



ARCTIC BLUE

CORRIDORS

**Safeguarding migrating
whales from growing pressures
for a connected Arctic Ocean**

**HERE WE PRESENT DATA ON
ARCTIC WHALE MIGRATIONS
ACROSS THE ARCTIC OCEAN.**

*We compare these with shipping activity
to raise awareness about the growing
threat of increased shipping to Arctic
whales and the actions needed to
ensure their protection.*



ARCTIC BLUE CORRIDORS

Arctic whales face **increasing pressures** on their journeys



The climate crisis is causing the Arctic to warm up to four times faster than the rest of the planet. This is reducing the thickness and extent of sea ice, extending the open water season and opening up new areas for industrial activities and shipping in the Arctic Ocean.



Shipping activity, particularly that of large industrial vessels, has increased over the last decade at a remarkable rate.

UNDERWATER NOISE

SHIP STRIKES

Whales in the Arctic move over vast distances, migrating between summer and winter habitats on routes known as **“blue corridors”**

The Arctic is home to three whale species found nowhere else on the planet. Narwhals, beluga whales and bowhead whales migrate between summer and winter habitats, often thousands of kilometres, across national borders and into the high seas. They take predictable routes, and these routes are known as blue corridors.

Blue corridors also bring whales from more southerly parts of the world up to the Arctic every summer to take advantage of the Arctic Ocean's bountiful food supply. The Arctic Ocean is a critical life support system for around a quarter of the planet's whale species.

Arctic blue corridors are important habitats for whales and they keep oceans connected for nature

Within blue corridors, Arctic whales carry out essential life activities such as mating, giving birth, feeding and socializing.

Their migrations along blue corridors generally follow the sea ice, and allow the whales to access everything they need across the year, including food, safety from predators, and sheltered places to raise young.

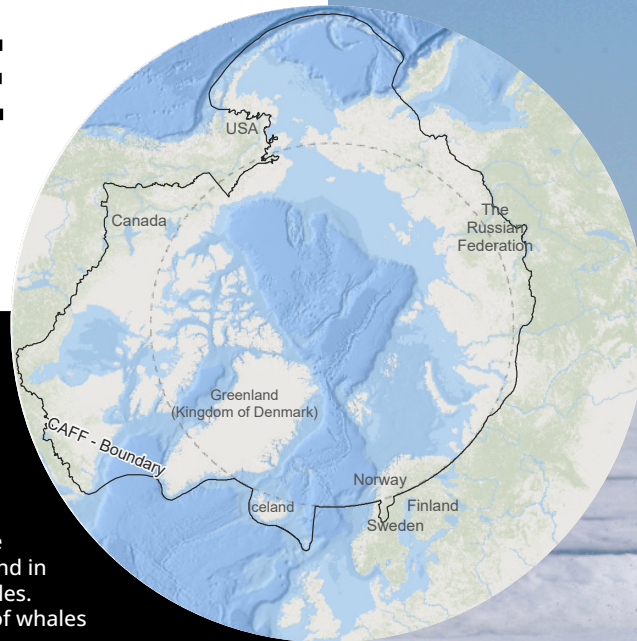
Action is needed to safeguard whales in blue corridors for effective conservation

We urge Arctic states, the Arctic Council, International Maritime Organization, shipping industry, and shipping companies to take action to safeguard migrating whales in the rapidly changing Arctic Ocean.

SUMMER HABITAT

WINTER HABITAT

ARCTIC WHALE MIGRATIONS



The Arctic

Ice and water dominate the Arctic and its ecosystems. Frozen most of the year, the Arctic Ocean contains diverse ecosystems and abundant, uniquely adapted wildlife. It is home year-round to three species of whales only found in the Arctic: narwhals, beluga and bowhead whales. It is also a summer destination for thousands of whales from southern waters.

The Arctic region is home to around 4 million people, including more than 500,000 Indigenous Peoples. The Arctic Ocean is surrounded by landmasses belonging to five nations. The Central Arctic Ocean lies beyond the boundaries of any one nation's jurisdiction.

Blue corridors

Like the wildebeest in Africa or birds across the globe, many whale species migrate between seasonal habitats.

Every spring and autumn, a great underwater migration takes place as tens of thousands of whales travel within, into, and out of the Arctic Ocean to take advantage of its food-abundant waters.

These migratory routes between important summer and winter habitats are known as **blue corridors**.¹

Some whales migrate thousands of kilometres from the tropics, while others move shorter distances within the Arctic. The Arctic Ocean is an important life support system for one-quarter of the planet's whale species.²



Photo © Paul Nicklen/WWF-Canada

Blue corridors are an essential part of whale life cycles.

They ensure the whales have access to everything they need throughout the year, including food, safety from predators, and sheltered places to raise young.³ As they migrate along these corridors, whales mate, feed, give birth, and socialize.

Knowing where migration routes are and when they are used is essential for safeguarding all Arctic whales during their migrations.

VISUALIZING WHALE MIGRATIONS

For the first time, blue corridors have been mapped across the Arctic Ocean for the three Arctic whale species: **narwhals, beluga whales and bowhead whales.**

These whales are uniquely adapted to the Arctic's icy waters and are found nowhere else on the planet. Like other migratory species, they follow environmental cues that signal a change in season, and their migration appears to be closely associated with sea ice.⁴

Information in these maps has been collated from publicly available sources, and data originates from a variety of methods including aerial surveys, ship-based observations, satellite tracking, Indigenous Knowledge and expert knowledge of Arctic whale migration.

The darkest blue areas represent the corridors with the most whale species and most information to support their presence. Based on our current knowledge, these areas could be considered 'superhighways' for Arctic whales.

Tracking whale migrations in the vast and harsh Arctic Ocean is challenging. Many coastal Indigenous communities have observed whale migrations for millennia, and continuous technological advances have made it possible for scientists to track migrating animals via satellite. Yet many gaps in our understanding remain, including how the climate crisis will affect whale migrations.



AUTUMN BLUE CORRIDORS
(active from September to November)

This map shows the blue corridors for the autumn migration, as the whales move from summer to winter habitats. At this time of year, much of the Arctic Ocean begins to freeze after summer, and the whales generally stay close to the ice as it advances south.



SPRING BLUE CORRIDORS
(active from March to July)

This map shows the blue corridors for the spring migration. After the long winter, the whales begin their journeys back towards their summer habitats as the ice cover recedes.



LEGEND





Photo © Paul Nicklen/WWF-Canada

Narwhals

Monodon monoceros

Narwhals live in the Arctic waters of Canada, Greenland, Norway and Russia, in 12 populations.

Narwhals are often called the 'unicorns of the sea', known for their long ivory tusks (1.5 to 2.5 m long) found almost exclusively in males. Narwhals are around five metres long and can live upwards of 100 years old.

These whales are one of the deepest diving marine mammals in the world, diving to depths of 1500 metres to feed. They feed most intensively in winter, while in summer they gather in large groups of hundreds and even thousands in bays and fjords where they raise their young and socialize.

NARWHAL AUTUMN CORRIDOR

As summer turns to autumn, narwhals begin to migrate from bays and fjords towards deeper waters as the ocean freezes. They travel quickly along coastal and more offshore corridors towards their wintering grounds in groups. Along the way, some stop over in fjords and productive deep-water canyons for days at a time, likely to feed.



LEGEND



NARWHAL SPRING CORRIDOR

During winter, narwhals do most of their feeding. They will dive and feed at great depths, spending more than three hours a day below 800 metres. As the sea ice begins to thaw, the narwhals move back towards their shallow, warm bays and fjords. Along the spring migration, narwhals mate and socialize with each other. As with beluga and bowhead whales, they must wait for cracks in the ice to form before they can venture too far from open water, since they breathe at the water's surface. Because of this, the spring migration can be much slower than the autumn one.





Photo © VDOS Global/WWF-Canada

Bowhead whales

Balaena mysticetus

Bowhead whales are found on both the Atlantic and Pacific sides of the Arctic, in three populations.

Bowhead whales are the longest living mammal on Earth and can live to be more than 200 years old. They are around 15 metres long and weigh between 60 and 80 tonnes.

Extensive commercial hunting, which began in the 16th century, severely depleted bowhead whale populations. Protected from commercial whaling for the last ninety years, they are recovering, although two of their three populations remain smaller than their pre-commercial whaling numbers.

BOWHEAD AUTUMN CORRIDOR

In summer, bowhead whales forage and the calves born in spring grow bigger. As the sea ice advances in autumn, the whales slowly follow the ice edge, using it as protection from killer whales, which cannot enter heavy ice-covered waters due to their tall dorsal fins. As the bowheads migrate with the ice edge, they linger to feed along the way, often travelling alone or in small groups.



LEGEND



BOWHEAD SPRING CORRIDOR

During winter, bowhead whales remain in semi-ice-covered waters that offer protection, a place to rest and food. As the sea ice begins to recede in spring, the bowheads travel back towards their summering grounds, following the ice edge or breaking up thinner sea ice with their heads. Along the way, they mate and give birth, with mothers and their calves typically migrating separately from others.





Photo © David Merron/WWF-US

Beluga whales

Delphinapterus leucas

Beluga whales occur in 21 populations across the Arctic. Some populations are resident in a single location year-round, others make short migrations between summer and winter habitats, and around six populations are considered migratory.⁵

Beluga whales are known for their stark white colouration, melon-shaped heads and song-like communication, and are often called the 'canaries of the sea'. They are the smallest of the three Arctic whales, ranging between 2.6 and 4.5 metres in length, and they live to 80 years old.

Belugas are highly sociable and often form groups ranging from a few individuals to hundreds of whales.

BELUGA AUTUMN CORRIDOR

During the summer, beluga whales gather in their hundreds or thousands in warm river estuaries, lagoons and shallow coastal waters. As the ice advances in the autumn, they migrate in large groups to their wintering grounds following the sea ice. The ice acts as protection from killer whales and supports a good supply of food.



LEGEND



BELUGA SPRING CORRIDOR

In the winter and spring, belugas mate. As the sea ice thaws, they follow the melting ice, feeding and socializing in groups. The spring migration typically brings them back towards the same summer grounds they used previously. These ice-free coastal waters, river estuaries and lagoons offer an optimal place to give birth, nurse, protect calves from killer whales, moult and feed.

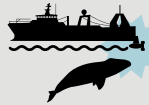


WHALES FACE GROWING THREATS ON THEIR JOURNEYS

The survival of Arctic whales depends on their ability to safely migrate within these blue corridors between important habitats.



CLIMATE CRISIS



SHIP STRIKES



UNDERWATER NOISE

The climate crisis is causing the Arctic to warm up to four times faster than the rest of the planet.⁶ This is reducing the thickness and extent of sea ice. In many parts of the Arctic, sea ice is retreating earlier in spring and returning later in autumn.

This not only affects migration cues for whales, but also their shelter from predators and food abundance.

Sea ice loss is extending the open water season and opening up new areas for industrial activities and shipping in the Arctic Ocean.

Shipping activity, particularly that of large industrial vessels, has increased over the last decade by a remarkable 37 per cent.

More shipping puts Arctic whales at a greater risk of being struck by ships and exposes them to higher levels of underwater noise pollution. This can result in death, severe injuries, disorientation and disturbance to whales.⁷

FROM 2013 TO 2023:



37%

more ships entering the Arctic

DOUBLED

The distance travelled by ships

Ensuring safe passage for whales through the Arctic is **more crucial than ever.**



Photo © Felix Cesare/WWF-US


AS SEA ICE DECLINES, A BATTLE FOR SPACE BEGINS

Shipping overlaps with many blue corridors in the Arctic

The orange lines on the map show tracks from all ships within the Arctic that transmitted their location via the Automated Identification System (AIS) from September 2022 to February 2023. This includes a variety of ship sizes, from fishing boats to large bulk carriers.

Several migration bottlenecks have been identified in the Arctic Ocean.⁸ They are typically the best or only route available to ships and animals and must therefore be used by both, often at the same time, leading to a high chance of overlap.

LEGEND

-  Blue Corridors
-  Ship tracks
-  Migration bottlenecks

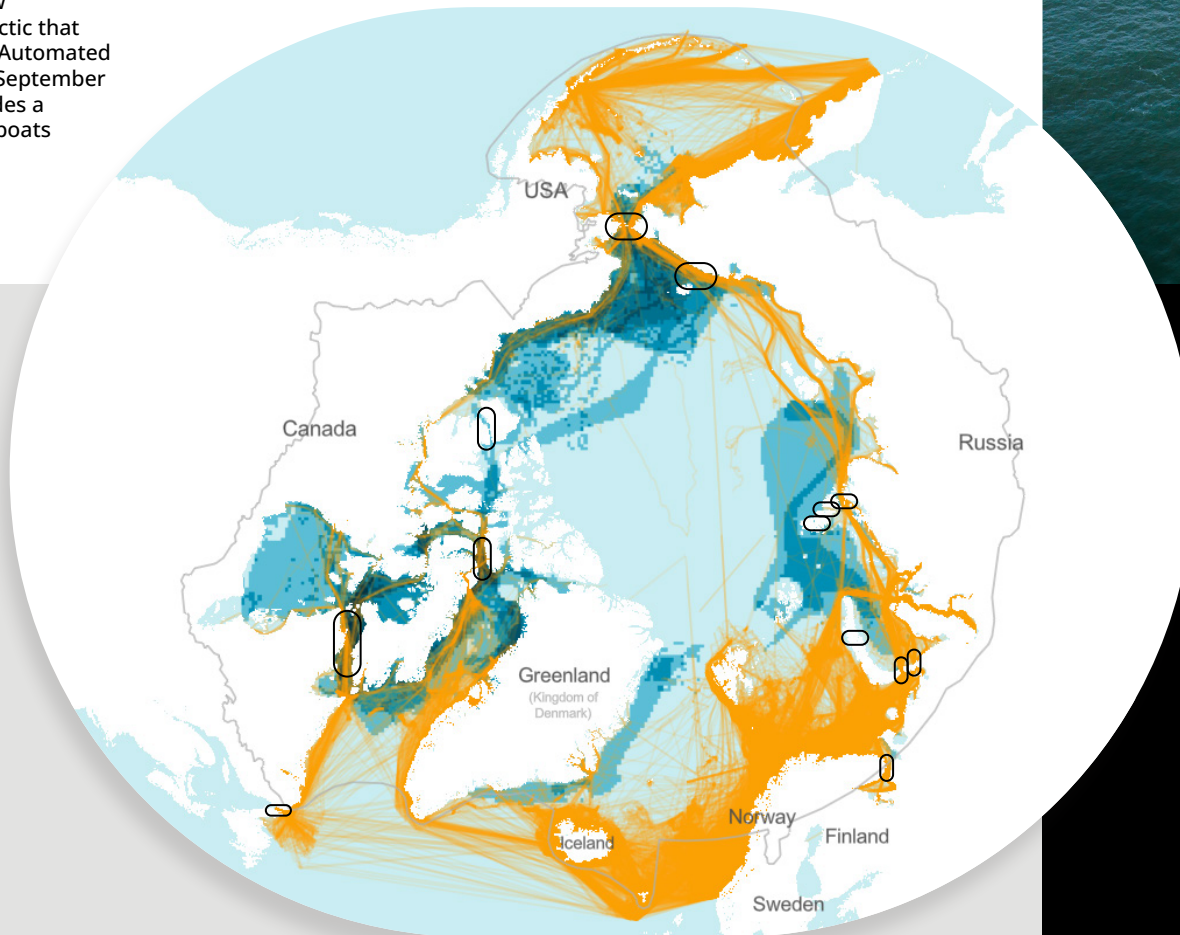
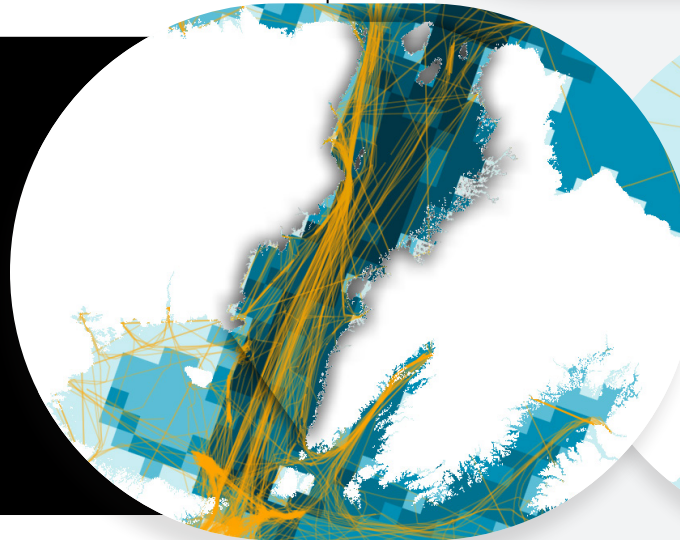
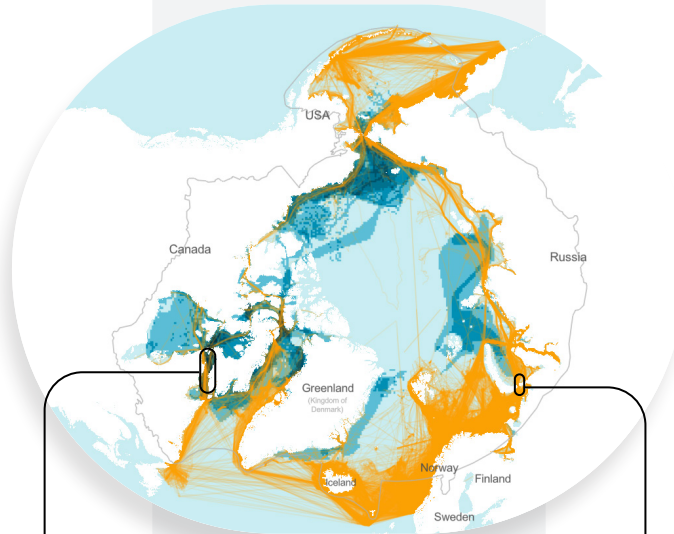


Photo © Robert So/Pexels

The overlap between shipping routes and blue corridors is especially problematic within narrow passages or **‘migration bottlenecks’**, where ships and migrating whales both travel.

Hudson Strait

Canada's Hudson Strait is a migration bottleneck that connects Hudson Bay and the Northwestern passages with more southern domestic ports and international ports in the North Atlantic. It facilitates grain export, nickel transport, and services remote communities. The strait, about 700 km long and 100 km wide at its narrowest point, supports year-round shipping with icebreaking vessels, mainly for nickel transport to southern Canada. Shipping traffic, currently moderate, is rising due to the longer ice-free season and potential expansion of the Baffinland Mary River Iron Mine, which could increase vessel traffic year-round via Foxe Basin.⁹

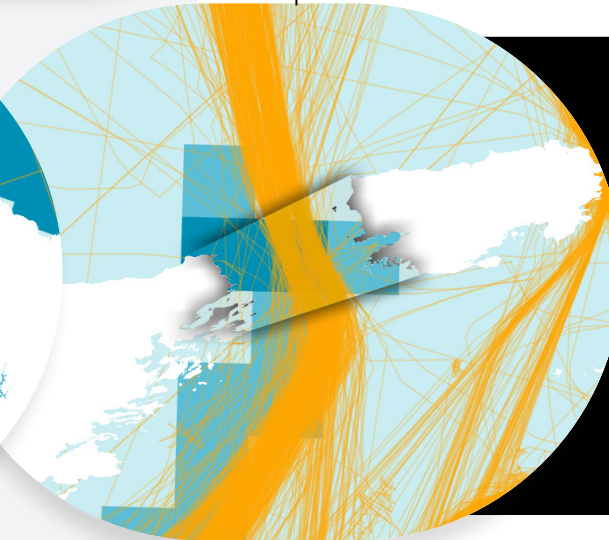


The Hudson Strait is a well-established 'superhighway' for thousands of marine mammals, including all three Arctic whale species, as they migrate through the strait in spring and autumn, with many staying over winter. Its special oceanographic characteristics make it a productive and vital area for marine life.¹⁰

With ship traffic in the area increasing, regulations on shipping are urgently needed to safeguard whales.

Kara Strait




Russia's Kara Strait, a 56 km-wide migration bottleneck, is an important part of the 5600 km-long Northern Sea Route (NSR), connecting Europe and Asia. Previously frozen for much of the year, sea ice loss along the Northern Sea Route has made it more accessible, providing a potentially attractive alternative to other shipping routes. Since 2010, the NSR has experienced a significant rise in ship traffic, with a nine-fold increase in the volume of cargo being transported.¹¹ Much of the ship traffic through the Kara Strait is transporting oil and natural gas (LNG) from nearby onshore and offshore extraction sites. As of 2023, the traffic was mostly west-bound, towards European ports, and Europe accounted for 80 per cent of Russian LNG sales by sea.¹²



The Kara Strait is an important area for marine mammals and seabirds¹³ yet little is known about Arctic whales' use of the strait. Research has identified the Kara Strait as a blue corridor for beluga whales; however, it is not known if nearby populations of narwhals and bowhead whales also use it.

Filling knowledge gaps on whale migratory behaviour in the Kara Strait, while also exercising a precautionary approach to further growth in shipping, is a high priority.

LEGEND

-  Blue Corridors
-  Ship tracks
-  Migration bottlenecks

SAFEGUARDING MIGRATING WHALES IN THE ARCTIC

The battle for space between migrating whales and ship traffic is not a local issue: it is a pan-Arctic problem.

Whales do not recognise borders.

The blue corridors of many whale populations span multiple national borders and the high seas. Climate change is already having profound effects on whale migrations in parts of the Arctic¹⁴, yet exactly how they will continue changing is not certain. Adding to these pressures is the unprecedented growth in Arctic shipping.

Action is needed to safeguard whales in blue corridors for effective conservation.

We urge Arctic states, the Arctic Council, International Maritime Organization, the shipping industry, and shipping companies to take action to protect migrating whales in the rapidly changing Arctic Ocean.

To fulfil global and regional commitments to protect and conserve vital ocean habitats, secure connectivity, and reduce threats to marine life, we call for the following actions to be implemented:

For Arctic States:



▶▶ Incorporate Arctic blue corridors into planning and implementation of the United Nations Global Biodiversity Framework to protect at least 30 per cent of oceans and sustainably manage the remaining 70 per cent by 2030.



▶▶ Ensure policies and management decisions are flexible and adaptive to the changing migration patterns of Arctic whales.

For the Arctic Council:



▶▶ Recognize Arctic blue corridors as important elements of ecological connectivity that must be secured through area-based conservation and marine spatial planning at the whole-ocean scale.



▶▶ Support Arctic states in implementing the Global Biodiversity Framework by 2030, including by establishing an ocean-scale spatial database for monitoring marine biodiversity and informing conservation planning and implementation at all levels.

For the shipping industry and shipping companies:



▶▶ Consider blue corridors in ships' voyage planning.



▶▶ Move shipping routes away from blue corridors wherever possible.



▶▶ Slow ships down to 10 knots or less, where ships must take the same routes as migrating whales.



▶▶ Innovate and invest in underwater noise reduction from ships through maintenance, design and technology.

For the International Maritime Organization:



▶▶ Recognize that the Arctic region requires special management of underwater noise from shipping and develop special guidance to achieve this.



▶▶ Mandate ships operating in Arctic waters to implement measures that protect marine mammals, as per Chapter 11, section 11.3.6 of the International Code for Ships Operating in Polar Waters (Polar Code).

For the research community:



▶▶ Lead collaborative and large-scale efforts to fill knowledge gaps and ensure monitoring of whale migrations in the Arctic through science, Indigenous Knowledge and local knowledge.



▶▶ Make data on Arctic whale migrations publicly available to inform decision-making.



Photo © VDOS Global/WWF-Canada



Photo © Sophie Lanfear/Silverback/Netflix

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MAKE SPACE FOR MIGRATING WHALES AND KEEP THE ARCTIC CONNECTED, FOR NATURE

An online report has been created by the WWF Global Arctic Programme. It serves as a call to action to safeguard migrating whales from growing pressures.

[Click here to view the online report](#)



Photo © Doc White/WWF

SPATIAL DATA DISCLAIMER

The spatial data in this online report were compiled from publicly available sources. The Arctic delineation used in the maps is from the Arctic Biodiversity Data Service (CAFF, 2023). The migration bottleneck boundaries were derived from [the ArcNet Guide](#). Author is not liable for positioning inaccuracies, subsequent updates, errors or omissions of data.

BLUE CORRIDORS MAPS

The Blue Corridors maps were produced by the WWF Global Arctic Programme using compiled publicly available data selected to represent Arctic whale migrations. Further information on the methodology behind the maps can be found [here](#).

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