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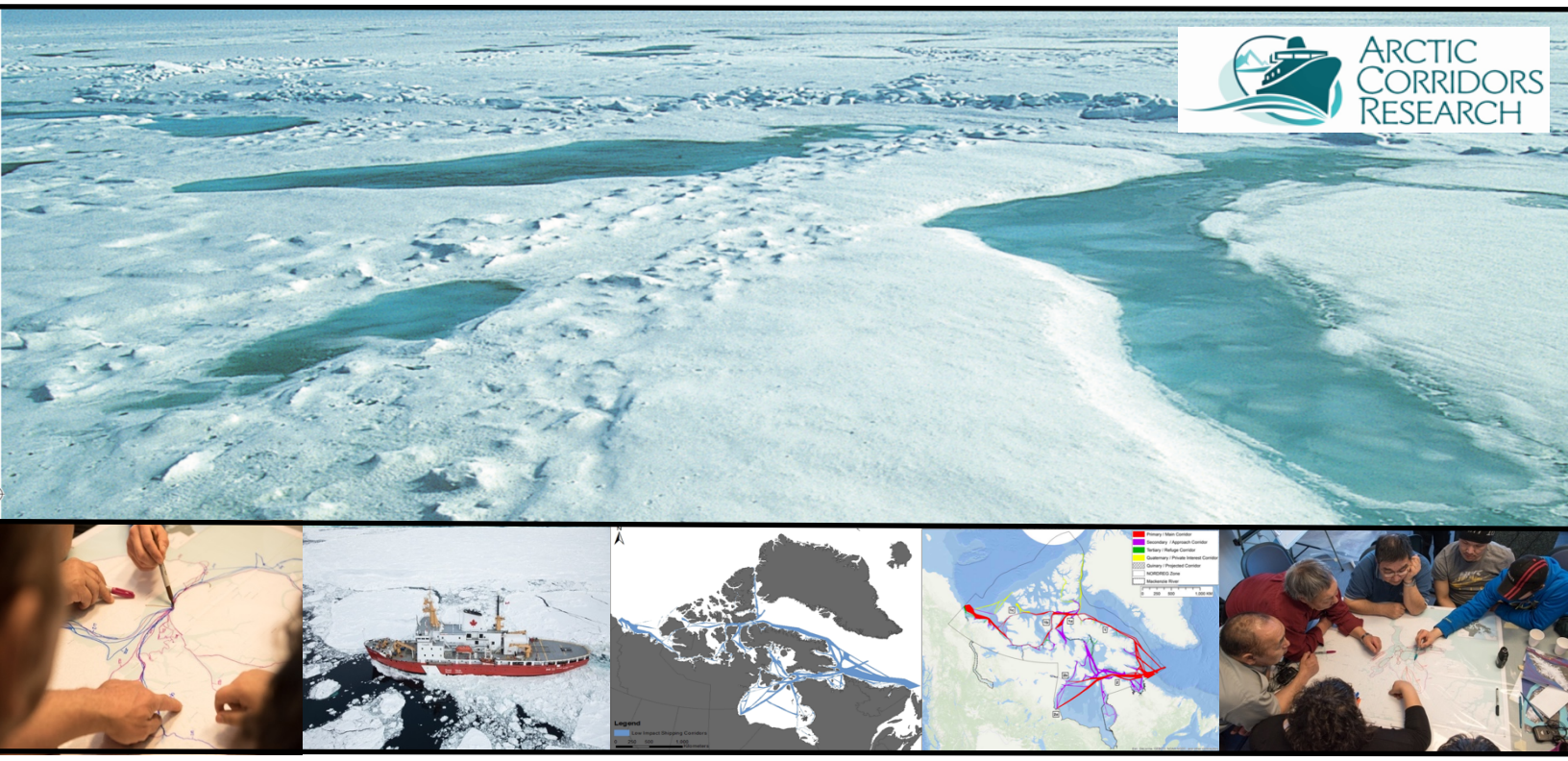
Development and Management of Low-Impact Shipping Corridors in Nunavut

Workshop Discussion Paper



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Department of Geography,
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See www.arcticcorridors.ca for a full list of project funders.

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Executive Summary

Climate change and the combined effects of other global economic factors have facilitated an **increase in Arctic shipping traffic**. The total kilometers travelled by ships in Inuit Nunangat has more than tripled since 1990 and most of this increase has occurred in Nunavut waters. Current and expected increases in Arctic shipping (movement of goods) and transportation (movement of people) in Nunavut will bring both risks and opportunities. The extent to which risks can be minimized and opportunities enhanced will depending highly on the effectiveness of a shared approach to management among national, regional, and local stakeholders and rights holders.

An important initiative for Arctic shipping management that has been established by the federal government of Canada is the '**Low Impact Corridors**' previously referred to as the Northern Marine Transportation Corridors. The aim of the Corridors initiative is to minimize the impacts of shipping in Inuit Nunangat through the creation of voluntary, incentive-based shipping routes that will guide future regulatory decision-making, infrastructure and investment decisions, and enhance safe navigation that respects both people and the environment.

The Corridors were developed by the Canadian Coast Guard, Transport Canada, and the Canadian Hydrographic Service using historic shipping data and an analysis of shipping risks. In partnership with the Canadian Coast Guard, a research team at the University of Ottawa established the '**Arctic Corridors and Northern Voices**' project (see www.arcticorridors.ca) in order to ensure that local perspectives and knowledge were also considered fully within corridors prioritization, implementation, and management. The project involved 14 community mapping workshops to identify local concerns, create culturally significant marine areas (CSMAs) and to identify local recommendations for the corridors. One of the consistent concerns expressed by community members was the need for a shared leadership approach to managing shipping in Inuit Nunangat.

The **purpose of this workshop** is to provide: 1) an introduction to the Low-Impact Shipping Corridors Initiative; 2) share knowledge from different perspectives about Arctic shipping concerns and opportunities; and 3) to begin a conversation about how the Corridors can be co-managed in Nunavut waters. **This discussion paper** contains background information, including a definition of Low-Impact Shipping Corridors, an overview of Arctic shipping trends, potential Corridors models, Nunavut community members' perspectives about the Corridors, and an introduction to the proposed Canadian Arctic Shipping and Transportation Network (CASTnet). It also outlines six key questions that are intended to guide discussions about Corridors development and shared management approaches for shipping in Nunavut waters.

Background and Workshop Context

In a 2014 report, the Office of the Auditor General of Canada noted the lack of a clear and cohesive vision for the country's Arctic shipping policy. Despite seven government studies completed, with more than 170 total recommendations issued, the Auditor General observed that little progress had been made in this area. One of the more recent attempts at improving Canada's Arctic shipping policy was the launch of the Northern Marine Transportation Corridors Initiative (NMTCI) in 2012. Led by the Canadian Coast Guard (CCG), this initiative sought to establish a system of voluntary marine corridors toward which CCG and other agencies could direct their financial, material, and human resource capacity to support vessel safety in the Arctic.

The inclusion of the term 'low-impact' within NMTCI was formally addressed upon the United States-Canada Joint Arctic Leaders' Statement issued by President Obama and Prime Minister Trudeau in late 2016. This joint statement indicated that CCG would now be joined by the Department of Fisheries and Oceans (DFO) and Transport Canada (TC) in the implementation of the NMTCI. The evolution of the NMTCI continued with the Government of Canada announcement of the Oceans Protection Plan (OPP) in 2016. With this announcement, the NMTCI found a new home - becoming the Northern Low-Impact Shipping Corridors initiative, as it is known today.

The Oceans Protection Plan (OPP) seeks to improve marine safety and responsible shipping, protect Canada's marine environment, and offer new possibilities for Indigenous and coastal communities. There are numerous initiatives within the OPP, of which 27 have a direct link to Inuit Nunangat. One of the most ambitious initiatives is the Northern Low-Impact Shipping Corridors (Corridors). This initiative aims to minimize the impacts of shipping along key routes in Canada's North. Transport Canada and the Canadian Coast Guard are currently seeking to engage with the Government of Nunavut, Inuit organizations, and industry to develop a governance framework and identify priority areas that will serve to guide decisions and services along the Corridors to ensure safer marine navigation while respecting the environment and its ecological and cultural significance.

A significant amount of preliminary work and research has already been accomplished on the subject of Arctic shipping corridors - particularly by academia, Inuit, and non-governmental organizations. This work has involved numerous communities and countless Nunavummiut. Given that the Government of Canada will soon begin formal engagement on the Corridors initiative, this workshop presents an excellent opportunity to bring together a wide range of participants for information sharing, discussion, and preparation for this engagement.

Workshop Objectives

1. Introducing Low-Impact Shipping Corridors Initiative
2. Sharing knowledge from different perspectives about Arctic shipping and Corridors development, such as:
    - ➢ Inuit
    - ➢ Governmental
    - ➢ Scientific
    - ➢ Management
    - ➢ Political
    - ➢ Legal
3. Beginning a conversation about Corridors management in Nunavut in preparation for planned consultations led by federal government agencies.

Questions Addressed in Discussion Paper

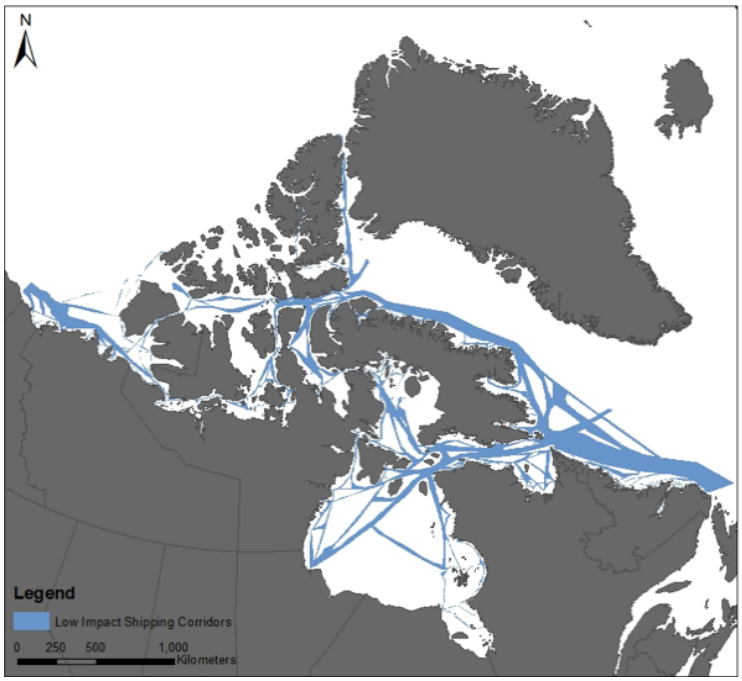
1. What are Low Impact Shipping Corridors?
2. Why are Low Impact Shipping Corridors Being Developed?
3. Who will be Involved in Low Impact Shipping Corridors?

Discussion Questions for Day 2

Based on your knowledge of marine transportation and your organization's role and interests in marine activities, please consider the following questions:

1. Who should be involved in the management of marine shipping corridors and why, and what type of role and responsibilities should they have?
2. How can your government / organization contribute to the management of Northern Low-Impact Shipping Corridors (e.g. regulatory, governance, information)?
3. What type of role/responsibility would your organization have in relation to Corridors?
4. What could a collaborative governance model look like?
5. Are there any marine priority geographic areas that warrant special consideration and why?
6. Are there any specific federal marine services that you would like the Government of Canada to prioritize within these geographic areas?

What are Low-Impact Shipping Corridors?



A **shipping corridor** can be defined as an area with:

> *"...a measurable amount of diverse marine transportation information and services in support of economic development, community re-supply, safety of navigation, and protection of the environment"*
>
> Leyzack, Chénier, & Hinds, 2014

The addition of 'low-impact' seeks to make clear that the shipping corridors are developed, governed, and managed in such a way as to promote safer navigation and respect the ecological and cultural significance of the environment.

Why are Low-Impact Shipping Corridors Being Developed?

According to the Government of Canada,

> *Northern, Inuit and other Indigenous communities depend on the marine environment for transportation, resupply, and traditional activities including the harvesting of food. Increasingly unpredictable ice conditions are altering the Arctic environment, impacting the duration of the shipping season, and attracting more cargo and passenger vessels. The Low-Impact Shipping Corridors initiative will establish a management framework that will promote safer marine activities in designated shipping corridors with a view to managing their environmental and social implications.*

Who Will be Involved in the Low-Impact Shipping Corridors?

Transport Canada (TC) and the Canadian Coast Guard (CCG) are leading this initiative, with support from the Canadian Hydrographic Service (CHS).

- TC is the lead federal department responsible for the development and enforcement of regulations and standards related to the safety and security of marine transportation and protection of the marine environment.
- CCG is responsible for services and programs that contribute to the safety, security, and accessibility of Canada's waterways - including icebreaking, marine communications and traffic services, aids to navigation, search and rescue, environmental response, and maritime security.
- CHS publishes and maintains nautical charts, as well as conducts regular field surveys for higher risk/higher priority areas using both shore-based resources and marine vessels - including specialized hydrographic craft and the use of multibeam sonar onboard CCG icebreakers.

TC and CCG are seeking to build partnerships with:

- Other federal departments;
- Inuit and other Indigenous organizations;
- Provincial and territorial governments;
- Industry stakeholders;
- Scientific institutions; and
- Non-governmental organizations.

Research and Reports of Interest

The following section briefly describes various research completed to date regarding shipping in Nunavut and the creation of low-impact shipping corridors. Additional information, including links to the complete documents, can be found in Appendix A.

Shipping Statistics

Shipping Trends in Nunavut from 1990-2015

Jackie Dawson, Olivia Mussels, Luke Copland, and Natalie Carter (2017)

Key Takeaways:

- Total distance travelled by vessels in Nunavut waters has more than doubled.
    - 1990: 345,567 km
    - 2015: 793,684 km
- Certain periods saw greater growth in traffic than others, for example:
    - 2005: 430,073 km
    - 2008: 702,561 km
- The distance travelled by some types of vessels increased more than others.
    - e.g. pleasure craft, fishing vessels, cargo ships
- Most vessels tended to travel in the same general areas over time.
    - However cruise ships have expanded their range, with increased traffic in the Northwest Passage as opposed to more southern routes used in the past.
- General cargo (re-supply) and government icebreakers consistently travel the greatest number of kilometres each year.

	Baseline (1990-2000)	**Phase 1 (2001-2005)**	**Phase 2 (2006-2010)**	**Phase 3 (2011-2015)**
Observation	Slight increase in traffic, but mostly steady	Small increase in traffic	Rapid increase in traffic; notably more tankers, fishing vessels, and pleasure craft activity	Another increase in traffic; decrease in passenger vessel activity
Average Distance Travelled	414,033 km	443,111 km	643,404 km	760,818 km

Corridors Development

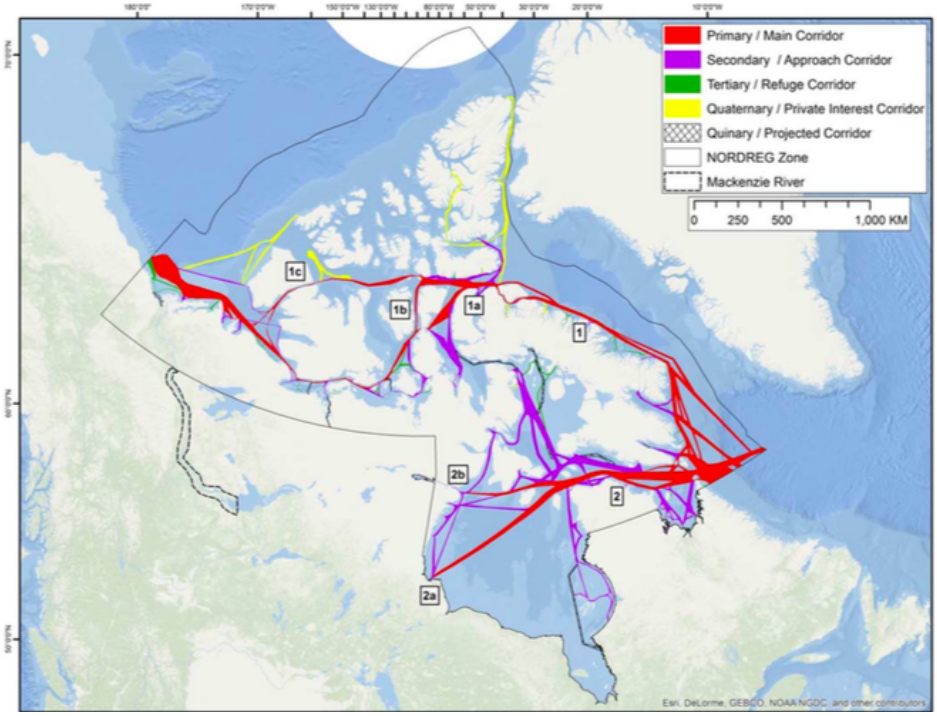
Northern Marine Transportation Corridors: Creation and Analysis of Northern Marine Traffic Routes in Canadian Waters

René Chénier, Loretta Abado, Olivier Sabourin, Laurent Tardif (2017)

Key Takeaways:

- This approach analyzed historical ship movement and proposed corridors in areas with a measurable amount of diverse marine traffic.
- Proposed corridors were divided into five different classes:
    - Main
    - Approach
    - Refuge
    - Private Interest
    - Projected
- These classes were then ranked based on a hierarchy to assign their relative level of importance.
- Approximately 80% of the historical ship movements are captured within these proposed corridors and 90% are within five nautical miles of the corridors.

Proposed Northern Marine Transportation Corridors



The Integrated Arctic Corridors Framework

The Pew Charitable Trusts (2016)

Key Takeaways:

- The Integrated Arctic Corridors Framework is complementary to the Northern Marine Transportation Corridors Initiative, but pushes certain policy items further, such as:
    - Deeper consideration for environmental protection and Inuit rights;
    - Greater focus on the role of Inuit in management, co-led by the federal government and Inuit organizations;
    - A tiered management approach, matching risk levels with readiness levels;
    - Corridors becoming the foundational national shipping and marine policy;
    - Integration of corridors into appropriate regulatory reforms and supporting initiatives.

Guiding principles:

1. Develop world-leading standards for human and vessel safety.
2. Establish comprehensive protection for Arctic marine environment and wildlife.
3. Fully and formally include Inuit in Arctic shipping policy creation and implementation.

Steps for building integrated Arctic corridors:

- Step 1: Create the Canadian Arctic Corridors Commission
    - Co-chaired by Inuit organization representatives and the federal government
    - Mandate: 1) develop the integrated corridors, 2) become the permanent management body responsible for overseeing the system
- Step 2: Consult and meaningfully engage Inuit
    - Inuit must be engaged in designation, classification and management of corridors in order to mitigate impacts to subsistence practices and other conflicts.
- Step 3: Integrate information
    - Incorporate information on human and vessel safety, environmental protection, and Inuit knowledge into the development process.
- Step 4: Designate corridors
    - Based on analysis of the full body of relevant information and through a multi-stakeholder process, select a system of shipping corridors.
- Step 5: Classify corridors
    - Because the corridors will intersect with sensitive, management measures must correspond with the level of risk of each corridor.
    - Tier 1 – Low risk; Tier 2 – Medium risk; Tier 3 – High risk

Community Perspectives

Arctic Corridors and Northern Voices Research Project

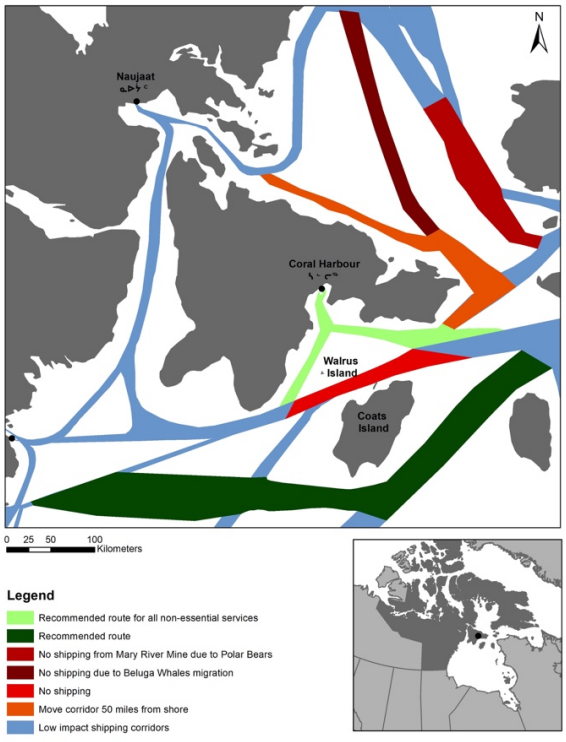
Natalie Carter, Jackie Dawson, Jenna Joyce, Annika Ogilvie, Jennie Knopp, Melissa Weber, Zuzanna Kochanowicz, and Olivia Mussels (2017a, b, 2018a, b, 2019)- uOttawa

Research Objectives:

- Describe local marine use areas, including significant socio-cultural, archaeological and ecological areas, and local travel routes, for integration into the Low-Impact Shipping Corridors;
- Document Inuit-identified potential impacts of marine vessels on identified marine use areas and community members; and
- Document Inuit-identified potential strategies for managing the Low-Impact Shipping Corridors and Arctic marine vessels.

Key Takeaways:

- See Appendix B for a summary of impacts, local concerns, and recommendations for Corridors in Nunavut as identified by community members in Arviat, Cambridge Bay, Gjoa Haven, Pond Inlet and Coral Harbour.



Example of community-identified recommendations for low-impact shipping corridors (near Coral Harbour, NU).

Pond Inlet community members identifying culturally significant marines areas Photo:meethenorth.org/Eric Guth

Cumulative Risk Study

Priscilla Schmitz, Ronald Pelot, Floris Goerlandt and Jackie Dawson (ongoing project, 2019)

The Northern Marine Transportation Corridors (NMTC) were established at the national level, based on current traffic patterns and marine crew safety, with limited consultation with territorial or Inuit governments. Hence, important areas for marine mammals and fish stocks in the region were not considered, leaving a serious gap regarding the receptors to potential shipping stressors in the framework (PEW Charitable Trusts, 2016). Normally, a shipping impact study covers only one stressor, but it is important for policy makers to appreciate the overall impact of all stressors combined. The NMTC does not incorporate a cumulative risk assessment (CRA) that combines different shipping stressors. Therefore, an evidence-based approach for improved shipping governance is needed, including a more comprehensive CRA of shipping stressors to the local receptors in the Nunavut waters. Coincidentally, Transport Canada (TC) has also recently initiated studies on better methods for cumulative effects of marine shipping through the Oceans Protection Plan, for different coastal environments around Canada including in the Eastern Arctic (Government of Canada, 2017).

Within this context, the objectives of this project are:

- Identify potential shipping stressors for marine mammals;
- Propose a framework for Cumulative Risk Assessment (CRA) for shipping stressors to marine receptors based on an existing algorithm developed by Halpern et al (2009). This framework aims to combine different stressors into one single risk equation and presents the results in a simple visualization format using a GIS (Geographic Information System) software;
- Apply the proposed CRA framework in a case study in Kitikmeot region for at least the two major shipping stressors. Based on local concerns, ship-source oil spills and noise pollution can be considered as two of the shipping stressors of greatest concern among the Northern communities. Thus, they will be used for the case study.

This proposed method can be extended to other types of shipping stressors (for instance, invasive species and air emissions), requiring further research.

The Canadian Arctic Shipping and Transportation Network (CASTnet)

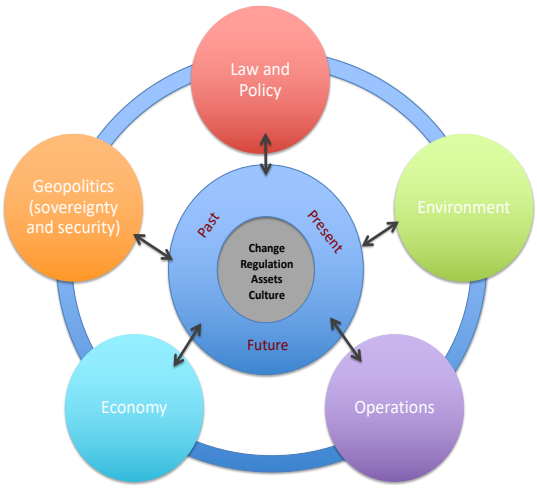
The development of a partnership-based research and knowledge network that is focused on applied and interdisciplinary science that responds directly to identified local and operational needs in Arctic Canada is needed. The Canadian Arctic Shipping and Transportation Research Network (CASTnet) is a university led-industry-government-northern-community partnership that intends to co-develop a world-class research network to undertake science that supports policy and decision-making for Arctic oceans governance and sustainable shipping.

Vision:

- To co-develop a world-class research network to undertake science that supports policy and decision-making for oceans governance, sustainable shipping and economic development, while training of the next generation of Arctic shipping research experts;
- To leverage the assets of such a network (ships, people, and coastal infrastructure) to improve ocean, ice, and atmospheric observations along Arctic shipping routes;
- To conduct science that supports 1) **decision-makers** to establish evidence-based policy and to position Canada as a global leader in Arctic oceans and shipping governance, 2) **industry** to operate more efficiently and in a safer environment, and 3) Arctic **communities** to mitigate local impacts and enhance economic opportunities.

Research Focus Areas:

- The initial focus areas are based on end-user surveys and will include: 1) Environment, 2) Operations, 3) Economy, 4) Geopolitics, and 5) Law and Policy.
- A set of research projects will be co-developed with project partners that respond to the identified information needs of industry, government (including Inuit Organizations), and communities and which look at challenge areas from a variety of lenses such as past, present, future, change, regulation, assets, and culture.



Appendix A – Links to Research and Reports

1. Jackie Dawson/University of Ottawa, Environment Society and Policy Group website: http://www.espg.ca/
2. Arctic Corridors and Northern Voices Research project website: http://www.arcticcorridors.ca/
3. Shipping Trends in Nunavut from 1990-2015: http://www.arcticcorridors.ca/wp-content/uploads/2017/11/NGMP-Shipping-Report_2017-V1.pdf
4. Arctic Corridors and Northern Voices community reports (Nunavut)
   Arviat: http://hdl.handle.net/10393/36924
   Cambridge Bay: http://ruor.uottawa.ca/handle/10393/37325
   Gjoa Haven: http://hdl.handle.net/10393/36911
   Pond Inlet: http://ruor.uottawa.ca/handle/10393/37271
   Coral Harbour: http://hdl.handle.net/10393/38505
5. Canadian Arctic Shipping and Transportation Research Network (CASTnet): http://www.arcticcorridors.ca/2019/01/15/espg-leads-castnet-co-development/
6. Identification of Ecologically and Biologically Significant Areas (EBSAs) in the Canadian Arctic: http://waves-vagues.dfo-mpo.gc.ca/Library/344747.pdf and http://www.dfo-mpo.gc.ca/science/rp-pr/spera-psrafe/projects-projets/012-eng.html.
7. Evaluating Institutional Arrangements for Marine Shipping Management, by Wang, 2017 (Please contact Jackie Dawson)
8. Examining Different Approaches to Managing Arctic Shipping, by Reid and Dawson, 2019 (Please contact Jackie Dawson)
9. Integrated Arctic Corridors Framework webpage: https://www.pewtrusts.org/en/research-and-analysis/reports/2016/04/the-integrated-arctic-corridors-framework
10. Northern marine transportation corridors, by Chénier et al., 2017: https://onlinelibrary.wiley.com/doi/epdf/10.1111/tgis.12295
11. Nunavut Agreement, 1993: http://www.gov.nu.ca/sites/default/files/files/013 - Nunavut-Land-Claims-Agreement-English.pdf
12. Nunavut Land Use Plan, 2016: http://www.nunavut.ca/files/2016DNLUP/2016_Draft_Nunavut_Land_Use_Plan.pdf
13. Shipping Cumulative Risk Assessment, by Schmitz et al., 2019 (Please contact Jackie Dawson)

Appendix B – Nunavut Community-Identified Recommendations for Corridors

Table 1. Summary of impacts, local concerns, and recommendations for Corridors in Nunavut as identified by community members in Arviat, Cambridge Bay, Gjoa Haven, Pond Inlet and Coral Harbour

Community	Impacts and local concerns	Corridor recommendations
Arviat	• Potential increase or decrease in local travel costs depending on where wildlife flees to • Behavioural changes in wildlife, decreased meat quality (changed taste of meat due to stress when animal flees) • Increased level of contaminants in sea, sea mammals, country food, and people • Increased shoreline erosion.	• Key areas where new or improved charting is needed • No-go zones, and restricted-use zones (size of ship, limited sonar, reduced wake and noise) • Preferred revised corridors including wider corridors located farther from shore • Permanent, lighted navigational markers or GPS co-ordinates marking reefs to guide ships in to Arviat • Monitoring ship sewage and waste disposal in Hudson Bay • Improved communication and feedback including notification of changes made to the low impact shipping corridors, and on-going discussions about the corridors as the sea, marine mammals and ship traffic change • Formation of a committee that includes territorial-level organizations, and hunters and community members from across the Canadian Arctic, to manage the low impact shipping corridors.
Cambridge Bay	• Contamination of Arctic waters, animals, and people • Behavioural changes in wildlife, destruction of animal habitat • Increased food insecurity • Increased incidence of dangerous ice conditions for local travel, and threats to water quality • Limited employment/income opportunities.	• The corridors initiative should be discussed with the Nunavut Impact Review Board • The federal government agencies involved in the low impact shipping corridors, the Royal Canadian Mounted Police (RCMP), Canada Border Services Agency (CBSA), and members of the municipal government should be at the Arctic Corridors workshops and community meetings. • The results of this study should be presented at the next Nunavut Tunngavik Inc. Annual General Meeting (October 2018) and shared with our Members of Legislative Assembly and Ministers. • Fact-finding using Inuit Knowledge and Western Science should continue in order for the federal government to have a good picture of how to proceed. • Areas and times of year where there should be no-icebreaking and no-winter-shipping • Areas where speed and wake should be reduced • Reduced noise pollution • Stronger regulations against waste disposal and discharge in the ocean

		• Improved communication between vessels and the hamlet of Cambridge Bay, and within Cambridge Bay • More RCMP presence on the ocean • More CBSA presence in Cambridge Bay in particular related to pleasure craft/yachts • Enforcement of permits, travel plans, and routes for pleasure craft • Ships should pay a damage deposit before going through the Northwest Passage. This will create a fund which can be accessed to pay for spill response equipment • Charting of shoals, dangerous areas, and shallow areas.
Coral Harbour	• Efficient delivery of essential materials and equipment will be less expensive than if delivered by air; • Disruption of Walruses during breeding, feeding, and migration may result in fewer Walruses in known, usual locations; • Noise from ships, in particular mining ships, disturbing marine mammals, damaging their hearing, and affecting the entire food chain. Ships are even louder when ice is present; • Lost revenue (from skin and tusk sales) and increased expenses (having to travel further) when harvesting; • Increased incidence of dangerous ice conditions for local travel (if ice is broken); • Increased food insecurity and reliance on expensive, less-nutritious store-bought food; • Risk of lost culture and insufficient or no country food for future generations; • Limited income and employment opportunities. • Existing spill-response capacity is not sufficient in Coral Harbour.	• Areas where only ships providing essential services for Coral Harbour should travel; • Recommended corridors for all non-essential services • No-go zones • Three areas that should be protected (Native Point, Walrus Island, and Coats Island) • Reduced ship noise • Improved re-supply efficiency • Improved communications between vessel operators, mining companies, and Coral Harbour residents • Inclusion of Coral Harbour residents in permitting and decision-making related to cruise ships and pleasure craft • Increased monitoring and research, and reporting of wildlife sightings • All of the organizations who have heard the concerns and recommendations in this report should lobby Transport Canada, Canadian Coast Guard, and Canadian Hydrographic Service to change these corridors and re-route ships as described in this report.
Gjoa Haven	• Employment opportunities, increased local travel costs • Gaining supplies and equipment, more timely cargo delivery • Positive and negative cross-cultural interactions • Threats to security, and exchange of alcohol and drugs • Behavioural changes in wildlife, destruction of animal habitat • Increased incidence of dangerous ice conditions for local travel	• Reduced-speed zones, and no-icebreaking zones • Narrower corridors located minimum distances from shores • Key areas where new or improved charting is needed • Monitoring and enforcement of ship traffic within and outside the low impact Shipping corridors • Improved communication between vessel operators, and the community.

	• Potential food insecurity and increased dependence on store-bought food • Cultural artifacts illegally moved	
Pond Inlet	• Behavioural changes in wildlife • Increased incidence of dangerous ice conditions • Decreased ability to access country food, skins, and furs • Increased food insecurity, dependence on store-bought food • Diminished physical and mental health • Loss of Inuit culture and disturbed cultural artefacts • Financial losses and opportunities	• Seasonal speed limits, no-go zones, no-anchoring zones, and no ice-breaking zones • Narrower corridors located minimum distances from shores • Monitoring and enforcement of ship traffic within and outside the corridors • Improved communication between government agencies, vessel operators, and the community.

Source: Carter et al., 2017a, b, 2018a, b, 2019

Appendix C – References and Further Reading

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