. Overall, the observed changes to cryospheric responses over the past ten years are dramatic and represent an obvious departure from the long-term predictions.

Pollution

The Arctic has always been recognized as a pristine environment, but pollution in many forms is starting to become a serious concern for all ecosystems. On land, "the melting ice and snow release contaminants that have been stored for many years, allowing the contaminants to re-enter the environment."[46] The limited sunlight exposure also prolongs the degradation process and increases the accessibility of toxic substances to inhabitants of the North. These contaminants reappear at different levels of the food chain, endangering the health of humans and animal species. Considering its modest population and the general absence of large-scale industrialization, the Arctic in itself does not represent a major source of pollution. However, the spillover of industrial

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[45] NASA, "Arctic Sea Ice Shrinks to New Low in Satellite Era", last accessed 23 February 2013, http://www.nasa.gov/topics/earth/features/arctic-seaice-2012.html.

[46] Arctic Council, *Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2011 Executive Summary* (Norway: Arctic Monitoring and Assessment Programme (AMAP), 2011), 9.

contaminants from other regions can reach the Canadian North via air or water currents, even if these pollutants originate from another country. In the air, the Arctic haze is a clear indication of pollution that persists longer each year in late winter and early spring.[47] At sea, the most concerning threat remains the routine, accidental or illegal oil discharges, that can easily damage the delicate aquatic ecosystem. In the marine environment, black carbon or other types of emissions from ships navigating in the Arctic waters may also have regional impacts by accelerating ice melt. As some of these indicators continue to raise flags on pollution across the Arctic region, the federal government will have to enhance legislation on its own territory, but also encourage its neighbours to do the same so as to avoid suffering from others' poor practices.

Opportunities and threats

There is still a great deal of uncertainty about future changes to the Arctic cryosphere and what ultimate consequences they will have on the environment and populations. The requirement for concerted monitoring and research is more than ever present in order to better predict these changes to ecosystems. Diminishing sea ice reduces opportunities for subsistence hunting by indigenous peoples and also impacts local fauna, including polar bears and marine mammals. Access to northern areas via the sea is increasing during the summer as sea ice disappears; allowing greater shipping, industrial activity and ship tourism. Offshore oil and gas activities will benefit from a longer open water season, although threats from icebergs may rise due to greater iceberg production. The increased glacier melt also creates new opportunities for hydroelectric

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[47] Tim Garrett, "Pollutant haze Heats the Arctic," *News Center The University of Utah* (2006), http://unews.utah.edu/old/p/051006-1.html.

generation. On land, access to many areas is becoming more difficult as ice roads melt earlier and freeze later and as permafrost degrades. Forestry may benefit from thawing permafrost in areas where there is enough water for trees to grow. On the other hand, thawing permafrost increases the risk of damage to infrastructure, although poor design in the past is also a contributing factor. There are risks to critical infrastructure that need to be taken into consideration where pipelines, buildings and houses are anchored on permafrost which may lose its bearing capacity due to extensive thawing cycles. A number of Inuit villages may be forced to relocate in response to these structural damages or the encroaching sea. At national and regional levels, adaptation will require leadership from governments and international bodies to mitigate the impacts and react to environment threats caused by rapid climate changes.

This chapter highlighted environmental issues mainly caused by natural phenomena that may impact on the Arctic ecosystems. It is obvious that additional research efforts are required to better predict the future effects of global warming, ice melting and global pollution. Without better estimations of probable environmental threats, it is very difficult for the Government of Canada to mitigate or prepare to react to the unexpected. For example, the Canadian Forces will have to remain mindful of these unpredictable climate variations when operating in the North, as well as take into account that transportation systems may not always function optimally. Nevertheless, these environmental changes also create opportunities for several types of industries that are projected to develop in the region. The next chapter will evaluate the impacts of a growing human presence in the Arctic in support of those emerging industries.

CHAPTER 4 - ANTHROPOGENIC ISSUES

This fourth chapter will present anthropogenic issues resulting from the growth in commercial, industrial, leisure and scientific activities in the Arctic. A large emphasis will be placed on the opening of transpolar shipping routes that are expected to contribute favorably to the development of all relevant industries. Actual examples will be used to illustrate some of the points made and to justify the implementation of enhanced policies in some areas of concern. The discussion will also include facts on other countries serving as comparative arguments for current and future Canadian initiatives in the making. At the end of this section, a summary of "Opportunities" and "Threats" will again be provided to continue compiling relevant data for the SWOT analysis conducted at the end of this paper.

Commerce

Due to the aforementioned impacts of global warming, there is a total of four transpolar shipping routes, illustrated at Figure 5 on the next page, that are becoming increasingly accessible to sea traffic. These routes are called the Northwest Passage (NWP), Northern Sea Route (NSR), Transpolar Sea Route (TSR) and Arctic Bridge Route (ABR).[48] The accessibility of transpolar shipping routes across the Arctic Ocean reduces the travel distance by 40% for ships navigating between Europe and the Pacific compared to previous routes.[49]

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[48] Malte Humpert and Andreas Raspotnik, "The Future of Arctic Shipping," *The Arctic Institute: Center for Circumpolar Security Studies*, (2012), http://www.thearcticinstitute.org/2012/10/the-future-of-arctic-shipping.html.

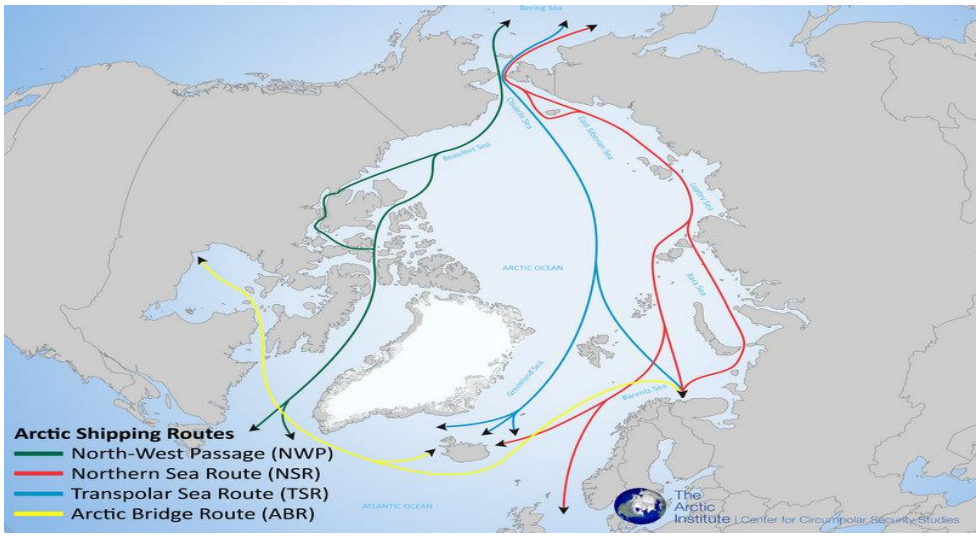

Figure 5 – Arctic Shipping Routes
Source: The Arctic Institute, www.thearcticinstitute.org

The Northwest Passage alone provides a possibility to navigate between Asia and the Atlantic by saving 7,000 kilometers on the current distance traveled when sailing through the Panama Canal. This represents significant savings in terms of time, fuel and transit fees for commercial shipping companies. In 2006, the Canadian Defence Minister Gordon O'Connor received a brief stipulating that "the Northwest Passage could be open to more regular navigation by 2015, if the current rate of ice thinning continued".[50] Since then, the speed at which the ice has been melting surpassed every prediction. Therefore, navigating through the Canadian Archipelago is already feasible in late summer and early autumn. Although Canada claims that the passage constitutes Canadian internal waters, the United States contends that the passage is an international strait, where "the coastal state typically retains title of the waters, but foreign vessels have the right of transit

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[49] Arctic Council, *Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2011 Executive Summary* (Norway: Arctic Monitoring and Assessment Programme (AMAP), 2011), 11.

[50] Michael Byers, "Unfrozen Sea: Sailing the Northwest Passage," *Policy Options*, May 2007.

passage."[51] In the past century, there have been ten ships and submarines from various nationalities that have transited through the Northwest Passage without requesting prior authorization from Canada.[52] The notion of internal waters would certainly be challenged by additional transits of unauthorized vessels, but would also confuse the issue of responsibility and liability if an accident was deemed to happen. On the other hand, there are other studies arguing that large-scale commercial shipping will continue experiencing difficulties to navigate through the Northwest Passage. The research shows that in certain parts of the Arctic and depending on the meteorological conditions, there are instances where melting ice would endanger ships rather than ease their journey. In fact, the Arctic Ocean multi-year ice, that is thicker and stronger than first-year ice, could flow into navigable lanes causing unforeseen damages to ships structures while sailing across the Arctic Archipelago. This type of ice represents a significant threat to most ships, along with the fact that the Arctic Ocean remains inadequately charted in some of the areas where increasing traffic is observed, with only 10% of the region charted to modern standards. The most recent marine accident of the *Zelada Desgagnes* in July 2012 is an evidence of these problems.[53] The cargo ship suffered significant damage when encountering unexpected ice buildup in Frobisher Bay and required to be escorted by the Canadian Coast Guard to deliver its cargo and repair its hull. Maritime traffic in the Canadian Arctic is still relatively stable with a total of 140 individual vessels reporting to the Canadian Coast Guard Marine Communication and Traffic Services in 2010 and 135

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[51] Michael Byers, "Unfrozen Sea: Sailing the Northwest Passage," *Policy Options*, May 2007.

[52] Nancy Teeple, "L'histoire des intrusions dans l'Arctique canadien, en bref," *Le Journal de l'Armée du Canada 12*, no. 3 (Winter 2010): 68.

[53] CBC News, "Ice Damages Hull of Sealift Ship Near Iqaluit," 26 July 2012.

vessels in 2011.[54] However, the number of trips observed by shipping vessels and other types of naval platforms is expected to increase, with a directly proportional number of marine accidents. Given the challenges of responding to shipping emergencies in this vast, remote region, accident prevention becomes a priority. Moreover, the environmental threats of international shipping in the Arctic are undeniable with critical risks such as oil spills that would result in disastrous consequences. Large ships emptying their ballast tanks as they enter these shallow waters could introduce destructive new species, including fish parasites or poisonous algae.[55] The International Maritime Organization is working on developing international regulations that will be mandatory for polar shipping. Canada plans to harmonize its national shipping rules with international requirements, especially as it applies to the Arctic and the protection of this fragile environment.

Exploitation

The reduction in sea ice and opening up of potential new ice-free shipping routes, could increase access to mineral wealth and extend oil and gas exploration. It is estimated that unexploited reserves in the Arctic could account for 30% of global undiscovered natural gas and 13% of global undiscovered oil.[56] It is challenging to forecast prospective investments in the Arctic region, but they could potentially reach an excess of $100

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[54] Transport Canada, "Marine Transportation", last accessed 31 March 2013, http://www.tc.gc.ca/eng/marine-menu.htm.

[55] Michael Byers, "Unfrozen Sea: Sailing the Northwest Passage," *Policy Options*, May 2007.

[56] Charles Emmerson and Glada Lahn, *Arctic Opening: Opportunity and Risk in the High North* (London: Chatham House-Lloyd, 2012), 19.

billion over the next ten years.[57] While these considerable economic development projects have the potential of generating substantial benefits, they also remain risky business ventures. The Arctic is a unique, complex and austere environment, where operators face challenging conditions including worksites remoteness, uncertain weather forecasts, extreme temperatures and prolonged periods of darkness. The consequences of environmental disasters in the Arctic could be worse than in other locations due to the vulnerability of the ecosystems. Furthermore, companies operating in the Arctic risk their global reputation with significant political focus and media coverage on the region. It is unlikely that smaller companies will invest in the region without having prior experience with services and technologies most adapted to operating in Arctic conditions. Some companies have already spent billions of dollars on deep-water licenses for exploitation in Canada, but have yet to obtain the permission to drill. This situation is attributable to restrictive regulations imposed by the National Energy Board after reviewing safety and environmental requirements for offshore drilling in the Arctic.[58] This review was initiated in reaction to the British Petroleum (BP)'s 2010 Deepwater Horizon disaster in the Gulf of Mexico. At this stage, most applications for offshore drilling in the Canadian Arctic are at a standstill, until the National Energy Board is satisfied that proponents have implemented solid safety programs to protect workers, the public and the unique Arctic environment. As for mining companies, they are doing far better. China invested through an Australian company called MMG Limited for building two mines in Nunavut by 2018

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[57] Cecilia Jamasmie, "Arctic Oil Extraction Frozen, but Mining to Bring a Melting $100 billion in Investments", *Mining.com*, 14 January 2013.

[58] National Energy Board, "Arctic Offshore Drilling Review," last accessed 31 March 2013, www.neb-one.gc.ca,.

that will produce significant amounts of zinc and copper.[59] Another on-going large-scale venture is the Mary River project on Baffin Island, which is supposed to allow the exploitation of one of the largest undeveloped iron ore deposits over a 21-year extraction period. Mining operations can have a range of environmental impacts from the exploration phase through to the development and operation of the mine. It is closely monitored and regulated with laws covering aspects such as pollutant restrictions and waste management. In the Canadian territories, mining has been a federal jurisdiction, through the Department of Aboriginal Affairs and Northern Development, but is in the process of being devolved to territorial governments.[60]

Tourism

Similarly to commercial shipping, the number of voyages by cruise ships has trended upward. The vessels most frequently found to be providing cruises in the Canadian Arctic are often former icebreakers and research vessels, such as the *Kapitan Khlebnikov*, a Russian icebreaker that was converted to offers luxury trips through the Northwest Passage. There is also an ice capable pocket cruise ship, called MS *Hanseatic*, that has navigated in the Canadian Arctic during August and September each year since 1993. Arctic cruises are not limited to the more accessible zones, but rather passenger vessels have navigated much of the Canadian Arctic. Cruise ship traffic is also fairly stable, at approximately 2,000 passengers on board seven cruise ships making 11 trips a

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[59] Cecilia Jamasmie, "Arctic Oil Extraction Frozen, but Mining to Bring a Melting $100 billion in Investments", *Mining.com*, 14 January 2013.

[60] Ramsey Hart and Dawn Hoogeveen, "Introduction to the Legal Framework for Mining in Canada", *MiningWatch Canada*, 18 July 2012.

year.[61] Increased passenger traffic in the Canadian Arctic raises another emergency response issue, which is the capacity to mount a rescue effort for hundreds or thousands of passengers. Previous experiences show that to rescue a cruise ship it is ideal to use the same type of vessel, since no other marine platforms have the capacity to do so. This was evidenced when a small Canadian cruise ship struck an iceberg off Antarctica and sank hours later after all 154 passengers aboard were rescued by another cruise ship that answered the distress call.[62] Based on that principle, the Danish Navy is "advising cruise companies to cooperate and sail in pairs in Greenland waters."[63] There is a lack of marine infrastructure and amenities on land to accommodate visitors in the Arctic region where tourism remains an emergent industry. The fact that only a few runways are paved across the region limits the type of aircrafts able to fly in some communities. In 2008, the visitors' exit survey revealed that more than half of Nunavut's yearly visitors were travelling for business, not leisure; with 41 per cent of visitors saying that the trip was good value for the money spent.[64] Over the years to come, it is expected that the continuing rise of tourism in the Arctic will serve at familiarizing a growing number of international travelers seeking exposure to northern wonders. This will contribute to increasing revenues for both the local communities and circumpolar state economies. At the same time, the development of infrastructure, as well as pollution and waste deriving

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[61] Transport Canada, "Marine Transportation", last accessed 31 March 2013, http://www.tc.gc.ca/eng/marine-menu.htm.

[62] Bill Cormier, "Iceberg Sinks Cruise Ship off Antarctica," *National Geographic News*, 24 November 2007.

[63] Brad Judson, *Trends in Canadian Arctic Shipping Traffic – Myths and Rumours* (Bejing: Polar Engineering Conference & Exhibition, 2010).

[64] CBC News, "Arctic Tourism Heating Up as Northwest Passage Melts," 24 August 2012.

from growing tourism are already causing significant environmental and social impacts. The Arctic Council, the Sustainable Arctic Tourism Association and conservation groups are urging governments and the tourism industry to collaborate to insure that tourism activities take into consideration the fragility of the Arctic ecosystems and native cultures.[65]

Research

The Canadian High Arctic Research Station project was first announced in 2007 with the Government of Canada's Speech from the Throne. "Under the rubric of strengthening Canada's sovereignty and place in the world," the Government committed to:

> build a world-class Arctic research station that will be on the cutting edge of Arctic issues, including environmental science and resource development. This station will be built by Canadians, in Canada's Arctic, and it will be there to serve the world.[66]

The Budget 2010 provided the Department of Aboriginal Affairs and Northern Development with $18 million over five years to undertake the pre-construction design phase for the research station. In the interim, the bulk of research efforts have been coordinated through the Churchill Northern Studies Centre that is funded by both government and private sectors. In addition to the ongoing global economic slump, Dawn Bazely, a Biology Professor at York University in Toronto states that: "there has been a shift in funding in the North from environment and climate research to national security

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[65] Russian Geographical Society, "Tourism & Recreation," last accessed 31 March 2013, http://arctic.ru/tourism-recreation.

[66] Science and Technology for Canadians, "Canadian High Arctic Research Station," last accessed 31 March 2013, www.science.gc.ca.

and resource development."[67] This is contrary to the content analysis results presented in chapter 2 and showing a recent shift from the topic of sovereignty to the environment in major Canadian newspapers. Scientists are typically very conscious of the environment in which they operate and take the necessary precautions to avoid damaging their surroundings through their work. However, the increased human presence alone is what concerns the local population and Arctic stakeholders, even if these visitors to the region do not harm the environment by their actions. The amenities and logistics resources required to support research initiatives are enough in themselves to disturb the peaceful state of the North.

Opportunities and Threats

There is no doubt that the Arctic will see an increased human presence in the near future be it for purposes of commercial shipping, industrial activities (drilling and mining), tourism or research. All of these activities will require the construction of infrastructure to accommodate large groups of visitors, as well as the expansion of amenities and services. The local population should benefit financially from most of these projects, in addition to showcasing the Arctic in a positive light. However, this increased level of activity will inevitably disrupt the quiet nature of the North and transform some of the communities into what will look like small villages or southern cities. Given the intensification of traffic on land and at sea, environmental concerns are similarly rising in regards to pollution, waste and noise management. Furthermore, an environmental disaster such as a large-scale oil spill remains the most concerning of all

[67] Sharon Oosthoek and Nick Walker, "North by Nature", *Research*, 11 December 2012.

threats, not only in the Arctic Ocean, but also on land or ice covered grounds. Concerted efforts from all stakeholders involved will be critical in order to coordinate development projects over the next decade, while global warming effects are enticing the international community to focus on the Arctic. Global and national governing bodies will have to implement policies and regulations in the same way to protect the environment in that unique part of the world.

This chapter underlined the potential benefits and challenges associated with four different industries under development in the Arctic region. Commercial activities will increase with the opening of transpolar shipping routes, while threatening the marine ecosystem with the risk of oil spillage. Natural resources exploitation will attract internal and external investments, but will increase pollution and waste. Tourism will provide a greater exposure to the beautiful Arctic region; though will only be adequately supported by expanding infrastructure and services in indigenous communities. Research will also contribute to an increased human presence in the North with limited residual impacts on the environment. The Government of Canada will presumably want to intensify the level of surveillance of these activities across the region. The Canadian Forces are normally responsible for providing such coverage, although it has been sporadically achieved in the past. The monitoring of regular patterns and changing situations will facilitate the global governance of the region by international organizations, as well as influence national strategies and policies in the future.

CHAPTER 5 – POLICY MAKING AND GOVERNANCE

This fifth chapter will discuss the governance framework of the Arctic starting by the international level of policy making. It will demonstrate how influential the Arctic Council can be, while at the same time being limited in its scope of authority. Bilateral and multilateral relations will then be introduced with a view of establishing their advantageous nature for the Government of Canada. The relevance of national strategies and policies will be validated, while taking into account the opportunities and threats that have been identified in the previous chapters. Ultimately, this section will provide "Strengths" and "Opportunities" to continue feeding the upcoming SWOT analysis.

The Arctic Council

The governance framework for the Arctic is fairly new and still being developed. The international organization mainly focused on that region is the *Arctic Council* that was formally established in 1996 under the Ottawa Declaration and serves as:

> a high-level intergovernmental forum (responsible) to provide a means for promoting cooperation, coordination and interaction among the Arctic States, with the involvement of the Arctic Indigenous communities and other Arctic inhabitants on common Arctic issues; in particular, issues of sustainable development and environmental protection in the Arctic.[68]

The Arctic Council involves eight Arctic countries that were previously mentioned in chapter 1 of this paper. There are also six international organisations furthering the interests of indigenous communities that have permanent participant status, such as the *Arctic Athabaskan Council* representing the American and Canadian Athabaskan member First Nation governments on the international stage. The Arctic Council is not a political

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[68] Arctic Council, "History", last accessed 7 April 2013, http://www.arctic-council.org.

decision-making body, but rather it is a high-level forum of discussion that informs and enables states to adopt progressive environmentally and socially responsible policies.[69] The European Commission notes that "the Arctic Council has been successful in preparing assessments, developing a regional identity and setting the Arctic agenda."[70] In May 2013, Canada will take on a leading role in assuming the chairmanship of the Arctic Council, with the appointment of Patrick Borbey, the current President of the Canadian Northern Economic Development Agency, as Chairman of the Senior Arctic Officials.[71] He will assume this responsibility as circumpolar nations are about to conclude a treaty on the prevention of oil spills and as the environmental concerns associated with increased shipping in the North are growing as fast as the ice levels are declining. The activities of the Arctic Council conducted in six working groups are covering a broad field of subjects, from climate change to emergency response. Rob Huebert affirms that "the Arctic Council has been unable to formulate a regionally acceptable set of policy actions to respond to (environmental) problems facing the region."[72] The Emergency Prevention, Preparedness and Response (EPRR) working group addresses environmental emergencies in the Arctic by developing guidance and risk assessment methodologies, response exercises and training. In January 2013, a workshop was held in Ottawa to discuss operational guidelines regarding an Arctic marine oil pollution preparedness and

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[69] P. Whitney Lackenbauer, *From Polar Race to Polar Saga: An Integrated Strategy for Canada and the Circumpolar World* (Toronto: Canadian International Council, 2009), 48.

[70] Commission of the European Communities, *The European Union and the Arctic Region* (Brussels: Communication from the Commission to the European Parliament and the Council, 2008), 10.

[71] The Canadian Press, "Canada Focuses on Development at Arctic Council; Experts fear Wrong Approach," *CBC News*, 3 December 2012.

[72] Rob Huebert, *Northern Exposure: Canada and the Changing International Arctic* (Ottawa: Institute for Research on Public Policy, 2008), 79.

response agreement. These guidelines will certainly serve as a solid overarching document for the development or refinement of national policies by circumpolar nations.

There is an emerging debate regarding the potential participation of countries without Arctic territory to the Arctic Council. In fact, India, China and Japan have asked to be permanent observers, but existing official members and direct Arctic stakeholders have not necessarily received this request favorably.[73] These Asian powers are seeking stakes in the region, especially since they are top consumers of natural resources that may get exploited in the Arctic in the future. The opening of transpolar shipping routes will have a serious impact on maritime trade between Asia, Europe and North America. India, China and Japan already have an Arctic presence, with research stations in Norway. By 2015, China plans on launching Arctic expeditions with its new polar ice-breaker ships. Recent scientific studies have established Asian ancestry of many of the Arctic tribes, which further complicates the issue. Canada in its chairman role will have to resolve this debate about admitting emerging powers, including Brazil, into the international forum.

Bilateral and multilateral agreements

The Government of Canada deals with many partners and maintains several bilateral relationships in the Arctic. Bilateral relations between Canada and the other circumpolar states, including the United States, the Russian Federation and the Nordic countries, have resulted in important partnerships and agreements.[74]

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[73] Raja Murthy, "China, India Enter Heating-up Arctic Race," *Asia Times*, 25 January 2012.

The United States is our most important partner in the Arctic, with which we have long collaborated on multiple fronts. Cooperation in the realms of public safety, environmental protection, transportation, infrastructure, science, technology, surveillance and military operations is underwritten by a myriad of agreements that together create a sound framework for the economic development and security of the Arctic.[75] These agreements are consistent with the objectives laid out in Canadian strategies and policies, as well as the United States Presidential Directive on Arctic Region Policy of 2009. In 2010, according to a poll conducted exclusively for Postmedia News and Global TV, 32 per cent of Canadians chose the BP's Deepwater Horizon oil spill in the Gulf of Mexico as the top story of the year, before the Haiti earthquake and Vancouver Olympics.[76] These results are reflective of the importance the Canadian population puts on environmental issues as reflected in the content analysis results in chapter 2. In order to address the crisis, the United States rallied a momentous whole-of-government effort that included significant military resources in the form of transportation aircrafts and up to 6,000 National Guard troops to assist with security, medical needs, engineering and other tasks.[77] Transport Canada provided expertise and sophisticated equipment in assistance of mapping and tracking the spreading oil slick by flying missions in the Gulf of Mexico.[78]

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[74] Foreign Affairs and International Trade Canada, "Circumpolar Bilateral Relations," last accessed 13 April 2013, http://www.international.gc.ca/polar-polaire/regions.aspx.

[75] Government of Canada, "Canada-U.S. Collaboration in the Arctic," last accessed 14 April 2013, http://www.international.gc.ca.

[76] Shannon Proudfoot, "Canadians name BP oil disaster as 2010's top news story," *The Gazette*, 27 December 2010.

[77] CBS Interactive Inc. "As Oil Reaches Shore, Military Joins Fight," *CBS News*, 30 April 2010.

[78] Paul Hunter, "Transport Canada Helps Track Gulf Oil Spill," *CBC News*, 11 May 2010.

It is very likely that Canada would also have to request assistance from the United States in various capacities, if facing an environmental disaster of that magnitude in the Arctic.

Canada and the Russian Federation share a unique Arctic identity that serves as common grounds for collaborating together. Over the past decades, Northern issues have been addressed as priorities of the Canada-Russia relations due to the fact that both countries share the largest part of Arctic Ocean coastlines. In 1989, an initial agreement on cooperation in the Arctic and the North was signed between Canada and the then Union of Soviet Socialist Republics (USSR) that was followed by a similar agreement with the Russian Federation in 1992.[79] The partners collaborate on Arctic issues related to the environment, transportation, indigenous peoples, natural resources, development, trade and tourism. Under Canada's leadership, the G8 launched the "Global Partnership against the Spread of Weapons and Materials of Mass Destruction" in 2002.[80] At the end of the Cold War, the Russian Federation inherited a significant amount of nuclear, biological and chemical weapons with related destructive materials. More specifically, many nuclear submarines in the Kola Peninsula remained inactive posing environmental threats. Consequently, Canada has provided large sums of money and resources to eliminate nuclear materials in the Arctic along the Russian coastline. Furthermore, oil spillage is currently a major environmental problem in Russia, with an average of about 20,000 oil spills each year estimated by Greenpeace.[81] The Russian government

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[79] Foreign Affairs and International Trade Canada, "Circumpolar Bilateral Relations," last accessed 13 April 2013, http://www.international.gc.ca/polar-polaire/regions.aspx.

[80] Department of Foreign Affairs and International Trade Canada, *Global Partnership Program: A Tangible Canadian Contribution to Reducing the Threat of Weapons of Mass Destruction* (Ottawa: Global Partnership Program, 2008).

commissioned a 2010 report evaluating that 500,000 tons of that spilled oil makes its way into rivers in northern Russia and then ends up in the Arctic Ocean. Russian authorities will have to enforce stricter policies to limit oil spillage, by engaging both the public and private sectors; otherwise all circumpolar states will have to deal with the impacts of these negligent actions on the environment in the near future.

Canada also maintains strong bilateral relationships with several Arctic coastal countries including Denmark, Iceland, Norway and Sweden. Considering the 2,000 kilometers of border that Canada shares with Greenland, there are historical and political relationships that have long been established and maintained between the two countries. In 1983, Canada and Denmark signed an agreement offering guidelines for the oil and gas industry and promoting mechanisms to prevent oil spillage.[82] A number of Memorandums of Understanding (MOUs) have been signed between the two countries, most specifically on cultural and educational arrangements, scientific cooperation, conservation and management of endangered species and joint military operations in the Arctic. This last MOU was signed in 2010 by the Canadian and Danish Chiefs of Defence Staff and supports a series of sovereignty exercises called Operation NANOOK that has been taking place in the Canadian North since 2007. Overall, Denmark is a valued partner for Canada in the North as both countries share a common approach on Arctic priorities. Finland also expresses comparable viewpoints to Canada when it comes to the Arctic Council being recognized as the principal multilateral forum to develop and promulgate

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[81] Daniel Schwartz, "Russia, World's Worst Oil Polluter, Now Drilling in Arctic," *CBC News*, 24 September 2012.

[82] Foreign Affairs and International Trade Canada, "Circumpolar Bilateral Relations," last accessed 13 April 2013, http://www.international.gc.ca/polar-polaire/regions.aspx.

Arctic policies. Finland is highly interested in the development of any ice-breaking capability since its exportations and importations are transported in exceed of 80% through the transpolar shipping routes.[83] In 2003, a MOU was signed between Canada and Finland to facilitate cooperation between the two countries in regards to advancements made specifically in the fields of space and technology. Iceland and Norway are also dynamic participants in the Arctic Council and respectively engaged with Canada in bilateral relations related to science and research, marine and ocean management, sustainable development and environment protection. Although Sweden does not have a coastline along the Arctic Ocean, it does have part of its territory in what is considered the Arctic region by definition. Sweden is a founding member of the Arctic Council and has been chairing the organization since 2011. Canada will work closely with Sweden when it takes over this responsibility in 2013 in order to ensure a successful chairmanship transition and continuity of efforts on priorities that were established over the past two years, including environment, climate, northern seas and indigenous people.

"The European Union (EU)'s growing attentiveness to Arctic issues suggests the need for constructive engagement with this supranational body."[84] In 2006, the EU established a Northern Dimension Policy with Iceland, Norway and the Russian Federation to promote dialogue and sustainable development in northern Europe. This initiative was a clear indication that the EU was now interested in shifting its traditional focus on central and southern Europe to this region growing in popularity on the

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[83] Foreign Affairs and International Trade Canada, "*Circumpolar Bilateral Relations*", last accessed 13 April 2013, http://www.international.gc.ca/polar-polaire/regions.aspx.

[84] P. Whitney Lackenbauer, *From Polar Race to Polar Saga: An Integrated Strategy for Canada and the Circumpolar World* (Toronto: Canadian International Council, 2009), 44.

international front. The release of the European Commission's report on the EU and the Arctic region in 2008 recommends that Europe plays "a leadership role in protecting the Arctic environment, promoting sustainable resource development and supporting indigenous populations."[85] These are the exact same priorities that are at the heart of the Canadian Northern Strategy.

Canadian Policies

The Department of Foreign Affairs and International Trade (DFAIT), in collaboration with other government departments that have Arctic and North mandates, "work together to set out a vision for Canada's actions in the Arctic that is based on cooperation with Northern governments and peoples and our Circumpolar neighbours."[86] The *Arctic Foreign Policy* promotes Canadian interests and values and delivers on the international dimension of the *Northern Strategy* in a number of specific areas. The foreign policy articulates "Canada's priorities with respect to sovereignty, economic and social development, environmental protection, and governance in the Arctic region."[87] It explains how Canada will lead others to demonstrate responsible stewardship and collaborate with partners to develop a region that represents national interests and values. One of the policy milestones is "Protecting the Arctic Environment" through collaboration with Arctic neighbours to address climate change, manage the ecosystem,

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[85] Commission of the European Communities, *The European Union and the Arctic Region* (Brussels: Communication from the Commission to the European Parliament and the Council, 2008), 10.

[86] Foreign Affairs and International Trade Canada, "Canada and the Circumpolar World", last accessed 12 April 2013, http://www.international.gc.ca/polar-polaire/index.aspx?lang=eng.

[87] Government of Canada, *Statement on Canada's Arctic Foreign Policy* (Ottawa: Her Majesty the Queen in Right of Canada, 2010).

establish standards and strengthen science. In order to face challenges and take advantage of opportunities of a changing North, the Government of Canada implemented a Northern Strategy and is taking concrete action in four priority areas including protecting the environmental heritage.[88] As such, Canada takes very seriously the protection of environmentally fragile lands and waters in the Arctic, by maintaining a difficult balance between scientific findings, prevention initiatives and development projects. As part of this comprehensive approach, the federal government improved some of the regulations regarding marine pollution prevention and launched initiatives to clean up abandoned mining sites across the Arctic. Altogether, Canada is recognized to be at the forefront of several global research efforts to study the effects of a changing climate on the Arctic region, and invest in assisting Northerners to adapt to these impacts.

This chapter argued that the Arctic Council is a constructive multilateral forum that represents a great window of opportunity for Canada when inheriting the chairmanship role in 2013. It also presented the significant benefits of several bilateral relations with other circumpolar countries, including several agreements improving environmental security. The exchange of lessons learned with partnering states represents a solid basis from which to develop plans of action in the event of maritime accidents or environmental disasters. National strategies and policies can be adjusted accordingly, while engaging all government departments, agencies and private organizations that represent a complex group of stakeholders in Arctic environmental issues. The next chapter will illustrate the intricacy of this whole-of-government concept in Canada.

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[88] Government of Canada, "Canada's Northern Strategy," last accessed 27 January 2013, http://www.northernstrategy.gc.ca/index-eng.asp.

CHAPTER 6 - ENVIRONMENTAL STAKEHOLDERS

This sixth chapter will present a wide variety of environmental stakeholders and their responsibilities associated with the Canadian Arctic region. It will illustrate the relationship intricacies between key actors, as well as the complexity of rallying a whole-of-government effort during a situation that requires the implementation of an emergency management plan. Although most of the stakeholders will be represented by federal departments or independent agencies, the introduction of private organizations to the mix will highlight additional challenges to be taken into consideration. Finally, a special attention will be given to the People from the North to demonstrate their important contribution when dealing with their homeland.

Governmental

In Canada, there are a substantial number of government departments that are interested in Arctic issues and their impact on the environment. The Department of Foreign Affairs and International Trade (DFAIT), as previously mentioned, is responsible for the promulgation of the Arctic Foreign Policy that promotes Canadian interests and values and delivers on the international dimension of the *Northern Strategy* in a number of specific areas. Environment Canada (EC) is involved in monitoring pollution and climate changes, as well as encouraging environmental prevention and sustainable development.[89] Transport Canada is interested in the safety of transpolar sea routes, ice roads, railways and aircraft activities. This department also has an Environmental Management Branch that focuses on contaminated sites, environmental assessment and

[89] Environment Canada, "Explore the Topics," last accessed 17 April 2013, www.ec.gc.ca.

environmental protection.[90] National Resources Canada (NRCan) is supporting scientific research efforts, such as the mapping of polar continental shelves and the evolution of climate changes, and is involved in development projects in the North for the exploitation of natural resources.[91] Aboriginal Affairs and Northern Development Canada (AANDC) is representing the interests of Aboriginal people from social, cultural, political and economic perspectives. It is also responsible to Northerners for transfers responsibility and control over land claims, natural resources development and environmental protection.[92] Fisheries and Oceans Canada (DFO) is enforcing fishing industry legalities and monitoring the impact of climate change on the marine ecosystem, flora and fauna.[93] Its icebreaking capability, search and rescue assets and environmental response program fall under the responsibilities of the Canadian Coast Guard (CCG). The CCG operates a fleet of 18 icebreakers from heavy to light and multi-tasked vessels, in addition to being involved in icebreaking research and development projects.[94] This small fleet of icebreakers is incapable of operating in the Northwest Passage in the winter and some of the ships are over 50 years old. Sooner or later, it will become difficult for this organization to continue fulfilling its mandates, especially when comes the time to escort state of the art icebreakers from other countries like China. The Department of National

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[90] Transport Canada, "Environmental Management," last accessed 16 April 2013, www.tc.gc.ca.

[91] Natural Resources Canada, "The Department," last accessed 16 April 2013, www.nrcan.gc.ca.

[92] Aboriginal Affairs and Northern Development Canada, "About AANDC," last accessed 16 April 2013, www.aadnc-aandc.gc.ca.

[93] Fisheries and Oceans Canada, "Featured Topics," last accessed 16 April 2013, www.dfo-mpo.gc.ca.

[94] Canadian Coast Guard, "Icebreaking Program," last accessed 16 April 2013, www.ccg-gcc.gc.ca.

Defence (DND) with the Canadian Forces are involved in the Arctic through its Joint Task Force North Command that will be described in greater details in the next chapter.

In the event of an environmental disaster, Public Safety Canada would normally be appointed as the lead department to coordinate and support the efforts of federal organizations, first responders, community groups, the private sector and other nations.[95] Through its Emergency Management cycle, Public Safety Canada would be coordinating all steps including the mitigation/prevention, preparedness, response and recovery. In all likelihood, two of the five agencies falling under the department portfolio would also be involved: Canadian Border Services Agency (CBSA) and the Royal Canadian Military Police (RCMP). CBSA would keep threats to national safety and health out of Canada, while the RCMP would maintain law and order, as well as provide investigative and protective services as required. The Canadian Forces would be responding to requests for assistance under the *Emergency Management Act* potentially providing reinforcement to law enforcement, humanitarian efforts, aid to civil power, recovery activities or critical infrastructure protection.[96] It is noted that some of the government departments' mandates seem to be overlapping in nature, which could generate conflicting approaches for the same issues. Moreover, most organizations have developed environmental emergency plans that may not have been synchronized with other partners.

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[95] Public Safety Canada, "What We Do," last accessed 14 April 2013, www.publicsafety.gc.ca.

[96] Department of National Defence. *Standing Operations Order for Domestic Operations* (Ottawa: Canada Command, 2012).

The whole-of-government concept has been exercised in both domestic and international contexts. It is a complex and multifaceted environment in which all actors need to fully cooperate with one another to achieve common goals. It has been a challenging construct that has not always been successfully implemented due to the contrast in cultural differences of key players and organizational priorities that often significantly differ. Many subject matters experts argue that for this concept to work there needs to be collective training, synchronized planning, common communication structures and reciprocal exchanges between departments.[97] Considering the fact that the Canadian Forces own unique capabilities, there is often a dependent relationship creeping up with civilian organizations relying heavily on military resources. This situation results in burdening the Canadian Forces with support tasks that may not have been part of the original mandate. Overall, the whole-of-government construct is still under development and gets more successful every time is it utilized at home and abroad.

Private

There is a wide variety of private organizations that can be considered as environmental stakeholders in the Arctic, therefore only the most established ones will be discussed in this section. Non-Government Organizations (NGOs) such as Greenpeace, the Canadian Red Cross and various private Search and Rescue Associations are all interested in the North. Greenpeace International has launched a campaign called "Save

[97] Catherine Deri, "A Meta-Analysis of Whole-of-Government Approaches to Leadership and Collaboration in Complex International Contexts" (Masters in the Art of Leadership, University of Guelph, 2009), 45.

the Arctic" that is targeting some of the larger development projects.[98] The Canadian Red Cross is concerned with the health of indigenous communities and would certainly be called upon to provide humanitarian assistance in the case of an environmental disaster. In addition to the usual NGOs, there are independent agencies such as the Transportation Safety Board (TSB) that is normally responsible for investigating maritime, air, rail or pipeline accidents.[99] Obviously, the private sector also includes large corporations that are attracted by economic opportunities in the Arctic. Shell is one of the lead companies investing in development projects, doing research, enhancing technology and implementing environment protection plans.[100] As climate changes continue to impact the environment, smaller companies that are less environmentally conscious wanting to do business in the region. It will become more challenging to monitor adherence to legislations as some of these inexperienced players may want to cut corners to optimize their profits at the detriment of environment security.

The People of the North

The indigenous communities have taken over progressive responsibilities over their regional affairs. They want to be included as equal partners in any discussions regarding the future of the Arctic. "The Government of Canada is committed to providing Canadian Northerners with more control over their economic and political destiny."[101]

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[98] Greenpeace International, "Save the Arctic", last accessed 17 April 2013, http://www.greenpeace.org/international/en/campaigns/climate-change/arctic-impacts/.

[99] Transportation Safety Board, "About the TSB," last accessed 17 April 2013, www.tsb.gc.ca.

[100] Shell Global, "Shell in the Arctic," last accessed 17 April 2013, www.shell.com.

Northern governments are empowered in several ways, including their permanent participation to the Arctic Council. The Harper's Administration has also diligently allocated financial assistance to the region to first benefit the local populations. A polar approach to the Arctic environment consists in Northerners favoring protection vice exploitation. However, Aboriginal communities understand that the North is highly coveted by development projects, therefore they are willing to comprise as long as these commercial undertakings are planned in a responsible manner. P. Withney Lackenbauer suggests that to improve cooperation and coordination between Northerners and all other stakeholders, the federal government should consider establishing a domestic version of the Arctic Council.[102] This "Arctic Canada Council" would include representatives from the aforementioned government departments and key private organizations that would meet on a periodic basis to discuss national issues, including environment security.

This chapter demonstrated the variety of stakeholders interested in Arctic issues and the challenges that may surface when leading an all-encompassing whole-of-government effort. With potentially conflicting mandates and differences in organizational cultures, each actor brings a certain set of priorities to the table that may not align with established common goals. These difficulties are compounded by enhanced federal legislations, financial risks assumed by private investors and the sensitivity associated with Aboriginal affairs. Ultimately, in order to succeed in working together, all stakeholders need to maintain open formal and informal dialogue, as well as take

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[101] Government of Canada, *Statement on Canada's Arctic Foreign Policy* (Ottawa: Her Majesty the Queen in Right of Canada, 2010).

[102] P. Whitney Lackenbauer, *From Polar Race to Polar Saga: An Integrated Strategy for Canada and the Circumpolar World* (Toronto: Canadian International Council, 2009), 52.

advantage of all opportunities to collaborate as a cohesive entity, so that they are better prepared to face any crisis in the future.

CHAPTER 7 - CANADIAN FORCES CAPABILITIES

This seventh chapter will argue that the Canadian Forces are ill-equipped to deal with an environmental disaster in support of a whole-od-government effort in the Arctic. A review of military capabilities will be conducted for all service elements, including the Canadian Army, Royal Canadian Navy and Royal Canadian Air Force. It will be demonstrated that most equipment currently used by the organization is either insufficient or inadequate to face the harsh conditions of the North. Large-scale procurement projects will also be introduced and commented on even if some of them have yet to materialize. At the end of this section a summary of "Strengths" and "Weaknesses" will be provided to contribute to the internal component of the upcoming SWOT analysis.

Kenneth Eyre, an independent writer and former Director of Research at the Pearson Peacekeeping Centre, stipulated that "the Canadian military has influenced the North more than the North has influenced the military."[103] In response to the 1969 Manhattan voyage, Prime Minister Pierre Trudeau and his defence planners highlighted the requirement for a Canadian presence in the North and claimed that surveillance was essential to the preservation and strengthening of Canada's position over territorial disputes in the area. The American Coast Guard cutter Polar Sea's 1985 transit of the Northwest Passage led Brian Mulroney's Conservative government to declare its intent to

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[103] Kenneth C. Eyre, "Forty Years of Military Activity in the Canadian North, 1847-87," *Arctic 40*, no. 4 (1987), 295.

improve surveillance capabilities in the Arctic, build a Polar class icebreaker, and even develop a fleet of nuclear submarines to patrol under the ice. Both Trudeau and Mulroney released White Papers on Defence that shifted the primary focus of the Canadian military to the maintenance of Canadian sovereignty, particularly the Arctic. In a speech delivered in Whitehorse on 11 March 2009, Minister of Foreign Affairs Lawrence Cannon re-affirmed the Harper Government's intentions to create a more extensive role for the Canadian Forces in the North.[104]

Joint Task Force North

The Canadian Forces have a command element called Joint Task Force North with its headquarter residing in the Western Territories that is responsible for exercising sovereignty and contributing to safety, security and defence operations in the Canadian North. Overall, there are approximately 500 regular military members stationed North of the 60th parallel to cover an area that is the size of Europe. In order to provide reinforcement, a group of 4000 volunteer reservists, called the Canadian Rangers are employed in remote areas. These Inuit who grew up in the North and are devoted to protecting their land have been serving the Canadian Forces for over sixty years. They provide "a military presence in isolated, northern and coastal regions of the country which cannot be covered practically or economically by other elements of the Canadian Forces."[105] Their distinct military purpose draws on the knowledge, abilities and traditions of community members. The federal government proposed to expand their

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[104] Lawrence Cannon (speech, Canada's Arctic Advisory Committee, Whitehorse, 11 March 2009).

[105] P. Whitney Lackenbauer, *From Polar Race to Polar Saga: An Integrated Strategy for Canada and the Circumpolar World* (Toronto: Canadian International Council, 2009), 23.

numbers to 5000, but this may be difficult to achieve since Ranger patrols have already been established in every northern community capable of sustaining this capability. In the case of a crisis response, Canadian Rangers can be easily overstretched, as they form very small pools of resources in each community and are not always available on short notice, depending on their regular life activities. The national Inuit organization in Canada, InuitTapiriit Kanatami (ITK) has recommended "a re-conceptualization and expansion of the Arctic Rangers program" in order to include tasks such as sustaining land-based skills, cultures and languages, as well as supplying food to communities and monitoring the environment.[106]

Canadian Army

The Canadian Army employs resources that are dedicated to the North in the form of four Arctic Response Company Groups.[107] These units were created in 2009 to support the Regular Force and Canadian Rangers in security and sovereignty operations taking place in the Canadian Arctic. These groups are mainly composed of Reservists, totally approximately 500 military members, whom are drawn from various provinces: Ontario, Manitoba, New Brunswick and Quebec. Through the management of natural disasters in southern Canada, such as floods, ice storms, hurricanes and blackouts, Army troops have proven to be valuable resources in case of emergencies. Unfortunately, land forces have limited experience operating through the harsh conditions of the Arctic environment. The

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[106] Inuit Tapiriit Kanatami (ITK), "An Integrated Arctic Strategy," last accessed 17 February 2013, http://www.itk.ca/sites/default/files/Integrated-Arctic-Strategy.pdf.

[107] Canadian Army, "New Arctic Response Company Group Emerges," last accessed 31 March 2013, http://www.army.forces.gc.ca/land-terre/news-nouvelles/story-reportage-eng.asp?id=3500.

Liberals supported the introduction of military exercises in the North that were expanded under the Conservatives to allow soldiers to develop some experience in that region.[108] The construction project of an Arctic Training Center in Resolute Bay, Nunavut represents an initiative that will certainly increase readiness states in preparation for future domestic operations. The training facility will be built onto the existing Polar Continental Shelf Project research base that is currently used by National Resources Canada as a logistic hub in the North. "Instead of a facility dedicated solely to protecting Canadian Arctic sovereignty, soldiers there will learn how to respond to accidents and disasters in the High Arctic."[109] The building will cost $18 million and the construction is scheduled to be completed by 2013 instead of the original deadline of 2007 previously announced by the Prime Minister.

Canadian Royal Navy

The Canadian Royal Navy is currently ill equipped to operate in the Arctic, with none of its ships having the double hulls capable of withstanding winter ice. The Halifax-class frigates can travel in the Arctic in summer conditions, but even then need to be on the lookout for small chunks of ice that could rupture the skin of the ship and result in an oil spill. Canada also has four submarines that are 15 years old and bought second hand from the British. In 2008 three of the four submarines were docked for extensive refit. These boats are diesel powered, which means that they can travel very limited distances under ice, before they need to resurface to recharge their battery. In 2006, Prime Minister

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[108] P. Whitney Lackenbauer, *From Polar Race to Polar Saga: An Integrated Strategy for Canada and the Circumpolar World* (Toronto: Canadian International Council, 2009), 23.

[109] CBC News, "Ottawa Moves Ahead with High Arctic Military Centre," 27 November 2011.

Stephen Harper spoke about the procurement of three heavy icebreakers capable of travelling through thick ice and carrying troops.[110] That project was quickly downscaled in 2007 when the federal government announced that the Canadian Forces would purchase half dozen patrol ships having a polar class of PC-5 allowing them to cut through only about one meter of ice. Although these Arctic Offshore Patrol Ships have been criticized as being basically inoperable during Arctic winter, they still represent the first genuine Arctic-capable Canadian vessels since the HMCS Labrador was paid off in 1957.[111]

Canadian Royal Air Force

The Canadian Royal Air Force Auroras are the backbone of the Northern surveillance programme to monitor intruders. Unfortunately, not one out of 18 Auroras is actually stationed in the Arctic. In the case of an alert, the Auroras need to fly from Nova Scotia or British Columbia, taking between eight to twelve hours before reaching the target area, giving the chance for a foreign submarine to be long gone. The aircrafts are more than 30 years old, which results in significant repairs and upgrades required to keep the planes operational. For example, in 2007, almost half of the patrols were cancelled because a large part of the fleet was under maintenance.[112] There is a Transport Squadron located in Yellowknife that is responsible for conducting operations in the Yukon, Northwest Territories and Nunavut. Its tasks include "airlift, utility and liaison flights in

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[110] Stephen Priestley, "Armed Icebreakers and Arctic Ports for Canada's North?" (Iqaluit: Canadian American Strategic Review (CASR), 2006).

[111] *Ibid*.

[112] Julian Sher, "*The Battle for the Arctic*" (Toronto: CBC Learning, 2009), DVD.

support of Canadian Forces Northern Area, the Canadian Rangers, other Canadian Forces activities and the Cadets in the North."[113] The Squadron operates four Twin Otters to carry out a myriad of tasks in sometimes very harsh weather conditions. Like all Air Force squadrons, it can conduct search and rescue missions as a secondary task, but has no dedicated capabilities for this type of mission. Typically, Canada's search and rescue teams operate four primary aircrafts: Hercules, Buffalos, Cormorants and Griffons.[114] The Air Force also counts on other types of aircraft to assist in search and rescue operations, especially in the Arctic where time and space may present a significant challenge. The Aurora maritime patrol aircraft and Sea King helicopters can assist with rescues taking place at sea. The Air Force also relies on the Canadian Coast Guard by sharing search and rescue responsibility with this organization in Canada and draws from a vast network of government departments, civilian agencies and volunteers.

Operation NANOOK

Since 2007, Operation NANOOK has been the largest of major sovereignty operations conducted annually in Canada's North and took place in several locations across the Northwest Territories and Nunavut. Its objectives include asserting sovereignty, enhancing abilities to operate in Arctic conditions and improving coordination with international military and security partners to maximize effectiveness in response to safety and security issues in the North. This aspect of the operation usually

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[113] Royal Canadian Air Force, "440 "Vampire" Transport Squadron," last accessed 24 February 2013, http://www.rcaf-arc.forces.gc.ca/17w-17e/sqns-escs/page-eng.asp?id=413.

[114] Royal Canadian Air Force, "Search and Rescue," last accessed 24 February 2013, http://www.rcaf-arc.forces.gc.ca/v2/page-eng.asp?id=17.

entails exercises using scenarios in which the Canadian Forces partner with other Canadian government departments and agencies, and with allied armed forces, to mount whole-of-government responses to security and environmental issues. The operation typically involves simultaneous activities at sea, on land and in the air, and all force generators may be tasked to deploy personnel, capital equipment and other resources. The number of military personnel deployed on Operation NANOOK has ranged from about 650 to more than 1,250. In 2010, the operation took place in the eastern Arctic and High Arctic. In addition to 900 Canadian Forces personnel, it involved about 600 personnel from the Canadian Coast Guard, the United States Navy, the United States Coast Guard and the Royal Danish Navy.[115] The operation concluded with a whole-of-government exercise using a spill-response scenario: a simulated petrochemical leak in Resolute Bay. Considering the current climate of federal budget reductions, it is possible that sovereignty exercises such as Operation NANOOK be temporarily reduced in scope.

Strengths and weaknesses

The responsibilities that lie on the shoulders of the Canadian Forces when it comes to the Arctic are clearly ones of safety, security and defence. In a traditional military sense, these terms would be recognized as contributing to the safeguard of sovereignty. However, the words safety and security have been more recently associated with the protection of the environment. With that focus in mind, the Canadian Forces have demonstrated that they are more than able to react to environmental threats when facing natural disasters in the southern part of the country. If such a catastrophe had to

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[115] Government of Canada, National Defence and the Canadian Forces, "Operation NANOOK," last accessed 23 February 2013, http://www.cjoc-coic.forces.gc.ca/cont/nanook/index-eng.asp.

occur in the Arctic region, due to natural or anthropogenic causes, it is questionable if the Canadian Forces would be able to handle the situation as efficiently. The organization benefits from a well-established command presence in the North that has gained a great appreciation of the unique native culture and peculiar environment. Military leaders have built an effective network with local, national and international partners and allies. Over the past decade, several military exercises were successfully conducted in the Arctic, allowing to reinstate knowledge and skills that had degraded over the years. In contrast, the type, amount and condition of the equipment used by all services (Army, Navy, Air Force) is unsuitable for the Arctic in general. The lack of soldiers, ships and aircrafts dedicated to the North renders any quick response to an environmental disaster to an impossible feat.

This chapter demonstrated that the Canadian Forces are lacking in human, material and financial resources to be able to face environmental crisis in the North. It is expected that the Canadian Forces will be called upon to react to a catastrophic event in the Arctic due to its previous success in the south and its unique capabilities. Although the organization should be requested as a last resort, it is most probable that it will get involved from the start, if not as one of the lead governmental departments. This may result in the Canadian Forces dealing inadequately with the crisis or its aftermath, placing the organization in a difficult position where it could be blamed for its actions or inactions. The next chapter will examine this challenging situation through a detailed SWOT analysis and provide potential solutions to address gaps by enhanced partnerships with other government departments and agencies in the future.

CHAPTER 8 – THE CANADIAN FORCES ENVIRONMENTAL STEWARDPHIP

This last chapter will use a SWOT analysis to examine internal and external factors that are either favorable or unfavorable to the Canadian Forces. This examination will be conducted while keeping in mind an organizational role in the process of emergency management to address an environmental disaster in the Arctic. A list of strengths, weaknesses, opportunities and threats will be compiled based on data collected in previous chapters. These data will be evaluated by categories and then potential correlations will be established between categories. This analytical method will highlight gaps impeding on the organization's ability to effectively assume its mandate. A reflection on potential solutions will be proposed in the last section in order to mitigate or eliminate the most critical gaps.

SWOT Analysis

A SWOT analysis consists in the development of a strategic balance sheet to assist an organization with the development of a preferred future. It is one of the time tested tools that allow an organization to respond effectively to changes in the environment by better understanding internal and external contexts. The benefits of a SWOT analysis are that it provides learning and knowledge vital to the organization's survival and prosperity. This analytical method is expected to be a valuable exercise to evaluate the potential success of the Canadian Forces in dealing with an environmental disaster in the Arctic within a whole-of-government construct.

Strengths

The "Strengths" are the characteristics of the organization that give it an advantage over others. Based on previous successes in domestic operations, the Canadian Forces benefit from an enviable reputation when it comes to emergency responses. In the past, the organization was recognized publically for its significant contributions in support of other government departments dealing with natural disasters or important accidents such as major air disasters. The current federal government administration has mandated the Canadian Forces to assume a significant role in the Arctic through the financing of large-scale exercises. These exercises have allowed the organization to foster relationships with Allied forces from other circumpolar countries and to reinforce its collaboration with other government departments and agencies in a whole-of-government context. The Canadian Forces have been able to enhance their knowledge of the North and make valuable employment of aboriginal resources that are the Canadian Rangers.

Weaknesses

The "Weaknesses" are the characteristics that place the organization at a disadvantage relative to others. The Canadian Forces footprint across the Arctic is extremely limited considering the extent of the territory to be covered. The ground forces specialized in northern operations are mainly composed of Reservists employed on a part time basis. There is no dedicated surveillance aircraft located in the North, therefore only partial coverage of the region is achieved at best. The Royal Canadian Navy does not currently have adequate icebreakers and is only expected to marginally improve this capability with the upcoming purchase of the Arctic Offshore Patrol Ships (AOPS). The

Search and Rescue military assets are dispersed across the country and shared with southern regions, which does not allow for a timely response if ever there was an urgent requirement arising in the Arctic. In the event of an environmental disaster, the Canadian Forces will most likely always be in a subordinate role to a lead agency, such as Public Safety Canada, not in a good position to influence decisions. Moreover, the organization should be a force of last resort where it could be called too late to act effectively after the situation may have significantly deteriorated.

Opportunities

The "Opportunities" are the elements that the organization could exploit to its advantage. It is difficult to predict the impact that having a Canadian at the head of the Arctic Council will have specifically on the Canadian Forces, but that leadership presence will certainly entice the federal government to further its northern agenda engaging the maximum number of governmental departments in so doing. This increased focus and involvement on the international front may generate occasions to enter into bilateral agreements or memorandums of understanding between military forces of circumpolar states. In order to competently contribute to further combined and joint military operations and exercises in the Canadian Arctic or abroad, it will be essential to continue training in this unique environment. The Arctic Training Center that will soon become operational in Resolute Bay will represent a great facility to practice and upgrade knowledge and skills for military troops. As the Canadian Forces continues to engage in northern operations with or without Allied forces, it will be essential to capture lessons learned and build on these observations to refine the planning process for future missions.

Threats

The "Threats" are the elements in the environment that could cause trouble for the organization. As previously stated, the climate changes in the Arctic are unpredictable and require further scientific investigation to accurately predict their future impacts on the environment. Since the Canadian Forces adopted the philosophy of "train as you fight" when getting troops ready, it is challenging to train military members for the unexpected. Moreover, the current climate of fiscal constraints will certainly affect funding for training and equipping military forces that are operating in the North. The instability of the transportation system (air, ground and marine) may impede on the Canadian Forces ability to navigate across the Arctic. Finally, the decrease in media coverage that the organization has experienced over the past five years will not play in favour of the Canadian Forces when it comes the time to obtain public support.

Table 2 –The CF and Environmental Threats in the Arctic (SWOT Analysis)

Strengths	**Weaknesses**
Good reputation Support from federal government Positive relations with Allies Whole-of-Government experience Knowledge of the North Aboriginal resources	Limited military footprint Partial surveillance oversight Inadequate icebreaker capabilities Dispersed Search and Rescue assets Subordinate role to lead agency Force of last resort
Opportunities	**Threats**
Arctic Council Chairmanship (2013) Bilateral agreements Arctic Training Center in Resolute Bay Lessons learned	Unpredictable climate changes Fiscal constraints Unstable transportation system Reduced media coverage

Most of the strengths identified in the balance sheet pertain to “soft” advantages, such as a reputation, relationships, experience and knowledge. Even with the best intentions, connections and support, the Canadian Forces cannot effectively accomplish a mission if adequate resources and equipment are not available. In fact, the list of weaknesses and threats contains all types of resources (human, material and financial) that are normally required for an organization to succeed. Moreover, the Canadian Forces have little control over some of the recognized threats, which prevents the organization from being able to mitigate or neutralize these threats. Some of the threats can also impact on the listed strengths and opportunities; for example, fiscal constraints may preclude the Canadian Forces from employing Aboriginal resources or making full usage of the Arctic Training Centre.

As previously discussed, in the event of an environmental disaster in the Arctic, the Canadian Forces represented at the center of Figure 6 below, could end up dealing with any other international or national stakeholders with vested interests in the region.

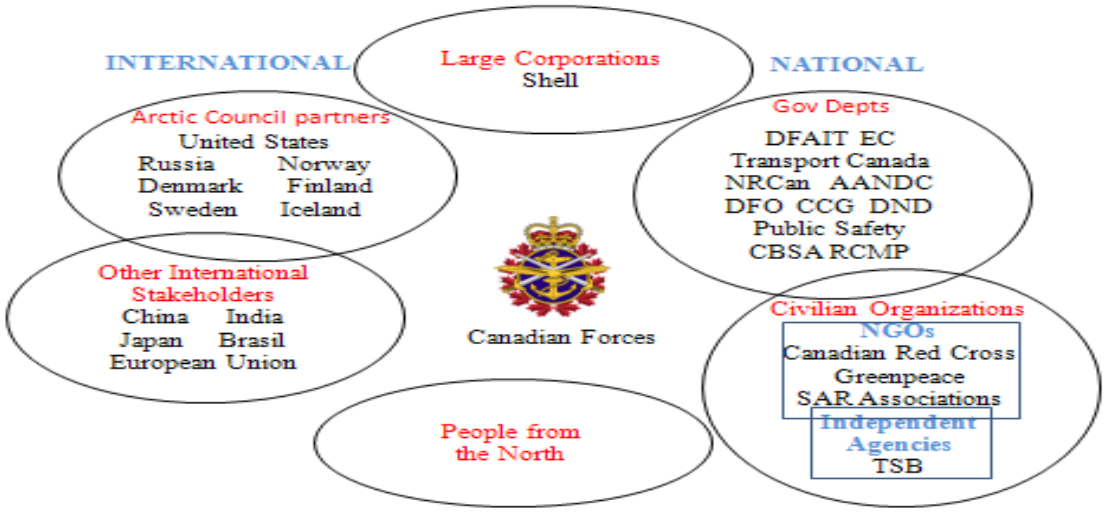

Figure 6 – Canadian Arctic Stakeholders (International and National)

The Canadian Forces need to continue optimizing its strengths by investing time and resources in maintaining solid relationships with the federal government, other government departments, Allied forces, the Canadian population and most specifically, the Aboriginal people of the North. These efforts can be deployed inside the Arctic environment but also throughout any other operations and exercises where the organization is involved, be it in a domestic or expeditionary context. In order to mitigate weaknesses, the Canadian Forces will have to partner with other stakeholders to increase its resource base. The Canadian Coast Guard is a great option for enhancing icebreaking capabilities by means of joint operational agreements. Bilateral partnerships also need to be optimized with circumpolar neighbours and developed with civilian agencies or private corporations. This will be a key aspect if the Canadian Forces want to succeed in the future, especially while fiscal constraints remain as a threat.

This last chapter reinforced the argument stipulating that the Canadian Forces are ill-equipped to deal with an environmental disaster in the Arctic. Through a comprehensive SWOT analysis, it was determined that the strengths and opportunities are not robust enough to overcompensate for the organizational threats and weaknesses. In fact, most gaps identified are resource based and could seriously impede on the Canadian Forces' ability to meet usual mandates., unless the organization draws from partnerships with circumpolar neighbors, other government departments or civilian agencies. Nevertheless, the Canadian Forces need to continue optimizing the organizational strengths and opportunities, so that when the federal government is in a better position to invest in additional capabilities, the organization is still in a good position to collaborate with all of its partners.

CONCLUSION

The Canadian Arctic has always been this mysterious, pristine and desolate region that was more or less of a priority for past federal governments. Although the area can be defined in several ways, depending on which experts look at the map, it essentially includes the terrestrial and marine areas north of the Arctic Circle. This region presents unique geographical features, with its permafrost above the tree line, summer and winter solstices and persistent cold temperatures. Its local communities adapted to challenging living conditions over time, adjusting to harsh climates and limited public services. The Arctic is believed to hold a quarter of the overall undiscovered world energy resources. This will inevitably continue drawing the attention of the international community. In fact, there was a perception that neighboring countries were interested in expending their territories by taking over Canadian land. However, this threat to national sovereignty was deemed unfounded and the majority of subject matter experts now agree that Canadian territory is not at jeopardy. This inference is reflected by the decline in written media coverage noted in a content analysis of three major Canadian Newspapers: Globe and Mail, National Post and Ottawa Citizen. Over the past five years, the results showed a steady coverage for environmental issues in the Arctic, while the number of articles on the topics of sovereignty and the Canadian Forces has been continually decreasing. The risks of environmental disasters ensuing from drastic climate changes in the Arctic are well documented. Global warming is more evident than ever in the North, with average temperatures that have increased at higher rates than previously observed. Similarly, in the last 20 years, the melting of polar ice surfaces has been more significant than in the last 10,000 years.

Environmental issues can result not only from natural phenomena, but also from anthropogenic causes due to a growing human presence in the Arctic. The opening of transpolar sea routes, including the Northwest Passage, is considerably reducing travel time between Europe and the Pacific. The development of industries such as commercial shipping, drilling and mining, as well as tourism and research are all contributing to potential problems of pollution, waste and noise management. The North will have to adapt to better accommodate large groups of visitors by expanding infrastructure and services in indigenous communities. However, Arctic challenges cannot all be resolve in the North. These considerable changes brought to the ecosystems and demographics are being addressed by the Arctic Council, involving the eight countries have territory north of the Arctic Circle. These circumpolar neighbors participate in global forums of discussion that enables each nation to adopt environmentally and socially responsible policies. Canada will be taking over the chairman role of the Arctic Council in 2013, while member states are about to conclude a treaty on the prevention of oil spills. Additionally, the newly appointed chairman will have to resolve a debate regarding the admission to the Arctic Council of emerging powers such as China, India, Japan and Brazil. Bilateral relations between Canada and the other circumpolar states have resulted in important partnerships and agreements. A number of these agreements comprise caveats on environmental security and protection with objectives consistent with Canadian strategies and policies. The global partnership against the spread of weapons and materials of mass destruction that was launched by the G8 in 2002 is an example amongst many initiatives to invest resources to maintain a clean environment in the Arctic and encourage other key players to do the same.

In Canada, the Arctic Foreign Policy and Northern Strategy articulate the federal government's priorities for the Arctic region. These documents prone responsible stewardship by leading collaborative efforts towards the development of a region that represents national interests and values. A significant number of stakeholders are mandated by the Government of Canada to assume certain responsibilities in regards to environment security in the North. Although some of the mandates may overlap, government departments are obligated to work together in order to achieve common goals. In the event of an environmental disaster, the federal government would initiate a whole-of-government effort that would most likely include the involvement of the Department of National Defence and the Canadian Forces. Although the Canadian Forces are normally a force of last resort through the principle of progressive response, the organization owns unique capabilities to intervene in national emergency situations. These capabilities have already been successfully employed during natural disaster scenarios occurring in the southern part of the country. However, there are serious concerns with operating these same capabilities in the harsh conditions of the Arctic. In fact, the Canadian Forces are ill-equipped to respond to an environmental disaster in the North, due to lack of human, material and financial resources, as well as equipment that is not adapted for the Arctic region. The Canadian Army employs Arctic Response Company Groups that are only composed of part time reservists that would be difficult to expediently mobilize. The Royal Canadian Navy does not currently own a suitable icebreaking capability or submarines that can travel extensive distances under ice. The Canadian Royal Air Force utilizes limited surveillance assets to monitor northern activities and employs search and rescue resources that are scattered across the country.

Over the past decade, a comfortable financial climate has allowed the Canadian Forces initiate procurement projects to improve northern capabilities, including the upcoming purchase of Arctic Offshore Patrol Ships. The organization has also been able to conduct large-scale military exercises, called Operation NANOOK, that have favorably contributed to enhancing relationships with Allied forces, other government departments, civilian agencies and private corporations. These advantages have been reflected as strengths in a strategic balance sheet produced through a SWOT analysis. The analysis served at evaluating the potential success of the Canadian Forces in dealing with an environmental disaster in the Arctic within a whole-of-government construct. The results demonstrated that most strengths are represented by "soft" advantages, such as a good reputation or support from the federal government. These strengths are significantly moderated by the identified threats that are represented by the aforementioned lack of resources. Basically, the Canadian Forces cannot effectively accomplish a mission is adequate resources are not available, even with the best intentions and support. Moreover, the current climate of fiscal constraints identified as a threat will impact negatively on some of the opportunities listed in the balance sheet. As such, it is expected that the organization will not be able to make optimal usage of the newly built Arctic Training Center in Resolute Bay. Ultimately, the Canadian Forces will have no other choice than continue to partner with the multitude of environmental stakeholders with vested interest in the Arctic. This will allow the organization to share resources and knowledge with its partners until funds become available again to increase its northern capabilities to a level that is appropriate to fill any mandate related to environment security and protection.

There is no doubt that climate changes will continue being significant catalysts for a greater usage of the Canadian Arctic. There still remains a great deal of research efforts that need to take place in order to better predict what the region can expect in the future. In addition to studying natural phenomena and anthropogenic issues observed in the region, it would be interesting to explore non-Arctic drivers that may influence the area. A comparison with similar regions such as the Antarctic could also be beneficial to not only understand how that part of the world changes, but also how it is governed. Any of these findings will assist the Government of Canada and its partners to adjust their strategies and policies accordingly in order to better benefit all stakeholders involved. The Arctic is no longer an isolated region that only the people from the North are interested in; it has become an extremely popular area with an international focus.

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