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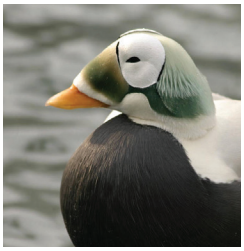


Vessel Waste a Growing Challenge in the Northern Bering Sea and Bering Strait

How garbage, sewage, and other pollutants are generated and regulated—and what can be done better

Overview

The northern Bering Sea and Bering Strait region has been an ecological, cultural, and economic center for Yup'ik, Cup'ik, St. Lawrence Island Yupik, and Inupiaq peoples for millennia. It provides food and spiritual and economic well-being for Indigenous people today. These waters also facilitate vital tug and barge deliveries to areas that are not connected by roads or frequented by airplanes. But in recent years, a confluence of factors, including less sea ice and more trade and resource development, has spurred a rapid increase in vessel traffic in the region, led by large cargo ships, tugs, and research vessels, and is forecast to continue to grow.

Many of these vessels provide important services for people, science, and commerce in the region, but they also present serious and growing challenges, including the production of large quantities of waste. Ocean vessels can generate up to 40 different types of waste while at sea, such as air emissions, garbage, sewage, machinery lubricant, ballast water, and deck runoff. Without effective management, this vessel waste can have significant negative impacts on people and the marine environment.

Unfortunately, existing rules governing the production and handling of waste are complex and often differ depending on a vessel's type, size, place of origin, destination, and distance from shore. To reduce ocean pollution, key regulations should be strengthened and combined with better monitoring and enforcement.

This brief examines four major sources of vessel waste that can be discharged into the sea: garbage, sewage, grey water, and oily water mixes. It assesses their potential effects on the northern Bering Sea's sensitive marine environment; reviews how they are regulated across three jurisdictional authorities: international, the United States federal government, and Alaska; and provides recommendations to improve regulation, monitoring, and enforcement.

The northern Bering Sea region

The northern Bering Sea and Bering Strait region is ecologically and culturally important, and the sea ice is a defining element of the region's social-ecological system. The movement of water and ice over the shallow shelf supports a highly productive marine ecosystem, which is fueled by tiny algae that grow on the underside of the sea ice during abundant spring sunshine. This region is host to one of the planet's largest marine migrations, which includes bowhead and beluga whales, Pacific walruses, bearded and ice seals, and seabirds.

The health of this marine environment is inextricably connected to the way of life and cultural well-being of the Yup'ik, Cup'ik, St. Lawrence Island Yupik, and Inupiaq peoples. These communities hunt and gather marine mammals, fish, mollusks, seabirds and their eggs, and ocean plants. Their strong and ancient cultural value of respect and caring for the marine environment is reflected in their year-round preparation for marine mammal hunting, which includes teaching, singing, and dancing.[1] The northern Bering Sea also supports local commercial fisheries for herring, crab, halibut, and salmon, and provides corridors and connections between communities.

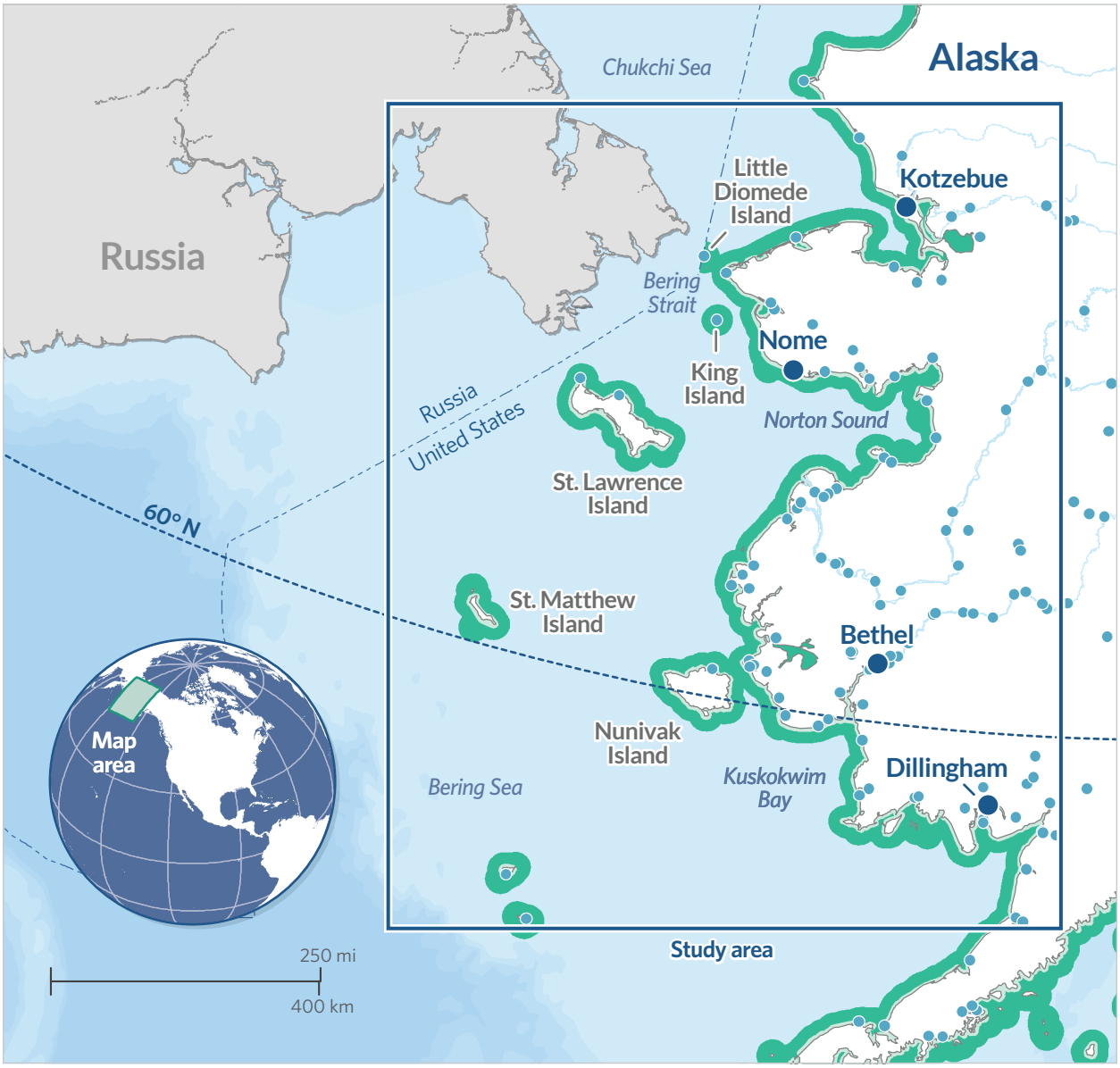
However, the Arctic is warming at twice the rate of elsewhere on the planet, causing drastic changes to the thickness, extent, and timing of sea ice and the marine food web.[2] These shifts, in turn, affect people's relationships with the ecosystem, such as by altering when certain species can be harvested as migration patterns change.[3] Less sea ice also means the region is increasingly navigable by more types of ships and for longer periods. Indigenous communities have raised concerns about the impacts of rising vessel traffic on this already stressed environment and their access to healthy traditional foods such as whole crabs, including the consumption of raw juice; clams harvested from walrus stomachs; and fresh bearded seals.[4]

A family shares salmon at home in Newtok, Alaska.

Figure 1

The Northern Bering Sea Shelf Lies at the Confluence of the Arctic and Pacific Oceans

Regional detail showing Alaska communities



3-nautical-mile boundary 12-nautical-mile boundary

Sources: Kawerak Inc., "Our Region," accessed Aug. 2, 2018, http://kawerak.org/our-region; Association of Village Council Presidents, "About AVCP," accessed Aug. 2, 2018, http://www.avcp.org/about-us; Bristol Bay Native Association, "Tribal Councils," accessed Aug. 2, 2018, https://www.bbna.com/our-communities/tribal-councils; Aleutians East Borough, "Information About the Aleutians East Borough Communities," accessed Aug. 2, 2018, https://www.aleutianseast.org/index.asp?SEC=C8F93C9F-B453-4E49-9E00-0A7E6C9B8A66&Type=B_BASIC; Northwest Arctic Borough, "Villages," accessed Aug. 2, 2018, https://www.nwabor.org/villages

Increasing vessel traffic

Vessels have long traversed Arctic waters to deliver goods and fuel to western Alaska communities that are not connected by roads or frequented by airplanes. But the scale of ship activity has grown rapidly in recent years in response to a variety of factors, including increased resource development, international trade relationships, research interests, and a longer navigation season: The waters of the northern Bering Sea are ice-free from about June 1 to Oct. 31.[5] Between 2008 and 2015, the region experienced a 145 percent increase in vessel traffic, led by large cargo vessels, research vessels, tugs, and even visits from large cruise ships,[6] although fishing vessels continue to account for the largest share of traffic in the southernmost waters of the region. Every ship that traverses Bering waters includes machinery and crew—and some also carry passengers—all of which generate waste, including garbage, sewage, grey water (produced from washing facilities), and oily mixes.

Vessel traffic is projected to increase, so to ensure the long-term health of the northern Bering Sea and Bering Strait's ecosystem and food security for the region's residents, harmful waste impacts must be understood and mitigated.

Jurisdictional authority in the northern Bering Sea region

Shipping rules are vast and complex, and they vary depending on where and how far from shore a vessel is sailing as well as its origin, destination, size, cargo, and activity (fishing, passenger, etc.), among other factors. For each pollutant examined in this brief, the discussion of regulation will consider the role of these authorities.

International

The International Maritime Organization (IMO)—a United Nations body comprising 174 member states—adopts safety, security, and pollution standards for the international shipping industry. IMO regulation covers each country's exclusive economic zone (EEZ), which extends from 12 to as far as 200 nautical miles (nm) from shore. The IMO has no enforcement mechanism; instead, member states are expected to enforce international standards in their waters.

Polar Code

The Polar Code is a set of mandatory regulations created by the IMO specifically to enhance vessel safety and pollution prevention in the harsh and vulnerable waters of the Arctic and Antarctica. In the northern Bering Sea, its boundary starts at 60 degrees north latitude, cutting across Nunivak Island. Ships traveling north of this boundary line must abide by these additional regulations.

Importantly, the code treats sea ice in much the same way that other IMO regulations handle land. For example, general IMO regulations permit discharge of untreated sewage starting at 12 nm from shore; the Polar Code affords this same protection to the ice, prohibiting discharge of untreated sewage within 12 nm of the ice edge or where at least a 10th of the ocean area around the vessel is covered by ice (i.e., 1/10th ice concentration).[7] This standard follows the sea ice as shown in Figure 2.

Figure 2

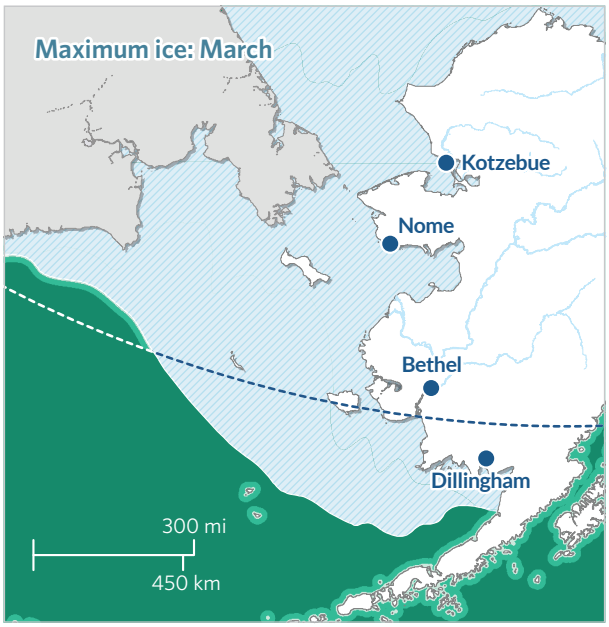
The Polar Code Provides Protections for Arctic Sea Ice Above 60° North

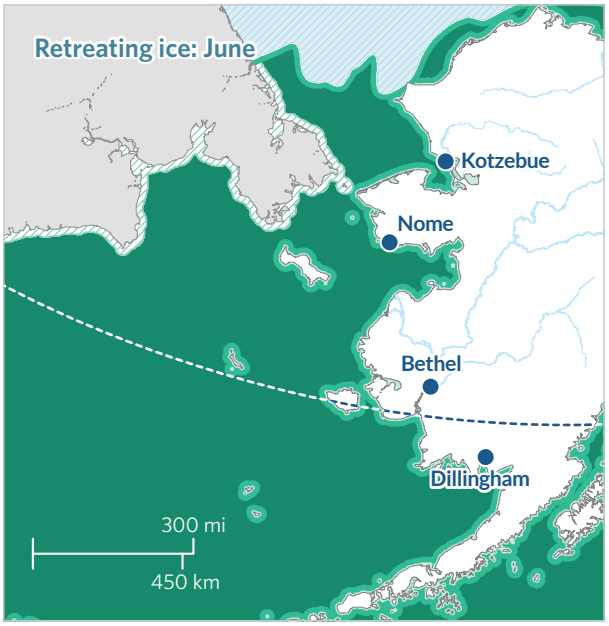
Average annual advance and retreat of Arctic ice, 2005-15, and implications for waste regulation

Sea ice

Treated sewage allowed, no garbage
3-12 nautical miles

Untreated sewage and ground food waste allowed
Greater than 12 nautical miles





Notes: The Polar Code treats the sea ice edge as an extension of land. North of the code boundary, restrictions on sewage and garbage discharges are determined by the presence of sea ice. Minimum sea ice (September) is not shown because of the small amount of ice coverage in the study area at that time.

Sources: National Snow and Ice Data Center, "Sea Ice Index, Version 2" (2016); International Maritime Organization, Marine Environment Protection Committee, Resolution MEPC.264(68): International Code for Ships Operating in Polar Waters (Polar Code) (May 15, 2015), http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Marine-Environment-Protection-Committee-(MEPC)/Documents/MEPC.264(68).pdf; Code of Federal Regulations, Navigation and Navigable Waters—Marine Sanitation Devices (2001), https://www.gpo.gov/fdsys/pkg/CFR-2001-title33-vol2/xml/CFR-2001-title33-vol2-part159.xml; Code of Federal Regulations, Protection of Environment—Marine Sanitation Device Standard (2016), https://www.gpo.gov/fdsys/pkg/CFR-2016-title40-vol25/xml/CFR-2016-title40-vol25-part140.xml; and Alaska Department of Environmental Conservation, "Commercial Passenger Vessel Environmental Compliance Program" (2018), https://dec.alaska.gov/media/1045/18-aac-69.pdf

Vessels traveling the northern Bering Sea must navigate three sets of rules depending on their size, type, and how far they are sailing from the coast.

United States

The U.S. government regulates ships traveling to or from U.S. locations while in federal waters (3 to 12 nm offshore), an area known as the territorial sea, and may enforce international standards within its EEZ (out to 200 nm from shore). The primary responsibility for setting federal vessel regulations in these waters rests with the Coast Guard and the Environmental Protection Agency. Vessel operators are responsible for securing required permits to discharge waste and for documenting certain releases. The Coast Guard may inspect vessels entering ports and review their records for consistency, but direct oversight of ship operations is limited. Vessels have been caught and fined for intentionally bypassing waste treatment systems and falsifying records.[8]

Ships on international voyages that sail through U.S. waters but do not stop at a U.S. destination are subject to what is known as "innocent passage," meaning that they are obligated to follow only international rules. In cases when international regulation is not as stringent as U.S. regulation, innocent-passage vessels in U.S. waters may pose an increased risk to regional ecosystems.

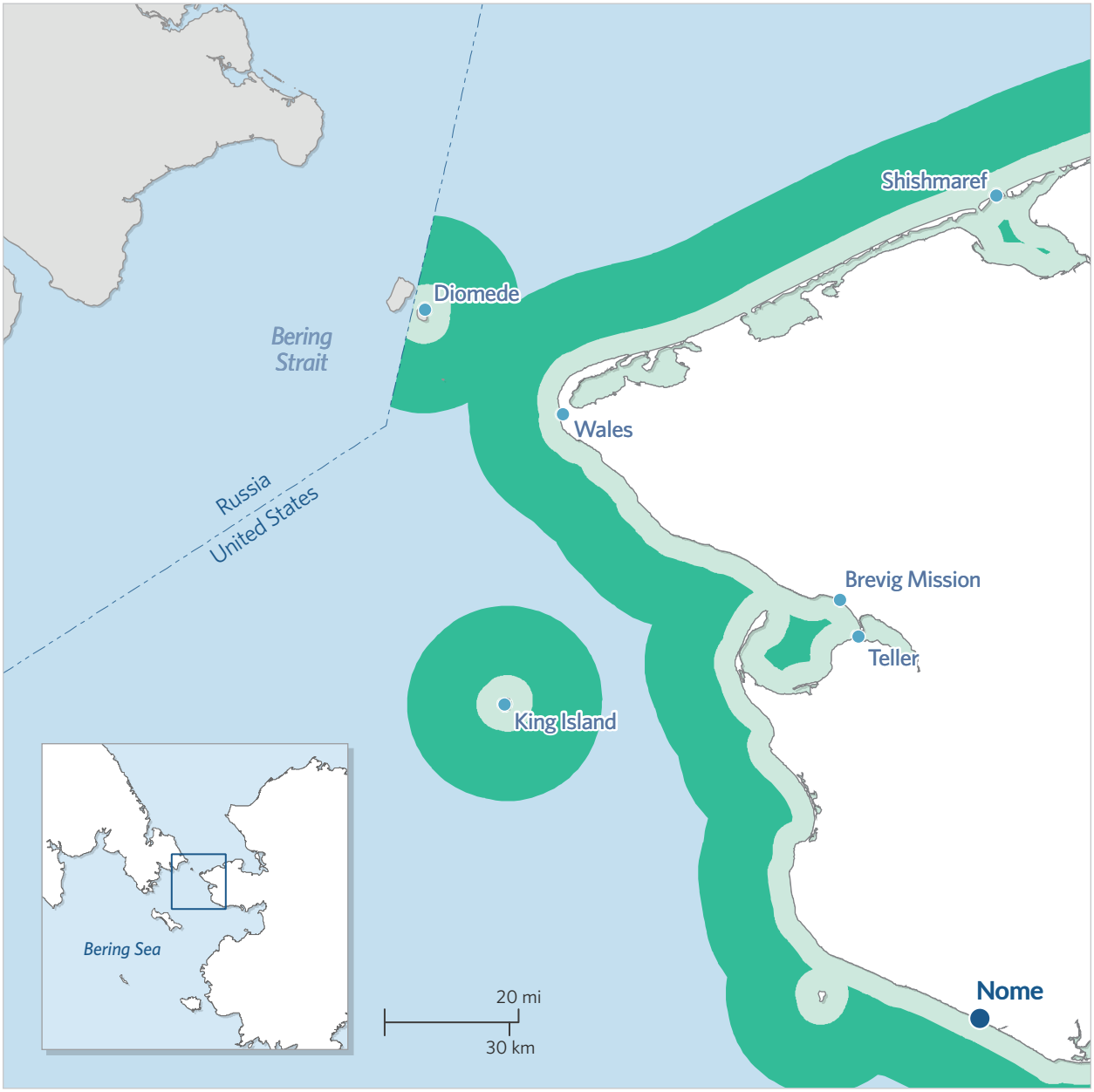
Alaska

The state has independent and superseding jurisdiction over its territorial waters, which extend 3 nm from shore. It has created a limited number of regulations for commercial passenger vessels, particularly cruise ships, in its waters but does not regulate most other vessels (cargo, tug, research, etc.), which follow federal rules even in state waters.

Figure 3

Alaska's Maritime Boundary Extends to 3 NM Offshore; Federal Authority Covers 3-12 NM

Detail of U.S. marine jurisdictions in the Bering Strait



Source: National Oceanic and Atmospheric Administration, Office of Coast Survey, "U.S. Maritime Limits and Boundaries," accessed Aug. 21, 2018, https://nauticalcharts.noaa.gov/data/us-maritime-limits-and-boundaries.html#general-information

Garbage

Vessels, crew, and passengers generate garbage through food preparation and scraps, personal belongings, fishing gear, ship parts and maintenance supplies, incinerator ash, and cargo residue. On most vessels, trash is initially sorted by type, with food separated from nonfood waste. The latter is then further sorted, depending on the requirements of the port where the vessel is likely to offload its garbage.

Impacts

Garbage and marine debris can injure marine life through entanglement, ingestion, and habitat damage; interfere with navigational safety; pose a threat to human health through microplastics and chemicals entering the food chain; and wash ashore, creating a burden for communities.[9]

Regulation

As recently as 40 years ago, it was acceptable to throw trash overboard, but since then, new rules have limited garbage releases in an ongoing effort to reduce their impacts on marine environments. Vessels generally are permitted to discharge food waste, but they may either incinerate nonfood waste on board or unload it at a port.

International

In 1988, the International Convention for the Prevention of Pollution From Ships, better known as MARPOL, went into force, setting rules for reducing garbage impacts from ships. MARPOL includes requirements for disposal of trash, management plans, reception facilities, placards, and record-keeping.[10] Ground food can be discharged beyond 3 nm if a vessel is underway. Food that is not ground can be discharged beyond 12 nm from shore. Disposal in the water of plastics and plastic materials, including synthetic ropes and plastic bags, is prohibited.

Polar Code

The code limits food discharges within the covered boundaries. Only ground food can be released, and it must be done at least 12 nm from shore or the ice edge, or in areas with at least a 10th ice concentration.

United States

Federal requirements mirror those of MARPOL in prohibiting disposal of plastic in the water and permitting discharge of food waste and cargo residue that is not easily recovered or harmful to the marine environment only when the vessel is underway and at least 12 nm from land. Ground food waste smaller than 1 inch can be discharged beyond 3 nm.

Alaska

Disposal of food waste and other types of garbage is prohibited in state waters.

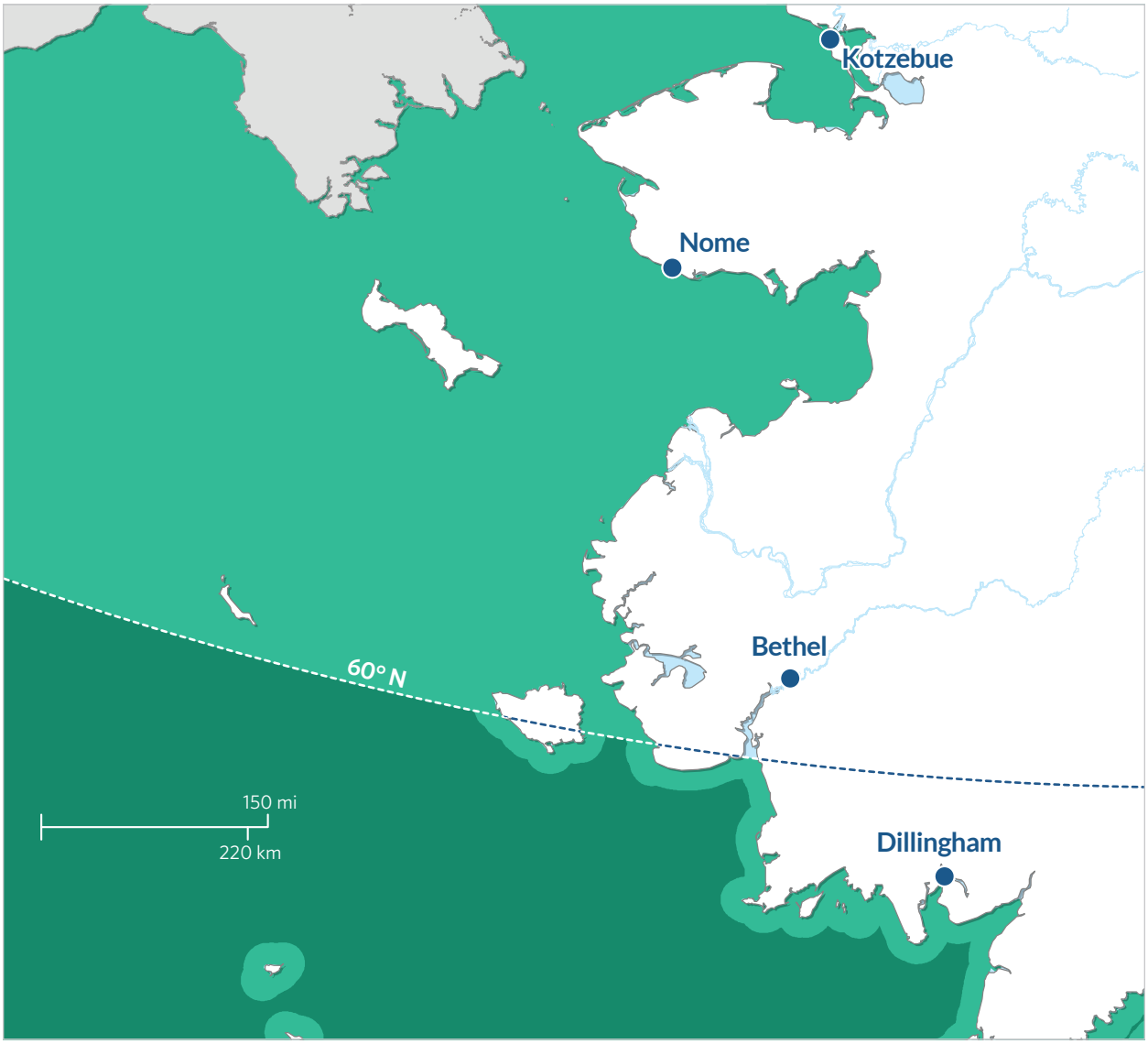
Areas for improvement

Marine debris is a well-known problem in Alaska, and international concern is growing over the breadth of pollution, especially plastics, in the world's oceans, including the Arctic.[11] In April 2018, members of the IMO agreed that more needs to be done to address marine plastic litter, including microplastics; members will submit proposals for consideration and action by the IMO.

Figure 4

Vessels May Discharge Food and Certain Other Garbage in Waters Off Alaska

Regulation of offshore trash



Ground food waste
3-12 nautical miles

Unground food waste and some cargo residue
Greater than 12 nautical miles

All other garbage prohibited

Sources: International Maritime Organization, International Convention for the Prevention of Pollution From Ships (MARPOL) (1997); International Maritime Organization, Marine Environment Protection Committee, Resolution MEPC.264(68): International Code for Ships Operating in Polar Waters (Polar Code) (May 15, 2015), http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Marine-Environment-Protection-Committee-(MEPC)/Documents/MEPC.264(68).pdf; Code of Federal Regulations, Navigation and Navigable Waters—Vessels Carrying Oil, Noxious Liquid Substances, Garbage, Municipal, or Commercial Waste, and Ballast Water: Garbage, Pollution, and Sewage (2001), https://www.gpo.gov/fdsys/pkg/CFR-2001-title33-vol2/xml/CFR-2001-title33-vol2-part151.xml

Sewage

Sewage, also known as blackwater, is generated mostly by people; the more crew and passengers on a vessel, the more sewage is produced. MARPOL defines sewage as drainage and other wastes from any form of toilet; medical premises (dispensary, sick bay, etc.) via wash basins, tubs, and drains; spaces containing live animals; or other wastewater mixed with these drainages.[12]

Impacts

Risks from sewage include harm to human health from the bacterium fecal coliform (FC) and to the marine environment from oxygen depletion and nutrient overenrichment. FC is from human and animal feces and, when found in water, may indicate the presence of other disease-causing bacteria or viruses.

Humans can become sick by swimming in polluted water or consuming contaminated shellfish, especially if it is eaten raw. Shellfish (crustaceans, mollusks) are traditionally harvested by communities in the northern Bering Sea region and are known to concentrate FC and other associated pathogens.[13]

In addition, the nitrogen and phosphorous components of sewage can act as a fertilizer for algae and other plants that can deplete the amount of oxygen in the water available for fish and other marine life. The combination of increased nutrients, depleted oxygen, and warming waters can lead to harmful algal blooms and contamination of shellfish with a toxin that can cause paralytic shellfish poisoning of humans and marine mammals.[14] These large bloom events are on the rise in Arctic waters.[15]

Regulation

Most vessels are designed to collect, store, and treat the sewage produced on board. However, treatment systems and rules vary depending on the type and size of vessel, how many people are on board, and where the ship is transiting. Sewage that has been treated for discharge is called "effluent."

International

International regulations require onboard treatment of sewage discharged within 12 nm from shore. Effluent must not contain more than 100 FC per 100 milliliters (ml) of water.[16] Untreated, or raw, sewage may be discharged in waters 12 nm from land and beyond. The United States has not ratified these regulations, choosing to create and enforce its own standards. U.S. vessels that sail internationally must comply with both.

Polar Code

Within the code boundary, ships may discharge untreated sewage beyond 12 nm from shore or the ice edge and effluent (containing no more than 100 FC per 100 ml of water) between 3 and 12 nm from land or the ice edge. Cargo vessels and cruise ships built on or after Jan. 1, 2017, must have an approved treatment plant operating at all times and may not discharge untreated sewage.[17]

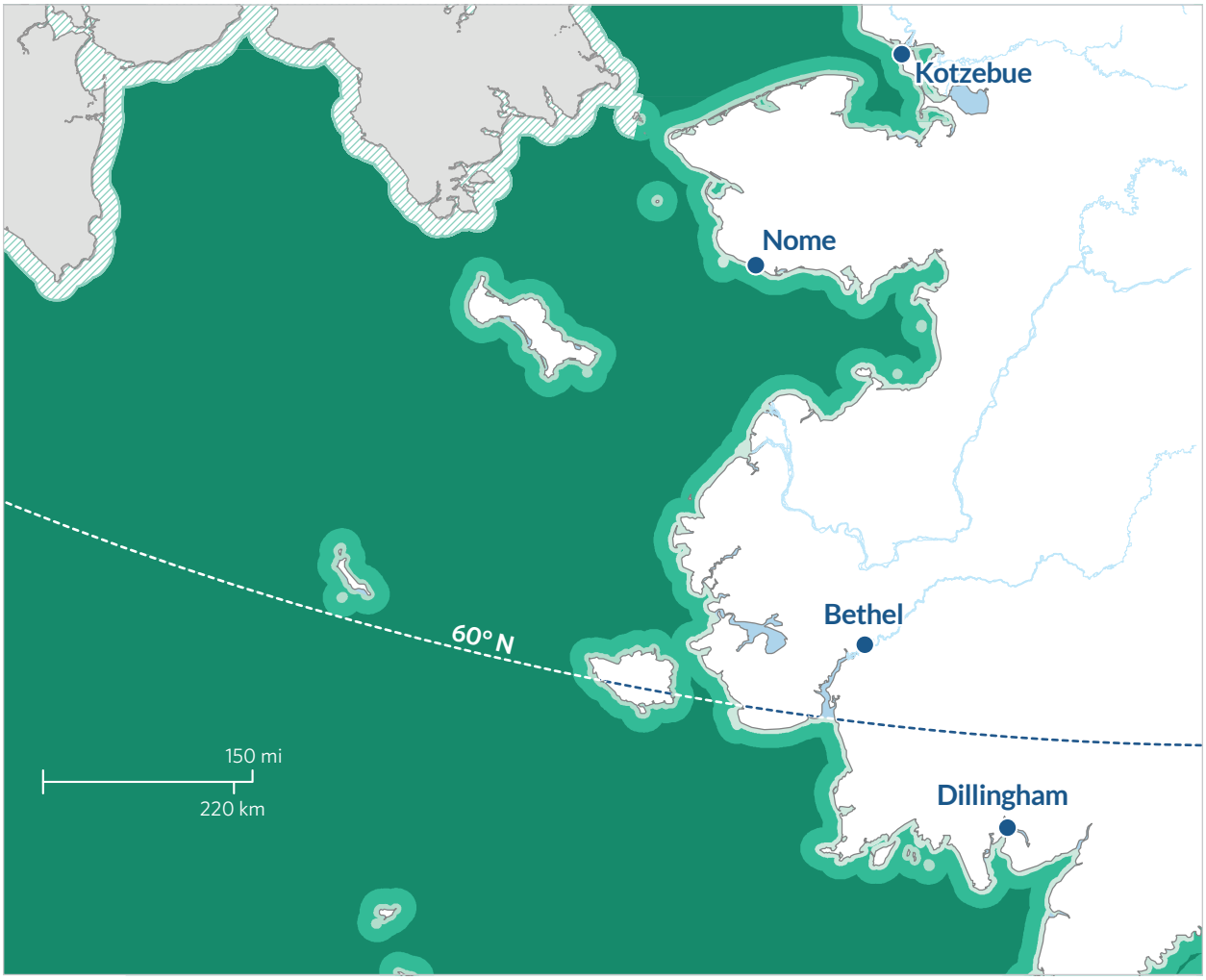
United States

Vessels longer than 65 feet are required to have a Type I or Type II Marine Sanitation Device (MSD) when traveling U.S. federal waters (3 to 12 nm); smaller vessels can have a holding tank. Type I MSD's effluent can have no more than 1,000 FC per 100 ml of water and no visible floating solids; Type II devices must limit effluent to no more than 200 FC per 100 ml.[18]

Figure 5

Sewage Harbors Bacteria That Are Harmful to Humans and Marine Ecosystems

Treated and untreated sewage from vessel traffic



Treated sewage:
- 40-200 fecal coliform bacteria (FC) per 100 ml (state of Alaska with permit)
  Less than 3 nautical miles

Treated sewage:
- 100 FC per 100 ml (international)
- 200-1,000 FC per 100 ml (U.S.)
  3-12 nautical miles

Untreated sewage
Greater than 12 nautical miles

Russian nearshore waters
(regulations may differ)

Sources: International Maritime Organization, International Convention for the Prevention of Pollution From Ships (MARPOL) (1997); International Maritime Organization, Marine Environment Protection Committee, Resolution MEPC.264(68): International Code for Ships Operating in Polar Waters (Polar Code) (May 15, 2015), http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Marine-Environment-Protection-Committee-(MEPC)/Documents/MEPC.264(68).pdf; Code of Federal Regulations, Navigation and Navigable Waters—Marine Sanitation Devices (2001), https://www.gpo.gov/fdsys/pkg/CFR-2001-title33-vol2/xml/CFR-2001-title33-vol2-part159.xml; Code of Federal Regulations, Protection of Environment—Marine Sanitation Device Standard (2016), https://www.gpo.gov/fdsys/pkg/CFR-2016-title40-vol25/xml/CFR-2016-title40-vol25-part140.xml; and Alaska Department of Environmental Conservation, "Commercial Passenger Vessel Environmental Compliance Program" (2018), https://dec.alaska.gov/media/1045/18-aac-69.pdf

Alaska

The state has some of the world's highest sewage treatment standards for passenger vessels within 3 nm of land. Vessels carrying 250 or more overnight passengers and intending to discharge must receive a permit, treat the sewage to include no more than 40 FC per 100 ml per day, and meet additional requirements for testing, monitoring, and reporting.[19] Vessels with 50 to 249 overnight passengers must either meet the federal treatment standard of no more than 200 FC per 100 ml or create a Best Management Practices Plan and have it approved by the state's Department of Environmental Conservation.[20]

Areas for improvement

Discharging raw sewage can harm the marine environment[21] but is still allowed in the northern Bering Sea under international rules; the IMO and U.S. should prohibit releases of untreated sewage into the marine environment and require that vessels instead treat sewage before discharging. Alaska has demonstrated that higher standards that reduce the presence of FC in ocean waters and the associated risks are feasible for vessels and enforcement agencies.[22] Federal and international regulators should follow suit by requiring both stricter treatment and more frequent monitoring, testing, and reporting of discharges.

Common murres eat small forage fish. People in the region harvest these birds and their eggs.

Grey water

Grey water is drainage from showers, sinks, dishwashers, and laundry facilities; it does not include sewage, water from toilets, and waste from hospital areas and cargo holds.[23] Grey water is generated by the people and services on a vessel; in general, the more crew and passengers on board, the more grey water produced. Luxury vessels such as cruise ships generate especially large quantities compared with other types of vessels because they are primarily passenger-serving.[24] The EPA estimates that cruise ships produce 67 gallons of grey water per person per day, compared with 45 gallons per person per day for other vessel types.[25]

Impacts

Grey water can pose risks similar to those from raw sewage; studies have found that it can contain comparable concentrations of FC and oxygen-depleting nutrients and chemicals.[26]

Regulation

Ships handle grey water in various ways, including continuously discharging it overboard, storing it in a dedicated tank for later disposal, or piping it into the sewage system to be treated and disposed of with the sewage. Compared with sewage, grey water is very loosely regulated.

International

Grey water is not recognized as a pollutant in MARPOL. The issue of adding it has been raised by IMO members.

Polar Code

Grey water is not recognized in the Polar Code.

United States

Requirements for the federal Vessel General Permit generally restrict the discharge of grey water close to shore if a vessel is traveling farther than 1 nm from land and has storage capacity, but these requirements do not provide numerical limits. U.S. rules also mandate that kitchen grease and oils be minimized in grey water and that vessels use phosphate-free and minimally toxic soaps and detergents.[27] Additional requirements for large passenger vessels, such as ferries and cruise ships, include monitoring, record-keeping, and reporting responsibilities; mandatory use of shore facilities while in port unless that port treats grey water; no discharge of untreated grey water within 3 nm of shore; and no release of certain chemicals from specialty services such as dry cleaners, photo labs, and medical spaces.[28]

Alaska

The state treats grey water like sewage for large passenger vessels in its waters out to 3 nm from shore. Vessels must ensure that discharges average less than 40 FC per 100 ml of water and comply with requirements for monitoring, testing, and reporting.

Areas for improvement

Grey water can pose risks such as those from sewage and should be recognized and regulated as a pollutant by the IMO.[29] The United States should strengthen its standards for grey water treatment.

Table 1

8 Main Ship Types Produced More Than 4.8 Million Gallons of Grey Water Each Season

Estimated grey water generation in the northern Bering Sea by vessel category, June–October, 2014-17

Vessel type*	Average total annual operating days†	Average number of crew members and passengers	Grey water generation rate in gallons (per person per day)	Estimated total grey water generation in gallons per 153-day season
Fishing	5,697.4	7	45	1,794,672.9
Cargo	908.7	25	45	1,022,271.7
Small to medium passenger (up to 500 crew and passengers)‡	96.8	208§	45	895,471.5
Tanker	274.1	25	45	308,402.5
Towing	1,101.5	6	45	297,396.0
Large passenger (500+ crew and passengers)‖	2.3	1,725	67	266,277.3
Tow (long/wide)	687.4	6	45	185,604.8
Tug	437.5	6	45	118,122.5

* The vessel types shown are those that generated the most grey water in the northern Bering Sea from June 1 to Oct. 31 for the years 2014 through 2017, and do not represent a comprehensive list of all vessels operating in the region during those periods.

† Operating days were calculated using Automatic Identification System (AIS) data, which were separated into distinct voyages. Periods when ships had transmission time gaps of more than 48 hours in a single year were omitted to exclude vessels that were not verifiably operating. For more information on the limitations of AIS data, see United States Coast Guard, "Preliminary Findings—Port Access Route Study: In the Chukchi Sea, Bering Strait, and Bering Sea," appendix G and H (2016), https://www.regulations.gov/contentStreamer?documentId=USCG-2014-0941-0040&attachmentNumber=1&contentType=pdf.

‡ The data for small to medium passenger vessels are based on 25 vessels, for which AIS data were available, transiting the region between June 1 and Oct. 31 for the years 2014 through 2017.

§ This number is the arithmetic mean of crew members and passengers from the included vessels and assumes that each vessel was at maximum capacity. Information on maximum capacity was unavailable for two vessels.

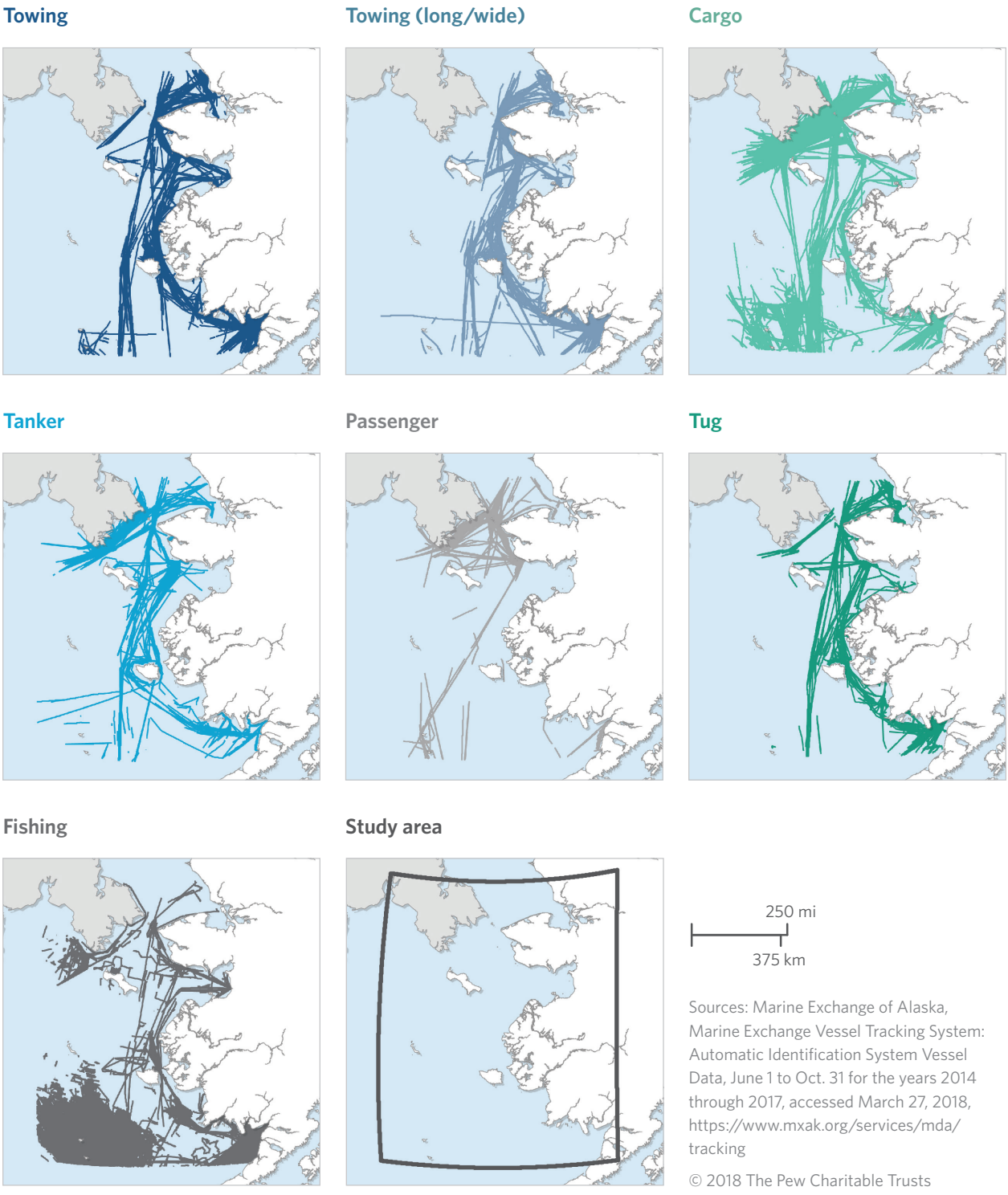
‖ Only one large passenger vessel was present in 2016 and 2017. The numbers are the average for those two years.

Sources: Environmental Protection Agency, "Graywater Discharges From Vessels," table 2 (2011), https://www3.epa.gov/npdes/pubs/vgp_graywater.pdf; Environmental Protection Agency, "Cruise Ship Discharge Assessment Report," section 3.2 (2008), https://nepis.epa.gov/Exe/ZyPDF.cgi/P1002SVS.PDF?Dockey=P1002SVS.PDF; Marine Exchange of Alaska, Marine Exchange Vessel Tracking System: Automatic Identification System Vessel Data, June 1 to Oct. 31 for the years 2014 through 2017, accessed March 27, 2018, https://www.mxak.org/services/mda/tracking

Figure 6

Ships That Typically Release Grey Water Travel Heavily Along the Alaskan Coast

Tracks for top grey water-generating vessels over 400 gross tons, by ship type



Sources: Marine Exchange of Alaska, Marine Exchange Vessel Tracking System: Automatic Identification System Vessel Data, June 1 to Oct. 31 for the years 2014 through 2017, accessed March 27, 2018, https://www.mxak.org/services/mda/tracking

Oil

Vessel machinery and equipment use a variety of lubricating and hydraulic oils that must be changed periodically as part of routine maintenance. Further, small amounts of grease, fuel, and oil from leaks and normal equipment operation mix with water in the bilge (the lowest spot in the ship), creating an oily water mix. Onboard systems pass this oily mix through an oily water separator, which divides it into sludge (waste oil) and oily water. Vessels may store waste oil on board for disposal at a port or burn it in an onboard incinerator. In most areas, the oily water may be discharged.

Impacts

The consequences of oil contamination for the marine environment are well-documented.[30] The type of oil (e.g., marine diesel, heavy fuel oil) and water conditions (e.g., cold, warm, icy, calm, choppy waves) will affect how the oil behaves and its impacts. Light oils, such as gasoline and diesel fuel, evaporate more quickly than heavy oils, such as bunker fuel, which can persist in the environment for months or years. Heavy oils can smother or coat wildlife, causing acute hypothermia in birds and some marine mammals, and other long-term health impacts for marine species.[31] These effects may, in turn, harm Indigenous people's access to traditional foods and contribute to food insecurity.

Regulation

U.S. and international maritime rules prohibit the discharge of most oil and oily mixtures.

International

Large ships on international voyages traveling 12 nm or farther from shore must take steps to reduce oil pollution, including protecting fuel tanks from leaks, ruptures, and collisions; segregating ballast water to prevent oil contamination; keeping records of oil processing and discharges; having double hulls when transporting oil as cargo; complying with vessel stability criteria; providing storage tanks for oily water; employing designated pumps and piping systems for oil and oily water; and having approved emergency spill-response plans.[32] While underway, ships may discharge only oily water that contains 15 parts per million (ppm) or less of oil.

Polar Code

The code prohibits discharges of oil or oily mixtures from ships within its boundaries, even in state and federal waters (0 to 12 nm). Vessels built before January 2017 operating in Arctic waters for more than 30 days that are unable to meet this requirement have until their first dry dock or major scheduled maintenance period (at approximately 30-month intervals) to come into compliance. Such ships must still treat their oily mixes to meet MARPOL's 15-ppm standard, while working to meet the additional code standards.[33]

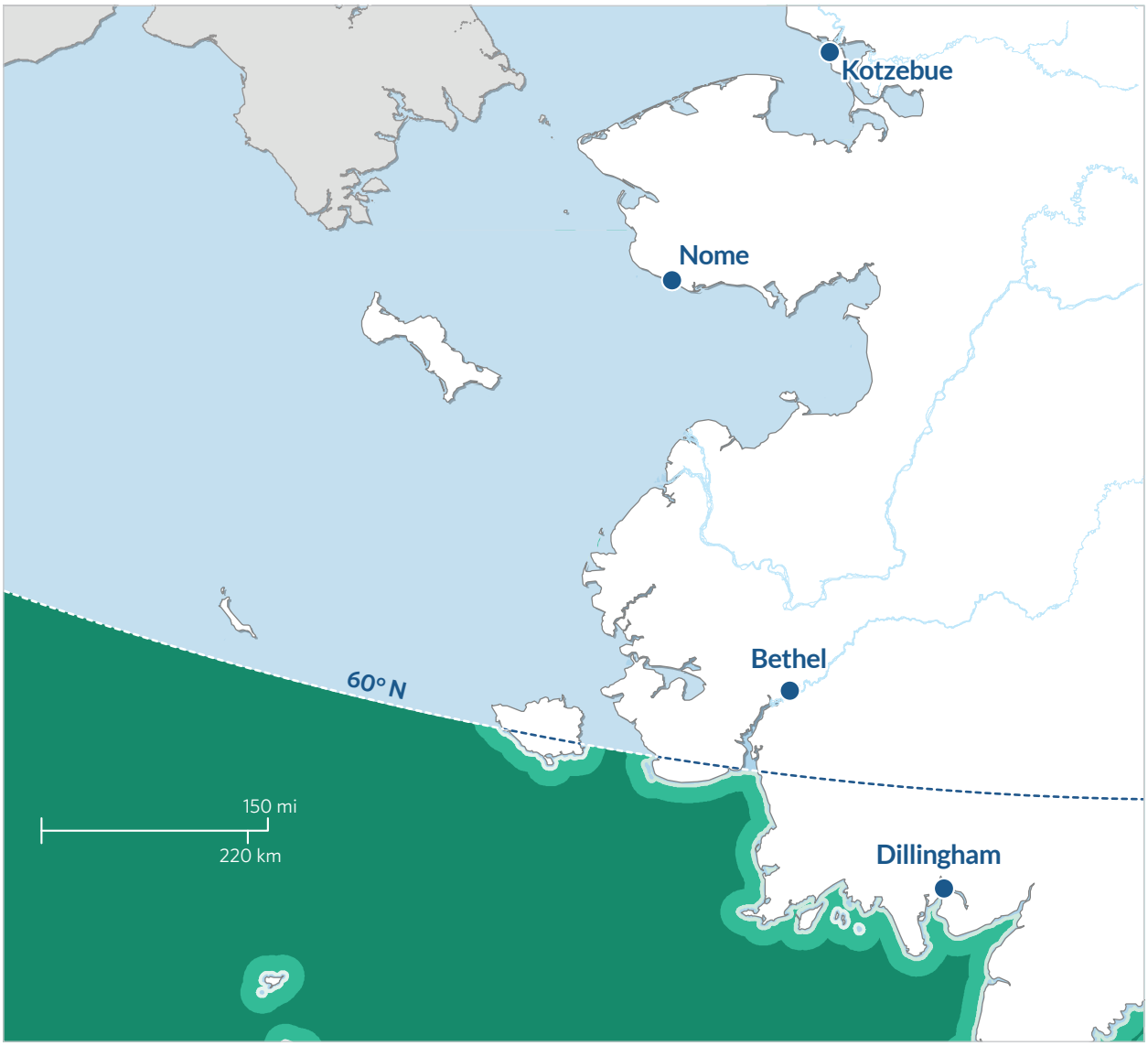
United States

Federal rules for oily waste are similar to those in MARPOL. Within 12 nm of land, a vessel's oily water separator must be equipped with a 15-ppm monitor and an alarm, and large vessels and oil tankers are required to have an International Oil Pollution Prevention certificate of compliance. The federal Vessel General Permit includes regulations for discharges from 1 to 3 nm, allowing ships to release oily mixes that meet federal treatment requirements in state waters.[34] The U.S. also sets certain design and construction standards for tankers, along with the use of double hulls.

Figure 7

Vessels May Not Release Oil or Oily Water in Most Northern Bering Sea Waters

Regulation of these discharges off Alaska's coast



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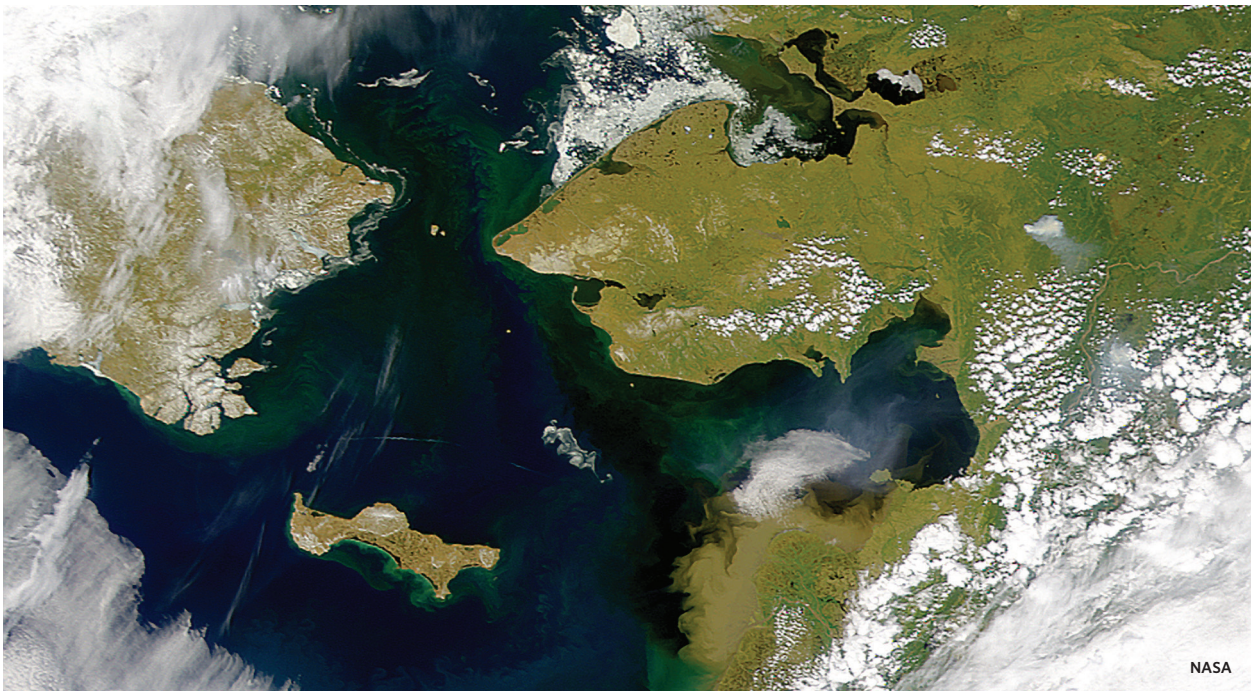

A satellite view of the Bering Strait, where the Pacific and Arctic oceans converge.

Alaska

The state does not have specific rules for oily water; vessels follow federal and international standards.

Areas for improvement

Oil in water can harm the marine environment and threaten Indigenous people's food security.[35] Therefore, waters south of the Polar Code boundary would benefit from a complete ban on oily discharges from ships, like the one above 60 degrees north.

Conclusion

Vessel waste presents significant challenges for the health and resiliency of the northern Bering Sea and Bering Strait. Indigenous people in the region are intricately connected to the marine ecosystem, and their food security and cultural and traditional practices may be affected by impacts from growing vessel waste streams. To mitigate the potential harms, and reduce the amount of pollution flowing into these ecologically and culturally significant waters, regulators at the international, U.S. federal, and Alaska state levels, in collaboration with Indigenous communities and other stakeholders, should consider the following:

- Monitor onboard trash and enforce rules limiting marine garbage, particularly plastics.
- Require that all vessels treat sewage to a high, consistent standard before discharging; prohibit releases of untreated sewage into the marine environment; and mandate more frequent monitoring, testing, and discharge reporting.
- Regulate grey water as a pollutant, similar to sewage, that must be treated on board before discharge.
- Prohibit oil and oily water discharges from ships south of the Polar Code boundary.

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This brief was updated on Oct. 22, 2018, to clarify the diet of Indigenous peoples in the Bering Strait region.

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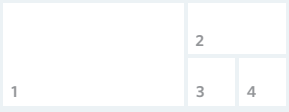

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