



Safety at the Helm: A Plan for Smart Shipping through the Bering Strait



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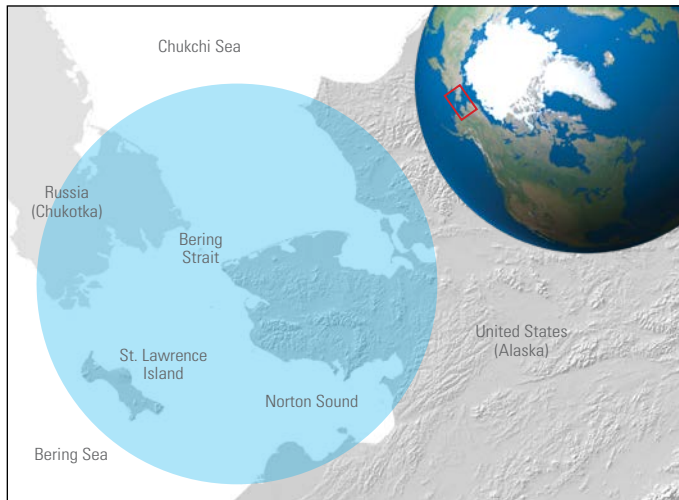
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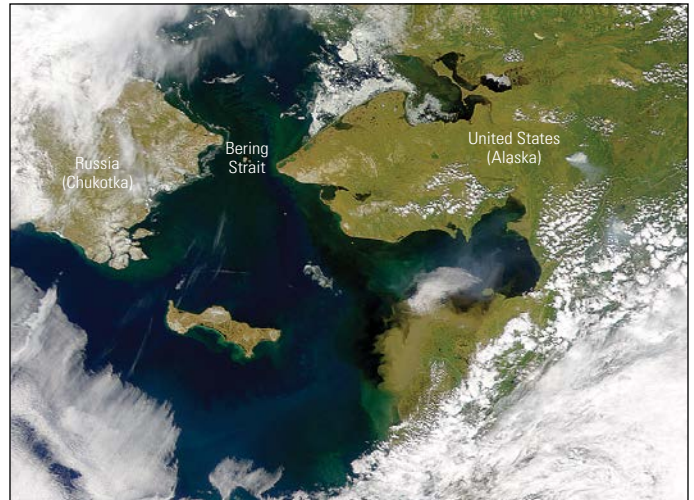
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EXECUTIVE SUMMARY

One of the few waterways linking two oceans, the Bering Strait is a 53-mile-wide stretch of water connecting the Pacific and Arctic Oceans. The ice pack covers the Bering Strait for much of the year.



The Bering Strait region, highlighted in blue, is part of the larger Arctic ecosystem © WWF.



Satellite photo of the Bering Strait region © NASA.

The Bering Strait is one of the Arctic's most biologically productive environments and a vital migratory corridor. The dramatic decline of the Arctic summer sea ice is rapidly changing the face of global commerce and trade at northern latitudes. In addition to climate change, increasing industrialization in the Arctic has the potential to significantly impact marine areas such as the Bering Strait.

Current data reflect a significant increase in AIS (Automatic Identification System) transits observed in the Bering Strait in the last decade. Where only 262 transits were recorded by AIS in 2009, in 2019 approximately 494 ship transits were observed through the Strait, including local delivery barges, oil tankers, and freighters and liquid natural gas (LNG) tankers from Russian ports in the Kara and Barents Seas. Ship traffic is expected to increase over the next decade and beyond, as the Northern Sea Route (NSR) becomes a more attractive shipping route for vessels traveling between Western Europe and Asia along the Russian coast. Offshore oil development in the Arctic Ocean as well as onshore oil, gas, and mining operations in the Northern Petroleum Reserve in Alaska (and possibly in the Arctic Refuge) will also bring increased traffic. Finally, cruise tourism traffic is also expected to grow.

The expansion of maritime activity presents new, elevated risks to this ecosystem—from oil spills, groundings, and collisions with hunters and marine mammals to increased water, air, and noise pollution. Stakeholders, particularly Bering Strait communities, have the opportunity to play a formative role in

determining the future of this region. Strong communications and traffic systems (including routes and Areas to Be Avoided) will minimize and prevent risks to the people and the rich marine environment of the Bering Strait.

International and domestic laws provide a variety of measures for regulating ships, including ship routing systems, vessel traffic management services, and special areas where certain rules can be implemented to enhance maritime safety and environmental protection. There are no ship reporting systems or vessel traffic services in the Bering Strait region, although AIS monitoring provides data on vessel transits for certain kinds of ships.

Recognizing potential risks of increasing shipping in the region, in 2018 the International Maritime Organization (IMO) took the first important step toward protecting this new maritime frontier, and approved two-way routes and precautionary areas for both sides of the Bering Strait. The IMO also approved proposed Areas to Be Avoided around St. Lawrence, King, and Nunivak Islands (See map on page 24).

To address the threats of increasing shipping traffic in the Bering Strait region, many stakeholders must work together. The IMO-approved measures are a good beginning, but more work remains to be done, including enhancing US-Russian cooperation in several areas. The following pages present a series of short- and long-term measures that will substantially contribute to reducing potential negative impacts from shipping in the Bering Strait.

WWF recommends that the US take these five actions to ensure the future safety of this unique and globally significant marine habitat:

- 1) Expand implementation of e-navigation measures and technology (including a dynamic Coast Pilot; electronic navigation aids; expanded use of AIS technology to transmit navigational safety information; automated AIS alerts for vessels entering protected areas; and provision of vessel information to Indigenous communities);
- 2) Adopt modern, internationally accepted Sea Traffic Management measures with the goal of creating an organized traffic management process (ideally, a US-Russian Sea Traffic Coordination Center) for the Bering Strait region;
- 3) Together with Russia, establish an Area to Be Avoided (ATBA) surrounding the Diomedede Islands in the Bering Strait, and consider seasonal or dynamic protective areas for the Bering Strait region;
- 4) Develop region-specific industry practices that will minimize adverse impacts and risks of increasing maritime activity (for example, speed restrictions or no-discharge zones);
- 5) Strengthen domestic and bilateral emergency prevention and response capabilities, including detailed joint emergency protocols and an active program of contingency planning and exercises with Russia.

Any resulting regulatory system must incorporate Traditional Knowledge and values from Indigenous communities, and include measures to minimize disturbance to Indigenous hunters by commercial traffic in the region.¹ These measures must be based on identified Indigenous marine use in the Bering Strait. Current information on areas of Indigenous marine use can be incorporated by NOAA in new editions of a dynamic Coast Pilot for the Bering Strait region. Communication with Indigenous and coastal residents' watercraft can be greatly improved by equipping them with AIS.

Transiting Russia's Northern Sea Route, which officially ends at the Bering Strait, often requires icebreaker support and ice pilotage
© Alexander Skryabin / WWF-Russia.



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WILDLIFE, HUMAN VALUES, AND SHIPPING CONCERNS

The Bering Strait supports some of the most remarkable wildlife in the world, which in turn has supported subsistence cultures for thousands of years. The region is a breeding, feeding, and migratory habitat for many birds, fish, and marine mammals, including a number of endangered species. WWF and The Nature Conservancy identified the Bering Strait as a high biodiversity priority ecoregion in 1999, and since then it has been an area of international focus because of its role as a chokepoint for shipping in the Arctic.

WILDLIFE AND PEOPLE

Thousands of Siberian Yupik, Central Yupik, Chukchi, and Inupiaq people reside in the Bering Strait region, leading lives that are closely tied to the bounty of the sea. Located in the center of the Bering Strait is Little Diomede Island, separated by just two miles of water from its Russian “twin” to the west, Big Diomede Island, also known as Ratmanova. Over 100 people reside on Little Diomede, whereas Big Diomede is no longer inhabited. In the southern part of the Strait, Saint Lawrence Island is also close to Russia, and home to the villages of Gambell and Savoonga. On the Russian side of the Strait, hundreds of people live in the Native villages of Uelen, Lorino, Yanrakinnot, and Provideniya. These and many other coastal communities along the Bering Strait in both Russia’s Chukotka and US Alaska have thrived for centuries thanks to their many innovations for adapting to life in the extreme northern environment, and the rich marine life—marine mammals, seabirds, and fish—of the region.

The bowhead whale has significant subsistence importance. Bowheads and other species support Inupiaq, Central Yupik, and Siberian Yupik communities in the Bering Strait region and on the North Slope.



The Bering Strait region is home to many Indigenous communities on both sides of the Strait © Adobe Stock.

BERING STRAIT WILDLIFE

WWF recognizes the Bering Strait to be one of the highest conservation priorities in the Arctic for its role as a major wildlife migratory pathway and as a summer foraging and breeding area for high concentrations of wildlife.

Cetaceans

© Vicki Beaver-NOAA-AFSC-NMML



Each year, the Bering Strait witnesses one of the greatest marine mammal migrations in the world. Gray whales (*Eschrichtius robustus*) travel more than 5,000 miles each way annually from Mexico, transiting the Strait to take advantage of the remarkably food-rich waters of the Arctic. At least 17,000 bowhead whales (*Balaena mysticetus*) migrate north from the Bering Sea to spring and summer feeding grounds in the plankton-filled waters of the Chukchi and Beaufort Seas. While following the spring leads—open areas in the Arctic ice—bowhead whales are capable of navigating under the ice also, making them an iconic Arctic species. Beluga whales (*Delphinapterus leucas*), particularly the eastern Chukchi and Beaufort Sea stocks, also use the Bering Strait as they move between the Bering Sea and the Arctic Ocean.

Seabirds

© Ian L. Jones/Memorial University



The Bering Strait is remarkable for its avian diversity. The National Audubon Society has identified several Important Bird Areas of global significance, which harbor nesting areas for approximately 4.7 million seabirds. Additionally, the cliffs of Russia's Chukotka Peninsula and the craggy coast of Alaska's Seward Peninsula provide nesting habitat for nearly another 5 million birds. Breeding seabirds include the common (*Uria aalge*) and thick-billed (*U. lomvia*) murre; black-legged kittiwakes (*Rissa tridactyla*); parakeet (*Aethia psittacula*) and crested (*Aethia cristatella*) auklets. Endangered species, such as the spectacled eider (*Somateria fischeri*), and other species of conservation concern, such as the yellow-billed loon (*Gavia adamsii*), which nests on Saint Lawrence Island, can also be found in the Bering Strait region.

Pinnipeds

© Kevin Schafer / WWF-Canon

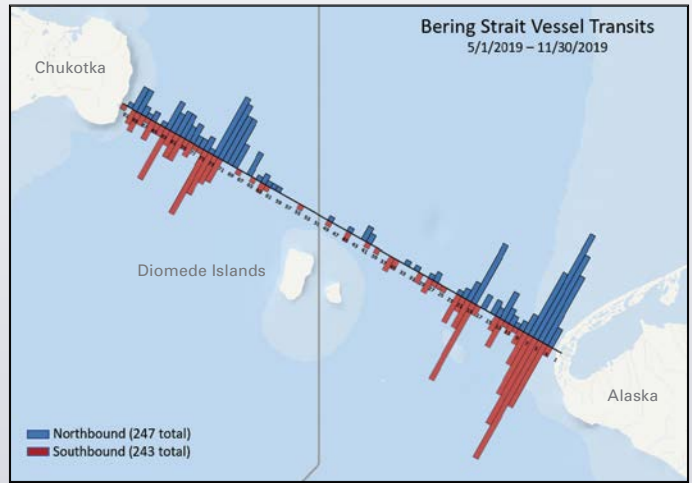
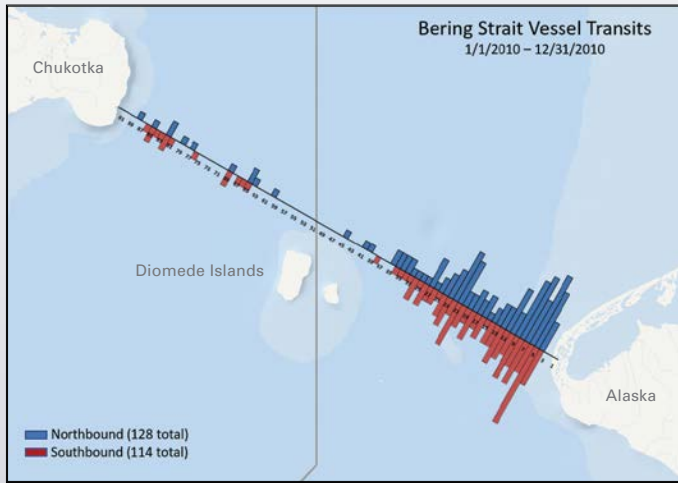


One of many species whose population straddles the US–Russia maritime boundary, the Pacific walrus (*Odobenus rosmarus divergens*) transits the Bering Strait as it moves between the Bering and Chukchi Seas. Walrus are highly dependent on sea ice, which they use as a diving platform to reach their favored prey, clams in the sediments of shallow waters. Walrus generally follow the ice edge, concentrating in winter polynyas (areas kept ice-free due to currents), and in summer following the southern edge of the receding ice. In recent years, due to the rapid retreat of the summer ice into waters too deep for the animals to forage, large numbers of walrus are forming “haul-outs” on Alaskan shores. This change represents a conservation concern, as high concentrations of walrus in one place on shore could lead to localized depletion of their food; stampeding and resulting mortality are related concerns.

REFERENCES

<http://ak.audubon.org/bering-sea>, WWF and TNC 1999 Biodiversity Assessment, <https://www.fws.gov/alaska/pages/marine-mammals/pacific-walrus>, https://www.tos.org/oceanography/assets/docs/26-4_clarke.pdf

The graphics below show how maritime traffic activity in the Bering Strait has changed over the last decade as Russia expands its export of natural gas, condensate, and dry bulk cargoes © Marine Exchange of Alaska.



The Bering Strait is a “marine mammal superhighway” and summer foraging and breeding area for bowhead whales, gray whales, belugas, and walrus. Nearly the entire Bering–Chukchi–Beaufort stock of bowhead whales moves through the Bering Strait twice each year. The Strait is also a focal point for the migration and summer foraging of millions of migratory birds.

Concentrated nutrients carried in the oceanic water from the shelf edge of Russia’s Cape Navarin, north around the Gulf of Anadyr, and through the western Bering Strait make the Bering Strait one of the most biologically productive marine ecosystems in the world. The highly productive benthic waters of the Chukchi Sea provide rich food sources, and the shallow ocean bottom makes them accessible to marine species, thereby supporting a rich web of life in this part of the Arctic.

However, this unique region is under threat from changing climate conditions and increasing industrial activity. The Arctic is now warmer than it has been at any time during the last 2,000 years. Summer ice extent has declined by 40% since satellite observation began in 1979. Over the same period, Arctic sea ice has thinned considerably, with ice thickness down on average by 70%.

The ice-free season is lengthening because of climate change, and vessel traffic is growing, making it more likely that ships will strike large pinnipeds and migrating whales. Underwater ship noise is increasing, along with pollution and the potential for oil spills. Damage to the Bering Strait habitat and wildlife will ultimately impact the communities that depend on these resources.



Artisanal Gray whale hunt by the Indigenous people, Chukotka, Russia © Staffan Widstrand / WWF.



SHIPPING CONCERNS

The number of commercial vessel transits in the Bering Strait region has increased significantly in the past decade, from 262 transits recorded by AIS in 2009, to 452 in 2015 (at the peak of Shell Oil Company’s Arctic exploration), over 350 individual transits in 2017 and 2018, and almost 500 in 2019. As melting ice makes the Arctic more accessible and extends the navigation season into October and November, the upward trend will likely continue.

Retreat of sea ice also opens up the Arctic to oil and gas exploration and extraction in the Chukchi and Beaufort Seas and along the Russian continental shelf, onshore oil and gas development in the National Petroleum Reserve in Alaska, and mining operations in the Canadian Arctic. In 2018, new Russian ice-class tankers carrying liquified natural gas (LNG) sailed from the Yamal Peninsula via the Northern Sea Route and the Bering Strait without icebreaker support. These shipments are the first of what will be regular east-bound shipments of LNG on the Northern Sea Route between June and November. By 2024, Russia expects to send three tankers per day carrying LNG to Asia from the Yamal Peninsula via the Northern Sea Route. Russia is also developing an LNG facility in the Gydan Peninsula in the Siberian Kara Sea that will send traffic east-bound through the Bering Strait after 2023.

As shipping rates increase, the risk of ecological damage also grows, both through dangers of daily operations (air and water pollution, noise, the use of heavy fuel oil) and through the increased potential for an accident or an oil spill. Ship ballast water can introduce invasive species, and underwater noise can disrupt wildlife communication. The likelihood of ship strikes with whales, other mammals, and possibly even small watercraft, increases as well. With the unpredictability of climate change and rapidly changing ice conditions, the risks only grow more severe in a transboundary area like the Bering Strait. Even regular vessel operations which produce many types of

waste (sewage, garbage, grey water, and oily water mixes) can have serious negative impacts on the marine environment and people of the region.

Oil spills, including from tanker groundings and vessel collisions, present one of the greatest risks to Arctic ecosystems. One of the main challenges to oil spill response capability in the Bering Strait region is limited maritime infrastructure, with only three ports on the Alaskan side (Nome, Kotzebue, and the DeLong Mountain Terminal at Red Dog Mine).²

Since the Bering Strait is considered a remote area under US Coast Guard rules, and there are limited oil spill response resources available, vessels subject to US oil spill prevention and response regulations comply with Alternative Planning Criteria (APC), which implement a combination of risk reduction measures and oil spill response measures in lieu of meeting the prescriptive US requirements for oil spill response equipment that cannot feasibly be achieved. Vessels that are on innocent passage³ are not required to comply with Coast Guard oil pollution prevention regulations.

Additional challenges to maritime safety in the Bering Strait include

- remoteness and lack of accurate and complete hydrographic data and information
- high latitudes in the region which may compromise communications, including accuracy of the standard Global Positioning System (GPS)
- limited VHF and HF radio coverage of the Arctic⁴
- no permanent US Coast Guard presence in the Bering Strait region—the closest stations are hundreds of miles away in Unalaska/Dutch Harbor and Kodiak
- unpredictable sea ice coverage in the Bering Strait while the Coast Guard has only one functioning heavy icebreaker in the Pacific

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LEGAL FRAMEWORK

The Bering Strait encompasses Russian and US waters, and the two countries have limited control beyond their 12-mile territorial area. Since marine mammals do not recognize political borders, US and Russian domestic laws alone will not sufficiently protect the region. A range of national, bilateral, and multilateral sources of law is available for managing traffic in the Strait, including enforceable and voluntary legal measures. However, additional Bering Strait-specific measures are needed to achieve effective management of traffic in the region.

INTERNATIONAL BODIES AND APPLICABLE LEGAL REGIMES

International Maritime Organization

The International Maritime Organization (IMO), a specialized agency within the United Nations, is responsible for the safety and security of shipping, and preventing ship pollution. The IMO establishes international rules and standards governing vessel traffic and has authority to approve certain types of navigational measures for the Bering Strait, because the Strait is used for international navigation.

Polar Code

In 2014, the IMO adopted the first mandatory rules for vessels sailing in the Arctic and antarctic regions—the International Code for Ships Operating in Polar Waters, or Polar Code. The Polar Code represents the first binding international framework for ships sailing in polar waters, in consideration of hazards and conditions unique to polar waters, and an expected increase in traffic in the Arctic and Antarctic. In the northern Bering Sea, the Polar Code’s boundary starts at 60 degrees north latitude, cutting across Nunivak Island.

The village of Diomedede, also known as Iqaliq, on Little Diomedede Island in the middle of the Bering Strait
© Elisabeth Kruger / WWF-US.



HOW THE POLAR CODE PROTECTS THE ENVIRONMENT

OIL



DISCHARGES

Discharge into the sea of oil or oily mixtures from any ship is prohibited



STRUCTURE

Double hull and double bottom required for all oil tankers, including those less than 5,000dwt (A/B ships constructed on or after 1 January 2017)



HEAVY FUEL OIL

Heavy fuel oil is banned in the Antarctic (under MARPOL). Ships are encouraged not to use or carry heavy fuel oil in the Arctic



LUBRICANTS

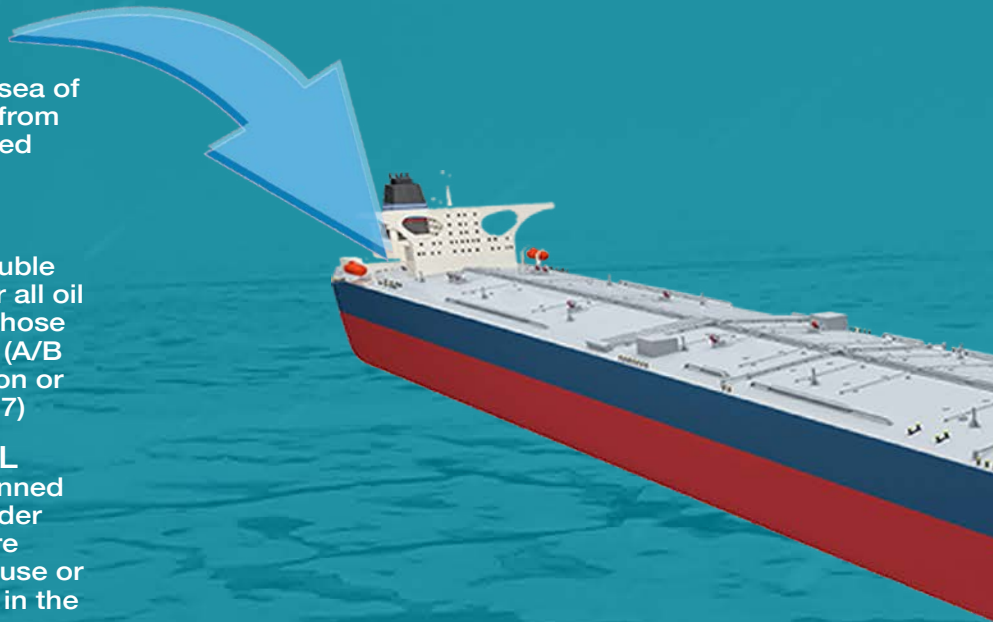
Consider using non-toxic biodegradable lubricants or water-based systems in lubricated components outside the underwater hull with direct seawater interfaces

INVASIVE SPECIES



INVASIVE AQUATIC SPECIES

Measures to be taken to minimize the risk of invasive aquatic species through ships' ballast water and biofouling



SEWAGE



DISCHARGES I

No discharge of sewage in polar waters allowed (except under specific circumstances)



TREATMENT PLANTS

Discharge is permitted if ship has an approved sewage treatment plant, and discharges treated sewage as far as practicable from the nearest land, any fast ice, ice shelf, or areas of specified ice concentration

BACKGROUND INFO

 THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WILL ENTER INTO FORCE ON 1 JANUARY 2017

 IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS: ADDITIONAL TO EXISTING MARPOL REQUIREMENTS

 IT PROVIDES FOR SAFE SHIP OPERATION AND PROTECTS THE ENVIRONMENT BY ADDRESSING THE UNIQUE RISKS PRESENT IN POLAR WATERS BUT NOT COVERED BY OTHER INSTRUMENTS

DEFINITIONS

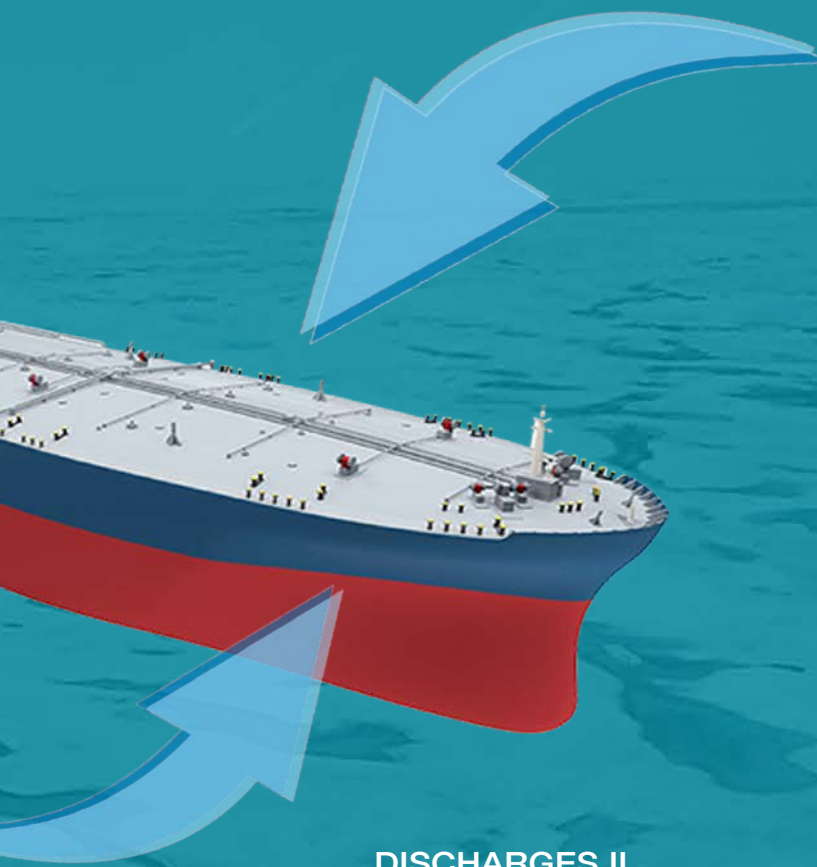


SHIP CATEGORIES

Three categories of ship designed to operate in polar waters in:

- A) at least medium first-year ice
- B) at least thin first-year ice
- C) open waters/ice conditions less severe than A and B

MARPOL CODE ENVIRONMENT



GARBAGE



PLASTICS
All disposal of plastics prohibited (under MARPOL)



FOOD WASTES I
Discharge of food wastes onto the ice is prohibited



FOOD WASTES II
Food wastes which have been comminuted or ground (no greater than 25mm) can be discharged only when ship is not less than 12nm from the nearest land, nearest ice shelf, or nearest fast ice



ANIMAL CARCASSES
Discharge of animal carcasses is prohibited



CARGO RESIDUES
Cargo residues, cleaning agents or additives in hold washing water may only be discharged if: they are not harmful to the marine environment; both departure and destination ports are within Arctic waters; and there are no adequate reception facilities at those ports. The same requirements apply to Antarctic area under MARPOL

DISCHARGES II

- Sewage not comminuted or disinfected can be discharged at a distance of more than 12nm from any ice shelf or fast ice
- Comminuted and disinfected sewage can be discharged more than 3nm from any ice shelf or fast ice



DEFINITIONS

FAST ICE: Sea ice which forms and remains fast along the coast, where it is attached to the shore, to an ice wall, to an ice front, between shoals or grounded icebergs

ICE SHELF: A floating ice sheet of considerable thickness showing 2 to 50m or more above sea-level, attached to the coast

CHEMICALS



DISCHARGES
Discharge of noxious liquid substances (NLS) or mixtures containing NLS is prohibited in polar waters



The Polar Code boundary runs across Nunivik Island south of the Bering Strait © WWF.

While an important step toward protecting Arctic ecosystems from increasing vessel traffic, the Polar Code has several significant gaps. These include failing to deal with risks posed by heavy fuel oil, grey water, underwater noise, invasive species, air pollution, and lack of recognition of local Indigenous subsistence activities or concerns. Also, the Code applies only to some vessels. For example, fishing vessels and vessels of less than 500 gross tonnage do not need to comply with its safety regulations. With respect to the Bering Strait, it appears that the Code protects its waters from garbage and untreated sewage less during ice-free periods, when most navigation takes place. The Polar Code treats the sea ice edge as an extension of land, and prohibits discharge of garbage and sewage within 12 nautical miles of the ice edge.⁵

Since enforcement of the Code lies with countries, cooperation between Arctic states is essential to effective implementation of the Code's requirements. Joint enforcement of the Polar Code by the United States and Russia is necessary in the Bering Strait region.

Convention on the Law of the Sea

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) recognizes several types of maritime jurisdictional zones, with varying degrees of authority by the coastal state over foreign-flagged vessels.⁶ Article 38 of UNCLOS applies to straits used for international navigation between high seas (like the Bering Strait), granting vessels the right of transit passage. A coastal state's authority to regulate transit passage is more limited than the authority to regulate vessel activities in other types of state waters.

Right of Transit Passage

UNCLOS allows coastal states regulating transit passage to adopt laws relating to safety of navigation, vessel traffic, pollution control, fishing, and customs, fiscal, immigration, and sanitary issues, with some restrictions. Under UNCLOS Article 42, such laws and regulations may "not discriminate in form or in fact among foreign ships" and cannot "have the practical effect of denying, hampering[,] or impairing the right of transit passage."

OTHER UNCLOS PROVISIONS RELEVANT FOR THE BERING STRAIT

Article 234 of UNCLOS allows for greater coastal state control over ice-covered areas:

Coastal states can unilaterally adopt regulations for "the prevention, reduction[,] and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone (EEZ), 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."

However, it is not clear how much ice coverage is required to give effect to this article. Also, while much of the Bering Strait region is covered by ice for half of the year, this may be reduced with climate change.

Article 211 of UNCLOS offers another route to greater coastal state control in the context of pollution prevention when that is justified by an area's oceanographical and ecological conditions as well as the particular character of its traffic. A coastal state can, after consulting with other states concerned, submit a request that the IMO adopt international rules and standards on pollution prevention or navigational practices. The proposal should include scientific and technical evidence in support of the request. It cannot include "design, construction, manning[,] or equipment standards other than generally accepted international rules and standards."

Article 211 allows states, acting through the IMO, to designate routing systems "designed to minimize the threat of accidents which might cause pollution of the marine environment, including the coastline, and pollution damage to the related interests of coastal States."

Compliance with both mandatory and voluntary measures is more likely if ships know they are being monitored by a vessel tracking system. Examples of successful voluntary compliance include Canada's reporting zones in the Northwest Passage (which allowed access to services such as ice information, routing, icebreaker assistance, and search and rescue response), and the IMO-established Area to Be Avoided near the Olympic Coast National Marine Sanctuary in Washington State.

Per UNCLOS Article 41, a coastal state can “designate sea lanes and prescribe traffic separation schemes ... where necessary to promote the safe passage of ships,” but to do so the state must develop a regulatory proposal for IMO approval, in cooperation with other states bordering the strait. For the Bering Strait, this means that the United States is limited in its ability to unilaterally adopt additional traffic regulations.

Any marine traffic regulation proposed by the United States and Russia needs to be approved by the IMO in order to be enforceable by the coastal states on foreign-flagged vessels in transit passage.

Other International Conventions

The Convention for the Safety of Life at Sea (SOLAS) allows the IMO to establish ship regulations to improve safety of life at sea, safety and efficiency of navigation, and/or the increased protection of the marine environment, such as

- ship routing systems that direct vessel traffic in certain areas
- ship reporting systems that facilitate communication between vessels and shore-based facilities
- shore-based vessel traffic systems, which can range from simple information exchange with ships to comprehensive management of vessel traffic in a particular area

The Convention for the International Regulations for Preventing Collisions at Sea (COLREGs) aims to avoid collisions and ensure navigation safety, including by requiring vessels to maintain a proper lookout and to proceed at a safe speed at all times.

The International Convention for the Prevention of Pollution from Ships (MARPOL), adopted in 1973 by the IMO, allows “special areas” of the ocean to be designated for protection from oil pollution and noxious liquid substances in bulk, sewage, and garbage.

The 1978 Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the 1995 Amendments establish international qualification standards for mariners on merchant ships.

The 2011 Arctic Search and Rescue Agreement, which went into force in January 2013, coordinates international search and rescue (SAR) coverage and response in the Arctic.

Bilateral Treaties

The United States and Russia have long recognized the importance of protecting the transboundary Bering Strait region from impacts of industrial activity and maritime traffic, as evidenced by several bilateral agreements that apply to the Bering Strait region, including

- the 1994 Agreement on Cooperation in the Field of Environmental Protection
- the 1989 Agreement Concerning Cooperation in Combating Pollution in the Bering and Chukchi Seas in Emergency Situations (the 1989 Pollution Agreement)
- the 2015 Agreement to Combat Illegal, Unreported, and Unregulated (IUU) Fishing, which makes specific reference to the crab stocks of the Bering Sea

THE 1989 POLLUTION AGREEMENT & THE JCP

Under the 1989 Concerning Pollution Agreement, the two countries are to render assistance to each other in combating pollution by oil and other hazardous substances within internal waters or territorial seas of the Bering and Chukchi Seas, including the waters of the Bering Strait. To implement this agreement, the United States and Russia developed a Joint Contingency Plan (the JCP). Under the JCP, the US Coast Guard and their Russian counterpart, the Marine Pollution Control and Salvage Administration (now Marine Rescue Service), have been holding meetings on both sides of the Bering Strait to discuss joint oil spill response.

Russian Law

Several Russian laws are relevant to the safety of shipping in the Bering Strait. The 1998 federal law “[o]n the Exclusive Economic Zone of the Russian Federation” allows for the adoption of special rules to protect the marine environment in 1) “ice-covered areas,” defined as areas “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 2) in “special areas,” defined as areas where, “for technical reasons related to oceanological and ecological conditions, as well as vessel traffic, there is a need for special mandatory measures to prevent pollution from vessels by oil, toxic liquids, and refuse.”

However, because the Russian EEZ law does not specify restrictions that may be imposed on ships in those areas, it is necessary to refer to relevant international treaties, such as Article 234 of UNCLOS (discussing ice-covered areas), MARPOL Annexes and Guidelines (discussing protective measures for special areas), and applicable IMO regulations for specific definitions and regulations that can be established in the Bering Strait.

Russian federal laws allow for the creation of marine buffer zones adjacent to terrestrial national parks and strictly protected natural territories (“*zapovedniks*”). Management regimes for these zones can limit or prohibit various types of industrial activity, including shipping. In the future, such zones may be established in the Bering Strait region and the Chukchi shoreline as part of the Beringia National Park, created in June 2013 by the Russian federal government.

US Maritime Laws and Regulations

Several federal laws may give the US Coast Guard and other federal agencies authority to implement certain navigational measures in the Bering Strait region. However, none of the US maritime laws contain Arctic-specific regulations.

The 1972 Ports and Waterways Safety Act (PWSA) aims to ensure safe navigation as well as environmental protection, empowering the US Coast Guard to establish vessel traffic services and separation schemes.

In 1977, the US Coast Guard promulgated navigation safety regulations (NSRs) for almost all navigable US waters, requiring most large vessels to carry designated charts and nautical publications and be equipped with radar. The NSRs include criteria for determining safe speed and other safety standards. By 2016, NSRs required most vessels to carry AIS.

The 2010 US Coast Guard Authorization Act aimed to implement the Arctic Council's 2009 Arctic Marine Shipping Assessment (AMSA) by encouraging the Coast Guard to negotiate with other Arctic nations and execute agreements through the IMO regarding marine safety, including placement and maintenance of aids to navigation; oil spill prevention and response capability; tracking systems; and search and rescue. This Act provides the US Coast Guard with broad powers to implement the 17 recommendations contained in the 2009 AMSA.

The Endangered Species Act (ESA), which prohibits any person from "taking" (including harassing, harming, wounding, or killing) any endangered species of fish or wildlife within the United States or its territorial sea, protects marine mammals.

The Marine Mammal Protection Act (MMPA) similarly prohibits disturbing or molesting marine mammals. The National Marine Fisheries Service (NMFS) has developed specific regulations to regulate close vessel approaches to large whales in Alaska and other areas. For example, NMFS issued a rule establishing a 100-yard approach limit for endangered humpback whales within 200 nautical miles of Alaskan shores, and requiring vessels to travel at a "slow, safe speed" when near the whales. While the rule was mainly aimed at whale watchers, NMFS specifically did not exempt commercial fishing vessels in transit.⁷

Alaska State Law

The State of Alaska has jurisdiction over waters extending three nautical miles from its shores, which includes Little Diomed Island in the middle of the Bering Strait. US vessels are subject to Alaska law to the extent it does not conflict with federal law. Foreign vessels likely have to follow Alaska law if it does not conflict with international law.

Currently, the following state regulations apply to certain ships in Alaskan waters:

- Tank vessels transporting oil or petroleum products and self-propelled non-tank vessels that are over 400 gross tons are required to have a vessel oil discharge prevention and contingency plan that is approved by the State of Alaska.
- Discharge of untreated sewage and greywater is prohibited within three nautical miles of land, for passenger vessels of a certain size (i.e., cruise ships).
- Larger vessels operating in Alaskan waters that are engaged in international trade and calling on an Alaskan port are required to have a pilot (mandatory pilotage); in the Bering Strait region, these waters include all waters surrounding St. Lawrence Island, Nunivak Island, St. Matthew Island, and Little Diomed Island, from shoreward to the outer limit of the three-mile territorial seas.



More vessels are sailing through remote areas like the Bering Sea, where humpback whale distribution and movement is still poorly understood © Sylvia Earle / WWF-Canon.

4

POTENTIAL TOOLS FOR REGULATING SHIP TRAFFIC IN THE BERING STRAIT REGION

Currently, the biggest gaps in shipping safety are that there is no vessel traffic management system or dynamic e-navigation measures in the Bering Strait region, and no Area to Be Avoided in the Bering Strait itself. Here, we discuss technologies and regimes that could be used to regulate ships in the Bering Strait region.

SHIP REPORTING SYSTEM

Ship reporting systems are established through the IMO. The information provided in ship reporting systems depends on the particular system but generally includes vessel name, radio call signs, position, speed, and course; the system can also provide information regarding whale sightings and ice conditions. Ship reporting systems have been implemented in several international straits, including the Torres Strait between Australia and Papua New Guinea, and the Strait of Gibraltar. Application of new AIS technology could be used to quickly and economically implement a ship reporting system.

Tracking Technology

Perhaps the most significant development in navigation safety since the introduction of radar is AIS technology. AIS is comprised of tracking and data transponders which transmit realtime information about the vessel over VHF (very high frequency) radio channels. AIS helps prevent vessel collisions, aids monitoring vessels' compliance with safety, security, and environmental regulations, and enhances response to maritime emergencies. AIS transmissions automatically provide information about the vessel to other vessels and to coastal authorities equipped with AIS receivers in an accurate and timely manner. AIS is capable of transmitting environmental data and safety information to vessels, which can also aid safe and environmentally sound operations.

In Alaska's Glacier Bay National Park, automated "watch dogs" transmit alerts and emails to the US National Park Service when larger vessels exceed speed restrictions in areas of the bay where there are high concentrations of whales. Such "alert trigger areas" are established in many areas of Alaska.⁸

By international treaty, most larger commercial vessels and passenger ships are required to be equipped with AIS. In recognition of the importance of AIS as a maritime safety tool, in 2014, the US Coast Guard expanded its AIS carriage requirements to include, among others, "vessels of 65 feet and over" operating in all US waters, including the Bering Strait. These carriage requirements capture virtually every vessel operating in the Bering Strait, with the exception of pleasure craft (many of which carry AIS voluntarily) and small local vessels. In practice, most responsible vessel operators equip their vessels with AIS, as this technology has been proven to substantially enhance maritime safety.

There are at least 21 IMO-approved, mandatory ship reporting systems, including systems in international straits, with environmental protection as an objective (in the Strait of Gibraltar and in the Torres Strait region). Two are in US waters (the Ship Reporting System for the Papahnaumokukea Marine National Monument PSSA and the North Atlantic Whale Reporting System).

Barges dredge for gold off the coast of Nome, Alaska, a hub community in the Bering Strait © Elisabeth Kruger / WWF-US.



Automatic Identification System (AIS) in Alaska

There are over 130 terrestrial-based AIS stations in Alaska, developed and operated by the nonprofit Marine Exchange of Alaska (MXAK). The MXAK system provides realtime information on AIS-equipped vessels operating in both US and Russian waters to the Coast Guard, State of Alaska vessel operators, and other organizations and entities that fund the operation of the system and have a role in aiding safe, secure, efficient, and environmentally sound maritime operations.

The MXAK maintains a 24x7 staffed Vessel Compliance Monitoring and Response System (VCMRS). This system monitors vessels operating in Alaskan waters and notifies a vessel, the Coast Guard, or other agencies as appropriate when a vessel is not complying with risk reduction measures (offshore routing), incurs an environmental infraction, or has a casualty.

The Arctic Council's Arctic Marine Shipping Assessment (AMSA 2009) recommends that "completion of an AIS receiver network in the Arctic is high priority; linkages between AIS and marine mammal awareness need to be developed." Given the interaction between marine wildlife and humans in the Bering Strait (from small hunting boats to tugboats, cargo vessels, and tankers), it is essential that utilization of AIS as a data transmission system be expanded so marine safety, emergency response, and environmental monitoring in the region can be improved.

E-Navigation

E-navigation is defined by the IMO as "the harmonized collection, integration, exchange, presentation[,] and analysis of marine information on board and ashore by electronic means to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment."⁹ E-navigation technologies include expansion of the use of AIS to transmit relevant data to mariners. This can include meteorological and hydrographic data, information about hazards, safety and security zones, marine protected areas, status of aids to navigation, and other waterway safety information.

Various types of AIS messages can provide both realtime and forecast data to vessels, including data on dynamic marine protected areas, virtual navigation safety buoys, ice reports, and other weather information. Such messages can be delivered for a specific time period, to automatically time out at the end of the period. Challenges remain in the implementation of this capability, including adoption of international standards and requiring vessels to have AIS systems capable of receiving and displaying information being disseminated. This data can, for example, also be used in a dynamic, continuously updated Coast Pilot that will transmit relevant information to mariners when they are approaching an area. NOAA is considering developing such a system, which should be a more effective way of communicating hazards than the current Coast Pilot.

Modern technologies can help minimize conflicts and collisions with Indigenous whalers and subsistence hunters, by providing information on the location of transiting ships to Indigenous people of the Arctic. For example, MXAK, in partnership with

the Wildlife Conservation Society, developed a smartphone application that presents information on vessels' locations within a certain radius of the local community.¹⁰ Similarly, transiting vessels can obtain information on local mariners when they are transmitting their position on AIS. The application is free for residents of the US Arctic communities.

Vessel Traffic Service

The IMO defines a Vessel Traffic Service (VTS) as "a service implemented by a Competent Authority, designed to improve the safety and efficiency of vessel traffic and to protect the environment." A VTS for the Bering Strait would have to be part of an IMO-approved ship routing or reporting system, and VTS placement in the Strait would have to be jointly decided by the US and Russia. The traditional VTS involves a vessel calling in, and the VTS telling the mariner what other vessels are in the area; these have been established in high-density ports (e.g., VTS LA/LB, San Francisco, Puget Sound, New York, and Houston). A traditional VTS will be too expensive to build and maintain in the Bering Strait, and it would be hard to justify the costs given that the traffic in the region is less than in other areas where VTS is in place.

New AIS technology is preferable to a traditional VTS, since information acquired and passed via a VTS can now be transmitted more accurately and in greater detail via an AIS network. As has been pointed out by the AMSA 2009 report, as well as by the IUCN/NRDC/UAF 2012 Bering Strait Region Workshop Reports, the best way to enhance maritime safety in the Arctic is to accelerate the Coast Guard's application of AIS technologies and capabilities.¹¹

Sea Traffic Management

New developments in technology are paving the way for new approaches to maritime safety. One such approach, called Sea Traffic Management (STM), has been recently presented at the IMO. STM, originally developed by the Swedish Maritime Administration, strives for efficient realtime data exchange to guide and monitor sea traffic in a manner similar to air traffic management.

STM seeks to create an organized traffic management entity called the Sea Traffic Coordination Center (STCC), which will act as a central hub, maintaining a record of all vessels at sea (using AIS and/or radar). STM can help enhance marine safety and environmental protection by enabling traffic controllers and mariners to:

- generate and communicate to vessels route plans with respect to weather, ice, environmental, safety, and geospatial constraints;
- monitor adherence to plans and make appropriate notifications to vessels that do not comply or stray off course;
- prevent collisions, as sharing of vessel coordinates allows routes to be modified with ease;
- offer ships pilot assistance in difficult-to-maneuver areas or whenever requested by the captain;
- exercise dynamic maritime spatial planning.

Adoption of STM will greatly improve situational awareness, reduce maritime risks, and allow for dynamic protection of environmentally sensitive areas.

SHIP ROUTING SYSTEMS

Under SOLAS, ship routing systems can be established “to improve safety of life at sea, safety and efficiency of navigation, or increase the protection of the marine environment.” IMO ship routing systems may be either voluntary or mandatory for vessels and may apply to “all ships, certain categories of ships, or ships carrying certain cargoes.”

Under IMO ships’ routing regulations, routing measures may include traffic separation schemes, two-way routes, recommended tracks, deep water routes (primarily for the benefit of ships whose ability to maneuver is constrained by their draught), precautionary areas (where ships must navigate with particular caution), Areas to Be Avoided, and other areas subject to specific regulations.

Under US law, the US Coast Guard can use its authority under the Ports and Waterways Safety Act to establish a ship routing system. In implementing and carrying out these measures, the US Coast Guard must consider a number of factors, including environmental protection. However, the US Coast Guard authority does not extend to foreign vessels transiting the Bering Strait on innocent passage, or to foreign vessels not engaged in trade with the United States (neither last nor next port a US port).

Coastal states along a channel used for international navigation are limited in their ability to enforce their regulations against vessels on innocent passage. However, under Article 211 of UNCLOS, they can “designate routing systems designed to minimize the threat of accidents which might cause pollution of the marine environment.”

An Area to Be Avoided is an area within defined limits in which either navigation is particularly hazardous or in which it is exceptionally important to avoid casualties, and which should be avoided by all ships, or by certain classes of ships. These areas may be adopted for reasons of exceptional danger or especially sensitive ecological and environmental factors.

A Precautionary Area is an area within defined limits where ships must navigate with particular caution, and within which the direction of flow of traffic may be recommended. A precautionary area can serve to control traffic flow around an area that may pose hazards to shipping or may complement a designated Area to Be Avoided.

IMO MEASURES FOR THE BERING STRAIT

In 2018, the IMO took an important step toward creating a ship routing system in the Bering Strait region by approving recommended two-way routes on both sides of the Strait, proposed by the United States and Russia, and three Areas to Be Avoided in the US waters of the northern Bering Sea (around Nunivak Island, St. Lawrence Island, and King Island, see page 24).

Even though compliance with these measures is voluntary, there is a high rate of compliance with IMO-sanctioned routing measures such as these. The expectation is that responsible mariners will likely follow the IMO recommendations, to minimize the risks of sailing in this area. The IMO is not likely to adopt any mandatory routing measures for the Bering Strait, given its role as an international waterway linking two oceans.



A polar bear meets a Russian icebreaker along the Northern Sea Route © Alexander Skryabin / WWF-Russia.

SPECIAL AND PROTECTED AREAS

Special Areas

Given the special nature and biological richness of the Bering Strait region, spatial and seasonal protections will be an important aspect of managing ship traffic in the Bering Strait. MARPOL provides for Special Areas where mandatory measures may be adopted for pollution prevention. To qualify as a Special Area under MARPOL, the area's oceanographical, ecological, and vessel traffic conditions must merit "special mandatory methods for the prevention of sea pollution." The area must experience a degree of traffic whereby conformance with the usual requirements of MARPOL would be insufficient to protect the area from pollution. There are currently no MARPOL Special Areas designated in the Arctic. There are Special Areas in almost all other oceans on the planet, including the Southern Ocean.

To obtain a Special Area designation, the proposing government must submit a proposal to the IMO explaining how the area fulfills the criteria for the designation. A Special Area can be proposed for the waters of one or more states, or even an entire enclosed or semi-enclosed area. If two or more countries have a common interest in the area, they would likely need to submit a joint proposal. If the IMO approves the designation, it becomes effective only when there are adequate facilities in the area to receive the particular harmful substance from affected ships.

A Special Area could be designated to implement specific pollution prevention measures in the Bering Strait region, although this would have little impact on ship routing and communications. Regulations associated with Particularly Sensitive Sea Areas, discussed in the next section, would allow for more control over routing and communications.

Particularly Sensitive Sea Areas

A Particularly Sensitive Sea Area (PSSA) is "an area that needs special protection through action by IMO because of its significance for recognized ecological, socio-economic, or scientific attributes where such attributes may be vulnerable to damage by international shipping activities."¹² There are currently no PSSAs in Arctic waters.

PSSAs are designated along with specific measures (Associated Protective Measures), which could include the designation of the same area as a Special Area subject to pollution controls; the adoption of a ship routing or reporting system near or in the area; or other measures aimed at protecting the area against environmental damage from ships, provided that they have an identified legal basis.

To be identified as a PSSA, a proposed area must meet at least one of the ecological, socio-economic or scientific criteria identified by IMO. Ecological PSSA criteria include factors such as the uniqueness or rarity of the area; the presence of critical habitat in the area; the degree to which the area is representative of a certain habitat type; the area's diversity and productivity; the presence of spawning or breeding grounds or migratory routes in the area; or the naturalness, integrity, or fragility of the area. Social, cultural, and economic criteria include the extent to which people depend on the ecological health of the area for social or economic purposes; the extent to which the area is

important for the support of traditional subsistence or food production activities; or the presence of historical or archaeological sites. Scientific and educational criteria include factors such as whether an area is of particular scientific interest; whether it can provide a baseline for monitoring studies; or whether it provides an outstanding opportunity for education. In addition, an application for designation of a PSSA must describe the area's vulnerability to damage from international shipping activities.

Dynamic Protected Areas

Traditional vessel traffic management tools, including protected areas, sea traffic lanes, or speed limits, are usually fixed and static. However, marine systems are fluid and dynamic. It would be useful to develop maritime governance mechanisms that would flexibly adjust based on realtime or near-realtime ecological and social data.

One such emerging approach is dynamic ocean management. While using many of the same tools as traditional static management, such as Areas to Be Avoided or reductions in speed, dynamic management strives to constantly adjust the parameters of these tools on an ongoing basis. For example, the borders of a traditional protected area would stay the same through time, reflecting conditions present at the time of its creation; the borders of a dynamic protected area would be continually updated and adjusted (annually, seasonally, or perhaps even weekly) to reflect the most current environmental, social, and other relevant conditions.

Such dynamic management has significant pluses, including being able to maximize environmental protections and economic benefits. However, truly dynamic management systems are difficult to administer because they require significant data collection, analysis, and distribution. Legitimate stakeholder engagement, especially from industry, is key to long-term compliance. Regardless of these challenges, implementation of dynamic management approaches makes sense in areas undergoing rapid environmental and climatic changes—such as the Bering Strait region.

To establish a PSSA, a nation must submit an application to IMO proposing an area for PSSA designation and adopt associated protective measures. If multiple countries have a common interest in an area, they should submit a coordinated proposal.

5

EXAMPLES OF SHIP REGULATORY SYSTEMS IN PLACE

TORRES STRAIT: SHIP REPORTING SYSTEM AND VESSEL TRAFFIC SERVICE

This ship regulatory system provides a good example of incorporating various navigational measures in a strait separating two countries. The Torres Strait is an international strait between Australia and Papua New Guinea, in the waters along the Great Barrier Reef. Water depths are often shallow (much of the navigable route through Torres Strait is confined in both width and depth), and the area is subject to monsoon climate, with tropical storms and cyclones. Traffic is not heavy relative to other international straits (there are approximately 3,000 transits of Torres Strait per year by vessels larger than 50 meters), but it consists of many fishing vessels, tourist vessels, and recreational craft that pose collision risks.

The IMO adopted Australia's proposal for a Torres Strait Ship Reporting System (REEFREP) in 1996 as a mechanism to enhance navigational safety, reduce the risk of shipping incidents, and minimize ship pollution within the Great Barrier Reef and Torres Strait. The reporting system is mandatory for ships of 50 meters or more in length, ships carrying bulk hazardous or potentially polluting cargo, and ships towing or

pushing vessels in the aforementioned categories. Reports are sent to the REEFREP Vessel Traffic Service Center¹³ at least two hours prior to entering the REEFREP area from the outside, or when sailing from a port within the area.

Within an hour of entering the REEFREP area, ships must provide a passage plan, including vessel details, pilot information, and route/waypoint information. Vessels are required to submit reports if they suffer damage or significantly deviate from the route, course, or speed previously advised. The REEFREP system provides vessels with information on ship traffic, including potentially conflicting traffic movements, navigational assistance, and maritime safety information that includes unusual weather conditions.

The Torres Strait became a PSSA in July 2005, when the IMO approved a joint proposal submitted by Australia and Papua New Guinea. Two (2) two-way routes were adopted by IMO for application in Torres Strait as Associated Protective Measures (APMs). The Strait is also covered by a voluntary pilotage regime, an extension of the marine pilotage system used in the Great Barrier Reef area since 1990.

This REEFREP is credited with reducing the number of groundings, from one per year between 1997 and 2003 to only one incident between the years 2004 and 2009.

Village of Sireniki, located on the coast of the Bering Sea, surrounded by mountains, Chukotka, Russia
© Adobe Stock.

UNITED STATES EAST COAST: SHIP REPORTING AND ROUTING SYSTEMS

Two areas off the east coast of the United States make up a unique ship reporting system designed to protect the endangered North Atlantic right whale from ship strikes. The system applies to ships of 300 tons or more that enter Cape Cod Bay, Massachusetts Bay, and the Great South Channel east of Massachusetts, as well as the 90 nautical-mile stretch along the coasts of Florida and Georgia.

The Northern Reporting System covers much of a preexisting traffic separation scheme servicing Boston. When entering the system, ships are required to provide the ship name, call sign or IMO identification number, position, course, speed, route, and destination. The Coast Guard center informs ships that they are entering an area of critical importance for the protection of the whale, that whales are present, and that ship strikes pose a serious threat to whales and may cause damage to ships. Ships are requested to report any whale sightings and dead, injured, or entangled marine mammals to the nearest local Coast Guard station. Communications generally take place through satellite communications, or HF and VHF radio.

In 2006, the IMO approved a modification to an existing traffic separation scheme for the Boston/New England area in order to move large ships away from waters with high concentrations of whales and areas frequently transited by smaller fishing boats. The lane shift added 3.75 nautical miles to the overall distance traveled by ships along these traffic lanes, and 10 to 22 minutes to each one-way trip.

In 2008, IMO adopted a voluntary seasonal Area to Be Avoided off the northeastern coast for ships of 300 gross tons or more. The Area to Be Avoided corresponds to the whales' feeding area. The restriction goes into effect each year between April and July, when the whales face the highest risk of ship strikes in this area. That same year, IMO approved a proposal to narrow traffic lanes servicing Boston in order to reduce the threat of vessel collisions with right whales and other whale species. Each lane is now 1.5 nautical miles wide.

HIGH-TECH, LOW-COST WAYS TO REDUCE SHIPPING IMPACTS ON WHALES

In 2012, the National Oceanic and Atmospheric Administration (NOAA) developed an iPad and iPhone application, WhaleALERT, that warned mariners when they entered areas of high risk of collision with right whales in the Boston Channel. The free application also provided information about right whale management measures, including speed limits, Areas to Be Avoided, and the latest data about right whale detections, all overlaid on NOAA digital charts.

The latest version incorporates a long list of threatened and endangered whales, and covers US Pacific, Alaskan, and Canadian waters. The application alerts users when they enter "whale safety zones," including seasonal management areas (where NOAA requires certain vessels to reduce speed), dynamic management areas (where whale sightings can trigger temporary, voluntary speed restrictions or advisory notices), voluntary Areas to Be Avoided for key right whale habitats, and recommended routes (for densely populated whale habitats). The app also allows users to report any live, dead, or distressed whale sightings to the appropriate response agency, and automatically sends sightings to a central database used by scientists and resource managers to better understand whale feeding and migration patterns.

Since 2018, WhaleALERT Alaska has allowed users to report sightings of harbor seals hauled out on ice, and displays temporary course and speed restrictions for the "Whale Waters" of Glacier Bay National Park.¹⁴



Bowhead whales are one of many migratory species that transit the Bering Strait, often swimming under heavy sea ice for long distances
© Martha Holmes / WWF.

PUGET SOUND VESSEL TRAFFIC SERVICE

Vessel traffic in the Puget Sound/Juan de Fuca region is managed jointly by the Canadian and United States Coast Guards through a Vessel Traffic Service, a traffic separation scheme, and surveillance systems including radar and AIS. The United States and Canadian Coast Guards operate the VTS pursuant to the 1979 Agreement for a Cooperative Vessel Traffic Management System for the San Juan de Fuca Region, through three Vessel Traffic Centers. In 1981, the IMO approved Traffic Separation Schemes for this VTS. Since then, the routes have been modified several times to improve navigation.

INDUSTRY INITIATIVES

Since the Bering Strait's status is an international strait, the concept of freedom of navigation restricts the ability of the United States and Russia to implement mandatory navigational measures in this waterway. The maritime industry, especially insurance underwriters and oversight organizations, can play an important role in aiding compliance through establishing their own mechanisms for minimizing the environmental harms of shipping and increasing compliance by mariners. For example, the industry can establish Arctic or Bering Strait-specific practices that will minimize risks and adverse impacts from increased maritime activity.

Existing examples of such initiatives include the ship reporting system that the oil and gas industry funded during years of Arctic exploration pursuant to an agreement with the Alaska Eskimo Whaling Commission, and Alaska Alternative Planning Criteria (APC) networks, discussed in more detail below.¹⁵

EXAMPLES OF REGION-SPECIFIC MEASURES

Easily implemented risk reduction practices include speed restrictions and prohibitions of discharges in sensitive areas, as well as adherence to voluntary measures recommended by the regulatory agencies (such as Areas to Be Avoided and recommended routes). Importantly, Indigenous communities in the Bering Strait have expressed concerns about pollution from shipping activities, and want the entire Bering Strait region to be a zero-discharge zone.¹⁶

Alaska Eskimo Whaling Commission Conflict Avoidance Agreement

During the years of Arctic exploration by the US oil and gas industry, the Alaska Eskimo Whaling Commission (AEWC) entered into a Conflict Avoidance Agreement (CAA) with oil and gas industry companies whose operations and vessel traffic in the Beaufort and Chukchi Seas could interfere with subsistence hunting of the bowhead whale. Some of the CAA risk-mitigating concepts and dynamic protective measures can be useful for developing new safety initiatives in the Bering Strait.

The agreement operated during “open water season,” the period of the year when ice conditions permitted navigation or oil and gas operations to occur. The CAA established avoidance measures to be taken in the vicinity of subsistence hunting, including requiring each industry participant to hire a Marine Mammal Observer to work on board certain types of vessels.

It also required mariners to avoid areas of active or anticipated whaling activity, and vessels were advised to stay at least five miles offshore to avoid whaling areas. The CAA prohibited waste discharge in certain areas, imposed a speed limit of 10 knots for vessels in the proximity of feeding whales or whale aggregations, and specified additional precautions in case a vessel inadvertently approached within a mile of observed bowhead whales.

Alaska Alternative Planning Criteria (APC) Providers

Industry providers of marine emergency response services for Western Alaska present examples of industry initiatives that reduce risks of maritime shipping through mandatory and voluntary measures.

The non-profit Alaska Maritime Prevention and Response Network, created in 2011 by Alaska maritime industry stakeholders, assists vessel operators in maintaining compliance with US oil spill and pollution prevention regulations.¹⁷ In exchange for access to an array of resources, Network enrollees agree to certain risk reduction measures which include: providing advance notice of transit sailings, sailing on predetermined routes to mitigate risk, and timely notification of an occurrence. Importantly, the Network requires enrolled vessels to comply with recommended ATBAs established by the IMO.

Resolve/1-Call Alaska, another APC provider, also requires its client ships to adhere to strict routing measures and other prevention-related measures, including advance notice of transit. Adherence to IMO-designated ATBAs and other navigational requirements written into APC programs is a compliance requirement for vessels over 400 gross tons which are not on innocent passage (i.e., bound for, entering, or departing a US port). 1-Call Alaska staff also report that, through education and communication, they have seen a great level of voluntary compliance with established ATBAs from vessels on innocent passage.¹⁸

SPEED RESTRICTIONS

Speed restrictions can greatly reduce the risks and impacts of ship strikes for whales, as well as ship-to-ship collisions. Restricting vessel speeds protects whales from collisions in two ways: by reducing the risk of serious or fatal injuries if a strike does occur, and by increasing the odds that a whale will have sufficient time to react and avoid the collision.

Researchers estimate that in areas and periods of reduced speeds off the US east coast, the risk of a whale succumbing to a collision with a ship is reduced by 80 to 90%.

While reducing speed may increase cost because the voyage will be longer, slower speeds are more fuel efficient. Speed restrictions may have an additional benefit, that of reducing noise levels, which would be even more important in areas of marine mammal feeding and migration.

Speed restrictions should, however, be subject to maritime safety—for example, they should not compromise a vessel's ability to navigate in adverse conditions.

6

RECOMMENDATIONS FOR A BERING STRAIT SHIP REGULATORY SYSTEM

As rising temperatures lead to dramatic decline in Arctic Sea ice, more vessels are transiting the region's waters, posing new risks to wildlife, habitats and coastal communities. Marine vessel traffic, if not properly managed, poses a threat to Arctic ecosystems and people.

MAXIMIZING SAFETY

A ship regulatory system for the Bering Strait region should do the following:

- Prevent pollution.
- Provide for protected areas corresponding to wildlife habitat and subsistence use areas.
- Help avoid collisions with marine mammals and other vessels.
- Minimize interactions between hunters and commercial traffic in the region.
- Improve navigational safety by taking into account unique hazards of the region, including changing weather and ice conditions, remote location, and lack of infrastructure.
- Ensure rapid response to any maritime incidents and spills.
- Facilitate bilateral communication, management of vessel traffic, and emergency preparedness and response.

Considering all the information about the tools available to minimize and mitigate impacts of shipping, WWF has five recommendations for the Bering Strait.

1. Expand implementation of e-navigation measures and technology

The US Coast Guard should harness emerging e-navigation technologies to improve maritime safety and environmental protection in the Arctic. E-navigation measures and technologies of interest in the Bering Strait region include development of a dynamic, regularly updated Coast Pilot that will transmit relevant information to mariners when they are approaching an area; electronic aids to navigation; expanding the use of AIS technology to transmit most up-to-date navigational safety information (for example, information on hazards, weather, chart corrections, virtual navigation aids or discrepancies in aids to navigation, and even dynamic marine protected areas); issuing automated AIS alerts for vessels entering protected areas; providing information on transiting ships to Indigenous communities; and alerting transiting vessels to the presence of local boats. AIS technology can be integrated into a more complex ship routing and reporting system in the Bering Strait.



Icebreaker convoy north of the Bering Strait, along the Northern Sea Route
© Alexander Skryabin / WWF-Russia.



A Yupik resident building a traditional *Baidara* (Walrus skin whaling boat), Uelen, Chukotka, Russia © Staffan Widstrand / WWF.

2. Adopt modern, internationally accepted Sea Traffic Management measures

Given Russia's intentions to use the Northern Sea Route for transport of oil and gas to Asian markets, the United States should follow the precautionary approach and adopt the emerging Sea Traffic Management (STM) approach to improving maritime safety in the Bering Strait. STM is a modern paradigm of efficient realtime data exchange that has been presented to the IMO as the next important step in vessel traffic safety. The STM approach should guide creation of an organized traffic management process in the Bering Strait, for example, a Sea Traffic Coordination Center (STCC) that will enhance marine safety and environmental protection through efficient monitoring of traffic and provision of realtime information to and from vessels. The STCC can enable vessels to use the optimal route based on the latest information about weather, ice conditions, or the everchanging needs and behavior of marine wildlife.

The United States can enter into an agreement with coastal communities, local authorities, and Alaska Native organizations to share realtime information pertinent to subsistence hunters through the STCC. In order to ensure comprehensive coverage of the Bering Strait region and to achieve a mandatory ship reporting system, the United States needs to cooperate with Russia and develop a joint STCC. If the United States is unable to obtain Russia's cooperation or IMO's approval, it can consider having a unilateral reporting system for vessels in US waters.

3. Establish an Area To Be Avoided (ATBA) around the Diomed Islands in the Bering Strait and consider seasonal or dynamic protective areas for the region

The US Coast Guard should establish an ATBA surrounding the Diomed Islands in the middle of the Bering Strait, as was recommended by the US Coast Guard and many stakeholders that submitted comments on the Bering Strait Port Access Routing Study in 2015. Ideally, the United States and Russia should develop a joint transboundary ATBA and submit the proposal to the IMO for approval. If a transboundary ATBA is not possible, the United States should move unilaterally to establish an ATBA in the US waters of the Bering Strait, around Little Diomed. In either case, Russian participation will be essential for obtaining IMO approval and for ensuring that marine mammals will be protected throughout the entire region.

The US Coast Guard and NOAA should also collaborate with local residents and biologists to develop seasonal or dynamic marine protected areas which would respond and adapt to biological or environmental changes in real time. Such areas will help protect key places that are highly important to marine wildlife and improving safety of navigation in the region. Seasonal or dynamic designations of protected marine areas could include measures listed in the Alaska Eskimo Whale Commission's Conflict Avoidance Agreement for approaching whales, marine mammal observers, and zones prohibiting certain types of waste discharge (for example, making the Bering Strait a discharge-free zone, as has been voiced by Bering Strait tribes). Speed restrictions should be implemented for areas where bowhead whales or other animals are likely to be present, since reducing speed to 10 knots would significantly reduce the risk of bowhead whale mortalities from collisions.

4. Develop region-specific industry practices that will minimize adverse impacts and risks of increasing maritime activity

Given the Bering Strait's status as an international strait, the IMO is not likely to approve any mandatory navigational measures in this waterway that would restrict freedom of navigation for vessels on innocent passage. Interested stakeholders should consider other mechanisms for minimizing environmental harms of shipping and increasing compliance by mariners. The maritime industry, especially insurance underwriters and oversight organizations, can play an important role in aiding compliance through establishing Arctic and Bering Strait-specific standards of care that will minimize risks and adverse impacts from increased maritime activity.

The ship reporting system that the oil and gas industry funded during years of Arctic exploration pursuant to an agreement with the Alaska Eskimo Whaling Commission presents one example of such industry initiative. Another example is provided by the routing and advance notice requirements incorporated into the APC programs maintained by the Alaska APC providers, Marine Exchange of Alaska and Resolve/1-Call Alaska (see discussion on page 19). The industry can adopt other region-specific measures, including seasonal speed restrictions and waste discharge bans, through voluntary programs.

5. Strengthen domestic and bilateral emergency prevention and response capabilities

Finally, the United States should enhance its emergency preparedness and response capabilities in the Bering Strait, through domestic channels and by implementing existing treaties with Russia. Improved communication and reporting systems, expanded use of AIS to transmit relevant information to mariners in real time, and voyage planning will all help reduce the risk of accidents and collisions. The US Coast Guard should also work with Russia to establish detailed joint response mechanisms and protocols, and hold regular training exercises under the existing Joint Contingency Plan for oil spills.

CONCLUSION

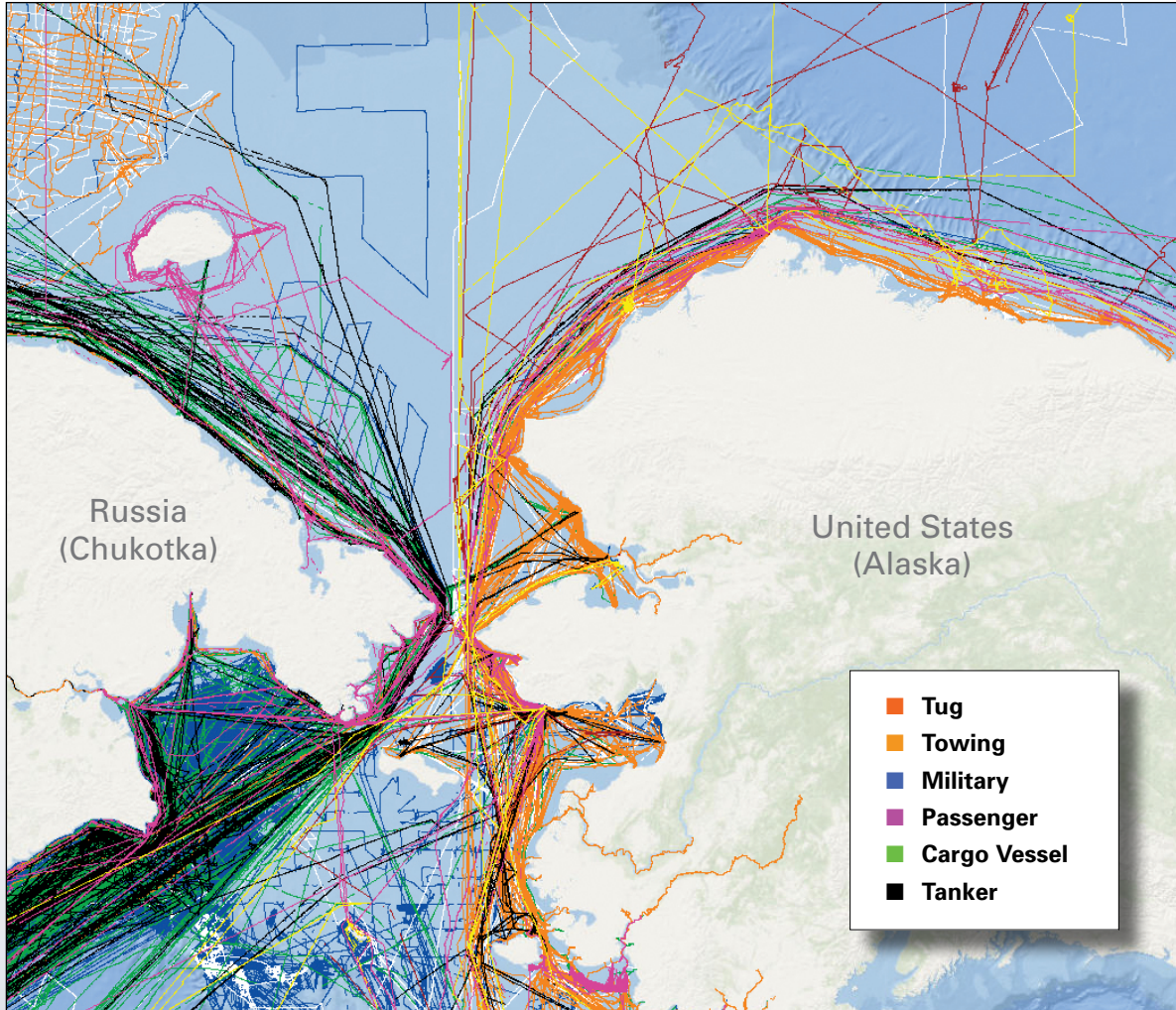
We have an opportunity to protect this new maritime frontier before it's too late. US–Russia collaboration will be essential to the success of our recommendations, from developing special protective areas and a joint vessel traffic management system, to improving joint oil spill preparedness and response systems. The United States and Russia need to continue taking proactive steps to ensure safe and environmentally sound shipping in this unique region.

ENDNOTES

- 1 Traditional Knowledge (TK) can provide valuable observations about connections between animals, water, and the weather. TK holders have important insights about appropriate behavior in the environment, including rules for ensuring safety while practicing subsistence. TK about long-term climate change or short-term weather changes can provide ways to understand and adapt to changes in the environment. See J. Raymond-Yakoubian, B. Raymond-Yakoubian, C. Moncrieff, *The incorporation of traditional knowledge into Alaska federal fisheries management*, Marine Policy Volume 78, April 2017, pp. 132-142.
- 2 The Alaska Chadux Corporation has oil spill response hubs in Kotzebue (established in the summer of 2016), Nome, Utqiagvik to the north, and Bethel.
- 3 The United Nations Convention on the Law of the Sea (UNCLOS) enshrines the concept of innocent passage through a coastal state's territorial sea. Passage is innocent so long as it is not prejudicial to the peace, good order or security of the coastal state. A vessel in innocent passage may traverse the coastal state's territorial sea continuously and expeditiously, not stopping or anchoring except in *force majeure* situations.
- 4 The nonprofit Marine Exchange of Alaska maintains a network of 130 AIS transceivers and receivers throughout Alaska, including four AIS transmitters (in Wales, Nome, Gambell, and Savoonga) and six receivers in the vicinity of the Bering Strait.
- 5 See Pew Trusts, *Vessel Waste a Growing Challenge in the Northern Bering Sea and Bering Strait* (October 10, 2018), available at pewtrusts.org/en/research-and-analysis/issue-briefs/2018/10/vessel-waste-a-growing-challenge--in-the-northern-bering-sea-and--bering-strait.
- 6 UNCLOS has not yet been ratified by the United States, but its navigation provisions confirm existing maritime law and are recognized by the United States as part of customary international law. As such, these provisions should be applicable to the Bering Strait.
- 7 Both the ESA and the MMPA authorize taking of marine mammals by Alaskan Natives for subsistence use.
- 8 Based on email communications with Marine Exchange of Alaska in January 2020.
- 9 See imo.org/en/OurWork/Safety/Navigation/Pages/eNavigation.aspx.
- 10 The Arctic Vessel Tracker App is available from either the AppStore (iOS devices) or GooglePlay (Android devices).
- 11 See IUCN Nome Workshop I and II reports (2012), available at: iucn.org/downloads/nome_workshop_report_final.pdf; and iucn.org/downloads/iucn_beringworkshopi2013.pdf.
- 12 See imo.org/en/OurWork/Environment/PSSAs/Pages/Default.aspx.
- 13 The center is manned 24 hours per day, 365 days per year, and is equipped with a sophisticated traffic information management tool that integrates and assists in analyzing all VHF communications, radar, LRIT, and AIS information that is relayed to REEFCENTRE. See msq.qld.gov.au/Shipping/Reefvts.aspx.
- 14 stellwagen.noaa.gov/protect/pdfs/whalealert_press.pdf; whalealert.org/; fisheries.noaa.gov/resource/tool-app/alaska-whale-alert-smartphone-app.
- 15 As described on p. 7, vessels transiting Western Alaska to or from a US port must have Alternative Planning Criteria (APC) in place in respect of oil spill response. The APC is required under US federal legislation for designated "Remote Areas" where full compliance with the National Planning Criteria is not possible.
- 16 Julie Raymond-Yakoubian, *Arctic Vessel Traffic and Indigenous Communities in the Bering Strait Region of Alaska*, *Sustainable Shipping in a Changing Arctic*, WMU Studies in Maritime Affairs 7, at 291, doi.org/10.1007/978-3-319-78425-0_16, also available at kawerak.org/wp-content/uploads/2018/08/Raymond-Yakoubian-2018.pdf.
- 17 The Network has implemented a Vessel Compliance Monitoring and Response System for Western Alaska that encompasses Arctic waters of the Bering, Chukchi, and Beaufort Seas.
- 18 Based on email communications with Resolve/1-Call Alaska in January 2020.

MAPS

ARCTIC MARITIME ACTIVITY IN THE BERING STRAIT IN 2019

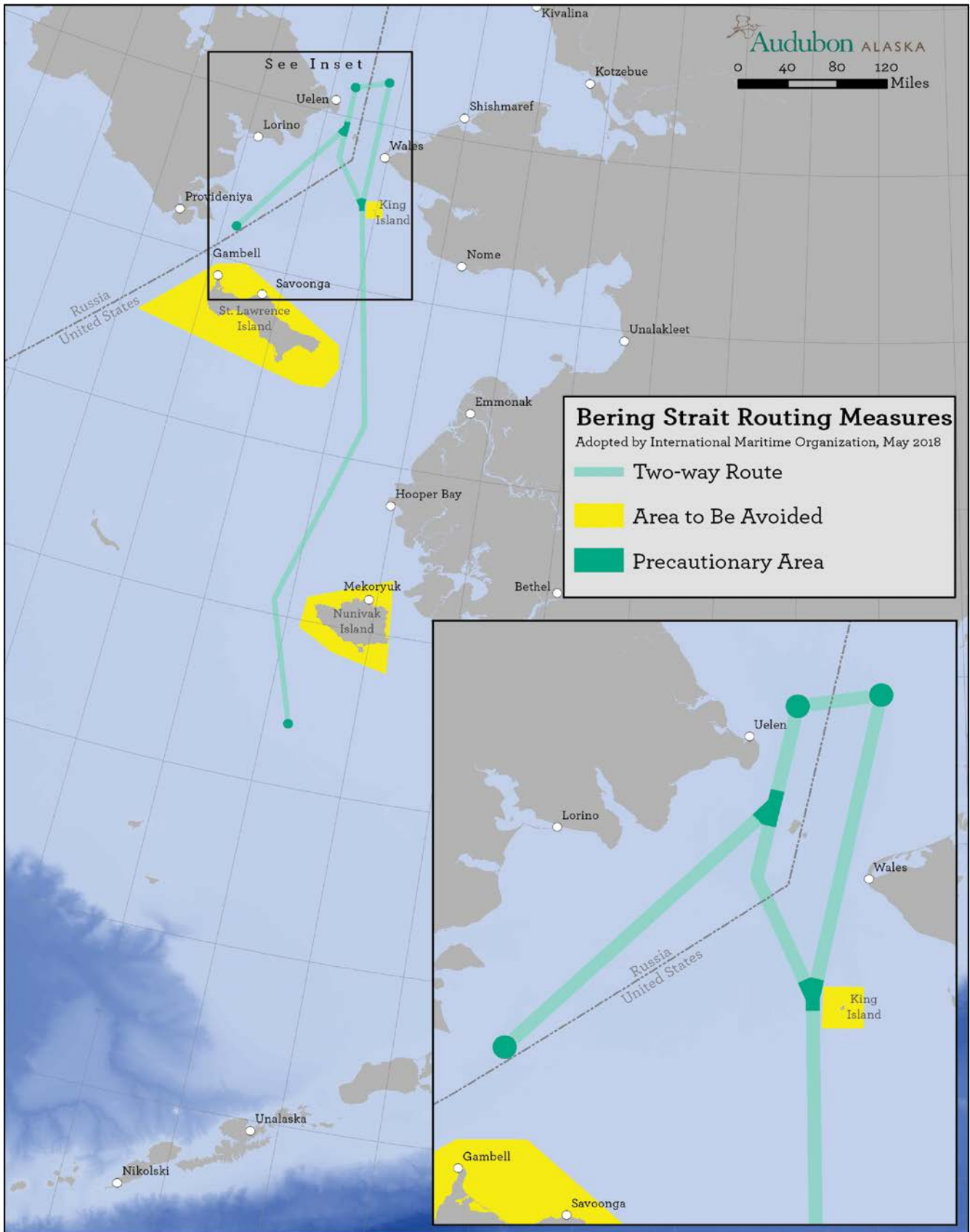


AIS records of Bering Strait traffic in 2019 show a prevalence of tanker or cargo vessels in the Russian waters, and tug/towing activity on the US side © Marine Exchange of Alaska.



A Northern Fulmar, a common seabird in the Bering Strait region, in flight © Elisabeth Kruger / WWF-US.

IMO MEASURES FOR THE BERING STRAIT REGION




In 2018 the IMO approved recommended routes for the US and Russian waters of the Bering Strait, and Areas to be Avoided around Saint Lawrence, King, and Nunivak islands © Audubon Alaska.

FACTS ABOUT THE BERING STRAIT REGION

- Few people outside of Alaska realize that the United States and Russia share a long maritime border. In fact, in the Bering Strait, Little Diomedede Island (US) and Big Diomedede (Russia) are just 2.4 miles apart; the international boundary passes between them.
- Over 13 thousand years ago, the area now known as the Bering Strait served as a land bridge that humans and wildlife used to travel from current-day Siberia to North America; today, the bridge is underwater and separates Asia from America.
- The Bering Strait, 53 miles wide at its narrowest, is one of the few waterways in the world that links two oceans.
- The region is home to thousands of Siberian Yupik, Central Yupik, Chukchi, and Inupiaq people who live in close contact with its abundant marine wildlife.
- The Bering Strait is a “marine mammal superhighway” and serves as a vibrant summer foraging and breeding area for bowhead whales, gray whales, belugas, and walrus.
- The Strait is a focal point for and millions of migratory birds, which breed, nest and feed in the productive waters here. More than 170 bird species regularly occur in the region.
- Changes in Arctic waters, including the decrease of sea ice, are making this region more friendly to sub-Arctic species, such as humpback, fin, and killer whales.
- For the past decade, vessel transits through the Bering Strait region have been steadily growing, and are projected to keep increasing in the years to come.

To learn more about this special area, please go to <https://www.worldwildlife.org/safety-at-the-helm>.



Black-legged kittiwakes nest on cliffs of Little Diomedede Island, with Big Diomedede Island visible across the international dateline, US-Russia border, and Bering Strait © Elisabeth Kruger / WWF-US.

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COVER PHOTOS

Beluga Whale © Kevin Schafer / WWF-Canon.

Hunter © Staffan Widstrand / WWF.

Walrus © Staffan Widstrand / WWF.

Seabirds © Elisabeth Kruger / WWF-US.

Tuboat and barge © Scott Dickerson / WWF-Canon.

Cruise boats like this one in the Bering Sea, are part of a growing ecotourism industry that may bring increased ship traffic to the Arctic and Bering Strait
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