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CANADA

A SECURE AND SOVEREIGN ARCTIC

Report of the Standing Committee on National Defence

Honourable John McKay, Chair

APRIL 2023
44th PARLIAMENT, 1st SESSION

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**Report of the Standing Committee on
National Defence**

**Hon. John McKay
Chair**

APRIL 2023

44th PARLIAMENT, 1st SESSION

NOTICE TO READER

Reports from committees presented to the House of Commons

Presenting a report to the House is the way a committee makes public its findings and recommendations on a particular topic. Substantive reports on a subject-matter study usually contain a synopsis of the testimony heard, the recommendations made by the committee, as well as the reasons for those recommendations.

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THE STANDING COMMITTEE ON NATIONAL DEFENCE

has the honour to present its

THIRD REPORT

Pursuant to its mandate under Standing Order 108(2), the committee has studied Arctic Security and has agreed to report the following:

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LIST OF RECOMMENDATIONS

As a result of their deliberations committees may make recommendations which they include in their reports for the consideration of the House of Commons or the Government. Recommendations related to this study are listed below.

Recommendation 1

That the Government of Canada immediately begin the process to procure undersea surveillance capabilities for Canadian Arctic waters in order to detect and monitor the presence of foreign threats to our national security..... 65

Recommendation 2

That the Government of Canada undertake on an urgent basis a procurement process to replace the Victoria-class submarines with new submarines that are under-ice capable for operations in our Arctic waters. 65

Recommendation 3

That the Government of Canada reconsider its longstanding policy with respect to the U.S. Ballistic Missile Defence program. 65

Recommendation 4

That the Government of Canada urgently address the personnel crisis in the Canadian Armed Forces by fast-tracking the recruitment of new members, aiming to complete the recruitment process in under six months to ensure we have the level of personnel needed to defend our Arctic now and into the future..... 65

Recommendation 5

That the Government of Canada undertake a comprehensive survey of our infrastructure, including military, civilian, and corporate holdings, as well as natural resources, mining and mineral operations in our Arctic for the purpose forward planning for NORAD modernization, developing a strategy for critical infrastructure investments and protecting Canadian interests from malign foreign actors. 65

Recommendation 6

That the Government of Canada invest in the technological training necessary for the Canadian Armed Forces to defend against future threats from new and emerging technologies already in use, and being developed, by our adversaries. 66

Recommendation 7

That the Government of Canada table in the House of Commons the timelines for the enhancement of our Forward Operating Locations in the Arctic, including when they will be able to accommodate the F-35 fighter jet. 66

Recommendation 8

That the Government of Canada prolong the operating season of the Nanisivik naval station in order to expand the availability of critical infrastructure in our High Arctic..... 66

Recommendation 9

That the Government of Canada immediately begin the procurement process to select a new strategic air-to-air refueling capability that can operate in the Arctic. 66

Recommendation 10

That the Government of Canada takes steps to increase the availability of hangarage use in the Arctic, especially in Iqaluit and Inuvik, to ensure that infrastructure remains available into the future..... 66

Recommendation 11

That the Government of Canada initiate the replacement of all outdated aircraft used for surveillance and search and rescue in the Arctic, including the Auroras, Twin Otters and Cormorants..... 66

Recommendation 12

That the Government of Canada proactively engage with our American allies to formulate a plan to intensify the speed with which our NORAD modernization progresses and to meet new air-based and missile threats..... 66

Recommendation 13

That the Government of Canada, when and where possible, in collaboration with territorial and Indigenous governments, as well as Indigenous development corporations, ensure that military infrastructure in our Arctic include dual-use benefits to close the infrastructure deficit in Arctic communities. 67

Recommendation 14

That the Government of Canada increase the presence of the Royal Canadian Air Force and Royal Canadian Navy in the Arctic and ensure the necessary infrastructure and resources are in place to support additional Canadian Armed Forces assets. 67

Recommendation 15

That the Government of Canada increase the presence of the Canadian Armed Forces Reserve in all three of Canada’s Territories in order to assert Canadian security and sovereignty at the extremities of our territory. 67

Recommendation 16

That the Government of Canada, in consultation with Northern and Indigenous communities as well as Indigenous leaders, rapidly increase the pace of development and deployment of clean and renewable energy sources, including possibly Small Modular Nuclear Reactors for the Canadian Arctic in order to provide the clean energy necessary to support NORAD modernization and to stabilize local energy infrastructure needs. 67

Recommendation 17

That the Government of Canada work with Indigenous-led corporations for the provision of subsea fiber optic and other information technology infrastructure projects to provide increased and affordable Internet coverage across the Arctic. 67

Recommendation 18

That the Government of Canada strengthen the review process for the sale of Canadian companies operating in the Arctic to entities owned by or controlled by, in whole or in part, foreign state-owned governments. 67

Recommendation 19

That the Government of Canada proactively ensure that no software or hardware devices used in the upgrade of NORAD infrastructure is developed by or procured from adversarial nations..... 68

Recommendation 20

That the Government of Canada fast-track the renewal of its space-based surveillance system; namely, the RADARSAT Constellation Mission launched in 2019. 68

Recommendation 21

That the Government of Canada immediately increase the Equipment Usage Rate for the Canadian Rangers. Thereafter, the Government should increase the rate annually in accordance with changes in the country’s inflation rate. 68

Recommendation 22

That the Government of Canada enhance professional development opportunities for the Canadian Rangers, including through increased operational experiences and emergency response training. To support an increase in the number of such opportunities, the Government should provide the 1st Canadian Ranger Patrol Group with additional administrative resources. 68

Recommendation 23

That the Government of Canada establish, through the National Search and Rescue Secretariat, a permanent Arctic search and rescue roundtable that includes federal, territorial and Indigenous governments, as well as local first responders. The roundtable should facilitate relationship building, improved communication, and the sharing of best practices regarding search and rescue, and planning for mass rescue operations. 68

Recommendation 24

That the Government of Canada examine opportunities to improve community-based search and rescue capabilities, including through the expansion of Very High Frequency radio capabilities and other communications in the Arctic that support search and rescue efforts. 68

Recommendation 25

That the Government of Canada establish additional marine search and rescue stations throughout the Arctic. 69

Recommendation 26

That the Government of Canada reform domestic defence procurement processes to ensure that major weapons systems and military equipment are delivered to the Canadian Armed Forces more expeditiously and on budget, and to prioritize the development of capabilities that contribute to Arctic defence and security. 69



A SECURE AND SOVEREIGN ARCTIC

INTRODUCTION

The Arctic is a vast, remote and inhospitable region encompassing more than 40% of Canada's land mass and 75% of the country's coastlines. Home to approximately 150,000 individuals, of whom more than half are Indigenous, the Arctic is a complex and challenging operating environment with limited infrastructure and high operating costs. In recent years, climate change, technological advancements, economic opportunities and geopolitics have led the Arctic to become a region of growing international importance and strategic competition, with both Arctic and non-Arctic states expressing political, economic and military interests in the region. The Arctic has historically been a region of co-operation and collaboration, and ensuring that it remains so is a priority for Canada.

The Canadian Armed Forces (CAF) has been engaged in the defence and security of the Arctic for decades, and has taken this responsibility very seriously, especially at the height of the Cold War when the region was both strategically important and a buffer zone between the United States and the Soviet Union. As the Cold War progressed and the threat of military confrontation between those two superpowers and their respective allies intensified, the defence of North America against possible airborne and seaborne attacks by way of the Arctic became imperative.

It was in that context that Canada and the United States formed the North American Aerospace Defense Command (NORAD) in 1958 and that the Government of Canada started to invest in the militarization of the North. The Cold War prompted Canada to build and operate chains of radar stations in the Arctic to detect Soviet bombers and missiles, to conduct regular military exercises and operations in the Far North, and to establish signals intelligence facilities, airfields, depots and other military infrastructure in the region. It was also during the Cold War that the CAF established the Canadian Rangers. A small, mobile force that is part of the CAF Reserve Force, the Canadian Rangers patrol the Arctic from their local communities, and essentially serve as the CAF's "eyes and ears" in the region. Most of the military assets mentioned above have been modernized over time and continue to contribute to Arctic defence and security. In many ways, those Cold War-era investments have been the basic foundations on which Canada has built up its Arctic security capabilities.

With the Cold War long over, Canada now faces a very different world. A new and challenging international security environment has emerged, and climate change is leading the Arctic to be more accessible at a point in time that is earlier than that



expected by most scientists. Geostrategic and economic interests are rising, and the region is no longer regarded as the sole domain of the Arctic states (i.e., Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States). Other countries, like China, are now regarding the Arctic with growing interest. It is anticipated that, within the next few decades, climate change and melting ice in the Arctic will provide improved access to considerable natural resources and will open new maritime trade routes. Greater human activity in the region will increase the frequency of various emergencies, such as search and rescue (SAR) incidents, as well as such other threats as environmental degradation and illegal activities. Moreover, states' competing claims and interests in the Arctic could potentially lead to future tensions in the region.

[General Wayne D. Eyre](#), Canada's Chief of the Defence Staff, and other Department of National Defence (DND) witnesses argue that Canada faces no immediate threat of military attack in the Canadian Arctic but acknowledge that changes in the global threat environment have renewed the strategic importance of the Arctic for the defence of North America. Although Russia's most recent invasion of Ukraine on 24 February 2022 has "significantly impacted Arctic collaboration between Russia and other Arctic states," [Jody Thomas](#), National Security and Intelligence Advisor to the Prime Minister of Canada, asserts that the military security in the Arctic remains stable. While agreeing with DND that – at present – there is "no immediate military threat in the Canadian Arctic," Jody Thomas recognizes that the rapidly evolving strategic environment is underlining the importance of effective safety and security frameworks, national defence and deterrence in the region. That is why efforts are currently underway to improve the CAF's capabilities, mobility and presence in the Arctic.

In this context, on 6 October 2022, the House of Commons Standing Committee on National Defence (the Committee) adopted a [motion](#) to undertake a study on the defence and security of the Arctic. In particular, the motion states the following:

That pursuant to Standing Order 108(2), that the Committee undertake a study on Arctic security that includes but is not limited to: Russia's threat to Canada's Arctic; China's threat to Canada's Arctic; the Security of Canadian Arctic Archipelago; Security of the Northwest Passage and NORAD Modernization; that the committee hold a minimum of 4 meetings; the committee invite the Canadian Armed Forces Chief of the Defence Staff; Chief of Defence Intelligence; Commander of the Canadian Army; Commander of the Royal Canadian Navy; Commander of the Royal Canadian Air Force and the Commander Canadian Joint Operations Command to appear before the committee; that the Committee include

Northern and [I]ndigenous witnesses; and that, the [C]ommittee report its findings and recommendations to the House.

Between 18 October and 8 December 2022, the Committee held 10 meetings on this study and heard from 46 witnesses comprising Canadian federal government and military officials, academics and other stakeholders. The Committee also received written briefs submitted by individuals who did not appear as witnesses. In addition, between 7 and 10 November 2022, the Committee travelled to Washington, D.C., to discuss issues relating to continental defence and security, particularly in the Arctic.

This report summarizes comments made when individuals appeared before the Committee or submitted a brief, as well as other relevant publicly available information. The first section analyzes recent changes to the global security environment and provides an overview of the growing and emerging security threats in the Arctic. The second section examines the ways in which Canada and the CAF monitor security threats and conduct surveillance in the Arctic, identifies gaps in – and the options for enhancing – Arctic domain awareness, and describes ongoing co-operation with the United States to modernize NORAD and make investments that will strengthen Arctic surveillance. Discussing the state of the CAF's operational readiness in the Arctic by focusing on the personnel, equipment, infrastructure, SAR and other resources available both to conduct operations and to respond to threats and emergency situations in the region, the third section also identifies possible areas for improvement. The report concludes with the Committee's thoughts and recommendations.

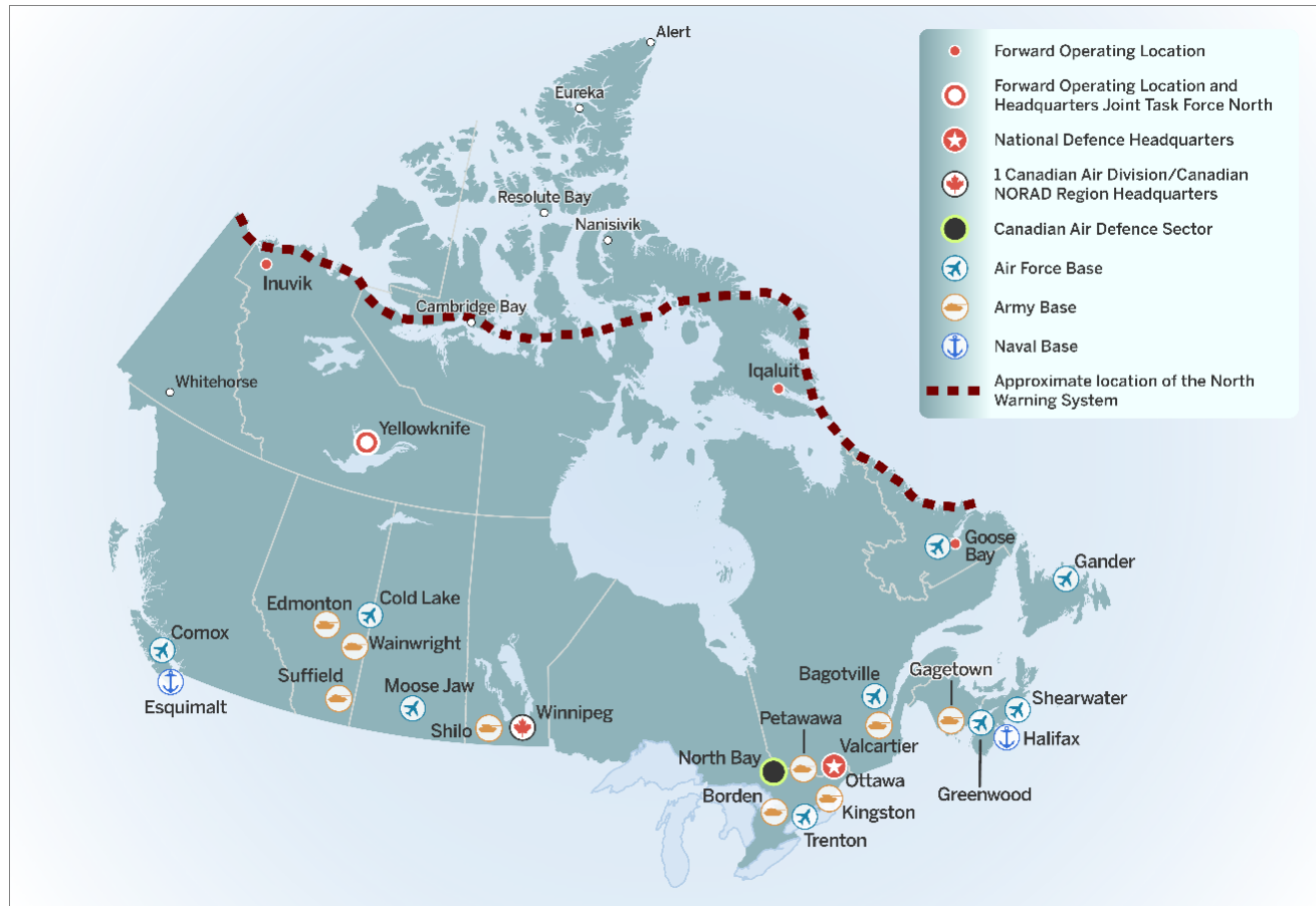


The Arctic Region



Source: Map prepared in 2023 using data from Arctic Council, [Arctic States](#); Natural Earth, [1:10m Cultural Vectors](#), version 5.1.1. The following software was used: Esri, ArcGIS Pro, version 3.0.2.

Selected Canadian Armed Forces Infrastructure Across Canada



Source: Map prepared in 2023 using data from Department of National Defence, [Canadian Armed Forces bases and support units](#) and [North American Aerospace Defence \(NORAD\)](#), presentation by Colonel Paul Prévost (Strategic Joint Staff), 21 April 2016; Natural Resources Canada, [Administrative Boundaries in Canada - CanVec Series - Administrative Features](#) and [Lakes, Rivers and Glaciers in Canada - CanVec Series - Hydrographic Features](#). The following software was used: Esri, ArcGIS Pro, version 3.0.2.



THE ARCTIC THREAT ENVIRONMENT

The threat environment in the Arctic has been evolving in recent years due to the changing climate, developing geopolitical situations, increasing economic opportunities, advancements in technology and other factors. In particular, relations have been deteriorating and tensions have been growing between the North Atlantic Treaty Organization (NATO) countries and Russia since the latter's most recent invasion of Ukraine, which is having an impact on the Arctic.

For most witnesses, the security situation in the Arctic is characterized by peace, co-operation, stability and no imminent military threat. However, several shared their concerns about how the return of great power competition, the rapidly changing global security environment, and rising tensions with increasingly aggressive authoritarian, revisionist, and expansionist states – like Russia and China – threaten the status quo in the Arctic.

General Eyre noted that “the world is more dangerous now than at any time since the Cold War, and maybe even since the eve of the Second World War,” adding that “strategic competition once again dominates the geopolitical landscape” and that “the rules-based international order that has underpinned our peace and prosperity for 80 years is fragile and threatened and needs to be defended.” According to Kevin Hamilton, Global Affairs Canada's Director General of International Security Policy, the “Arctic region remains peaceful” and has been “a region of international co-operation and peace” since the end of the Cold War. That said, he cautioned that the Arctic “is not tension-free,” and stressed the need to “remain alert to the impact of ongoing geopolitical conflict and the activities of our adversaries.”

In this context, witnesses focused on how the term “threats” should be defined in the Arctic context and discussed the challenges of climate change, geopolitics and global power competition, and the individual and joint ambitions and activities of Russia and China.

Defining Arctic Threats

Lieutenant-General (Retired) Alain Parent defined the term “threat” as a “calculus of capabilities and intent” to harm, and Lieutenant-General (Retired) Walter Semianiw explained that capability and intent “come together to define whether or not [a particular threat is of] a low or a high risk.”

Witnesses asserted that Canada currently faces no military threats from any states. [General Eyre](#) commented that there is “no real threat today to [Canada’s] territorial sovereignty; nor do I see one in the near future.” Similarly, [Kevin Hamilton](#) mentioned that “Canada's Arctic sovereignty is of long standing and is well established.” He emphasized that, “every day, through a wide range of activities, governments, indigenous peoples and local communities all exercise Canada's enduring sovereignty over our Arctic lands and waters.”

However, acknowledging that “today, [the CAF does not] see a clear and present threat to our sovereignty,” [General Eyre](#) warned that “we cannot assume that this will always be the case,” adding that, “in the decades to come, ... that tenuous hold that we have on our sovereignty at the extremities of this nation, is going to come under increasing challenge.” In particular, he drew attention to the complexity and unpredictability of the rapidly changing global security environment, and suggested that growing competition from authoritarian states – like China and Russia – has led Canada and its allies to no longer have the “luxury of being able to laser-focus on a single strategic competitor” and to “live in a tri-polar security environment where liberal democracies must divide their attention between two competitors who employ different strategies but pose the same danger to this security and stability.”

Underscoring the ambitions of China and Russia in the Arctic, as well as Canada’s limited current presence in the region, [General Eyre](#) said that Canada should “invest in [military] capabilities today that will be with us for decades to come” so that the country will be in a better position to deal effectively with potential future threats to its Arctic sovereignty. In his opinion, “as Russia, China and a host of other countries express interest in the Arctic, the politics of the region become more complex, and the danger of escalation sparked by miscalculation, miscommunication or misunderstanding becomes more acute.”

Although witnesses generally agreed that Canada faces no immediate military threat from other countries concerning its sovereignty, some pointed out that the country still faces other types of threats and challenges in the Arctic. [Dr. P. Whitney Lackenbauer](#), Professor and Canada Research Chair in the Study of the Canadian North at Trent University, categorized those threats as being of two types: those transiting through or over the Arctic, and those to or in the Arctic.

[Dr. Lackenbauer](#) described the former type of threats as being mostly of a military nature and aiming to strike at targets outside of the Arctic. As he indicated,

[t]hese are things like cruise missiles, hyperkinetic glide vehicles, ballistic missiles, bombers and submarines. ... These weapons and delivery systems are not primarily



oriented at striking Arctic targets; they're geared toward global balance of power and deterrence, and thus best situated on the international level of analysis. ... That stated, they do have an Arctic nexus, because [Canada and the United States] have invested in or are investing further in Arctic capabilities to detect, deter and defend against these global threats.

That said, [Dr. Lackenbauer](#) also argued that most of the threats to the Arctic are non-military, although “some theoretical threats are kinetic military threats.” Stating that – in the unlikely event of a war – radar stations, signals intelligence facilities, airfields and other military infrastructure in the Arctic might be targeted because of their strategic significance, he continued:

I don't typically consider traditional military threats as the most acute security threats to the North American Arctic. Instead, I think of foreign interference, including misinformation campaigns designed to undermine the credibility of the Canadian state or to polarize debate on sensitive issues and widen existing fault lines, intending to destabilize our democratic societies. This category could also include a below-the-threshold [cyber] attack on a piece of critical infrastructure that is designed to create panic to force the Government of Canada to redirect resources in efforts to deal with that problem.

In addition, he referred to climate change and pandemics as threats emanating from outside of the Arctic that could negatively affect the region.

Climate Change and its Arctic Impacts

Witnesses described climate change and its Arctic impacts as being the most pressing threats for Canada in the region. [Jody Thomas](#) said that “climate change remains the most prominent and visible threat to the Arctic and all its inhabitants.” As well, she remarked that the Arctic is warming at a rate that is four times the global average, resulting in melting sea ice, rapid coastal erosion, increased precipitation, permafrost degradation, deteriorating infrastructure and the migration of invasive species. Furthermore, she pointed out that the rapid warming of the Arctic is improving access to northern resources and leading to the possible development of new shipping routes in the Arctic Ocean. Jody Thomas also cautioned that, with the Arctic “warming faster than the rest of the globe ... hydrocarbons, rare earth minerals and [other resources] that are of interest are more accessible.”

[Jody Thomas](#) notes that the short navigation season, narrow waterways, volatile ice conditions, insufficient mapping to modern standards and lack of support infrastructure currently pose severe challenges to navigation in the Arctic, which has security implications and create demands concerning – among others – domestic emergency

response, navigational safety and SAR operations. Similarly, [Vice-Admiral Angus Topshee](#), Commander of the Royal Canadian Navy (RCN), warned that “climate change is not something that’s necessarily going to make the north more accessible at sea.” In his view, climate change makes navigation in the Arctic “more unpredictable and in some ways more dangerous” because it “move[s] the ice up against the western edge of the Arctic archipelago,” displaces icebergs, and “can create storms and other phenomena that complicate the situation in the north.”

Recognizing that geopolitical tensions are “front of mind” today, [Kevin Hamilton](#) commented that it is “important to remember that global climate change remains a grave threat to the Arctic and to its people, including northern indigenous communities.” He added that, as climate change makes the Arctic more accessible, “international activities and interests will continue to grow, including from some states that do not share our values,” such as China and Russia. Moreover, according to him, “Canadians have long benefited from the protection afforded by geography, particularly the geography of our northern approaches,” but, “as the Arctic will continue to gain in strategic importance in the years and decades to come, the natural protections once afforded by an ice-covered and distant Arctic will no longer be sufficient to guarantee Canada's security and sovereignty.” For that reason, Kevin Hamilton thought that Canada should continue to work with regional allies and partners to “minimize and manage regional tensions, to confront threats and to respond to shared challenges.”

In [Dr. Lackenbauer](#)’s opinion, “climate change is the existential threat to humanity” and is “a clear and present danger” to the Arctic, where its impacts are “most directly and urgently playing out ... right now.” He described the main threats in the region as being “primarily on the soft security and safety side of the operational mission spectrum, meaning threats associated with environmental and climate change as well as major air disasters or maritime disasters.” In addition, he said that threats in the Arctic include the impacts of climate change on Arctic military operations and on critical infrastructure, including defence installations.

[Dr. Stéphane Roussel](#), Professor at the National School of Public Administration, expressed similar views, stating that the “main concern” in the Arctic is the impact of climate change and the resulting increased human activity in the region over the next decades, particularly relating to tourism, scientific research, fishing and other economic activities. He contended that greater human activity in the Arctic will be the CAF’s main challenge in the coming years. Dr. Roussel emphasized that Canada’s military is “usually the main tool” that the Government of Canada uses “to act in a region as isolated as [the Arctic],” and indicated that the CAF increasingly provide SAR, as well as humanitarian assistance and disaster relief during domestic weather-related emergencies. He



speculated that “there will be more calls upon the armed forces and more pressure on them” to deploy and operate in the Arctic.

Drawing a distinction between the resources available in Canada’s South and in the North, [Dr. Rousset](#) noted that the former “has other resources to fall back on before calling in the [CAF]” for assistance during a disaster or other domestic emergency, while such “is not the case in the North.” Furthermore, he mentioned that “conditions are extremely difficult, and there are simply not enough resources to face an environmental disaster, a major air crash or a shipwreck” in the Arctic, and asserted that – at present – “only the Canadian Armed Forces have the necessary resources” to respond to such incidents in the region.

Geopolitics and Global Power Competition

Witnesses characterized great power competition and rising tensions with Russia and China, and their impacts on the Arctic, as main challenges for Canada. [Jody Thomas](#) said that the Arctic is “an area of high interest for allies and adversaries,” and commented that climate change – which is rapid and enduring – is making the region more accessible for navigation, with commercial and military technologies also connecting the North to the rest of the world and thereby eroding the Arctic’s historical isolation from geopolitical affairs. In her view, Canada and like-minded Arctic states continue to “promote a low-tension vision for the region,” although this vision is “increasingly complicated by current geopolitical frictions, strategic competition and an ever-growing number of states, both friendly and adversarial, seeking access and influence.” Moreover, according to her, “while Canada continues to see no immediate threat of military attack to the Canadian Arctic, the Arctic region is generally seen by Canada and its allies as a theatre of competition and potential instability.” She underscored the importance of effective safety and security frameworks, strong alliances and credible deterrence in the region.

As well, [Jody Thomas](#) noted that “adversarial states [like Russia and China] are increasingly active in the region,” and are “building Arctic-capable military equipment with the goal of seeking to secure control over strategic assets and resources.” In her opinion, such states “are also looking to make economic investments, which could be leveraged for coercive effect.”

That said, most witnesses predicted that war among the Arctic states is highly unlikely. [Dr. Lackenbauer](#) stated that, when compared to other regions of the world, most Arctic states believe that there is a relatively low risk of armed conflict in the region. Furthermore, he speculated that there is probably not a “greater likelihood of interstate

conflict arising over Arctic disputes over resources, Arctic boundaries, Arctic state sovereignty or commercial access to shipping lanes than there was nine months ago or even five years ago.” However, he observed that “forms of interstate competition are already occurring below the threshold of armed conflict” in the Arctic, emphasizing that hybrid warfare, cyber attacks, cyber espionage and disinformation campaigns have become “central pillars” of Russian and Chinese approaches to strategic competition and warfare around the world. Moreover, [Dr. Anessa Kimball](#), Professor at the Université Laval, cautioned that “increasing militarization of the region due to great power competition significantly raises the risk of accidental crises.”

Witnesses maintained that recent geopolitical changes and the return of great power competition is having – and will continue to have – an impact on Arctic security in the years to come. [Dr. Robert Huebert](#), Associate Professor at the University of Calgary, considered the geopolitical threat to Canadian security, particularly in the Arctic, to be “one of the critical existential threats that Canada faces to its security.”

[Dr. Aurel Braun](#), Professor at the University of Toronto, described the Arctic as “a vast and forbidding region that is also enormously important strategically, [holding] as much as 25% of the fossil fuel reserves in the world.” Noting the growing competition from some countries – like Russia and China – to access those resources, he commented that Canada and other Western countries have been slow to recognize the growing geostrategic importance of the region, and emphasized that their historical tendency has been to regard the Arctic as “a zone of peace and co-operation, where the priorities are cultural exchanges, rescue operations and aviation regulations,” rather than a “centre of geostrategic interest.” In Dr. Braun’s view, “this attempt to segregate the region from global geopolitics has been a naïve ... mirage of wishful Western thinking.” He argued that Canada and other Western countries “face a harsh geopolitical reality” in the Arctic, a region in which the political, economic, environmental and military domains are “deeply interrelated” and in which “Russia plays an outsized role that has been complicated further by climate change and the evolution of Russian-Chinese relations.”

Witnesses highlighted new military technologies that pose a significant challenge for armed forces worldwide. According to [General Eyre](#), they are “changing the character of conflict.” In particular, witnesses drew attention to the proliferation of unmanned aerial systems and long-range, high-speed cruise missiles, the rapid development of hypersonic and autonomous weapon systems, and emerging threats in the space, artificial intelligence and cyber realms. For them, combined with existing military threats and a changing global security environment, these technologies require Canada and countries around the world to adapt continually to a multi-domain threat environment. As well, witnesses acknowledged significant investments by China and Russia in



modernizing their militaries, including to equip them with the latest military technologies and capabilities in order to have an edge in combat against potential adversaries. They specifically mentioned these countries' investments in hypersonic weapons, ballistic and cruise missiles, and autonomous weapon systems.

[Dr. Huebert](#) characterized “weapon technology” as an important part of the geopolitical threat to Canada. He stated that, since 1999, Russia has “embarked upon a policy of developing a range of not only offensive, conventionally powered weapon systems, but also nuclear-powered weapon systems.” In his opinion, Russia’s “big breakthrough” is the ability to use long-range underwater vehicles, such as the country’s Poseidon nuclear torpedoes. Explaining that Russian investments in weapon technology are a threat because of that country’s geography and proximity to the Arctic, he contended that “[m]any of these weapon systems, both in terms of their surveillance communications but also the means of delivery, are based in the [region].”

For witnesses, the rapid advances in military technologies have an impact on Arctic security. [Jody Thomas](#) underlined that the Arctic remains a strategically important region for continental defence because the northern approaches to North America “continue to present a potential avenue of attack.” She elaborated by saying that:

Rapid technological changes—including in cruise missiles and hypersonic technology—and the rise of competition in new domains, such as space, emerging technologies, and cyber, are impacting the way states pursue their interests. These changes also enhance their ability to project military force in the Arctic and hold North America at risk.

That said, [Jody Thomas](#) also noted that growing tensions with Russia about its invasion of Ukraine led Canada and like-minded Arctic states to work together closely “to ensure Arctic tensions are responsibly managed.” In her view, circumpolar collaboration and co-operation among the Arctic states will be essential to minimize and manage tensions in the Arctic, as well as to ensure that the region remains peaceful, co-operative and safe.

The Russian Threat

Witnesses described Russia as a growing threat to Canada and its allies in the Arctic, expressing particular concerns about Russia’s militarization of its Arctic region, its increasingly aggressive posture against neighbouring states and its complete disregard of international borders. [Kevin Hamilton](#) summarized those concerns in the following way:

Russia's continued military buildup and weapons testing in the Arctic remains troubling in and of itself, but its unprovoked invasion of Ukraine demonstrates Russia's complete

lack of respect for international principles of sovereignty and territorial integrity, fundamental principles that underpin co-operation in the Arctic.

Sharing similar views, [General Eyre](#) stated that “Russia's illegal war in Ukraine not only is an alarming demonstration of Russia's disregard for established international borders, but also has important implications for Arctic security.” He added that Russia has made it clear to the world that it considers the Arctic to be of “great importance to its security and its economic interests—and continues to increase its military presence there.”

As well, witnesses discussed the growing tensions between NATO countries and Russia over the latter's invasion of Ukraine and identified potential repercussions in the Arctic because these tensions have spilled over into regional circumpolar affairs. [Dr. Lackenbauer](#) referred to the temporary pause in the Arctic Council's activities by Canada, Denmark, Finland, Iceland, Norway, Sweden, and the United States in March 2022, and – recently – the limited resumption of the Arctic Council's work without Russia. [Kevin Hamilton](#) remarked that “[I]ike-minded Arctic states have responded in a strong and concerted manner” by “discontinuing their cooperation with Russia in regional forums such as the Arctic Council.” Furthermore, [Dr. Lackenbauer](#) stressed the need for Canada “to maintain Arctic peace and civility while supporting [its] principled stand against Russian aggression,” and to consider how the country and its allies can “avoid an increasingly destabilizing security dilemma vis-à-vis Russia in the Arctic.”

[Major-General Michael Wright](#), Commander of Canadian Forces Intelligence Command and Chief of Defence Intelligence, asserted that “Canada faces threats from Russia,” and underlined that “Russia has military capabilities in the Arctic and could decide to move from its current defence posture to offence.” [General Eyre](#) noted that, “even though Russia is focused on Ukraine and its land forces are getting pretty chewed up there,” Russia still retains “significant capability in the other domains: cyber, space, air, maritime, surface and subsurface.” Mentioning that threats are a combination of capabilities and intent to harm, [Lieutenant-General \(Retired\) Parent](#) warned that “Russia has increased its [military] capabilities for the Arctic” in recent years and – as demonstrated by the evolution of that country's war against Ukraine – its “intent is now nebulous and subject to miscalculation.” Similarly, [Kevin Hamilton](#) acknowledged that “Russia's continued military buildup and weapons testing in the Arctic remains troubling in and of itself,” and highlighted that the country's “unprovoked invasion of Ukraine demonstrates Russia's complete lack of respect for international principles of sovereignty and territorial integrity, fundamental principles that underpin co-operation in the Arctic.”

According to [Dr. Michael Byers](#), Professor and Canada Research Chair in Global Politics and International Law at the University of British Columbia, “Russia is a significant security threat to Canada, including in the Arctic, and has been since the 1950s.” He



commented that, “through long-range bombers carrying nuclear warheads through to the development of intercontinental ballistic missiles and through today to the development of cruise missiles and hypersonic missiles, Russia is a threat to North American security” He drew attention to the aggressive international behaviour of Vladimir Putin’s regime in recent years, especially since the invasion of Ukraine, contending that the Russian “threat is greater now than it has been at any point” since the Cuban missile crisis in 1962 and arguing that “[w]e live in dangerous times in terms of the Russian threat to North America.”

[Dr. Braun](#) indicated that Russia is the largest Arctic state and has concerns and interests in the Arctic that are legitimate. In his opinion, “no other country has as significant a percentage of its population or derives as much of its [gross domestic product, or GDP] from resource extraction and shipping in the region.” He contended that the Arctic accounts for at least 20% of Russia’s GDP, compared to 1% for the United States, and suggested that Russia’s “significant” threat in the Arctic derives from motives and ambitions that “go far beyond [the country’s] legitimate national interests.”

As well, [Dr. Braun](#) referred to three areas of concern regarding Russia and the Arctic. First, characterizing the Putin regime as an “increasingly repressive personalist regime” that faces domestic challenges in terms of its political legitimacy, succession, economic future and national identity, he speculated that the regime has been trying to divert attention away from its domestic repression and its “failure to create a successful modern state” by pursuing increasingly aggressive foreign policies and resorting to “external aggression.” In his view, the Arctic is not immune to such Russian aggression. Second, Dr. Braun explained that, with an economy highly dependent on energy extraction and with more than 60% of the value of the country’s exports comprising fossil fuels, “Russia has made the Arctic central both to its economy and to its political and military strategy.” He also described Russia as an “extremely poor custodian of the fragile ecosystem of the Arctic” because the country has engaged in massive and risky exploration and has moved “from pipeline diplomacy to weaponizing energy.” Finally, Dr. Braun referred to Russia’s recent “engag[ement] in a massive military buildup” in the Arctic, including a series of sophisticated and state-of-the-art nuclear weapon and advanced anti-aircraft systems. According to him, Russia has “more [military] bases north of the Arctic Circle than do all other countries combined” and owns “more heavy icebreakers than all other states.”

Although he did not believe that there is a threat of Russia invading the Canadian Arctic, [Dr. Braun](#) asserted that, as long as Russia “remains a dictatorship with a failed economy that looks for political legitimacy via foreign adventures,” is “energy-dependent” and “continues to drift from junior Chinese partner to a vassal [of China],” Russia is a

“growing threat” in the Arctic that Canada should address “with prudence,” including through having “a military capacity that is effective and credible.”

However, not all witnesses regarded Russia as a military threat in the Arctic. [Dr. Adam Lajeunesse](#), Associate Professor at St. Francis Xavier University, said that “Russia is not strong or confident in the Arctic” and, instead, is “terribly insecure and vulnerable.” Emphasizing that Russia has more than 24,000 kilometres of Arctic coastline to defend and that the Russian Arctic is home to much of that country’s strategic nuclear capability, a strategic sea route, some of the world’s largest natural gas and oil deposits, and numerous mining operations, he argued that “Russia’s northern military deployments are rooted not in confident visions of power projection, but rather in a terrible sense of insecurity that these vulnerable resources and industries are at risk.” Dr. Lajeunesse maintained that most of the weapon systems that the Russians have deployed in the Arctic are essentially defensive in nature, commenting that:

Russia’s vulnerability stems primarily from what it has in the Arctic. Unlike North America, Russia’s economy is very closely tied to assets that are located in the Arctic. ... The fact that it has a lot of very valuable, very vulnerable assets in the north is where that insecurity comes from.

Similarly, [Dr. Roussel](#) stated that “Canada’s military interests in the Arctic are not threatened, “whether it be in the short or medium term. ... [T]he hostilities and tensions with Russia will [not] have a direct and immediate impact on Canadian interests in the Arctic.” In his opinion, “Russia has not staked any claims to Canadian territory” and “has no strategic interest” in doing so. He also mentioned that a Russian invasion or occupation of Canadian territory in the Arctic would constitute “an attack on Canadian territory as per Article 5 of the North Atlantic Treaty” and would result in a military response by NATO. Agreeing with Dr. Roussel, [Dr. Byers](#) indicated that:

Russia is not going to invade the Canadian Arctic. ... Russia already owns half of the Arctic, incontestably. Russia doesn’t need any North American Arctic, and Russia would lose very badly, faced with the combined response capability of NATO, including the United States, so an invasion, in terms of attempting to conquer territory, is just not on their cards.

Regarding concerns about Russia’s militarization of the Arctic, [Kevin Hamilton](#) stressed that “the buildup” is in the Russian Arctic on the country’s Arctic territories. He added that, “from a purely military point of view, we don’t detect that land-based or sea-based buildup as a direct threat inasmuch as we don’t perceive the Russians trying to initiate an attack against the Canadian north.” That said, in his view, the Putin regime’s aggressive nature “does give us concern” because “[w]e’ve seen that [the Russians] have very little to no regard for international law, so even though we don’t see the material



buildup prima facie as a particular threat aimed at Canada, we do see the politics surrounding that kind of military buildup as a matter of concern.”

According to [Dr. Roussel](#), even though Russia is not a military threat in the Arctic at the moment, the country still represents a “threat to Canada, especially in terms of disinformation and cyber attacks.” He underscored that Canada has already been the target of Russian disinformation and cyber attacks that have disrupted computer systems, and contended that those “threats also target the Arctic, because the Internet connections in many [northern] communities are vulnerable to these types of attacks.”

[Dr. Lackenbauer](#) and [Dr. Byers](#) distinguished between Russia’s threat in the North American Arctic and in the European Arctic. In Dr. Lackenbauer’s opinion, there is a tendency to regard the Arctic as a single geopolitical space and “some issues and threats are truly circumpolar in orientation, [but] other aspects are best considered through a sub-regional perspective.” He noted that some “threats to the European Arctic ... are substantively different from threats facing the Canadian Arctic,” and – providing the example of Russian land forces along the Arctic borders of the Nordic states of Europe, particularly Norway and Finland – claimed that this threat “represents a very different situation from what we face in Canada,” which shares no land border with Russia. Suggesting that “most of the action right now” is in the European – not the Canadian – Arctic, Dr. Byers elaborated by saying that:

It’s in the North Sea, the Norwegian Sea and the Barents Sea. The preponderance of Russia’s military strength, its non-army military strength — naval, air force, [intercontinental ballistic missiles] — is in northwestern Russia in the Russian Arctic, predominantly on the Kola Peninsula. Their access to the world’s oceans is through the Greenland-Iceland-United Kingdom gap, and NATO naval forces and air forces are very active in dealing with Russian activity in that area.

[Dr. Byers](#) also commented that Russia’s submarine activity in the European Arctic has increased in recent years and is now comparable to the level during the latter part of the Cold War.

Concerning the North American Arctic, [Dr. Huebert](#) observed that the threat derives from Russian long-range bombers, submarine-launched missiles, intercontinental ballistic and cruise missiles, and hypersonic weapons. In his view, the threat to Canada would be in the aerospace and maritime domains, specifically from the “[Russian] air force and the navy ..., not [Russian] land forces.”

The Chinese Threat

Witnesses drew attention to China and its ambitions in the Arctic. [General Eyre](#) underscored that “China, which has declared itself a near-Arctic state, also has aspirations of northern influence,” and asserted that the country’s “polar silk road ambitions include using the Northern Sea Route through Russia's Arctic to import energy and export goods.” [Kevin Hamilton](#) said that “Chinese interests in the Arctic are mirrored by Chinese stated and manifest interests in a great number of regions around the world.” Characterizing China as expansionist, he pointed out that “the Arctic is just one piece” of a plan to project power and influence around the world.

According to [Dr. Braun](#), Canada has to “confront the reality” that “China is becoming increasingly interested in the Arctic” from the perspectives of resource extraction and of developing a “polar silk road” to market products globally. Agreeing with Dr. Braun, [Dr. Byers](#) contended that China's principal interests in the Arctic over the last decade have been access to shipping and to resources. [Dr. Kimball](#) concurred with Dr. Byers, adding that the Chinese regard the Arctic as “a new frontier where there are available resources and where they have exploration and mining rights” and maintaining that the country “continue[s] to look for a spot where they could establish a toehold in the region.” In [Dr. Huebert](#)’s opinion, “Chinese security interests [in the Arctic] cannot be underestimated.”

Recognizing that the designation has no legal meaning, witnesses nevertheless expressed concerns about China’s assertion that the country is a “near-Arctic” state. [Dr. Lackenbauer](#) suggested that “[w]e need to continually remind China that ‘near-Arctic state’ is an idea with no legal status. ... [China has] international rights as an international actor, like everybody else in areas beyond national jurisdiction in the Arctic. [China has] no special status.” He encouraged Canada to be careful about its rhetoric concerning China, arguing that Canada should not “elevate” China to the “status of a peer competitor in the Arctic itself.” Dr. Lackenbauer stated that, because China is “not an Arctic state,” it has “none of the sovereignty or rights associated with being an Arctic state.”

That said, [Dr. Byers](#) acknowledged that China’s increasing power and centralization of authority under President Xi Jinping constitutes both a global threat and a “major concern” – although not yet an “imminent” threat – for Canada. [Dr. Lackenbauer](#) urged caution, noting that “China does represent risks in our Arctic,” such as “through economic activities and concerns about science and research security.”

Similarly, [Kevin Hamilton](#) highlighted that Canada does “not perceive a military threat, a sea-based military threat, from China in the Canadian Arctic” now or at any reasonable foreseeable time in the future. However, he speculated that “there is a potential for



challenge to our sovereignty in the Arctic.” He added that China is increasing its military projection capabilities globally, including in the Arctic, but asserted that the country does not – at present – have the capability to project military power towards the Canadian Arctic. Indicating that the Chinese can deploy occasional surface vessels – such as icebreakers – to the Arctic, and can undertake activities that might be of concern to Canada in the region, he maintained that the projection of a Chinese “blue-water military capability across the Pacific [Ocean] towards our Arctic is not something [that Canada] assess[es] as a challenge right now,” although “it is very likely that it will become a challenge in the future.” [Major-General Wright](#) emphasized that “China is in the midst of exploring options and conducting tests in the Arctic,” and said that Canada is aware of China’s “military ambitions for the region.”

In [Kevin Hamilton](#)’s view, although China is not currently a military threat in the Arctic, the country does represent a threat in other domains. He stated that “[w]e have seen nefarious Chinese activity aimed at Canada through hybrid threats, through cyber activities and predatory investment attempts, so we are monitoring those issues very carefully.” Moreover, [Vice-Admiral Topshee](#) noted that, while not posing “a direct threat” to Canada at this time, China does constitute “an indirect threat to the international order based on rules and standards,” including in the Arctic. Regarding China’s respect for – or acceptance of – the legal and political status quo in the Arctic, as well as that country’s international behaviour and aggression directed to Taiwan and other countries, [Dr. Braun](#) mentioned a lack of “confidence that China will respect international legality.” According to him, in its relationship with China, Canada has learned to be both “extremely careful” and “wary about handing anything over to China.”

China–Russia Co-Operation

Mentioning China–Russia relations and the two countries’ intensifying co-operation in the Arctic, witnesses described both situations as a source of growing concern to Canada and its allies. In their opinion, having those two revisionist and expansionist countries working together as allies in the Arctic could pose a serious challenge to Canada and Canadian interests in the region in the coming years. [Major-General Wright](#) indicated that China–Russia co-operation in the Arctic “would pose significant threats to Canada’s ability to protect its sovereignty.” Agreeing with Major-General Wright, [General Eyre](#) emphasized that “Russia seeks to undermine a rules-based international order, while China seeks to bend it to its advantage.” [Dr. Justin Massie](#), Professor at the Université du Québec à Montréal, said that “the international order as we know it is becoming fragmented” and more volatile because of the “consolidation of the Sino-Russian axis” and because Western countries are “consolidating into a bloc.”

[Dr. Braun](#) outlined the reasons for increasing China–Russia co-operation in the Arctic, stating that “Russia has a very powerful military presence and a growing one in the Arctic,” but has a “rather small economy,” resulting in “Russia need[ing] Chinese assistance.” He argued that, in contrast, China has a large economy, as well as many financial and other resources, but needs energy and trade. Furthermore, Dr. Braun remarked that “China understands that the Arctic is important because there are so many fossil fuels in that region,” which is the reason for that country’s support for Russian exploration in the Arctic. In his view, China also wants to develop the Northern Sea Route because it would “cut down 30% of the time and distance of shipping things from Asia to Europe” and would increase China’s potential as an exporter.

However, [Dr. Braun](#) also asserted that the relationship between China and Russia has been changing in recent years, evolving from a partnership to a relationship “where Russia may become more and more of a vassal state [of China],” in which case “China would dictate according to its own needs, which is to have unbridled exploration for resources in the Arctic.” He warned that, if that situation were to occur, China “would ... have control with Russia of the Northern Sea Route, and that would present another kind of danger to us.” Dr. Braun maintained that, although “China’s actions in the Arctic are not predominantly military per se,” the Chinese are “acting together with Russia, and Russia has heavy and growing military investment” in the region, which he characterized as “worrisome.”

[Dr. Braun](#) expressed concern that Canadians are spending too much time “trying to reassure [themselves] that there’s no real external threat” in the Arctic, that the Arctic is – and always will be – a region unaffected by geopolitics and tensions between states in other regions of the world, that peace and international co-operation will continue to prevail, and that Russian and Chinese threats in the region are “indeterminate, distant and insignificant.” According to him, those are “false assurances” that diminish the “very significant threats that have been building up” in recent years. Drawing attention to the military expansionism and aggressive behaviour of China and Russia on the international stage, he commented that those two states are increasing co-operation in the Arctic region and urged Canada to have “a reality check.”

That said, [Dr. Byers](#) suggested that China and Russia “are not friends” but instead are merely “allies of convenience,” explaining that the two countries

are not friends in the way that Canada and the United States are friends. ... I don't see [the China–Russia] relationship becoming much closer in terms of trust or in terms of integrating their militaries. However, ... Russia is the weaker power, and China is rapidly becoming more powerful. ... [Moreover], Russia and potentially China could begin to cause problems. ... We could see low-level harassment in the Canadian Arctic, so we do



need to step up our surveillance capabilities. ... We need to keep our eyes on what's happening.

[Dr. Byers](#) also asserted that it is important not to disregard Russia's Arctic sovereignty and sovereign rights as an Arctic state, both of which China lacks. Agreeing with Dr. Byers, [Kevin Hamilton](#) highlighted the "friction" between China and Russia because of the former's growing ambitions in the region, stating that "[t]he Russians have a great deal of concern about this Chinese polar silk road concept because it comes so close to Russian territory" and competes with Russia's interests in the Arctic. He added that the Russians also have concerns about unauthorized Chinese exploitation of precious resources in the Russian Arctic.

DOMAIN AWARENESS AND SURVEILLANCE IN THE ARCTIC

Domain awareness is a critical component of Canada's approach to Arctic security and sovereignty, and surveillance of the region is key to identifying and responding to threats in the Arctic. Indicating that threats can exist on land, at sea, in the air, in space and in cyberspace, [General Eyre](#) stated that "having knowledge and expertise in every domain in the far north is paramount," adding that "having the capability to respond to threats in each of those domains is crucial." [Vice-Admiral J.R. Auchterlonie](#), Commander of Canadian Joint Operations Command, made the same point when stressing the importance of multi-domain awareness in the Arctic. According to him, "[a]ll-domain awareness is critical. When I talk about multidomain awareness, what I mean is what we are seeing in the air, on the land, in the sea and below the sea, in the information space, in space and in cyber." Moreover, in his opinion, Canada needs to "have that all-domain awareness in all theatres of operation, but specifically in our north, to make sure that we know what's going on. ... within our sovereign territory, waters and airspace."

Notwithstanding current efforts to strengthen Canada's domestic and continental defences, including through NORAD modernization, witnesses emphasized that a number of challenges need to be addressed in order to avoid capability gaps in Arctic surveillance in the coming years. In particular, they underscored Arctic domain awareness and surveillance, NORAD and its modernization, missile defence, and various ways in which Canada could strengthen its surveillance capabilities in the Arctic.

Domain Awareness and Surveillance

Witnesses repeatedly mentioned that the Arctic is an enormous, complex and challenging region to monitor. [Brigadier-General Pascal Godbout](#), Commander of Joint Task Force North, indicated that "the Canadian north is a truly unique environment." He

also pointed out that, although the Arctic represents more than 40% of Canada's land mass, the region is "very sparsely populated, with only 0.4% of the Canadian population living there." Brigadier-General Godbout also drew attention to the Arctic's "very limited infrastructure in terms of transportation, energy and communication." Agreeing with Brigadier-General Godbout, [Jody Thomas](#) described the region as a difficult and unforgiving environment, "with a harsh climate, sparse population, limited physical and digital infrastructure and high operating costs."

Noting that the significant challenges encountered when surveilling such an enormous territory are not new, [Dr. Roussel](#) commented that, "up to now, no Canadian government, even during war times, has been able to find a satisfying solution to the issues facing a region as large as the Arctic." In his view, the surveillance challenges that the CAF currently face in the Arctic are perfectly normal, with the CAF "experiencing [those challenges] for a very long time."

According to [Vice-Admiral Topshee](#), "the real issue is our ability to ensure surveillance across the entire Arctic region." Suggesting that he "wouldn't say [that Canada's] current surveillance capability is poor," he acknowledged that there is room for improvement and maintained that "many initiatives are under way" to improve Arctic domain awareness. In his opinion, the "modernization of NORAD will help us enhance our Arctic surveillance capability in every domain, especially the maritime domain."

Similarly, [Dr. Lackenbauer](#) argued that "improved domain awareness and information dominance are key" to Canada's security in the Arctic, contending that the focus of such efforts is "gathering, analyzing and sharing information at the speed of relevance, not only among decision-makers within Canada but also among our allies and partners." He asserted that domain awareness and surveillance are areas in which Canada should both invest and seek to excel. Likewise, [Dr. Byers](#) said that, "[i]n terms of the Arctic, we need to maintain and improve our capability to see what's going on there. That's the first step." He stated that the Arctic is "a very, very big region" and "very hostile," and particularly identified Russia as a main "threat to Canada" in the Arctic. He claimed that Russia is increasing its arsenal of nuclear missiles, including ballistic and cruise missiles and hypersonic weapons, and commented that – consequently – Canada must improve its surveillance capability in the Arctic. In his view, Canada "should improve [its] ability to see what's going on in airspace, including space, [and] tracking potential missiles and tracking what's happening on the ground," as well as at sea, both on the surface and under water.

Witnesses described Arctic domain awareness and surveillance as a whole-of-government effort involving co-operation among various federal departments and



agencies, as well as information sharing with numerous domestic and international organizations. [Vice-Admiral Topshee](#) drew particular attention to “very strong co-operation” at the federal level “when it comes to surveillance in the Arctic ... thanks to Canada's three maritime security operations centres, where a number of government departments and agencies work together.” Witnesses indicated that some of the key federal organizations engaged in Arctic surveillance include the CAF, DND, the Canadian Coast Guard (CCG), Fisheries and Oceans Canada, the Royal Canadian Mounted Police (RCMP), Transport Canada, and Environment and Climate Change Canada. [Jody Thomas](#) also mentioned that “domain awareness is a system of systems,” which includes a wide range of equipment and technologies, such as ships, aircraft, radar stations, sensors and satellites.

[Karen Hogan](#), Auditor General of Canada, identified a number of significant gaps in Canada’s surveillance capabilities in the Arctic that are outlined in her November 2022 report on a recent performance audit of surveillance of Canada’s Arctic waters. She said that the audit’s focus was “whether key federal organizations have built the maritime domain awareness needed to respond to safety and security risks and incidents associated with increasing vessel traffic in Arctic waters.” Auditor General Hogan emphasized that “no federal organization is solely responsible for this surveillance of Canada's Arctic waters,” and explained that the audit examined the Arctic surveillance activities of five federal organizations: Transport Canada, Fisheries and Oceans Canada, the CCG, DND, and Environment and Climate Change Canada.

Entitled [Arctic Waters Surveillance](#), the Auditor General’s report concluded that, over the past decade, these five federal organizations had “repeatedly identified gaps in the surveillance of Arctic waters, but they ha[d] not taken action to address them.” [Auditor General Hogan](#) highlighted that “these gaps include limited capabilities to build a complete picture of ship traffic in the Arctic and the inability to track and identify vessels that don't use digital tracking systems, either because they don't have to or because they are not complying with requirements.” In addition, she noted that the audit also found that “weaknesses in the mechanisms that support information sharing, decision-making and accountability affected the ... efficiency” of Canada’s Marine Security Operations Centres. According to the Government of Canada, the [mission](#) of these centres is “to generate maritime domain awareness by combining the knowledge and skills of the partner government organizations to detect and assess marine security threats and incidents and to support a coordinated response.”

The Auditor General’s report also underscored the need to replace and enhance Canada’s ship and aircraft fleets, equipment and infrastructure required for maritime domain awareness. It identified “significant risks” that there will be gaps in the country’s

surveillance and patrolling of, as well as presence in, the Arctic in the coming decade as a result of equipment reaching the end of its useful service life before replacements become available. As well, the report concluded that infrastructure improvement projects in the Arctic are behind schedule, are rising in cost and have limited capabilities. Recognizing the extent to which “effective surveillance in the Arctic relies on marine vessels, aircraft and satellites,” [Auditor General Hogan](#) discussed the audit’s finding that “much of this equipment is old and its renewal has been delayed to the point that some equipment will likely need to be retired before it can be replaced.” She warned that the timeline for replacing some of this equipment – especially icebreakers, patrol aircraft and satellites – is “many years away.”

Regarding Arctic surveillance assets, the Auditor General’s report stated that patrol aircraft used for Arctic surveillance – including the sole Dash 7 that Transport Canada uses to conduct surveillance patrols of Canada’s maritime domain and the Royal Canadian Air Force’s (RCAF’s) fleet of CP-140 Auroras – are “reaching the end of their useful lives” and need to be replaced. Moreover, the report cautioned that, although two defence procurement projects to replace the Auroras with a new multi-mission patrol aircraft and a long-endurance, remotely piloted aircraft system are at an early phase, “no strategy has been put in place to renew” the Dash 7.

As well, [Auditor General Hogan](#) stated that “satellites are also nearing the end of their service lives and currently do not meet surveillance needs.” The Auditor General’s report specified that Canada’s current satellite surveillance capabilities “do not meet the needs of [DND] and other federal organizations for earth-observation data,” and asserted that the RADARSAT Constellation Mission satellites are currently used at full capacity and cannot fulfill all demands made by federal organizations for radar imagery of Canada’s territory. Moreover, according to the report, a capability gap may arise because those satellites are expected to reach the end of their useful lives in 2026 and their replacements are not expected to be deployed for at least another decade. The report indicated that this gap “would limit Canadian surveillance capabilities in the Arctic for years,” could “significantly degrade Canada’s ability to detect and track vessels in the Arctic waters,” and “would likely increase Canada’s reliance on its allies for surveillance information.”

[Auditor General Hogan](#) also drew attention to the audit’s finding that infrastructure projects to support ships and aircraft operated by the CAF and other federal organizations in the Arctic are “deficient and behind schedule,” with negative consequences for the ability to maintain patrol aircraft and replenish ships in the Arctic. In particular, the Auditor General’s report pointed out that work on the Nanisivik Naval Facility project – which the Government of Canada announced in 2007, with work



starting in 2015 – has experienced repeated delays, leading to the current prediction that the facility will be completed in 2025. Moreover, the report maintained that the facility is expected to be of much more limited use than was originally expected, suggesting that an inability to heat fuel tanks will reduce the facility’s period of operations to about four weeks annually. She speculated that, “[a]s a result, Royal Canadian Navy ships may not be resupplied where and when needed.”

The Auditor General’s report concluded that, “overall, the federal government has not taken the required action to address long-standing gaps affecting its surveillance of Canada’s Arctic waters,” with the result that “the federal organizations that are responsible for safety and security in the Arctic region do not have a full awareness of maritime activities in Arctic waters and are not ready to respond to increased surveillance requirements.” [Auditor General Hogan](#) proposed that the Government of Canada “urgently needs to address these long-standing issues and put equipment renewal on a sustainable path to protect Canada's interests in the Arctic,” specifically mentioning “extra ships, new ships, new satellites and new aircraft.” She warned that, “if we don’t take action immediately, we will see very significant gaps [in surveillance capabilities] in the next decade,” which will affect Canada’s domain awareness in the Arctic.

The North American Aerospace Defense Command and its Modernization

Recognizing Canada’s contributions of financial resources, personnel, jet fighters and other air assets, and military infrastructure to NORAD, witnesses focused on NORAD’s importance to the defence of North America and the urgent need for modernization, which will occur in co-operation with the United States. On 14 August 2021, the Canadian and U.S. governments released a [joint statement on NORAD modernization](#), noting that “NORAD must be able to detect and identify ... threats earlier and respond to them faster and more decisively, including aerospace threats transiting our northern approaches.” As well, the joint statement outlined priority areas for new investments. On 20 June 2022, the Government of Canada [announced](#) its NORAD modernization plan. [Vice-Admiral Auchterlonie](#) commented that, “in terms of strategic investments,” almost \$40 billion is expected to be spent on NORAD modernization over the next 20 years. According to [DND](#), approximately \$4.9 billion will be allocated during the first six years.

Summarizing the NORAD modernization plan, [Jonathan Quinn](#), DND’s Director General of Continental Defence Policy, identified five key areas of investment: detection and awareness, which includes “significant investment in over-the-horizon radar technology that will dramatically enhance our ability to monitor aerospace threats to the

continent”; “technology-enabled decision-making, and command and control, using artificial intelligence, machine learning and cloud computing,” which will give NORAD “the ability to ingest and analyze all the information coming in from those sensors much more quickly in order to enable fast decision-making”; defensive capabilities, including the acquisition of “new air weapons, including longer-range air-to-air missiles, [which] will enable the current and future fighter fleet to defend against aerospace threats, such as cruise missiles”; infrastructure and support capabilities, “including an additional investment in air-to-air refuelling aircraft and enhancements to fighter aircraft infrastructure across the country at NORAD's forward-operating locations in the north”; and research and development “across all domains,” which will “make sure that Canada is at the cutting edge of technology in defending against potential threats to the continent in all the domains.”

Lieutenant-General Alain Pelletier, Deputy Commander of NORAD, underlined the continued relevance and importance of NORAD to the defence of North America, including the Arctic. He highlighted that Canada and the United States formally established NORAD in 1958 as a binational military command and asserted that NORAD has been successfully defending North America for more than 60 years through fulfilling three primary missions: aerospace warning, aerospace control and maritime warning. In the context of NORAD's missions, Lieutenant-General Pelletier defined “North America” as “Alaska, Canada, the continental United States, Puerto Rico and the U.S. Virgin Islands, including air defence identification zones, the air approaches, the maritime areas and the maritime approaches.” According to him, NORAD also delivers “integrated threat warning and attack assessment for missiles, a mission that spans the entire globe.”

As well, Lieutenant-General Pelletier contended that NORAD has a history of evolving, as required, to changes in the global security environment and to technological advances. He explained that, over the last 60 years, the “threat to North America has evolved from a northern approach long-range aviation to now a 360-degree threat, and from all domains.” Moreover, he commented that, “for the first time in [NORAD's] collective history of binational defence, we now have two strategic competitors, Russia and China, both with nuclear weapons, and a third actor in North Korea.”

Elaborating on the importance of the Arctic to NORAD, Lieutenant-General Pelletier stated that, “with ongoing climate change, Russia, China and other states are increasingly interested in the Arctic,” which is of concern to NORAD because “the Arctic is the closest path to attack North America.” He expressed concerns about Russia's militarization of its Arctic region, and mentioned an increase – in recent years – in the number of times that NORAD has had to scramble jet fighters to intercept Russian military aircraft operating near North American airspace in the Arctic. Furthermore,



Lieutenant-General Pelletier said that 2022 saw “one of the largest numbers [of Russian aircraft interceptions] ... probably since 2014.”

In [Lieutenant-General Pelletier](#)’s opinion, in executing its assigned missions “effectively,” NORAD “must outpace our global competitors, deter our adversaries, deny and defeat threats through all-domain awareness, information dominance and decision superiority, and be globally integrated with our allies.” He claimed that NORAD modernization is essential “to the defence of North America” and to “help address evolving missile threats and maritime warning challenges.” Lieutenant-General Pelletier added that, “as threats continue to rapidly evolve and the Arctic becomes increasingly accessible,” Canada and the United States must “field critical capabilities ... that will enhance our domain awareness, enable persistent operation and provide national decision-makers adequate time to make key decisions.”

Witnesses stressed the importance of NORAD to Arctic security. According to [Kevin Hamilton](#), Canada’s partnership with the United States in NORAD is “of critical importance to Arctic security.” Likewise, [Dr. Andrea Charron](#), Associate Professor and Director of the Centre for Defence and Security at the University of Manitoba, pointed out that “the primary deterrent to the North American Arctic has been via NORAD,” which she said is a situation that is not likely to change in the future.

As well, witnesses drew attention to consultations with Indigenous communities as part of NORAD modernization. [General Eyre](#) stated that “consultation is extremely important as we go forward with all of these projects to make sure that we have excellent mutual understanding and respect so that there are no surprises.” Agreeing with General Eyre, [Jonathan Quinn](#) characterized consultation as “paramount,” and indicated that DND has already undertaken some initial consultations with Indigenous leadership, as well as provincial and territorial governments, as proposals for NORAD modernization are being developed. He commented that DND received “lots of fantastic feedback about what the local priorities are,” with DND then “over[laying] that [feedback onto] the Canadian Armed Forces requirements to proactively seek out opportunities for mutual benefit.”

Underscoring the need to modernize NORAD, witnesses generally recognized that this ambitious endeavour will be costly. [Dr. Kimball](#) noted that it is “very important at this juncture” to “think about what Canada is going to invest in when it does NORAD modernization.” She explained that “in the past there was more logic to having fixed locations” in the Arctic, such as ground-based radar stations, but predicted that the future is likely “to involve thinking about some of these things in a more mobile sense,” thereby giving “Canada more flexibility with its capacities.”

Witnesses generally welcomed the announcements that have been made, to date, to modernize NORAD, although some held the view that more could be done. [Dr. David Perry](#), President of the Canadian Global Affairs Institute, expressed concerns about the funding currently allocated for NORAD modernization, describing it as insufficient and limited “to only a set of infrastructure and aerospace investments.” Noting that there is no funding designated for any naval capability, he asserted that “NORAD modernization is a good start to bolstering [Canadian] Arctic defences,” but suggested that Canada should also “look to build on those investments in defence infrastructure and aerospace assets by adding subsurface naval capabilities and integrated air and missile defences to improve our ability both to understand what is happening in our coastal waters and to defend Canada against missile threats.” In his opinion, those new investments should include “additional sensing/warning [technology] that could feed into ... missile [defence] systems, as well as some actual mechanisms to potentially shoot down a missile if we wanted to.”

Similarly, [Dr. Huebert](#) advocated improvements in the aerospace realm, highlighting the need to ensure that the four forward operating locations in the North are “able to maintain themselves 24-7” in spite of the harsh Arctic environment. As well, he stressed the importance of having aircraft to operate from those forward operating locations, including jet fighters and air-to-air refueling aircraft. In that context, he urged Canada to procure, as rapidly as possible, the F-35 jet fighters to replace the RCAF’s aging CF-18s and to acquire new air tankers to ensure that the RCAF has the “air refuelling capabilities to deal with the threat that [Russia] and [China] will be presenting in the long term.”

[Dr. Charron](#) and [Dr. James Fergusson](#), Professor at the University of Manitoba’s Centre for Defence and Security Studies, contended that NORAD modernization should include an expansion of NORAD’s mission beyond aerospace warning, aerospace control and maritime warning to include all environments – air, space, maritime, land and cyber – for all of North America. In their view, NORAD needs multi-domain capabilities to face new and emerging threats. In particular, Dr. Fergusson wondered whether the time has come “to expand the NORAD mission suite and in fact move towards the development of a true integrated North American defence command.” He also proposed that Canada and the United States might consider adding Denmark (Greenland) and possibly Iceland to the NORAD agreement so that “the eastern approaches to North America” are covered effectively. However, [Jonathan Quinn](#) noted that Canada and the United States have agreed that there is “sufficient work to do to enhance NORAD's capabilities to fulfill its current mandate of aerospace warning and control and maritime warning,” with a mutual decision “not to even look at expanding the mandate of NORAD at this time.”



Witnesses also drew attention to the need to replace the North Warning System's network of 11 long-range and 36 short-range radar stations located along the shores of the Arctic Ocean, which is reaching the end of its operational life. [Lieutenant-General Pelletier](#) summarized the North Warning System's limitations by saying that:

The North Warning System, as is, is very limited in its ability to actually detect the current threat represented by Russia right now, and China in the future—especially given that the threat from China may be coming from the west coast, and the North Warning System is geared towards a threat coming from the Arctic, which is what it was designed for back in the early 1980s.

[Dr. Fergusson](#) also underlined the need to modernize the North Warning System, emphasizing that it cannot track cruise missiles or hypersonic weapons. According to [Dr. Byers](#), “[w]e need to upgrade the North Warning System to provide continued surveillance and assistance to our American allies,” including “over-the-horizon radar.” In his opinion, “those radar stations in the north are our biggest contribution to North American security.” He indicated that:

The reason we have our radar surveillance in the Arctic is to preserve the ability of our American friends and neighbours to launch [a nuclear response] in the event of a Russian first strike. ... The North Warning System is ... protecting us by providing us with the assurance that Russia will be destroyed if they launch [an attack] at North America. ... We need to preserve the mutually assured destruction that has protected us since the 1960s in terms of the nuclear deterrent.

As well, witnesses noted the over-the-horizon radar system that Canada plans to develop to replace the North Warning System as part of NORAD modernization. Explaining that the new system will give complete coverage of Canada, including its Arctic archipelagos, [Jonathan Quinn](#) commented that “[t]he idea is that the Canadian contribution to the new layered surveillance system would be an Arctic over-the-horizon radar site near the Canada-U.S. border that would look to the outer reaches of Canadian territory. A second site would be in the High Arctic in Canada that would see up and over the [North] [P]ole.” He added that DND plans to have the High Arctic radar systems be operational approximately two years after the system at the lower latitude, which is expected to be “up and running towards the end of the 2020s.”

In the interim, plans are underway to keep the North Warning System operational until it is replaced, with the Government of Canada [announcing](#) – in January 2022 – that an in-service support contract had been awarded to Nasittuq Corporation for the sustainment and maintenance of the North Warning System for an initial period of seven years, followed by four two-year option periods. [Jonathan Quinn](#) described the awarding of this \$500 million contract as both a positive step and an example of the type

of commercial opportunities that NORAD modernization can bring to northern communities. [Clint Davis](#), President and Chief Executive Officer of Nunasi Corporation, observed that Nasittuq Corporation – of which Nunasi Corporation is a shareholder – has “significantly ramp[ed] up staff” and training, and is providing employment opportunities to Inuit. He also referenced the \$112 million contract awarded to Nasittuq Corporation, which the Government [announced](#) in October 2022, to provide support services to Canadian Forces Station (CFS) Alert for an initial period of eight and a half years, thereby offering further employment opportunities for Inuit. [Clint Davis](#) noted that Nasittuq Corporation has been providing services at CFS Alert since 2012.

Witnesses anticipated that Indigenous communities will also have other opportunities in the coming years as contracts are awarded for NORAD modernization. [Jonathan Quinn](#) said that “enhancements to northern infrastructure that are part of the NORAD modernization plan,” such as the upgrades to the forward operating locations in Yellowknife, Inuvik, Iqaluit and Goose Bay, will “all yield Indigenous employment opportunities and economic growth.” In his view, as DND “launch[es] additional infrastructure projects in the north and establish[es] the sites for the over-the-horizon radar [system], we certainly anticipate more opportunities along those lines for northerners.” Agreeing with Jonathan Quinn, [Kevin Hamilton](#) stated that, “[f]or NORAD modernization and military investments in the north, [DND] will look at every opportunity to create jobs for local populations and make some of the infrastructure useful to civilian populations.”

[Clint Davis](#) highlighted the “very positive impact” of military contracts on northern communities, characterizing the benefits as “profound” and indicating that NORAD modernization will have “a generational impact.” According to him, such contracts ensure “training development and job opportunities” for the local communities, and also provide “procurement opportunities” for local Inuit businesses and development corporations, thereby helping achieve “economic reconciliation” as the “net revenue flows back for the benefit of the [local] community.” He said that local communities and businesses are looking forward to the economic opportunities and long-term contracts that may result from NORAD modernization in the coming years.

Missile Defence

Witnesses raised concerns about Canada’s lack of a missile defence system, suggesting that the country is currently vulnerable because of virtually no capability to intercept inbound missiles of any type. As well, they referred to Canada’s lack of participation in ballistic missile defence (BMD) and to the Government of Canada’s February 2005 announcement that Canada would not join the United States in a BMD program.



Recognizing that “Canada's policy on ballistic missile defence has not changed,” [Jonathan Quinn](#) commented that “Canada has always played a significant role in the warning against attack from all aerospace threats” – including ballistic missiles – through NORAD, and asserted that Canada will “continue to play that role.” He also called attention to investments in NORAD modernization that “will enhance [the country’s] ability to make those contributions.”

According to some witnesses, the Government of Canada should reconsider the 2005 decision not to join the United States’ BMD system. Underscoring Chinese and Russian investments in ballistic and cruise missiles, as well as hypersonic weapons, [Dr. Fergusson](#) argued that “we need to have the capacity to intercept missiles in flight,” which would have “implications for long-standing Canadian policy on ballistic missile defence.” Similarly, [Lieutenant-General \(Retired\) Parent](#) suggested that it is time to “embrace integrated air and missile defence as a whole” and to “re-evaluate” the 2005 decision, mentioning that “not being part of the anti-missile system costs us in credibility, because it means we are choosing what we want to defend ourselves against, when our defence should be total.” Claiming that the system “works” and can hit a “bullet with a bullet,” he acknowledged that it was originally designed to address “the terrorist threat of North Korea” and “not ... to go against Russia or China.” That said, he contended that the system could still defend against an attack from Russia or China “because a missile is a missile” and “it doesn't matter what it is.”

However, a number of witnesses held the view that Canada should not join the United States’ BMD system and should invest in a different type of missile defence system that can address the full range of missile threats. They noted that the missile threat today is not limited to ballistic missiles, but also includes advanced cruise missiles, hypersonic weapons, armed drones and other aerial weapon systems not covered by the BMD system. [Dr. Perry](#) indicated that “[w]e are facing a broader array of missile threats than we did 20 years ago,” and elaborated by stating that, “[t]o say there's a specific need to focus on just one type of [missile], I think, is an incomplete answer at best, because there's a range of possible scenarios that we need to improve our defences against.” [Jonathan Quinn](#) said that cruise missiles are “increasingly of concern” to NORAD, and [Major-General Iain Huddleston](#), Commander of Canadian NORAD Region, added that hypersonic weapons also provide NORAD with “a significant challenge.” Similarly, [Jody Thomas](#) pointed out that:

Ballistic missile defence is important, but there are many other threats, such as hypersonics, cruise missiles and weapons that can reach Canada's shore from a far distance, which is recent. It used to be that you would have to get a ship, submarine or a bomber close to Canada. These missiles can now be launched from overseas and reach

North America. We need to take broad view of what the missile threat is and what the North American response to that is going to be, as opposed to just focusing on BMD.

[General Eyre](#) recognized that the Government of Canada’s decision concerning participation in the United States’ BMD system is a “policy question,” but emphasized that it is “very difficult” to “carve out an artificial stovepipe on one type of threat” – that is, ballistic missiles – when there are “various types of [missile] threats that we are facing.” Specifically mentioning ballistic missiles, cruise missiles, hypersonic weapons and submarine-launched missiles as examples, he explained that Canada’s allies are now looking at integrated missile defence systems that focus on the expanding range of missile threats. General Eyre commented that:

I think policies related to ballistic missile offence are becoming less and less relevant. Now, our allies have adopted the concept of integrated air and missile defence, which is built on three systems: a sensor system, a threat response system, and a command and control system. Since all the systems are fully integrated into a single network and since there are multiple threats—ranging from hypersonic threats to various missiles including cruise missiles—it’s hard to target just one specific threat. Integrated air and missile defence is the concept of the future.

Witnesses expressed the need for Canada to have an integrated air and missile defence system. [General Eyre](#) observed that, as demonstrated by “the war in Ukraine and the number of Russian missiles that are being intercepted,” there is “efficacy in having an air defence counter-missile system.” In [Dr. Perry’s](#) opinion, Canada needs an “integrated air and missile defence system that would be able to cover a broad range of potential launch mechanisms.” Elaborating on the desired approach, he contended that:

The best defence is to have a layered, integrated set of systems that can defend against a range of incoming missiles. ... A system that can deal with a broad array of different missile threats in a way that is cohesive and integrated, that doesn't have to rely on distinct sets of pieces of technology being cobbled together but was designed to be integrated from the beginning.

In addition to missiles, witnesses drew attention to the threat posed by the proliferation of drones. [Major-General Conrad Mialkowski](#), Deputy Commander of the Canadian Army, noted that the CAF is watching global developments in drones “very closely,” and is engaged in discussions with allies about possible solutions to counter unmanned aerial systems. However, he stressed that “the Canadian Armed Forces has not yet selected any type of specific response to [the threat posed by drones], because the technology is rapidly emerging.” Major-General Mialkowski claimed that detecting and responding to drones in the “Arctic operating environment ... is one area that deserves our continued attention.” Agreeing with Major-General Mialkowski, [Dr. Massie](#) asserted



that Canada has been underinvesting in “air defence against surveillance and strike drones that are being used by the Russians and other foreign powers.”

Strengthening Canada’s Surveillance of the Arctic

Arguing that Canada should enhance surveillance capabilities and domain awareness in the Arctic, witnesses identified a number of gaps in existing capabilities and made several proposals. They advocated measures that would enhance Canada’s domain awareness in the region, particularly in terms of investments in underwater detection systems, submarines, satellites, drones and surveillance aircraft.

For witnesses, the main surveillance gap in the Arctic concerns the detection of threats and under water activities. They underscored that Canada currently has no capability to detect submarines, underwater drones or other types of submersible systems operating in the Arctic Ocean. [Lieutenant-General \(Retired\) Parent](#) said that he does not think “that we have 100% awareness of everything that sails in the Arctic,” adding that “the biggest problem is probably under the surface. You know what you know, and to know it, you need to have persistent surveillance.”

Witnesses encouraged investments in underwater sensor systems. [General Eyre](#) contended that Canada “can, and must, do more” in terms of Arctic surveillance, especially under water, stating that “[o]ur hold on our Arctic would be much more secure with greater subsurface domain awareness at sea.” Agreeing with General Eyre, [Dr. Hubert](#) indicated that “what has been completely lacking from any discussion is how we modernize our undersea listening capabilities. ... It’s something we have to be looking at.”

Highlighting maritime surveillance gaps, [Vice-Admiral Topshee](#) argued that “we can always improve.” That said, he noted the existence of initiatives designed to enhance underwater detection. Providing an example, he described the Royal Canadian Navy’s (RCN) successful testing of a new, portable underwater sonar system – known as a towed reelable active-passive sonar – that was installed on the Arctic and Offshore Patrol Ship (AOPS) *HMCS Harry DeWolf* when it transited the Northwest Passage last year and successfully “detect[ed] submarines.”

Similarly, [Dr. Perry](#) claimed that Canada requires underwater detection technology to monitor the Arctic. He stated that “underwater sensors would be an area that I think we should focus on, so likely acoustical devices,” which could be “put in the water at a place where you want to listen ... to have an idea of who is operating there, even if you don't have your own ship or submarine” at that location.

[Lieutenant-General \(Retired\) Semianiw](#) urged Canada to acquire an underwater sensor capability, characterizing the current awareness about “what is going on below the seas ... across Canada's north” as the “weakest area” in terms of surveillance. In his view, Canada has nothing in its “tool box” to detect foreign submarines passing through the North, and “there are technologies today that could be put into place across our main sea passages to know what's going on beneath our waters.”

Most witnesses also supported the procurement of new submarines, with [Vice-Admiral Auchterlonie](#) describing replacement of Canada’s Victoria-class submarines with a new class of submarines as being “vital to the sovereignty and security of Canada,” especially in the Arctic. He explained that, “in terms of sovereignty in the north” and “in terms of capability, a submarine brings significant capability for deterrence and sovereignty,” especially if the submarine has the potential “to operate in the north.”

[Dr. Perry](#) mentioned that it is imperative for Canada to move forward with plans to replace Canada’s four Victoria-class submarines. Arguing that very serious consideration should be given to procuring new submarines, he indicated that:

We need to broadly be looking at replacing those submarines with either new submarines themselves or a system of underwater vehicles that could be operated remotely—perhaps working in conjunction—as well as additional sensing capability to be able to detect other people's submarines that could be working in Canadian coastal waters and approaches.

Viewing submarines as being essential for surveillance and deterrence, [Dr. Perry](#) said that, at the moment, “we don't know who's in our waters. We might be able to get some of that information from some of our allies if they're [in the Arctic], but if we don't have our own submarines there, we don't have a good understanding of what's happening within our coastal waters.”

According to [Dr. Massie](#), “one of the main gaps [in Arctic surveillance capabilities] is the absence of planning, whether budgetary or operational, for replacing the fleet of Canadian submarines,” which he described as essential to the security of Canada’s waters. In his opinion, “[w]hether we consider that the Northwest Passage is in Canadian or international waters, we still need that capacity. The fact that we are not planning to replace the fleet leads us to believe that we will lose that defence capacity.”

Witnesses also called for the Government of Canada to consider acquiring ice-capable nuclear-propelled submarines for operations in the Arctic. Elaborating on the advantages of using that type of submarine in the Arctic maritime environment, [Lieutenant-General \(Retired\) Parent](#) maintained that “the best deterrence” in the North would be a submarine with under-ice capability, and “hopefully a nuclear submarine that could stay



there” for long periods of time. He predicted that, if it were known that a Canadian nuclear submarine was operating in the Arctic, “nobody will come forward” and enter those waters, adding that “we [would] achieve deterrence because the cost inflicted [on foreign trespassers] would be too high.” At present, China, France, India, Russia, the United Kingdom and the United States are operating nuclear submarines. Australia has plans to acquire a fleet of nuclear submarines for its navy under the AUKUS agreement among Australia, the United Kingdom and the United States, and such other countries as Brazil are considering the purchase of nuclear submarines.¹ In the late 1980s, Canada planned to acquire a fleet of 10 to 12 nuclear submarines, but the project was cancelled because of the end of the Cold War.²

However, not all witnesses agreed that Canada should procure nuclear submarines, with some speculating that acquiring and maintaining such naval assets would be extremely expensive. [Dr. Massie](#) warned that, “if we had to invest in a new fleet of nuclear submarines, as Australia is doing, the cost would be so high that we would have to use the money budgeted for other Canadian defence priority items.”

Witnesses also highlighted the need to improve Canada’s space-based capabilities for Arctic surveillance. [Dr. Byers](#) commented that Canada has “very good space-based surveillance right now,” mentioning the three satellites launched in 2019 as part of the RADARSAT Constellation Mission system that were “built for Arctic security” and that are “our eyes in the sky in the Arctic.” That said, he also noted that those satellites have a seven-year lifespan and will soon need to be replaced. Dr. Byers asserted that “[t]he procurement for the replacement needs to be set in motion now.” For him, renewal of the RADARSAT Constellation Mission is “absolutely top of [the] list” of priorities.

Explaining that “it is very difficult to have communication as well as surveillance capabilities in the high Arctic,” [Lieutenant-General Eric Kenny](#), Commander of the RCAF, emphasized the advantage of using satellites for this purpose, and of using them alongside drones, radar and other surveillance systems to obtain a clearer assessment of threats and activities in the Arctic. In his view, “[t]he reality is that we need to be able to see threats ... to our sovereignty first to be able to then deter or defeat them if required.” He stated that DND is currently “working on ... having the satellite infrastructure in place to operate in the Arctic,” and identified the focus as being satellite “communications in the high Arctic” and “surveillance from space.”

1 International Institute for Strategic Studies, *The Military Balance 2023*, pp. 18–489.

2 For example, see: Marc Milner, *Canada’s Navy: The First Century*, Toronto University of Toronto Press, 1999, pp. 291–293.

As well, [Lieutenant-General Kenny](#) recognized the need for DND and the CAF to work cooperatively, as well as in partnership with other federal departments and agencies, the private sector and allies, to share information and obtain the best space-based assessment possible. According to him,

[s]pace is becoming more congested and more contested, and it's competitive. ... The military should not be solely focused on doing only [its] own [satellite] programs. [The military] need[s] to be partnered with commercial industries, with the Canadian Space Agency and with our allies ... because satellites have a limited shelf life, and we can't, unfortunately, just switch them out once they're up there without a replacement. ... The ability to have redundancy and resiliency comes with increased capacity, whether that's through commercial industry, private partnerships or the military.

[Lieutenant-General Kenny](#) warned that, “if we don’t partner closely with our commercial satellite providers,” there is a risk that “we won’t be as successful as we could as we move forward.”

In addition to investing in satellite technology for Arctic communications and surveillance, witnesses supported Canada and allies working more closely in space. [Dr. Huebert](#) urged replacement of the RADARSAT Constellation Mission with a new satellite capability and suggested that Canada should also consider “integrating with the Americans and the Europeans in terms of their satellite surveillance capability.”

[Jonathan Quinn](#) explained that NORAD modernization includes replacing the RADARSAT Constellation Mission with an asset owned by DND and the CAF, rather than continuing with the current approach of a government-owned satellite system that provides services to various federal organizations, including DND and the CAF. In his opinion, the development of a satellite system owned by DND and the CAF is needed “to make up for the increased demand that we have for earth-based observation, not only for the Arctic but also for other missions around the world, and also to account for security requirements ... and the necessity for DND/CAF to have the ability to share information at higher classification levels than is necessary for other government departments.”

Witnesses also focused on the need for the Government of Canada to acquire drones for Arctic surveillance. In [Dr. Massie’s](#) opinion, “Canada has been grossly underinvesting in drones,” and the war in Ukraine has proven the usefulness of drones in battle and for other military operations. He contended that drones could be useful in the Arctic and elsewhere, arguing that “[d]rones, for aerial surveillance and ISR [intelligence, surveillance and reconnaissance], are fundamental for Canada. This is the niche [capability] we should invest in ... but we don't.” According to [Lieutenant-General \(Retired\) Semianiw](#), “having unmanned medium and large drones patrolling our Arctic



working closely with the [Canadian] Rangers would additionally increase our ability to detect land threats across the 2.6 million square kilometres of Canada's north.”

Lieutenant-General Kenny pointed out that the CAF is acquiring a drone capability under the Remotely Piloted Aircraft System project, with this new asset potentially used for Arctic surveillance. He commented that, “[i]f all goes well, we will have a contract in place by 2024 to purchase drones that will be based in Greenwood, Nova Scotia, and Comox, British Columbia,” adding that “they will be able to take off from Yellowknife, as well as land there.” Lieutenant-General Kenny said that, with those drones, the CAF “will be able to carry out missions all over Canada lasting many hours, a capability we don't currently have. That will be extremely important for our sovereignty.” Recognizing that the procurement process for the Remotely Piloted Aircraft System is still underway, he mentioned that the project’s high-level requirements require those drones “to be able to operate in the Arctic and to be able to operate out of places such as Yellowknife.”

Furthermore, Lieutenant-General Kenny claimed that, “[w]ith drones specifically, or the Remotely Piloted Aircraft System project when it is delivered, as early as 2026, what we're anticipating is increased domain awareness [in the Arctic], at least from air- and ground-based perspectives.” Citing NORAD modernization, he suggested that those drones, alongside new capabilities in the areas of space-based surveillance and communication and over-the-horizon radar, will allow Canada “to have that domain awareness” in the Arctic.

Finally, witnesses underscored the need to procure new long-range patrol aircraft to replace the RCAF’s fleet of CP-140 Auroras. Dr. Byers noted that Canada’s “Aurora long-range patrol aircraft are 40 years old,” and stated that, although “[t]hey're still doing a great job, we should be renewing those” aircraft with a new air asset. Agreeing with Dr. Byers, Dr. Rousseil called on the Government of Canada to move forward with the acquisition of long-range patrol aircraft to “develop a very mobile [surveillance] capacity in the Arctic.”

ARCTIC READINESS

In collaboration with federal and territorial partners, the CAF play an integral role in ensuring the safety and security of the Arctic while also enforcing sovereignty. Yet, the operating environment in the Arctic is challenging and resource-intensive, and the permanent presence of CAF personnel and the infrastructure to support northern operations are limited. Witnesses warned that increasing levels of commercial activity in the Arctic, as well as greater geopolitical interest and climate change in the region, will lead to additional demands on military assets. For them, these factors raised questions

about the CAF's ability to carry out its sovereignty and safety responsibilities in the region, and about whether the CAF is positioned to meet the challenges of a future Arctic environment characterized by a higher degree of competition and instability.

Brigadier-General Godbout indicated that the CAF's permanent presence in the North comprises approximately 340 members of the defence team. Headquartered in Yellowknife, Northwest Territories, and reporting to Canadian Joint Operations Command (CJOC), Joint Task Force North (JTFN) leads the CAF's operations in the North. He outlined CJOC's activities in the North as: "showing a visible, consistent presence; surveillance and control; support for northern populations and communities; and cooperation with all of government." With detachments in Iqaluit, Nunavut, and Whitehorse, Yukon, most JTFN forces are based in Yellowknife and comprise the following military units:

- 440 Transport Squadron, which operates four CC-138 Twin Otter transport-utility aircraft;
- the Yellowknife Company of the Loyal Edmonton Regiment, which is the first reserve unit to be stationed in the Arctic; and
- 1st Canadian Ranger Patrol Group, which comprises more than 1,700 Canadian Rangers in 61 patrols and 1,400 Junior Canadian Rangers in 44 patrols across 65 communities throughout the North.

JTFN responds to requests for the CAF's assistance relating to disaster relief and other critical incidents and directs the CAF's support for ground SAR efforts. As well, JTFN is responsible for monitoring territorial and maritime areas that cover nearly 8.8 million square kilometres, including areas that reach the North Pole, extend west to the border of Yukon and Alaska, and span the maritime regions of Hudson Bay, Ungava Bay and James Bay.

In addition to JTFN, there are 47 North Warning System radar stations located throughout the North, and the CAF Arctic Training Centre in Resolute Bay, Nunavut, which is used periodically throughout the year for cold weather training and Arctic exercises. Moreover, Inuvik's Mike Zubko Airport acts as a forward operating location for the RCAF and NORAD. At CFS Alert, the CAF collects signals intelligence and maintains High Frequency and Direction Finding facilities to support SAR. As well, in Eureka, Nunavut, the CAF hosts a High Arctic weather station, and the Nanisivik Naval Facility on Baffin Island, Nunavut, is a deep-water port that will host the Nanisivik naval refuelling station when it opens.



As explained by [General Eyre](#), the ability to conduct operations in the Arctic depends on four components of “readiness”: “the people, the equipment, the training and the sustainment.” He said that investing in each of these components is critical for establishing a more “persistent presence in the North with capabilities that come from the South.”

Witnesses agreed that the rapidly evolving strategic context in the North warrants a credible deterrence posture that is supported by investments in four areas: equipment; SAR operations; personnel; and infrastructure.

Equipment

The CAF treats the Arctic as an expeditionary theatre, and – as with overseas missions – deploys with all capabilities required to operate in the region. Witnesses underscored the need for the CAF to have the right tools to enforce jurisdictional control of the Arctic, including capabilities that both deter and defend against incursions into aerial and maritime spaces, and argued that operating in a changing Arctic environment requires tailored equipment and a strengthened mobile capacity to ensure that personnel can be deployed quickly and efficiently from southern Canada. In this context, witnesses focused on Arctic maritime and air assets, identified capability gaps, and outlined the impacts of investment and procurement delays.

[General Eyre](#) contended that defending the Arctic, sovereignty over the region and northern approaches to Canada’s South requires “a sustained and visible military presence there.” According to [Vice-Admiral Topshee](#), “[t]he CAF has enough capability in all domains to ensure Canada’s sovereignty and security in Canada’s north, and to respond to current and future threats.” Questioning this assertion, [Dr. Huebert](#) emphasized that Canada’s ability to enforce its sovereignty “is something that keeps me up at night.” [Dr. Kimball](#) speculated that, considering the uncertainty about Russian and Chinese ambitions in the Arctic, the current configuration of defence assets in North America “is not sufficiently strong to deter incursions into the aerial and maritime spaces.” In a written brief submitted to the Committee, Dr. Braun characterized Canada’s military response to geostrategic, economic and environmental threats in the region as “tepid at best.”³ Although he sees no immediate threat to Canada’s territorial

3 Document submitted to the Committee by Dr. Aurel Braun, “The Cold Reality Behind Russia’s Charm Offensive: Why Canada needs a realistic Arctic Policy,” Aurel Braun and Stephen J. Blank, The Macdonald-Laurier Institute, April 2020, p. 15.

sovereignty, [General Eyre](#) cautioned that, “[i]f the day arrives when that sovereignty is threatened, our presence there is limited.”

Witnesses discussed the importance of icebreaking capabilities for Arctic security and safety, noting that the CCG manages Canada’s national icebreaker fleet of a mix of 19 light, medium and heavy icebreakers, which facilitate access to open waters in the spring to allow fisheries to open, resupply for Northern communities, marine SAR, responses to environmental incidents and scientific research. As well, they indicated that there are between 50 and 80 icebreaking requests each year in the North, and that the CCG generally operates between six and nine ships to accomplish various Arctic missions. However, the core of the CCG’s icebreaking fleet is nearing the end of its operational life. The *CCGS Louis S. St-Laurent* and the *CCGS Terry Fox* – both of which are Arctic Class 4 (heavy icebreaker) vessels – entered service in 1969 and 1983, respectively. Through the National Shipbuilding Strategy, the Government of Canada will procure six program icebreakers and two polar icebreakers. [Neil O’Rourke](#), the CCG’s Assistant Commissioner for the Arctic Region, claimed that the new polar icebreakers “will be larger and more powerful than the current heavy icebreakers in our fleet and will enable the [Canadian] Coast Guard to operate in the Canadian Arctic throughout the year with enhanced capabilities to support a variety of taskings and provide a capability unmatched to date by the current fleet.” Witnesses stated that Seaspan’s Vancouver Shipyards and Davie Shipyard in Lévis, Québec, will each build one vessel, with construction expected to begin in 2025 and at least one vessel predicted to be delivered by 2030.

Recognizing that icebreaking capabilities need to be maintained while the new polar icebreakers are being built, witnesses described the Government of Canada’s plans to provide interim support. They stated that, in 2018, the Government announced that it would acquire three medium commercial icebreakers from the Davie Shipyard, which converted and delivered those ships to the CCG between 2018 and 2022. [Neil O’Rourke](#) mentioned that a fourth commercial light icebreaker “will be ready to serve for the 2023 icebreaking season,” with the use of these four interim icebreakers “ensur[ing] uninterrupted service by the [Canadian] Coast Guard while existing vessels are taken out of service to undergo vessel life extension work.” He explained that the current plan involves work to extend the life of the *CCGS Louis S. St-Laurent* during the off-season to keep the icebreaker in service until 2030 when a new polar icebreaker is available. As the only ship in the CCG’s fleet that can currently reach the High Arctic, the retirement of the *CCGS Louis S. St-Laurent* before a new polar icebreaker is delivered could have a significant impact on Canada’s icebreaking capabilities. [Nicholas Swales](#), Principal with the Office of the Auditor General of Canada, commented that “life extensions don’t always extend life as much as is hoped for,” and recalled that there have been instances of CCG ships that underwent life extension being pulled out of service more quickly than



initially planned. However, [Robert Wight](#), the CCG's Director General for Vessel Procurement, asserted that the CCG is "confident that we will be able to continue to send seven to nine vessels to the Arctic as required and keep the St. Lawrence open, as well, down into the Great Lakes, until the new fleet arrives."

Witnesses drew attention to the role that the Harry DeWolf class of Arctic and Offshore Patrol Ship (AOPS) will play in enforcing sovereignty and providing security in the North. According to the Government of Canada, the AOPS – which will operate in the North between June and October in first-year ice – are designed to "conduct armed sea-borne surveillance in Canada's waters, including in the Arctic; enforce Canadian sovereignty in cooperation with Canadian Armed Forces partners and other government departments; and enhance our ability to assert Canadian sovereignty."⁴ Witnesses also said that the RCN will receive six AOPS in total, with three having been delivered to date and the remaining three expected to be delivered by 2027. They also noted that two additional AOPS will be built for the CCG following delivery of the RCN's vessels.

In [Vice-Admiral Topshee's](#) opinion, the Harry DeWolf class "is tracking very well in terms of delivering on the statement of requirements and producing, in fact, a ship that is better than what we had hoped for originally." He elaborated that "[t]he *HMCS Harry DeWolf* went through the Arctic last year via the Northwest Passage and circumnavigated North America. That is the first time that a Canadian warship has done that since 1954, proving our ability to operate throughout the Canadian Arctic archipelago." [Dr. Lajeunesse](#) underlined the versatility of the AOPS to carry out a range of tasks, stating that:

What the AOPS bring to the table is a platform ... that can move around Fisheries and Oceans [Canada] personnel, RCMP, Transport Canada or [Canada Border Service Agency, or CBSA] agents. These are large, capable, versatile ships that can serve as platforms for other government departments to do their jobs. At the same time, they serve as our eyes and ears on the Arctic waters. They are able to access pretty much any area where any other ship, apart from heavy icebreakers, can go. ... They are a good solution married up with increased aerial surveillance, satellite surveillance and potentially, down the road, subsurface surveillance as well.

As well, witnesses highlighted the ability of the AOPS to support various federal departments because the CCG does not have constabulary responsibilities, which are law enforcement powers that are crucial to intercepting vessels that do not have permission to be in Canada's waters. [Neil O'Rourke](#) explained that the CCG does not typically have RCMP or Transport Canada officials on its ships when operating in the Arctic, but maintained that – in an emergency situation – RCMP or Transport Canada officials could be on a CCG ship "in 30 minutes by helicopter." In noting that various

4 Government of Canada, "[Arctic and Offshore Patrol Ships](#)," 8 February 2023.

coast guard models exist across the Arctic states, he mentioned that the U.S. Coast Guard has “additional law enforcement and regulatory responsibilities, which in Canada reside either with the RCMP or Transport Canada.” Referring to models in other countries, [Neil O’Rourke](#) outlined that:

The Norwegian Coast Guard, for example, is actually part of the Norwegian navy, but separate. I won't talk about the Russians. The U.S. Coast Guard ... is like a combination of our Transport [Canada], [Canadian] Coast Guard and RCMP. Then there are the Danes. ... The Finns are the Finnish Border Guards, so they're actually almost like a combination of CBSA and the [Canadian] Coast Guard.

Because the CCG has responsibility for the heavy icebreakers and the AOPS are incapable of operating in the Arctic year-round, [Lieutenant-General \(Retired\) Semianiw](#) wondered whether there is a maritime capability gap and posed the following questions: “How could we have an armed naval presence in our north across the entire year? Do we arm the [Canadian] Coast Guard? Do we build icebreaking capability with the Royal Canadian Navy, or do we purchase submarines that can go under the ice?”

Describing the role played by the CAF’s air assets in ensuring Arctic defence and security, witnesses emphasized that the future fighter aircraft will play an integral role in carrying out Canada’s NORAD commitments and in defending against Arctic aerial incursions. [Dr. Perry](#) stated that the new fighter jets are “incredibly important and long overdue.” On 9 January 2023, following the Committee’s final meeting of this study, the Government of Canada [announced](#) an estimated investment of \$19 billion to acquire “a new fleet of eighty-eight, state-of-the-art F-35 fighter jets, through an agreement ... finalized with the United States government and Lockheed Martin with Pratt and Whitney.” The announcement indicates that the first four fighter jets are expected to be delivered in 2026, followed by deliveries in 2027 and in 2028, with the full fleet predicted “to arrive in time to enable the phase out of the CF-18s by the end of 2032.”

Witnesses contended that attention must now be paid to ensuring that the new fighter jets are capable of operating and sustaining missions in the Arctic, including in co-operation with Canada’s allies. According to them, infrastructure – such as the forward operating locations – must be quickly adapted to accommodate the future fighter aircraft. In [Dr. Huebert](#)’s view, “[w]e need to ensure that the forward operating bases—the airfields from which we would be operating—are able to maintain themselves 24-7, even in an Arctic environment. A crisis is not going to wait for nice weather.” [Major-General Huddleston](#) noted that “the F-35 is being delivered in conjunction with a huge investment in infrastructure that will properly support the fighters and the defence of Canada ... which very much includes a renovation and a refresh of all the forward operating locations in the North in order to properly support



the F-35.” [Lieutenant-General \(Retired\) Parent](#) commented that changes to the forward operating locations are required for the security of the fighter jets because of the F-35’s “cutting-edge technology.” [Jonathan Quinn](#) indicated that “[t]he intention is to upgrade northern [CAF] installations in Yellowknife, Inuvik, Iqaluit, and Goose Bay by modernizing the infrastructure to accommodate the arrival of the future fighter aircraft and also different types of aircraft to expand the types of operations that can be conducted out of those important locations.”

[Dr. Huebert](#) pointed out that, because all of Canada’s Nordic allies except Sweden “have opted for [the F-35],” the Arctic will require refuelling capabilities compatible with that aircraft. Characterizing the CAF’s current air-to-air refuelling capability as “limited,” [Lieutenant-General Pelletier](#) explained that “Canada and the RCAF have been providing both our tactical tankers, the C-130H tanker as well as the Airbus, which has a multi-role platform as well, to support our operations on a non-persistent basis. For the regular response, we actually rely on tankers provided by the U.S. Air Force.” However, he maintained that the NORAD modernization plan includes “an enhancement to the strategic air-to-air refuelling capabilities of the [RCAF] that will enable greater participation and support of our activity. It’s going to increase not only our response posture but also our reach in the very wide area of the Canadian Arctic.”

Recognizing that developing capabilities to operate in the Arctic is time-consuming and costly, witnesses questioned whether current levels of investment – combined with procurement processes – could give the CAF the tools that it needs quickly enough to defend the Arctic in a rapidly evolving environment. [Dr. Fergusson](#) described recent NORAD modernization announcements as “vital,” but added that “the time frame for committing \$4.9 billion ... over six years and \$40 billion over 20 years implies that we are going to lag far behind relative to the threat environment we have to deal with to ensure that we have a credible posture of defence by deterrence. We’re late and we will remain vulnerable for a long time.” [Dr. Perry](#) warned that “Canada needs to act with an urgency that it is not demonstrating yet to strengthen its Arctic defences.” Acknowledging that preserving Arctic security will become more difficult in the decades to come, and underlining the “challenges of developing capabilities and infrastructure to operate in that harsh environment,” [General Eyre](#) asserted that “it will take decades to be ready.”

To avoid capability gaps, witnesses proposed that the Government of Canada should prioritize projects that contribute to defence and security in the North and should launch related renewal processes sooner rather than later. [Auditor General Hogan](#) emphasized that “[e]ffective surveillance in the Arctic relies on marine vessels, aircraft and satellites, all of which are aging. The government urgently needs to address these long-standing issues and put equipment renewal on a sustainable path to protect

Canada's interests in the Arctic.” Witnesses realized that addressing these needs will entail additional spending. According to [Dr. Perry](#), the “difficulty we face right now is that our resource commitments and the ability to execute the resources that have been committed don’t align” with the domestic, continental and international pressures that the CAF is experiencing. He contended that, to address this “mismatch between capacity and intent,” there is a need to “increase our ability to commit and spend more resources across a broad array of fronts.”

Due to the length of time that is often needed to complete a defence procurement project from its initial stages to delivery, witnesses expressed concerns that the Government of Canada’s procurement processes have been detrimental to Arctic defence and security, citing the Nanisivik naval refuelling station as an example. Reinforcing the “glacial pace of Arctic defence investments,” [Dr. Perry](#) stated that,

[o]f the five projects intended to renew the Canadian Armed Forces core equipment platforms in the 2008 “Canada First” defence strategy, three of them—the replacement of our frigates and destroyers, new fighter aircraft and maritime patrol planes—would meaningfully improve our Arctic defences. None of the three projects that I just cited has yet resulted in the delivery of a single plane or ship. Under current schedules, they won’t until between 2025 and the mid-2030s.

Witnesses noted that procurement delays typically involve cost increases. In [Dr. Perry](#)’s opinion, because of inflation, DND “is losing several tens of billions of dollars’ worth of purchasing power with the various delays in purchasing things on time.” To address delays, [Auditor General Hogan](#) called for projects to have clear requirements and milestones, with [Nicholas Swales](#) suggesting that more timely decision making could help to improve procurement processes. Mentioning the Auditor General of Canada’s findings that radar imagery satellites are at – or will reach – the end of their expected service lives long before the launch of their replacements, he argued that “decisions to start taking action are happening after it’s too late to get the result in a timely manner.”

As well, witnesses underscored the need to address procurement delays to ensure that Arctic capabilities can be acquired as quickly as possible. [Neil O’Rourke](#) encouraged the Government of Canada to “continue to offer support and align the plan with the delivery dates” to ensure that the icebreakers are built according to the planned construction schedule. Discussing the plans to modernize NORAD, [Dr. Perry](#) said that substantial changes are needed to the current procurement system to avoid a situation in which the investments “take between two and three decades to actually produce operationally employable defence assets.”



Search and Rescue

Witnesses explained that, in Canada, SAR is a shared responsibility among federal, provincial, territorial and municipal governments, as well as communities and volunteer organizations, and elaborated that the CAF leads federal aeronautical SAR efforts, while maritime SAR is led by the CCG with air support from the CAF. They also indicated that, although ground SAR is the responsibility of provincial, territorial and municipal responders, the Canadian Rangers can – on request – provide aid during such operations in the communities where they operate. As well, witnesses outlined that two volunteer organizations – the Civil Air Search and Rescue Association (CASARA) and the Canadian Coast Guard Auxiliary – also support Arctic SAR operations.

Conducting SAR operations is one of the CAF’s core missions, with the CAF and the CCG coordinating the national response to air and maritime SAR through the Joint Rescue Coordination Centres (JRCC) located in Victoria, British Columbia, Halifax, Nova Scotia, and Trenton, Ontario.⁵ JRCC Trenton covers the Northwest Territories and Nunavut, including north of Baffin Island.⁶ Other than 440 Squadron’s four CC-138 Twin Otter utility-transport aircraft in Yellowknife, the CAF has no dedicated SAR assets based in Canada’s Arctic.⁷

Witnesses speculated that, as climate change leads the Arctic’s natural resources and maritime routes to become more accessible, the number of SAR missions is expected to rise. In addition, [Dr. Kimball](#) warned that “[i]ncreasing militarization of the region due to great power competition significantly raises the risk of accidental crises.” However, recognizing that it can take a significant amount of time to forward deploy to the Arctic, witnesses drew attention to federal SAR response times. They noted that SAR efforts can be impeded by the logistically difficult and time-consuming processes associated with moving aircraft from bases in Canada’s South to the North, especially when refuelling and crew changes are considered. From a maritime SAR perspective, [Neil O’Rourke](#) emphasized that “people don’t necessarily appreciate that moving ships or assets from one part of the Arctic to another can take days at a time.”

[Dr. Kikkert](#), Professor of Public Policy and Governance at St. Francis Xavier University’s Brian Mulroney Institute of Government, commented that “environmental change is absolutely making search and rescues more common, and the actual execution of those searches more difficult.” Given the distances involved, as well as familiarity with local

5 Government of Canada, “[Search and Rescue](#),” 20 January 2022.

6 Government of Canada, “[Joint Rescue Coordination Centre](#),” 11 August 2022.

7 Government of Canada, “[440 Transport Squadron](#),” 19 February 2019.

geographical, sea and ice conditions, witnesses reinforced the pivotal role that local SAR responders play in the North. They maintained that, with limited resources and a rising number of SAR operations, these responders are facing a wide range of challenges and community-based SAR systems are experiencing new pressures from increased activities. [Dr. Kikkert](#) contended that there are more than 200 public searches annually in Nunavut, and many more that are not reported officially. He highlighted that local SAR groups in Cambridge Bay have “been quite busy rescuing ecotourists who are skiing between Cambridge Bay and Gjoa Haven.”

[Neil O’Rourke](#) pointed out that the CCG has taken steps to enhance its role in Arctic SAR. He mentioned that, in July 2018, the CCG opened its first Arctic marine response station located in Rankin Inlet, Nunavut, where it has worked closely with local communities to expand the Canadian Coast Guard Auxiliary. As well, he stated that the CCG has

been able to provide funding to communities to procure a search and rescue vessel to become a part of the [Canadian] Coast Guard auxiliary. We’re very happy now to have 32 communities participating in this—46 vessels and over 430 volunteers—as part of our auxiliary in the North. This is a really great asset for search and rescue, especially when it comes to community-based search and rescue.

Acknowledging that the Canadian Coast Guard Auxiliary units “tap into in-depth local knowledge of the marine environment, develop new skills, and improve response times and effectiveness,” [Dr. Kikkert](#) welcomed their expansion. [Neil O’Rourke](#) supported the development of additional SAR stations across the Arctic that are similar to the Arctic marine response station located in Rankin Inlet.

Witnesses underlined that a range of federal departments and agencies operate in the Arctic and suggested that they lack a cohesive SAR strategy that incorporates both Indigenous priorities and the realities of operating in the region. [Dr. Kikkert](#) encouraged additional investments in initiatives that “empower local responders, improve community-based capabilities and save money by reducing the need for the deployment of a Hercules or a Cormorant from the south, which generally costs hundreds of thousands of dollars for each flight.” [Madeleine Redfern](#), Chief Operating Officer at CanArctic Inuit Networks Inc., observed that the federal bureaucracy in the North has been highly transient, which has prompted calls for more Indigenous participation as a means of providing greater stability to northern projects and programs.

To bring greater cohesion and stability to Arctic SAR efforts, [Dr. Kikkert](#) advocated “the immediate re-establishment of a permanent Arctic or northern search and rescue round table by the national search and rescue secretariat.” In [Dr. Kikkert’s](#) view, bringing



together local first responders, as well as policy makers from the North and South, would facilitate both the co-development of a comprehensive Arctic SAR strategy that properly addresses the region's unique SAR challenges and "the building of relationships, improved communication, the sharing of best practices and lessons learned on SAR prevention and response, the synchronization of efforts, planning for mass rescue operations, and discussions around the basing, pre-positioning and/or contracting of primary SAR units in the Arctic."

Layers of jurisdictional responsibilities, combined with limited telecommunications infrastructure, have created SAR coordination and communication challenges. With a focus on the Very High Frequency radio capabilities that allow mariners to communicate with the CCG and other emergency services, [Neil O'Rourke](#) commented that such capabilities do not exist in the North "outside a few pockets," leading the federal SAR system to be activated unnecessarily. He said that "[w]e deploy assets at a huge cost to the Government of Canada ultimately, and all of this, in theory, could have been avoided if there were [better] communication." [Dave Taylor](#), Director of CASARA, also identified communications challenges, maintaining that it can be difficult for CASARA volunteers to communicate effectively with the Canadian Rangers, whose radios are encrypted.

Observing that local responders are well placed to address small-scale SAR incidents but have limited capacity to address complex, large-scale emergencies, witnesses expressed concerns about preparedness for mass rescue operations. [Vice-Admiral Auchterlonie](#) characterized Arctic maritime navigation as "exceptionally dangerous," and indicated that there are about 150 marine transits in the North each year, largely for resupply purposes. Witnesses emphasized that, although Arctic waters are becoming navigable for longer periods of time during the year, the voyage is not less risky. [Jody Thomas](#) cautioned:

[A]s the ice melts, multi-year ice comes down from the polar cap and is in the navigable waters. It's much more dangerous for navigation. The Arctic is not charted to modern standards. ... The consequence and the ecological disaster that could occur from that if something goes wrong—a ship going aground—is significant. We have to be prepared for it.

[Dr. Kikkert](#) predicted that "low-probability, high-consequence events like a mass rescue operation ... will be an 'all hands on deck' situation that will require mass co-operation across the federal, territorial and regional governments, but also with our international partners." Witnesses underlined that no Arctic state can manage a mass rescue operation on its own. [Neil O'Rourke](#) discussed the results of a 2021 international SAR exercise that demonstrated a transit time of at least four days for a ship from any Arctic country to reach the North Pole. Reiterating that "international dimensions are essential

for proper search and rescue response,” [Dr. Kikkert](#) added that “there's nothing more complex and nothing more challenging than a mass rescue operation in the Arctic. The more planning and the more relationships we can build in the lead-up to this, the better that will actually occur.”

Personnel

Witnesses drew attention to the tasks completed by CAF personnel stationed in the Arctic, specifying that they conduct surveillance and security patrols, undertake annual sovereignty exercises, provide aeronautical SAR, and operate and maintain military facilities. [General Eyre](#) noted that Arctic readiness hinges on having “the right people” in the North. That said, witnesses suggested that Arctic operations are affected by the CAF’s ongoing and dire personnel needs. In [Dr. Huebert’s](#) opinion, “we are not bringing in enough people. We are not training them properly. We are not getting to the numbers that are necessary to meet the modern threat today.” He cited that, as a result, “we are facing a disaster.” Agreeing with Dr. Huebert, [Dr. Roussel](#) concluded that the combined pressure facing the CAF because of insufficient recruits and an increasing demand for the CAF’s services in the South “is the main challenge that we will face over the next few years, and it directly concerns the Canadian Arctic.”

[General Eyre](#) acknowledged that he is “extremely concerned about” the CAF’s recruitment and retention challenges, and stated that the CAF is seeking to “rebuild” through the recently announced [reconstitution plan](#). [Vice-Admiral Topshee](#) elaborated on that plan, saying that “[t]he Chief of Military Personnel is working on a number of different initiatives to make sure we take care of the quality of life for our members and their families across the board. Many of [these initiatives] are still waiting to go through a process of Treasury Board approval.” Witnesses highlighted that there are critical staffing shortfalls for certain CAF occupations, and particularly mentioned the shortage of pilots. Referring to a “crisis of personnel,” [Major-General Huddleston](#) confirmed that the RCAF has “lost too many fighter pilots,” and [Lieutenant-General Kenny](#) commented that the RCAF is focusing on recruiting, fast-tracking training processes and retaining experienced members. [Major-General Huddleston](#) said that the RCAF has recently changed its pay structure and is adjusting its approach “to mandatory service after pilot wings.” However, he underscored that these initiatives are “certainly not the silver bullet,” and argued that the RCAF’s retention strategies need to prioritize “fixing processes and policies primarily in order to encourage our pilots to remain with us.”

As well, [Major-General Mialkowski](#) listed occupations experiencing critical shortages, drawing attention to signals trades, communications, computer systems trades,



engineers to assist with acquisition and capability development in the land domain, medical specialists in the Canadian Forces Health Services and administrative personnel, particularly human resources and financial managers. [Neil O'Rourke](#) conveyed that, although the CCG has not experienced a decrease in the number of personnel, "[t]here's an international shortage of mariners." He observed that the CCG has "sometimes been forced to tie up ships because we are short a cook or an engineer and are just not able to find one within our complement. It certainly is an issue for us, and we are very focused on trying to make improvements."

In the view of witnesses, training plays a pivotal role in the CAF's ability to conduct Arctic operations. They stressed the importance of projecting Arctic capabilities through exercises in order to deter potential adversaries and described Operation NANOOK as the CAF's most visible training exercise in the North. [Major-General Mialkowski](#) affirmed that Operation NANOOK brings together CAF resources from across the country, including the Canadian Rangers and international partners. Noting the whole-of-government approach taken to Operation NANOOK, [Major-General Peter Scott](#), Chief of Staff of Canadian Joint Operations Command, characterized the 2022 exercises as a "resounding success," and indicated that partners from Belgium, France, Japan, South Korea and the United States were invited to participate.

Because of the changing Arctic environment, witnesses called for additional training and exercises to take place. [Lieutenant-General \(Retired\) Semianiw](#) contended that the northern exercises are important and underlined the need for more of them. Agreeing with Lieutenant-General (Retired) Semianiw, [General Eyre](#) maintained that the CAF must "invest and continue to train in the North and increase training in that harsh environment." [Dr. Kikkert](#) asserted that exercises in the North should be both sustained and enlarged to include more partners because these exercises are "making a big difference in getting the north ready for some of the safety and security issues that are going to arise in the near future." According to the witnesses, climate change is one such issue, and it is leading to shorter training periods. [Dr. Magali Vullierme](#), Researcher at Université de Montréal, provided the example of disruptions to the Canadian Rangers' patrol exercises due to increasingly unpredictable weather conditions.

In [Dr. Charron's](#) opinion, the CAF should consider conducting joint Arctic exercises across alliances – such as the United States' Arctic Edge, Operation NANOOK and NATO's Arctic exercises – to build confidence and trust while also signalling to Russia that "we are operating together." She also argued that all domains should be involved in Arctic exercises because "that's what we're going to have to prepare for. It's going to be a climate change event and an adversary will take advantage of that and the lack of resilience on the ground."

Witnesses discussed the role of the Canadian Rangers in supporting Arctic defence and security. Acknowledging that the Canadian Rangers live in Canada's remote and coastal regions, witnesses outlined the Canadian Rangers' activities, drawing attention to their tasks relating to conducting North Warning System patrols, supporting ground SAR operations, participating in operations in the North and, when requested, assisting during emergencies. Canadian Rangers are issued a rifle, ammunition and a distinctive red hoodie as their uniform, and are paid when on duty, receiving an Equipment Usage Rate for their use of personal vehicles and equipment when participating in approved activities. [Major-General Mialkowski](#) provided that the typical Canadian Ranger is about 48 years old, works 13 days per year as a Canadian Ranger, and has 13 years of service in that capacity. The 1st Canadian Ranger Patrol Group is headquartered in Yellowknife and comprises 1,700 Canadian Rangers who are responsible for the country's three territories, as well as part of northern British Columbia. Many of the Canadian Rangers are Inuit. In 2022, the Canadian Rangers celebrated their 75th anniversary.

Recognizing that the Canadian Rangers are members of their communities, witnesses highlighted that the Canadian Rangers help to build strong links between the CAF and northern populations, with the CAF benefitting from the Canadian Rangers' knowledge of the local area and – in turn – the Canadian Rangers' training and capabilities strengthening the resilience of their communities. In [Dr. Vullierme's](#) view, the Canadian Rangers play an important role in reinforcing human security in the North. She emphasized that the Junior Canadian Ranger program, which focuses on teaching youth in remote communities practical and cultural skills, leads to "a strong desire to strive for the overall and holistic well-being of these communities." [Dr. Roussel](#) commented that the Canadian Ranger program "works very well," and stated that "[t]here's a consensus ... that the Canadian Rangers are important and that they have to be maintained."

In that context, witnesses observed that there are opportunities to provide more support to the Canadian Rangers. [Lieutenant-General \(Retired\) Semianiw](#) said that "the support [that the Canadian Rangers] receive ... in terms of equipment, training and logistics needs to be improved dramatically for the Rangers to be prepared to detect a modern threat and respond to it." [General Eyre](#) referred to the Canadian Ranger program as "an important tool in building our situational awareness," and suggested that more resources may be needed.

Witnesses generally agreed that the Canadian Ranger program could be strengthened, but they disagreed about where additional resources should be allocated. [Lieutenant-General \(Retired\) Semianiw](#) advocated expanding and professionalizing the Canadian Ranger program, and mentioned that "[e]xpanding the reserve forces in Whitehorse, Yellowknife and Iqaluit with some new forces in Resolute Bay would be the most



economical and efficient way to have land forces on the ground in the north where needed quickly.” However, [Dr. Roussel](#) cautioned that the Canadian Ranger program “is probably operating at full capacity and it would be difficult to add any new patrols and responsibilities. I don't think we need to establish new relationships, but rather cultivate the ones we already have.” He speculated that, although more communities want to be included in the Canadian Rangers’ patrols, “the benefits would be marginal at best.”

[Dr. Kikkert](#) explained that, rather than increasing their number, some Canadian Rangers – such as Calvin Aivgak Pedersen, Volunteer with Kitikmeot Search and Rescue – are interested in receiving more training and gaining operational experience.⁸ Agreeing with Dr. Kikkert, [Dr. Vullierme](#) described the goal as providing existing Canadian Rangers with better training, rather than increasing the number who are recruited. Regarding the types of training that could be provided, [Dr. Kikkert](#) maintained that the Canadian Rangers are often called upon to respond to emergencies in their communities and would appreciate training that is specific to the challenges that their communities face, such as wildfires or flooding. Acknowledging that the Canadian Rangers would like more operational experience, Calvin Aivgak Pedersen indicated that the 1st Canadian Ranger Patrol Group needs additional administrative support and headquarters staff to make it possible to gain this experience.

[Dr. Kikkert](#) noted that the Canadian Rangers are comfortable using their own equipment – such as snow machines and boats – when they are on patrol and stressed that the Equipment Usage Rate has not kept pace with inflation. Communicating one of Calvin Aivgak Pedersen’s proposals, [Dr. Kikkert](#) remarked that an increase in the Equipment Usage Rate would allow the Canadian Rangers to invest in their own machines, tools and equipment, making them more effective during patrols.

Witnesses underscored that multilateral engagement with Canada’s allies and partners is critical when responding to the Arctic’s evolving challenges. Citing climate change and the destabilizing effects of Russia’s disregard for the rules-based international order, they encouraged collective action with like-minded countries to manage tensions and promote security in the region. [Dr. Byers](#) asserted that “[t]his is a time for like-minded countries to pull together,” and pointed to the resolution of the maritime boundary and Hans Island dispute between Canada and Denmark as an example of how territorial differences can be addressed “through negotiation, not invasion.” [Dr. Lackenbauer](#) suggested that a similar approach could be taken regarding the overlapping claims

8 Calvin Aivgak Pedersen was unable to provide testimony to the Committee due to technical difficulties. Dr. Kikkert incorporated Calvin Pedersen’s statement into responses to questions posed by the Committee members, and the statement was also submitted to the Committee.

between Canada and the United States in the Northwest Passage and called for the two countries to have “open-minded discussions” on this issue.

Witnesses discussed the impact of Russia’s most recent invasion of Ukraine on the work of the Arctic Council. [Heidi Kutz](#), Senior Arctic Official and Director General for Arctic, Eurasian, and European Affairs at Global Affairs Canada, commented that “Canada and our like-minded partners have condemned Russia's invasion ... as being contrary to the principles of sovereignty and territorial integrity, which stand essential to the Arctic Council.” She highlighted that, immediately following the invasion, all Arctic states except Russia paused the Arctic Council’s work. Since then, those states have reinitiated co-operation with each other. [Kevin Hamilton](#) outlined that “Canada continues to work closely with like-minded Indigenous and state partners to promote collaboration and continue the important work of the Arctic Council on projects that do not involve Russia.”

[Dr. Lackenbauer](#) expressed concerns about seven of the Arctic Council’s members pausing their co-operation with Russia, particularly regarding scientific research and collaboration with the Permanent Participants.⁹ He described the Arctic Council as “an absolutely innovative forum for Indigenous engagement in international affairs,” and claimed that disruptions to its work curtails the ability of Indigenous peoples to contribute to, and to inform, discussions about the Arctic. In a document submitted to the Committee, Dr. Charron warned against entrenching the “Arctic seven” versus Russia format, arguing that “[w]e must always leave the door open to Russia for those important, practical discussions regarding search and rescue, climate change, pollution mitigation and Indigenous reconciliation and the Arctic is the area on which to concentrate given its importance to Russia.”¹⁰ [Dr. Charron](#) predicted that the Arctic Council will play a role in eventually normalizing relations with Russia after that country “returns all annexed territory to Ukraine.”

As well, witnesses focused on NATO’s interests in the Arctic amid rising geopolitical tensions. They emphasized that five of the eight Arctic states are currently NATO members and observed that accession by Finland and Sweden would increase this number to seven. Witnesses also maintained that Canada must be prepared to respond to threats against NATO’s territory, including in the Arctic. [Dr. Massie](#) contended that “[w]e need to be able to do our part in the joint defence of NATO, and that involves having capacity.” In [Lieutenant-General \(Retired\) Parent’s](#) opinion, Canada and its allies

9 A notable feature of the [Arctic Council](#) is its formal inclusion of Indigenous peoples’ organizations as [Permanent Participants](#), which “have full consultation rights in connection with the Council’s negotiations and decisions.” The Permanent Participants take part in the Arctic Council’s deliberations, although decisions are made consensually by the eight member states.

10 Document submitted to the Committee by Andrea Charron.



“have to make sure that there is no gap or seam between the European portion of the Arctic and the North American portion of the Arctic.” According to [Dr. Lackenbauer](#), “we need to synchronize our Arctic-related homeland defence efforts with our allies” in order to “credibly and collaboratively address shared threats ... in a rational, proportionate and resource-effective manner.”

[Dr. Fergusson](#) noted that an increase in the number of allied exercises in the Arctic would “enable us to integrate, to be interoperable and to have a centralized command and control system to deal with threats to the Arctic.” However, he also pointed out that NATO’s priorities in the Arctic may differ from those of Canada because NATO is “interested in one set of problems emerging for NATO security or European security” but Canada is focused on other aspects of security in the Arctic, including domestic and continental defence.

Witnesses cautioned that enhanced allied co-operation in the Arctic could have implications for Russia’s perception of military threats in the region. In [Dr. Fergusson’s](#) view, some activities – such as the meetings of the “Arctic seven” and NATO defence ministers – are problematic because they “imply that North America and NATO are integrating together and that ... we will use this as an avenue to threaten Russia.” Agreeing with Dr. Fergusson, [Dr. Charron](#) underlined the importance of continuing to use confidence-building measures – such as informing each other about Arctic exercises – to reduce regional tensions.

Recognizing that climate change is a driver of instability in the Arctic, witnesses were encouraged by Canada’s co-operation with NATO to establish a Climate Change and Security Centre of Excellence. [Dr. Lackenbauer](#) asserted that climate change in the Arctic is a threat that “requires us to develop the right capabilities now” and, looking ahead, to anticipate the ways in which environmental stressors will affect geopolitical competition in the region. He characterized the establishment of this centre of excellence as a “step in the right direction.” [Kevin Hamilton](#) confirmed that the impacts of climate change on the security environment in the Arctic will be addressed through this centre, to be based in Montreal. In [Dr. Kimball’s](#) opinion, there are opportunities for Canada to work more closely with NATO in other areas that would strengthen Canada’s Arctic security expertise, such as by joining the NATO centres of excellence on energy security and northern operations.

Infrastructure

Witnesses emphasized that infrastructure development will be integral to sustaining northern operations and to safeguarding Arctic security in the years ahead. Outlining the

readiness component of “sustainment,” [General Eyre](#) clarified that this component refers to the CAF’s “ability to not just supply our troops or our people at the extremities of our country, but to invest in infrastructure so that they have these lily pads of support.” He highlighted the vast distances between “nodes of infrastructure” in the Arctic and indicated that “[w]e need more of them” to support a persistent CAF presence in the region.

Suggesting that the immense infrastructure deficit in the North hinders the CAF’s ability to operate in the Arctic, witnesses also said that this deficit is a national defence and security risk. Calvin Aivgak Pedersen contended that “[s]ecurity in the North needs an update. We only have a small handful of docks for your ships to anchor, your big planes can only land in just as small a number of airstrips, ...[.] [H]ow are you going to set a viable base when you can’t even park your equipment?”¹¹ [Dr. Jessica Shadian](#), President and Chief Executive Officer of Arctic360, remarked that – from the U.S. perspective – the state of Canada’s critical infrastructure in the North jeopardizes continental security.

Witnesses identified a broad range of infrastructure needs and, mindful of announcements to date about NORAD modernization, mentioned the importance of upgrades to airports and runways. [Dr. Shadian](#) described communities in the Arctic as “fly-in-fly-out.” [Clint Davis](#) observed that “[n]ot one road is connecting any community in Nunatsiavut,” and stated that “ensuring we have the right airstrip and airport infrastructure in place ... [is] a critical investment.” Agreeing with Clint Davis, [Les Klapatiuk](#) urged the Government of Canada to prioritize airport infrastructure upgrades. He also drew attention to hangarage needs at the Inuvik forward operating location, where his company – International Logistical Support Inc. – owns and operates a 21,000-square-foot, all-season hangar facility known as the “Green Hangar.” According to [Les Klapatiuk](#), until recently, the “Green Hangar” had been supporting NORAD and CAF operations, particularly by providing refuelling services, but DND has not yet renewed the company’s contract. In his view, the “termination of [this contract] is an infrastructure retreat that impacts NORAD, our defence, and search and rescue.”

However, providing a different perspective, [Major-General Huddleston](#) argued that, although the “Green Hangar” is useful for storage or deployments of larger contingents of personnel or aircraft, “it is not essential to our NORAD search and rescue operations in the North.” He added that:

That hangar used to be useful for us to forward-deploy our Hercules tactical tanker. It was used for no other reason. The forward operating location in Inuvik is fully capable of supporting the F-18s. We no longer use the Hercules tactical tanker to support that

11 Document submitted to the Committee by Calvin Aivgak Pedersen.



mission. Therefore, we do not need the Green Hangar in order to support NORAD operations.

Witnesses discussed the need for energy infrastructure to enable CAF operations in the Arctic throughout the year, with [Vice-Admiral Auchterlonie](#) asserting that “fuel is essential for operations in the North.” Claiming that the Nanisivik refuelling station will play a role in sustaining a long-term CAF presence in the region, he also pointed out that the refuelling station is “being brought to capability to ensure we can fuel not only military resources in the North, but also our [Canadian] Coast Guard assets.” [Neil O’Rourke](#) confirmed that, “right now, [the CCG] essentially refuel[s] ship to ship in the North, and we’re going to be able to at least remove some of that ship-to-ship refuelling that occurs today by using the Nanisivik facility once it’s open.”

According to the witnesses, both the CAF and northern communities need access to reliable and affordable energy infrastructure. Noting that 52 of 53 Inuit communities and all North Warning System sites rely on diesel, [Clint Davis](#) maintained that “there’s a great opportunity to see what we can do to incorporate renewable energy into some of these sites, certainly, as a part of NORAD modernization.” [Madeleine Redfern](#) commented that “[h]ydro, solar, wind and geothermal may be options, depending on geography,” and – citing a feasibility study that is underway – suggested that other diesel-dependent communities, like Iqaluit, could consider the use of small modular reactors.

Witnesses mentioned that attracting greater private-sector interest to the Arctic is a priority, but also stressed that Indigenous communities and development corporations should be involved in all aspects of business planning in the North. [Madeleine Redfern](#) emphasized that Inuit representatives and communities want to move beyond consultation to projects that are primarily Inuit-owned and Inuit-led, underscoring that “Northerners must be a part of the solution.” [Les Klapatiuk](#) said that projects too often have no long-term economic benefits for northern communities. [Dr. Shadian](#) highlighted that there has been a focus on bringing financial investors from southern Canada together with northern Indigenous development corporations “to share with one another so Northerners can educate Bay Street about projects and project potential in the North.” Encouraging Inuit equity ownership in major projects “so that we benefit beyond just training or jobs,” [Madeleine Redfern](#) contended that Inuit businesses and development corporations are “very good business partners, and our experience should be drawn upon throughout the various stages of planning for domestic security.” [Clint Davis](#) agreed that there is a need to attract more investment to the region to support a “more sustainable build-out of the Arctic.”

[Dr. Shadian](#) stated that the North will play a “vital role” in Canada’s forthcoming critical minerals strategy. However, in her opinion, foreign-owned businesses’ growing interest in

the Arctic's critical minerals represents a national security risk that should not be underestimated. Drawing attention to the infrastructure deficit, she argued that foreign companies will "fill the gap if we're not ahead of the game." [Dr. Massie](#) agreed with Dr. Shadian and claimed that revisionist states often rely on strategies that fall below the threshold of armed conflict. He identified these strategies, such as investments in critical infrastructure and in rare metals and other natural resources, as a threat to the Government of Canada. [Madeleine Redfern](#) expressed concern about the attempts "by Huawei to provide their technical solutions for connecting 70 of our northern communities" and by Shandong – a Chinese company – "to acquire TMAC Resources, which was a mine situated in the Kitikmeot region [of Nunavut]."

Referring to the United States' interest in investing in Canada's critical minerals, [Dr. Shadian](#) pointed out that "we have what the world wants." She then questioned whether Canada should have "the opportunity and the ability to decide where its supply chains will be built and where they go." As well, she encouraged the Government of Canada "to make sure it's doing everything to protect its national interests in this area and to decide for itself the direction and the future of its critical minerals economy."

In the view of witnesses, there is a dire need for telecommunications infrastructure to support Arctic defence and security, as well as northern residents. [Lieutenant-General \(Retired\) Parent](#) advocated the development of a communications "backbone to cover all the North" that would be both a key enabler for the CAF and a service for northern populations. In [Madeleine Redfern's](#) opinion, existing telecommunications infrastructure in the North is owned and operated by "companies that are either in Yukon or in the south" but that infrastructure "can and should actually be owned and run by Nunavut Inuit." According to her, the Government of Canada's Universal Broadband Fund, which can provide up to \$50 million for mobile Internet projects that primarily benefit Indigenous peoples, does not result in telecommunications redundancy in northern and remote communities. Suggesting that this situation is "extremely concerning," [Madeleine Redfern](#) explained that, "[w]hen Telesat effectively goes down due to weather issues ... we lose telecommunication services right across the Arctic." For that reason, she described the region as vulnerable, and remarked that – in the event of a failure – "a seamless transition to another ... network" is needed to ensure consistent all-domain awareness. To address this vulnerability, [Madeleine Redfern](#) highlighted that CanArctic Inuit Networks' efforts to develop 4,500 kilometres of subsea fibre optic cable networks could "connect Inuit communities in all four regions of Inuit Nunangat" and meet the needs of communities, the private sector and the CAF, as well as serve environmental purposes.



Witnesses predicted that climate change is likely to exacerbate infrastructure needs in the North. Stressing that “climate change has been a lived reality for citizens living in northern Canada,” [Dr. Ross Fetterly](#), Professor at the Royal Military College of Canada, asserted that northern residents face “a double threat of already inadequate infrastructure in a rapidly warming climate.” He observed that all levels of government in Canada have been slow to adapt infrastructure to climate change, which presents a particularly acute challenge for the North, where the cost of infrastructure is high. In addition to noting that climate change poses budgetary, operational and capacity challenges for the CAF, [Dr. Fetterly](#) urged all levels of government in the North “to update infrastructure policies, regulations, standards and building codes to explicitly account for the complex and severe impacts of northern climate change.”

Emphasizing that investments in multi-purpose infrastructure are the key to a prosperous, safe and secure Arctic, witnesses characterized NORAD modernization as an opportunity to focus on such infrastructure and to ensure the comprehensive involvement of Inuit residents. In [Clint Davis’s](#) opinion, “the federal priorities of reconciliation and national security can support each other when it comes to the Arctic.” He also said that Inuit businesses are “ready to work with the military and other federal departments to develop plans that will meet security needs, while respecting the sovereignty, rights, and way of life of our communities.”

[Lieutenant-General Pelletier](#) indicated that investments in NORAD modernization will help to develop multi-purpose infrastructure, and stipulated that, “whether it’s a hangar or the elongation or improvement of runways, it’s going to benefit not only the military community but hopefully the local communities as well.” However, given the extent of the infrastructure deficit, witnesses doubted that northern communities would benefit from defence-related investments in the long term. [Dr. Shadian](#) maintained that, “[i]n terms of NORAD helping northerners, I guess I don’t believe in trickle-down infrastructure,” and commented that “it is not possible to have a NORAD modernization conversation without talking about major investments needed in broadband communications as well as ensuring that the North contains high volumes of reliable, consistent, low carbon energy supplies.” In her view, “that conversation is a conversation that cannot be independent of social and economic needs in the North.”¹²

Witnesses highlighted the need for an overarching strategic vision for infrastructure development in the Arctic. Citing limited progress to date, they attributed a lack of multidisciplinary collaboration on such development to the work of various departments

12 Document submitted to the Committee by Dr. Jessica Shadian. Jessica Shadian, Ph.D., “Shadian Opening Remarks: Building Multi-purpose, Multi-user Strategic Infrastructure in the Canadian North,” Arctic 360, 4 October 2022.

and agencies, which occurs in silos, and to rigid federal structures and processes. According to [Madeleine Redfern](#), “[federal departments] simply do not know how to take bits of different mandates and different pots of money and integrate them to support one smart investment that does lots of things.” Agreeing with Madeleine Redfern, [Dr. Lackenbauer](#) stated that “[a]ddressing infrastructure deficits in the North that create vulnerabilities in the security sphere should be synchronized wherever possible, in order to address persistent social, health and economic inequities in the region.” However, he added that “[t]his [approach] requires that the Government of Canada do things differently from the way it has done things in the past.”

[Dr. Shadian](#) underlined that “we need to know what we have. We need a comprehensive inventory of existing critical infrastructure with potential multi-use purposes [and] its state of repair/disrepair.”¹³ As well, she contended that “[w]e need a vision, so we need to have a sense of where we want to go.” Agreeing with Dr. Shadian, [Madeleine Redfern](#) proposed that defence-related investments should be complemented by “a really fulsome infrastructure investment strategy that pulls in the private sector, from the mines to the investors, the northern and federal governments, and of course our Indigenous communities and peoples, who want to be part of that.”

COMMITTEE’S THOUGHTS AND RECOMMENDATIONS

The Arctic environment is transforming. The growing military and economic interests of revisionist states, like Russia and China, in the region loom large. Long characterized by peace, co-operation and the rules-based international order, the Arctic risks being destabilized by heightened geopolitical tensions.

With temperatures rising at a rate that far exceeds the global average, the Arctic is also on the front line of climate change, and its effects are altering access to circumpolar resources and maritime routes. As more countries look to the region for economic gain, increased human activity entails a new set of challenges for the CAF, DND and other federal entities, provincial and territorial governments, and northern residents. The Committee is convinced that, given the complex and interrelated issues in the Arctic, the CAF must be positioned to defend Canada’s national interests while meeting evolving safety, security and sovereignty demands.

It is almost certainly the case that there is no immediate threat of military attack in the Arctic, but changes in the global threat environment have renewed the region’s strategic importance to the defence of North America. The Committee is aware of the magnitude

13 Ibid.



and scope of Russian and Chinese investments in Arctic capabilities and is concerned that the surveillance gap in the North makes Canada vulnerable.

There is no doubt that investments in NORAD modernization are critical to both continental defence and enhanced Arctic domain awareness in the coming years. However, despite announced and anticipated investments, the Committee is certain that significant gaps remain regarding Arctic surveillance and domain awareness, particularly in relation to monitoring underwater activities in the Arctic Ocean. To close those gaps and strengthen Canada's multi-domain monitoring of its Arctic territory, further investments are needed in surveillance, including in drones, underwater sensors and new submarines, patrol aircraft and space-based satellite systems.

There is also an urgent need for Canada to bolster its expeditionary capabilities and readiness to operate in the Arctic environment. The Committee recognizes that, with a limited permanent presence in the North, it is imperative that CAF personnel are able to be deployed to the region quickly and are properly trained to operate in the harsh Arctic environment, and that military equipment can operate – whether alone or with allies – in the region's severe conditions.

To date, efforts to improve Arctic capabilities have been hampered by the CAF's perennial challenges, particularly in relation to recruiting and retaining personnel and procuring equipment. The Committee has examined some of these challenges in other reports and appreciates that General Eyre and other military officials have acknowledged that the CAF is facing a personnel crisis that is currently being addressed through efforts to reconstitute its forces. At the same time, delays and rising costs are affecting several procurement projects that would meaningfully improve Arctic defences. Unfortunately, the acquisition of new polar icebreakers, jet fighters and air-to-air refuelling aircraft are years – if not decades – away. If left unaddressed, existing and unforeseen challenges would negatively affect the CAF's ability to operate in the Arctic.

Furthermore, comprehensive Arctic defence and security cannot be attained without thoughtful and forward-looking investments in northern infrastructure. In the Committee's view, the infrastructure deficit in Canada's North is a significant barrier. It is a barrier to defence and security, to economic development, and to improving the quality of life in northern and Indigenous communities. These communities and the CAF alike need access to affordable energy supplies, consistent telecommunications, and appropriate transportation facilities. In this context, there are opportunities for defence-related investments to support the development of multi-purpose infrastructure.

Overall, the Committee endorses one of the main messages communicated by witnesses: look "over the horizon." With the Arctic environment in flux, it is apparent

that now is the time to make the right investments to strengthen Arctic surveillance and domain awareness, as well as to enhance the CAF's capabilities and readiness to respond rapidly to evolving threats and challenges in an increasingly unpredictable domain. The Government of Canada must move forward – expeditiously and with resolve – to ensure that the Arctic remains a region of peace, co-operation, safety and security in the decades to come.

In light of the foregoing, the Committee recommends:

Recommendation 1

That the Government of Canada immediately begin the process to procure undersea surveillance capabilities for Canadian Arctic waters in order to detect and monitor the presence of foreign threats to our national security.

Recommendation 2

That the Government of Canada undertake on an urgent basis a procurement process to replace the Victoria-class submarines with new submarines that are under-ice capable for operations in our Arctic waters.

Recommendation 3

That the Government of Canada reconsider its longstanding policy with respect to the U.S. Ballistic Missile Defence program.

Recommendation 4

That the Government of Canada urgently address the personnel crisis in the Canadian Armed Forces by fast-tracking the recruitment of new members, aiming to complete the recruitment process in under six months to ensure we have the level of personnel needed to defend our Arctic now and into the future.

Recommendation 5

That the Government of Canada undertake a comprehensive survey of our infrastructure, including military, civilian, and corporate holdings, as well as natural resources, mining and mineral operations in our Arctic for the purpose forward planning for NORAD modernization, developing a strategy for critical infrastructure investments and protecting Canadian interests from malign foreign actors.



Recommendation 6

That the Government of Canada invest in the technological training necessary for the Canadian Armed Forces to defend against future threats from new and emerging technologies already in use, and being developed, by our adversaries.

Recommendation 7

That the Government of Canada table in the House of Commons the timelines for the enhancement of our Forward Operating Locations in the Arctic, including when they will be able to accommodate the F-35 fighter jet.

Recommendation 8

That the Government of Canada prolong the operating season of the Nanisivik naval station in order to expand the availability of critical infrastructure in our High Arctic.

Recommendation 9

That the Government of Canada immediately begin the procurement process to select a new strategic air-to-air refueling capability that can operate in the Arctic.

Recommendation 10

That the Government of Canada takes steps to increase the availability of hangarage use in the Arctic, especially in Iqaluit and Inuvik, to ensure that infrastructure remains available into the future.

Recommendation 11

That the Government of Canada initiate the replacement of all outdated aircraft used for surveillance and search and rescue in the Arctic, including the Auroras, Twin Otters and Cormorants.

Recommendation 12

That the Government of Canada proactively engage with our American allies to formulate a plan to intensify the speed with which our NORAD modernization progresses and to meet new air-based and missile threats.

Recommendation 13

That the Government of Canada, when and where possible, in collaboration with territorial and Indigenous governments, as well as Indigenous development corporations, ensure that military infrastructure in our Arctic include dual-use benefits to close the infrastructure deficit in Arctic communities.

Recommendation 14

That the Government of Canada increase the presence of the Royal Canadian Air Force and Royal Canadian Navy in the Arctic and ensure the necessary infrastructure and resources are in place to support additional Canadian Armed Forces assets.

Recommendation 15

That the Government of Canada increase the presence of the Canadian Armed Forces Reserve in all three of Canada's Territories in order to assert Canadian security and sovereignty at the extremities of our territory.

Recommendation 16

That the Government of Canada, in consultation with Northern and Indigenous communities as well as Indigenous leaders, rapidly increase the pace of development and deployment of clean and renewable energy sources, including possibly Small Modular Nuclear Reactors for the Canadian Arctic in order to provide the clean energy necessary to support NORAD modernization and to stabilize local energy infrastructure needs.

Recommendation 17

That the Government of Canada work with Indigenous-led corporations for the provision of subsea fiber optic and other information technology infrastructure projects to provide increased and affordable Internet coverage across the Arctic.

Recommendation 18

That the Government of Canada strengthen the review process for the sale of Canadian companies operating in the Arctic to entities owned by or controlled by, in whole or in part, foreign state-owned governments.



Recommendation 19

That the Government of Canada proactively ensure that no software or hardware devices used in the upgrade of NORAD infrastructure is developed by or procured from adversarial nations.

Recommendation 20

That the Government of Canada fast-track the renewal of its space-based surveillance system; namely, the RADARSAT Constellation Mission launched in 2019.

Recommendation 21

That the Government of Canada immediately increase the Equipment Usage Rate for the Canadian Rangers. Thereafter, the Government should increase the rate annually in accordance with changes in the country's inflation rate.

Recommendation 22

That the Government of Canada enhance professional development opportunities for the Canadian Rangers, including through increased operational experiences and emergency response training. To support an increase in the number of such opportunities, the Government should provide the 1st Canadian Ranger Patrol Group with additional administrative resources.

Recommendation 23

That the Government of Canada establish, through the National Search and Rescue Secretariat, a permanent Arctic search and rescue roundtable that includes federal, territorial and Indigenous governments, as well as local first responders. The roundtable should facilitate relationship building, improved communication, and the sharing of best practices regarding search and rescue, and planning for mass rescue operations.

Recommendation 24

That the Government of Canada examine opportunities to improve community-based search and rescue capabilities, including through the expansion of Very High Frequency radio capabilities and other communications in the Arctic that support search and rescue efforts.

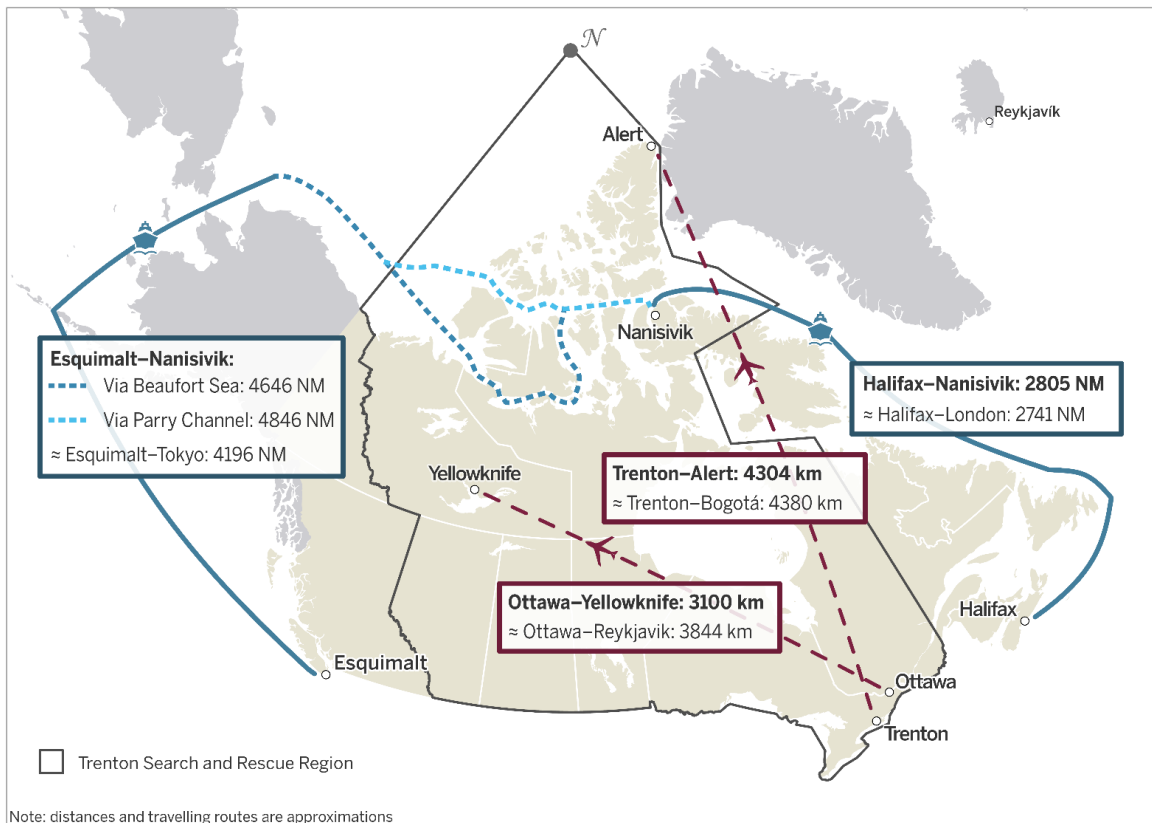
Recommendation 25

That the Government of Canada establish additional marine search and rescue stations throughout the Arctic.

Recommendation 26

That the Government of Canada reform domestic defence procurement processes to ensure that major weapons systems and military equipment are delivered to the Canadian Armed Forces more expeditiously and on budget, and to prioritize the development of capabilities that contribute to Arctic defence and security.

APPENDIX A: APPROXIMATE DISTANCES BETWEEN SELECTED MILITARY SITES IN CANADA



Source: Map prepared in 2023 using data from Natural Earth, [1:50m Cultural Vectors](#) and [1:50m Physical Vectors](#), version 5.1.1; Department of National Defence, [Canadian Armed Forces bases and support units](#) and [National Search And Rescue Manual](#), page 26; Naval routes and distances from Smart, Dave, [AOPS & the Arctic: Future Trends and Influences](#), Presentation to the CFPS Arctic Workshop, Centre for the Study of Security and Development, 5 June 2015, page 29; Naval distances also from [SEA-DISTANCES.ORG](#); Flight distances calculated by map author. The following software was used: Esri, ArcGIS Pro, version 3.0.2.

APPENDIX B: LIST OF WITNESSES

The following table lists the witnesses who appeared before the committee at its meetings related to this report. Transcripts of all public meetings related to this report are available on the committee’s [webpage for this study](#).

| Organizations and Individuals | Date | Meeting |
|--|------------|---------|
| <p>Department of National Defence</p> <p>Gen Wayne D. Eyre, Chief of the Defence Staff, Canadian Armed Forces</p> <p>LGen Eric Kenny, Commander of the Royal Canadian Air Force</p> <p>MGen Conrad Mialkowski, Deputy Commander, Canadian Army, Canadian Armed Forces</p> <p>Jonathan Quinn, Director General, Continental Defence Policy</p> <p>MGen Peter Scott, Chief of Staff, Canadian Joint Operations Command, Canadian Armed Forces</p> <p>VAdm Angus Topshee, Commander, Royal Canadian Navy</p> <p>MGen Michael Wright, Commander, Canadian Forces Intelligence Command and Chief of Defence Intelligence</p> | 2022/10/18 | 34 |
| <p>As an individual</p> <p>Robert Huebert, Associate Professor, University of Calgary</p> <p>Anessa Kimball, Full Professor, Université Laval</p> <p>Justin Massie, Full Professor, Université du Québec à Montréal</p> | 2022/10/25 | 35 |

| Organizations and Individuals | Date | Meeting |
|--|-------------|----------------|
| <p>As an individual</p> <p>Aurel Braun, Professor, University of Toronto</p> <p>Michael Byers, Professor, Canada Research Chair in Global Politics and International Law, University of British Columbia</p> <p>P. Whitney Lackenbauer, Professor, Canada Research Chair in the Study of the Canadian North, Trent University</p> <p>Stéphane Roussel, Professor, École nationale d'administration publique</p> | 2022/10/27 | 36 |
| <p>As an individual</p> <p>Andrea Charron, Associate Professor, Department of Political Studies, and Director, Centre for Defence and Security Studies, University of Manitoba</p> <p>James Fergusson, Professor, Department of Political Studies, Centre for Defence and Security Studies, University of Manitoba</p> <p>Ross Fetterly, Academic</p> | 2022/11/01 | 37 |
| <p>Department of National Defence</p> <p>MGen Iain Huddleston, Commander, Canadian NORAD Region, Canadian Armed Forces</p> <p>LGen Alain Pelletier, Deputy Commander, North American Aerospace Defense Command</p> <p>Jonathan Quinn, Director General, Continental Defence Policy</p> | 2022/11/01 | 37 |
| <p>As an individual</p> <p>Adam Lajeunesse, Professor, St. Francis Xavier University</p> <p>David Perry, President, Canadian Global Affairs Institute</p> | 2022/11/03 | 38 |

| Organizations and Individuals | Date | Meeting |
|---|-------------|----------------|
| <p>Department of Foreign Affairs, Trade and Development</p> <p>Kevin Hamilton, Director General, International Security Policy</p> <p>Heidi Kutz, Senior Arctic Official and Director General, Arctic, Eurasian, and European Affairs</p> <p>Stephen Randall, Executive Director, Oceans, Environment and Aerospace Law</p> | 2022/11/15 | 39 |
| <p>International Logistical Support Inc.</p> <p>Les Klapatiuk</p> | 2022/11/15 | 39 |
| <p>Nunasi Corporation</p> <p>Clint Davis, President and Chief Executive Officer</p> | 2022/11/15 | 39 |
| <p>Civil Air Search and Rescue Association</p> <p>Dale Kirsch, President</p> <p>Bill Ralph, National Administrator, Civil Air Search and Rescue Association National Office</p> <p>Dave Taylor, Director</p> | 2022/11/22 | 40 |
| <p>Department of Fisheries and Oceans</p> <p>Neil O'Rourke, Assistant Commissioner, Arctic Region, Canadian Coast Guard</p> <p>Robert Wight, Director General, Vessel Procurement, Canadian Coast Guard</p> | 2022/11/22 | 40 |
| <p>As an individual</p> <p>LGen (Ret'd) Alain J. Parent</p> <p>LGen (Ret'd) Walter Semianiw</p> | 2022/11/24 | 41 |
| <p>Department of National Defence</p> <p>VAdm J.R. Auchterlonie, Commander of the Canadian Joint Operations Command, Canadian Armed Forces</p> <p>BGen Pascal Godbout, Commander, Joint Task Force (North), Canadian Armed Forces</p> <p>MGen Iain Huddleston, Commander, Canadian NORAD Region, Canadian Armed Forces</p> <p>Jonathan Quinn, Director General, Continental Defence Policy</p> | 2022/11/24 | 41 |

| Organizations and Individuals | Date | Meeting |
|--|-------------|----------------|
| Arctic360 Jessica M. Shadian, President and Chief Executive Officer | 2022/11/29 | 42 |
| As an individual Peter Kikkert, Assistant Professor, Public Policy and Governance, Brian Mulroney Institute of Government, St. Francis Xavier University Calvin Aivgak Pedersen, Volunteer, Kitikmeot Search and Rescue Madeleine Redfern, Chief Operating Officer, CanArctic Inuit Networks Inc. Magali Vullierme, Researcher, Centre de recherche du Centre hospitalier de l'Université de Montréal | 2022/11/29 | 42 |
| Privy Council Office Mike MacDonald, Assistant Secretary to the Cabinet, Security and Intelligence Jody Thomas, National Security and Intelligence Advisor Jordan Zed, Interim Foreign and Defence Policy Advisor to the Prime Minister | 2022/12/08 | 44 |

APPENDIX C: LIST OF BRIEFS

The following is an alphabetical list of organizations and individuals who submitted briefs to the committee related to this report. For more information, please consult the committee's [webpage for this study](#).

Arctic360

REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the committee requests that the government table a comprehensive response to this Report.

A copy of the relevant *Minutes of Proceedings* ([Meetings Nos. 34, 35, 36, 37, 38, 39, 40, 41, 42, 44, and 54](#)) is tabled.

Respectfully submitted,

Hon. John McKay
Chair

Supplemental Opinion from the New Democratic Party

The New Democratic Party would first like to thank everyone involved in producing this report, especially those who serve in the Canadian Armed Forces. We want to thank the academics, community leaders and policy makers that shared their experience with the Standing Committee on National Defence. We also want to thank the Library of Parliament analysts, the committee clerk and the interpreters for their work.

Our study includes testimony from a dozen meetings and several written briefs, exploring elements of Arctic Security. The New Democratic Party appreciates the evidence provided by all participants, and we wish the Committee's recommendations reflected the full testimony we heard.

Climate Change

The Committee passed a motion to study "Russia's threat to Canada's Arctic; China's threat to Canada's Arctic; the Security of Canadian Arctic Archipelago; Security of the Northwest Passage and NORAD Modernization". The New Democratic Party is concerned that this report's recommendations strayed from this mandate while minimally addressing or outright ignoring testimony on the most imminent threat to the Arctic: Climate Change.

The committee was reminded by Dr. P. Whitney Lackenbauer that we must distinguish "between threats passing through or over the Arctic rather than threats to or in the Arctic". The committee's recommendations focused too strongly on potential threats to North America passing through the Arctic, at the expense of centering threats to the Arctic itself.

The Arctic Ocean's warming rate is up to seven times faster than the global average. The United Nations estimates that by 2050, up to 70 percent of Arctic infrastructure will be at risk from loss of permafrost. This is a direct threat against both the Canadian Armed Forces and Arctic communities.

This threat to Arctic security was discussed at length throughout the committee: Chief of Defence Staff Gen. Wayne Eyre stated the challenge of making "infrastructure durable and sustainable into the future with the changing circumstances related to climate change". Chief of Defence Intelligence MGen Michael Wright stated that while Russia and China pose threats, the "third threat facing the Arctic is climate change".

With climate change, we have already seen the number of voyages in Canadian Arctic waters triple in the last three decades. New sea lanes are being opened by melting ice, which will cause increased fishing, transportation, tourism and research activity in the area. Further, the loss of permafrost is also increasing the viability of access to the Arctic's massive oil reserves, natural gas and precious minerals.

This will bring new threats in the Arctic that must be addressed. We will need to increase domain awareness for Arctic sovereignty. We will need increased Search and Rescue capabilities as new activity in the region is met by increasingly unpredictable disasters caused by climate change. Increased fish populations and access to new transportation routes will require increased naval constabulary services to combat illegal activity.

The testimony heard at committee was rooted in the context of this increased activity caused by climate change, which is why the New Democratic Party is profoundly disappointed with the report's lack of climate policy. The New Democratic Party tried to push for the consideration of climate change as the existential threat to Arctic security, but unfortunately the committee was opposed.

Within this context, Indigenous peoples and Arctic communities must be central to our Arctic security strategy: Whether it is the disastrous impact of climate change on the Arctic, or it is the increased activity in the Arctic, Indigenous peoples and Arctic communities will be the front lines and first responders. All government spending on Arctic security must reflect this truth. As part of Arctic security, we must see investments in the north help northerners access safe housing, clean drinking water, fresh food and healthcare.

The New Democratic Party is concerned that this report continues a decades-long tradition of defence policy leaving Arctic communities behind. It is easy to fall into escalating calls for the militarization of the Arctic, but this is a disconnect from what this committee heard from witnesses. The best Arctic security policy is investments in our Arctic communities.

Canadian Rangers

One clear message heard at committee is the need to invest in the Canadian Rangers to address threats to the Arctic. Gen. Wayne Eyre described the Canadian Rangers as “an important tool in building our situational awareness”. We heard from Calvin Pedersen, a fourth-generation Canadian Ranger, about his work in monitoring vessel traffic in the Northwest Passage. We heard from Dr. Peter Kikkert about the important operational capabilities uniquely offered by the Canadian Rangers, as they are “often mobilized as the first responders to provide aid to their communities and their regions”.

The Canadian Rangers are essential to meeting the security needs to address the impact of climate change and increased economic activity in the Arctic. We also heard from Dr. Peter Kikkert that “The Rangers wear lots of hats, so they're often volunteers on the ground search and rescue teams in their communities. They're often members of the Coast Guard auxiliary units that go out to do marine searches ... The training that is given to Rangers is not always just used in an official capacity, but is often used to bolster the search and rescue system on a voluntary basis”.

Investments in the Canadian Rangers will increase our domain awareness, increase the CAF's operational capabilities, and will bolster search and rescue capacity.

New Democrats strongly support recommendations **21-25** and hope the Government will act on these quickly.

Rangers have faced mistreatment from successive governments that expect continued service while being undercompensated for equipment usage, a slow and inadequate reimbursement process for damaged equipment, and a lack of funding for administrative supports. As the need for Canadian Rangers increases, we must act immediately to solve these concerns.

In addition to the permanent Arctic search and rescue roundtable prescribed in recommendation 46, the committee received a written submission entitled Inuit Nunangat needs a community public safety officer program, first published in Policy Options and coauthored by witnesses Calvin Pedersen, Peter Kikkert, and P. Whitney Lackenbauer. New Democrats support this approach to building community resilience.

Infrastructure Investments in the Arctic

The New Democratic Party strongly supports recommendations 13, and wish the language in the recommendations went further to mandate the Government to prioritize investments that serve Indigenous peoples and Arctic communities. As we expect more and more from Arctic communities, Canada's history of neglect and harm must be reconciled with meaningful investments. In prioritizing the backlog of NORAD modernization and the backlog of infrastructure gaps in the Arctic, we can address many shared needs.

Gen. Wayne Eyre told the committee: "We need to look for win-win solutions. When we invest in security in the north, it has to be security not just for the entire country, but more specifically for the north as well. At the same time, it has to bring economic benefits and job opportunities to those communities in the far north and open up other opportunities such as communications".

Further, we heard from the President and CEO of Nunasi Corporation, Clint Davis, that "Inuit have lived there for 5,000 years, and our uninterrupted presence substantiates any Canadian claim of sovereignty over the Arctic ... federal priorities of reconciliation and national security can support each other when it comes to the Arctic ... the goals of Arctic security can only be reached through well-planned investments in local infrastructure".

New Democrats believe the government must use funding allocated for NORAD modernization to address the infrastructure and service gaps in the Arctic. We must give greater attention to the water crisis, housing crisis, and health care crisis in Arctic communities; all these crises are a threat to Arctic security.

Ballistic Missile Defence & Disarmament

Finally, the New Democratic party strongly rejects recommendation 3. After hearing the witness testimony throughout this study, New Democrats believe it is time to permanently shelve the Ballistic Missile Defence system conversation. Here is a short collection of expert testimony on Ballistic Missile Defence systems:

Gen. Wayne Eyre: "I think policies related to ballistic missile offence are becoming less and less relevant".

Jonathan Quinn, Director General, Continental Defence Policy: "While Canada's policy on ballistic missile defence has not changed, Canada has always played a significant role in the warning against attack from all aerospace threats. We'll continue to play that role".

Jody Thomas, National Security and Intelligence Advisor to the Privy Council: “We need to take a broad view of what the missile threat is and what the North American response to that is going to be, as opposed to just focusing on BMD”.

LGen (Ret’d) Alain J. Parent: “The ballistic missile defence system is a U.S. system only. It was not built to go against Russia or China. It was built to go against the terrorist threat of North Korea, mainly”.

Dr. Adam Lajeunesse: “Arctic security and defence are very important, and we need to make serious investments, but we need to zero in on what exactly the threat environment is. What I have argued is that we are not seeing, and are not likely to see, a great power threat to the Arctic ... I’m arguing that it would be a waste of money and an inefficient use of our resources to build the Arctic defences in such a way as to gear them towards Russia or China”.

While the decision to not join the Ballistic Missile Defence system by Prime Minister Paul Martin continues to upset the hawkish voices in the room, New Democrats understood then and understand now that joining the U.S. Ballistic Missile Defence system is a mistake.

First, the U.S. Ballistic Missile Defence system was explicitly designed to deal with North Korea, a country that was not part of this study. It is inappropriate and disappointing that the committee chose to wedge this conversation into the study while refusing to adequately discuss climate change.

Second, New Democrats do not believe that sabre-rattling in the Arctic with Ballistic Missile Defence systems will accomplish anything except escalate tensions further.

Finally, New Democrats believe in the principles of disarmament. Over 50 years ago, the Soviet Union and the United States agreed to the Anti-Ballistic Missile Treaty to limit the amount of anti-ballistic missile systems. This was widely seen as necessary to slow down the rapid development of nuclear-capable intercontinental ballistic missile warheads because it removed the need for military superpowers to react against the other’s defensive capabilities.

The American withdrawal of the Anti-Ballistic Missile Treaty in 2002 was a mistake. We have seen the rapid development of cruise missiles and hypersonic missiles that are being used in Putin’s illegal invasion of Ukraine. New Democrats believe we must do everything we can to slow the development of new missile technology, oppose nuclear arms build-ups and actively support international efforts to promote nuclear disarmament.