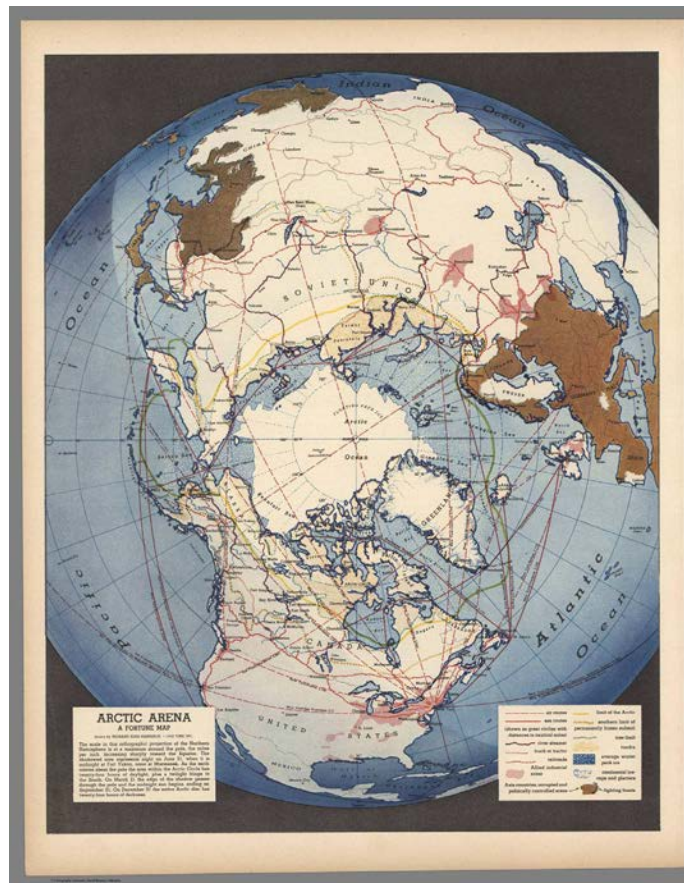
REPORT

Military Footprints in the Arctic



By Ernie Regehr
with Kelsey Gallagher

The Simons Foundation Canada

MARCH 2024

Military Footprints in the Arctic

The Simons Foundation Canada

©2024 Ernie Regehr

First published March 2024

Text and research: Ernie Regehr

Research: Kelsey Gallagher

Design and layout: Tasneem Jamal

Maps: Draimaxion

Cover: "Arctic Arena": This map was drawn by Richard Edes Harrison and published in 1942 in *Fortune* magazine. Public Domain Image

TABLE OF CONTENTS

List of Figures 4

Preface 5

Introduction 8

Military Presence/Facilities in the Arctic 12

- Canada 12
- United States 15
- Greenland-Denmark 19
- Norway 19
- Russia 22

3. Return to Diplomacy 29

Endnotes 31

Appendix: Arctic Military Facilities List 37

LIST OF FIGURES

Map 1: Continuously attended military sites 7
Map 2: Sites capable of hosting fighter and/or bomber aircraft 11
Fig. 1: Joint Task Force North headquarters (with headquarters building inset), in Yellowknife, NWT 12
Fig. 2 Inuvik, NWT Forward Operation Location 13
Fig. 3 Canadian Forces Station Alert 13
Fig. 4: Nanisivik Naval Station 14
Fig. 5: The Hall Beach North Warning System Long-Range Radar 14
Fig. 6: The American Fort Wainwright army base at Fairbanks, Alaska 15
Map 3: Sites hosting air defence installations and/or ground troops 16
Fig. 8: Fort Greely 17
Fig. 7: Kotzebue, on a peninsula in Alaska's GoodHope Bay off the Bering Strait 17
Fig. 9: Alaska's Clear Space Force Station 18
Fig. 10: The US Pituffik Space Base in Greenland 18
Fig 11: Greenland's Joint Arctic Command in Nuuk 19
Fig 12: Porsangermoen, Norway 20
Fig. 14: The Vardø X-band radar in Norway's north near Russia's Kola Peinsula 21
Fig. 13: The Norwegian forces' Setermoen infantry camp 21
Fig. 15 S-400 air defence units are part of Novaya Zemlya's Rogachevo Air Base 22
Fig. 16 Wrangle Island's trefoil base 22
Fig. 17: Franz Josef Land's "trefoil" facility (with winter scene inset) 23
Fig. 18: The Severomorsk air base on the Kola Peninsula 23
Map 4: Russia's Arctic bastion 24
Fig. 19: Severomorsk is Headquarters for the Northern Fleet 25
Fig. 20 The Gadzhiyevo Naval Base 26
Fig. 21 Nuclear warhead and missile storage bunkers at Gadzhiyevo 26
Map 5: Russian NSR and Emergency Response Centres 27

Military Footprints in the Arctic

March 2024

Preface

Russia's all-out war on Ukraine, now into its third year, makes this an unlikely time for even thinking about, never mind advocating for, pan-Arctic security cooperation. Washington's National Strategy for the Arctic still insists it "values the unique spirit of international cooperation that has generally characterized the Arctic since the end of the Cold War," but it also concludes that "Russia's brutal war in Ukraine has made this cooperation with Russia virtually impossible *at present*" (emphasis added)."[1] That is now the broad consensus in the non-Russian Arctic, but the White House Arctic strategy nevertheless implies that, while cooperation is precluded "at present," it will at some point again be necessary. Indeed, the Arctic Council, now chaired by Norway, announced in September 2023 that all eight members states had agreed to guidelines that allow the Council's working groups to resume their work, with Russia's full participation.[2] And in February 2024, the eight Arctic States, in consultation with the Indigenous Permanent Participant organizations, decided "to gradually resume official Working Group meetings in a virtual format."[3] That is not security cooperation (the Arctic Council does not address military/security issues), but once the war on Ukraine recedes as the primary obstacle to deeper engagement with Russia, pan-Arctic security cooperation will once again be on the agenda. And that agenda will have to contend with the region's ongoing militarization. Concerns about Russia's Arctic military build-up, along with some parallel military upgrades by the Arctic's NATO states (now including all but Russia), are real, but the decades long expansion of Arctic military installations and operations will not prevent, but will require, a gradual move toward greater security cooperation in the region.

There are now some 69 staffed or attended Arctic military sites in the five states with Arctic Ocean coastlines. Map 1 shows 8 such sites in Canada, Greenland/Denmark with 3, Norway 15, Russia 32, United States 10, and Iceland 1. All are in the Arctic region broadly defined, but not all are above the Arctic Circle – for example, all but one of the ten US Alaskan sites included are below the Arctic Circle.

The total number of such sites obviously depends on how a military site is defined. Media and thinktank accounts illustrate the point. The Economist has declared that Russia "has built at least 475 military sites along its northern border in the past six years."[4] High North News, on the other hand, noted that Russia has undertaken "15 years of revitalizing Arctic and maritime assets, including the reopening of more than a dozen Russian Arctic military airfields and bases since 2007."[5] The International Institute for Strategic Studies refers to "the reactivation of about 50 Soviet-era outposts" since 2007.[6] So, is the Russian total the 32 sites listed here, 475 sites "built" in six years, a dozen sites "reopened" over 15 years, or something in between, like 50 reactivated Soviet outposts?

NATO Secretary-General Jen Stoltenberg leaned toward the largest of those numbers during his August 2022 visit to Canada, writing in the Globe and Mail that Russia is "opening hundreds of new and former Soviet-era Arctic military sites."[7] In response to a request for clarification, NATO's press office explained that the Alliance "see[s] a significant build-up of Russian military sites and hardware in the country's Arctic region," which includes unattended installations such as radars, storage facilities, and communication nodes. That broader category would in Canada raise the count of military sites from 8 to closer to 60 if, for example, the North Warning System radars were all included, and higher still

if pre-positioned equipment sites of the Canadian Armed Forces (CAF) were included. But staying with staffed sites, the total number of Russian arctic military sites is, by media and research community accounts, routinely reported to be in the 30-40 range (depending partly on how multiple facilities in some Kola Peninsula bases are counted).

Whatever the definition, staffed military locations in the Arctic Five do not run into the hundreds, but their numbers and status have been on the rise. It is a militarization trajectory that has received significant attention in recent years, in the media as well as by academics and policy researchers, resulting in considerable expansion of research and analysis, and reporting, on Arctic Security. The Arctic Institute[8] is a key source of information on global research and analysis of Arctic affairs. The North American and Arctic Defence and Security Network[9] (NAADSN) brings together a wide range of essential resources, reflecting practitioner, academic, and civil society approaches. The Ice Curtain project[10] of the US Center for International and Strategic Studies has produced detailed information and broad analyses in a series on key Russian military locations and installations in the region. These are joined by Arctic publications of the UK's Chatham House,[11] by Nordic and Russian research centers like the Arctic Review on Law and Politics,[12] and by media sources like The Barents Observer,[13] High North News,[14] and Arctic Today.[15] The result is a regular flow of Arctic security information and analysis.[16]

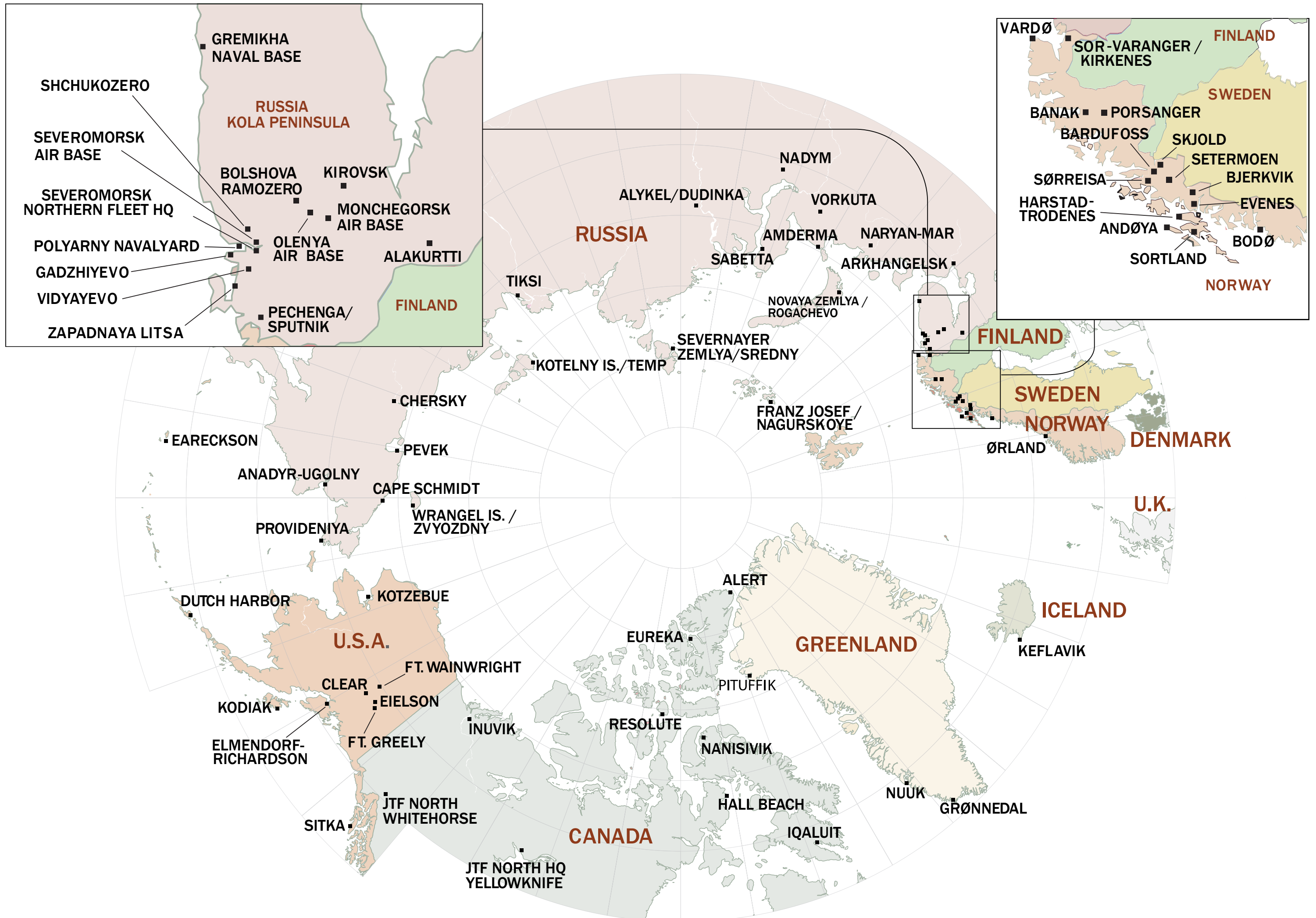
This report is indebted to those sources and others cited in the end notes. We are grateful to three Arctic scholars – Sergey Sukhankin, Senior Fellow in the Jamestown Foundation, Washington; Adam Lajeunesse, Associate Professor of Public Policy at St. Francis Xavier University; Andreas Østhagan, Senior Researcher, Fridtjof Nansen Institute, Oslo – for commenting on an earlier iteration of this paper. Of course, any omissions and errors are ours alone. Indeed, we welcome corrections and comments. Our objective in producing this report is to make a reliably informed contribution to public understanding of the overall military footprint in the Arctic.

Our analysis of the implications of Arctic militarization draws on our roots in the disarmament/peacebuilding community and reflects a predilection toward encouraging military restraint, demilitarization, intensified diplomacy, and regional cooperation in support of security and public safety. It may be a truism, but still a truth worth repeating, that no Arctic-centered conflicts or controversies are amenable to military solutions, and the current and encouraging reality is that no such conflicts or military operations are anticipated by any of the states in the region. Nevertheless, it is also the case that the major powers and their regional allies are currently not meeting what should be their collective responsibility to try to protect this extraordinary region against political and military spillover from the conflicts that preoccupy them elsewhere. Russia's devastatingly consequential war on Ukraine has been disastrous for Arctic cooperation, and as long as that war continues there are no prospects for a full return to business as usual.

Ours is a fragile planet, and in few places is that fragility greater and more immediate than in the Arctic.

Ours is a fragile planet, and in few places is that fragility greater and more immediate than in the Arctic. It is a region that, in addition to its harsh geographic challenges, prominently features the same Russia and NATO that are now embroiled in Europe's most dangerous armed conflict since World War II. To boot, the Arctic is warming at four times the global rate.[17] It is a region that above all requires advances in human security and creative responses to the crises of climate change, economic and social dislocation, and strategic instability, not accelerated military competition and the further accumulations of the destructive technology and paraphernalia of military combat.

Map 1: Continuously attended military sites



Click here to enlarge map

Introduction

Arctic exceptionalism is certainly not what it used to be. The modern Arctic is obviously not enjoying immunity from the dramatic rise in global strategic tensions, even though there are no regionally rooted conflicts or even competing interests to warrant discord beyond what might be routinely expected, and peacefully managed, among any group of states pursuing independently defined national interests within a shared region. The Arctic is certainly an out of the ordinary, exceptional, region in its economic, environmental, and demographic conditions, and not least in its traditional impulse toward collaboration and cooperation in response to those conditions. And even if that impulse has not currently managed to shield the Arctic from rising strategic tensions, it remains the case that those tensions are not rooted in the region. The increasingly ruinous Russia-NATO relations have been allowed, and even encouraged, to spill northward to undermine the region's stability and post-Cold War inclinations towards cooperation. In the wake of Russia's 2014 annexation of Crimea and its 2022 overt invasion of Ukraine, virtually all Arctic cooperation with Russia – diplomatic, economic, scientific, and military – was suspended. It's true that security cooperation was never prominent, but military-to-military contacts were for a time routine, Russia participated in forums such as the Arctic Chiefs of Defence Staff meetings, and cooperation between US and Russia, and Norway and Russia, in some Coast Guard operations occurred.[18]

In the brief interlude from the final years of the Cold War, and especially Mikhail Gorbachev's famous 1987 call[19] to establish the Arctic as a zone of peace, to Russia's annexation of Crimea in 2014, the Arctic enjoyed a political narrative that dared to entertain visions of a zone of sustainable cooperative security. Even as Arctic states engaged in significant competition and tensions in other contexts, it was still possible to anticipate a cooperative high north – where, as Gorbachev put it, "the Euroasian, North American and Asian Pacific regions meet." The 2008 Ilulissat Declaration[20] may not be universally regarded as an agreement of sufficient heft to truly shape the regional security environment, but it nevertheless was and remains an important reflection of past cooperation and a compelling vision for a future of the "orderly settlement" of disputes – notably to settle competing territorial or continental shelf claims according to existing international law, and to strengthen cooperation in the management of Arctic affairs "based on mutual trust and transparency."[21] Ilulissat still serves as a touchstone for how relations among Arctic states could be conducted. Indeed, all eight Arctic States formally declare that they share serious economic and political interests in maintaining a stable region that benefits from reliable and institutionalized state-to-state cooperation.[22]

Following the establishment of the Arctic Council in 1996, the region built its credibility as a well-managed international zone – a remarkable collective feat in a region in which the prominent, essentially pre-eminent, regional influence is not held by the US and its NATO allies, but by Russia. While the assumptions and expectations of that post-cold war/pre-Ukraine interlude have largely evaporated, Arctic states have continued to disavow any direct military threats against their Arctic territories – whether emanating from within the region or directed toward Arctic territories from outside the region. None of which changes the fact that the Arctic for well over a decade has evolved into a zone of active re-militarization. No Arctic state still claims that the Arctic, particularly the eastern or European Arctic, will always be shielded from the spill-over effects of NATO/Russia tensions in Europe, currently due especially to Russia's invasion of Ukraine, or protected from the big power competition that, inevitably, includes China and its growing interest in the region.[23]

It is also, however, important to recognize that current military expansion is certainly not exclusively, or even primarily, a response to the changing strategic environment. Much of it is focused on changing regional conditions brought on by climate change, and thus the need to support civilian authorities forced to deal with increased access to and activity in the region – all Arctic states having a genuine interest in enhancing domain awareness in the face of that increasing accessibility. Civilian authorities rely heavily on military personnel, equipment, and infrastructure to carry out their roles in areas such as border control, sovereignty reinforcement, emergency response operations, and public safety measures generally. While these are not generally mandated mili-

tary roles, national armed forces tend to have the physical and budgetary capacity for them. These are all responsibilities of growing importance and operational pace, and thus also require increased assistance from national military forces.

Of course, Arctic militarization also derives significantly from the habits of major powers to extend their competitive postures to any and every region in which they encounter each other, whether or not that region is itself a location of serious contention. In the Arctic, Russia and the US/NATO are long-time strategic/military competitors, especially where the North Atlantic meets the European Arctic. At the other end of the Arctic, they are separated by a mere 80 kilometers across the Bering Strait. They have learned neighbourly mutual accommodation, but in times of tension, that neighbourliness seems inevitability to succumb to a habitual turn to mutually provocative military demonstrations.

Examples of the latter include Russian and Chinese naval patrols in the Bering Sea and near the Aleutian Islands.[24] In 2022, the Russian frigate Admiral Gorshkov patrolled along the Norwegian coast from the Barents Sea to the North Sea, the Russian missile cruiser Marshal Ustinov along with a frigate and helicopter conducted anti-submarine warfare training in the Norwegian Sea, and Russian forces test-launched a Tsirkon hypersonic cruise missile from within the Norwegian exclusive economic zone.[25] US/NATO examples include anti-submarine warfare patrols in the Barents Sea where Russian second-strike deterrent forces patrol.[26] In May 2020 US and UK ships entered the Barents Sea in what Russia regarded as a Western incursion into its "backyard,"[27] and a signal that Barents Sea incursions would now "become a habit,"[28] the impact being to foster rather than ease their festering anxieties. In August 2023 the US Coast Guard vessel Healy sailed from Kodiak, Alaska through the Chukchi and East Siberia Seas along Russia's Arctic coast, then moved north of the Russian Franz Josef Land archipelago and Svalbard, ending at Norway's Arctic port in Tromsø. Joined for the latter part of the journey by a Norwegian Coast Guard vessel, the Healy's route was within Russia's exclusive economic zone until reaching Norwegian waters. It was a scientific mission, but the presence of US Navy and Air Force, as well as UK, officers on board the Healy, a US military vessel, made more than a scientific statement. The Russians took note and punctuated their monitoring of the journey with a series of naval military exercises along the Healy's route.[29]

In turn, anxieties nurtured by militarization marginalize the diplomacy and engagement that are essential to regional stability and de-escalation.

The increasingly ruinous Russia-NATO relations have been allowed, and even encouraged, to spill northward to undermine the region's stability and post-Cold War inclinations towards cooperation.

No Arctic power is better placed than is Norway to judge the strategic climate in today's Arctic, and as High North News recently observed, in Norway "barely anyone talks of low tension in the arctic anymore."[30] But editor-in-chief Arne O. Holm, acknowledging that Russia's attack on Ukraine has ended the talk of low tension, nevertheless concludes:

> "that does not mean that all escalation of the military activity on the western side promotes low tension. Perhaps rather the opposite. Above all it means that the channels between east and west must be kept open to avoid the last remnant of assurance being completely replaced by deterrence."

Not surprisingly, given Russia's concentration of strategic and regional forces in the Arctic, it carries out extensive operations and exercises throughout the region, frequently perceived as provocative by the region's non-Russian states, as Russia simulates attacks on NATO targets. At the same time, some US and NATO operations, while fewer in number, are also perceived as provocative

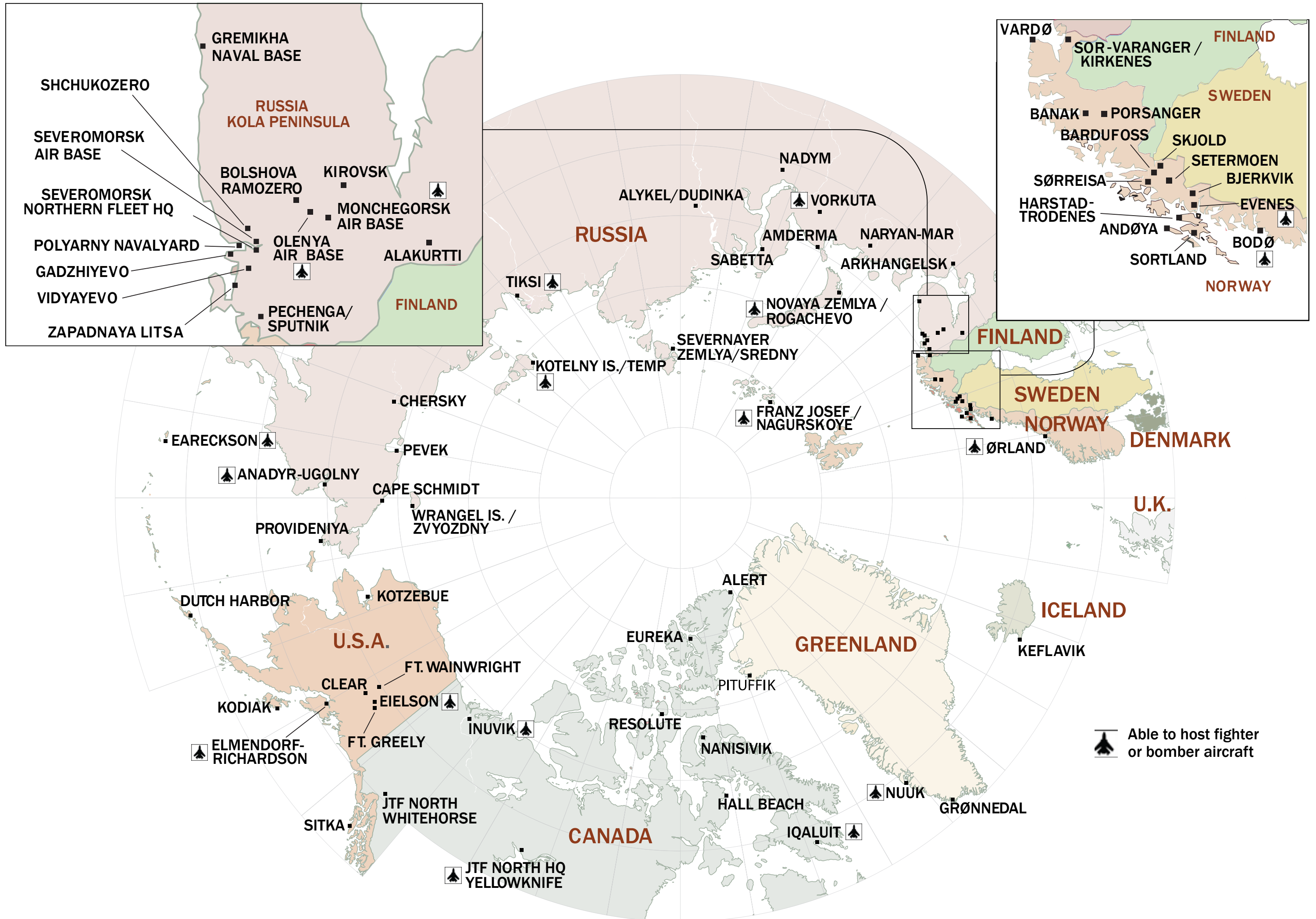
The Arctic region covers parts of eight countries (top row): Sweden, Norway, Iceland and (bottom row) Russia, Finland Canada, the United States, Greenland-Denmark.

by Russia. While the current strategic environment essentially precludes overt security cooperation, to the extent that stability and reduced tension are valued, refraining from provocative military actions should logically be the preferred norm. Furthermore, engagement and cooperation can still be encouraged and facilitated at the non-state level, notably among indigenous communities across the circumpolar region, although there are real doubts about the ability of Russia's indigenous organizations to act freely and independently from Moscow. An Arctic policy primer by Canadian academics concludes that Russia's "growing totalitarian tendencies and confrontation with the West has led to near total state control over regional [indigenous] representative organizations."[31]

To its credit, the US Arctic Strategy continues to affirm cooperation and promises, despite the challenges created by Russia's attack on Ukraine: "… the United States will work to sustain institutions for Arctic cooperation, including the Arctic Council, and position these institutions to manage the impacts of increasing activity in the Region."[32] In the meantime, the tensions remain and pan-Arctic cooperation remains on hold. In August 2022 Canada hosted a meeting of "like-minded" Arctic Chiefs of Defence Staff, including representatives from Canada, Denmark, Finland, Iceland, Norway, and United States. Canada's Gen. Wayne Eyre's concluding statement said in part: "The Arctic is at an inflection point where effects from Russia's illegal invasion of Ukraine and their military build-up in the Arctic, the impacts of climate change, technological advancements, and economic interests are driving increasing interest, activity, and competition in a way that makes this region more strategically important than ever before."[33] And in January 2023, the US Chief of Staff of the Army led a meeting in Norway of chiefs of defence from 11 countries plus the US and Norway. Norway declined to identify the countries involved, except to say that they were allies and that the agenda included "challenges in the Arctic and High North."[34]

These Arctic challenges have prompted the Arctic states of the geopolitical west to largely eschew direct diplomatic engagement with Russia, by any measure the most prominent presence in the Arctic, in favour of enhancing their military infrastructure and capacity. The following offers a summary account of the military footprints of the five states bordering on the Arctic Ocean.

Map 2: Sites capable of hosting fighter and/or bomber aircraft



Click here to enlarge map

Military Presence/Facilities in the Arctic

The 69 military sites, most being continuously staffed, in the littoral states of the Arctic Ocean (see Map 1), range from dual use civilian/military airstrips and ports to bases hosting some of the world's most fearsome strategic arsenals. Anecdotal descriptions of some of the facilities are included in the following pages, but there is no attempt to assess relative military capabilities or strengths.

The Canadian Armed Forces (CAF) Joint Task Force North (JTFN)[35] operates out of five permanent locations, none of which has been explicitly designated a "base" by the Minister.[36] The JTFN is headquartered in Yellowknife (Fig. 1). It hosts four military units: 440 Transport Squadron, the Yellowknife Company (reserves), 1st Canadian Ranger Patrol Group (CRPG - reserves), and Area Support Unit (North). The Rangers of the CRPG are a primary, and unique, on-the-ground military presence in the Canadian Arctic. The Yellowknife facility is shown on Map 3 as hosting ground troops, but, in fact, the Rangers do not have a central location and instead operate dispersed throughout Arctic communities, where they are always present and serve as "lightly-equipped, self-sufficient mobile forces to support CAF national security and public safety operations"[37] – in effect, every Ranger's house becomes a "base" where his or her gear is stored and from which each Ranger operates.

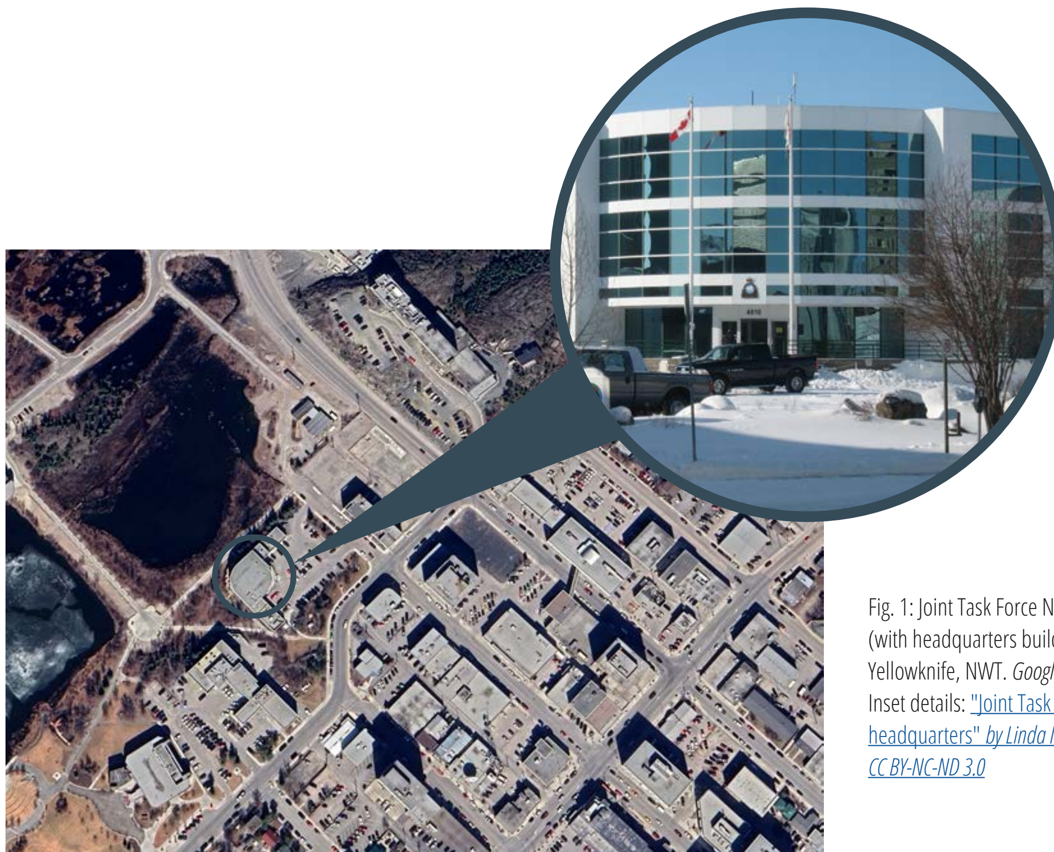


Fig. 1: Joint Task Force North headquarters (with headquarters building inset), in Yellowknife, NWT. *Google Earth*
Inset details: "Joint Task Force North headquarters" *by Linda N. Seale licensed by CC BY-NC-ND 3.0*

CANADA

In Canada, the emphasis is certainly on dual use facilities, with a prominent focus of military forces in the Canadian Arctic being assistance to civilian authorities. The vast Arctic territories of Canada, the ultra-long northern coastlines, and the expansive frontier airspaces, mean that servicing remote locales and controlling extensive borders are consistent challenges and obvious priorities.

JTFN operates detachments in Whitehorse and Iqaluit. Inuvik hosts a small detachment linked

Fig. 2 (top): Inuvik, NWT Forward Operation Location for Canada's fighter aircraft. *Google Earth*

Fig. 3 (left): Canadian Forces Station Alert, the most northerly military facility on the planet, maintains signals intelligence operations, as well as communications in support of search and rescue operations and climate change researchers. *Google Earth*

to the Canadian Forces Base at Cold Lake, Alberta, as well as a forward operating location for Canada's fighter aircraft (Fig. 2). The Canadian Forces Station Alert (Fig. 3) is at the northern tip of Ellesmere Island of Nunavut. It is the most northerly military facility on the planet and houses both military and civilian personnel, notably for signals intelligence, military operations, search and rescue, and Environment Canada. Eureka on Ellesmere Island is a seasonal site supporting weather and communications facilities in Alert.

A primary JTFN mission is to pursue full situational awareness of Canada's North, including ongoing assessments of the security and defence environment, and of course managing the Canadian Armed Forces' northern operations and exercises with mission partners from the federal government, territorial governments, northern communities, and defence forces and Coast Guards of other countries.

The Coast Guard has no permanent locations in the Canadian Arctic, but the not yet operational Nanisivik Naval Station on Baffin Island (Fig. 4) is to be a seasonal berthing and refueling facility – for civilian as well as Canadian naval and Coast Guard vessels. The recently opened deep-sea port in Iqaluit will be a civilian/commercial port, but similarly available to the Navy and Coast Guard.

The North Warning System (NWS), operated jointly with the US through NORAD (the Canada-US North American Aerospace Defence Com-

Fig. 4: Nanisivik Naval Station, the much-delayed naval refueling station (in Admiralty Inlet off Lancaster Sound at the north end of Baffin Island) is nearing completion. *Google Earth*

mand), has a clear national defence and strategic mission. It operates 47 unattended radars in Canada (11 long-range, 36 short-range). An example is the Hall Beach site at the renamed village of Sanirajak on the Melville Peninsula, Nunavut, (Fig. 5).[38] These radars join similar sites in Alaska (4 long-range, 3 short-range) along with Atlantic and Pacific coastal radars to monitor air traffic approaching Canadian air space (the overwhelming majority of which being civilian aircraft). Unidentified or suspect aircraft (or balloons![39]) designated for interception can be intercepted by aircraft flying out of four forward operating locations (FOLs, linked to home bases at Cold Lake and Bagotville) – Inuvik, Yellowknife, and Iqaluit, in the Arctic, plus Goose Bay, Labrador.[40] Map 2 indicates facilities hosting fighter aircraft throughout the Arctic.

Fig. 5: The Hall Beach North Warning System Long-Range Radar. *Google Earth*

Fig. 6: The American Fort Wainwright army base at Fairbanks, Alaska, reports its purpose to be "to deploy, fight and win our nation's wars." Like other Alaska installations, the primary focus is the Pacific rather than the Arctic region. *Google Earth*

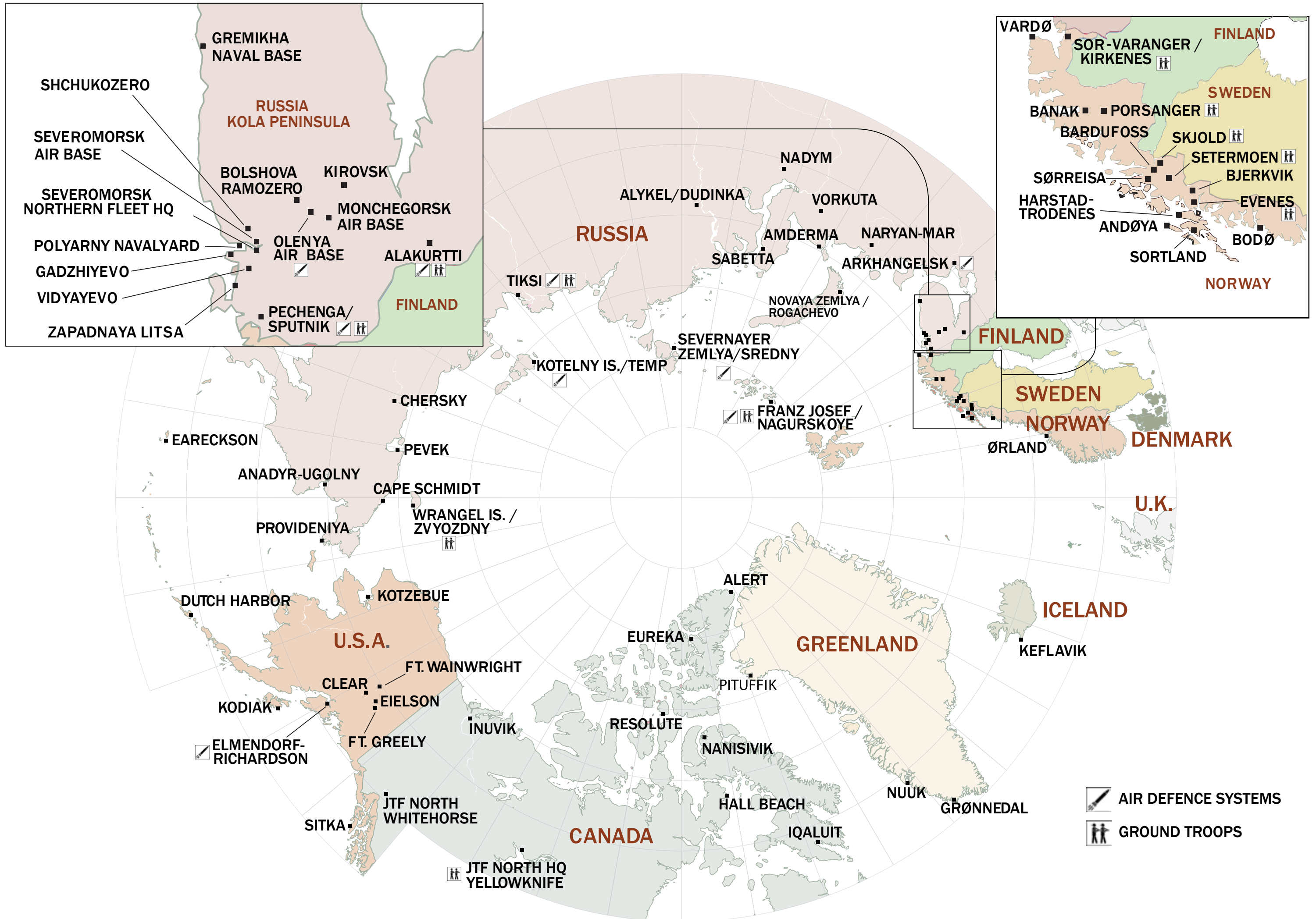
The NWS was built during the Cold War to detect Russian strategic bombers approaching North America's Arctic frontiers, although Canadian NWS radars are deployed primarily along the northern mainland coast and notably do not monitor approaches to the islands of the more northerly archipelago. Contemporary threats, however, are not primarily bombers, although Russian (or Soviet) strategic bombers have for decades patrolled the Arctic in international air space and are met by Canadian fighters from time-to-time when they venture near Canadian frontiers. The current strategic threat to North America is primarily intercontinental ballistic missiles (ICBMs), which the NWS cannot detect or track. Longer range cruise and hypersonic missiles also cannot be reliably detected, and the bombers that carry them can now launch their missiles from outside the current detection range of the NWS. Russia has the capacity to launch missiles aimed at targets in the North American heartland from positions well away from the Arctic frontiers and need not necessarily transit the Arctic for the shortest route to targets in the North American heartland.[41] Plans are thus underway for a complete overhaul of the system in cooperation with the United States – plans that include new over-the-horizon radar systems and that were reiterated during President Joe Biden's March 2023 visit to Ottawa.

In peacetime, Canada's day-to-day air defence operations in the Arctic (and especially along Canada's Pacific and Atlantic coasts) are primarily in support of civil authorities mandated to maintain control over civilian air and maritime approaches to Canada.

UNITED STATES

While the US is increasingly explicit in its intention to respond to Russian preeminence in the Arctic,[42] Alaskan military facilities are still oriented more toward Pacific strategic interests than the Arctic. Security concerns regarding the

Map 3: Sites hosting air defence installations and/or ground troops



Click here to enlarge map

Fig. 7: Kotzebue, on a peninsula in Alaska's GoodHope Bay off the Bering Strait, is the seasonal Arctic home of the US Coast Guard. *Google Earth*

Arctic are obviously increasing, but Washington's Arctic security policy has only recently begun to take on any sense of urgency. There was no direct mention of the Arctic in either the Trump Administration's 2018 unclassified summary of its 2018 National Defense Strategy,[43] or in the Biden Administration's March 2021 Interim National Security Strategic Guidance.[44] A 2021 US Congressional Research Report[45] on Arctic affairs quotes a US Air Force official as saying that US military power in the high north is really "forward positioned" for "power projection" into the Indo-Pacific and Europe. Nevertheless, the same report does refer to "the return of great power competition" in the Arctic and makes the point that all US military services, including the Coast Guard, are expanding their Arctic activities and facilities (the latter including plans for an expanded deep water port at Nome, Alaska to accommodate Navy and Coast Guard, as well as large civilian, vessels.)[46]

Ice conditions in the European Arctic allow year-round naval operations from bases within the region, but the more challenging ice conditions in the North American Arctic mean naval surface operations are based in the south and move north seasonally. US submarine operations are also based in the south, but they can operate in the north in all seasons (these are normally attack submarines, not those carrying nuclear-armed intercontinental ballistic missiles, or SSBNs). Hence, the naval footprint in the North American Arctic is lighter than in the European Arctic.

Fort Wainwright is a major infantry centre (Fig. 6) – Map 3 indicates facilities hosting ground troops throughout the Arctic. Eielson Air Force Base is the home of two squadrons of F-35 fighter aircraft, while the Elmendorf-Richardson Joint Base hosts the F-22 Raptor fighter aircraft.[47] Both bases have trained for and tested Patriot and other air defence systems in cold weather conditions.[48] Eare-

Fig. 8: Fort Greely hosts missile defence interceptors designed for mid-course interceptions of North Korean missiles in outer space. *SecureWatch*

Fig. 9: Alaska's Clear Space Force Station operates a Long Range Discrimination Radar designed to scan polar and north Pacific regions as part of the strategic missile defence system. *Google Earth*

Fig. 10: The US Pituffik Space Base in Greenland includes a ballistic missile early warning radar that also contributes to space surveillance. *Google Earth*

Fig 11: Greenland's Joint Arctic Command in Nuuk is the command site for Greenland and the Faroes Islands. *Google Earth*

ckson Air Station, located where the Aleutians end near Russia's Kamchatka Peninsula, is also oriented toward the Pacific and Europe. It hosts the large Cobra Dane radar linked to the continental ballistic missile defense operations. Kotzebue (Fig. 7) is a seasonal forward operating base for the US Coast Guard and is headquarters for the annual Arctic Shield training exercise for responding to catastrophic events such as earthquakes. It coordinates military and civilian agencies in the north, reflecting the aid-to-civilian-authorities element of the military presence in Alaska.

Alaska also hosts the key strategic ballistic missile defence installations. Fort Greely is the site of 40 (out of a total of 44) interceptor missiles, with another 20 being added (Fig. 8), and the Clear Space Force Station hosts an early warning and tracking radar (Fig. 9). The missile defense radars also perform space situational awareness missions for the US Air Force Space Command.[49] These are the core elements of the ground-based mid-course interception homeland missile defence system, aimed not at Russian or Chinese ICBMs, but at the emerging North Korean threat, with no capability for intercepting cruise or hypersonic missiles.

GREENLAND-DENMARK

Denmark's military operations in Greenland are largely oriented toward public safety rather than strategic dynamics, but the most prominent military facility in Greenland is in a decidedly strategic role – that being the American Pituffik Space Base (formerly the Thule Air Base – Fig. 10).[50] Also part of the American homeland missile defence operation, the base hosts an upgraded ballistic missile early warning and tracking radar. In January 2023 F-35 fighter aircraft operated out of Pituffik as part of a NORAD exercise.[51]

Greenland's own primary military facility is the Joint Arctic Command at Nuuk (Fig. 11). It undertakes surveillance and sovereignty operations and supports search and rescue, fishery vessel inspections, and scientific expeditions. The Danish, American, and Canadian navies and coast guards are also able to use Nuuk as a fueling facility.

NORWAY

Norway shares a 196km Arctic border with Russia, giving frontier patrols and sovereignty protection operations a clear strategic, as well as local, dimension and special importance in a neighbourhood that some warn "quickly could develop into confrontation."[52] This has been a long-term, familiar reality for Norway, as the only NATO member during the Cold War with a land border with the Soviet Union. Norway is thus accustomed to maintaining an active military presence in the Arctic, and as tensions have once again surged, its open-

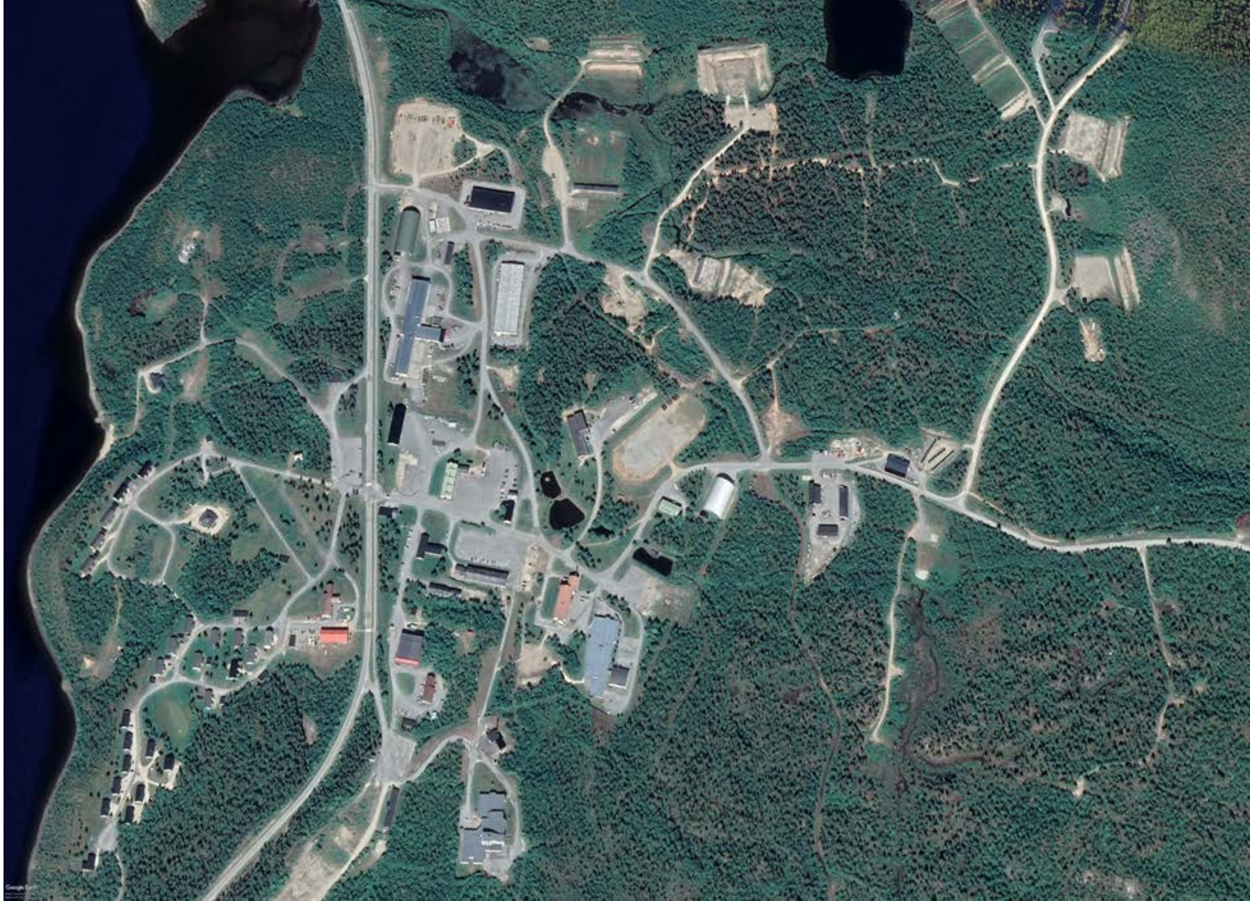


Fig 12: Porsangermoen, Norway, hosts the Porsanger army garrison base in northern Norway. *Google Earth*

ness to an enlarged NATO presence has also become more prominent. The 2020 Norwegian Arctic defence plan warns that "if Norway does not have a regular and predictable presence in the North, a space could open for allies or others to fill," and thus a loss of Norwegian influence over security arrangements "in its own neighborhood."[53] For close to two decades already, Norwegian concern about Russia's posture in the European Arctic has grown and security investment and attention have increased, with particular boosts after the 2014 and 2022 Russian actions against Ukraine.

Among a dozen or more Arctic military establishments in Norway's Arctic, Porsangermoen (Fig. 12) is the northernmost infantry base. Located within 200 kms of Russia, it was the site of the 2020 signing of a new commitment to enhance Nordic (Norway, Sweden, Finland, Denmark, and Iceland) defence cooperation,[54] their collective signal that they intend to assert defence leadership in their part of the Arctic. Sor-Varanger/Kirkenes to the east is another infantry base located near the border with Russia – and just across that border is Russia's Pechenga infantry base in the north of the Kola Peninsula.[55] Further southwest, well away from the Russian border, American marines on rotation train at the Setermoen infantry camp (Fig. 13), where the US Marine Corp has for some time maintained equipment stockpiles. While Norway maintains a policy against any nuclear weapons presence or foreign forces being permanently based in Norway, in addition to American marines, Royal Marines Commandos of the United Kingdom deploy annually to Camp Viking, a new Arctic operations base in Norway's high north, just south of Tromsø, under a new agreement to support British Commando deployments over the next 10 years.[56] Norway also maintains a dock that accommodates American nuclear powered submarines at Grøtsund, just north of Tromsø.[57] From 2021 to mid-2023 there were 10 known US fast attack nuclear powered submarine visits to the port – Los Angeles and Virginia class

Fig. 13: The Norwegian forces' Setermoen infantry camp also hosts US marines on temporary training deployments. *Google Earth*

subs equipped with Tomahawk cruise missiles, torpedoes, and anti-ship missiles.[58]

Other facilities include the Norwegian Coast Guard headquartered at Sortland, search and rescue helicopters at Banak, and F-35 fighters based at Orland Air Base. The American B-2 bomber made its first landing in a Scandinavian country at the Orland Base in August 2023.[59]

The most northerly military facility in Norway is the Vardø X-band radar (Fig. 14), situated on a coastal island extending into the Barents Sea. It is focused on tracking deep space objects, although Norwegian officials have said the radar is also used in research and development, as well as for "surveillance of the Norwegian area of interest, including technical gathering of intelligence."[60] Russian military exercises in the area have simulated air attacks on the Vardo radar, and Norway's Ministry of Foreign Affairs has made it clear to the Russians that "such behavior does not promote good neigh-

Fig. 14: The Vardø X-band radar in Norway's north near Russia's Kola Peinsula is a surveillance radar focused on space and regional monitoring. *Google Earth*

Fig. 15 (left): S-400 air defence units are part of Novaya Zemlya's Rogachevo Air Base. *SecureWatch*

Fig. 16 (above): Wrangle Island's trefoil base, linked to a radar facility and communications installation just north of the base. *SecureWatch*

borly relations."[61] Norway's Svalbard Islands lie further north but are demilitarized under Article 9 of the 1920 Svalbard Treaty, which grants Norway sovereignty, but with certain conditions, and some rights that accrue to states parties to the Treaty (which include Russia).

Finland and Sweden, now NATO members, regularly join Norway and other allies in joint military exercises. An example of the kinds of joint operations the region mounts is the March 2023 naval exercise involving 13 NATO countries operating in international waters off the north Norwegian coast. Some 40 ships and aircraft were involved – with Russian vessels keeping watch nearby.[62]

RUSSIA

There are two relatively distinct groups of military facilities in Russia's Arctic. One group is made up of the installations outside the Kola Peninsula, stretching from Anadyr-Ugolny's dual use civilian and military airfield in the far east to Arkhanglesk in the west across the White Sea from the Kola. The other group is the high concentration of air, naval, and infantry bases on the Kola Peninsula, perhaps the highest concentration of military firepower on the planet, ranging from sea-based strategic nuclear forces to infantry soldiers on snowmobiles.

There are no major Russian air bases among the non-Kola group, but a number of sites along the full length of the Russian Arctic have the capacity to host fighter and bomber aircraft from Kola bases on operations (Map 2) and, in some cases, air defence missiles – for example, Ugolny, Tiksi, Kotelny, Vorkuta, Franz Josef Land, and Novaya Zemlya. The latter two extend the reach of the Kola operations and are oriented toward projecting power into the Norwegian Sea and the North

Fig. 17: Franz Josef Land's "trefoil" facility (with winter scene inset) is barracks and operational centre base for the Nagurskoye base. *SecureWatch*

Atlantic. Tu-95s bombers have reportedly flown from Vorkuta for missile attacks on Ukraine.[63] Many other airstrips in the Russian Arctic could accommodate landing and take-off of fighter aircraft but would not normally host operational fighters.

Many of the air bases and forward operating locations that can host fighter aircraft have some air defence capabilities (Fig. 15 and Map 3). Centres outside the Kola Peninsula that host radar facilities include Cape Schmidt, Wrangel Island (Fig. 16), Cherskey (planned), Tiksi, Kotelny, Dudinka (Alykel), Novaya Zemlya, Franz Josef Land, and Vorkuta.

Three sites – Franz Josef Land (Fig. 17), Kotelny Island, and Wrangel Island – include substantial trefoil garrisons capable of housing up to 150 ground troops each. Russia's Arctic military facilities also include 10 announced Emergency Response Centres (Map 4).[64] Of course other bases also include search and rescue and emergency response capabilities. Monitoring and control of the Northern Sea Route, as well as supporting civilian authorities in their public safety missions, are part of the mission of forces operating out of the non-Kola military facilities.

Fig. 18: The Severomorsk-3 air base on the Kola Peninsula is a major centre for military aircraft, including fighter aircraft that are also deployable to Nagurskoye and Rogachevo or elsewhere in the Arctic. *Google Earth*

Map 4: Russia's Arctic bastion

Click here to enlarge map

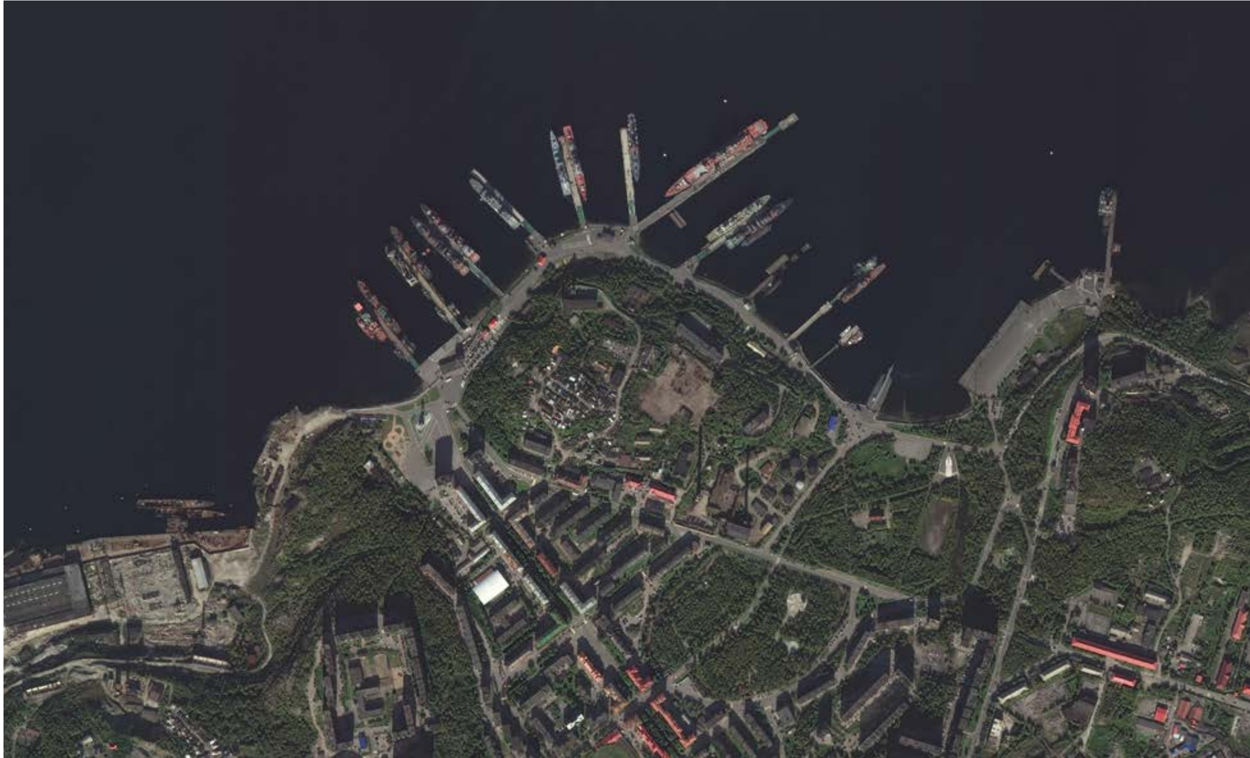


Fig. 19: Severomorsk is Headquarters for the Northern Fleet. *SecureWatch*

The Kola Peninsula hosts three major air bases – Severomorsk (Fig. 18), Olenya, and Monchegorsk. These sites host a range of aircraft – including upwards of 80 fighters in various configurations and roles, as well as surveillance, long-range anti-submarine patrol, and air defence aircraft, plus electronic intelligence, and transport aircraft. There are no strategic, nuclear armed, bombers based in the Arctic, but can be deployed there.[65]

The Northern Fleet, headquartered at Severomorsk (Fig. 19), hosts more than two dozen submarines and more than three dozen surface vessels, including combat, coastal patrol, mine clearance and amphibious ships – aided by a large fleet of icebreakers. The Gadzhiyevo base hosts the Northern Fleet's strategic submarines armed with nuclear-tipped intercontinental range ballistic missiles (SSBNs – Fig.20). The Northern and Pacific Fleets (the latter based on the near-Arctic Kamchatka Peninsula) operate five previous generation Delta IV SSBNs and five new generation Borei models.[66] Another five of the Borei SSBNs are in the works, with the ultimate plan being to retire the Delta IVs and to operate 10 Borei models, five each with the Northern Fleet and the Pacific Fleet. Each sub has the capacity to carry 16 intercontinental ballistic missiles armed with multiple independently targeted nuclear warheads. As of 2023, the Pacific Fleet was assigned four Borei subs, while the Northern Fleet was operating the five remaining Deta IVs and one Borei, with more of the latter slated for deployment.[67] The Ghadszeyevo base includes major missile and nuclear warhead storage facilities (Fig. 21).

Pechenga and Alakurtti are home to the Arctic Brigade land forces, established in 2014 under the Northern Fleet, and large numbers (as many as 80 percent by one estimate) of the Kola ground troops have been deployed in Ukraine, suffering major losses.[68]

The heavy concentration of military firepower on the Kola Peninsula, as well as the preference for conducting nuclear deterrence patrols in the Barents Sea, reinforces the importance of the Barents Sea as a bastion (Map 4). That in turn gives rise to deployments at Franz Josef Land and Novaya Zemlya in support of protecting that bastion and efforts to erect a line of defence where the bastion meets the North Atlantic. The forces in Russia's western Arctic are prominently oriented toward defending that bastion and limiting NATO op-

Fig. 20 (top): The Gadzhiyevo Naval Base hosts the Northern fleet's SSBN submarines, equipped with nuclear armed ballistic missiles capable of reaching North American and European targets from their patrol operations in the Barents Sea and beyond. *SecureWatch*

Fig. 21 (right): Nuclear warhead and missile storage bunkers at Gadzhiyevo. *Google Earth*

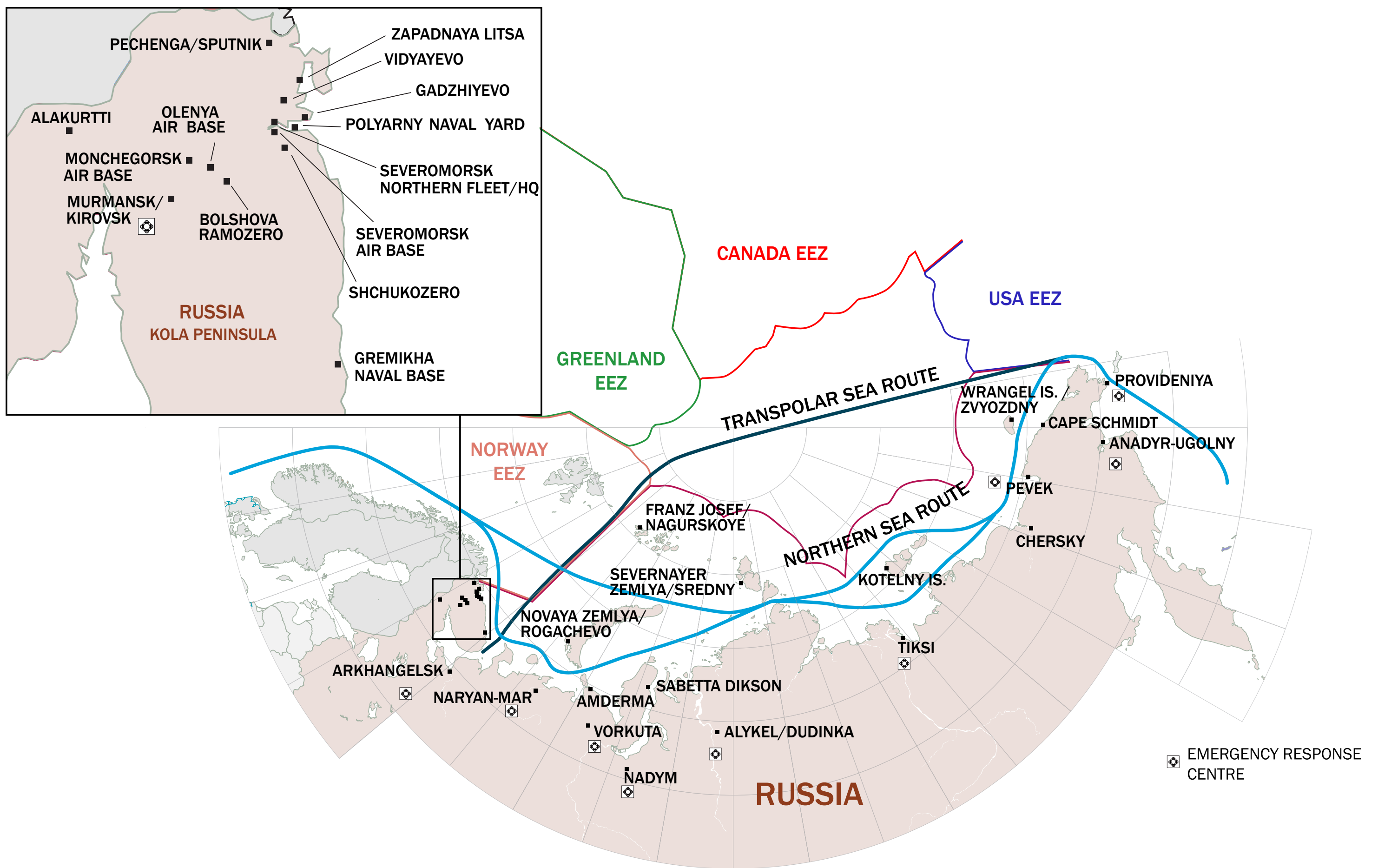
tions, in the event of combat in Europe, for air and sea approaches to Russia's most potent military assets in the Arctic.

Geography has determined that Russia's naval access to the Atlantic Ocean must be via the Arctic, and it is through its Arctic-based military operations that Russia addresses, or competes with, the Atlantic operations of European and US forces. That makes the Arctic, specifically the Kola Peninsula, a primary staging area for Russia's global strategic presence.

Russia maintains the most prominent and formidable military presence in the Arctic, but NATO members in the Arctic collectively have at least as many staffed conventional military facilities as Russia. The seven non-Russian Arctic states are through NATO also part of a global military network that far outpaces Russian forces and capabilities.[69]

At the same time, Russia's domestic military requirements in the Arctic are perceived to be growing, especially related to maritime transportation services and oil and gas operations that rely on exports shipped via the Arctic Ocean. In 2023 there was a significant increase over 2022 levels in cargo transits along the Northern Sea Route, due primarily to oil and gas shipments to China.[70] Russia also has the largest Arctic population of any of the

Map 5: Russian NSR and Emergency Response Centres



Click here to enlarge map

states bordering on the Arctic Ocean. Hence, its security forces necessarily also aid northern civilian authorities in carrying out their responsibilities for sovereignty reinforcement, coastal/frontier patrols, emergency responses, and managing and protecting the expanding intercontinental transportation through the international waters of its Arctic Ocean exclusive economic zone (Map 5). The Russian Border Guard Service (FSB) in April 2023 signed a new maritime security cooperation agreement with China emphasizing missions "to combat terrorism, illegal migration, fighting smuggling of drugs and weapons, as well as stopping illegal fishing.[71]

Russia's military expansion in the Arctic, the same goes for all states of the region, aims at improved domain awareness and measures to ensure protection of national borders and resources in the area. The Northern Sea Route is obviously regarded as a long-term economic boon to Russia and there is some recognition that military developments along that route are largely defensive, even if often interpreted as largely offensive in the West[72] (while these are international waterways, Moscow is bent on managing them as Russia's national waters). While Russia's restoration of full radar coverage along its 22,600-kilometer (14,000-mile) Arctic frontier is a major benefit to civil aviation and border patrols, Western military observers frequently see it primarily in terms of military missions like the deployment of fighter aircraft along its frontier airspace.[73]

All major Arctic states rely on coastal radars to monitor aircraft approaching their national airspace and territorial frontiers, and dispatch reconnaissance/interceptor aircraft to respond to approaches to national territory. This applies to Russia as well, and the much-noted air defence missile systems (reportedly with ranges up to 400km) deployed by Russia in the region have a primary role of defending against incursions into national air space, rather than for power projection.

Perceptions of the significance of any military installations change when the larger strategic environment or context changes. Prior to 2010, the new and restored military facilities in the Russian Arctic appeared to many observers to be, while perhaps more than needed in the largely benign Arctic of the day, understandable as supportive of the expanding responsibilities of civilian authorities in an increasingly accessible region – and of Russia's ambitions to recover its global power status. In the radically changed context of 2014 and since, not surprisingly, the same facilities have taken on a much more sinister presence amidst fears that Russia's expansionist ambitions elsewhere, and China's interests in the region, could have implications for the Arctic, making for considerably greater caution and suspicion regarding Russia's growing northern military capabilities. In the current context it is not an overstatement to say that those same facilities are now viewed with alarm – with part of that change in perception also stemming from the extensive exercises now undertaken by Russia in the Barents, Norwegian, and North Seas, some aggressively simulating attacks on NATO targets.

Perceptions of the significance of any military installations change when the larger strategic environment or context changes.

Nevertheless, those facilities and on-the-ground capabilities are largely as planned a decade ago. Furthermore, with some Northern Fleet assets and ground forces from Pechenga and Alakurtti deployed to the Ukraine war, Russia's Arctic military readiness has been negatively affected.[74] One American study found that even before its full-scale invasion of Ukraine, Russia had significantly cut spending on conventional defence in the Arctic, while sharply increasing government spending on commercial development, relying also on private sector and especially on non-military Chinese investment.[75]

3. Return to Diplomacy

With East/West relations at a post-Cold War low, it remains the case that expanding Arctic military facilities need not on their own make Arctic centered tensions inevitable. The tensions that have taken hold in the Arctic are not intrinsic to the region. Nevertheless, with all seven non-Russian Arctic states now in NATO, the Arctic is being positioned as one more stage on which to play out the dangerous East/West drama, not because the Arctic itself is a zone of conflict, but because of spillover from conflicts in other regions into the Arctic. When in November 2022 the Pentagon used a C-130 transport aircraft to demonstrate, on Norway's Arctic Andoya Island, that it could use a standard cargo air drop procedure to launch an air-to-surface cruise missile, the special operations commander declared, "we are intentionally trying to be provocative without being escalatory"[76] – without any explanation as to how the former could avoid the latter. Russia's test launch of a Tsirkon hypersonic cruise missile from within Norway's EEZ was no doubt accompanied by similar rationales.[77]

NATO's current (2022) Strategic Concept insists it is "not seek[ing] confrontation and poses no threat to the Russian Federation," and that it "remain[s] willing to keep open channels of communication with Moscow to manage and mitigate risks, prevent escalation and increase transparency."[78] That begs the question of how best, when Russia is in egregious violation of the rules-based order, to restore meaningful dialogue, along with arms control and disarmament, as the priority approach envisioned and promised in the Ilulissat Declaration's commitment to the "orderly settlement" of disputes."[79]

A 2020 report by the US Think Tank CSIS (from well before Russia's all-out invasion of Ukraine)[80] called on the US to "bolster its diplomatic presence" regarding the Arctic in the interests of "a more robust diplomatic outreach to Russia." Among other things, it called on Washington to "initiate annual meetings of the foreign and defense ministers of the eight Arctic Council nations," and "promote more frequent meetings of the five Arctic coastal states to discuss management of the CAO" (Central Arctic Ocean).

Since then, of course, the strategic environment has suffered major and consequential decline. The US Alaskan Senator Lisa Murkowski is aligned with the currently prevailing view when she says "we cannot engage as if there is not a war that has been perpetrated by Russia, an invasion by Russia."[81] But others also make the counterpoint that it was active engagement and diplomacy in the context of Cold War hostilities that helped to save the planet from catastrophe.

Current instances of ongoing cooperation include the Arctic Council's six Indigenous organizations, the Council's permanent participants, which continue to do cross-border work and make use of opportunities for communication with their Russian counterparts. And the US Coast Guard still has some open lines of communication with Russians, says Rear Admiral Nathan Moore, commander of the Coast Guard's Alaska division:

> "You have to be able to speak to your neighbor, your next-door neighbor. You don't have to be best friends with them, but you've got to be able to speak with them for shared interests across what is the natural physical border directly with Russia here in Alaska."[82]

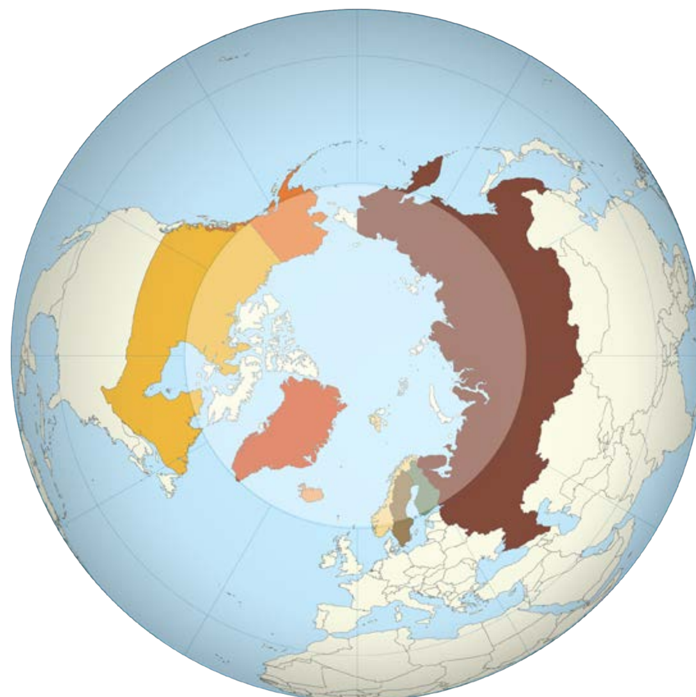
As long as the Ukraine war continues, prospects for a return to Arctic state-to-state security cooperation are worse than dim. The non-Russian Arctic has clearly come to see Moscow as just as unreliable as an Arctic partner as it is in Europe and elsewhere, but at the same time, the Arctic and the rest of world must address common and urgent global threats such as climate change challenges. As Michael Paul, Senior Fellow of the German Institute for International and Security Affairs, Stiftung Wissenschaft und Politik (SWP) of Berlin, bluntly puts it, "we need Russia's partnership for saving the future."[83] That spells a future of serious peril, unless, Paul concludes, the international community can succeed in "ending the war in Ukraine and starting a new Arctic security dialogue." Or, as Evan T. Bloom, the former Arctic diplomat with the United States, puts it, "…there can be no progress on Pan-Arctic issues without Russian participation."[84] For now, that remains a tall order.

Canada's first indigenous Governor General, Mary Simon, an Inuk from the northern Quebec region of Nunavik, has voiced similar concerns, with the reminder that Indigenous Peoples,

along with things like scientific research agendas and climate change challenges, transcend national boundaries. While emphasizing the essential requirement to defend Canada's northern sovereignty, she also noted in an interview with Radio-Canada International that there is still need for collaboration with people "within Russia and all Arctic countries on issues like climate change and Indigenous Peoples." In each of the countries of the Arctic there is a need "to figure out how you can continue working together when a terrible war is going on [which is] contradictory to the rules-based international order."[85] Key issues like rising sea levels continue and, she said, "these are things that we have to continue to work together on."

Notably, some of the Arctic military facilities throughout the Arctic support ongoing scientific research and responses to climate challenges in the Arctic. For those facilities to advance regional security instead of insecurity, they require active regional diplomacy and engagement. Military initiatives or capacity do not replace diplomacy, they become more effective when guided with the assistance of diplomacy. It is only direct engagement that can make it possible to pursue complementary and constructive operations in a region of shared security needs. Russia is currently radically out of step with such a shared security agenda, but acquiescing to its belligerence by reinforcing non-engagement and increased confrontation serves a disruptive agenda destined to heighten tensions and reduce security.

The Arctic military facilities described in this report are not by definition inimical to cooperation and reduced tensions. The strategic systems in Alaska and the Kola Peninsula await renewed attention to arms control and disarmament, while the other military facilities, dispersed widely throughout the region, require some easing of strategic tensions and a return to diplomatic engagement that, by tradition and mission, is intended to bridge the political and military divides that threaten the planet. Finland, with its extended experience with Russia and before that the Soviet Union has a sophisticated mixture of military preparedness and "an unwavering commitment to dialogue."[86] And in a 2022 analysis, undertaken after Russia's February 24, 2022 invasion of Ukraine, the International Institute for Strategic Studies concluded that the Arctic could yet be a positive force for stepping back from the current divides. "Given the shared interests in the [Arctic]," says the 2022 IISS analysis, "if there is to be any thawing in relations with Russia – albeit probably not for quite some time – the Arctic may be a space to watch"[87] – and a place to act.



Endnotes

1 “Implementation Plan for the 2022 National Strategy for the Arctic Region” The Whitehouse, 18 October 2023. https://www.whitehouse.gov/wp-content/uploads/2023/10/NSAR-Implementation-Plan.pdf

2 Astri Edvrdsen, “Light at the End of the Tunnel for the Arctic Council,” High North News, 12 September 2023. https://www.highnorthnews.com/en/light-end-tunnel-arctic-council

3 “Arctic Council Advances Resumption of Project-Level Work,” 28 February 2024. https://arctic-council.org/news/arctic-council-advances-resumption-of-project-level-work/

4 “How war in Ukraine is changing the Arctic: Co-operation with Russia has collapsed—and China is ascendant,” *The Economist*, 04 July 2022. https://www.economist.com/the-economist-explains/2022/07/04/how-war-in-ukraine-is-changing-the-arctic

5 Malte Humpert, ”Control Over Arctic Ocean Top Priority Of New Russian Naval Doctrine,” *High North News*, 04 August 2022. https://www.highnorthnews.com/en/control-over-arctic-ocean-top-priority-new-russian-naval-doctrine

6 “Arctic cooperation after Russia’s break with the West,” *Strategic Comments*, Volume 28, Comment 20, October 2022. https://www.iiss.org/publications/strategic-comments/2022/arctic-cooperation-after-russias-break-with-the-west#:~:text=Arctic%20cooperation%20after%20Russia%E2%80%99s%20break%20with%20the%20West,since%20the%20invasion%20of%20Ukraine%20in%20February%202022.

7 Jens Stoltenberg, “In the face of Russian aggression, NATO is beefing up Arctic security,” *Glob and Mail*, 24 August 2022. https://www.theglobeandmail.com/opinion/article-in-the-face-of-russian-aggression-nato-is-beefing-up-arctic-security/

8 https://www.thearcticinstitute.org/

9 https://www.naadsn.ca/research/

10 https://www.csis.org/analysis/ice-curtain-protecting-arctic-motherland

11 https://www.chathamhouse.org/topics/defence-and-security

12 https://arcticreview.no/index.php/arctic/article/view/3338/6318

13 https://thebarentsobserver.com/en

14 https://www.highnorthnews.com/en

15 https://www.arctictoday.com/

16 In addition to these institutions, a large number of individuals could also be numbered, but we will limit ourselves to noting the invaluable contributions of Dr. Adele Buckley’s posts to relevant listservs of news and analysis of Arctic actions and developments.

17 Paul Voosen, “The Arctic is warming four times faster than the rest of the world,” *Science*, 14 December 2021. https://www.science.org/content/article/arctic-warming-four-times-faster-rest-world

18 Andreas Østhagen, “Coast Guard Cooperation with Russia in the Arctic,” The Arctic Institute, 6 June 2016. https://www.thearcticinstitute.org/coast-guard-cooperation-with-russia-in-the-arctic/

19 https://www.barentsinfo.fi/docs/Gorbachev_speech.pdf

20 https://arcticportal.org/images/stories/pdf/Ilulissat-declaration.pdf

21 For some analysts, the Ilulissat Declaration “is now well and truly resigned to history” and that “the Arctic is past the point of no return in terms of circumpolar trust, respect, and dialogue.”

Elizabeth Buchanaan, “Russia’s gains in the great Arctic race,” 4 May 2023. https://warontherocks.com

22 For example: Sub-regional government-to-government cooperation occurs through groupings like the Barents Euro-Arctic Council and the West Nordic Council. Indigenous communities come together

through organizations like the Inuit Circumpolar Council (ICC) and the Saami Council. International agreements

like the Law of the Sea and the International Maritime Organization and, more recently, the Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean, are especially important to Arctic governance. Arctic public safety and security agreements include the 2011 Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic and the 2013 Agreement on

Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. The Arctic Coast Guard Forum was established in 2015, with all eight Arctic Council states part of the arrangement.

Ernie Regehr, "Cooperative Security and Denuclearizing the Arctic," *Deterrence, Arms Control,*

and Cooperative Security: Selected Writings on Arctic Security (North American and Arctic Defence and Security Network, 2020), pp. 77-78.

23 Pavel Devyatkin, "China and the Arctic: Reflections in 2023, The Arctic Institute, 9 November 2023. https://www.thearcticinstitute.org/china-arctic-reflections-2023/

Matthew P. Funaiole, Brian Hart, Joseph S. Bermudez Jr., and Aidan Powers-Riggs, "Frozen Frontiers:

China's Great Power Ambitions in the Polar Regions," Center for Strategic and International Studies, 18 April 2023. https://features.csis.org/hiddenreach/china-polar-research-facility/

24 John Feng, "Russian and Chinese Navy Ships Spotted Less Than 100 Miles off U.S. Coast," *Newsweek*, 27 Septmber. https://www.newsweek.com/russian-chinese-navy-ships-spotted-less-100-miles-off-us-coast-1746669#:~:text=A%20group%20of%20Russian%20and%20Chinese%20warships%20were,and%20Beijing%27s%20second%20joint%20patrol%20in%2012%20months.

25 Operations listed in the CSIS *Arctic Military Tracker*. https://arcticmilitarytracker.csis.org

26 Thomas Nilsen, "US nuclear subs makes port call in Tromsø to collect supplies: The U.S. nuclear-powered submarine 'USS Washington' is armed with cruise missiles and is tasked to patrol northern waters where Russian submarines sail out from the Kola Peninsula. *The Barents Observer*, 11 January 11, 2022. https://thebarentsobserver.com/en/security/2022/01/us-nuclear-subs-armed-cruise-missiles-makes-port-call-tromso

27 Harry Lye, "US Navy Returns to the Barents Sea," *Naval Technology*, 05 May 2020. https://www.navaltechnology.com

28 David B. Larter, "The US Navy returns to an increasingly militarized Arctic, *Defense News,* 12 May 2020. https://www.defensenews.com

29 Atle Staalesen, "American coast guard vessel is sailing into Russian Arctic Waters," *The Barents Observer*, 18 September 2023. https://thebarentsobserver.com/en/security/2023/09/american-coast-guard-vessel-sailing-russian-arctic-waters-almost-same-time-moscow

Thomas Nilsen, "USCG Healy docks in Tromsø after joint voyage with Norwegian Coast Guard northeast of Svalbard," *The Barents Observer*, 01 October 2023. https://thebarentsobserver.com/en/arctic/2023/10/uscg-healy-docks-tromso-after-trans-arctic-voyage

30 Arne O. Holm, "Barely Anyone Talks of Low Tension in the Arctic Anymore," *High North News*, 17 March 2023. https://highnorthnews.com

31 P. Whitney Lackenbauer, Evgeniia Sidorova, Sergey Sukhankin, "RAIPON, Russian Indigenous Peoples, and the War in Ukraine: Pro-Kremlin Narratives and Voices of Dissent, North American and Arctic Defence and Security Network, *Policy Primer*, 21 July 2023. https://www.naadsn.ca/wp-content/uploads/2023/07/23jul-RAIPON-Russian-Indigenous-PWL-ES-SS-NAADSN-policy-primer.pdf

32 The United States National Strategy for the Arctic Region. https://www.whitehouse.gov October 2022.

33 Govt. of Canada, "Statement by the Chief of Defence Staff on the Conclusion of the Arctic Chiefs of Defence Meeting," 8 Augst 2022. https://www.canada.ca/en/department-national-defence/news/2022/08/statement-by-the-chief-of-the-defence-staff-on-the-conclusion-of-the-arctic-chiefs-of-defence-meeting.html

34 Astri Edvardsen, "New Military Summit about the Arctic," *High North News*, 27 January 2023.

https://www.highnorthnews.com/en/new-military-summit-about-arctic#:~:text=In%20November%2C%20the%20Arctic%20Security%20Forces%20Roundtable%20%28ASFR%29,and%20the%20UK%20%E2%80%93%20once%20every%20six%20months.

The report referred to other similar meetings:

In August, an Arctic Chiefs of Defense meeting was held in Canada with representatives from the host country, the US, Norway, Sweden, Finland, and Denmark. Its purpose was to share experiences from ongoing Arctic operations and coordinate increased cooperation between the countries. Initially, this framework also included Russia, but the regular annual meeting between all the Arctic chiefs of defense was terminated in 2014 after the Russian annexation of Crimea.

At the end of October, the Northern Europe Chiefs of Defence Conference was organized in Poland. The five Nordic countries were represented, as well as the three Baltic countries, the aforementioned host country, the Netherlands, Germany, the UK, and the US. The top military leaders discussed regional security challenges and confirmed their commitment to deeper defense cooperation, including technological collaboration between NATO allies and partner countries, among other things.

In November, the Arctic Security Forces Roundtable (ASFR) was held in France. This conference brings together high-ranking military leaders from the seven western Arctic countries – as well as from the observer states France, Germany, the Netherlands, and the UK – once every six months. The format was established by Norway and the US in 2010 to promote regional understanding and strengthen multilateral security cooperation in the High North. ASFR contributes to coordinated approaches between allied and partners to mitigate the risks of unintended escalation, said Brigadier General Edward Vaughan of the US European Command during this fall's meeting.

35 https://www.canada.ca/en/department-national-defence/services/operations/military-operations/conduct/regional-task-force/north.html

36 Queen's Regulations and Orders (QR&O) Volume I, Chapter 1: Introduction and Definitions. "'base' means a unit designated as such by or under the authority of the Minister..." https://www.canada.ca/en/department-national-defence/corporate/policies-standards/queens-regulations-orders/vol-1-administration/ch-1-introduction-definitions.html

37 Canadian Rangers. https://www.canada.ca/en/army/corporate/canadian-rangers.html

38 https://www.canada.ca/en/department-national-defence/services/operations/allies-partners/norad.html

The Hall Beach site is on the map, but is not included in the continuously attended sites.

39 Stephanie Hogan, "When a suspected Chinese spy balloon flew over Canada, why didn't we shoot it down?" CBC News, 09 February 2023. https://www.cbc.ca/news/canada/spy-balloon-canada-norad-questions-1.6742695

40 https://www.canada.ca/en/department-national-defence/services/operations/allies-partners/norad/norad-modernization-project-timelines.html

41 When in Canada, the NATO Secretary-General said "the shortest path to North America for Russian missiles or bombers would be over the North Pole." Jens Stoltenberg, "NATO Is Beefing Up Arctic Security," *The Globe And Mail,* 24 August 2022. https://www.theglobeandmail.com/opinion/article-in-the-face-of-russian-aggression-nato-is-beefing-up-arctic-security/

42 Melody Schreiber, "A sweeping US Senate bill aims to address key Arctic issues: The Arctic Commitment Act would focus U.S. investment on national security, shipping, research, and trade in the Arctic," *Arctic Today*, 04 August 2022. https://www.arctictoday.com/a-sweeping-us-senate-bill-aims-to-address-key-arctic-issues/

43 Summary of the National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge. January 2018 https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf

44 https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/03/interim-national-security-strategic-guidance/

45 *Changes in the Arctic: Background and Issues for Congress*, Congressional Research Service Report 41153, Updated October 12, 2021. https://crsreports.congress.gov

46 Mark Thiessen, "First US deep water port for the Arctic to host military, cruise ships," The Associated Press, 19 June 2023. https://www.militarytimes.com/news/your-military/2023/06/19/first-us-deep-water-port-for-the-arctic-to-host-military-cruise-ships/

47 "Eielson AFB completes F-35A Lightning II fleet," US Air Force, 19 April 2022. https://www.af.mil/News/Article-Display/Article/3002750/eielson-afb-completes-f-35a-lightning-ii-fleet/

48 "US Army Deploys Patriot, Other Air Defense Systems in Alaska," The Defense Post, 23 March 2022. www.thedefensepost.com

"Arctic Edge Brings Army's Patriot, Avenger Systems to Alaska," Air and Space Forces, 22 March 2022. www.airandspaceforces.com

49 "Missilethreat." Center for Strategic and International Affairs, Missile Defense Project. https://missilethreat.csis.org

50 Hilde-Gunn Bye, "New Name for Thule Air Base in Greenland," *High North News*, 12 April 2023. https://www.highnorthnews.com

51 Sakshi Tiwari, 1st Time In History US Deploys F35 Fighters to Greenland...," *Eurasian Times* 01 February 2023. https://eurasiantimes.com.

52 Atle Staalesen, "Norway strengthens its Arctic military in new defense plan as security concerns grow in the region," *The Independent Barents Observer*, 20 April 2020. https://www.rcinet.ca/eye-on-the-arctic/2020/04/20/norway-strengthens-its-arctic-military-in-new-defense-plan-as-security-concerns-grow-in-the-region/

53 Atle Staalesen, "Norway strengthens its Arctic military in new defense plan as security concerns grow in the region," *The Independent Barents Observer*, 20 April 2020. https://www.rcinet.ca/eye-on-the-arctic/2020/04/20/norway-strengthens-its-arctic-military-in-new-defense-plan-as-security-concerns-grow-in-the-region/

54 Atle Staalesen, "Nordic politicians sign landmark defense cooperation deal in Arctic Norway," , *The Independent Barents Observer*, 24 September 2020. https://www.rcinet.ca/eye-on-the-arctic/2020/09/24/nordic-politicians-sign-landmark-defense-cooperation-deal-in-arctic-norway/

55 Paul McLeary, "Along The Russian Border, Norway Holds The Northern Line," Breaking Defense, 05 December 2019. https://breakingdefense.com/2019/12/along-the-russian-border-norway-holds-the-northern-line/

56 "New Arctic operations base for UK commandos," Royal Navy, 08 March 2023. https://www.royalnavy.mod.uk/news-and-latest-activity/news/2023/march/08/230308-campvikingnorway

57 "Port call for reactor-powered vessels at Grøtsund," 26 Sep 2022. https://www.forsvaret.no/aktuelt-og-presse/aktuelt/grotsund

58 Astri Edvardsen, "Tenth Visit by American Submarines in Gøtsund, Tromsø," *High North News*, 14 June 2023. https://www.highnorthnews.com/en/tenth-visit-american-submarines-grotsund-tromso

59 Jennifer H. Svan, "American B-2 stealth bomber lands in Norway for first time, *Stars and Stripes*, 31 August 2023. https://www.stripes.com/branches/air_force/2023-08-31/bombers-conduct-historic-mission-norway-11223787.html

60 "The Globus II Radar and Norwegian Surveillance Activities in the North," Federation of American Scientists, 25 February 2000.

61 Thomas Nilsen, "Norway says Russia's mock attack on Vardø radar troubles stability in the north," *The Barents Observer*, 13 March 2018. https://thebarentsobserver.com/en/security/2018/03/oslo-such-behavior-does-not-promote-good-neighborly-relations

62 Atle Staalesen, "As NATO flotilla exercises along the North Norwegian coast, Russian vessels lure in nearby waters," *The Barents Observer*, 22 March 2023. https://www.rcinet.ca/eye-on-the-arctic/2023/03/22/as-nato-flotilla-exercises-along-north-norwegian-coast-russian-vessels-lure-in-nearby-waters/

Thomas Nilsen, "Land forces at Kola, Russia reduced to one-fifth, Norwegia Intelligence, *The Barents Observer*, 13 February 2023. https://www.rcinet.ca/eye on the Arctic/

63 (Google Translate from Russian) "Russia has started using a new air base for missile strikes on Ukraine," *Military Courier,* 18 September 2023. *https://web.archive.org/web/20230918160329/https:/mil.co.ua/rosiya-pochala-vykorystovuvaty-novu-aviabazu-dlya-raketnyh-udariv-po-ukrayini/*

64 Malte Humpert, "Two new Arctic emergency centers to open along Northern Sea Route," *High North News,* 31 January 2017. https://www.arctictoday.com/two-new-arctic-emergency-centers-to-open-along-northern-sea-route/

"Arctic maritime rescue centers of EMERCOM will be located in Dudinka, Murmansk, Arkhangelsk, Naryan-Mar, Vorkuta, Nadym, Tiksi, Pevek, Provideniya and Anadyr. A total of 980 persons will be working at the centers, according to EMERCOM. 6 of these centers are already opened." The same report also lists Dikson as a Maritime Rescue Coordination Center (headquarters in Moscow); and Arkhangelsk, Pevek, and Tiksi as Maritime Rescue Coordination Subcenters.

The report: "Maritime emergency preparedness resources in the Arctic – capacity challenges and the benefits of cross-border cooperation between Norway, Russia, Iceland and Greenland," MARPART Project Report 4. Editors: Natalia Andreassen, Odd Jarl Borch, Johannes Schmied. https://core.ac.uk/download/pdf/225907864.pdf

"Russia opens first of ten new search and rescue centers in the Arctic," Cryopoitics, 04 September 2013. https://www.cryopolitics.com/2013/09/04/russia-opens-first-of-ten-new-search-and-rescue-centers-in-the-arctic/

Sabetta referenced in: "Four New SAR Centers in the Russian Arctic," 02 February 2018, *High North News.* https://www.highnorthnews.com/en/four-new-sar-centers-russian-arctic

65 *The Military Balance, 2022*, International Institute for Strategic Studies (IISS). *https://www.iiss.org/publications/the-military-balance/the-military-balance-2022*

66 The Nuclear Notebook of the *Bulletin of the Atomic Scientists* authoredby Hans M. Kristensen and Matt Korda of the Federation of American Scientists, is the most extensive and authoritative public source of information on global nuclear arsenals. https://thebulletin.org/nuclear-notebook/

67 Military Balance 2022; Nuclear Notebook, "Russian Nuclear Forces, 2023."

68 Atle Staalesen, "Russia's Arctic Brigade in Alakurtti counting its many dead,"*The Barents Observer*, 22 February 2023. https://www.rcinet.ca/eye-on-the-arctic/2023/02/23/russias-arctic-brigade-in-alakurtti-is-counting-its-many-dead/#:~:text=The%20troops%20trained%20to%20defend%20the%20Russian%20Arctic,information%20resource%20is%20commemorating%20more%20than%2065%20men.

69 Valery Konyshev, "Can the Arctic remain a region of international cooperation in the context of the Ukrainian crisis?" *Arctic Yearbook 2022.*

70 Malte Humpert, "China Pushes Northern Sea Route Transit Cargo to New Record," *High North News*, 18 December 2023. https://www/highnorthnews.com

71 Thomas Nilsen, "FSB signs maritime security cooperation with China in Murmansk," *The Barents Observer*, 25 April 2023. https://thebarentsobserver.com/en/security/2023/04/fsb-signs-maritime-security-cooperation-china-murmansk

72 https://www.cnas.org/publications/podcast/navigating-relations-with-russia-in-the-arctic-olesen-and-hansen

73 Vladimir Isachenkov, "Russia Stakes Its Hold on the Arctic With Military Base," Real Clear Defense, 05 April 2019. https://www.realcleardefense.com/articles/2019/04/05/russia_stakes_its_hold_on_the_arctic_with_military_base_114309.html

74 Colin Walland and Njord Wegge, "The Russian Arctic Threat: Consequences of the Ukraine War," Center for Strategic and International Studies, 25 January 2023. https://www.csis.org/analysis/russian-arctic-threat-consequences-ukraine-war

75 "Shifting Ice: Russia's Increasing Reliance on the Private Sector and the PRC in the Arctic," Strider Technologies Inc., 2024. https://www.striderintel.com/resources/shifting-ice-russias-increasing-reliance-on-the-private-sector-and-the-prc-in-the-arctic/)

76 John Vandiver, "'Unconventional' delivery of US airpower in Arctic tailored to serve notice to Russia," *Stars and Stripes*, 09 November 2022. https://www.stripes.com/branches/air_force/2022-11-09/red-dragon-missile-norway-russia-7986361.html

77 Thomas Nilsen, "Russia's new hypersonic Tsirkon missile was fired from Norwegian sector of Barents Sea," *The Barents Observer*, 23 February 2022. https://thebarentsobserver.com

78 https://www.nato.int/cps/en/natohq/topics_210907.htm

79 https://cil.nus.edu.sg/wp-content/uploads/2017/07/2008-Ilulissat-Declaration.pdf

80 Heather A. Conley and Matthew Melino, with Nikos Tsafos and Ian Williams, "America's Arctic Moment: Great Power Competition in the Arctic to 2050," 30 March 2020, Center for Strategic and International Studies (CSIS), A Report of the CSIS Europe Program. https://www.csis.org/analysis/americas-arctic-moment-great-power-competition-arctic-2050

81 Yereth Rosen, "Despite Russia's post-invasion isolation, some narrow openings for Arctic cooperation remain," *Arctic Today*, 05 April 2023. https://www.arctictoday.com/despite-russias-post-invasion-isolation-some-narrow-openings-for-arctic-cooperation-remain/

82 YerethRosen, 2023.

83 Michael Paul, “Russia’s war and the prospects for Arctic States’ cooperation,” Arctic Yearbook 2022.

84 Ed Struzik, “how Tensions With Russia are Jeopardizing Key Arctic Research,” Yale Environment 360, 07 February 2023. https://e360.yale.edu/features/russia-ukraine-war-arctic-research

85 Dylan Robertson, “Int’l arctic cooperation needs to continue despite rupture with Russia: Canada’s GG,” Canadian Press, Eye on the Arctic, March 1, 2023. www.rcinat.ca

86 Alexander Dalziel and Henri Vanhanen, “What Canada can learn from its new NATO ally Finland,” *The Globe and Mail*, 27 April 2023. https://macdonaldlaurier.ca/what-canada-can-learn-from-its-new-nato-ally-finland-alexander-dalziel-and-henri-vanhanen-in-the-globe-and-mail/#:~:text=Geopolitically%2C%20the%20entry%20of%20these%20highly%20educated%2C%20well-governed%2C,matters%20of%20national%20security%2C%20defence%20and%20foreign%20policy.

87 “Arctic cooperation after Russia’s break with the West,” Strategic Comments, Vol. 28. *IISS*. October 2022. https://www.iiss.org/en/publications/strategic-comments/2022/arctic-cooperation-after-russias-break-with-the-west/

Appendix

Arctic Military Facilities List

Canada

1. **Yellowknife, Northwest Territories**
   Joint Task Force North (JTFN) Headquarters
2. **Whitehorse, Yukon**
   JTFN Detachment
3. **Inuvik, Northwest Territories**
   Forward Operating Location for fighter aircraft
4. **Resolute Bay, Nunavut**
   Canadian Armed Forces Arctic Training Centre
5. **Alert, Nunavut**
   Canadian Forces Station Alert
6. **Eureka, Nunavut**
   Communications facilities linked to Alert
7. **Nanisivik, Nunavut**
   Naval and Coast Guard refuelling facility
8. **Iqaluit, Nunavut**
   JTF North Detachment Nunavut
   Forward Operating Location for fighter aircraft

   Hall Beach, Melville Peninsula, Nunavut (not ontinuously staffed)
   One of 11 long range and 36 short range radar sites Canada for the NORAD North Warning System

United States

1. **Eareckson Air Station**
   Hosts the AN/FPS-108 COBRA DANE phased array radar for the United States Space Force
2. **Dutch Harbor**
   Coast Guard Dock with civilian and Coast Guard berthing and warehousing
3. **Kotzebue**
   Annually established forward operating location for US Coast Guard
4. **Fort Wainwright**
   US Army Base
5. **Clear Space Force Station**
   Missile warning and tracking, and space domain awareness
6. **Eielson Air Force Base**
   Hosts F-35 fighters
7. **Kodiak Air Station**
   US Coast Guard
8. **Elmendorf-Richardson Air Force and Army joint Base**
   Hosts Alaskan NORAD Region, F-22 fighters
9. **Fort Greely**
   Hosts ballistic missile defence mid-course interceptors
10. **Sitka Air Station**
    US Coast Guard Air Station

Greenland

1. **United States Pituffik Space Base** (formerly Thule Air Base)
   Supports missile warning, space surveillance, satellite command and control
2. **Nuuk, Greenland**
   Joint Arctic Command of the Danish Defence Forces in Greenland and the Faroes Islands
3. **Grønnedal, Greenland**
   Station of the Danish Joint Arctic Command

Iceland

Keflavik Base, Iceland
Periodically hosts NATO fighter, AWACS and support aircraft participating in Icelandic Air Policing deployments. US B-2 stealth bombers have operated from Keflavik.

Norway

1. **Sortland**
   Navy and Coast Guard
2. **Andoya Air Station**
   Maritime Patrol Aircraft
3. **Harstad-Trodenes**
   Navy, and Allied Training Centre
4. **Evenes**
   Army garrison
5. **Bjerkvik**
   Maintenance centre
6. **Setermoen**
   Armoured battalion
7. **Sorreisa**
   Surveillance
8. **Skjold**
   Army battalion
9. **Bardufoss**
   Helicopter base
10. **Porsanger**
    Army
11. **Banak**
    Air Force – F-16 fighters
12. **Sor-Varanger/Kirkenes**
    Patrols border with Russia
13. **Vardo**
    Radar facility
14. **Orland Air Base**
    Air Base – F-35 fighters
15. **Bodo**
    Search and Rescue helicopter squadron of the Joint Rescue Coordination Centre of Northern Norway.

Russia Arctic (non-Kola)

1. **Anadyr-Ugolny**
   Military/Civilian airfield
2. **Provideniya**
   Civil/Military Airfield Serves east end of Northern Sea Route
3. **Cape Schmidt**
   Airfield (also serves Wrangel)
4. **Wrangel Island/Zvyozdny**
   Trefoil Base – Polar Star
   No air access
5. **Pevek**
   Military Civilian airfield
   Nuclear Power Plant on barge
6. **Chersky**
   Port, airfield
7. **Tiksi**
   Garrison to house 100 military personnel
   Naval Base, Airfield
8. **Kotelny Island – Temp**
   Trefoil Base
   Airfield (year-round transport aircraft)
9. **Severnayer Zemlya – Sredny**
   Airfield
10. **Alykel/Dudinka**
    Airfield/Emergency Rescue Centre
11. **Nadym**
    Airfield
12. **Sabetta/Dikson**
    Border guard location, linked to LNG operations
    Dual use Airfield
13. **Amderma**
    Airfield
14. **Franz Josef – Nagurskoye**
    Trefoil Base
    Airfield
15. **Novaya Zemlya – Rogachevo**
    Harbour and Airfield, Air defence units
16. **Vorkuta**
    Airfield
17. **Naryan-Mar**
    Airfield
18. **Arkhangelsk**
    Headquarters of North Command
    Military logistics centre

Russia Arctic (Kola)

19. **Pechenga/Sputnik**
    Airfield, Infantry Base (Arctic Brigade)
    Naval Infantry Brigade at Sputnik

20. **Alakurtti**
    Air strip, Arctic Brigade

21. **Zapadnaya Litsa**
    nuclear powered subs
    Four facilities:
    Andreeva Bay (spent fuel, radio active waste
    Bolshaya Lopatka (Main base: nuclear-powered subs, including Yassen Class)
    Malaya Lopatka (maintenance facility now closed)
    Nerpicha (nuclear weapons storage)

22. **Vidyayevo**
    Diesel powered subs
    Guba Ara, diesel sub base
    Guba Ura, proposed LNG terminal docks

23. **Gadzhiyevo**
    SSBN Base
    Nuclear weapons/missile storage
    Sayda Guba (sub storage etc)
    Olenya Guba (spy sub base)
    Nerpa Shipyard

24. **Olenya Air Base**
    Naval Reconnaissance Air Division

25. **Severomorsk Northern Fleet HQ**
    Okolnaya weapons storage and handling

26. **Severomorsk Air Base**
    Domain awareness
    Range of patrol and combat aircraft

27. **Monchegorsk**
    Air base, fighter aircraft

28. **Polyarny Naval Base**
    Services and dismantles military vessels, including nuclear submarines

29. **Schukozero**
    Nuclear Weapons storage

30. **Bolshoya Ramozero**
    Nuclear Weapons storage

31. **Gremikha**
    Submarine reactor cores storage
    Subs withdrawn from service
    Storage of spent fuel and radioactive waste

32. **Kirovsk**
    Emergency Rescue Centre, Murmansk

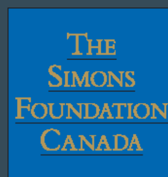
Severodvinsk Shipbuilding Centre (not on Map)
- submarine construction/dismantlement

Ernie Regehr, OC

Ernie Regehr is Senior Fellow in Arctic Security and Defence at The Simons Foundation Canada; Research Fellow at the Centre For Peace Advancement, Conrad Grebel University College, the University of Waterloo; co-founder and former Executive Director of Project Ploughshares.

Kelsey Gallagher

Kelsey Gallagher is a Researcher at Project Ploughshares. He holds an MA in Peace and Conflict Studies from Conrad Grebel University College, University of Waterloo, and a BA in Political Science from Western University.



The Simons Foundation Canada is a private charitable foundation based in Vancouver, Canada, dedicated to advancing positive change through education in peace, nuclear disarmament, international law and human security, with a major project on Arctic Security.