

CURRICULUM RESOURCE GUIDE FOR  
EDUCATORS



# ARCTIC SECURITIES:

HOW TO UNDERSTAND  
CURRENT CHALLENGES IN THE  
CIRCUMPOLAR WORLD



WEDNESDAY, NOVEMBER 6TH, 2024  
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# Table of Contents

Outlining Standards .....	pp. 3-4
Washington State K-12 Social Studies Learning Standards.....	p.3
College, Career, & Civic Life C3 Frameworks for Social Studies State Standards.....	p.4
Educating for Global Competence.....	p.5
Learning Objectives.....	p.6
Key Terms.....	p.7
Arctic Background Information.....	pp. 8-11
The Arctic from the Canadian Perspective.....	pp. 12-13
Canada's Arctic Strategy & Security Challenges in the North.....	pp. 14-20
A New "Arctic Silk Road".....	pp. 21-30
Russia's Arctic Expansion.....	pp. 31-43
Photo Bibliography.....	pp. 44-46

## How To Use This Guide



Visual Media



Audio / Podcast



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Lesson Plans

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# Outlining Standards

## A Note on Learning Standards Presented in this Guide

Three sets of standards have been linked to each of the learning objectives in this packet. The **Washington State K-12 Social Studies Learning Standards** and the accompanying Grade Level Requirements are the social studies standards for WA State.

The **College, Career, & Civic Life C3 Framework for Social Studies State Standards** are the standards published by the National Council for the Social Studies. Guiding the packet as a whole is the Framework for Global Learning created by the Asia Society and the Council of Chief State School Officers titled *Educating for Global Competence: Preparing Our Youth to Engage the World* (2011).

Cross-objective standards are listed at the beginning of the packet, and content-specific standards can be found after each learning objective.

The standards provided have been selected for relevance, but are not exclusive: many other standards, such as Common Core, may be applicable to the resources and learning objectives identified in this packet. The intention for this packet's organization is to provide educators with an idea of resources available and possible uses for resources. Users should feel free to create their own learning objectives and to select resources according to the specific needs of their classrooms.

## WASHINGTON STATE K-12 SOCIAL STUDIES LEARNING STANDARDS

There are five EALRs in Social Studies, one for each of the discipline areas: civics, economics, geography, and history, and a fifth for social studies skills.

### (1) Social Studies EALR 1: CIVICS

The student understands and applies knowledge of government, law, politics, and the nation's fundamental documents to make decisions about local, national, and international issues and to demonstrate thoughtful, participatory citizenship.

### (2) Social Studies EALR 2: ECONOMICS

The student applies understanding of economic concepts and systems to analyze decision-making and the interactions between individuals, households, businesses, governments, and societies.

### (3) Social Studies EALR 3: GEOGRAPHY

The student uses a spatial perspective to make reasoned decisions by applying the concepts of location, region, and movement and demonstrating knowledge of how geographic features and human cultures impact environments.

### (4) Social Studies EALR 4: HISTORY

The student understands and applies knowledge of historical thinking, chronology, eras, turning points, major ideas, individuals, and themes on local, Washington State, tribal, United States, and world history in order to evaluate how history shapes the present and future.

### (5) Social Studies EALR 5: SOCIAL STUDIES SKILLS

The student understands and applies reasoning skills to conduct research, deliberate, and form and evaluate positions through the processes of reading, writing, and communicating.

# Outlining Standards

## COLLEGE, CAREER, & CIVIC LIFE C<sub>3</sub> FRAMEWORK FOR SOCIAL STUDIES STATE STANDARDS

The C<sub>3</sub> Framework is organized into the four Dimensions, which support a robust social studies program rooted in inquiry.

The four Dimensions are as follows:

- (1) Developing questions and planning inquiries;
- (2) Applying disciplinary concepts and tools;
- (3) Evaluating sources and using evidence;
- (4) Communicating conclusions and taking informed action

DIMENSION 1: DEVELOPING QUESTIONS AND PLANNING INQUIRIES	DIMENSION 2: APPLYING DISCIPLINARY TOOLS AND CONCEPTS	DIMENSION 3: EVALUATING SOURCES AND USING EVIDENCE	DIMENSION 4: COMMUNICATING CONCLUSIONS AND TAKING INFORMED ACTS
Developing Questions and Planning Inquiries	<ul style="list-style-type: none"> <li>Civics</li> <li>Economics</li> <li>Geography</li> <li>History</li> </ul>	<ul style="list-style-type: none"> <li>Gathering and Evaluating Sources</li> <li>Developing Claims and Using Evidence</li> </ul>	<ul style="list-style-type: none"> <li>Communicating and Critiquing Conclusions</li> <li>Taking Informed Action</li> </ul>

Dimension 2 has four disciplinary subsections: (1) **Civics**; (2) **Economics**; (3) **Geography**; (4) **History**. Each disciplinary subsection has three to four additional categories, which provide an organizing mechanism for the foundational content and skills within each discipline.

### C<sub>3</sub> Framework Organization

CIVICS	ECONOMICS	GEOGRAPHY	HISTORY
Civic and Political Institutions	Economic Decision Making	Geographic Representations: Special Views of the World	Change, Continuity, and Context
Participation and Deliberation: Applying Civic Virtues and Democratic Principles	Exchange and Markets	Human-Environment Interaction: Place, Religions, and Culture	Perspective
Processes, Rules, and Laws	The National Economy	Human Populations: Spatial Patterns and Movements	Historical Sources and Evidence
	The Global Economy	Global Interconnections: Changing Spatial Patterns	Causation and Argumentation

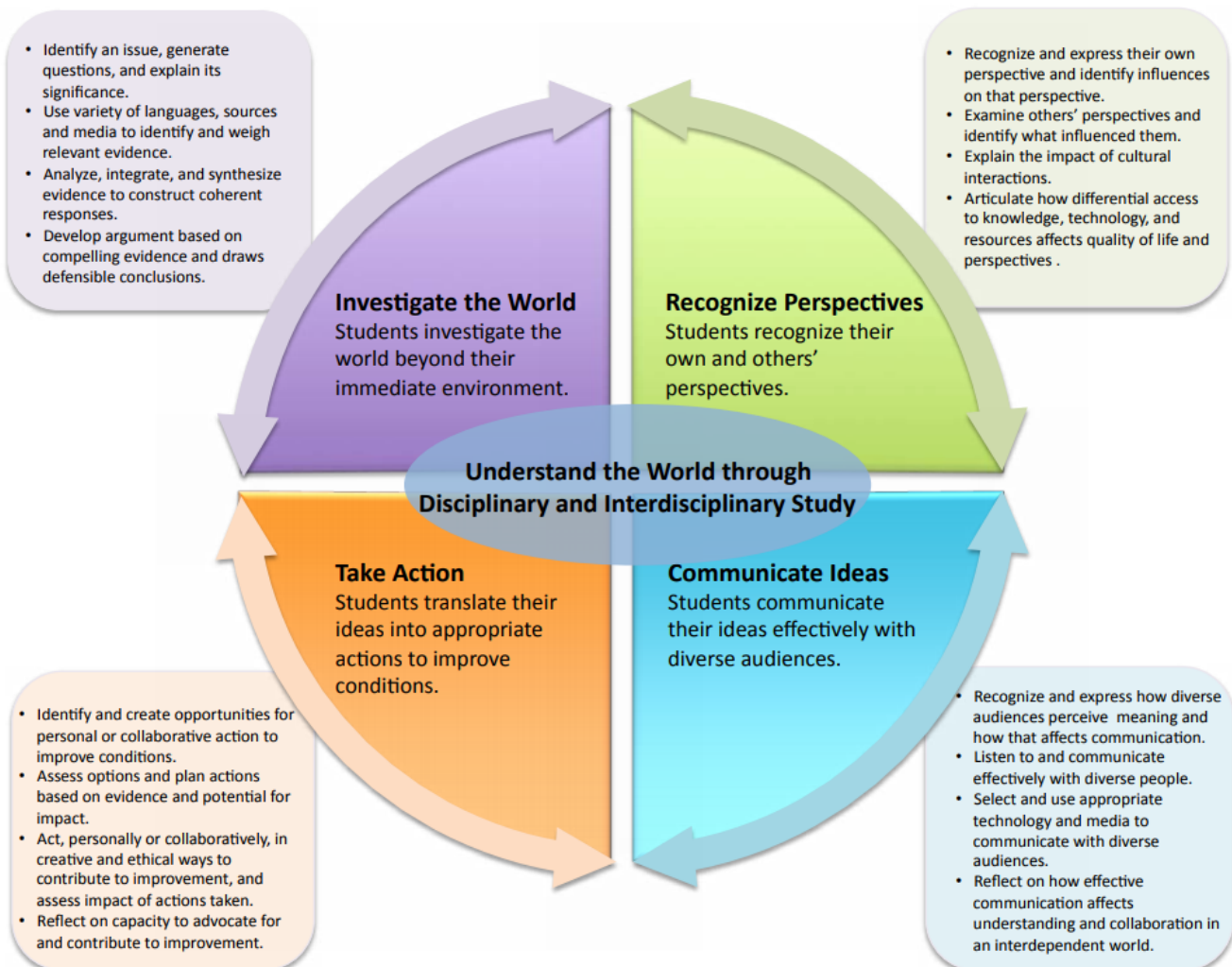
# Educating For Global Competence

Frameworks taken from *Educating for Global Competence: Preparing Our Youth to Engage the World* (Asia Society and the Council of Chief State School Officers 2011).

“Global competence is the capacity and disposition to understand and act on issues of global significance” (Chapter 2).

Globally competent students are able to perform the following four competences:

1. **Investigate the world** beyond their immediate environment, framing significant problems and conducting well-crafted and age-appropriate research.
2. **Recognize perspectives** others’ and their own, articulating and explaining such perspectives thoughtfully and respectfully.
3. **Communicate ideas** effectively with diverse audiences, bridging geographic, linguistic, ideological, and cultural barriers.
4. **Take action** to improve conditions, viewing themselves as players in the world and participating reflectively.



# Learning Objectives

1. Students will be able to analyze and discuss the geography and history of the circumpolar world.
2. Students will be able to define geopolitics and analyze the geopolitical significance of the Arctic region.
3. Students will be able to analyze and discuss the complexity of Arctic social, political, and environmental systems from interdisciplinary perspectives.
4. Students will be able to identify, analyze, and discuss the role of the Arctic Council in governing the Arctic region.
5. Students will be able identify and explain different elements of Arctic security, including human security (food, health, etc.)
5. Students will be able to identify Arctic policy challenges and evaluate efforts to address these political, economic, social, and environmental issues.
6. Students will be able to identify, discuss, and evaluate the role of international organizations in addressing Arctic policy issues.
7. Students will be able to identify and evaluate how Arctic Indigenous communities are playing a leading role in local governance.
8. Students will be able to identify, assess, and discuss Arctic Indigenous agency in addressing political, economic, social, and environmental issues.
9. Students will be able to identify and evaluate the use of technology (including innovations in space) in addressing Arctic security issues.
10. Utilizing the Arctic as a case study, students will be able to evaluate and make connections between local and global issues across selected regions of the world.



# Key Terms

**Circumpolar Region**: the northern lands of the world's eight northernmost countries, Canada, Finland, Denmark (including Greenland and the Faroe Islands), Iceland, Norway, Russia, Sweden, and the United States (Alaska)

**Nunavut**: vast territory of northern Canada that stretches across most of the Canadian Arctic

**Arctic Council**: the leading intergovernmental forum promoting cooperation, coordination and interaction among the Arctic States, Arctic Indigenous Peoples and other Arctic inhabitants on common Arctic issues, in particular on issues of sustainable development and environmental protection in the Arctic

**Near-Arctic State**: one of the continental States that are closest to the Arctic Circle

**Arctic Sovereignty**: the consolidation of political control over distant Northern regions by the southern capitals of circumpolar states and tended to focus on maritime boundary disputes, perceived foreign threats to territory and control over natural resources

**Polar Silk Road**: Arctic shipping routes that connect major economic centres via the Arctic Circle

**Northwest Passage**: historical sea passage of the North American continent

**Polar-Observing Satellites**: satellites that constantly circle the Earth in an almost north-south orbit, passing close to both poles

**Arctic Governance**: a region undergoing profound environmental, economic and social change, where new actors are coming to the fore and new regulatory frameworks are emerging

**Transpolar Route**: a future Arctic shipping route running from the Atlantic Ocean to the Pacific Ocean across the center of the Arctic Ocean

**Northern Sea Route**: a shipping lane officially defined by Russian legislation between the Atlantic Ocean and the Pacific Ocean specifically running along the Russian Arctic coast from Murmansk on the Barents Sea, along Siberia, to the Bering Strait and Far East

**Council of the Barents Euro-Arctic Region**: the official body for inter-governmental co-operation in the Barents Region

**"Arctic Five"**: the grouping of the five Arctic littoral states (Canada, Denmark, Norway, Russia, and the United States of America) in addressing Arctic affairs

**Tuberculosis**: infectious disease that is caused by the tubercle bacillus, *Mycobacterium tuberculosis*. In most forms of the disease, the bacillus spreads slowly and widely in the lungs, causing the formation of hard nodules (tubercles) or large cheese like masses that break down the respiratory tissues and form cavities in the lungs. Blood vessels also can be eroded by the advancing disease, causing the infected person to cough up bright red blood.



# Arctic Background Information

## [The Arctic: Location & Geography](#)

"With Dive and Discover, your students are at the frontline of scientific inquiry as they join scientists—geologists, chemists and biologists—who are exploring the seafloor and making amazing new deep-sea discoveries. Daily updates, photos, videos and email correspondence with scientists from these research vessels allow your students to follow the progress of the scientific missions and find out about life on the floating laboratories at sea." [For Teachers](#).



## [Discovering the Arctic: For Teachers](#)

"Welcome to Discovering the Arctic, an education resource for schools, developed by the Royal Geographical Society with IBG, in partnership with the UK Foreign and Commonwealth Office, British Antarctic Survey and the Scottish Association for Marine Science. This is not a 'scheme of work' but a resource to dip into depending on your curriculum needs and priorities. It is aimed at GCSE level in England and Wales (14 - 16 year olds) but is suitable for other age groups with some adaptation."

## [Arctic States](#)

The Arctic States have territories within the Arctic and thus carry the role as stewards of the region. Their national jurisdictions and international law govern the lands surrounding the Arctic Ocean and its waters. The northern provinces of the Arctic States offer a home to more than four million people, whose health and well-being is on the top of the Arctic Council's agenda.





# Arctic Background Information



## [The Arctic Region: Life in the North, Grade 5](#)

"This region is located north of the Arctic Circle and the tree line. Short, cool summers and long, cold winters help to maintain permafrost on the land. The southern part of this area has small hills; the northern part has mountains, glaciers, plains, and islands. Very little vegetation grows in this area. Oil, gas, lead, zinc, and silver can be found in this region."

## [Climate Change | WWF Arctic](#)

"The Arctic's average temperature has already risen at a rate of almost three times the global average, warming faster than any other region on Earth, suffering from amplified climate crisis effects while also trying to cope with the impacts from a growing global rush for resources, new shipping routes, and opportunities."

## [10 Facts about the Arctic | National Geographic Kids](#)

"Wrap up warm, gang, because we're off on an icy adventure to the Arctic in our ten brrr-illiant Arctic facts!"

## [Arctic Weather and Climate | Quick Facts](#)

"Although the Arctic may seem far removed from the rest of the globe, Arctic climate and weather are closely linked with climate and weather elsewhere. Cold conditions in both the Arctic and Antarctic play key roles in global circulation patterns in the atmosphere and ocean. In other words, weather phenomena at lower latitudes, such as heat waves, cold snaps, storms, floods, and droughts, can be strongly shaped by what is happening in the Arctic. At the same time, the Arctic's location and configuration creates northern phenomena rarely found elsewhere."



## [5 Maps That Explain the Arctic \(September 7th, 2023\)](#)

"What first comes to mind when you think of the Arctic? Ice? Polar bears? Climate change? It wasn't until very recently that we've gotten a clearer picture of the Arctic...But just what are we mapping in the Arctic? Geographic boundaries, climate change, ecology, geology, trading routes, oil exploration, the natural environment, and even the research that is taking place north of 60°."

# Arctic Background Information



[How to Teach about Arctic Animals So Kids are Engaged \(May 27th, 2023\)](#)

"The Arctic is one of the two coldest places on planet Earth, the other is obviously the Antarctic! Kids love learning about the climate and the animals that live there. I wanted to share with you some ideas that you can use while planning your Arctic Animals unit and lesson plans."

[Arctic and Northern Policy Framework \(September 22nd, 2022\)](#)

"The Arctic and Northern Policy Framework is a profound change of direction for the Government of Canada. For too long, Canada's Arctic and northern residents, especially Indigenous people, have not had access to the same services, opportunities, and standards of living as those enjoyed by other Canadians. There are long standing inequalities in transportation, energy, communications, employment, community infrastructure, health and education. While almost all past governments have put forward northern strategies, none closed these gaps for the people of the North, or created a lasting legacy of sustainable economic development."

[10 Arctic Facts You Might Not Know \(August 16th, 2022\)](#)

"The Arctic is a mesmerising region at the top of the world, quite literally, that incorporates parts of eight countries – Canada, Greenland, Iceland, Norway, Finland, Sweden, Russia and the United States. Because of its rich history, fascinating cultures and unique wildlife that cannot be found anywhere else in the world, it is a favourite for travellers seeking true adventure and authentic experiences."



# Arctic Background Information



[Arctic | National Geographic \(May 19th, 2022\)](#)

"The Arctic is the northernmost region of Earth. Most scientists define the Arctic as the area within the Arctic Circle, a line of latitude about 66.5° north of the Equator. Within this circle are the Arctic ocean basin and the northern parts of Scandinavia, Russia, Canada, Greenland, and the U.S. state of Alaska."



[UNIKKAAT \(August 2020\)](#)

"This podcast, launched in August 2020, brings you stories, testimonials, and reports from the four circumpolar countries where 180,000 Inuit live – in Alaska, Canada, Greenland, and Chukotka in Russia."



[Arctic Peoples \(October 2014\)](#)

"Students will explain how Arctic peoples' lives have been shaped by climate, describe how current changes in climate are impacting Arctic peoples, and predict how Arctic communities may be impacted by future changes in climate."



[Teaching Notes: The Emerging Arctic \(March 24th, 2014\)](#)

"This interactive InfoGuide—which includes videos, infographics, maps, and timelines—explores whether the Arctic can be developed sustainably and peaceably. Teaching notes by Lawson Brigham, Distinguished Professor of Geography and Arctic Policy, University of Alaska Fairbanks."



# The Arctic from the Canadian Perspective



## [Canada's Arctic Marine Atlas](#)

"Canada's Arctic Marine Atlas, produced by Oceans North and its partners, provides an overview of the marine mammals, seabirds, fish and other wildlife that thrive in our northern waters – and highlights the importance of a healthy ecosystem for the people who live there."

## [CANADA | Canada and the Arctic Region](#)

"Nearly 40 percent of Canada's land mass is considered Arctic and Northern, consisting of the Northwest Territories, Nunavut, Yukon, and the northern parts of several provinces. Canada's Arctic is home to approximately 150,000 inhabitants, of which more than half are Indigenous. Although Canada's Arctic region is vast, less than one percent of Canada's population lives there."



## [Arctic Imperative - Lesson Plan](#)

"With the generous support of Dr. Grant, Canadian Geographic Education created this resource, Arctic Imperative: Education Resources for Canadian Schools, to help secondary school teachers and students to explore the Arctic through the lenses of identity, sovereignty, climate change and governance. Each lesson contains a passage from Grant's Polar Imperative as well as maps and other primary and secondary source materials.'





# The Arctic from the Canadian Perspective



[Climate Change in the Canadian Arctic - Report/Presentation](#)

"The Arctic climate is warming rapidly now and much larger changes are projected."

[Global Affairs Canada: Departmental Plan 2023-2024](#)

"In a rapidly changing and increasingly uncertain global landscape, Canada's capacity to advance its priorities on the international stage is important for the security, prosperity and health of Canadians. Global Affairs Canada

will respond to immediate needs of Canadians and—together with allies and partners from around the world—will intensify efforts to find solutions to shared challenges, including addressing the impacts of Russia's illegal invasion of Ukraine, the global food and energy crises, the climate crisis, and the continued fight against the Covid-19 pandemic. The department will also foster an inclusive and sustainable path to economic recovery and growth, and contribute to efforts to build back better with partners around the world, including through Canada's commitment to implement the 2030 Agenda for Sustainable Development and in support to the Prime Minister's role as co-chair of the UN Sustainable Development Goals Advocates group."



[Highlights from the 2022 Arctic Report Card \(December 13th, 2023\)](#)

"Since 2006, the National Oceanic and Atmospheric Administration has issued this annual report that pulls together peer-reviewed, reliable and concise environmental information, analyzing various components of the Arctic's current environment system relative to historical records."

[Indigenous Peoples of Québec and Eastern Canada \(September 1st, 2023\)](#)

"In Canada, the term Indigenous peoples encompasses the First Nations, the Inuit, and the Métis. In French the term is peuples autochtones du Québec. First Nations peoples are considered the original inhabitants of modern-day Canada. They typically inhabit the southern part of the country. The Inuit people live in the northernmost regions of Canada. They call their homeland Inuit Nunangat, which makes reference to the land, water, and ice found in the Arctic. The Métis are peoples who have mixed French and Cree ancestry. They live mainly in Alberta, Saskatchewan, and Manitoba, which altogether are known as the Prairie Provinces."

# Canada's Arctic Strategy & Security Challenges in the North



[A Long-Term Proxy for Sea Ice Thickness in the Canadian Arctic: 1996–2020 \(August 15th, 2023\)](#)

"The Parry Channel, which is part of the Northwest Passage and relevant for shipping, shows significant thinning in autumn. The sea ice thickness proxy product provides, for the first time, the opportunity to study long-term trends and variability in sea ice thickness in the Canadian Arctic, including the narrow channels in the Canadian Arctic Archipelago."



[Senators Discuss Committee Report on Arctic Security and Defence \(June 28, 2023\)](#)

"Members of the Senate Committee on National Security, Defence and Veterans Affairs hold a news conference on Parliament Hill to discuss the findings of their study on security and defence in the Arctic. As part of the study, the committee conducted fact-finding missions throughout Northern Canada, as well as to the NORAD command centre in Colorado Springs, Colorado. The report highlights the vulnerabilities that plague Canada's North due to a variety of factors such as its economically underdeveloped nature, climate change-related issues and the threats posed geopolitically by China and Russia. It focuses on the importance of collaboration between the federal government and Indigenous communities in the North to address these challenges. Taking part in the news conference are senators Tony Dean, Jean-Guy Dagenais, Margaret Dawn Anderson, and Pierre-Hugues Boisvenu."

## **Fast Fact:**

"The Arctic region is home to about four million people. Indigenous peoples make up the majority of Greenland's population and over half of the Arctic Canadian population."

<https://www.adventurecanada.com/canadian-high-arctic-and-greenland/top-of-the-world-ten-facts-about-the-arctic>

# Canada's Arctic Strategy & Security Challenges in the North

[Arctic Security Under Threat: Urgent Needs in a Changing Geopolitical and Environmental Landscape \(June 28th, 2023\)](#)

"From March 2022 to April 2023, the Standing Senate Committee on National Security, Defence and Veterans Affairs conducted a study of issues relating to security and defence in the Arctic, including Canada's military infrastructure and security capabilities. In some respects, that study complemented earlier studies undertaken by a number of parliamentary committees. During hearings in Ottawa, and fact-finding trips to the Canadian Arctic and the headquarters for the North American Aerospace Defense Command (NORAD) in Colorado Springs, Colorado, the committee heard about three themes: the international security environment and the Arctic; Arctic security and increased access to the region; and military capabilities and security infrastructure in the Arctic."

[Building a Safer North: Climate Security Risks in the Canadian Arctic \(June 15th, 2023\)](#)

"What happens in the North impacts the world, and when you look at security issues and climate change, the world is paying attention more than ever," recently noted Canadian Governor-General Mary Simon at an event at the Arktikum Science Centre in Rovaniemi, on February 9th, 2023."

[Canada and the Circumpolar Regions \(June 12th, 2023\)](#)

"The Arctic is central to Canada's national identity, prosperity, security, values and interests. The Canadian Arctic covers 40% of Canada's territory and is home to more than 200,000 inhabitants, more than half of whom are Indigenous. Advancing Canada's Arctic priorities involve many departments across the Government of Canada, both at home and internationally."

## **Did You Know?**

"The phenomenon known as Arctic Amplification refers to the fact that the Arctic is warming at twice the rate as the rest of the world. In some parts of the Arctic, the warming is three times that of the rest of the world. As the Arctic loses more sea ice coverage, it loses its bright, reflective surface and opens up the darker ocean. This darker surface absorbs more solar energy, amplifying the warming trend. Losing Arctic sea ice clogs up Earth's air conditioning capabilities. More heat is absorbed and less is reflected back into space."

<https://nsidc.org/learn/parts-cryosphere/arctic-weather-and-climate/quick-facts-about-arctic-weather-and-climate>

# Canada's Arctic Strategy & Security Challenges in the North

## [Climate Change Adaptation in Canada \(May 17th, 2023\)](#)

"Changes in climate will persist and, in many cases, will intensify over the coming decades. That will have significant impacts on Canadian communities through our economy, social well-being (health, culture, etc.) and environment. We must understand these impacts and the options available to us if we want to build resilience through adaptation, reduce the associated risks and costs of climate change's impacts and support sound decision-making."

## [The Arctic: A Primary Canadian National Interest \(May, 15, 2023\)](#)

"A meaningful debate on Canada's role in the Arctic is long overdue, but we may be finally witnessing its start. Such a debate is of particular importance, given the central place that the circumpolar region occupies in the tapestry of Canada's national interests."

## [Arctic Indigenous Peoples in Canada \(March 15, 2007, Last Edited January 27, 2023\)](#)

"Indigenous peoples in Canada, both historical and contemporary, have inhabited six cultural areas that, unlike provinces and territories, do not have strict boundaries, and instead refer to areas in more general terms. The Arctic is one of these cultural areas. The others include the Plains, Plateau, Subarctic, Northwest Coast and Eastern Woodlands. Referred to as Inuit Nunangat, the Inuit homeland comprises those inland and coastal areas north of the treeline. It is for this reason that the terms Inuit — itself a generic term — and Arctic peoples are often used interchangeably."





# Canada's Arctic Strategy & Security Challenges in the North



[The Arctic is Warming 4 Times Faster than the World. What Does that Mean for the N.W.T.? \(November 28th, 2022\)](#)

"If we manage to cap global warming at 1.5 C since pre-industrial times, it'll be several degrees warmer in Canada's North. This is the first installment of a series that looks at what six degrees of warmth will mean for the N.W.T."

[Canadian Arctic Sovereignty \(February 6th, 2006, Last Edited June 15th, 2022\)](#)

"Arctic sovereignty is a key part of Canada's history and future. The country has 162,000 km of Arctic coastline. Forty per cent of Canada's land mass is in its three northern territories. Sovereignty over the area has become a national priority for Canadian governments in the 21st century. There has been growing international interest in the Arctic due to resource development, climate change, control of the Northwest Passage and access to transportation routes."

[Plastic Pollution Accelerating the Consequences of Climate Change in Canada's Arctic, according to New Research \(May 15th, 2022\)](#)

"As Canada's Arctic continues to accumulate plastic, and climate change takes its toll on northern environments and communities, experts have evidence to suggest each threat is exacerbating the other, according to a recent paper published in Nature this month."



[Blue Skies Podcast | Canadian Arctic Strategy with Dr. Jessica Shadian \(May 9th, 2022\)](#)

"MP Erin O'Toole sits down with Dr. Jessica Shadian, President and CEO of Arctic360, to discuss Canada's Arctic and the absence of a long-term strategic plan for this important region. Dr. Shadian explains how Canada can learn from other Arctic nations to create a strategy which addresses security, sovereignty, investment and infrastructure concerns in our North, and talks about the work of Arctic360, Canada's premier Arctic-policy think tank."



# Canada's Arctic Strategy & Security Challenges in the North



[Earth from Space: Canadian Arctic Archipelago \(March 6th, 2020\)](#)

"The Copernicus Sentinel-3 mission takes us over part of the Canadian Arctic Archipelago."

[Preparing for the Impacts of Climate Change Along Canada's Arctic Coast: The Importance of Search and Rescue \(October 2019\)](#)

"The Arctic is undergoing transformative climate change, with profound implications for transportation safety in marine areas. Circumpolar marine risks are growing due to ship traffic increases linked to more ice-free open water, as well as increases in hazards for individuals that frequently travel on ice and trails in the region. While recent Government of Canada policies have attempted to respond to the growing risk of marine and coastal emergencies, there is strong evidence that the federal government and communities along Canada's Arctic coast are minimally prepared for the emerging risks."

[Canada Warming Twice As Fast As the Rest of the World, Report Says \(August 3rd, 2019\)](#)

"Canada's Arctic has seen the deepest impact and will continue to warm at more than double the global rate. The report suggests that many of the effects already seen are probably irreversible."



[Arctic Canada - The Culture Cure \(December 2018\)](#)

"Arctic Canada and the Culture Cure is a podcast all about the Canadian Arctic, the land, the people, the culture and what it can teach the rest of the world. Canada's Arctic continues to hold the world spellbound. Twenty-four hours of darkness in winter, to twenty-four hours of daylight in summer, temperatures as extreme as -84 F, walrus, muskox, polar bear, narwhal, and indigenous peoples, rich in culture and tradition that have survived the test of time. Through interviews with prominent community members, elders, hunters, politicians, artists, musicians and sports figures, we will explore tradition, retention and revitalization of culture, colonialism, residential school, climate change, and much more. Production and technical support provided by Shushiela Appavoo."

## **Fast Fact:**

"The main, but not exclusive, body of Arctic governance, is the Arctic Council. The Council is primarily made up of the eight Arctic states and representatives of the Indigenous Peoples of the Arctic, but it also hosts Observers, as non-Arctic states and organisations can be granted observer status."

<https://www.csap.cam.ac.uk/news/article-geopolitics-climate-change-arctic2/>

# Canada's Arctic Strategy & Security Challenges in the North



[W5: Canada C3 Expedition's Journey Through the Arctic \(October 21st, 2017\)](#)

"CTV's Omar Sachedina joins 350 Canadians as they embark on an incredible voyage of discovery through the Northwest Passage as part of the Canada C3 expedition."

[Polar Initiative Policy Brief Series | ARCTIC 2014: Who Gets A Voice and Why It Matters \(September 2014\)](#)

For more than a century, Canada's Arctic policy tended to be ad hoc, reactive, and piece-



meal. This policy began to change after the Cold War as Canadian policy makers saw an opportunity to develop a cooperative international regime that could foster stronger and more productive relations among the former adversaries of the region; at the same time, policymakers could promote and protect Canadian interests. Successive Canadian governments have focused their attention on protecting Arctic sovereignty, from Americans, and Arctic security, from the Soviets/Russians.

[Adapting to the Effects of Climate Change on Inuit Health \(June 2014\)](#)

"Climate change will have far-reaching implications for Inuit health. Focusing on adaptation offers a proactive approach for managing climate-related health risks—one that views Inuit populations as active agents in planning and responding at household, community, and regional levels...In this article, we tackled this deficit, drawing upon our understanding of the determinants of health vulnerability to climate change in Canada to propose key considerations for adaptation decision-making in an Inuit context."

[The Sea Ice is Our Highway | An Inuit Perspective on Transportation in the Arctic \(March 2008\)](#)

"This report from the Inuit Circumpolar Council (ICC) Canada contributes to the Arctic Marine Shipping Assessment (AMSA) being conducted by the Arctic Council. It provides the AMSA project with an Inuit perspective on the human dimension of shipping. As a Permanent Participant at the Arctic Council, ICC speaks on behalf of all 155,000 Inuit living in Greenland, Canada, Alaska and Russia."



# A New “Arctic Silk Road”



## Elementary Level Resources—China

“Teachers seeking maps and other visual materials on landscape and culture are encouraged to consult this teaching module on East Asia’s geography.”



## China's Arctic Ambitions | The Real Story | BBC Podcast (2023)

“China is located nearly 3,000 kilometres from the Arctic Circle but that hasn't stopped it taking a keen interest in the region. Last year China described itself as a 'near Arctic State' and said that it plans to play a crucial role in the Arctic's future. The melting of the polar ice has made it possible to exploit the Arctic's riches, from natural gas and oil to rare minerals, which are crucial for China's growth. As leaders from the eight-nation Arctic Council travel to the northern Finnish city of Rovaniemi for talks next week, some people are asking whether Beijing is on a resource grab mission and it is not concerned about the environmental price of exploiting the Arctic. Others say that Chinese investments can be a lifeline for many Arctic communities who have been suffering from years of under investment. Celia Hatton and a panel of expert guests discuss China's race towards the Arctic and what it means for the rest of the world.”

## China's Advent in the Arctic - Rise of Chin Arctic? (August 23rd, 2023)

“This article will make an attempt to understand the dynamics in the Arctic and how the region has become a playing field with the rise of Chinese expansionism. It will also highlight the need to cautiously observe this rise that will have an impact on the region and all its stakeholders, of which India is one by virtue of being an observer state in the Arctic Council, coupled with a global domino effect of a stronger China.”



# A New “Arctic Silk Road”



## [China Is Determined To Push Its Way Into the Arctic \(August 11th, 2023\)](#)

“The U.S. is an Arctic nation as much as it is an Atlantic or Pacific one. To defend American sovereignty in the high north, policymakers must not only do more to raise public awareness of security threats but also work to ensure that the U.S. is properly resourced to defend its national sovereignty. One immediate step that would help on both counts is for the Select Committee on the Chinese Communist Party to hold a public hearing on the threat from China in the region.”

## [Chinese Perspective on the Arctic and its Implication for Nordic Countries \(June 20th, 2023\)](#)

“As the U.S. and China enter full-scale competition, the U.S. elite groups, despite serious domestic differences, have reached a rare consensus on committing to limiting China’s ability to threaten the U.S. leadership position in the world and in the Arctic. The 59th Munich Security Conference saw both the U.S. and China depart from polite niceties as their competition entered a more dangerous phase.”



## [The Polar Silk Road \(June 15th, 2023\)](#)

“Warming temperatures and thawing sea ice could soon allow for the expansion of maritime routes through the Arctic region at certain times of the year. Polar powers looking to capitalize not only on the shortened shipping lanes but also on the natural resources that exist there are eyeing up this geopolitically strategic space, with Russia and also China, which is a part of the Arctic Council and a self-defined 'near-Arctic state', having become two of the most prominent players in the region.”

# A New “Arctic Silk Road”



## [What's Cracking in the Arctic? \(March 29th, 2023\)](#)

“As rising global temperatures thaw the ice at the North Pole of the planet, competition between nuclear-powered states threatens to heat up the Arctic Circle even further. An increasingly minable Arctic, which contains vast natural resources, has piqued the economic interests of oil-hungry great powers, even as the warmer climate jeopardizes Indigenous tribes. Here’s how the Arctic could become the next frontier of great-power competition.”

## [What Does China's Arctic Presence Mean to the United States? \(December 29, 2022\)](#)

“Researchers at RAND and the Swedish Defence Research Agency looked at where China is operating in the Arctic, what it wants, and what that could mean for regional security. They concluded that China has made only limited inroads in the Arctic, but that's not for lack of trying.”

## [China Regional Snapshot: Arctic \(October 25th, 2022\)](#)

“The PRC published an Arctic Strategy in 2018, which outlined plans to develop a Polar Silk Road and created the title of “near-Arctic state”, a classification which does not exist and is not universally recognized. This strategy, the “near-Arctic state” title, and the increasing investment in Arctic infrastructure are aimed to give the PRC more standing in its claim as an Arctic stakeholder.”



## [Dragon in the North: Assessing the Growing Chinese Threat to the Arctic “Region \(October 11th, 2022\)](#)

The China Center will host a conference, entitled “The Dragon in the North: Assessing the Growing Chinese Threat to the Arctic Region,” organized by Hudson Senior Fellow Dr. Arthur Herman. Hudson Senior Fellow and Director of the China Center Dr. Miles Yu will host this event. Hudson Distinguished Fellow and 70th Secretary of State Michael R. Pompeo will deliver the keynote address. Arthur Herman and Dr. Roslyn Layton of China Tech Threat will moderate panels consisting of the world’s leading experts on China’s march toward the Arctic.”

### **Fast Fact:**

“As ice melts, new shipping routes open up in the Arctic. These routes will be tempting time-savers, but incredibly dangerous. Imagine more shipwrecks or oil spills like the Exxon-Valdez in areas that are inaccessible to rescue or clean-up crews.”

<https://www.worldwildlife.org/pages/six-ways-loss-of-arctic-ice-impacts-everyone>



# A New “Arctic Silk Road”

[Forced to Look East? Russia, China, India, and the Future of Arctic Governance \(September 16th, 2022\)](#)

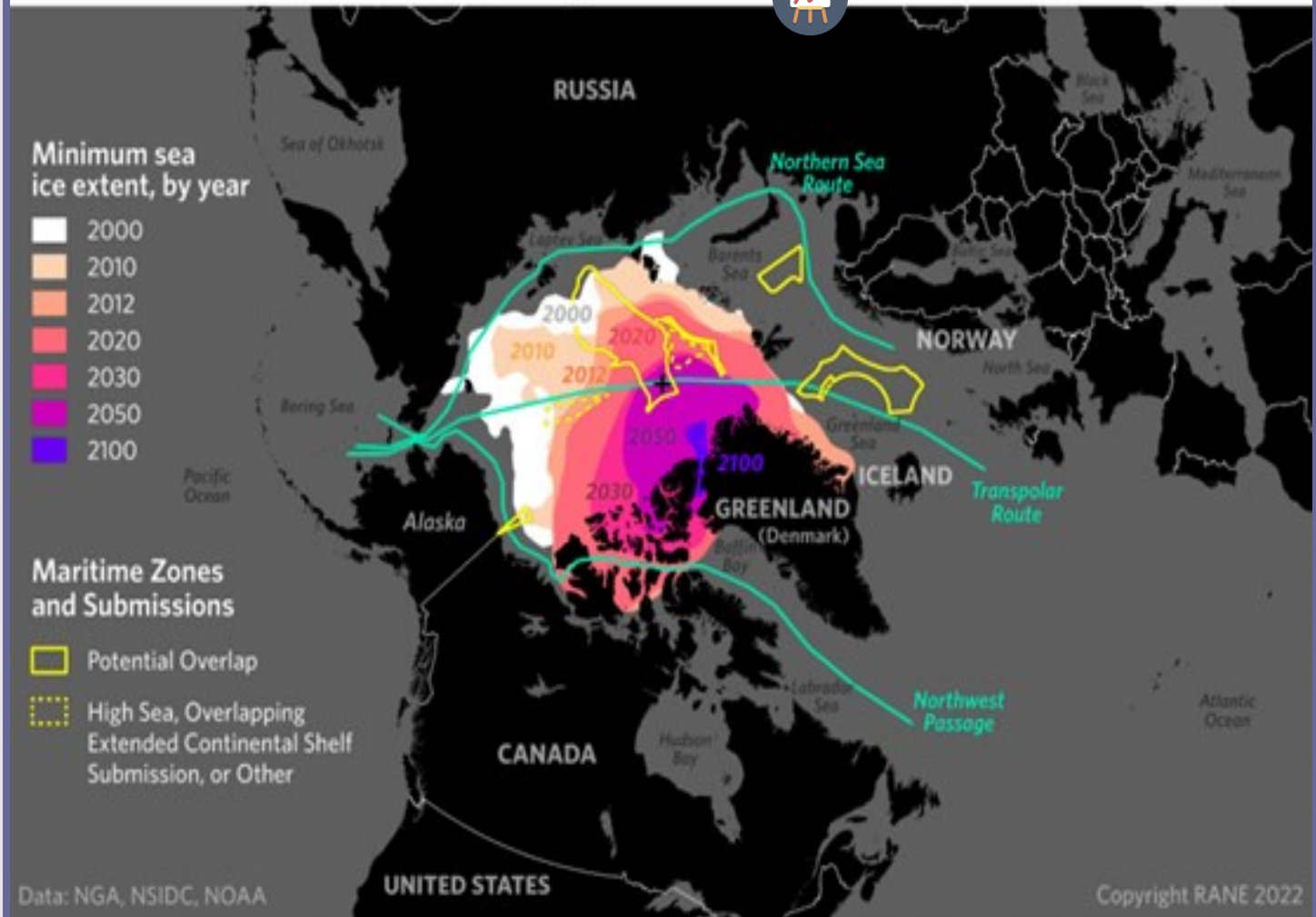
“This essay examines what the suspension of the Arctic Council, the deliberate exclusion of Russia from the Council’s working groups, and the growing Western-led isolation of Russia means for the future of Arctic governance. It further considers the implications of the Russian Federation being forced to increasingly look eastwards on changing the governance mechanisms of the Arctic region.”

[Relations on Thin Ice: A Narrative Analysis of Chinese Governance in the Arctic \(July 2022\)](#)

“Shedding light on a sorely overlooked topic in the literature – China’s Arctic discourse and strategy – this article applies an inductive, social constructivist approach, utilising qualitative content analysis and constituent dimensions to analyse Chinese Arctic narratives. Seeking to answer the questions: “How has China attempted to position itself as a legitimate actor in the Arctic, and has it been accepted?” and “How will this impact governance architecture in the region?” The results show that China has been accepted as a legitimate actor in Arctic governance via a discourse of scientific exploration and cultural ties.”

## Arctic Sea Ice and Shipping Corridors

Minimum sea ice extent and modeled future extent by year





# A New “Arctic Silk Road”



## [China and the Arctic: Great Power Competition, Security and Regional Responses \(October 21st, 2021\)](#)

“China’s rise and its geopolitical, economic and normative implications have increasingly been felt in the Arctic. Describing China as a “near-Arctic state”, Beijing has gradually leveled up the importance of the Arctic in its overall grand strategy. The event focuses on the security implications of China’s growing presence in the region. Apart from traditional inter-state relations between China and regional states, especially Russia, and NATO members, including the US, the event also covers hybrid and emerging areas of international security, including space and cyberspace and the Arctic’s role in these developments. As such, the panel aims to contribute to constructive regional responses to China’s growing importance in these domains.”



## [Game: SMARTIC Arctic Case Study \(October 21st, 2021\)](#)

“Students will build off of an introductory presentation on climate change in the Arctic to devise a strategy to manage climate change impacts on a global scale (the Arctic). After a brief synopsis on current issues and management approaches in the Arctic, students will use information based on the stakeholders and interests they've identified in readings done before class, to pinpoint areas of high interest, negotiate conflicts, and develop a sustainable, multi-stakeholder management plan for high priority areas. The net effect on students will be to: (1) understand the complex web of stakeholder interests and scientific issues (2) learn how to devise a strategic plan for a global issue and an area of significant socio-economic, political, and environmental importance.”

## [Northern Expedition: China’s Arctic Activities and Ambitions \(April 2021\)](#)

“This report explores China’s internal discourse on the Arctic as well as its activities and ambitions across the region. It finds that China sometimes speaks with two voices on the Arctic: an external one aimed at foreign audiences and a more cynical internal one emphasizing competition and Beijing’s Arctic ambitions. In examining China’s political, military, scientific, and economic activity — as well as its coercion of Arctic states — the report also demonstrates the seriousness of China’s aspirations to become a “polar great power.”

# A New “Arctic Silk Road”

[Arctic Geopolitics: China’s Remapping of the World \(April 7th, 2021\)](#)

“China’s ambitions in the Arctic are suggestive of a new geopolitical perspective. How do maps visualise the Arctic Silk Road, and China as a ‘near-Arctic state’? And what does this mean for Arctic politics? Jochem Vriesema explores the role of geography in China’s Arctic strategy, by analysing two important maps.”

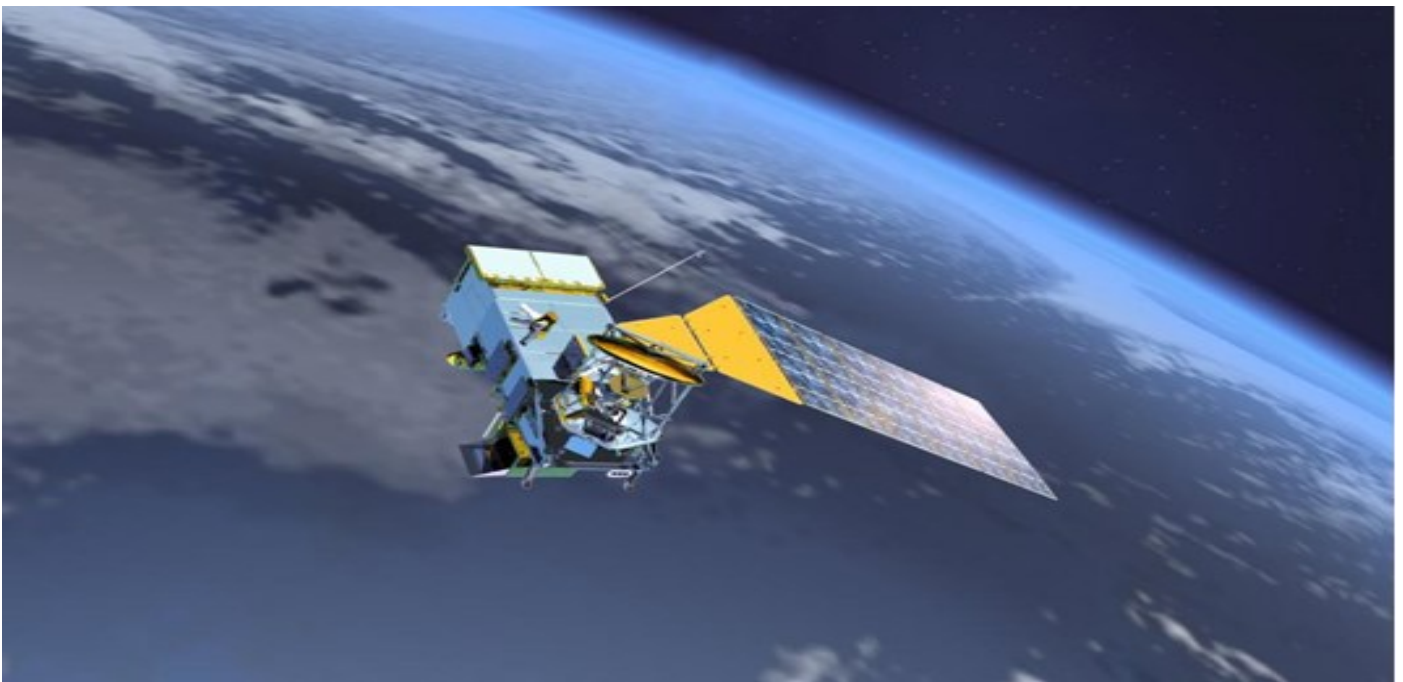


[China's Arctic Ambitions | U.S.-China Horizons \(February 18th, 2021\)](#)

“Arctic security and international relations expert Marc Lanteigne explores China's scientific, economic, and political interests in a rapidly changing region. Dr. Marc Lanteigne is an associate professor of political science at UiT - the Arctic University of Norway, and is the author and editor of several books, including “Routledge Handbook of Arctic Security” (Routledge 2020).”

[China to Launch Satellite to Monitor Arctic Shipping Routes \(December 8th, 2020\)](#)

“China announced plans to launch a new imaging satellite to monitor Arctic shipping routes. The satellite will employ Synthetic Aperture Radar (SAR) technology able to observe the Earth’s surface even during night time and through cloud layers or smoke. The spacecraft will be placed into a sun-synchronous orbit at an altitude of 720 kilometers and produce high quality imagery. At a resolution of 50 meters the satellite can image strips up to 300 kilometers wide. The project is being jointly developed by China’s Academy of Space and Technology and Sun Yat-sen University, one of China’s top universities. The project represents the first SAR satellite developed by the newly established Joint Research Center for Space-based Observation.”



# A New “Arctic Silk Road”



## [Toward Sustainable Arctic Shipping: Perspectives from China \(October 29th, 2020\)](#)

“The current study performs content analysis to examine China’s official perspectives toward sustainable Arctic shipping. The main contributions of this study are threefold. First, it fills a research gap by presenting China’s major views on how to promote the sustainability of Arctic shipping based on substantial qualitative data from the websites of several Chinese government agencies. Second, a content analysis approach is introduced into the field of Arctic studies, thus enriching the research methods in this domain. Third, several policy recommendations on the sustainable development of Arctic shipping are proposed.”

## [Arctic Space Challenge for NATO Emerging from China’s Economic and Financial Assertiveness \(September 2020\)](#)

“China’s space activities in the region have been expanding. In December 2018, the relatively new Ministry of Natural Resources (MNR), which now oversees the Chinese Arctic and Antarctic Administration (CAA), launched the ‘Arctic Environment Satellite and Numerical Weather Forecasting Project’. According to MNR, it is to assist China’s role in the governance of the Arctic and in the building of the Polar Silk Road.”

## [What Is China Doing In The Arctic? \(September 23rd, 2020\)](#)

“According to the Arctic Institute, China’s contemporary involvement in Arctic affairs began in the 1980s. Since that time China has conducted numerous Arctic expeditions and in 2003 established its first research base, the Yellow River Station, on Svalbard Island. The China Remote Sensing Satellite North Polar Ground Station, which was China’s first overseas satellite receiving station, opened in Kirkenes in 2016 and a second research station, the China-Iceland Arctic Science Observatory, opened in Iceland in 2018. There are currently four Chinese research stations in Antarctica and several more which are in development.”

# A New “Arctic Silk Road”

[Reducing China’s Black Carbon Emissions: An Arctic Dimension \(April 14th, 2020\)](#)

“China’s Arctic engagement has increased considerably during the past decade, which has not only offered plentiful economic opportunities but also created new risks and concerns among the eight Arctic states, non-state actors, and peoples. To increase understanding of dimensions of Beijing’s Arctic activities, The Arctic Institute’s China Series 2020 probes into China’s evolving Arctic interests, policies, and strategies, and analyzes their ramifications for the region (and beyond).”

[Understanding China’s Arctic Activities \(February 25th, 2020\)](#)

“China is stepping up its activities in the far north, seeking economic opportunities presented by the impacts of climate change. But what are the strategic implications of its activities and could they take on a military dimension? Marisa Lino explains.”



[S6E2: China’s Polar Frontiers | The Arctic | Sustainable Asia \(December 2019\)](#)

“Last year, China published its Arctic Policy white paper, positioning itself as a stakeholder in Arctic governance and making waves internationally as countries tried to understand China’s intentions. Why is China so interested in the Arctic region? And how do the impact of warmer temperatures and climate change shift China’s priorities in the North Pole? From Belt and Road initiatives to bans on fishing, China performs a delicate balancing act working with the sovereign nations of the Arctic.”





# A New “Arctic Silk Road”

## [The Role of the Arctic in Chinese Naval Strategy \(December 20th, 2019\)](#)

“In her recent China Brief article, Dr. Anne-Marie Brady examined the prospect of China deploying military power to the Arctic (China Brief, December 10). Applying the methods she used in her pathbreaking 2017 book, Brady draws from authoritative Chinese sources to demonstrate the growing importance of the Arctic in China’s strategic calculus.”

## [Facing Up to China’s Military Interests in the Arctic \(December 10th, 2019\)](#)

“China’s military ambitions in the Arctic, and its growing strategic partnership with Russia, have rung alarm bells in many governments. In May 2019, for the first time, the U.S. Department of Defense annual report on China’s military capabilities had a section on China’s military interests in the Arctic and the possibility of Chinese submarines operating in the Arctic basin (Department of Defense, May 2019). In August 2019, NATO Secretary General Jens Stoltenberg raised concerns about what he diplomatically referred to as “China’s increased presence in the Arctic” (Reuters, August 7).”

## [The Increasing Security Focus in China’s Arctic Policy \(July 16th, 2019\)](#)

“This article examines publicly available data and documents from international organizations; Chinese bureaucracy, organizations and academic journals; media; various national governments of Arctic Countries; and Chinese academic output on Arctic issues to analyze China’s evolving approach on the Arctic.”



## [The Ice Silk Road: Is China a “Near-Arctic-State?” \(February 2019\)](#)

“Ms. Maud Descamps explores the economic and political impact

surrounding potential new trade routes that could open-up in the Arctic region given the rapid pace of melting polar ice-caps. Her paper provides an analysis on the measures taken by China to ascertain greater access to the region and reap the financial benefits of this new frontier.”

# A New “Arctic Silk Road”



## [Geography Lesson Plan: Examining China's New Silk Road \(January 30th, 2019\)](#)

“The question of space - both internal and external - is a central theme constituting the rise of China. And the Belt and Road Initiative (BRI) is one of the central projects encapsulating the outward ambitions to expand the power and influence of the Chinese central government. The BRI has indeed come to increasingly shape the political and economic trajectories of the world, dividing, for example, European countries from one another on contentious decisions on whether to take action against China for aggressive moves in the South China Sea and on human rights.”

## [China's Arctic Policy | The State Council Information Office of the People's Republic of China \(January 2018\)](#)

“The Chinese government hereby issues this white paper, to expound its basic positions on Arctic affairs, to elaborate on its policy goals, basic principles and major policies and positions regarding its engagement in Arctic affairs, to guide relevant Chinese government departments and institutions in Arctic-related activities and cooperation, to encourage relevant parties to get better involved in Arctic governance, and to work with the international community to safeguard and promote peace and stability in, and the sustainable development of, the Arctic.”

## [China's 'Airpocalypse' Linked to Arctic Sea Ice Loss \(March 15th, 2017\)](#)

“The air pollution that lingered over eastern China for nearly a month in 2013 has been linked to the loss of Arctic sea ice the previous autumn. A study says the haze lasted much longer because the melting ice and increased snowfall altered wind circulation patterns. If Arctic ice continues to shrink due to climate change, the scientists say similar events will likely recur.”

# Russia's Arctic Expansion



## [Wrangel Island Teaching Materials](#)

"This digital exhibit was curated by Dartmouth undergraduates in Professor Ross Virginia's course, Environmental Studies 15: Environmental Issues of the Earth's Cold Regions, taught online in Spring terms 2020 and 2021. The exhibit focuses on the multiple connections between Wrangel Island and the rich, complex, and controversial career of Vilhjalmur Stefansson. They present a fascinating, tragic, and historically and politically important series of events connecting Stefansson to Wrangel Island. The Wrangel Island Saga (so named by the students in ENVS 15) begins in the "heroic age" of polar exploration and reaches into the current geopolitical conflict between Russia and Ukraine."



## [Being Productive in the Arctic Ocean](#)

"Students will be able to identify the three realms of the Arctic Ocean, and describe the relationships between these realms. Students will be able to identify major factors that limit primary productivity in the Arctic Ocean, and will be able to describe how these factors exert limiting effects."



## [Russian Occupation in the Arctic](#)

"This is part of a series of Geography lessons designed for KS3 around the place of Russia. This SOW is complete with fully resourced lessons, assessments, furthering reading and ideas for building in cultural capital to the curriculum. There is clear sequencing of skills and knowledge throughout."





# Russia's Arctic Expansion



[Curricula and Lesson Plans | Russian, East European, and Eurasian Center](#)

"To gain access to Lesson Plans, Crafts and Culture Units, or Library Guides, you must fill out the form that appears once you click on the title of the desired unit. Once you complete the form, you will be directed to the materials via a link on the form thank you-screen, and REEEC will send you any additional materials at no charge."



[Climate Change and the Russian Arctic](#)

"On this page you will find Key Stage Three worksheets and Key Stage Five worksheets for A level. The final worksheet of each set is a GIS task. All activities are focused on Climate change and the Russian Arctic."



[Arctic Geopolitics: The Svalbard Archipelago \(September 14th, 2023\)](#)

"A short, spoken-word summary from CSIS's Otto Svendsen on his brief with Andreas Østhagen and Max Bergmann, "Arctic Geopolitics: The Svalbard Archipelago."



[Russia is Sending Crude Through the Arctic to China \(August 31st, 2023\)](#)

"As Russia continues to look for ways to sell its oil and gas, it's turning increasingly to the Arctic. This summer has seen a sharp increase in the number of Russian oil tankers shuttling crude to ports in China via polar waters. Climate change means there is less ice for ships to navigate. NPR's international affairs correspondent Jackie Northam reports."





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# Climate Change and the Russian Arctic

## Changes in snowfall

Since the mid-twentieth century there has been a decrease in snow cover periods across certain parts of Russia. The snow cover period has become particularly shorter in Western Siberia, Taymyr and Yakutia. In 2020 Siberia experienced an extraordinary heatwave which lasted several months, thawing permafrost and sea ice. The highest ever recorded temperature above the Arctic circle was made in the Russian town of Verkhoyansk, a staggering 38°C.

Release of carbon dioxide and methane

Tundra release of carbon and methane

Permafrost is thawing

Climate is warming

Arctic warming accelerates and is amplified



The biomes of Russia

- Tundra
- Taiga Boreal
- Temperate Forest
- Steppe Prairies
- Desert
- Permafrost
- Shorter snow cover periods
- Sea level rise
- Arctic warming
- Release of carbon and methane
- Permafrost is thawing
- Climate is warming
- Arctic warming accelerates and is amplified
- Release of carbon dioxide and methane
- Tundra release of carbon and methane

## CASE STUDY

### Arctic tundra biome

The Nenets reindeer herders cover vast distances as part of an annual cycle as they move with their reindeer herds from the winter pastures of the forest tundra northwards towards the summer pastures adjacent to the Barents and Kara Seas.

The warming climate in the Arctic region presents the Nenets with a range of pressures linked to this seasonal migration. In particular, the thawing and gradual degradation of permafrost impedes the progress of both the Nenets and their herds as they move across the region with the surface layer becoming unstable and difficult to traverse. The migratory movement is further impeded by the ongoing development of hydrocarbon resources on the Yamal Peninsula which ensures the region is criss-crossed with new transport routes and pipelines.



## CASE STUDY

### Taiga biome

The warming climate in Russia's northern territory is encouraging a number of trends which have the potential to alter the character and extent of the region's immense boreal forest. Most notably, forest fires now strike with greater regularity; increasing tree mortality and decreasing carbon sequestration in the biosphere. Rising average temperatures also facilitate other natural disturbances such as the northward movement of pests and disease.

## Changes in the thaw rate (borehole comparison)

The **Tiksi Stone Ridge borehole** 20m deep in the Russian Arctic tundra (latitude 71.587 longitude 128.777) has seen a 0.52°C temperature increase for 2008-2016. This is a dramatic warming of important frozen carbon storage.



The **Umaytyl 28 borehole** 20m deep in the Russian taiga (latitude 61.429 longitude 128.849) has seen a 0.25°C temperature increase for 2008-2016.



## Permafrost

Permafrost formation begins when water is trapped and frozen in soil, sediment and rock pores. After at least two consecutive years if the ground remains below zero degrees, it's called permafrost.

Continuous permafrost is an unbroken sheet of frozen material which extends under all surfaces and remains below zero degrees.

Average global temperatures have warmed by roughly 1°C compared to pre-industrial times. However warming has not been felt equally around the world - it has been particularly extreme in the high latitudes. Arctic temperatures have increased at least twice as fast (current estimates say 2-3 times as fast) when compared to the mid-latitudes, largely due to melting land and sea ice. This phenomenon is known as 'Arctic amplification'. It has caused the top 'active layer' of the ground (permafrost soil that thaws in summer and refreezes in winter) to deepen, making more organic matter available for biological decomposition.

Coastal erosion of permafrost



## Flora and fauna of the tundra

- Pinkish flower
- Densely growing arctic moss
- Berry



- Northern Russian tundra reindeer
- Brown bear
- Snowy owl

The associated ARCC-funded research project brings together researchers from the UK (University of Birmingham and Royal Holloway College of Education), the Netherlands (in order to explore the development of forest climate science research), with a particular focus on the debate concerning human impacts on climate systems, and on forest contributions to related observational sciences.

WWF is the world's leading independent conservation organisation. Our mission is to create a world where people and nature can thrive together. To achieve our mission, we are finding ways to help businesses that threaten the world's wildlife, clean forests and seas. Dr Caroline Duck, Polar Specialist at WWF UK, contributed to developing the content of the project.

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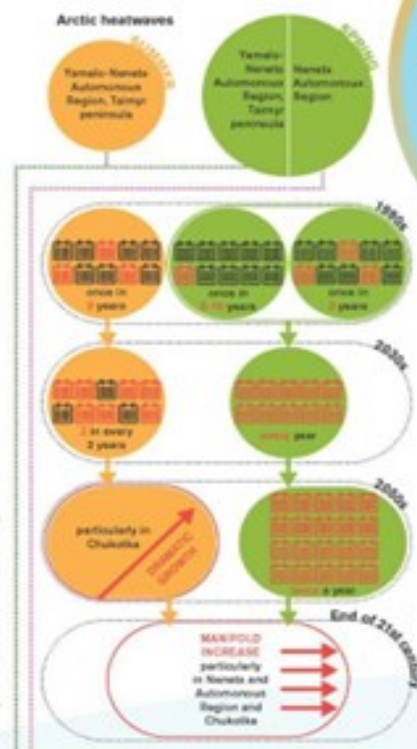


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# Thawing permafrost and Russian Arctic infrastructure

**Representative Concentration  
Pathway (RCP)** describes the  
concentration of greenhouse gases in  
our atmosphere. Our future pathway  
might be the RCP 4.5 projection, leading  
to a global temperature rise of between  
2°C and 3°C by 2100. This will have a  
devastating impact on the landscape  
of the Russian Arctic. It is hoped that  
progress made at COP26 in Glasgow  
will lead to RCP 2.6, which might be  
achieved with enhanced ambition and  
political action.



Thawing of near-surface permafrost will  
damage infrastructure. The map below shows  
future geohazard potential for permafrost in the  
Russian Arctic. It is a visualisation of where  
infrastructure may be in danger of damage, from  
low risk (yellow) to high risk (red).

Permafrost describes water which has become trapped and  
frozen in soil, sediment, and rock pores for at least two consecutive  
years. 65% of the Russian Federation is permafrost\*.

Thawing permafrost can result in significant impacts to industrial  
activity and settlements in the Arctic.

Nearly 50% of oil and gas fields in the Russian Arctic are located in  
areas where permafrost thaw could seriously damage infrastructure  
by 2050.



\* As reported by Olesya Maygus, Sky News Moscow correspondent, in the article The Big Thaw

The **Nenets Autonomous Okrug (NAO)** is  
presenting much earlier signs of global warming\*\*  
than other central and eastern parts of the Russian  
Arctic. The coastal region of NAO is considered  
high risk for infrastructural damage due to thawing  
permafrost.

In NAO, there has been a marked increase in the  
incidence of heatwaves. Many now occur much  
earlier in the year. In the 1990s they were recorded  
once every 3-5 years in the spring, however between  
2006-2015 they increased in frequency to about  
once every 2 years.

The **Yamalo-Nenets Autonomous  
Okrug (YaNAO)** is the larger of the two  
adjacent autonomous areas and has some  
of the world's largest natural gas fields. In  
spite of the okrug's rich natural resources it remains  
hampered by environmental degradation from  
thawing permafrost, with poor transport infrastructure  
and dilapidated housing.

Heatwave frequency is projected to increase  
dramatically. In the 2050s, it is likely that the YaNAO  
will experience heatwaves twice a year, in spring  
and summer.

**Okrug**  
An administrative  
district or region  
in the Russian  
Federation

As the frozen layer of permafrost thaws the  
ground deforms, warping critical infrastructure  
such as telegraph poles, internet cables,  
buildings, and oil pipelines.

One solution has been to insert metal pipes  
along the perimeter of buildings to freeze the  
soil in the summer and maintain stability.



The associated AHRC-funded research project brings together researchers  
from the UK (University of Birmingham and Manchester) and Russia (Higher  
School of Economics, St Petersburg) in order to explore the development  
of Soviet climate science post-1945, with a particular focus on the debates  
concerning humankind's influence on climate systems and on Soviet  
contributions to related international initiatives.

WWF is the world's leading independent conservation organisation.  
Our mission is to create a world where people and wildlife can thrive together.  
To achieve our mission, we are finding ways to help transform the future for the  
world's wildlife, rivers, forests and seas. Dr Alamy Kokorin Head of the Climate  
and Energy Programme at WWF-Russia contributed to developing the content  
of the poster.

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# Russia's Arctic Expansion



[Geopolitical Tensions Between NATO and Russia Increase in the Arctic | DW News \(August 28th, 2023\)](#)

"The Arctic was once a zone free of geopolitical tensions. But its plentiful resources and maritime routes have increased its importance for many countries. The Kremlin has stepped up its military presence there, using the region as a testbed for advanced weapons. And NATO countries are also focusing on the far north. Our correspondent Alexandra von Nahmen traveled to Norway, where the alliance is holding joint exercises."



[Russia's Arctic? Understanding Putin's Game Plan for the Arctic Region | Vantage with Palki Sharma \(July 22nd, 2023\)](#)

"The Arctic has turned into a new battleground. As climate change impacts the region and the ice melts, new routes are opening. The riches of the Arctic are getting easier for exploitation and there's a new scramble for resources. Who is leading the race for now? Palki Sharma tells you."

[An Arctic 'Great Game' as NATO Allies and Russia Face Off in Far North \(July 17th, 2023\)](#)

"For several years now, European and U.S. security and intelligence officials have been keeping a closer eye on the world above the Arctic Circle, knowing that melting polar ice will open new trade routes, propel a race for natural resources and reshape global security. Western officials watched as Russia revived Soviet-era military sites and while China planned a "Polar Silk Road."





# Russia's Arctic Expansion

## [The Geopolitics of Climate Change: Scenarios and Pathways for Arctic 2050 \(July 6th, 2023\)](#)

"Last month, the Arctic Initiative held a closed-door seminar for climate scientists, regional experts, Indigenous and youth leaders, and national security officials from six Arctic states. Our goal was to identify the most plausible scenarios (end-states) and pathways (path-dependent processes leading to end-states) for how geopolitics linked to climate change in the Arctic might evolve and identify actionable steps that the U.S. government might consider taking today to manage emerging risks. The event was conducted off the record, with a lively and wide-ranging discussion."



## [Russia and the Arctic Maritime Challenge \(June 19th, 2023\)](#)

"The shadow of the Ukraine War has significantly increased perceptions of the Arctic and the High North as a region of heightened strategic risk. An unpredictable and weakened Russia sees the region as of increased importance, and Moscow has been displaying greater assertiveness not least over the Northern Sea Route. At the same time, NATO's footprint and stakes in the region are growing. What does this augur for defence, deterrence and stability, especially in the maritime domain, against the background also of changing environmental and geoeconomic dynamics and the increasing intrusion of other actors like China?"



## [Nuclear risks from Kakhovka Dam Destruction and Enduring Issues "Surrounding Soviet-Era Energy Infrastructure \(June 16th, 2023\)](#)

The recently destroyed Kakhovka Dam and the nearby Zaporizhzhia Nuclear Power Station are inextricably linked legacies of Soviet energy infrastructure that have become major concerns in the midst of the war in Ukraine. Achim Klüppelberg from the Nuclear Waters project at KTH Royal Institute of Technology is an expert on nuclear energy in Ukraine and Russia, and he joins the podcast to provide an in-depth analysis of the dire situation in the lower-Dnieper region. He also explains the enduring risks and complexities surrounding nuclear energy and infrastructure in the post-Soviet space, including Chernobyl, and discusses an array of nuclear issues related to the Russian Arctic."



# Russia's Arctic Expansion

[As the Ice Melts, A Perilous Russian Threat is Emerging in the Arctic \(June 13th, 2023\)](#)

"The eight Arctic states – Canada, Finland, Denmark, Iceland, Norway, Sweden, the US and Russia – have long collaborated on scientific research through the Arctic Council, a non-military body. Until now. After Russia's invasion of Ukraine, Arctic Council meetings ceased. So did cooperation with Russia. This has hampered progress on climate and environmental research and turbocharged the militarisation of the Arctic."

[Norway's Arctic Council Chairship: Priorities vs Geopolitics \(June 3rd, 2023\)](#)

"This article analyses the priorities presented by Norway for its two-year chairship of the Council."

[Arctic Risks Loom Large as Blinken Tours NATO's North \(May 31st, 2023\)](#)

"Russia may be having major difficulties in Ukraine, but it remains a vast power in the north and the Arctic, where climate change is opening new sea routes for trade and trouble."

["Russia Will Stay in The Arctic Council as Long as it Serves Our Interests" \(May 11th, 2023\)](#)

"As Russia transferred the Chair of the Arctic Council to Norway, Russia's Arctic Official Nikolay Korchunov states that the responsibility for the future of a restored council lies in Norway's hands."



# Russia's Arctic Expansion

[From Russia to Norway:  
Three Scenarios for the  
Arctic Council's Future  
After the Chairmanship  
Handover \(April 25th,  
2023\)](#)

"Russia's invasion of Ukraine in February 2022 has had lasting impacts on every region of the world, even as far north as the Arctic. One month after the invasion, the seven other Arctic states apart from Russia – Canada, Denmark, Finland,



Iceland, Norway, Sweden, and the United States – released a statement saying they would pause their activities in the Arctic Council. Russia was also suspended in other Arctic regional bodies, such as the Barents Euro-Arctic Council and the Northern Dimension. Traditionally non-aligned Sweden and Finland also began their NATO accession processes. When it became clear that the war in Ukraine would not end imminently, the remaining seven Arctic states allowed some resumption of work in the Council on projects (more than 70 out of 128) that did not involve Russia."



[MWI Podcast: Russia and the Arctic Conundrum \(April 8th, 2023\)](#)

"A major challenge to the Arctic status quo has emerged as a result of Russia's aggression toward Ukraine, especially with its February 2022 invasion and the ongoing war there. As a result of that aggression, a host of countries joined together to implement a comprehensive sanctions regime and to isolate Moscow politically. That included the other Arctic states suspending participation in Arctic Council activities for the duration of Russia's chairmanship of the organization. Effectively, engagement with Russia on everything from science and climate issues to Arctic search and Russia has ceased."



[Satellite Images Reveal Changes at Key Russian Military Bases in the Arctic \(December 21st, 2022\)](#)

"Despite its startling Ukraine losses, Russia continues to expand its Arctic defenses, which leaves NATO edgy. CNN's Nick Paton Walsh reports."

## Russia Fortifying Bases in Arctic Region



● Key regional headquarters    
 ● Confirmed bases Russia is building/upgrading    
 ● Bases Russia may upgrade



### Key Locations

- |   |  |
|---|--|
| <span style="color: #0056b3;">1</span> Bodø, Norway's National Joint Headquarters   | <span style="color: #c00000;">6</span> Sredny Ostrov |
| <span style="color: #0056b3;">2</span> Severomorsk, home of Russia's Northern Fleet | <span style="color: #ff9900;">7</span> Alykel        |
| <span style="color: #ff9900;">3</span> Naryan-Mar                                   | <span style="color: #ff9900;">8</span> Tiksi         |
| <span style="color: #c00000;">4</span> Rogachevo                                    | <span style="color: #c00000;">9</span> Temp          |
| <span style="color: #c00000;">5</span> Nagurskoye                                   | <span style="color: #c00000;">10</span> Zvyozdny     |
|   | <span style="color: #c00000;">11</span> Mys Shmidta  |
|   | <span style="color: #ff9900;">12</span> Ugolny       |

There is division inside NATO as to the role of the alliance in the Arctic. Norway is a leader in promoting NATO's role in the Arctic.

Most of the national interests of Arctic states are not military in nature, but rather economic concerns involving shipping routes, fishing, and mineral rights. Even so, Russia has taken steps to militarize the Arctic. Russia's Northern Fleet, based at **Severomorsk**, accounts for two-thirds of the Russian Navy. A new Arctic command called the Northern Fleet-Joint Strategic Command will be

established by 2015 to coordinate all Russian military activities in the region.

Over the next few years, two new brigades will be permanently based in the Arctic region, and Russian Special Forces have been training in the region. Old Soviet-era facilities have been reopened and modernized above the Arctic Circle. These will provide a string of military fortresses along the important Northern Sea Route. In light of Russia's recent behavior in Ukraine, the U.S. and NATO should continue to monitor Russian activity in the Arctic.



# Russia's Arctic Expansion



[Inside Russia's Arctic Military Base | BBC News \(May 23rd, 2021\)](#)

"Russia now has a military base at the top of the world – on the remote archipelago of Franz Josef Land. As global warming increases access to the Arctic region and its rich resources, Russia is expanding its military presence there – making some in the West nervous."

[A New Cold War: Russia Ends Over Three Decades of Optimistic Cooperation in the Arctic \(November 21st, 2022\)](#)

"The escalation of Russia's war against Ukraine has directly impacted international cooperation in the Arctic. After three decades of cooperation, Arctic governance is now de facto fragmented into two parts: Russia and the Western Arctic."

[New U.S. Arctic Strategy Focuses on Geopolitical Rivalries and Climate Change \(October 7th, 2022\)](#)

"The United States released a new national strategy for the Arctic on Friday, the first in nearly a decade devoted to the rapidly changing region. Security in the Arctic, especially with Russia's aggression against Ukraine, is the top priority, but the U.S. also aims to sharpen its focus on climate change, economic development, and global governance — with a particular emphasis on Indigenous leadership in the Arctic."





# Russia's Arctic Expansion



## [Russia's Reimagined Arctic in the Age of Geopolitical Competition \(March 9th, 2022\)](#)

"The melting Arctic serves as a precursor for a renewed geopolitical contest among the great powers. Russian policy posture of developing Yamal LNG and opening of the Northern Sea Route (NSR) as a global shipping artery sets the course for Russia on the Arctic's chessboard. Similarly, the revival of the Northern Fleet shows Moscow's anticipation to counter the maritime threats coming from the United States. Meanwhile, the US approach is likely to challenge the Russian claims on NSR and Arctic militarization in the context of Sino-Russian cooperation. Finally, using the qualitative content analysis, the article argues that the melting Arctic has enabled Russia to increase its geopolitical influence due to its topography and military might, which has intensified geopolitical competition in the region."

## [Russia in the Arctic—A Critical Examination \(March 29th, 2021\)](#)

"Russia's Arctic ambitions have attracted increasing attention in the West over the past decade as climate change opens up new opportunities in the region for navigation and exploration of its riches. For its part, Moscow casts a wary eye on what it sees as a challenge from the United States and the North Atlantic Treaty Organization (NATO) to its position and ambitions there. The Kremlin's rhetoric about Western encroachment has become more strident, in sync with its enhanced military posture and ambitious economic and infrastructure projects."

## [Foundations of the Russian Federation State Policy in the Arctic for the Period up to 2035 \(March 2020\)](#)

"Current Foundations is a strategic planning document to ensure the national security of the Russian Federation (hereinafter national security) and is designed to defend the national interests of the Russian Federation in the Arctic. Current Foundations defines the goals, main trends and objectives, as well as the means for implementing the State Policy of the Russian Federation in the Arctic."

# Russia's Arctic Expansion

[Russia is Dominating the Arctic, but It's Not Looking to Fight Over It \(December 27th, 2019\)](#)

"While the world focuses on trade wars and shifting geopolitical dynamics, Russia has been quietly expanding its own political, economic and military influence in a lesser-watched space: the Arctic."

[The Different Levels of Geopolitics of the Arctic \(December 25th, 2019\)](#)

"Few areas have been the source of as much speculation, hype, and overgeneralization as the Arctic region at the start of the 21st century. Propelled to the top of the international agenda by high profile flag-plantings and resource appraisals a decade ago, the Arctic continues to lure researchers and journalists to venture northward to "the next great game."



[The Arctic: Russia's Plan for the World's Newest Ocean \(October 24th, 2017\)](#)

"There's a new ocean at the top of our globe. In just the past three decades, global warming has shrunk the size of the Arctic Ocean's summer ice by half. The region is now more accessible than it's been in 1,000 years, and governments around the world have taken notice."



[Climate Change, Russia, and the Race for the Arctic \(February 2013\)](#)

"In this episode of History Talk, host Patrick Potyondy interviews historian and Origins editor Nicholas Breyfogle about the international race for the arctic. He tells us about the complex and perhaps explosive historical dimensions of climate change."

[Russia's Warming Arctic Is a Climate Threat. War Has Shut Scientists Out of It \(October, 23, 2024\)](#)

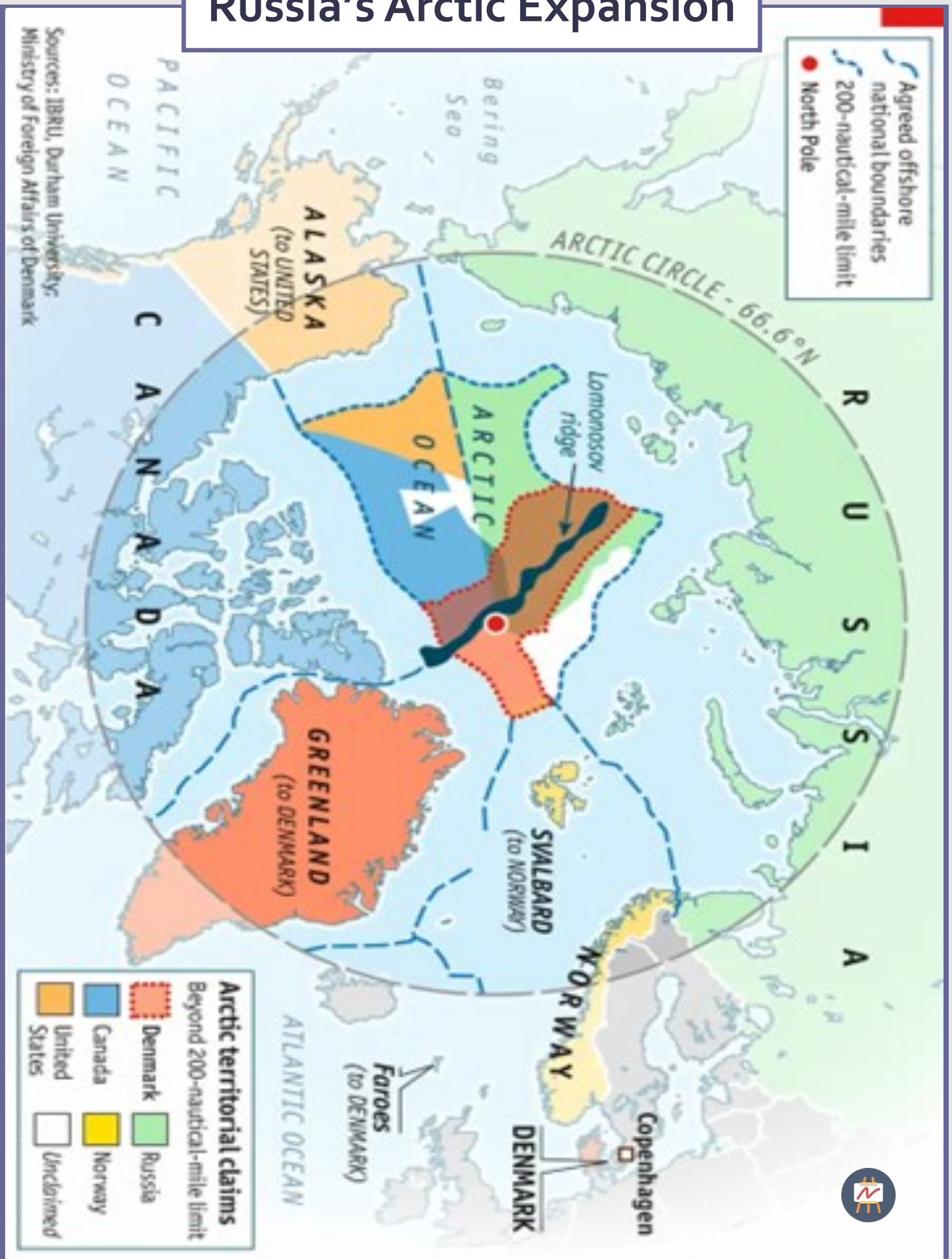
Climate science has been stymied as Russia continues its war in Ukraine. The stalled work threatens to leave the West without a clear picture of how fast the Earth is heating up.

[Russia's Espionage War in the Arctic \(September 9th, 2024\)](#)

For years, Russia has been using the Norwegian town of Kirkenes, which borders its nuclear stronghold, as a laboratory, testing intelligence operations there before replicating them across Europe.



# Russia's Arctic Expansion





# Photo Bibliography

## Learning Objectives

<https://www.marshallcenter.org/en/publications/security-insights/risks-and-opportunities-arctic-strategic-recommendations-ess-n-20-06-0>

## Arctic Background Information

<https://resources.arctickingdom.com/6-reasons-canadas-arctic-is-the-ultimate-polar-destination>

<https://www.britannica.com/place/Arctic-Circle>

<https://news.climate.columbia.edu/2020/05/15/sustainable-arctic-indigenous-groups/>

<https://oceanwide-expeditions.com/blog/freshwater-ecosystems-in-the-arctic>

## Arctic from the Canadian Perspective

<https://www.oceansnorth.org/en/canada-arctic-marine-atlas/>

<https://www.oceansnorth.org/en/canada-arctic-marine-atlas/>

## Canada's Arctic Strategy & Security Challenges in the North

[https://www.cgai.ca/rights\\_of\\_passage\\_its\\_time\\_the\\_us\\_recognizes\\_canadas\\_arctic\\_claim](https://www.cgai.ca/rights_of_passage_its_time_the_us_recognizes_canadas_arctic_claim)

<https://www.discover-the-world.com/blog/experience-canadian-arctic-wildlife/>

<https://www.coolantarctica.com/Travel/canada-arctic-travel.php>

<https://www.oceansnorth.org/en/canada-arctic-marine-atlas/>

<https://gradefive.mrpolsky.com/regionsofcanada/arctic-region.html>

## A New "Arctic Silk Road"

<https://abcnews.go.com/Politics/pentagon-warns-chinas-increased-activity-arctic-growing->

<https://www.rand.org/pubs/articles/2022/what-does-chinas-arctic-presence-mean-to-the-us.html>

<https://worldview.stratfor.com/article/chinas-opportunity-break-arctic-governance>



# Photo Bibliography

## A New "Arctic Silk Road"

<https://www.nytimes.com/2019/05/24/climate/china-arctic.html>

[https://www.eurasiantimes.com/china-to-deploy-listening-devices-in-the-arctic-ocean-to-#google\\_vignette](https://www.eurasiantimes.com/china-to-deploy-listening-devices-in-the-arctic-ocean-to-#google_vignette)

<https://www.globaltimes.cn/page/202307/1295042.shtml>

<https://www.politico.eu/article/china-arctic-greenland-united-states/>

<https://www.sipri.org/commentary/expert-comment/2018/shipping-along-arctics-northern-sea-routewill-be-determined-russia-china-cooperation-region>

## Russia's Arctic Expansion

<https://www.americansecurityproject.org/russian-arctic-military-bases/>

<https://www.wsj.com/articles/russias-war-on-ukraine-upends-arctic-climate-change-research-11648299602>

<https://www.rgs.org/schools/teaching-resources/climate-change-and-the-russian-arctic/>

<https://www.rgs.org/schools/teaching-resources/climate-change-and-the-russian-arctic/>

<https://www.bloomberg.com/news/features/2023-03-13/nato-russia-are-flexing-their-military-power-in-the-arctic#xj4y7vzkg>

[https://en.wikipedia.org/wiki/Russian\\_Arctic\\_National\\_Park](https://en.wikipedia.org/wiki/Russian_Arctic_National_Park)

<https://gjia.georgetown.edu/2019/12/05/different-levels-of-arctic-geopolitics/>

<https://thebarentsobserver.com/en/2023/08/gigantic-russian-flag-unveiled-arctic-ocean-its-sign-dominance-and-defiance-uit-professor>

<https://www.businessinsider.com/chart-of-russias-fortification-of-the-arctic-2015-3>

<https://globalnews.ca/news/1884450/russia-launches-massive-military-drills-in-the-arctic/>

# Photo Bibliography

## Russia's Arctic Expansion

<https://www.csis.org/analysis/arctic-geopolitics-svalbard-archipelago>

[https://www.nytimes.com/2024/10/22/climate/russia-alaska-arctic-global-warming.html?  
unlocked\\_article\\_code=1.UU4.oqr-.yC-T8UlisJOM&smid=url-share](https://www.nytimes.com/2024/10/22/climate/russia-alaska-arctic-global-warming.html?unlocked_article_code=1.UU4.oqr-.yC-T8UlisJOM&smid=url-share)

<https://www.businessinsider.com/chart-of-russias-fortification-of-the-arctic-2015-3>