THE CIRCLE

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The opening Arctic:

Sailing into unknown seas

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Contents

ARCTIC SHIPPING

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Mt Mastera breaking through ice.
Photo: Neste Oil

COVER: The Canadian Coast Guard Ship *Louis S. St-Laurent* makes an approach to the U.S. Coast Guard Cutter *Healy* in the Arctic Ocean Sept. 5, 2009.

Photo: Patrick Kelley, U.S. Coast Guard

Shipping in tomorrow's Arctic

SHIPPING MEANS many things to the various people that live and work in the Arctic. To local communities it means the seasonal supply of essential provisions. To the fishermen that ply their trade in the Barents Sea it is the means to access and harvest one of the largest sources of white fish on the planet. It is the means to deliver the petroleum and minerals from the far north to the markets of Europe, America and Asia. 'Shipping' could even be used to describe the small craft used by Indigenous communities to harvest fish and marine mammals. Indeed many forms of shipping have been an essential component of human endeavour in the Arctic for hundreds of years.

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However, climate change and increasing arctic industry have delivered a new perception of arctic shipping. Headlines in the world's media are announcing the opening of new trade routes in the wake of receding sea ice. The Arctic is proclaimed widely as the world's last untapped hydrocarbon reservoir, and an increasingly important and accessible source of coal and minerals. As the wilderness areas of the world continue to diminish, tourists and explorers are looking to the poles as the ultimate nature experience.

The diversity of shipping in the Arctic goes hand in hand with a diversity of opinion regarding what the future will hold. As usual when producing *The Circle*, we have asked people from a variety of sectors and backgrounds to outline what they see as the challenges and ways forward for arctic shipping, hoping in this way to fuel international efforts to identify gaps and develop solutions.

> **"The diversity of shipping in the Arctic goes hand in hand with a diversity of opinion regarding what the future will hold.**

The Indigenous perspective on shipping presented here highlights the importance of respecting the rights and livelihoods of the people in the Arctic. The NGO contributors outline the unique natural values of the Arctic and the need for precautionary approaches, given the uncertainties and risks related to arctic shipping. The legal perspectives point out that the current legal regime is left open for interpretation, while also outlining the ongoing processes to ensure better regulation through mandatory measures and a Polar Code for shipping. The national and security perspective contributors outline the attractive economic potential and strategic interests linked to arctic shipping. Finally, the commercial perspective provides a reality check for everyone who thinks that trans-arctic shipping will be the norm before the middle of this century.

While few look at the issue of shipping from the same angle, important trends can be seen. We hope that these trends, facts and opinions will contribute to a better understanding of the shipping challenges that emerge as the ice is melting, and ultimately to governance and industry solutions that will be effective and appropriate for tomorrow's Arctic. ○

Sculptures carry climate message from Greenland

Photo: Cool(E)motion

IN MARCH, WWF joined internationally renowned Dutch sculptor Ap Verheggen and his Cool(E)motion team in launching a novel method of bringing the message of arctic climate change to the world. The team erected two sculptures on icebergs off the west coast of Greenland that will then drift southward with the icebergs, ultimately melting into the sea.

"In this time when people are trying to throw doubt on the reality of climate change, it is important that we continue to demonstrate that climate change is real, is happening now, and is triggering vast changes in the Arctic," said Gert Polet of WWF-Netherlands. "Partnering with artists and Greenlandic people helps us to show that climate change is not an issue just for environmentalists, but an issue for everybody."

The more than lifesize sculptures represent a stylized whip with which Inuit guide their dog teams through the Arctic. Sculptor Ap Verheggen came up with the concept after being impressed with the impacts of climate change on the daily life of the northern people.

"The Inuit culture, their entire way of life is being threatened by climate change," said Verheggen. "In visiting the Arctic to prepare for this project, Inuit have told of their concern about the disappearing sea ice and how it makes their day-to-day life and work more and more difficult. Cool(E)-motion will use slowly decaying art to visualize for the world the consequences of climate change not only on the natural environment in the vulnerable Arctic but also on cultural aspects of its Indigenous peoples."

In the spring melt, the icebergs will likely start to drift south, past the east coast of North America. Monitoring devices aboard the icebergs will allow people to track their progress via the Internet. The sculptures are fitted with a web camera and transponder and can be tracked on Google Earth at www.coolemotion.org.

Report on the costs of a melting Arctic

THE PEW Environment Group's Oceans North Programme released recently a report estimating the dollar figure to society of a melting Arctic. The report, titled *Arctic Treasure: Global Assets Melting Away*, "for the first time quantifies the global cost of the Arctic's declining ability to cool the climate, indicating that the rapid melting of the region could carry a minimum price tag of $2.4 billion (2 400 000 000 000) US by 2050".

A new Polar Code

IN FEBRUARY, the International Maritime Organization (IMO) began developing a new mandatory Polar Code for shipping. The process is expected to take 2-4 years. WWF has submitted input to IMO, outlining the essential elements of a Polar Code. If enacted, it will constitute a major step forward in ensuring the safety of shipping in ice-covered waters and protection of the polar environments.

An arctic primer

LOOKING FOR a basic primer on the twin issues of climate change and industrial development in the Arctic? A new book called *After the Ice – Life Death, and Politics in the New Arctic* would be a good place to start. The book is especially strong on its examination of potential oil and gas development, and gives a good layperson's explanation of the forces operating on the arctic ice. The information is up to date, and the author (Alun Anderson) makes a decent attempt at including Indigenous and community perspectives as well as those of scientists and experts.

Walrus-polar bear conservation exchange

Map: Ketill Berger, Film & Form

IN FEBRUARY, WWF in Alaska and the US Fish and Wildlife Service hosted three Chukchi Indigenous leaders and one Russian biologist to share their experience observing changes in polar bear and walrus distributions, primarily due to climate change.

"The walrus and polar bear have taken care of our needs for many years. They are now experiencing difficult times and it is our turn to care for them," said Sergei Kavriy, head of the Russian polar bear commission of the Chukotka Association of Traditional Marine Mammal Hunters and the local representative for the Russian Association of Indigenous Peoples of the North (RAIPON). Kavriy, and the three other visitors Vladilen Kavriy, Fedor Tymnitagin and Anatoly Kochnev have been instrumental in developing "Umky" (polar bear) patrols in Vankarem, Chukotka.

The polar bear patrol project was established in 2006 at the initiative of the people of Vankarem, with support from WWF. The patrol – which now has become a model for other communities in Chukotka – works to ensure the safety of people living near polar bears, to preserve walrus haul-outs and other unique places, and to help local people participate in scientific projects on polar bears and other animals. In order to keep local people safe, Umky patrol members escort children to school and to daycare, patrol the village for bears, and keep people informed about the current situation.

Patrol members have also participated in wildlife monitoring and observation, and have collected valuable information that is informing experts around the Arctic about change in the region.

During the stay the Chukotka team visited several villages on Alaska's North Slope, and participated in a number of meetings in Anchorage where they shared their unique experiences. They also shared their stories on the Alaska Public Radio Network.

"The Umky patrol represents a grassroots effort to not only protect wildlife and nature, but also to better understand what is happening with polar bear and walrus populations in the region," said polar bear coordinator Geoff York. "Meaningful conservation is only possible when local people are informed and engaged on the ground. They are the front line as we work to understand what is occurring in the arctic regions and as we work together in finding solutions."

Melting ice bear in London

TO COINCIDE WITH last year's UN Climate Conference in Copenhagen, WWF-UK co-sponsored a life-sized ice sculpture of a hunting polar bear in Trafalgar Square. For twelve days the London Ice Bear slowly melted, revealing a bronze skeleton, a pool of water and a powerful environmental message. Visitors were encouraged to touch and shape the bear - symbolic of how we all have the power to create positive change.

The Ice Bear was a huge success attracting thousands of visitors to the sculpture and to the WWF website. The launch was a momentous, almost chaotic occasion officiated by arctic explorer Pen Hadow and children from WWF-UK's eco schools. Other attendees included Ed Miliband's Department of Energy and Climate Change and a representative from PR Week who said it was the "best campaign" he'd seen in a long time.

Photo: WWF

A TALE OF TWO PASSAGES

Last summer, two expeditions set out to sail through the historic northern waterways. One sailed through the Northwest Passage from west to east, with four crew and the 40 foot *Silent Sound*. Another went through the Northeast Passage, with a crew of eight and 60 foot *Explorer of Sweden*. CAMERON DUECK and NEIL HAMILTON experienced firsthand that voyages which previously took years now can be done in a few months, due to the melting sea ice.

Sailing through the me

Silent Sound *in the Nortwest Passage, summer 2009.*

lting ice – a glimpse of the future

Photo: Cameron Dueck

"**HAVE YOU SEEN** our barge? Do you know when it's coming?"

The questions were shouted over 100 meters of quiet water in the bay in front of Ulukhaktuk. The remote Victoria Island town clearly didn't get many visitors by sea, and the sight of a sailing yacht dropping anchor in the bay attracted attention. If we had come by sea it meant we must have knowledge of who else was headed their way. Most importantly, we might know if their barge was on its way.

Their question was one we were asked in many ports, and rightly so. There's not much long-range marine traffic in the Arctic, and if we were to have crossed paths with a barge we'd likely have noticed it. Unfortunately we had not seen their barge, so they'd have to wait a little longer for their annual supply of soft drinks, ATVs, boats and furniture. And that meant paying high prices for air-delivered goods. A can of Coca-Cola flown in by airplane once the year's barge-delivered supplies were depleted could fetch $5. The day the barge arrived the market for canned soft drinks would plummet to $1.

It's hard to argue against the benefit of increased access to the remote communities in the Arctic, at least on economic terms. Isolation is the main reason why the cost of living is so high in the Arctic, and although shipping will remain limited to summer months, increased traffic can only help lower prices. What is true for soft drinks must apply to all the other modern day conveniences that arrive in the Arctic by sea and air.

Sailing a 40-foot yacht through the Northwest Passage gave me a unique glimpse of what arctic shipping could mean. Just as I jumped at the opportunity to sail these historic waters now that climate change is melting the sea ice for a few weeks each summer, shipping companies are also eyeing northern waters.

While shipping into the Arctic is already increasing, it's hard for me to imagine that trans-arctic commercial shipping will ever become more than an occasional occurrence. One of the most difficult factors of sailing the passage was its unpredictability in terms of ice coverage. I had to adjust *Silent Sound's* sailing plans several times in order to account for the ice, which was either melting more slowly or moving faster with the wind and current than I'd expected. A large container ship can push through far more ice than a small sailing boat, but arctic waters remain very unpredictable for an industry that has come to measure port departure and arrival times down to the hour.

What would it mean if ships were to begin regularly sailing through the Arctic in order to get from the Atlantic to Pacific waters? It would certainly mean that Canadian authorities would have to spend time and money creating and maintaining a better buoy system in the Arctic. Lights, buoys and other markings are scarce in the Arctic, and many that are in place are in disrepair due to the extreme weather conditions. When we sailed through the Arctic we encountered icebreakers from the Canadian Coast Guard on several occasions, but if there was to be steady commercial traffic much more rigorous monitoring would be needed.

Increased traffic could bring a few jobs to the Arctic, but not many. Ships traveling from Asia to Europe and back would have no need to stop in the Arctic, so it's unlikely there will be much of an increase in ports and services such as bunkering. ○

"What would it mean if ships were to begin regularly sailing through the Arctic in order to get from the Atlantic to Pacific waters?

CAMERON DUECK led the Open Passage Expedition through the Northwest Passage last summer. His journalism career has spanned the globe, from North America to Europe and Asia, with regular escapes to sea to satisfy his passion for offshore ocean sailing. Dueck, originally from Canada, now lives in Hong Kong, where he is writing a book and producing a television documentary about his voyage through the Northwest Passage.

A passage with history

Explorer of Sweden *in the Northeast Passage, summer of 2009.* Photo: WWF

THE NORTHEAST PASSAGE is much longer, less travelled, and may turn out to be much more important than its Canadian equivalent simply because of geography: the Northeast Passage is the natural arctic link between the eastern and western hemispheres.

The strategic value of the route was recognised by Russian leaders in the 17th century not long after their early explorations of their northern domains. A series of expeditions mapped the coast and charted the waters along Russia's northern boundary from 1730 until 1741, an incredible exercise led by people with almost mythical names: Laptev, Chelyuskin, Malygin, and Bering. Later, in 1820, the Russian Admiralty despatched Baron Ferdinand Wrangel to explore the frozen Chukchi Sea where he almost reached the island that today bears his name.

After several attempts at reaching the North Pole, the Swedish scientist and explorer Adolf Erik Nordenskiöld turned his attention to transiting the Northeast Passage. The voyage began in 1878 in Tromsø and although he was stopped by ice only 200 km short of the Bering Sea, the following July he completed the transit and sailed home via Japan and the Suez Canal.

HOPED-FOR ARCTIC HIGHWAY

Based on the premise of opening a trading route the voyage was almost certainly an economic failure. It provided impetus however for others, including Fridtjof Nansen, to explore the Barents, Kara, Laptev, and Chukchi Seas. No one was able to make the voyage to the Bering Strait in one year because of the short summer season and the ubiquitous presence of sea ice.

The Soviet Union prioritized the 'Northern Sea Route' as a major development project in the 1930s. It was 1932 before the first ship passed along the route in a single season. The passage failed to become the hoped-for 'Arctic Highway' in spite of massive investment in science, navigation aids and the highly subsidised development of towns and other infrastructure. Ultimately this coincided with defence policy and the Northeast Passage played a significant role in the 'Arctic Game' during the Cold War.

The collapse of the USSR led to the implicit abandonment of the policies promoting the Northern Sea Route, and importantly led to the almost complete depopulation of the Russian Arctic region: about 90 per cent of the people in this massive region have left since 1991, the infrastructure has collapsed, and almost all economic activity has stalled (a couple of mines excepted).

Yachts in the waters to the north of Russia are a relatively new phenomenon: the intrepid Nikolai Litau sailed

"I think we are well past the tipping point and need to start thinking about, and managing, the Arctic Ocean as a very sensitive marine area.

DR NEIL HAMILTON trained initially as a geologist (B.Sc. (Hons)) and later as a geographer (M.App. Sc., Ph.D) and a strategic analyst. He has worked with leading international research institutes to investigate options for dealing with climate change and has extensive experience in the development and management of large scale international environmental research programmes. Most recently, he was the Director of the WWF International Arctic Programme, and Leader of the WWF Arctic Network Initiative.

west from the Bering Strait in 1998 but had to overwinter before completing the voyage. My French friend Erik Brossier is believed to be the first person to transit the Northeast Passage in a sailing yacht in a single season in 2002, closely followed by Arved Fuchs of Germany.

COMPLETE OPENING

However the summer of 2009 proved different, perhaps prompted by the complete opening of the passage in 2005 and again in 2008. At least three sailing boats made it through in 2009, and I have heard of at least five more.

One of those yachts, the *Explorer of Sweden* expedition led by Ola Skinnarmo, carried WWF staff from Svalbard to the Bering Strait. I sailed with the crew from Kirkenes to Tiksi. *Explorer*, an extraordinary 18 metre steel expedition cruising yacht, was recreating the voyage of Nordenskiöld, except that we were able to do the entire voyage in record time due to the declining arctic sea ice.

Despite being familiar with the science I was amazed at how little ice was present in the traditional 'pinch points' like the Vilkitsky Strait. At Cape Chelyuskin (the northernmost point of the Eurasian mainland) for example, there was a 30 km wide ice-free strait in a place which is normally solid fast ice. Attempting to land at Cape Chelyuskin we found thin mobile sea ice blown against the coast by northerly winds. In the Kara and Laptev Seas, often completely covered in ice, we saw only two lonely icebergs, glacial ice that had calved off glaciers in Zevernaya Zemlya. The sea ice was totally gone.

I took home many thoughts from the voyage, not least an appreciation of the vastness of the Arctic Ocean, and its freedom from the obvious impacts of human activity. It gave me hope for the future. As for the sea ice, I think we are well past the tipping point and need to start thinking about, and managing, the Arctic Ocean as a very sensitive marine area. The conditions experienced by the early explorers, like Nansen and Nordenskiöld, no longer exist. ○

A groundbreaking arctic shipping assessment

Last year, the *Arctic Marine Shipping Assessment (AMSA) 2009 Report* was approved at the Arctic Council Ministerial Meeting in Tromsø, as the first of its kind for the entire Arctic. AMSA chair and US co-lead, LAWSON BRIGHAM, provides an overview of the key issues and his personal perspectives on what is undoubtedly one of the most comprehensive arctic shipping assessments to date.

AT THE 2004 Arctic Council Ministerial Meeting in Reykjavik, the ministers called for an 'arctic shipping assessment'. For the next five years, nearly 200 experts led by Canada, Finland and the US under the Council's working group on Protection of the Arctic Marine Environment (PAME) analysed current and future arctic marine activity. The focus is on arctic marine safety and environmental protection, consistent with the Arctic Council mandates of environmental protection and sustainable development.

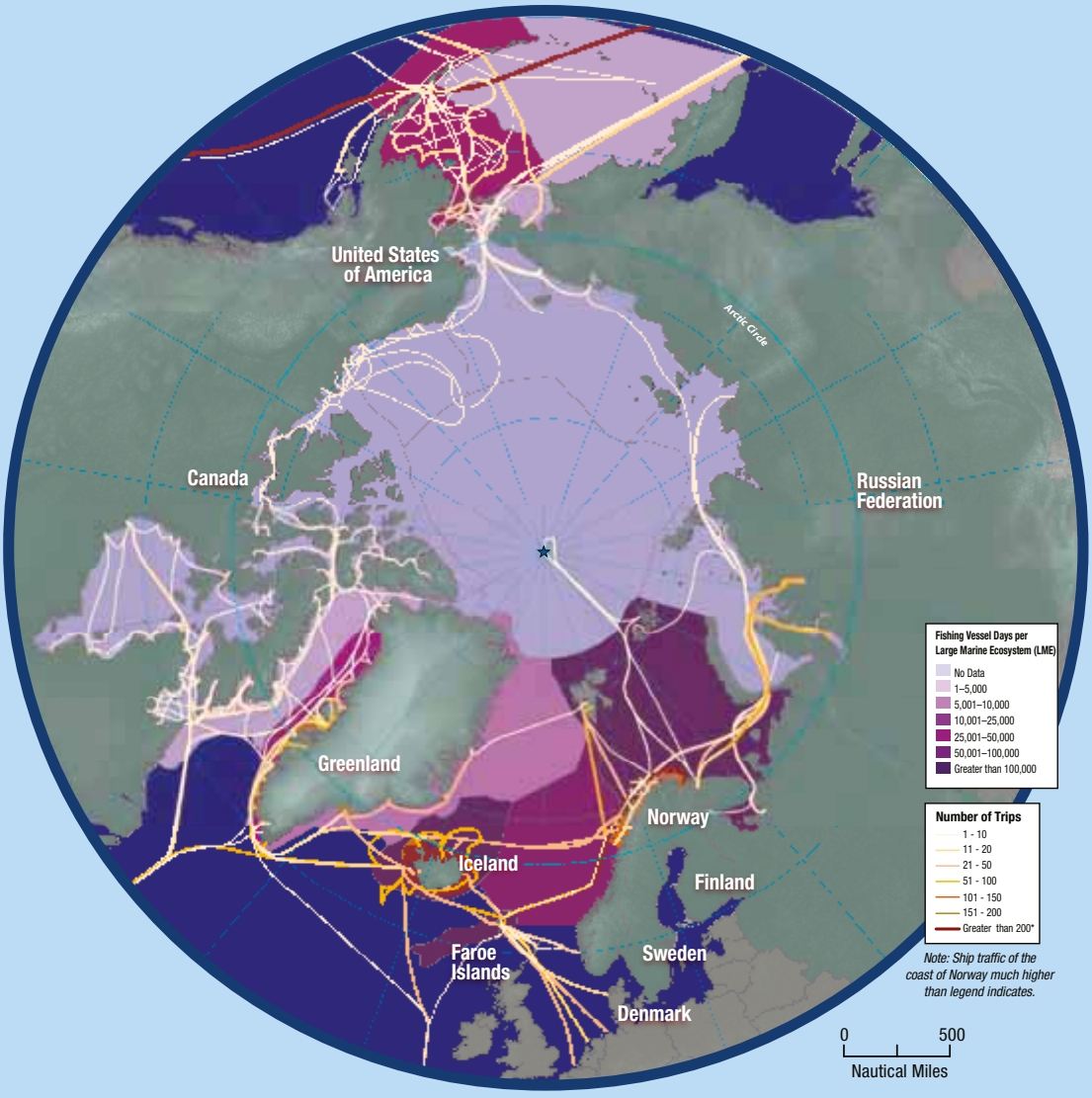
My personal view is that AMSA can be considered three things: a baseline assessment using the 2004 AMSA database as an historic snapshot of arctic marine activity early in the 21st century; a strategic guide for a host of arctic and non-arctic actors and stakeholders; and, a policy document of the Arctic Council, since the *AMSA 2009 Report* was negotiated and represents a consensus document of the Council.

DR LAWSON BRIGHAM is Distinguished Professor of Geography and Arctic Policy at the University of Alaska Fairbanks. During 2005-09 he was chair of AMSA and Vice Chair of PAME. As an icebreaker captain in the US Coast Guard, he sailed on voyages to the Arctic and Antarctic. He received his PhD from Cambridge University in the UK and his research interests include the Russian maritime Arctic, remote sensing of sea ice, ice navigation, arctic climate change, and polar geopolitics.

Arctic shipping is broadly defined in AMSA to include many types of ships and vessels such as icebreakers, container ships, tankers, bulk carriers, cruise ships, fishing vessels, offshore supply vessels, ferries, tug-barge combinations, government survey vessels, salvage ships, and coast guard ships. Combatant naval ships were not included since naval and security activities are not the mandate of the Council.

ARCTIC MARINE ACTIVITY

The baseline of the assessment is the AMSA database, which contains 2004 ship data received from the arctic states. According to this database, an estimated



Overview of all vessel activity for 2004, including fishing vessels
Source: AMSA

MAP: ARCTIC COUNCIL, *ARCTIC MARINE SHIPPING ASSESSMENT 2009 REPORT.*

6000 individual vessels operated in the Arctic region during 2004. Fishing vessels made up slightly less than half of the total and bulk carriers 20 per cent of the total. The regions with the highest concentrations of traffic were coastal Norway and northwest Russia (Barents and Pechora seas), the North Pacific Great Circle Route near the Aleutian Islands, and cruise ships in summer off the Greenland coasts.

Arctic natural resource development – development of oil and gas, hard minerals such as zinc and nickel, and fisheries – was found to be the primary driver of marine traffic in the Arctic. A good example is the year-round arctic marine transport system between Dudinka on the Yenisey River (serving the mining complex at Norilsk) and Murmansk. A second example is the servicing in summer of the Red Dog zinc mine off the northwest coast of Alaska by large bulk ore carriers transporting ore to British Columbia and East Asia. AMSA also found that the global marine tourism industry has come to the Arctic in the

form of large numbers of cruise ships on polar voyages in summer, particularly in Greenlandic waters. Climate change represented by arctic sea ice retreat is a factor in that the continuing decrease in extent and thickness of sea ice will allow for greater marine access throughout the Arctic Ocean and plausible increases in the length of the navigation seasons.

MAIN ISSUES AND CONCERNS

One of the most important issues facing greater commercial marine use of the Arctic Ocean is what kind of impact these many new uses and users will have on the economic, environmental, social and cultural well-being of arctic communities. The impact on arctic Indigenous people of future arctic shipping was one of the key areas studied in AMSA, including through Town Hall Meetings in arctic communities in Canada, Iceland, Norway and the United States. The assessment found that arctic residents do recognize the potential economic benefits of increased shipping, but they also expressed concern for the social, cultural and environmental effects of such expansion.

It is very clear from AMSA's analysis that UNCLOS is the legal framework that influences and guides governance of the Arctic Ocean. AMSA also notes that the International Maritime Organization is the appropriate United Nation's body that focuses on marine safety and environmental protection measures for the global maritime industry including the Arctic. Notable within AMSA's 96 findings is that the most significant environmental concern in the Arctic is the accidental release or illegal discharge of oil into the marine environment. The lack of basic marine infrastructure in the Arctic (charts, communications, search & rescue, ports, salvage, aids to navigation, marine traffic systems, environmental response, and more), except for the Norwegian coast and coastal northwest Russia, is a serious concern to the arctic states and remains a fundamental constraint to future arctic marine traffic. A key, related finding is the general lack of uniform and mandatory arctic ship regulations and mariner (ice navigator) standards for the Arctic Ocean. None of the current International Maritime Organization (IMO) conventions such as MARPOL have been adapted for arctic marine operations, especially those related to operations in ice-covered waters.

17 RECOMMENDATIONS

AMSA's 17 recommendations focus on three, inter-related themes: (1) Enhancing Arctic Marine Safety; (2) Protecting Arctic People and the Environment; and, (3) Building the Arctic Marine Infrastructure. Many of the marine safety recommendations involve the IMO and underline the global nature of marine operations. The development of uniform and mandatory standards and requirements for ships operating in the Arctic will be an important part of this, and implementing an Arctic Search and Rescue (SAR) agreement is a practical first step for the arctic states. In addition, a better understanding of Indigenous arctic marine use should be gained though a series of surveys to obtain baseline information. Furthermore, critical issues such as invasive species, oil spills, marine mammal impacts, and ship stack emissions need to be addressed. So do the challenging tasks of enhancing infrastructure such as ice navigation training, surveillance and monitoring, environmental response and basic hydrographic and environmental data. My overall sense is that all of the recommendations will require significant financial investment, expanded international cooperation, and development of new public-private partnerships.

The implementation of the recommendations presented by AMSA has already started, both within

Photo: © Kjell-Ove Storvik, Norwegian Seafood Export Council/Eksportutvalget for fisk

"According to the AMSA database, an estimated 6000 individual vessels operated in the Arctic region during 2004.

Fishing boats leaving Lofoten, Norway.

the Arctic Council and in the broader international community.

■ At the Ministerial Meeting in Tromsø the Ministers approved the formation of an Arctic Search and Rescue (SAR) Task Force that would report directly to the Senior Arctic Officials, and PAME commenced development of an AMSA implementation strategy.

■ The effort to develop an Arctic SAR agreement commenced in Washington, DC with a December 2009 workshop hosted by the US Coast Guard and US Department of State.

■ In October 2009, the University of the Arctic, University of Alaska Fairbanks and Dartmouth College sponsored a workshop in Fairbanks which identified primary stakeholders and actors for each of the AMSA recommendations and developed a roadmap to move each recommendation forward.

■ During 2009 the IMO made significant progress with several key AMSA issues such as arctic ship requirements and ice navigator training.

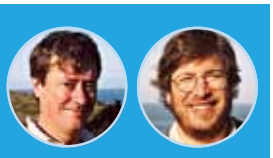
■ In 2010 the IMO will establish a programme to develop a mandatory Polar Code by 2014.

My overall impression of AMSA is that it is a timely message by the arctic states to the world indicating a framework and range of strategies to address the complex challenges of protecting arctic people and the environment in an era of ever expanding arctic marine use. ○

Concern about the environmental impact

Initial increases in arctic shipping traffic are likely to come from destinational voyages, such as ships servicing new oil and gas platforms, rather than from cargo vessels transiting the Northwest Passage or the Northern Sea Route, say DOUG NORLEN and DAVID GORDON. Although increasing shipping is bad news for the arctic environment, there is prospect for progress.

NEW OIL AND GAS projects are already leading to greater shipping pressures in the Arctic, as evidenced by the flotilla of ships that Shell wants to send to the Chukchi and Beaufort Seas to conduct exploration activities.



DOUG NORLEN is Policy Director and **DAVID GORDON** is Executive Director of Pacific Environment, which protects the living environment of the Pacific Rim by promoting grassroots activism, empowering communities, and reforming international policies. Both have engaged actively on shipping issues at the Arctic Council, including the Protection of the Arctic Marine Environment Working Group.

Many communities in the Arctic are especially concerned about the likely impacts of a large oil spill from a major ship catastrophe. Environmental damage continues to persist from sub-arctic disasters such as the 1989 Exxon Valdez spill or the 2004 Selendang Ayu spill, which contaminated the Aleutian Islands with over 1.7 million liters of oil.

Meanwhile, oil companies have made little progress in understanding how to clean up oil spills in ice conditions. Recent experiments conducted by a coalition of oil companies fall far short of the needed proof that oil spills can be contained in arctic ice. Poor weather conditions and darkness will hamper clean-up efforts, while industry relies on *in situ* burning and the use of dispersants, both of which will lead to significant additional environmental impacts. Industry representatives acknowledge that they still have no effective way to clean up oil under ice.

MOST SIGNIFICANT THREAT

This is why Alaska Native and environmental organizations in Alaska joined forces in January to sue the US Minerals Management Service (MMS) for issuing a permit to Shell Oil to drill in the Chukchi Sea, one of Alaska's arctic marine treasures. The lawsuit argues that MMS conducted an inadequate review of the potential harm from drilling, which will impact the migration of bowhead whales, and threatens to harm whales, walruses, and other species that are key to the subsistence of Indigenous communities and to this sensitive ecosystem.

Experts at the Arctic Council's Protection of the Arctic Marine Environment Working Group (PAME) developed the Arctic Marine Shipping Assessment (AMSA) to help understand the likely human and environmental impacts of increased shipping in the Arctic.

AMSA predicts that the most significant factors affecting arctic shipping will be the demand for resources and trade and effectiveness of governance mechanisms. The assessment points out that the "most significant threat from ships to the Arctic marine environment is the release of oil through accidental or illegal discharge". AMSA's recommendations, if adequately implemented, are a crucial first step to address the looming threats the arctic environment and communities face from increased shipping.

NEED FOR HIGHEST STANDARDS

Environmental groups, including Pacific Environment, Friends of the Earth, Earthjustice, and Clean Air Task Force, believe binding measures should include improved crew training and requirements for emergency prevention, preparedness and response capabilities. Moreover, environmental groups believe that the highest global standard for ship design, construction, operation and equipment standards be required and that only polar class vessels with adequate ice-strengthening should operate in well-defined polar waters.

Some arctic marine environments are too fragile, sensitive or vulnerable to environmental and social damage even with the best available standards and practices. For this reason, AMSA recommended the mapping of ecologically and culturally sensitive sea areas that should be protected from shipping by identifying and protecting Particularly Sensitive Sea Areas.

Several countries, including Norway, Sweden and the United States, are advancing discussions on the significant impacts of black carbon emissions from shipping on the arctic climate. Black carbon, or soot, is now recognized as a significant short-lived climate forcer that may be responsible for up to 30 per cent of arctic warming. Increased shipping, with the use of bunker fuel, will greatly increase the emissions of black carbon directly in the Arctic which, ironically, could further speed the warming cycle.

Much remains to be done to refine and implement specific protection measures, but the prospects for progress are positive. The Arctic Council and its working group PAME have made admirable progress not only in approving the AMSA, but also in following up on its recommendations to help make them mandatory. Arctic communities and environmental organizations are watching closely to make sure that governments protect the Arctic's subsistence resources and sensitive marine environments from the looming impacts of increased shipping. ○

Photo courtesy of the Exxon Valdez Oil Spill Trustee Council/Wikimedia Commons.

Birds killed as a result of oil from the Exxon Valdez spill.

The bill for the spill

The 1989 *Exxon Valdez* spill resulted in tremendous costs to life, livelihoods and cultures. In brief, some of the impacts include:

- 2,100 kilometers (1,300 miles) of shoreline fouled
- 250,000 seabirds killed
- nearly 4,000 sea otters killed
- 300 harbor seals killed
- 250 bald eagles killed
- more than 20 orcas killed
- billions of salmon and herring eggs destroyed
- $20 billion in subsistence harvest losses
- $19 million in lost visitor spending in the year following the spill
- at least $286.8 million in losses to local fishermen

Unprepared for another *Exxon Valdez*

A 2009 WWF report showed that two decades after the *Exxon Valdez* oil tanker struck an iceberg and spilt millions of litres of oil into the delicate arctic environment, governments and industry in the region remain unprepared to deal with another such disaster.

The report, *Lessons Not Learned,* recommends that all arctic countries conduct comprehensive risk assessments that include industrial activities, shipping, petroleum development and anticipated impacts of climate change.

"The *Exxon Valdez* spill has been the best-studied oil spill in history and scientists have found that even 20 years later, the damage from the spill continues," said Margaret Williams, managing director of WWF's Alaska program. "Fishermen's livelihoods were destroyed, many wildlife and fish populations still haven't recovered and the Alaskan economy lost billions of dollars. We can't let that happen in Bristol Bay or anywhere else in the Arctic."

Arctic cruise tourism – threat or opportunity?

Is tourism in the Arctic really booming? And is arctic cruise tourism such a bad thing for the environment? FRIGG JØRGENSEN examines the issues.

NORWEGIAN, GREENLANDIC and Canadian governments have pointed out tourism as a target area for commercial development in the Arctic. Efforts have been made and measures taken to facilitate such development in all three countries.

Together with a growing interest for the Arctic from the international tourism market, the efforts have given positive results as tourism has grown in many arctic regions giving new and needed business opportunities to many communities.

The growth in arctic cruise tourism has however not been as rapid and large as one can get the impression of, especially from the media but sometimes also from non-industrial interests within governments as well as NGO's with environmental protection objectives. Words such as "dramatic growth", "cruise tourism booming" and "mass-tourism" have often been used when describing cruise tourism development in the Arctic. The reality, however, looks quite different.

Cruise vessels have been visiting the arctic areas for at least 140 years. While records from early years are difficult to find, records from Svalbard show that 6000–7000 cruise tourists visited Kongsfjorden in the late 1930s. Today, more than 70 years later, the numbers are more accurate and higher, but the table below shows no drastic or dramatic development in cruise tourism in the Arctic in recent years.

CONCERN FOR THE ENVIRONMENT

The picture of booming cruise tourism has been followed by a focus on and concern for the arctic environment. Headings like "Cruise tourism is a great threat to the arctic environment" have been normal reading for a while but recently one could also read articles

Photo: Trym Ivar Bergsmo, Spitsbergen Travel

in Norwegian newspapers under the heading "Tourism is melting Svalbard". The occasion was a new report from the Norwegian Climate and Pollution Agency (KliF) which pointed to ship traffic and especially cruise traffic in Svalbard as the greatest contributors to emissions in the area, further contributing to melting arctic ice and climate change.

While there is no doubt that transportation worldwide contributes substantially to emissions, according to calculations made by AECO, this report over-calculates the fuel consumption on cruise vessels in Svalbard with more than double of what is reality. Whether this is due to lack of knowledge or deliberate "up-scaling" are only speculations, but it does not contribute to an expedient debate and way forward in regards to measures needed.

When some governmental agencies and others try to paint a picture of the arctic cruise industry and the arctic cruise tourist as the worst threat to the arctic environment and the reason for climate change, they are not credible. Despite at least 140 years of cruise tourism in the Arctic there is no reliable research showing any considerable negative impact from cruise tourism. Most birds and animal species are in better condition and greater numbers than they have been for decades. And if they are endangered it is not due to tourist activities. Very few areas show signs after visits in regards to paths, and garbage left behind is known to be a non-existing problem in arctic cruise tourism. On the contrary, in Svalbard cruise-tourists have contributed to cleaning tons of sea-transported garbage from beaches around the archipelago. Only rarely is there any mention of the ongoing exchange to newer vessels and technology - not only changing from heavy fuel oil (HFO) to marine gas oil (MGO),

Number of cruise passengers to Svalbard (Norway) and Greenland 2005 – 2009

	2005	2006	2007	2008	2009
Svalbard	34760	34908	40256	38737	38269
Greenland	16446	22051	23506	28891	26976

Sources: Governor of Svalbard, Greenland Tourism
Numbers include all commercial cruise traffic; passengers on small, medium and large conventional cruise vessels as well as passengers on small expedition cruise vessels.

FRIGG JØRGENSEN is General Secretary of the Association of Arctic Expedition Cruise Operators (AECO). She has a college degree in tourism and has been working with tourism in the Arctic for almost twenty years, including nine years as supervisor for Svalbard Tourism AS and six years as tourism adviser for the Governor of Svalbard.

Shorelanding in Svalbard from MV Polar Star.

Photo: Nina Bailey, Spitsbergen Travel

but also reducing the fuel consumption considerably. The Eastern Svalbard ban on HFO three years ago and the recent decision to include larger part of the rest of Svalbard in the ban has not made large headings in the news.

Guest surveys show that tourism in the Arctic is dominated by well educated and knowledgeable tourists interested in seeing and learning. They all can, and many have, become ambassadors for the protection of the arctic environment. They have no interest in harming the arctic environment. They are the public, they have knowledge and they do not like to be pointed out as environmentally unfriendly and "climate criminals". Nor has the cruise industry any interest in harming the environment as it would be like sawing off the branch they are sitting on. The cruise industry has not only welcomed many of the regulations that have been necessary to protect the arctic environment, but for some even stricter self-regulations also apply.

GREAT EDUCATION OPPORTUNITY

Tourism in the Arctic is a great opportunity to educate the public in environmental and climate change issues. It is part of Norwegian policy and strategies to use Svalbard as a platform for education in these areas – and invite more people to visit and learn, just as Hillary Clinton, John McCain, Ban Ki-moon, EU's climate commissioner, and many others have learnt from their visits to Svalbard. But the invitation does not apply to 'normal' tourists. The invitation is limited to VIPs. Instead a proposal which will prohibit tourism in more than 40 per cent of the Svalbard archipelago is under consideration while governmental agencies and also NGO's are contributing to painting a negative picture of the tourism industry and the tourists in the Arctic.

This is a challenge for the tourism industry in the Arctic, but perhaps also a challenge for the environment. Melting arctic ice will clearly at some point lead to more sea transportation in the north. The question is how we can ultimately find the best and fastest way to manage it – by building fronts and pulling in different directions or by joining forces and starting to cooperate and prepare for the meeting with tomorrow's arctic sea transportation. Well managed tourism is not a threat. It is an opportunity. ○

"The cruise industry does not have any interest in harming the environment as it would be like sawing off the branch they are sitting on.

Navigating through unclear water

The consequences of increased access to the Arctic Ocean, where navigation remains extremely difficult and oil spills harder to clean up, could be severe, says TULLIO SCOVAZZI. At the same time, the legal regime related to arctic navigation remains far from clear.

THE GENERAL REGIME of marine spaces is set out in the rules of the law of the sea, as codified in the 1982 United Nations Convention on the Law of the Sea (UNCLOS), and applies in principle also to polar waters. For the purposes of navigation, marine spaces are divided into different areas, each of which is subject to specific rules. Navigation in the marine internal waters by ships flying a foreign flag is possible only with the permission of the coastal state and in compliance with the conditions set by it. In the 12-mile territorial sea all states enjoy the right of innocent passage, which means continuous and expeditious navigation not prejudicial to the peace, good order or security of the coastal state. In the case of straits, which consist of the overlapping territorial seas of one or more states and which are used for international navigation, a special regime, called transit passage, applies. In the 200-mile exclusive economic zone, all states enjoy freedom of navigation, having due regard to the rights of the coastal state on the exploitation of the mineral or biological resources. On the high seas, all states enjoy the freedom of navigation and other internationally lawful uses of the sea related to this freedom (this vague formula is intended by the maritime powers as including the right to engage in military manoeuvres).

However, the regime of arctic navigation is today far from being clear. A special UNCLOS provision (Art. 234) applies to "ice-covered areas": "Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year creates obstructions or exceptional hazards to navigation and pollution of the marine environment could cause major harm or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence."

QUESTIONS OF INTERPRETATION

Subtle questions of interpretation are hidden in the redundant wording of Art. 234. At what temperature do climatic conditions become "particularly severe"? How many days or months is "most of the year"? Do the laws and regulations adopted by the coastal states for ice-covered areas also apply during the part of the year when these areas are not covered by ice? What happens if in certain years the waters are ice-covered for most of the year, but in other years they are not (also considering that the precise calculation of the duration of ice-coverage can only be made at the end of the winter season)? Can a situation be envisaged where ice covers the area for most of the year, but the climatic conditions are not particularly severe? In which cases is a hazard to navigation "exceptional"? When can pollution of the marine environment cause a "major harm"? In which cases is a disturbance of the ecological balance "irreversible"? Do the words "within the limits of the exclusive economic zone" refer to the 188-mile ice-covered waters between the 12-mile and the 200-mile limits or do the words in question refer to the whole 200-mile belt? Art. 234 does not provide any clear-cut answer to any of the questions above and leaves the way open to divergent interpretations by the states concerned.

> **"Art. 234 does not provide any clear-cut answer and leaves the way open to divergent interpretations by the states concerned.**

DR TULLIO SCOVAZZI is professor of international law at the University of Milano-Bicocca, Milan, Italy. He occasionally participates, as legal advisor of Italy, in negotiations and meetings relating to law of the sea, cultural matters and human rights.

STRAIGHT BASELINES

Present problems of arctic navigation are multiplied by the systems of straight baselines applied by the Russian Federation (Decree of 15 January 1985) and Canada (Order of 10 September 1985). These systems – which measure the extent of the territorial sea and the exclusive economic zone not from the

coastline, but from straight baselines joining the most external points on the mainland or islands – enclose within the internal waters areas that are considered as territorial sea or even high seas by other countries (in particular the United States). The Russian 1990 Regulations for Navigation of the Seaways of the Northern Sea Route set forth several requirements for navigation through the route. The conformity of this enactment with international law has been questioned by the United States, especially as regards its incidence on passage through maritime straits. ○

The Arctic vs the Antarctic:

New developments for polar shipping

While both poles have been experiencing an increase in traffic over the past decade, the nature of shipping differs considerably, writes SIAN PRIOR. So do the legal regimes.

IN THE ARCTIC, supply ships, vessels transporting oil, gas and minerals, and fishing boats form the largest contribution, with the cruise sector growing too. Whereas, in the Antarctic, the numbers of ships operating in the region are significantly lower and largely comprised of cruise shipping, fishing and research and resupply vessels.

In arctic waters, between 1995 and 2004, nearly 300 accidents and incidents were recorded, and while the level of shipping in antarctic waters is lower a number of serious accidents and incidents have been recorded too. This includes the 'wake-up call' sinking of the Liberian-flagged passenger vessel *Explorer* in November 2007 following ice damage to the hull. In many instances, including the sinking of the *Explorer*, damage to a vessel is accompanied by a spill of oil. In remote polar regions there is little that can be done to recover the oil, and very little is done to monitor its impact on the environment and wildlife.

In addition to accidents, polar shipping can have an impact on the fragile environment in other ways – through legally permissible routine discharges of sewage, sewage sludge, grey water, food wastes, emissions to air such as black carbon, nitrogen oxide and sulphur dioxide, and illegal discharges of oils, chemicals, plastic garbage and fishing gears. Even discharges of ballast water, emissions from antifouling paints and underwater noise may pose a threat in sensitive polar waters.

In recognition of the threat posed by shipping in polar waters, a number of measures have already been agreed by the relevant international or regional frameworks to protect the environment and ensure safety of shipping. There is, however, disparity in regulations between the Antarctic and the Arctic. The Antarctic is designated as a "Special Area" under the MARPOL Convention[1] where any discharge of oil or oily mixtures from any ship is prohibited. So is all garbage with the exception of food wastes. Such provisions do not apply to the Arctic, although global standards for discharges from ships are applicable. More recently, there has been agreement at the International Maritime Organization (IMO) that the use and carriage of heavy fuel oils will be banned on ships operating in antarctic waters. It is anticipated that this new measure will be finalised in March 2010 and take effect from a date, yet to be decided, in 2011. Other measures have been approved through the Antarctic Treaty System and provide greater protection for antarctic waters than is currently the case for the Arctic, including a Resolution which effectively introduces the provisions of IMO's Ballast Water Management Convention ahead of full ratification of the global convention.

The current approach to the management of shipping in polar waters has been ad hoc and piecemeal, yet it is widely acknowledged that because of the poles' remoteness and unique ecological characteristics, heightened safety and environmental standards are fundamental to prevent or mitigate the harm to the regions' people, wildlife, waters and climate. In recognition of this, in February this year, work began at the IMO to develop a mandatory Polar Code. Such a code offers an opportunity to improve, and where appropriate synchronise, safety and environmental standards for shipping in both arctic and antarctic polar waters. ○

DR SIAN PRIOR is a freelance consultant focusing on interpretation of marine science for marine policy development. She has developed policy and undertaken advocacy for the maritime industries and environmental groups for over 20 years, including 15 years leading marine programmes with WWF. She currently advises the Antarctic & Southern Ocean Coalition on polar shipping policy and advocacy.

1 The International Convention for the Prevention for the Prevention of Pollution from Ships, 1973 introduced the designation of a Special Area, which is an area of sea where because of oceanographic or ecological conditions and the nature of traffic, special provisions for the prevention of ships' pollution are required.

Fears and fantasies of the melting Arctic

The increasing access is enabling for some and worrisome for others. Shipping is caught up in a matrix that involves defence, resource-related, territorial and even identity-related issues, says KLAUS DODDS.

KLAUS DODDS is Professor of Geopolitics at Royal Holloway, University of London. He is convening, with Richard Powell at the University of Liverpool, a series of seminars on the future of the polar regions. Further information available at: http://www.polar-geopolitics.com/

IN RECENT YEARS, there has been much speculation about the changing nature of the Arctic. Put simply, climate change scientists are warning that the High North is increasingly likely to be ice-free during the summer season. Juxtaposed with this spectre of icy degradation is another, epitomised by the widely reproduced images surrounding the Russian flag-planting episode in the central Arctic Ocean in August 2007. For some commentators, this has provoked angst over either a 'scramble for resources' and/or an Arctic increasingly accessible to a wide range of users ranging from civilian shipping companies to illegal migrants and terror groups intent on wreaking havoc on energy-related infrastructure. While sceptical of some of those rather overblown claims pertaining to geopolitical instability and resource speculation, the changing geopolitics of accessibility is worthy of further reflection.

In 2009, the Arctic Marine Shipping Assessment (AMSA) was released under the auspices of the Arctic Council. The latter, created in 1996, is the most important inter-governmental forum pertaining to the Arctic. Within the remit of the Arctic Council, a series of working groups have produced in the recent past other interventions including the Arctic Climate Impact Assessment. The AMSA confirms that the eight arctic states including Canada, Finland and the United States commit themselves to working together to promote arctic marine safety and to

Photo: Neste Oil

enhance marine environmental protection. Expanding marine infrastructure in the High North is also identified as germane not least because larger volumes of maritime traffic will place greater pressures on the management of shipping including search and rescue capabilities. Working with the International Maritime Organization is seen as critical in further developing new international regulations, especially the Guidelines for Ships Operating in Arctic Ice-covered Waters.

“The changing geopolitics of accessibility is worthy of further reflection.

COLD WAR DETERRENT

Notwithstanding the regulatory structure that might be applied to the Arctic, the root of the challenge lies with the Arctic region itself. As one of the most militarised spaces during the Cold War, the ice-covered waters of the region acted as a deterrent, especially in the winter season. Military shipping, including submarines operating under the icepack, was a regular feature of the Arctic as American, British and Russian vessels patrolled the region. Specifically, transit routes such as the Northern Sea Route and the Northwest Passage strategic and sensitive by the coastal states of Russia and Canada respectively. In the case of Canada, the Northwest Passage was, and remains, a major source of sensitivity in US-Canadian relations. For successive governments in Ottawa, the Northwest Passage was part of Canadian internal waters whereas US administrations argued that the passage was an international strait where rights of innocent passage prevailed. The voyage of the oil tanker SS Manhattan through the passage in 1969 brought this schism to the fore, and showed that the Nixon administration was not going to accept the Canadian argument pertaining to the Northwest Passage.

The disappearance of the ice in the Arctic is central to understanding the current policies of the Harper government in Canada. Underwriting pronouncements such as the Northern Strategy (2007) and National Defence Canada (2008) is a concern that an accessible Arctic places new pressures on the government to protect Canadian polar sovereignty. Shipping is, therefore, caught up in a matrix that involves defence, resource-related, territorial and even identity-related issues. The Harper government believes that the prospect of increased shipping – whether it relates to tourism, fisheries, resource extraction and/or even illicit movement of terrorists and smugglers – places explicit pressure on Canada to respond to its third coastline, after the Atlantic and Pacific seaboards. While Indigenous and First Nations communities might welcome enhanced economic opportunities relating to shipping, it also raises issues pertaining to possible environmental degradation and intensifying resource extraction.

NERVOUS GOVERNMENTS

The likelihood of arctic shipping expanding is high. The savings are considerable for companies seeking to travel from Europe to Asia and vice versa. Avoiding the Panama Canal would see thousands of nautical miles removed in total journey time. Recently, the Northern Sea Route has been opened and the German Beluga Group claimed in 2009 to be first Western company, with the help of Russian icebreakers, to save 4000 nautical miles off the journey between Korea and the Netherlands. Likewise in the case of the Northwest Passage, there has been growing evidence of tourist and logistically based voyages traversing the Canadian High North. This has led the Harper government to place increased emphasis on bolstering the civilian and military presence in the Arctic so that other stakeholders recognise Canadian sovereignty.

Arctic shipping is not, and never will be divorced from the wider geopolitics of the Arctic including the contested areas involving islands, maritime boundaries and passages. Mobility is both enabling for some and worrisome for others. It goes to the heart of the contemporary geopolitical condition; climate change and sea ice degradation have unleashed arctic fears and fantasies. It is worth remembering that both the Arctic and Antarctic have so often been central to narratives of national identity. The Arctic Ocean, barely visible to metropolitan populations, is hosting an increasing mixture of economic activities involving state and non-state actors. The governments of the five arctic coastal states are nervous despite the calls for resilience and robustness. Continued uncertainty over the territorial ownership of the seabed coupled with regional environmental change, will provoke opportunities for *inter alia* competitive adventure, scientific curiosity, security anxieties, and economic opportunism. It might also generate regional cooperation and international maritime standards. The two are not mutually exclusive. ○

“The Arctic Ocean, barely visible to metropolitan populations, is hosting an increasing mixture of economic activities involving state and non-state actors.

Would you take any risks that would ruin your home?

Photo: Gunn-Britt Retter

Coastal Saami culture on shore at the Builovtta Seasaami collection in Unjárga/Nesseby and a modern fishing boat in the Varangerfjord.

The Indigenous right to culture includes a right to healthy marine ecosystems. We cannot afford any risks to our livelihood posed by the increased shipping activities in the Arctic, says GUNN-BRITT RETTER.

THE SUB-ARCTIC REGION of Fenno-Scandinavia is our homeland. Our cultural heritage is a living culture and exists primarily in the Saami people's traditional livelihoods and use of land, territories and natural resources. Our primary cultural production happens in our homeland and constitutes our economies and inspires the development of our cultural expressions like 'duodji' (handicrafts), our joiks, our stories and our art. As Indigenous people and a minority, our culture is protected by the United Nations (UN) International Covenant on Civil and Political Rights from 1966, where Article 27 states that as a minority we have a right to enjoy our culture. The UN determines that the article also comprises the material basis for culture, or in other words the livelihoods. This interpretation has been endorsed by the national states the Saami live in.

The Saami interest in marine issues is motivated by our dependence on healthy and productive ecosystems in the Arctic as a vital component of our livelihoods. The Saami people is a coastal people and has depended on fisheries since time immemorial. Fjord- and coastal fisheries have traditionally been a substantial part of the coastal Saami's economic activities which include hunting, berry picking, gathering of other natural resources, fresh water fishing and more recently (the last 200–300 years) also small scale farming. Today, some Saami have fishing as their only occupation or profession.

GUNN-BRITT RETTER is Head of the Saami Council's Arctic and Environmental Unit, where she has been since 2005. She has previously worked as an advisor to the Arctic Council's Indigenous Peoples' Secretariat in Copenhagen and is an active spokesperson on Indigenous rights in the Arctic. In 2005 Retter was elected to the Saami Parliament in Norway and is now in her second term representing the Norwegian Saami Association (NSR).

■ Article 27 of the UN's International Covenant on Civil and Political Rights from 1966 states that *"In those States in which ethnic, religious or linguistic minorities exist, persons belonging to such minorities shall not be denied the right, in community with the other members of their group, to enjoy their own culture, to profess and practise their own religion, or to use their own language".*

There has never been a lot of money in this economy, but it has provided enough to develop the culture in the region over 10,000 years.

RACE FOR RESOURCES

We see again a race to the Arctic to utilize its resources. The race is driven by globalisation, increased access, advanced technology and demand for resources both onshore and offshore. It is money in these activities, all of which seem to lead to increased shipping in the region. Are environmental organisations also using the Arctic as a showcase which is easy to visualize when bringing out their message, creating an impression of an already accessible Arctic with no ice, while at the same time creating a demand among the adventurous tourists for cruises to the Arctic?

Can any of the arctic states confirm that they have emergency preparedness in place for when an accident happens with a tanker carrying crude oil, during transshipment, or if a cruise ship goes down with a couple of thousand tourists onboard? Are we prepared for such accidents? It is only a question of *when* it will happen close to our coastline. Will the fish stocks we depend upon cope with such accidents? How long time can our culture rely on alternative resources while marine ecosystems recover, before our possibilities to utilize our fishing rights are gone?

RIGHT TO HEALTHY ECOSYSTEMS

Our right to culture embedded in the UN Covenant implies as I see it also a right to healthy marine ecosystems. We cannot afford any risks to our livelihood. All activities must apply the highest possible standard at all times, and always strive for higher safety levels. If you can afford to build a big ship, you should also afford to apply the necessary emergency preparedness measures.

Even though the public might think the Arctic Ocean will soon be ice-free, this will only be for a short time during the summer. Even then the routes and the ice conditions will be unpredictable and ice bergs moving around. I am concerned that an accessible Arctic to a certain extent is still an illusion that might encourage people and companies to take unnecessary risks in trying to save time and being adventurous.

We will live our lives in this region, also after the resources are spent. And we would not want to put our future at stake or take any risks that would ruin our home. Will you? ○

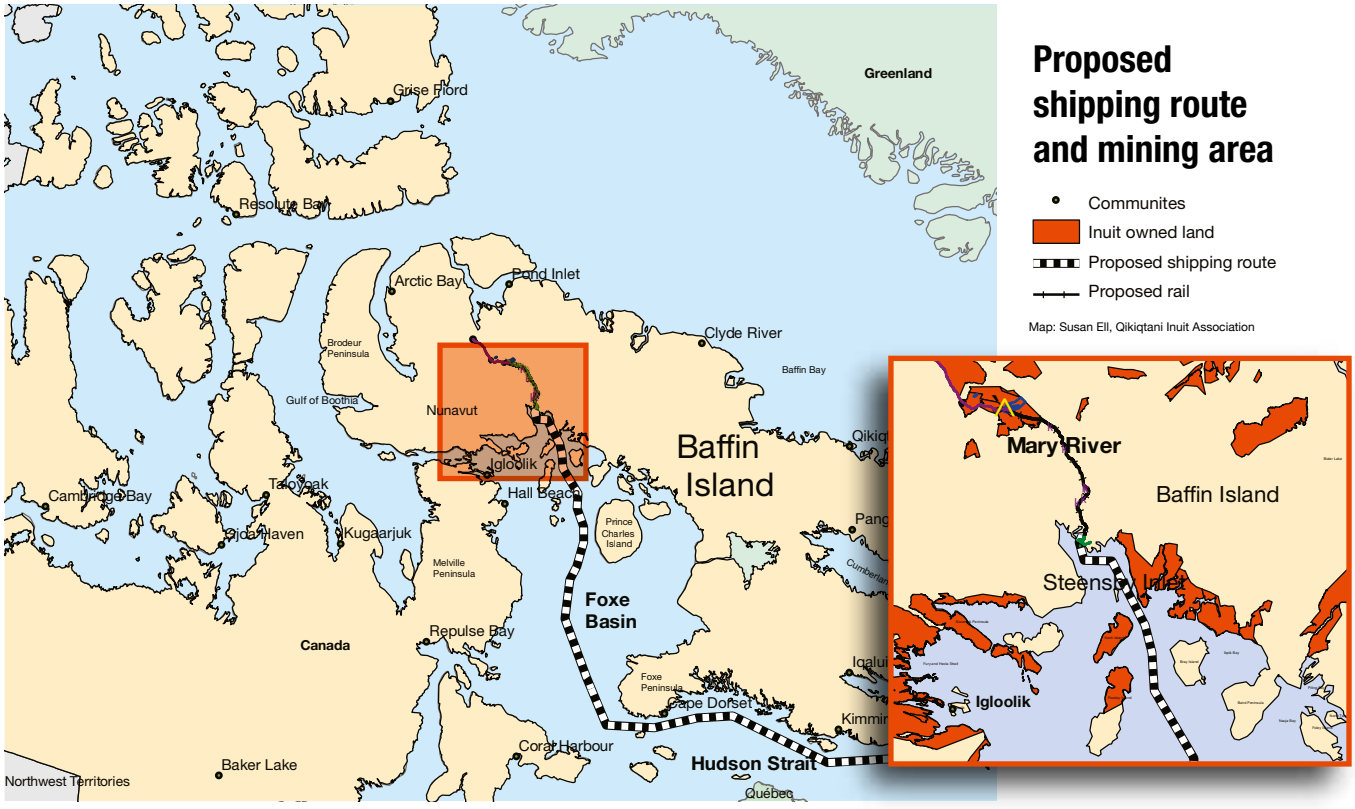
■ The Saami people live in what today is known as Finland, Norway, Russia and Sweden. Reindeer husbandry is essential to the Saami culture and is probably the part of the culture most people have heard about in relation to the Saami people. The Saami people is however, also a coastal people and depended on fisheries and a combination of other livelihoods.

Breaking Ice

A mining proposal in Nunavut is causing concern as the proposed shipping route would go through Foxe Basin and Hudson Strait, where Canadian Inuit have hunted for generations. While the proposal is being reviewed, it is important to remember that project feasibility has very different meanings for the people involved, says OKALIK EEGEESIAK.

IN MARCH 2008, Baffinland Iron Mines Corporation (BIMC) submitted a development proposal for the Mary River Project to the Nunavut Impact Review Board (NIRB) with clear ambitions of constructing and operating a full scale iron ore mining operation with an expected 21-year mine operating life. The iron ore BIMC is proposing to extract is located within an area of Inuit Owned Land in a region long known to Inuit and the mining industry as a region rich in natural resources.

Fast forward from the submission of BIMC's development proposal to today where the environmental assessment process is beginning to unfold. After numerous visits to potentially impacted communities throughout Nunavut and Nunavik (Arctic Quebec) and formal discussions on the nature and breadth of the project, NIRB has issued Guidelines for the Development of an Environmental Impact Statement. The ball now clearly rests in BIMC's court as they are required to address all of the information requirements set out before them, such as identifying terrestrial and marine



species using historical and current habitat distributions, seasonal migration patterns, critical areas and potential interactions with project facilities and shipping operation.

No small task considering what the proposed project entails.

A SHIP EVERY TWO DAYS

The Mary River Project is designed around delivering 18 million tons of iron ore to market per year. In environmental terms, the mining process is clean, conventional and localized. The crux of the project is not so much the design and approval of the mining process, rather the means of getting the ore from north central Baffin Island to iron ore markets abroad.

The transportation associated with the project involves a one-hundred plus kilometre railway from the Mary River mine site to the proposed port at Steensby Inlet coupled with year round shipping, including seasonal icebreaking, through Hudson Straight and Foxe Basin. BIMC is planning to ship the ore using a fleet of dedicated 180,000 DWT (deadweight tonnage) capacity icebreakers. These project-specific icebreakers are considerably larger than past or present commercial shipping vessels operating in the Canadian Arctic. The shipping frequency required to move 18 million tonnes of iron ore on a year round basis requires more than one-hundred return voyages a year. This translates into a ship passage every two days. It is also important to point out that the company is exploring for further deposits which could have the combined effect of extending the life span of the mine and increasing production.

The terrestrial and marine environments that figure prominently in the BIMC's plans overlap areas of extensive land use and harvesting for as many as a dozen Inuit communities. Through the early stages of the environmental assessment process Inuit expressed many concerns related to the value and importance of continued wildlife harvesting, both from a cultural and a sustenance perspective. Inuit in Igloolik and Hall Beach have long hunted within Foxe Basin. Coral Harbour, Cape Dorest, Kimmirut and communities in Nunavik regularly harvest marine species frequenting Hudson Straight. In north Baffin, Clyde River, Pond Inlet, Arctic Bay, Igloolik and Hall Beach all have a long history of harvesting caribou within

OKALIK EEGEESIAK is President of the Qikiqtani Inuit Association. She is from Iqaluit, with an extensive political, management, and administrative background. She has chaired, sat on, and worked for national, regional, and community boards and committees and has also represented both federal and territorial governments in various capacities.

the project area – particularly at the proposed mine site.

INUIT INFLUENCE

The Qikiqtani Inuit Association's (QIA) mandate is to protect and promote Inuit rights and values for Nunavut Land Claims Agreement beneficiaries in 13 communities within the Baffin region of Nunavut - an area stretching from the Belcher Islands in southeastern Hudson Bay to Ellesmere Island in the High Arctic. QIA is responsible for ensuring that the rights and interests of Inuit beneficiaries are fully respected. These include such matters as lands management and ownership, the negotiation and implementation of Inuit Impact Benefit Agreements (IIBAs), water and wildlife rights and the inclusion of Inuit traditional knowledge in planning and decision-making.

In preparation for the environmental assessment QIA is creating community based committees that will participate in the formal review process. The assessment and permitting process will take several years before a final decision is expected. QIA is also developing a traditional knowledge and land use project to define the extent and the relationship Inuit have to the project area. However, environmental assessment is just one way in which Inuit can exert influence of the proposed project. Other avenues include granting access to Inuit Owned Lands and finalizing IIBA negotiations. To effectively accomplish all of this QIA has assembled a team including community leaders and experts with backgrounds in land use and harvesting, wildlife, socio-economics, mining, economics and business.

For BIMC, project feasibility means the ability to provide markets with a cost competitive source of high quality iron ore. For QIA, project feasibility means whether Inuit can gain a level of comfort once all mitigation measures, access rights, compensation and benefits have been weighed against the potential impacts – environmental, socio-economic, cultural and otherwise.

A challenge for all involved. ○

Building a waterway through the Arctic

Russia is planning industrial and infrastructure development which will significantly increase shipping in the Northern Sea Route, writes ALEXEI BAMBULYAK. At the heart of this development are strong economic and strategic interests.

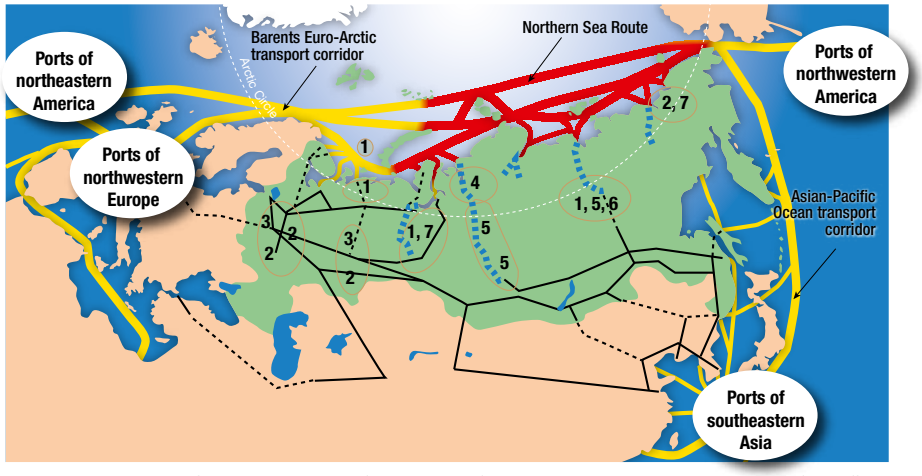
THE FIRST SEAPORT of Russia, Arkhangelsk, had its 425th year anniversary in 2009. Here the Northern Sea Route, also called the Northeast Passage, started. According to the definitions of the Russian Ministry of Transport, the Northern Sea Route is Russia's national transportation route located within inland waters, territorial sea and the exclusive economic zone, and stretching from Novaya Zemlya in the west to the Bering Strait in the east. In commercial shipping, the Northern Sea Route is known as a lane from the Atlantic Ocean to the Pacific Ocean along the Russian Arctic coast.

After the fall of the Soviet Union, Russia's sea transportation capability deteriorated sharply. From the 1990s, the Northern Sea Route was given a greater priority through the development of seaports in the Russian Arctic. The *Transport Strategy of the Russian Federation for the period to 2030*, adopted by the Government in 2008, places great emphasis on increasing the seaports' capacities. According to this strategy, the volume of annual cargo turnover in the Russian seaports should be over 500 million tonnes in 2020 and exceed 1000 million in 2030.

OIL AND GAS EXPLORATION

Development of port capacities in the Russian Arctic is directly connected to

System of international transport corridors "east–west–east"



Export: 1 - hydrocarbons, 2 - ferrous metals, 3 - mineral fertilizers, 4 - non-ferrous metals, 5 - timber, 6 - coal **Import:** 7 - food stuffs

Sea transport corridors · Railways · Railways to be constructed · River shipping lines · Areas of of cargo sources for the Northern Sea Routes

Adapted from map from the Central Marine Research & Design Institute (CNIIMF) by Ketill Berger, 2010

Photo:Bioforsk Svanhovd.

Tanker escorted through the Northern Sea Route.

exploration of oil and gas in the North and the increase of hydrocarbon exports. In 2009, the seaports of Varandey in the Pechora Sea, Arkhangelsk and Vitino in the White Sea, and Murmansk in the Barents Sea shipped more than 15 million tonnes of petroleum products for export. With the development of new onshore fields in Taymir, Yamal and Nenets, as well as offshore deposits in the Kara, Pechora and Barents seas, up to 100 million tons of liquid hydrocarbons for export may pass through the Russian arctic seaports each year. In addition, the largest Russian mining company Norilsk Nickel ships metals via Dudinka in the Kara Sea and Murmansk.

Murmansk is the only ice-free seaport in the Russian Arctic. In 2009, the annual freight turnover of Murmansk seaport exceeded 30 million tonnes. Most of the cargo was crude oil and coal. According to a construction and modernization project which was included as a prioritized investment project in the Russian Federal Programme 'Development of the Transport System of Russia in the period 2010–2015', the annual freight turnover in Murmansk should be increased to 80 million tonnes.

There are plans to build new deep-sea ports in Belomorsk and Arkhangelsk in the White Sea and in Indiga in the southeast of the Barents Sea. Liquefied natural gas (LNG) plants and port terminals should be developed in Teriberka on the Kola Peninsula and in Kharasavey on the Yamal Peninsula. With the implementation of Gazprom's Yamal megaproject, in 2030 the annual gas production on Yamal and the Kara Sea shelf will exceed 300 000 million cubic metres of natural gas. These industrial and infrastructure development projects will significantly increase shipping in the Northern Sea Route.

STRATEGIC INTERESTS

The arctic icebreaking fleet plays one of the most important roles in facilitating operations in the Northern Sea Route and establishing a transport corridor for international trade. Today, the Russian icebreaking fleet consists of 28 icebreakers, including seven nuclear ones. *50 Let Pobedy,* the newest and largest nuclear icebreaker in the world, is Russian. According to Atomflot, three new generation nuclear icebreakers should be built to secure Russia's strategic interests in the Arctic.

In 2001, a partnership was formed to coordinate the use of the Northern Sea Route, comprising federal and regional government officials, Russian shipping companies and international research and educational institutes. In 2009, this partnership developed a federal law project called 'On the Northern Sea Route', which will determine the external borders of the sea route and formalize its status as a Russian national transport lane in the Arctic. It should also help regulate shipping along the route to let it become a possible commercial shipping corridor between Europe and Asia.

According to the Russian Association of Indigenous Peoples of the North, Siberia and the Far East (RAIPON), an intensive development of the Northern Sea Route may have both positive and negative consequences for the Indigenous peoples. On one side, the route plays an important role in the economic and social welfare of the northern regions and local populations. On another, industrial development causes environmental challenges and may endanger Indigenous peoples' traditional culture and nature use.

The arctic shipping route goes along the traditional lands of Sami, Nenets, Nganasan, Dolgan, Evenk, Even, Chukchi and Yupik who depend on hunting, fishing and reindeer herding. These are territories of permafrost, tundra forests and wetlands with unique arctic ecosystems vulnerable to industrial influence and pollution. Russian arctic seas, rivers and coastal areas work as 'nurseries' for migratory birds, marine mammals and fish, equally important in local as in global contexts. A precautionary approach must be a core element for planning any activities in these areas. ○

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The arctic trade potential

An arctic trade route would shorten the distance between important markets. This potential for reducing transit time, fuel consumption and emissions makes it an attractive alternative to the trade routes of today. Det Norske Veritas' (DNV) Arctic Container (ARCON) Project has looked into the possibilities, challenges and risks related to a future container trade route crossing the Arctic Ocean in international waters. MORTEN MEJLÆNDER-LARSEN and ØYVIND ESPELAND look at the picture today, and in 2050.

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A TRANS-ARCTIC TRADE ROUTE will reduce the distance between many of the major markets of today: American west-coast to Europe, American east-coast to Asia and, the one with the greatest potential – eastern Asia to Europe. For the latter an arctic route will reduce the distance by 40 per cent (see fig. 1), which in principle will pay off through reduced fuel costs per trip and additional trips per year. The question is how the benefits compare with additional costs connected to arctic operations, and how this picture may change in the future.

The ARCON project addressed these issues by simulating the transits and related costs for three different container vessel designs intended for arctic operations (see fig. 2). Conventional hull shapes are superior in ice-free waters, but have difficulties progressing through the ice, while it is the opposite for an ice-breaking hull. A compromise solution combining a conventional bow with an aft designed for astern operation in ice was also included, but with larger uncertainty connected to the performance and price. The speed in level ice and through ridges was evaluated by available ice resistance formulations, and performance curves estimating the speed in given ice conditions were established. Acknowledged climate models were used to derive typical seasonal ice conditions until 2050 in order to include future trends in the simulations.

A route between Yokohama and Rotterdam, considered to be one of the first routes to become profitable for arctic shipping, was chosen in this case study. The cost reduction related to fuel, together with discharge of the Suez Canal fee, has to be larger than the additional costs related to the arctic route. The additional costs are related to increased fuel consumption and reduced speed in ice, and increased building costs for arctic vessels. Cargo insurance and operational costs are also assumed to increase by 50 per cent.

Although the double acting vessel (the compromise solution) shows slightly better performance in the simulation, a conventional vessel with ice strengthening is considered most relevant. This vessel uses a regular Suez route during winter and spring, and utilizes the arctic route when the ice conditions are less severe. It is based on a well-known design which can be used in non-arctic trades without too much penalty if the markets change, reducing the risk for the owner. The ice-breaking

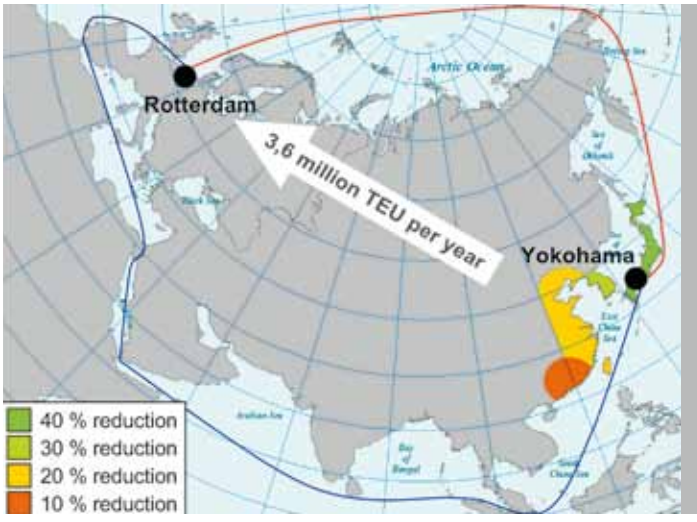


Fig 1. Assumed transport volume as of 2007, and potential reduction of distance from Rotterdam compared to the Suez route.

Fig.2

1. Conventional container vessel with ice strengthening

2. Purpose-built vessel with icebreaking hull shape.

3. Compromise solution.

vessels have a too large speed loss in open water to be competitive.

ARCTIC CHALLENGES

Even though the calculated costs may seem promising (fig. 3) they do not give the complete picture. The 'cost' of the additional risk has not been included in the evaluation, but it is of course an important factor for arctic operations. There are several challenges when operating in the Arctic, like the low temperatures, the effect of icing, human fatigue, and lack of trained and experienced crew.

Recognized class rules for ice strengthening, winterization and other technical issues are already available, and the technical side is therefore not regarded as a showstopper for container traffic in arctic waters. Further development is however needed in areas such as emergency evacuation and rescue, and weather and ice forecast for arctic waters, but good solutions for these topics are expected to follow an increased interest in the Arctic.

Environmental issues will definitely be relevant for an arctic trade route, and will be a topic for discussion. The Arctic Ocean is however international waters and requirements for emissions and environmental impact may be assumed to be in line with those stated for existing Ship Emissions Control Areas (SECA). In addition, technology in compliance with even stricter requirements already exists or is being developed. Technical solutions for a minimum environmental impact are therefore available for arctic vessels, but with an additional cost involved.

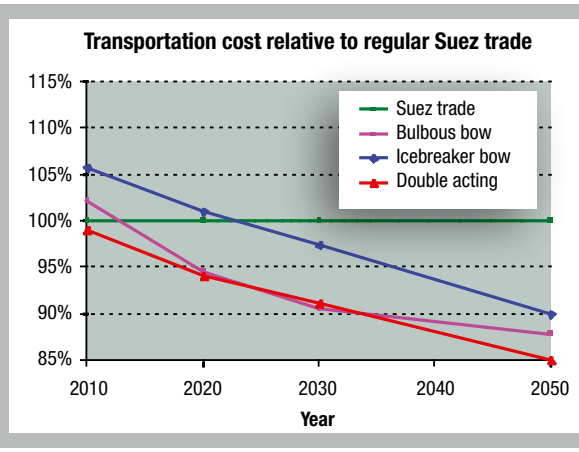
Another main challenge for arctic container traffic is related to the business aspect. Today the container business is operated after the just-in-time principle with very strict requirements to regularity, a trend that is expected to continue. With the continuously changing conditions in the Arctic, large variations in transit speed must be expected and more flexible schedules are required. Alternatively, introduction of buffer days in the schedule can improve the regularity, but will at the same time decrease the effect of reduced transit time. Continued ice melt in the Arctic will however be beneficial, and together with improved technology the regularity is expected to become better in the longer run. In addition, a more diverse regime with different requirements to regularity of delivery, depending on type of goods, may be demanded.

HIGH ECONOMIC RISKS

Technically it is already possible to design vessels suitable for the arctic route, and how the arctic trade will develop is mainly a question about how the world trade is developing. Arctic trading has to be initiated by ship owners and operators, who will take their decisions based on economic potential and involved risk.

At present the ice conditions are considered too heavy for the benefits to outweigh the expected additional costs, and further reduction in ice extent and thickness is a premise to release the arctic potential. The simulations of future ice conditions do however show such a decrease, and the future cost estimation for arctic trade vessels shows a favourable trend compared to the Suez trade used today. The uncertainties of other variables such as future transport patterns and volumes, oil price etc., add a high economic risk to the equation. The project has therefore concluded that even though there is a potential for profit from arctic trade routes, it is not expected to be utilized on a large scale in the near future. ○

Fig. 3. Comparison of simulated transportation cost per TEU (twenty-foot equivalent unit) relative to Suez trade as a function of year.



Sailing into unknown seas

The future of arctic shipping is directly linked to a number of financial and physical uncertainties, and some very clear realities. In light of the environmental sensitivities of the Arctic, this means that a stronger focus on precautionary measures is urgently needed, says PATRICK LEWIS.

WHILE THE MEDIA was quick to announce the arctic oil boom, the industry has moved somewhat slower than expected and continued instability in the energy market keeps pushing the timelines of extraction further into the future. In February 2010, the much anticipated Shtokman development was again put on hold with operation not projected to commence until 2016. Tourism has also suffered from the global economic downturn with fewer tourists willing to pay the large price tag for the trip, and fewer vessels chartered to supply the trade.

DR PATRICK LEWIS is Programme Officer for Immediate Threats for WWF International Arctic Programme where he coordinates WWF's activities associated with impacts from petroleum development, fisheries and shipping activities in the Arctic. He has previously managed the emergency response component of the Marine Invasive Species Programme of the Australian government and has extensive experience researching human impacts in Antarctica.

In addition to the significant questions in regards to how and when industry will expand in the high north, the physical environment supplies its own ambiguity. One of the many significant concerns is the lack of comprehensive hydrographic data in the Arctic and the dependence upon incomplete and outdated sea floor projections. Essential satellite and information technology services to the global fleet of vessels are very intermittent and unreliable in the far north. In an area where vessels are likely to be diverted from planned courses due to sea ice, this lack of certainty means that no one can be entirely sure exactly how deep the water is and where a risk of grounding exists. In addition to potentially diverting vessels to vulnerable areas and increasing the risk of accidents, the unpredictability of the ice and weather conditions is a significant impediment for an industry that depends upon fixed schedules.

ARCTIC DANGER

This lack of knowledge and the sensitivity of the arctic environment to ship-related risks such as oil spills, acoustic disturbance and emissions are of particular concern for WWF. Oil spills are almost impossible to clean up in the ice and weather conditions of the Arctic, and in cold conditions the impact of spills is likely to persist for long periods. Additionally, the iconic marine mammals and seabirds which are a defining part of this area are vulnerable to many of the emissions and disturbances that are synonymous with increased shipping activity. While we know that many species and habitat types in the Arctic desperately need additional measures to protect them, it is exceedingly difficult to show exactly which areas need such protection based on the available information.

Despite the many questions that dominate the discussion there are also some clear realities. Shipping is increasing in the Arctic and it is happening now. In 2010 Sovcomflot will be the first company to use the Northern Sea Route for commercial delivery of oil when it sends one of its purpose-built ice-classed shuttle tankers to Japan with oil loaded at the Varandey terminal on the Pechora Sea coast of Russia. Baffinland Iron Mines Corporation is currently advancing a development proposal for Mary River in the Foxe Basin of the Canadian Arctic which involves a new shipping route with year round operation in a location that has rarely seen commercial shipping.

Developments in the north are rapidly outpacing the ability of governance instruments to effectively regulate shipping. Furthermore, as ships explore new waters with unpredictable ice and weather conditions, the support services such as hydrographic data, weather predictions and satellite surveillance are slow to catch up. This creates an element of danger associated with arctic shipping. The isolation, weather conditions and climate that create these dangers also guarantee that problems that may be small in other regions frequently threaten human safety, the integrity of the vessel, and the environment when they occur in the Arctic.

> **"All that is needed is political will and a focus on precautionary measures when data is insufficient to deliver certainties.**

The headlines and announcements of new

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routes and maritime opportunities have certainly not gone unnoticed by the arctic coastal states. Indeed, the national and international responses to this issue demonstrate that where the need is urgent, governments and international organizations can move relatively quickly to provide the regulatory requirements to fill the gap. In the International Maritime Organisation (IMO), voluntary guidelines for the operation of vessels in ice covered waters in both poles have already been approved, and in 2010 the IMO has embarked upon a process to produce mandatory measures to ensure that polar shipping is safe and environmentally friendly. It is anticipated that these measures will be delivered as soon as 2014.

PARALLEL PROCESSES NEEDED

Mandatory measures for polar shipping will deliver some significant environmental benefits but cannot solve all of the environmental concerns that accompany increased shipping in the Arctic. Such measures may provide the means to regulate the types of vessels operating in ice-covered waters and how they operate, but in many respects the arctic maritime environment is still barren of many of the regulatory instruments that protect vulnerable environments from shipping related risks. Parallel processes are urgently needed to address outstanding questions such as: Should there be a ban on the carriage of heavy fuel oils in the Arctic similar to that imposed in the Antarctic? How and when will the arctic coastal states develop protective measures to ensure that vulnerable areas are not threatened by shipping? How will the international community regulate ships such as fishing vessels which will likely not be required to comply with any IMO regulations on a mandatory basis?

WWF is optimistic that many of these questions can be answered quickly and effectively – all that is needed is political will and a focus on precautionary measures when data is insufficient to deliver certainties. But as the world prepares for increased shipping in the Arctic, we cannot afford to be complacent. WWF is actively contributing by prompting governments and the shipping industry to develop governance solutions to manage shipping. We are also working closely with partners to establish science-based solutions to key issues in the Arctic. In particular we are focused on developing tools to protect vulnerable areas and species from shipping-related risks and identifying what the risks are in relation to carriage of heavy fuel oils, noise disturbance and air emissions.

Shipping in the Arctic promises to deliver many things to northern communities, but it also carries a risk of significant impact to the environment that defines this area. Likewise, shipping in the arctic delivers many economic promises to the global economy, but also poses uncertainty and risks that are unpalatable to world markets. One certainty that exists amidst the many questions is the fact that the far north is not a blank space on the map. The challenge is to ensure that as the map of arctic resources and ship routes continues to develop, sufficient attention is given to ensuring that the environment is a major consideration and that wilderness is allowed its own space. ○

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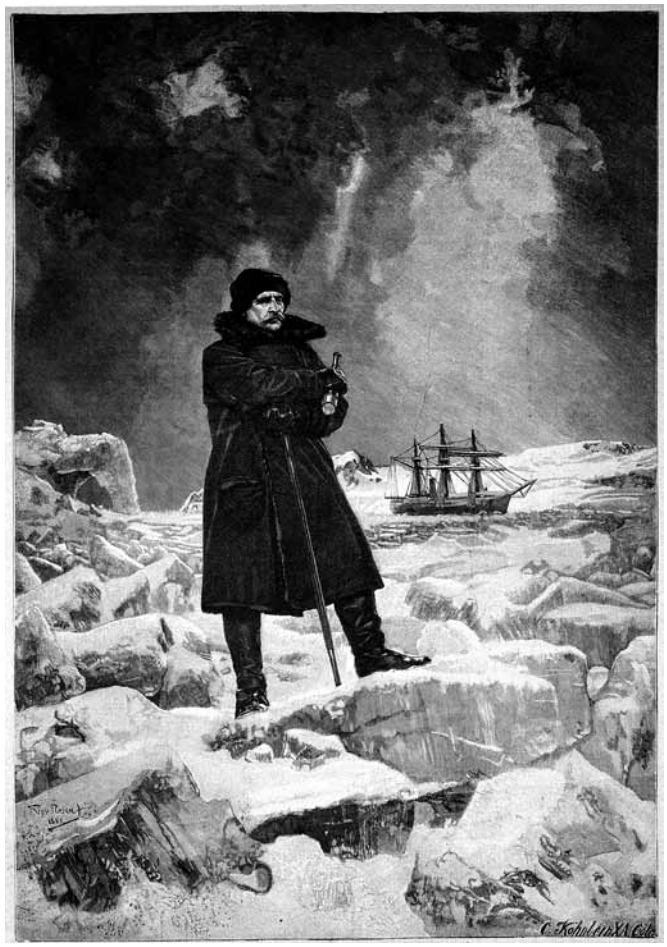
The Picture



Copper engraving based on a painting of Nordenskiöld by Georg von Rosen in 1886.

First through the Northeast Passage

Finnish-Swedish explorer Nils Adolf Erik Nordenskiöld (1832–1901) was the first person to complete a voyage from the Atlantic to the Pacific Ocean through the Northeast Passage. Nordenskiöld set out in July 1878 from Tromsø, Norway, with the converted whale boat *Vega* and with support from the Swedish King. At the end of August, only 100 nautical miles from the Bering Strait, *Vega* got stuck and had to spend 10 months in the ice, before the voyage could be completed the following year.
(Source: Wikipedia)