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ASLS21 is supported by moderators from the following organizations:



In support of U.S. Northern Command's Arctic Security and Defense Mission

Alaskan Command hosts

Arctic Senior Leader Summit 2021 (ASLS21)

A Virtual Summit on Arctic Security and Defense

University of Alaska
10-11 March 2021

LITERATURE
REVIEW



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ARCTIC SENIOR LEADER SUMMIT 2021 LITERATURE REVIEW

Introduction

Introduction and overview.



In support of United States Northern Command (USNORTHCOM), Alaskan Command (ALCOM) (a subordinate unified command reporting to USNORTHCOM) is hosting a two-(partial) day ***Arctic Senior Leader Summit 2021*** (ASLS21) via a virtual event on 10-11 March 2021.

ASLS21 “Day 1” will be a half-day of keynote presentations by current Department of Defense (DOD) leaders and a focused set of panels addressing current and emerging challenges, risks, and opportunities affecting Arctic region Security and Defense interests. The purpose of ASLS21 Day 1 is to gain insights of new and existing Arctic leaders on the current and emerging defense and security policies & priorities of the Arctic region. While ASLS21 is principally a U.S. audience, U.S. Arctic Defense Allies and key regional partners are invited to participate. **ASLS21 “Day 2”** will consist of a half-day tabletop exercise providing a smaller group of invited leaders with an opportunity to address decision-making encounters via plausible but fictitious crisis scenarios. The purpose of ASLS 21 Day 2 is to principally familiarize participating military leaders in the unique challenges of Arctic crisis response.

ALCOM Arctic Senior Leader Summits and associated (but broader in scope) Arctic Symposiums are oriented to the USNORTHCOM Area of Responsibility (the North American Arctic), but inclusive of the USNORTHCOM Area of Interest (the greater Pan-Arctic region). Participants include a multidisciplinary community of Canadian leaders and subject matter experts as well as other NATO allies and partners, principally from the Nordic region. These ALCOM Arctic-focused events increase Arctic region understanding and awareness by using an array of professional Arctic subject matter experts (SMEs) to increase knowledge and enhance interagency, international, and academic partnerships. ALCOM ASLS is a complement to ALCOM Arctic Symposia, which are organized as 200+ participant multiple-day events which comprehensively seek to orient, educate, and engage participants from the staff through senior leaders on current and emerging aspects on the Arctic from a multidisciplinary and multicultural vantage. Arctic Symposia are organized with plenary, breakout tracks and field activities.

An ASLS21 principal goal is to support the USNORTHCOM Arctic mission and to support Commander, Alaskan Command’s “*USNORTHCOM Lead for Arctic Affairs*” responsibilities as designated by Commander, USNORTHCOM. This will be accomplished by conducting a focused exchange of insights and associated discussion via a select and multidisciplinary set of leaders, oriented on the Arctic.

In order to prepare ASLS21 participants, ALCOM’s supporting team at the Arctic Domain Awareness Center, located at the University of Alaska, has prepared the following Literature Review to serve as a source document of summaries and citations oriented to defense and security aspects Arctic strategies, policies, important papers and more across the pan-Arctic region.



Literature Review

Geopolitical Considerations in the Arctic

Changes in the Arctic: Background and Issues for Congress

Summary (*abbreviated*): The diminishment of Arctic sea ice has led to increased human activities in the Arctic, and has heightened interest in, and concerns about, the region's future. The United States, by virtue of Alaska, is an Arctic country and has substantial interests in the region. The seven other Arctic states are Canada, Iceland, Norway, Sweden, Finland, Denmark (by virtue of Greenland), and Russia.

The Arctic Council, created in 1996, is the leading international forum for addressing issues relating to the Arctic. The United Nations Convention on the Law of the Sea (UNCLOS) sets forth a comprehensive regime of law and order in the world's oceans, including the Arctic Ocean. The United States is not a party to UNCLOS.

Record low extents of Arctic sea ice over the past decade have focused scientific and policy attention on links to global climate change and projected ice-free seasons in the Arctic within decades. These changes have potential consequences for weather in the United States, access to mineral and biological resources in the Arctic, the economies and cultures of peoples in the region, and national security.

The geopolitical environment for the Arctic has been substantially affected by the renewal of great power competition. Although there continues to be significant international cooperation on Arctic issues, the Arctic is increasingly viewed as an arena for geopolitical competition among the United States, Russia, and China. Russia in recent years has enhanced its military presence and operations in the Arctic, and the United States, Canada, and the Nordic countries have responded with their own increased presence and operations. China's growing diplomatic, economic, and scientific activities in the Arctic have become a matter of increasing curiosity or concern among the Arctic states and other observers.

Citation: O'Rourke, R. (2021, January 6). Changes in the Arctic: Background and Issues for Congress. Congressional Research Service. R41153, Version 176. Retrieved from: <https://crsreports.congress.gov/product/pdf/R/R41153>

United States Strategic Considerations and Policy

The Department of Air Force Arctic Strategy

Executive Summary: The Department of the Air Force Arctic Strategy fully supports the 2018 National Defense Strategy (NDS) and implements the 2019 Department of Defense (DoD) Arctic Strategy embracing the DoD's desired Arctic end-state: A secure and stable region



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where U.S. national interests are safeguarded, the homeland is protected, and nations address shared challenges cooperatively.

The strategy outlines the Department of the Air Force's unique role and optimizes Air Force and Space Force capabilities for the region. The Arctic's increasing strategic importance, coupled with the Services' significant regional investment, requires the Department to have a unified, deliberate, and forward-looking approach, ensuring the Air and Space Forces can compete and defend the nation's interests in the Arctic region.

Residing at the intersection between the U.S. homeland and two critical theaters, Indo-Pacific and Europe, the Arctic is an increasingly vital region for U.S. national security interests. The Arctic's capacity as a strategic buffer is eroding, making it an avenue of threat to the homeland, due to advancements by great power competitors. Additionally, it hosts critical launch points for global power projection and increasingly accessible natural resources. While the DoD analyzes the immediate prospect of conflict in the Arctic as low, the confluence of activities in the region by great power competitors with increased physical access due to receding land ice and sea ice, yields the potential for intensified regional competition as well as opportunities for cooperative endeavors with allies and partners.

The Department of the Air Force contributions to U.S. national security in the Arctic are large, but relatively unknown. Given the Arctic's vast distances and challenges to surface operations, air and space capabilities have long been essential to gain rapid access and provide all-domain awareness, early warning, satellite command and control, and effective deterrence. Offering a solid foundation on which to build and project power across the region, the Department of the Air Force is the most active and invested U.S. military department in the Arctic.

The strategy identifies the Arctic as a region of strategic opportunity for the Air and Space Forces, Joint Force, allies, and partners. It provides recommendations in light of the Arctic's most significant strategic threats and opportunities, based on Combatant Commander requirements and the Air and Space Forces' missions.

The Department approaches the Arctic with four main lines of effort: Vigilance, Power Projection, Cooperation, and Preparation. The strategy outlines how the Air and Space Forces will organize, train, and equip to provide Combatant Commanders with combat-credible assets capable of conducting operations throughout the Arctic into the future.

First, through investments in missile warning and defense, as well as command, control, communications, intelligence, surveillance, and reconnaissance (C3ISR), the Air and Space Forces will defend the homeland by maintaining vigilance.

Second, the Air and Space Forces will utilize unique positioning afforded by bases in locations like Alaska and Greenland to project combat-credible, all-domain air and space power. Infrastructure, focused on thermal efficiency and durability, will be combined with fifth generation aircraft and lethal capabilities to ensure the Air and Space Forces remain agile and capable in the future.



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Third, strong alliances and partnerships in the Arctic are a strategic advantage for the United States. The strategy outlines ways to enhance cooperation as well as interoperability, operations, and exercises between the United States and its Arctic partners. To uphold the international rules-based order in the Arctic, the Air and Space Forces must leverage the strong defense relationships among Arctic nations and work closely with regional and joint partners.

Finally, the strategy outlines essential training and preparation for operations within this unique environment. To meet this challenge, the Department will renew focus on training, research, and development for Arctic operations, while leveraging the Arctic expertise of the Total Force.

Citation: U.S. Department of the Air Force. (2020). The Department of Air Force Arctic Strategy. Retrieved from <https://www.af.mil/Portals/1/documents/2020SAF/July/ArcticStrategy.pdf>

United States Coast Guard Arctic Strategy

Executive Summary (*Abbreviated*): This document outlines three strategic objectives in the Arctic for the U.S. Coast Guard over the next 10 years:

Improving Awareness: Coast Guard operations require precise and ongoing awareness of activities in the maritime domain. Maritime awareness in the Arctic is currently restricted due to limited surveillance, monitoring, and information system capabilities. Persistent awareness enables identification of threats, information-sharing with front-line partners, and improved risk management. Improving awareness requires close collaboration within DHS, as well as with the Departments of State, Defense, Interior, the National Science Foundation and other stakeholders to enhance integration, innovation, and fielding of emerging technologies. The Intelligence Community and non-federal partners are also vital stakeholders.

Modernizing Governance: The concept of governance involves institutions, structures of authority, and capabilities necessary to oversee maritime activities while safeguarding national interests. Limited awareness and oversight challenge maritime sovereignty, including the protection of natural resources and control of maritime borders. The Coast Guard will work within its authorities to foster collective efforts, both domestically and internationally, to improve Arctic governance. In so doing, the Coast Guard will review its own institutions and regimes of governance to prepare for future missions throughout the Arctic.

Broadening Partnerships: Success in the Arctic requires a collective effort across both the public and private sectors. Such a collective effort must be inclusive of domestic regulatory regimes; international collaborative forums such as the Arctic Council, International Maritime Organization (IMO), and Inuit Circumpolar Council; domestic and international partnerships; and local engagements in Arctic communities focusing on training and volunteer service. Success in the Arctic also depends upon close intergovernmental cooperation to support national interests, including working closely within DHS, as well as with the Department of



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State, Department of Interior and other Federal partners as the U.S. prepares to assume Chairmanship of the Arctic Council in 2015.

Beyond these three strategic objectives, there are a number of additional factors that will position the Coast Guard for long-term success. These factors include building national awareness of the Arctic and its opportunities, strengthening maritime regimes, improving public-private relationships through a national concept of operations, seeking necessary authorities, and identifying future requirements and resources to shape trends favorably. This strategy outlines a number of priorities, ranging from capabilities and requirements to advances in science and technology that will facilitate our Nation's success in the region. Specifically, the strategy advocates to leverage the entire DHS enterprise and component capabilities to secure our borders, prevent terrorism, adapt to changing environmental conditions, enable community resilience and inform future policy. Operating in the Arctic is not a new venture for the Coast Guard. However, adapting to changing conditions will require foresight, focus, and clear priorities. This strategy will ensure we attain the aim of safe, secure, and environmentally responsible maritime activity in the Arctic by improving awareness, modernizing governance, and broadening partnerships to ensure long-term success.

Citation: U.S. Coast Guard. (2013) U.S. Coast Guard Arctic Strategy. U.S. Coast Guard Headquarters, Washington, D.C. (May 2013) Retrieved from:
https://www.uscg.mil/Portals/0/Strategy/cg_arctic_strategy.pdf

A Blue Arctic: Department of the Navy Strategic Blueprint for the Arctic

Introduction (*abbreviated*): This regional blueprint is guided by the objectives articulated in the National Security Strategy, National Defense Strategy, Department of Defense Arctic Strategy, and Advantage at Sea: Prevailing in Integrated All-Domain Naval Power; supported by the U.S. Navy Strategic Outlook for the Arctic and informed by the U.S. Coast Guard's Arctic Strategic Outlook. Our naval forces will operate across the full range of military missions to deter aggression and discourage malign behavior; ensure strategic access and freedom of the seas; strengthen existing and emerging alliances and partnerships; and defend the United States from attack.

Naval forces will preserve peace and build confidence among nations through collective deterrence and security efforts that focus on common threats and mutual interests in a Blue Arctic. This requires an unprecedented level of critical thinking, planning, integration, and interoperability among our joint forces and international partners, along with greater cooperation among U.S. interagency, state, local, and indigenous communities.

The United States will always seek peace in the Arctic. History, however, demonstrates that peace comes through strength. In this new era, the Navy-Marine Corps team, steadfast with our joint forces, interagency teammates, allies and partners, will be that strength.

Citation: U.S. National Ice Center. (2021, January 5). A Blue Arctic: Department of the Navy Strategic Blueprint for the Arctic. U.S. Department of the Navy. Retrieved from:



<https://media.defense.gov/2021/Jan/05/2002560338/-1/-1/0/ARCTIC%20BLUEPRINT%202021%20FINAL.PDF/ARCTIC%20BLUEPRINT%202021%20FINAL.PDF>

Coast Guard Polar Security Cutter (Polar Icebreaker) Program: Background and Issues for Congress

Summary: This report provides background information and issues for Congress on the Polar Security Cutter (PSC) program—the Coast Guard’s program for acquiring new PSCs (i.e., heavy polar icebreakers). The PSC program has received a total of \$1,169.6 million (i.e., about \$1.2 billion) in procurement funding through FY2020, including \$135 million in FY2020, which was \$100 million more than the \$35 million that the Coast Guard had requested for FY2020. With the funding it has received through FY2020, the first PSC is now fully funded, and the second PSC has received initial funding.

The Coast Guard’s proposed FY2021 budget requests \$555 million in procurement funding for the PSC program. It also proposes a rescission of \$70 million in FY2020 funding that Congress had provided for the procurement of long lead time materials (LLTM) for a 12th National Security Cutter (NSC), with the intent of reprogramming that funding to the PSC program. The Coast Guard states that its proposed FY2021 budget, if approved by Congress, would fully fund the second PSC.

The issue for Congress is whether to approve, reject, or modify the Administration’s FY2021 procurement funding request for the PSC program and the proposed rescission of FY2020 NSC funding, and, more generally, whether to approve, reject, or modify the Coast Guard’s overall plan for procuring new polar icebreakers. Congress’s decisions on this issue could affect Coast Guard funding requirements, the Coast Guard’s ability to perform its polar missions, and the U.S. shipbuilding industrial base.

Citation: O’Rourke, R. (2010, May 5). Updated (February 5, 2020) Coast Guard Polar Security Cutter (Polar Icebreaker) Program: Background and Issues for Congress. Congressional Research Service. <https://fas.org/sgp/crs/weapons/RL34391.pdf>

Arctic Policy of the United States: An Historical Survey

Abstract: Because Alaska is not contiguous with the other continental United States, the United States was slow to develop a coherent, comprehensive Arctic policy until late in the twentieth century, a policy which continues to evolve. For American policy leaders, Alaska was remote and of minimal consideration. The discovery of the largest oil deposit in North America at Prudhoe Bay in 1968, coincident with the rise of the national environmental movement, generated new appreciation of the significance of the Arctic to the United States, and new policy initiatives. The United States worked with the Law of the Sea conferences at the United Nations to formulate its Arctic interests, which it expressed chiefly through the Arctic Council. Today US Arctic policy is directed toward issues of sovereignty and Arctic sea commerce, new resource development, and the impacts of global climate change. The United States has committed significant resources to scientific analysis of Arctic conditions and potential development, a commitment likely to continue into the long-range future.



Citation: Haycox S. (2020) Arctic Policy of the United States: An Historical Survey. In: The Palgrave Handbook of Arctic Policy and Politics. Palgrave Macmillan, Cham.
https://doi.org/10.1007/978-3-030-20557-7_15

The Implications of U.S. Policy Stagnation toward the Arctic Region

Introduction (*abbreviated*): The United States' strategic position near Russia and neighboring Canada allows the U.S. access to the Beaufort Sea, the Chukchi Sea, and the Bering Sea and requires the United States to manage a lengthy maritime border with Russia that extends through the Bering Strait and Chukchi Sea into the Arctic Ocean as far as permitted under international law. The U.S. government has articulated its fundamental interest in the Arctic for more than 40 years in a series of government strategies: beginning with President Nixon's 1971 National Security Decision Memorandum (NSDM-144), to Ronald Reagan's 1983 National Security Decision Directive (NSDD-90), to President George W. Bush's National Security Presidential Directive 66 and Homeland Security Presidential Directive 25, signed in 2009, and the 2016 Report to Congress from the Department of Defense on Strategy to Protect United States National Security Interests in the Arctic Region. Each document established broad guidelines for U.S. policy in the region that aligned with the geostrategic realities at the time.

The challenge for an overarching U.S. Arctic policy is that it must address all of these cross-cutting issues simultaneously: protect the homeland, pursue environmental adaptation and resilience, and address global economic and security dynamics while engaging in anticipatory policymaking. U.S. government strategies and documents for the Arctic are largely descriptive in nature, and they have yet to alter resource allocations (with the exception of recent congressional funding for one heavy-icebreaker, which will be predominantly used in Antarctica) or establish new organizational structures that can more efficiently address these cross-cutting issues. They also do not offer a clear set of priorities.

Citation: Conley, H.A., Melino, M. (2019) The Implications of U.S. Policy Stagnation toward the Arctic Region. Center for Strategic and International Studies. Retrieved from: https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/191009_ConleyMelino.pdf

A Strategic Approach and Interagency Leadership Could Improve Federal Efforts in the U.S. Arctic.

Summary: Maritime shipping activity, as indicated by the number of vessels in the U.S. Arctic, generally increased from 2009 through 2019. Domestic maritime activity declined after the discontinuation of offshore oil and gas exploration activities in Alaska's Chukchi Sea in 2015. However, since 2015, international activities related to natural gas development, particularly in the Russian Arctic, have increased, according to stakeholders. Factors affecting decisions of ship operators about whether to operate in the U.S. Arctic include increased operating costs of Arctic-capable ships, environmental changes that have caused more volatile weather and ice conditions, and concerns over environmental impacts.

Agencies have taken some steps to address Arctic maritime infrastructure gaps identified by federal agencies, such as a lack of nautical charting, but federal efforts lack a current



strategy and interagency leadership. Examples of agency actions include the U.S. Coast Guard developing recommended shipping routes and the National Oceanic and Atmospheric Administration continuing to chart Arctic waters. To guide federal efforts, the White House developed a National Strategy for the Arctic Region in 2013 and established an interagency Arctic Executive Steering Committee (AESC) in 2015. However, agency officials and stakeholders noted the strategy is now outdated due to changing conditions in the Arctic. As a result, federal efforts lack a current government-wide strategy that aligns with key management practices such as identifying goals, objectives, and establishing performance measures. Moreover, U.S. Arctic interagency groups do not reflect leading collaboration practices, such as sustained leadership and inclusion of all relevant stakeholders, and the White House has not designated which entity is to lead U.S. Arctic maritime infrastructure efforts. For example, the AESC is now dormant according to agency officials and staff at the White House Office of Science and Technology Policy (OSTP), which chairs the AESC. Without a current strategy and a designated interagency entity with these collaboration practices in place, agencies may miss opportunities to leverage resources and target infrastructure improvements in areas that would best mitigate risks.

Citation: U.S. Government Accountability Office. (2020). Maritime Infrastructure: A Strategic Approach and Interagency Leadership Could Improve Federal Efforts in the U.S. Arctic (Publication No. GAO-20-460). Retrieved from <https://www.gao.gov/products/gao-20-460>

People's Republic of China & East Asian Strategic Considerations

China's Arctic Policy & The Polar Silk Road

Abstract: On 26 January 2018, China released the much-anticipated White Paper that sets out its policies and position on the Arctic. China understands the economic opportunities and the territorial challenges in the region as it seeks a greater role in Arctic development. The White Paper outlines China's ambitious plan to develop a Polar Silk Road across the Arctic. It also summarizes China's policy goals and the principles guiding its conduct. As a non-Arctic state with no territorial sovereignty in the region, China's ambition would be dependent on its cooperation and the alignment of its interest with Arctic states. In considering China's Arctic policy, this paper considers three pertinent questions: (1) what China's key interests in the Arctic are, (2) what the aims and basis of China's Arctic policy are as outlined in the White Paper and (3) how China's Arctic policy complements its Polar Silk Road vision as an extension of its Belt and Road Initiative.

Citation: Lim, K.S. (2020). China's Arctic Policy & The Polar Silk Road. Arctic Yearbook 2018, pp. 420-432. (Akureyri, Northern Research Forum)
<https://doi.org/10.1080/1088937X.2018.1455756>

China's Arctic Policy: How China Aligns Rights and Interest

Abstract: Unlike the Arctic states, China has no territorial sovereignty and related sovereign rights to resource extraction and fishing in the Arctic. Faced with very limited rights as a non-Arctic state, China has been eager to design strategies to bridge the widening gap between



the legal and institutional constraints in the Arctic and its growing Arctic interests. It has developed a self-defined Arctic identity as a 'near-Arctic state' and sought – and in 2013 gained – observer status in the Arctic Council, to prepare the ground for a future expanded foothold in the region. China's first-ever white paper on Arctic policy of 26 January 2018 seeks to justify the country's Arctic ambitions through its history of Arctic research and the challenges and opportunities that rapid climate change in the Arctic present the country. China acknowledges for the first time that its Arctic interests are no longer limited to scientific research but extend to a variety of commercial activities. These are embedded in a new China-led cooperation initiative which aims to build a 'Polar Silk Road' that connects China with Europe via the Arctic and corresponds to one of two new 'blue ocean passages' extending from China's 21st Century Maritime Silk Road, launched in 2013. The white paper stresses China's commitment to upholding the institutional and legal framework for Arctic governance and to respecting the sovereign rights of the Arctic states. On the other hand, it asserts China's right as a non-Arctic state to participate in Arctic affairs under international law. China's Arctic policy suggests a strong desire to push for the internationalization of the Arctic's regional governance system. The white paper is not a strategy document, and is more interesting for what it omits, such as the national security dimension that is a major driver of China's Arctic ambitions.

Citation: Grieger, G. (2018). China's Arctic Policy: How China Aligns Rights and Interest. European Parliamentary Research Service. Members' Research Service PE 620.231.

Retrieved from:

[https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/620231/EPRS_BRI\(2018\)620231_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/620231/EPRS_BRI(2018)620231_EN.pdf)

China's Arctic Dream

Introduction (*abbreviated*): China has emerged as an engaged and active Arctic Actor over a relatively short period of time. In 2009 China created its Polar Research Institute. As a mid-latitude country that is impacted by global climate trends, the Chinese government has organized eight Arctic Scientific expeditions and it currently has two research stations in the Arctic – on Svalbard and in Northern Iceland – with ambitions to launch a research station in northern Canada. China's Scientific agenda focuses on mid-latitude weather, changes in Arctic sea ice, and ocean acidification.

Citation: Conley, H. (2018). China's Arctic Dream. Center for Strategic and International Studies (CSIS), CSIS Europe Program. Retrieved from: http://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/180402_Conley_ChinasArcticDream_Web.pdf

Coming into the cold: Asia's Arctic interests

Abstract: In their Arctic strategy documents, the five Arctic coastal states (Canada, Greenland/Denmark, Norway, Russia, and the USA) all point to increased traffic and regional activity as a promising economic possibility and a security and governance challenge. These developments have not gone unnoticed by non-Arctic states who have demonstrated an



increasing interest in the region, most noticeably through their successful applications to gain permanent observer status in the preeminent regional forum – the eight-country Arctic Council. We argue that the rising interest of non-Arctic actors highlights some interesting questions about how governance in the region will develop and how Arctic states envision the region's global significance. This article engages with questions about Arctic governance through a study of the Arctic interests of four Asian states (China, Japan, Singapore, and South Korea) and how Arctic states are meeting this increased interest. We focus on the varied reception of non-Arctic states by established Arctic actors, namely the USA, Russia, and Norway, and how they have reacted to the idea of Asian observer states in the Arctic Council. This study is primarily based on a set of qualitative interviews with civil servants and nonstate actors engaged in Arctic governance, media reports and primary documents.

Citation: Solli P.E., Rowe E.W., Lindgren W.Y. (2013) Coming into the cold: Asia's Arctic interests. *Polar Geography*, 36:4, 253-270. DOI: 10.1080/1088937X.2013.825345

Russian Federation Strategic Considerations

The Ongoing Formation of Russia's Arctic Policy: A New Stage?

Abstract: This paper provides an overview of Russia's Arctic policy with a focus on recent changes in the spatial development and legislative/institutional frameworks. It briefly explains the definition of the Arctic Zone of the Russian Federation (AZRF) and examines its basic consolidation mechanism, as well as socio-economic challenges to its development and some legislative gaps. The paper identifies the roles of various actors and institutions in decision-making processes. In doing so, it also investigates how both Western sanctions and oil prices affected the realization of the Arctic policy's main objectives. It argues that Russia will continue to promote the benefits of using the NSR and to attract all interested parties in the exploitation of the AZRF's natural resources, but there is a need to revise some strategies in order to do it effectively, considering new circumstances.

Citation: Galimullin, D., Matveenko, Y. (2019). The Ongoing Formation of Russia's Arctic Policy: A New Stage? *Arctic Yearbook 2019*. Northern Research Forum and the University of the Arctic Thematic Network (TN) on Geopolitics and Security. Retrieved from: <https://arcticyearbook.com/arctic-yearbook/2019/2019-scholarly-papers/318-the-ongoing-formation-of-russia-s-arctic-policy-a-new-stage>

Russian Formal and Practical Geopolitics in the Arctic: Change and Continuity

Abstract: This article examines current Russian expert and official narratives on the Arctic, situating them in the broader context of the debate on Russia's role in the international system. Combining a critical geopolitics approach to the study of international relations with content analysis tools, we map how structural geopolitical changes in the wider region have shaped narratives on the Arctic in Russia today. Two types of Russian narratives on the Arctic are explored—the one put forward by members of the Russian expert community, and the one that emerges from official documents and statements by members of the Russian policymaking community. With the expert narratives, we pay particular attention to the Arctic



topics featured and how they are informed by various mainstream approaches to the study of international relations (IR). In examining policy practitioners' narrative approaches, we trace the overlaps and differences between these and the expert narratives. Current expert and official Russian narratives on the Arctic appear to be influenced mostly by neorealist and neoliberal ideas in IR, without substantial modifications after the 2014 conflict, thus showing relatively high ideational continuity.

Citation: Godzimirski, J. M., Sergunin, A. (2020). Russian Formal and Practical Geopolitics in the Arctic: Change and Continuity. *Arctic Review*, 11, 22-46.
<https://doi.org/10.23865/arctic.v11.1350>

Telling Domestic and International Policy Stories: The Case of Russian Arctic Policy

Abstract: Based on extensive empirical analysis of policy communication, this chapter investigates the difference between the Arctic narratives presented by the Russian government to the domestic and foreign audiences. We apply narrative policy analysis (Nye 2004; Jones and McBeth 2010) to demonstrate how the Russian government offers two separate, yet intersecting policy stories. For the domestic audience, it highlights the socio-economic significance of natural (hydrocarbon) resources to the development of the Arctic region and Russia as a whole and demonstrates persistence in turning the Arctic into the primary resource base 'against all odds' (such as the Western economic sanctions and low price of oil). For the foreign publics, it presents the narrative of the Arctic as a territory of peace and stability, emphasizing adherence to the norms and principles of the international law.

Citation: Gritsenko, D., Tynkkynen, V.P. (2018). Telling domestic and international policy stories: the case of Russian Arctic policy. In *Russia's far north: the contested energy frontier* (pp. 191-205). Routledge - Taylor & Francis Group. <https://www.taylorfrancis.com/books/e/9781315121772/chapters/10.4324/9781315121772-13>

Forecasting Conflict in the Arctic: The Historical Context of Russia's Security Intentions

Abstract: The Arctic has reemerged as a region of geo-political consequence following rapid reduction in sea ice in the past decade. As the only non-NATO Arctic littoral state, Russia's approaches to the many disputes in the region will undoubtedly have the greatest bearing on the future security environment. This article examines the two most threatening circumpolar disputes, seabed delineation and navigation rights, and postulates that Russia's policies on both issues conform to historical patterns. Recent Russian policy decisions are placed in historical context in order to gauge conflict potential in the Arctic related to these two disputes. The main finding is that the path-dependent trajectories of both issues are becoming ever more distinct as Russia articulates its Arctic policies. In particular, structural and historical factors encourage Moscow toward cooperation and compromise on seabed negotiations but also suggest that Kremlin intransigence on navigation will continue, with potentially detrimental effect on regional stability.



Citation: Flake, L. (2015) Forecasting Conflict in the Arctic: The Historical Context of Russia's Security Intentions, *The Journal of Slavic Military Studies*, 28:1, 72-98, DOI: 10.1080/13518046.2015.998122

The Arctic Policy and Port Development along the Northern Sea Route: Evidence from Russia's Arctic Strategy

Abstract: As global warming continues, the melting rate of Arctic glaciers is further accelerated, which provides favorable conditions for the development of the Arctic's abundant resources, shipping, and ecological research. Accordingly, Russia, as the country with the longest Arctic coastline, has promulgated a series of policies and guidelines which aimed at the development of the Arctic region and the revitalization of the Northern Sea Route (NSR). By strengthening infrastructure construction, reducing port dues, and improving handling efficiency to promote the development of ports along the NSR and also to give full play to the transportation potential of NSR, which is an inherent need for the development of Russian Arctic region. However, how Russia's Arctic strategy may affect port development along the NSR and whether the Russian Arctic strategy can promote the development of ports along the NSR remain to be investigated. This study, based on the multi-source data, uses the difference-in-difference (DID) method to estimate the impact of Russia's Arctic strategy on the development of ports along the NSR. The results from this study indicate that Russia's Arctic strategy has failed to promote the development of ports along the NSR during 2003–2012, and the growth of port cargo throughput is overly reliant on energy exploitation. All of our preliminary results throw light on the nature of the impact of Russia's Arctic strategy on the development of ports along the NSR.

Citation: Liu, C.Y., Fan, H.M., Dang, X.J., Zhang, Xuan, Z. (2020) The Arctic policy and port development along the Northern Sea Route: Evidence from Russia's Arctic strategy. *Ocean & Coastal Management*. <https://doi.org/10.1016/j.ocecoaman.2020.105422>.

Canadian Strategic Considerations

Canada's Arctic and Northern Policy Framework: A Roadmap for the Future?

Introduction (*abbreviated*): The ANPF highlights many well-known issues that Northerners have identified for years, including climate change impacts, food insecurity, poverty, health inequalities, and housing shortages. It is useful in reinforcing common understandings of these problems with those most affected, reiterating the importance of these issues to the general Canadian public, and setting priorities for federal policy. The framework also points out that the government and its Indigenous and territorial partners have already acted on some of the challenges and opportunities identified during the long co-development process – particularly through innovative and unique community-based initiatives. The ANPF's expressed objective, however, is to provide a “roadmap” to achieve the “shared vision” co-developed by the groups involved in the process. If this is a roadmap, it is one with few clear directions – a map that identifies hazards, problems, and opportunities, but does little to



illuminate how the federal government will work practically with its partners to navigate the complex terrain around myriad Arctic policy priorities and seemingly intractable political dilemmas.

Citation: Kikkert, P., Lackenbauer, P.W. (2019) Canada's Arctic and Northern Policy Framework: A roadmap for the future? Arctic Yearbook 2019. (Akureyri, Northern Research Forum). Retrieved From: https://arcticyearbook.com/images/yearbook/2019/Briefing-Notes/9_AY2019_BN_Kikkert_Lackenbauer.pdf

Regional Border Security Management in the Territorial North

Introduction: Overall, the management of the international land border by the Canadian Border Services Agency (and correspondingly, the US Department of Homeland Security in Alaska) is consistent with that of other regions of Canada, meaning that the same federally mandated rules and regulations apply. Customs and immigration inspections occur here, and a host of regulations and laws are imposed upon both private and commercial travelers as they cross the line. While a number of federal laws and agreements govern the management of the border, one of the most important of these is the Canada-US Beyond the Border Framework for border management. An evolving framework and cooperation agreement, it invites bilateral cooperation, yet also clearly aligns with national security practices and discourages exceptionality. The idea is to create national borders that are uniform, have a common 'look and feel' and that reflect the priorities of their respective states.

If the way in which boundaries and borders have been perceived and regionalized in the North leads to the presumption that a single border management framework works throughout all regions, nothing could be further from the truth. Moreover, it would be wrong to assume that the only real border is the in-situ international land boundary. Indeed, there are many different types of borders that divide the region, at different scales and in different ways. These emerge from the very different histories and the very different ways through which Westphalian notions of state have been operationalized within the region. There are, for example, land borders that divide Canada from the United States. There are also layers of boundaries which divide sub-national regions and non-state actors from each other and that define subsidiarity in this way. In some spaces, there are maritime boundaries – both established, claimed and disputed. Borders manage the flows of peoples and goods, relationships between international interests, and state sovereignty. They are integral to the conceptualization of security from the point of view of the state. And yet, if poorly implemented or managed, borders may at times contribute to insecurity.

That point is made in this chapter where we explore Canada's 'Territorial North'. This includes the three Canadian territories lying north of 60 degrees north latitude: Yukon, the Northwest Territories and Nunavut – an extremely large area of land and water which occupies approximately 40 per cent of Canada. Yet, because of their remote geographies, low levels of economic activity and limited populations, border management services within the region are vastly underrepresented. For example, while there are miles of land, air and maritime boundaries in the region, there are only four international land border crossings located along the Canada-US land border. Two are located between Yukon and Alaska, and



two more crossings are located in an area that is technically outside of the Territorial North – lying on the boundary between Alaska and British Columbia, although few would argue that point. Similarly, there is only one airport with established border inspection facilities, while maritime boundary enforcement and inspections are much more flexible still.

In the following discussion, we look at the implications of remote geographies for border management and regional security. The point is that security in the North American Arctic region provides a distinctive set of challenges that are very different from those of the South. Yet, the templates and tools for managing security tend to be one and the same. The following discussion highlights this discomfiture with regard to border management along Canada's international boundaries within the Arctic region and suggests where new ways of approaching and understanding security arrangements may be required. It sketches out the impact of remoteness, low density populations and generalized national policies upon security arrangements in the Canadian Arctic and sub-Arctic region, with consideration given to Canada's close relationship to Alaska and the broader circumpolar region. We begin with a historical overview, followed by consideration of how traditional border security is managed, and then turn to the challenges of traditional management which are now beginning to affect the security of the region.

Citation: Nicol, H.N., Lajeunesse, A., Lackenbauer, P.W., Everett, K. (2019) Regional Border Security Management in the Territorial North. Menezes, D.R, and Nicol, H.N. (eds.). 2019. *The North American Arctic: Themes in Regional Security*. London: UCL Press, pp. 134-155. DOI: <https://doi.org/10.14324/111.9781787356610>

Geopolitics of Arctic Passages and Continental Shelves

Introduction: Melting summer sea ice in the Arctic is documented and has been making the headlines since 2007. The phenomenon, underlined by scientists and the media since the turning of the century, has triggered speculation on the opening of much shorter sea routes linking Europe via the eastern North American coast to Asia, as well as increased access to the mineral riches of the region. The prospect of growing shipping traffic in Arctic waters, especially through the Northwest Passage in the Canadian Arctic Archipelago, or through the Northeast Passage north of Russia, has fueled rhetoric on the status of these Arctic routes and controversy over the pace of such shipping growth. Similarly, much rhetoric has been voiced regarding the extent of continental shelves in the Arctic.

There are actually two very different issues regarding Arctic sovereignty for Canada at the present time. They are often confused but do not imply the same policy actions, nor the same dimensions of the UN Convention on the Law of the Sea (UNCLOS), which Canada ratified in 2003. These two issues are, first, the extension of the continental shelves beyond the Exclusive Economic Zones (EEZ) of the 5 riparian countries bordering the Arctic Ocean; and second, the political and legal status of the Arctic passages, namely the Northwest Passage across the Canadian Arctic Archipelago, and the Northeast Passage, north of Siberia.



Citation: Lasserre, F. (2011) Geopolitics of Arctic Passages and Continental Shelves. Public Sector Digest, November 2011. Retrieved From: <https://www.ggr.ulaval.ca/sites/default/files/documents/Lasserre/Publications/geopolitics.pdf>

Canada's Arctic policy. Striking a balance between national interests and circumpolar cooperation

Introduction: The Arctic is undergoing rapid changes, both environmentally and politically, and the Arctic states as well as non-Arctic actors are working to establish a presence, secure national interests and natural resources in the High North. Canada is an interesting player in this unpredictable region, with the potential to become an Arctic great power. Canada is the world's second largest country, over 40% of its landmass is located in the north, it has an extensive Arctic coastline and considerable prospects for northern energy and natural resource development. At the same time, Canada's northern territories – the Yukon, the Northwest Territories and Nunavut – are severely underdeveloped. Both the federal and the territorial governments face enormous challenges in terms of social and economic development, infrastructure improvements, providing education and job opportunities, improving housing conditions and the health of Aboriginal peoples and northerners in the territories. These challenges notwithstanding, it is crucial for the federal government to facilitate the continued habitation of the Canadian Arctic to assert and maintain its sovereignty claims to the region, which is becoming increasingly vital as international interests in the circumpolar north grows. To deepen the understanding of how Canada works to position itself in the High North, this thesis sets out to answer the problem statement: what are the main priorities for Canada in its Arctic region, and how does Canada pursue its Arctic policy on the domestic and international level? The thesis examines how Canada works domestically and maneuvers on the international arena to respond to challenges in the region while safeguarding domestic interests and protecting its Arctic sovereignty. It focuses on policy issues pursued unilaterally, through bilateral relations with the other Arctic states and through transnational cooperation in multilateral forums, primarily the Arctic Council. It presents Canada's actions, intentions and motives behind these actions, as well as the outcomes of Canadian Arctic policymaking.

Citation: Steinveg, B. (2014) Canada's Arctic policy. Striking a balance between national interests and circumpolar cooperation. The Arctic University of Norway, Department of Sociology, Political Science and Community Planning, Master Thesis in Political Science. Retrieved From: <https://hdl.handle.net/10037/7079>

Greenland and the Kingdom of Denmark Strategic Considerations

Greenland as a self-governing sub-national territory in international relations: Past, current and future perspectives

Introduction: Greenland was used by the US as a platform and as an extended arm within its security and foreign policy during the World War II and the cold war. After this thing changed, although Greenland remained important in Danish-US relations under the umbrella of NATO. Nowadays, the geostrategic position of Greenland between North America and Europe is



gaining fresh prominence in the race for natural resources in the Arctic. Many issues arise from the prospective opening of the Arctic, all of which may have fateful impacts on future development in the region. Climate change, claims related to the extension of the continental shelf, exploitation and exploration of natural resources, together with the protection of indigenous peoples are all current issues that must be taken into consideration in the context of security and foreign policy formation in Greenland. The future of the Thule Air Base is also relevant. This article reviews developments from the World War II to the present regarding international relations from a Greenlandic perspective. As a self-governing sub-national territory within the realm of Denmark, Greenland does not have the ultimate decision-making power within foreign and security policy. The new Self-Government Act of 2009, however, gives Greenland some room for maneuver in this respect.

Citation: Ackrén, M., Jakobsen, U. (2014) Greenland as a self-governing sub-national territory in international relations: Past, current and future perspectives. *Polar Record*, Volume 51, Issue 4, pp. 404 – 412 DOI: <https://doi.org/10.1017/S003224741400028X>

Greenland & the Arctic Council: Subnational Regions in a Time of Arctic Westphalianisation

Abstract: In recent years renewed global interest in the Arctic and the Arctic Council, in particular, has led to what can be called a ‘Westphalianisation’ of Arctic politics. This Westphalianisation can be found in the increasing number of globally powerful states including China, Japan, and India as well as the European Union which have all sought a formal role in Arctic policymaking (specifically by seeking observer status on the Arctic Council – the most significant fully circumpolar intergovernmental regime). The Arctic Council itself has shifted from a high-level forum to an intergovernmental regime which has begun to produce a number of binding agreements under its auspice. At the same, over the past thirty years subnational regions around the world have become powerful global actors. This is due in part to the strength of certain subnational economies, the inability for states and the intergovernmental system (e.g., UN) to meet the challenges facing subnational regions, as well as a broader reconceptualization of sovereignty, namely the decentralization of traditional governance. Subnational regions, subsequently, are increasingly finding or seeking a greater voice in global politics.

In the Arctic, unlike earlier periods of history when global powers arrived and were met with little if any political resistance, in today’s Arctic subnational entities from Greenland to Nunavut and Alaska have all attained the legitimacy and the agency to engage in global politics on their own accord. This chapter will focus on the future of the Arctic Council in light of this renewed global interest in the Arctic alongside the rise of globally situated subnational Arctic regions. In particular this chapter will focus on a global Greenland as a window into the incongruent forces between the Westphalianisation of the Arctic Council and the growing power of Arctic subnational regions. At the very time that Greenland is gaining its greatest strength on its path towards greater self-determination its role on the Arctic Council is being diminished. Borrowing from IR and political geography literatures this chapter will look at the implications of these tensions for the future of Arctic governance and within this the future efficacy of the Arctic Council.



Citation: Olsen, I.H., Shadian, J.M. (2016). Greenland & the Arctic Council: Subnational Regions in a Time of Arctic Westphalianisation. Arctic Yearbook. Retrieved from: https://arcticyearbook.com/images/yearbook/2016/Scholarly_Papers/8.Shadian.pdf

Greenlandic Sovereignty in Practice: Uranium, Independence, and Foreign Policy in Greenland between Three Logics of Security

Abstract: One of the key questions facing Greenland observers is how the island will orient itself vis-à-vis external actors – Denmark, foreign nations, companies, and NGOs among others – as it further develops its foreign relations. One thing seems evident from the literature: Greenland essentially strives to become a Westphalian nation-state and Greenlandic politics are driven by a yearning for sovereignty and independence, which is likely to shape how Nuuk faces the world (Gad 2014; Gerhardt 2011). However, when analyzing Greenland's foreign relations, analysts need more concrete schema for understanding how Greenlandic policymakers approach specific issues. It is the meeting point between independence, sovereignty, and concrete matters that shapes how the island orients itself towards the world. Understanding how threats to future independence is translated into tangible politics in public discourse reveals both the limits and opportunities faced by outside actors when interacting with Greenland and the nature of the political setting in Greenland.

Citation: Kristensen, K. S., Rahbek-Clemmensen, J. (2018). Greenlandic Sovereignty in Practice: Uranium, Independence, and Foreign Policy in Greenland between Three Logics of Security. Greenland and the International Politics of a Changing Arctic: Postcolonial Paradiplomacy between High and Low Politics (pp. 38-53). Routledge. Routledge Research in Polar Regions <https://doi.org/10.4324/9781315162645-4>

Finland, Sweden, and Norway Strategic Considerations

Securing Anticipatory Geographies: Finland's Arctic Strategy and Geopolitics of International Competitiveness

Abstract: This paper presents an analysis of Finland's Arctic strategy, providing a perspective on contemporary 'Arctic geopolitics' outside the dominant emphasis on the territorial politics of the Arctic Ocean coastal states. Concurrently, this serves as an empirical framework for interpreting the contextual de- and re-territorializing manifestations of geopolitical state strategies that are increasingly about securing competitive advantages, rather than exerting or extending territorial control over resources. By deploying the notion of anticipatory geographies this paper shows that Finland's Arctic strategy documents have produced two intertwined promotional visions that are predicated on the discourses of international competitiveness and which relate Finland to the Arctic region. These are 1) Finland as a key provider of solutions to problems in Arctic development and 2) Finland as an attractive territorial node in 'Arctic flows'. These anticipatory geographies are facilitated in practice through the political consolidation of 'Arctic' markets for Finnish exports and through infrastructure projects purportedly enhancing the position of Finland within various 'economic flows'. Together, these notions illuminate the geopolitical dimension of attempts



to secure competitive advantages and how this relates to the processes of state spatial transformation through de- and re-territorialization, especially beyond the recently much emphasized context of city-regionalism.

Citation: Väättänen, V. (2019) Securing Anticipatory Geographies: Finland's Arctic Strategy and the Geopolitics of International Competitiveness, Geopolitics, DOI: 10.1080/14650045.2019.1580267

Finland and NATO: Strategic Choices and Identity Conceptions

Abstract: This chapter explores Finland's relationship with NATO, analyzing the evolution of the relationship since the Cold War, as well as the ongoing political debate over joining the Alliance. It argues that psychological factors, identity issues and domestic politics explain the nature of Finland's policy towards NATO at least as much as geopolitical determinants and strategic calculations based on national interest. The role of the key outside drivers for change in Finland's policy towards NATO—Russia, NATO itself and the United States, as well as Sweden—are also assessed. The chapter concludes that despite many changes in Finland's security environment, NATO membership remains only 'an option', since domestic politics, identity conceptions and psychological factors all work in favor of policy continuity.

Citation: Forsberg T. (2018) Finland and NATO: Strategic Choices and Identity Conceptions. The European Neutrals and NATO. New Security Challenges. Palgrave Macmillan, London. https://doi.org/10.1057/978-1-137-59524-9_5

Sweden and the NATO debate: views from Sweden and Russia

Abstract: Sweden is a country that has a reputation and historical legacy as being "neutral" and working for peaceful solutions to different global problems after the bitter experiences in the 18th and 19th centuries that saw it fall as a regional power of the Baltic Sea region in a series of conflicts with the Russian Empire. Contemporary mainstream politics and society places itself firmly in the camp of global liberalism and the stressing the importance of the trans-Atlantic partnership, which influences how Sweden views its mission and approach to global affairs. Sweden's centuries long policy of neutrality/non-alignment is being tested in an environment of deteriorating relations with Russia. This is most clearly seen in the NATO debate where a noticeable split is taking place in society along the lines of humanitarian values (those supporting neutrality/non-alignment) and "interests" (namely supposed security interests by the pro-NATO side).

Historical experience has shown that the principled stand of neutrality by minor powers in times of armed conflict and tension is a difficult balance. The contradiction here can be seen through utopian values and ideals being enforced with a top-down approach that are presented as being interests, which in effect have the potential to create greater risk for Sweden and are therefore not in the objective best interests of the country. Interests in the context of this commentary are understood as concrete and pragmatic policy that is intended to tangibly benefit a country pursuing its aims and goals within the realist understanding of international relations. Although this may include values and norms, but these can at times



be used subjectively and emotionally to prime and mobilize an audience under the banner of “objectivity” and “interests.” Therefore, norms and values can actually be associated with the idea of humanitarianism as an interest. Values and norms can take on more of a constructivist nature in international relations.

Sweden has maintained a tradition for almost two centuries of keeping out of wars, after the disastrous results of aligning with Napoleon Bonaparte and attacking Russia, losing the territory of Finland as part of the consequences. This shaped their approach, from an expanding empire that was often involved in armed conflict and expansion, to an attempt to preserve what was left of the once Baltic Sea regional power. The conflicts between Sweden and Russia have resulted in an asymmetric relationship between the Baltic Sea neighbors, where some in Sweden have come to view Russia as an existential threat.

Citation: Simons G., Manoylo, A., Trunov, P. (2019) Sweden and the NATO debate: views from Sweden and Russia, *Global Affairs*, 5:4-5, 335-345, DOI: 10.1080/23340460.2019.1681014

Norway and Russia in the Arctic: New Cold War Contamination?

Abstract: The standoff between Russia and the West over Ukraine has already obstructed cooperation across a range of issues. Could it also affect state interaction between Norway and Russia in the Arctic—an area and a relationship long characterized by a culture of compromise and/or cooperation? Here we start from the theoretical premise that states are not pre-constituted political entities but are constantly in the making. How Russia views its own role and how it views other actors in the Arctic changes over time, calling for differing approaches. That holds true for Norway as well. To clarify the premises for interaction between Russia and Norway in the Arctic, we scrutinize changes in official discourse on Self and Other in the Arctic on both sides in the period 2012 to 2016, to establish what kind of policy mode— “realist,” “institutionalist,” or “diplomatic management”—has underlain the two countries’ official discourse in that period. Has Norway continued to pursue “balancing” policies undertaken in the realist mode with those in the diplomatic management mode? Which modes have characterized Russia’s approach toward Norway? Finding that realist-mode policies increasingly dominate on both sides, in the conclusion we discuss how the changing mode of the one state affects that of the other, and why a New Cold War is now spreading to the Arctic.

Citation: Wilhelmsen, J., Gjerde, K.L. (2018) Norway and Russia in the Arctic: New Cold War Contamination? *Arctic Review on Law and Politics*. 2018, 9 382-407. DOI: 10.23865/arctic.v9.1334

Resolving Arctic Sovereignty from a Scandinavian Perspective

Abstract: Smaller Scandinavian states are at a distinct disadvantage as a result of the current framework governing the Arctic. In order to better preserve their interests in the environment, the rights of their indigenous groups, and their security interests, these states



should lead the push to develop a working group within the Arctic Council with a view toward the creation of an Arctic treaty.

Citation: Traner, H. (2011) Resolving Arctic Sovereignty from a Scandinavian Perspective. Case Western Reserve Journal of International Law, Volume 44, Issue 1, Article 23. Retrieved from: <https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=1103&context=jil>

European Union and the United Kingdom Strategic Considerations

Geopolitics and Security in the Arctic: What Role for the EU?

Abstract: The Arctic has received considerable attention over the last decade due to climate change, positive resource appraisals and the increased military presence in the region. Portrayals range from those that warn of impending conflicts to those that emphasize the region's unique cooperative environment. To what extent are the generalizations about Arctic security and geopolitics accurate? What fuels these generalizations? Moreover, what is the role of the EU in this changing geopolitical environment? This article examines the causes of conflict in the Arctic and argues that the disputes over territory, resources and the North Pole are limited in magnitude. At the same time, the security dynamics within the Arctic are relevant, given each state's relations to Russia. The EU's role, however, is less a geopolitical one and more concerned with two dimensions, namely *awareness* and *support*. For EU policymakers and decision-makers, understanding the complexities of the north should take priority over re-inventing the Union's role in the region.

Citation: Østhagen, A. (2017) Geopolitics and security in the Arctic: what role for the EU? European View 16, 239–249 (2017). <https://doi.org/10.1007/s12290-017-0459-1>

The European Union and its Northern Frontier: European Geopolitics and its Arctic Context.

Abstract: The present study explores European geopolitical agency in a distinct spatial-temporal context: The Arctic region of the early 21st century. Thus, it provides an in-depth analysis of the European Union's process to construct European legitimacy and credibility in its 'Northern Neighborhood' between 2008 and 2014. Embedded in a conceptual and methodological framework using critical geopolitics, this study assesses the strategic policy reasoning of the EU and the implicit geopolitical discourses that guide and determine a particular line of argumentation so as to claim a 'legitimate' role in the Arctic and accordingly construct a distinct 'European Arctic space'. In doing so, it establishes a clearer picture on the (narrated) regional interests of the EU, and the related developed policy and concrete steps taken in order to get hold of these interests. Eventually, the analysis gets to the conceptual bottom of what exactly fashioned the EU with geopolitical agency in the circumpolar North. As a complementary explanation, this study provides a thick description of the area under scrutiny – the Arctic region – in order to explicate the systemic context that conditioned the EU's regional demeanor and action. Elucidated along the lines of Arctic history and identity, rights, interests and responsibility, it delineates the emergence of the Arctic as a region of and for geopolitics. The findings indicate that the sui generis character of the Arctic as European neighborhood essentially determined the EU's regional



performance. It explicates that the Union's 'traditional' geopolitical models of civilian or normative power got entangled in a fluid state of Arctic affairs: a distinct regional system, characterized by few strong state actors with pronounced national Arctic interests and identities, and an indefinite local context of environmental changes, economic uncertainties and social challenges. This study applies critical geopolitics in a Political Science context and essentially contributes to a broader understanding of EU foreign policy construction and behavior. Ultimately, it offers an interdisciplinary approach on how to analyse EU external action by explicitly taking into account the internal and external social processes that ultimately condition a certain European foreign policy performance.

Citation: Raspotnik, Andreas (2016). The European Union and its Northern Frontier European Geopolitics and its Arctic Context. PhD thesis, Universität zu Köln. <http://kups.ub.uni-koeln.de/id/eprint/7083>

Reactive Power EU: Russian Aggression and the Development of an EU Arctic Policy

Abstract: There are many factors driving the development of European Union (EU) foreign policy. While much of the literature focuses on how particular interests, norms or internal processes within Brussels institutions, this article sheds light on the role of external factors in shaping EU foreign policy through an in-depth examination of the recent development of EU Arctic policies. We find that increased Russian aggression, not least in Ukraine, is key to understanding why the EU recently has taken a strong interest in the Arctic. In a more insecure environment, Member States are more prone to develop common policies to counter other powers and gain more influence over future developments, especially as it relates to regime-formation in the Global Commons. In effect, the EU demonstrates a kind of reactive power when it comes to dealing with new geopolitical threats.

Citation: Cross, M.K., Riddervold, M. (2019) Reactive Power EU: Russian Aggression and the Development of an EU Arctic Policy. *European Foreign Affairs Review*, Issue 1, pp. 43-60. <https://kluwerlawonline.com/journalarticle/European+Foreign+Affairs+Review/24.1/EEER2019004>

The UK'S Defence Arctic Strategy: Negotiating the Slippery Geopolitics of the UK and the Arctic

Abstract: Following the UK defense secretary's announcement in September 2018 that the Ministry of Defence is to devise a Defence Arctic Strategy, Duncan Depledge, Klaus Dodds and Caroline Kennedy-Pipe look back on how UK defense has engaged with the Arctic over the past two decades and draw attention to the shift in focus from climate change to hard security threats. They analyze what this means for the development of national Arctic policy in general, including the potential for divergence with other stakeholders such as the Foreign Office and the Scottish government. They conclude by considering how UK Arctic policy might change after Brexit.

Citation: Depledge, D. Dodds, K. & Kennedy-Pipe, C. (2019) The UK's Defence Arctic Strategy, *The RUSI Journal*, 164:1, 28-39, DOI: 10.1080/03071847.2019.1605015



Arctic Defense and Security Considerations

Maritime Militarization in the Arctic: Identifying Civil-Military Dependencies

Abstract: This paper reconsiders extant discourses on Arctic security within the wider body of militarization literature and suggests that the enduring peacetime roles of Arctic maritime forces has resulted in a limited, but recognizable, militarism. However, this militarism is not to be confused with alarmist interpretations of potential interstate conflict or a predilection towards violence. Rather, in focusing on the blurred responsibilities between regional naval, coast guard, and civilian organizations, I highlight the social-economic and material dependencies between Arctic civil societies and their governments' security providers. Specifically, this paper compares Norwegian, Danish, and Canadian approaches to their respective regional maritime security interests, emphasizing how the process of militarization has developed in the relationships between their Arctic civil societies and those countries' Arctic maritime security infrastructures. It argues that Arctic literature would do well to move beyond binary debates over whether the Arctic is or is not militarized, and instead recognize that certain sectors of regional societies have long been dependent on the continued sustainment and modernization of maritime and, occasionally, naval power, which continuously provides support for peacetime civilian ways of life. Only with this understanding can the material developments of Arctic military and paramilitary power be properly contextualized.

Citation: Choi, T. (2020) Maritime Militarization in the Arctic: Identifying Civil-Military Dependencies. Arctic Yearbook 2020. Retrieved from:
https://arcticyearbook.com/images/yearbook/2020/Scholarly-Papers/4_Choi.pdf

International Relations within the Circumpolar North

Between classical and critical geopolitics in a changing Arctic

Abstract: Puzzled by how geographical changes in the Arctic might cause changes in state behavior the authors of this article have been inspired to return to the roots of geopolitical reasoning. By combining insights from the intellectual roots of the geopolitical tradition with empirical data on geographical changes as well as policy changes in the Arctic today, we investigate the degree to which geopolitics, in the sense of geography influencing politics, is still a useful approach in the discipline of International Relations (IR). In limiting our primary focus to the state level and investigating the period since the turn of the millennium, this article seeks to develop new knowledge concerning if, how, and to what extent geography matters in international politics. Our empirical investigation indicates that geographical changes in the Arctic have indeed had an effect on power relations among several states. Overall, this article shows that geography is an important factor in IR in the sense of enabling or empowering state actors. However, while it appears that physical geography is a possible factor in the cases analyzed to explain changes in identified power potentials, it does not always account for these changes on its own. Economic, political, legal, and historical factors also play a role in the observed power shifts.



Citation: Wegge N., Keil, K. (2018) Between classical and critical geopolitics in a changing Arctic, *Polar Geography*, 41:2, 87-106, DOI: [10.1080/1088937X.2018.1455755](https://doi.org/10.1080/1088937X.2018.1455755)

Three-Way Power Dynamics in the Arctic

Abstract: The Arctic is an emerging region of great significance to US-China Russia great power competition. This is due to the concentration of natural resources in the Arctic, as well as its future use as a transportation corridor between the Pacific and Atlantic. Russia's dominant position in the Arctic complicates the US-China dyad. While most high-level US security strategies and discourse identify the return of great power competition as the dominant current security paradigm, China and Russia are generally treated in isolation from each other. However, when it comes to the Arctic, China-Russia cooperation is a crucial factor to consider when formulating US strategy. This article places Chinese ambitions in the Arctic in the context of Chinese grand strategy and assesses the basis of, and prospects for, Chinese-Russian Arctic cooperation. It also advances a three-track framework for understanding Chinese-Russian cooperation in the Arctic—economic, military, and political—in which issues of control and trust are contested.

Citation: Pincus, R. (2020) Three-way Power Dynamics in the Arctic. *Strategic Studies Quarterly*, Spring 2020. USAF Air University Retrieved from: https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-14_Issue-1/Pincus.pdf

Regional Order in the Arctic: Negotiated Exceptionalism

Abstract: Traditional theories of International Relations have thus far failed to explain the unusual degree of cooperation seen in the Arctic between Russia on the one hand, and the seven Western Arctic states led by the United States on the other. Rather than witnessing a devolution into competition and conflict over strategic shipping routes and hydrocarbon resources, regional Arctic institutions have continued to grow in strength and number in the past several years, and transnational ties have deepened. This has prompted some observers to describe the Arctic as 'exceptional' – somehow immune to or isolated from global political competition.

This chapter argues that the Arctic regional order is exceptional insofar as Arctic states and those states with involvement in the region have worked to negotiate an order and balance of power predicated on norms such as cooperation and multilateralism. The establishment of an Arctic international society has seen great powers and smaller powers come together to form an order aimed at promoting norms and institutions not seen elsewhere in the world. By using an English School approach to understand the Arctic, we contend that Arctic international society has been deliberately negotiated in a way that promotes cooperation between Arctic states. However, this order can be disrupted if Arctic international society does not take conscious steps to maintain a strong institutional framework that protects Arctic internationalism.



Citation: Exner-Pirot, H., Murray, R. (2018) Regional Order in the Arctic: Negotiated Exceptionalism, Arctic Institute. Politik. Retrieved from: <https://www.thearcticinstitute.org/regional-order-arctic-negotiated-exceptionalism/#:~:text=This%20chapter%20argues%20that%20the,such%20as%20cooperation%20and%20multilateralism.>

The Good, the Bad and the Ugly: Three Levels of Arctic Geopolitics

Abstract: Statements about conflict surrounding the Arctic is quite common. In May 2019, in a speech in conjunction with a meeting at the Arctic Council – the Arctic’s foremost cooperative mechanism – US Secretary of State Mike Pompeo lambasted both Russia and China for their “provocative actions” that are “part of a pattern of aggressive behavior”. That October, France’s Minister of the Armed Forces even

compared the Arctic to the Middle East. 2 Yet both the United States (as a member of the Arctic Council) and France (as an observer) are strong supporters of Arctic cooperative mechanisms, and repeatedly stress their desire to ensure that the circumpolar region remains insulated from troubles elsewhere.

Ideas of the Arctic as an arena for political competition and rivalry are therefore often juxtaposed with the view of the Arctic as a region of harmony and shared interests. Such regional approaches have led to Arctic security debates being dominated by ideas of “exceptionalism” – the notion that the Arctic is unique and separate from the (geo)political rivalries elsewhere in the world.

There seems to be a confusing multitude of actors and layers of engagement in Arctic geopolitics. Numerous questions are left concerning the geopolitical characteristics of the Arctic, contradictory statements by Arctic states about the region, and how regional relations might evolve in the near future.

This article unpacks the notion of Arctic geopolitics by exploring the different, at times contradictory, political dynamics at play in the North. It explores three levels of inter-state relations: the regional (Arctic) level, the international system, and the level of bilateral relations. Labelling these levels as “good,” “bad” and “ugly” – an unabashed borrowing from Sergio Leone’s epic 1966 film – helps shed light on the distinctiveness of each and on how they interact.

Citation: Østhagen, A., (2020) The Good, the Bad and the Ugly: Three Levels of Arctic Geopolitics. Balsillie Papers, Volume 3, Issue 04. Retrieved from: <https://balsilliepapers.ca/wp-content/uploads/2020/12/Balsillie-Paper-Osthagen.pdf>

Interstate Relations in the Arctic: An Emerging Security Dilemma?

Abstract: The five states that surround the Arctic Ocean— Russia, Canada, the United States, Denmark, and Norway—have in recent years taken various measures to protect their economic and security interests in the north. The measures include not only the adoption of Arctic strategies, but also the development of new military capabilities. As in other parts of



the world, one state's military efforts to enhance its security may have the unfortunate effect of making others feel less secure, and therefore more likely to undertake similar efforts. Thus, despite being a low-tension region, the Arctic is by no means immune to the logic of the security dilemma.

Citation: Åtland, K., (2014) Interstate Relations in the Arctic: An Emerging Security Dilemma? *Comparative Strategy*, 33:2, 145-166, <https://doi.org/10.1080/01495933.2014.897121>

Crises and international cooperation: An Arctic case study

Abstract: This article contributes the insight that during an international crisis, a pre-existing state of complex interdependence can help to preserve cooperation. It derives the insight from a case study on the International Relations of the Arctic before and after the 2014 Russian annexation of Crimea. The case study is examined through the lens of Robert Keohane and Joseph Nye's concept of 'complex interdependence', as developed in their 1977 book *Power and Interdependence* – a concept which provides the analytical breadth necessary for a multifactorial situation of regional cooperation and conflict. It finds that Arctic international relations had achieved a state of complex interdependence by 2014, and that some important elements of interdependence then disappeared after the annexation of Crimea. But while most military and economic cooperation between Russia and Western states was suspended, many aspects of regional cooperation continued, including on search and rescue, fisheries, continental shelves, navigation and in the Arctic Council. The question is, why has Arctic cooperation continued in some issue areas while breaking down in others? Why have Russian–Western relations in that region been insulated, to some degree, from developments elsewhere? The concept of complex interdependence provides some answers.

Citation: Byers, M., (2017) Crises and international cooperation: An Arctic case study. *International Relations*, Volume 31, Issue 4. <https://doi.org/10.1177/0047117817735680>

Arctic Council and Strategic Implications

Debates over the Role of the Arctic Council

Abstract: This article examines the role(s) that the member governments want the Arctic Council to have in Arctic Ocean affairs. The article identifies and examines three determining debates over the role and future of the Arctic Council: The first preceded the Arctic Council's creation in 1996, the second occurred during and as a result of the Ilulissat meeting in 2008, and the third followed the political shift in the United States in 2009.

Citation: Pedersen, T. (2012) Debates over the Role of the Arctic Council, *Ocean Development & International Law*, 43:2, 146-156, DOI: 10.1080/00908320.2012.672289

Soft Securitization: Unconventional Security Issues and the Arctic Council

Abstract: The Arctic Council is the principal institution for Arctic regional governance, and it is involved in numerous activities in the Arctic region. Although its mandate explicitly



excludes matters related to military security, some scholars have argued that the Council nonetheless contributes to Arctic security governance through its coordinating and policy-shaping role on a variety of topics essential for the interests of states and human wellbeing in the region (Charron 2012; Chater 2014; Chater and Greaves 2014; Greaves 2013; Wilson 2016). In this sense, the Arctic Council can be viewed as an unconventional security actor that contributes to framing different policy areas in 'security' terms. However, there has been limited empirical analysis of which issues the Arctic Council frames as security-relevant through its declarations and other official outputs, and what the specific security implications of those issues are understood to be. This article contributes to understanding the Arctic Council's role as a security actor in the context of a rapidly changing circumpolar region and provides a starting point for assessing securitizing moves by a regional international governmental organization. As such, it asks: Does the Arctic Council use security language to depict particular issues as relevant to Arctic security? How does the Arctic Council understand the 'security-ness' of those issues? Methodologically, the article undertakes textual analysis of the Council's publicly available online documents, including multilateral agreements and declarations, policy papers, working group reports, public statements, and other related sources. It examines the Council's use of security language to assess whether such rhetoric is mobilized to identify specific threat-referent relationships or whether such rhetoric is mobilized in an 'adjectival' sense that does not construct particular issues as existentially threatening.

Citation: Greaves, W., Pomerants, D. (2017) Soft Securitization: Unconventional Security Issues and the Arctic Council. The Arctic Institute. Politik. Retrieved from: <https://www.thearcticinstitute.org/soft-securitization-unconventional-security-issues-arctic-council/>

The politics of Arctic international cooperation: Introducing a dataset on stakeholder participation in Arctic Council meetings, 1998–2015.

Abstract: Contemporary Arctic transformations and their global causes and consequences have put international cooperation in the Arctic Council, the region's most important forum for addressing Arctic affairs, at the forefront of research in Northern governance. With interest in Arctic regional affairs in world politics being at a historical high, the actual participation and contribution by interested actors to regional governance arrangements, such as the Arctic Council, has remained a blind spot very much. This article introduces and analyses a novel dataset on stakeholder participation in the Arctic Council (STAPAC) for all member states, Permanent Participants and observers in Ministerial, Senior Arctic Officials' and subsidiary body meetings between 1998 and 2015. The article finds that participation in the Arctic Council varies significantly across meeting levels and type of actors, and that new admissions to the Council, a source of major contestation in recent debates, do not necessarily result in more actors attending. The article further discusses these findings in light of three prevalent debates in Arctic governance research and shows the empirical relevance of the STAPAC dataset for the study of Arctic cooperation and conflict, observer involvement in the Arctic Council system and political representation of indigenous Permanent Participants.



Citation: Knecht, S. (2016) The politics of Arctic international cooperation: Introducing a dataset on stakeholder participation in Arctic Council meetings, 1998–2015. *Cooperation and Conflict*, Volume: 52 issue: 2, page(s): 203-223.

<https://doi.org/10.1177/0010836716652431>

The Arctic Five Versus the Arctic Council

Introduction: As climate change opens the Arctic to human activity and the region steadily captures more international attention, a rich tapestry of Arctic international governance mechanisms has formed and propagated. From the sub-regional to the pan-Arctic, numerous forums now exist where Arctic and non-Arctic states and other entities interact to address the issues facing the roof of the world, but “[t]he Arctic Council has emerged as perhaps the most important of these.”

In recent years, however, another regional body has appeared on the scene: the Arctic Five. Many opine that this loose union of the five Arctic littoral states, that excludes other Arctic states and native organizations, is usurping the Arctic Council’s central position in northern governance. The Arctic Five, through its compression of regional decision making, is also charged with undermining the spirit of cooperation that the Council has helped unfurl across Arctic international relations.

The aforementioned view is widespread, and certainly possesses a degree of truth. But the relationship that has developed and that could develop between the Arctic Five and Arctic Council is more nuanced than popularly put forth. As such, this Briefing Note aims to elaborate on how these two regional associations actually and potentially interact, both negatively and positively. While actions by the Arctic Five can detract from the work and regional position of the Arctic Council, the former is not the harbinger of the latter’s demise. Furthermore, these two groups can even complement one another to positively address Arctic issues.

Citation: Kuersten, A. (2016) The Arctic Five Versus the Arctic Council. *Arctic Yearbook* 2016. Retrieved from:

https://arcticyearbook.com/images/yearbook/2016/Briefing_Notes/9.Kuersten.pdf

Explaining Non-Arctic States in the Arctic Council

Abstract: How has the role of observers in the Arctic Council evolved and why is there increased interest in participation by states and international institutions? This article examines the influence and interest of observers in international institutions. The Arctic Council is an international institution founded in 1996 to promote Arctic environmental protection and sustainable development. Ultimately, observers are weak actors in the Council. Despite this weakness, actors seek to become observers for two reasons. First, actors seek to contribute to the governance of environmental issues of global importance. Second, actors strive to gain as states develop the economic potential of the Arctic region.



Citation: Chater, A. (2016) Explaining Non-Arctic States in the Arctic Council, Strategic Analysis, 40:3, 173-184, DOI: 10.1080/09700161.2016.1165467

People's Republic of China and Russian Federation Relations within an Arctic Context

Arctic Matters: Sino-Russian Dynamics

Introduction: As the Arctic ice recedes, interest in resource extraction and promising trade routes increases. Two actors in particular will have a strong impact on the region: China and Russia. Both are bound by an intricate dynamic of cooperation and competition, particularly in the energy sphere. As their interests do not always overlap, tensions and asymmetries between them may increase.

Citation: Shagina, M., Zogg, B. (2019) Arctic Matters: Sino-Russian Dynamics. CSS ETH Zurich, CSS Analyses in Security Policy, No. 270, September 2020.
<https://doi.org/10.3929/ethz-b-000431770>

The Arctic Dimension in Sino-Russian Relations

Abstract: This chapter presents a new region of cooperation between China and Russia, that of the Arctic. The authors show how Russia has moved from initial reluctance towards Chinese engagement in the north, towards a policy of facilitating closer cooperation with China. As such, the development towards cooperation in Arctic also confirms the larger trend of closer relations between Moscow and Beijing. Russia has accepted China as an observer into the Arctic Council and has invited China in developing energy projects and the Northern Sea Route (NSR). The authors also note that China is aware of the strategic importance Russia attaches to the Arctic, and Beijing has reassured Moscow that it does not seek to challenge Russian interests in the region.

Citation: Hsiung C.W., Røseth T. (2019) The Arctic Dimension in Sino-Russian Relations. In: Sino-Russian Relations in the 21st Century. Palgrave Macmillan, Cham.
https://doi.org/10.1007/978-3-319-92516-5_8

People's Republic of China and NATO Member State Relations within an Arctic Context

Intensifying U.S.-China security dilemma dynamics play out in the Arctic: Implications for China's Arctic strategy

Introduction: The U.S., Russia and China are all assigning higher strategic priority to the Arctic and are strengthening their diplomatic and military presence and activities in the region. For the U.S. and Russia, it links up with the growing security tension in the surrounding regions, e.g., the North Atlantic Ocean and the Baltic Sea region. However, the deepening great power competition with China also increasingly drives Washington's diplomatic and military offensive in the region. For China, it is a question about ensuring access to Arctic sea routes and resources, e.g., energy, minerals and fisheries, and making sure that China gets a say in Arctic governance. The so-called "Arctic exceptionalism" – i.e., the Arctic as a low-tension region, where the great powers, despite conflicts in other regions, continue to cooperate and



refrain from political and military coercion to get their way – is under pressure. This article analyzes how Arctic politics and security are increasingly intertwined with global security developments that are dominated by intensifying U.S.-China security dilemma dynamics. It further discusses the implications for China's Arctic strategy pointing to how recent developments make it even more difficult for China as the only great power without Arctic territory to ensure its access to and influence in the region. Seen from the perspective of numerous Chinese Arctic scholars, this underlines the growing importance of strengthening China's economic and strategic cooperation with Russia in the region...

Citation: Sørensen, C. (2019) Intensifying U.S.-China security dilemma dynamics play out in the Arctic: Implications for China's Arctic strategy. Arctic Yearbook 2019. Retrieved from: https://arcticyearbook.com/images/yearbook/2019/Scholarly-Papers/21_AY2019_Sorensen.pdf

The Security Implications of China-Greenland Relations

Introduction: This article seeks to understand how China could affect the security of the region by focusing on its economic interest in the Arctic and its relations with Greenland. Sino-Greenlandic relations have deepened during the last few years. However, the goals pursued by the two parties are different. China's interest is purely economic, whereas Greenland's is political – namely, supporting its quest for independence. In this context, Denmark's point of view must also be scrutinized when analyzing the relations between Greenland and a major power like China, as Denmark remains sovereign over Greenland's foreign policy.

Citation: Dubois, K. Gagaridis, A. (2018). The Security Implications of China-Greenland Relations. Polar Research & Policy Initiative. Retrieved from: <http://polarconnection.org/security-china-greenland-relations/>

Arctic Indigenous Peoples: Concerns and Input

A Land Without Borders – Inuit Cultural Integrity

Introduction: Since first contact, Inuit of the Arctic circumpolar region have faced numerous impacts to their overall cultural security and integrity. Significantly, one area that has stifled their security is the imposition of artificial borders across Inuit Nunaat. The right to determine and freely travel where hunting may be most advantageous or to visit relations has been severely affected throughout Inuit Nunaat. Gone are the days of freedom to travel, to trade and to maintain other spiritual, cultural, political, economic, and social engagements throughout Inuit Nunaat. The nation-state notion of border security has threatened and undermined the cultural security of Inuit throughout their Arctic homeland and territory. This chapter introduces the issue in the context of the Inuit and argues that there is a need for coordination, coherence, and collaboration due to the numerous challenges faced by Arctic indigenous peoples whose territory and membership span international borders. It also emphasizes the need to ensure and uplift Inuit cultural security through law and policy changes that effectively guarantee the multiple, interrelated rights and interests of Inuit.



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There is an urgent need for local, regional, and national governments across the Arctic to provide coherence in this regard. Directly relevant is the need for UN member states to collaborate with indigenous peoples, based on rights affirmed by the United Nations Declaration on the Rights of Indigenous Peoples and other international human rights instruments, to overcome these challenges. Inuit have had a long-standing tradition of placing their footprints throughout the Arctic, travelling on both land and the ice paths that have allowed them to survive as a species within the Arctic. Today, Inuit are keen not only to maintain and develop contacts amongst blood relations, but also to remove barriers in order to develop in all realms of social, cultural, economic and spiritual dimensions. It is their view that, as a distinct people with a common culture and history, UN member states have a responsibility to take effective measures to implement this multidimensional right.

In addition to familial and direct blood relations, specific areas where these measures would apply include the interrelated dimensions of spiritual, social, and cultural customs, practices, and institutions. For instance, indigenous ceremonies, such as burials, have been hindered due to international borders. The continuing practices of indigenous economies must be accommodated, recognized, and respected: for A Land Without Borders – Inuit Cultural Integrity 69 example, the rights to use, possess and trade marine mammal byproducts are an important element of Arctic indigenous economic activities and include use of seal skin, walrus ivory and other byproducts. Another dimension includes the need for cross-border collective management and co-management of resources that present challenges for effective exercise of indigenous human rights, which fall within this sphere of concern, to indigenous peoples whose communities and territory transcend international borders.

Seemingly elementary issues to many have emerged as barriers for Inuit as well. For example, since 9/11, the need for passports and other government identification is often difficult for Inuit in remote, rural communities to comply with, due to lack of such government offices being present or within reach. In addition, the four respective countries of the Inuit – Russian Federation, United States, Canada, and Denmark/ Greenland – have distinct requirements that many Inuit are not cognizant of nor compliant with. For those in the Russian Federation and specifically Chukotka, regardless of the familial relations and direct cultural tie to the Siberian Yupik of St. Lawrence Island of Alaska, to apply for and gain a visa for international travel is onerous, costly and reflects a process where there is no guarantee that it will be responsive, timely or possible. Another distinct example is Canada's requirements for those from Kalaallit Nunaat to have Electronic Travel Authorization (eTA) to enter Canada. Inequitable treatment of indigenous peoples, in contrast to others that choose to emigrate between Canada and the USA, is objectionable as well.

Citation: Dorrough, D. (2019) A Land Without Borders – Inuit Cultural Integrity. Menezes, D.R, and Nicol, H.N. (eds.). 2019. The North American Arctic: Themes in Regional Security. London: UCL Press, pp. 67-86. DOI: <https://doi.org/10.14324/111.9781787356610>

The Inuit Future: Food Security, Economic Development, and U.S, Foreign Policy



Introduction: Global climate change, with its resulting loss of sea ice, has opened up access to the Arctic Ocean as never before. Moreover, the rate of global warming and pace of development are accelerating. Stakeholders have different ideas on how to handle these changes. Depending on one's perspective, the pace of development seems to be too fast or too slow; and like most contentious issues, the best solutions lie somewhere in the middle.

Citation: Stotts, J. (2013), The Inuit Future: Food Security, Economic Development, and U.S. Foreign Policy. Environmental Law Reporter, Volume 43, Issue 10.

<https://www.eli.org/sites/default/files/eli-pubs/elr-article-2.pdf>

Social impacts of climate change and resource development in the Arctic: Implications for Arctic governance

Abstract: This paper aims to explore the socio-political implications of climate change as the melting ice ignites new debates over territorial sovereignty of Arctic coastal states. Previously ice-jammed waterways are now open, and a number of recent geological surveys have identified new potential sites with vast energy resources. Competition over resources causes states to question each other's jurisdiction over specific parts of the Arctic. What used to be internal waters of one particular state can now be referred to as international waters by other actors interested in the benefits of resource extraction. Arctic indigenous groups, especially the Inuit, and Sami are directly affected by the current governance patterns that are fragmented across too many different bodies dealing with maritime navigation, tourism, fisheries and administration.

Citation: Arruda, G.M. and Krutkowski, S. (2017), "Social impacts of climate change and resource development in the Arctic: Implications for Arctic governance", Journal of Enterprising Communities: People and Places in the Global Economy, Vol. 11 No. 2, pp. 277-288. <https://doi.org/10.1108/JEC-08-2015-0040>

Inuit diplomacy in the circumpolar north

Abstract: This paper aims to explore the socio-political implications of climate change as the melting ice ignites new debates over territorial sovereignty of Arctic coastal states. Previously ice-jammed waterways are now open, and a number of recent geological surveys have identified new potential sites with vast energy resources. Competition over resources causes states to question each other's jurisdiction over specific parts of the Arctic. What used to be internal waters of one particular state can now be referred to as international waters by other actors interested in the benefits of resource extraction. Arctic indigenous groups, especially the Inuit, and Sami are directly affected by the current governance patterns that are fragmented across too many different bodies dealing with maritime navigation, tourism, fisheries and administration.

Citation: Wilson, G.N. (2007), Inuit diplomacy in the circumpolar north, Canadian Foreign Policy Journal, 13:3, 65-80, DOI: 10.1080/11926422.2007.9673443



Community Perspectives on the Environmental Impacts of Arctic Shipping: Case Studies from Russia, Norway, and Canada

Abstract: Communities across the Arctic are experiencing growth in transiting, destination and domestic ship traffic. Environmental impacts resulting from Arctic shipping have been well documented, but little is known about how these impacts affect livelihoods and adaptive capacity of the local communities that are reliant on their natural landscapes. Given the heterogeneity of the Arctic, this study applied a community-based approach to empirically assess the impacts of shipping on the environment. Interviews were conducted in three island communities: Solovetsky in Russia (n = 24), Longyearbyen on Svalbard, Norway (n = 22) and Cambridge Bay, Canadian Arctic (n = 24). Despite differences in the trends of shipping activities that occur in each of the case study communities, there was consensus regarding significant environmental impacts from ship traffic on the natural environment, and that these in turn present a great concern for community livelihoods. The concerns differ greatly among the three communities and depended on the local context and perceptions and use of the natural environment. We conclude that the natural environment represents a salient determinant of adaptive capacity in the context of growing ship traffic across the Arctic. Moreover, this context-dependent determinant varies in the way it is perceived across case communities.

Citation: Olsen, J., Carter, N.A., Dawson, J. (2019) Community perspectives on the environmental impacts of Arctic shipping: Case studies from Russia, Norway and Canada. *Cogent Social Sciences*, 5: 1609189, <https://doi.org/10.1080/23311886.2019.1609189>

Understanding and Adapting to Observed Changes in the Alaskan Arctic: Actionable Knowledge Co-production with Alaska Native Communities

Abstract: Global changes in climate, connectivity, and commerce are having profound impacts on the Arctic environment and inhabitants. There is widespread recognition of the value of incorporating different worldviews and perspectives when seeking to understand the consequences of these impacts. In turn, attention to local needs, perspectives, and cultures is seen as essential for fostering effective adaptation planning, or more broadly, the resilience of local peoples. The emerging literature on “knowledge co-production” identifies factors that can help incorporate such local needs and information. This field focuses on how different models of what has been termed the “science-policy interface” can incorporate multiple epistemologies. Such an approach goes beyond observing or assessing change from different scales and perspectives, to defining conditions that support the co-production of actionable knowledge. This approach requires the development of response tools that can accommodate the dynamic relationships among people, wildlife, and habitats that straddle cultures, timescales, and sometimes, national boundaries. We use lessons from seven Alaskan cases studies to describe a typology of five elements important for the co-production of locally relevant actionable knowledge. Three elements are consistent with earlier work, including 1) evolving communities of practice, 2) iterative processes for defining problems and solutions, and 3) presence of boundary organizations, such as a government agency, university, or co-management council. Our results for the Alaskan Arctic also emphasize the



critical need to incorporate 4) the consistent provision of sufficient funds and labor that may transcend any one specific project goal or funding cycle, and 5) long temporal scales (sometimes decades) for achieving the co-production of actionable knowledge. Our results have direct relevance to understanding the mechanisms that might foster greater success in more formalized co-management regimes.

Citation: Robards, M.D., Huntington, H.P., Druckenmiller, M., Lefevre, J., Moses, S.K., Stevenson, Z., Watson, A., Williams, M., 2018. Understanding and adapting to observed changes in the Alaskan Arctic: Actionable knowledge co-production with Alaska Native communities. *Deep. Res. Part II: Topical Studies in Oceanography*. 152, 203–213.

<https://doi.org/10.1016/j.dsr2.2018.02.008>

Bering Strait Voices on Arctic Shipping Workshop Report

Summary: This report identifies the conclusions and covers the proceedings of the Bering Strait Voices on Arctic Shipping (BSVAS) workshop held by Kawerak, Inc. in 2014. The workshop involved a round table discussion between tribal leaders and municipal leaders, with participants discussing three topics: protection of natural resources, safety and security, and economic development and infrastructure. These themes were chosen because of their importance to the region and specifically to help Kawerak form a holistic long-term planning process on how to address the impacts of Arctic shipping in the Bering Strait region. Within each of the three focus areas, workshop participants were provided with two questions. The first question centered on the concept of primary concerns about impacts to the region's residents as a result of increased Arctic shipping. The second question asked participants to start thinking about solutions to address some of their concerns. Solutions could be in the form of policies, advocacy, projects, or programs.

Citation: Kawerak, Inc. 2015. Bering Strait Voices on Arctic Shipping Workshop Report. Kawerak Inc. Marine Program. <https://kawerak.org/wp-content/uploads/2018/04/MP-Bering-Strait-Voices-on-Arctic-Shipping-final-report.pdf>

International Governance and Regulation within the Arctic

Managing a contested region: The Arctic Council and the politics of Arctic governance

Summary: The article explores the tension between institutional integration and interstate bargaining in Arctic politics by focusing on the Arctic Council and on the role of Arctic and non-Arctic stakeholders. It argues that despite the growing influence of regionalism, intergovernmentalism continues to shape Arctic governance and to work against a “final” set of regional institutions or convergence. From the perspective of the eight Arctic states, the key problem has been to reconcile the desire to elevate the international standing and legitimacy of the Arctic Council by keeping its door open to non-regional actors with a determination to maintain their own privileged position. After adopting a postponement strategy at the 2011 Nuuk Ministerial Meetings, the Arctic Eight finally broke the deadlock by granting non-Arctic states, notably China, an observer status at the 2013 Kiruna Ministerial Meeting. Yet, the conclusion is that the Arctic Council has not been transformed into a body



of political authority or a policy-making instrument. The Arctic Eight have opened up space for regionalism; the Search and Rescue Agreement and Oil Spill Preparedness agreements were the result of Arctic Council initiatives. The case is made, however, that the political end products are likely to be agreements between states without institutional enforcement mechanisms.

Citation: Ingimundarson, V. (2014) Managing a contested region: The Arctic Council and the politics of Arctic governance, *The Polar Journal*, 4:1, 183-198, DOI: 10.1080/2154896X.2014.913918

Governmentality of the Arctic as an international region

Summary: Linked to the image of a wild and still-to-be-explored territory, as well as to images of the region as one of new economic opportunities, discourses on the Arctic also tie in with issues of climate change, cooperation and conflict, Arctic governance, international law and the situation and rights of indigenous people, as well as Great Power politics. Taken together, these aspects characterize a region whose formation is different from regionalization processes in other parts of the world. As the regional peculiarity of the Arctic is reflected by a variety and plurality of representations, discourses, perceptions and imaginaries, it can usefully be analyzed as a region of unfolding governmentality. The present article argues that the prospects for the Arctic are strongly intertwined with perceptions and depictions of it as an international region subject to emerging practices of governmentality. By drawing on both Foucault's texts and governmentality studies in international relations (IR), we discuss how the Arctic is affected by governmental security rationalities, by specific logics of political economy and order-building, as well as becoming a subject for biopolitical rationalizations and imaginaries. The discourses and practices of governmentality that permeate the Arctic contribute to its spatial, figurative and political reframing and are aimed at making it a governable region that can be addressed by, and accessible for, ordering rationalities and measures.

Citation: Albert, M., Vasilache, A. (2017) Governmentality of the Arctic as an international region, *Conflict and Cooperation*, Volume: 53 issue: 1, page(s): 3-22.

<https://doi.org/10.1177/0010836717703674>

Governance of Ice-covered Areas: Rule Construction in the Arctic Ocean

Summary: This article recounts the negotiations and emergence of Article 234 concerning ice-covered areas in the UN Convention on the Law of the Sea. As Arctic shipping increases, more vessels and flag states may be subject to the provisions of Article 234, which permit coastal states to both prescribe and enforce special measures to protect the marine environment in ice-covered areas. The history of the Article 234, disclosed partially through declassified U.S. government documents, provides context for implementation of the provision by Arctic coastal states and flag states.



Citation: Kraska, J. (2014) Governance of Ice-Covered Areas: Rule Construction in the Arctic Ocean, *Ocean Development & International Law*, 45:3, 260-271, DOI: 10.1080/00908320.2014.929462

Governance within the Circumpolar Transportation system

Implementing Marine Management in the Arctic Ocean

Summary: The Arctic region today faces serious geopolitical, socioeconomic, and environmental challenges. While one may hope for a decrease in geopolitical tensions, the socioeconomic and environmental problems are likely to grow more acute. The dramatic reduction in Arctic sea ice and the other profound changes brought on by a warming climate have already changed the Arctic Ocean in ways that we are only beginning to understand. While these changes are making the Arctic Ocean more accessible for a range of human activities, they are also disrupting marine ecosystems and threatening the well-being of Arctic residents whose lives and livelihoods depend on a healthy Arctic Ocean.

Despite these challenges—and in some sense because of them—the common interests of governments, Arctic residents, and other stakeholders in the effective management of increasing human activities in the Arctic Ocean remain very real. The time is ripe to imagine and articulate a vision for a stronger architecture for advancing these common interests, in both the short-to-medium and longer terms, in hopes that policymakers will find the necessary political space in which to move forward on these matters.

This article briefly reviews current efforts to improve Arctic marine management and offers several suggestions for building a stronger architecture to implement needed measures.

Citation: Balton, D., Zagorski, A., 2020. Implementing Marine Management in the Arctic Ocean, Wilson Center Polar Institute & Russian International Affairs Council, https://doi.org/10.1007/978-3-030-44975-9_12

Shipping in Polar Waters: Adoption of an International Code of Safety for Ships Operating in Polar Waters (Polar Code)

Summary: The Polar Code is intended to cover the full range of shipping-related matters relevant to navigation in waters surrounding the two poles – ship design, construction and equipment; operational and training concerns; search and rescue; and, equally important, the protection of the unique environment and eco-systems of the polar regions.

The Code will require ships intending to operating in the defined waters of the Antarctic and Arctic to apply for a Polar Ship Certificate, which would classify the vessel as Category A ship - ships designed for operation in polar waters at least in medium first-year ice, which may include old ice inclusions; Category B ship - a ship not included in category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions; or Category C ship - a ship designed to operate in open water or in ice conditions less severe than those included in Categories A and B.



The issuance of a certificate would require an assessment, taking into account the anticipated range of operating conditions and hazards the ship may encounter in the polar waters. The assessment would include information on identified operational limitations and plans or procedures or additional safety equipment necessary to mitigate incidents with potential safety or environmental consequences.

Ships need to carry a Polar Water Operational Manual, to provide the Owner, Operator, Master and crew with sufficient information regarding the ship's operational capabilities and limitations in order to support their decision-making process.

The chapters in the Code each set out goals and functional requirements, to include those covering ship structure; stability and subdivision; watertight and weathertight integrity; machinery installations; operational safety; fire safety/protection; life-saving appliances and arrangements; safety of navigation; communications; voyage planning; manning and training; prevention of oil pollution; prevention of pollution from noxious liquid substances from ships; prevention of pollution by sewage from ships; and prevention of pollution by discharge of garbage from ships.

Citation: International Maritime Organization (IMO). Shipping in Polar Waters: Adoption of an International Code of Safety for Ships Operating in Polar Waters (Polar Code), Retrieved from: <https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/POLAR%20OCODE%20TEXT%20AS%20ADOPTED.pdf>. Summary Retrieved from: <https://www.imo.org/en/MediaCentre/HotTopics/Pages/polar-default.aspx>.

The IMO Regulatory Framework for Arctic Shipping: Risk Perspectives and Goal-Based Pathways

Abstract: The International Maritime Organization (IMO), in its capacity as a specialized agency of the United Nations, is the global regulator to ensure safety, security, environmental standards, efficiency and sustainability of international shipping. The current regulatory framework of IMO, which is developed and maintained on a continuous basis, includes over 50 international instruments and numerous codes, guidelines and circulars that cover every aspect of international shipping ranging from design, construction, equipment, manning and operation to ship recycling. The safety net of the universally adopted IMO regulations currently covers approximately 1.5 million seafarers and more than 60,000 ships. With declining ice cover leading to an increasing spiral of traffic despite the many hazards, safety of shipping in polar waters and, in particular, the Arctic and its fragile environment is a current focus area of IMO and purported to be addressed by the Organization through a set of goal-based regulatory standards. This chapter provides an overview of the IMO framework and process of shipping regulation and maps the transition from prescriptive to goal-based approach. Risk-based approaches to safety are discussed in the context of the Canadian Arctic. The chapter further reviews the IMO instruments relevant to the Arctic, including the Polar Code, and discusses the approaches to implementation at the flag state, coastal state and regional level, lending new insights and future pathways on tiered implementation of the IMO goal-based framework.



Citation: Hebbar, A. A., Schröder-Hinrichs, J.U., Mejia, M.Q., Deggim, H. Pristrom, S., 2020. The IMO Regulatory Framework for Arctic Shipping: Risk Perspectives and Goal-Based Pathways. Governance of Arctic Shipping, Springer Polar Sciences, https://doi.org/10.1007/978-3-030-44975-9_12

Governance within the U.S. Arctic Maritime EEZ

Port Access Route Study in the Chukchi Sea, Bering Strait, and Bering Sea

Summary: The United States Coast Guard's (USCG) Seventeenth Coast Guard District conducted a Port Access Route Study (PARS) of the Bering Sea, Bering Strait and Chukchi Sea to evaluate the applicability and the need for creation of new vessel routing measures. The overarching goal of the Port Access Route Study is to determine if ship routing measures can help reduce the risk of marine casualties and their impact on the environment, increase the efficiency and predictability of vessel traffic, and preserve the paramount right of navigation while continuing to allow for other reasonable waterway uses.

Citation: Seventeenth Coast Guard District. (2016). Port Access Route Study: In the Chukchi Sea, Bering Strait, and Bering Sea, Preliminary Findings. Docket Number USCG-2014-0941 and USCG-2010-0833. Retrieved from: <https://www.regulations.gov/document?D=USCG-2014-0941-0040>

Routing Measures and Mandatory Ship Reporting Systems: Establishing of Two-way Routes and Precautionary Areas in the Bering Sea and Bering Strait

Summary: This document is a proposal by the United States and the Russian Federation to establish six two-way routes and six precautionary areas in the Bering Sea and Bering Strait off the coast of Chukotskiy Peninsula and Alaska. These waters are expected to see increased traffic due to rising economic activity in the Arctic. Use of the proposed routes is intended to be voluntary for all ships of 400 gross tonnage and above.

Citation: Sub-Committee on Navigation, Communications, and Search and Rescue, 2017. Routing Measures and Mandatory Ship reporting Systems: Establishment of Two-way Routes and Precautionary Areas in the Being Strait. International Maritime Organization, Sub-Committee on Navigation, Communications, and Search and Rescue, 5th Session Agenda Item 3. Retrieved from https://www.navcen.uscg.gov/pdf/IMO/NCSR_5_3_7.pdf.

Arctic Maritime Traffic and Shipping Routes

A Quantitative Assessment of Arctic Shipping in 2010-2014

Abstract: Rapid loss of sea ice is opening up the Arctic Ocean to shipping, a practice that is forecasted to increase rapidly by 2050 when many models predict that the Arctic Ocean will largely be free of ice toward the end of summer. These forecasts carry considerable uncertainty because Arctic shipping was previously considered too sparse to allow for adequate validation. Here, we provide quantitative evidence that the extent of Arctic shipping in the period 2011–2014 is already significant and that it is concentrated (i) in the



Norwegian and Barents Seas, and (ii) predominantly accessed via the Northeast and Northwest Passages. Thick ice along the forecasted direct trans-Arctic route was still present in 2014, preventing transit. Although Arctic shipping remains constrained by the extent of ice coverage, during every September, this coverage is at a minimum, allowing the highest levels of shipping activity. Access to Arctic resources, particularly fisheries, is the most important driver of Arctic shipping thus far.

Citation: Eguiluz, V. Fernandez-Gracia, J., Irigoien X. Duarte, C., 2016. A Quantitative Assessment of Arctic Shipping in 2010-2014. *Sci Rep* 6, 30682 (2016).

<https://doi.org/10.1038/srep30682>

A Ten-Year Projection of Maritime Activity for the U.S. Arctic Region, 2020-2030

Summary: This report, This Report by the U.S. Committee on the Marine Transportation System (CMTS) is an update to the 2015 CMTS report of the same name (2015 Report). It provides a detailed account of past and present vessel activity patterns in the northern U.S. Arctic and surrounding waters around the Bering Strait. The 2019 report also projects how many additional vessels might be expected in the region over the next decade, out to 2030 through four scenarios.

The four scenarios included in this study are the Reduced Activity Scenario, Most Plausible Scenario, Optimized Growth Scenario, and Accelerated, but Unlikely Scenario. Each provides a different possibility for vessel activity in the northern U.S. Arctic and surrounding waters over the next decade, ranging from annual growth rates of 0.3% to 4.9% and total annual vessel counts of 284 ships to 535 vessels. Of the four scenarios generated, the Most Plausible Scenario best agrees with mathematical projections from available historic data for the region. The Most Plausible Scenario, based on conservative assumptions, indicates that the number of vessels operating in the U.S. Arctic in 2030 is likely to be more than triple the number of vessels in 2008, while the highest estimates included in the Accelerated, but Unlikely Scenario reflect growth more than four times the 2008 numbers and twice the number we see today. The total transits and movements into, out of, and within the U.S. Arctic will likely more than double the vessel numbers, underscoring the urgency to take on planning and evaluation exercises to be prepared for a changing Arctic maritime environment.

Citation: U.S. Committee on the Marine Transportation System (2019). A Ten-Year Projection of Maritime Activity in the U.S. Arctic Region, 2020–2030. Washington, D.C., 118 p.

Retrieved from

https://www.cmts.gov/downloads/CMTS_2019_Arctic_Vessel_Projection_Report.pdf

Arctic Marine Shipping Assessment 2009 Report

Executive Summary: The Arctic is undergoing extraordinary transformations early in the 21st century. Natural resource development, governance challenges, climate change and marine infrastructure issues are influencing current and future marine uses of the Arctic. The Arctic Council, recognizing these critical changes and issues, at the November 2004 Ministerial



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meeting in Reykjavik, Iceland, called for the Council's Protection of the Arctic Marine Environment (PAME) working group to "conduct a comprehensive Arctic marine shipping assessment as outlined under the Arctic Marine Strategic Plan (AMSP) under the guidance of Canada, Finland and the United States as lead countries and in collaboration with the Emergency Prevention, Preparedness and Response (EPPR) working group and the Permanent Participants as relevant." The Arctic Marine Shipping Assessment, or The AMSA 2009 Report, is the product of that Arctic Ministerial decision in Reykjavik and was approved at the 2009 Ministerial meeting in Tromsø.

The decision to conduct the AMSA followed the release in 2004 of two relevant Arctic Council reports. First, the Arctic Climate Impact Assessment (ACIA) was a major study that received global attention and reported on the rapid and severe climate change ongoing in the Arctic. One of the key findings of the ACIA was that "reduced sea ice is very likely to increase marine transport and access to resources." The second report, the Arctic Marine Strategic Plan (AMSP), presented the council's strategic goals for protecting the Arctic marine environment. The AMSP called for future application of an ecosystems approach to the Arctic Ocean and for a comprehensive assessment of Arctic marine shipping.

The AMSA is designed to be circumpolar in breadth and also to consider regional and local perspectives. The assessment's central focus is on ships: their uses of the Arctic Ocean, their potential impacts on humans and the Arctic marine environment and their marine infrastructure requirements. The AMSA does not place a primary focus on determining the operational and economic viabilities of specific marine routes within and across the Arctic Ocean.

All ship types are considered in the AMSA under the general topic of Arctic shipping: tankers, bulk carriers, offshore supply vessels, passenger ships, tug/barge combinations, fishing vessels, ferries, research vessels and government and commercial icebreakers. The result of the AMSA data survey effort produced a comprehensive estimate of how many ships (less naval vessels) operated in the Arctic for a given year. This survey represents an historic capture of information from the Arctic states that can be used as a long-term database against which to measure future Arctic marine traffic levels. In addition, more than 185 experts participated directly in the work of the AMSA. Thirteen major AMSA workshops were held from July 2006 through October 2008 on a broad range of relevant topics, including scenarios of future Arctic navigation, indigenous marine use, Arctic marine incidents, environmental impacts, marine infrastructure, Arctic marine technology and the future of the Northern Sea Route and adjacent seas. The AMSA workshops provided extensive information for developing the report sections.

Citation: Arctic Marine Shipping Assessment 2009 Report. Arctic Council, April 2009, second printing. <https://pame.is/projects/arctic-marine-shipping/amsa>

Economic and Resource Development Considerations

Identification of Development Areas in a Warming Arctic with Respect to Natural Resources, Transportation, Protected Areas, and Geography



Arctic SLS...advancing strategic discourse on the High North

Abstract: The starting point of the analysis in hand is a brief discussion of the so-called ‘Arctic Passages.’ Considering that ice and ice-pacts will remain a concern in the future, the support of icebreakers will still be needed to facilitate the safe passage of ships. Describing the state of these types of vessels currently available is the main aim, with a particular focus on key state players: the Russian Federation (RF), the United States of America (USA) and Canada. Additionally, a critical evaluation of future plans in relation to the introduction of icebreakers into service is taking place. Russia has already built and operates a certain number of vessels that are fully capable to handle current traffic demands, as well as the expected future increase. On the opposite direction, both Canada and USA are facing problems to deal with current demands and the situation during the next couple of years looks rather troublesome. Their obvious lack of icebreaking capabilities is somewhat disconcerting given the expected demand in the Arctic region in coming years coupled with the lengthy acquisition and production process required for a new icebreaking fleet. An acceleration of their acquisition plans and activities to cover the identified gap in icebreakers’ services is clearly a high priority.

Citation: Eliasson, K., Ulfarsson, G. F., Valsson, T., & Gardarsson, S. M. (2017). Identification of development areas in a warming Arctic with respect to natural resources, transportation, protected areas, and geography. *Futures*, 85, 14–29.
<https://doi.org/10.1016/j.futures.2016.11.005>

Challenges and Opportunities of Oil and Gas Investment in the Arctic

Abstract: With a rapidly changing climate, Arctic nations are now adjusting their policies to meet the more navigable and less hostile Arctic. Estimations indicate that the Arctic could hold 30% of the world’s undiscovered gas, 13% of the world’s undiscovered oil, and 44 billion barrels of natural gas liquids.

In this sense, the aim of this Capstone project is to illustrate the opportunities and challenges related to future Arctic oil and gas development. In particular, the group has chosen to focus on offshore oil and gas given that this is the main focus of future exploratory activity. Although Arctic drilling is not commercially viable at this time and is not expected to be in the near future, a careful analysis of its expected costs and benefits remains relevant, since Shell and other industry leaders have continued their activity in the region. Taking a long-term view, the project outlines the key motivations for oil and gas development, focusing on geopolitical tensions; the interests of the three most important Arctic states, i.e., Russia, the U.S. and Canada; environmental challenges; shipping; technology; infrastructure; and tax regimes and investment activities. We look each of these aspects in turn, using the different Arctic countries as our unit of analysis where appropriate.

Citation: Alegre, M., Donzelli, G., Farhat, A., Hansen, H., Horwich, K., Li, Y., Tuozzolo, M., Zhou Q. (2015) Challenges and Opportunities of Oil and Gas Investment in the Arctic. Capstone Project, Columbia University, School of International and Public Affairs. Retrieved from: https://sipa.columbia.edu/file/6033/download?token=8VlCh_DS



Fisheries within the U.S. Arctic EEZ

Alaska's Commercial Fisheries

Abstract: Commercial fisheries of Alaska fall under a mix of state and federal management jurisdictions. In general, the state has management authority for all salmon, herring, and shellfish fisheries, whereas the federal government has management authority for the majority of ground fish fisheries, excepting those within 3 nautical miles of shore and a few others. The first major commercial fisheries targeted salmon and herring in the late 1800s when much of the product was slated for storing and shipment. Today, commercial salmon and herring fisheries occur along most of Alaska's coastline north to the southern Chukchi Sea, with annual harvests averaging 750 million lbs. and 80 million lbs. of salmon and herring, respectively, in the 5-year period 1998–2002. Commercial shellfish fisheries target a diverse assemblage, including 7 crab species, 5 shrimp species, scallops, at least 3 clam species, and several "miscellaneous" invertebrates, including sea urchins and sea cucumbers. Crab harvests have fluctuated widely during their history. Peak years have seen as much as 400 million lbs. harvested, with a recent 5-year average of 137 million lb. Commercial shrimp harvests reached peak levels of over 120 million lbs. in the 1970s and declined following a climate induced regime shift to average harvests of slightly over 2.2 million pounds in the 5-year period 1998–2002. Ground fish fisheries for a variety of species dominate the harvest poundage, with nearly 4.2 billion lbs. harvested on average in the 5-year period 1998–2002. The majority of that total, about 2.9 billion lbs. was walleye Pollock (*Theragra chalcogramma*), 555 million lbs. were Pacific cod (*Gadus macrocephalus*), and 483 million lbs. were various flatfish.

Citation: Woodby, D., Carlile, D., Siddeek, S., Funk, F., Clark, J. H., & Hulbert, L. (2005). Commercial fisheries of Alaska. *Special publication*, 59. Retrieved from: <http://www.adfg.alaska.gov/FedAidpdfs/Sp05-09.pdf>

Marine Mining: Governance and Related Issues

A Review of Some Environmental Issues Affecting Marine Mining

Abstract: This article reviews information recently available from existing marine and coastal mining for responses to environmental issues affecting marine mining at different depths. It is particularly but not exclusively concerned with those issues affecting seabed biodiversity impact and recovery. Much information has been gathered in the past 10 years from shallow mining operations for construction aggregate, diamonds, and gold, from coastal mines discharging tailings to shallow and deep water, and from experimental deep mining tests. The responses to issues identified are summarized in a series of eight tables intended to facilitate site-specific consideration. Since impacts can spread widely in the surface mixing layer SML, and can affect the biologically productive euphotic zone, the main issues considered arise from the depth of mining relative to the SML of the sea. Where mining is below the SML, the issue is whether it is environmentally better to bring the extraction products to the surface vessel for processing (and waste discharge), or to process the extraction products as much as possible on the seabed. Responses to the issues need to be



site-specific, and dependent on adequate preoperational environmental impact and recovery prediction. For deep tailings disposal from a surface vessel, there are four important environmental unknowns: (1) the possible growth of “marine snow” (bacterial flocs) utilizing the enormous quantities of fine tailings particles (hundreds or thousands of metric tons per day) as nuclei for growth, (2) the possibility that local keystone plankton and nekton species may migrate diurnally down to and beyond the depth of deep discharge and hence be subjected to tailings impact at depth, (3) the burrow-up capability of deep benthos and their ability to survive high rates of tailings deposition, and (4) the pattern and rate of dispersion of a tailings density current through the deep water column from discharge point to seabed. Actions to obtain relevant information in general and site-specifically are suggested.

Citation: Ellis, D.V. (2001) A Review of Some Environmental Issues Affecting Marine Mining. *Marine Georesources & Geotechnology*. 19:1, 51-63, DOI: 10.1080/10641190109353804

Precautionary management of deep-sea mining

Abstract: Interest in deep-sea mining developed in the early 1970s, with a focus on manganese nodules in international waters. Mining may actually occur first, however, on rich polymetallic sulfide deposits associated with hydrothermal vents within exclusive economic zones. Even though mining for polymetallic sulfides may not take place for several years, precautionary performance standards, environmental regulations, and the establishment of Marine Protected Areas may help guide the marine mining industry toward a goal of minimizing environmental impacts. Once substantial investments in prospecting and exploring a potential mining site are made, implementation of environmental regulations may prove to be much more difficult.

Citation: Halfar, J. Fujita, R.M. (2002) Precautionary management of deep-sea mining, *Marine Policy*, Volume 26, Issue 2, 2002. Pages 103-106 DOI: 10.1080/10641190109353804

Defining “serious harm” to the marine environment in the context of deep-seabed mining

Abstract: Increasing interest in deep-seabed mining has raised many questions surrounding its potential environmental impacts and how to assess the impacts’ significance. Under the United Nations Convention on the Law of the Sea (UNCLOS), the International Seabed Authority (ISA) is charged with ensuring effective protection of the marine environment as part of its responsibilities for managing mining in seabed areas beyond national jurisdiction (the Area) on behalf of humankind. This paper examines the international legal context for protection of the marine environment and defining the significant adverse change that can cause “serious harm”, a term used in the ISA Mining Code to indicate a level of harm that strong actions must be taken to avoid. It examines the thresholds and indicators that can reflect significant adverse change and considers the specific vulnerability of the four ecosystems associated with the minerals targeted for mining: (1) manganese (polymetallic) nodules, (2) seafloor massive (polymetallic) sulphides, (3) cobalt-rich (polymetallic) crusts and (4) phosphorites. The distributions and ecological setting, probable mining approaches and the potential environmental impacts of mining are examined for abyssal polymetallic



nodule provinces, hydrothermal vents, seamounts and phosphorite-rich continental margins. Discussion focuses on the special features of the marine environment that affect the significance of the predicted environmental impacts and suggests actions that will advance understanding of these impacts.

Citation: Levin, L.A. et Al. (2016) Defining “serious harm” to the marine environment in the context of deep-seabed mining. *Marine Policy*, Volume 74, Pages 245-259.
<https://doi.org/10.1016/j.marpol.2016.09.032>.

Incident Response, Logistics, and Command and Control

Informal Disaster Governance in the Arctic

Introduction (*abbreviated*): Imagery of climate change disproportionately affecting the Arctic has become a common theme in world media and scholarship. The world has realized that ‘what happens in the Arctic doesn’t stay in the Arctic’, as the astonishing volume of publications with this precise title demonstrates. However, rarely do these accounts consider the Arctic beyond the tragic storyline of an empty, pristine, and static landscape disappearing, all the while threatening to affect the entire world’s climate. Put differently, Arctic communities and the disaster-related challenges they face do not take center stage in these debates. Yet, disasters and disaster risks have always been abundant throughout the Arctic, and the region’s communities face tremendous disaster risk reduction and response (DRR/R) challenges in their own backyards. These range from earthquakes, avalanches, landslides, floods, and meteorites to climate change-related disasters including sea level rise, systemic environmental consequences or fears over melting permafrost unleashing past diseases hidden in the ice and leading to global pandemics. At the same time, climatic changes have resulted in a more accessible Arctic and increased realization of economic opportunities across various realms including mining, fishing, tourism, research, or maritime/air traffic. Subsequently, more people and infrastructure are potentially at risk of being affected by the region’s disaster potential, adding to the already significant pressures on Arctic communities to mitigate risks and adapt to their changing environment.

To meet this new reality, Arctic populations actively invest in the region’s DRR/R capabilities and resources including expanding search and rescue (SAR) capabilities, research activities and technological innovations. Notably, in recognizing the Arctic’s challenging environment and disasters’ often transboundary and cross-border nature, Arctic nations have identified DRR/R as an issue that requires international cooperation and have created strong collaborative governance mechanisms to address the associated challenges. Examples include the Arctic Council and its climate change- and disaster-related working groups, diverse bi- and multilateral SAR agreements, coast guard collaboration and joint preparedness exercises. Thus, conforming with DRR/R experts’ recommendations, Arctic



populations emphasize the importance of cooperation for DRR/R and, arguably, have gone beyond what the field of DRR/R has achieved in many other corners of the globe.

Nonetheless, it is questionable whether such high-level formal disaster governance (FDG) can effectively address communities' DRR/R needs. Contemporary FDG efforts are critiqued for their reliance on bureaucratic institutional frameworks conceived during and for the industrial era, as well as their often technocratic framing of disaster risks that ignores the underlying vulnerabilities that are key to disasters occurring in the first place. Thus, FDG is increasingly perceived as too rigid, slow, and narrow to properly reduce and respond to disasters.³ This is particularly true when collaborative cross-border DRR/R efforts are required which raise further questions of authority and responsibility. Instead, FDG is often insufficient, comes too late or may never be forthcoming, and when it does, it may ignore local realities to the extent that it may be irrelevant or even harmful.

The remainder of this chapter is structured as follows. The next section provides an overview of the specific Arctic disaster context. Section 15.3. discusses formal arrangements to deal with DRR/R, and why these face such significant challenges in doing so, both in the Arctic and equally worldwide. This section also discusses the necessary switch from the still-popular disaster management framework to one that emphasizes disaster governance (DG). In Section 15.4., this chapter focuses on the importance of informality in DRR/R, both in its own right and in its complementary role and relationship with formal DG. While informal disaster governance can be both positive and negative in nature and consequence, this chapter focuses predominantly on its positive aspects, while also outlining potentially negative repercussions. The last part of this chapter offers conclusions and suggests avenues for future research. The aim of this chapter and the concept of IDG is not to discredit formal disaster governance, but rather to bring observations about the existence and performance of IDG into systematic and comparative focus. To stay within the scope of this book, this chapter cannot offer a fully-fledged analysis of IDG. However, its reflections may serve as a starting point to encourage further discussion.

Citation: Duda, P.I. (2019) Informal Disaster Governance in the Arctic. Menezes, D.R, and Nicol, H.N. (eds.). 2019. *The North American Arctic: Themes in Regional Security*. London: UCL Press, pp. 289-309. DOI: <https://doi.org/10.14324/111.9781787356610>

Complex Network Modeling and Evolutionary Game Simulation of the Arctic Environmental Emergency Response and Governance

Abstract: Climate change provides opportunities in the surrounding areas of North Pole to commercial shipping activities, but which also poses risks to ship strikes, oil spills, chronic marine environmental pollution, etc. However, the public product supply of Arctic environmental emergency response and governance is seriously insufficient. As such, a collective and effective system should be established to protect the Arctic environment. In the present paper, a complex network model of Arctic environmental emergency response and governance system is developed. The strategy of each country in the complex network is demonstrated by evolutionary game simulations of this system model. Computational results



indicate that the benefit of environmental emergency response and governance affects the cooperation strategy of each country. Moreover, Long-term benefit and return intensity are the key parameters of environmental emergency response and governance benefit. These findings extend theoretical research in the sustainable development Arctic routes and provide reference for the participation of other countries beyond the Arctic Council.

Conclusion: This paper models the countries involving in Arctic environmental emergency response and governance as a complex network. Moreover, we simulate the evolutionary game of the public good of Arctic environmental emergency response and governance. The following conclusions can be drawn from simulation of the complex network.

- (1) We prove the complex network shows the characteristics of small world.
- (2) Long-term benefit and return intensity parameters are the key factors influencing the strategy of each country in the evolutionary game simulation of supplying the public good of Arctic environmental emergency response and governance.
- (3) The long-term benefit promotes cooperation. When the return intensity is high enough to make the environmental benefit larger than the long-term benefit, countries tend to withdraw.
- (4) Increasing the proportion of long-term benefit and forming binding agreements concerning Arctic environment governance may be helpful to enhance cooperation between countries.

Citation: Fan, H., Jiang, X., Li, C., Yuan, Z., 2018. Complex Network Modeling and Evolutionary Game Simulation of the Arctic Environmental Emergency Response and Governance. *Wirel. Pers. Commun.* 102, 951–961. <https://doi.org/10.1007/s11277-017-5118-y>

Joint-Task Force Management in Cross-Border Emergency Response. Managerial Roles and Structuring Mechanisms in High Complexity-High Volatility Environments

Abstract: In this paper we focus on managerial roles and structuring mechanisms within the crisis preparedness system. We elaborate on the challenges of crises management in complex and volatile environments. The coordination and control mechanisms are of importance to safeguard operations including joint operations including several preparedness institutions, especially in cross-border cooperation. We include examples from the maritime Arctic. This paper contributes to the crisis management literature emphasizing the relations between context, managerial roles and the organizational structuring mechanisms needed to facilitate the interplay between several emergency response actors.

Citation: Borch, O.J., Andreassen, N., 2015. Joint-task force management in cross-border emergency response. Managerial roles and structuring mechanisms in high complexity-high volatility environments. *Information, Commun. Environ. Mar. Navig. Saf. Sea Transp.* 217–224. <https://doi.org/10.1201/b18514>

[Arctic Domain Context Decision Making](#)

Evaluating Educational Needs in Maritime Emergency Management within the Arctic: The Case of Sweden



Abstract: Climate change and diminishing sea ice pave the way towards increased human activities in the wider Arctic region. However, these new opportunities for shipping, tourism, energy exploration and various other sectors also involve risks, with ship accidents and oil spills standing out. The status quo pressing problem concerns habitat degradation, and other negative impacts on the Arctic environment, as well as the implementation of stricter maritime preparedness and environmental regulations. Following the introduction of the International Maritime Organization's (IMO) International Code for Ships Operating in Polar Waters (Polar Code) and related amendments, it has become crucial for the Arctic States to emphasize on improving the prevention and crisis management regime pertaining to large maritime emergency incidents. The MARPART project on maritime preparedness and international partnership in the High North is an ongoing research project concerning Norway, Sweden, Denmark, Greenland, Iceland, and Russia. The principal objective is to map and highlight the challenges of large-scale emergencies in an Arctic context and recommend improvements in the preparedness and crisis management domains. One part of the project, MARPART-2 MAN, is focused on the development of competence needs coupled with gaps related to the competence of personnel at the on-scene tactical level, mission coordination at the operational level, and staff management at regional and national strategic level. To that end, a comparative study has been conducted among five countries that have operational experiences regarding large-scale incidents in extremely cold climate areas. The World Maritime University (WMU) has been responsible for the review of the Swedish emergency response capacities. The assessment concerns mapping current educational programs and training within Swedish emergency management in academic and professional training institutions with a special focus on the High North. The outcome identified important gaps between the demand side competence needs and the supply side within emergency management education. WMU, with its capacity-building focus, is playing a pivot role in the following areas: a) designing new educational activities, training, and exercises which aims to fill this gap, and b) developing concepts and tools for simulation for improving the crisis management of large maritime emergency actions.

Citation: Larsson, J., Drewniak, M., Dalaklis, D., Kitada, M., 2018. Evaluating Educational Needs in Maritime Emergency Management Within the Arctic: The Case of Sweden. INTED2018 Proc. 1, 2225–2232. <https://doi.org/10.21125/inted.2018.0417>

Operational risk issues and time-critical decision-making for sensitive logistics nodes.

In this chapter an approach which supports decision-making processes for time-critical situations in supply chain networks after the occurrence of serious disruptions is described. The focus lies on the development of a concept that enables organizations to maintain business, or at least rapidly recover after a disruption, so that the impact is reduced to a minimum. While most strategies and measures regarding supply chain risks are concerned with the prevention and mitigation of risks, the approach presented concentrates on how to handle the impacts of such risks. Therefore, the primary objective is to assure that business can rapidly be resumed after the occurrence of a potential crisis. For this purpose, the approach aims to (1) achieve transparency by developing and applying a reference model for sensitive logistics nodes, (2) identify potential risks and (3) support the decision-making



process by proposing pre-planned standard measures in the context of time-critical situations. Exemplarily, freight villages representing a specific type of sensitive logistics node, are used as a subject of investigation.

Citation: Breuer, C., Siestrup, G., Hans-Dietrick, H., 2012. Operational Risk Issues and Time-Critical Decision-Making for Sensitive Logistics Nodes. *Decis. Supply Chain Integr.* 1, 145–164. <https://doi.org/10.1007/978-1-4471-4033-7>

Conceptualizing cold disasters: Disaster risk governance at the arctic edge.

Abstract: Present literature on disasters predominantly focuses on warm, accessible and well-populated contexts. However, as human activities in Arctic and Antarctica become more common, cold contexts, and their special characteristics, become more relevant to study. In the present article, we explore in more depth the particular circumstances and characteristics of governing what we call 'cold disasters'. The article is structured in four overall parts. The first part, Cold Context, provides an overview of the specific conditions in a cold context, exemplified by the Arctic, and zooming in in Greenland to provide more specific background for the paper. The second part, Disasters in Cold Contexts, discusses 'cold disasters' in relation to disaster theory, in order to elucidate how cold disasters, challenge existing understandings of disasters, also it provides examples of emergency scenarios, in order to demonstrate the demanding dynamics of cold contexts. In the third part, Governing Cold Disasters, we discuss the main implications for the governance of 'cold disasters' in the Greenlandic context. Finally, we offer our conclusions.

Citation: Laut, K.C., Vendelø, M.T., Sørensen, B.R., Dahlberg, R., 2018. Conceptualizing cold disasters: Disaster risk governance at the Arctic edge. *Int. J. Disaster Risk Reduct.* 31, 1276–1282. <https://doi.org/10.1016/j.ijdr.2017.12.011>

Arctic and Western Alaska Area Contingency Plan

The Arctic and Western Alaska Area Contingency Plan (or AWA-ACP) is a tactical and operational instruction and guidance manual for responders and planners preparing a coordinated Federal, State, and local exercise and/or response to a discharge, or substantial threat of discharge of oil and/or release of a hazardous substance from a vessel or on/offshore facility operating within the area bounded by the Western Alaska Captain of the Port (COTP) Zone. The Western Alaska COTP boundary includes all Alaskan coastal waters except Prince William Sound and Southeast Alaska.

The AWA-ACP provides everything needed for a coordinated oil or hazardous material response. This includes: instructions on proper spill protocol; designations of the spill response command hierarchy; methods of oil spill response for various environments; proper planning of hazardous material or oil spill responses; required correspondence and documentation; available logistical and material response assets; organizations that may assist with response funding; instructions on evaluating, handling, and transporting



hazardous/radiological substances; and a guide to marine firefighting, salvage, and lightering operations.

Additionally, the AWA-ACP contains the necessary forms and documents for large-scale accident response. AWA-ACP has extensive lists of contact information for industrial and governmental actors who may be involved in large-scale response efforts. There is also information on the response capabilities, location and climate, transportation facilities, utilities, housing, and economy for villages, towns, and cities along the Western Alaska COTP Zone.

Citation: Alaska Department of Environmental Conservation. 2018. Arctic and Western Alaska Area Contingency Plan. <https://dec.alaska.gov/media/10703/arctic-western-plan.pdf>

Arctic Environmental Conditions

Sea Ice: Hazards, Risks, and Implications for Disasters

Abstract: The role of sea ice as a natural hazard is discussed with a focus on Arctic and sub-Arctic regions where risks associated with human activities and ice processes are the greatest. Hazard assessment and emergency response need to consider a range of controlling factors that can lead to events initiating an accident, failure, or full-scale disaster. These factors include environmental hazards, equipment, procedures and settings, and people. Quantifying risks associated with the presence of sea ice requires the joint consideration of the probability of specific hazards and the magnitude of their impacts. Both of these also depend on the type and level of human activity, such that disaster risks are substantially higher in the Arctic than in the Antarctic. We identify three types of sea-ice hazards: (1) broad, long-term hazards and associated risks associated with a rapid reduction in summer ice extent; (2) near-term hazards resulting from changes in sea-ice extent and dynamics such as increased coastal erosion and threats to coastal infrastructure; and (3) immediate risks and the potential for disasters derived from the combination of sea-ice hazards and human activities such as shipping or offshore resource development. A review of key properties and processes governing the role of sea ice as a hazard focuses on recent rapid changes in ice extent and concentration in the Arctic and resulting threats to coastal systems. Other key factors include the distribution of old perennial ice that has a greater thickness and higher mechanical strength than seasonal ice, patterns of ice movement that determine advection of ice hazards, and the degree of ice deformation that can generate thick, rough ice and represent a hazard in its own right. These factors are examined in the context of a case study for the Beaufort and Chukchi Seas in the North American Arctic. Linking specific environmental hazards to the geospatial distribution of human activities and vulnerable ecosystems allows for an integrated Arctic hazards assessment, currently still in its infancy. The need for coordinated environmental observations in informing hazard assessments and emergency response is discussed in the context of recent increases in maritime activities in the Arctic.



Citation: Eicken, H., Mahoney, A. R. (2015) Sea Ice: Hazards, Risks, and Implications for Disasters. Coastal and Marine Hazards, Risks, and Disasters, Chapter 13, pg 381-401. <https://doi.org/10.1016/B978-0-12-396483-0.00013-3>

Mid-Winter Breakout of Landfast Sea Ice and Major Storm Leads to Significant Ice Push Event Along Chukchi Sea Coastline

Abstract: During the winter of 2016, anomalous sea ice conditions and a powerful storm culminated in a destructive erosion event along the Chukchi Sea coastline of Cape Espenberg, Alaska. This event is commonly referred to as an “ice push” or “ivu,” the Inupiat word for an ice ridging event. In this article, we report the process and impact of this event by combining traditional ecological knowledge, news accounts, meteorological data, remote sensing, and ground surveys. The midwinter detachment of shorefast ice was caused by a low-pressure system and wind-driven swell that destabilized shorefast ice, while northerly winds developed an open-water lead offshore to the eventual impact area. These conditions preceded the impact of an extratropical cyclone on December 31, 2016, when powerful southerly winds and the second largest storm surge in Kotzebue Sound since at least 2003 led to the compressional failure of the ice cover under uniaxial loading perpendicular to the southern coastline of the Cape, resulting in the ice push event. Ice-pushed debris was shoved up to 6.2 m above mean high water, with ~3.5 km of coastline experiencing net erosion. The largest accumulation of ice-pushed debris had a volume of 1,000 m³ and rose 3 + m above the surrounding ground surface even after roughly 6 months of melting. On low-lying areas, driftwood and other debris were deposited 130 m landward by the surge 5.0 m above mean high water, indicating the potential threat of such events to property, infrastructure, and, in this case, archeological sites and associated cultural resources. The anomalous environmental and sea ice conditions that preceded the ivu seem to suggest that such events may occur more frequently in a warmer Arctic.

Citation: Bogardus, R., Maio, C., Mason, O., Buzard, R., Mahoney, A. and de Wit C (2020) Mid-Winter Breakout of Landfast Sea Ice and Major Storm Leads to Significant Ice Push Event Along Chukchi Sea Coastline. Earth Sci. 8:344. doi: 10.3389/feart.2020.00344

Landfast Sea Ice Breakouts: Stabilizing Ice Features, Oceanic and Atmospheric Forcing at Barrow Alaska

Abstract: Landfast sea ice is an important seasonal feature along most Arctic coastlines, such as that of the Chukchi Sea near Barrow, Alaska. Its stability throughout the ice season is determined by many factors but grounded pressure ridges are the primary stabilizing component. Landfast ice breakouts occur when these grounded ridges fail or unground, and previously stationary ice detaches from the coast and drifts away. Using ground-based radar imagery from a coastal ice and ocean observatory at Barrow, we have developed a method to estimate the extent of grounded ridges by tracking ice motion and deformation over the course of winter and have derived ice keel depth and potential for grounding from cumulative convergent ice motion. Estimates of landfast ice grounding strength have been compared to the atmospheric and oceanic stresses acting on the landfast ice before and during breakout



events to determine prevailing causes for the failure of stabilizing features. Applying this approach to two case studies in 2008 and 2010, we conclude that a combination of atmospheric and oceanic stresses may have caused the breakouts analyzed in this study, with the latter as the dominant force. Preconditioning (as weakening) of grounded ridges by sea level variations may facilitate failure of the ice sheet leading to breakout events.

Citation: Jones, J., Eicken, H., Mahoney, A. R., MV, R., Kambhamettu, C., Fukamachi, Y., Oshima, K.I., George, J.C. (2016) Landfast Sea Ice Breakouts: Stabilizing Ice Features, Oceanic and Atmospheric Forcing at Barrow Alaska. *Continental Shelf Research*, Volume 126, Pg 50-63. <https://doi.org/10.1016/j.csr.2016.07.015>

Applications of Sea Ice and Weather Modeling Data in Search and Rescue (SAR) Operations in the Arctic: A Case Study in Utqiagvik, Alaska

Executive Summary: This research investigated the potential use and application of radar, satellite, and other tracking data for sea ice and weather conditions in maritime-related Search and Research (SAR) operations in the Arctic. Specifically, this study analyzed a SAR event for a missing small vessel due into Utqiagvik (formerly, Barrow), Alaska in July 2017. This study feeds into the Arctic Domain Awareness Center (ADAC) funded project - Developing sea ice and weather forecasting tools to improve situational awareness and crisis response in the Arctic - which seeks to create a prototype sea ice and weather forecasting module for hazard planning in Utqiagvik. An archival analysis of email communications regarding the SAR event and the U.S. Coast Guard (USCG) case file) was conducted, in addition to semi-structured interviews (n=17) with relevant stakeholders to understand how this SAR event unfolded, the different types of information that were used during the SAR event, and challenges to data accessibility and availability in the Arctic. This research found that data availability and accessibility, particularly in low bandwidth and further offshore areas, are challenges to data uptake during a SAR event. Nonetheless, this specific SAR incident helped to illuminate there is a breadth of tools that can be applied and used in a SAR context - traditional and knowledge, modeling data, and USCG operational data. Specifically, modeling data from tools developed by the Arctic Domain Awareness Center (ADAC), the University of Alaska Fairbanks (UAF) and other research institutions was generated during this event to help support the local SAR effort. However, a level of pre- or post-processing was necessary in many cases, which can be a challenge for when data is needed immediately. This research holds implications for future use and uptake of modeling data in local SAR operations in Utqiagvik specifically and potentially across Arctic Alaska. Given that local SAR operators are predominantly the first line of response to maritime emergencies in the North Slope, the ability to share and provide a set of resources to support SAR operators can be beneficial, particularly in a rapidly changing Arctic. A more targeted and systematic way to utilize and draw upon scientific research for SAR operations can potentially support the local SAR community, especially when immediate information is necessary. In particular, leveraging different products to validate, interpolate, and extrapolate information against one another, can help create more comprehensive situational awareness, especially for further offshore SAR events. Further research is therefore necessary to see how such information can be adapted to be SAR-ready, to help maximize time. Lastly, further research to understand



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different SAR contexts can be of use to help identify which information resources could be useful and for what purpose. A review of other SAR events is one potential way to expand understanding of SAR information needs, helping to support the development and refinement of SAR-relevant information products.

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