A Guide for Integrating *Inuit Qaujimajatuqangit* into Decision-making for Marine Shipping Development in Nunavut, Canada

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Abstract

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Shipping development in the Arctic region is becoming a topic of local, national, and international interest and is closely linked to other issues in the Arctic, such as climate change and natural resource exploitation. Shipping development is moving forward while the Inuit people of Nunavut, Canada remain closely connected to the land and sea, relying on the land and sea for culturally relevant subsistence hunting and fishing activities. *Inuit Qaujimajatuqangit* (IQ) is an Inuktitut term that broadly means Inuit traditional knowledge and encompasses all that Inuit know. IQ and its principles represent tools that can and should be used in the management of marine resources and activities. The Nunavut Land Claims Agreement (NLCA) provides the requirement for Inuit input on management decisions that may affect their ways of life. However, shipping development in Nunavut is seemingly advancing without much consideration for the Inuit people and their use of the marine environment. There is need for improved management of marine shipping in Nunavut in order to consider the direct and indirect effects of shipping on the environment and people at the local level. Considering the effects of shipping does not mean halting shipping development, but rather ensuring that shipping development moves forward in an environmentally sustainable and socially responsible way. It is recommended that marine managers responsible for shipping in Nunavut's waters gain an understanding of IQ and utilize improved methods for incorporating IQ into the decision-making process.

Keywords: Marine Shipping; Inuit; *Inuit Qaujimajatuqangit*; Traditional Knowledge; Nunavut; Decision-making; Shipping Management.

List of Abbreviations

AMSA: Arctic Marine Shipping Assessment

EA: Environmental Assessment

GN: Government of Nunavut

ICC: Inuit Circumpolar Council

IQ: *Inuit Qaujimajatuqangit*

MARPOL: International Convention for the Prevention of Pollution from Ships

NIRB: Nunavut Impact Review Board

NLCA: Nunavut Land Claims Agreement

NPC: Nunavut Planning Commission

NRCcan: National Research Council

NRI: Nunavut Research Institute

NWB: Nunavut Water Board

NWMB: Nunavut Wildlife Management Board

QIA: Qikitani Inuit Association

SOLAS: International Convention for the Safety of Life at Sea

STCW: International Convention on Standards of Training, Certification and Watchkeeping for Seafarers

UNCLOS: United Nations Convention on the Law of the Sea

UNDRIP: United Nations Declaration on the Rights of Indigenous Peoples

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Chapter 1: Introduction

1.1 Overview of the Management Problem

There is growing interest and many opportunities in the Arctic region for economic development. One such interest and opportunity is in the sector of marine shipping. Shipping development in the Arctic is being driven by many factors, including climate change and the search for natural resources. However, developments are occurring while indigenous people in the North continue to practice their traditional ways of life and rely on subsistence hunting and fishing activities. Therefore, Arctic shipping development is being met with concern over the protection of marine ecosystems and maintenance of indigenous peoples' ways of life.

There are a diversity of interests and issues that are unique to the Arctic region as a whole, ranging from the international to the local scale and cover sectors such as socioeconomics, policy, and the environment. Perhaps the most unique feature of the Arctic, and the Canadian territory of Nunavut in particular, is the dominant population of indigenous people and their continued reliance on country foods obtained through traditional livelihoods. With all of the combined interests and issues in the Arctic, management of resources and activities becomes very complex.

Shipping activity is expected to increase in Nunavut, but at the same time there appears to be little appreciation or understanding of traditional knowledge in the region by shipping decision-makers. It is legally required under international and national mandates to include indigenous people in decisions which could affect their traditional and current ways of life. Due to the possibility that Arctic shipping activity might negatively affect the marine environment and ecosystems that Inuit people rely on for food and cultural purposes, development of shipping needs to be undertaken with

consideration of Inuit use of marine space and resources. For the purpose of this paper, "shipping" will refer to all types of Arctic marine shipping unless otherwise specified.

This study proposes that indigenous traditional knowledge, otherwise known as *Inuit Qaujimajatuqangit* (IQ) in Nunavut, can be used as a management tool to augment existing information that is available to decision-makers, meaningfully include Inuit people in decision-making, and improve overall management of marine shipping. By incorporating IQ and local people in the decision-making process, impacts on the environment and traditional ways of life can be minimized. This being said, it is not readily apparent whether or not IQ is currently being used, or how it is being incorporated into decision-making for shipping. For the purpose of this paper, the terms traditional knowledge and IQ may be used interchangeably due to their similarities and use in other publications.

1.2 Climate Change, Resource Development, and Shipping

Development of shipping in the Arctic is being driven by many factors. Two key factors, climate change and natural resource development, will be discussed here.

Climate change in the Arctic is resulting in more drastic environmental changes compared to the reset of the world. Warming effects are amplified in the Arctic region where air temperature has increased twice as fast as the global average, sea-ice extent has decreased about 35% since 1979, and sea ice thickness in late summer has declined about 40% since 1958 (Lemke, 2012). Indeed, 2012 represented the lowest sea-ice extent in Canada's Arctic in over 40 years (Figure 1).

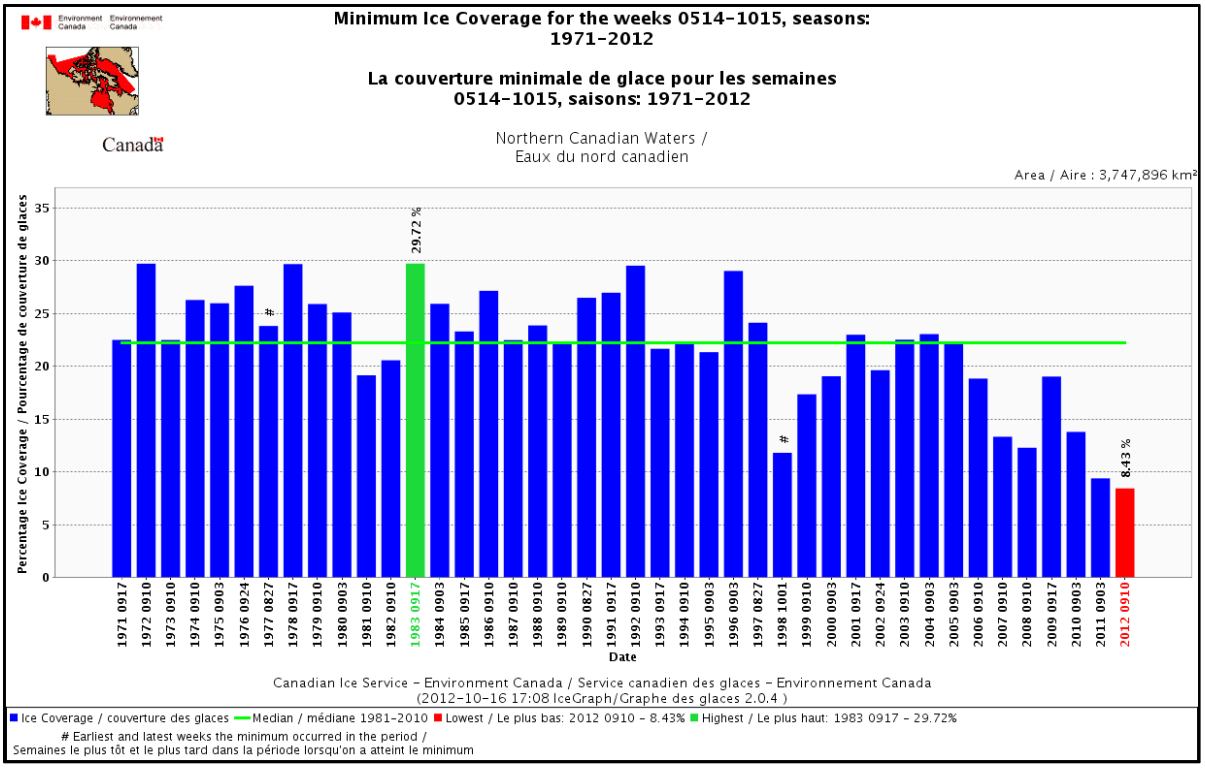

***Figure 1*. The lowest ice cover extent since 1971 was recorded in 2012 (Environment Canada, 2012).**

A reduction in sea-ice extent is presenting the opportunity for establishment of new, previously inaccessible shipping lanes and allowing shipping activity to increase in the Arctic (Wilson, Falkingham, Melling, & Abreu, 2004; Corell, 2006; Stroeve et al., 2008; Ho, 2010). Opening of new shipping lanes, especially through the Northwest Passage has sparked international interest and consequently raised concerns of Canada's sovereignty over this area. Canada claims full sovereignty over the Northwest Passage sea routes (Pharand, 2007; Chircop, 2009; Lasserre, 2010a). The European Union and the United States, on the other hand, deny this claim and both regard the Northwest Passage as an international strait, placing it under international jurisdiction (Pamel, 2012).

Climate change and its effects on the environment and people are the focus of much research in the Arctic. Bolton et al. (2011) identify six sector categories that will

likely be impacted by climate change in the Arctic: (1) infrastructure and transportation, (2) health and wellbeing, (3) business and economy, (4) culture and education, (5) hunting and subsistence harvesting, and (6) institutional and resource management. While the potential direct impacts of climate change are widespread and warrant considerable attention from academics and managers, the indirect effects of climate change in the Arctic, such as increased resource exploitation and shipping, remain largely unexplored (Cameron, 2012).

The world's growing population and demand for natural resources is driving development in remote and previously undeveloped regions, such as the Arctic. Following natural resource development is the need for increased shipping to deliver supplies and export products to market. Marine shipping is the preferred method for moving supplies and products around the world because it is more cost effective than other modes of transportation. It is also the most feasible option in the Arctic due to the limited accessibility of most communities and the lack of infrastructure for other modes of transportation (Marisec, n.d.; Prowse et al., 2009).

1.3 Shipping and the Inuit

The management of shipping in the Arctic region is a complex mosaic of international, national, regional, and local perspectives. Shipping is often considered an international industry, with the global economy relying heavily on marine transport of goods (IMO, 2013a). While this is true, ships move through multiple jurisdictions, including the exclusive economic zones (200 miles from the baseline onshore) and territorial waters (12 miles from the baseline onshore) of coastal states, and can impact people at the local level. Currently, shipping activities in Canada's Arctic include both

international and domestic activity, namely port development, marine-based cruise tourism, and shipping related to resource development projects including mining and oil and gas extraction (Borgerson, 2008; Lasserre, 2010b).

Nunavut's land is sparsely populated and natural resources within the territory remain largely undeveloped; therefore, new development comes with uncertainty regarding the potential impacts on the fragile Arctic environment and Inuit people (Verhaag, 2002; Mayer, 2007). These potential impacts need to be considered and addressed collaboratively with Inuit people throughout shipping development projects. Nunavut as a territory is slowly assuming a greater role in decision-making when it comes to management of natural resources and shipping through devolution of power from the federal government. Frameworks for incorporating traditional knowledge systems of the Inuit into development may help to work towards sustainable development and socially responsible management (Mayer, 2007).

The Inuit are closely connected to the marine environment, with communities in Nunavut being located almost exclusively along the coast (Figure 2) (Smith, 2009). To the people, marine space and sea ice has always been considered an extension of the land. The Inuit use the sea ice for travel and as a platform for hunting and fishing purposes. These subsistence hunting and fishing activities are significantly important to Inuit culture and for providing food and other materials for the community (Smith, 2009).

***Figure 2*. Locations of communities in Nunavut. Retrieved from http://env.gov.nu.ca/nunavutmap.**

In keeping with the principles and intent of the international *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP) (UN General Assembly, 2007) and the federal *Nunavut Land Claims Agreement Act* (NLCA), local Inuit people must be consulted before shipping and port development moves forward. Consultations can be used to assess the Inuit use of the marine environment and minimize the possible negative impacts of shipping on their activities. *Inuit Qaujimajatuqangit* (IQ) may provide valuable information about the marine environment for managers and work to lessen impacts on the environment and Inuit ways of life.

Additionally, Inuit use and occupancy of the Arctic marine environment is often used as an argument for Canadian sovereignty over Northern waters. However, this

argument cannot be considered valid if Inuit use and control over this environment is hindered or taken over by other users (Mifflin, 2008, as cited in Fenge, 2013). Therefore, in addition to helping recognize indigenous rights and uphold treaty agreements, Inuit influence over marine management, including shipping, can serve to strengthen Canada's claim to sovereignty in Northern waters.

In order for IQ to be integrated into the management of marine shipping in Nunavut, and the Arctic more broadly, some obstacles must first be overcome. While land claims agreements have made legal progress on land, Inuit claims to the sea have not been so successful. The Inuit are facing a sort of "double jeopardy" when it comes to controlling their marine territories, as aboriginal sovereignty rights to the sea go unrecognized, and sea space cannot be delineated and owned by people or groups as it is with space on land (Mulrennan and Scott, 2000). In the absence of complete control over marine space, the Inuit can still influence marine management by infusing it with their knowledge, having their uses recognized, and participating in decision-making. However, before this influence can be achieved, the validity and usefulness of IQ as a management tool must be recognized, there must be a vector for IQ to be incorporated into management, and proper methods for using IQ in management must be employed.

1.4 Purpose and Objectives

The purpose of this graduate project is to better understand the decision-making processes surrounding shipping activity in Nunavut, Canada. The governance of Arctic shipping will be explored and areas where IQ can best fit into the decision-making will be identified. Furthermore, the results of this study will provide guidance and

recommendations to managers for incorporating IQ into the management of shipping development projects.

This study responds to recommendations for further research outlined in earlier publications. It responds to the Arctic Marine Shipping Assessment: Research Opportunities, calling for "interdisciplinary analyses of interactions and impacts of marine shipping with Arctic communities" (pg. 132). Furthermore, this study responds to a report by the ICC (2012) entitled, *A Circumpolar Inuit Response to the AMSA,* which calls for engagement with Arctic communities to determine if effective communication mechanisms exist for engagement. If there are no effective communication mechanisms then it is suggested that those mechanisms should be developed in order to engage and coordinate with the shipping industry and other economic activities, particularly for planning of new marine activity. This study suggests that effective mechanisms for incorporating IQ into shipping decision-making are not being used correctly or do not exist, and then suggests ways in which methods for incorporating IQ could be improved upon.

Chapter 2: Methodology

2.1 Research Questions and Overview

Four research questions were established to frame the approach to this project.

1. How is the local level (Inuit communities) involved in marine-related and shipping decision-making in Nunavut?
2. What are the benefits of including IQ in marine-related decision-making? How might shipping policy and planning development benefit from IQ?
3. Who is making shipping-related decisions in Nunavut? How much influence do different government bodies have on shipping policy and planning?
4. How is IQ being considered in shipping development projects? How should it be incorporated into the decision-making process?

Research activities consisted of a literature review and semi-structured interviews. Results from the literature review and interviews, as well as the concluding recommendations, can act as a guide for marine managers who are attempting to incorporate IQ into shipping-related decision-making in Nunavut.

2.2 Literature Review

The literature review on shipping examines the current and projected state of shipping, the risks of shipping, and governance and decision-making. This review included examination of international, national, territorial, and local level regulatory tools for shipping. Risks related to shipping focused on the specific risks (direct and indirect) that shipping poses to indigenous populations, rather than an exhaustive list of all possible risks.

The literature review on the use of IQ in marine management included defining IQ, how it can be incorporated into management, and examples of incorporating IQ into marine management initiatives in Nunavut. This involved examining the Government of Nunavut (GN) and their commitments to using IQ in management, as well as how indigenous knowledge is becoming recognized at international organizations.

There is a lack of literature on the use of IQ, or traditional knowledge in general, for planning and managing marine shipping. This literature review attempts to identify where the relevant topics may complement one another and why it is important for IQ to be incorporated into shipping decision-making.

2.3 Primary Data Collection

In order to collect primary data, ethics approval was obtained from Dalhousie University and a license to perform research was required from the Nunavut Research Institute (NRI) (Appendix A and B).

Primary data was collected through semi-structured interviews carried out with federal, territorial, and local government representatives as well as relevant Inuit organizations. The use of semi-structured interviews allows freedom for the participant to elaborate on their answers and for the interviewer to ask further questions for clarification if needed. This approach to conducting interviews has been identified as an effective method for gathering both reliable and comparable data (Cohen & Crabtree, 2006). The use of qualitative social research methods allows for in-depth studies that enhance the available data on a particular subject. Qualitative methods are often employed to give voice to a misrepresented or unrepresented group of people, which is applicable to this study as it involves an indigenous population. Qualitative methods are holistic in nature

and aim to identify relationships and clarify certain phenomena and theoretical concepts (Ragin, 2010).

To conduct the interviews, the researcher (Andrea Flynn) travelled to Nunavut, specifically the communities of Clyde River, Pond Inlet, and Iqaluit, in July of 2013. According to the 2011 census data from Statistics Canada, the population of Nunavut is about 32,000, the population of Clyde River is 934, the population of Pond Inlet is 1,549, and the population of Iqaluit is 6,699 (Statistics Canada, 2012a; Statistics Canada, 2012b; Statistics Canada, 2012c). A representative sample of the population was not sought for this study; rather, government and Inuit organization representatives who deal with matters related to shipping and traditional knowledge were identified and recruited for interviews. Potential participants were identified through Internet searches, advice from colleagues, and contacting government organizations. This led to the identification of approximately 35-40 potential participants, of which 24 actually participated in the study (Table 1).

***Table 1*. Number of interviewees from each level of government/organization.**

Level of Government/Organization	No. of Interviewees
Federal	7
Territorial	7
Local	10

Interviews lasted approximately 30-60 minutes and took place in a comfortable setting for the participant, such as an office or communal meeting place. The interviews were not digitally recorded in an effort to take cultural concerns into account and encourage candidness of participants. Notes were taken on the responses by the

researcher and then reviewed with the participant at the end of the interview to ensure validity. Any interviews that were not able to be completed in person were completed by phone.

The interview questions (Appendix C) provided background information on the participant, to allow for accurate data analysis, and information on the use of IQ in shipping-related decision-making. Interviewing participants from all levels of government enabled multiple perspectives to be included and helped to identify where decision-making power lies. The influence of IQ in decision-making was discussed directly in interview responses and can also be inferred based on local level and Inuit participation in decision-making.

Interview responses were analyzed according to qualitative thematic analysis methods described in Attride-Stirling (2001). The results of the interview analysis and the final recommendations can guide decision-makers in the use and application of IQ in shipping development. Obtaining expert opinion and advice through interviews on how to best include IQ in decision-making ensures that the guide and recommendations respond to the actual needs of managers and are usable in decision-making.

Chapter 3: Literature Review Findings

3.1 The recent history of Nunavut and the NLCA

In 1993, the *Nunavut Land Claims Agreement Act* (NLCA) was signed, followed by the passing of the *Nunavut Act* in 1994 by Canadian Parliament, which led to the eventual establishment of the territory of Nunavut on April 1, 1999 (Dewar, 2009). However, the lands owned by Inuit under the NLCA, and the political unit of Nunavut are quite different. In an article by Wenzel (2004), Nunavut is described as "two Nunavuts": one emerging from the NLCA, and the other emerging from the formation of Nunavut.

The NLCA is a modern treaty, signed between Canada and the Inuit (represented by Nunavut Tunngavik Incorporated). The NLCA gives Inuit the right to use and make decisions about wildlife, resources, and governing organizations in their lands. Of the approximately 1.9 million km^2 of land that comprises Nunavut, Inuit-owned land amounts to approximately 350,000 km^2 (approximately 18% of the total land), with subsurface (mineral) rights to an even smaller proportion of the total land mass (Daoust, Haider, & Jessen, 2010).

The purpose of the *Nunavut Act* was to create the new territory of Nunavut, which would include both Inuit-owned land under the NLCA and other land in the territory that fell under territorial or federal jurisdiction. This is the Nunavut that exists today; it has its own territorial government, receives funding from the federal government, and has control over some social and resource policies (Daoust et al., 2010).

Nunavut is unique compared to the other provinces and territories in Canada because the indigenous population is the majority; approximately 85% of the people are Inuit (Nunavut Bureau of Statistics, 2013). These Inuit largely rely on subsistence

hunting and trapping activities for food; in some areas as much as half of the meat and fish that consumed is derived from these practices (Statistics Canada, 2008). This only goes to show how intensely the Inuit remain connected to the natural environment and traditional hunting and fishing activities.

It was expected that the new Government of Nunavut (GN) would embody the way of life of the Inuit people, reflecting the Inuit population and Inuit-owned land, and taking control of decision-making. However, this was not the case and the GN took the same form as other contemporary territorial governments, with the federal government maintaining at least partial control over the lands and resources (Wenzel, 2004; Alcantara, 2013).

While the NLCA and the *Nunavut Act* made great strides towards Inuit self-determination and nation-building within Canada, there is still some contention in the relationship between the Inuit, the GN, and the federal government (Dewar, 2009). Since the formation of the GN, the Inuit relationship with the federal government has fallen to the wayside. Therefore, there is a need for more interaction between the Nunavut Tunngavik Inc. (NTI, representing the Inuit under the NLCA), and the territorial and federal governments so as to involve Inuit at the local level and their needs in territorial and federal government decisions (Dewar, 2009).

3.2 Marine-related decision-making in Nunavut

Article 15 of the NLCA addresses marine areas in Nunavut, Marine areas defining them as:

> …that part of Canada's internal waters or territorial sea, whether open or ice-covered, lying within the Nunavut Settlement Area [Figure 3], but does not

include inland waters. The reference to internal waters or territorial sea includes the seabed and subsoil below those internal waters or territorial sea (NLCA, 1993, pg. 5).

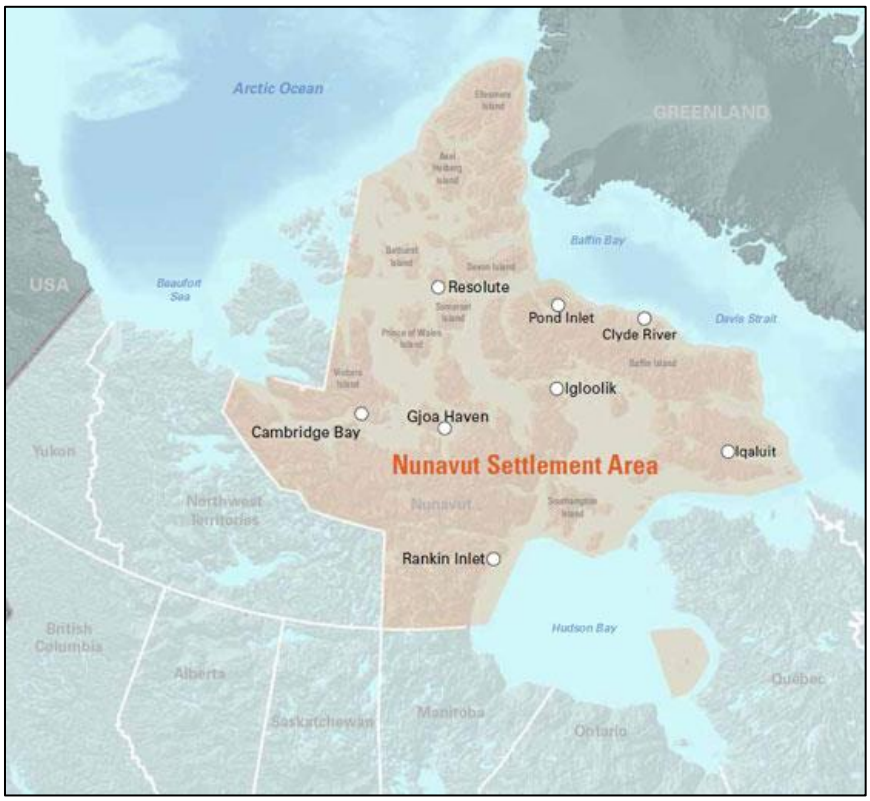

***Figure 3*. Map of the Nunavut settlement area (retrieved from www.neb-one.gc.ca).**

Inuit-owned lands under the NLCA cannot extend into the defined marine areas; however, elsewhere in Article 15 it is identified that there is a need to develop and coordinate policies regarding marine areas and a need for Inuit involvement in marine management. Inuit involvement is considered necessary due to their traditional and current use of the marine environment, particularly land-fast ice, as well as the dependence on subsistence harvesting and an economy based on marine resources (Mulrennan and Scott, 2011).

Article 15, Part four of the NLCA indicates that the Nunavut Impact Review Board (NIRB), Nunavut Water Board (NWB), Nunavut Planning Commission (NPC), and Nunavut Wildlife Management Board (NWMB) (public government institutions) may advise the federal government regarding marine areas through a Nunavut Marine Council. This Council can organize policy and program development with relation to the marine environment. However, the Canadian government has never officially funded the formation of a Marine Council, which has inherently prevented its successful implementation (Kelley & Ljubicic, 2012; PEW, 2013). This lack of commitment from the Canadian government to implement some key aspects of the NLCA is becoming a source of legal turmoil and serious dissatisfaction from the Inuit (Fenge, 2013).

Article 15 of the NLCA further indicates that Articles 5 (Wildlife), 6 (Wildlife Compensation), 8 (Parks), 9 (Conservation Areas), 11 (Land Use Planning), 12 (Development Impact), 23 (Inuit Employment Within Government), 24 (Government Contracts), 25 (Resource Royalty Sharing), 27 (Natural Resource Development), 33 (Archeology), and 34 (Ethnographic Objects and Archival Materials) shall all apply to marine areas, subject to any qualifications contained in those Articles. Some of the most prominent topics in these sections include Inuit representation for international and domestic interjurisdictional decision-making with regard to wildlife in marine areas, the consideration of the effects of development activities on the well-being of Inuit people, and the Inuit right to use open waters in land-fast ice zones for resource harvesting. If the NLCA were to be upheld completely by the federal government, decision-making for marine areas of Nunavut would be inclusive of Inuit people and consider their well-being above almost all other factors. Therefore, marine related decision-making for the waters

surrounding Nunavut must be done collaboratively with Inuit; this would include decisions regarding shipping development.

3.3 Shipping in the Canadian Arctic

Currently, there are three main shipping routes that are feasible through the Canadian Arctic: routes through (1) the port of Churchill and other communities in Hudson Bay with all traffic moving through the Hudson Strait; (2) the Beaufort Sea with all traffic moving through the Bering Strait; and (3) the Northwest Passage, which is comprised of a number of paths through the Canadian archipelago (Figure 4).

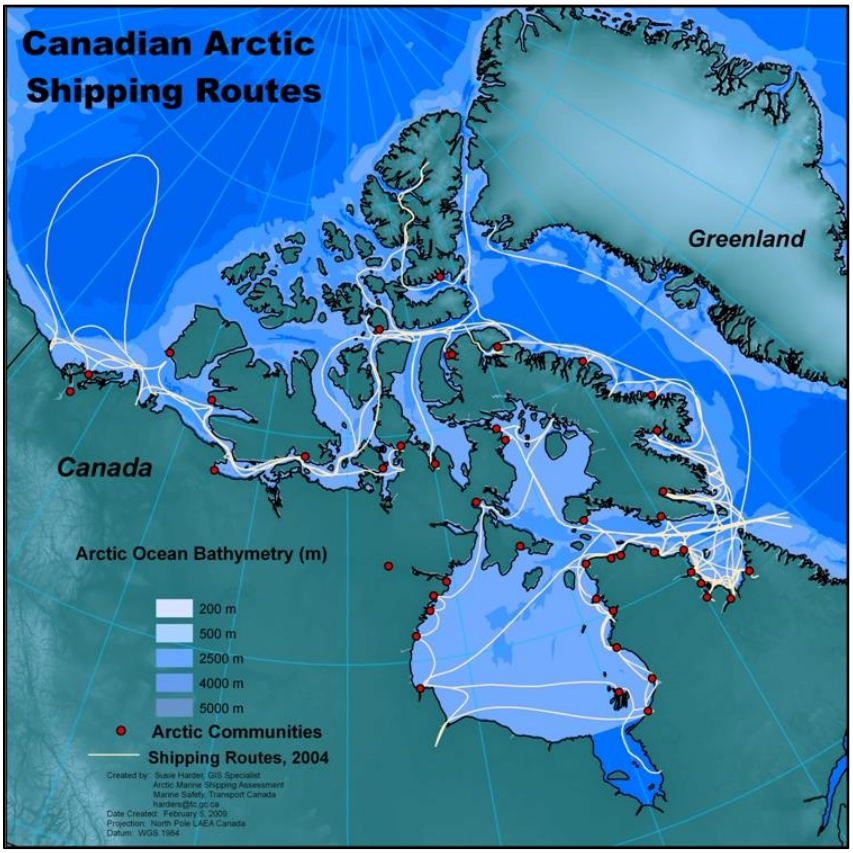

***Figure 4*: Navigable shipping routes through Canada's Arctic (retrieved from http://www.nrlmry.navy.mil/forecaster_handbooks/arctic_climatology/narratives/northwest_passage_narrative.htm).**

Arctic marine shipping in Canada is made up of a variety of activities, such as dry bulk carriage stimulated by resource development, liquid bulk carriage stimulated by resource development, community supply and resupply, cruise shipping, container shipping, bulk transit traffic, and other activities (i.e. fishing, seismic, etc.). Of these activities, dry and liquid bulk carriage related to resource development is expected to increase dramatically in the near future following mining and oil and gas projects (Hodgson et al., 2008; Lasserre, 2010a).

Shipping related to resource development projects is an issue now in Nunavut and increased shipping of supplies and products will likely begin in the near future. For example, the proposed Baffinland iron ore mining project at Mary River, Nunavut could ultimately involve truck, rail, and sea transportation. The initial plan involves products being moved by rail to a new port (not yet constructed) in Steensby Inlet where they will be loaded onto ships. However, it is important to note that recent changes to the initial plan will see products trucked to an existing port in Milne Inlet where they will be loaded onto ships from that location (Figure 5). This will be the case until construction of the Steensby port is complete. Although shipping in Arctic waters is common during the ice-free season, the year-round shipping that will be required for maximum efficiency in the Baffinland project and ship routes to and from Steensby Inlet will be a new activity in the area (Baffinland, 2012).

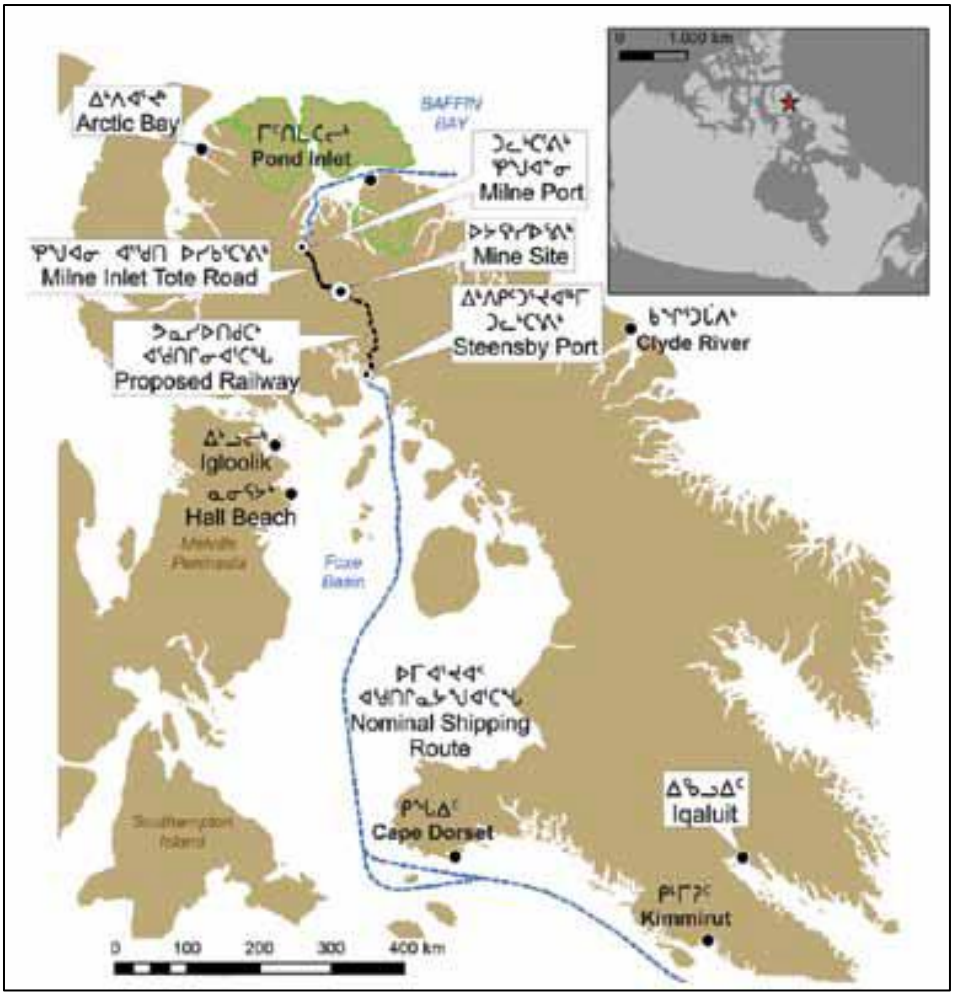

***Figure 5*. Map of communities and proposed transportation routes for the Baffinland Project (Baffinland, 2012, February).**

Shipping related to community supply and resupply is extremely important in Nunavut and has been operating for many years (since settlement of Nunavut communities). However, this important social service suffers from lack of financial investment, difficult operating conditions, and a piecemeal approach (multiple service providers) in Nunavut. Furthermore, the lack of port infrastructure in Nunavut limits the effectiveness of community supply and resupply by preventing the ability to employ containerized shipping (Brook & Frost, 2012). The challenges already being faced by this

shipping sector should be considered when exploring new shipping developments in Nunavut.

Cruise ships have been operating in the Canadian Arctic since 1984 when the first cruise voyage through the Northwest Passage occurred. Since this time, cruise shipping has grown into a more mature industry, with increasing presence in the Arctic, regular patterns of activity, and the establishment of new routes (Stewart et al., 2007). However, Stewart and Draper (2008) urge marine managers to learn from the dramatic increase in cruise activity that occurred in the Antarctic, and the unique dangers associated with operating in the polar regions. Indeed, dangers are already causing problems for polar cruises. A cruise ship ran aground in 2010 on an uncharted rock shelf in Nunavut's Coronation Gulf; luckily no human injuries were suffered (CBC, 2010).

Trans-arctic shipping is of considerable interest as sea ice diminishes through the Northwest Passage and associated sea routes. However, the unpredictability of seasonal ice regimes will make shipping through the Arctic dangerous and will require ice-breaking services (Prowse et al., 2009). While some argue that time and money could be saved by employing routes for trans-Arctic shipping, others are skeptical. Additionally, the reliance of the container shipping industry on just-in-time delivery make the feasibility of Arctic shipping for this purpose questionable, as many factors could impede or slow delivery (Lasserre, 2010a).

Other kinds of shipping include marine seismic activity and industrial fishing activity. Marine seismic surveying is used to determine geographical features of the offshore environment. It is done by emitting acoustic sound waves from a ship and recording the time and intensity of the wave that is bounced off of the bottom of the sea

and received by a streamer that is towed behind the boat. The sound that is emitted from the ship (usually produced by an airgun) is of concern due to the unknown impact of the sound on various marine species, particularly marine mammals, which use sound to communicate and navigate (LaPierre et al., 2011). Industrial fishing on the other hand is still developing. It is expected that like other forms of shipping, industrial fishing could grow as sea ice diminishes (Young, 2009).

3.4 Shipping in the Arctic: a risky pursuit

The risks from shipping that will be discussed within the scope of this project include those that relate to the Inuit people and their ways of life. There are two types of risks that are applicable: risks that the environment poses to shipping, and risks that shipping poses to the environment and local people. All of these risks are associated in some way with the natural environment and Inuit ways of life.

The Arctic environment presents unique risks to the shipping industry. Sea ice, glacial ice (icebergs), storm waves, and shoals can all be encountered in the Arctic (Prowse et al., 2009). Accidents caused by these adverse shipping conditions and possible lack of accurate charts for the area could result in any number of consequences, ranging from loss of valuable cargo, to environmental damage, to loss of human life.

Alternatively, shipping could pose risks to the environment and Arctic communities. Possible impacts of shipping include: (1) making passage through ice and causing delaying ice formation or accelerated break-up; (2) disturbing ecosystems, particularly marine mammals through noise and vessel strikes; (3) introduction of invasive species through ballast water and on hulls; (4) polluting the environment through operational discharges and spills; and (5) disturbing community access to ecosystems and

resources that are vital to theirculture and lifestyle (Hodgson et al., 2008; Kelley & Ljubicic, 2012).

Land-fast sea ice extends from the land and over the ocean and is essential to Inuit ways of life. The NLCA acknowledges the importance of sea ice for Inuit use; for example, Article 16 is dedicated solely to the land-fast ice of the east Baffin coast (Figure 6). Travel over sea ice is an integral part of the Inuit way of life, both traditionally and currently. For example, the Inuit Circumpolar Council (ICC) Canada recently prepared a document entitled "The Sea Ice is Our Highway" (2008) for the Arctic Council's Arctic Marine Shipping Assessment (2009). This document highlighted the importance of sea ice to the Inuit and has been praised for its attention to Inuit perspectives on issues related to sea ice.

Furthermore, Aporta (2011) describes how sea ice may be viewed as an obstacle to non-native people interested in Arctic shipping, but to the Inuit, sea ice is seen as "home". This view of the ice still exists, even after social, economic, and political integration of Nunavut and the Inuit into Canada. The sea ice supports Inuit subsistence livelihoods by providing access to the sea for hunting and fishing. Inuit often have place names for specific ice features such as polynas and ridges that form each year. Trails on the ice are important transportation routes used by Inuit to get to other communities and to hunting areas. Efforts to work with Inuit to document knowledge of sea ice can help to preserve their culture and can also be used in development planning, such as designation of sea routes, to minimize disruption of current sea ice use by Inuit (Aporta, 2011). If shipping involves passage through ice then Inuit use of that ice for travel may be

hindered, meaning that Inuit should be involved in designating shipping routes in order to minimize negative effects on their lifestyle.

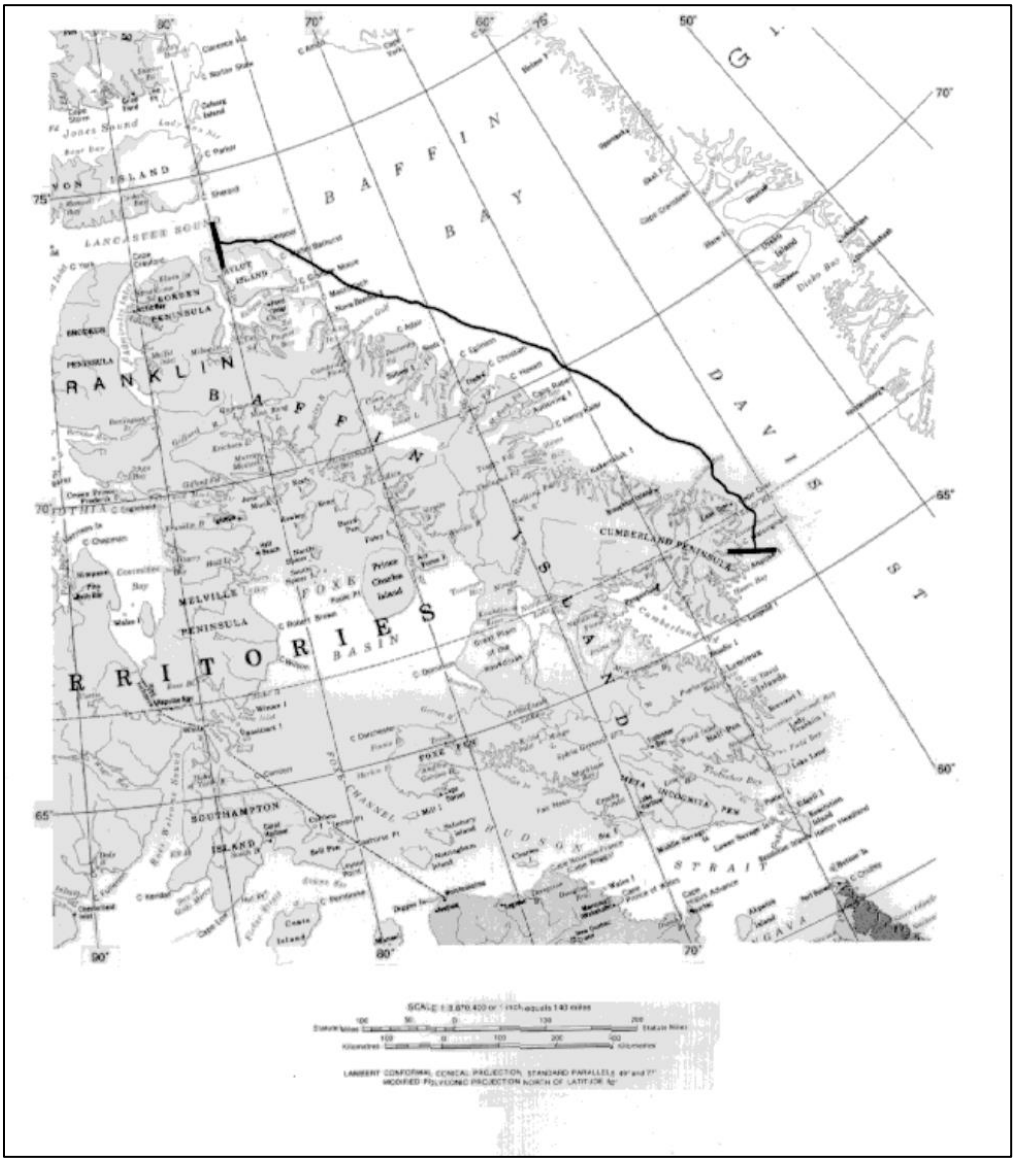

***Figure 6*. Land fast ice extent on east Baffin coast (NLCA, 1993, pg. 138).**

The potential impacts of shipping on the natural flora and fauna are one of the largest concerns regarding Arctic shipping. These include risks associated with vessel strikes, noise, habitat disturbance, air pollution, marine pollution from accidental spills or operational discharges, and introduction of invasive species though ballast water (Arctic

Council, 2009). Impacts on the environment are seen as a threat to the Inuit way of life because of their high dependence on healthy marine ecosystems for their hunting and fishing needs. Shipping related to natural resource extraction could pose great environmental risks due to the nature of the products that will be carried, such as ores and hydrocarbons. Shipment of these products will require strict control and regulation in order to reduce the risk of pollution and environmental damage (Lasserre, 2010a).

Currently, there is limited shipping occurring in Canada's North, limited shipping experience in Arctic environments, and uncertain projections about future shipping activity. However, with the anticipated increase in shipping activity, determining out how to manage shipping in order to reduce risks to the environment and local people is feasible now and should be pursued (Hodgson et al., 2008). Again, the focus of this paper is not on the specific risks that shipping poses to the environment and people, but rather on the consequent impact of shipping activity on Inuit people and how IQ can be used to help manage shipping and associated risks in future development projects.

3.5 Decision-making for Shipping

Decision-making for shipping is influenced by all levels of government, from local to international. However, these levels have different jurisdictions, powers, and degrees of influence when it comes to decision-making (VanderZwaag et al., 2008). Here, the different levels of government will be examined to identify the governing ability held by each with regard to shipping in the Arctic.

3.5.1 International

Due to the international nature of the shipping industry, it is largely governed by international organizations, primarily the IMO and the Arctic Council. It is at the international level that global standards for shipping are set and adopted by participating

states, including specific standards for Arctic shipping (VanderZwaag et al., 2008). Existing international regulatory frameworks for ships operating in polar regions include the United Nations Convention on the Law of the Sea (UNCLOS - legal framework guiding use of marine space), International Convention on Safety of Life at Sea (SOLAS - safety requirements), International Convention on Marine Pollution (MARPOL - marine pollution and environmental protection), International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW - training and competency of ship crew), and related guidelines, including fishing regulations (Deggim, 2013). International regulatory frameworks are often broad and encompassing with the intention that they will guide the formation of national policies for shipping in the waters of coastal states.

The IMO is a special agency of the United Nations that is responsible for shipping safety, security, and pollution prevention (IMO, 2013b). Currently, the IMO is working on an International Code of Safety for Ships Operating in Polar Waters (the Polar Code) to enhance safety and environmental protection with regard to Arctic shipping (Deggim, 2013). The Polar Code will include ship-building, crew training, and search and rescue regulations to deal specifically with Arctic conditions. Other international efforts related to the Polar Code include those by the Arctic Regional Hydrographic Commission, which was established in 2010 under Canada's leadership, to develop navigational charts and other technology for Arctic shipping (Pamel, 2012).

The Arctic Council is an intergovernmental organization that fosters collaboration between Arctic states and indigenous groups. Arctic states represented on the Council include Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden,

and the U.S.A. There are also Permanent Participants, which include representative organizations of indigenous peoples. While the Arctic Council does not currently hold any decision-making power with regard to Arctic shipping, it is working towards obtaining some regulatory power, similar to the IMO (Pamel, 2012). The Arctic Council is an important forum that can influence decisions made by regulatory bodies at all levels, and serve as a vector for indigenous peoples to have a voice in Arctic issues.

3.5.2 National

National representatives participate at international organizations, like the IMO and the Arctic Council. Through these organizations, nations have a say in the international management of Arctic activities and standard setting. However, international conventions and protocols are only binding for signing nations, meaning that not all nations have to abide by the rules and standards set by these international bodies (VanderZwaag et al., 2008). This can be an issue and complication for an international industry like shipping, where ships traverse transboundary routes.

Coastal states in the Arctic region can take initiative to set standards within their territorial waters (VanderZwaag et al., 2008). Under the international UNCLOS and national *Oceans Act* (1996), Canadian territorial waters include all waters within the 12 nautical mile zone; furthermore, the exclusive economic zone (EEZ) reaches out to 200 nautical miles. This amounts to an EEZ of about 2.9 million km^2 and comes with extensive management responsibility, including leadership, sovereignty, trade, Northern development, industrial development, transportation, environment, and collecting scientific and traditional knowledge to understand the marine environment (Eddy, Fast, & Henley, 2002). Canada has extensive legislation to regulate Arctic shipping and its impact on the environment, such as the *Arctic Waters Pollution Prevention Act* (1970,

2009), *Canada Shipping Act* (2001), *Oceans Act* (1996), and the *Marine Liability Act* (2001). Of particular interest to this study is the *Arctic Waters Pollution Prevention Act* which gives Canada the ability to exercise extended pollution control regulations in the entire EEZ of the Arctic (DFO, 2013).

3.5.3 Territorial and Local

Territorial legislation can supplement federal laws and regulations on shipping (Pamel, 2012). Territorial legislation and policies that could be applicable to shipping in Nunavut include the NLCA (1993), the *Nunavut Act* (1993), and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (2002). However, all territorial documents indicate that marine shipping is the responsibility of the federal government, not the GN (Kelley & Ljubicic, 2012). This is primarily due to the nature of maritime law in Canada, which gives the Canadian government jurisdiction over marine areas, with little or no authority given to provincial or territorial governments (Alley & Topelko, 2007).

Devolution of jurisdictional authority from the federal government to the GN is a possibility. Indeed, the GN is working toward gaining jurisdictional control and revenues obtained from non-renewable resources both on land and under the seabed within Canada's internal waters that surround Nunavut. The GN is requesting devolution of jurisdiction over internal waters (within the baseline of Canada's Arctic islands) based on national interest (progressing de-colonization efforts and strengthening sovereignty claims), cultural significance to the Inuit (provisions outlined in the NLCA and importance to Inuit economy), regulatory efficiency (to ease processes of development for companies and minimize complexity), and consistency with the land claim and Canadian law (Nunavut wants similar rights to the internal waters that surround them, similar to provinces) (Mayer, 2007).

Local levels of government and Inuit organizations, such as the Hamlet governments and Hunters' and Trappers' Organizations (HTOs), can and must play a role when it comes to shipping surrounding Nunavut due to provisions in the NLCA for Inuit involvement in marine decision-making. This role can be quite important, especially in the Arctic where local people rely on the marine environment for their livelihoods (VanderZwaag et al., 2008). This being said, there has been little recognition of how Arctic communities might be impacted by increased shipping and little research has been done on the perspectives of the Inuit on shipping and related policies (Kelley & Ljubicic, 2012).

Local level organizations (i.e. HTOs), non-governmental organizations, and industry can also participate at the international level and can adopt international standards. Indigenous representation is seen on the Arctic Council and international shipping companies often adopt international standards. However, indigenous groups are often not considered to be involved in the governance of marine shipping at any level, even though their ways of life are identified as being at risk from shipping activities (VanderZwaag et al., 2008).

3.6 *Inuit Qaujimajatuqangit*

Indigenous traditional knowledge that is specific to the Inuit of Nunavut is referred to in Inuktitut as *Inuit Qaujimajatuqangit* (IQ) (Tester & Irniq, 2008). Indigenous traditional knowledge can be broken down into two parts, indigenous and traditional. Indigenous knowledge can be defined as local knowledge that is unique to a culture or society and is used in local-level decision-making on a variety of issues (Boven & Morohashi, 2002). Traditional knowledge can be defined as being holistic and adaptive,

gathered over generations by the people who use that knowledge for their livelihoods (Berkes, Colding, & Folke, 2000). Furthermore, the term traditional ecological knowledge (TEK) is often used to describe the knowledge of indigenous people. However, TEK narrows knowledge to that about the natural environment and does not recognize knowledge about other aspects of indigenous ways of life (Wenzel, 2004).

IQ emerged as a concept following the NLCA to describe the Inuit way of life and to guide the formation and actions of the GN. IQ can be defined as:

> … all aspects of traditional Inuit culture including values, world-view, language, social organization, knowledge, life skills, perceptions, and expectations. Anonymous 1998:1 (as cited in Wenzel, 2004).

Therefore, IQ is not simply a knowledge system that is tied to the natural environment or any one particular part of Inuit life; it encompasses much more than that and can be linked to socioeconomic and cultural practices of the Inuit (NWMB, n.d.). IQ remains an important concept today because of the continued importance of wildlife and hunting to the Inuit identity and culture and the contribution of natural food products (country food) to the local economy (McCloud et al., 2000, as cited in Wenzel, 2004).

Additionally, Tester and Irniq (2008) conclude that IQ represents a place, or a foundation, where Inuit people are connected and can come together. The challenge then becomes to use IQ in management in order to preserve Inuit culture and identity. This includes standing up for the connections between humans, animals, and landscapes that are integral to the Inuit. IQ represents a culture and all that it means to be Inuit and to live in the Arctic.

The GN has publicly committed to incorporating IQ into its operations, including policy-making and delivery of programs and services. In response to and increase in resource development projects, and a consequent increase in marine shipping, the GN's Department of Economic Development has also committed to following the principles of IQ when developing policies and programs (Arnakak, 2002). The Department of Economic Development's IQ Working Group provides advice on the use of IQ in decision-making. The Working Group created a framework for incorporating IQ into the work of the Department of Economic Development. Six guiding principles were identified for the framework:

1. *Pijitsimiq*: a concept of serving and providing for.
2. *Aajiiqatigiingniq*: a concept of comparing views or taking counsel.
3. *Pilimmaksamiq*: a concept of hands-on teaching and learning; important in capacity-building.
4. *Piliriqatigiingniq*: a concept of working together and collaborating.
5. *Avatimik Kamattiamiq*: a concept of environmental stewardship.
6. *Qanuqtuurunnamiq*: a concept of innovation and reflecting on a problem and coming up with many solutions.

These IQ principles attempt to embody the meaning of IQ and guide a holistic approach to economic development initiatives. However, more specific guidelines for applying IQ to development projects, such as shipping development, are needed so that managers know where IQ can fit into the decision-making process. Additionally, it is

still considered a work in progress to determine specifically how IQ will be incorporated in the GN's decision-making protocol, or any other level of decision-making for that matter (Arnakak, 2002; Wenzel, 2004).

3.7 Examples of IQ Use in Marine Management in Nunavut

3.7.1 Integrated Management

Integrated management, mandated under Canada's *Oceans Act*, is suggested as a method to help make decisions for sustainable use, development, and protection of marine areas and resources. It is also meant to help break sectoral approaches to marine management and acknowledge multiple uses and interrelationships within the marine environment (Eddy et al., 2002). In these ways, integrated management could be used to help incorporate Inuit and IQ into decision-making for marine shipping.

Coastal Zone Canada, a non-profit society, held a forum in 2006 to promote integrated coastal zone management and focused on the challenges faced by coastal people in the Arctic as changes are occurring due to environmental and anthropogenic factors. In particular, this forum brought Inuit to the table to hear their views, knowledge, and needs related to changing conditions in the Arctic. It was identified that IQ must be better utilized in integrated management efforts for the land and sea. While no decisions about coastal issues were made at this forum, it was a step towards the use of integrated management and IQ for ocean issues in the Arctic (Blakney, 2008).

3.7.2 Community-based co-management

Community-based co-management is a method that is used to incorporate IQ into decision-making. Community-based co-management can be broken down into two parts: community-based and co-management. Community-based refers to the use of indigenous institutional arrangements and knowledge in management. Co-management refers to the

sharing of responsibility and authority over resource management between government and the community or local resource users (Pomeroy, 1995). Community-based co-management is employed for some aspects of natural resource management in Nunavut and can act as a vector for IQ to be incorporated into marine management and decision-making. The sharing of knowledge and knowledge types in co-management is thought to contribute to social-ecological understanding, trust-building, and learning (Dale & Armitage, 2011).

Two examples will be explored here. The first example of IQ being incorporated into marine management comes from marine mammal co-management in Nunavut. In 1999, the Nunavut Wildlife Management Board implemented an experimental community-based narwhal management program. The communities of Arctic Bay, Qikiqtarjuaq, Pond Inlet, Repulse Bay, and Kugaaruk were involved in the program. Some decision-making power related to regulation of quota allocation and the creation of a reporting system for landings was given to the communities and local HTOs (see Figure 7 for governance structure and description). Quota regulations set by HTOs were required to conform to existing Canadian legislation and the Department of Fisheries and Oceans Canada (DFO) retained power to set, vary, and remove quotas. It is acknowledged that Inuit and IQ are being increasingly included in wildlife management since the signing of the NLCA; however, it is also acknowledged that the goals in the NLCA for achieving proper inclusion of Inuit people and values will take a long time to be fully realized. With the narwhal co-management project, IQ is being incorporated into the management of the fishery, but there are still some obstacles to overcome with regard to respect and trust

between Inuit and the DFO, and Inuit knowledge and western science knowledge, respectively (Dale & Armitage, 2011).

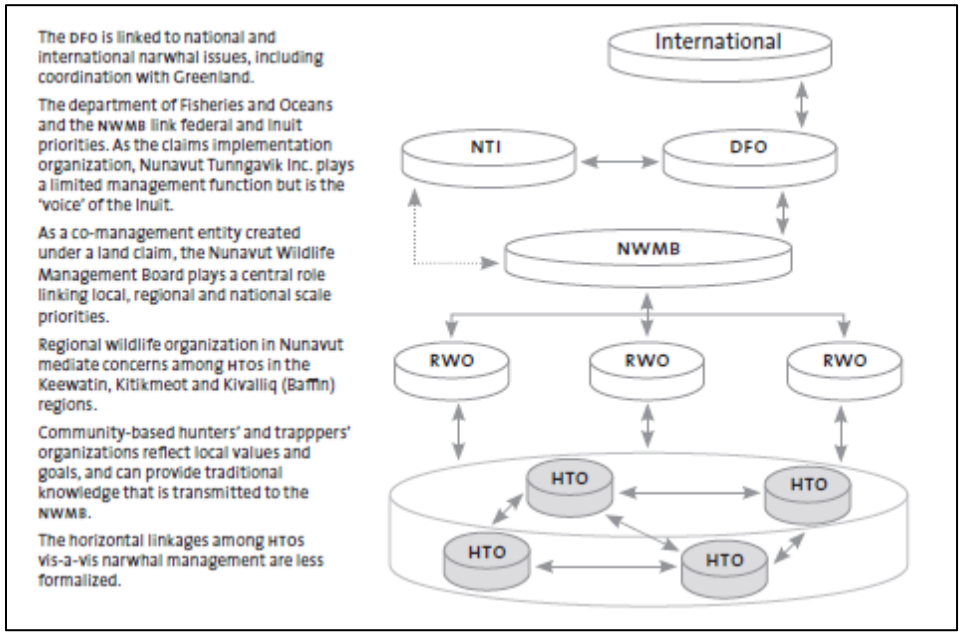

***Figure 7*. Community-based narwhal management process in Nunavut, adapted from Berkes et al. (2005).**

The second example of community-based co-management comes from polar bear co-management in Nunavut. Dowsley and Wenzel (2008) use the four categories of knowledge, as described by Usher (2000), to explore how Inuit approach the co-management system for polar bears: 1) knowledge about the environment, 2) knowledge of the use of the environment, 3) environmental values, and 4) the knowledge system itself. The study found that there is disagreement between western science findings and IQ on the health and condition of polar bear populations. Western science has found a decrease in the body condition of polar bears and a decrease in population, while IQ suggests that the population is doing well and numbers may be increasing. This disagreement on polar bear populations has naturally led to disagreement on how the

species should be managed. Dowsley and Wenzel (2008) conclude that there are many overlaps between the western science and IQ knowledge systems, especially in Usher's categories 1 and 2 of traditional knowledge. However, the more abstract categories 3 and 4 need to be more closely considered and successful co-management will require respect and trust between management stakeholders.

3.7.3 Science and IQ

IQ can be incorporated into management through collaborative management approaches and devolution of some responsibility and decision-making to the community level. However, in both examples from the previous section, differences were encountered between IQ and western science knowledge systems that caused conflict (Table 2).

***Table 2*. Differences between western science and traditional knowledge (Indian and Northern Affairs Canada, 2001, pg. 4).**

Factor	Western Science	Traditional Knowledge
Approach	Compartmental	Holistic
How Communicated	Written	Oral
How Taught	Lectures, Theories	Observations, Experience
How Explained	Theory, "Value-free"	Spiritual, Social Values

While the two types of knowledge may have differences, they can also be complementary. Modern science has yet to fully understand the complexities of the Arctic environment, whereas traditional knowledge has about this environment has been

accumulated over time, hence the need for traditional knowledge to augment existing scientific knowledge (Riedlinger & Berkes, 2001). Additionally, traditional ecological knowledge has been likened to adaptive management. Adaptive management is often considered to be a preferred method of environmental management over the more western method based on steady-states because it allows for uncertainty and resilience-building within social systems (Berkes et al, 2000). Efforts should be made to move past the differences and toward the similarities and complementary nature of traditional and scientific knowledge systems. The two systems should be used to inform and enhance each other. Engaging both knowledge systems from the beginning and collaboratively designing projects and coming up with solutions to management problems could help bring the two systems together for effective management (Huntington et al., 2012).

3.7.4 Consultations

Other examples of using IQ being employed in management can be seen in the form of community consultations. Consultations are commonly used by governing bodies to interact, inform, and engage with Inuit people (Price, 2007). Additionally, consultations are a requirement of the Crown (federal government) under the NLCA and are necessary for ensuring that development does not severely and negatively impact local people.

Lessons learned from the consultation process for oil and gas development in the Arctic can be directly applied to consultations undertaken for shipping development (Huntington et al., 2012). There is need to consider both the amount of consultation and the influence of consultation on final decisions. Too little consultation could inadequately involve local people, while too much consultation could negatively impact the lives of indigenous people who spend time and effort attending meetings. Additionally, the

influence of consultations on final decisions is often not clear (Huntington et al., 2012). It can be frustrating when local people take time to participate in consultation and then do not see how their input is included in the final decision.

For shipping, it is important that Inuit are involved in the process of planning for development purposes. Including local people at the outset of project design can ensure that the project moves forward efficiently. If local people are not included from the beginning, additional time may be needed for consultation after plans are already made (Huntington et al., 2012). Involving local people at the outset allows for transparency in the planning process and Inuit influence may be more easily recognized.

3.8 IQ and Shipping

Inuit people have expressed their concerns over shipping. The Inuit Circumpolar Council (ICC) – Canada Report (ICC, 2008) submitted to the Arctic Council's Arctic Marine Shipping Assessment (AMSA) (Arctic Council, 2009) examines Inuit perspectives on Arctic shipping. Many Inuit expressed concern about the release of pollutants, expansion of resource development, and disruption of wildlife. However, the Inuit were also interested in the potential benefits of increased Arctic shipping, such as supply delivery and reduced living costs.

In a study by Kelley and Ljubicic (2012), international, national and territorial policy documents were examined to determine which ones included Inuit perspectives on shipping. It was found that only the NLCA identified sea ice as being used by Inuit, while the rest viewed ice only as a hazard to shipping. This indicates that there is a lack of Inuit input into policy development regarding shipping. The differences between Inuit and non-Inuit perspectives on shipping indicate that Inuit see shipping as good for community

re-supply and transportation; however, there are still concerns over the risks that shipping poses to the environment and ways of life. On the other hand, non-Inuit tend to view Arctic shipping as a means to access remote areas, enable economic development, and support Canadian Arctic sovereignty – all "good" things. Inuit input into policy formation would be apparent if more policies viewed ice as a socially and economically important environmental structure, rather than simply an impediment to shipping (Kelley & Ljubicic, 2012).

Inuit have legal rights to defend their way of life and use of the natural environment through the NLCA. This legal right has been upheld in court decisions on the matter. A recent example involving IQ and shipping comes from a case between the Qikiqtani Inuit Association (QIA) and Natural Resources Canada (NRCan). The QIA went to the Nunavut Court of Justice over marine seismic testing that was proposed by NRCan. The seismic testing had already been approved by the Nunavut Impact Review Board (NIRB) and was to be carried out by the *Polarstern*, a German research vessel, in Baffin Bay and Lancaster Sound, Nunavut in 2010. The court case ruled in favour of the petitioners who argued that meaningful consultation did not occur and that the seismic testing posed too great a risk to marine mammals, consequently disturbing the traditional Inuit food supply (Qikiqtani Inuit Association, 2010; Pamel, 2012). This is an important example as it illustrates how the local level can successfully influence shipping activities in the Arctic through exercising legal rights.

Other shipping issues concerning IQ come from the international level. There is a recognized need to draw on existing IMO routings in other regions to assess how Arctic states could address ship routing in order to protect sensitive marine areas and meet the

concerns of indigenous communities and organizations (VaderZwaag et al., 2008). Drawing on experience from other areas in the world where shipping may have affected indigenous populations is important in marine management of Arctic areas to avoid making the same mistakes twice. Undoubtedly, local level influence could help to reduce negative impacts on indigenous populations and maximize the efficiency and social responsibility of shipping operations.

Inuit knowledge is also working its way into the operation of the Arctic Council through projects that focus on collecting and utilizing indigenous knowledge (George, 2012). In this way, indigenous knowledge could be incorporated into the operations of the Arctic Council and influence the stance that the Council takes on Arctic issues, like shipping. Recognition of the value of indigenous knowledge for management is just one step towards incorporating this knowledge into decision-making.

Chapter 4: Interview Findings

4.1 Overview of Responses to Interview Questions

The interview questions yielded a wide range of responses. Most participants discussed shipping and IQ as it relates to their personal experience, employment, and employment mandates. This allowed for identification of many issues under the umbrella of marine shipping as representatives from many areas of government were interviewed and each dealt with different aspects of shipping. The topic of integrating IQ into decision-making then became the common thread throughout the interview responses.

Interviewees may not have had the same level of knowledge or outlook on the use of IQ in shipping decision-making. It became apparent in the interviews that some participants did not fully understand what IQ is and why it is an important aspect of management in Nunavut. However, many participants identified similar areas where they thought that IQ could help to mutually benefit the shipping industry and coastal communities in Nunavut.

All interviewees indicated that they foresee the amount of shipping activity increasing in both the short term (the next few years) and long term (beyond the next few years). In the short term, shipping activity related to community supply/resupply, the cruise industry, seismic exploration, and other resource development projects (particularly the Baffinland iron ore mine in Mary River) were seen as the major factors driving an increase in shipping. In the longer term, climate change, melting sea ice, and international shipping interest in the Northwest Passage were viewed as factors that will drive an increase in shipping activity. With the anticipated increase in shipping, in both the short and the long term, most participants identified the need to ensure that both the environment and Inuit ways of life are minimally affected by shipping activities.

While many local level Inuit participants recognized that shipping activity is increasing in Nunavut, they also identified that shipping will not necessarily become more important to them. Community supply and resupply, or the sealift, is a vital service that provides communities with supplies that they need throughout the year and is much more cost effective than flying supplies in by air on a regular basis. This service has existed since establishment of communities in Nunavut and it is the only shipping service that is truly important to people. Therefore, other shipping activity is seen primarily as a threat to the marine environment and animals that Inuit people rely on for subsistence hunting and fishing.

Interviewees identified that all marine shipping is regulated at the federal level in Canada. Territorial and local level governments act in an advisory role and are involved when it comes to final approval of projects and developments that involve shipping. Some of these territorial and local government bodies are involved in permitting for shipping (i.e. cruise ship community visits); however, this was considered a minimal role in decision-making. Territorial and local governments have little influence during the planning stages of project design and hold no power to approve or disprove final plans. Many interviewees indicated that territorial and local government bodies should have more influence over shipping activities that occur in Nunavut's coastal waters.

Many interviewees were unsure as to whether or not IQ is being considered by shipping companies and government agencies. The federal government has a duty to consult with the Inuit under the NLCA, but is still vague as to how IQ is incorporated into this process and how it ultimately influences decisions that are made after consultation. Due to the complex regulations and legislation surrounding marine shipping and the

current federal government's focus on economic development, many participants felt that IQ is not at the top of the list when it comes to decision-making in Nunavut. It was suggested that the linkage between IQ and final decisions should be more clear so that local people can see how their input into decisions (through consultation or other means) is translated into meaningful outcomes.

The differences between science and IQ were discussed by many participants. No participants felt that science was superior to IQ, or vice versa. However, many participants indicated that decisions are often based more on science than on IQ. The existing western model of decision-making tends to rely on science and documented facts. Due to the fundamental differences between science and IQ (as discussed in Table 2 earlier), IQ is still not trusted as a source of information for decision-makers, even after attempts are made to validate, gather, and incorporate IQ.

Participants discussed various ways that IQ is or should be collected and integrated into decision-making. Interviewees identified consultation as the primary method of gathering and incorporating IQ into decisions. Consultation in this regard can be considered an event (or sometimes multiple events) in which people, including community members, government, and industry, can get together and discuss concerns, share knowledge, and make recommendations. However, many participants suggested alternative methods that they felt may be more effective for incorporating IQ into decision-making. Some of the suggested methods include forming lasting partnerships in communities with local Inuit people, hiring local Inuit people to act as community liaisons or to work with shipping companies, and informing and engaging communities before, during, and after project developments to encourage effective communication. All

of these suggested methods are longer lasting than simple consultation events and can involve Inuit input at various stages in the decision-making process.

Although it was unclear to participants how IQ is being incorporated into decisions that are made for marine shipping, many indicated that shipping companies would benefit from using IQ in their decisions and incorporating it into operational planning. These benefits might include learning about the local environment, filling in knowledge gaps in scientific information, and operating in a more socially responsible manner. However, other participants indicated that the shipping industry may not benefit from including IQ in decision-making as it would simply cost companies money (to perform IQ studies) and any possible benefits would not be financially substantial. In other words, from a financial point of view for the industry, the return on investment from performing IQ studies and incorporating it into decision-making may not be worthwhile.

On the other hand, almost all interviewees thought that communities would benefit greatly from incorporating IQ into decision-making. To participants, incorporating IQ into decisions would mean that communities would be more informed, Inuit would be more likely to benefit from new development, Inuit traditional use of the marine environment would be considered in decision-making, and efforts could be made to limit impacts on the environment and traditional ways of life. Again, for IQ to be incorporated and these benefits to be realized, Inuit involvement in decision-making would have to go beyond simple consultation events. In order for IQ to be fully incorporated it must be trusted as a source of information and Inuit must be involved throughout the decision-making process. The benefits of incorporating IQ into decision-making have the potential to be two-fold: benefiting both shipping and communities.

Most interviewees recognized the value of including the Inuit and IQ in decision-making for shipping development in Nunavut. Despite this recognition, many also indicated that IQ is not currently being integrated into shipping decisions adequately, or at all for that matter. Furthermore, when consultation over shipping related activity has happened in the recent past there has been dissatisfaction over the results of this process. The influence of local concerns and input in final decisions has not been apparent, making it seem as though IQ was not considered. This has resulted in overall distrust in government and decision-makers as they claim to integrate IQ into decisions but regularly fail to illustrate how IQ has ultimately been considered.

4.2 Analysis of Interview Responses

Qualitative thematic analysis was used to analyze interview responses. Indicator words and phrases were used as codes to describe issues raised by interviewees (Appendix D). While some participants directly stated the code words or phrases (i.e. some participants directly referred to the "federal government"), others may have indirectly referred to the code words or phrases (i.e. the name of a federal department). Themes were then identified by analyzing the codes and issues.

The number of participants who spoke directly or indirectly about each code was used to determine the importance of the issues discussed in interviews. This allowed for prioritization of issues within each of the themes, based on how many participants referred to each code word or phrase. Codes and issues will hereon be used synonymously, as codes simply refer to the broader issues that were discussed in the interviews.

The responses were also separated by level of government. The levels of government represent broad categories, for example, the territorial level refers to interview participants from the GN and public government institutions. Likewise, the local category includes participants from Hamlet governments as well as community Inuit organizations. The separation of answers based on level of government allowed for more accurate analysis of the responses and identification of differences in priorities between levels of government.

4.2.1 Themes

The identified codes and issues were grouped into 5 main themes (see Appendix D for the thematic analysis).

1. Governance of shipping in Nunavut (Governance).
2. Shipping activity in Nunavut (Shipping).
3. Inuit traditional and current lifestyles (Lifestyles).
4. The environment (Environment).
5. Methods for incorporating IQ into shipping decision-making (Methods).

Graphs of the number of participants who talked about each code were prepared for each identified theme. The graphs offer a visual representation of the issues that were discussed within each theme, making it easy to identify the issues that were discussed most frequently and helps to prioritize the issues within each theme.

Additionally, the bars on the graphs are colour-coded to distinguish between issues that were discussed by different levels of government. This helped to determine where there are differences and similarities between perspectives from different levels. The

most frequently discussed issues under each theme and interesting trends in the data will now be examined further.

Governance. Governance refers to the decision-makers and the legislation, regulations, policies, guidelines, and practices that they use to deal with particular issues – marine shipping in this case. The complexity of governance surrounding shipping in Nunavut was apparent in the interviews as participants made reference to multiple decision-makers, stakeholders, regulatory devices, and issues for decision-makers. All levels of government were discussed as well as many of the regulatory devices used for Arctic shipping.

The topics that were discussed most frequently within the governance theme were local government, legislation and regulation, and science (Figure 8). It could be expected that local government would be discussed frequently as IQ was under consideration and including IQ in decision-making would inherently require some participation of Inuit people at the local level. However, while the local government was identified as being the primary point of contact for accessing IQ and including IQ in decision-making, they were not considered to have much, if any influence over marine shipping. Legislation and regulation was also discussed frequently. This is likely due to the extensive legislation and regulation that applies to all marine shipping as well as the NLCA, which contains provisions for the inclusion of Inuit in marine decision-making. Science as a source of information was also discussed by many participants. Although nobody suggested that science should not be used by decision-makers, many recognized that scientific knowledge on the Arctic environment is not complete and that IQ could be used to

supplement scientific knowledge. Many participants also thought that IQ should be considered a valid source of information for decision-makers, similar to science.

A trend in the responses is apparent as the federal government representatives talked about all issues identified within the governance theme, while territorial and local representatives focused more on certain governance issues related to who should be included in decision-making and how decisions are made. This trend indicates that the territorial and local governments can readily pinpoint issues that need attention within the governance theme. Results from the thematic analysis also suggest that there is a desire at the local level to have more influence over decisions that are made for marine shipping in Nunavut.

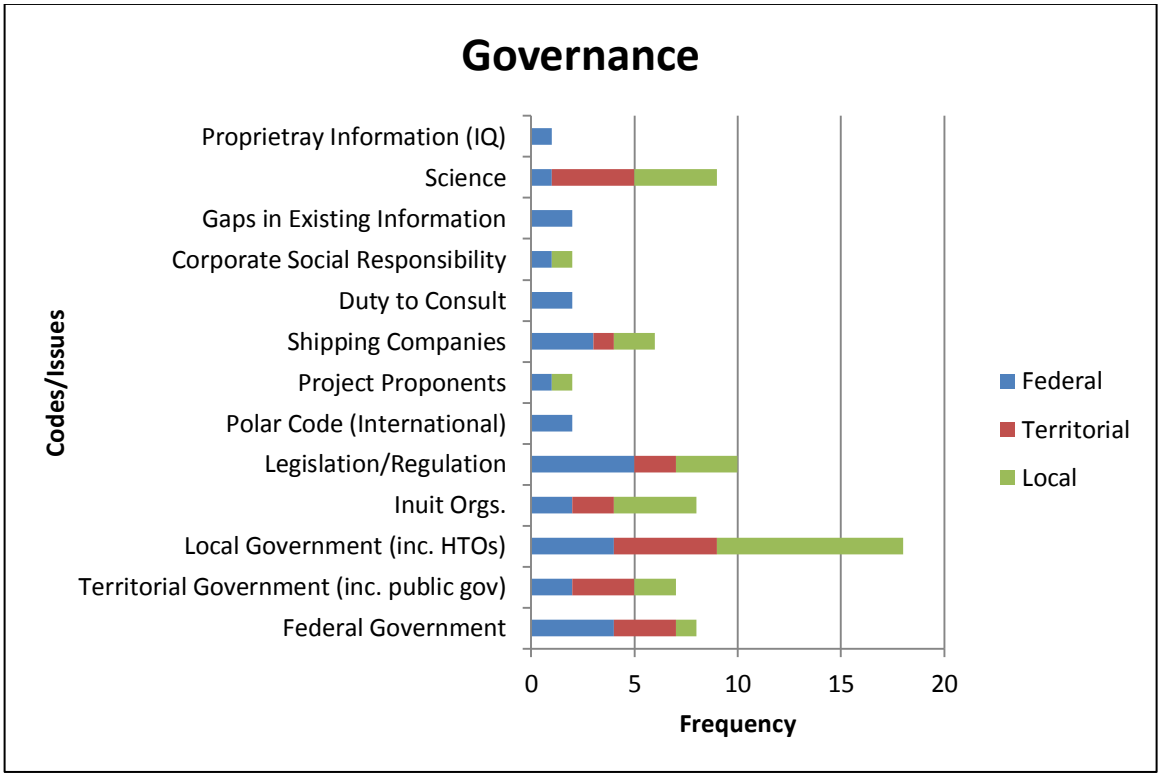

Figure 8. **Frequency of codes/issues discussed under the theme of governance.**

Shipping. The shipping theme represents the different types of marine shipping, technical details of ship operations, and other issues directly related to shipping (Figure 9). The specific concerns and issues raised by interviewees changed slightly with the type of shipping being discussed. However, it remained consistent that Inuit concerns were not focused on shipping itself, but instead on the effects of increased shipping activity on the marine environment and consequent impacts on Inuit lifestyles.

The most frequently discussed topics within the shipping theme were resource development, tourism (cruise ships), and ship routing. Resource development was the most prominent topic, likely because of the Baffinland project at Mary River which will require extensive shipping. Most people know about this project and are aware of the consultations that have taken place in the surrounding communities.

Tourism was a topic of much discussion, particularly at the local level. The cruise shipping industry has been growing in the Arctic region and people are seeing more and more cruise ships visiting communities. Ship routing is an issue where management decisions can easily incorporate IQ. IQ can identify when and where ships should go to minimally impact the environment and Inuit activities.

The trend in the graph for shipping indicates that the territorial and local government representatives generated a more extensive list of issues related to shipping in Nunavut those from the federal government. This indicates that people at the territorial and local level see more issues, or at least consider more issues, under the theme of shipping than their federal colleagues. While representatives at the federal level are no doubt aware of most of the issues within shipping that were raised by the local level, they did not specifically address these topics during interviews.

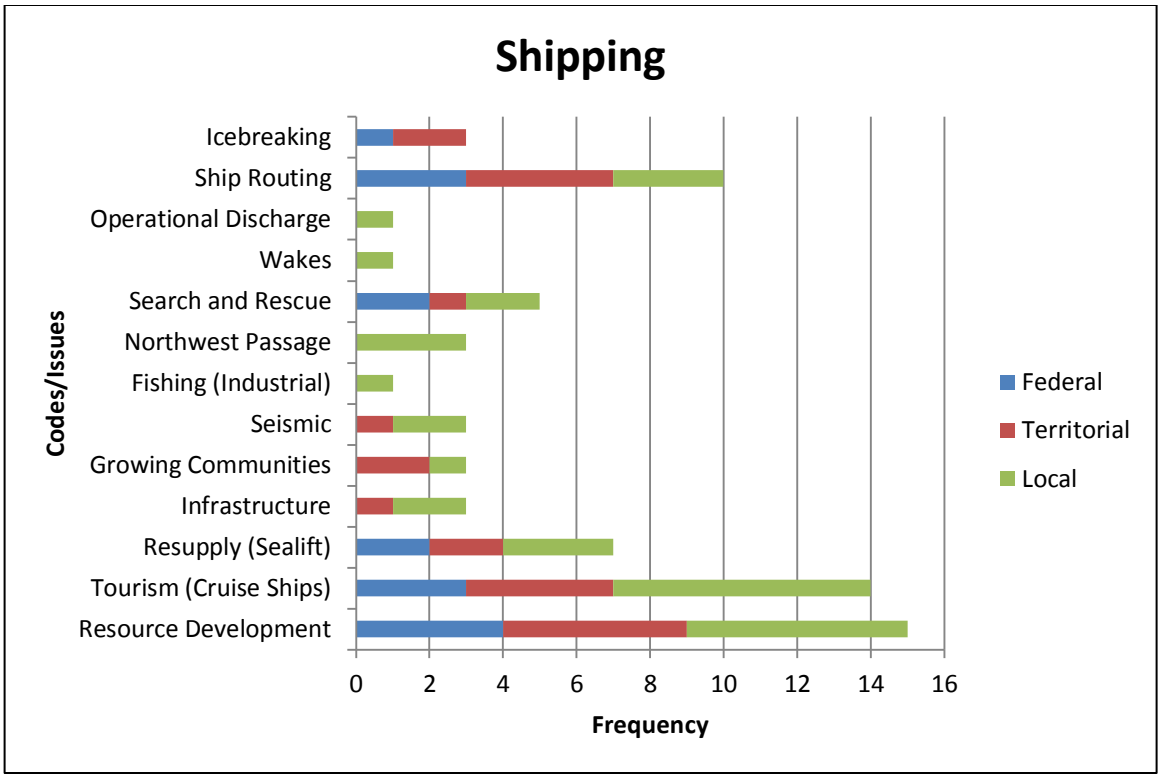

***Figure 9*. Frequency of codes/issues raised under the theme of shipping.**

Lifestyles. Inuit lifestyle is reflective of both traditional and current activities. Inuit are inherently connected to the land and sea around them and many Inuit participants made it clear that you cannot separate the Inuit from the natural environment. Inuit use of the marine area over time has led to the production of knowledge about how to travel, hunt, fish, and survive in this area. The Inuit can provide decision-makers with details on IQ and use of marine space. Therefore, with proper methods for incorporating IQ, decisions can respect Inuit use of space and resources and efforts can be made to reduce impacts on Inuit lifestyles. Indeed, the most prominent topic of discussion within the lifestyles theme was Inuit use of the marine environment, which includes activities such as hunting and traveling (Figure 10). There were not many issues discussed under the theme of lifestyles; therefore the only real trend was that Inuit use was the most

prominent discussion topic. It was also sometimes difficult to distinguish between when people were talking about lifestyles or the natural environment, due to the close connection of the two themes (they often talked about these two themes together). However, Inuit lifestyles, including traditional and current use of marine space, is certainly a theme that was identified as important to be considered in shipping decision-making.

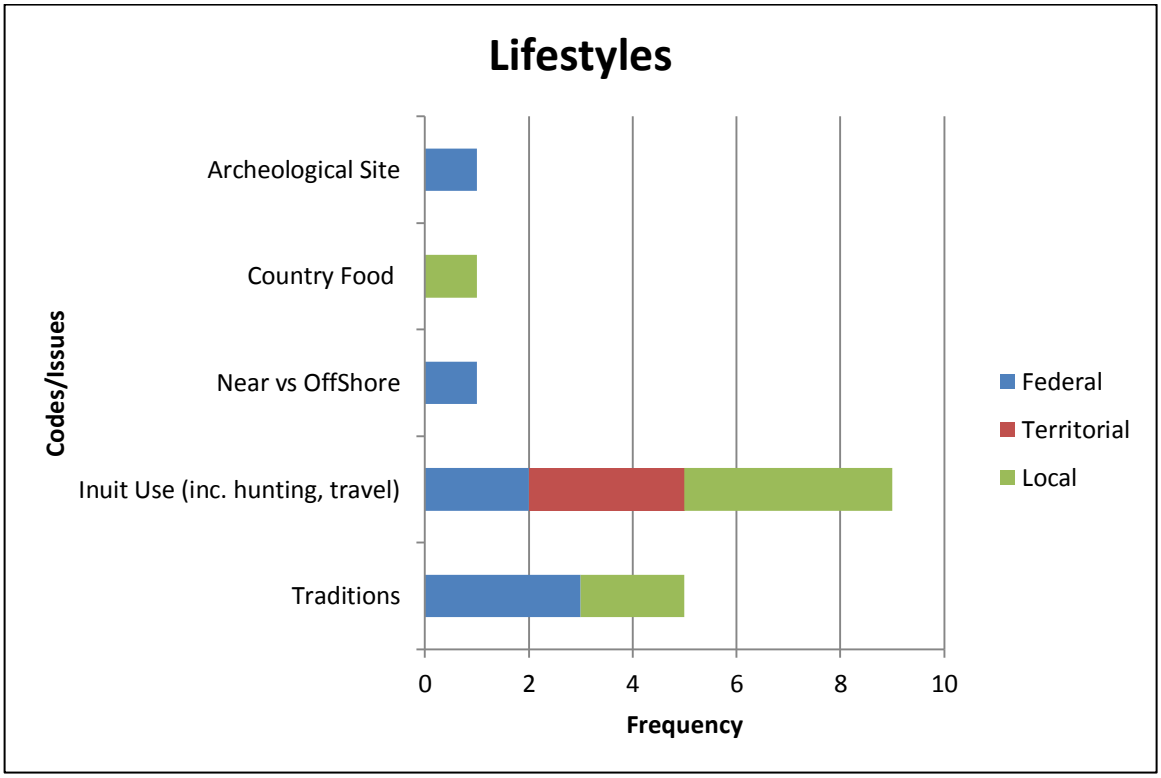

***Figure 10*. Frequency of codes/issues discussed under the theme of Inuit lifestyles.**

Environment. The environment theme refers to marine wildlife and natural processes. Due to the sustained connection of the Inuit to the environment, they have come to know and understand many things about the marine environment. Inuit knowledge of the environment for shipping can be very useful, especially in areas such as ice conditions, wildlife migration and behaviour, and climate or weather patterns.

However, Inuit knowledge about specific environmental impacts from shipping (i.e. how wakes produced by ships might affect the shoreline) simply does not exist because shipping is a relatively new development in the Arctic and many Inuit have not had to deal with the impacts of shipping before. Therefore, IQ related to the environment could be particularly valuable during planning stages as well as monitoring before and after shipping development.

Within the environment theme, the most common topics of discussion were wildlife, ice, and climate change (Figure 11). The effects of shipping on wildlife are the largest concern. Inuit people know that shipping will affect the wildlife and may cause some animals to change their behaviours (i.e. leave certain areas). If wildlife is affected then many other aspects of Inuit life may also be affected, due to the Inuit use of the marine environment and resources. Climate change was discussed not only as the cause of melting sea ice and opening up of new shipping lanes, but also as a source of uncertainty. It was recognized that Inuit knowledge may not be specific to climate change and how it will affect the marine environment, but Inuit knowledge could provide information on what changes are occurring and play a role in assessing that change. There were no major trends under this theme other than the most commonly discussed topics of wildlife, ice and climate change.

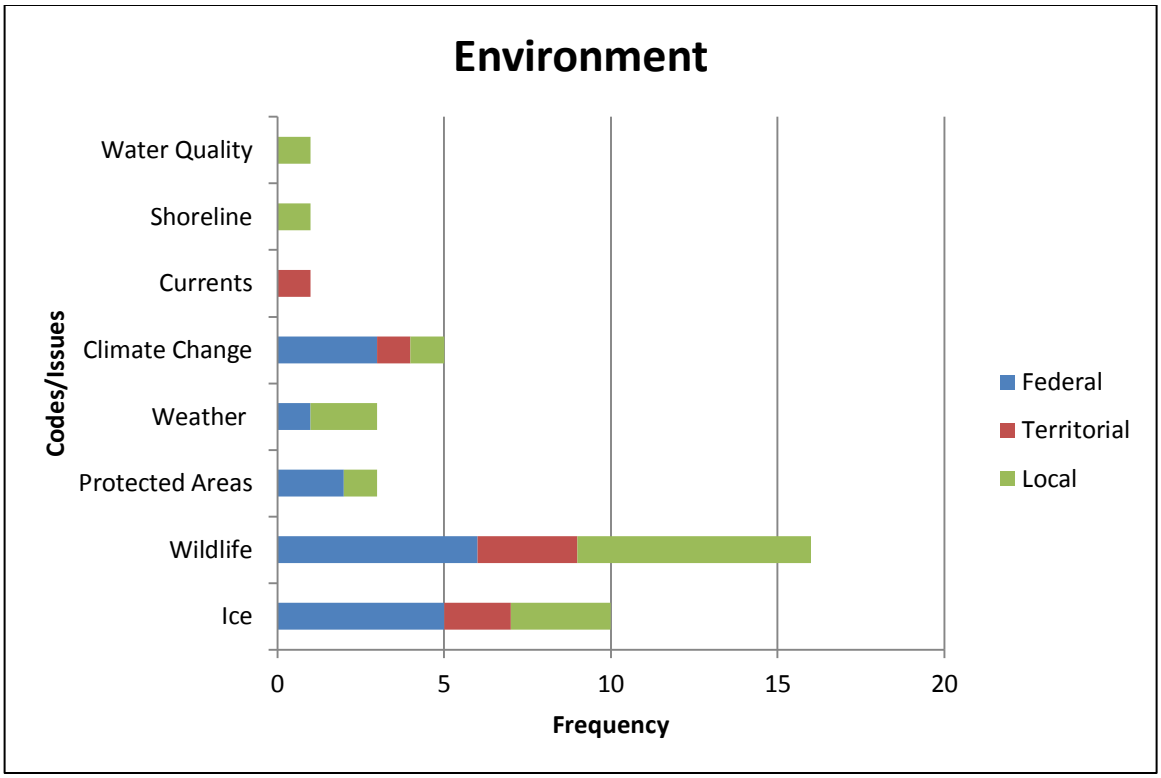

***Figure 11*. Frequency of codes/issues discussed under the theme of environment.**

Methods. Methods for incorporating IQ into marine decision-making in the past have left ample room for improvement. During interviews, participants discussed ways in which IQ could be incorporated more meaningfully in the future. A variety of existing methods and suggestions for potentially more effective methods were discussed. Existing methods were not deemed useless or ineffective; rather, improvements upon existing methods seemed to be most pertinent.

The most prominent areas of discussion within the methods theme were consultation, informing, and elders/locals (Figure 12). Consultation was recognized as the primary method for collecting and incorporating IQ into decision-making. However, suggestions were made that could improve consultations, such as informing communities on project developments and identifying elders and knowledgeable locals. Many people indicated

that local people need to be kept informed throughout the decision-making process. As well, elders and knowledgeable locals were identified as the ones who should be providing IQ for management of marine shipping.

The apparent trend within the methods theme is that many of the suggestions for improving methods came from the territorial or local level. This indicates that people at these levels see areas for improvement in the existing methods for incorporating IQ into decision-making and can identify how to make those improvements. By collaboratively working with territorial and local representatives, managers could develop consultation and engagement techniques that would be more effective and perhaps incorporate IQ more meaningfully in decision-making.

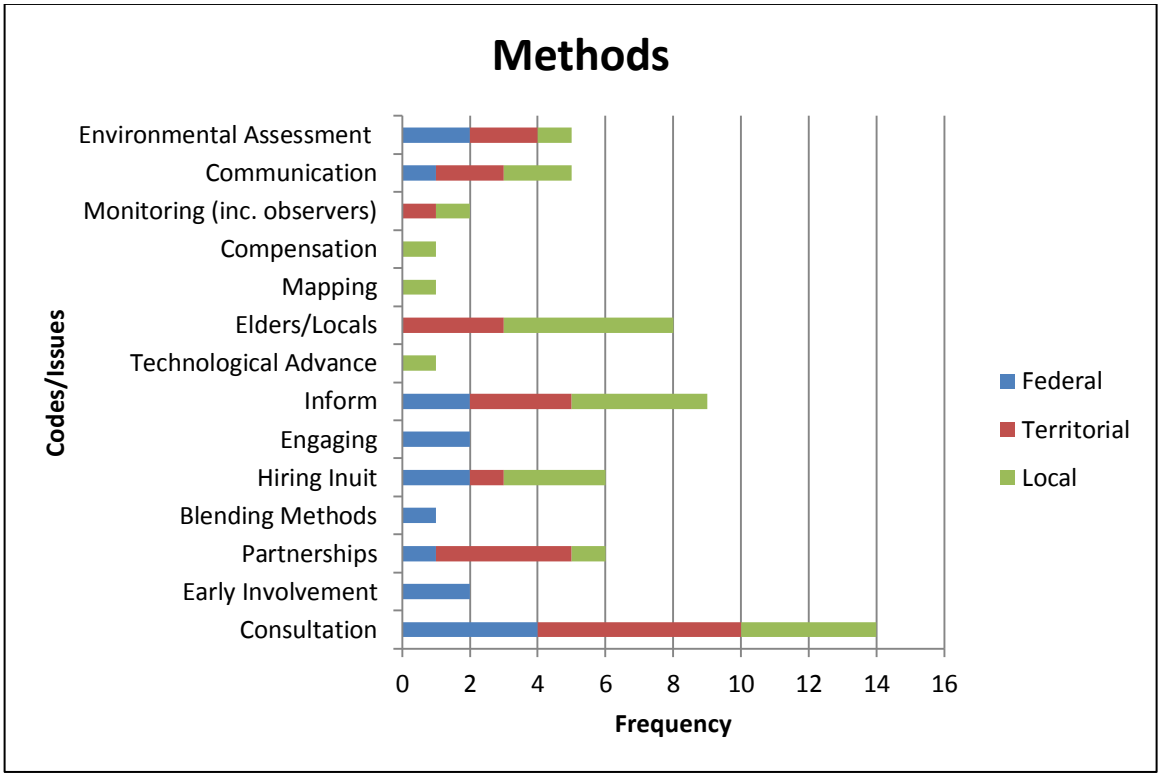

***Figure 12*. Frequency of codes/issues discussed under the theme of methods for incorporating IQ into decision-making.**

4.2.2 Governance, Methods, and Shipping

To help understand how governance of shipping in Nunavut includes IQ, and how the methods for incorporating IQ into decision-making might be improved, a matrix and graphical representation of analysis was produced (Appendix E and Figure 13, respectively). The matrix was used as an intermediate step to analyze the findings from the literature review and interviews and identify areas where issues within the themes of governance, methods, and shipping could interact. Note that not all of the issues identified in the thematic analysis were used in the matrix because some of the issues were combined for clearer analysis of interactions. The graph represents the relative importance of specific issues based on the analysis of interactions.

The issue of shipping related to resource development will be used as an example to explain the rationale behind the graph and how conclusions are drawn from it, as it had the most interactions in the matrix. This indicates that shipping related to resource development was relatively the most important issue related to the themes of governance, methods, and shipping that was discussed in the interviews. A few other trends from Figure 13 will be identified and explained briefly to further illustrate the usefulness of this analysis.

The topic of shipping related to resource development projects (like the Baffinland project) are often large and complex issues that involve most, or all levels of government as well as many methods for gathering and utilizing IQ. Local governments are consulted, and territorial and federal governments may be involved in consultation as well as project approval and permitting. During the EA phase of project development, project proponents conduct consultations and engagement events in an attempt to gather and

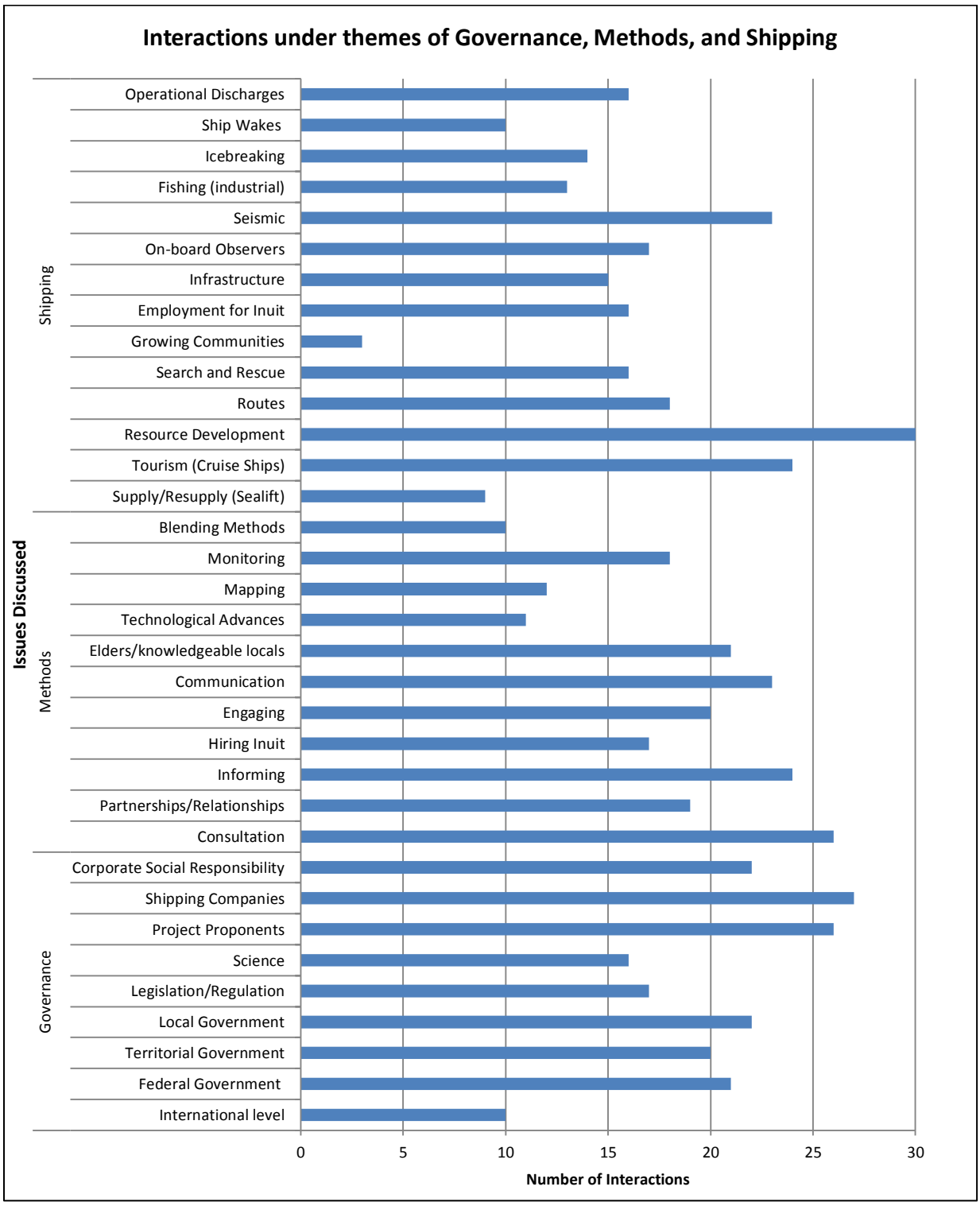

Figure 13. **The number of interactions between issues under the themes of shipping, governance, and methods for incorporating IQ into decision-making.**

consider IQ in decision-making. However, this does not mean that IQ is meaningfully incorporated into decision-making; indeed, many interviewees felt that different methods for incorporating IQ could be employed to improve the process (i.e. better communication throughout the consultation and EA process).

The graph (Figure 13) helps to determine which issues may need the most attention when it comes to incorporating IQ into decision-making. It is clear from the graph that shipping related to resource development, tourism, and seismic surveying are the types of shipping that interact most intensely with governance and methods for incorporating IQ into decision-making, while other shipping, like the sealift service, is not of such great importance within these themes.

The topics of consultation, informing, and communication within the methods theme had many interactions. Consultation was identified in the interviews as the most commonly used method for incorporating IQ into decision-making. On the other hand, informing and communication were seen as areas where methods for incorporating IQ could be improved upon.

Shipping companies, project proponents, and local government also had many interactions. This indicates that they are all important players in shipping decision-making. Indeed, the shipping companies and project proponents are often the entities that directly interact with local communities and employ the methods for incorporating IQ into decision-making.

The described interactions are complex and highly interwoven. However, it is important to understand how governance, methods for incorporating IQ into decision-making, and shipping come together in order to improve how decisions are made.

4.2.3 The Environment, Inuit Lifestyles, and Shipping

As a result of the literature review and interview analysis, specific areas where IQ and shipping interact can be identified. These are areas where IQ could influence shipping decisions and where shipping could have an impact on Inuit people. A matrix is used here to identify these areas of interaction (Figure 14), followed by an explanation of the interactions. Issues within the themes of environment, Inuit lifestyles, and shipping were used in this matrix.

While IQ is a very broad concept that encompasses many parts of Inuit life and accumulated knowledge, the areas of IQ that may be most influential for shipping management come from Inuit knowledge about the environment and about their lifestyles. Therefore, this matrix specifically identifies where IQ and shipping can come together for improved and mutually beneficial management of marine space and resources.

Note that many of the issues under each theme in the matrix were the codes identified for the thematic analysis; however, not all codes were used directly as some were grouped together or broken into their components to better illustrate the interactions. Please keep in mind that the identified interactions do not represent a complete list of all possible interactions. Rather, they represent the findings from the literature and the topics that were discussed in interviews and identified as important by participants. The interactions are described below to explain the nature of the interactions that were identifed.

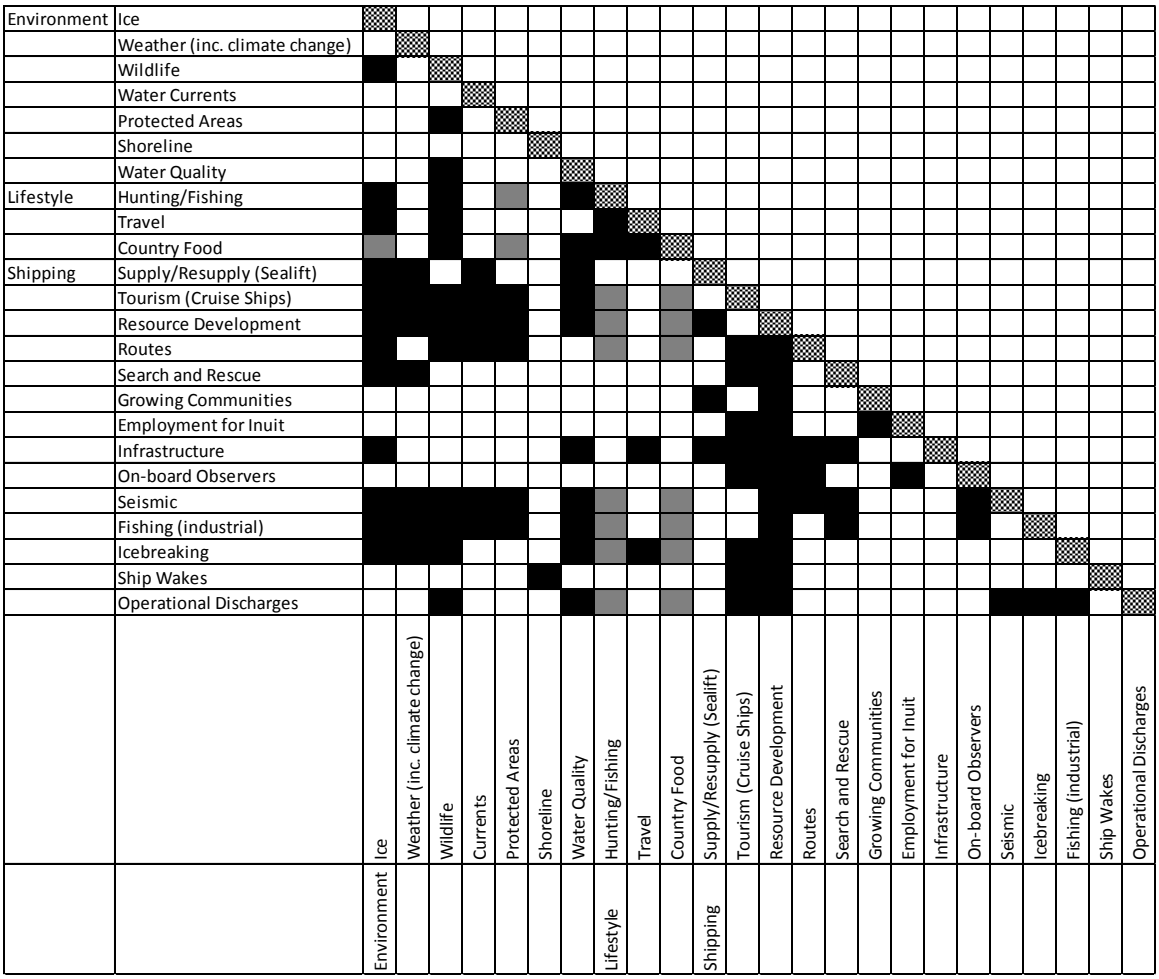

***Figure 14*. Matrix of interactions between shipping, Inuit lifestyles, and the environment. Black, direct interactions; gray, indirect interactions.**

The most apparent interaction trend in this matrix is the division of direct and indirect interactions (black and gray, respectively). The indirect effects of shipping are primarily grouped under the categories of country food and hunting and fishing, both of which fall under the lifestyle theme. To begin, the direct interactions will be discussed, followed by the indirect interactions.

Within the category of ice, direct interactions were identified with wildlife, hunting and fishing, travel, ship routes, search and rescue, infrastructure, and all types of shipping

(supply and resupply, tourism, resource development, seismic, fishing, and icebreaking). Ice and wildlife directly interact as many animals depend on sea ice for at least part of their life (i.e. polar bears use the sea ice for a large part of the year). Ice directly interacts with Inuit travel and hunting and fishing, as Inuit use the sea ice to travel from place to place or for travel to traditional hunting and fishing grounds. They also use the ice as a platform for hunting and fishing activities. Ice and all types of shipping directly interact simply because shipping operations may be affected by ice at some point; this is unavoidable in the Arctic region. Related to shipping, port development and placement could depend on ice conditions in the area, routing could be planned strategically to avoid ice or to follow icebreakers, and ice could present a safety hazard to ships.

Within the category of weather (including climate change) interactions can be seen with all types of shipping as well as with safety (search and rescue). This is because weather directly affects shipping operations, especially in the north where conditions can change quickly and pose serious threats to safety. Due to the adverse weather that is often encountered in the Arctic, safety and search and rescue plans must be in place to respond to emergencies. Climate change may also affect all types of shipping as sea ice is melting and opening new shipping lanes.

Under the category of wildlife, direct interactions can be seen with ice, all aspects of Inuit ways of life, all types of shipping except for supply and resupply, routing, and icebreaking. The interaction with ice was discussed previously (moving forward, interactions that were previously discussed will not be discussed again). Wildlife directly interacts with Inuit ways of life (hunting and fishing, travel, and country food supply) because all of the ways of life identified in this study relate to wildlife in some way.

Wildlife interactions exist with all types of shipping, but for different reasons. Shipping related to resource development will require frequent shipping, in the same area, and over extended periods of time. All of these factors could seriously affect wildlife in an area, causing them to change their behaviour in some way, such as avoiding the area. Wildlife and tourism interact with wildlife because tour (cruise) ships often travel around looking for marine wildlife to please the tourists on board. Inuit are concerned that cruise ships will disturb wildlife, again causing them to change their behaviour. Wildlife and industrial fishing interact simply because fishing vessels go out to sea for the purpose of harvesting fish. Seismic surveying and wildlife interact because the ship carries seismic equipment that emits sound and could disturb marine wildlife, particularly marine mammals. Routing and wildlife are deemed to interact because the route of ships could affect wildlife more or less depending on how carefully the routes were planned and whether or not wildlife was considered during planning. Icebreaking also interacts with wildlife as it could affect how wildlife use the ice. If changes in behavior occur due to any kind of shipping, the Inuit may have a hard time finding animals as they may move from areas where they were traditionally found. Notably, wildlife and supply and resupply shipping is not indicated as having an interaction. Although this kind of shipping could potentially have an effect on marine wildlife, it was not identified as having an effect because Inuit rely so heavily on sealift and because the sealift visits communities so infrequently.

Water currents were discussed as having potential interactions with all types of shipping. Inuit people may know about ocean currents in certain areas, which may be useful information for ship operators.

Hunting and fishing activities directly interact with ice, wildlife, travel, and country food. Interactions between hunting and fishing and travel exist because Inuit depend on being able to travel over the land and sea in order to reach the wildlife that they want to harvest. Hunting and fishing and country food directly interact because hunting and fishing provides country food for the community.

Within the category of travel, direct interactions were identified with ice, wildlife, hunting and fishing, country food, port development, and icebreaking. Travel and country food interact directly because the provision of country food depends on the ability of Inuit to travel to harvesting areas. Travel and port development directly interact as many Inuit use boats to travel and port development could be beneficial for Inuit who own boats. Finally, travel and icebreaking directly interact because Inuit travel on top of the ice and icebreaking could disturb this. In one example that was discussed in interviews pertaining to travel and icebreaking, a shipping company (operating in Voisey's Bay, Newfoundland and Labrador) agreed to install small bridges over broken ice so that Inuit could continue to use their traditional trails.

Within the category of shipping related to resource development, direct interactions can be seen with ice, weather, wildlife, currents, port development, routing, safety, and icebreaking. This type of shipping directly interacts with port development because large projects, such as the Baffinland project, will require port development if they are to reach maximum efficiency for shipping in supplies and exporting products. Shipping related to resource development directly interacts with routing because it is imperative that ship routes are chosen based on efficiency and also in an effort to minimize effects on the environment and local people. A direct interaction can be seen with icebreaking as

development related to resource development will likely require year-round shipping and icebreaking services. Finally, there is direct interaction between safety (search and rescue) and all types of shipping because the increase in shipping activity will increase the risk of an accident happening and mechanisms must be in place to deal with these risks.

Shipping related to tourism directly interacts with wildlife, weather, currents, routing, safety, and icebreaking. Routing of cruise shipping is a real concern in Inuit communities as they want to be informed and know when and where cruise ships are going, primarily so that they know if wildlife will be affected or not. Safety is another major concern with Arctic cruise ships as they can carry many people, the risk of an accident occurring is greater in the Arctic due to unique and dangerous climatic conditions, and there is a lack of ability to respond to an accident. Icebreaking could also interact directly with cruise shipping; however, most cruise ships enter the Arctic during ice-free times.

Supply and resupply shipping directly interacts with ice, weather, currents, port development, safety and icebreaking. Direct interaction with port development exists because community supply and resupply could be made much easier and more efficient with new port development.

Seismic surveying directly interacts with ice, weather, wildlife, currents, routing, safety, and icebreaking. Routing could be critical for seismic shipping as the route that the ship takes could result in serious disturbance of marine wildlife.

Infrastructure and port development directly interacts with ice, travel, resource development, supply and resupply, and routing. Routing and port development directly interact as desired ship routes may dictate where ports should be placed, or vice versa.

Routing directly interacts with ice, wildlife, all types of shipping except for industrial fishing and supply and resupply, port development, safety, and icebreaking. Routing and safety interact because routes may be determined in part due to safety reasons. Routing and icebreaking interact because during times when ice is present, ship routes may be determined by the path of icebreakers or in efforts to avoid ice.

Ship wakes and operational discharges are technical aspects of shipping that can directly interact with the environment and Inuit lifestyles. Ship wakes may interact with the shoreline, if they are large enough when they contact the shore. The identified source of wakes that may affect the shoreline come from cruise ships and shipping related to resource development. Operational discharges directly interact with wildlife, water quality, and can come from all types of shipping activities. Indirect interactions under both ship wakes and operational discharges occur with country food and wildlife because anything that affects the environment and wildlife could affect these two aspects of Inuit lifestyles.

Indirect interactions were seen between hunting and fishing and all types of shipping except for supply and resupply. This was determined based on the responses to interview questions and the overall concern that all types of shipping could directly affect wildlife and indirectly affect Inuit hunting and fishing activities. However, supply and resupply shipping was not deemed to have an impact on hunting and fishing as Inuit rely on this service to deliver necessary supplies to them, and delivery happens infrequently (once per

year in most of Nunavut's small coastal communities). For these reasons Inuit communities have little concern over the effects of community supply and resupply shipping because it is such a vital supply service to them. Other indirect interactions under hunting and fishing are with routing and icebreaking. Depending on the routes chosen for shipping traffic, ships could disturb wildlife, indirectly affecting hunting and fishing practices. Similarly, icebreaking could disturb wildlife and indirectly affect hunting and fishing.

Indirect effects were seen between country food and the same categories as discussed above for hunting and fishing (all types of shipping except supply and resupply, routing, and icebreaking). The same indirect effects were seen here because country food is largely made up of the products of hunting and fishing. Therefore, anything that affects hunting and fishing will also affect the supply of country food. Country food also indirectly interacts with ice, as the ice provides transportation and hunting and fishing platforms, which is necessary to provide country food.

The final indirect interaction was seen between shipping related to resource development and supply and resupply shipping. This indirect interaction is present because resource development requires supplies to be delivered and projects will bring more people to the north, requiring more supplies. Another indirect effect is on the price of sealift services; right now sealift services are very expensive resulting in high prices for the good shipped. However, if sealift services are required more often, then the price for this service may go down, leading to lower prices for the goods being shipped.

Chapter 5: Discussion and Recommendations

The literature review provided background information on shipping and IQ in Nunavut. The interviews and analysis provided perspective and detailed guidance for managers, identifying specific management issues related to shipping and IQ. Now the results will be discussed, compared to other findings in the literature, and recommendations will be made.

5.1 Discussion

Governance. Within the governance theme the primary issue that became evident through the analysis was that involvement of people from the local level is instrumental for incorporating IQ into decision-making. While shipping decisions fall under the federal government's jurisdiction, Inuit people must still be included in decision-making due to provisions in the NLCA that require consultation on decisions that may affect their lifestyles. However, the incorporation of Inuit and IQ into western ways of decision-making can pose some challenges; even when attempts are made to incorporate IQ, decisions still seem to be based more on scientific knowledge, rather than IQ.

Although devolution of control from the federal government to the GN over marine shipping is not likely to happen in the near future, a governance approach based on IQ for shipping in Nunavut could still be achieved. In this case, the guiding principles for incorporating IQ into decisions that were developed by the GN could be utilized at the federal level in an attempt to govern shipping in Nunavut. While it is still unclear how the GN itself incorporates IQ into their operations (Arnakak, 2002) and contemporary government in Canada is based on western models of governance (White, 2006), attempts should still be made to embrace and incorporate IQ into decision-making for shipping. Additionally, some methods for incorporating IQ into decision-making can effectively

devolve some responsibility to lower levels of government, such as through community-based co-management approaches (Dale & Armitage, 2011).

Methods for incorporating IQ into decision-making. Participants in the interviews, particularly local level participants, identified many ways that methods for incorporating IQ into decision-making could be improved upon. Suggestions were made on how to incorporate IQ into decisions, like identifying local elders and knowledgeable individuals to provide IQ. Some suggestions, such as keeping people at the local level informed on shipping projects and planning may not be an obvious way of including IQ in decisions. However, informing is an important way to include IQ because it can be reciprocal; Inuit can be informed of project developments and decision-makers can be informed of Inuit concerns and suggestions at the same time. Informing is really another form of effective communication and engagement, allowing for IQ to be incorporated into decision-making. These findings are similar to those in Dowsley and Wenzel (2008) who found that in co-management regimes it is important to understand the knowledge system and communicate effectively, on all aspects of management, between Inuit, scientists, and managers.

Eddy et al. (2002) explored integrated management in the Arctic and used similar interview methods to this study, qualitatively assessing and compiling a list of uses and concerns related to the marine environment. Through relationship-building in communities and interviews, community engagement was considered effective. Indeed, in this study many interviewees identified relationship building as being key to effective management and decision-making. This study also supports the conclusion by Eddy et al.

(2002) that individual, semi-structured interviews made for difficult and complicated assessment of responses, although the final product is comprehensive and holistic.

It is important that methods for incorporating IQ into decision-making are undertaken. Governmental bodies that exist at all levels have western structures, which make it difficult to adequately incorporate IQ into their activities, as it is very hard to incorporate IQ into decision-making without the cultural underpinning that it is formed upon (White, 2006; Dowsley & Wenzel, 2008). Therefore, although the structure of decision-making bodies may limit the incorporation to IQ to some degree, efforts still must be made to include IQ in the best ways possible, whether through co-management boards, consultation, relationship-building, or ideally, through a combination of many methods.

Shipping. Inuit concerns about shipping are growing as shipping activity threatens to increase dramatically in the near future. Again, shipping itself is not the concern, but rather the direct effects on the environment and indirect effects on Inuit lifestyles. The findings from this study suggest that IQ can work to benefit both the shipping industry and Inuit communities. The shipping industry could operate in more sustainable and responsible ways, while communities could benefit through reduced impacts on the environment and their ways of life or even through employment opportunity. The governance issues and methods for incorporating IQ into decision-making are applicable to many types of shipping. However, the concerns about the environment and Inuit lifestyles related to shipping can vary with the type of shipping being addressed.

A limited number of studies have addressed shipping as it relates to the Inuit and IQ. Marine shipping management concerns identified by Kelley and Ljubicic (2012), that are

unique to the Arctic region may include: (1) mobile and variable ice conditions that present hazards to shipping; (2) poor ice charts due to the remoteness of the area; (3) poor and outdated navigational charts; (4) lacking infrastructure for emergency response; and (5) icebreakers affect the ice regime which wildlife and Inuit communities depend on for various activities. Kelley and Ljubicic (2012) also identify that IQ is not being considered in management of Arctic shipping adequately. Blakney (2008) found that Inuit are concerned about marine transportation planning, especially regarding shipping routes, regulation and safety, and transportation effects on wildlife. This study supports the findings of Kelley and Ljubicic (2012) and Blakney (2008), and further suggests specific methods to improve consideration of IQ in shipping management.

Environment. The environment can be viewed as the underlying concern related to shipping development. Harm or changes to the natural environment caused by shipping could have serious indirect effects on the Inuit people and lifestyles.

This study did not investigate any one aspect of the environment in depth, instead issues and concerns related to the environment were identified as being related to shipping and IQ. For example, unlike in the ICC report on Inuit use of sea ice that was submitted to the Arctic Council's AMSA report, findings from this study did not identify specific concerns over shipping related to sea ice. However, many of the interviewees identified sea ice knowledge and the use of sea ice by wildlife and the Inuit as being one area where IQ could contribute to shipping decision-making. The findings from this study complement those of the ICC report, in that the ICC report studied Inuit and sea ice in depth and this study identified how Inuit and concerns about shipping are and should be better incorporated into shipping decisions.

Inuit lifestyles. Inuit lifestyles was not necessarily the most commonly discussed theme throughout this study, but it does serve as the basis for much of the local level concern regarding shipping and IQ. It is clear that Inuit people want to continue practicing their traditional ways of life that are closely connected to the natural environment (ICC, 2008). This study agrees with findings from interviews in Marquez and Eagles (2007) on cruise shipping and policy development, in that decision-makers must respect Inuit communities and take their concerns into consideration for policy development and shipping operations.

5.2 Recommendations

The final recommendations presented here offer guidance for marine managers dealing with marine shipping in Nunavut and including IQ in decision-making. This is not necessarily a complete set of recommendations for the use of IQ in decision-making, but it is reflective of the findings from this study.

1. Understand what IQ is and why it is a valid source of information.

For managers working in Nunavut, IQ contains fundamental principles that should be adhered to in order to incorporate Inuit people and their knowledge into decision-making. Before attempting to work with Inuit people and manage resources and activities in Nunavut, managers should make an effort to understand what IQ is and why it is valuable for management.

2. Incorporate principles of IQ at all levels of government.

Shipping is primarily regulated at high levels of government, like the international and federal levels. To effectively incorporate IQ into decision-making, these high levels of government must learn about IQ and utilize its principles. Therefore departments and people working on Arctic marine shipping at the international and federal level must embrace IQ. While the territorial and local levels may recognize and work to incorporate IQ into their operations, the federal and international levels should do the same.

3. Form relationships with communities that may be affected by shipping activity.

Relationship building was considered one of the best ways to improve management of marine resources and uses, including shipping. Simply using consultation events, without relationship building, in the past have often not satisfied community expectations or the legal requirements to consider Inuit and their lifestyles in management. Moving towards a longer-lasting relationship between communities and decision-makers, based on trust and cooperation could help to correct problems that have arisen in the past.

4. Combine many methods for effectively incorporating IQ into decision-making.

This recommendation is linked to the previous recommendation to build relationships with communities. Managers may have to use many methods to effectively build relationships and incorporate IQ into shipping decisions. Effective and long-lasting communication is essential to build relationships and trust. For shipping, this means that

people are made aware of what ships are doing, where they are going, and what the possible impacts might be on the marine environment and Inuit lifestyles.

Working with communities to develop methods for integrating IQ into decision-making could also help to ensure that methods will be effective. It could also work to reduce the time needed for consultation after plans are established since IQ was already being considered early in the process.

5. Make clear linkages between IQ and final decisions.

The findings from this study suggest that consulting in meaningful ways means that it is clear how IQ is incorporated into decisions that are made. The linkages between IQ and the final decisions must be clear so that people can see how their specific concerns and input are considered and responded to.

6. Address environmental concerns – don't just acknowledge them.

This recommendation means taking action on the environmental concerns that are raised related to shipping, including concerns raised by Inuit communities. Taking action could entail developing better shipping technologies, changing operating procedures, or putting monitoring programs in place to reduce the impacts of shipping on the environment. Taking these actions is an important step in the direction of sustainability and responsibility of Arctic shipping operations. Addressing environmental concerns can be a concerted effort between governments, industry, and people at the local level.

7. Respect and work to minimize impacts on Inuit lifestyles.

This recommendation ties in with the first; to understand IQ and why it is valuable for management. Respecting Inuit lifestyles means that, as a manager of shipping, you understand that Inuit are closely connected to the marine environment and that shipping is taking place in an environment that Inuit people still rely on for culturally significant subsistence activities. Respecting Inuit lifestyles and the IQ that they are based upon are important aspects of development activities in Nunavut. Minimizing impacts on Inuit lifestyles ties in with the recommendation that managers should address the environmental concerns of the Inuit. Reducing impacts on the environment inherently reduces impacts on Inuit lifestyles, as the two are so closely connected. Ensuring that Inuit people can still carry-out their ways of life alongside shipping development will require that the environment is respected and cared for.

5.3 Limitations on this Study

There are some limitations on this research. First, the research is exploratory, small-scale and preliminary. This study draws conclusions based solely on the literature review and the limited number of interviews that were conducted and further research on this topic is warranted. The subject of incorporating IQ into management of shipping is literature poor; therefore, the literature search was separated into the components of decision-making, shipping, and IQ. Despite the lack of literature on IQ and its usefulness for shipping and the sometimes difficult process of including IQ in decision-making, industry and government at local, national, and international levels must work now to incorporate Inuit and IQ into Arctic shipping development (AOR, 2011).

The interview findings complemented the literature review findings. However, these interviews were done over a limited length of time. While local representatives from participating Inuit organizations were included in interviews, no other community individuals were recruited to take part in the study. This was primarily due to time constraints on this study. In future studies more in-depth interviews with local Inuit knowledge holders (such as elders) could enrich the understanding of how IQ should be integrated into shipping decision-making.

The literature review explored the international side of shipping but no interviews were conducted with representatives from the international level. Some interviewees suggested that representatives from the international level should be sought after. The international level is important for shipping because of the international nature of the industry, thus it is important to understand the decisions that are made at this level and how traditional knowledge and indigenous peoples are included. In future studies, a closer examination of the international level is warranted. Likewise, no participants were recruited from the shipping industry. Some interviewees indicated that the industry perspective is critical as they are often involved in shipping decision-making and are the ones who will ultimately be operating in the Arctic environment and affecting local communities.

Chapter 6: Conclusion

The anticipated increase of marine shipping in Nunavut and the continued use and reliance on the marine environment for subsistence and cultural purposes by the Inuit makes for a complex management issue. This management issue bridges high to low levels of governance as well as management sectors from the environment to indigenous rights to safety and emergency response.

Governance issues revolve around the fact that the local level is not able to successfully influence shipping management. Lack of devolution of power to lower levels of government and failure to establish appropriate vectors to incorporate IQ into marine management seem to be at the root of these governance issues. In the unlikely scenario that decision-making over shipping will be devolved to lower levels of government in Nunavut, methods and guidelines for incorporating local people and their knowledge into decision-making are required. This study acts as a starting point and offers some guidance for incorporating IQ into the decision-making process related to marine shipping.

Due to the continued importance of subsistence livelihoods to the Inuit, the potential impacts of shipping reach far beyond the natural environment. Marine resources for the Inuit are of socio-economic and cultural importance. The Inuit also possess legal rights that give them a say in development projects that may impact their use of the natural environment. Therefore, they have the right to defend the environment on which they rely and question how marine shipping will affect their ways of life.

Management tools, such as community-based co-management, have been used in Arctic marine management to link communities to higher level management structures and to share knowledge. A form of community-based co-management can and should be

used for managing shipping so as to encourage and achieve community-level involvement in high-level decision-making. Additionally, consultations with Inuit for shipping development must be done early and throughout the planning process, forming long term relationships, to ensure that IQ is incorporated at all stages of shipping development.

Arctic marine shipping is an interdisciplinary topic. Management of shipping requires an understanding of many issues including governance, politics, socio-economics, and the environment. Therefore, managers must keep this in mind and know that shipping management will be complex and making decisions may take extensive time and effort. Furthermore, when dealing with shipping and Inuit populations, there are unique considerations that involve the environment and well-being of indigenous people. Managers must try to understand the unique culture of the Inuit, their knowledge system, and how to incorporate IQ into marine shipping decisions; making decisions with great humility and respect for the local people who may be affected.

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Appendix A: Dalhousie Ethics Approval

Social Sciences & Humanities Research Ethics Board
Letter of Approval

May 31, 2013

Ms Andrea Flynn
Science\Marine Affairs Program (Science)

Dear Andrea,

REB #: 2013-2963
Project Title: Toward a Policy Framework to Guide Managers in the Use of Inuit Qaujimajatuqangit for Shipping Development in Nunavut

Effective Date: May 31, 2013
Expiry Date: May 31, 2014

The Social Sciences & Humanities Research Ethics Board has reviewed your application for research involving humans and found the proposed research to be in accordance with the Tri-Council Policy Statement on *Ethical Conduct for Research Involving Humans.* This approval will be in effect for 12 months as indicated above. This approval is subject to the conditions listed below which constitute your on-going responsibilities with respect to the ethical conduct of this research.

Sincerely,

Dr. Sophie Jacques, Chair

Post REB Approval: On-going Responsibilities of Researchers

After receiving ethical approval for the conduct of research involving humans, there are several ongoing responsibilities that researchers must meet to remain in compliance with University and Tri-Council policies.

1. Additional Research Ethics approval

Prior to conducting any research, researchers must ensure that all required research ethics approvals are secured (in addition to this one). This includes, but is not limited to, securing appropriate research ethics approvals from: other institutions with whom the PI is affiliated; the research institutions of research team members; the institution at which participants may be recruited or from which data may be collected; organizations or groups (e.g. school boards, Aboriginal communities, correctional services, long-term care facilities, service agencies and community groups) and from any other responsible review body or bodies at the research site

2. Reporting adverse events

Any significant adverse events experienced by research participants must be reported **in writing** to Research Ethics **within 24 hours** of their occurrence. Examples of what might be considered "significant" include: an emotional breakdown of a participant during an interview, a negative physical reaction by a participant (e.g. fainting, nausea, unexpected pain, allergic reaction), report by a participant of some sort of negative repercussion from their participation (e.g. reaction of spouse or employer) or complaint by a participant with respect to their participation. The above list is indicative but not all-inclusive. The written report must include details of the adverse event and actions taken by the researcher in response to the incident.

3. Seeking approval for protocol / consent form changes

Prior to implementing any changes to your research plan, whether to the protocol or consent form, researchers must submit them to the Research Ethics Board for review and approval. This is done by completing a Request for Ethics Approval of Amendment to an Approved Project form (available on the website) and submitting three copies of the form and any documents related to the change.

4. Submitting annual reports

Ethics approvals are valid for up to 12 months. Prior to the end of the project's approval deadline, the researcher must complete an Annual Report (available on the website) and return it to Research Ethics for review and approval before the approval end date in order to prevent a lapse of ethics approval for the research. Researchers should note that no research involving humans may be conducted in the absence of a valid ethical approval and that allowing REB approval to lapse is a violation of University policy, inconsistent with the TCPS (article 6.14) and may result in suspension of research and research funding, as required by the funding agency.

5. Submitting final reports

When the researcher is confident that no further data collection or analysis will be required, a Final Report (available on the website) must be submitted to Research Ethics. This often happens at the time when a manuscript is submitted for publication or a thesis is submitted for defence. After review and approval of the Final Report, the Research Ethics file will be closed.

6. Retaining records in a secure manner
Researchers must ensure that both during and after the research project, data is securely retained and/or disposed of in such a manner as to comply with confidentiality provisions specified in the protocol and consent forms. This may involve destruction of the data, or continued arrangements for secure storage. Casual storage of old data is not acceptable.

It is the Principal Investigator's responsibility to keep a copy of the REB approval letters. This can be important to demonstrate that research was undertaken with Board approval, which can be a requirement to publish (and is required by the Faculty of Graduate Studies if you are using this research for your thesis).

Please note that the University will securely store your REB project file for 5 years after the study closure date at which point the file records may be permanently destroyed.

7. Current contact information and university affiliation
The Principal Investigator must inform the Research Ethics office of any changes to contact information for the PI (and supervisor, if appropriate), especially the electronic mail address, for the duration of the REB approval. The PI must inform Research Ethics if there is a termination or interruption of his or her affiliation with Dalhousie University.

8. Legal Counsel
The Principal Investigator agrees to comply with all legislative and regulatory requirements that apply to the project. The Principal Investigator agrees to notify the University Legal Counsel office in the event that he or she receives a notice of non-compliance, complaint or other proceeding relating to such requirements.

9. Supervision of students
Faculty must ensure that students conducting research under their supervision are aware of their responsibilities as described above, and have adequate support to conduct their research in a safe and ethical manner.

Appendix B: Nunavut Research Institute License

Nunavummi Qaujisaqtulirijikkut / Nunavut Research Institute
Box 1720, Iqaluit, NU X0A 0H0 phone:(867) 979-7279 fax: (867) 979-7109 e-mail: mosha.cote@arcticcollege.ca

SCIENTIFIC RESEARCH LICENSE

LICENSE # 02 043 13N-A

ISSUED TO: Andrea Flynn
Dalhousie University
5599 Fenwick St.
Halifax, Nova Scotia
B2G 1R1 Canada
902 476 0930

TEAM MEMBERS: C.Milley,L.Fanning

AFFILIATION: Dalhousie University

TITLE: Toward a Policy Framework to Guide Managers in the Use of Inuit Qaujimajatuqangit for Shipping Development in Nunavut.

OBJECTIVES OF RESEARCH:
The purpose of this study is to create a framework for marine managers to guide decision makers in the use of I.Q. into shipping development projects.The goal of the proposed interviews is to understand who is making decisions in Nunavut with regard to shipping and how I.Q. should be incorporated into those decisions.

TERMS & CONDITIONS:

DATA COLLECTION IN NU:
DATES: July 01, 2013-August 01, 2013
LOCATION: Clyde River,Pond Inlet

Scientific Research License 02 043 13N-A expires on December 31, 2013
Issued at Iqaluit, NU on July 11, 2013

for
Mary Ellen Thomas
Science Advisor

Appendic C: Interview Questions

1. Name and affiliation.
2. How long have you lived/worked here?
3. In your opinion, how much do you know about shipping in Nunavut waters?
4. Do you see shipping becoming more or less important in Nunavut in the short or long term?
5. How much influence does your affiliation have on decision-making with regard to shipping?
6. How much influence do you think your affiliation should have? Why?
7. Do you think that shipping companies and government agencies consider IQ in their decisions?
8. If yes, how is IQ being used in decision-making? If no, why is it not being used?
9. Do you think shipping would benefit from the use of IQ in decision-making? If so, why?
10. How can IQ be included in decision-making with regard to shipping? How should it be included?
11. Who should provide the IQ for decision-making?

Appendix D: Thematic Analysis

Codes	Issues Discussed	Theme
Federal government	- Transport Canada (TC) is the primary regulatory body for Arctic shipping in Canada; they are the guardian of the pertinent legislation; focus on safety, environmental protection, and efficiency - Environment Canada acts as an advisor with regard to shipping; works with protected areas and cruise ships; collaborates with TC and communities - Aboriginal Affairs and Northern Development Canada (AANDC) has heightened knowledge on IQ due to the nature of the department	Governance
Territorial Government	- Have a moderate amount of influence related to some aspects of shipping – namely tourism and sealift	Governance
Local Government	- Local levels of government and local organizations are the best to consult with on shipping because they live in the areas and local people use the land and sea there - HTOs and Regional Inuit Orgs hold IQ and can provide it to proponents/whoever is consulting - Locals are often not involved in planning, just consulted after plans are already made	Governance
Legislation/Regulation	- Most federal legislation for shipping is old and will need updating, especially after release of the new Polar Code - No regulations at local level; but Clyde has a by-law that cruise ships have to pay to come - Need for more regulations	Governance
Polar Code (International Level)	- Canada is pushing for strict regulations of Arctic shipping at the international level	Governance
Project Proponents	- Proponents gather IQ to present to permitting agencies for development projects	Governance
Shipping Companies	- Shipping companies often want to use IQ and carry out activities in the best possible way – to act in a corporately responsible way; however, it is also expensive to carry-	Governance

	out IQ studies and making suggested changes to shipping may cost a lot of money	
Duty to Consult	- The federal government has a legal duty to consult with Inuit on developments that may affect their ways of life	Governance
Corporate Social Responsibility	- Companies must practice corporate social responsibility	Governance
Gaps in existing info	- IQ can fill in gaps in scientific knowledge about the Arctic environment - Although should use IQ, need to have more scientific studies on effects of shipping - IQ needs to be trusted more as valid information - IQ is gaining recognition but it is still not fully trusted	Governance
Science	- IQ is not quantifiable like scientific information, so it is hard to incorporate it into western ways of decision-making	Governance
Proprietary information	- IQ is proprietary and should not be free to anyone; scientific info is not free, so why should IQ be free?	Governance
Resource Development (including mining and oil and gas)	- Increases in shipping are largely due to resource development projects (i.e. Baffinland) and tourism development - Resource development will require associated shipping of supplies and products	Shipping
Tourism (Cruise ships)	- Local Inuit are concerned where cruise ships are going and what they are doing - Cruise passengers bring some revenue to remote communities - Safety and cruise shipping in the Arctic is a concern	Shipping
Resupply (sealift)	- Local Inuit identified that shipping will not grow in importance to them – sealifts are already extremely important – so other than sealift, shipping only represents a threat to the environment	Shipping
Baffinland	- Baffinland did well in the beginning with IQ studies; they also addressed community concerns outright in the responses to communities – IQ played a direct role in the final decisions - However, there was not much consultation	Shipping

	regarding changes to the plans and shipping routes for the project	
Infrastructure	- There are no roads in the north so need other modes of transportation, like shipping; but there is no infrastructure in place for shipping or search and rescue; need for ports and port development	Shipping
Communities Growing	- Growing communities need more supplies to be delivered	Shipping
Seismic	- Seismic is an issue and concern in communities because of potential effects on wildlife	Shipping
Fishing (industrial)	- Industrial fishing is a concern to people in communities	Shipping
Northwest Passage	- Climate change is opening new sea routes (such as the Northwest Passage) and also causing changes on land, like melting permafrost which can damage airplane runways - Inuit know that the Northwest Passage is opening up and there is interest in shipping there; lots of people are concerned about the important wildlife in this area and they know that shipping will affect the animals	Shipping
Search and Rescue	- Need to work more closely with shipping companies for search and rescue purposes; search and rescue should have more influence over decisions	Shipping
Wakes	- Some issues related to shipping such as how wakes might affect the shoreline and how operational discharges may affect the environment are issues that need to be addressed, but traditional knowledge about these things does not exist and Inuit rarely think of these (possibly very serious) effects of shipping	Shipping
Operational discharges	- Operational discharges are a concern. However, many Inuit may not even know about this threat.	Shipping
Ship Routing	- People need to be informed about where ships are going. - Inuit can offer guidance on where ships can go and when in order to lessen impacts on	Shipping

	the environment and Inuit lifestyles.	
Icebreaking	- Icebreaking could present dangers to Inuit travelling on the ice. Animals also act differently in the presence of icebreakers (i.e they may follow the broken ice tracks), or they cannot use the ice anymore.	Shipping
Ice	- IQ can be useful to inform decision-makers on ice patterns, wildlife in an area, and shipping route designation - One example from Voisey's Bay: they build bridges over areas where ice was broken for ship passage so that people can still travel on the ice	Environment
Wildlife	- Whales are important to the Inuit and Inuit are concerned that shipping may affect whale movement and therefore their hunting practices - Inuit rely on wildlife that move around and travel to deep water, but they hunt the animals closer to shore - Ships should avoid important wildlife areas	Environment
Protected areas	- Protected areas should be avoided or managed carefully for cruise shipping	Environment
Weather (including climate change)	- Inuit know the weather and environment well because they have lived here so long - Does science really know enough about the environment and climate up in the north to make big decisions about shipping? - Although IQ is important, climate change may be affecting its accuracy about certain environmental aspects	Environment
Currents	- Local people know the currents and how water moves in the area	Environment
Shoreline	- The shoreline may be affected by ship wakes. Inuit people may not know about this affect, but they should be made aware of it. Science does not know how things like ship wakes might affect the shorelines	Environment
Water Quality	- Water quality could decrease with the release of operational or accidental waste and oil. What will the effects be of decreased water quality?	Environment
Traditions (way of life)	- People in Nunavut have lived there for a	Lifestyles

	long time and still rely on many of the same activities for survival.	
Inuit use of Environment (hunting, travel)	- Inuit use the marine environment for travel and hunting and fishing. They are deeply connected to the environment because it provides so much for them.	Lifestyles
Near shore vs. offshore	- Inuit use the near shore area, but not necessarily deeper waters further from the coast; but this does not mean that Inuit are not affected by what happens in the offshore area	Lifestyles
Country Food	- Country food is vital to the community as many people eat a large proportion of country food. People want to continue consuming country food. (Many people talked indirectly about country food while they were talking about hunting and fishing). - People who rely on country food are the ones who should have a day in decision-making – shipping could affect their lives	Lifestyles
Archeological Sites	- People are concerned that important archeological sites could be damaged when visitors come to communities; especially with increased tourists from cruise ships	Lifestyles
Consultation	- Consultation and partnerships are ways to incorporate IQ into decision-making - It is often not clear how IQ gathered in consultations is incorporated into final decisions - Need to take cultural norms into account when consulting	Methods
Partnerships (building relationships)	- Partnerships are needed in order for non-Inuit to understand IQ - Networks of IQ holders and organizations that can provide IQ - Long term relationships	Methods
Blending Methods	- Need to blend methods for collecting IQ and involving Inuit; include local people and Inuit orgs	Methods
Hiring Inuit	- Hiring Inuit to act as community voices may work well alongside consultations	Methods
Engaging	- People should get together (collaborative	Methods

	meetings) more to discuss concerns and knowledge - There are two issues: Inuit need to be more aware of their rights and how they can be involved and decision-makers need to realize that IQ is valuable and can serve to make decisions	
Informing	- Communities are not being informed fully when it comes to development activities - People want to be informed throughout project development	Methods
Early involvement	- Need to introduce development projects early to incorporate IQ early; be proactive; inform people	Methods
Technological advances	- If IQ was taken seriously then people would be working towards making ships quieter to lessen effects on animals - Need more research on how shipping will affect wildlife and people	Methods
Elders/identified locals	- Elders hold a lot of knowledge, as well as other community members who are not necessarily elders	Methods
Mapping (collaboratively)	- Collaborative mapping to identify Inuit use areas and wildlife areas are often an effective consultation tool	Methods
Compensation	- Compensation and sharing royalties from development is needed - If changes to the environment occur due to shipping and consequently affect Inuit ways of life, compensation should be provided. Plans for compensation should be in place before shipping begins.	Methods
Monitoring effects	- Monitoring effect is needed. If there are effects then changes may be needed in management, or compensation may be required. - Observers on ships could help monitor the effects of shipping.	Methods
Communication	- Sometimes language barriers are evident and need to be considered - Communication could be improved by building relationships and keeping locals	Methods

	informed. - Need better communication during consultations as well, so people know where the project stands in the planning stage	
Environmental Assessments	- Environmental assessments (EAs) are a way to incorporate IQ; but IQ may not be of much use to shipping decisions after that - With EAs it is often not clear how the IQ studies influence final decisions; communities are not informed of how the IQ was used	Methods
Inuit Employment	- Inuit may be employed by shipping companies and through the decision-making process	Methods
Observers	- Observers on ships was identified as a way to involve Inuit and have them influence shipping management	Methods

Appendix E: Matrix used as an intermediate step in the interview analysis