



Frozen Frontlines: Evaluating the Strategic Importance of NORAD Modernization on Arctic Sovereignty

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JCSP 50

Exercise Solo Flight

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CANADIAN FORCES COLLEGE - COLLÈGE DES FORCES CANADIENNES

JCSP 50 - PCEMI n 50

2023 - 2024

Exercise Solo Flight – Exercice Solo Flight

**Frozen Frontlines: Evaluating the Strategic Importance of
NORAD Modernization on Arctic Sovereignty**

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Frozen Frontlines: Evaluating the Strategic Importance of NORAD Modernization on Arctic Sovereignty

The North American Aerospace Defense Command (NORAD) stands as a model of bi-national cooperation between Canada and the United States, designed to monitor and defend the skies of North America. Established in 1958 during the Cold War, NORAD has evolved significantly from its early focus on the potential threat of Soviet bombers. Today, its remit includes providing maritime warning, aerospace warning, and aerospace control for North America. As the Arctic becomes an increasingly contested zone, with Russia and China asserting their strategic interests through military build-up, economic investments, and diplomatic maneuvers, the role of NORAD is more crucial than ever.

Historically, the Arctic was a peripheral concern in global politics, but climate change and technological advancements have transformed it into a geostrategic focal point. The melting Arctic ice is opening new shipping routes and unlocking previously inaccessible natural resources, attracting not just environmental and economic interest but also significant geopolitical competition. Russia, with its extensive Arctic coastline, has reinvigorated its Soviet-era bases and deployed sophisticated military assets in the region. China, though a non-Arctic state, has declared itself a "Near-Arctic State" and is looking to secure its interests through the Polar Silk Road initiative¹, integrating economic endeavors with military logistics.

In response to these developments, NORAD's modernization has become imperative. The organization is upgrading its radar technology and satellite communication to enhance its domain awareness capabilities. This technological overhaul aims not only to keep pace with the advancements of potential adversaries but also to ensure a continuous and effective monitoring and defense posture in the Arctic region. By integrating innovative technologies and expanding surveillance capabilities, NORAD aims to maintain a strategic advantage in a region where physical presence and technological outreach are equally significant.

Moreover, NORAD's approach is not limited to technological enhancement alone. Recognizing the multifaceted nature of the new Arctic challenges, it is also advocating for a comprehensive strategic framework. This framework seeks to safeguard North American sovereignty by reinforcing military alliances and enhancing cooperative security measures with other Arctic states and indigenous communities. The inclusion of indigenous peoples in safeguarding the Arctic is vital, not only for recognizing their sovereign rights and traditional knowledge but also for promoting sustainable development within their communities. This integrated approach ensures that NORAD's modernization and strategic planning go hand in hand with diplomatic efforts and community engagement, thereby fostering a holistic security environment.

¹ 1776 Main Street Santa Monica and California 90401-3208, 'What Does China's Arctic Presence Mean to the United States?', 29 December 2022, <https://www.rand.org/pubs/articles/2022/what-does-chinas-arctic-presence-mean-to-the-us.html>.

This essay argues that the modernization of NORAD and the implementation of a comprehensive strategic framework are critical to defending North American sovereignty and security interests in the Arctic. As global powers like Russia and China expand their influence in the region, it is imperative for Canada and the United States to advance their technological capabilities and strategic alliances. This proactive stance is necessary not only to counter the immediate challenges but also to maintain long-term stability in the Arctic. By addressing these multifaceted challenges through an inclusive and forward-thinking approach, NORAD can ensure the protection of North America's northern borders against the backdrop of shifting global dynamics.

THE EVOLUTION OF NORAD

The development of the NORAD has been characterized by a dynamic interplay of reactive and proactive measures in response to evolving threats and advances in technology. Originally established in 1958 during the Cold War's peak, NORAD initially concentrated on countering Soviet bomber incursions, exemplified by the creation of the Distant Early Warning (DEW) Line and other radar networks across North America's northern frontiers.² This system, though cutting-edge for its era, was predominantly a reactive formation, prompted by the USSR's proven capabilities and aggressive postures.

With the emergence of intercontinental ballistic missiles (ICBMs), NORAD underwent a proactive transformation in the early 1960s, exemplified by the inception of the Ballistic Missile Early Warning System (BMEWS). This shift not only expanded its focus from detecting long-range bombers to intercepting missile threats but also highlighted NORAD's ability to preemptively adapt to technological shifts.

Post-Cold War, NORAD faced novel challenges from asymmetric warfare and non-state adversaries, particularly evident after the events of 9/11. The NORAD Agreement's renewal in 2006 marked a pivotal redirection towards aerospace and maritime control bringing it up to speed with once unrealistic threats.³ Initiatives like Operation NOBLE EAGLE and the Maritime Warning Mission were responses to the emergent threat types that diverged from traditional focuses.⁴ Additionally, ongoing upgrades in radar and satellite communications reflect NORAD's sustained efforts to integrate both reactive and proactive strategies within a complex and volatile international security framework.⁵

Despite this, NORAD's fundamental capabilities have remained largely static for the last four decades, with only minor adjustments in policy and fighter deployment post-9/11. NORAD continues to effectively address threats posed by cruise missiles, including those launched from air (ALCMs) and sea (SLCMs). Yet, the technological landscape in defense has evolved

² Andrea Charron et al. NORAD : Beyond Modernization, Centre for Defence and Security Studies, University of Manitoba, 31 January 2019, p.24

³ NORAD agreement renewal 2006

⁴ Dawson, Michael. "NORAD : Remaining Relevant." *The School of Public Policy Publications (Online)* 12, no. 40 (2019): 1-18

⁵ Canada, Canada Department of defense 2021. "Departmental results report (Canada. Department of National Defence)

significantly. Recent strategic discourses suggest a pivot from counterterrorism back to interstate conflict and deterrence, contexts that led to NORAD's original formation.⁶ It is now crucial that NORAD undertakes necessary modernizations to safeguard North American sovereignty and maintain security, especially in the Arctic region.

THREATS AND CHALLENGES

Numerous threats and challenges currently have the potential to impact the NORAD, Arctic regions, and the broader sovereignty of North America. The subsequent section will focus on identifying the countries that represent these threats, elaborating on their strategic interests and ambitions in the Arctic, and examining the capabilities they hold. This analysis aims to provide a comprehensive overview of the geopolitical dynamics and military capabilities that could influence security and sovereignty in these critical areas

RUSSIA

Russia has a lot at stake in the North, both militarily and economically. Over 53% of Russia's border stretches along the Arctic Ocean, with a population of over 2.5 million people living above the Arctic Circle and therefore Russia is heavily invested in the north from a national security standpoint.⁷ Economically, the Arctic is a crucial area for the Russian government with a massive amount of natural resources within their territory. It is estimated that eighty percent of Russia's natural Gas and almost 20 percent of their oil production lie along the Northern Sea Route (NSR).⁸ This particular northern sea route is also known as the North East Passage and runs entirely above the Arctic Circle and inside Russia's economic exclusion zone (EEZ).



Figure 1: Arctic Shipping Routes. Northeast Passage in yellow, Northwest Passage in green, and the Transpolar Route in red. Source: US Coast Guard Arctic Strategic Outlook. Map created with ESRI ArcGIS online software.

⁶ MacDonald-Laurier Institute. NORAD and the Evolution of North American Air Defence: Andrea Charron and James Ferguson for Inside Policy

⁷ 'NATO Arctic Russia', The arctic review, accessed 2 May 2024, <https://arctic.review/international-affairs/arctic-countries/#Russia>.

⁸ Minna Ålander, 'High North, High Tension: The End of Arctic Illusions', 11 May 2023, <https://policycommons.net/artifacts/3793116/high-north-high-tension/4598945/>.

The NSR is another vital reason that Russia has vested interest in the north and as global warming leads to melting sea ice, the NSR becomes more navigable throughout the year. Russia anticipates that the route will become increasingly viable for regular shipping, which could transform global shipping patterns and strengthen Russia's position as a central shipping hub. The NSR offers a shorter maritime path between Europe and Asia, reducing shipping times and costs. All of this adds up to GDP for Russia. Access to more natural resources, easier ability to ship these commodities and get it to countries buying from them. As access to these routes continues to become more usable with the effects of global warming so too does strategic importance and protection. These routes might bring harsh climates and rough seas but unlike many of the global shipping routes throughout the world they come without choke points and pirates and yet bring transit times of up to fifty percent less on some routes.⁹

Militarily, Russia has also made great investments in the north and a show of force to some extent. The presence of significant oil and gas reserves also motivates Russia to strengthen its military presence, aiming to secure these critical resources. Moreover, the geopolitical significance of the Arctic, with its potential for new shipping lanes and resources, has prompted Russia to reassert its influence and claim over vast parts of the region. Russia's military buildup in the Arctic includes renovating old airfields and deploying new radar systems and creating a more robust infrastructure to enhance operational capabilities and surveillance.¹⁰ Russia has taken great stride to invest in the north through mining and the ability to power these remote areas through the use of floating nuclear power plants.¹¹

Russia has reactivated and modernized several Soviet-era airfields and built new bases across the Arctic. Notable among these are the Nagurskoye airbase on Alexandra Land in the Franz Josef Land archipelago, which has been equipped with advanced MiG-31BM fighter jets capable of carrying hypersonic missiles, a threat to be addressed later. This airbase, along with others, extends Russia's reach, allowing for better control and surveillance of the Northern Sea Route.¹²

In recent years Russia has also made the northern fleet area its own military district emphasizing its importance while bolstering its capabilities.¹³ Russia's key naval division in the Arctic, has been strengthened with advanced nuclear-powered submarines and icebreakers. Russia continues to launch new submarines, such as the "Kazan," a Yasen-class submarine capable of carrying nuclear missiles, highlighting the militarization and strategic importance of the region for Russia.¹⁴

⁹ Tad Schnauffer, 'GNSI Decision Brief: Strategic Competition in the Arctic: Sooner or Later?' (Tampa, FL: Global and National Security Institute, December 2023), <https://doi.org/10.5038/HJDH3296>.

¹⁰ Ålander, 'High North, High Tension'.

¹¹ Schnauffer, 'GNSI Decision Brief'.

¹² Schnauffer.

¹³ Ålander, 'High North, High Tension'.

¹⁴ Schnauffer, 'GNSI Decision Brief'.

While all of this build up militarily has been with purpose to bolster its northern borders, resources and sovereignty, since the war on Ukraine, Russia's north bases are actually manned and equipped at approximately 20 percent of prewar times.¹⁵

CHINA

China's presence in the Arctic and its implications for North American security, particularly NORAD, pose a complex challenge. The research highlights several dimensions of this issue, from strategic maneuvers to geopolitical ambitions and environmental concerns. China's strategic interest in the Arctic is diverse, involving access to new shipping routes, the exploration of untapped natural resources, and the potential to exert influence in a geopolitically sensitive region. Although not an Arctic state, China declared itself a "Near-Arctic State" and has been increasingly active in the region.¹⁶ Its involvement includes scientific expeditions, investments in infrastructure, and participation in Arctic governance through forums such as the Arctic Council.¹⁷

China's growing presence in the Arctic holds substantial strategic implications for NORAD. The development of new maritime pathways, notably the Northern Sea Route, is poised to alter the naval equilibrium, facilitating swifter links between Asia and Europe. This shift reduces China's reliance on traditional maritime chokepoints, which are often under the control of potential rivals, and introduces new complexities to the security landscape of the Arctic region.¹⁸

China's approach to environmental governance in the Arctic also presents challenges. While Beijing promotes a narrative of sustainable development, the environmental impact of its infrastructural investments and increased maritime traffic could pose ecological risks, complicating efforts to protect the fragile Arctic environment.¹⁹ This situation requires NORAD and its partners to not only prepare for traditional security threats but also consider non-traditional challenges such as environmental disasters, which could have security implications.

China's ambition to integrate its Belt and Road Initiative (BRI) with its Arctic strategy through the Polar Silk Road emphasizes a strategic push to enhance its global influence by establishing new maritime routes. These routes, primarily the Northern Sea Route (NSR), promise shorter transit times between Asia and Europe, potentially altering global shipping patterns and reducing reliance on traditional routes controlled by Western powers or their

¹⁵ Schnauffer.

¹⁶ Matthew P. Funaiole Powers-Riggs Brian Hart, Joseph S. Bermudez Jr , Aidan, 'Frozen Frontiers: China's Great Power Ambitions in the Polar Regions', accessed 5 May 2024, <https://features.csis.org/hiddenreach/china-polar-research-facility>.

¹⁷ 'China's Arctic Policy', accessed 24 April 2024, https://www.fmprc.gov.cn/mfa_eng/wjdt_665385/wjzcs/201801/t20180126_679659.html.

¹⁸ Henry Tillman, Jian Yang, and Egill Thor Nielsson, 'The Polar Silk Road: China's New Frontier of International Cooperation', *China Quarterly of International Strategic Studies* 04, no. 03 (January 2018): 345–62, <https://doi.org/10.1142/S2377740018500215>.

¹⁹ Tillman, Yang, and Nielsson.

allies.²⁰ This shift in maritime dynamics directly challenges NORAD's traditional security paradigms, which have long included monitoring and securing these navigational passages.

The development of the Polar Silk Road could facilitate a greater physical presence of Chinese maritime and potential military assets in the Arctic region. The presence of Chinese icebreakers, including nuclear-powered ones, alongside the increasing capability of deploying naval forces under the guise of research or commercial vessels, poses a direct challenge to NORAD.²¹ This could lead to the need for a heightened surveillance and response strategy to ensure that the Arctic remains a zone free from conflict and domination by any single nation, particularly in areas close to North American borders.

China's proactive policy and involvement in Arctic affairs, despite not being an Arctic state, allows it to influence Arctic governance. By asserting itself as a near-Arctic state and investing in infrastructure and research within the region, China is positioning itself to play a crucial role in the future geopolitical landscape of the Arctic.²² This emerging influence is a challenge for NORAD countries, as it could shift the balance of power in regional decision-making processes, including those affecting resource exploitation and environmental management. The United States has deemed "China as a potentially destabilizing force, with the economic and military power to try to bend the established order to its liking."²³ China has some investment in mining operations in the arctic and have gone as far as trying to buy a former US navy base in Greenland that was denied by the Danish government.²⁴

RESOURCES AND WHO OWNS THEM

A primary driver for both of the countries outlined above is the abundance of natural resources in the arctic, a vast expanse rich in resources, most notably hydrocarbon reserves, which are estimated to comprise about 22% of the world's undiscovered, technically recoverable resources.²⁵ This bounty has attracted the interest of several key global players, including the Russian Federation, Norway, Denmark (via Greenland), Canada, and the United States, each of whom is keen on extending their territorial claims to exploit these resources. The scramble for the Arctic is propelled not only by resource competition but also by the strategic military and shipping positions these areas hold, further intensified by the diminishing ice cover due to global warming.

The legal framework for these territorial claims and their recognition hinges heavily on the United Nations Convention on the Law of the Sea (UNCLOS), which seeks to mediate maritime disputes by setting out the rights and responsibilities of nations in their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of

²⁰ Tillman, Yang, and Nielsson.

²¹ Monica and California 90401-3208, 'What Does China's Arctic Presence Mean to the United States?'

²² Powers-Riggs, 'Frozen Frontiers'.

²³ Monica and California 90401-3208, 'What Does China's Arctic Presence Mean to the United States?'

²⁴ Powers-Riggs, 'Frozen Frontiers'.

²⁵ Kristin Bartenstein, 'Flag-Planting: What Legal Framework Governs the Division of the Arctic Continental Shelf?: What Legal Framework Governs the Division of the Arctic Continental Shelf?', *International Journal* 65, no. 1 (March 2010): 187–206, <https://doi.org/10.1177/002070201006500112>.

marine natural resources. However, the Arctic poses unique challenges due to its complex geological features and the overlay of continental and oceanic boundaries.²⁶

One notable event that highlighted the intensifying race to stake claims in the Arctic was Russia's symbolic planting of a titanium flag on the seabed at the North Pole in 2007, underscoring its readiness to assert its claim vigorously. This act of flag-planting, while largely symbolic, underscored the geopolitical tensions that are likely to escalate as Arctic nations vie for control over parts of the ocean floor that could hold vast reserves of oil and natural gas.²⁷

It is important to recognize that Russia's actions were not the initial instances of its territorial claims beneath the Arctic ice. The country had been actively seeking to extend its economic exclusion zone (EEZ) beyond the standard 200 miles for some time. The process began in 2002 when Russia first made its claim, setting the precedent that other Arctic nations soon followed. This marked the beginning of a competitive dynamic in the northern regions as states vie for control and access to valuable resources and strategic positions.²⁸

For NORAD, which has a vested interest in the security implications of these territorial claims, the increasing activity in the Arctic could necessitate a recalibration of its defense postures and capabilities. The Arctic's strategic importance as a potential missile route and its proximity to critical military radar installations make it a significant concern for NORAD. As nations build up military presences and lay sovereign claims to overlapping parts of the Arctic, the potential for conflict increases, particularly as the diminishing ice opens new navigable waters and potential strategic corridors.

The implications of these extended territorial claims are profound. They not only raise possibilities for conflict between nation-states over access and rights but also set the stage for possible future disputes over maritime navigation rights and environmental management. The complexity of maritime delimitation in the Arctic, with unresolved disputes such as those involving the Beaufort Sea between the U.S. and Canada, exemplifies the challenges of diplomatic negotiation and international law in high-stakes environments.²⁹

Moreover, the extended continental shelf claims, particularly those involving the Arctic Ocean, are expected to be contentious as nations like Russia submit extensive territorial claims based on the continental shelf beyond their 200 nautical mile economic zones, as permitted by UNCLOS. These claims are subject to scientific validation and require agreement from a commission of the United Nations—a process that is both scientifically and diplomatically rigorous.³⁰

²⁶ Bartenstein.

²⁷ Bartenstein.

²⁸ Bartenstein.

²⁹ James S. Baker and Michael Byers, 'Crossed Lines: The Curious Case of the Beaufort Sea Maritime Boundary Dispute', *Ocean Development & International Law* 43, no. 1 (1 January 2012): 70–95, <https://doi.org/10.1080/00908320.2012.647509>.

³⁰ Bartenstein, 'Flag-Planting'.

While the Arctic offers substantial resources, the path to their exploitation is fraught with geopolitical, legal, and environmental challenges. Nations involved in the Arctic must navigate complex international legal frameworks, potential conflicts, and the environmental implications of exploiting pristine territories. As the ice recedes, opening new passages and possibilities, the strategic importance of the Arctic is only set to increase, drawing ever more intense international focus and contention.

THREATS

Now that we have outlined the geostrategic players in the arctic it is important to outline the capabilities they possess should tensions erupt over claims and resources in the north, which will in turn identify shortfalls of the current NORAD capabilities.

It is obvious from the preceding, that both China and Russia could be considered a threat to the Arctic, Canada and north America as a whole. An actor can not be considered a threat however unless they possess a “combination of intent and capability”. It may be difficult to predict future intent, but the importance is to be prepared and track the capabilities of these states.³¹ In recent years both China and Russia have built an arsenal of weapons to include ice breakers, supply, research and navy vessels and submarines, but the newer capability of hypersonic glide vehicles and hypersonic cruise missiles is one of serious concern for NORAD and the defense of North America. The current structure of the North Warning System (NWS) built between 1986 and 1992 is not capable of dealing with these threats.³² In addition, the maritime warning system and underwater monitoring have little capability.

All of these threats have been recognized by both the United States and Canada and are starting to be addressed through NORAD modernization plans. Canada has funded 38.6 Billion dollars spread across twenty years that will update infrastructure to current northern bases and will also replace and enhance the current NWS with arctic and polar over the horizon radars. Other funding will be designated to command and control systems, aircraft, and missiles.³³ Funding will also go to low earth orbit surveillance, undersea surveillance, and hypersonic and cruise missile defence.³⁴

Due to a rise in the capabilities and the competition threatening the international rules-based order, the need to revisit the ballistic missile defence (BMD) program that Canada abstained from in 2005 might also be necessary.³⁵ The arctic is contested environment and also

³¹ NDDN, Evidence, 1st Session, 42nd Parliament, 22 March 2016 (Stephen Burt).

³² David Roza, ‘NORAD Boss: Over the Horizon Radar “Not the End-All, Be-All” For Defending Homeland’, Air & Space Forces Magazine, 10 May 2023, <https://www.airandspaceforces.com/norad-vanherck-over-the-horizon/>.

³³ ‘NORAD Modernization Project Timelines’, 24 March 2023, <https://www.canada.ca/en/departement-national-defence/services/operations/allies-partners/norad/norad-modernization-project-timelines.html>.

³⁴ National Defence, ‘Annex C: Canada’s NORAD Modernization Plan’, 8 April 2024, <https://www.canada.ca/en/departement-national-defence/corporate/reports-publications/north-strong-free-2024/annex-c-canada-norad-modernization-plan.html>.

³⁵ Chase, Steven and Patrick Brethour.

"Ottawa Pledges \$4.9-Billion to NORAD: Investment Over Six Years Meant to Address Gap in Defences Against Advanced Missile Tech from Russia, China." The Globe and Mail, Jun 21, 2022.

the inroads of future attacks on North America should they occur. The capability to have ground-based shooting units in the north capable of shooting down threats should not be undervalued. Although BMD on Canadian soil will require a revisit of the command and control and how Canada will integrate with USNORTHCOM, the lemon might be worth the squeeze.³⁶

CHALLENGES IN THE NORTH

Operating in the Arctic's harsh environment presents significant challenges for both military and civilian entities. The effects of global warming, which are amplified three to four times in the far north, have not substantially eased the operational and infrastructural hurdles in this region. Despite some thawing, the Arctic passages remain frozen for the majority of the year, complicating logistical operations. This necessitates the aerial transport of supplies and waste over vast distances. Additionally, sea lifts, which are viable only during the brief Arctic summer, require meticulous planning and forecasting to ensure they do not deplete the already scarce resources relied upon by indigenous communities.³⁷

Geographical remoteness and the associated costs represent one significant challenge in Arctic operations, yet the stark scarcity of infrastructure compounds the issue further. While the NORAD modernization initiatives have allocated substantial funds to enhance security and military capabilities in the Arctic, these financial commitments leave limited resources available for critical civil infrastructure projects such as roads, communication networks, and healthcare facilities. It is widely contended that, given the growing strategic interest in the Arctic, prioritizing such fundamental infrastructure is essential.³⁸ Although the funding for these essential services may not directly emanate from NORAD's budget, the Canadian government acknowledges the necessity of these improvements. Furthermore, it recognizes that fostering relationships and ensuring the participation of Indigenous communities are crucial for the successful implementation of these infrastructure projects.

The new defence policy "Our North Strong and Free" has made promises to partner with the northern communities and other government departments so that everyone can benefit from investments in a whole of government approach.³⁹ Recently the Canadian Defence Minister also stated that these investments will create jobs and opportunities for the people of the north. There

³⁶ 'NORAD_beyond_modernization_2019.Pdf', accessed 2 May 2024, https://umanitoba.ca/centres/cdss/media/NORAD_beyond_modernization_2019.pdf?SOMNIA.

³⁷ CDA Institute, "NORAD Modernization: Report One: Awareness & Sensors" 16 September 2020, <https://cdainstitute.ca/norad-modernisation-report-one-awareness-sensors/>

³⁸ CDA Institute, "NORAD Modernization: Report One: Awareness & Sensors" 16 September 2020, <https://cdainstitute.ca/norad-modernisation-report-one-awareness-sensors/>

³⁹ National Defence, 'Our North, Strong and Free: A Renewed Vision for Canada's Defence', 8 April 2024, <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/north-strong-free-2024.html>.

will be investments in highways, powerplants, communications and water treatment facilities, all of which will be consulted on and partnered by Northern and Indigenous people.⁴⁰

This collaboration is not a new premise as the current NWS is under contract by Inuit company, Nasittuq and through this relationship much can be learned moving forward for larger contracts and greater development. The success of the NWS in terms of indigenous employment and integration is also a testament to the effective collaboration between multiple governmental agencies. Notably, Crown-Indigenous Relations and Northern Affairs Canada, Indigenous Services Canada, and Public Services and Procurement Canada play pivotal roles in this process. These agencies collectively ensure that the NWS operations are not only compliant with federal standards but also beneficial to the indigenous communities involved.⁴¹

Crown-Indigenous Relations and Northern Affairs Canada focuses on maintaining and strengthening the relationship between the government and indigenous peoples, ensuring that the latter's rights and interests are respected in projects like the NWS.⁴² Indigenous Services Canada contributes by facilitating access to essential services, including education and training that enable indigenous peoples to qualify for and excel in jobs created by the NWS. Meanwhile, Public Services and Procurement Canada manages the logistical and procurement aspects of the NWS, which includes enforcing policies that prioritize hiring local indigenous workers and procuring services from indigenous-owned businesses.⁴³

The collaborative approach taken in the management of the NWS also reflects a broader governmental commitment to reconciliation and partnership with indigenous communities. By involving indigenous leaders in the planning and implementation phases of NWS operations, the government demonstrates respect for indigenous sovereignty and traditional knowledge. This participatory approach not only ensures that the projects align with indigenous interests but also helps build trust and mutual respect, which are crucial for the sustainability of such initiatives and NORAD initiatives moving forward.

Despite these considerations, the financial burdens associated with constructing and maintaining infrastructure in the Arctic are substantial, and the consequences of global warming must also be weighed in terms of the sustainability of these investments.⁴⁴

⁴⁰ National Defence, 'Remarks by Minister of National Defence Bill Blair to the Canadian Global Affairs Institute Conference on NORAD Modernization', speeches, 8 May 2024, <https://www.canada.ca/en/department-national-defence/news/2024/05/remarks-by-minister-of-national-defence-bill-blair-to-the-canadian-global-affairs-institute-conference-on-norad-modernization.html>.

⁴¹ National Defence, 'Backgrounder – North Warning System In-Service Support', backgrounders, 31 January 2022, <https://www.canada.ca/en/department-national-defence/news/2022/01/backgrounder--north-warning-system-in-service-support.html>.

⁴² Government of Canada; Crown-Indigenous Relations and Northern Affairs Canada, 'Arctic and Northern Policy Framework', policy, 14 June 2019, <https://www.rcaanc-cirnac.gc.ca/eng/1560523306861/1560523330587>.

⁴³ Defence, 'Backgrounder – North Warning System In-Service Support'.

⁴⁴ 'NORAD_beyond_modernization_2019.Pdf', accessed 1 May 2024, https://umanitoba.ca/centres/cdss/media/NORAD_beyond_modernization_2019.pdf?SOMNIA.

JOINT COLLABORATION AND EXERCISES IN THE NORTH

Joint military exercises in the Arctic are a critical element of North American security strategy, serving both to deter potential adversaries and to assert sovereignty. Coupled with the ongoing modernization of NORAD, these exercises ensure that North America can protect its interests in the Arctic while fostering international cooperation. As the Arctic continues to grow in global significance, the strategic focus on this region will undoubtedly intensify, underscoring the importance of readiness and collaboration in facing the challenges ahead.

Joint military exercises such as Amalgam Dart and Noble Defender are central to the strategy of deterrence in the Arctic operations.⁴⁵ These exercises demonstrate the readiness and capability of the NORAD enterprise and its allies to operate in harsh Arctic conditions, thereby reinforcing their sovereignty claims. Such exercises ensure that NORAD and its partners are well-prepared to counter any aerial threats that might arise in this strategically sensitive region.⁴⁶

These exercises also serve as a physical assertion of sovereignty. By conducting operations in the Arctic, Canada and the United States make a clear statement about their rights and responsibilities in the region. This is crucial not only for North American security but also for protecting the interests of indigenous communities and preserving the Arctic environment. Furthermore, these operations help maintain the rule of law in international waters and airspace, which is often challenged by nations like Russia and China, who are also looking to expand their influence in the Arctic.⁴⁷

NORAD's modernization is directly tied to its mission of aerospace warning, aerospace control, and maritime warning for North America. Upgraded systems allow for better surveillance and quicker response times, which are necessary given the increased military activities of adversarial nations in the Arctic. As outlined in the White House's Arctic strategy, it is necessary for “increased exercises with partner countries to deter aggression in the Arctic, especially from Russia.”⁴⁸ The American strategy takes a whole of government approach involving other government departments and civilian agencies to show an increased presence in the north and prepare for operations in the harsh environment.

⁴⁵ ‘NORAD CONDUCTS ARCTIC AIR DEFENCE EXERCISE AMALGAM DART’, North American Aerospace Defense Command, accessed 11 May 2024, <https://www.norad.mil/Newsroom/Article/2650105/norad-conducts-arctic-air-defence-exercise-amalgam-dart/https%3A%2F%2Fwww.norad.mil%2FNewsroom%2FArticle%2F2650105%2Fnorad-conducts-arctic-air-defence-exercise-amalgam-dart%2F>.

⁴⁶ ‘NORAD Completes Long-Planned Air Operation in the Arctic’, North American Aerospace Defense Command, accessed 11 May 2024, <https://www.norad.mil/Newsroom/Press-Releases/Article/3282123/norad-completes-long-planned-air-operation-in-the-arctic/https%3A%2F%2Fwww.norad.mil%2FNewsroom%2FPress-Releases%2FArticle%2F3282123%2Fnorad-completes-long-planned-air-operation-in-the-arctic%2F>.

⁴⁷ Bryant Harris, ‘White House Arctic Strategy Calls for Enhanced Military Presence’, Defense News, 7 October 2022, <https://www.defensenews.com/pentagon/2022/10/07/white-house-arctic-strategy-calls-for-enhanced-military-presence/>.

⁴⁸ Harris.

CONCLUSION

In concluding the examination of NORAD's modernization amidst escalating Arctic challenges, it is evident that timely and comprehensive updates are critical to safeguarding North American sovereignty against the burgeoning geopolitical pressures from global powers such as Russia and China. These nations are assertively marking their presence in the Arctic, capitalizing on the strategic and resource-rich potential of the region, thereby elevating the urgency for NORAD's response.

Russia, with its extensive Arctic coastline and revived military infrastructure, poses a formidable challenge. The modernization of Soviet-era bases and the deployment of advanced military assets highlight Russia's intent to fortify its dominance over Arctic territories and shipping lanes. This resurgence not only secures critical resources but also enhances Russia's ability to control emerging maritime routes, which are becoming more accessible due to climate change. Conversely, China's strategic ambitions, articulated through its self-declared status as a "Near-Arctic State" and the Polar Silk Road initiative, aim to establish alternative global shipping routes and extend its influence into the Arctic. By developing new maritime pathways, China seeks to bypass traditional chokepoints and reshape the maritime strategic landscape, challenging NORAD's historical monitoring and control capabilities.

The necessity for NORAD's modernization is underscored by the dual threat of sophisticated military advancements and strategic territorial claims by these nations. However, the timeliness of these modernizations is concerning. The process of upgrading radar, satellite communications, and other surveillance technologies, while critical, is slow compared to the rapid militarization and strategic deployments by Russia and China. This gap presents a significant risk, potentially leaving North American defenses not fully prepared to counter immediate and evolving threats.

Moreover, the environmental and logistical challenges of operating in the Arctic add another layer of complexity to NORAD's readiness. The harsh climate, remote locations, and difficult terrain impede the construction and maintenance of necessary infrastructure, thereby slowing the pace of technological upgrades essential for enhanced surveillance and response capabilities. Collaborations with indigenous communities, while crucial for ensuring the sustainable and ethical development of the region, introduce additional procedural steps that can extend timelines for operational readiness. These partnerships are vital for integrating traditional knowledge into strategic planning and for fostering long-term relationships that support NORAD's objectives. However, they require thoughtful engagement and mutual understanding, which necessitates time and careful negotiation.

In essence, while the strategic modernization of NORAD is imperative for maintaining security and sovereignty in the face of emerging Arctic challenges, there are substantial obstacles that may hinder its timely completion. The accelerating military and strategic interests of Russia and China in the Arctic, coupled with the operational and environmental hardships of the region, create a pressing need for NORAD to expedite its modernization efforts. Ensuring that these updates are implemented efficiently and effectively is crucial.

The modernization of NORAD and the implementation of a comprehensive strategic framework are critical to meeting these milestones, however this will only be possible with a synergistic effect from both nations, the indigenous community, other government departments and all other parties involved. This relationship and central goals will not only counter immediate threats but also establish a robust framework to address future challenges, thereby securing North America's strategic interests in the Arctic amidst rapidly shifting global dynamics.

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