

The Polar Invasion: An Examination of Canadian Policy Perspectives Associated with
Arctic Governance

by

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Table of Contents

List of Tables	iv
List of Figures	v
Abstract	vi
Abbreviations	vii
Acknowledgements	1
Chapter 1. Introduction	2
Chapter 2. Geography of the Arctic	6
2.1 Physical Geography	
2.2 Bathymetry	6
2.3 Ice	8
2.4 Climate and Climate Change	10
Chapter 3. Arctic Activity/Timeline	13
3.1 Current Users	13
3.2 Historical Context	13
3.3 Shipping	17
3.3.1 Vessels Operating in the Arctic	17
3.4 Fisheries	18
3.5 Oil and Gas	23
3.6 Tourism	29
3.7 Defence	32
Chapter 4. Major Players	35
4.1 Governments	35
4.2 Organizations	37
4.2.1 Arctic Council	37
4.2.2 Indigenous Peoples	37
4.2.3 Observer Nations	38
4.3 United Nations	39
4.3.1 International Maritime Organization (IMO)	40
Chapter 5. Legal and Sovereignty: Uncertainty in the Arctic	43
5.1 Definition of Sovereignty	43
5.2 Evolution of Canada's Territorial Claims	42
5.3 Internal Waters, Territorial Seas, Exclusive Economic Zone and High Seas	44
5.4 Terrestrial Claims - Hans Island	46

5.5 Canada / US Beaufort Sea Dispute	47
5.6 Sector Theory	48
5.7 Historic Title	49
5.8 Baselines	51
5.9 International Strait	54
5.10 UNCLOS Article 234	56
5.11 De Jure vs De Facto	57
5.12 Summary Are We Losing The North?	57
Chapter 6. Analysis of Canada's Northern Strategy	61
6.1 Introduction	61
6.2 Methodology	62
6.3 Vision	63
6.4 Exercising Canadian Arctic Sovereignty	64
6.5 What do Canadians Believe?	65
6.6 Failure to Launch	66
6.7 Search and Rescue (SAR)	69
6.8 Salvage and Environmental Response	73
6.9 Security and Surveillance	74
Chapter 7. Final Thoughts	80
Bibliography	86
Appendix 1. Indigineous Arctic People	100
Appendix 2. Chronology of Sovereignty Events	103
Appendix 3. Northern Strategy Committments	104
Appendix 4. Other Levels of Canada	106

List of Tables

Table 1. Description of Canada's maritime zones.	46
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List of Figures

Figure 1. The Northern Canada Vessel Traffic Services (NORDREG) zone (shaded).(Transport Canada,2010).....	8
Figure 2. Observed and Projected Harvests of cod and shrimp (Thousands of tonnes) off Greenland over time with climate change (ACIA, 2004, pg. 62).....	19
Figure 3. Map of the Donut Hole (Bailey, 2011).....	21
Figure 4. Percentage probability of the presence of at least one undiscovered oil and/or gas field with recoverable resources greater than 50 million barrels of oil equivalent (MMBOE) within each shaded area. (Stauffer, 2008).....	24
Figure 5. Tarsiut Island caisson in the Beaufort Sea (Timco & Johnson, 2004).....	25
Figure 6. The Beaufort Sea contains a21,000 km ² triangular area (see map), which is claimed by both Canada and the United States. Possibly containing 1,700,000,000 m ³ of natural gas, and over 1,000,000,000 m ³ of oil, the dispute has gone unresolved (ArcticEcon 2011).....	26
Figure 7. Map of Greenland Leases (Greenland Oil & Minerals, 2011).....	27
Figure 8. The main tourist ship routes used in the past decade (Aisling et al., 2011).....	31
Figure 9. Canada's maritime zones (Fisheries and Oceans Canada, 2010).....	44
Figure 10. Map of Hans Island (Google Earth, 2012).....	47
Figure 11. Map of the Beaufort Sea (Canada, Parliament, 2011).....	48
Figure 12. Straight baselines of Canadian archipelago (Pharand, 2007).....	52

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Abstract

The effects of climate change on Arctic sea ice have created unprecedented international interest in accessing the Northwest Passage as a cost efficient alternative for shipping between the Pacific and Atlantic Oceans. Concurrently, polar nations are hastening to prepare United Nations Convention on the Law of the Sea (UNCLOS) claims to establish the outer limits of their continental shelves. This paper provides a contextual overview of the scientific prediction for sea ice recession, a historical summary of the varied drivers and issues causing increased Arctic activity, and a discussion of pertinent sovereignty and legal issues. This will serve as background information for the author's analysis and conclusions. These issues are evaluated against Canada's historical policy decisions and actions to determine the policy, governance and operational investments that might best position the nation's legal case for sovereignty and governance over the Arctic. In recent years, Canada has articulated its National Arctic Strategy at both the national and international levels. This paper describes how the government has represented Canadian sovereignty policies and evaluates whether or not its position is sufficiently comprehensive and equally enduring to ensure the Canadian public's sovereignty and economic interests are and will continue to be met. The strategic findings suggest policies, which appear to lack clarity of operational deliverables, insufficient coordination of interdepartmental investments and measures at the political level to ensure adequate continuity across successive governments.

ABBREVIATIONS

ACAP - Arctic Contaminants Action Program

ACIA - Arctic Climate Impact Assessment

AIS - Automatic Identification System

AEPS - Arctic Environmental Protection Strategy

AMAP - Arctic Monitoring and Assessment Programme (Arctic Council working group)

AMSA - Arctic Marine Shipping Assessment

AMSP - Arctic Marine Strategic Plan

AMVER - Automated Mutual-Assistance Vessel Rescue System

ATON - Aid to Navigation

AWPPA - Arctic Waters Pollution Prevention Act (Canada)

CAFF - Conservation of Arctic Flora and Fauna

CCG - Canadian Coast Guard

COLREGs - Convention on the International Regulations for Preventing Collisions at Sea, 1972

DEW - Distant Early Warning Site

DWT - deadweight tonnage

EEZ - exclusive economic zone

EPPR - Emergency Prevention, Preparedness and Response (Arctic Council working group)

ECDIS - Electronic Chart Display and Information System

GHG - greenhouse gas

GIS - Geographic Information System

GPS - Global Positioning System

IAATO - International Association of Antarctic Tour Operators

IACS - International Association of Classification Societies

ICJ - International Court of Justice

IHO - International Hydrographic Organization

IMO - International Maritime Organization

INSROP - International Northern Sea Route Programme

IPCC - Intergovernmental Panel on Climate Change

LRIT - Long-range identification and tracking of ships

LME - Large Marine Ecosystem

LNG - liquefied natural gas

LPG - liquefied petroleum gas

M/V - Motor Vessel

MARPOL 73/78 - International Convention for the Prevention of Pollution from Ships, 1973 as Modified by the Protocol of 1978 Relating Thereto

MOU - memorandum of understanding

MSC - Maritime Safety Committee

NSR - Northern Sea Route

NWP - Northwest Passage

PAME - Protection of the Arctic Marine Environment (working group)

SDWG - Sustainable Development Working Group

UNCLOS - United Nations Law of the Sea

UNFCCC - United Nations Framework Convention on Climate Change

VTS - vessel traffic services

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Chapter 1. Introduction

Over the last several decades, the influence of climate change has increasingly created unprecedented access to Arctic waters, and in doing so resurrected international interest in both the Northern Sea Route and the Northwest Passage.

The South Kara Sea (Russia) is estimated to contain almost 39% of undiscovered gas however substantial deposits of gas are also thought to lie on the shelves of Alaska, Canada, and Greenland (Denmark) (Gautier et al., 2009). The Alaska and Greenland deposits lie along potential UNCLOS disputed areas between Canada and United States (Dufresne, 2008) and Canada and Denmark (Potts & Schofield, 2008).

The retreat of the Arctic ice pack is one of several variables that have aroused interest in alternative, cost effective options for shipping between the Pacific and Atlantic oceans, tourism via cruise ships, and multinational companies wishing to exploit the hydrocarbons and minerals found in the Arctic (Arctic Council, 2009).

In all likelihood, the Arctic will endure substantial growth during the upcoming decades such as resource exploration and exploitation that will increase marine activities. A chronological review of northern activities is beneficial in order to further understand the historical and projected impact on Canada's existing position as well as projected future developments, with an emphasis on the Canadian Arctic. Notwithstanding this Canadian focus, this paper will also examine, in lesser detail the other regions of the Arctic such as the Northern Sea Route.

This paper provides a geographical overview to better situate this discussion of the Arctic region and the probable increases in shipping which will drive further rapid environmental, socio-economic, political and institutional changes. The preceding process facilitates the

identification of the major stakeholders at the international, domestic and industry levels and further identifies how they may become drivers of change.

Furthermore Canada must prepare claims establishing the outer limits of their Continental shelves for submission under UNCLOS. These claims are being prepared in anticipation of the discovery of mineral and hydrocarbon resources, with the most prosperous of them expected to be found in the Arctic (Stauffer 2008).

While avoiding becoming embroiled too deep into the operational implementation, the overview will reside at the strategic level in order to allow examination of aspects of Canada's Northern Strategy. This discourse will consider the role of governments, organizations, and industry, both domestically and internationally. The combination of these interim summaries and views from the previous sections provide the essential criteria by which the success or failure of Canada's strategy may be judged.

The author seeks to identify the successes and ongoing challenges in Canada's performance in the implementation of their strategy to date, as well as consider the legal instruments and policies and how they are fundamental to sovereignty and Canadian claims for territories and resources (Government of Canada 2009).

Finally, there will be a strategic overview from the author resulting in a summary of recommendations and conclusions the government may wish to consider.

In recent years the receding ice coverage has impacted the Arctic people and environment, forcing these situations to the forefront of diplomatic agendas of world powers. One of the first concrete examples of the circumpolar nations willingness to cooperate on examining Arctic issues was the signing the 1973 Agreement on the Conservation of Polar Bears between the northern nations of Canada, Denmark, Norway, Russia, and the United States

(Environment Canada, 2011). Recognizing the seriousness of these issues, the Arctic nations met in Finland in 1991 and initiated the Arctic Environmental Protection Strategy (AEPS), founding a non-binding environmental protection agreement among the eight Arctic nations (Canada, Greenland/Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States). These members created six working groups, and were later incorporated into the Arctic Council which was founded in September 19, 1996. These original groups were:

1. Protection of the Arctic Marine Environment (PAME)
2. Emergency Prevention, Preparedness and Response (EPPR)
3. Arctic Monitoring and Assessment Programme (AMAP)
4. Sustainable Development Working Group (SDWG)
5. Conservation of Arctic Flora and Fauna (CAFF)

Some, not all, elements of the indigenous peoples of the Arctic are represented through the Indigenous Peoples Secretariat representing three AEPS Permanent Participants: the SAAMI Council (Nordic and Western Russia), the Inuit Circumpolar Conference (U.S., Canada, Greenland and Russia) and the Association of Indigenous Minorities of the North, Siberia and the Far East of the Russian Federation.

The Arctic Council is a consensus forum to provide a means for cooperation, coordination and interaction among the eight Arctic states and Arctic peoples (native and others) on common environmental and sustainable development issues. The Council subsumed the five AEPS programs. (Arctic Council 2012)

The PAME group perhaps is most topical for this paper as they were tasked in November 2004 with a specific mandate to conduct a comprehensive Arctic marine shipping assessment. This mandate was drawn from the Arctic Marine Strategic Plan (AMSP), with the guidance of

Canada, Finland and the United States as the lead countries. Also, contributions and collaboration were to be supplied by the Emergency Prevention, Preparedness and Response (EPPR) working group and the Permanent Participants as relevant (The Arctic Marine Shipping Assessment {AMSA} 2009 Report). PAME was given the mandate by the Arctic Council to keep under review the adequacy of global and regional legal, policy and other measures, and where necessary to make recommendations for improvements that would support the Arctic Council's Arctic Marine Strategic Plan (2004). The global exposure and ensuing debate of these situations progressed further with the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) at the 1992 Rio, *United Nations Conference on Environment and Development* (United Nations, 1992). These precursors eventually led to the formation of The Arctic Council in 1996, through the instrument of the Declaration on Establishment of The Arctic Council, (The Ottawa Declaration). This created perhaps the most influential and arguably most effective forum for Arctic cooperation (Arctic Council, 1996).

Chapter 2. Geography of the Arctic

2.1 Physical Geography

There are many ways by which one can define borders of Arctic territory. In scientific circles, diverse disciplines cannot agree on a uniform definition for the parameters that can define what constitutes the Arctic region. Depending on one's perspectives and objectives there are various criteria by which to delineate the Polar Regions from the southern territories, including criteria such as isotherm, permafrost, the tree line, and coordinates of the Arctic (Payne, 2012). For the purposes of this paper, Arctic shipping governance falls from regulatory frameworks that are most commonly defined by geographical references (latitude and longitude), which are fixed points as compared to the permafrost line, which as it melts, it moves northwards, resulting in a non-stationary metric. This barren, treeless northern zone is generally classified as tundra, but gradually transforms into a polar desert at higher latitude where the temperature is colder and drier, with glaciers currently covering 5% of land surface. Despite these severe conditions, the tundra regions and polar deserts of the high Arctic contain a surprisingly large number of species. Large mammals such as the polar bear, muskox and arctic fox all manage to survive in the extreme high northern latitudes (French, 2013).

Canada's northern territory represents 40% of total land area of Canada, with a population widely dispersed across Canada's territories. Most of this population live in the territorial capitals or industrial centers, with the remaining population scattered in isolated communities spread across the Arctic. This information is relevant to discussions later in this paper concerning the complexity of delivering government programs from the federal or territorial governments to an isolated population. Also pertinent and vital to the discussion is that fifty-percent of the

population in the three territories claim Aboriginal ancestry according to the 2006 Census of Population (Natural Resources Canada, 2012).

Notwithstanding the validity of the definitions of the Arctic as noted above, the scope of this paper is mostly limited to shipping and how it affects shore based governance. Therefore most discussions will be related to the geographical bathymetrical zone as iterated in Northern Canada Vessel Traffic Services Regulations (NORDREG). The NORDREG Zone covers Canada's coastal northern waters, including the shipping safety control zones under the Arctic Waters Pollution Prevention Act, which extend out to 200 nautical miles offshore, up to the outer limit of Canada's exclusive economic zone as depicted in *Figure 1 (Transport Canada, 2010)*. Since July 1, 2010 the regulations are mandatory and target mostly large vessels and barges as the volume of the fuel oil and other dangerous cargoes pose the greatest risk to the environment. Using powers delegated from the Canada Shipping Act, the Canadian Coast Guard (CCG) has been tasked to operate this system ensuring safe efficient navigation and environmental protection. This new mandatory requirement demands the vessel report information such as their identity, position and destination to the CCG (Transport Canada, 2010). The sovereignty significance of the history, of how and why NORDREG was created and amended over time will be discussed in the legal section of this paper.

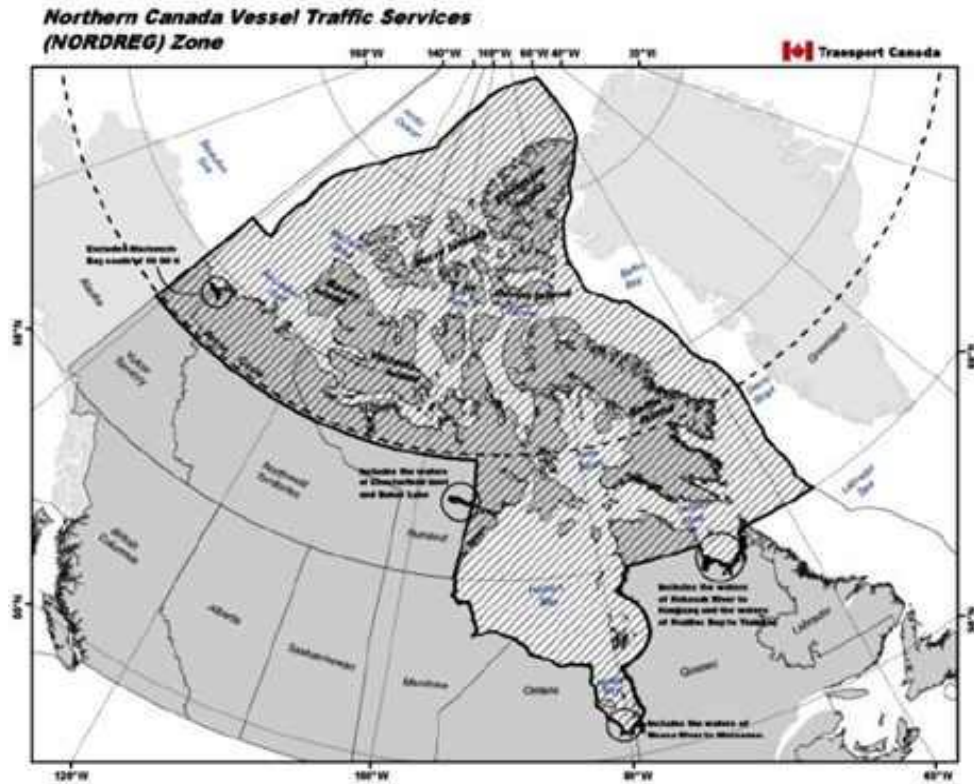


Figure 1. The Northern Canada Vessel Traffic Services (NORDREG) zone (shaded). (Transport Canada, 2010).

2.2 Bathymetry

The Arctic bathymetry in much of the Russian zones consists of a relatively shallow and broad continental shelf, extending north from the Russian Federation and spreading out more than 1,000 kilometers in places. Canada's northern region is comprised of a large archipelago with deeper water however depths are variable amidst the islands, especially as the continental landmasses and islands are approached. The North American shelf area extends 100 to 200 kilometers from the United States and Canada, with average depths ranging from 100 to 200 metres. At the continental slopes, the break between the shelf and the deep ocean basin, depths are between 300 and 500 metres (Arctic Council, 2009).

One hazard challenging Arctic shipping is the seabed mounds called pingos, of which there are over 300 that have been mapped on the Canadian Beaufort Shelf. As these seabed features are similar to the 1400 pingos mapped on the adjacent Tuktoyaktuk Peninsula, their occurrence underwater makes them a hazard to navigation for deep draft vessels. There are two contributing factors that make them more unpredictable, they are essentially found at random, and their occurrence, unlike most geomorphological formations are often larger or even elongated in shape, in comparison to their terrestrial counterparts. Also it is not unreasonable to believe that similar numbers to those found on land will likely be found on the seafloor once it has been thoroughly charted (Blasco, et al., 2006).

2.3 Ice

The sea ice plays a crucial role in the arctic for human and wildlife existence, both through its presence and absence, as it greatly affects the Arctic climate regulating temperatures of land and sea alike. The two main forms of sea ice are seasonal or first-year ice and perennial or multiyear ice. Seasonal ice forms during winter and melts during the next summer and any first-year ice surviving the summer becomes multi-year ice. This ice loses its salt content over a number of years, rendering it almost salt free and much thicker than first-year ice. Sea ice freezes as a solid sheet of land-fast ice along the Arctic coasts in bays and small islands and beyond the fast-ice is the drifting polar pack ice.

Sea-ice extent in the Arctic follows a seasonal cycle that has significant inter-annual variability both in the maximum and minimum coverage. Nevertheless in the past several decades there has been an observed trend towards more prolonged summer ice free periods. This manifestation has generated greater interest in shipping the Arctic; however it has detrimental effects on wildlife and the Inuit peoples. This loss of the shore fast and sea ice that usually

protects unstable coastlines from erosion and flooding will render the areas vulnerable destroying valuable habitat for a life and humans alike (ACIA, 2005).

Polynyas are persistent and recurrent regions of open water and/or thin ice or reduced ice concentration, to tens of thousands of square kilometers in areal extent, that occur within the sea ice zones of both hemispheres at locations, where a more consolidated and thicker ice cover would be expected. Rather than simply constituting recurrent “windows” in the sea ice, polynyas are profoundly affected by, and intimately linked to, local and even regional ice conditions (i.e., the “icescape”). They provide ecologically important Arctic “oases” that enable birds and mammals to overwinter at high latitudes and encourage enhanced primary production in the spring (Barber & Massom, 2007). Although there is some variability in ice extent from year to year, the annual cycle of melting and freezing continues, the overall downward trend in the September sea ice extent, recorded by the US National Snow and Ice Data Center (NSIDC) since 1979, is strong and unambiguous (NSIDC, 2013).

2.4 Climate and Climate Change

In 2004 the Arctic Climate Impact Assessment (ACIA) report was released, a jointly sponsored report of the inter-governmental Arctic Council and the non-governmental organization, the International Arctic Science Committee (IASC). The report provided a comprehensive compilation and analysis of the state of knowledge at that point in time concerning the effects and potential consequences of climate change on the Arctic. The ACIA-2004 study garnered global attention with its revelation of the rapid and severe climate change ongoing in the Arctic. The key findings of the Arctic Climate Impact Assessment were:

- Arctic climate is now warming rapidly and much larger changes are projected
- Reduced sea ice is very likely to increase marine transport and access to resources

- Many coastal communities and facilities face increasing exposure to storms
- Indigenous communities are facing major economic and cultural impacts
- Thawing ground will disrupt transportation, buildings, and other infrastructure
- Arctic warming and its consequences have worldwide implications
- Arctic vegetation zones are very likely to shift, causing wide-ranging impacts
- Animal species, diversity, ranges and distribution will change
- Elevated ultraviolet radiation levels will affect people, plants and animals
- Multiple influences interact to cause impacts to people and ecosystems

The Intergovernmental Panel on Climate Change (IPCC) in their 2007 report *Climate Change 2007 - The Physical Science Basis*, have described their document as "the standard reference for all concerned with climate change in academia, government and industry worldwide," (IPCC, 2007, p. 1) and in that report they asserted that the Arctic sea ice will decrease in both coverage and thickness with most models showing the greatest warming periods being the autumn and early winter. In one more recent paper there seems to be a downward trend in the September Arctic sea ice extent from 1953–2006 that is larger than any of the IPCC AR4 simulations and would indicate current summer minima are approximately 30 years ahead of the ensemble, mean model forecast (Stroeve et al., 2007).

To illustrate the level of interest that this subject evokes in the public, a simple web search of the words "Climate Change" today on one internet browser resulted in 123,000,000 hits in 10 seconds. This demonstrates that over the past several decades, the world at large has become more aware of climate change as an issue that will have consequences on their lives

despite a large proportion of the hits not be meaningful or precise in this academic effort. It is however significant in that in this global commons of the rank and file of the world that the alarm has been rung and it can have an effect on policy makers and academics pursuits.

Unfortunately, the issue has been portrayed by some sectors of academia, the media and political arenas as simply a theory, and not as an observable phenomenon caused by mankind. In a recent letter published in *Science* and endorsed by over 250 scientists drawn from credible, prominent academic and government institutions, they strongly reasserted that the evidence supported anthropogenic causes for climate change (Gleick et al., 2010). The purpose of their letter was to respond to public assaults on climate scientists and their climate science, by climate change deniers who they allege are driven by special interest groups. They stated that the IPCC and other scientific assessments of climate change, involving thousands of scientists producing massive and comprehensive reports that contained some errors that were subsequently noted during academic peer review and corrected or redressed. Therefore, this evidence provides the most definitive and credible data supporting global warming theory that has originated from the assessments carried out by the three Working Groups of the IPCC in their Fourth Assessment Report (AR4). In it they have stated that: “warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level. It provides an integrated view of climate change as the final part of the IPCC’s Fourth Assessment Report (AR4).

Chapter 3. Arctic Activity/Timeline

3.1 Current Users

About 4 million people live in the Arctic, half of which are in the Russian Federation and about 1.3 million in the Nordic Countries, 130,000 in Canada and 650,000 in the US (Young & Einarsson, 2004). The eight Arctic countries are Canada, Denmark with the Faroe Islands and Greenland, Iceland, Norway, Finland, Sweden, the Russian Federation and the United States. Arctic communities and Indigenous people in particular rely on marine ecosystems for an important part of their livelihood and wellbeing. In the Arctic Council, six indigenous organizations are recognized as parties to the Arctic Council.

International Arctic stakeholders may subject users to domestic marine regulations within their respective EEZ's, however they hold no sway over outside nations such as China who can and will access the High Seas Zones of the Arctic Ocean. The non-polar nations will undoubtedly bring their positions forward when domestic regulations are contrary to their economic interests. The Canadian and Russian stance concerning the Northwest and the Northeast passages being International Straits will clearly be of foremost concern (PAME, 2013).

This section gives a sector-by-sector analysis of existing and prospective Arctic marine uses and users, and provides an initial assessment of the wider, contextual factors that will influence future developments in each sector.

3.2 Historical Context

The history of Arctic shipping literally spans centuries and for the purposes of this paper this timeline is been divided up into three somewhat arbitrary time periods, referred to as the *First, Second and Third Waves of Arctic Invasions*. What follows is a very brief history with a

few examples of the type of activities which transpired to write the history of shipping in the Arctic with the goal of providing somewhat of a contextual framework.

The First Wave of Europeans arrived in the Arctic in wooden ships with hopes of discovering a shorter route to the Orient with the purpose of accessing commodities. This, in turn, initiated their focus on the northerly routes over Europe, North America and Asia rather than around the southern continents. It was beyond their capability to successfully transit due to the ice when they attempted as seasonal ice growth, unpredictable movement of ice and the short window of opportunity greatly limits access for travel through the Arctic. Some of those European adventurers perished in the Arctic during their pursuits (Northern Research Portal, 2006).

In 1845, a well known expedition under command of Sir John Franklin, an experienced Arctic explorer, set out on his third sortie in search of the "Northwest Passage" with two vessels, outfitted with ample provisions and a compliment of 128 crew and well-trained officers. Unfortunately all evidence of the crew was lost with the exception of three deceased crew members who had been buried in the permafrost near Beechey Island during the winter of 1845–1846 (Warren et al., 1998). It has recently been determined, based on modern analysis of their recovered frozen and perfectly preserved bodies that all three suffered from severe lead poisoning. It is theorized that because lead containers were used to store water and food, that perhaps the entire crew became deranged and disoriented and vanished into the icy wasteland during the subsequent months (Warren et al., 1998).

The opening of the Suez in 1869 and later the Panama Canal in 1914 had dramatic impacts on global trade routes, shortening transit distances considerably and therefore ending the search for an effective shorter route through the harsh climates and waters the Canadian and

Russian northern waters (Rodrigue, 2013). This development effectively closed the first wave of Arctic shipping activity with the exception of some government vessels and fishing vessels in later years supplying or exploring the region.

The Second Wave of activity in the Arctic began in earnest following World War II, with activities linked with the development of the Cold War. During this period of distrust and hostility associated with the nuclear arms race and the risk of incoming attacks over the polar region, the governments of Canada and the United States entered into a bilateral agreement to establish and operate early detection radar sites. These listening posts known as Distant Early Warning (DEW) sites were comprised of a large series of continental defence radars. These sites stretched from Alaska to Greenland and were monitored by Canadians and Americans both on location and from NORAD in Colorado. The sites followed the 69th parallel about 200 miles north of the Arctic Circle. The purpose of the DEW Line was to provide the United States and Canada with the earliest possible warning of the approach of airborne objects over the polar region, to allow for time to mount an effective defence.

What is most pertinent to the development of these DEW Line sites in the Canadian Arctic was the massive construction project, which was on a very short timeline that demanded a large labor force of some 25,000 people. In addition there were major military and commercial airlifts estimated at over 460,000 tons of equipment, a large portion which was delivered by sea. Due to the limited ice free season in the Arctic the demands and rigors of this huge project helped push the demand for more ice-capable vessels in order to extend the season. During that second wave, the ever-growing capabilities of ships evolved through the presence of technology, the design and construction of ships hulls and increased horsepower enabling operation in this harsh environment. One can only assume that this incursion into the indigenous people's territory

could only have had radical effects on their lifestyle and traditional ways (Lackenbauer et al., 2005).

Oil and gas development in the Canadian Arctic dates back as far as 1919 when Imperial Oil discovered oil at Norman Wells and continued into the 1950s. By 1968, the exploration activity had increased and within a few years several major gas fields were discovered hence intensifying exploration and investment offshore. The rate of development was slowed during 1978 - 1984 by the negotiation of the Inuvialuit Final Agreement between the federal and territorial governments.

The Third Wave was now clear to proceed with the commencement of Beaufort Sea oil boom. Prior to the impediments to industry posed by negotiations for the land agreements, in the early 1970's the learning process associated with working in Arctic ice with drill ships had already commenced with a total of 142 Canadian Arctic offshore wells drilled, 92 being in the Beaufort Sea area. It was during this period that many of the challenges associated with operating in extreme environments with ice, production was often interrupted, and ships were forced off station by the ice. Concurrently, industry attempted to compensate for the Arctic conditions with strategies such as constructing the first man-made offshore artificial island and later a Caisson-Retained Island (CRI). The latter structure had an octagonal-shape with the central core filled with sand. It was formed by 8 individual caissons held together with two pre-stressed bands of steel wire cable. It was the innovation of the oil companies that helped drive forward construction of ice-reinforced drill ships and standby icebreakers (Aboriginal Affairs and Northern Development Canada, 2012).

3.3 Shipping

Currently the shipping world has begun the acceleration of the third wave of Arctic exploration and exploitation, now possible by the loss of sea ice due to climate change. We now see the Arctic is becoming a new frontier for adventure tourism and the transport of natural resources out of their Arctic source to the markets of the world. Though not a comprehensive list, the Arctic fleets are generally composed of government vessels, transport ships, industry services vessels, and fishing boats.

According to the Arctic Marine Shipping Assessment Report (AMSA) of 2009, there were approximately 3,000 vessels in the Arctic in 2004. Of these, some 1,600 were fishing vessels that reported their activity and did not venture far into the Arctic Ocean. The remaining 1,400 trips include short haul trips to various ports for resupply and resource extraction. Although useful as a general high level view, when interpreting data that has been gathered by a multitude of different nations; languages; technical systems; data fields and categorizations, it is prudent to recognize that regional variances may be dramatic. Additionally, there can be a great deal of inter-annual variability between years and between vessel activity types (Ellis & Brigham, 2009).

3.3.1 Vessels Operating in the Arctic

Since AMSA, the cruise ship industry has continued to operate large and medium-sized ships, some ice-capable, along Greenland's west coast during a 2-3 month summer season, and along its east coast and around Svalbard in fewer numbers. Both marine areas have limited or nonexistent marine infrastructure. However, as of July 2012, the Norwegian Pilotage Act and regulations were made applicable to Svalbard, thus introducing state pilotage service, compulsory pilotage and pilot exemption certificates on Svalbard.

During the summer of 2010, two cruise ships sailed the length of the Northwest Passage (NWP), and another in each of the 2011 and 2012 shipping seasons. During the summer 2012, *The World*, a 196.3 metre condominium ship, became the largest tourist ship to transit the NWP. The NWP has also experienced a notable increase in adventurers and small yacht voyages in 2010 (Arctic SAR, 2011), 2011 (IMO, 2010), and 2012 (IMO status, 2012). These small vessel voyages along the NWP present a new set of challenges for the maritime authorities in the remote Canadian Arctic such as ice-breaking support. To put these numbers in perspective, as of the 2012 navigation season, there have been only 183 full voyages of the NWP since Roald Amundsen's voyages aboard *Gjøa* from 1903-1906 (Headland, 2012). However, development of a trans-Arctic route through the NWP does not appear likely in the near future.

In the near term, destinational voyages related to natural resource development in the Canadian Arctic are likely to increase. For example, the Mary River Mine is being developed based on the use of a shuttle system of icebreaking iron ore carriers from Baffin Island to European ports. Recognizing that global supply and demand patterns are the dominant driver, other major mineral development prospects in Canada, Greenland and other Arctic locations may be more likely to proceed if comparable shipping services are feasible.

3.4 Fisheries

Of the five major oceanic regions (Pacific Ocean, Atlantic Ocean, Indian Ocean, Southern Ocean, and Arctic Ocean), the Arctic Ocean is the smallest (covers 2.8% of the Earth's total surface area) and shallowest (average depth 1050 metres/3,450 feet) (Pidwirny, 2006). It is also one of the most unspoiled and largely unexploited marine regions of our planet covered by oceans. The international portion of the Arctic Ocean, after being permanently frozen for at least 800,000 years, has experienced 40% open water during the past five summers. It is highly

probable fishing efforts in these areas will be pursued in the very near future and lacking clear international governance the ecosystems will not be effectively protected (Taylor, 2012).

Until recent years, the fishing sector represented a substantial share of the Arctic's maritime economy. It still consists of both small-scale and large-scale boats/ships; the main species found in the Arctic are cod, haddock, black halibut, and herring. These catches serve a variety of uses, such as human food, fish oil, and fishmeal. Although the indigenous people have kept the small-scale coastal fishing intact over many decades, their activity is decreasing (Aisling et al., 2011). The effect of climate change and ocean warming on fish stocks such as cod and herring, has resulted in these species migrating northward (Arctic Transform, 2009). The opposite of this is that some other species such as northern shrimp may be negatively affected. Species whose principal habitat was in sub-Arctic waters might also move north, further complicating the situation. Non-Arctic countries will send their industrial fishing vessels to explore the area to assert their rights in this region (ACIA, 2004).

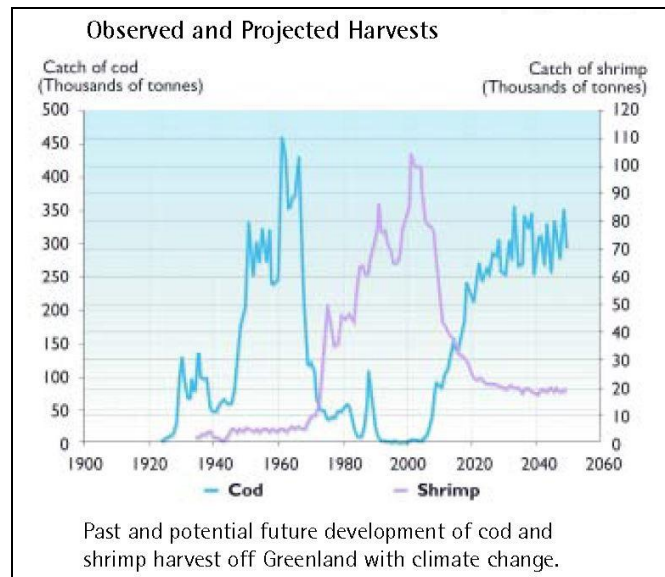


Figure 2. Observed and Projected Harvests of cod and shrimp (Thousands of tonnes) off Greenland over time with climate change (ACIA, 2004, pg. 62).

Canadian science and regulatory officials, perhaps more than any Arctic nation, have already experienced how inadequately regulated fishing along their EEZ has devastated domestic fish stocks. The best example of inadequately regulated fishing in Canadian history is the collapse of the North Atlantic cod fishery off Newfoundland during the mid-1990s. Although the Northwest Atlantic Fisheries Organization's (NAFO) report from 2010 indicates the cod numbers grew 69% since 2007, it still remained at just 10% of its 1960s population. It is unlikely a full stock recovery will occur in the foreseeable future.

If commercial fishing commences in the Arctic, Canada is not in a position to exploit this new global commons because it does not have a large foreign-going fishing fleet. It is probable that non-Arctic nations will send their industrial fishing vessels to exploit any high seas stocks. Due to the proximity of the Arctic fishing zones, Canada will be forced to deal with the impacts on straddling stocks within the Canadian EEZ. Any depletion of one fish species could create a domino effect within the ecosystems of Canadian waters (Taylor, 2012). To date there is no international regime specific to the Arctic high seas zone that can ensure that commercial fishing could be done in a sustainable manner. In April 2012, two thousand international scientists signed an open letter calling on the leaders of the five Arctic coastal countries – Canada, the United States, Russia, Norway and Greenland (Denmark) – to prevent the start of commercial fishing in international Arctic waters until scientific research can be conducted and management measures are in place (NOAA, 2013 as cited in Østreng et al., 2013).

The history of the Alaskan Pollock fishery is an example that helped drive the requirement for international governance to deal with migratory straddling stocks in an area between Russia and the United States known as the *Donut Hole*. In the 1950s the overall catch of Pollock in the North Pacific was a modest 300,000 tons but by the late 1980s the totals had

risen to 6.7 million tons with 25% to 30% of the landings coming from the Donut Hole (FAO, 1994). Finally in 1992 the above-mentioned nations agreed upon a Donut Hole harvest moratorium, this occurred arguably well after the damage had been done and the stock fully plundered (FAO, 1994; Munroe, 2000).

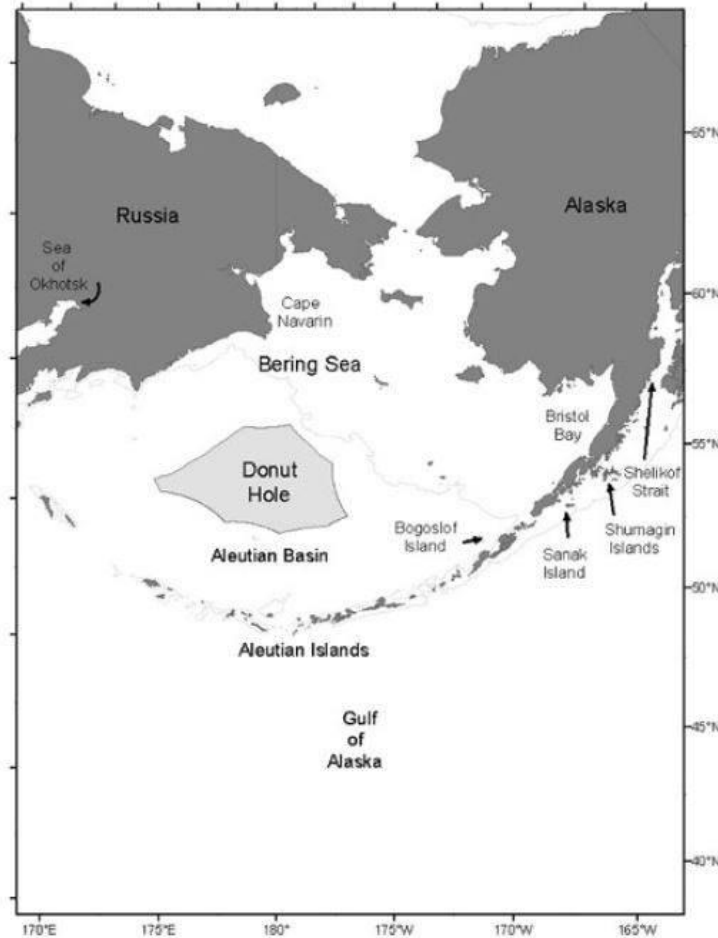


Figure 3. Map of the Donut Hole (Bailey, 2011).

The collapse of the Newfoundland cod and the pollock fishery in the Donut Hole played a role in illustrating the requirement for fishing nations of the world to seek the United Nations support in resolving these problems. On December 4, 1996 the United Nations Agreement on

Straddling Fish Stocks and Highly Migratory Fish Stocks was signed and subsequently came into force December 11, 2001 (United Nations, 2013).

This is a complex multi-faceted issue but in précis the UNCLOS protocols for EEZ's are well established. UNCLOS defers the management of high seas stocks to Regional Fishery Management Organizations respecting conservation of stocks. Though there are no pan-Arctic management agreements, there already are bodies in existence such as the Northwest Atlantic Fisheries Organization (NAFO) that could be able to fulfill requirements under Articles 63-64 and 118-119 of the UNCLOS. Ideally this will be done in collaboration with other circumpolar parties ensuring that interpretation of these articles remain consistent.

Although the Arctic Council does not have a regulatory authority unto themselves they have proven very effective at raising issues upward to the highest level of politics, now including observers and industry. This is perhaps a good opportunity for Canada as Chair of the Arctic Council to promote Canadian interests and further empower this unique association of nations, industry and Non-Government Organizations (NGO's).

In summary, it seems prudent that the circumpolar states should give serious consideration to the following initiatives:

- pool existing information on Arctic marine ecosystems, on living marine resources in the Arctic and on existing Arctic fisheries;
- coordinate cooperative Arctic research programs to improve understanding of these ecosystems perhaps through the University of the Arctic;
- prepare for the conservation and management of new or expanding fisheries and create integrated fisheries conservation and management regimes with other circumpolar states and the indigenous community and;

- follow the Canadian and American example to study the Arctic ecosystem before rushing in with fishing and other exploitation efforts, lest there be a collapse of the magnitude of the North Atlantic cod fishery (Arctic Transform, 2009).

3.5 Oil and Gas

As authorities discussed in section "3.2 Historical Context", there has been significant development in the oil exploration and exploitation in the Arctic; in the Canadian context it has been limited to the Beaufort Sea. Until recently, Denmark began granting licences for exploratory drilling in Davis Strait which indirectly impacts Canada with increased traffic along boundary waters and the risk of Search and Rescue (SAR) and oil spill incidents. Currently there rests substantial petrochemicals available for extraction under the Arctic icepack sought based on the authoritative data found in the 2008, US Geological Survey (USGS) analysis. In that study they estimated that the seabed contains about:

- 13% of the world's remaining undiscovered oil deposits;
- 30% of the undiscovered natural gas and;
- 20% of the undiscovered liquid natural gas.

The same study also estimated that approximately 84% of the estimated resources lie offshore where exploration and extraction is more costly and perilous due to both the water and ice. The chart below estimates the percentage probability of the presence of at least one undiscovered oil and/or gas field with recoverable resources greater than 50 million barrels of oil equivalent (MMBOE) within each shaded area.

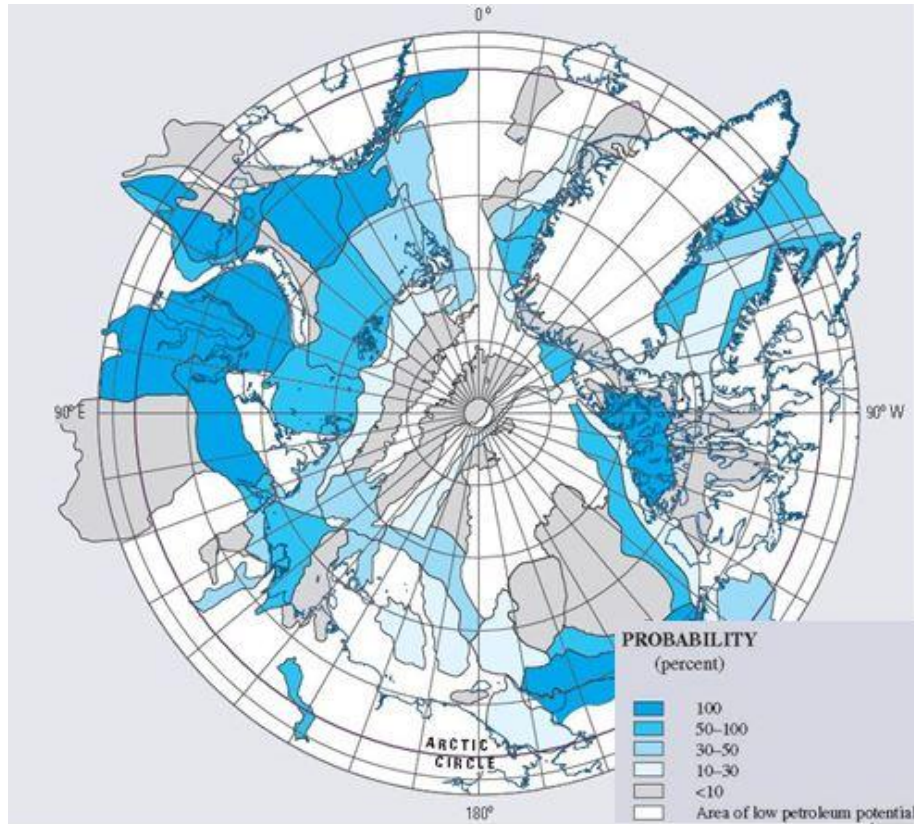


Figure 4. Percentage probability of the presence of at least one undiscovered oil and/or gas field with recoverable resources greater than 50 million barrels of oil equivalent (MMBOE) within each shaded area. (Stauffer, 2008).

The same study asserted that the majority of the known Arctic oil and gas is located on Continental shelves that are already within uncontested EEZs. The minority however will undoubtedly be affected by the UNCLOS submissions for the prolongation of continental shelves. Given that the current estimates of Arctic oil and gas have been placed at US \$11.93 billion, one can see the motivation of the nations seeking larger zones, as it will give them the ability to lease sites and gain tax revenue from companies seeking to extract oil and gas (Aisling et al., 2011).

The challenges caused by the harsh environment encountered during oil exploration and exploitation operations in the Arctic, are quite possibly the most difficult in the world. Here one must deal with bitterly cold temperatures, high winds and intense sea conditions. Adding further

difficulty to working in this environment industry must cope with the relentless pressure that the ice pack exerts against their platforms. This has necessitated companies developing innovative means to allow for their structures to operate year-round in this environment which naturally leads to higher operating costs. In the Canadian context oil companies in the Beaufort Sea area have created new designs including but not limited to artificial islands and concrete caissons. One such example occurred in 1981 when Gulf Canada Resources developed a concrete caisson system which consisted of four concrete caissons that were constructed off-site and were ballasted down with sand when on site and in position. There were two limiting factors associated with this design, the first being that once established in place it is cost prohibitive to consider changing locations and that over time these units experience wave action which undermines their footings (Timco & Johnson, 2004).

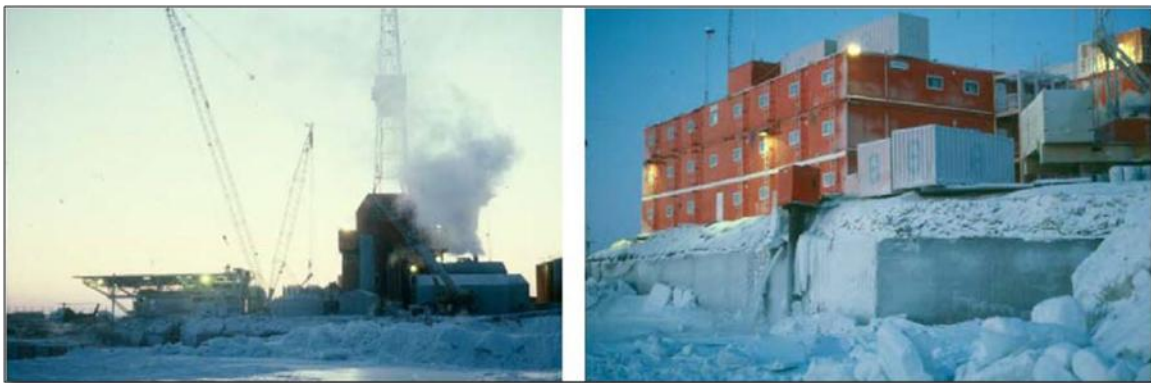


Figure 5. Tarsiut Island caisson in the Beaufort Sea (Timco & Johnson, 2004).

In Canada, there has been renewed interest in the Arctic wells previously abandoned as unprofitable at the end of the 1980s. Several 9-year exploration leases were awarded between 2007 and 2010, subject to investment commitments of some \$1.8 billion. These projects have been on hold since May 2010 pending a review of offshore drilling (See Appendix 3).

The United States has commenced issuing exploratory licenses for the Beaufort Sea in the offshore environment, in addition to the oil production that is currently ongoing on the North Slope of Alaska. In 2008, five corporations have won exploration leases for the Beaufort and Chukchi Seas, paying out a total of \$2.66 billion. There has been however a moratorium on offshore drilling in Canada and the United States that has largely held exploration largely in check. In 2011, a report commissioned by Shell estimated “commercial production of Arctic Alaska offshore oil and gas resources would generate government revenue estimated at \$97 billion (in 2010 dollars) in the Beaufort Sea and \$96 billion in the Chukchi Sea over 50 years” (Snow, 2011). The combination of substantial increases in petroleum prices in the late 90s and the ice-pack receding there may well be a second boom in the Arctic which will drive increases in shipping.

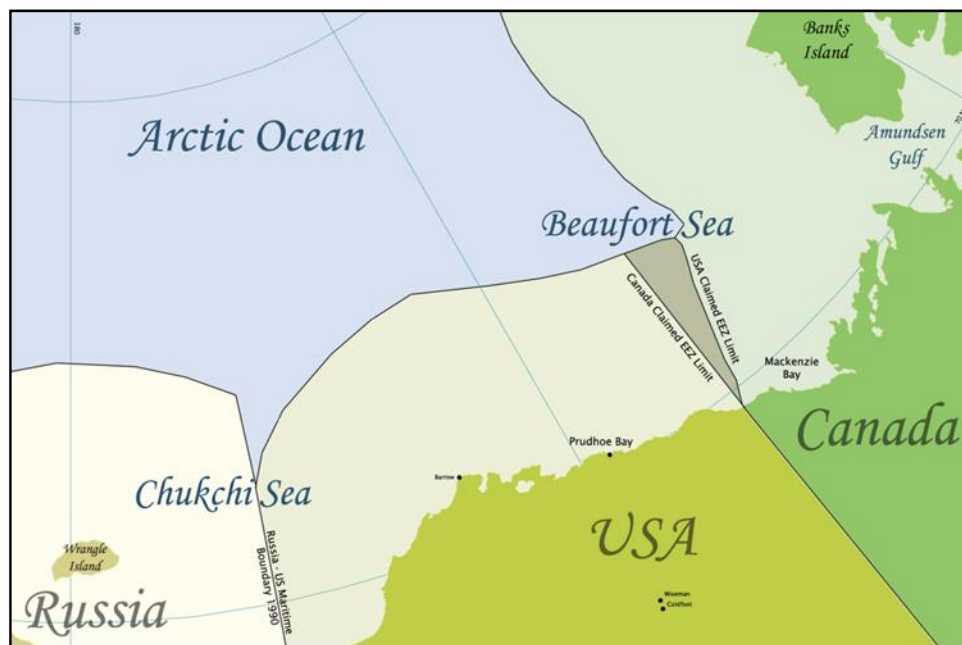


Figure 6. The Beaufort Sea contains a 21,000 km² triangular area (see map), which is claimed by both Canada and the United States. Possibly containing 1,700,000,000 m³ of natural gas, and over 1,000,000,000 m³ of oil, the dispute has gone unresolved (ArcticEcon 2011).

Similarly in recent years, Greenland has experienced an unprecedented international interest in the hydrocarbon potential in the Greenland offshore areas. By the end of 2012, the total number of licences was 20 which covered waters of a total of 202,175 km². NUNAOIL expects the number of licences to increase over the next few years as new licensing rounds for the Greenland Self-Government authorities award of licences will follow in 2013 and 2014 in the Greenland Sea off North-East Greenland. NUNAOIL is a partner in all 20 licences and participates as a carried (non-paying) partner in the exploration phase with an ownership interest ranging from 8 to 12.5%.

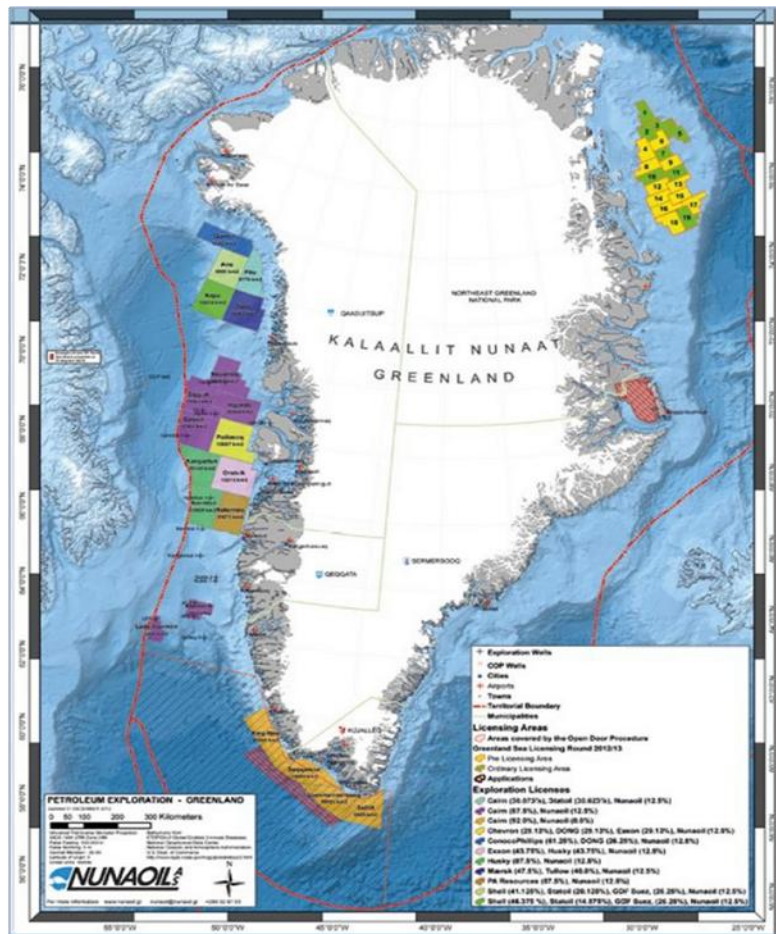


Figure 7. Map of Greenland Leases (Greenland Oil & Minerals, 2011).

It seems evident that Greenland and the Beaufort Sea will be both commencing with the next phase of development and no one knows with any certainty what lies under the Arctic ice pack north of Canada and Russia. In fact efforts have already begun in Davis Strait on the Danish side along with the inevitable protests from environmentalist organizations such as Greenpeace. In spring of 2011 Greenpeace activists attached themselves to one of Cairn Oils drill-rigs the Leiv Eiriksson operating in the region to draw media attention to the risk of a major spill in the region (Nunatsiaq News Online 2011).

One thing for certain, based upon past behavior, it seems inevitable that mankind's thirst for oil will drive mankind to any length to find it. Today, the offshore is limited due to technical problems, however incrementally these are being overcome with innovations such as caisson development to deal with ice pack and improvements in technology for finding oil such as 3-D seismic data. Taking well exploration to the next step of exploitation would likely demand the development of safe and secure techniques to store product on-site and its periodic transfer to shore facilities. Due to the scarcity of population centers in the Arctic there is virtually no common infrastructure for industry such as deepwater ports, airports, reliable roads and support for human needs.

Should all of these challenges be overcome, a very onerous risk that has yet to be resolved is development of suitable legislative and governance regimes, associated with this northern industry. An oil spill of the magnitude of the Exxon Valdez occurring in ice at these temperatures would inevitably result in devastating effects on Arctic shorelines habitats, seabirds, fish stocks, and marine mammals. Perhaps the most at risk beyond the wildlife and habitats are the indigenous people who depend on them so. A combination of climate change impact coupled with proponents of Arctic developments such as the Mary River iron ore

Development have placed the Inuit into a Hobbsian dilemma. They are facing habitat loss threatening their tradition self sufficiency so therefore are left with the only option being to get on board with developments for jobs to support themselves (NIRB 2007). Therefore it is wise to closely monitor these expanding industries, maintaining stewardship both from government as well as industry for the safety and protection of both the people and the environment.

3.6 Tourism

The pursuit of recreational adventures dates back as far as the early 1800's, the initial tourists to the Arctic consisted of anglers, fishermen, hunters, mountaineers and explorers. Passing decades saw an increase in awareness of Arctic's attractions such as fisheries, exotic species, and remote areas. These activities were evidenced in the 1800's by the publishing of many articles, journals as well as guidebooks focusing on the recreational potential available in the Arctic. (Conway, 1897; Williams, 1859; Suydam, 1899; Lainige, 1807; Scidmore, 1885, 1896 as cited UNEP 2007).

Arctic tourism was increasingly promoted by their government, communities and businesses which in turn alerted the cruise ship industry, and as such it has developed into a diversified and established industry with a steady growth since 1984 (Stewart et al., 2007). In 2003, the tourism businesses formed the Association of Arctic Expedition Cruise Operators (AECO) with the goal of defining their own code of conduct that will be profitable yet also sustainable in the long term. Arctic marine tourism is mostly confined to coastal trips, particularly along the Norwegian, Svalbard, and west Greenland coasts. Other popular routes are direct to the North Pole from Norway and Russia, and through Canada's Northwest Passage. In the years from 2003 to 2007 the number of cruise ship arrivals at Greenland ports rose from 164 to 375 (Greenland Tourism and Business Council, 2007).

In 2009, the Arctic Marine Shipping Assessment (AMSA) was released and amongst the report findings was the remarkable growth in Arctic cruise ship traffic. In 2004 there were more than 1.2 million passengers aboard Arctic destination cruise ships but by 2007 that number had more than doubled (Arctic Council, 2009). The majority of cruise ships observed recently in Arctic waters are not purpose-built for Arctic operations. Many are built for voyaging in open water, lower latitudes, and warmer climates (Lawson, 2010). However in 2006 at least one scheduled cruise liner (the MS Bremen) successfully navigated the Northwest Passage (Aisling et al., 2011).

Given the vulnerability and inexperience of the indigenous community, it is possible that the vast number of tourists may prove to be unsettling, due to the visitors worldly, dominant presence. Although their tourism season is quite brief some indigenous peoples have embraced the attraction of tourism and the accompanying benefits during the active season. This leaves the winter months profitless and indigenous peoples with only traditional subsistence living that is becoming untenable due to the deteriorating effects of climate change the natural habitat. In summary the world they were born into is changing leaving them vulnerable (Horejsova & Paris, n.d.). Therefore, ideally the needs of the indigenous and their tourist clients shall be given equal consideration when determining the impacts that tourism may have on each community. In fact, to avoid the development of speculative suspicions, the host community must be part of all discussions, with all final decisions made by the host community itself. The primary goals are to:

- protect the natural environment,
- create profits and
- encourage the tourists to shop at local businesses for food and lodging, and the provision of guides.

These actions are supportive of dispersing financial benefits across all stakeholders (Norwegian Maritime Directorate, 2000).

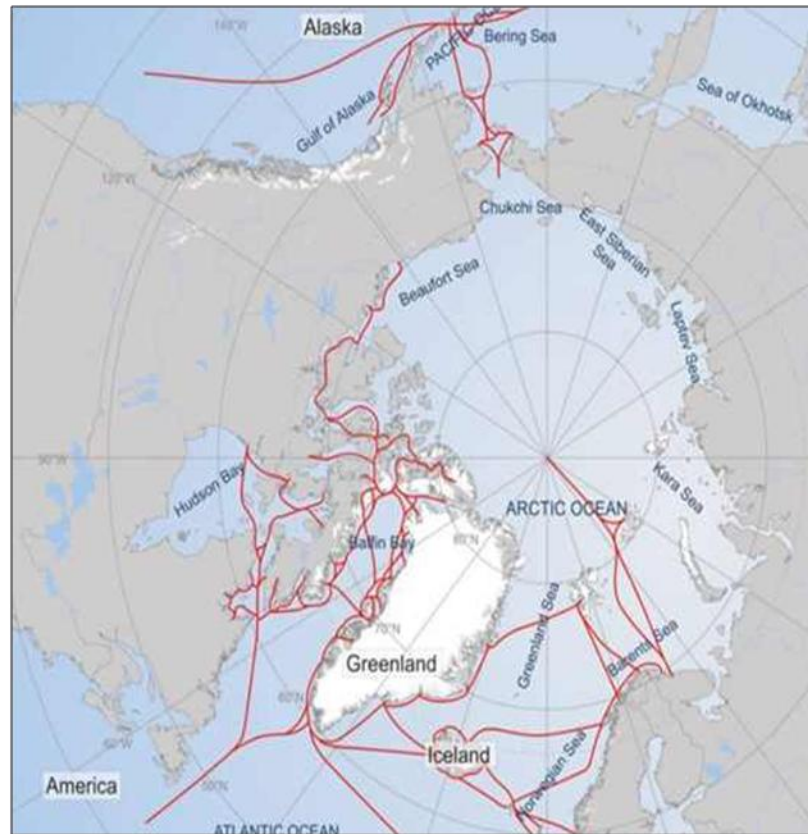


Figure 8. The main tourist ship routes used in the past decade (Aisling et al., 2011).

The common misconception in the South that open water through most of the cruising seasons results in no ice and less hazards is far from accurate. The reality is that there is still the risk of ice damage from growlers and bergy bits and the sparse hydrographic data increases risks of striking uncharted underwater hazards. There are also high-risk tourism adventures conducted by more daring visitors during the remaining months (fall, winter, and spring) that can result in more frequent and difficult SAR operations. One example which happened in June 2013, required Canadian SAR agencies to expend ~\$2,748,046.00 to rescue wealthy tourists and a hunting party from a drifting Arctic ice floe which had separated from the mainland. The

National Post reported that the tour director stated there never was an emergency and that his tour clients who paid in the order of \$10,000 were having dinner served to them and listening to presentations while the military was mobilizing for their rescue (National Post, 2013).

Collectively, Canada, Denmark (Greenland), Finland, Iceland, Norway, Russia, Norway, Sweden and the United States maintained an interest in the operational parameters surrounding tourism by participating in the enactment and enforcement of laws and regulations, which govern marine operations and pollution.

3.7 Defence

Prior to the onset of the Cold War there was very little interest or activity in the Canadian Arctic region. During the years leading up to and during World War II the primary domestic activity in the Canadian Arctic was identifying landing fields for aircraft going to Alaska or transiting across the continent. Perhaps the best illustration of this dismissal of any threat by the military and political leadership is illustrated by the 1938 quote from then Prime Minister, Mackenzie King declared, “May I point out that undoubtedly Canada is the most secure of all countries.” He dismissed “the launching of fantastic expeditions across half the world [by belligerents intending to attack Canada]” and stated that “at present danger of attack upon Canada is minor in degree and second-hand in origin. It is against chance shots that we need immediately to defend ourselves”(Horn, 2011). In 1942 the US military began construction of the Alaska Highway as a vital supply link for fortifying US troops in Alaska from a feared Japanese invasion. The Canol Road, was created to supply road access and build an oil pipeline from Norman Wells in Northwest Territories to the Alaskan Highway also supporting the war effort (Greenwood 1992).

Following WWII the establishment of the Distant Early Warning Line (DEW) sites in the 1950's as described in section 3.2 Historical Context, signalled the start of the militarization of the Canadian Arctic, ironically paid for, constructed and staffed by Americans perhaps weakening Canadian sovereignty. The trigger that was pulled in 1945 that began the Cold War for Canada was the defection of the major Soviet spy Igor Gouzenko who made it readily apparent that their former World War II allies in Moscow were actively spying both during and after the war. Given that Canada was located strategically between the two superpowers geographically they soon found themselves living under the potential flight path for bombers and missiles from the Soviet Union. United States their largest trading partner and long term ally, cemented their need to cooperate with US. The relationship was further reinforced in 1957-1958 when Canada and the United States created the North American Air Defense Command to coordinate their air defenses against Soviet bombers with nuclear payload payloads.

This militarily advantageous relationship between Canada and the US was also fraught with domestic political pitfalls. At the time the Canadian defense minister announced that Canada would require a fleet of 10 to 12 nuclear submarines to patrol the Arctic under the ice thereby protecting Canadian sovereignty (Lajeunesse, 2007; Granatstein, 2011). An eminent Canadian legal scholar commented that the proposed acquisition of submarines would not necessarily prevent loss of sovereignty rights unto itself and it potentially could be equally effective to acquire subsea detection and control capabilities (Pharand, 1989). In the late 1980's the Canadian nuclear submarine program was cancelled and instead Canada opted for the used British, Victoria class diesel-electric submarines (Lajeunesse, 2008). Recent literature has indicated Canada has not completely abandoned its goal of having situational awareness

of submarines under the ice as the Northern Watch program is developing a sub-surveillance system for detecting submarines (Huebert, 2010).

The Royal Canadian Air Force (RCAF) flies a large inventory of aircraft that are used to carry out a multitude of roles in peace and in conflict, all in support of the RCAF's mission of providing relevant, responsive and effective air power. The RCAF utilizes CF-18 Hornet fighter aircraft based strategically across the country on standby to intercept hostile military aircraft or commercial aircraft to be used as a weapon. They are fast and manoeuvrable fighters which can be deployed quickly and have relatively long ranges. They can be equipped with weaponry to be used against hostile air, sea or ground targets. The bulk of the other aircraft such as CP-140 anti-submarine surveillance, Sea King's, CC-130 Hercules, CC-177 Globemaster III and the CH-149 Cormorant are multi-tasked to surveillance, air transport in search and rescue to name just a few missions (Government of Canada 2014). The number of these airframes will be discussed in chapter 7 in much more detail in relation to security, surveillance, maritime patrol and search and rescue. As Marine activity both grows and changes in the Canadian Arctic the government will have to adapt their military aircraft to match the mission sets required. Unfortunately the project acquisition timelines for government purchases is not nimble preventing the government from making purchases on the fly except in time of conflict. Therefore it is very important that government policy on the Arctic be both well conceived and flexible to deal with changing needs. It seems to me that much of the governments attention has focussed on the AOP's and CCG icebreaker requirements but in given the Arctic's great distances, long transit times and short survivability, more discussion is needed over air resources to overcome these challenges.

Chapter 4. Major Players

4.1 Government

The Canadian government system is multifaceted and can be viewed through a variety of perspectives but for the purposes of this discussion it is suffice to say that Canada's government is a democratic constitutional monarchy.

As a constitutional monarchy, Canada's formal Head of State is a British hereditary Sovereign (Queen or King), who reigns by the rule of law in accordance with the Constitution Act of 1867. The Canadian monarch does not reside in Canada therefore the Governor General of Canada is the national level vice regal representative of the Canadian monarch. Although the appointment is made on the advice of the Canadian Prime Minister, the Governor General carries out most of the daily constitutional and ceremonial duties, and throughout the tenure s/he maintains direct contact with the formal Head of State. The executive branch of the Government of Canada consists of the Head of State (represented by the Governor General), the Head of Government (represented by the Prime Minister) and the Cabinet (a group of ministers chosen by the Prime Minister and appointed by the Governor General).

As a parliamentary democracy, the sitting government members are elected by the people to represent them in the House of Commons in Ottawa where they pass legislation and approve and monitor the business of government ministries. The ruling government, elected for four year cycles, is led by a Prime Minister and their own selected Cabinet ministers, each responsible for a departmental portfolio. The second chamber of government is the Senate made up of Senators are appointed by the Governor General on the advice of the Prime Minister who reviews bills which cannot be passed without their assent.

There are three levels of government: the federal government, the provincial or territorial government, and the municipal government which is quite often subdivided into regional/local representation. Each provincial and territorial government has an elected legislature led by their Premier and their cabinet where they govern through legislative power. Although the three northern territories are geographically immense, the populations are sparse; they possess only some of the powers and responsibilities.

The table in Appendix 4 reflects the responsibilities for the various levels of government including those shared jurisdictions between levels of government that allows for tailoring the needs of the diverse provinces. Each level of government has its own responsibilities.

The final segment of Canadian democracy is the First Nations, Metis and Inuit represented by band chiefs and councillors who have major responsibilities on First Nations reserves, including housing, schools and other services. Unlike other levels of government there provincial, regional and national Aboriginal and Inuit organizations are a voice for their people in their relationships with the federal, provincial and territorial governments. On December 1, 2006, the *Nunavik Inuit Land Claims Agreement* was signed setting the basis upon which federal and provincial governments would interact with Nunavik's government. These new conventions though signed must be operationalized between the various levels of government which will happen over time and will influence Federal policy on the Arctic (Nunavik Inuit Land Claims Agreement Act 2008).

4.2 Organizations

4.2.1 Arctic Council

The Arctic Council, established with the signing of the Ottawa Declaration in 1996, is the leading multilateral forum through which Canada advances their foreign policy and promotes Canadian Arctic interests internationally. The Arctic Council is a consensus-based, high level intergovernmental forum that works to promote the environmental, social and economic aspects of sustainable development in the Arctic region. The implementation of these endeavours through six expert working groups focusing on such issues as monitoring, assessing and preventing pollution in the Arctic, climate change, biodiversity conservation, emergency preparedness and prevention, and the living conditions of the Arctic residents. The Arctic Council is comprised of the eight Arctic States namely Canada; Denmark; Finland; Iceland; Norway; the Russian Federation; Sweden and the United States.

Canada was the first Chair of the Arctic Council from 1996 to 1998. The Chair of the Council rotates among the member countries every two years with Canada currently taking over as Chair in 2013 followed by the United States in 2015 (Foreign Affairs, Trade and Development Canada, 2013).

4.2.2 Northern Indigenous Peoples

The Arctic Council provides a platform for the Arctic states and Northern Indigenous peoples who've been granted Permanent Participants status who have full participatory rights in connection with the Council's negotiations and decisions. Out of a total of 4 million inhabitants of the Arctic, approximately 500,000 belong to indigenous peoples with the following six organizations representing them:

- Aleut International Association (AIA);

- Arctic Athabaskan Council (AAC);
- Inuit Circumpolar Council (ICC);
- Gwich'in Council International (GCI);
- Russian Association of Indigenous Peoples of the North (RAIPON);
- Saami Council.

4.2.3 Observer Nations

Arctic Council Observers status is available to non-Arctic states, inter-governmental, inter-parliamentary organizations, as well as nongovernmental organizations. The criterion for acceptance into the Arctic Council is that an organization must accept the values and interests permanent Arctic Council member states. They must also recognize the Arctic states sovereignty and they must be bringing their expertise relevant to the work of the group. Therefore all decision-making powers rest with the Arctic Council member states and permanent participants.

Notwithstanding the title of observer, these groups must bring a desirable benefit through their engagement in the Arctic Council working groups, and may submit written statements or documents that represent their views on issues under discussion, provided they have the discretionary approval of the chairperson.

At the time of the creation of this document, there have been twelve non-Arctic countries that have been given observer status in the spring of 2013, namely; China, France, Germany, Italian Republic, Japan, People's Republic of China, Poland, Republic of Korea, Republic of Singapore Republic of India, Spain, State of Japan, The Netherlands and the United Kingdom. There are currently nine inter-governmental and inter-Parliamentary organizations, as well as eleven non-governmental organizations recognized as having observer status (Arctic Council, 2011).

4.3 United Nations

The United Nations provides a valuable forum through which matters that deal with the Arctic can be discussed at the international level. Perhaps the two most relevant mechanisms in regards to this analysis are the work being conducted by the recognized international treaty law provided by the United Nations Law of the Sea (UNCLOS) and the advice provided by the International Panel on Climate Change (IPCC).

The adoption of UNCLOS Part VI, Articles 76 and 77 on the Continental Shelf by the majority of international states through ratification, allows for an orderly mechanism to extend nation's Continental shelves. This also has defined the rights of the nations within their EEZ with Annex II of UNCLOS, providing the criteria by which nations can claim and have their claims evaluated for their continental shelf and their continental shelf extensions. As these areas are believed to be rich in natural resources, nations are hurrying to submit their justifications for extension to the United Nations, including Canada. The most notable nation that has not ratified UNCLOS at this time is the United States of America but according to media articles do seem to be seriously considering the adoption of criteria (Alaska Dispatch, 2012).

The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. It was established in 1988 by the UN General Assembly, the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) to review and assess the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. The research monitoring of climate related data or parameters is actually conducted on a voluntary basis by thousands of scientists worldwide who contribute these data and findings to the IPCC for review.

The IPCC is open to all member countries of the United Nations (UN) and currently has members from 195 countries. Due to their scientific and intergovernmental composition, the IPCC is well placed to provide rigorous and balanced scientific information while remaining policy relevant in neutral but never prescriptive nor binding. Therefore the endorsement of their work remains to decision makers the participating countries.

4.3.1 International Maritime Organization (IMO)

IMO is a specialized agency of the United Nations. It became operational in 1959 and, today, has 170 Member States and three Associate Members. A large number of intergovernmental organizations and non-governmental organizations also participate actively in its work. IMO however has no mandate for the implementation of IMO measures, the responsibility instead lies with is of the Member States (IMO, 2013). The IMO consists of the Assembly; the highest governing body of the IMO is the Assembly, consisting of all the member states and meets once every two years. The secondary level of authority lies with the organizations executive branch, the Council, which are responsible for the supervision of all subcommittees work and can even perform some of the functions of the assembly, with the exception of making recommendations to member Governments. There are five main subcommittees: the Maritime Safety Committee (MSC); the Marine Environment Protection Committee (MEPC); the Legal Committee; the Technical Co-operation Committee and the Facilitation Committee and a number of Sub-Committees which support the work of the main technical committees.

Most relevant when analyzing Arctic issues, are the two committees critical to the management of Arctic Marine shipping namely MSC and MEPC. The MSC consists of representatives from all member states and considers any matter related to aids to navigation,

construction and equipment of vessels, manning and safety standpoint, safe manning practices, rules for the prevention of collisions, handling of dangerous cargoes, maritime safety procedures, marine casualty investigations, salvage and search and rescue (IMO, 2013). An example of their work is the implementation of the Long Range Identification and Tracking (LRIT) at its 83rd session in Copenhagen, Denmark in 2008. This satellite tracking system provided participating contracting governments the ability to access the vessel position data for safety and environmental purposes. In the case of the Arctic, having satellite based, ship-reporting capabilities North of 60 has greatly improved domain awareness, despite it not having 100% coverage at high latitudes (IMO, 2007).

Under the purview of the COMSAR Sub-Committee Global Maritime Distress and Safety System is being updated and reviewed looking specifically into the communication requirements for the polar areas. The COMSAR Sub-Committee is hoping to include the use of more modern communication technologies to assist in the challenges of SAR in remote areas.

In keeping with their safety mandate IMO is adopted a number of guidelines for ships operating in remote regions such as the Arctic. Examples of these are the 2006 Guide for Cold Water Survival and the 2007 Guidelines on Voyage Planning for Passenger Ships Operating in Remote Areas. In addition, IMO is providing new guidance for personnel training for Mariners working on board ships in polar waters which is reflected in the 2010 Manila Amendments to the Convention on Standards for Training Certification and Watchkeeping (STCW) (IMO, 2013).

Together with MEPC, they have worked in close collaboration with the development of the Guidelines For Ships Operating In Polar Waters which was adopted in Resolution A.1024(26) by the IMO Assembly in December 2009 (IMO, 2010). More recently the IMO membership is agreed that the polar code would become a mandatory instrument applicable to

severe environmental conditions found in Polar Code. The Polar Code will cover an array of shipping-related matters relevant to navigation in Arctic and Antarctic waters. This will include ship design, construction and equipment; operational and training concerns; search and rescue; and, pollution prevention measures for the unique polar regions. (IMO, 2013).

Chapter 5. Legal and Sovereignty: Uncertainty in the Arctic

5.1 Definition of Sovereignty

Although Canadians have been recently inundated with references to "sovereignty" in popular media, periodicals and books, the meaning can be highly contextual which can impact discourses significantly. It is essential then to provide definition and context to this term to provide relevance this discussion of Canadian Arctic activities and policy. To begin, Merriam Webster Dictionary defines sovereignty as "supreme power especially over a body politic and freedom from external control or autonomy" (Sovereignty, (n)). Philpott (1995) defines sovereignty to be supreme authority within a territory that implies both undisputed supremacy over the land's inhabitants and independence from unwanted intervention by an outside authority. McRae (2007) attributes political, legal, economic and social dimensions to sovereignty and like most authors reiterates that element of a states independence of the authority of other states. Sovereignty also can be viewed in legal and political frameworks that govern terrestrial sovereignty and territorial seas, both which can be subjective and lead to ambiguity in legal or diplomatic discourses.

5.2 Evolution of Canada's Territorial Claims

Canada's Arctic land claim over its Arctic Archipelago reaches back to when Britain first came to hold legitimate title over the North American Arctic region in 1763 through the terms of the Treaty of Paris with France. Later, the Dominion of Canada developed its claim to the Arctic territories and waters as a result of the two British Orders in Council transferring the Arctic lands to Canada, first, in 1870, and the second in 1880.

5.3 Internal Waters, Territorial Seas, Exclusive Economic Zone and High Seas

Over the next few sections the discussion frequently refers to the status of various water expanses. The following graphic is provided to supply some basic definition and understanding. The intent is to aid but not explain in detail the effect on sovereignty of the passage of foreign vessels through the various marine waters. The detail will be part of the discussions of baselines and internal waters.

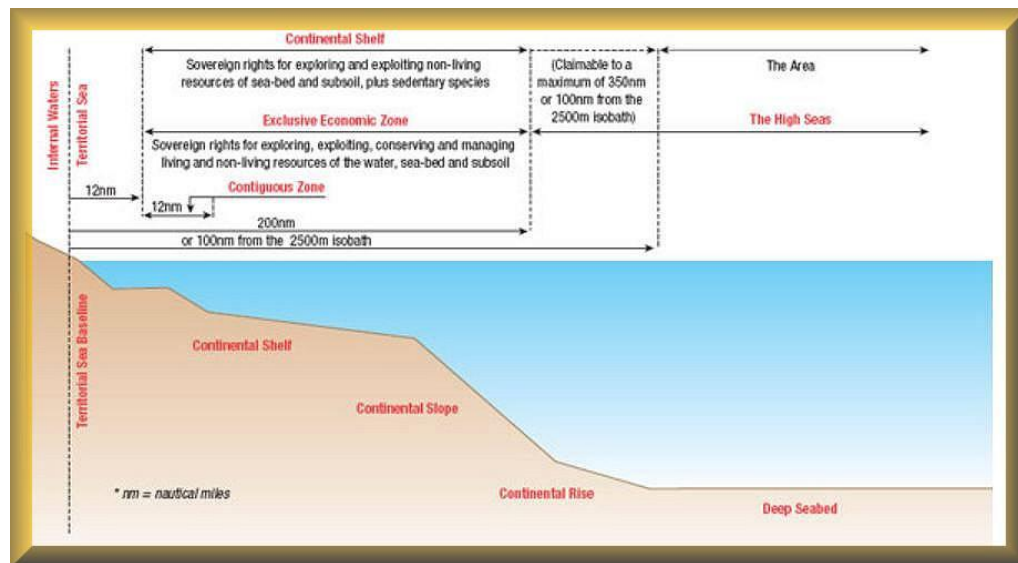


Figure 9. Canada's maritime zones (Fisheries and Oceans Canada, 2010).

In analysing 1982 United Nations Convention on the Law of the Sea (UNCLOS), Arnd Bernaert (2008) portrays the concept of "innocent passage" as descriptive and perhaps even somewhat subjective versus prescriptive. This perhaps is to allow for the application of coastal state law in areas of the safety of navigation, implementation of sea lanes and traffic separation schemes, fishing, and environmental protection to name a few. Transitory navigation through the territorial seas must not be prejudicial to the peace, good order or security of the coastal state with the intent of this clause being applicable also in the case of an unlisted threat. Until right of transit in the Canadian Archipelago is tested in international courts it will remain subjective what Canada's legal options are. The parameters of application would be that the offence is of an equal

seriousness to the named activities and that any such measures must be in conformity with the Convention and international law to allow continuous and expeditious passage.

Even if these conditions have been fulfilled, there remain exceptions to the right of innocent passage with respect to criminal and civil jurisdiction of the coastal state on foreign vessels, which can be summarized as follows: a coastal state may not exercise its jurisdiction on board a foreign vessel unless there is a serious threat to the coastal state, measures for the suppression of drug traffic are necessary, requests for aid have been made, or there is a particular situation in which the vessel has left the internal waters of the coastal state and is still in the territorial sea and action by the coastal state is warranted (Bernaert, 2008). If the vessel cannot be stopped in the territorial sea, further action may be taken in accordance with the provisions UNCLOS Article 111 for hot pursuit (UNCLOS, 1982).

Table 2 is provided to add more clarity for the zones graphically in Figure 8 and acts as a second aid memoir for the discussions that follow. Although a generalization, the powers and control that can be exerted by a coastal state decrease when the distance off their coastline increases. The four main maritime zones outlined under the UNCLOS and stated in Canadian law in the Oceans Act, are:

. Table 1. Description of Canada's maritime zones

Internal Waters	(all waters landward side of a state's jurisdictional coastline)	State maintains full control including the right to deny innocent passage (United Nations, 1959).
Territorial Sea	(0–12 nautical miles)	According to UNCLOS-Article 56 foreign ships (both military and civilian) are allowed innocent passage sovereign territory of the state, although foreign ships (both military and civilian) are allowed innocent passage through it; this sovereignty also extends to the airspace over and seabed below (UNCLOS, 1982).
Exclusive Economic Zone	(12–200 nautical miles)	In the exclusive economic zone, the coastal State has sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources. Powers and responsibility for the protection and preservation of the marine environment. Again, foreign ships (both military and civilian) are allowed innocent passage.
High Seas	(the area beyond the outer limit of a coastal state's continental shelf)	UNCLOS-Article 87 allows for the high seas to be open to all States, whether coastal or land-locked including freedom of: navigation; fishing and scientific research etc...(UNCLOS, 1982).

5.4 Terrestrial Claims - Hans Island

Canada's remaining two applications of sovereignty as it relates to its Arctic territories involve the land and the seas (whether liquid or frozen). In the first case, a thorough literature review shows that Canada has only one terrestrial challenge to its sovereignty, namely from Denmark over ownership of Hans Island which straddles Nares Strait between Greenland and Ellesmere Island in Canada. This small rock has been contested for decades but according to

Adrian Humphreys of National Post there are unconfirmed rumours that Canada and Denmark diplomats have struck a deal to divide the island down the middle (Humphreys, A. 2012). The issue of terrestrial sovereignty challenges over the Canadian archipelago has been minimized as an issue repeatedly by numerous authors including Pharand (2007), Bartenstein (2010), McCrae (2007) and Dufresne (2008) to name just a few.



Figure 10. Map of Hans Island (Google Earth, 2012).

5.5 Canada / US Beaufort Sea Dispute

In 1825 Convention between Great Britain and Russia set a maritime border between present-day Alaska and what is now Canada along the 141st meridian. At the time of the delimitation of borders in 1825 the progression of maritime law only included 3 mile territorial waters. As a consequence this border has come into question in light of the potential wealth of

offshore oil and gas deposits. The United States rejects the earlier delimitation in preference to one based on equidistance from the land masses. This dispute remains unresolved and the disputed territory forms a polygon of about 21,436 km² (Mychajlyszyn, 2008).

Geological Services high probability of the existence of gas deposits in the area, with the opportunity for leases. This particular dispute could potentially escalate, as either nation would lose political capital domestically with a lost judgement in any formal review. Huebert suggests it would be more pragmatic to proactively negotiate a settlement based on NAFTA. Off the record, some officials suggest that the two sides have unofficially agreed not to accept any bids but this is not confirmed (Huebert, 2009).

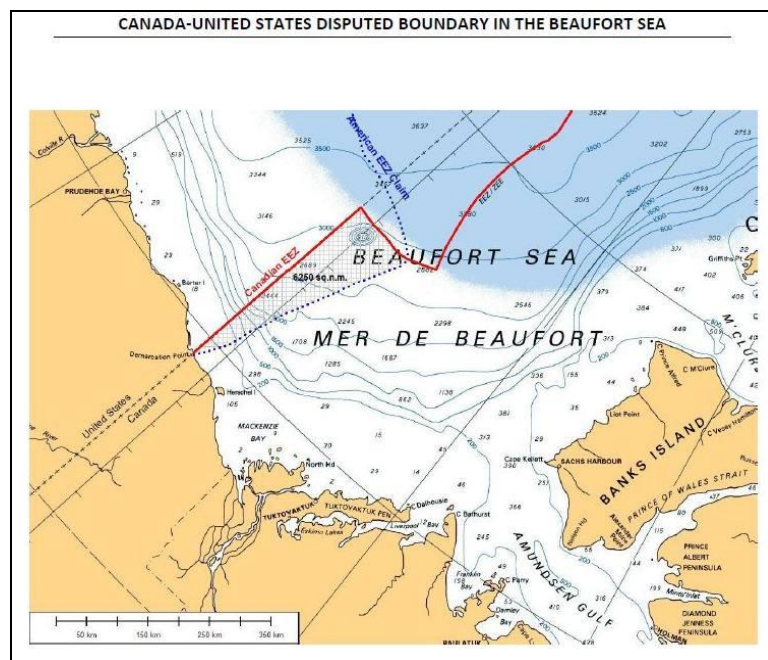


Figure 11. Map of the Beaufort Sea (Canada, Parliament, 2011).

5.6 Sector Theory

In 1907, Canadian Senator Pascal Poirier stated that Canada's Arctic claim consisted of land, water and ice that extended from the mainland of Canada up to the North Pole, bounded by sector lines - the 141st meridian of west longitude to the west and the 60th meridian of west

longitude to the east - which formed an apex at the North Pole (McRae, 2007). This is what later became known as the sector theory (Coates et al., 2008). Lester B. Pearson (1946), then Canada's ambassador to the United States, made the claim over water explicit by declaring that the sector theory justified Canada's claims "not only to the land within the sector, but to the frozen sea as well" (Pearson, 1946).

The sector theory doctrine, though convenient for apportioning territory, finds little validity in state practice or in customary international law in the Arctic. Canada and the Soviet Union have supported the method while it has been strongly rejected by Norway, the United States, and Denmark. In summary Canada is unlikely to be successful using this method as an accepted legal basis for asserting sovereign claims over areas of land or sea, as sector theory has not developed into a valid rule or principle of international law (Joyner, 1991).

5.7 Historic Title

Canada claims full sovereignty over the Arctic waters as contained within its baselines, including the Northwest Passage, based on in part historic title and if successfully argued then no right of passage would exist. Pharand and others oft quote the definition of historic waters as the one given by L. J. Bouchez: "Historic waters are waters over which the coastal State, contrary to the generally applicable rules of international law, clearly, effectively, continuously, and over a substantial period of time, exercises sovereign rights with the acquiescence of the community of States." This definition reflects three basic requirements generally agreed upon: (i) exclusive exercise of state jurisdiction, (ii) a long lapse of time, and (iii) acquiescence by foreign states (Pharand, 2007).

Pharand (2007) states that there have been two principal claims of internal waters made by Canada prior to its declaration of baselines. The first official Canadian claim of internal

waters was made in 1973 when the Bureau of Legal Affairs issued a letter stating Canada's claim on internal waters within the Canadian Arctic Archipelago is based on a historical basis. This was despite the fact that this claim appeared nowhere in any treaty or legislation. The second claim followed in 1975 when Secretary of State for External Affairs Allan MacEachen gave evidence before the Standing Committee on External Affairs and National Defence. His evidence was that “as Canada’s Northwest Passage is not used for international navigation and since Arctic waters are considered by Canada as being internal waters, the regime of formerly referred to as "innocent passage", now transit passage does not apply to the Arctic” (Pharand, 2007).

Using the Bouchez definition for a historical claim, Canada does have a claim over the Arctic based on the ongoing use and occupation ice for travel and hunting by its Inuit people “from time immemorial.” Unfortunately the claim could be weakened by the melting icecap simply melting away. With respect to a historic title, Pharand's conclusion is that Canada is not in a position to discharge its heavy burden of proof that it has exercised exclusive jurisdiction over those waters for a sufficiently long period of time and with the acquiescence of foreign states, particularly those primarily affected by the claim (Pharand, 2007). However, this presumes that customary law originating in Europe can usurp the rights of indigenous peoples. Perhaps it is time for an international precedent as they were unaware until John Cabot first proposed the existence of a NWP 1490 (Arctic Council, 2009). The following quotation by Mary Simon, President, Inuit Tapiriit Kanatami (ITK) speaks volumes to both their long term indigenous rights to the land and ice as well as their unity as present day Canadians:

"The Arctic is our homeland. We call it Inuit Nunaat. We have occupied this vast territory for thousands of years. We have developed a culture and language deeply rooted in our physical surroundings. The Arctic defines who we are. In turn, our presence and way of life help define

the Arctic.... We are as strongly Canadian as we are Inuit. We pay the same taxes as other Canadians. We carry Canadian passports."

5.8 Baselines

Prior to 2003, customary law and the 1958 Geneva Convention on the Continental Shelf were the only sources of law applicable to the Canadian Arctic. In 1969 the arrival of the American tanker USS Manhattan in the Arctic caused a political furor in Canada that resulted in Canada increasing their declaration for Territorial Waters from three to twelve nautical miles and their enacting of the 1970 Arctic Waters Prevention Act. The coastal state has sovereign rights over the territorial sea but ships of all states enjoy the "right of innocent passage" through these territorial seas. Canada has exercised jurisdiction over the territorial sea on its east and west coasts out to twelve nautical miles since 1970, first under the Territorial Sea and Fishing Zones Act and now under the Oceans Act. The mechanism brought into force by Canada in 1970 was the NORDREG reporting regulations under the *Arctic Waters Pollution Prevention Act* (AWPPA) (1970). These regulations were not mandatory for the first two decades but compliance has been near 100%. Academics such as Pharand (2007),⁷ Byers and Lalonde (2006) as well as the Canadian Senate in documents such as their 2009 report *Rising to the Arctic Challenge: Report on the Canadian Coast Guard* (Recommendation 11 and 12) have been recommending Canada make these mandatory lest we leave the impression we are leaving our internal waters unattended (Canada Parliament, 2009). The Canadian government amended the AWPPA, effective July 1, 2010, with a mandatory requirement for traffic to report to the Canadian Coast Guard at NORDREG (Government of Canada, 2010).

The baselines for measuring the Arctic territorial sea were originally set in 1967 (Fisheries and Oceans 2013), but in 1985 the incursion of the USCG Polar Sea resulted in a

second political "crisis" in Canada. This situation prompted the government to declare all waters inside the 1967 baselines to be to Canada's territory or in UNCLOS nomenclature "internal waters" (Bartenstein, 2010).

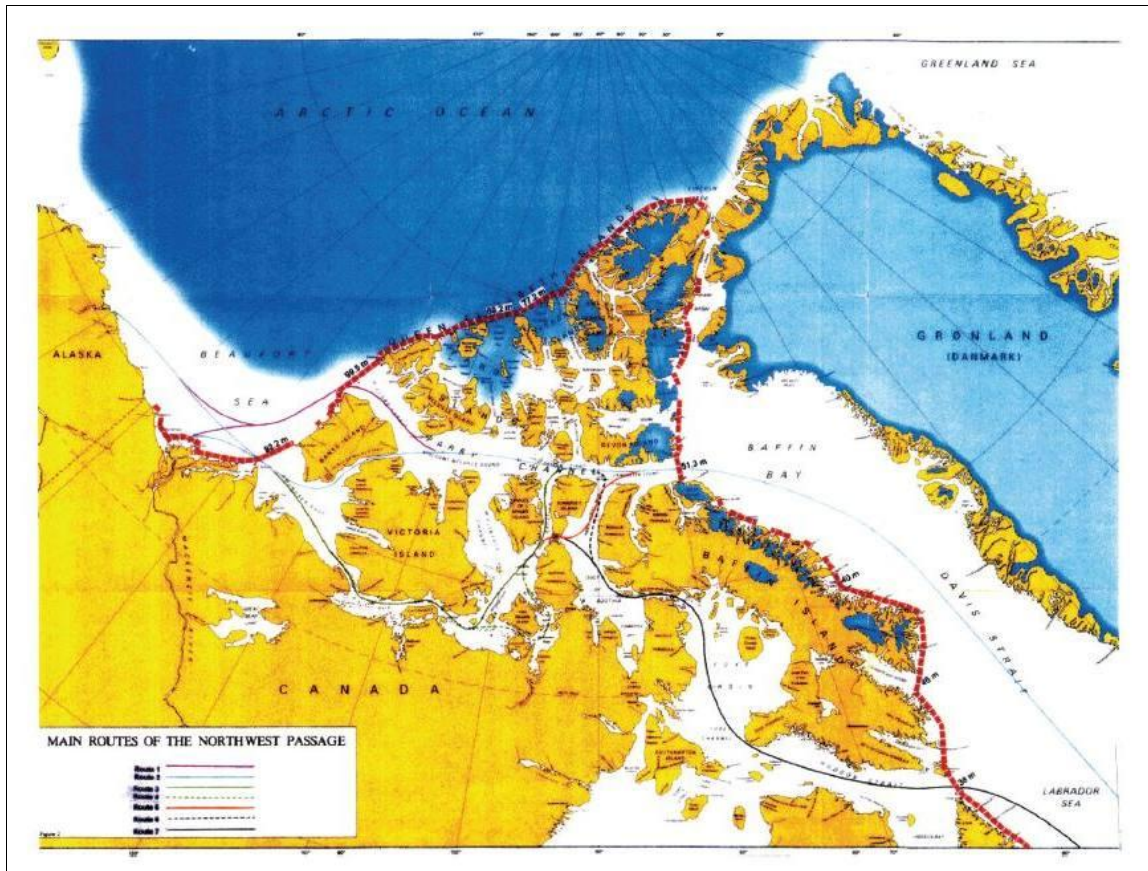


Figure 12. Straight baselines of Canadian archipelago (Pharand, 2007).

Canada has based this position on the fact that where Canada's coastline is very irregular, drawing straight baselines joining appropriate points on the coast is an accepted practice of defining a nation's internal water. Canada claims her baselines are in compliance with UNCLOS and enshrined in Canadian legislation under the Oceans Act. The United States and European Union dispute Canada's straight baselines enclosing the Arctic Archipelago (Fisheries and Oceans Canada, 2013). As stated earlier, with the exception of Hans Island, there is no challenge to Canada's sovereignty over the islands of the Arctic which means that the Arctic islands - the

whole of the Arctic Archipelago should be no different than any other islands that are part of Canada (McRae, 2007).

The Canadian claim of internal waters in the Arctic based on baselines seems to be an effort of the government to bolster their sovereignty claims beyond the tenuous sector theory and Canada's claim of historic waters. The objective one presumes is to maintain control over the Northwest Passage and other territorial waters of the north and to respond to other nations claims to a right of innocent passage.

Under Article 8 of UNCLOS, when straight baselines are drawn around waters that were not previously considered internal, a right of transit passage remains - as it does elsewhere on the territorial seas. However Canada was acting under customary international law in adopting its position of drawing straight baselines in 1985 and so was not bound by Article 8 and 35 of UNCLOS. Canada's position is therefore that as UNCLOS is regarded as a new treaty-law rule which cannot supersede pre-existing customary international law. The counterargument is of course that by ratifying UNCLOS, Canada became bound by the rule enunciated at Article 8 and 35 so therefore cannot defeat the right of innocent passage through its drawing of baselines (Dufresne, 2008). It would undoubtedly have to go before the International Court of Justice (ICJ) to resolve this disagreement and Canada has stated that they were prepared to do just that, accepting no substitutes. At the same time they left the door open for a bilateral Agreement on Arctic Cooperation in 1988 with the United States (Pharand, 2007). Both parties in this agreement however, reserved their legal positions on the law of the sea, implicitly protecting their respective positions on the international legal status of the waters of the Northwest Passage (McRae, 2007).

This Canadian claim of internal waters represents Canada's attempt to establish their authority to control or even prohibit shipping in the Northwest Passage, indeed throughout the waters of the Arctic Archipelago and beyond.

5.9 International Strait

In respect of straits used for international navigation, the right of the coastal state to regulate shipping exercising the right of passage is much more constrained. The word "innocent" has been removed from the designation of this kind of passage and replaced with "transit passage". In accordance with the 1982 Convention transit passages "cannot be impeded" including submarines in their submerged mode. In short, the coastal state cannot exceed international standards such as those found in the International Maritime Organization's (IMO) MARPOL regulations to regulate the discharge of oil or other noxious substances. As mentioned earlier a states authorities continue to increase as a vessel approaches their shoreline where passage can be denied in internal waters, the greatest control for a state regulator. The powers diminish thereafter beginning at the territorial sea, then the EEZ and finally high seas (Bernaert, 2008).

The question then, is the Northwest Passage an international strait? If one accepts, as seems to be the case, that Donat Pharand is perhaps the preeminent expert on Northwest Passage related legal issues, then one must accept that the Northwest Passage is fully encompassed by the internal waters of Canada (Pharand, 1989). This allows for the geographic criterion to be met in that the Passage links two parts of the high seas or Exclusive Economic Zones.

One must however consider the judgment of the International Court of Justice in the 1949 Corfu Decision where they determined, as explained by Pharand, that "before a strait may be considered international, proof must be adduced that it has a history as a useful route for

international maritime traffic" (Pharand, 2007, p. 35). Based on this a similar interpretation of the United Kingdom in its Pleadings of 1951 in the Fisheries case, he concluded that given the historical traffic, the few commercial ships and the control exercised by Canada over all foreign transits, it is evident that the Northwest Passage has not had a history as a useful route for international maritime traffic. If the Corfu Channel Case sets the usage test standard of the volume, the Court concluded that the Corfu Channel was an international strait based on a transit rate of 3000 ships per year. There have been approximately 100 surface transits of the Northwest Passage over the past 100 years (McRae, 2007). Thus the second criterion of the 1949 Corfu decision is dramatically absent as of 2007. Pharand and other scholars and jurists urge caution as if a sufficient number of vessels transit the passage without seeking Canadian permission (only two), Canada's claims to the legal status of the passage could be challenged with a stronger claim that the passage constitutes an international strait (Carnaghan & Goody, 2006).

There is a potentially important qualification in that while the surface transits are known, much less is known about transit by submarines. It is assumed that they occur but it is not clear whether they occur under Canadian authority and with the consent of the Government of Canada or whether they are transits of which Canada knows little. If, in fact, they have been surreptitiously using the sub-surface passages without Canadian knowledge or consent, then it might be possible to show that the Northwest Passage has been "used for international navigation" however with surreptitious use the state cannot prove usage so therefore have no claim. Furthermore, it is highly unlikely that a nation would be forthcoming with these details of their naval operations as the ICJ does not protect documents as secret (McRae, 2007).

5.10 UNCLOS Article 234

After having declared the AWPPA in 1970 which had voluntary reporting only, a modicum of control was exerted over the Arctic EEZ, the government quietly began utilizing UNCLOS negotiations to strengthen their claim on the Arctic waters based on its special sensitivity to environmental stressors such as oil pollution. They were successful and the 1982 UN Convention on the Law of the Sea contains a provision known as the "arctic exception" (McRae, 2007). Article 234 of UNCLOS (1982) permits coastal states to regulate to prevent, reduce or control marine pollution in ice-covered areas within its exclusive economic zone - that is within 200 nautical miles of its coast. The notable exceptions to Article 234 are according to Article 236 the provisions of the Convention regarding the protection and preservation of the marine environment do not apply to warships or other government ships (UNCLOS, 1982).

Having succeeded in gaining this control, Canada should not rest on its laurels if it hopes to maintain this functional control of "ice-covered areas", therefore should the ice no longer be present in the Northwest Passage (NWP) for most of the year it remains to be seen whether Article 234 maintains its applicability. While this may not occur for some time, it indicates the precariousness of relying simply on Article 234 as a justification for Canadian authority to regulate shipping in the Arctic.

In Russia's 2009 Arctic Strategy, the Russian government in similar fashion to Canada, highlights its longstanding position on the legal status of the NSR namely that under Article 34 that the NSR is a "national transportation route" under Russia's jurisdiction. However, unlike Canada, Russia does likely have justification with those passages which "only" utilize their territorial waters; however there exist also portions of the 2200-2900 nautical mile routes that can either force traffic into or out of territorial sea based on ice conditions. The Russian's have

used this fact to hold that because the NSR is an integrated transportation route, "the integral nature of the NSR for transport makes the risks of environmental accidents or hazards to navigation warrants them to extend their rights to outside of their EEZ where ice coverage and particularly severe climate conditions cause exceptional hazards to navigation, and pollution could cause major harm to the ecological balance in their adjacent waters. Their case, though pushing the legal boundaries, does seem to hold with the precautionary approach given they are essentially the primary responders and stakeholders. Russian regulations therefore require all vessels intending to enter the NSR give advance notification to Russian authorities and submit an application for guiding, which implies paying a fee for using the route. Whether this is a reasonable application of the article to unilaterally adopt and enforce non-discriminatory laws and regulations in their Exclusive Economic Zones (EEZs) remains untested (Zysk, 2010).

5.11 De Jure vs De Facto

There are two other criteria that are important to any discussion of Canadian Arctic sovereignty, notably the legal concept of "De Jure and De Facto". De jure is defined by the Merriam-Webster Dictionary as by right, based upon laws or actions of the state, the latter actions normally in domestic law (de jure., adv or adj.). Merriam-Webster defines de facto as "in reality: actually" or exercising power as if legally constituted (de facto., adv or adj.). The Harper government has struck on the slogan use it or lose it which seems to state that Canada must actively use the territories or someone in the international community will take it.

5.12 Summary: Are We Losing The North?

As stated earlier in the work, it appears that there are no outstanding claims against terrestrial Canadian Territory, so one must deduce that the Prime Minister is speaking of the Northwest Passage. If foreign uncontrolled navigation takes place in the Northwest Passage

without Canada taking adequate preventive measures, Pharand (2007) states it is possible that the NWP might be internationalized and subject to the right of transit passage. As noted earlier in the discussion of *International Straits*, the NWP has neither the volume of traffic, nor anything approaching the requirements that it be a recognizable international route. Pharand (2007, p. 45) stated that "the inescapable conclusion is that no right of innocent passage exists in the new internal waters of the Northwest Passage."

Given that the historical claim to sovereignty may be of meagre support to Canada's claims, then the government is left with the primary choice of defending its Baselines claim. At the time of the announcement of the AWPPA in 1985, Canada's Secretary of State for External Affairs, Joe Clark made it clear they were prepared to do so, even if it meant taking the matter before the International Court of Justice for a "de jure" ruling (Pharand, 2007a). However McRae (2007, p. 13) warns that: "predicting the outcome of litigation is a hazardous business in international law, particularly when one is dealing with an area that is in a sense unique, with little in terms of prior precedent to assist in the prediction." This is likely why both the United States and Canada negotiated the 1988 Agreement between the Government of Canada and the Government of the United States of America on Arctic Cooperation, to which both sides seem to have mostly adhered (Government of Canada, 1988). The United States agreed in 1988 that it would request prior authorization for its icebreakers, but on the express understanding that it would not affect its refusal to recognize Canada's claim. There is a caveat that must be noted that this agreement applies only to icebreakers, not to commercial vessels or warships (Pharand, 2007, p. 13). Indeed each year that Canada's receives no active challenges, it strengthens their position and so it is unwise to create opportunities for other countries to mount a challenge (McRae, 2007).

Bartenstein (2010) warns that acknowledging publicly that Canada could lose the "de jure" NWP claim that could be interpreted as a government admission of doubt as to the veracity of their 1986 proclamation of baselines around the Arctic Archipelago. If Canada believes as they have stated, that the NWP is internal waters based on straight baselines established following the ICJ method, and then by default they have full Canadian sovereignty over them. No right of transit passage would apply now or in the future. Therefore it seems logical for Canada to act as sovereign rulers of the waters supporting our de jure status. This would be achieved by both our governance of, and supporting services to Arctic shipping.

This portion of the paper is a review of the meanings of a number of terms related to sovereignty and UNCLOS to better prepare for the discussion of the Canadian Arctic that follows. The literature seems to suggest that there are no outstanding claims on terrestrial territory in the north with the exception of Hans Island that is potentially on the cusp of resolution. Although still cited in contemporary literature as an outstanding claim, sector theory appears to not be a particularly strong argument for sovereign rights with only Russia supporting the concept. There exists another bilateral disagreement with the United States, namely the Beaufort Sea boundary dispute, where, if accurate, Huebert's sources hold that both nations have been unofficially cooperating, as evidenced by the similar behaviour of calling for oil leases, yet neither nation granting them (Huebert, 2009). This type of cooperation does not seem too unusual as evidenced by the North American Aerospace Defense Agreement 2006 (NORAD) (Government of Canada, 2006) which added a maritime component and the 1988 Canada/United States Agreement on Arctic and such is the history of these allies they will negotiate a compromise (Government of Canada, 1988). Most recently President Obama formally stated his government's intention to strengthen international cooperation by working through bilateral

relationships and multilateral bodies, including the Arctic Council in their *National Strategy For The Arctic Region* (Government of the United States, 2013). Perhaps the most notable portion of this document is it has stated intent to work toward U.S. accession to the United Nations Convention on the Law of the Sea (Law of the Sea Convention). This mirrors his similar text produced in Canada's foreign policy statement indicating that Canada would do everything possible using existing international bodies including international legal frameworks. Obama did not however step back from their position for freedom of navigation through both the Northwest Passage and the Northern Sea Route as already discussed in section 5.9. These mixed objectives involving Canada, United States and Russia around freedom of navigation merit watching for they could someday test traditional allegiances. In summary it is unwise to provoke either legal confrontations which have very uncertain outcomes, nor should we be sabre rattling against much more militarily powerful nations such as Russia or the United States. The prudent choice is diplomacy and negotiation whilst formulating complimentary policies and making military and domestic investments to back them up.

Chapter 6. Analysis of Canada's Northern Strategy

6.1 Introduction

Increasingly, other nations of the world are turning their attention northward including players such as China (Jakobson, 2010) and Japan who are far removed from the Arctic, but are still seeking a role that allows them input into Arctic governance (Arctic Council, 2011). Along with four other nations, China and Japan successfully lobbied and were awarded observer status into the Arctic Council in 2013. Though they will not have voting privileges, they are permitted to be present and provide indirect feedback. Canada does not accept the premise that the Arctic requires a fundamentally new governance structure or legal framework; however, it does realize that the Arctic nation states, on their own, are unable to appropriately manage the North as these unprecedented changes occur (Government of Canada, 2010a).

Dating back before Confederation, a review of the Canadian position on Arctic sovereignty reveals there have been large gaps of time when the status of the North was ignored. Often when positions were finally made, leaders were often vague and in many instances our Arctic territorial claims contained contradictory descriptions (Carnaghan & Goody, 2006). This ultimately has created a disjointed policy landscape for the Arctic.

It really was not until 1969 when the United States tanker S.S. Manhattan's planned voyage through the Northwest Passage sparked immediate attention from the Canadian government, and Canada began to formulate what after many iterations of both Conservative and Liberal governments ultimately became the 2010 Arctic Strategy. In 1970 Canada passed the Arctic Waters Pollution Prevention Act, declaring Canadian regulatory control over pollution within a 100-mile zone. This unilateral move by the government created international

disagreement with the exception of Russia, which quickly followed with similar declarations over her northern waters (Østreng 2010). As this move was in a direct clash of the United States position on the Northwest Passage being an International Strait, tensions between the Canada and the US increased. The nations finally agreed to disagree, and in 1988 they signed a formal agreement that neither conceded legal positions but interim protocols for interactions in the Arctic were established. (Government of Canada, 1988). In 2010, the government continued protecting their rights in the Northwest Passage by making it mandatory for ships entering the Canadian Arctic zone to report their presence to the Canadian Coast Guard through NORDREG (Keil, 2012).

The Canadian policy on Arctic affairs seems to come into maturity through two main events, the first was the 2009 release of Canada's position and strategy on the Canadian Arctic, entitled *Canada's Northern Strategy: Our North, Our Heritage, Our Future* (Government of Canada, 2009). This announcement was followed in 2012 with the release by Department of Foreign Affairs and International Trade of the *Statement on Canada's Arctic Foreign Policy: Exercising Sovereignty and Promoting Canada's Northern Strategy Abroad* (Government of Canada, 2012). These statements represented the most comprehensive and unambiguous communication of Canadian Arctic policy ever. Given this mature policy framework it is important to evaluate its applicability and effectiveness against the international and domestic realities including fiscal ones.

6.2 Methodology

These policy statements provide the vision and action items the government has declared and therefore provides a suitable means framework upon which to evaluate the adequacy of government's ability to cope with the influx of marine traffic in the Arctic. Where applicable, the

author will seek insight from Russian government's past/present actions of coping with the retreating ice and the opening of the Northern Sea Route. Although Canada has seen much more open water in recent years in the Northwest Passage, predictions by Arctic mariners are that the nature of the archipelago will mean that the group will be remaining undependable for liner traffic. The goal in this exercise is to identify the issues that are likely to manifest themselves and possible means to cope with them, based on the policy positions of the current government along with the current experiences one can glean from Russia.

6.3 Vision

As mentioned, the Government of Canada's increased focus on the north in the last several decades has resulted in both a new foreign policy and the national strategy and has made some commitments to address these changes. These statements emphasize that Canadian Arctic is intrinsic to Canada's heritage and identity and the government is becoming more inclusive by facilitating the creation and development of the northern aboriginal governments and institutions. They have pledged to honor northern traditions respecting the land and the environment, while at the same time supporting sustainable development. They espouse the notion that through surveillance military and constabulary presence on the ground and on the sea they will protect the sovereign interests of Canada.

They have stated that the Northern Strategy's vision will be operationalized by the implementation of the following four pillars:

- Exercising our Arctic Sovereignty
- Promoting Social and Economic Development
- Protecting our Environmental Heritage
- Improving and Devolving Northern Governance

During the remaining sections of this document the vision of the Canadian government will be evaluated against the first of these four criteria to determine their successes and/or failures implementation. The emphasis will be focused upon those initiatives that directly or indirectly impact the country as a result of increased shipping activity. These impacts will, at some level be relevant to all Canadians and as Prime Minister Harper's statement that it would take a whole-of-government approach to address them is an accurate observation.

6.4 Exercising Canadian Arctic Sovereignty

In this section we will review how a nation can exercise their sovereignty and evaluate whether the current Canadian approach Arctic sovereignty is in the best interest all of the Canadian people. Huebert defines sovereignty as processing three main attributes; a defined territory, the population living within that territory and an organized governance system with an acknowledgment that these criteria are subjective. The Canadian Northern archipelago has faced no challenge to its terrestrial territory, inhabitants or governance but as discussed at length in Chapter 5, its waterways are much more contentious. Huebert holds that when borders are held as being in contention, generally speaking there are three options for resolving them namely militarily, politically or through a negotiated settlement of power-sharing. In the Canadian context as discussed earlier, it is imperative to ensure there is no doubt that Canada controls all boundaries, including maritime zones. As was concluded in Chapter 5, that Canada's position both militarily and legally in this matter was sufficiently nebulous that we should avoid confrontation.

It has been apparent in the tenor of the past Harper government's statements that they have taken a bullish approach internationally in regards to the defending our sovereignty. The strategy firmly asserts that Canadians will have the presence in the North, and the capability and

capacity to protect and patrol the land, sea and sky in our sovereign Arctic territory. A layperson would question the viability of Canada to protect their territory, given that they are sandwiched between two superpowers and without the détente provided by allegiances with the United States and NATO, Soviet Union could easily prevail in a military confrontation.

It appears in the latter portion of the Harper regime that the government has begun to veer from their pugilistic approach in now discuss Canada's Arctic sovereignty claims to be based upon historic title due to the presence of the Inuit and other aboriginal people and subarctic. This messaging is most noticeable in their tendency to speak more of his government enhancing our stewardship of the region, meeting the needs of the indigenous people, defining our domain and advancing our knowledge of the region. This is ultimately more achievable than militarizing the Arctic and will also help focus the government on settling land claims with the Inuit which ultimately strengthens Canada's sovereignty stance.

6.5 What do Canadians Believe?

The results of a poll on Arctic security, the week of January 26, 2011 by researchers at the Canada Centre for Global Security Studies at the Munk School of Global Affairs and the Walter and Duncan Gordon Foundation contained very interesting findings. The poll asked Canadians as well as citizens of seven other Arctic countries, “From what you know or have heard, is the Northwest Passage within Canadian waters, an international waterway or in dispute?” About three quarters of Canadians responded that it was the Canadian waterway the majority of respondents from the United States, Russia, Denmark (Greenland), Norway, Sweden, Finland and Iceland – said they didn’t know. These results must be somewhat disturbing for the average Canadian with whom it never occurred that the Northwest Passage could be anything other than Canadian waters. Ironically it appears the other polar nations population, if

representative of their fellow citizens, do not even have the issue on their radar. This calls into question the wisdom of the Canadian government using sabre rattling publicly both domestically and internationally make their policies on the Arctic known versus using their chair position of Arctic Council and diplomacy to make our case on the Arctic. The Canadian population imagine their government will ensure the security of the Arctic and likely believe there is a continuing role for the Canadian military there, perhaps even a heightened one but it is an expensive strategy of doubtful result against superpowers.

6.6 Failure to Launch

Despite the ongoing rhetoric of the Harper leadership with promises of major capital projects in conducting northern exercises, well attended by the media, these apparent displays of force and persistent surveillance in the Arctic somehow seem ineffectual. What is missing in part is actually delivering on announcements and ensuring a long-term dedication of the resources necessary. Successive Liberal and Conservative governments have a long history of making announcements that do not come to fruition.

Perhaps the worst debacle of all was the cancellation of an existing contract to Cormorant SAR helicopters by the newly elected Chretien government to replace the aging Labrador helicopters desperately needed to maintain search and rescue operations. Not long after that one of these aging helicopters crashed killing all aboard, it was only then that the Liberal government began seeking a contract for much stripped-down model of the Cormorant. To add to the debacle according to CBC reports that the cancelled contract probably cost more to the Canadian taxpayers due to contract cancellation penalties and they were capable original aircraft would have cost (CBC, 2005).

Canadians are currently observing similar problems with the government's commitment to build a deep water fuelling dock and facility in Nanisivik and other capital projects. In the case of the Prime Minister's announcement in 2007 of the new Nanisivik facility for Arctic Bay, it promised major upgrades to the jetty, offices and accommodations including a capacity for two years fuel for CCG and DND. In February 2012, however CBC news reported that all work on the jetty had been postponed indefinitely, fuel storage capacity has been slashed, and the only building will be an unheated storage unit (CBC, 2012).

In addition the government released the National Shipbuilding Strategy and the successful bidder from the results of a Request for Proposals, was announced in October 19, 2011. This long-term program for the construction of a fleet of vessels for both the Navy and the Canadian Coast Guard with the Navy's Arctic component being 10 Arctic Offshore Patrol Ship (AOPS) which would only become capable of making way in first-year ice and the long overdue RCN Joint Supply Ships (Public Works and Government Services Canada, 2011).

The difficulty with these two purchases is the project management has been fraught with delays and it would be difficult to predict when either ship will be operational. As is common with government capital projects there are pundits who did not agree with the mission profile or statement of requirement for the AOPS, but what is surprising is that this number included Rear Admiral (Ret) Dan McNeil. He suggested that equipping CCG icebreakers with 50 calibre machine guns would provide an inexpensive, if only short-term show of force for sovereignty until a well-thought-out policy could be drafted (Lambie, 2006). In fact the Senate holds that the current design of the AOPS will require Coast Guard icebreaking support to extend their geographical reach and the length of their operating season which draws into question if these vessels are mission adequate (Government of Canada, 2009, pg 33).

Given the discordant commentaries on the design for the AOPS perhaps if they sought more diverse involvement our leadership would be surprised at how much wisdom can come from the general population, as well as the rank-and-file government public service. If the statement of requirement the AOPS are an appropriate solution to fulfill a need, then it begs the question just how quickly it gained the derogatory moniker of "slush breaker".

Many Canadians may remember the announcement of the new icebreaker announced for the Coast Guard in 1970 that was to be the CCGS Louis St-Laurent which was to be replaced with the \$450 million Polar Program 8 Icebreaker Program that never came to fruition due to a reassessment of priorities and budget cuts (Honderich, 1987). Now another government, in the final stages of an expensive war in Afghanistan had announced the acquisition of another large icebreaker only to recently prioritize the construction of the RCN's Joint Supply Ships ahead of the CCGS Diefenbaker. This delay will result in the CCGS Louis St-Laurent requiring service life extension costing approximately \$55 M and delay the delivery of her replacement until 2024 while all other classes of icebreakers continue to require more maintenance and experience more serviceability challenges (Public Works and Government Services Canada 2013).

The consequences associated with the delays and reductions of these current capital projects, though not as critical as the human cost of the SAR helicopter replacement program they continue the Canadian government's less than stellar track record. These practices demonstrate a readily recognizable pattern that is observable both as not necessarily being linked to partisan politics and spanning multiple terms of office of governing parties. If the federal government of Canada wishes to maintain their credibility domestically and internationally, not to mention re-establishing the confidence of the Canadian people, then a solution to correct this disturbing phenomena must be created and implemented.

Professor Huebert suggests that it would be a wise decision to re-evaluate the Arctic Strategy 2000 and have some thoughtful debates on military build-up in the Arctic (Huebert, 2010). Although I share Huebert's belief that dialogue must be reopened, I believe it must be more inclusive with the indigenous population, RCMP, Canadian Coast Guard and all other stakeholders. Perhaps it is time to seek a solution for both our sovereignty and security requirements using the whole of government approach that has served us so well in search and rescue and environmental response. It is time that the nation the size of Canada, recognize their limited funding envelope and show leadership by becoming very strategic in investments such as the National Ship Procurement Strategy and frame the discussion to include constabulary needs as well as airlift requirements to name just two areas.

6.7 Search and Rescue (SAR)

Notwithstanding the search rescue helicopters mentioned in the previous item, search and rescue in the Arctic has issues of a geographical and meteorological nature along with the effects of polar ice. The federal government obviously did not create these effects but they can be held accountable for the minimal effort they have taken to prevent or minimize the impact of accidents or incidents resulting from them. This is perhaps a result of the fact that until the world experienced the effects of climate change, polar states worldwide only had to deal with shipping traffic for short periods of time in the summer due to sea ice. The world is experiencing longer periods of ice free water over larger areas in the Polar Regions, which has resulted in an increase in international and destination shipping in the Arctic. Prior to climate change basic triage capabilities such as nurses and medics were all one would expect to find in the mostly small northern communities, however since that time many of these smaller communities have become

larger towns with populations requiring hospitals. The smaller outlying villages also require more advanced means of healthcare delivery, such as Licensed Practicing Nurses.

The reason for the growth of the communities is varied, but many can be attributed to the absence of ice in the Arctic that permits more readily accessible shipping options for resupply, tourism and allows for resource exploration and exploitation in areas not previously accessible by water. The downside to this scenario is it increases the likelihood of incidents of the search rescue the polar nations find difficult to respond to because of large distances and long transit times for the aircraft to the relatively long time a ship can take to get on scene. Personally, having spent considerable time pondering what would be the ramifications of a transpolar flight crash, with survivors or the abandonment of a passenger ship in the high Arctic; it would challenge any of the polar nations to mount an effective response.

Canada has already had to respond to a SAR incident involving a cruise ship in the Arctic namely the passenger vessel Clipper Adventurer with 128 passengers on board that ran aground in Coronation Gulf, Nunavut in August of 2010. The nearest rescue vessel was the CCGS Amundsen which was some two days away which is not an unusual situation to have vessels distant from one another in the Canadian Arctic. There are two fundamental challenges associated with search and rescue coordination and response in the Arctic, namely severe weather conditions and transit times of responders which influence survivability of casualties. Fortunately for all concerned the weather remained relatively calm during the transit time for the Coast Guard and all passengers were successfully and safely evacuated by the Canadian Coast Guard.

The Transportation Safety Board of Canada (TSB) findings from their investigation into the grounding of the M/V Clipper Adventurer illustrated dramatic changes in statistics for

passenger vessel traffic in the Arctic in the seven years between 1980–1987. During this period there were only four Arctic passenger voyages, and these were conducted by one passenger vessel however, in the past seven years, there have been a total of 105 distinct voyages, conducted by seven different passenger vessels. During this time, there has been an average of nine passenger vessels per year conducting a total of 15 voyages per year. With approximately 105 passengers per voyage, there are at least 1575 passengers in the Arctic every year. Passenger vessels are also considered high risk since, among other consequences; an emergency in the Arctic could leave passengers and crew stranded for an extended period of time in a harsh environment.

It is expected that with the continued melting of polar ice in the future, traffic will increase as vessels (particularly foreign flagged and crewed) increasingly use the Northwest Passage, and new and previously inaccessible areas open up for passenger ships to visit. Given the remoteness of the region, the navigational challenges of the Arctic, and the potential unfamiliarity of foreign crews with Arctic navigation, the Board is concerned that if up-to-date information about hazards to safe navigation does not reach vessels resulting in passengers, crew and the environment placed at increased risk.

It was largely as a result of the polar nation's involvement with the Arctic Council, that these shared issues raised to the most senior leadership of their own governments. In 2011, the Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic was signed by all the Arctic Council nations, acknowledging that no sole nation could manage a major disaster alone in such a vast expanses and harsh conditions (Arctic Council, 2011b).

This agreement is not the first international accord in which Canada was both involved and took a leadership position in implementing. The International Aeronautical and Maritime

Search and Rescue (IAMSAR) Manual adopted jointly by the International Maritime Organization (IMO) as well as the International Civil Aviation Organization (ICAO). This manual provides an international framework for both airmen and Mariners that can be used to have in common way to plan and conduct air-sea SAR operations and is found in Safety of Life at Sea Convention Chapter V (IMO, 1993).

The concept of cooperation aside, each nation bears the responsibility for the territory within which they have agreed to provide SAR control and response capabilities. In Russia where they expect to see much more rapid growth in shipping traffic in the upcoming years they have not hesitated to move ahead with creating new facilities from which to coordinate and stage SAR operations. In 2011, the Russian government in expectation of dramatic increases in traffic along the Northern Sea Route, created projects that committed \$28US million for the creation of ten centers for search and rescue along the Northern Sea Route which will employ approximately 980 personnel by the project end date 2015 (Barents Observer, 2011).

Here in Canada, the demands of increased shipping on the SAR system is especially demanding in the Arctic region due to the survivability of victims, only lengthy transit distances with resulting low response times which forces victims to be prepared to survive by their own devices until help can arrive. To date there are no concrete plans in Canada to enhance Arctic response capability and capacity and given the increases in cruise traffic and number of passengers the risk to life is high.

One last insightful comment attributed to Danish Rear Admiral Kudsk that "Experience from Antarctica shows that you need a cruise ship to rescue a cruise ship - no other vessels have the capacity. So we are advising cruise companies to cooperate and sail in pairs in Greenland waters". Canadian authorities might well take notice of this and the fact that the Danish Navy's

station to their heavier class vessels on the Western and Eastern coasts of Greenland fearing a disaster with cruise vessels.

6.8 Salvage and Environmental Response

The recent incident with the Clipper Adventurer in August of 2010 in the Canadian Arctic has also demonstrated the absence of appropriate salvage capacity in the high Arctic. One hopes that it served as a wake-up call for underwriters, business community, ship-owners and of course the federal government of Canada for what could have occurred with worse weather or had the vessel been more severely damaged (Transportation Safety Board of Canada, 2010). All of these stakeholders play vital roles in containing and cleaning up oil spills, arranging for salvage and repair of vessels and of course paying the related costs.

In the spring of 2013, the Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic was signed by the governments of Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden, and the US. The Agreement, will strengthen cooperation among states in the event of an oil pollution incident in the Arctic region in much the same fashion as did the Aeronautical and Marine SAR (IMO, 1993). The remaining deficiency however, is that cooperation does not necessarily increase the salvage and the oil spill cleanup resources in proximity to any given spill prior to its occurrence. Therefore this does not greatly improve spill mitigation because of distance and response transit time issues. The other aspect of emergency response for oil is that both the presence of sea ice in low water temperatures in the area environment presents challenges to the recovery efforts depending on the product spilled, the water temperature, the time of year and the availability of daylight just a few. A perusal of the gap analysis of response techniques in cold climates conducted for the National Energy Board of Canada, demonstrates challenges posed by the extremely wide array of

variables which can influence spill response planning. (S.L. Ross Environmental Research Limited, 2011).

Consequently, although this agreement facilitated by the Arctic Council amongst its members, is a satisfactory preliminary step towards the protection of the pristine Arctic environment from spills. Based on the precautionary principle, it is preferable to prevent damage to the environment by adopting regulations that govern both the construction Arctic vessels seeking access to the Arctic, ensuring there is appropriate response equipment and instructing proper infrastructure for the transfer of hydrocarbons in Arctic locales. Given that it is far more expensive and environmentally damaging to clean up an oil spill after one occurs versus preventing it in the first place.

6.9 Security & Surveillance

As was discussed in Chapter 5 there are no current sovereignty disputes over terrestrial territories in the Canadian Arctic except for Hans Island and as was mentioned prior, there still rests the Beaufort Sea dispute with the United States but perhaps the most precarious dispute revolves around the question of whether or not the waterways joining the Pacific and Atlantic oceans constitute internal waters to Canada or alternatively an international Strait. Based on this assumption there remains a limited basis to conduct surveillance in the Arctic and mitigate security risks, which under the Harper administration has consistently been an all hazards approach. This is best demonstrated by this government creation of the Government of Canada Operations Centre (GOC) which monitors all threats/risks to Canada and provides an interdepartmental forum to best make high level operational decisions (Public Safety, 2013). Recent moves by the Harper government as discussed in the previous two sections have noted two of these risks, with the last threat being national security from failing nations, terrorism and

criminality. Since the events of 9/11 the government of Canada has undertaken a series of initiatives including legislative changes to better prepare the nation to combat these threats to our security and sovereignty. At a very strategic level the government undertook to establish the Ministry of Public Safety, a portfolio ministry that encompassed the Royal Canadian Mounted Police Canadian Border Services Agency, Canadian Security Intelligence Agency and Public Safety Canada, the corporate entity for the department. It was clear by this grouping of agencies, as well as verbiage within the National Security Policy that the Liberal government of the time planned to respond to all threats to the country, whether cyber security, health or terrorism within the same portfolio, a practice that the Harper Conservative government has continued. It also proclaimed that the Minister of Transport would hold lead agency responsibility for all Marine safety and security initiatives, whereas the Public Safety Minister was designated lead agency with responsibility for enforcement and policing.

At the same time they designated the Minister of National Defense to be the lead minister for the coordination of on water responses to threats or crises within the Exclusive Economic Zone. The National Security Policy also assigned DND to lead a project to establish Marine Security Operation Centers in partnership with CBSA, transport Canada, the RCMP, and the Canadian Coast. The notion was that MSOC's would become information fusion centers where the agencies that collected the most Marine transportation information would be co-located in collaborative environment. There was also funding allocated to DFO, CCG, and DND to increase aerial surveillance activities to provide better situational awareness of activity on and around the water some of which was used to increase northern presence (Department of Public Safety and Emergency Preparedness 2004). A cursory review of these initiatives appears straightforward; nonetheless there are distinct regulatory and legislative limitations to both the MSOC initiative

as well as use of DND for surveillance in domestic waters. Having reviewed this legislation, the first of two aspects that stand out as it relates to DND involvement in domestic security and law enforcement are that the National Security Policy did not provide any increase in national defenses ability to act without Minister to Minister request under the Criminal Code of Canada and DND could only be called upon only when “the matter cannot be effectively dealt with, except with the assistance of the Canadian Forces” (Defence Act 1985. S273.6 [1-4]). Parliament amended the National Defence Act, by adding re-defined terminology such as “terrorism” by simply referencing the Criminal Code of Canada which seems to reinforce the notion that criminal or terrorist acts are the purview of the domestic agencies. This gives the impression that parliament had the opportunity to create a constabulary role for DND, but deliberately did not (Defence Act 1985. S2.1). Instead they continued to reinforce the customary use of the Criminal Code of Canada with existing domestic agencies.

This seems to indicate that for the most part and increased surveillance is not being applied for national defense purposes but to support domestic regulatory and enforcement agencies. In fact, one can only speculate upon how Canada would militarily respond to a warship exercising its proclaimed right to innocent passage through the Northwest Passage. The analysis of the possible actions the Canadian government could consider using should the Russians, Chinese or even the American would be best left to another in-depth scholarly debate.

The domestic security and enforcement efforts are fraught with ample challenges in carrying out surveillance in the Canadian Arctic due to the sheer size of the region. By extension these challenges have a tremendous impact on the cost of surveillance to maintain domain awareness and to demonstrate a Canadian sovereign presence. It is only logical that a small nation such as Canada should use a whole of government approach to such an undertaking, yet in

the face of these challenges, Huebert ruminates that recent reductions in national defense budgets have eliminated a large proportion of military programs that provided presence in the Arctic. He bases his conclusion on the loss of capacity for long-range patrol deployments of DND's CP-140/C P140A Aurora and Arcturus aircraft. Nonetheless, the mitigating initiative by the Harper government has allocated extra funds to DFO and Transport Canada to increase their capacity to patrol in the Arctic however they do not replace the DND capability to have 10 to 12 hour controls over 9000 km without refueling. They are however, equipped with quite capable, modern electronic surveillance packages according to a CBC report describing how Transport Canada aircraft using their electronics caught and charged a Cypriot register vessel who spilled a mere 50 L of oil at sea (CBC, 2007). It seems that recent comments from military officials advocating the use of drones for coastal and Arctic surveillance along with transport Canada and DFO aircraft provide the most economical yet effective blend of resources (Campion-Smith, 2013). Despite comments by Defense Minister Peter MacKay in 2012 that seemed to indicate that his department was in the market for UAVs capable of Arctic operations, DND has yet to provide any announcement for a possible timeframe for any such acquisition (Aviation Week, 2012).

The second means conduct surveillance is by the use of surface vessels whether the Royal Canadian Navy or the Canadian Coast Guard to maintain an Arctic presence and project Canadian sovereignty. Huebert has asserted that neither their DND's submarines nor surface vessels possess the capability to operate in Arctic waters and the reality is that the Canadian Coast Guard with their fleet of icebreakers shoulders the responsibility for Arctic patrols on water (Huebert 2011).

There are two differing views on how to best spend taxpayers money on surface coverage in the Arctic with one supporting the Harper government's proposed Arctic Offshore Patrol Ships (AOPs) for the Royal Canadian Navy while the other would prefer to see those funds spent to furnish the Canadian Coast Guard with at least two more Diefenbaker class ice breakers. An article in Frontline Magazine is fairly representative of those who support supplying of 6-8 AOPs stating that having armed, military warships capable of operating in first-year ice to carry out sovereignty, search and rescue, environmental response patrols and to enforce Canadian law with the physical force to back up our assertions. The article acknowledges the naval vessels slow speed but argues this can be compensated for with fast helicopters, satellite and aerial surveillance, however this argument as flawed is a Coast Guard ship also could be equipped likewise (MacLean 2012).

Senator Colin Kenny holds a differing view asserting that the Navy has already been reduced in size and that further expanding their mandate would weaken their ability to mount their other primary mount mandates. He cites research done by his staff which shows the Canadian Coast Guard could get 3 to 4 heavy icebreakers with the same amount of money being used on the dubious AOPS producing a greater protection Canadian sovereignty in the Arctic (Hamilton Spectator 2012). The Senate security committee also reviewed the choice between icebreaker from a fiscal point of view and according to witnesses even a cursory cost/benefit analyses demonstrates that a 250 person crew is far more expensive than the ~30 person crew of the Coast Guard icebreakers. On the fiscal side, even a cursory cost/benefit analysis of just crewing costs demonstrates that the costs of DND conducting coastal patrols are prohibitive. They hesitate to given a constabulary mandate which would not come with the same legal constrictions of using DND in a domestic enforcement capacity and they state that they have support from some

defense representatives, industry, academia and even the unions representing the Canadian Coast Guard (Standing Senate Committee on National Security and Defence 2003). Despite the often passionate views on either side of the RCN versus CCG solution to Arctic sovereignty and law enforcement, given the government's propensity to move forward with capital projects in a timely manner as discussed in section 6.5 *Failure to Launch*, the debate could be rendered moot by changing climatic or world events.

Chapter 7.0 Final Thoughts

This paper has discussed at length the metamorphosis the Arctic has faced over the past decades as the ice recedes and the southerners migrate north seeking to exploit the wealth of natural resources found there and awaiting the opening of fabled Northwest Passage to the Orient. The latter of the two has sparked endless debates in both the mainstream media and academia ranging from alarmist to pragmatic concern over Canada's legal and sovereign rights. The only action with any certainty to end the debate is to submit the matter to the International Court of Justice for resolution. As respected lawyers such as Pharand have observed, Canada's case is one built literally and metaphorically on thin ice and any decision is likely to set an international precedent that may not favor Canada. The NWP, unlike most international strait cases such as the Corfu decision only navigable by vessels, whilst the Inuit of Canada have not only used it for transportation, but also have lived upon it for millennia. This situation will force a decision of right of way never before encountered and a clash of ancient historical claim to the area predating European statutes. So the conundrum Canada faces is to roll the dice of deal with successive crisis with no clear strategy.

Canada has previously taken the bold step of enacting the Arctic Waters Pollution Prevention Act which although not formally accepted by nations, they did nothing more than issue rhetoric to enunciate their denial of recognition of Canada's on record. In fact the American and Canadian governments signed an agreement as mentioned earlier to "agreed to disagree" establishing process to avoid conflict but still permit access to the Arctic. This strategy of avoidance has worked today however there is no guarantee that it would continue into the future with many more international players taking an interest. As fate would have it on the fortunate

side the open water has arrived in the Northern Sea Route ahead of the Northwest passage thereby buying Canada time to both learn and to prepare for the invasion of industry and tourism. Notwithstanding Canada's questionable footing on the NWP not being considered an international Strait, there have been a number of recent signs that although there is an appetite to use the NWP, they are not prepared to take on the burden of stewardship. Two of these recent examples which were largely as a result of the activities of the Arctic Council were the *Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic* the *Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic*. I therefore propose that it is probable that as long as Canada does not prevent commercial access to the Arctic nor make accessing the region uneconomical, then it is unlikely that any nation will be motivated to their own risk going before the International Court of Justice. It is to support this notion that I conducted a review of the current Canadian policy stance on the Arctic and those programs that are fundamental to the support and good governance of the region.

My critique in this chapter of the search and rescue, environmental response, and security programs of the federal government have highlighted deficiencies that I believe must be addressed to enable effective, destinational shipping in the Arctic in the future. The federal government has both a domestic and an international responsibility to establish functional capability and capacity to provide response and stewardship in the North. I have found no fatal flaws the federal government's strategies strategy or vision documents however it is in the delivery of these goals that there is a great deal of room for improvement. Although I have been critical of the choices for investment in infrastructure and capital projects such ships and aircraft the opinions I hold were developed from what I have heard, read and discussed with others and are inevitably biased as are other viewpoints. I propose that no matter which side of the Northern

Strategy one holds most would likely agree that the federal government's failure to acquire the assets and infrastructure in a timely manner has caused the implementation to fall dangerously behind. It may be pessimistic but it is unlikely that any government in the near future will conquer the curse of the four year political vision. The somewhat simplistic solution of course is to enumerate more detailed deliverables and timelines falling from the high overarching policy statements and also hold one Minister accountable for the coordination necessary in achieving these goals.

Despite this handicap, there is room for improvement within the ranks of senior and middle level bureaucracies in coordinating their tasks using what has become known as the whole of government approach to solving problems. One mechanism that is shown promise is the formation of the Interdepartmental Marine Security Working Group (IMSWG), established as a forum for identifying coordinating federal government actions within the scope of maritime security.

To be clear this working group is specific to maritime security however it is the concept that I am proposing for the model at each level of governance to improve communication, minimize communication silos and to make the best use of scarce resources whether they be federal provincial or territorial.

One notable example is IMSWG which is chaired by Transport Canada and has sought to devise solutions to address organized crime, public security and anti-terrorism activities through the work of the main group, as well as subcommittee's established to deal with specific issues as they arise. This group maintains representation from the Public Safety portfolio agencies, DND, CSIS, CCG, and DOJ to name just a few and by their collaboration they seek common interests within their mandates to become more effective in responding to threats as well as achieving

savings by attempting to reduce duplication of service (Legros, 2013). Much like the difficulty combating asymmetrical threats in the security world, the Arctic programs carry with them huge challenges related to both weather and distance however if all departments with northern mandates could establish working relationships similar to IMSWG, then perhaps improvements on the delivery of this National Strategy could be minimized.

There are a number of common themes that flow throughout this document which outline the deficiencies and a number of aspects of Arctic affairs as well as the challenges and impediments to resolving them. It matters not whether one discusses icebreakers airports or warships is potential solutions international challenges in the Canadian Arctic, the common thread is that none of these solutions comes without an enormous price tag. Government agencies are required to work within extremely structured and bureaucratic frameworks that do not engender cost savings nor the speed of delivery the private sector enjoys. Secondly these extremely detailed and complex procurement systems and financial reporting systems force government planners and managers into artificial time frames to match political agendas versus project-management agendas. Therefore government agencies such as Public Works and Government services Canada are held to timelines that are shaped by political mandates, so up until this last majority government they had been essentially looking at two-year planning cycles. These time frames combined with changes in mandates and sometimes changes of government make for an unwieldy and inefficient system and renders understandable project delivery failures. Until these realities of politics can be addressed this however will remain the domain of public servants must work in along with those wishing to do business with the government. When one includes the other challenges such as geography whether and other levels of

government it is virtually impossible for the federal government to utilize a cookie-cutter approach to project management.

That being said, there are successful programs being implemented, such as the example of when the government of Nunavut and Fisheries and Oceans Canada identified that they required proper harbor facilities for the fishing fleets working near Baffin Island. In response the federal government is supporting the development of fisheries harbor in Pangnirtung. This one small step could greatly aid the development of the fishing industry in the North by the provision of suitable infrastructure to load and offload their catch and supplies. In addition, Territorial governments receiving aid in broad range of infrastructure programs including broadband, Recreational and Green infrastructure, to lay a much-needed foundation for a growing North. Together, these investments contribute to a stronger economy, a cleaner environment and more prosperous communities through annual unconditional funding just over \$2.5 billion and very importantly the funding helps allow them to determine their own needs (Government of Canada 2009).

Just like in the South, it is a mammoth effort required to update existing infrastructure and create new facilities and services such as hospitals, schools, infrastructure and social services. The federal government has been working with the territories by providing funding to improve the quality and availability of these institutional changes particularly in Nunavut, but with the evolving mineral and tourism increases by way of cruise ship it is hard to predict just how much capacity systems and infrastructure will have to bear. It may be the industry and government must partner to ensure essential requirements of the people and the industries are met.

I have highlighted several key infrastructure issues which need to be addressed in the near future should Canada wish to maintain its stewardship in the Arctic namely rescue, environmental response and salvage base(s) strategically located for instances of distress and salvage such as was the case with the M/V Clipper Adventurer. To be truly effective such basis must also have an airlift facility co-located for both salvage support and major casualty evacuation capacity. One idea that may have merit would be to partner with industry using the P3 funding model which has had some measure of success in the South realizing of course it would be more challenging in the Arctic environment. Currently the Canadian Coast Guard does not charge Marine Service Fees for Arctic shipping and that may have to remain the case into the future if the federal government wishes to encourage resource development in the destination shipping industry needed to support such an endeavour.

Finally, much as the science community is warning that we are at or have passed the tipping point for climate change recovery, so too are we approaching the related but secondary tipping point that is a call for action from the federal government of Canada. The Russians, as discussed earlier have seen the opportunity and unlike Canada recognized that there was a deficiency of infrastructure and have begun to slowly develop governmental facilities in their region and construct new icebreakers. The Government of Canada must soon move to address the governance and infrastructure issues or they will miss this valuable lead time to take advantage of the opportunity for prosperity and to protect their nation's environment and people. It would be wise to make good use of their fortuitous opportunity as the chair of Arctic Council to advance their agenda and build bridges with their Arctic partners.

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Appendix 1.

Indigenous Arctic Peoples. (Arctic Council, 2012)

Group	Geographic Regions	Nations	People	Goals
Inuit Circumpolar Council	Greenland/ Denmark, Canada, Alaska/USA and Chukotka/Russia	Denmark, Canada, USA and Russian Federation	150,000	Unite circumpolar Inuit; Promote Inuit rights/ interests internationally; Ensure long-term policies that safeguard the Arctic environment; Full and active role in the political, economic, and social development of circumpolar regions (Arctic Council, 2012)
Aleut International Association	Formed by union of the Aleutian/Pribilof Islands and the Association of the Indigenous Peoples of the North of the Aleut District of the Kamchatka Russian Federation (AIPNADKR).	United States Russian Federation	3500 (circa 2003)	The organization goals are to address: environmental and cultural concerns of the extended Aleut family of the Bering Sea for millennia. Russian and American Aleuts share a need to understand global processes, such as trans-boundary contaminants transport, the impacts of climate change, and the effects of fisheries on the ecosystem of the Bering Sea (Arctic Council, 2012a).
Russian Association of Indigenous Peoples of the	Represents some 41 Indigenous Peoples of the	Russian Federation	300,000	Goals are: to protect indigenous peoples' human rights,

North (RAIPON)	Russian North			defend their legal interests, assist in solving environmental, social, economic, cultural and educational issues, and to promote their right to self governance (Arctic Council, 2012b).
Saami Council	Is a representative body for co-operation among all the Saami people.	Norway, Sweden, Finland and the Russian Federation.	100,000	The primary aim of the Saami Council is to: promote Saami rights and interests in the four countries where the Saami are living, attaining recognition for the Saami as a nation, maintaining their economic, social and cultural rights in the legislation of the four states and international laws in general (Arctic Council, 2012c).
Gwich'in Council International (GCI)	Northwest Territories, Yukon and Alaska	Canada, USA	9,000	Established by the Gwich'in Tribal Council its goals are: to ensure all regions of the Gwich'in Nation are represented at Arctic Council, play an active and significant role in the development of policies that relate to the Circumpolar Arctic. priorities include the environment, youth,

				culture and tradition, social and economic development and education and economic development and education (Arctic Council, 2012d).
Arctic Athabaskan Council	Northwest Territories, Yukon, Nunavut and Alaska	Canada and United States	45,000	The Arctic Athabaskan Council (AAC) is an international treaty organization established to defend the rights and further the interests internationally of American and Canadian Athabaskan member First Nation governments in the eight-nation Arctic Council and other international for a (Arctic Council, 2012e).

Appendix 2.

CHRONOLOGY OF SOVEREIGNTY EVENTS (Carnaghan and Goody, 2006).

1880 - Arctic Islands order in council proclaims Canadian sovereignty over all British territories in North America.

1969 - Voyage of U.S. tanker S.S. Manhattan through the Northwest Passage.

1970 - Canada passes the Arctic Waters Pollution Prevention Act, declaring Canadian regulatory control over pollution within a 100-mile zone.

1973 - Canada and Denmark agree on “delimitation of the continental shelf” between Greenland and Canada.

1985 - Voyage of U.S. icebreaker CGS Polar Sea through the Northwest Passage.

1985 - Government of Canada announces plans to acquire “Polar 8 icebreaker.”

1987 - Canada’s 1987 White Paper on Defence announces plans to acquire 10-12 nuclear submarines.

1988 - Canada and United States reach an agreement on “Arctic Cooperation,” which pledges that voyages of U.S. icebreakers should seek consent from Canada.

2000 - Government of Canada releases The Northern Dimension of Canada’s Foreign Policy, including policy of asserting Canadian sovereignty in the North.

2003 - Canada ratifies United Nations Convention on the Law of the Sea (UNCLOS).

2004 - Arctic Climate Impact Assessment (Arctic Council) is released.

2004 - Speech from the Throne, announcing a “northern strategy.”

2005 - Canada’s Minister of National Defence visits Hans Island in July.

2005 - A U.S. nuclear submarine voyages to the North Pole in December, possibly travelling through Canadian Arctic waters.

2009 - Canada’s Northern Strategy Our North, Our Heritage, Our Future

Appendix 3.

NORTHERN STRATEGY COMMITMENTS

Report of the Standing Senate Committee on Fisheries and Oceans. (2009). Controlling Canada's Arctic Waters: Role Of The Canadian Coast Guard.. Committee Business, Senate Reports) 40th Parliament - 2nd Session December 2009.

Recent Northern Strategy Commitments

Sovereignty Strengthening Our Presence

- \$720 million to procure a new Polar Icebreaker – the CCGS John G. Diefenbaker
- Procuring new Arctic/Offshore Patrol Ships
- Expansion and modernization of the Canadian Rangers
- Establishing a Canadian Forces Army Training Centre in Resolute Bay
- Establishing a deep-water berthing and fuelling facility in Nanisivik
- Launching RADARSAT II satellite
- Ongoing military exercises and surveillance operations such as Operation Nanook
- Enhancing our Stewardship
- Introducing new ballast water control regulations
- Amending the Arctic Waters Pollution Prevention Act
- Making reporting mandatory for all vessels under NORDREG
- Defining Our Domain and Advancing Our Knowledge
- An additional \$40 million over four years to fund scientific studies to determine the full extent of Canada's continental shelf as defined under UNCLOS

Economic and Social Development

Supporting Northern Economic Development

- \$50 million to establish an Economic Development Agency for the North
- \$90 million for the renewal of the Strategic Investments in Northern Economic Development program
- Launching the Northern Regulatory Improvement Initiative
- Issuing \$1.8 billion in offshore oil and gas exploration licenses in the Beaufort Sea
- \$120 million over two years to extend the Mineral Exploration Tax Credit
- Investing \$100 million in geo-mapping in the North to inform and guide the private sector in its mineral and petroleum exploration efforts
- Increasing funding for tourism promotion and community cultural and heritage institutions
- Negotiating basin-opening financial support for the Mackenzie Gas Project
- Providing \$37.6 million in support of environmental assessments, regulatory coordination, science, and Aboriginal consultations related to the Mackenzie Gas Project
- Addressing Critical Infrastructure Needs

- \$42 million to establish a commercial fisheries harbour in Pangnirtung
- Investing in Northern infrastructure, including recreational and green infrastructure
- Extending broadband service to under-served communities

Supporting Northerners' Well-Being

- Investing \$200 million over two years for social housing in the North.
- \$20 million over 2 years to increase the daily residency deduction for Northerners
- Supporting the Aboriginal Skills and Employment Partnership Program
- Increasing funding by \$195 million between 2006 and 2009 to enhance Territorial Formula Financing
- Delivering the Food Mail Program
- Improving territorial health systems and reducing reliance on outside care
- Strengthening support to Canada's university granting councils for research in support of industrial innovation, health priorities, and social and economic development in the North.
- Establishing graduate student fellowships on Canada's role in the circumpolar world

Environmental Protection

- Being a Global Leader in Arctic Science
- \$156 million, the largest single country investment, for International Polar Year research
- Committing to establish an Arctic Research Station, including \$2 million to support a feasibility study for the research station
- \$85 million to upgrade the existing network of Arctic research infrastructure
- Signing a memorandum of understanding with the United Kingdom for cooperation in polar research activities
- Protecting Northern waters and lands
- Establishing conservation areas and national parks
- \$15 million over three years to create and expand protected areas in the Northwest Territories
- Supporting the Health of the Oceans initiative
- Accelerating action on the reclamation and remediation of federal contaminated sites across Canada.

Governance

- Made-in-the-North Policies and Strategies
- Negotiating and implementing land claims and self-government agreements with Aboriginal Northerners
- Providing the Right Tools
- Advancing devolution and implementation of agreements to build effective governance models

Source: Government of Canada

Appendix 4.

Other Levels of Government in Canada

Local or municipal government plays an important role in the lives of our citizens. Municipal governments usually have a council that passes laws called “by-laws” that affect only the local community. The council usually includes a mayor and councillors or aldermen. Municipalities are normally responsible for urban or regional planning, streets and roads, sanitation (such as garbage removal), snow removal, firefighting, ambulance and other emergency services, recreation facilities, public transit and some local health and social services. Most major urban centres have municipal police forces.

The **First Nations** have band chiefs and councillors who have major responsibilities on First Nations reserves, including housing, schools and other services. There are a number of provincial, regional and national Aboriginal organizations that are a voice for First Nations, Métis and Inuit people in their relationships with the federal, provincial and territorial governments.¹

Provincial, territorial and municipal elections are held by secret ballot, but the rules are not the same as those for federal elections. It is important to find out the rules for voting in provincial, territorial and local elections so that you can exercise your right to vote.

Government	Elected Officials	Some Responsibilities
Federal	<ul style="list-style-type: none"> Members of Parliament (MPs) 	<ul style="list-style-type: none"> National Defence Foreign Policy Citizenship Policing Criminal Justice International Trade Aboriginal Affairs Immigration (shared) Agriculture (shared) Environment (shared)
Provincial and Territorial	<ul style="list-style-type: none"> Members of the Legislative Assembly (MLAs) or Members of the National Assembly (MNAs) or Members of the Provincial Parliament (MPPs) or Members of the House of 	<ul style="list-style-type: none"> Education Health Care Natural Resources Highways Policing (Ontario, Quebec) Property and Civil Rights Immigration (shared)

Government	Elected Officials	Some Responsibilities
	Assembly (MHAs)	<ul style="list-style-type: none"> • Agriculture (shared) • Environment (shared)
Municipal (local)	<ul style="list-style-type: none"> • Mayor, Councillors or Aldermen 	<ul style="list-style-type: none"> • Social and Community Health • Recycling Programs • Transportation and Utilities • Snow Removal • Policing • Firefighting • Emergency Services