SAFEGUARDING CANADIAN ARCTIC SOVEREIGNTY AGAINST CONVENTIONAL THREATS

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The effects of climate change as well as national interests over control of vast amounts of natural resources in the Arctic seem to be destabilizing the geostrategic environment involving the circumpolar states. A traditional conflict scenario in the near future is not out of the question, particularly if the legal framework governing the region, the United Nations Law of the Sea Treaty, is proved inadequate to address the full range of issues in the region and fails to resolve territorial claims. Canada has ongoing disputes in the Arctic region with the United States, Russia, and Denmark, and has recently reaffirmed its commitment to its national sovereignty. Based on an analysis of military capabilities for Arctic operations as well as a qualitative comparison between each of these countries, this study establishes that Canada does not have the necessary military capabilities to deter and counter conventional threats to its sovereignty in the Arctic. Consequently, Canada should leverage the other means of national power, specifically its existing multilateral security and defense agreements, to ensure its sovereignty in the Arctic.

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

SAFEGUARDING CANADIAN ARCTIC SOVEREIGNTY AGAINST CONVENTIONAL THREATS, by MAJ Dave Abboud, Canadian Forces, 95 pages.

The effects of climate change as well as national interests over control of vast amounts of natural resources in the Arctic seem to be destabilizing the geostrategic environment involving the circumpolar states. A traditional conflict scenario in the near future is not out of the question, particularly if the legal framework governing the region, the United Nations Law of the Sea Treaty, is proved inadequate to address the full range of issues in the region and fails to resolve territorial claims. Canada has ongoing disputes in the Arctic region with the United States, Russia, and Denmark, and has recently reaffirmed its commitment to its national sovereignty. Based on an analysis of military capabilities for Arctic operations as well as a qualitative comparison between each of these countries, this study establishes that Canada does not have the necessary military capabilities to deter and counter conventional threats to its sovereignty in the Arctic. Consequently, Canada should leverage the other means of national power, specifically its existing multilateral security and defense agreements, to ensure its sovereignty in the Arctic.

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TABLE OF CONTENTS

Page

ACRONYMS

ACIA	Arctic Climate Impact Assessment.
ASW	Anti-Submarine Warfare.
AWACS	Airborne Early Warning and Command and Control System.
BCT	Brigade Combat Team.
CANADACOM	Canada Command.
CBRN	Chemical, Biological, Radiological, and Nuclear.
CF	Canadian Forces.
EW	Electronic Warfare.
GDP	Gross Domestic Product.
GIUK	Greenland Iceland United Kingdom.
HQ	Headquarters.
ICBM	Inter Continental Ballistic Missile.
IISS	International Institute for Strategic Studies.
ISR	Intelligence, Surveillance, and Reconnaissance.
NATO	North Atlantic Treaty Organization.
NORAD	North American Aerospace Defense.
NORTHCOM	Northern Command.
NRF	NATO Response Force.
NSPD	National Security Presidential Directive.
NSR	Northern Sea Route.
NWS	North Warning System.
SAM	Surface to Air Missile.
SAR	Search and Rescue.

SLOC	Sea Lane Of Communication.
SOF	Special Operations Force.
UAV	Unmanned Aerial Vehicle.
UN	United Nations.
UNCLOS	United Nations Convention on the Law Of the Sea.
USGS	United States Geological Survey.

ILLUSTRATIONS

Page

TABLES

Page

CHAPTER 1

INTRODUCTION

This study examines Canada's gap in military capabilities to address potential conventional threats to its sovereignty in the Arctic. It also provides recommendations on how the Canadian government can compensate for that gap by leveraging other elements of national power such as using and expanding existing security and defense agreements. Canada maintains modest but relevant and credible armed forces to protect the nation's interests and undertake its tasks derived from international security partnerships and alliances. The Canadian government has recently maintained a strong posture over issues concerning its sovereignty in the Arctic. The changing geostrategic environment in the region however, and the nature of the potential conventional threat, may compel Canada to review its national strategy shortly to ensure its sovereignty through other means.

Background

The Arctic is a barren land which is sparsely populated and contains very little infrastructure. The polar projection of a map reveals interesting particularities about the Arctic. It is generally characterized as a maritime domain and the majority of the Arctic Ocean is covered almost year-round by ice. Moreover, the excessively cold northern weather makes the Arctic environment a very difficult and expensive area to operate in. The Arctic region is often defined as that area where the average temperature for the warmest month is below 10 degrees Celsius as illustrated in figure 1.

Figure 1. Map of the Arctic Region

Source: University of Texas Libraries, Perry-Castaneda Library Map Collection, http://www.lib.utexas.edu/maps/polar.html (accessed March 25, 2009).

During the Cold War, the strategic significance of the Arctic region was readily apparent. It offered approach routes for Intercontinental Ballistic Missiles (ICBM), ballistic missile submarines, and bomber aircraft for both the United States and Russia. For Western Europe, the waters between Greenland and Norway, the Greenland Iceland United Kingdom (GIUK) gap, offered approach routes for submarines and aircraft threatening the Atlantic sea lanes, and for naval fleets and amphibious forces threatening Norway and Iceland.[1] Since 2002 however, the geostrategic environment has changed significantly due to the consequences of climate change.

Climate change is melting the Arctic ice sheet at an alarming rate. The Arctic Climate Impact Assessment (ACIA), a peer-reviewed scientific document produced in 2004 by the world's leading experts, suggests that the Arctic may be completely ice-free during summer periods by the end of this century.[2] The two most important implications of an opening Arctic are improved access to likely vast energy and mineral resources and potentially shorter maritime shipping routes. The Northern Sea Route (NSR) along Russia's northern coast has been used frequently by commercial shipping for the past three decades, usually with the assistance of icebreakers. In August 2007, the Northwest Passage maritime route through Canada's Arctic Archipelago became navigable for the very first time without the need for icebreakers. According to the US National Intelligence Council's Global Trends 2025 report, these resource and shipping benefits are unlikely to materialize before 2025 due to associated costs and technological requirements.[3] This interval provides concerned countries time to adjust their sights and means towards this newly accessible strategic resource base. The geostrategic

environment of the Arctic is now characterized as a race between circumpolar states to secure strategic resources.

There are several international disputes regarding boundary or territorial claims in the Arctic region. Canada has five ongoing disputes with the United States, Russia, and Denmark. The only framework providing legal provisions to resolve these disputes is the United Nations Law of the Sea Treaty (UNCLOS). Produced in 1982, UNCLOS came into effect in 1994, stemming from three different conventions. The provisions of UNCLOS however, may not be sufficient to resolve every dispute in the Arctic region. For example, Canada considers the Northwest Passage to be internal waters while other countries, including the United States, insist it is an international Strait. The outcome of this dispute is extremely significant since this maritime shipping route would decrease travel time from Europe to Asia by approximately two weeks. "By some estimates, the Passage will within a decade become ice-free for much of the year. It would then offer a shipping channel from Europe to Asia some 7,000 kilometers (4,350 miles) shorter than the route through the Panama Canal."[4] It would rival the Panama Canal in scope and profitability. If unresolved by legal provisions, this dispute has the potential to generate flashpoints and create an international conflict, even between countries sharing membership of common security and defense agreements such as the North American Aerospace Defense (NORAD) and the North Atlantic Treaty Organization (NATO). There is a potential, however slim, for a conventional military confrontation over natural resources and trade routes across the basin of the Arctic Ocean.

Strong statements have been issued recently by the political leadership of Canada in support of improving its sovereignty and security in the Arctic. It has adopted the

Canada First Defence Strategy in 2008 in an effort to address these current and emerging challenges and threats by providing an increased presence in the north as well as acquiring additional military capabilities. Even when considering these additional forces however, Canada will not have the necessary military capabilities for Arctic operations to successfully deter and counter conventional threats to its sovereignty in the Arctic. This assertion is based on the worst case scenario primer explained in chapter two and reinforced in the analysis provided in chapter four.

This thesis first describes the geostrategic environment, discusses the potential for conflict, and explains current views regarding Canadian military capabilities and requirements to protect its Arctic region. It then presents an analysis of the national interests, policies and military capabilities for Arctic operations of countries involved in disputes with Canada and draws a comparison of this qualitative assessment. Finally, it concludes by making recommendations on how Canada can best compensate for its gap in military capabilities to effectively deter and counter conventional threats to its Arctic sovereignty.

Primary and Secondary Research Questions

Does Canada have the necessary military capabilities for Arctic operations to deter and counter conventional threats to its sovereignty in the Arctic? There are three secondary questions:

1. What is the current geostrategic environment in the Arctic region including the potential for conflict?

2. What are the national interests, policies, and military capabilities of Canada, the United States, Russia, and Denmark regarding the Arctic?

3. After comparing each country's military capabilities for Arctic operations and identifying a gap in Canadian military capabilities, how should Canada proceed to ensure its sovereignty in the Arctic?

Assumption

With the gradual disappearance of the ice sheet in the Arctic and the opening of a navigable maritime route in Canada's northern territories, circumpolar states as well as other countries that formally had no interest in the region may pursue their national interests with all or some elements of their national power. This study will assume, after making the case in point, that some countries may employ conventional military means to achieve their national interests and therefore, Canada could face a conventional threat in its Arctic region. This study deliberately presumes a worst case scenario type of conflict in the Arctic.

Definitions

Listed below is a brief glossary of key terms relevant to this study. These definitions will assist the reader in understanding the strategic environment and analysis presented in this paper. Some terms are only broadly defined by the existing literature and comments have been added for clarity.

Arctic Circle. The region around the North Pole north of the 66º33' Parallel. It includes the Arctic Ocean, thousands of islands, and the northern parts of Europe, Asia, and North America.

Arctic region. It is the region where the average temperature for the warmest month of the year is below 10 degree Celsius. The geography of this region is characterized by tundra.

Climate change. A long-term shift in climate measured as a change in some or all of the features associated with weather, such as temperature, wind, and precipitation. This can involve both changes in average conditions (e.g. mean daily temperature) and in the variability of the weather. The shift in conditions should continue over an extended period of time.[5]

Global warming. A sustained increase in global average surface temperature. It is just one aspect of climate change.[6]

Joint Function. Related military capabilities and activities grouped together to help Joint Force Commanders integrate, synchronize, and direct joint operations.[7]

National waters. The waters under the sovereign jurisdiction of a nation or state. In international rights, they include the territorial waters of twelve nautical miles and a contiguous zone of twelve additional nautical miles. An exclusive economic zone of 200 nautical miles from land is also recognized.[8]

Northwest Passage. A passage by sea linking the Atlantic and the Pacific Oceans along the North coast of North America. This passage is within the Canadian Arctic Archipelago between Baffin Bay and the Beaufort Sea.[9]

Sovereignty. An autonomous state; supreme authority within a limited sphere; freedom from external control.[10] Sovereignty over uninhabited areas implies some form of presence or the ability to project presence as well as the responsibility to govern and administer.

Limitations

The limitations of this study are twofold. First, the research only includes unclassified information which is generally available. Therefore, the research on national interests and military capabilities may not include the latest or most accurate data. Second, the information related to climate change is variable and therefore predictions cannot be made precisely. Despite this gap in available information and the variable nature of information related to climate change, this study is still considered relevant to current affairs as well as future force planning.

Scope and Delimitations

The research conducted was limited to the historical background, national interests, policies, and military capabilities for Arctic operations of the circumpolar states involved in disputes with Canada. These constraints were imposed on the scope of the research to ensure its feasibility and the accessibility of appropriate information.

Significance of Thesis

This paper provides a synthesis of current issues concerning Canada in the Arctic, namely the effects of climate change, the legal framework governing the region, the existing security and defense agreements, and ongoing international disputes. It also discusses the potential for conflict in the region and describes the nature of conventional threats. More importantly, it investigates the national interests, policies, and military capabilities for Arctic operations of four circumpolar states, Canada, the United States, Russia, and Denmark, and provides a qualitative assessment of these capabilities as well as a comparison. The analysis, recommendations, and conclusion of this study could be

of value to the Canadian and American governments as well as their respective armed forces.

A great deal of literature has recently been written on the subject of the Arctic, to include books, scientific research, professional journal and media-based articles, as well as service-based papers and research. Chapter two examines this body of work by secondary research questions in order to investigate the current state of affairs in the Arctic region, the potential for a conventional conflict, as well as the views regarding Canadian defense capabilities and requirements for the Arctic. The review reveals the rich, complex, geostrategic, and meaningful nature of this topic.

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[1] George Lindsey, *Strategic Stability in the Arctic* (London: Brassey's for the International Institute for Strategic Studies, 1989), 3-5.

[2] Susan Joy Hassol, *Impacts of a Warming Arctic: Arctic Climate Impact Assessment* (Cambridge: Cambridge University Press, 2004), 30.

[3] Department of National Intelligence, *Global Trends 2025: A Transformed World* (Washington, DC: US Government Printing Office, 2008), 53.

[4] The Economist, "Breaking the Ice," *The Economist* (August 21, 2004), 32.

[5] Environment Canada, *EnviroZine*, http://www.ec.gc.ca/EnviroZine/english/issues/79/any_questions_e.cfm (accessed September 20, 2008).

[6] Merriam-Webster, *Merriam-Webster Online*, http://www.merriam-webster.com/ (accessed September 20, 2008).

[7] United States Armed Forces, Joint Publication 3-0, *Joint Operations* (Washington, DC: Government Printing Office, 2006), III-1 to III-37.

[8] Merriam-Webster, *Merriam-Webster Online*, http://www.merriam-webster.com/ (accessed September 20, 2008).

[9] Ibid.

[10] Ibid.

CHAPTER 2

LITERATURE REVIEW

The purpose of this study is to determine whether Canada possesses the required military capabilities to deter or counter conventional threats to its sovereignty in the Arctic. The previous chapter introduced the topic of this thesis and offered an overview of the outline. This chapter defines the state of affairs in the Arctic region, discusses the potential for conflict, and provides current views on Canadian military capabilities and requirements for Arctic operations. When combined with the analysis provided in Chapter four, it essentially sets the stage for the recommendations provided in Chapter five.

State of Affairs

The melting of the Arctic ice is causing important geostrategic consequences in the region that may dissolve existing security and defense agreements. There are currently several territorial disputes in the Arctic among the five circumpolar states, Canada, Denmark (via Greenland), Norway, Russia, and the US (via Alaska) and the potential for open conflict exists due to the inadequate legal framework governing the region.

Projections on the Melting of the Arctic Ice Cap and Consequences

The world's climate and weather patterns are changing. There is an increase in the unpredictability and severity of weather anomalies such as hurricanes, mega floods, extended droughts, receding permafrost, melting of glaciers, and ice sheets.[1] Global

warming is largely recognized as the most significant aspect of climate change in our time as temperature records from 1855 to 2005 indicate that nineteen of the twenty warmest years have occurred between 1980 and 2005.[2] Climate change is a global phenomenon with possible exponential trends.

The Arctic Climate Impact Assessment highlights the implications of a warming Arctic. Some of their key findings are: The Arctic climate is warming rapidly and much larger changes are projected, reduced sea ice is very likely to increase maritime transport and access to resources, and ground thawing will disrupt transportation-related infrastructure.[3] Over the past thirty years, the annual average sea ice extent has decreased by about eight percent. In summer, it has decreased by about twenty percent. Sea ice has also become thinner. Particular areas have showed thickness reductions of up to forty percent between the 1960s and the 1990s. The assessment projects additional declines in the future. Some models show near-complete disappearance of Arctic summer sea ice by 2090.[4] Figure 2 illustrates the projected ice extent for the next century and highlights the maritime shipping routes.

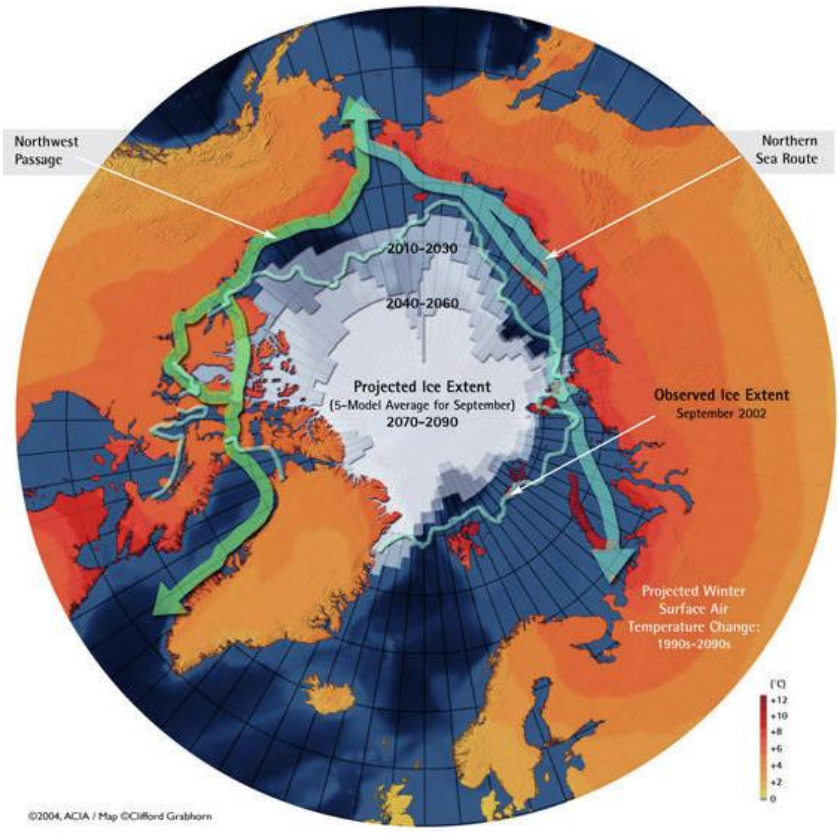

Figure 2. Melting Projections of the Arctic Ice Sheet
Source: Arctic Climate Impact Assessment, "*Impacts of a Warming Arctic"* (UK: Cambridge University Press, 2004), 82.

Global warming is in fact amplified north of the 60th parallel by an effect known as the ice-albedo feedback loop. Dark colored land and water that are replacing the reflective shield of ice and snow absorbs more sunlight and stores more heat which, in turn, increases the regional temperature and the rate of melting. It is a vicious cycle that may be impossible to stop. "If the Arctic is especially sensitive to climate change, the whole planet is especially sensitive to changes in the Arctic."[5] Much of what is being observed and researched in the Arctic drives worldwide climate changes that could lead to abrupt ones. Some scientists further argue that the world is on the verge of climate

tipping points from which there is no coming back. Phenomena such as the greenhouse effect, the ocean conveyor, and methane releases from melting permafrost are subsets of global warming that amplify its effects and rate. The ACIA declares that there is also a possibility that gradual warming could trigger an abrupt change in climate. Jim Hansen, NASA's top climate modeler, declared in 2005 that "We are on the precipice of climate system tipping points beyond which there is no redemption."[6] The theory of climate system tipping points and its advocates reinforce the conservative nature of the estimates provided by the ACIA. The Arctic ice sheet may melt faster than expected; some studies argue there may be no-ice between July and September in the Arctic as early as 2013.[7] In the next ten to twenty years, the Arctic region will probably be substantially ice free during summer months, from July to September, but will still ice over during the winter with first year ice. Therefore, sea travel in the region will require icebreaking capability, ice-strengthened hulls, or both.

The opening of the Northwest Passage through Canadian territory is a direct consequence of climate change. It opened for the first time to commercial shipping in August and September of 2007. It may become an extremely lucrative shipping route in the medium term as a direct result of the decrease in ice cover and increased accessibility. The passage makes travel between Europe and Asia much shorter and therefore far more economical and it can serve substantially larger vessels than the Panama Canal.[8] Currently, free-drifting icebergs, sub-zero temperatures, icing on structure and equipment, and the lack of support infrastructure such as airfields and ports make operations in the Arctic particularly dangerous and difficult to sustain. Prohibitive insurance costs and unpredictable ice conditions make this passage an impractical

proposition for commercial fleets, especially when compared to the NSR which is a safer alternative at the moment. However, diminishing ice levels in the near future will modify the risk and may provide transit opportunities through the Northwest Passage that are financially attractive. Energy companies may also turn to maritime routes as alternatives to land-based infrastructure because the thawing of the Arctic permafrost has the undesired effect of collapsing pipelines.

The Arctic region may also hold vast amounts of fossil fuels and minerals and, as another consequence of climate change, these resources will become accessible to exploitation. More than 400 onshore oil and gas fields have already been discovered north of the Arctic Circle. Considering cumulative production and remaining proven reserves, these fields account for almost ten percent of the world's known conventional petroleum resources.[9] Based on a July 2008 report from the United States Geological Survey (USGS), Arctic undiscovered reserves are assessed at approximately ninety billion barrels of oil, 1,669 trillion cubic feet of natural gas, and forty-four billion barrels of natural gas liquids.[10] These account for almost fourteen percent of global undiscovered oil reserves and forty percent of global undiscovered natural gas reserves using a USGS world petroleum assessment from 2000.[11] Moreover, eighty-four percent of these undiscovered reserves are expected to occur in offshore areas.[12] The USGS report also declares that the extensive Arctic continental shelves may constitute the geographically largest unexplored prospective area for petroleum remaining on Earth. Fossil fuel reserve estimates also usually increase over time due to technological advancements and economic circumstances. The Arctic region is potentially also rich in minerals, particularly gold, platinum, and copper. For instance, in 2003, Canada became

the world's third largest diamond producer on a value basis behind Botswana and Russia, based on only three mines discovered in its northern territories in the 1990s and exploited since 1998.[13] Local discoveries in the Arctic have redefined the global market of these strategic resources.

The ACIA is clear that the Arctic is warming, and that it will continue to warm at an alarming rate.[14] The effects of climate change as well as population increases around the world will exacerbate resource scarcities and therefore, there will be an increase in demand that may very well be supplied by the natural resources located in the Arctic region.

Legal Framework Governing the Arctic Region

The United Nations Convention on the Law of the Sea (UNCLOS) is the most important piece of international maritime law because it regulates the use and resources of all ocean space. The Convention has more than 150 member states. The United States is the only circumpolar nation that is not a party to UNCLOS. Although it has signed the treaty, it did not ratify or accede to it yet, citing concerns with the treaty's deep sea-bed mining provisions, even if it recognized that the portions relating to navigation and over flight reflect customary international law.[15] The treaty is thus not legally binding on the United States.

UNCLOS defines several ocean zones stretching away from the coast. The first is the "territorial sea."[16] It is the ocean space extending twelve nautical miles from a country's coastal low-water mark. Within this zone, nations may exercise complete sovereignty over the water, seabed, and airspace. The second zone is the "contiguous zone."[17] It is the ocean space between twelve and twenty-four nautical miles from the

coastal low-water mark. Nations may use this zone to enforce its customs, fiscal, and sanitary laws and regulations. Finally, UNCLOS defines a third zone, the "exclusive economic zone."[18] It is the area between twenty-four and 200 nautical miles from a country's coastal low-water mark. Within it, nations may exercise sovereignty over the natural resources located in, on, or below the seabed, and maintain sole control of any other activity associated to the economic exploration and exploitation of this zone, including fisheries.

UNCLOS also regulates the ocean seabed outside of these zones. It allows countries to exercise exclusive sovereignty over the natural resources, such as fossil fuels, found on the seabed and subsoil of an area extending up to 350 nautical miles from a country's coastal low-water mark.[19] This area has to be the natural prolongation of the continental shelf from a country's territorial sea zone. UNCLOS allows Arctic coastal nations ten years from the date they ratify the treaty to make claims in this zone.[20] Russia has until 2009, Canada until 2013, and Denmark until 2014 to stake claims. Determination of a claim within these provisions is difficult in contested areas.

Several articles in UNCLOS also discuss access rights and navigational provisions. In essence, all ships have a right of passage to travel through each of the zones described above provided the passage is peaceful, continuous, and expedient, and subject to lawful certification by the respective sovereign state. Furthermore, countries bordering straits used for international navigation cannot control its access.[21]

The Illulissat, Greenland, Declaration of May 2008 between the five Arctic

circumpolar states reaffirms the legitimacy of UNCLOS. It states:

> The law of the sea provides for important rights and obligations concerning the delineation of the outer limits of the continental shelf, the protection of the marine environment, including ice-covered areas, freedom of navigation, marine scientific research, and other uses of the sea. We remain committed to this legal framework and to the orderly settlement of any possible overlapping claims.[22]

It adds: "We therefore see no need to develop a new comprehensive international legal regime to govern the Arctic Ocean."[23] Concerned governments expressed their commitment to abide by UNCLOS, which would allow territorial disputes to be resolved according to the provisions of UNCLOS stated above. However, the International Tribunal for the Law of the Sea is limited in its jurisdiction and can only provide arbitration and advisory opinions.[24] Therefore, even with the consent of the parties involved, UNCLOS may be unsuitable for resolving complex disputes in the Arctic region.[25]

Security and Defense Agreements

Canada is a member of two strategically vital security and defense agreements, NORAD and NATO. This partnership and alliance, respectively, complement Canada's ability to deter and defend its territory against conventional threats. The extent to which it provides an increased ability to counter conventional threats in the Arctic region however is limited as explained below.

The NORAD Agreement is the primary means through which Canada conducts air surveillance and control. It is a bilateral, Canada-US command established in 1957 to ensure North American air defense.[26] NORAD answers equally to the president of the US and the prime minister of Canada and the forces assigned to it remain under

operational control of each country. NORAD's mandate has evolved over the years to include aerospace warning of ballistic missiles and surveillance and monitoring of aircraft suspected of illegal drug trafficking. It accomplishes its mission by using a network of satellites, ground-based and airborne radars, and fighters. Yet, Canada has only intermittent surveillance coverage of much of its vast airspace even when the radar system is augmented with Early Warning and Control System (AWACS) aircraft.[27] Since 11 September 2001, NORAD is also looking inward at potential airborne threats. The ability to defend against low-altitude air threats such as cruise missiles is limited since no system currently exists to continuously monitor that type of threat to North America.[28]

A bi-national planning group was established in 2003 to examine increased land and maritime military cooperation for the defense of North America. The result of which was the sole addition, in the Agreement renewal of May 2006, of a maritime warning mission consisting of intelligence sharing of activities conducted in US and Canadian maritime approaches and areas, and inland waterways.[29] The NORAD Agreement remains relevant to North American defense. It does not however include any provision for Arctic maritime and land security other than intelligence sharing of maritime warning.

Canada is also an active member of NATO, a collective defense alliance. Established in 1949, it is composed of, currently, twenty-eight European and North American countries.[30] Its role is to safeguard the freedom and security of its member countries by political and military means. It is committed to defending its member states against aggression or the threat of it with the principle that an attack against one or several members is considered as an attack against all. In 2008, the total number of

forces of NATO countries was 3.761 million active duty troops, all services combined.[31] It has a multinational military structure and command system. It also engages in dialogue and cooperation with non-NATO countries that contributes to international stability.

In 2002, NATO launched a modernization process to ensure that it can effectively deal with 21st century threats. It is optimizing its operational capabilities through the NATO Response Force (NRF) which is "A highly ready and technologically advanced force made up of land, air, sea and special forces components that the Alliance can deploy quickly wherever needed."[32] This force is supposedly capable of performing missions worldwide across the whole spectrum of operations and can number up to 25,000 troops, start to deploy after five days notice and sustain itself for operations lasting thirty days or longer if resupplied. NATO is also improving its air and sealift capabilities as well as chemical, biological, radiological and nuclear defense (CBRN), and air-to-air refueling capabilities. The NRF however, can only be used following a consensual decision by its political decision-making body, the North Atlantic Council. Moreover, NATO's commitment in Afghanistan, Iraq and Sudan, may preclude the use of additional forces in the near future, especially in the Arctic. On that note, Tomas Brynjolfsson, an advisor on international affairs to the Parliament of Iceland, argues that, as the Arctic's importance grows for the West's energy and economic security, its security should be a common responsibility for the North Atlantic states and NATO.[33] However, NATO may be further limited in its ability to respond to a military crisis in the Arctic if that crisis involves its own members at odds over disagreements on Arctic issues.

Even if NORAD and NATO are still relevant to Canada's defense architecture, these organizations may not provide the expected military support in the Arctic region if push comes to shove and Canada's north is threatened by conventional military means. This especially holds true when considering that the United States and Denmark, both members of NATO, may actually be the countries involved in a crisis with Canada since they both have ongoing boundary disputes with the latter.

International Disputes Concerning Canada

There are several disputes resulting from historical disagreements or land claims in the Arctic region. Six of them concern Canada. The other nations involved in these six disputes are the United States, Russia, and Denmark.

The first dispute is over the Northwest Passage Strait. This dispute is a direct result of the decrease in Arctic sea ice and likelihood of increased accessibility. The United States does not recognize Canadian claims that the strait is internal waters and it has the support of the European Union. In their view, the passage may be used for international navigation.[34] Their concern is freedom of movement through sea lanes within the Canadian Arctic Archipelago in order to enable unimpeded maritime travel between the Atlantic and the Pacific. In addition, the United States does not want to set a precedent with this case that could be used against it in similar situations in other international waterways. For Canada, control of the strait is a question of national pride and identity, the ability to enforce strict safety, environmental, and technical standards and shipping regulations, and economic benefits from increased shipping.[35] Indeed, waterways north of Canada could serve as conduits for illegal immigrants and terrorists. Both the United States and Canada have legal arguments. Rob Huebert, the Associate

Director of the Centre for Military and Strategic Studies at the University of Calgary, suggests that, ultimately, "Canada can afford to lose the right to refer to the Northwest Passage as internal waters, but it cannot afford to lose control over the regulation of the ships that sail on it."[36]

In addition, a disagreement exists between Canada and the United States over a "wedge of territory in the Beaufort Sea that may contain billions of barrels of oil and gas."[37] This territory is a 6,250 square kilometer stretch of sea north of the Yukon-Alaska border. In 1825, The United Kingdom, Canada's sovereign at the time, and Russia, which still owned Alaska, established the original maritime boundary. Canada maintains that the boundary should be a direct continuation of the land boundary between Alaska and the Yukon while the United States insists it should be drawn differently in relation to the coastline.[38] According to Harrington, this dispute may escalate for the following two reasons: The economic incentives to drill are likely to grow exponentially, and the United States is aggressively pursuing domestic energy resources as an alternative to its reliance on foreign supplies.[39] Since the United States has not ratified UNCLOS yet, its provisions will not be applicable to this case.

The third dispute is with Russia and Denmark regarding the Lomonosov Ridge. It is a vast 1,800 kilometer underwater range beneath the North Pole. Russian scientists discovered it the 1940s. It may hold vast reserves of natural resources, particularly oil and gas deposits. It has geological connections with Russia via the New Siberian Islands, Canada via Ellesmere Island, and Denmark via Greenland. Concerned countries are in the process of collecting evidence to submit claims in accordance with UNCLOS. Russia made a first claim in 2001 that was not accepted for lack of scientific proof. The recent

Russian submarine flag planting ceremony on the sea bottom at the North Pole was an expedition to collect additional geological data for a subsequent submission expected in 2009. Canada is expected to submit a claim by 2013. Denmark has publicly stated its intent to submit a competing claim by 2014. The United States is also in the process of collecting evidence to file a claim regarding the extension of its continental shelf in the event that the US Congress ratifies the treaty.[40] Each country wants to secure as much territory as possible for future resource exploitation. The provisions of UNCLOS may be insufficient to determine successful claims if these overlap based on distinct geological connections.

A fourth dispute exists between Canada and Denmark over the maritime boundary in the Lincoln Sea, between Nunavut and Greenland. The two countries agreed upon the maritime boundary in 1974. However, during the establishment of exclusive economic zones in accordance with UNCLOS, this boundary was extended northward into an area not covered by the original agreement. The disputed territory is only sixty-five square miles.[41]

In addition, Canada and Denmark are both claiming Hans Island. It is a tiny island approximately 1,300 square meters in size, located in the Nares Strait between Ellesmere Island and Greenland straddling the maritime boundary between Canada and Denmark. The 1974 agreement only delineated the maritime boundary and the line was not drawn around or across this island. Following sovereignty assertions by both Canada and Denmark in 2005, the two countries agreed to discuss their differences through the United Nations.[42]

Finally, there are tensions involving Canada and Denmark over fishing between Baffin Island and Greenland. Based on Canadian Coast Guard assertions, Canada accuses fishers from Greenland and the Faeroe Islands of illegally entering Canadian waters between Baffin Island and Greenland in order to gather shrimp and turbot, which is currently a growing market.[43] These assertions however have not been confirmed due to Canada's lack of surveillance capability in the region.

Some or all of these international disputes may be impossible to settle in court under the provisions of UNCLOS. Without a binding International Court of Justice arbitration system, the only recourse available to these countries may end up being the use of military or economic pressure to assert their positions.

Potential for Conflict in the Arctic Region

The Arctic region is currently an unstable geostrategic environment and its future is uncertain. The Cold War prevented the development of international cooperation in the region and major issues were not addressed during that time. Moreover, the expectations are that the upcoming Arctic thaw and ongoing thirst for Arctic energy supplies will produce additional international tension. The document titled *Global Trends 2025: A Transformed World* produced by the US National Intelligence Council in November 2008 asserts that the rising energy demands of growing populations and economies over the next twenty years will heighten tensions between states competing for limited resources. It explains that:

> Perceptions of energy scarcity will drive countries to take actions to assure their future access to energy supplies. In the worst case this could lead to interstate conflicts if government leaders deem assured access to energy resources to be essential to maintaining domestic stability and the survival of their regime.[44]

It also explains that the future development of novel drilling techniques may create new opportunities to exploit ultra-deep oil fields, but that such fields located in areas of contested ownership, such as the Arctic, will create the potential for conflict.

There are several ongoing disputes between states regarding land and maritime boundaries and the increase of military activity in the region may create flashpoints. Disputes between states may be difficult to resolve diplomatically. UNCLOS offers a basis for negotiation, but is not comprehensive enough to always provide resolution. Unlike Antarctica, there is no ban on weapons in the Arctic. Several circumpolar states are strengthening their capabilities, and military activity in the Arctic region is steadily increasing. This was recognized during NATO's recent conference in Reykjavik, Iceland in January 2009 and, as such, NATO Secretary-General Jaap de Hoop Scheffer stated that NATO would need a military presence in the region to defuse likely tensions.[45] Russia reacted disapprovingly to this announcement. Russia's perception is that NATO's planned military presence in the Arctic region is being accomplished solely to defend the national interests of NATO members in the region, specifically the US and Canada.[46] In February 2009, famous Russian polar explorer and deputy chairman of the current State Duma Artur Chilingarov pointed out that Russia will not wage a new Cold War in the Arctic, but it will protect its interests.[47] This dynamic suggests that the region may become a new hot spot. Hence, increased tensions between states as well as between regional security partnerships and alliances may ultimately lead to a conventional conflict in the region if diplomatic and economic negotiations over differences fail.

Several renowned scholars share this view. Huebert states that "climate change and resource development are transforming the Arctic from a backwater into a region of

major international importance"[48] He argues that a perfect storm is brewing and it should prompt the Canadian government to act by acquiring the means of national power to assert its sovereignty in the region.

There is another school of thought however that believes military conflict in the Arctic is unlikely. Several regional experts such as Whitney Lackenbauer, a fellow at the Canadian International Council, believe that there is no immediate security crisis in the North. He asserts that there is no conventional military threat in the Arctic and suggests that current alarmism is driven by misunderstanding.[49] The Canadian Standing Senate Committee on National Security and Defence is also of the opinion that little or no threat exists in northern waters to the security of Canadians. The committee proclaims that disagreements over Canada's sovereignty in these waters are not going to be settled through the use of gunboats but through the use of diplomacy or in the courts.[50] History lessons however suggest that one should prepare for the worst. In the case of the Arctic region, the worst case is a conventional military conflict.

It is difficult to visualize what a conventional threat in the Arctic would resemble. The campaign objectives, whether diplomatic, economic, informational, or military in nature, would be unambiguous and relatively limited due to the climate and distances involved. The control of key terrain providing strategic benefits such as maritime shipping lanes and forward refueling in the Arctic region is fundamentally linked to military campaign objectives in that environment. The campaign would draw on all available means of national power and the military offensive would probably involve the use and synchronization of joint combat power. Maritime assets for instance would be required to control the sea lines of communications (SLOC) as well as to project power

on shore. The 1989 paper titled *Strategic Stability in the Arctic* by the International Institute for Strategic Studies (IISS) argues that the transatlantic SLOCs, the GIUK gap, and the submarine passages west of Greenland as well as through the Arctic Ocean are strategically vital to NATO.[51] NATO's declaration of this region as strategically important and the recent statement from NATO's Secretary-General about the need for a military presence in the Arctic reinforces this view of collective defense. Any conventional threat in the Arctic region would be enabled by maritime assets.

The IISS paper also speculates on the use of air assets. In addition to air superiority and air interdiction, some aircraft such as the long-range bomber, could be used to execute "a quick decapitating strike to paralyze the enemy's defenses and retaliatory capacity."[52] Such strikes would require air refueling however because of the distances involved. On the other hand, intercepting these aircrafts at such high latitudes is a costly enterprise. It requires extensive infrastructure such as early warning radar stations and forward air bases, as well as equipment and personnel.[53] The interception of a Russian long-range bomber in the Beaufort Sea and close to Canadian airspace on 18 February 2009, on the eve of US President Obama's visit to Ottawa, reaffirms this type of threat and underlines the complexity of aerial interception in the Arctic.[54] The Canadian fighter jets, scrambled from Cold Lake in Alberta, 1400 miles away from the intercept point, had to be refueled by a US Air Force tanker aircraft from Fairbanks, Alaska as well as land at a forward air base in Inuvik, Northwest Territory to carry out their round trip mission.

Finally, the IISS paper outlines the conventional threat to land installations. It explains that the destruction or occupation of isolated northern outposts, radar sites, oil

and gas platforms and pipelines, as well as the seizure of coastal areas bordering key Straits in the Arctic region would provide a valuable diversion in a wider conflict by forcing defensive deployments which could divert manpower from elsewhere on a scale out of proportion to the size of the offensive force.[55] These targets could easily be attacked by cruise missiles, as well as airborne or submarine-delivered forces. Even if these scenarios were designed during the Cold War, they are still applicable today in varying degrees of implementation.

The ability to seize and control an area of strategic significance in the Arctic such as SLOC access or chokepoints, sustain a presence there until any challenge is neutralized, and prevent violations of Canadian sovereign territory is at the core of the capability to assert Canadian sovereignty in the Arctic. Based on the information above, there seems to be a potential for conflict in the Arctic region and therefore, conventional threats in Canada's Arctic are a possibility.

Canadian Defense Capabilities and Requirements

Canada is investing in joint surveillance, combat, and sustainment assets, and increasing its presence in the Arctic region through major exercises and scientific exploration missions. There are conflicting views however on whether or not bolstering military capabilities to ensure sovereignty in the Arctic is the correct way-ahead.

In a Master's degree thesis produced in 2007, Canadian Forces Major Robin Lessard explores the issue of capabilities required for Canada to meet emerging threats in the Arctic due to climate change. He acknowledges the possibility, however slim, of a conventional threat to Canada's sovereignty in the Arctic. He asserts, based on an analysis of capabilities required to achieve the desired effects of aerial deterrence and

destruction, land control of key terrain, and maritime boarding that Canada can successfully counter conventional threats in the Arctic even if there exists only a small quantity of means available.[56]

Most experts and scholars, however, agree that Canadian military capabilities are not sufficient to counter conventional threats in the Arctic. In her book *Security and Defence in the Terrorist Era* published in 2005, Elinor C. Sloan favors increasing Canadian military capabilities to guarantee security as well as regaining credibility and influence with the US. She argues that, based on a comparison with US security and defense policy and capabilities, the emerging threats linked to climate change in the Arctic require Canada to specifically increase its ability to conduct surveillance in the Arctic, and develop the capability to conduct maritime patrols as well as defend against cruise missiles.[57] She further ascertains that the post-9/11 security environment is driving the Canada-US defense relationship to be more closely integrated than at any other time, but also insists that Canada needs to acquire robust military capabilities to gain sufficient credibility in its security and defense partnership with the United States.[58]

Huebert reverberates these assertions by stating that protecting Canada's sovereignty in the Arctic will require the Canadian Forces to be capable and proficient at operating in the North as well as equipped as such and therefore significant investments are required.[59] In terms of specific requirements to address conventional threats or sovereignty challenges in the Arctic, Kyle D. Christensen, a strategic analyst in the Directorate of Maritime Strategy in Canada's National Defence Headquarters, makes the point that the Canadian Navy is limited by its marginal ability to sail into northern waters and that it should acquire Arctic patrol ships with an enhanced ice capability.[60] Peter J.

Gizewski and Andrew B. Godefroy, both strategic analysts serving in the Canadian Army's Directorate of Land Concepts and Doctrine, argue that a permanent northern base with stationed forces specifically trained and equipped for Arctic operations would fill the void in land forces capabilities.[61] Lieutenant-General (retired) George Macdonald asserts that the Canadian Air Force has sufficient capabilities in existing and planned air fleets to conduct tactical and strategic air mobility, search and rescue, airborne communication, command and control, tactical aviation, surveillance, and force projection. He states however that the challenge facing military leadership is the allocation of these relatively small fleets to meet concurrent domestic and expeditionary roles.[62] All of these authors agree on the requirement for a joint interagency approach to planning, procurement, training, and field operations, and additional infrastructure such as new or upgraded airfields to cater to increased flight activity as well as sea ports to ensure force sustainment.[63] Finally, they also inform that future operational imperatives may be constrained by the cost associated with these new, or increased, capabilities.

Others such as Andrea Charron acknowledge that Canada is lacking military capabilities to protect its sovereignty in the Arctic, but argue that the favorable course of action would be bi-national cooperation in pursuit of stewardship of the waters with the US to ensure the continued continental security of North America.[64] She argues that increasing Canada's presence in the North can either be done multilaterally, bilaterally or continentally, and the increased presence must be aimed at protecting the environment, the local inhabitants, and the borders. She adds that a cooperative security plan, as is the case with the Great Lakes, would be mutually beneficial and most successful.[65] In fact, she skillfully affirms: "The United States does not help Canada defend itself, it helps

Canada to help defend the United States."[66] A cooperative approach would offset some of the costs involved with creating or increasing capabilities to meet threats to Canada's sovereignty in the Arctic.

I believe that such views should be well supported by an appropriate analytical framework based on a worst case scenario. In this case, a capability-based approach is probably the best way to examine requirements for Canadian military capabilities and requirements for the Arctic. The worst case scenario, as discussed previously, is without a doubt a conventional military incursion within Canadian territory by a country currently at odds with Canada over a territorial dispute. The aims of the incursion would be to secure key strategic areas and assert national interests.

This chapter has highlighted relevant issues addressing this thesis in existing literature. It has discussed the current state of affairs in the Arctic and ascertained that there is a potential for conflict in the region and therefore conventional threats to Canada's sovereignty in the Arctic. It has also discussed conflicting views regarding Canadian military capability requirements in the Arctic. Most authors and scholars concur with the fact that Canada needs to bolster its capabilities for Arctic operations, but only a few proclaim the need to engage in a multilateral approach. This study supports that preceding postulation based on an analysis of the military capabilities for arctic operations of the countries involved in disputes with Canada. The next chapter discusses the research methodology that has been used to conduct the analysis.

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CHAPTER 3

RESEARCH METHODOLOGY

The review of literature conducted in chapter two put the Arctic geostrategic environment in perspective by describing the consequences of climate change, the legal framework governing the region, the current security and defense agreements of which Canada is a part, and the current international disputes concerning Canada. In addition, the literature review discussed the different schools of thought associated with the potential for conventional conflict in the Arctic and Canadian defense requirements to counter such a threat. It did not however answer the primary research question.

To query the issue of whether or not Canada has the necessary military capabilities to deter and counter conventional threats to its Arctic sovereignty, one must evaluate Canada's military capabilities associated to operations in the Arctic region and compare them to other countries which may constitute a potential conventional threat. This chapter first describes the steps taken to obtain the relevant information to answer the primary and secondary research questions. It then describes the research methodology applied to include the feasibility and suitability of method. Finally, this chapter discusses the value and significance of this approach.

First, this study made extensive use of online books, professional journal articles, news articles, and organizational websites. The US Army Combined Arms Research Library in Fort Leavenworth, KS provided the hardcopy documents and enabled access to a few service-school papers and secondary sources as well.

Next, the methodology used is a comparative case study of Arctic military capabilities between Canada and three other countries. These three countries are the US,

Russia and Denmark because they have ongoing territorial disputes with Canada. Since the most dangerous threat scenario to Canada's Arctic sovereignty is a conventional attack, this study analyzes the national interests and policies, and arctic operations capabilities of the armed forces of these countries and compares the qualitative results to identify a gap in Canada's ability to enforce its sovereignty in the Arctic. The criteria applied are based on the joint functions and are further defined with specific joint and service capabilities and tasks stemming from the US Armed Forces Joint Publication 3-0 and related to Arctic operations as described in table 1 below.

Table 1. Description of joint functions used for assessment of arctic operations capabilities

Joint Function	**Description**
Command and Control	Joint interoperability Airspace, land, and maritime command and control Regional expertise
Intelligence	Real time, continuous and cold weather capable collection capabilities such as the following surveillance and reconnaissance assets: Satellites, dedicated aircrafts, UAVs, surface and subsurface radars
Fires	Offensive counter air Air and maritime interdiction and strategic attack capabilities Fire support Electronic attack capabilities Medium and long range ballistic missiles
Movement and Maneuver	Operational reach Air, sea (surface and subsurface), and land cold weather capable assets Icebreaking capability
Protection	Air and missile defense Operational area security Personnel recovery CBRN defense Emergency and consequence management and response
Sustainment	Infrastructure, airfields, and seaports Replenishment at sea In flight refueling

This research is capabilities-based. The assessment of capabilities for each joint function pertaining to each country is made qualitatively using the following terminology: significant, moderate, or minimal. This research is feasible by using open source and unclassified material. Only credible professional sources have been used from renowned authors, scholars, and academic and governmental institutes, as well as established media.

The research methodology is deemed suitable to answer the primary research question. It provides a synthesis of national interests and military means in the Arctic region of key countries as well as a qualitative comparison of them. The qualitative comparison supports the recommendations provided in chapter five regarding the way ahead for Canada. The weakness of this research methodology is that it does not address the complexity of the Arctic environment, its historical, social, and economical factors. This was done deliberately in order to simplify the research and crystallize the results towards the primary research question.

This chapter has described the methodology that has been used to answer the primary research question. The next chapter will provide a comparative study of the national interests and military capabilities for Arctic operations of the key countries involved as well as highlight key findings.

CHAPTER 4

ANALYSIS OF ARCTIC OPERATIONS CAPABILITIES

This study examines whether Canada possesses the required military capabilities to deter and counter conventional threats to its sovereignty in the Arctic. The previous chapter discussed the research methodology that has been used to gather the data required for a comparative case study of Arctic operations capabilities. This chapter reviews the national interests and established policies, and examines the military capabilities for Arctic operations of four countries, Canada, the United States, Russia, and Denmark. It then compares the military capabilities between these countries based on joint functions and establishes key findings in order to answer the primary research question.

Canada: Strong and Free?

Canada's assertion of sovereignty over its Arctic territory is an important element of its national security policy. It is well summarized in Prime Minister Stephen Harper's July 2007 declaration:

> Canada has a choice when it comes to defending our sovereignty over the Arctic. We either use it or lose it. And make no mistake, this government intends to use it. Because Canada's Arctic is central to our national identity as a northern nation. It is part of our history. And it represents the tremendous potential of our future. In defending our nation's sovereignty, nothing is as fundamental as protecting Canada's territorial integrity; our borders, our airspace and our waters. More and more, as global commerce routes chart a path to Canada's North and as the oil, gas and minerals of this frontier become more valuable, northern resource development will grow ever more critical to our country.[1]

A month later, he toured the Canadian Arctic and used this platform to reaffirm the commitment to expand the CF presence in the region and increase its capabilities.

In 2007, Ottawa announced procurement plans in line with this new policy. As such, the size of the Canadian Rangers, a reserve component of the CF made up of aboriginals and designed to provide a permanent presence in the Arctic, will be expanded from 4,100 to 5,000. There are plans to build up to eight ice-strengthened Polar-class 5 Arctic patrol vessels as well. These vessels will guard the Northwest Passage and Arctic coast. Plans were also announced to establish a docking and refueling facility at the deep-water port of Nanisivik, located at the eastern entrance to the Northwest Passage, and also establish an Arctic Training Centre in Resolute Bay, situated along the Northwest Passage's main channel almost at its midpoint. The Arctic Training Centre will provide facilities for cold weather training activities and a location for pre-positioning equipment and vehicles in the High Arctic. Canada has also recently increased its presence in the Arctic through the conduct of annual joint interagency exercises in its Arctic territories and several scientific and geological expeditions.[2]

Canada has a population of approximately thirty-three million and the Canadian Forces are composed of 64,000 active duty personnel. They are set to expand to 75,000 by 2015. The reserve components are composed of 27,000 personnel. The defense budget was 18.4 billion US dollars in 2007. This amount represented a meager 1.2% of Canada's 2007 Gross Domestic Product (GDP). It was increased slightly from 1.1% in 2006.[3] Although relatively small in size, the CF have considerable scope and at least minimal capabilities in all joint functions. What it lacks in traditional capabilities, it compensates by participating actively in bilateral and multilateral security and defense agreements. It is an active member of NORAD and NATO.

Command and control. Since the CF is a unified force, it benefits from first-rate joint interoperability. It is organized in four joint operational commands that are assigned forces from the three force generators, the Army, Navy, and Air Force. Domestic and continental operations including the Canadian Arctic is the responsibility of a joint operational command called CANADA COMMAND (CANADACOM).[4] It is nested within NORAD and is therefore in continuous coordination with the Unites States NORTHERN COMMAND (NORTHCOM). CANADACOM is further organized in six regional sub-commands. Joint Task Force North is the regional sub-command that oversees operations in Canada's Arctic. It is based in Yellowknife in the Northwest Territories and has detachments in Yukon and Nunavut, the other Canadian northern territories.[5] To ensure command and control of deployed task forces, the CF maintains a Joint operational HQ as part of the Canadian Expeditionary Force Command.[6] The Navy also has several principal surface combatants outfitted with command and control suites, however these ships are not ice-strengthened. In terms of regional expertise, every soldier in the CF is trained in winter warfare and is provided with specialized clothing and equipment for extreme cold operations. A small cadre of regular force instructors tasked to train and administer the Canadian Rangers maintain expertise as well. Overall, the CF have moderate command and control capabilities for arctic operations.[7]

Intelligence. Canada recently launched the satellite RADARSAT-2 which is capable of day and night all weather surface observation of Canada's Arctic region. This satellite significantly improves Canada's ability to detect small vessels and objects across its territory.[8] The CF have eighteen long range maritime surveillance aircraft which conduct regular patrols in the Arctic. It is also currently leasing Heron medium altitude

long endurance UAVs for employment in Afghanistan with a view to acquiring a limited number for domestic sovereignty patrols.[9] Canada's portion of NORAD's North Warning System (NWS) is composed of forty-seven radars that ensure continuous coverage of Canada's airspace in the Arctic.[10] The Canadian Rangers provide a small permanent military presence across the wide expanse of Canada's Arctic as well. Canada lacks however, sub-surface sensor capability to consistently monitor the activities of foreign submarines that transit under the Arctic ice. Their intelligence capabilities are therefore moderate.

Fires. The CF has minimal fires capabilities. The Air Force has only eighty-nine CF-18 fighter aircraft for offensive counter-air. The Navy can conduct limited maritime interdiction with a total of three destroyers, twelve frigates, four diesel-electric submarines as well as twenty-eight ASW helicopters. Finally, fire support is limited to the Air Force's F-18s and the Army's 455 artillery pieces and mortar tubes.[11]

Movement and maneuver. The CF have moderate operational reach stemming from its strategic and operational lift aircraft as well as its newly purchased heavy lift helicopters. It has forty-three transport aircraft of different types including four C-17 Globemaster and twenty-four C-130 Hercules. The Air Force also has twenty-eight maritime helicopters, and ninety-four tactical utility helicopters. It has recently acquired sixteen CH-47 heavy lift helicopters which will be delivered shortly.[12]

The Canadian Navy has fifteen principal surface combatants, twelve patrol and coastal ships, and four diesel-electric attack submarines.[13] The submarines cannot operate in the Arctic because of their requirement to regularly surface. These ships are organized in two separate fleets, one on each coast. Canada only has two aging heavy

Arctic icebreakers, four Arctic icebreakers, and nine ice-strengthened ships which all belong to the Coast Guard.[14] Their main purpose is maritime control and search and rescue. The CF have no icebreaking capability or ice-strengthened ships that would allow safe and unimpeded naval Arctic operations.

The Canadian Army has three independent combined arms mechanized brigade groups, the equivalent of reinforced US Army Stryker Brigade Combat Teams (BCT). The Army reserve force is composed of ten low readiness light brigades. [15] The Reserve component will also establish four Arctic response companies in an effort to dedicate assets for operations in Canada's north.[16] The CF have a Special Operations Force (SOF) that can conduct direct action and counterterrorism. Essentially, Canada has moderate movement and maneuver capabilities for Arctic operations in large part due to the recent procurement of strategic and tactical lift.

Protection. The Canadian military has moderate protection capabilities. Canada benefits from the NORAD bilateral agreement with the United States for strategic missile and airspace defense. In terms of ground-based air defense, the Army has thirty-four low level Air Defense Anti-Tank Systems. The presence of the Canadian Rangers provides effective operational area security in the north. Personnel recovery is performed by the Air Force search and rescue teams who have fourteen SAR helicopters at their disposal, and may also be carried out by SOF operators. Lastly, the CF have a Joint CBRN company that handles emergency response.

Sustainment. The Canadian military currently has minimal sustainment capabilities for Arctic operations. There is limited infrastructure available in the northern territories as well as limited accessibility. The region is sparsely populated with about

100,000 people spread over seventy different communities in a total land area of three and a half million square kilometers, roughly half the size of Europe.[17] A railroad connects Churchill, Manitoba which is located in Hudson Bay and therefore has an open access to the Arctic sea lanes, with the rail network of North America. There is a sea port at Iqaluit, Nunavut and another one that will be built in Nanisivik along the Northwest Passage as part of the government's expansion plan in the Arctic. The northernmost permanently inhabited place in the world is Alert, Nunavut.[18] It is a military signals intelligence base that also has an airfield and a weather station. Its closest military installation is Thule Air Force Base in Greenland 676 kilometers away. There are also four military forward operating locations in the northern territories that provide support to temporary northern deployments. These landing strips, combined with seven tanker aircraft, enable long range air patrols over the Arctic.[19] The Canadian Navy only has two aging auxiliary oil replenishment vessels that will eventually be replaced by three new Joint Support Ships.[20] These new ships will be able to support three to four maritime helicopters and may be reconfigured for disaster assistance. They will also be ice-strengthened and able to operate in thin ice. Finally, the Canadian Operational Support Command can deploy general engineering, signals, logistics, and medical units to support a deployed joint task force.[21]

The CF are lean, but have at least minimal to moderate capabilities to enable Arctic operations in all joint functions. The largest gap in capability is likely ice-strengthened and icebreaker ships as well as sub-surface intelligence collection capabilities such as nuclear-powered submarines. The Canadian government asserts a sturdy posture. Because of its limited military capabilities for Arctic operations and its

reliance on bilateral and multilateral security agreements however, one wonders if Canada's True North will remain strong and free in its entirety.

The United States of America: The Eagle Looks North

The United States seeks to assert its interests in the Arctic region. The White House issued on 9 January 2009 a National Security Presidential Directive (NSPD) and Homeland Security Presidential Directive on the Arctic that reflects this view.[22] The document recognizes the effects of climate change in the Arctic region and announces broad policies. It fails however to specify any priority or order of precedence. In terms of national security and homeland security needs, the directive stipulates that the United States "… is prepared to operate either independently or in conjunction with other states to safeguard these interests."[23] It also mentions that the nature of the Arctic being a maritime domain requires the United States to project sea power throughout the region. Freedom of the seas being a top national priority, the directive states that the Northwest Passage is a strait used for international navigation and that recognizing it as such supports the ability of the United States to exercise these same rights through other strategic straits around the world. The implementation concept of this directive includes developing greater capabilities and capacity to protect US sovereignty in the region, encouraging the peaceful resolution of disputes in the Arctic region, determining basing and logistics support requirements such as airlift and icebreaking capabilities, and protecting US interests with respect to hydrocarbon reservoirs that may overlap boundaries. The United States however has yet to ratify UNCLOS and consequently cannot claim exclusive economic zones in the Arctic and is unable of peacefully resolving territorial disputes with other nations until it does.

The Arctic will likely see a boost in American presence in the near future.[24] The US military will conduct additional operations and exercises in accordance with the NSPD. Other US departments may also be forced to deal with law enforcement, homeland security, or environmental disaster problems in the Arctic and particularly northern Alaska as it becomes more navigable and widely used by international shipping as well as multinational oil companies conducting exploratory drilling and seismic surveying in the Beaufort Sea.

The United States is a member of NATO, NORAD, and a permanent member of the United Nations (UN) Security Council. It has a population of approximately 301 million. Their armed forces, all services combined, are composed of 1.498 million active duty personnel, and there are approximately one million troops in reserve, not including the National Guard. The defense budget was a staggering 622 billion US dollars in 2007 and is increasing gradually to offset the cost of operations to prosecute the Long War worldwide. That amount represented 4.54% of the US 2007 GDP.[25] To evaluate the US armed forces properly, one has to consider its different services. The National Guard assets however are not part of the assessment below since they would not be available to project power into the Arctic due to their inherent domestic role.

Command and control. The Arctic region is divided between three US Combatant Commands, NORTHCOM, European Command, and Pacific Command.[26] Canada's Arctic region is part of NORTHCOM's area of operations therefore any military intervention in Canada's Arctic would be the responsibility of the Commander NORTHCOM, who is also the commander of NORAD. The US Navy's 2nd Fleet Headquarters (HQ) stationed in the Atlantic Ocean could become NORTHCOM's

maritime component. Commander 2nd Fleet has two amphibious command ships at his disposal.[27] The US Army is continuing its transformation to the Modular Army. Its command apparatus includes three corps HQs and ten division HQs. Each one of these HQs can assume the role of a land component command. There is a total of fifty-three AWACS in the US Armed Forces which provide airspace command and control. The US Strategic Command would also have a role since it is a joint command that centralizes missile defense, global strike, information operations as well as Intelligence, Surveillance and Reconnaissance (ISR) capabilities, and enables quick and efficient use of strategic reconnaissance, intelligence collection, and early warning assets. It has enormous capabilities which are outlined in the paragraphs below. In addition, there is some regional expertise with some active duty units based in Alaska including a Stryker BCT. The US Armed Forces are not unified, but they can field an extremely effective joint task force for operations in the Arctic if required.

Intelligence. The early warning and intelligence collection capabilities of the US military are unmatched. It has more than fifty-eight space based reconnaissance systems including radar imaging and infra-red, electronic and signals intelligence, nuclear detonation detection, and navigational satellites. It boasts fifty-five radars integrated to the NORAD NWS, as well as a host of strategic systems, both maritime and land-based, providing space surveillance and tracking capabilities.[28] The US military also has 144 specialized reconnaissance aircraft platforms and a total of 1,737 UAVs spread across all services.[29] Most of these UAVs are tactical ones, however the Air Force has eleven RQ-4A Global Hawks and is planning to increase that number in the coming years.[30] In addition, the US Army can field over 251 land-based tactical radar systems.[31]

Fires. The US military has significant fires capabilities. It can conduct offensive counter-air missions with over 3,371 fixed-wing fighter jets. The US Air Force also possesses stealth aircrafts currently including ninety-one F/A-22A Raptor and twenty B-2A Spirit.[32] The US Navy can conduct strategic attacks and maritime interdiction with fourteen nuclear-powered ballistic missile submarines, fifty-seven nuclear-powered attack submarines, twenty-nine of which are armed with Tomahawk missiles, and seventy-four surface combatants also armed with Tomahawk missiles.[33] Furthermore, the US Air Force has ninety-four B-52H Stratofortress and sixty-five B-1B Lancer strategic bombers.[34] The US also has 500 ICBMs. The US Navy can conduct effective anti-submarine warfare (ASW) with 220 ASW helicopters in its inventory.[35] In addition to fixed-wing aircraft in close air support, the US military has over 1,225 attack helicopters and twenty-one AC-130 gunships that can provide fire support.[36] Most UAVs can also carry payloads and the US Army has an inventory of 6,530 artillery pieces, mortar tubes or missile systems including 830 Multiple Launch Rocket Systems.[37] Finally, each service can conduct electronic attacks with their respective aircraft platforms.

Movement and maneuver. The US military has an enormous quantity of naval, land, and air assets and unrivaled operational reach. The US Air Force has 681 transport aircraft and 171 transport helicopters.[38] In addition to its ballistic missile nuclear submarines, the US Navy has fifty-seven nuclear-powered attack submarines. It has 106 surface combatant ships including ten nuclear-powered aircraft carriers, twenty-two cruisers, fifty-two destroyers, and twenty-one frigates. It also has thirty-two amphibious ships and 334 amphibious craft, affording the US Marines astonishing freedom of maneuver anywhere in the world.[39] 2nd Fleet in the Atlantic Ocean has thirty-five

submarines, fifty-four surface combatants, and twenty-two amphibious ships assigned.[40] Naval aviation operates from the aircraft carriers and is composed of over 1,171 combat capable aircraft. The only icebreaking capability however rests with the US Coast Guard in the form of three icebreakers including two heavy ones.[41] Moreover, US Navy ships are not ice strengthened.

The Marine Corps is composed of three Marine Expeditionary Forces. They have 368 transport and eighty-one utility helicopters, as well as sixty tilt rotor aircraft.[42] The US Army is completing its transition to the Modular Army. It is planning to grow to forty-eight active duty BCTs, twenty-eight reserve component BCTs, and approximately 225 support brigades.[43] These BCTs can be task-tailored. The US Army also has 399 support helicopters, and 1,935 tactical utility helicopters of different types.[44] These aviation assets are organized in eleven combat aviation brigades that provide a great air assault capability. The US Army also has airborne and amphibious capabilities. The US Special Operations Command combines special force units from each service. It includes five Special Forces Groups, a Ranger Regiment, an aviation regiment, a psychological operations group, a Civil Affairs battalion, eight SEAL teams and several Air Force wings.[45]

On the other hand, most of the US maneuver platforms and weapons systems were not designed to operate in a cold weather environment. A series of Coast Guard test deployments conducted in the summer of 2008 to the North Slope of Alaska determined that the equipment had difficulty operating in minus forty degree temperatures.[46] One could assume that the US military equipment is similarly inadequate for the harsh Arctic climate. The US military is also committed worldwide with a very high operational

tempo. Therefore, the US military only has moderate movement and maneuver capabilities for arctic operations.

Protection. The US military has an integrated strategic missile defense system composed of sea-based interceptors on Aegis-class cruisers and destroyers, and twenty-one ground-based interceptors. They also have over 1,281 air defense systems including 483 Patriot systems which can provide operational area air defense.[47] The US Special Operations Command as well as various Marine Corps units can easily conduct personnel recovery anywhere in the world. In terms of CBRN capabilities, the US Army has one chemical brigade and the Marine Corps have a Chemical Biological Incident Response Force.[48] NORTHCOM also has a Joint Task Force Civil Support specifically designed for emergency and consequence management and response throughout the continental United States.[49]

Sustainment. The United States is a circumpolar state because of Alaska. Alaska is a non-contiguous state, as well as the largest state of its country, and the least densely populated. The northern part of Alaska along the Arctic Ocean, the "Alaskan Bush," is the less crowded part of the state and encompasses only 380 communities. There is limited infrastructure available outside of Anchorage which includes a highway and a railroad.[50] The US military can use two bases in the United Kingdom, Fylingdales Moor and Mildenhall, to support operations in the Arctic. Under the NORAD agreement, the US military can also use the infrastructure in Canada's North for airspace surveillance. In addition, under a 1951 treaty with Denmark, the United States can use the territory of Greenland in defense of the North American continent. The base at Thule is the United States' northernmost base and provides communications and logistics support. It is also

part of the US missile defense and early warning systems.[51] The US Army has a Cold Regions Test Center that conducts winter, mountain, and northern environment developmental testing.[52] The US Armed Forces Military Sealift Command has an auxiliary fleet of forty logistics and supply ships.[53] It also has a Strategic Sealift Force of twenty-five support ships maintained at four days readiness. Finally, each service has an in-flight refueling capability. The joint assets amount to a total of 656 tanker aircraft.[54] Based on the limited available infrastructure, however, the sustainment capabilities of the US military for Arctic operations are moderate.

The US armed forces capabilities are immense. Even if the US armed forces are spread all over the world and are committed in large numbers on different operations, they could surge significant joint combat power in the Arctic region. They are deficient however in terms of icebreaking capability and northern infrastructure. One could argue it is only a matter of time before the United States acquires these capabilities especially since the eagle is currently looking north.

Russia: The Bear Stirs Out of his Den

The Russian Federation has been through tumultuous times, but it is steadily rising from the collapse of the Soviet Union in 1991 and its 1998 financial crisis. It is currently increasing its regional influence using all means of national power. Russia is a member of the Commonwealth of Independent States, the Collective Security Treaty Organization, and a permanent member of the UN Security Council. It has a population of approximately 141 million. The Russian Federation is currently the most powerful circumpolar State in terms of physical presence. It governs half of the Arctic territories in terms of land mass and nearly half of its inhabitants.[55]

Russia has recently reaffirmed its interests in the Arctic. In 2007, Vladimir Putin described the Arctic as Russia's strategic reserve in the development of its statehood. He proclaimed the urgent need to secure Russia's strategic, economic, scientific, and defense interests in the Arctic.[56] Russia's northern regions are an important source of natural resources. In fact, Russia obtains 90% of her gas, 60% of her oil, 60% of her copper, and 98% of her platinum metals from its northern territory. The Russian north also accounts for 20% of the national income and two-thirds of hard currency earnings.[57] Off-shore oil production in the north is increasingly important for Russia because its oil production from developed fields in the south may peak around 2010, even when its recently regained power status is almost exclusively based on her role as an energy producer.[58] The NSR is also an incredible catalyst of economic wealth for Russia. It allows the Arctic region to be developed much more quickly than all the rest of Russia since the rivers inland east of the Urals flow north.[59] The desire to retain a powerful status and preserve their resource-driven economic growth are major factors influencing Russia's Arctic policy which aims to secure as much territory and resources as possible. The notion that Russia's Arctic expansion is a sort of compensation for the loss of its hegemony over Eastern Europe in the 1990s is also a recurring theme in Russian writing.[60] In any case, the Arctic is perceived to be at the core of Russia's national security based on the long-term availability of natural resources.

The Russian military is well aware of these national interests. According to Northern Fleet commander Admiral Vladimir Vysotskiy, "… the basis for Russia's future and socioeconomic stability and security is now being laid down in developing the resources and spaces of the Arctic."[61] He further emphasized the importance of an

increased military presence in the Arctic by declaring in 2004: "… at present it is only through the Arctic seas that Russia has full open access to the high seas and the possibility of broad operational maneuver for the Navy's submarine forces."[62] Indeed, Russia's Maritime Strategy for 2001-2020 emphasizes the importance of free access of Russian naval forces to the Atlantic, the Northern Fleet's important role in the defense of Russia, and the significance of the NSR for economic development. The Strategy also talks about extraction of natural resources, defense of Russian interests in the Arctic, and limitation of foreign navy presence.[63] This strategy stems from perceived threats which include militarization of the Arctic by NATO in an effort to control global SLOCs, and environmental group proposals for limitation of economic activities in the Arctic to weaken Russia. To counter these perceived threats, Russian "rhetoric" emphasizes the need to use military means.

In terms of increased presence, most of the Russian Navy was relocated to the Northern Fleet when it lost its warm water ports post-Cold War.[64] More recently, Russia resumed its long range strategic bomber patrols over the Arctic in August 2007.[65] Arctic bases were reactivated to support these patrols.[66] Two scientific expeditions were also undertaken at the North Pole, in 2004 and 2007, to survey the ocean floor and provide more data for subsequent claims to UNCLOS.[67] Moreover, the Russian Federation conducted several military exercises in the Arctic region lately including a naval exercise in the Barents Sea in July 2007 incorporating over 7,000 personnel and thirty vessels, and a large-scale strategic exercise involving long range bombers over the Arctic with in-flight refueling in September 2007.[68]

After more than a decade of military reform, Russian armed forces have improved substantially, particularly in joint force activities such as readiness, force projection, and interoperability.[69] Russian defense budget and expenditures are also increasing steadily. In 2007, it was estimated at 102 billion US dollars, representing 5.15% of its GDP compared to 3.72% in 2005 and 4.11% in 2006.[70] Since 2007, the majority of funds allocated to equipment expenditures are aimed at modernizing rather than reforming the military. Indeed, the 2007 State Armament Program stretches to 2015 and envisions the replacement of 45% of existing military hardware. It also aims to make the Russian navy the second most powerful in the world by 2027 by adding two new carrier groups, one for the Pacific Fleet and one for the Northern Fleet.[71] The list of acquisition proposals includes fifty SS-27 ICBMs, thirty-four new strategic bombers, two multi-purpose nuclear submarines, as well as twelve warships.[72] These improvements and modernization plan are strong indicators of Russia's increasing potential to regain a form of strategic military parity with the United States.

The Russian military was composed of 1.03 million active duty personnel in 2007 including an Army of 360,000 soldiers. Russia can also count on an all-arms reserve of approximately twenty million soldiers because of its reserve obligation to age fifty.[73] It has significant Arctic operations capabilities in all joint functions. Although Russian equipment is not the most sophisticated, it is designed to withstand very cold temperatures and operate during a harsh winter, or in an Arctic environment. This provides the Russian armed forces with a considerable advantage over other militaries worldwide and unmatched capabilities for Arctic operations.

Command and control. Russia has significant command and control capabilities. The Russian Navy is composed of four fleets: Northern, Pacific, Black Sea, and Baltic. It also has a flotilla in the Caspian Sea. The Northern Fleet is the largest of the three European Fleets and in several respects the most important, mainly because of its access to the Atlantic Ocean. It is responsible for operations in the Atlantic and Arctic regions. Northern Fleet HQ is located at Severomorsk, just north of the port of Murmansk on the Kola Peninsula.[74] Russia is the only country that has a designated military naval Fleet that is intended to operate in an extreme cold weather environment. Lastly, the Russian Air Force has twenty A-50 Mainstay aircraft, similar to the AWACS, providing airspace command and control.[75]

Intelligence. Russia has a space-based ICBM and Submarine Launched Ballistic Missile launch detection capability with a limited number of serviceable satellites. It also has a modernized early warning radar system that covers mostly its western-most portion, particularly the Kola Peninsula and Moscow. Nonetheless, this system is capable of detecting targets at optimum range from within Russian borders.[76] The system also includes several leased ground-based radars from four Soviet Union era satellite countries, Belarus, Ukraine, Kazakhstan, and Azerbaijan.[77] The Russian armed forces have a host of UAVs but the exact numbers are not verified. Their latest UAV is the Tu-300 Korshun which is a high altitude long endurance aircraft with a maximum speed of 950 km/h.[78] The Russian Air Force is also testing "Aerostatika" airships with a view to provide increased low-level aerial reconnaissance and observation.[79] It can also collect intelligence with sixty-seven submarines. Accordingly, it has significant intelligence capabilities.

Fires. The Russian military has significant fires capabilities. The Russian Air Force is developing a fifth-generation fighter designed to compete with the F-22 Raptor, the SU-50, with a projected introduction date in 2015 that will replace their MIG-29 Fulcrum and SU-27 Flanker.[80] It has a total of 261 long range strategic bombers.[81] The Russian Navy's aviation has a broad ASW capability totaling twenty Tu-142 Bear and 155 helicopters of different types.[82] These assets are spread throughout each Fleet. For instance, Northern Fleet has fourteen aircraft and forty-two helicopters dedicated to ASW.[83] The Russian Navy also possesses airborne electronic warfare (EW) capabilities with a total of thirty-seven aircraft based on the Il-38 and Il-20 platforms.[84] The Army has over 26,121 artillery and mortar tubes as well as 1288 attack or armed helicopters organized in twenty different regiments which can provide fire support.[85] It has fifteen strategic missile nuclear submarines of which eleven are based in Northern Fleet.[86] In addition, it has over 200 medium-range missile systems and 508 ICBMs, roughly half of which can be launched by mobile missile launchers.[87]

Movement and maneuver. Russia has significant operational reach. It has over 477 transport aircraft spread across its Air Force and Navy.[88] To further increase its operational reach, the Russian military is also examining the possibility of replacing their thirty Tu-134 aircraft with the new Tu-334 which can carry 102 passengers over a distance of 3,150 km and may be used for special operations.[89] Northern Fleet has several aircraft including thirty fighters and twenty-seven transports. It also has sixteen Ka-29 assault helicopters and fifteen Mi-8 Hip transport helicopters.[90]

The Russian Navy has sixty-seven submarines, sixty-two principal surface combatants including one aircraft carrier, and over forty-five amphibious ships and other

craft.[91] The Northern Fleet has forty-two submarines, ten principal surface combatants including the Kuznetsov aircraft carrier, six amphibious ships, and a naval infantry brigade.[92] Both the Baltic Fleet and Pacific Fleet, which could be called to operate or reinforce the Northern Fleet in the Arctic region have similar capabilities.[93] The Russian Navy has eighteen icebreakers of various sizes. There are also six commercial nuclear-powered heavy icebreakers still commissioned. These aging vessels have been absorbed by the Russian state nuclear corporation Rosatom in August 2008. Gazprom and LUKoil, both oil production corporations, have also announced plans to build nuclear-powered icebreakers to service their off-shore oil platforms and oil shipping through the NSR.[94]

The Russian Army is composed of three combined arms tank divisions, sixteen combined arms motorized rifle divisions, two air assault brigades, as well as four airborne divisions and three independent airborne brigades for a total of 35,000 airborne troops.[95] It also has nine Spetsnaz Special Forces brigades. It has an astonishing amount of equipment, including 23,000 tanks and 15,140 armored infantry fighting vehicles.[96] Russia's movement and maneuver capabilities are quantitatively significant.

Protection. The Russians have significant protection capabilities. They are upgrading national strategic air defenses, based on the SA-20 Triumph Surface to Air Missile (SAM) to include the capability to withstand the effects of jamming devices.[97] It also has over 2,465 operational and tactical air defense systems.[98] In terms of operational security, in addition to having the most densely populated northern regions in the world; Russia's Federal Security Service has formed a new Arctic directorate and established border control stations along the NSR.[99] The Russian Navy has sixty-two SAR

helicopters to conduct personnel recovery with while deployed forward.[100] Finally, the Russian armed forces are equipped and trained to fight in and respond to a CBRN environment.

Sustainment. The Northern Fleet is based out of Severodvinsk and the Kola Peninsula.[101] It is an area of the Arctic Ocean bordering the Russian coast that does not completely freeze over during winter. Murmansk, as the main base area for oil development in the Barents Sea and beyond, has a population of 325,000 and has fully developed infrastructure and transport links.[102] Other areas of the Russian Arctic coast have a full infrastructure in place ready for future economic development as well. Russia's rich history of Arctic exploration as well as the development of sustainment nodes to shore up the NSR in the last decade has provided Russia with the most developed northern infrastructure in the world. The Russian armed forces also have replenishment at sea and in-flight refueling capabilities. The Northern Fleet has over 130 logistics and support ships while the Pacific Fleet has fifty-seven.[103] The Russian Air Force has in-flight refueling capability with twenty Il-78 tanker aircraft.[104] The Russian military has significant sustainment capabilities for Arctic operations.

Russia has by far the greatest amount of military forces positioned within the Arctic Circle. This situation combined with the nature of Russian equipment designed to operate in cold climate as well as the extensive infrastructure already located in northern Russia makes the Russian military well positioned for any intervention in the Arctic. Finally, because Russia does not assume global but only regional responsibilities, it can probably concentrate military forces in the Arctic to a greater extent than the United States. After almost twenty years in hibernation, the bear is awakening once again.

Denmark: The Swan Spreads its Wings

Denmark is a member of NATO, the European Union, and the Organization for Security and Cooperation in Europe. It has a population of approximately 5.5 million. Denmark is responsible for the sovereignty of the territory of Greenland even though Greenland's 57,000 inhabitants have had home rule since 1979. Associate Professor Nielsen of the University of Greenland defines Greenland as "… a microstate with a hinterland containing a tremendous promise of future potential."[105] Greenland's status as part of Denmark is currently the subject of domestic debate. A change in its status is discussed in a ten to twenty year timeframe. If Greenland does achieve independence, it would need to provide for its own defense and security which could be possible with additional income from energy, minerals, and shipping stemming from a melting Arctic environment. An independent Greenland could also seek to establish a closer relationship with the United States, Canada, the European Union, or a combination of these.[106]

In 2004, Denmark launched a twenty-five million US dollars surveying project to prove that the Lomonosov Ridge is linked geologically to Greenland. It is also conducting a bilateral surveying project of uncharted parts of the Arctic Ocean with Canada.[107] A scientific expedition was undertaken to the North Pole in August 2007 assisted by a Russian icebreaker. Preliminary results indicate that the North Pole likely falls within Denmark's boundaries.[108] Nevertheless, the resources under the Arctic ice cap are still up for grabs.

The Danish military is smaller than Canada's but similar in general capabilities and organization. In recent years however, it has reoriented its focus from national

defense towards capabilities for international operations.[109] Its defense budget was 4.32 billion dollars US in 2007, representing 1.3% of Denmark's 2007 GDP. This is a slight increase from 1.2% in 2006. The Danish armed forces are composed of 30,000 active duty personnel and 53,700 Home Guard, or reserve, personnel.[110] It has very modest Arctic operations capabilities.

Command and control. The command and control apparatus is based in Denmark. All services are interoperable with each other. The Danish military maintains regional expertise through the Sirius patrols and arctic warfare exercises which are conducted by SOF units. The conventional Army has no Arctic capabilities or training.[111]

Intelligence. Denmark has minimal intelligence collection capabilities. It only has twelve observation helicopters and seven short range Sperwer UAVs. The Sirius long range dismounted patrols can also provide intelligence.[112]

Fires. The Danish Air Force has forty-eight F-16s. These fighter aircraft have previously flown non-stop from Denmark to a base in Greenland without being refueled in-flight thus demonstrating the capability to reinforce Greenland's airspace. The Danish military also has fifteen ASW helicopters. Finally, the Army has 859 artillery and mortar tubes.[113] These capabilities are minimal.

Movement and maneuver. The Danish military has limited operational reach. It has only four C-130J Hercules and three CL-604 Challenger aircraft. However, as a participating country to the NATO Airlift Management Organization, Denmark can employ NATO's strategic airlift capability, which is four C-17 aircrafts.[114] The Danish military also has twelve attack helicopters. The Danish Navy has three Corvettes and forty-nine patrol and coastal combatants including four Thetis class ships which have

double-skinned ice-reinforced hulls designed to break through eighty centimeters of solid ice.[115] These four Thetis class vessels are tasked with sovereignty enforcement, search and rescue, fishery inspection, and support to Greenlandic authorities. The Army is composed of one combined arms mechanized infantry division of two mechanized infantry brigades however one of those brigades is a conscript training brigade. It also has a SOF unit.[116]

Protection. The Danish military has a control and air defense group armed with surface to air missiles. It also has an air defense battalion. These assets are based in Denmark but can be deployed to Greenland if required. The security of the vast expenses of Greenland is maintained by a small permanent presence of long range dog-sledge and kayak patrols called Sirius. These patrols assert Danish sovereignty over Greenland. Search and rescue is done by navy ships and helicopters.[117] Protection capabilities are therefore minimal.

Sustainment. There are multiple airfields on Greenland which are permanently manned as well as docking facilities. The Danish Navy has seventeen small logistics and support ships. The Danish military does not have an in flight refueling capability.[118] Therefore, Denmark has minimal sustainment capabilities.

Denmark's force projection is very limited. Most of the Danish military capabilities are based in Denmark. In short, the Danes have minimal Arctic operations capabilities in all joint functions even if their ice-strengthened frigates provide some arctic region patrolling ability. Hence, the Danish swan is spreading its wings with its Arctic territorial assertions but remains on the ground for lack of adequate capabilities.

Comparison

The outcome of the country case studies on national interests and military means by joint function is a qualitative comparison of assessed capabilities produced at table 2. This comparison generates key findings regarding the contemporary military imbalance prevailing in the Arctic region.

Table 2. Comparison of military arctic operations capabilities

Joint Function	**Canada**	**United States**	**Russia**	**Denmark**
Command and Control	Moderate	Significant	Significant	Minimal
Intelligence	Moderate	Significant	Significant	Minimal
Fires	Minimal	Significant	Significant	Minimal
Movement and Maneuver	Moderate	Moderate	Significant	Minimal
Protection	Moderate	Significant	Significant	Minimal
Sustainment	Minimal	Moderate	Significant	Minimal

It is evident that Canada cannot match the US or Russia's military capabilities in an Arctic environment. It has a significant capability gap if it wishes to deter and counter conventional threats to its Arctic sovereignty in a unilateral manner. When compared to the big brothers on the block, the CF have particular shortfalls in the functions of intelligence, fires, movement and maneuver, and sustainment. Specific capabilities are required in each of these areas to enable Arctic operations against conventional threats. First, there is a requirement for some type of sub-surface intelligence collection capability that would enable tracking foreign submarines operating in the Arctic eventually to deter them from using Canada's internal waters. This capability can take the form of nuclear-powered submarines or sub-surface radars. Second, Canada needs to bolster its fires capability by acquiring strategic attack, electronic attack and additional fire support assets such as Tomahawk missiles, attack or armed helicopters, and airborne

EW platforms. Third, Canada's military icebreaking capability is non-existent. The projected Arctic offshore patrol ships will have ice-strengthened hulls, but they will not be considered icebreakers. The Canadian Coast Guard's icebreaker fleet is old and will need to be replaced soon. Finally, the infrastructure in Canada's northern region is currently limited, but one could argue that by 2012, with the establishment of the projected facilities along the Northwest Passage, this will be remedied. Even if Canada would acquire the capabilities listed above, a significant difference in quantity of forces would still exist in a military clash against the United States or Russia.

The United States has also several shortfalls regarding Arctic operations. The infrastructure in northern Alaska is limited, the US armed forces lack regional expertise, and some of the equipment is not designed for operations in an arctic climate. But most of all, the United States has a significant gap in icebreaking capability with only four aging available icebreakers and no ship designed with an ice-strengthened hull. Russia on the other hand seems to possess the will and the ability to not only assert its Arctic sovereignty, but also conduct effective expeditionary operations when required. Finally, Denmark has limited capabilities to assert its sovereignty should the need arise and therefore could benefit from a multilateral security agreement.

This chapter has analyzed and compared the military capabilities for Arctic operations of Canada, the United States, Russia, and Denmark. It has established that a military imbalance currently prevails in the Arctic. Russia seems to possess the means and the intent to assert itself in the Arctic while the other countries are unable to do so. These countries will have to develop their capabilities or leverage other means to counter a possible Russian expansion. This chapter has further established key findings regarding

Canada's gap in capabilities to deter and counter conventional threats to its Arctic sovereignty, mainly in the areas of intelligence, fires, movement and maneuver, and sustainment. These findings answer the primary research question and provide a framework for the next chapter's recommendations on how to address Canada's shortfall in military capabilities.

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CHAPTER 5

RECOMMENDATIONS AND CONCLUSION

The purpose of this study is to determine Canada's gap in military capabilities to address conventional threats to its sovereignty in the Arctic. The analysis conducted in Chapter four examined this question and established key findings stemming from a qualitative comparison of military capabilities for Arctic operations. Indeed, despite the fact that Canada will bolster and strengthen its capabilities through capital and modernization projects in the near future, specifically in the areas of surveillance and response to contingencies, it will still be unable to counteract conventional threats to its Arctic from such nations as the United States and Russia. In other words, Canada cannot protect its own sovereignty in the Arctic against the United States or Russia, both of whom still have unresolved territorial disputes with Canada in the Arctic. Canada will have to rely on other means of national power to safeguard its Arctic. This Chapter will interpret the key findings of this study, make recommendations for further study on this topic and on possible solutions to compensate for Canada's gap in military capabilities, as well as provide a brief summary of this thesis.

Interpretation of Findings

The fundamental meaning of the results of the qualitative comparison conducted in Chapter four is that Canada has to somehow find a way to compensate for its gap in military capabilities for Arctic operations. It could acquire the key capabilities it lacks to ensure its sovereignty against potential conventional threats, but these capabilities are expensive to develop and maintain. Consequently, this simplistic and unilateral approach

is problematic to achieve particularly given the current global economic downturn which could have a long lasting impact on the Canadian economy and the Government's ability to provide the budgetary requirements for such an endeavor.

Canada could leverage other elements of national power to compensate for its gap in military capabilities for Arctic operations, specifically diplomatic means. Canada could rely on common security and defense agreements with other nations to provide the gap in capabilities as a coalition. However, there are serious implications associated with relying on bilateral or multilateral agreements. For example, such an agreement may place additional parallel demands on already stretched military resources by forcing Canada's hand in participating to multilateral military operations abroad. It may also impose provisions for special access on Canadian soil that would undermine the very sovereignty it tries to ascertain such as an open access through the Northwest Passage.

This study provided several additional insightful findings. First, the Arctic region is undoubtedly a valued geostrategic environment in which nations will compete in the near and medium term in order to assert their own national interests. These national interests are further defined as securing strategic natural resources and SLOCs. The Arctic region is still largely undefined and the legal provisions of UNCLOS may be unsuitable to resolve all disputes. Furthermore, some of these disputes are between members of legacy security and defense agreements. For example, Canada has territorial disputes with the United States and Denmark which are both members of NATO.

Next, the study demonstrated that the United States is ill prepared for potential interventions in the Arctic. Militarily, it lacks icebreaking capability and Arctic capable forces. Diplomatically, it has not consented to UNCLOS. It is not in a favorable position

to assert its national interests in the Arctic region. The United States could therefore also benefit from some type of common security and defense agreement in the Arctic to contain a possible Russian expansion in the region.

Third, Russia has significant capabilities for Arctic operations which include a vast infrastructure and regional expertise. In addition, Russia's long term growth as well as its international relevance and credibility are linked to its resources in the Arctic region. Accordingly, one could argue that Russia is aware of its prominence in the Arctic region and it may allow and be ready for an escalation of military posture to occur in that region to assert its interests in the years ahead.

Finally, NATO may be the only organization with the collective means to limit or contain Russia's possible expansion in the Arctic. Some NATO members may want to resist Russian claims in the Arctic as a way to limit its regional influence. Other members such as the United States may wish to deliberately slow down Russia's momentum in that region for a given time.

On the other hand, NATO may not be as single-minded and high-powered as it was during the Cold War. One could argue its long-term commitment in Afghanistan preempts the effective future use of the NRF. The addition of seven members in 2004, Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, and Slovenia, and two more in 2009, Albania and Croatia, may have weakened the decision-making process for NATO intervention especially as it pertains to the Arctic region. Indeed, these eastern European countries may not share the same interests over the Arctic and they have an equal vote in NATO's unanimous decision-making process. Some European NATO members may have additional constraints such as a reliance on Russian supply of oil and gas as well as

the requirement to use the NSR. These constraints may moderate their desire to confront Russia on issues concerning the Arctic region. Consequently, NATO, as a collective defense organization, is not currently well positioned to assume a role against Russian expansion in the Arctic region.

These findings provide a limited framework to address recommendations pertaining to how Canada can best safeguard its sovereignty in the Arctic. In terms of multilateral solutions, one has to consider that each country will have its own agenda and perspective based on national interest in the region. Canada's best course of action therefore may not be shared by prospective associates.

Recommendation

Considering the findings above, Canada can best safeguard its sovereignty in the Arctic by using a multidimensional approach. At the tactical level, Canada should continue enhancing its current military capabilities as well as its northern infrastructure as forecasted and planned. At the operational level, Canada should expand the existing NORAD bilateral security agreement with the United States to include a maritime and land security agreement. Finally, at the strategic level, Canada should rely on NATO to limit or contain Russian expansion. This way ahead provides a suitable and effective framework which encompasses "soft" power to increase deterrence. Leveraging those multilateral defense agreements however, will imply second and third order geostrategic effects that may be hard to foresee in the present.

There are pros and cons with expanding the NORAD security agreement with the United States. The expansion would relate to maritime and land security. The bi-national planning group established in 2003 initially provided a framework for a

combined maritime and land security agreement but that framework was not adopted. Instead, both countries agreed to share maritime intelligence as an interim solution.[1] The main issue preventing this way forward is both countries coming to terms over the nature of the Northwest Passage. The benefits of establishing effective maritime control in the Arctic and specifically along the Northwest Passage might compel the United States to at least reach an agreement of sorts over the nature of the Northwest Passage.[2] There would also be issues related to command and control relationships as well as national jurisdiction and sovereignty. US Coast Guard Lieutenant Commander Anthony L. Russell echoes this way ahead from an American perspective. In a fall 2008 article titled "Seizing Strategic Opportunity in the Arctic," he states: "America should work closely with its Canadian allies toward complementary development, basing, and employment of Arctic assets."[3] He also adds that this could be done by expanding the existing framework that NORAD currently provides. Expanding NORAD's role would provide Canada with increased military capabilities in the Arctic for deterrence and response. It would also strengthen bilateral cooperation with the United States. Finally, it would also simplify the decision-making process for an intervention in the Arctic.

There are also pros and cons with relying on NATO as a collective defense agreement to ensure Canadian sovereignty and repel any intrusion or attack in its territory. At the strategic level, NATO provides, by its very nature, a credible political and military deterrent that benefits Canada. However, the issue of unresolved territorial disputes between members of NATO is cause for reflection as is the national interests of each NATO members. From the perspective of other countries, NATO may be the only way to provide strategic parity with Russia in the region and contain future Russian

expansion. Canada should therefore leverage its membership in NATO to complement its means of safeguarding its sovereignty in the Arctic.

This topic requires further study because of the complexity of the Arctic geostrategic environment. This study could have looked at all elements of national power, but it was focused on the military means in order to narrow the scope of the research. Any further study could integrate part or all of the elements of national power applied to the Arctic region. In addition, further research could be done using classified material in order to increase the accuracy and reliability of the analysis of military capabilities for Arctic operations of the different countries. Finally, the issue of expanding the NORAD security agreement or improving security ties with the United States should be looked at much more in depth to determine whether or not it is a sound solution. Similarly, understanding the impending dynamic between NATO and Russia in the Arctic region may provide additional insight to this problem from a Canadian perspective.

Conclusion

This study has defined the current Arctic geostrategic environment and ascertained that there is a potential for conventional conflict in the Arctic as well as possible conventional threats to Canadian sovereignty in the region. Indeed, the effects of climate change and their associated consequences of increased access to natural resources and maritime routes are prompting circumpolar states to invest in their Arctic capabilities. The region is getting more and more attention and this is reflected in the media headlines. An analysis of military capabilities for Arctic operations has established that Canada does not have the required military capabilities to guarantee its

sovereignty in the Arctic when compared with two countries it has unresolved disputes with, the United States, and Russia. Consequently, Canada should employ a multidimensional approach to safeguard its sovereignty in the Arctic. This approach includes enhancing Canada's current military capabilities as planned, expanding NORAD's role to maritime and land security in the Arctic for increased presence and control, as well as leveraging its membership and participation in NATO which provides strategic stability in the region. This multidimensional and multilateral way ahead provides Canada with complementary means and increased deterrence. Because of its relevancy and importance, this topic should be further studied and researched in the coming years as the situation develops.

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