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ANY OTHER BUSINESS

Arctic indigenous food security and shipping

Submitted by FOEI, WWF and Pacific Environment[1]

SUMMARY

Executive summary:	Food security for many coastal Arctic indigenous communities is inextricably tied to the bounty of the sea. This document highlights threats to that food security in light of increased Arctic shipping. We request that Member States and industry take into account the preservation and protection of Arctic indigenous subsistence practices and, more broadly, food security when developing safety and environmental guidelines and regulations pertaining to shipping in this region, including but not limited to the Polar Code.
Strategic direction:	7.1, 7.3
High-level action:	7.1.2, 7.3.1
Output:	No related provisions
Action to be taken:	Paragraph 15
Related documents:	DE 54/13/8, DE 54/13/9; DE 57/11/4; MEPC 62/4/16; MEPC 65/11/5; MEPC 68/3/20; MEPC 69/INF.17, MEPC 69/20/1; MEPC 70/17/4; MSC 95/21/11; NAV 57/INF.10 and NAV 57/INF.11

Introduction

1 Native subsistence is an issue that is occasionally mentioned in IMO proceedings[2]; however, the broader topic of indigenous food security and its relationship to shipping, particularly in the Arctic context, to our knowledge has not been discussed by the Organization. This submission looks at the issue to some degree, and underscores threats that need to be evaluated and addressed in order to mitigate potential food security impacts by the sector.

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[1] The preparation of this document was assisted by the European Climate Foundation.

[2] *See* Guide on oil spill response in ice and snow conditions; Workshop on Environmental Aspects of the Polar Code, DE 56/INF.3; a document about the Banc d'Arguin National Park and adjacent sea from Mauritania, MEPC 69/INF.19; a few environmental NGO submissions; the United States' Aleutian Islands ATBA proposal, NCSR 2/3/5; and submissions from Papua New Guinea, such as the proposed Jomard Entrance PSSA, MEPC 70/8.

2 For purposes of this submission, we use the Alaskan[3] Inuit definition of food security[4]:

> "the natural right of all Inuit to be part of the ecosystem, to access food and to care-take, protect and respect all of life, land, water and air. It allows for all Inuit to obtain, process, store and consume sufficient amounts of healthy and nutritious preferred food – foods physically and spiritually craved and needed from the land, air and water, which provide for families and future generations through the practice of Inuit customs and spirituality, languages, knowledge, policies, management practices and self-governance. It includes the responsibility and ability to pass on knowledge to younger generations, the taste of traditional foods rooted in place and season, knowledge of how to safely obtain and prepare traditional foods for medicinal use, clothing, housing, nutrients and, overall, how to be within one's environment. It means understanding that food is a lifeline and a connection between the past and today's self and cultural identity. Inuit food security is characterized by environmental health and is made up of six interconnecting dimensions: 1) Availability, 2) Inuit Culture, 3) Decision-Making Power and Management, 4) Health and Wellness, 5) Stability and 6) Accessibility. This definition holds the understanding that without food sovereignty, food security will not exist. [5]"

Threats from shipping

3 The threats to Arctic indigenous food security from shipping are numerous and significant. Generally, they include oil and chemical spills; marine mammal strikes and disturbance; food waste disposal; invasive species introduction from ballast water discharges and hull fouling; wastewater effluent; and air emissions, including black carbon and air toxins.

4 Cargo or bunker spills, especially persistent substances such as heavy fuel oil,[6] can have devastating social and environmental consequences.[7] This is particularly true in the Arctic, where a dearth of spill response assets, severe weather, and ineffective oil collection equipment all contribute to oil recovery challenges.[8] Moreover, oil spilled in Arctic and sub-Arctic marine and coastal environs can remain within sediments for over a decade.[9] In addition, the lack of species diversity and slow growth rates in Arctic marine ecosystems may exacerbate an oil spill's adverse ecological effects, and therefore could have a more harmful impact on indigenous subsistence practices and, consequently, food security.

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3 Food security is, of course, not only an Alaska Native concern. Nunavut household food insecurity is eight times the Canadian average. Alexander Kim, *Tackling the Culture Clash Over Country Food in Nunavut*, ARCTIC DEEPLY, Aug. 5, 2016, *available* at https://www.newsdeeply.com/arctic/articles/2016/08/05/tackling-the-culture-clash-over-country-food-in-nunavut.

4 While this submission uses the Alaskan Inuit definition of food security, the views expressed are strictly those of environmental NGOs. This document does not implicitly or explicitly purport to represent the views of Arctic indigenous peoples or organizations.

5 Inuit Circumpolar Council-Alaska 2015. Alaskan Inuit Food Security Conceptual Framework: How to Assess the Arctic From an Inuit Perspective: Summary Report and Recommendations Report 5. Anchorage, AK, *available* at http://iccalaska.org/wp-icc/wp-content/uploads/2016/03/Food-Security-Summary-and-Recommendations-Report.pdf; *see also* Circumpolar Inuit Response to Arctic Shipping Workshop Proceedings, Ottawa, Canada, March 14-15, 2013, *available* at http://www.inuitcircumpolar.com/uploads/3/0/5/4/30542564/201309121300arcticshippingscreenversion_revised.pdf.

6 Deere-Jones, T., (2016). Ecological, Economic and Social Costs of Marine/Coastal Spills of Fuel Oils (Refinery Residuals). A Report to the European Climate Foundation.

7 The AMSA report concluded that "the most significant threat from ships to the Arctic marine environment is the release of oil through accidental or illegal discharge." Arctic Council, Arctic Marine Shipping Assessment 2009 Report 5 (April 2009) [hereinafter AMSA 2009].

8 *See* Heavy Fuel Oil Releases from Shipping in the Arctic, PAME (I)/16/5.2/a/HFO, Phase III by USA, RUS, KoD, NOR, ICE, 2016; AMSA 2009, at 5.

9 Peterson, C.H. et al. (2003). Long-term ecosystem response to the Exxon Valdez oil spill. Science, 302(5653): 2082-2086.

5 Increased Arctic shipping will likely raise the risk of cetacean strikes.[10] Therefore, reducing co-occurrence between ships and whales through the use of routeing measures and, where this is not possible, speed limits are useful tools to mitigate strike risk.[11] A considerable body of evidence supports the conclusion that higher ship speeds increase the risk of whale-ship collisions in several ways. Laist et al. (2001) review accounts of collisions with whales at known speed and found that lethal and serious injuries to whales increase significantly as speeds increase between 10 and 14 knots.[12] Faster speeds reduce time for whales and ship operators to detect and avoid each other, and increase the ship's hydrodynamic properties that can pull whales towards ship propellers and hulls.[13] Vanderlaan and Taggart (2007) modelled the likelihood of lethal injury to large whales and also conclude that lethal injuries decline significantly below 15 knots. They found that when speeds exceed 11.8 knots, the probability of a lethal injury increases by 50% and reaches nearly 100% at speeds over 15 knots.[14]

6 Greater levels of ship traffic in the region could also enhance wildlife disturbance. Cruise ships, particularly, tend to seek out wildlife (e.g. seabird colonies, marine mammal haul-outs) to satisfy passenger demand and thus can come into close proximity to various species of animals.[15] Cruise ship operations in Disenchantment Bay, Alaska, for example, have resulted in harbour seal disturbance, flushing them off the ice and into cold glacial waters, thereby taxing energy levels.[16] Unfortunately, ship compliance with a rule developed to mitigate this type of disturbance – a 463 meter (0.25 nm) minimum approach distance regulation – has been low.[17] In addition, the presence of cruise ship passengers in Arctic villages can also result in disturbance to coastal communities, especially if proper planning is not conducted.[18]

7 As ships break ice they create temporary openings, which can act as an artificial polynya. This can confuse marine mammals, causing them to become trapped[19] too far from the ice edge. Shipping in sea ice will also likely cause seal habitat destruction and fragmentation, resulting in the separation of seal mother-pup pairs, displacement from their natal site, and whelping site breakage. These impacts will result in energy loss to mother and pup and also stress to the mother, which may affect lactation, with consequential detrimental effects on pup survival.[20] The breaking up of sea ice by ships could also result in direct impacts to Arctic subsistence practices, such as cutting off hunters from travel corridors (i.e. through ship-created leads).[21]

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[10] *See* AMSA 2009, at 5, 106, 131.

[11] Silber, G.K. et al. (2012). The role of the International Maritime Organization in reducing vessel threat to whales: Process, options, action and effectiveness. Mar. Policy, 36(6): 1221-1233.

[12] Laist, D.W. et al. (2001). Collisions between ships and whales. Mar. Mammal Sci., 17(1): 35-75.

[13] Silber, G.K., Slutsky, J., & Bettridge, S. (2010). Hydrodynamics of a ship/whale collision. J. Exp. Mar. Biol. Ecol., 391:10–19.

[14] Vanderlaan, A.S.M. & Taggart, C.T., (2007). Vessel collisions with whales: the probability of lethal injury based on vessel speed. Mar. Mammal Sci., 23(1): 144–156.

[15] *See* AMSA 2009, at 125, 127, 137.

[16] Jansen, J. K. et al. (2010). Reaction of harbor seals to cruise ships. J. Wildlife Manage., 74(6): 1186-1194.

[17] Young, C., Gende, S., & Harvey, J. (2014). Effects of vessels on harbor seals in Glacier Bay National Park. Tourism in Marine Environments, 10(1–2): 5-20 (finding compliance rates of 22 per cent, although 33 per cent of vessel–seal encounters resulted in disturbance when vessels were even more than 463 m from seals.).

[18] *See* Stewart, E.J., Dawson, J., & Draper, D., (2011). Cruise Tourism and Residents in Arctic Canada: Development of a Resident Attitude Typology, J. Hosp. Manage. Tourism, 18(1): 95-106; AMSA 2009, at 123-125, 130.

[19] Laidre, K. et al. (2012). Unusual narwhal sea ice entrapments and delayed autumn freeze-up trends. Polar Biol. 35: 149-154.

[20] Wilson S., et al. (2008). Response of mothers and pups of the Caspian seal, *Phoca caspica*, to the passage of icebreaker traffic. In *Proceedings of the Marine Mammals of the Holarctic,* Odessa, October 2008, 593-595.

[21] AMSA 2009, at 130-131. In addition, increased ship traffic can drive prey outside the range of hunters or make them travel much greater distances in pursuit, as well as endanger hunters in small boats. Id.

8 As traffic increases in the Arctic so too does underwater noise which can significantly interfere with marine mammals. Marine mammals depend on sound for food-finding, communication, reproduction, detection of predators, and navigation.[22] Observed impacts of anthropogenic noise include: behavioural changes (e.g. feeding, breeding, resting, migration), masking of important sounds, temporary or permanent hearing loss, physiological stress, and changes to the ecosystems that result in a reduction of prey availability.[23]

9 Bioinvasion risk into Arctic waters via ballast water discharge and hull fouling could also increase with elevated shipping activity in the region, jeopardizing subsistence activities.[24] While few non-native organisms have been introduced into the Arctic marine environment through shipping operations, the risks remain substantial, particularly as the regulatory framework surrounding ship-mediated invasive species risk is varied and relatively weak. Even with the entry into force of the Ballast Water Management Convention, which is anticipated in the near term, the adequacy of its standards, test protocols,[25] and enforcement structure remains a concern. Additionally, safeguards against alien species introduction through hull fouling, despite the relatively recent adoption of IMO voluntary guidelines, are not sufficiently robust.

10 The establishment of non-native species in Arctic waters could have a profound effect on an area's marine ecology and indigenous livelihoods. For example, the introduction of an alien species could impair or eliminate a rung on the Arctic marine food chain – which tends to be short – potentially affecting fish or other marine species upon which coastal Native inhabitants depend. Harm to these resources could have a significant adverse impact on the nature-based economies characteristic of many Arctic indigenous communities,[26] including their cultural practices and food security in general.

11 Wastewater effluent can have a detrimental effect on the marine ecosystem. This could be especially problematic in cold-water environs, where substances tend to break down more slowly. It should be noted, as well, that compliance with MARPOL Annex IV standards is questionable.[27] Whenever empirical analyses have been undertaken of Annex IV or similar standards, the results are troubling, with exceedances by orders of magnitude sometimes observed.[28] Moreover, ship grey water, whose contaminant constituents are similar to sewage (apart from ammonia), is not regulated internationally, leaving large swaths of Arctic waters exposed to untreated or inadequately treated wastewater discharges. Cruise ships, which can generate and discharge millions of litres of grey water a week, are of special concern.[29] As

[22] Weilgart, L.S. (2007). A brief review of known effects of noise on marine mammals. Int. J. Comp. Psychol. 20(2):159-168.

[23] Id; Moore, S.E. et al. (2012). A new framework for assessing the effects of anthropogenic sound on marine mammals in a rapidly changing Arctic. BioScience 62: 289-295.

[24] MEPC 69/INF. 17, Ship-mediated bioinvasions in the Arctic: pathways and control strategies, submitted by FOEI, 9 Feb. 2016; *see also* AMSA 2009, at 150-151.

[25] Cohen, A.N, & Dobbs, F.C. (2015). Failure of the public health testing program for ballast water treatment systems. Mar. Pollut. Bull. 91: 29-34.

[26] Larsen, J.N. (2014). Marine invasive species: Issues and challenges in resource governance and monitoring of societal impacts. Pp. 23-31 in: Marine Invasive Species in the Arctic. Nordic Council of Ministers.

[27] This is to say nothing of the fact that untreated sewage, even under the Polar Code, may be discharged by vessels in the Arctic. MEPC 68/21/Add.1, Annex X, International Code for Ships Operating in Polar Waters.

[28] MEPC 67/8/1, Information based on the experience gained with sewage treatment plants, submitted by the Netherlands, 8 Aug. 2014 (of the 32 ships sampled "… a vast majority of the sewage treatment plants did not meet the sewage treatment standards as per resolutions MEPC.2(VI) or MEPC.159(55)."); U.S. Environmental Protection Agency, Cruise Ship Discharge Assessment Report 2-9 (2008) [hereinafter EPA Cruise Ship Report].

[29] EPA Cruise Ship Report, at 3-2; AMSA 2009, at 137.

greater numbers of cruise ships operate in the Arctic,[30] overall volumes of grey water discharge, particularly along sensitive coastlines and/or established corridors, could increase significantly.

12 Food waste may be another concern to local marine ecosystem health. While the Polar Code enhances regulatory standards for food waste discharge in polar waters, requiring that it be ground and discarded 12 nm from the nearest coastline, ice-shelf, or fast ice,[31] the impacts of marine food waste disposal are little studied. One evaluation, Polglaze (2003), reports that "If discharged in sufficient quantities, food waste can contribute to increases in biological oxygen demand, chemical oxygen demand, and total organic carbon, diminish water and sediment quality, adversely effect marine biota, increase turbidity, and elevate nutrient levels."[32] Polglaze (2003) also finds "that food waste components may be detrimental to fish digestion and health, and have unsuitable nutrient content."[33] Thus, at-sea disposal of large volumes of food waste from cruise ships can pose ecological risk to discrete Arctic waters.[34]

13 Air emissions from shipping pose an acute and substantial risk to the food security of Arctic indigenous peoples. Specifically, black carbon from ship exhaust accelerates warming in the region, particularly by absorbing solar radiation when deposited on snow and ice, thereby increasing melting.[35] Studies[36] have shown current black carbon production from shipping in the Arctic already exceeds 1000 mt and is expected to double by 2030 and perhaps quadruple by 2050.[37] Black carbon emissions from shipping in the Arctic contribute to climate change in a region already experiencing warming at levels twice that of the rest of the planet. Increasing temperatures accelerate the loss of sea ice – already 2016 has had several months of the lowest Arctic sea ice extent on record[38] – which leads to a myriad of ecological alterations, including modified whale migration pathways, increased walrus aggregations on land, and loss of seal and polar bear habitat. Changes such as these can have direct impacts on Arctic indigenous populations that hunt and forage marine fauna and flora, and whose communities have often relied on marine resources for their nutritional, cultural, and spiritual well-being for millennia.[39]

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30 Eleven cruise ships with more than 1,000 passengers and crew (operated by MSC, P&O Cruises, Holland America Line, Fred. Olsen Cruises, Crystal Cruises, Cruise & Maritime Voyages, Costa) are scheduled to operate in Arctic waters, as defined by the Polar Code, in 2016.

31 MEPC 68/21/Add.1, Annex X, International Code for Ships Operating in Polar Waters.

32 EPA Cruise Ship Report, at 5-11.

33 EPA Cruise Ship Report, at 5-11 – 5-12.

34 Holland America Lines and Royal Caribbean Cruises reported weekly food waste generation rates of 12 cubic meters per vessel. EPA Cruise Ship Report, at 5-2.

35 AMAP (2015). Summary for Policy-Makers: Arctic Climate Issues 2015, Short-lived Climate Pollutants, AMAP Secretariat.

36 Paxian, A. et al. (2010). Present-day and future global bottom-up ship emission inventories including polar routes. Environ. Sci. Technol. 44 (4): 1333-1339; Corbett, J.J. et al. (2010). Arctic shipping emissions inventories and future scenarios. Atmos. Chem. Phys. 10: 9689-9704.

37 Corbett, J.J. et al. (2010). Arctic shipping emissions inventories and future scenarios. Atmos. Chem. Phys. 10: 9689-9704; *see also* AMAP 2015, at 7.

38 *See* National Snow and Ice Data Center, *available* at http://nsidc.org/arcticseaicenews/charctic-interactive-sea-ice-graph/.

39 *See* AMSA 2009, at 106-108 (stating that more than 85 per cent of the subsistence harvest in the Bering Strait region is marine-derived).

14 Shipboard waste incineration in the Arctic may also contribute to the region's elevated toxin levels. The burning of incidental ship waste produces deleterious emissions such as furans, dioxins, polycyclic aromatic hydrocarbons (PAHs), heavy metals (e.g. mercury), hydrochloric acid, and black carbon.[40] The lack of stringent air pollution controls on ship incinerators[41] as well as the general absence of spatial strictures on shipboard incineration in the Arctic,[42] and elsewhere, suggest that these operations may pose a risk to Arctic indigenous food security – although the magnitude of threat is difficult to discern at this time.

Action requested of the Committee

15 The Committee is invited to note the concerns expressed by the co-sponsors and propose safeguards for the protection of Arctic indigenous food security from the threats posed by shipping, as appropriate.

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[40] Just Cruising? Environmental effects of cruise ships, Office of the Parliamentary Commissioner for the Environment Te Kaitiaki Taiao a Te Whare Pāremata, New Zealand, 13 (2003), available at http://www.pce.parliament.nz/assets/Uploads/Reports/pdf/just_cruising.pdf; *see also* California Air Resources Board, Staff Report: Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure for Cruise Ship Onboard Incineration, iv, (2005), available at http://www.arb.ca.gov/regact/csoi/isorcomp.pdf.

[41] Cruise Ship Environmental Task Force, Regulation of Large Passenger Vessels in California, a report to the California legislature, 56 (2003), available at http://montereybay.noaa.gov/resourcepro/resmanissues/pdf/CA_cruise%20_ship_rept.pdf; *see also* AMSA Report, at 137.

[42] MEPC 65/11/5, Comments on the report of DE 57 – Incineration in polar waters (Polar Code), by FOEI, CSC, Pacific Environment and WWF, at 3.