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# Climate Change and the Northern Sea Route: Effects on Supply Chains, the Environment, and Geopolitics



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April 2023



# Introduction

Courtesy of NOAA

Anthropogenic climate change devastates marine ecosystems and populations worldwide: erosion submerges [coastal lands](#), warming ocean temperatures disrupt fragile marine ecosystems, and rising sea levels threaten coastal cities. But as temperatures warm and polar ice thaws, world leaders are also adapting to climate change by seizing an extraordinary opportunity – a new artery in the global supply chain. The Northern Sea Route (NSR), a 14,000-kilometer-long passage extending from the Barents Sea in the West to the Bering Strait in the East,

has captured the attention of navigators, businesses, and nations seeking shorter trade routes for centuries. Yet, the Arctic's thick ice staved off trade. That is now changing.

The United States, through its [2022 National Strategy for the Arctic Region](#), is poised to capture the potential of the shifting Arctic by transforming Alaska into a thriving Northern hub. Despite the strategy's ambitious goals, it does not lose sight of the importance of protecting the environment and Alaskan indigenous communities.

# Shrinking Ice, Growing Routes: The Arctic Northern Sea Route

In the 16th century, Venetian explorer Sebastian Cabot wrote about the possibility of the Northern Sea Route to connect Europe with Asia. Near the end of that century, famed Dutch explorer Willem Barents attempted to sail the route, but the ice and harsh conditions made it impassable. He did not survive his endeavor.

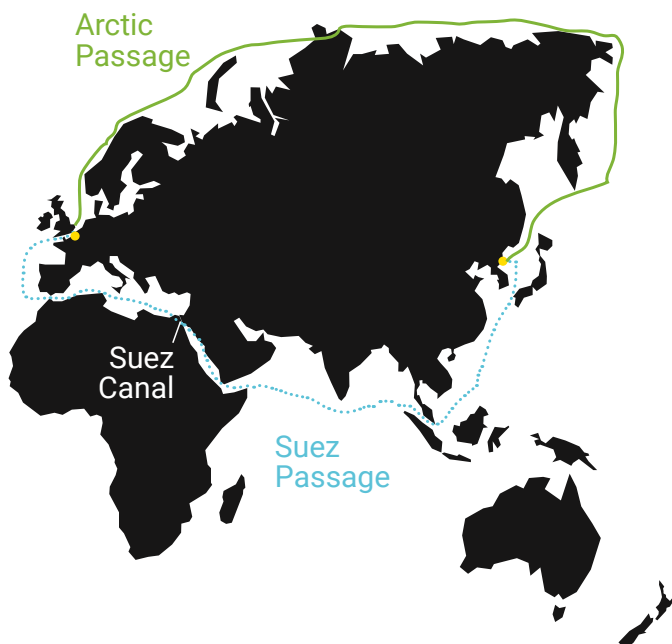
Five centuries later, the NSR has passed from abstraction into reality. Since the beginning of the 21st century, Arctic temperatures have risen more than [twice the global average](#). The extent of sea ice has reached record lows, and as the ice diminishes, nations and businesses are rushing to take advantage of the new trade opportunity.

The route has already seen a nearly 200 percent increase in traffic over the past five years, and by

2024 experts predict that more than [80 million tons](#) of cargo will flow through the route annually. Arctic and near-Arctic countries are now investing billions of dollars into their Arctic presence to protect their slice of the pie. In August 2022, [President Biden created](#) an Ambassador-at-Large position for the Arctic, underscoring the accelerating interest in the region.

Like a seesaw, an increase in trade through one route decreases it in another. The Netherlands' Bureau for Economic Policy Analysis [predicts](#) that two-thirds of the goods which pass through the Suez Canal will be rerouted to the NSR. It is not hard to see why: the NSR reduces shipping distances by [40 percent](#) compared to the Suez Canal, from 23,000 to 14,000 kilometers, the U.S. National Strategy notes.

Sameh A. Rassoul, the chief internal auditor at National Navigation Company, a major shipping corporation based in the Middle East, stated in [Financial Management](#) that, "Fully opening the NSR may play a significant role in reshaping the world trade map, as well as affect the economics of many countries" and that those supply chain leaders should "get ready for some key investment opportunities in many categories." The drastic reduction in transportation costs will surely rearrange the complex spiderweb of supply chains the world currently relies on. Supply chain strategists worldwide will soon be calculating a cost comparison between an ice-breaker escort and an extra 9,000 kilometers of shipping, with an inescapable conclusion awaiting them.



Source: [Financial Management](#)

# The Risks

The NSR is poised to become critical to the global economy. Yet businesses and the environment will face subsequent risks.

Predicting ice melt is still far from an exact science, and the consequences of miscalculation can be expensive. In 2021, the Eastern portion of the NSR froze over weeks before it typically does, leaving [ships trapped](#) in thick sea ice. In addition, the impact of increased shipping on the environment is unclear. The NSR

risks shipping accidents, oil spills, air pollution, and other unexpected consequences in one of the world's most fragile ecosystems. French President Emmanuel Macron urged global carriers to forego the route in his 2019 G7 Summit address, [saying](#), "this route may well be quicker, but it is the consequence of our past irresponsibility." In response, CMA CGM and MSC, two European container shipping companies, have [vowed](#) not to use the route.

# The Pragmatic Case for the NSR

Others argue that the route would be a net positive for the environment because a shorter distance traveled results in fewer emissions. Zhaojun Wang, a biologist at the Smithsonian Environmental Research Center, [presented a study](#) that found that traveling through the NSR reduces a vessel's emissions by 24 percent compared to the Suez Canal route, conserving about 264 metric tons of fuel per trip.

In addition to the potential benefits to the environment, Charles Norchi, director of Oceans and Coastal Law at the University of Maine School of Law, [argues that](#) the NSR may reduce supply chain vulnerabilities:

Although there is risk associated with the route, Amanda Lynch, professor of Earth, Environmental, and Planetary Sciences at Brown, [believes that](#) we need to accept the reality that its increased use may be a foregone conclusion: "these routes are opening up, and we need to start thinking critically about the legal, environmental and geopolitical implications."

**“Diversifying trade routes — especially considering new routes that can’t be blocked, because they’re not canals — gives the global shipping infrastructure a lot more resiliency.”**  
—Charles Norchi

# International Reaction

With so much at stake, states must define their Arctic strategy or risk losing out. While Arctic states have long had strategies to protect their regional interests, the list of non-Arctic states adopting Arctic strategies continues to grow: China, France, India, Japan, South Korea, and the United Kingdom have all released strategies in recent years. The proliferation of interest in the region has irritated Russia, which has long seen Arctic shipping lanes as its domain. Since 2018, Russian policymakers have repeatedly stated that non-Arctic countries should not have a military role in the region. Russia also charges burdensome fees and restrictions to ship through their waters. Amanda Lynch [remarked](#) that a shipping operator told her, “We’re not afraid of

icebergs. We’re afraid of icebergs of Russian paperwork.”

As activity increases, so does the tension. The Office of the Director of National Intelligence stated in a [2021 National Intelligence Estimate](#) that the “increased presence of China and other non-Arctic states very likely will amplify concerns among Arctic states as they perceive a challenge to their respective security and economic interests” and that “contested economic and military activities will increase the risk of miscalculation.” When economic interests concentrate in a particular region, security interests often follow. Increasingly, national Arctic strategies are defining their militaries’ posture towards the region.

# United States’ Response

As an Arctic nation, the United States is instrumental in guiding the region’s transformation. On the heels of establishing an Arctic Ambassador-at-Large at the U.S. Department of State and the U.S. Department of Defense (DoD) establishing an Arctic Strategy and Global Resilience Office, the Biden Administration also updated its National Strategy for the Arctic Region in October 2022. Four pillars and five principles undergird its latest Arctic strategy:

## Pillars:

1. Security
2. Climate Change and Environmental Protection
3. Sustainable Economic Development
4. International Cooperation and Governance

## Principles:

1. Consult, Coordinate, and Co-Manage with Alaska Native Tribes and Communities
2. Deepen Relationships with Allies and Partners
3. Plan for Long-Lead Time Investments
4. Cultivate Cross-Sectoral Coalitions and Innovative Ideas
5. Commit to a Whole of Government, Evidence-Based Approach

The pillars which structure the new document are the same ones that guided the 2013 National Arctic Strategy, save for one exception. The only entirely new addition is the third: Sustainable Economic Development. While the 2013 strategy does deal meaningfully with



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Arctic economic issues, the increased emphasis on sustainable development in the latest strategy is significant.

This chart illustrates the intensification of interest in the Arctic’s growing economic viability by comparing the frequency of economic topics mentioned between the 2013 and 2022 strategies:

Theme	Word Occurrence	2013	2022
Economic and development aspects	Economic	11	31
	Opportunity/y/ies	15	21
	Invest/ing/ment	4	39
	Develop/ed/ment/ing	30	44

Source: [MP-IDSA](#)

Although the NSR looms large in the current Arctic National Strategy, the document directly references the route only a single time. The absence of references is likely attributable to the tension created by the Russian invasion of Ukraine; to speak directly of American designs so close to Russia’s coast would be unnecessarily inflammatory.

However, the strategy directs its most significant investments toward the route. The most prominent project is constructing a deep draft harbor at Nome, Alaska. In a roundtable discussion among the strategy’s key authors, Devon S. Brennan, Director for Maritime and Arctic Security at the National Security Council, [remarked](#) that while the harbor at Nome is primarily for docking military vessels, “it also has a high level of commercial applicability.” The strategy document also designates the procurement of new icebreaker vessels and the development of “smaller ports, airfields, and other infrastructure.” Alaska will likely become one of the most attractive stops along the NSR shipping lane.

**“We will invest in infrastructure, improve access to services, and support the development of industries that expand economic opportunity for local communities, support the energy transition, and build the resilience of U.S. supply chains.”**  
**—National Strategy for the Arctic Region**

The massive infrastructure development necessary to transform Alaska into a thriving Arctic hub requires more than federal dollars. The U.S. is already applying a solution to this problem abroad. A common practice within the international development sector is to use public resources to catalyze and direct private investment toward development objectives. The 2022 National Strategy proposes repurposing many international development agencies, such as the Export-Import Bank, the U.S. International Development Finance Corporation (DFC), and U.S. Trade and Development Agency for domestic use in Alaska. These agencies, which have directed billions of dollars of investments across middle- and low-income countries, will now do the same in the American Arctic.

Capturing the Arctic’s economic potential is essential, but the updated National Strategy recognizes that it cannot come at the cost of the environment or indigenous communities. Because of the Arctic’s faster rate of warming and global sea level rise caused by ice cap melt, preventing environmental degradation in the Arctic is more critical and complex than in other regions. The strategy addresses this dilemma by emphasizing the importance of reducing localized emissions and investing in climate-resilient infrastructure.

“More than 60 percent of Alaska Native communities are considered environmentally threatened due to climate change.”

[National Strategy for the Arctic Region](#)

Preventing further environmental damage by reducing local greenhouse gas emissions is critical to safer development in the Arctic. The strategy calls for restraining localized carbon dioxide, methane, and black carbon emissions while shoring up indigenous communities against the consequences of past damage, such as adverse impacts on food security and increased vulnerability to drought and wildfires.

The strategy’s provisions for the environment and Alaskan indigenous communities are part of the larger investment made by the recently passed Inflation Reduction Act (IRA). The IRA includes [nearly \\$370 billion](#) in investments toward the communities most impacted by climate change and the energy transition. According to [Rhodium Group](#), an independent research provider, the investment made by the IRA will get total U.S. greenhouse gas emissions far closer to the 2030 target set in the Paris Agreement. Because of the IRA and the Arctic Strategy, the Arctic region’s inhabitants will be some of the primary beneficiaries of this reduction in emissions.

# How WBD Can Help

Sound infrastructure underlies the success of the Arctic's NSR, and financing this massive investment will require more than just federal dollars. WBD has extensive experience creating innovative infrastructure financing arrangements in international development. We currently support the Millennium Challenge Corporation to close Indonesia's half-trillion-dollar infrastructure investment gap by using blended finance to stimulate private investment into Indonesia's public infrastructure.

cloud-based portal and reduced DISA's costs by over \$100 million by identifying gaps in the supply chain. We forged our supply chain service line in the arduous proving ground of South Asia. In India and Bangladesh, WBD implemented the USAID-funded [Cross Border Infrastructure and Connectivity Program \(CBIC\)](#) to create sustainable and clean regional supply chains by identifying and securing financing for crucial waterway and shipping infrastructure projects.

**“We're eager to help make the business case for more private investment in Indonesia's infrastructure... Getting these approaches right will support MCC's goal of promoting economic growth and poverty reduction in Indonesia.”**

**—Scott Caldwell, President, Washington Business Dynamics**

In projects spanning the globe, from Asia to Africa and Latin America, WBD has proven to be a premier firm in development and infrastructure finance. We look forward to assisting the U.S. international development community in tackling the financing gap in the Arctic with the same urgency as we do in the developing world.

With the unfolding Arctic supply chain revolution, the private and public sectors can benefit from WBD's expertise in supply chain strategy and logistics. Recently, WBD's process improvement tools provided senior DoD leadership with a customized

[Supply chain challenges](#) are complex, but in no region are they more complex than the Arctic. The challenge of operating in one of the most ecologically fragile regions on Earth requires deep experience in developing safe and sustainable transportation solutions that prioritize local communities. Under CBIC, WBD's technical experts and engineers are creating a green and climate change-resilient supply chain infrastructure by innovating new vessel designs that phase out dirty fuels and utilize cutting-edge technologies.

Greening South Asia's vessel fleet will reduce waste spills, lower greenhouse gas emissions,



## Cross Border Infrastructure and Connectivity Program



### Use of Alternative Fuels

- Hydrogen
- GTL/Biouel Methanol
- Ethanol
- LNG/CNG



### Air Pollutants Emission Reduction

- After-treatment
- New engine concepts/ optimization
- Alternative technologies



### Energy Consumption Reduction

- Energy-efficient ship design
- Hybrid/diesel-electric propulsion
- Electric propulsion
- Energy-efficient navigation

and diminish transport costs in the region. As the supply chains flowing through the Arctic multiply, plans to construct the subsequent infrastructure must place climate resilience, community needs, and minimal environmental impact at the forefront.

The obstacles to operating in the Arctic are complex and diverse. Thankfully, WBD has experience and expertise equal to the challenge. From development finance to supply chain logistics to vessel greening, WBD is well-positioned to help federal and commercial clients make better decisions in the Arctic.