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SHIPPING CORRIDORS AS A FRAMEWORK FOR ADVANCING
MARINE LAW AND POLICY IN THE CANADIAN ARCTIC
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ABSTRACT

This article describes how a new policy – Arctic shipping corridors – can provide an adaptable framework for advancing marine law and policy in the Canadian Arctic. As the polar ice pack recedes due to climate change, vessel traffic in the region is increasing. As an initial response, the Canadian federal government has proposed a system of voluntary marine transportation corridors. Shipping corridors are a pragmatic policy solution that could be used to advance a number of priority maritime issues including: responsible economic development, human and vessel safety, environmental protection, and Inuit rights. Effective designation and management of shipping corridors requires a more integrated approach than exists now to account for the complexity of the Arctic marine environment. This paper explores how corridor design can create a national arctic shipping policy that advances (1) marine safety, (2) Inuit land claims agreements, (3) environmental protection, and (4) international cooperation.

KEY TERMS

Arctic Corridors, Arctic Shipping, Northwest Passage, Marine Conservation, Marine Safety, Canada

INTRODUCTION

The Canadian Arctic Ocean remains one of the least travelled and most hazardous ocean zones in the world.¹ However, melting sea ice is increasing the perception and reality that the Canadian Arctic is a viable navigation route.² To date, there has been limited shipping activity in the Canadian Arctic; but, as sea ice recedes due to climate change providing a longer open-water shipping season, a new era of Arctic marine transportation is emerging.³ Predictions of ice-free summer months in the Arctic Ocean in the foreseeable future have fuelled speculation and exploratory interest over Arctic shipping routes for minerals, oil and gas, and other commercial goods.⁴

This reality, however, is still decades away. Despite recent increases – the Canadian Coast Guard reports that Canadian Arctic waters have seen a 166% increase in voyages since 2004 – the total number of voyages is still relatively low compared to other global shipping zones.⁵ The Canadian government thus has lead-time to plan for and invest in strategic initiatives that foster an effective and sustainable Arctic-specific shipping policy for Canada. In particular, basic infrastructure, modern charting, emergency prevention and preparedness, environmental protections, and robust vessel management and monitoring are requisites to avoid a large-scale pollution or loss of life event.

The prospect of significant increases in transit or destination shipping presents a number of key questions for regulators, which have been repeatedly raised in nearly four decades of review of northern marine transportation.⁶ Moreover, the regulatory regime

¹ ARCTIC COUNCIL, ARCTIC MARINE SHIPPING ASSESSMENT REPORT 89-90 (2009), http://www.pame.is/images/03_Projects/AMSA/AMSA_2009_report/AMSA_2009_Report_2nd_print.pdf

² S.R. Stephenson, L.C. Smith & J.A. Agnew. *Divergent Long-Term Trajectories of Human Access to the Arctic*. 1 *Nature Climate Change* 156. 158-59 (2011)

³ See L. Pizzolato et al., *Changing Sea Ice Conditions and Marine Transportation Activity in the Canadian Arctic Between 1990 and 2013*, 123 *CLIMATIC CHANGE* 161, 162-63 (2014); COUNCIL OF CANADIAN ACADEMIES, *COMMERCIAL MARINE SHIPPING ACCIDENTS: UNDERSTANDING THE RISKS IN CANADA* 49-53 (2016).

⁴ See L.C. Smith & S.R. Stephenson, *New Trans-Arctic Shipping Routes Navigable by Mid-Century*, 110 *PROC. OF THE NAT'L ACAD. OF SCI.* E1191 (2013); S.R. Stephenson et al., *Projected 21st-Century Changes to Arctic Marine Access*, 118 *CLIMATIC CHANGE* 885, 895, 897 (2013).

⁵ PEW CHARITABLE TRUST, *THE INTEGRATED ARCTIC CORRIDORS FRAMEWORK: PLANNING FOR RESPONSIBLE SHIPPING IN CANADA'S ARCTIC WATERS 1* (2016),: <http://www.pewtrusts.org/~media/assets/2016/04/the-integrated-arctic-corridors-framework.pdf>.

⁶ See generally, DAVID BRANDER-SMITH ET AL., *PROTECTING OUR WATERS: PUBLIC REVIEW PANEL ON TANKER SAFETY AND MARINE SPILLS RESPONSE CAPABILITY* (1990); ARCTIC COUNCIL, *supra* note 1; SENATE OF CAN. STANDING COMM. ON FISHERIES AND OCEANS, *CONTROLLING CANADA'S ARCTIC WATERS; ROLE OF THE CANADIAN COAST GUARD* (2009); SENATE OF CAN. STANDING COMM. ON FISHERIES AND OCEANS, *RIISING TO THE ARCTIC CHALLENGE: REPORT ON THE CANADIAN COAST GUARD* (2009); OFFICE OF THE AUDITOR GENERAL OF CANADA, *OIL SPILLS FROM SHIPS* (2010); SENATE OF CAN. STANDING COMM. ON NAT'L SEC. AND DEF., *SOVEREIGNTY AND SECURITY IN CANADA'S ARCTIC* (2011); OFFICE OF THE AUDITOR GENERAL OF CANADA, *MARINE NAVIGATION IN THE CANADIAN ARCTIC* (2014); Tanker Safety Panel Secretariat, *Phase II – Requirements for the Arctic and for Hazardous and Noxious Substances Nationally, in A REVIEW OF CANADA'S SHIP-SOURCE SPILL PREPAREDNESS AND RESPONSE: SETTING THE COURSE FOR THE FUTURE* (2014); GOVERNMENT OF CANADA, *CANADA TRANSPORTATION ACT REVIEW, VOL. I & II* (2016)..

governing Arctic shipping is extremely complex.⁷ Governed by international agreements, national regulations and territorial laws, different types of shipping are subjected to different regulatory regimes and agreements.⁸ Effective regulation of Arctic shipping poses real challenges to Canada and circumpolar governments alike.

A promising new initiative has emerged from the Canadian government that embodies an innovative way of thinking about shipping regulation in the Arctic. The Northern Marine Transportation Corridors (NMTC) Initiative, jointly led by the Canadian Coast Guard, Transport Canada and the Canadian Hydrographical Service, is a new policy framework aimed at developing voluntary Arctic shipping corridors throughout Canada's domestic Northern waters.^{9*} An Arctic transportation corridor is a federally designated shipping route that represents the safest passage for vessels and is supported by strategic investments in services, infrastructure, and environmental protection.^{10*} Under this policy, designated shipping corridors would receive enhanced levels of financial, material, and human resource capacity to support vessel safety.¹¹ Arctic corridors will take time to build and complete. However, mature corridors should be supported by strategic investments in services, infrastructure, and environmental conservation measures. Through careful designation and tailored/site-specific management, corridors can be designed to minimize risk to vessels and the environment, and to account for the provisions of settled Inuit land claim agreements. Vessel operators are incentivized to use corridors in order to access higher levels of government services, reduce risk to their vessel and crew, and minimize their impact on the environment.¹²

The NMTC policy aims to limit the operational footprint of Arctic shipping by incentivizing ships to use routes where service levels and supporting infrastructure are highest.¹³ Figure 1 depicts the preliminary NMTC developed by the federal government. Corridors provide a strategic operational and planning framework for regulating shipping activities. This pragmatic initiative has received broad support from diverse stakeholders.¹⁴ Notably, corridors were part of the Obama-Trudeau Joint Statement on the Arctic and are emerging as a focus area for cooperation between the United States and Canada.¹⁵ However, corridors remain a work in progress. For example, the same

⁷ D. VanderZwaag et al., *Governance of Arctic Marine Shipping*. 2008 Marine & Env'tl. Inst. 1-4.

⁸ *Id.*

⁹ CANADIAN COAST GUARD. WARMING OF THE NORTH: CHALLENGES AND OPPORTUNITIES FOR ARCTIC TRANSPORTATION, SUPPLY CHAIN MANAGEMENT AND ECONOMIC DEVELOPMENT.2 (2015).

https://umanitoba.ca/faculties/management/ti/media/docs/ALVARO__NMTC_Presentation.pdf

¹⁰ *See id.* at 3.

¹¹ *See id.* at 2-3.

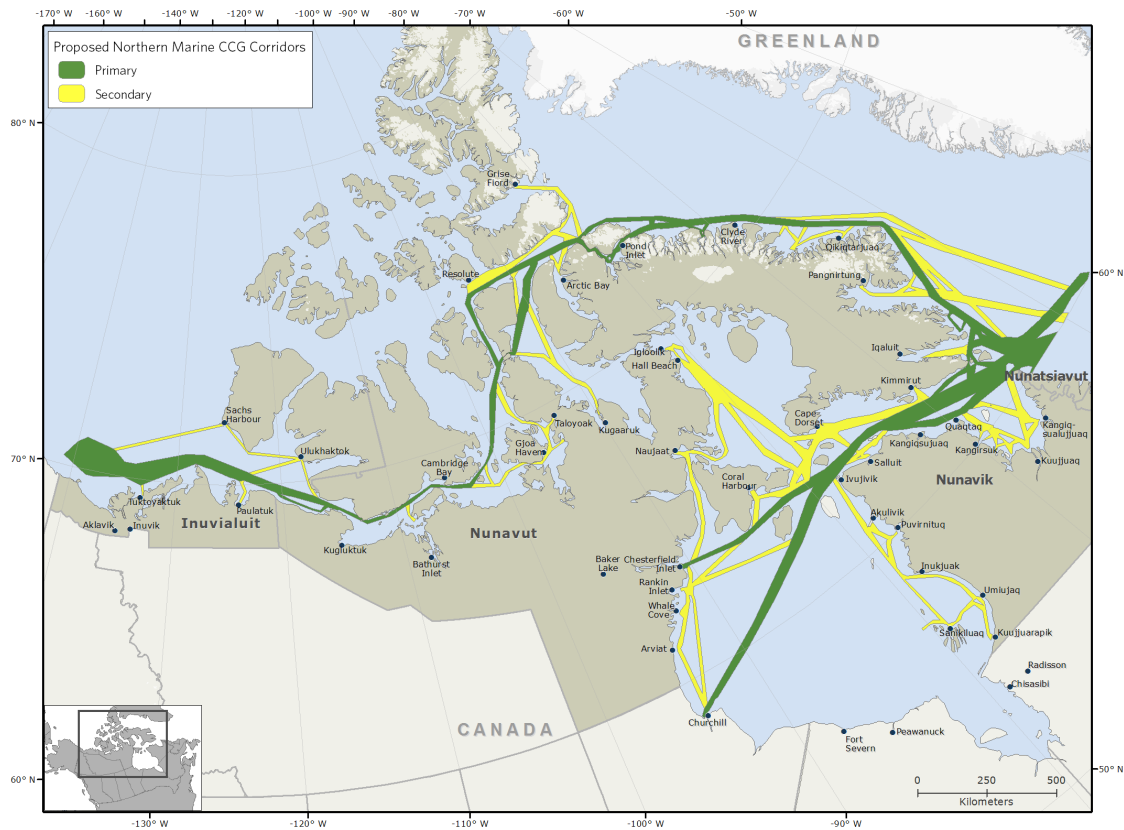
¹² *See id.* at 3

¹³ Preliminary Arctic shipping corridors ensure vessels are routed to areas that contain: (1) the most complete bathymetric surveying and nautical charting, (2) the greatest number of navigational aids, and (3) have the most expedient access to ice breaker deployment, ports, places of refuge, and government oversight. *See Id.* at 7.

¹⁴ The federal government has engaged with interested stakeholders throughout the process of developing the NMTC. In March 2016, the government hosted six engagement sessions on the NMTC, including in two northern communities. At a Canadian Marine Advisory Committee meeting for the Prairie and Northern Region on May 11, 2016, the government reported that the response of the engagement has been overwhelmingly in support of moving forward with the corridors initiative. *Id.*

¹⁵ US-Canada Joint Statement on Climate, Energy and Arctic Leadership, (Washington, D.C., United States of America, March 10, 2016), available at <http://pm.gc.ca/eng/news/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership>.

academics, Inuit organizations, northern communities, and civil society groups that have expressed support for the concept and framework offered by Arctic shipping corridors have also expressed concerns that the current conceptualization of corridors lacks a fundamental consideration: integration of and protection for environmentally and culturally sensitive areas in the region.¹⁶ For corridors to reach their full potential they must be more than a recognition and formalization of existing traffic patterns.



¹⁶ While recognizing the merits of this approach, academics, local communities, and civil society groups have voiced concerns that there are key gaps in the government’s preliminary design of the corridors. A workshop in December 2015 brought together leading Canadian academics to discuss the implications of arctic shipping corridors in Canada. They concluded that the government has given an incomplete consideration to environmental areas, that the corridors have important international implications that must be assessed and that Canadian Inuit must be consulted and engaged. Similar concerns were raised at engagement sessions that were hosted by the government in March 2016 in order to seek validation of the concept and social license to move forward with the corridors initiative. For a more detailed account see Dawson, J., Porta, L., Okuribido-Malcolm, S., deHann, M., and Mussells, O, *Proceedings of the Northern Marine Transportation Corridors Workshop*, December 8, Vancouver, B.C.’ uO Research: Ottawa, ON, 2016, available at http://www.espg.ca/wp-content/uploads/2013/04/NMTC_Workshop_Proceedings_FINAL_REVISED.pdf. The most in-depth analysis of the corridors to date is a report released in April 2016 by the Pew Charitable Trusts. The report, entitled *The Integrated Arctic Corridors Framework*, provided detailed mapping and analysis of the government’s preliminary corridors relative to important environmental areas and Inuit uses and provided a policy road map for creating integrated arctic shipping corridors. *The Integrated Arctic Corridors Framework*, The Pew Charitable Trusts, April 2016.

Figure 1. Preliminary Northern Marine Transportation Corridors developed jointly by the Canadian Coast Guard, Transport Canada and the Canadian Hydrographic Service. Primary corridors represent the most-used routes and secondary corridors depict the routes to communities. Source: Canadian Coast Guard, 'Northern Marine Transportation Corridors Initiative' (presentation to the Company of Master Mariners of Canada, April 29, 2014), available at <http://www.mastermariners.ca/maritimes/uploads/05marinecorridors.pdf>, accessed July 12, 2016.

The NMTC represents the potential foundation for responsible and effective shipping governance in the Arctic and will guide the future of maritime transport in the region for the next century and beyond. Investment decisions, infrastructure development, resource development, and maritime trade opportunities will be leveraged and influenced by the location of corridors and the related services and infrastructure existing within their bounds. Where the corridors are located is therefore as important as where they are not located considering their power to guide future vessel traffic away from or towards certain areas. The simple act of creating corridors at all, even initial routes that will be re-prioritized over time, sends a message to the world - intended or not - that Canada's Arctic is "open for business". Thus there is an urgent need to carefully consider how the corridors can most effectively provide a foundation for an integrated and strategic vision for sustainable shipping in Arctic Canada that includes regulation and policy within and outside their boundaries.

Through the integration of other types of information and data currently missing from the initiative, corridors could become a broader framework for marine planning and have the potential to advance policy on a number of priority policy issues. In this article, we aim to assess how the corridors can develop into a strategic planning framework and new policy tool for regulators. We describe and analyze corridors in the broader context of marine law in order to depict the intersection points between Arctic shipping corridors and maritime regulation and governance. In particular, the Arctic shipping corridors are assessed with respect to (1) marine safety law, (2) Inuit land claims agreements, (3) protection of the marine environment, and (4) mechanisms for international cooperation. It should be noted that regulating shipping through the Canadian Arctic is complicated by a dispute over the status of the Northwest Passage (NWP) under international law. This article presumes the status quo (that the NWP constitutes internal waters of Canada) and does not address the potential implications of an international strait through the NWP.

II. MARINE SAFETY

The concept of marine safety can pertain to design, construction, equipment requirements, crew qualifications, pollution prevention, and search and rescue. Marine safety in the Canadian Arctic is governed by a body of international, national, and territorial law, and is underpinned by services and infrastructure provided by federal government agencies.

Shipping in the Arctic is much different than shipping elsewhere in the world because of unique hazards such as low temperature, presence of sea ice, daylight, extreme weather, potential ridged ice, and remoteness. These risks require regulators to hold vessels travelling through Arctic waters to the highest standard possible to ensure Arctic-ready ship design and construction, on-board equipment, crew training and voyage planning. The following section describes the marine safety regime that supports Arctic

vessel traffic in Canada and the potential for corridors to enhance implementation of this regime in the Arctic region and to provide a framework for the continuous improvement of Canadian marine safety laws and governance.

At the international level, the United Nations Convention on the Law of the Sea (UNCLOS) creates the basic legal framework for all activities associated with the Arctic maritime domain, including shipping.¹⁷ UNCLOS codifies a range of maritime zones and the degree of rights and obligations that coastal (and other) states have with regards to each zone. A suite of IMO conventions and resolutions support this regime and establish the international regulatory framework for Arctic shipping. All eight Arctic states - Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, Russia, Sweden and the United States - are parties to the six (described below) key international shipping safety Conventions¹⁸. These Conventions contain safety standards and regulations that are followed by each Arctic state as they pertain to shipping safety of large vessels.^{19, 20}

The International Convention for the Safety of Life at Sea, 1974 (SOLAS) is the most significant international convention concerning marine safety.²¹ Its main objective is to specify minimum standards for the construction, equipment, and operation of ships. Other conventions managed by the International Maritime Organization (IMO) that pertain to marine safety include the International Convention for the Prevention of Pollution from Ships 73/78 (MARPOL), the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978 (STCW), the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (AFS), the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREG), and the International Convention on Load Lines (Load Lines).²²

¹⁷ Donald R. Rothwell, *International Law and Arctic Shipping*, 22:1 MICH. ST. INT'L. L. REV. 67, 68-99 (2013).

¹⁸ There are a few exceptions regarding select annexes and amendments: SOLAS Amendment 1996 does not include Canada, United States, Russia, or Iceland as Parties; MARPOL Annex 4 (re: sewage discharge) does not include Iceland or the U.S.; and STCW Amendment 1995 does not include Sweden, United States or Finland). International Maritime Organization (October 10 2016). Status of multilateral Conventions and instruments in respect of which the International Maritime Organization or its Secretary-General performs depositary or other functions. *Status of Conventions*, INTERNATIONAL MARITIME ORGANIZATION, <http://www.imo.org/en/About/Conventions/StatusOfConventions/Documents/Status%20-%202016.pdf> (last visited Oct. 20 2016).

¹⁹ International Convention on the Control of Harmful Anti-Fouling Systems on Ships, Oct. 5, 2001; United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 396; Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, Feb. 17, 1978, 1340 U.N.T.S. 184; International Convention for the Safety of Life at Sea, 1974, Nov. 1, 1974, 1184 U.N.T.S. 2; International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, July 7, 1973, 1361 U.N.T.S. 2; Convention on the International Regulations for Preventing Collisions at Sea, 1972, Oct. 20, 1972, 1050 U.N.T.S. 17; International Convention on Load Lines, Apr. 5, 1966, 640 U.N.T.S. 133.

²⁰ These conventions typically apply to passenger ships, cargo ships over 500GT, and to varying extents to cargo ships between 300-500GT.

²¹ *Brief History of IMO*, INTERNATIONAL MARITIME ORGANIZATION, (2016) Available at <http://www.imo.org/en/About/HistoryOfIMO/Pages/Default.aspx>

²² *Maritime Safety*, INTERNATIONAL MARITIME ORGANIZATION, (2016) <http://www.imo.org/en/OurWork/Safety/Pages/Default.aspx>.

Until recently, none of these conventions contained provisions that address the unique and considerable risks of shipping through the Arctic.²³ To address this gap, the IMO has spent the last several years developing a mandatory International Code of Safety for Ships Operating in Polar Waters (Polar Code) to replace its existing set of optional Guidelines for Ships Operating in Polar Waters.²⁴ The mandatory Polar Code will supplement the aforementioned existing IMO instruments in order to improve the safety of shipping in polar waters when it enters into force on 1 January 2017.^{25*} The Code covers design, construction, equipment, operations, training, search and rescue, and environmental protection measures relevant to ships operating in both Arctic and Antarctic waters.²⁶ The safety regulations of the Polar Code were adopted by the IMO in November 2014 as an add-on code to SOLAS, while the environmental regulations were adopted in May 2015 as an add-on code to MARPOL.²⁷

Designing the Polar Code was an extended, consensus-based project involving States, NGOs, and industry representatives, and represents only the mandatory minimum safety standards to be met by polar vessels.²⁸ The IMO's priority was primarily to reach a consensus and enact mandatory requirements in a timely manner.²⁹ A central shortcoming of Polar Code is that it does not provide strong enough protection for the environment, including the lack of a ban on heavy fuel oil, which was blocked by the Russian Federation due to its reliance on heavy fuel oil for its domestic shipping operations.³⁰

International law making can be slow and has a history of being reactive.³¹ Since the Arctic cannot wait for a major loss of life or pollution event before substantial policymaking occurs, it will be up to national governments to drive stronger regulations through unilateral and bi-lateral policy and legislative initiatives. For its part, Canada has already established several Arctic-specific legal instruments to support safety of navigation.³² Canada's Arctic vessel safety regulatory regime is arguably the strongest of all circumpolar nations and as such, much of Canada's work has been to raise the

²³ With the exception of training requirements for arctic seafarers in the STCW and updates to SOLAS Chapter V regarding meteorological services and warnings to include ice data, Ice Patrol Services and danger messages including for ice conditions. Aldo Chircop, *Ships in Transit, Regimes in Transition: Regulating International Navigation and Shipping in the Arctic* presented at Arctic Frontiers, Tromsø, Norway, 22 January 2014, available at <http://www.arcticfrontiers.com/downloads/arctic-frontiers-2014/conference-presentations-3/wednesday-22-january-2014/629-05-aldo-chircop/file>, (last accessed July 12, 2016).

²⁴ International Maritime Organization. *Shipping in polar waters*. (2016),: <http://www.imo.org/en/mediacentre/hottopics/polar/pages/default.aspx>.

²⁵ International Maritime Organization, *supra* note 24.

²⁶ International Maritime Organization, *supra* note 24.

²⁷ International Maritime Organization, *supra* note 24.

²⁸ David Snider. *2014 in Review: Polar Shipping* (December 16, 2014), <http://www.maritime-executive.com/features/2014-in-Review-Polar-Shipping>.

²⁹ Snider, *supra* note 28.

³⁰ Bob Weber, *Polar Code still leaves significant gaps, experts say*, CBC NEWS, May 13, 2015, <http://www.cbc.ca/news/canada/north/polar-code-still-leaves-significant-gaps-experts-say-1.3073036>.

³¹ Chircop, *supra* note 23.

³² See Arctic Waters Pollution Prevention Act (R.S.C., 1985, c. A-12); Arctic Shipping Pollution Prevention Regulations (C.R.C., c. 353); Northern Canada Vessel Traffic Services Zone Regulations (SOR/2010-127)

standards for arctic shipping through action at the international level, including the Arctic Marine Shipping Assessment (AMSA) and the mandatory Polar Code.³³

Canada's national regulatory regime for Arctic shipping – codified in the Arctic Waters Pollution Prevention Act (AWPPA) - meets a higher standard than the Polar Code.³⁴ This AWPPA was motivated by sovereignty concerns following the transit of the US tanker Manhattan in 1969, and Canada has since justified this unilateral action under international law based on a special provision negotiated into the UNCLOS.³⁵

The AWPPA establishes a 200-nautical mile pollution prevention zone, where discharges of waste are strictly prohibited with limited exceptions.³⁶ The AWPPA and its Arctic Shipping Pollution Prevention Regulations (ASPPR) create Arctic-specific requirements for certain ships such as: (1) ship construction standards, (2) special equipment requirements, (3) mandatory insurance, (4) on-board ice navigators, (5) pollution prevention officers, and (6) additional liabilities for pollution.³⁷ Under the AWPPA, liability applies both to the owner of a ship and the owner of its cargo, and covers all costs incurred by the Crown to repair, remedy, reduce, or mitigate damage, as well as all actual loss or damage incurred by other persons up to a limit.³⁸ The ASPPR divides the Canadian arctic into 16 shipping safety control zones where access is granted based on a zone/date system.³⁹ Figure 2, below, depicts ASPPR Shipping Safety Control Zones. Access to these zones is granted based on a zone/date system in conjunction with the Arctic Ice Regime Shipping System (AIRSS).⁴⁰ In order to access these waters, certain classes of vessels are also subject to the reporting requirements under the Northern Canada Vessel Traffic Services Zone (NORDREG).⁴¹

³³ Olav Schram Stoke., *Regime interplay in Arctic shipping governance: explaining regional niche selection*. 13 Int'l Environ Agreements 65-85 at 77(2013).

³⁴ Arctic Waters Pollution Prevention Act, R.S.C. 1985, c. A-12.

³⁵ Article 234 of the UNCLOS provides: "Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence." United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 396.

³⁶ Oil may only be discharged for the purposes of saving life or preventing the loss of a ship; damage from stranding, collision or foundering; or through the exhaust of an engine or through leakage from an underwater machinery component necessary to ship function. Domestic waste and industrial waste deposits are also permitted with appropriate authorizations under federal legislation.

³⁷ Arctic Waters Pollution Prevention Act, R.S.C. 1985 c.A-12; Arctic Shipping Pollution Prevention Regulations, C.R.C., c. 353.

³⁸ Arctic Waters Pollution Prevention Act, R.S.C. 1985 c.A-12.

³⁹ Arctic Shipping Pollution Prevention Regulations, C.R.C., c. 353.

⁴⁰ Transport Canada. Arctic Ice Regime Shipping System (AIRSS) Standards - TP 12259E. (1998).

⁴¹ *Id.*

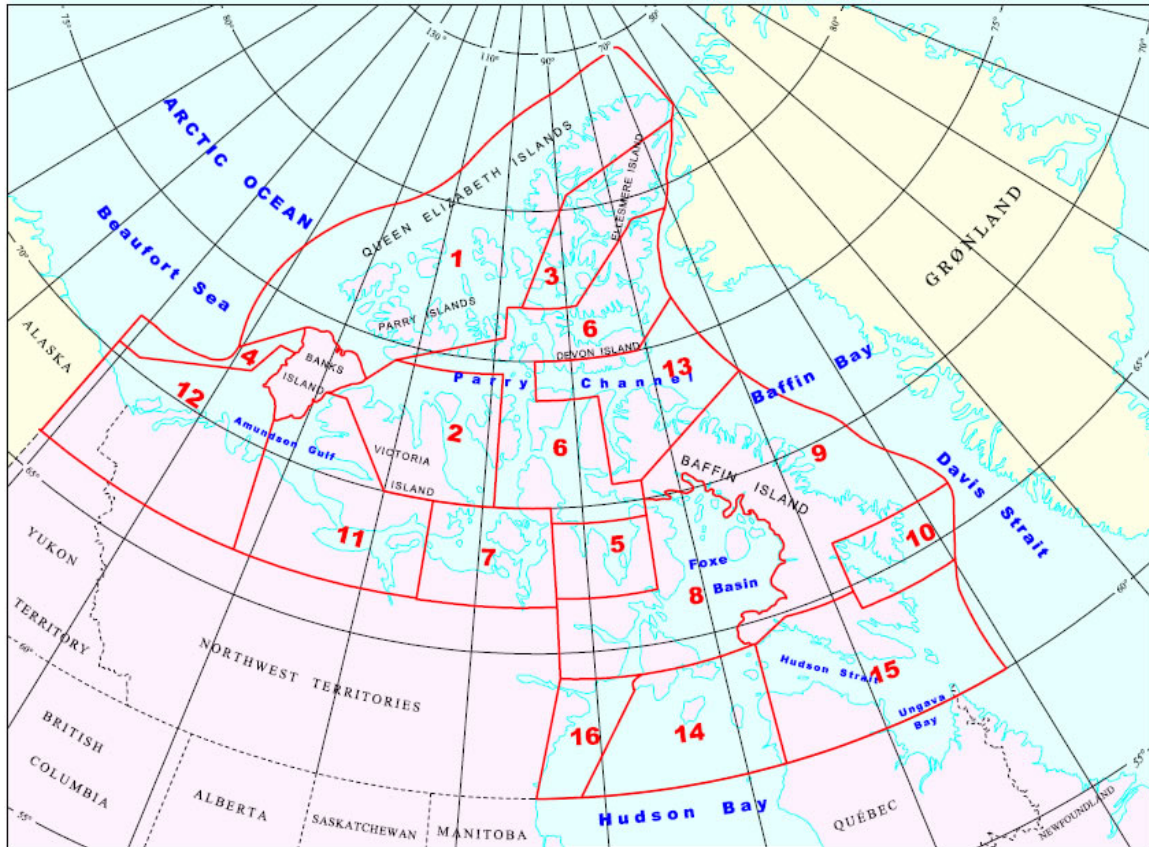


Figure 2. ASPPR Shipping Safety Control Zones. Source: Transport Canada, ‘Arctic Ice Regime Shipping System (AIRSS) Standards - TP 12259’, modified 2010-03-24, available at <https://www.tc.gc.ca/media/images/marinesafety/appendixa-lg.jpg>, (last accessed July 12, 2016).

In 2010, Canada imposed mandatory reporting requirements for certain vessels that wish to navigate within NORDREG, including the Mackenzie River.⁴² Mandatory reporting to NORDREG now applies to: (1) vessels of 300 gross tonnage or more, (2) vessels that are engaged in towing or pushing another vessel, if the combined gross tonnage is 500 gross tonnage or more, and (3) vessels carrying a pollutant or dangerous goods.⁴³

In spite of Canada’s longstanding Arctic-specific marine law that includes the most stringent Arctic-specific legislation governing shipping, the Arctic region experiences a disproportionately high number of accidents compared to other regions in

⁴² The NORDREG zone includes: the shipping safety control zones prescribed by the Shipping Safety Control Zones Order; the waters of Ungava Bay, Hudson Bay and Kugmallit Bay that are not in a shipping safety control zone; the waters of James Bay; the waters of the Koksoak River from Ungava Bay to Kuujuaq; the waters of Feuilles Bay from Ungava Bay to Tasiujaq; the waters of Chesterfield Inlet that are not within a shipping safety control zone, and the waters of Baker Lake; and the waters of the Moose River from James Bay to Moosonee. (Northern Canada Vessel Traffic Services Zone Regulations, SOR/2010-127).

⁴³ There are three main types of reports required: a sailing plan when vessels are about to enter the NORDREG zone and before they depart from a berth within the NORDREG zone; a periodic position report once daily; a final report upon arrival at a berth within the zone or immediately before exiting the zone; and a deviation report when the vessel deviates significant from their sailing plan. (Northern Canada Vessel Traffic Services Zone Regulations, SOR/2010-127).

Canada.⁴⁴ Thus, regulation alone is not sufficient to guarantee safe shipping. Arctic governments must also provide nautical charting, navigational aids, ice and weather information, supporting infrastructure, and safety services. The vastness and remoteness of the region, coupled with historically low levels of vessel traffic and correspondingly low investment, has created a deficit in these critical, operational aspects of arctic shipping. In regions such as the Arctic, where there is a limited tax base to warrant significant investment in regional and local infrastructure, there needs to be different funding formulas for decision-making.⁴⁵ Building these resources now, in response to increasing shipping and future prospects presents a significant challenge to federal agencies.

In order to effectively support marine safety in the Arctic, coordinated and strategic implementation of these laws and protocols is critical. To date, the Canadian government has yet to develop an overarching vision and strategy for arctic shipping. This has resulted in an *ad hoc* approach that in the long term will not meet the shipping needs of Canada.⁴⁶ An effective approach to marine safety in the Arctic will require the application of a risk-based framework that can account for both the spatial and temporal dynamics of risk, life, and environment in Canada's northern waters. The corridors initiative provides an opportunity for establishing that framework.

A recent report by the Pew Charitable Trusts, *The Integrated Arctic Corridors Framework: Planning for responsible shipping in Canada's Arctic waters*, describes a roadmap for creating, classifying, and managing a network of Arctic marine shipping corridors based on the level of risk to vessels, the environment, and Inuit cultural, subsistence, and economic practices.⁴⁷ The authors describe the need for site-specific strategies for corridor safety – including developing site-specific management strategies in corridors where risk is greatest to humans, vessels, and wildlife.

Corridors are a tool for identifying and incentivizing the use of the “safest route” through a given area or to a specific destination.⁴⁸ The “safest route” means using an integrated risk analysis that considers risks to vessels as well as risks to the environment, and to local people, in particular Inuit. This includes recognition that areas outside the corridors are riskier routes and vessels travelling within these areas could potentially be subjected to elevated scrutiny and safety requirements as well as possible insurance implications. The voluntary nature of corridors helps to avoid jurisdictional issues under the UNCLOS. However, it serves as a framework of implementing national (AWPPA, etc.) regimes, regional regimes (Arctic Council agreements), and international regimes (UNCLOS, Polar Code, MARPOL, etc.).

III. INUIT LAND CLAIMS AGREEMENTS

⁴⁴ Council of Canadian Academies, *supra* note 3.

⁴⁵ See NAT'L ABORIGINAL ECON. DEV. BD., RECOMMENDATIONS ON NORTHERN INFRASTRUCTURE TO SUPPORT ECONOMIC DEVELOPMENT (2016), <http://naedb-cndea.com/reports/recommendations-on-northern-infrastructure.pdf>.

⁴⁶ OFFICE OF THE AUDITOR GEN. OF CAN., *Supra* at 9-11.

⁴⁷ THE PEW CHARITABLE TRUSTS, *THE INTEGRATED ARCTIC CORRIDORS FRAMEWORK: PLANNING FOR RESPONSIBLE SHIPPING IN CANADA'S ARCTIC WATERS* 20-21 (2016).

⁴⁸ CANADIAN COAST GUARD, *Supra* at 10.

At present, neither national nor international legislation governing Arctic shipping acknowledges the use of sea ice by Inuit.⁴⁹ Five settled Inuit land claims agreements in Canada afford Inuit constitutionally protected legal rights to ensure management and decision-making over their lands and waters. Arctic shipping has the potential to affect Inuit ability to use sea ice and waters and Inuit engagement on this issue is critical so that communities have the opportunity to minimize risks, maximize opportunities, and can shape and engage in management, monitoring, and pollution prevention and response.

The risks posed by increasing shipping traffic include potential for restricting and endangering travel over ice and water, disturbances to local wildlife, and the contamination of traditional food sources, among others. Movement over ice is an integral aspect of Inuit culture and identity. The Inuit Circumpolar Council of Canada, in a series of interviews, found communities were committed to preserving their traditional diet despite a changing climate and subsequent shifts in wildlife migrations and abundance.⁵⁰ Therefore, hunters often travel further from communities in order to maintain food and cultural security. Icebreaking vessels can negatively affect sea ice conditions, including altering typically well-known ice conditions or travel routes - potentially cutting off safe routes home for Inuit.

Increased shipping in the Arctic is also expected to disrupt how Inuit can access wildlife. Potential challenges include: (1) introduction of contamination or invasive species into the marine environment; (2) dissemination of underwater noise and light pollution which has been shown to disturb wildlife; (3) vessel strikes of marine mammals; (4) alteration of sea ice pattern, integrity, and resilience, and (5) habitat degradation for ice-dependent species.⁵¹ Inuit also may suffer from contamination of country food resulting from ship source pollution or spill events.

Oil spills in particular are of great concern to Inuit as they could potentially contaminate country food sources and result in food insecurity. The devastating consequences of large oil spill events to a productive marine ecosystem were exemplified by the 1989 Exxon-Valdez spill, which caused extreme environmental, social, economic, and cultural damages.⁵² The clean-up operation alone cost approximately \$2.5 billion.⁵³ In the criminal plea agreement Exxon was fined \$150 million, the highest penalty ever (at the time) for an environmental offense. Exxon paid an additional \$100 million in criminal

⁴⁹ See INUIT CIRCUMPOLAR COUNCIL CAN., *THE SEA ICE IS OUR HIGHWAY: AN INUIT PERSPECTIVE ON TRANSPORTATION IN THE ARCTIC* (2008), http://www.inuitcircumpolar.com/uploads/3/0/5/4/30542564/20080423_iccamsa_finalpdfprint.pdf; INUIT CIRCUMPOLAR COUNCIL CAN., *THE SEA ICE NEVER STOPS: REFLECTIONS ON SEA ICE USE AND SHIPPING IN INUIT NUNAAT* (2014), http://www.inuitcircumpolar.com/uploads/3/0/5/4/30542564/sea_ice_never_stops_final.pdf.

⁵⁰ INUIT CIRCUMPOLAR COUNCIL CAN., *THE SEA ICE IS OUR HIGHWAY* *Supra* at 11.

⁵¹ See ARCTIC COUNCIL *Supra* at 6-7.

⁵² LAWRENCE PALINKAS ET AL., *Social, Cultural, and Psychological Impacts of the Exxon Valdez Oil Spill*, 52 Hum. Org. 1, 1 (Spring 1993); GARY SHIGENAKA, *TWENTY-FIVE YEARS AFTER THE EXXON VALDEZ OIL SPILL: NOAA'S SCIENTIFIC SUPPORT, MONITORING, AND RESEARCH* 7 (2014), http://response.restoration.noaa.gov/sites/default/files/Exxon_Valdez_25YearsAfter_508_0.pdf.

⁵³ Governments' Memorandum in Support of Agreement and Consent Decree at 3, *United States v. Exxon Corp.*, No. A91-082 CIV (D. Alaska 1991), <http://www.evostc.state.ak.us/Universal/Documents/History/GovMemo.pdf>.

restitution and \$900 million in a civil settlement.⁵⁴ A class action lawsuit was brought against Exxon Mobile by 32,000 fishermen, Alaska indigenous peoples, and others whose economic livelihoods were compromised by the spill. A spill of this magnitude in Canada's Arctic could permanently damage Inuit food and cultural security.

Despite the lack of acknowledgement of Inuit use of sea ice in shipping regulations, there are some avenues for legal recourse in the case of ship source oil spills through a system of liability. The AWPPA, Canada Shipping Act (2001) (CSA), and the Marine Liability Act (2001) (MLA), form the basis of Canada's legal regime for oil-spill preparedness and liability. The AWPPA is a "zero discharge" Act which states "no person or ship shall deposit or permit the deposit of waste of any type in the Arctic waters."⁵⁵ This includes the deposition of waste on any mainland or island where the waste may enter Arctic waters.⁵⁶ The Act provides for a system of civil liability and for the designation of pollution prevention officers for enforcement purposes. Punishments for offences under the AWPPA include monetary fines and forfeiture of ship and cargo.⁵⁷

The MLA implements the liability schemes from several international conventions. These include the International Convention on Civil Liability for Oil Pollution Damage, 1992 (CLC),⁵⁸ articles 1 to 10 of the International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001 (Bunkers Convention),⁵⁹ the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS Convention),⁶⁰ and, finally, the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 and the 2003 protocol to that Convention (together also known as the IOPCF Convention).⁶¹

⁵⁴ Exxon Valdez Oil Spill Trustee Council, *Settlement* (June 8, 2016), <http://www.evostc.state.ak.us/facts/settlement.cfm>.

⁵⁵ Arctic Waters Pollution Prevention Act, R.S.C. 1985, C. A-12 (Can.).

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ The CLC provides for compensation for persons (including Inuit) who suffer oil pollution damage resulting from ship source oil pollution, by placing liability on the ship owner of the polluting vessel. The Convention applies to all seagoing vessels actually carrying oil in bulk as cargo, but only ships carrying more than 2,000 tons of oil are required to maintain insurance in respect of oil pollution damage. (1992 Protocol to amend the 1969 International Convention on Civil Liability for Oil Pollution Damage, art. 4(1), Nov. 27 1992, 1956 U.N.T.S. 255.)

⁵⁹ The Bunkers Convention require ships over 1,000 gross tonnage must maintain insurance or other financial security to cover the liability for pollution damage of registered owners in an amount equal to the limits of liability under the applicable national or international limitation regime. International Convention on Civil Liability for Bunker Oil Pollution Damage, art. 7(1) Mar. 23, 2001, Gr. Brit. T.S. No. 1 (2005) (Cm 6693).

⁶⁰ The HNS Convention establishes a comprehensive two-tier compensation regime covering pollution damage from the hazardous and noxious substances carried by ships, as well as the risks of fire and explosion (e.g., loss of life, personal injury, and property damage). Tier one provides for compensation from ship owner insurance policies, while tier two provides for any necessary additional compensation from the HNS Fund, created by the Convention. (International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea art. 12-14 May 3, 1996, 35 ILM 1406)

⁶¹ The IOPCF Convention creates the international compensation fund and a supplementary fund (IOPCF Fund) to compensate for oil pollution damage covered by the CLC and the Bunkers Convention. (Protocol of 1992 to amend the International Convention on the establishment of an international fund for compensation for oil pollution damage, Nov. 27, 1992, 1953 U.N.T.S. 330; 2003 Protocol to the 1992

The MLA specifies the entitlement of the government to recover the costs of spill response from the polluter, with the liability always being placed on the polluter. There is currently no criminal liability for ship pollution in Canada. In addition to the liability funds created under the international regime, the MLA created the Ship-source Oil Pollution Fund (SOPF), which is financed by levies paid by shippers and receivers of oil in Canada. The SOPF may provide a mechanism by which Inuit who are negatively impacted by shipping pollution could claim compensation. If the Inuit individuals are part of the fishing industry, they may claim loss of income caused by ship-source oil pollution. Other classes of claims for which the SOPF may be liable include the following: claims for oil pollution damage; claims for costs and expenses of oil spill clean-up, preventive measures and monitoring; and claims for oil pollution damage and clean-up; costs where the cause of the oil pollution damage is unknown and the Administrator of the SOPF has been unable to establish that the occurrence that gave rise to the damage was not caused by a ship.

An affected Inuit group could also bring a claim for compensation directly against a ship owner's insurer, if the Bunkers Convention applies (i.e., the pollution is caused by a Bunkers Convention certified vessel over 1,000 GT). Finally, Inuit groups subject to the Nunavut Land Claims Agreement also have a preventative or precautionary measure available to them in the form of the power to approve shipping activities that are associated with extractive projects via their project proposals. Companies submit proposals to the Nunavut Impact Review Board (NIRB), which include a description of proposed marine shipping vessels, routes, frequency, subject to the NIRB's approval. There may be available mechanisms for incorporating compensation for any shipping damages into the Project Certificates issued by the NIRB.

The development of Arctic corridors offers the opportunity for a clear and transparent mechanism to implement provisions of Inuit land claim agreements by engaging Inuit and their land claims institutions in decision-making, management, recognition of Traditional Knowledge, and the assessment of current liability limits for ship-based pollution. Presently, liability limits underestimate the costs of spill prevention, response, remediation, and victim compensation when compared to past spill response efforts throughout the world. Many factors contribute to the extreme variability of costs associated with a marine oil spill. According to the International Tanker Owners Pollution Federation there are six dynamics which affect the total cost: (1) type of oil spilled, (2) physical, biological and economic characteristics of the spill location, (3) weather and sea conditions, (4) amount spilled and rate of spillage, (5) time of year, and (6) management and effectiveness of response operations.⁶² Given the abstract nature of these factors, ascertaining a defensible and verifiable assessment of the range of potential costs associated with marine oil spill events, analysis must focus on case study data. When oil hits water what do we know to be true? In extreme cases, such as the Macondo spill in the Gulf of Mexico, total costs can reach upwards of \$65 billion.⁶³ Arctic

International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, May 16, 2003, 2012 UKTS 48)

⁶² I.C. White and F. Molloy, *Factors that Determine the Cost of Oil Spills*, THE INTERNATIONAL TANKER OWNERS POLLUTION FEDERATION LIMITED (Apr. 2003), <http://www.itopf.com/knowledge-resources/documents-guides/document/factors-that-determine-the-cost-of-oil-spill-2003/>.

⁶³ Chris Baltimore, *Factbox: What's BP's potential pricetag for Macondo?*, REUTERS (Mar. 3, 2012), <http://www.reuters.com/article/2012/03/03/us-bp-costs-idUSTRE8220R320120303>.

corridors offer the chance for Inuit engagement in the determination of liability limits for oil spills in areas that will affect them the most.

IV. PROTECTING SENSITIVE MARINE AREAS

The Arctic environment is facing unprecedented changes due to climate change. In particular, the loss of sea ice is fundamentally altering ocean dynamics and challenging the resilience of Arctic ecosystems. In this shifting and vulnerable environment, increased access by ships, including shipping associated with large-scale development projects, warrants enhanced scrutiny and attention. Regulators and Inuit organizations must carefully consider how and when vessel traffic should be permitted in sensitive marine areas so as not to unduly disrupt fragile habitat and sensitive or at-risk species.

The preamble to the AWPPA underscores Canada's commitment to Arctic development that occurs in step with environmental protection and stewardship, and with due regard for the wellbeing of Inuit.⁶⁴ Exploitation of the natural resources of the Canadian Arctic is beginning to occur at a greater scale than in the past, and is being facilitated through access by large vessels.⁶⁵ Not only are more and larger ships using the Canadian Arctic but shipping also exhibits a high degree of concurrence with important ecological areas.⁶⁶ Figure 3, below, depicts the overlap between recent shipping patterns and areas of ecological importance in the Canadian Arctic.⁶⁷ The Northwest Passage is in fact a network of passages for humans, vessels, fish, birds, and marine mammals. In practice, it is not possible for ships to simply avoid all environmentally sensitive areas. To keep pace with emerging developments in the marine environment and ensure the sustainability of arctic shipping, Canada is preparing to identify and protect its most sensitive Arctic marine areas.⁶⁸

⁶⁴ Arctic Waters Pollution Prevention Act, R.S.C. 1985, c A-12 (Can.) ("Parliament [...] recognizes and is determined to fulfil its obligation to see that the natural resources of the Canadian arctic are developed and exploited and the arctic waters adjacent to the mainland and islands of the Canadian arctic are navigated only in a manner that takes cognizance of Canada's responsibility for the welfare of the Inuit and other inhabitants of the Canadian arctic and the preservation of the peculiar ecological balance that now exists in the water, ice and land areas of the Canadian arctic").

⁶⁵ In recent years, the Canadian Arctic has begun to host some of the largest ships ever to access its waters. Shipping associated with large scale mining projects, such as the Baffinland iron ore mine in North Baffin Island, the Meadowbank mine in the Kivalliq region of Nunavut and the Raglan mine in northern Nunavik, are bringing intensive vessel traffic to certain routes. See, *MV Nunavik the newest icebreaker to hit Arctic waters*, CBS NEWS (Mar 24, 2014), <http://www.cbc.ca/news/canada/north/mv-nunavik-the-newest-icebreaker-to-hit-arctic-waters-1.2583861>; Holly Birkett, *First panamax carries iron ore from Canada's Arctic to Europe*, SPLASH 24/7 (Aug. 31, 2015), <http://splash247.com/first-panamax-carries-iron-ore-from-canadas-arctic-to-europe/>.

⁶⁶ PEW CHARITABLE TRUSTS, *supra* note 5.,

⁶⁷ Figure 3. Ship tracks (2014) overlap with important ecological areas in the Canadian Arctic. Canadian Important Bird Areas, IBA CANADA, http://www.ibacanada.ca/explore_how.jsp?lang=EN; S.A. Stephenson and L. Hartwig, The Arctic Marine Workshop, FISHERIES AND OCEANS CANADA (Feb. 2010), <http://www.dfo-mpo.gc.ca/Library/341178.pdf>; Lori T. Quakenbush, Robert J. Small, and John J. Citta, Satellite Tracking of Bowhead Whales, BUREAU OF OCEAN ENERGY MANAGEMENT (Aug. 2015), <http://www.data.boem.gov/PI/PDFImages/ESPIS/5/5343.pdf>.

⁶⁸ The federal government has made domestic and international commitments to protect 5% of marine and coastal areas by 2017 and 10% by 2020. The Prime Minister's mandate letters to the Minister of Environment and Climate Change and the Minister of Fisheries, Oceans and the Canadian Coast Guard,

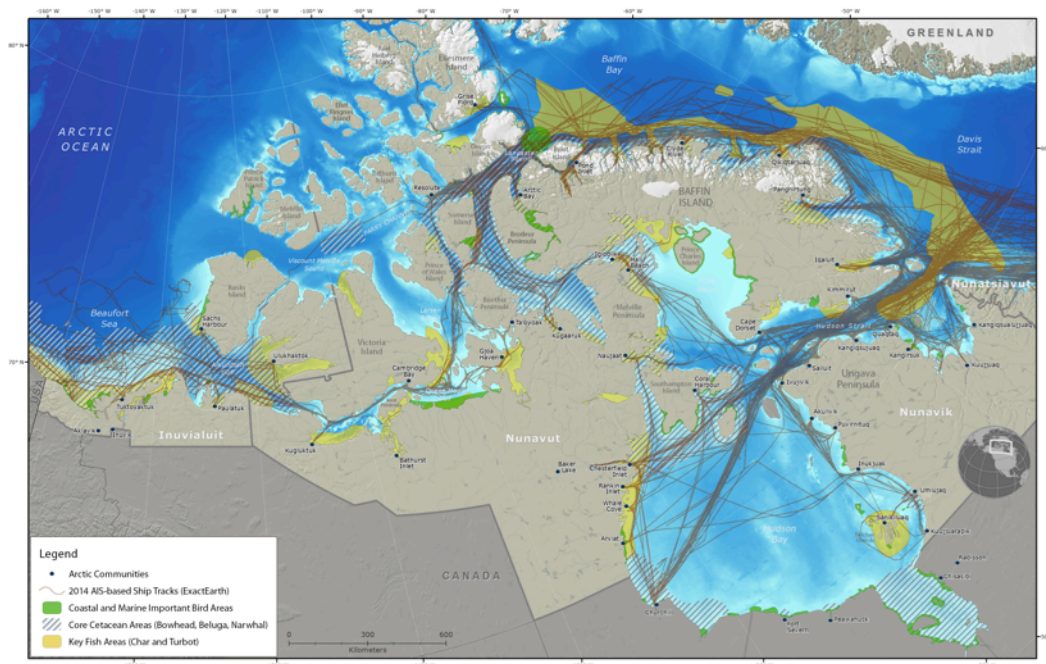


Figure 3 exactAIS Archive, Satellite AIS Data—Arctic, <http://www.exactearth.com>; Flanders Marine Institute, ‘VLIZ Maritime Boundaries Geodatabase’, available at <http://www.marineregions.org>, accessed Sept. 4, 2015.

The federal government has not adequately considered how the preliminary corridors development or use overlaps with environmentally sensitive areas, nor has it sufficiently identified culturally sensitive areas. In their current design, 77% of the preliminary corridors overlap with areas that have been officially designated as ecologically or biologically significant.⁶⁹ It is unclear what percentage overlap with significant or sensitive cultural sites, as these sites have not yet been adequately inventoried in the region. Despite these overlaps and gaps, the corridors have the potential to be an important tool for protecting sensitive marine areas. They provide a framework for determining and implementing the most appropriate conservation tool in areas affected by shipping. There are a number of options for enhancing protection for sensitive marine areas using the corridors as a framework, including (a) refining corridor design, (b) pursuing international shipping designations, (c) creating marine protected areas, (d) creating special management zones, and (e) improving environmental response capacity.

A. Refining Corridor Design

Corridors are a way of encouraging the use of safe areas by mariners, and conversely, they are a way of discouraging vessels from operating in unsafe or sensitive areas. By excluding the most vulnerable and sensitive marine areas from the corridors design, these critical areas are afforded a *de facto* level of protection from shipping.

published in December 2015, to reiterated the government’s intention to meet these goals. See Justin Trudeau, *Ministerial Mandate Letter to the Minister of Fisheries, Oceans and the Canadian Coast Guard*, <http://pm.gc.ca/eng/minister-fisheries-oceans-and-canadian-coast-guard-mandate-letter>.

⁶⁹ THE PEW CHARITABLE TRUSTS, *supra* note 5.

Analysis published by the Pew Charitable Trusts demonstrated the potential gains to the shipping industry and environment that could be achieved by integrating information on ecological and Inuit use areas into corridors design. Using the preliminary corridors in the Beaufort Sea as a case study, the analysis found that the corridors unnecessarily coincided with significant ecological and biological areas in the Canadian Beaufort Sea region.⁷⁰ By re-assessing and refining corridor placement, the authors were able to argue for and demonstrate how a smaller corridor footprint would interfere with 25% less area designated as important for wildlife and Inuit use, and exclude a greater proportion of hazardous ice areas, all while capturing a greater amount of annual vessel traffic.⁷¹

An integrated approach that incorporates protection for sensitive marine areas is a simple and cost effective means of supporting sustainable Arctic shipping future for Canada. Yet, many of the Canada's most travelled Arctic passages are bottlenecks for ships, local users and marine animals. In these places, such as the Kitikmeot region, Lancaster Sound, Hudson Strait, and parts of the Beaufort Sea, it is impossible to exclude all sensitive areas from the corridors. In order to effectively manage sensitive areas within the corridors, protective measures outside of corridors must be present. Designations by the IMO such as marine protected areas (MPAs), or special management zones need to be developed and incorporated into corridor governance and management. Presently there are no IMO designations in the Canadian Arctic.

B. International Maritime Organization Designations

The International Maritime Organization (IMO) offers a number of solutions for protecting marine areas where shipping has the potential to negatively impact the environment. Special IMO measures for enhancing environmental protection in analogous regions – such as the North American Emissions Control Area and the heavy fuel oil ban in the Antarctic – do not apply to Arctic waters. The Polar Code will enhance protection for the Arctic, however, as described above, it provides a minimum standard for safety Arctic shipping and is not sufficient to protect the Arctic's most vulnerable or important areas.

The most relevant IMO designation for Arctic shipping corridors is the Particularly Sensitive Sea Area (PSSA).⁷² A PSSA is a special designation for areas where international shipping has the potential to negatively impact the environmental, socio-economic, or scientific value of the area.⁷³ Once a PSSA has been approved by the IMO, special measures can be brought to bear on maritime activities.⁷⁴ These include routing measures, areas to be avoided (ATBA), strict application of MARPOL discharge

⁷⁰ *Id.* at 17-18.

⁷¹ *Id.* at 20.

⁷² Special Area designations, available under the International Convention for the Prevention of Pollution from Ships (MARPOL), are also of interest for the Arctic – in particular related to emissions control and use and carriage of heavy fuel oil – however these zones are typically applied to a much larger area and therefore their implementation in the Arctic is not facilitated by the corridors approach. Presently, there are no special area designations north of the 60th parallel. *Special Areas Under MARPOL*, IMO www.imo.org/en/OurWork/Environment/SpecialAreasUnderMARPOL/pages/Default.aspx (last visited Dec. 7, 2016).

⁷³ International Maritime Organization. *Particularly Sensitive Sea Areas* (October 20 2016),

www.imo.org/en/OurWork/Environment/PSSAs/Pages/Default.aspx.

⁷⁴ *Id.*

and equipment requirements for ships, such as oil tankers, and installation of Vessel Traffic Services.⁷⁵ IMO designations are well recognized by the shipping industry and can be highly effective, even when voluntary. This effectiveness was demonstrated in the Roseway Basin ATBA, recognized by the IMO in 2007.⁷⁶ The Roseway Basin ATBA protects an area in Atlantic Canada where risk of vessel strikes with endangered right whales was particularly high. Despite its voluntary nature, high levels of compliance within just the first five months of implementation resulted in an 82% reduction in the risk of lethal vessel strikes to right whales within the ATBA.⁷⁷

A drawback of the PSSA designation, however, is that a candidate area must be vulnerable to impacts from international shipping.⁷⁸ Given that most of the shipping currently occurring in the Canadian Arctic is destination, sensitive marine areas in the Canadian Arctic may not qualify for such designations at this time. However, Canada can choose to enact unilateral area designations in the interest of environmental protection from shipping without the need to seek IMO approval using Article 234 of UNCLOS.⁷⁹

C. Marine Protected Areas

There are three principal options under Canadian federal law for the creation of a marine protected area (MPA). First an MPA can be created under s.35 of the *Oceans Act*,⁸⁰ second an MPA can be created as a protected marine area under the terms of the *Canada Wildlife Act*,⁸¹ and third, an MPA can be established as a national marine conservation area (NMCA) under the *Canada National Marine Conservation Areas Act*.⁸² Marine areas may also be protected as Migratory Bird Sanctuaries,⁸³ National Wildlife Areas⁸⁴ or as National Parks.⁸⁵ The *Oceans Act* accords the Minister of Fisheries and Oceans the responsibility to “lead and coordinate the development and implementation of a national system of marine protected areas on behalf of the Government of Canada.”⁸⁶ The Department of Fisheries and Oceans (DFO) adopted *Canada’s Federal Marine Protected Areas Strategy* in 2005 with the goal of establishing “a network of marine protected areas, established and managed within an integrated oceans management framework, that contributes to the health of Canada’s oceans and marine

⁷⁵ *Id.*

⁷⁶ Angela S.M. Vanderlaan & Christopher T. Taggart, *Efficacy of a Voluntary Area to Be Avoided to Reduce Risk of Lethal Vessel Strikes to Endangered Whales*, 23(6) CONSERVATION BIOLOGY 1467, 1468 (2009).

⁷⁷ *Id.* at 1467–1474.

⁷⁸ International Maritime Organization. Res. A.982(24), ¶ 1.2 (Dec. 1, 2005).

⁷⁹ United Nations Convention on the Law of the Sea, art. 234, Dec. 10, 1982,, 1833 UNTS 397.

⁸⁰ *Oceans Act*, S.C. 1996, c 31 (Can.).

⁸¹ *Canada Wildlife Act*, R.S.C. 1985, c W-9 (Can.).

⁸² *Canada National Marine Conservation Areas Act*, S.C. 2002, c 18 (Can.).

⁸³ *See* Migratory Birds Sanctuary Regulations, C.R.C. 1978, c 1036 (Can.).

⁸⁴ *See* *Canada Wildlife Act*, *Supra* note 53.

⁸⁵ *See* *Canada National Parks Act*, S.C. 2000, c 32 (Can.). *See generally*, CANADA’S FEDERAL MARINE PROTECTED AREAS STRATEGY 5 (2005). (Referring to additional possibilities including critical habitat designation under the *Species at Risk Act*, S.C. 2002, c 29 (Can.), and a closure under the *Fisheries Act*, R.S.C. 1985, c F-14 (Can.).)

⁸⁶ *Oceans Act*, *supra* note 52.

environments.”⁸⁷ The Strategy emphasises that the federal government is “committed to working with affected Aboriginal Peoples throughout Canada to collaboratively plan, establish and manage marine protected areas.”⁸⁸

Canadian federal government is presently considering how to meet its commitment under the Convention on Biological Diversity to protect 10% of domestic waters by 2020.⁸⁹ The Obama-Trudeau Joint Arctic Statement further underscored the connection between shipping corridors and marine protection by calling for “an ambitious conservation goal for the Arctic,” and “low impact shipping corridors.”⁹⁰ Arctic shipping corridors provide a framework for understanding how shipping activities interact with sensitive marine ecology, biology, and oceanography. Parts of critical marine habitat areas of vulnerable or at-risk species that cannot be completely excluded from the corridors system should become prime candidates for marine protection by the federal government.

The federal government’s Marine Protected Areas Strategy also outlines the goal of creating a network of MPAs to increase the effectiveness and connectivity of individual protected areas.⁹¹ Because corridors represent the most used routes for ships as well as key migratory routes for wildlife,⁹² the corridors initiative provides a valuable tool for planning such a network. A network of Arctic MPAs will be most effective if it is designed to work in coordination with present and future ship traffic.

V. MECHANISMS FOR INTERNATIONAL COOPERATION

Circumpolar nations share many of the same challenges related to Arctic shipping.⁹³ Regionally, Arctic nations are working together through the Arctic Council and in other bi- and multi-national forums to coordinate and cooperate on key issues. Arctic shipping corridors offer a political and operational framework for addressing these challenges in coordination with other circumpolar nations, and have already been identified as a key focus area for cooperation between the United States and Canada.⁹⁴

Recognizing the unique challenges facing mariners and regulators in the Arctic, circumpolar nations began making important strides towards formal cooperation following the release of the Arctic Marine Shipping Assessment (AMSA) in 2009. Developed by the Arctic Council, with leadership from Canada, the United States and Finland, the AMSA is the most comprehensive assessment of shipping risks in the Arctic to date and provides a policy road map for decision-makers to enhance safety, security and environmental protection of Arctic waters.⁹⁵ Key recommendations from the

⁸⁷ CANADA’S FEDERAL MARINE PROTECTED AREAS STRATEGY, at 12.

⁸⁸ *Id.* at 11.

⁸⁹ GOVERNMENT OF CANADA, *2020 Biodiversity Goals & Targets for Canada* (2015), available at <http://www.biodivcanada.ca/default.asp>.

⁹⁰ US-Canada Joint Statement on Climate, Energy and Arctic Leadership, *supra* note 15.

⁹¹ CANADA’S FEDERAL MARINE PROTECTED AREAS STRATEGY, *supra* note 59.

⁹² The Pew Charitable Trusts, *supra* note 5.

⁹³ For example, providing services in support of safe navigation, coordinating search and rescue activities, protecting sensitive environments, facilitating regional economic development, and ensuring shipping incidents can be addressed in a timely and effective manner. (Arctic Council, *supra* note 1).

⁹⁴ US-Canada Joint Statement on Climate, Energy and Arctic Leadership, 2016.

⁹⁵ Arctic Council, *supra* n 1, at 3.

assessment include the need for international cooperation, arctic-specific IMO standards, multi-lateral cooperation and capacity building for search and rescue and emergency response, engagement with Arctic communities, protection for marine mammals, special designations for ecologically and culturally sensitive areas, and investment in supporting infrastructure and service, among others.

Since 2009, the international and circumpolar communities have made progress on several of these recommendations. Most notably, a mandatory IMO Polar Code will be implemented in January 2017, and two legally binding international agreements have been negotiated under the auspices of the Arctic Council – one on cooperation on Search and Rescue operations in 2011 and another on cooperation on oil pollution preparedness and response in 2013.⁹⁶ Though these agreements have been criticized for not going far enough,⁹⁷ they are a starting point for international cooperation in the Arctic and provide the foundation for future work on shared issues.

Integrated shipping corridors offer a pragmatic and innovative approach for bringing circumpolar nations together in bi-lateral and multilateral forums to explore achievable international policy for Arctic shipping. Through the creation, development, and management of integrated corridors, Arctic shipping can be made safer and more affordable while strengthening environmental protection and protecting the rights of Arctic Indigenous peoples. Arctic-specific bodies created to coordinate international action, such as the Arctic Coast Guard Forum or the Arctic Council, could advance cooperation and diplomacy among circumpolar nations and international partners by championing the development of integrated arctic shipping corridors.

The Arctic is unique in that circumpolar nations have been able to cooperate on shared priorities here, in spite of geopolitical conflict in other regions. Responsible economic development, human and vessel safety, environmental protection, and rights of Indigenous peoples are priorities shared by all Arctic nations⁹⁸. Voluntary, integrated

⁹⁶ Arctic Council, Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic (2011), https://oaarchive.arctic-council.org/bitstream/handle/11374/531/EDOCS-3661-v1-ACMMDK07_Nuuk_2011_SAR_Search_and_Rescue_Agreement_signed_EN_FR_RU.PDF?sequence=5&isAllowed=y; Arctic Council (2013), Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. Kiruna. <http://www.arctic-council.org/index.php/en/document-archive/category/425-main-documents-from-kiruna-ministerial-meeting>.

⁹⁷ See, e.g., Kevin McGwin, *Better than nothing: Environment groups and the shipping industry welcome the Polar Code, even if it leaves room for improvement*, Arctic J. (Mar. 20, 2014), <http://arcticjournal.com/business/509/better-nothing>; P. Koring, 'Proposed Arctic Council treaty on oil spills 'useless,' Greenpeace says', *The Globe and Mail* (Feb 4, 2013), <http://www.theglobeandmail.com/news/politics/proposed-arctic-council-treaty-on-oil-spills-useless-greenpeace-says/article8158237/>.

⁹⁸ See, e.g., Arctic Council, 12 May 2011, Nuuk Declaration on the occasion of the Seventh Ministerial Meeting of the Arctic Council, https://oaarchive.arctic-council.org/bitstream/handle/11374/92/07_nuuk_declaration_2011_signed.pdf?sequence=1&isAllowed=y (last accessed September 21, 2016); Arctic Council, 24 April 2015, Iqaluit Declaration 2015 on the occasion of the Ninth Ministerial Meeting of the Arctic Council., https://oaarchive.arctic-council.org/bitstream/handle/11374/662/EDOCS-3431-v1-ACMMDCA09_Iqaluit_2015_Iqaluit_Declaration_original_scanned_signed_version.PDF?sequence=7&isAllowed=y (last accessed September 21, 2016).

shipping corridors present a holistic vision that could serve as a road map for pan-Arctic solutions to the next generation of shipping challenges.

VI. DISCUSSION AND CONCLUSION

The Arctic poses some of the most hazardous shipping conditions on Earth. Ice-infested waters, low-visibility, extreme cold, and severe weather are just some of the challenges faced by mariners. In the coming decade, declining Arctic sea ice is going to result in more unpredictable weather and hazardous multi-year ice floes throughout the Canadian Arctic archipelago.⁹⁹ A special regime is emerging that aims to address the unique hazards of operating in this region and account for its sensitive marine environment.

Arctic shipping corridors are a strategic policy framework that, when fully implemented, will help to ensure vessels travel along the safest routes while minimizing their impact to the environment and to the Inuit who call the region home. This article argued the safest route can be defined using an integrated risk analysis that considered risks to vessels as well as risks to the environment and to local people, in particular Inuit. Areas outside the corridors would therefore be considered riskier routes and vessels travelling in these areas could potentially be subjected to elevated scrutiny, safety, and insurance requirements.

As presented above, the ability to direct shipping into designated, classified, developed, and managed corridors will dramatically reduce risk in Canada's Arctic Ocean. All efforts should be made to promote the use of these shipping corridors through regulation and voluntary mechanisms and by regularly re-assessing the corridors based on new scientific information and emerging local knowledge. Nonetheless, vessel transits will continue to take place beyond the system of corridors, though hopefully at reduced levels. Shipping activities that are most likely to fall beyond the corridors include Coast Guard transit, scientific journeys, tourism, and subsistence fishing. Riskier navigation beyond the corridors requires additional management to ensure safety to people and the environment,¹⁰⁰ and should be part of an overall and integrated system for maritime transportation governance that builds on the foundation developed through the corridors system.

Canada is currently unprepared for substantial increases in shipping activity. Though the risk is more acute outside the corridors, substantial risk remains even within the regions designated as the preliminary NMTCs. Information and infrastructure are not in place for safe and responsible shipping. Outside of known transit routes, very limited portions of the ocean have been mapped to adequate standards. Navigational aids, supporting on-shore infrastructure, oil spill response capacity, hazardous waste

⁹⁹ Cecilie Mauritzen & Erik Kolstad. *The Arctic Ocean – an ocean in transition*. in Marine Transport in the High North. (J. Grue and R. Gabrielson 2011) . The Norwegian Academy of Science and Letters, Oslo; Pizzolato, L., Howell, S.E.L., Derksen, C., Dawson, J., and L. Copland. (J. Grue and R. Gabrielson eds., 2014). Changing sea ice conditions and marine transportation activity in Canadian Arctic waters between 1990 and 2012. *Climatic Change*.

¹⁰⁰ J. Dawson, M.E. Johnston, E.J. Stewart, & C. Lemiux, *Identifying and evaluating adaptation strategies for cruise tourism in Arctic Canada* (2016) 24 *J. OF SUSTAINABLE TOURISM*; J. Dawson, M.E. Johnston, and E.J. Stewart, *Governance of Arctic expedition cruise ships in a time of rapid environmental and economic change* (2014) 89(1) *OCEAN AND COASTAL MANAGEMENT* 88-99 Mar. 2014.

management, and ice-breaking capacity decrease rapidly as one moves away from these commonly used shipping routes, which have now become the basis for the corridors placement.

Development of integrated corridors along with a cohesive system for maritime transportation governance would address these deficiencies within the designated routes. For obvious economic reasons, it would not be possible to extend this level of support to the expansive oceanic spaces beyond the corridors. Beyond the importance of ensuring appropriate placement of the corridors that considers both cultural and environmental implications, perhaps the most important consideration is how the corridors will be managed or co-managed in real time among the multiple federal agencies, provincial and territorial agencies, and Inuit government in the region. The development and public release of the NMTC is clearly just the beginning of an important initiative to ensure safe and sustainable shipping in Arctic Canada. An enormous amount of work is still required to ensure the placement, implementation, and governance of the corridors is effective and to develop trans-national connections to global corridors systems. The NMTC is a fundamental foundation for sustainable maritime transportation governance in Canada and if developed and managed effectively could become a model for safe and environmentally responsible marine governance.