

CIRCUMPOLAR MILITARY FACILITIES OF THE ARCTIC FIVE

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Circumpolar Military Facilities of the Arctic Five

Introduction

This compilation of current military facilities in the circumpolar region¹ continues to be offered as an aid to addressing a key question posed by the Canadian Senate more than five years ago: “Is the [Arctic] region again becoming militarized?”² If anything, that question has become more interesting and relevant in the intervening years, with commentators divided on the meaning of the demonstrably accelerated military developments in the Arctic – some arguing that they are primarily a reflection of increasing military responsibilities in aiding civil authorities in surveillance and search and rescue, some noting that Russia’s increasing military presence is consistent with its need to respond to increased risks of things like illegal resource extraction, terrorism, and disasters along its frontier and the northern sea route, and others warning that the Arctic could indeed be headed once again for direct strategic confrontation.³ While a simple listing of military bases, facilities, and equipment, either based in or available for deployment in the Arctic Region, is not by itself an answer to the question of militarization, an understanding of the nature and pace of development of military infrastructure in the Arctic is nevertheless essential to any informed consideration of the changing security dynamics of the Arctic.

What follows relies on a broad range of media, government, academic, and research centre sources, all of which are indicated in the footnotes.⁴ This paper is regarded as a “work in progress” and continues to be updated as new information and changes in military posture and engagement relative to the Arctic become available.

Comments, corrections, further information, and suggestions for additional sources are all most welcome. Please send any such comments, corrections, and additions to:

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¹ The current list is confined to the five Arctic Ocean states, but the intention is to expand it to include all the states of the Arctic Council.

² Standing Senate Committee on National Security and Defence, “Sovereignty and Security in Canada’s Arctic: Interim Report,” The Honourable Pamela Wallin, Chair; The Honourable Romeo Dallaire, Deputy Chair, March 2011. <http://www.parl.gc.ca/Content/SEN/Committee/403/defe/rep/rep07mar11-e.pdf>

³ These perspectives, for example, are reflected in four recent papers from the Arctic Institute linked to a June 15 discussion in Washington on circumpolar security cooperation. <http://www.thearcticinstitute.org>

⁴ Of particular initial value have been and remain the following:

Huebert, Rob, “The Newly Emerging Arctic Security Environment,” March 2010, Canadian Defence and Foreign Affairs Institute.

<http://www.cdfai.org/PDF/The%20Newly%20Emerging%20Arctic%20Security%20Environment.pdf>

Huebert, Rob; Exner-Pirot, Heather; Lajeunesse, Adam; Gullledge, Jay, “Climate Change and International Security: The Arctic as a Bellwether,” Center for Climate and Energy Solutions, May 2012, <http://www.c2es.org/docUploads/arctic-security-report.pdf>

Defence Watch, the column/blog of David Pugliese in the *Ottawa Citizen*. <http://ottawacitizen.com/category/news/defence-watch>

Standing Senate Committee on National Security and Defence, “Sovereignty and Security in Canada’s Arctic: Interim Report,” The Honourable Pamela Wallin, Chair; The Honourable Romeo Dallaire, Deputy Chair, March 2011.

<http://www.parl.gc.ca/Content/SEN/Committee/403/defe/rep/rep07mar11-e.pdf>

Siemon T. Wezeman, “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012.

http://books.sipri.org/product_info?c_product_id=442

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CANADA

1. Security Assets based in the North for Operations in the North

1.1 Bases (including stations, naval facilities, radar sites, etc.)

Yellowknife, Northwest Territories

- Joint Taskforce North (JTFN)⁵
- 1st Canadian Ranger Patrol Group (under JTFN)⁶
- 440 Transport Squadron (under JTFN)⁷

Whitehorse, Yukon

- JTFN detachment⁸

Alert, Nunavut

- Canadian Forces Station (CFS) Alert⁹, open since the late 1950s
- Usually approximately 25 Canadian Forces personnel stationed there, plus 30 civilian support personnel and up to four Environment Canada staff
- DND planning \$13M-\$15M in energy efficiency upgrades at Alert, along with six other bases across Canada, making total investments in energy efficient updates approximately \$100 million to \$175 million.¹⁰

Eureka, Nunavut

- Hosts a high Arctic weather station¹¹
- A link between Alert, Nunavut and Ottawa for the High Arctic Data Communications System II (HADCS II) on Ellesmere Island, which “provides secure data, telephone, fax, DWAN, Internet communications between CFS Alert and Ottawa”:
 - A chain of six unmanned line-of-sight microwave repeaters – Grant, Ida, Victor, Whiskey, Yankee, Blacktop – from CFS Alert to Eureka with a satellite link between Eureka and Ottawa.¹²

Iqaluit, Nunavut

- JTFN detachment¹³
- Coast Guard MCTS Centre¹⁴ (Maritime Communication and Traffic Services)
 - A hub for the Coast Guard’s Arctic operations while open from May – December, monitoring Arctic vessel traffic.

Forward Nanisivik Naval Facility, Nunavut

- Naval berthing/docking and refuelling facility¹⁵
 - Location: Baffin Island, Nunavut
 - Facility approved by Nunavut Impact Review Board
 - Intended initially to be fully operational by 2015, with initial operating capacity in 2012, then delayed to 2016,¹⁶ and now anticipating being fully operational in 2018.¹⁷

⁵ “Joint Task Force North,” National Defence and the Canadian Armed Forces, last modified 5 April 2016, <http://www.forces.gc.ca>

⁶ “1st Canadian Ranger Patrol Group,” Canadian Army, last modified 8 April 2016, <http://www.army-armee.forces.gc.ca>

⁷ “440 Transport Squadron,” Royal Canadian Air Force, last modified 3 May 2016, <http://www.rcaf-arc.forces.gc.ca>

⁸ “Detachments and Units” National Defence and the Canadian Armed Forces, last modified 6 January 2014, <http://www.forces.gc.ca>

⁹ “Canadian Forces Station Alert,” Royal Canadian Air Force, last modified 23 January 2014, <http://www.rcaf-arc.forces.gc.ca>

¹⁰ Ruskin, Brett, “Canadian Forces to invest at least \$100M in green infrastructure,” CBC News, 25 April 2016, <http://www.cbc.ca/>

¹¹ Regehr, E., “Arctic Security and the Canadian Defence Policy Statement of 2017,” The Simons Foundation, 31 August 2017, http://www.thesimonsfoundation.ca/sites/default/files/Arctic%20Security%20and%20the%20Canadian%20Defence%20Policy%20Statement%20of%202017%20-%20DAS%2C%20August%2031%202017_2.pdf

¹² “Canadian Forces Station Alert,” Royal Canadian Air Force, last modified 23 January 2014, <http://www.rcaf-arc.forces.gc.ca>

¹³ “Detachments and Units” National Defence and the Canadian Armed Forces, last modified 6 January 2014, <http://www.forces.gc.ca>

¹⁴ “Marine Communications and Traffic Services MCTS,” Canadian Coast Guard, last modified 10 June 2016, <http://www.ccg-gcc.gc.ca>

¹⁵ “Nunavut regulator approves Arctic naval facility,” CBC Online, 25 October 2013, <http://www.cbc.ca>

¹⁶ Col. (Retd) Sylvain Lescoutre, “Forward Operating Location Nanisivik: Halifax’s Gateway to Canada’s Arctic,” Royal United Services Institute of Nova Scotia, 24 April 2012, <http://www.rusi.ca>

¹⁷ “Building the North: Project List, Canada’s Economic Action Plan,” Government of Canada, date not available, <http://actionplan.gc.ca/>

- The federal government awarded a \$55.8-million construction project to Almiq Contracting of Iqaluit in June 2014 and ground was broken in July of 2015.¹⁸
- In March 2012 DefenceWatch reported a major scaling back of plans for the facility, which was confirmed in September 2014¹⁹, and again in 2016. SIPRI's 2016 Background Paper noted it would be downsized to a refuelling base and delayed by several years.²⁰

Costs:

- In December 2013, a briefing note to Defence Minister Rob Nicholson approved a \$258 million plan to build the docking and refuelling station. The station was first estimated to cost \$100 million in 2007. In September 2014, the Defence Department scaled back the budget for the project due to the increasing costs. The budget for the base is now \$116 million.²¹

Operational Specifications:

- Part-time, summer-only refuelling station for the Arctic Offshore Patrol Ships (and other govt ships)
- Operational in summer and will be shut-down when not in use
- No longer planning a jet-capable airstrip, instead a gravel runway at nearby Arctic Bay (built by Government of Nunavut)
- No permanent housing – will use Department of National Defence (DND) trailers
- Will support operations of the new Arctic Offshore Patrol Ships, and other government maritime vessels²²

Resolute Bay, Nunavut

- Canadian Forces Arctic Training Centre (CAF ATC), which exists to allow the Canadian Army to “generate sufficient forces at an appropriate level of readiness for force employment to help meet the range of objectives and contingencies specified by the Government of Canada”.²³
- The CAF ATC includes:
 - Accommodations for up to 140 DND/CAF personnel
 - Dining and recreation building
 - 1100 square meters of warehouse space, including:
 - Facilities for mechanical work
 - Vehicle storage
 - Classroom
 - Briefing rooms
 - Operations centre
- Announced in February 2016 that the CAF wishes to expand its Arctic Training Centre at Resolute Bay. Expansion would allow the base to be operable year-round, improve conditions for troops, support increased training opportunities for Canadian Rangers and CAF personnel based in more southerly bases, and provide key support for Operation NANOOK.^{24 25}

Deep Sea Port, Iqaluit

- A new Iqaluit deep sea port and small craft harbour is expected to be built by 2020. The project is expected to cost \$85-million. In addition to its use by oil and cargo tankers, the port will likely be used by northern Coast Guard and military vessels.²⁶

¹⁸ “Nanisivik, Nunavut, naval facility breaks ground,” CBC News, 18 July 2016, <http://www.cbc.ca/>

¹⁹ Pugliese, David, “DND significantly cuts back on Harper’s much-ballyhooed plan to build a naval facility at Nanisivik,” Defence Watch, 22 March 2012, <http://blogs.ottawacitizen.com/>

²⁰ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

²¹ “Plans for Arctic Naval Base scaled back after costs soared,” The Prince George Citizen, 8 September 2014, <http://www.princegeorgecitizen.com>

²² “Strong, Secure, Engaged: Canada’s Defence Policy,” Ministry of National Defence, 2017, p. 79, <http://dgpaapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>

²³ “Backgrounder - Canadian Armed Forces Arctic Training Centre,” Department of National Defence, last modified 15 August 2013, <http://www.forces.gc.ca>

²⁴ Pryce, Paul, “Resolute Bay: A chilly response in Ottawa,” The Nato Association of Canada, 1 March 2016, <http://natoassociation.ca>

²⁵ “Battle for the Arctic: Canada Boosts Military Presence in the Far North,” Sputnik News, 29 May 2016, <http://sputniknews.com>

²⁶ Van Dusen, John, “Iqaluit’s deep sea port inches forward,” CBC News, 28 September 2016, <http://www.cbc.ca>

Forward Operating Locations (FOLs) for CF-18s

- Inuvik
- Yellowknife
- Iqaluit
- Rankin Inlet
- Goose Bay

Forward Transportation Hubs

Since 2011, there has been some public discussion regarding the development of forward operating bases:

Canadian Military Journal: “Defence must develop a greater capacity to operate in the Arctic for extended periods. This can be done by acquiring the necessary infrastructure in key locations that can be used as either a hub or as temporary forward operating bases. Such a capability would allow the CF to better deal with rapid response operations, including such matters as Search and Rescue. Moreover, it would allow the government to have better situational awareness, and to project key national elements anywhere within the Arctic region on very short notice.”²⁷

The Toronto Star reports on a study commissioned by the Canadian Forces operational support command exploring the possibility of creating minimal transportation hubs with a landing strip and storage facilities at various locations in the Arctic – including Alert, Inuvik, Whitehorse, Rankin Inlet, Iqaluit, and Nanisivik (similar to plans for overseas hubs for prepositioning basic equipment and facilities).²⁸

Rankin Inlet – Canada’s first Arctic inshore rescue boat station

Station with a six person crew opening in June 2018 with the goal of expanding search and rescue coverage and reducing response times. Will operate out of an existing building and will be open seasonally.²⁹

Arctic National Aerial Surveillance Program Complex, Iqaluit

It was announced by Canada’s transport minister in August 2017 that, as part of Canada’s \$175 million Oceans Protection Plan, Canada will be devoting \$29.9 million to the construction of an aerial surveillance program complex in Iqaluit, Nunavut.³⁰

²⁷ Balasevicius, Tony, “Towards A Canadian Forces Arctic Operating Concept,” Canadian Military Journal, 2011, <http://www.journal.forces.gc.ca>

²⁸ Woods, Allan, “Canada looking at building military bases in Arctic,” The Star, 14 July 2011, <http://www.thestar.com>

“...this new plan would see the force’s hulking C-17 transport aircraft be loaded with personnel, supplies and a disassembled military helicopter — likely at CFB Trenton in Ontario — and dispatched to the northern hub. There, the helicopter would be reassembled and the Arctic hub would be used as a base for the mission. “Based on calculations that factor in the time it would take to travel to the Arctic from Trenton and the costs involved (which was then cross-referenced with ship and airline traffic, as well as the probability of space junk hurtling toward Earth), the study found Nunavut’s Rankin Inlet — on the western shore of Hudson’s Bay — would be the most cost-effective spot for a single hub, reducing transportation costs by 28 per cent.

“The average response time to get anywhere in the Arctic from the Rankin Inlet staging base was still 48 hours, underlining the vast territory to be covered. Resolute, located on Cornwallis Island in Nunavut, offers the quickest average response time at 35 hours, but the runway there would require further development to accommodate a C-17 aircraft, the study said.

“From a cost-avoidance perspective, the optimal number of hubs would be three, corresponding to Iqaluit, Yellowknife and Rankin Inlet,” said the report, noting that an average of 49 per cent of transportation costs could be saved.

“Using a three-hub solution, the maximum response time would be 46 hours instead of 64 hours for a single hub. The minimum response time would be 16 to 18 hours for locations around the hubs,” said the study.

²⁹ “Rankin Inlet selected as new location for Arctic search and rescue station,” CBC News, 5 January 2018, www.cbc.ca

³⁰ Quinn, Ellis, “Canada announces \$175 million investment in Arctic waters protection,” Radio Canada International, 28 August 2017, <http://www.rcinet.ca>

1.2 Equipment

1.2.1 Air

CC-138 Twin Otters³¹

DeHavilland Canada CC-138 Twin Otter



Photo Credit: CC-138 Twin Otter side views, Stephen Priestley,
<http://www.casr.ca/101-af-cc138-twin-otter.htm>

- Location: Yellowknife, Northwest Territories
- 440 Squadron operates four Canadian-designed and –produced
- Approximately 55 aircrew and technicians, who are a mixture of Regular Force and Reserve Force members
- Maintains capability for "off-airport" operations on skis in the winter and on tundra tires in the summer
- The CC-138 Twin Otter Life Extension Project
 - *Defence Acquisition Guide 2014*: The CC-138 Twin Otter Life Extension Project will focus on making the aircrafts operational beyond 2018 by replacing the "Wing Boxes, install Cockpit Voice Recorders/Flight Data Recorders" and the aircrafts overall supportability. The project is estimated to cost between \$20 and \$49 million, with final delivery in 2020.³²
 - *Defence Acquisition Guide 2015*: Final delivery date adjusted to 2022.³³ The 2016 *Defence Acquisition Guide* confirmed this date.³⁴

Surveillance Drones

- Transport Canada is considering using an unmanned aerial system to monitor Arctic waters, scanning for environmental problems and shifting sea ice, as well as serving as an increased display of Canadian sovereignty over Arctic waters. The department's request notes that, "There is an increased presence of domestic marine activity and foreign vessels in the Arctic, thereby increasing the need for surveillance."³⁵

Canadian Air Defence Identification Zone (CADIZ)³⁶

- Canada is planning to expand the CADIZ to cover the entire Canadian Arctic archipelago.
- Exists as part of an effort to provide effective aerospace warning and control for all of North America.
- According to Canada's 2017 Defence Policy, "An expanded CADIZ will increase awareness of the air traffic approaching and operating in Canada's sovereign airspace in the Arctic."

1.2.2 Land

Canadian Forces Station Alert³⁷ (See 'Alert' under 'Bases' for more information)

- Collects signal intelligence
- High Frequency and Direction Finding (HFDF) facilities to support search and rescue

³¹ "CC-128 Twin Otters," Royal Canadian Air Force, last modified 17 April 2015, <http://www.rcaf-arc.forces.gc.ca>

³² "Defence Acquisition Guide 2014," National Defence and the Canadian Armed Forces, June 2014, <http://www.forces.gc.ca>

³³ "Defence Acquisition Guide 2015," National Defence and the Canadian Armed Forces, May 2016, <http://www.forces.gc.ca>

³⁴ "Defence Acquisition Guide 2016," National Defence and the Canadian Armed Forces, May 2016, <http://www.forces.gc.ca>

³⁵ Bob Weber, "Transport Canada wants drones to watch Arctic waters," The Canadian Press, 9 March 2016, <http://www.metronews.ca>

³⁶ "Strong, Secure, Engaged: Canada's Defence Policy," Ministry of National Defence, 2017, <http://dgpapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>

³⁷ "Canadian Forces Station Alert," Royal Canadian Air Force, last modified 23 January 2014, <http://www.rcaf-arc.forces.gc.ca>

North Warning System³⁸ (NWS)

- A joint United States and Canadian radar system, including 11 long-range and 36 short-range radars along Arctic coast of Canada
- These are elements of a “radar buffer zone” 4,800 km long and 320 km wide (from the Alaska border to across Baffin Island to Greenland and down the Labrador Coast)³⁹
 - The bulk of the NWS radars are not at the frontier, but are well within Canadian territory, and thus cannot monitor the air approaches to Canadian territory and air space in the high Arctic
- The Canadian Senate heard testimony from an Inuk Corporate Executive, Charlie Lyall, endorsing the Canadian military presence: “For Inuit, an active military presence in the Arctic is vital and provides strong partnerships for its major projects.” He told the Senate Committee that Inuit participation in clean-up of old Distant Early Warning (DEW) sites had expanded their capacity for Northern contract work, as well as for undertaking contract negotiations. He also spoke about the Inuit role in North Warning System operation and maintenance. “DND can continue to play a vital role in the fiscal and corporate development process for Inuit.”⁴⁰
- The Canadian part of the North Warning System was operated and maintained by Pan Arctic Inuit Logistics (PAIL) and and ATCO Structure and Logistics from 2001 - 2014. ⁴¹ As of April 2014, Raytheon Canada, an Ottawa-based company, was awarded a 5-year contract to carry out the job.⁴²
 - According to CBC News, “at least a fifth of the salaries paid through the [Raytheon] contract must be for Inuit beneficiaries, and at least three beneficiaries must be full-time supervisors, managers or manager trainees.”
- *Defence Acquisition Guide 2016* lists a preliminary estimate of \$1.5 billion in replacements for the NWS, with a contract being awarded in 2024 and final delivery of the replacements planned for 2026 – 2036.⁴³
- The 2017 Canadian Defence Policy made clear that updates will be made but no clarity is given in this report on how. According to the report, the NWS is approaching “the end of its life expectancy from a technological and functional perspective,” and announced that, “Canada and the United States have already launched bilateral collaboration to seek an innovative technological solution to continental defence challenges including early warning. Studies are ongoing to determine how best to replace this important capability as part of the overall NORAD modernization.”⁴⁴
 - “The replacement timeline will extend over at least two decades: research and analysis into options to be completed by 2020; the chosen system to be approved in 2021; from that is to follow a request for proposals from industry to be completed by 2023; with the final contract to be awarded in 2024,” and delivery/installation to take a least a decade after that.⁴⁵

All Domain Situational Awareness Science and Technology Program

- Will be managed by Defence Research and Development Canada (DRDC).
- “Includes plans to spend \$133 million over five years on research and analysis in support of enhancements to monitoring the air and maritime (surface and subsurface) approaches to Canada, with a particular emphasis on the Arctic. The effort will include international cooperation with the Five Eyes states (Canada, Australia, New Zealand, United Kingdom, US), with a focus on four areas:
 - Strategic surveillance of airborne traffic and aerospace warning;
 - Awareness of maritime traffic in Canadian approaches and Arctic littoral regions;
 - Awareness of sub-surface activity approaching or in Canada’s North; and
 - Analysis of sensor mixes and information integration and sharing for all domain awareness to enable detection of modern threats beyond the threshold of the current systems.”⁴⁶

³⁸ “North Warning System,” National Defence and the Canadian Armed Forces, last modified 17 December 2012, <http://www.forces.gc.ca>

³⁹ “The Canada-U.S. Defence Relationship,” National Defence and the Canadian Armed Forces, last modified 10 February 2015, <http://www.forces.gc.ca>

⁴⁰ Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, <http://www.parl.gc.ca>

⁴¹ Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, <http://www.parl.gc.ca>

⁴² “Raytheon wins 5-year North Warning System contract,” CBC News, 1 April 2014, www.cbc.ca

⁴³ “Defence Acquisition Guide 2016,” National Defence and the Canadian Armed Forces, May 2016, <http://www.forces.gc.ca>

⁴⁴ “Strong, Secure, Engaged: Canada’s Defence Policy,” Ministry of National Defence, 2017, <http://dgpapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>

⁴⁵ Regehr, Ernie, “Replacing the North Warning System: strategic competition or Arctic confidence building?” The Simons Foundation, 1 March 2018.

⁴⁶ Regehr, Ernie, “Replacing the North Warning System: Strategic competition or Arctic confidence building?,” The Simons Foundation, 1 March 2018, <http://www.thesimonsfoundation.ca>

All-Terrain Vehicles

David Pugliese:

- “The Army has an Arctic capability project underway called the medium all-terrain vehicle. Canada already operates the Hägglunds Bv206, a tracked armoured vehicle built by a Swedish subsidiary of Britain’s BAE Systems.
- “We have a re-life package for that or separately we have the BvS10,” said Jim Reid, BAE’s business development director for Canada.
- Reid said such vehicles could play more than just a role in the Arctic.
- “It’s not just about the snow. It actually gives you a capability to do other things,” he said, noting that the BvS10 has been used in Afghanistan and Sierra Leone.
- General Dynamics Land Systems-Canada and ST Kinetics, a Singapore firm, also have their eye on the Army project. They’ve joined forces to promote the Bronco New-Generation Marginal Terrain Vehicle.
- No cost details or timelines have been released on the Army project.”⁴⁷

In April 2014 the Government announced that it would acquire 17 “marginal terrain” vehicles for the Canadian Special Operations Forces, for operating in Arctic and desert conditions, but that the Canadian Army proposal to acquire 100 such vehicles for use in the Arctic and elsewhere to replace the Bv206 would be delayed until after 2023.⁴⁸

Update March 2016: The Canadian Army plans to replace the Bv206 to either Argo XT tracked small unit support vehicles or D900 diesel-powered snowmobiles. Trials are currently in progress to decide which the army will use.⁴⁹

Stealth Snowmobiles

- “In August 2011, the Department of National Defence informed industry it was interested in the development of a prototype snowmobile for covert military operations in Canada’s Arctic. The department’s science branch, Defence Research and Development Canada, has reserved 500,000 Canadian dollars to develop a prototype gas-electric hybrid vehicle. The government has told industry that existing gas-powered engines are too noisy for covert operations, and it wants a snowmobile with a silent mode that could be activated when necessary.
- The special operations forces are interested in acquiring such a vehicle, military sources said. It is expected that a prototype can be developed by next March.”⁵⁰
 - In 2013 the military was testing a new hybrid-electric snowmobile, to test speed, noise levels, endurance, and acceleration. The Globe and Mail reports the snowmobile, nicknamed Loki, has a \$620,000 price tag, the value of the development contract with CrossChasm Technologies of Waterloo, Ontario. The report says “National Defence has made it clear it does not intend to spend any more money on Arctic mobility for eight years, but its research branch says the evaluation of the silent snowmobile, though still in its early states, will continue.”⁵¹
 - Meanwhile, the Canadian Press reported in 2013 on the slow pace of replacing the current inventory of snowmobiles and all-terrain vehicles in the north. While 1980s era vehicles were slated for replacement, Arctic military units have been informed they will have to stay in service much longer. Leading up to 2013, 310 snowmobiles had been replaced, out of a fleet of 963, and another 310 all-terrain vehicles were required. However, an Army spokesperson confirmed that “there are no plans at this time to purchase (additional) Arctic vehicles.” New acquisitions are not scheduled until 2021/22 when the “Domestic and Arctic Mobility Enhancement” project is slated to kick in.⁵²

⁴⁷ Referred to by David Pugliese, “Canada Ramps Up Arctic Arsenal,” Defense News, 25 January 2012, <http://www.defensenews.com>

⁴⁸ Pugliese, David, “Canada’s Special Forces to get new vehicles for the Arctic but Army left out in the cold,” Ottawa Citizen, 18 April 2014, www.ottawacitizen.com

⁴⁹ Richard Tomkins, “Cold war prep: Canadian tests Army vehicles in the Arctic,” United Press International, 4 March 2016, <http://www.upi.com>

⁵⁰ Referred to by David Pugliese, “Canada Ramps Up Arctic Arsenal,” Defense News, 25 January 2012, <http://www.defensenews.com>

⁵¹ Blatchford, Andy, “Canadian Forces test ‘Loki,’ a stealth snowmobile for covert Arctic ops,” Globe and Mail, 18 August 2014, <http://www.theglobeandmail.com>

⁵² Brewster, Murray, “Army scrambles to buy snowmobiles for Arctic units amid spending deep freeze,” Globe and Mail, 18 August 2013, <http://www.theglobeandmail.com>

1.2.3 Sea

- The Canadian Arctic Underwater Sentinel Experiment, or CAUSE, costing approximately \$16 million, consists of “developing and testing a number of new technologies at a remote military station in Gascoyne Inlet”.⁵³
- Technology is currently being tested for the purpose of autonomously monitoring and patrolling Arctic waters while analyzing the data received by sensors.⁵⁴

1.3 Organizations and Operational Units (personnel)

Command Centres: JTFN (including locations of headquarters and detachments)⁵⁵

- Joint Taskforce North (JTFN)
- Headquartered in Yellowknife
- One of six regional joint task forces under the Canadian Joint Operations Command, the six are: JTF North (headquartered in Yellowknife, Pacific (Victoria), West (Edmonton), Central (Toronto), East (Montreal), Atlantic (Halifax)
- JTFN describes its area of responsibility as covering about four million square kilometres, 40 percent of Canada’s land mass, and 75 percent of its coastline which includes 94 major islands and 36,469 minor islands of the Arctic Archipelago
- There has been a permanent military command in Yellowknife since 1970

440 Transport Squadron⁵⁶ (under JTFN)

- Location: Yellowknife, Northwest Territories
- The only RCAF unit permanently stationed in the Canadian north
- 440 Squadron's tasks include airlift, utility and liaison flights in support of Canadian Forces Northern Area, the Canadian Rangers, other Canadian Forces activities and the Cadets in the North; can assist in search and rescue missions, but it is not a dedicated search and rescue unit

Reserve Units

- JTFN also hosts a small army reserve unit (well short of 100) based in Yellowknife

Training Facilities

- Canadian Forces Arctic Training Centre⁵⁷
- Location: Resolute Bay, Nunavut
- Opened Aug 16, 2013
- Used for training and operations, including annual Exercise Arctic Ram
 - Pre-position equipment and vehicles
 - Also serves as “a command post for emergency operations and disaster response in support of civilian authorities.”
 - The Arctic Training Centre facilities include:
 - Accommodations for up to 140 DND/CAF personnel
 - Dining and recreation building
 - 1100 square meters of warehouse space, including:
 - Facilities for mechanical work
 - Vehicle storage
 - Classroom
 - Briefing rooms
 - Operations centre

⁵³ Thomson, Jimmy, “Canadian military developing surveillance system to monitor Arctic waters,” CBC News, 2 August 2017, <http://www.cbc.ca>

⁵⁴ Thomson, Jimmy, “Canadian military developing surveillance system to monitor Arctic waters,” CBC News, 2 August 2017, <http://www.cbc.ca>

⁵⁵ JTFN is one of six regional joint task forces under the Canadian Joint Operations Command, the six are:

JTF North (headquartered in Yellowknife, Pacific (Victoria), West (Edmonton), Central (Toronto), East (Montreal), Atlantic (Halifax). Details of JTFN are at the Department of National Defence Website: <http://www.cjoc.forces.gc.ca>

⁵⁶ “440 Transport Squadron,” Royal Canadian Air Force, last modified 3 May 2016, <http://www.rcaf-arc.forces.gc.ca>

⁵⁷ “Backgrounder - Canadian Armed Forces Arctic Training Centre,” Department of National Defence, 15 August 2013, <http://www.forces.gc.ca>

Press reports have noted the increased focus on emergency response capacity and disaster assistance to civilian authorities. In 2013, then Defence Minister Rob Nicholson put it this way:

*“The Canadian Armed Forces Arctic Training Centre will reinforce the Canadian Armed Forces’ presence in this important region of Canada while providing support to civilian authorities.”*⁵⁸

- Announced in February 2016 that the CAF wishes to expand its Arctic Training Centre at Resolute Bay, and possibly allow for operations year round.

“We need to build (on) what we’ve got right now in terms of capacity,” said Canadian Army Lt.-Col. Luc St-Denis, who co-ordinates training at the center and who oversaw its initial development. “January to April is a small season. There is potential for more than that, especially in the springtime and summertime.”⁵⁹

CC-138 Twin Otters Aircrew⁶⁰

- Location: Yellowknife, Northwest Territories
- Approximately 55 aircrew and technicians, who are a mixture of Regular Force and Reserve Force members

Canadian Forces Station Alert Personnel⁶¹ (since the late 1950s)

- Location: Qikiqtaaluk Region, Nunavut
- Usually about 25 Canadian Forces personnel stationed there, plus 30 civilian support personnel and up to four Environment Canada staff

Rangers

1st Canadian Ranger Patrol Group (under JTFN)⁶²

- Headquartered in Yellowknife⁶³
- Encompasses Nunavut, Yukon, Northwest Territories, and Northern British Columbia⁶⁴
- The 1CRPG is part of a national ranger force of about 4,000, operating in more than 200 communities, with language capabilities in 26 languages, many of which are Indigenous.⁶⁵
 - “The 1st Canadian Ranger Patrol Group (1 CRPG) encompasses Nunavut, Yukon, Northwest Territories, and Atlin, B.C. which account for about 40 percent of Canada’s land mass. 1 CRPG has over 1750 Rangers in 60 patrols and more than 1600 Junior Canadian Rangers (JCR) in 41 communities across the north.”⁶⁶
 - an earlier (Feb 2012) report indicated that the 58 hamlets then served by 1CRPG were distributed in the north with 25 patrols in Nunavut, 22 in Northwest Territory, 11 in Yukon Territory and 1 in Atlin, BC.⁶⁷ The website of the Canadian Army includes an interactive map showing all locations along with brief descriptions of each unit’s activities.⁶⁸
 - DND offers this comment on the demographics and conditions of the areas under Ranger patrols: “With only three medium-sized cities to speak of, it oversees many small communities, some of which are only accessible by air or by ice in the winter. Many of the residents in 1 CRPG speak another language other than French or English as their primary language. And the land covered by CFNA is buried by snow and ice, and covered in darkness for many months each year.”⁶⁹
- Ranger tasks include:
 - providing local expertise to army
 - serving as guides and advisors in operations and exercises
 - conducting North Warning System (NWS) patrols
 - assisting in search and rescue
 - “...their presence and vigilance help assert Canadian sovereignty and provide Canada Command with ‘eyes and ears’ in the country’s most remote areas.”⁷⁰

⁵⁸ “Ottawa opens scaled-back Arctic training facility in Nunavut’s Resolute Bay,” Nunatsiaq Online, 15 August 2013, <http://www.nunatsiaqonline.ca>

⁵⁹ Pugliese, David, “Canadian military looks to expand Arctic footprint,” 23 May 2016, Defence News, <http://www.defensenews.com>

⁶⁰ “CC-128 Twin Otters,” Royal Canadian Air Force, last modified 17 April 2015, <http://www.rcaf-arc.forces.gc.ca>

⁶¹ “Canadian Forces Station Alert,” Royal Canadian Air Force, last modified 23 January 2014, <http://www.rcaf-arc.forces.gc.ca>

⁶² “1st Canadian Ranger Patrol Group,” Canadian Army, last modified 8 April 2016, <http://www.army-armee.forces.gc.ca>

⁶⁴ “1st Canadian Ranger Patrol Group,” Canadian Army, last modified 8 April 2016, <http://www.army-armee.forces.gc.ca>

⁶⁵ “About the Canadian Rangers,” Canadian Army last modified 6 June 2014, <http://www.army-armee.forces.gc.ca>

⁶⁶ “1st Canadian Ranger Patrol Group,” Canadian Army, last modified 12 July 2013, <http://www.army-armee.forces.gc.ca/en/1-crpg/index.page>

⁶⁷ “1st Canadian Ranger Patrol Group,” Canadian Army, last modified 8 April 2016, <http://www.army-armee.forces.gc.ca>

⁶⁸ “Patrols,” Canadian Army, last modified 4 January 2016, <http://www.army-armee.forces.gc.ca>

⁶⁹ “Patrols,” Canadian Army, last modified 4 January 2016, <http://www.army-armee.forces.gc.ca>

⁷⁰ DND - BG #09.002a - 17 April 2009. The Canadian Forces in the North. <http://www.cfna.dnd.ca/nr-sp/09-002a-eng.asp>

- “The Government, as Prime Minister Harper announced in 2007, is enlarging the Canadian Rangers. JTFN will add 300 Rangers, bringing the total up to 1,900 in the North, with numbers nationwide to rise from about 4,000 up to 5,000.”⁷¹
 - 2013, 4,990 Rangers are serving in 178 patrols
 - 2015, the replacement of Lee-Enfield rifles is to begin with new rifles phased in over three years to 2018.⁷²
- According to SIPRI’s 2016 Background Paper, Trudeau’s Liberal government is planning to further increase the size of the Rangers, with a “special small battalion-sized (500 troops) regular army unit for Arctic operations” included in that plan.⁷³
 - Canada’s Defence Policy Report in 2017 notes plans to, “enhance and expand the training and effectiveness of the Canadian Rangers to improve their functional capabilities within the Canadian Armed Forces”.⁷⁴
- See Operation NUNALIVUT (annual exercise involving the Rangers)



Photo Credit: Ranger, Canadian Army: <http://www.army-armee.forces.gc.ca/en/canadian-rangers/index.page>

P. Whitney Lackenbauer on Rangers:

“The danger, of course, is to manage expectations so that policy-makers do not try to make the Rangers into something they are not. They are Reservists, but they cannot be expected to possess the same capabilities as southern-based units. Making them more military will neither improve Canada’s security nor our sovereignty. ... The Rangers are not broken, and I see danger in trying to fix them.”⁷⁵

Re replacement of Lee-Enfield rifles

- In 2015, the Canadian Army “acknowledged to the [Ottawa] Citizen that it was having trouble coming up with enough money to buy new rifles to replace the 60-year-old guns used in the Arctic by the Canadian Rangers.” The rifles were supposed to be delivered in 2014, but “the army acknowledges the purchase won’t happen until 2017-2021.”⁷⁶
- As of April 2018, DnD reported that Colt will produce 6,820 of the new .308 calibre C19 rifles by 2019.⁷⁷
 - “The Canadian Ranger Rifle production deliveries from Colt Canada commenced in March 2018 and will continue until they are completed in late 2019.”

Canadian Coast Guard Auxiliary expansion to the Arctic

- Creation of a Coast Guard Auxiliary in the Arctic was promised as part of Canada’s \$1.5 billion oceans protections plan, unveiled in November 2016 by three federal government departments. The Auxiliary is expected to contribute to “improvements in safety, especially in increased protection from oil spills and other marine emergencies”.⁷⁸

⁷¹ Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, p. 7, <http://www.parl.gc.ca>

⁷² “Building the North: Project List, Canada’s Economic Action Plan,” Government of Canada, date not available, <http://actionplan.gc.ca/>

⁷³ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

⁷⁴ “Strong, Secure, Engaged: Canada’s Defence Policy,” Ministry of National Defence, 2017, <http://dgpaapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf>

⁷⁵ Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, p. 9, <http://www.parl.gc.ca>

⁷⁶ “Canada’s Special Forces to get new vehicles for the Arctic but Army left out in the cold,” Ottawa Citizen, 18 April 2014, www.ottawacitizen.com

⁷⁷ Pugliese, David, “New rifles for the Canadian Rangers now being delivered,” Ottawa Citizen, 5 April 2018, <http://ottawacitizen.com>

⁷⁸ “Arctic will share in Canada’s new \$1.5 billion oceans protection plan,” Nunatsiaq News, 8 November 2016, <http://www.nunatsiaqonline.ca>

- The CCG Auxiliary expanded to Nunavik in November 2016, and there are now 24 members in six communities, with¹³ more members expected to join by the end of 2017. “The CCGA’s goal is to have 12 members per community by the end of 2018.”⁷⁹ They hope to have members in each of the region’s 14 villages by the end of 2018, as well.⁸⁰
- Expanding Coast Guard Auxiliary units in all coastal Inuit communities will aid the Coast Guard significantly in their aim to bolster SAR programs in the Arctic.⁸¹

1.4 Policy Units and Regulators

Northern Canada Vessel Traffic Services (NORDREG)

- Vessels over 300 tons (or over 500 tons combined of a vessel towing or pushing another vessel) and/or carrying dangerous materials sailing in northern waters are required to submit a sailing plan, provide position updates, report any deviation from the sailing plan, and send in a final report.⁸² The compulsory reporting reinforces Canada’s sovereignty claims but, on the other hand, draws attention to the lack of enforcement capacity.⁸³ The 2011 Senate Committee Report describes NORDREG in this way:

“Canada also maintains situational awareness through law and regulation in the North, particularly through NORDREG—the Northern Canada Vessel Traffic Services Zone. In the summer of 2010, NORDREG was extended from 100 nautical miles to 200 nautical miles offshore.

“Whereas NORDREG compliance was originally voluntary, as of summer 2010 it became mandatory. All vessels of 300 gross tonnes or more, or 500 gross tonnes combined weight if involved in a towing or pushing operation, and any vessel or combination of vessels carrying pollutants or dangerous goods, must submit reports before entering, while in, and upon leaving the NORDREG Zone.

“The Canadian Coast Guard must verify that the vessels are suitably constructed to withstand ice conditions, monitor their location at all times, and provide support services including updated ice condition information. [One witness] recommended that all vessels, not just those over 300 gross tonnes, be subject to NORDREG.”⁸⁴

The Maritime Communications and Traffic Services Centre in Iqaluit receive reports from ships during the period of approximately May 15 to December 31 for:

- Arctic waters from the Canada/Greenland border to longitude 141° W, and north to the geographic North Pole;
- Waters of the Mackenzie River watershed;
- Waters of Hudson Bay, Hudson Strait, Foxe Basin, Ungava Bay, and James Bay.⁸⁵

The Arctic Security Working Group⁸⁶

- The 2011 Senate Committee Report: “The *Arctic Security Working Group* is made up of representatives from the Canadian Forces, Canadian Coast Guard, other federal government departments and agencies, the territorial governments, aboriginal peoples organizations and other Northern stakeholders.

“It meets twice a year and has dealt with issues such as the possibility of terrorist attack on natural gas facilities, contraband moving through the mail and the increased risk of an air disaster due to increased air traffic. Col (Ret’d) Leblanc said the ASWG was created to improve “practically non-existent communications” between departments, and to improve security. He recommended to the Committee that the ASWG be maintained.”⁸⁷

⁷⁹ “Canadian Coast Guard Auxiliary grows to six Nunavik communities,” Nunatsiq News, 9 November 2017, <http://www.nunatsiaqonline.ca>

⁸⁰ “Canadian Coast Guard Auxiliary grows to six Nunavik communities,” Nunatsiq News, 9 November 2017, <http://www.nunatsiaqonline.ca>

⁸¹ Sevunts, Levon, “Canadian Coast Guard wraps up busy Arctic season,” RCI, 17 October 2017, <http://www.rcinet.ca>

⁸² “Vessel Traffic Reporting Arctic Canada Traffic Zone (NORDREG),” Canadian Coast Guard, last modified 24 June 2016, <http://www.ccg-cc.gc.ca>

⁸³ Exner-Pirot, Heather, “What’s In a Name? NORDREG Becomes Mandatory,” Eye on the Arctic, 12 July 2010, <http://eyeontheartctic.rcinet.ca>

⁸⁴ Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, p. 15, <http://www.parl.gc.ca>

⁸⁵ Peter Varga, “Iqaluit Coast Guard office maintains pan-Arctic vigil,” Nunatsiq Online, 26 July 2013, <http://www.nunatsiaqonline.ca>

⁸⁶ “Marine Communications and Traffic Services MCTS,” Canadian Coast Guard, last modified 10 June 2016, <http://www.ccg-gcc.gc.ca>

⁸⁷ Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, <http://www.parl.gc.ca>

The group meets “to enhance the interaction and working relationships of the ASWG membership. It provides a venue for discussing matters that address security and safety issues in the Arctic in a team environment. ‘The Team North approach to addressing the security concerns of the Arctic is imperative because no single department, federal or territorial, works independently in the north; collectively, success will be achieved and the Government of Canada’s mandate will be fulfilled,’ said Brigadier-General Chris Whitecross, the Commander of Joint Task Force North (JTFN). ...The Team North approach is essential for ensuring the safety and security of Canadians now, and into the future.”⁸⁸

Pan Arctic Inuit Logistics (PAIL)⁸⁹

- PAIL⁹⁰ is wholly owned by the Inuit through organizations linked to the four territories delineated by land claims agreements: Inuvialuit (within the NWT), Nunavut, Nunavik (Northern Quebec), and Nunatsiavut (Northern Labrador).
- PAIL formed in order to attain the contract to operate and manage the North Warning System (NWS). The NWS work is done through a joint venture between PAIL and ATCO Structure and Logistics,⁹¹ a manufacturer of modular buildings, remote workforce accommodations, emergency response services, etc.
- The Canadian Senate heard testimony from an Inuk Corporate Executive, Charlie Lyall, endorsing the Canadian military presence: “For Inuit, an active military presence in the Arctic is vital and provides strong partnerships for its major projects.” He told the Senate Committee that Inuit participation in clean-up of old Distant Early Warning (DEW) sites had expanded their capacity for Northern contract work, as well as for undertaking contract negotiations. He also spoke about the Inuit role in North Warning System operation and maintenance. “DND can continue to play a vital role in the fiscal and corporate development process for Inuit.”⁹²

2. Security Assets based in the South for Operations in the North

2.1 Bases (including stations, naval facilities, radar sites, etc)

Not available

2.2 Equipment

2.2.1 Air

Aircraft⁹³

In response to Canada’s updated defence policy report in June 2017, CBC reported that, “Ottawa has unveiled a plan to boost military spending by more than \$30-billion over the next decade – much of it to pay for the ballooning cost of new warships and fighter jets...”⁹⁴ Canada’s Defence Policy Report also notes the plan to “align the Canadian Air Defence Identification Zone (CADIZ) with our sovereign airspace”.⁹⁵ However, no information on how this will be made feasible is disclosed.

⁸⁸ ASWG Staff, “16th Meeting of the Arctic Security Working Group,” 16 May 2007, Security Innovator, <http://securityinnovator.com>

⁸⁹ Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, <http://www.parl.gc.ca>

⁹⁰ Pan Arctic Inuit - <http://www.pail.ca>

⁹¹ ATCO Structure and Logistics - <http://www.atcosl.com/en-ca/>

⁹² Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, <http://www.parl.gc.ca>

⁹³ “Aircraft,” Royal Canadian Armed Forces, last modified 19 August 2015, <http://www.rcaf-arc.forces.gc.ca>

⁹⁴ ⁹⁴ LeBlanc, Daniel, Chase, Stephen, “Ottawa lays out \$62-billion in new military spending over 20 years,” The Globe and Mail, 7 June 2017, www.theglobeandmail.com

⁹⁵ “Strong, Secure, Engaged: Canada’s Defence Policy,” Ministry of National Defence, 2017, dgaapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf

CP-140 (P-3C) Aurora



Photo Credit: CP-140 Aurora, Royal Canadian Air Force

<http://www.rcf-arc.forces.gc.ca/en/aircraft.page>

- 18 in operation
- Capable of 17 hour flights and a range of almost 10,000 km (patrols average 10 hours and 5,000 km) without refuelling, and are primarily used for northern maritime surveillance and patrol.
- Monitor for illegal fishing, immigration, drug trafficking, pollution violations, SAR, and deliver survival material in Arctic – Survival Kits Air Droppable, or SKADs (all of these roles are essentially aid to the civil authority)
- Canada is in the process of updating and extending the life of 14 of these 18 CP-140 Auroras, with the intention to operate only 10 at once in a rotation of 14 in order to achieve a life expectancy to 2030.⁹⁶
 - Initially, the 18 CP-140 patrol aircraft was planned to be replaced by 10-12 new aircraft from 2020.⁹⁷ “In February 2014 the Canadian Government announced it would not replace the CP-140 but would instead extend the life of the aircraft to 2030 and refit the aircraft in a \$2.13 billion life-extension project. These enhancements and modifications will begin in 2014 and be completed by 2021 through the Aurora Incremental Modernization Project (AIMP), the Aurora Structural Life Extension Project (ASLEP) and the Aurora Extension Proposal (AEP).”⁹⁸
 - AIMP and ASLEP are currently in implementation phase, with close out occurring in 2020 and 2019 respectively.⁹⁹
- “Next year, the CP-140s will receive a Block IV upgrade which will include new infrared counter measures, a tactical data link 16 to complement link 11 and full motion video, imagery, email, chat, and VOIP.”¹⁰⁰

CF-18 Fighter Aircraft



Photo Credit: CF-188 Hornet, Royal Canadian Air Force

<http://www.rcf-arc.forces.gc.ca/en/aircraft.page>

- Based in Cold Lake, Alberta and Bagotville, Quebec
- Controlled out of Canadian Air Defence Sector (CADS) in North Bay
- Modernization completed in 2010 extended their operational life to at least 2020¹⁰¹
- 77 operational CF-18s (59 CF-18AM or F/A-18A, and 18 CF-18BM or F/A 18B) regularly deployed to the Arctic region¹⁰²

⁹⁶ Pugliese, David, “Canada needs to boost Aurora fleet now, start purchase of new surveillance aircraft,” Ottawa Citizen, 5 May 2017, <http://ottawacitizen.com>

⁹⁷ Wezeman, Siemon, T., “Military Capabilities in the Arctic,” SIPRI Background Paper, SIPRI, March 2012.

⁹⁸ “Expanding the CP-140 Modernized Aurora Fleet”, Royal Canadian Airforce, last modified 20 March 2014, <http://www.rcf-arc.forces.gc.ca/>

⁹⁹ “CP-140 Aurora fleet modernization and life extension,” National Defence and the Canadian Armed Forces, 10 January 2017, <http://www.forces.gc.ca>

¹⁰⁰ Laird, Robbin, “NATO allies and North Atlantic maritime threats,” Vol. 14, No. 4, FrontLine Defence, 30 September, 2017, <http://www.sldinfo.com>

¹⁰¹ “CP-140 Aurora fleet modernization and life extension,” National Defence and the Canadian Armed Forces, 10 January 2017, <http://www.forces.gc.ca>

¹⁰² Laird, Robbin, “NATO allies and North Atlantic maritime threats,” Vol. 14, No. 4, FrontLine Defence, 30 September, 2017, <http://www.sldinfo.com>

- Throughout 2016, the Harper government made plans to make upgrades that would push the lifespan of the aircrafts to 2025, until they could replace all the F/A-18s with 65 F-35s.¹⁰³ About 1/3 of the fleet was upgraded. However, the Trudeau government changed the plan, announcing that they would replace F/A 18s with a cheaper alternative, possibly F/A 18Cs.¹⁰⁴
- In February 2017, the Canadian government announced it was buying 18 Boeing Super Hornets as “interim” fighter jets to ease pressure on the aging fleet of CF-18s until a permanent replacement can be bought.¹⁰⁵ The deal was to be official by end of 2017.¹⁰⁶
 - However, the Liberal government’s plan to buy new Super Hornets was stalled when the Super Hornets’ manufacturing company, Boeing, filed a trade complaint against Canadian aerospace firm Bombardier.¹⁰⁷
- Also in 2017, within the government’s “Strong, Secure, Engaged” plan to increase military spending by over \$30 billion over the next 10 years, the government committed to increasing spending on fighter planes. CBC reported that, “the long-term replacement fleet for Canada’s aging CF-18 warplanes will consist of 88 aircraft at a cost of up to \$19-billion.”¹⁰⁸ According to an announcement by Public Services and Procurement Canada, “On Sept. 29, 2017, Canada submitted an expression of interest, formally marking Canada’s interest in the Australian equipment. Canada expects to receive a response by the end of this year that will provide details regarding the availability and cost of the aircraft and associated parts that Canada is considering.”¹⁰⁹
- Also in the wake of the decline of the U.S.-made Super Hornets, “Lockheed Martin has officially offered its F-35 as an interim aircraft to supplement the RCAF’s aging CF-18 jets.”¹¹⁰
- By the end of 2017, the Canadian government confirmed the purchase of Australian F-18s.¹¹¹
- As of January 2018, the plan is that 18 used Australian F-18s will be distributed across 2 bases. According to a senior Canadian government official, “The aircraft will be employed at 3 Wing Bagotville and 4 Wing Cold Lake. DND is currently reviewing infrastructure requirements to accommodate the additional aircraft. Any modifications are expected to be minimal as the supplemental jets are of similar age and design to the CF-18.”¹¹²

Supply and Search and Rescue Aircraft (in addition to the 4 CC-138 Twin Otters based in North)

CC-177 Globemaster III¹¹³



Photo Credit: C-17 Globemaster III, Royal Canadian Air Force
<http://www.rcf-arc.forces.gc.ca/en/aircraft.page>

- Made its first landing in Resolute Bay in July 2010 (has also landed and taken off in winter conditions)
- Used for first time in Operation Boxtop in August 2010, landing in Alert (first landing there in May 2010)¹¹⁴

¹⁰³ “The Military Balance 2012,” IISS, 7 March 2012, p. 52., <https://www.iiss.org>

¹⁰⁴ “The Military Balance 2012,” IISS, 7 March 2012, p. 52., <https://www.iiss.org>

¹⁰⁵ Pugliese, David, “Time running out to upgrade Canada’s aging CF-18 jets,” Ottawa Citizen, 14 April 2016, <http://news.nationalpost.com>

¹⁰⁶ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A new Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016, p. 4.

¹⁰⁷ Pugliese, David, “Liberal MPs sideline Conservative motion to study purchase of 18 Super Hornets,” Defense Watch, 10 February 2017, <http://ottawacitizen.com/news/national/defence-watch/liberal-mps-sideline-conservative-motion-to-study-purchase-of-18-super-hornets>

¹⁰⁸ Pugliese, David, “Liberal MPs sideline Conservative motion to study purchase of 18 Super Hornets,” Defense Watch, 10 February 2017, <http://ottawacitizen.com/news/national/defence-watch/liberal-mps-sideline-conservative-motion-to-study-purchase-of-18-super-hornets>

¹⁰⁹ Pugliese, David, “Liberal MPs sideline Conservative motion to study purchase of 18 Super Hornets,” Defense Watch, 10 February 2017, <http://ottawacitizen.com/news/national/defence-watch/liberal-mps-sideline-conservative-motion-to-study-purchase-of-18-super-hornets>

¹¹⁰ LeBlanc, Daniel, Chase, Stephen, “Ottawa lays out \$62-billion in new military spending over 20 years,” The Globe and Mail, 7 June 2017, www.theglobeandmail.com

¹¹¹ Pugliese, David, “Canada takes first official step to buying used fighter jets from Australia,” Ottawa Citizen, 10 October 2017, <http://ottawacitizen.com>

¹¹² Pugliese, David, “Lockheed Martin offers F-35 to Canada as 'interim' fighter jet,” National Post, 7 August, 2017, <http://nationalpost.com>

¹¹³ “CC-177 Globemaster III,” Royal Canadian Air Force, last modified 23 April 2014, <http://www.rcf-arc.forces.gc.ca>

¹¹⁴ “CC-115 Buffalo,” Royal Canadian Air Force, last modified 1 August 2013, HYPERLINK “<http://www.rcf-arc.forces.gc.ca/en/aircraft-current/cc-115.page>”

CC-115 Buffalo



Photo Credit: CC-115 Buffalo, Royal Canadian Air Force

<http://www.rcf-arc.forces.gc.ca/en/aircraft.page>

- “All six Canadian Forces CC-115s are employed by 442 Transport and Rescue Squadron out of Comox, British Columbia. The squadron is responsible for an SAR zone stretching from the BC–Washington border to the Arctic, and from the Rocky Mountains to 1200 km out over the Pacific Ocean. With a maximum load of 2727 kg—or 41 fully equipped soldiers—the Buffalo has an operational range of 2240 km.”¹¹⁵
- As of December 2016, the Airbus C-295 was announced as Canada’s next fixed-wing search-and-rescue plane to replace the nearly 50 year-old CC-115 Buffalo aircraft.¹¹⁶

Airbus C-295



Photo Credit: C-295 Airbus, Airbus

<http://www.cbc.ca/news/politics/fixed-wing-search-planes-1.3885653>

- In early December 2016, a number of officials from the Trudeau government announced the selection of the Airbus C-295 as Canada’s next fixed-wing search-and-rescue plane to replace the nearly 50 year-old CC-115 Buffalo aircraft.¹¹⁷
- A two-step procurement process will cost \$4.7 billion over the next two decades.
 - The first phase — at a cost of \$2.4 billion — involves the purchase of 16 C-295W aircraft modified for search-and-rescue missions as well as “a training simulator, to be located in Comox, B.C., and 11 years of in-service support and maintenance”.¹¹⁸

¹¹⁵ “CC-115 Buffalo,” Royal Canadian Air Force, last modified 1 August 2013, <http://www.rcf-arc.forces.gc.ca>

¹¹⁶ Brewster, Murray, “Airbus chosen to build Canada’s new search planes, ending 12-year procurement odyssey,” 7 December 2016, CBC News, www.cbc.ca

¹¹⁷ Brewster, Murray, “Airbus chosen to build Canada’s new search planes, ending 12-year procurement odyssey,” 7 December 2016, CBC News, www.cbc.ca

¹¹⁸ Brewster, Murray, “Airbus chosen to build Canada’s new search planes, ending 12-year procurement odyssey,” 7 December 2016, CBC News, www.cbc.ca

CC-130 Hercules



Photo Credit: CC-130 Hercules, Royal Canadian Air Force
<http://www.rcaf-arc.forces.gc.ca/en/aircraft.page>

- Workhorse of airlifts to north
- “The first CC-130E Hercules entered service in Canada in 1960, and the current CC-130H Hercules was purchased in 1996.
“The CC-130 Hercules is a four-engine fixed-wing turboprop aircraft that can carry up to 78 combat troops. It is used for a wide range of missions, including troop transport, tactical airlift (both palletized and vehicular cargo), search and rescue (SAR), air-to-air refuelling (AAR), and aircrew training. It can carry more than 17, 000 kilograms (about 38, 000 pounds) of fuel for tactical AAR.”¹¹⁹
- The last CC-130E Hercules took final flight on April 6 2016.¹²⁰

CC-130J Hercules



Photo Credit: CC-130J Hercules, Royal Canadian Air Force
<http://www.rcaf-arc.forces.gc.ca/en/aircraft.page>

- 17 new CC-130J Super Hercules
 - All delivered by 2012
 - Made first landing in Alert in Sept 2010¹²¹
 - “September 2011 marked the first time that the annual resupply mission to Canadian Forces Station Alert in the Arctic (Operation Boxtop) was carried out using solely the CC-130J”¹²²
- “The CC-130J Hercules is a four-engine, fixed-wing turboprop aircraft that can carry up to 92 combat troops or 128 non-combat passengers. It is used for a wide range of missions, including troop transport, tactical airlift (both palletized and vehicular cargo) and aircrew training. While on the outside the CC-130J looks almost identical to the older Hercules, internally the J-model Hercules is essentially a completely new aircraft.”¹²³

¹¹⁹ CC-130 Hercules - <http://www.rcaf-arc.forces.gc.ca/en/aircraft-current/cc-130.page>, last modified 16 August 2013

¹²⁰ Pugliese, David, “Last RCAF C-130E Hercules flies into history,” Ottawa Citizen, 6 April 2016, <http://ottawacitizen.com>

¹²¹ “CC-130J Hercules (Cargo Aircraft),” Royal Canadian Air Force, last modified 23 April 2014, <http://www.rcaf-arc.forces.gc.ca>

¹²² “Canada welcomes final CC-130J Hercules,” CC-130J.ca, 8 June 2012, <http://cc-130j.ca>

¹²³ “CC-130J Hercules (Cargo Aircraft),” Royal Canadian Air Force, last modified 23 April 2014, <http://www.rcaf-arc.forces.gc.ca>

- *Defence Acquisition Guide 2014*: Upgrades to the CC-130J “will ensure compatibility with the future European and North American airspace requirement”. Project estimated to cost between \$100 million and \$249 million and to be delivered between 2021 and 2025.¹²⁴

February 2016: “Cascade Aerospace Inc., announces the completion of the first Block 7.0 upgrade installation on a C-130J Super Hercules operated by the Royal Canadian Air Force (RCAF). This is the first C-130J Block 7.0 upgrade to be completed outside of an Original Equipment Manufacturer (OEM) or Government facility. All 17 CC-130Js in the RCAF’s fleet will receive the Block 7.0 upgrade with Cascade Aerospace managing the installation process.”¹²⁵

- *Defence Acquisition Guide 2015*: Final delivery estimated for 2025.¹²⁶

CC-150 Polaris



Photo Credit: CC-150 Polaris, Royal Canadian Air Force

<http://www.rcaf-arc.forces.gc.ca/en/aircraft.page>

- “The CC-150 Polaris [Airbus a-310] is a multi-purpose, twin-engine, long-range jet aircraft that can be converted for passenger, freight or medical transport, or any combination of these configurations. The Polaris can reach a speed of up to Mach 0.84 (1029 km/h) carrying a load of up to 32,000 kilograms (70,560 pounds). Passenger loads range from 28 to 194 people, depending on the particular aircraft tail number and configuration.”¹²⁷
 - Canada operates 3 CC-150 (2 are in tanker role)
- *Defence Acquisition Guide 2015*: Prolong the life expectancy of the CC-150 Polaris beyond 2026. Five CC-150 aircrafts will be upgraded, with the final delivery between 2026 and 2035. The project is estimated to cost \$100 million to \$249 million.¹²⁸
- *Defence Acquisition Guide 2016*: With final delivery expected by 2025, DND plans to install a missile approach warning and infrared countermeasures system in the CC-150 fleets.¹²⁹

CC-150T (refuelling tanker)

- “As part of the Air Force Multi-Role Tanker Transport (MRTT) program, two CC-150 Polaris aircraft have been converted to strategic air-to-air refuellers for Canada’s fleet of CF-18 Hornet fighter aircraft. The Polaris MRTT is capable of transferring 36,000 kilograms (79,380 pounds) of fuel to receiving aircraft over a journey of 4,630 kilometres (2,875 statute miles). Consequently, one Polaris tanker can ferry a flight of four CF 18 Hornets non-stop across the Atlantic Ocean.”¹³⁰
- “The RCAF has plans to replace its CC-150 Polaris refuelling tankers but is holding off until the Liberal government makes its decision on what type of aircraft will be selected to replace the CF-18s.”¹³¹

¹²⁴ “Defence Acquisition Guide 2014,” National Defence and the Canadian Armed Forces, June 2014, <http://www.forces.gc.ca>

¹²⁵ IMP Group International Inc., “Cascade Aerospace begins Block 7.0 Upgrade on Canada’s CC-130J Hercules,” 9 February 2016, <http://www.impgroup.com>

¹²⁶ “Defence Acquisition Guide 2015,” National Defence and the Canadian Armed Forces, March 2015, <http://www.forces.gc.ca>

¹²⁷ “CC-150 Polaris,” Royal Canadian Air Force, last modified 22 May 2014, <http://www.rcaf-arc.forces.gc.ca>

¹²⁸ “Defence Acquisition Guide 2015,” National Defence and the Canadian Armed Forces, May 2016, <http://www.forces.gc.ca>

¹²⁹ “Defence Acquisition Guide 2016,” National Defence and the Canadian Armed Forces, May 2016, <http://www.forces.gc.ca>

¹³⁰ “CC-150 Polaris,” Royal Canadian Air Force, last modified 22 May 2014, <http://www.rcaf-arc.forces.gc.ca>

¹³¹ Pugliese, David, “Polaris replacement will have to wait until decision on new fighter jet, says RCAF commander,” Ottawa Citizen, 2 May 2016, <http://ottawacitizen.com>

*Fixed-Wing Search and Rescue Aircraft Replacement Project*¹³²

- The Government of Canada is buying 16 C295W aircraft equipped with advanced technology systems to support Canada's search and rescue operations."¹³³
- These aircraft are replacing the ageing fleet of six CC-115 Buffalo aircraft and 13 CC-130 Hercules aircraft that have been used for SAR duties over the past 20 to 40 years.¹³⁴
- The contract was awarded to Airbus Defence and Space on December 1, 2016.¹³⁵
- The first aircraft are expected to be delivered by 2019 with the last delivered in 2022 and "the contract for the initial period of 11 years is valued at \$2.4 billion".¹³⁶ This is ahead of the estimated schedule made by the government during the project definition process.¹³⁷

Helicopters

CH-146 Griffon Helicopter (Bell 412)



Photo Credit: CH-146 Griffon, Royal Canadian Air Force
<http://www.rcaf-arc.forces.gc.ca/en/aircraft.page>

- Part of Operation NANOOK in 2010 and 2011
- A utility transport vehicle, it has been in service since 1995 and its "primary role is tactical transportation of troops and material. It is also used at home and abroad for search and rescue (SAR) missions, surveillance and reconnaissance, casualty evacuation and counter-drug operations."¹³⁸
- In May 2013 the three Griffons at Canadian Forces Base Goose Bay were all grounded for repairs.¹³⁹
- The Canadian Government plans to extend the life of the aging helicopters to 2024 to "bridge the gap until a replacement capability is acquired through the Tactical Reconnaissance Utility Helicopter project". The cost of the project is estimated at \$500 million – \$1.5 billion.¹⁴⁰

¹³² The Senate Committee's 2011 Report said this of the SAR replacement:

"The aging CC-115 Buffalo and CC-130 Hercules fixed wing aircraft need to be replaced. They have been the backbone of Canada's SAR fleet since the 1960s. In 2004, a Statement of Operational Requirements (SOR) was drafted for replacement fixed wing SAR airplanes—but in the fall of 2010, after program delays due to higher priority procurements, comments on the SOR by industry and an SOR review by the National Research Council, the Department of National Defence has gone back almost to square one and is drafting a new SOR. In the meantime, Canada's shrinking fleet of elderly Buffaloes and Hercules keeps flying. Defence Minister Peter MacKay, however, has indicated that the wait will soon be over.

¹³³ "Fixed-Wing Search and Rescue Aircraft Replacement Project," Public Services and Procurement Canada, last modified 19 January 2017, www.tpsgc-pwgsc.gc.ca

¹³⁴ "Fixed-Wing Search and Rescue Aircraft Replacement Project," Public Services and Procurement Canada, last modified 19 January 2017, www.tpsgc-pwgsc.gc.ca

¹³⁵ "Fixed-Wing Search and Rescue Aircraft Replacement Project," Public Services and Procurement Canada, last modified 19 January 2017, www.tpsgc-pwgsc.gc.ca

¹³⁶ "Fixed-Wing Search and Rescue Aircraft Replacement Project," Public Services and Procurement Canada, last modified 19 January 2017, www.tpsgc-pwgsc.gc.ca

¹³⁷ "Defence Acquisition Guide 2014," National Defence and the Canadian Armed Forces, June 2014, <http://www.forces.gc.ca>

¹³⁸ "CH-149 Cormorant," Royal Canadian Air Force, last modified August 2013, <http://www.rcaf-arc.forces.gc.ca>

¹³⁹ National Defence and the Canadian Armed Forces (June, 2014). Defence Acquisition Guide 2014, <http://www.forces.gc.ca/en/business-defence-acquisition-guide/index.page>

¹⁴⁰ "Defence Acquisition Guide 2015," National Defence and the Canadian Armed Forces, May 2016, <http://www.forces.gc.ca>

CH-149 Cormorant



Photo Credit: CH-149 Cormorant, Royal Canadian Air Force
<http://www.rcaf-arc.forces.gc.ca/en/aircraft.page>

- The Air Force's only dedicated search and rescue (SAR) helicopter
- A range of over 1000 km without refuelling
- Equipped with a full ice protection system¹⁴¹
- *Defence Acquisition Guide 2015*: The Cormorant is to receive a mid-life upgrade, the objective of which is "to extend the all-weather rotary wing search and rescue capability to at least 2040, to return the capability to the Trenton main operating base, and to provide capability improvements to enhance its overall mission effectiveness." The cost is estimated to be between \$500 million - \$1.5 billion and the request for proposal is to be released in 2017.¹⁴²
- *Defence Acquisition Guide 2016*: The request for proposal release has been pushed to 2018.¹⁴³

CH-124 Sea King



Photo Credit: CH-124 Sea King, Royal Canadian Air Force
<http://www.rcaf-arc.forces.gc.ca/en/aircraft-current/ch-124.page>

- Operates from destroyers and frigates in anti-submarine roles
- Also contribute to search and rescue, disaster relief, counter-narcotic operations, and fisheries and pollution patrols.
- To be replaced by the CH-148 Cyclone¹⁴⁴

¹⁴¹ "CH-149 Cormorant," Royal Canadian Air Force, last modified 1 August 2013, <http://www.rcaf-arc.forces.gc.ca>

¹⁴² "Defence Acquisition Guide 2015," National Defence and the Canadian Armed Forces, March 2015, <http://www.forces.gc.ca>

¹⁴³ "Defence Acquisition Guide 2016," National Defence and the Canadian Armed Forces, May 2016, <http://www.forces.gc.ca>

¹⁴⁴ "CH-124 Sea King," Royal Canadian Air Force, last modified 1 August 2013, <http://www.rcaf-arc.forces.gc.ca>



Photo Credit: CH-148 Cyclone, Royal Canadian Air Force

<http://www.rcf-arc.forces.gc.ca/en/aircraft.page>

- 28 are on order from Sikorsky, but has been a highly troubled program
 - More than 5 years behind schedule and cost over-runs
 - Canadian forces now have at least six interim versions of the Cyclone for pilot training.¹⁴⁵
- DND is expecting a fully capable CH-148 Cyclone delivered in 2018.¹⁴⁶
- DND says the Cyclone “will conduct Surface and Subsurface Surveillance and Control, utility and search and rescue missions. It will also provide tactical transport for national and international security efforts. ...[It] is built with lightning-strike and high-intensity radio frequency pulse protection. ...The Cyclone has a day-and-night flight capability, and can fly in most weather conditions in temperatures ranging from -51°C to +49°C. With a maximum cruise speed of 250 km/h, the CH-148 is approximately 10% faster than a Sea King. The Cyclone can also fly 450 km without refuelling.”¹⁴⁷
- As of March 2017, the project is now in implementation stage, having accepted 11 Cyclones, and plans are to reach full operational capacity (28) by 2025.¹⁴⁸
 - “The cost is \$3.2 billion for acquisition project management, infrastructure and contingency costs. The cost for major in-service support until 2038 is \$5.8 billion.”¹⁴⁹

Medium to Heavy Lift Helicopter

- “The Department of National Defence (DND) acquired 15 advanced, multi-mission, Medium-to-Heavy lift helicopters, or more specifically the Canadian version of the F-model Chinook (also known as CH-147F)... Canada took delivery of the 15th and final Chinook in July 2014.”¹⁵⁰
- “April 2015: Two Chinooks were deployed for the first time to Kapuskasing as a response to flooding.”¹⁵¹
- “Domestic roles for the Chinook helicopters will focus on the provision of logistical or mobility support to CF Land Forces and CANSOFCOM, other Government departments, law enforcement agencies, or other civil authorities. The Chinook helicopter will provide a vital capability to conduct secondary Search and Rescue when required and support major air disaster response across the continent, particularly in Canada’s North given increasing commercial air activity in that region. The Chinook will also be capable of responding to humanitarian emergencies such as fire, floods and earthquakes. The versatility, impressive capacity and long range of this helicopter make the Chinook ideal for operations in Canada’s vast territory and demanding environment.”¹⁵²
- “With a heavy-lift capability of up to 40 personnel or 11,363 kilograms of cargo, they will be able to deploy independently, including to the High Arctic. The operating range is increased to a basic 609 kilometres, with a mission radius of 370.4 kilometres.”¹⁵³

¹⁴⁵ “CH 148 Cyclones delivered to Halifax airbase,” CBC News, 19 June 2015, <http://www.cbc.ca>

¹⁴⁶ Department of National Defence, “Archived - Maritime Helicopter Project: Status (Fact Sheet),” Government of Canada, last modified June 2014, <http://news.gc.ca>

¹⁴⁷ “CH-148 Cyclone,” Royal Canadian Air Force, last modified 18 September 2013, <http://www.rcf-arc.forces.gc.ca>

¹⁴⁸ “CH-148 Cyclone procurement project,” National Defence and the Canadian Armed Forces, 9 March 2017, <http://www.forces.gc.ca>

¹⁴⁹ “CH-148 Cyclone procurement project,” National Defence and the Canadian Armed Forces, 9 March 2017, <http://www.forces.gc.ca>

¹⁵⁰ “Fixed Wing Search and Rescue Aircraft Replacement Project,” National Defence and the Canadian Armed Forces, last modified 13 May 2016, www.forces.gc.ca

¹⁵¹ “Medium-to-heavy lift helicopter project: status,” National Defence and the Canadian Armed Forces, last modified 25 June 2015, <http://www.forces.gc.ca>

¹⁵² The Role And Capabilities of the Chinook F Model

¹⁵³ “Canada’s newest generation of Chinook helicopters,” Flightglobal/Airspace Forum, 13 January 2013, <http://www.flightglobal.com>

Satellite Surveillance

RADARSAT

- RADARSAT-1 is an Earth observation satellite developed by Canada to monitor environmental changes and the planet's natural resources.
 - An operational radar satellite system capable of timely delivery of large amounts of data
 - Equipped with an aperture radar (SAR) instrument, it acquires images of the Earth day or night, in all weather and through cloud cover, smoke and haze.
 - Launched in November 1995¹⁵⁴
- RADARSAT-2 was launched in December 2007, Canada's next-generation commercial radar satellite, offering technical advancements to enhance marine surveillance, ice monitoring, disaster management, environmental monitoring, resource management and mapping in Canada and around the world. ¹⁵⁵ RADARSAT-2 is "one of Canada's most sophisticated satellites". Yet, "there are some recent concerns that the success of RADARSAT-2 is proving to be a headache for the Canadian government. According to a November 2012 admission by the Department of National Defence (DND), estimates by the Canadian Space Agency (CSA) have indicated that the government's "data allocation will expire by August 2017" due to the exponential growth of the demand for information in maritime domain awareness, a statement that has since been contradicted by sources at the CSA".
- "According to the CSA and DND, the RADARSAT Constellation Mission (RCM) remains on target for a 2018 launch".

¹⁵⁶

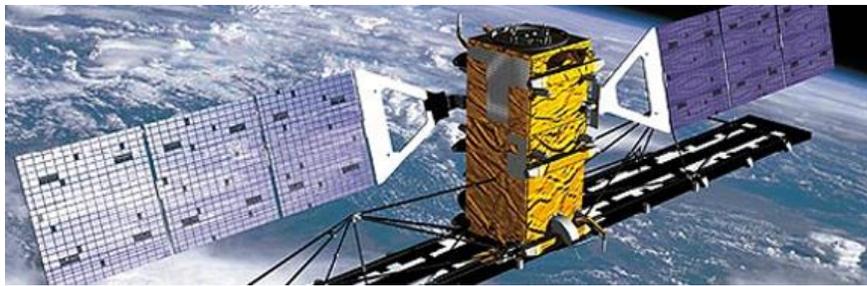


Photo Credit: RADARSAT 2, Canadian Space Agency, <http://www.asc-csa.gc.ca/eng/satellites/radarsat2/>

RADARSAT Constellation

- Objectives:
 - "The evolution of the RADARSAT Program with the objective of ensuring C-band data continuity, enhanced operational use of SAR data and improved system reliability over the next decade."¹⁵⁷
 - To provide complete coverage of Canada's land and oceans.
 - In addition to assisting in disaster management and in monitoring of environmental change, the constellation will make possible the monitoring of marine traffic in the north and beyond, according to MDA, through: "...repeat imaging of the same area at different times of day, dramatically improving the frequency of monitoring coastal zones, northern territories, Arctic waterways and other areas of strategic and defence interest. RCM will also incorporate automated identification system technology, which when combined with the powerful radar images, supports the immediate detection and identification of ships worldwide."¹⁵⁸
- Launches first planned for 2016 and 2017, but now "launch of the three satellites is targeted for the third quarter of 2018".¹⁵⁹
- Plans for three new RADARSAT satellites were awarded in Jan 2013¹⁶⁰
- MacDonald, Dettwiler and Associates Ltd. (MDA) awarded \$706-million contract with the Canadian Space Agency
- The company will build, launch and provide initial operations for what is planned to be a constellation of three satellites.
 - Building on technology that MDA has developed through the Radarsat-1 and Radarsat-2 missions.

¹⁵⁴ "RADARSAT-1," Canadian Space Agency, last modified 21 March 2014, <http://www.asc-csa.gc.ca>

¹⁵⁵ "RADARSAT-1," Canadian Space Agency, last modified 21 March 2014, <http://www.asc-csa.gc.ca>

¹⁵⁶ "Canadian satellites 'on target' to revolutionize maritime domain awareness," Defence IQ, 2014, <http://www.defenceiq.com>

¹⁵⁷ "RADARSAT Constellation," Canadian Space Agency, last modified 30 March 2017, <http://www.asc-csa.gc.ca>

¹⁵⁸ "MDA awarded \$706 million contract to build three radar satellites," MDA Information Systems website, 9 January 2013, <http://www.mdacorporation.com>

¹⁵⁹ "Building the North: Project List, Canada's Economic Action Plan," Government of Canada, date not available, <http://actionplan.gc.ca/>

¹⁶⁰ The Canadian Press, "MacDonald, Dettwiler and Associates sign \$706M Radarsat deal," CBC News, 9 January 2013, <http://www.cbc.ca>

Maritime Monitoring and Messaging Micro-Satellite (M3MSat)

- Objectives:
 - DND says M3MSat will be able to track digital signals from ships and thus enhance the capacity to identify marine traffic, and to detect the direction and cruising speed of vessels to ensure that they legally and safely navigate Canadian waters.¹⁶¹
 - Overall, M3MSat's mission aims to "improve Canada's space-based capabilities to detect ships and manage marine traffic. It is also testing a device that could change the way we monitor the health and safety of satellites."¹⁶²
- The launch of the M3MSat, a Canadian military satellite for maritime surveillance in conjunction with Radarsat 2, was delayed as the result of sanctions against Russia. It was to have been launched in Kazakhstan from a Russian facility.¹⁶³ The launch was re-scheduled for June 2016 and launched successfully from a facility in Sriharikota, India.¹⁶⁴



Photo Credit: M3MSat, Canadian Space Agency, <http://www.asc-csa.gc.ca/eng/satellites/m3msat/>

Project Polar Epsilon

- Objectives:
 - *Defence Acquisition Guide 2014*: "Polar Epsilon 2 (PE2) will enhance existing Polar Epsilon (PE) capabilities... increasing the government of Canada's near-real time situational awareness of activities in Canada's three ocean approaches and... increased surveillance persistence of Canada's Arctic." The project will cost between \$100 million and \$249 million, with the final delivery anticipated 2019.¹⁶⁵
- Polar Epsilon vs. Polar Epsilon 2
 - "The Polar Epsilon project uses information from RADARSAT-2 to produce imagery for military commanders to use in order to conduct operations in their areas of responsibility, "including surveillance of Canada's Arctic region and maritime approaches, the detection of vessels, and support to CF operations globally."¹⁶⁶
 - Polar Epsilon 2 will use data from the next generation of Canadian Earth-observation satellites, known as the RADARSAT Constellation Mission, which is set to launch in 2018. "The data obtained from the RADARSAT Constellation Mission will be used for various surveillance needs ranging from monitoring of ice flows within Canada's coastal waters, providing surveillance of Canada's ocean approaches; monitoring environmental conditions, such as floods and forest fires; and managing and mapping natural resources in Canada and around the world."¹⁶⁷

¹⁶¹ Pugliese, David, "Russian sanctions have killed Canadian satellite launch," Ottawa Citizen, 24 April 2014, www.ottawacitizen.com

¹⁶² "Maritime Monitoring and Messaging Microsatellite (M3MSat)," 22 June 2016, Canadian Space Agency, <http://www.asc-csa.gc.ca>

¹⁶³ "Maritime Monitoring and Messaging Microsatellite (M3MSat)," 11 May 2016, National Defence and the Canadian Armed Forces, <http://www.forces.gc.ca>

¹⁶⁴ "Canada's M3MSat Successfully Launch," 22 June 2016, Government of Canada, www.news.gc.ca

¹⁶⁵ "Defence Acquisition Guide 2014," National Defence and the Canadian Armed Forces, June 2014, <http://www.forces.gc.ca>

¹⁶⁶ "A new step for the Polar Epsilon project," *The Maple Leaf*, (Vol. 13, No. 24), Department of National Defence, 21 July 2010, <http://www.forces.gc.ca>

DND says: "Canadian Forces have been using this [Satellite] data for their Polar Epsilon Project—all-weather, day-night surveillance to detect and track foreign vessels, and maintain 'Arctic situational awareness' to respond to natural disasters, environmental crises, and assist with search and rescue."

"The implementation phase of Polar Epsilon began in March 2009 with the design and construction phase of two new RADARSAT-2 ground stations, one on the east coast in Masstown, N.S., and the other on the west coast in Aldergrove, B.C. The ground stations will be wholly owned and operated by the Government of Canada and are expected to be operational by March 2011. Completion of the Polar Epsilon project is expected by late 2011.

"The advantage of Polar Epsilon is that its imagery can be used to accurately determine locations, which allows for a more efficient and cost-effective use of other Canadian military assets, such as patrol aircraft and ships. Polar Epsilon can also be used to survey for oil or water pollution and airplane or satellite crash sites. The project, however, does not have the capability to detect missiles, nor can it track individuals. The data provided by Polar Epsilon is used primarily to support military operations, but will prove invaluable in supporting the regular activities of numerous departments and agencies."

¹⁶⁷ "Polar Epsilon 2 Project," Government of Canada, 17 June 2016, <http://news.gc.ca>

- Current stage of Polar Epsilon went fully operational in August 2011.¹⁶⁸
- SIPRI's 2016 Background paper notes that, "this programme has been modified to use data from three civilian satellites, to be launched in 2018, linked to a military network to be ordered in 2017 for delivery in 2019."¹⁶⁹

Enhanced Satellite Communication Project

- "The Canadian military wants to build a new constellation that would provide 24-hour satellite communications for the Arctic region as early as 2023... The program would likely include at least two satellites in an elliptical orbit and could cost about \$2.4 billion Canadian dollars, said Col. Jeff Dooling, director of space requirements for the Canadian Department for National Defence."¹⁷⁰
- Research for the program has been drawn from an incomplete Canadian Space Agency study that started in 2010.¹⁷¹
- "The program would feature X-band and Ka-band communications as well as ultra-high frequency narrowband communications over the North Pole."¹⁷²
- According to the Canadian *Defence Acquisition Guide 2016*, this project will complete the CAF's SATCOM Roadmap.¹⁷³

*Development of quantum illumination sensing to support radar*¹⁷⁴

- "DND, through Public Services and Procurement Canada, has awarded a contract to the Institute for Quantum Computing at the University of Waterloo to study new quantum technology to contribute to improving remote sensing methods in the Arctic. This \$2.7 million contract is being awarded under the 2016 Innovation Call for Proposals for the All Domain Situational Awareness (ADSA) Science & Technology (S&T) program."
- "A new sensing technique – quantum illumination – will allow radar operators to cut through heavy background noise and isolate objects, including stealth aircraft, with unparalleled accuracy."

Uninhabited Aerial Vehicles

RQ-21A Blackjack

- The Canadian government's 2016 acquisition of 5 RQ-21A Blackjacks from the U.S. Navy brings resolution to the DND's lengthy Joint Uninhabited Surveillance and Target Acquisition System (JUSTAS) project to secure surveillance drones.¹⁷⁵ Delivery of the Blackjacks is set for 2021, and the \$14.2 million contract also includes training on how to use the new technology.¹⁷⁶
- The Blackjacks, made by Insitu, have a 16 ft wingspan, 16 hr endurance, and can reach 19 500 ft.¹⁷⁷ They are designed for surveillance purposes only.¹⁷⁸
- This arrangement makes delivery ahead of schedule, as the contract award for JUSTAS was originally planned for 2020 with final delivery in 2025.¹⁷⁹
- Imagery from Project Epsilon is not frequent enough to allow for real time tracking of ship traffic, so it is argued that aerial surveillance has to augment satellite surveillance, notably through UAVs.¹⁸⁰

¹⁶⁸ "Polar Epsilon keeps watch over Canada's coastal waters," MDA Information Systems website, date not available, <http://www.mdacorporation.com>

¹⁶⁹ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

¹⁷⁰ Gruss, Mike, "Canada eyes \$2.4 billion Arctic satellite communications constellation," Space News, 30 June 2016, <http://spacenews.com>

¹⁷¹ Gruss, Mike, "Canada eyes \$2.4 billion Arctic satellite communications constellation," Space News, 30 June 2016, <http://spacenews.com>

¹⁷² Gruss, Mike, "Canada eyes \$2.4 billion Arctic satellite communications constellation," Space News, 30 June 2016, <http://spacenews.com>

¹⁷³ "Defence Acquisition Guide 2016," National Defence and the Canadian Armed Forces, May 2016, <http://www.forces.gc.ca>

¹⁷⁴ National Defence and the Canadian Armed Forces, "Government of Canada announces contract award to the University of Waterloo for research and development in support of Arctic surveillance," Government of Canada, 12 April 2018, <https://www.canada.ca>

¹⁷⁵ Ruskin, Brett, "Canada's new \$14.1M fixed-wing drones are runway free", Canadian Broadcasting Company, 15 July 2016, <http://www.cbc.ca>

¹⁷⁶ Wagner, Elise, "After a decade, Canada has drones," NATO Association of Canada, 3 September 2016, <http://natoassociation.ca>

¹⁷⁷ Wagner, Elise, "After a decade, Canada has drones," NATO Association of Canada, 3 September 2016, <http://natoassociation.ca>

¹⁷⁸ Ruskin, Brett, "Canada's new \$14.1M fixed-wing drones are runway free", Canadian Broadcasting Company, 15 July 2016, <http://www.cbc.ca>

¹⁷⁹ "Defence Acquisition Guide 2015," National Defence and the Canadian Armed Forces, March 2015, <http://www.forces.gc.ca>

¹⁸⁰ Levon Bond, "JUSTAS and Project Epsilon: Integrated Intelligence, Surveillance, and Reconnaissance of the Canadian Arctic," *Canadian Military Journal*, Vol. 11, No. 4, Autumn 2011, <http://www.journal.forces.gc.ca/vo11/no4/doc/Page%2024%20Bond%20Article%20English.pdf>

5 Heron CU-170

- Leased since 2011 from MacDonald, Dettwiler and Associates of Vancouver, BC to replace the Sperwer and “meet the urgent and growing demand for UAV support to operations until a long-term UAV solution is in place”¹⁸¹
- Long term plan secured in 2016 when Canadian government signed a contract with the US Navy to acquire their RQ-21A Blackjacks. See ‘RQ-21A Blackjacks’ for more details.

2.2.2 Land

Not available

2.2.3 Sea

Ships - Coast Guard Icebreakers

- Canadian Coast Guard icebreakers are the primary naval presence in the Canadian Arctic.
- They are said to “respond to specific sovereignty challenges identified by the Canadian Government”¹⁸²
 - In the summer of 2014, Canada sent two icebreakers to the High Arctic to gather scientific data “to bid for control of the sea floor under and beyond the North Pole”.¹⁸³
- Support for Canadian Navy ships on Arctic voyages and commercial ships, and perform research
- The Coast Guard’s icebreaking capabilities have been considered lacking. For instance, they are only able to provide Arctic icebreaking service during summer months (beginning in late June and going into November).¹⁸⁴
- Project Resolute: Presented on April 21 2017 as a solution to meet the Canadian Coast Guard’s capability shortages. The project is a “multi-company partnership – provides Canada with the world’s four most powerful, privately-owned multi-role icebreakers at a fraction of the cost of building from scratch.”¹⁸⁵
 - This flexible leasing arrangement will address Canada’s icebreaking and oil-spill response capability requirements.
- The Coast Guard fleet currently includes:
 - Two heavy icebreakers:
 - CCGS Louis S. St-Laurent
 - CCGS Terry Fox
 - Four medium icebreakers:
 - CCGS Amundsen [a research vessel]¹⁸⁶
 - CCGS Des Groseilliers
 - CCGS Henry Larsen
 - CCGS Pierre Radisson
 - In 2017, the Canadian Coast Guard expanded its hydrographic mapping capacity by including high resolution EM 712 multi-beam echo sounders on two of its medium icebreakers.¹⁸⁷
 - Seven light icebreakers (high-endurance multi-tasked vessels which can operate only in the Western Arctic).¹⁸⁸
- A new polar icebreaker (CCGS John G. Diefenbaker) is planned for the Coast Guard
 - Design contract has been issued and construction contract awarded to Seaspan Marine Corp. of B.C.¹⁸⁹ New \$1.3 billion ship was to be delivered in 2017 for sea trials. ¹⁹⁰Arctic performance trial and full operational capability was to be achieved in 2018.¹⁹¹
 - In 2013, production of this new icebreaker was delayed to prioritize the non-Arctic acquisition of support ships for the navy. SIPRI’s 2016 Background Paper reported that, “The icebreaker will not be

¹⁸¹ “CU-170 Heron,” Canadian Forces Military, 5 June 2016, <http://canadianforcesmilitary.com>

¹⁸² “Icebreaking Levels of Service,” Canadian Coast Guard, last modified 24 June 2013, <http://www.ccg-gcc.gc.ca>

¹⁸³ Weber, Bob, “Canadian icebreakers head out to map Arctic sea floor,” The Canadian Press, 8 August 2014, <http://www.theglobeandmail.com>

¹⁸⁴ “Icebreaking Levels of Service,” Canadian Coast Guard, last modified 24 June 2013, <http://www.ccg-gcc.gc.ca>

¹⁸⁵ “Project Resolute holds the key to Canadian Coast Guard icebreaker capability shortages,” PRNewswire, 21 April 2017, <https://www.benzinga.com>

¹⁸⁶ Amundsen - <http://www.amundsen.ulaval.ca/index.php?url=1>

¹⁸⁷ Haun, Erin, “Canadian Coast Guard Expands Mapping Capability,” Marine Technology News, 14 August 2017, <https://www.marinetechologynews.com>

¹⁸⁸ “Icebreaking Levels of Service,” Canadian Coast Guard, last modified 24 June 2013, <http://www.ccg-gcc.gc.ca>

¹⁸⁹ Brian Pehora, “Coast Guard: new \$1.3 billion Arctic icebreaker to be ready by 2022,” Nunatsiaq News Online, 28 January 2016, <http://www.nunatsiaqonline.ca>

¹⁹⁰ Brian Pehora, “Coast Guard: new \$1.3 billion Arctic icebreaker to be ready by 2022,” Nunatsiaq News Online, 28 January 2016, <http://www.nunatsiaqonline.ca>

¹⁹¹ “Building the North: Project List, Canada’s Economic Action Plan,” Government of Canada, date not available, <http://actionplan.gc.ca/>

ready before 2021 and, with the price estimated in 2014 at 1.3 billion Canadian dollars (\$1.2 billion), there is some speculation that it might be cancelled.”¹⁹²

- Most recent updates from the Canadian government state that, due to supply ship delays, the completion of the Diefenbaker will be delayed until 2022 or 2023.¹⁹³

Ships - Navy

The Canadian Navy has a fleet of 33 vessels (3 Destroyers, 12 Frigates, 2 Supply Ships, 12 Coastal Defence; 4 submarines)



Photo Credit: CCGS Louis S. St-Laurent, Canadian Coast Guard

http://www.ccg-gcc.gc.ca/Fleet/Vessel?vessel_id=81



Artist's conception of CCGS John G. Diefenbaker, Canadian Coast Guard,

http://www.nunatsiaqonline.ca/stories/article/65674coast_guard_new_1.3_billion_arctic_icebreaker_to_be_ready_by_2022/

Ssubmarines)¹⁹⁴

- While the Destroyers and Frigates are “ice-strengthened” and have the range to sail in the Arctic, they do not have icebreaking capabilities
- The home ports are Maritime Forces Atlantic (MARPLANT) in Halifax, and Maritime Forces Pacific (MARPAF) in Esquimalt, B.C.
- The Canadian Surface Combatant project surrounds a plan to build and outfit a fleet of up to 15 new warships, with construction starting in the mid 2020s.¹⁹⁵ With Ottawa’s June 2017 plan unveiled to increase military spending significantly over the next decade, the project is now expected to cost between \$56-billion and \$60-billion (an increase in 15-30 billion from the previous government’s forecast).¹⁹⁶ The last of the vessels is expected to be built in 2040, with the ships’ overall operating life to last until 2070.¹⁹⁷
 - “Judy Foote, minister of public services and procurement, said in June 2016 that up to 15 new Canadian Surface Combatant ships will replace the navy’s present Iroquois-class destroyer and its seven Halifax-class frigates that form the bulk of the navy’s Atlantic Fleet.”

The navy’s last research vessel, CFAV Quest, will be decommissioned due to cost-cutting measures, “leaving the country’s defence scientists without their own ship to conduct research in the Arctic and other locations, according to documents leaked to Postmedia”.¹⁹⁸

¹⁹² Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

¹⁹³ Berthiaume, Lee, “New delay slows construction of navy supply ships, polar icebreaker,” The Canadian Press, 9 December 2016, <http://www.thecanadianpress.com/>

¹⁹⁴ “Royal Canadian Navy, Fleet & Unit,” Royal Canadian Navy, last modified 19 August 2013, <http://www.navy-marine.forces.gc.ca>

¹⁹⁵ Pugliese, David, “Company to be chosen by 2017 to design new navy ships,” Ottawa Citizen, 1 May 2015, <http://ottawacitizen.com/>

¹⁹⁶ LeBlanc, Daniel, Chase, Stephen, “Ottawa lays out \$62-billion in new military spending over 20 years,” The Globe and Mail, 7 June 2017, www.theglobeandmail.com

¹⁹⁷ Pugliese, David, “Canadian Surface Combatant team, led by Lockheed Martin Canada, unveiled,” Ottawa Citizen, 28 November 2017, <http://ottawacitizen.com>

¹⁹⁸ Pugliese, David, “Say Goodbye to Canadian Forces Auxiliary Vessel Quest – military quietly orders ship to be “divested””, Ottawa Citizen, 2 September 2016, <http://ottawacitizen.com>

Arctic/Offshore Patrol Ship (AOPS) procurement

- The shipbuilding strategy originally announced by Harper in 2011 was “an umbrella agreement that designated the Irving shipyard in Halifax and the Seaspan shipyard in British Columbia as the two locations.” Currently, the Trudeau government is negotiating details of the agreement with the yards.¹⁹⁹
- According to the Defence Acquisition Guide 2015, “the Naval Shipbuilding Projects Office (NSPO) intends to establish an In-Service Support (ISS) Contract that combines the Arctic/Offshore Patrol Ships’ and Joint Support Ships’ ISS requirements into a single, 35-year through-life contract.”²⁰⁰
- More details on the contract status:
 - The project was announced by the Harper government as a \$3.1 billion project²⁰¹, though the budget increased in 2015 to ensure the delivery of all six Harry DeWolf-class vessels.²⁰²
 - As of June 2017, the keel has been laid for the second of the six ships, HMCS Margaret Brooke.²⁰³
 - The beginning of construction on the Royal Canadian Navy's (RCN) first Harry DeWolf-class of arctic offshore patrol vessels (AOPS) began in June 2016.²⁰⁴
 - Irving Shipbuilding said the following in a September 2016 statement issued to the press: “Construction on the first AOPS vessel, HMCS Harry DeWolf, is well underway with 50 of the ship’s 64 components complete or under construction. On August 25, Irving Shipbuilding was pleased to cut steel on the second AOPS, the future HMCS Margaret Brooke. HMCS Harry DeWolf is scheduled to be delivered to the Royal Canadian Navy in summer of 2018, however it won’t head to the Arctic until 2029.²⁰⁵ The whole class expected to be in service by 2022.²⁰⁶
- In August 2017, Thales Canada and Australia received the \$4.13 billion in service support contract for the AOPS and joint service support fleet.²⁰⁷ Details on the ships themselves:
 - The AOPS will have ice-breaking capabilities up to 1 meter thick and will be operable only in the summer months.²⁰⁸
 - The vessels will “allow the RCN to operate further north on a sustained basis into the Canadian Arctic, while boosting its Arctic collaboration with the Canadian Coast Guard, as well as other governmental departments and international allies.”²⁰⁹

Submarines

The Canadian Press reports that the Navy has begun exploring a replacement for the current Victoria class submarines:

- The Canadian Press reported in August 2012 that a DND briefing note calls for “bigger, quieter boats that can perform stealth missions, launch undersea robots and fire guided missiles at shore targets.” Rather than protecting sea lanes, subs are now sought more for coastline surveillance, intelligence-gathering, and ship to shore firing:
 - Coastline surveillance and intelligence gathering includes Arctic
 - International missions are also a consideration: as Vice-Admiral Paul Maddison told a Senate Committee in 2012, to lose [a submarine capability] for a G8 nation, a NATO country like Canada, a country that continues to lead internationally, and aspires to lead more, I would consider that a critical loss.”²¹⁰

¹⁹⁹ Pugliese, David, “Irving facing significant offshore challenges in building Arctic Offshore Patrol Ships,” *Ottawa Citizen*, 8 September 2016, <http://ottawacitizen.com>

²⁰⁰ “Defence Acquisition Guide 2015,” National Defence and the Canadian Armed Forces, March 2015, <http://www.forces.gc.ca>

²⁰¹ Jordan Press, “PM talks up need for Arctic military presence,” *Vancouver Sun*, 25 August 2012, <http://www.vancouversun.com>

²⁰² Gunn, Andrea, “First of Irvings Halifax-made patrol ships nearly ready,” *The Chronicle Herald*, <http://thechronicleherald.ca>

²⁰³ “Keel laid of Canadian Navy’s second Happy DeWolf-class AOPS,” *Naval-Technology.com*, 1 June 2017, <http://www.naval-technology.com>

²⁰⁴ “Construction begins on Canadian Navy’s first Harry DeWolf-class AOPS,” *NavalTechnology.com*, 14 June 2016, www.naval-technology.com

²⁰⁵ Beswick, Aaron, “Canada scrambling to ensure increasingly busy North is monitored and protected,” *The Northern Pen*, 12 March 2018, <http://www.northernpen.ca>

²⁰⁶ Gunn, Andrea, “First of Irvings Halifax-made patrol ships nearly ready,” *The Chronicle Herald*, <http://thechronicleherald.ca>

²⁰⁷ “Thales receives \$4.13bn ISS contract for Canadian Navy’s AOPS and JSS fleet,” *Naval-Technology.com*, 31 August 2017, www.Naval-Technology.com

²⁰⁸ Beswick, Aaron, “Canada scrambling to ensure increasingly busy North is monitored and protected,” *The Northern Pen*, 12 March 2018, <http://www.northernpen.ca>

²⁰⁹ “Construction begins on Canadian Navy’s first Harry DeWolf-class AOPS,” *NavalTechnology.com*, 14 June 2016, www.naval-technology.com

²¹⁰ Brewster, Murray, “Navy planners trying to sell Ottawa on submarine replacement plan,” *Globe and Mail*, 20 August 2012, <http://www.theglobeandmail.com>

- The 2014 procurement guide confirms plans to “extend the service life of the Victoria Class submarine beyond its current mid-2020s end of life,”²¹¹ and the 2016 Defence Acquisition Guide estimates delivery of the project is 2026-2036.²¹² The Submarine Equipment Life Extension (SELEX) Project is estimated above \$1.5 billion.²¹³

Under Water Surveillance Systems

“To improve the situational awareness of the Canadian Forces in the Arctic, a four-year *Northern Watch Technology Demonstration Project* is underway, run by Defence Research and Development Canada. *Northern Watch* researchers are testing both surface and underwater sensors “to collect surveillance data at a navigation chokepoint.” They are also running simulations using data from surface and space-based sensors.”²¹⁴

- In April 2012 Operation Nunavut included diving operations off of Devon Island to install “undersea surveillance devices.”²¹⁵
- Defence Research and Development Canada released a report on the technical results of the Northern Watch project in June 2016. The project was successful in shedding light on successes and limitations of the NW Surveillance system.²¹⁶
 - The report notes that much more work needs to be done before an autonomous/remote-controlled multi-sensor surveillance system could become a reality.
 - Project shortfalls arose because the costs were beyond the reach of the project funding.

Amphibious Ship to Shore Craft

- Acquisition a matter of some discussion in early 2010s, but no formal action has taken place to acquire vessels.
- David Pugliese reported in 2012 that “the country’s decision to build a fleet of Arctic and offshore patrol vessels, as well as a new Polar-class icebreaker, has sparked discussions between the Army and Arktos Developments, Surrey, British Columbia. The company builds the Arktos amphibious craft, and company President Bruce Seligman said the government is interested in placing those onboard the patrol vessels and icebreaker. The craft originally was designed to evacuate people from oil rigs, and it can carry 52 in that mode. Arktos has sold 21 amphibious craft so far, mostly to the oil and gas industry. Seligman said in the Canadian situation, the Arktos could be used as a “connector” to transport people from ship to shore.”²¹⁷

2.3 Organizations and Operational Units (personnel)

Army Personnel

- “A special small battalion-sized (500 troops) regular army unit for Arctic operations is to be set up”²¹⁸
- “Canada also is creating a 500-member Army response capability for the Arctic”²¹⁹
- Canadian reserves unit in Yellowknife to be increased to 100 by 2019²²⁰
- “Four Arctic Response Company Groups—Canadian Forces reservists from militia regiments in southern Canada—are being trained in Arctic operations in case they need to be deployed there. On that last point, however, the commander of Joint Task Force (North) was asked whether southern troops have the ability to do more than operate at the survival level and with a minimum of tactical capability in the Arctic. ‘No, we do not,’ BGen Millar told the Committee, ‘In years past we did. We had tremendous capability with the Canadian Forces to operate and deploy to the North.’ But he added that since the attacks of 9-11, ‘We are at the stage of rebuilding that very capability that we used to have.’”²²¹“However, Major General Alan Howard, assistant chief of the land staff of the Canadian Army, complained that the Canadian Army has lost the ‘ability to operate up north in the Arctic’ because of the focus on operations in Afghanistan. The army’s capabilities for Arctic operations are to be improved after

²¹¹ “Defence Acquisition Guide 2014,” National Defence and the Canadian Armed Forces, June 2014, <http://www.forces.gc.ca>

²¹² “Defence Acquisition Guide 2016,” National Defence and the Canadian Armed Forces, May 2016, <http://www.forces.gc.ca>

²¹³ “Defence Acquisition Guide 2014,” National Defence and the Canadian Armed Forces, June 2014, <http://www.forces.gc.ca>

²¹⁴ Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, <http://www.parl.gc.ca>

²¹⁵ “It’s Arctic spring exercise season for Canada’s military: Operation Nunavut to kick off April 10,” Nunatsiq News, April 9, 2012, <http://www.nunatsiagonline.ca>

²¹⁶ Heard, Garry, J., McArthur, Bruce, Inglis, Gary, “Overview of the technical results of the Northern Watch Project,” Defence Research and Development Canada, June 2016, http://cradpdf.drdc-rddc.gc.ca/PDFS/unc253/p804761_A1b.pdf

²¹⁷ Referred to by David Pugliese, “Canada Ramps Up Arctic Arsenal,” 25 January 2012, <http://www.defensenews.com>

²¹⁸ Wezeman, Siemon, T., “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012.

²¹⁹ Referred to by David Pugliese, “Canada Ramps Up Arctic Arsenal,” 25 January 2012, <http://www.defensenews.com>

²²⁰ Referred to by David Pugliese, “Canada Ramps Up Arctic Arsenal,” 25 January 2012, <http://www.defensenews.com>

²²¹ Wallin, Pamela, Dallaire, Romeo, “Sovereignty and Security in Canada’s Arctic: Interim Report,” March 2011 Interim Senate Report Standing Senate Committee on National Security and Defence, March 2011, <http://www.parl.gc.ca>

Canada's withdrawal from Afghanistan in 2012. In addition, a special small battalion-sized (500 troops) regular army unit for Arctic operations is to be set up. Since 2008, Canadian reserve forces have included an Arctic company, based in Yellowknife, NWT, which under the Northern Strategy is planned to have a strength of 100 by 2019.²²²

- A 2015 policy paper on the CAF's presence in the Arctic noted that Canada is "establishing a number of small, but well trained, reserve and permanent force units designed for rapid and agile response [in the Arctic]".²²³
 - Excerpt from the policy paper:
The Army can now, theoretically, deploy a staggered series of responders anywhere in the North to reinforce the ever capable Rangers, or deploy to an area without a Ranger patrol. This capability is limited in size but appropriate to the sorts of threats envisioned. Given the logistical and transportation difficulties inherent to Arctic operations, a small self-sufficient force is preferable, for instance, to the kinds of regiment level deployments and airdrops practiced from the 1940s to the 1980s.²²⁴

Canadian Coast Guard

- In 2016, Coast Guard activity in the Arctic included the deployment of eight CCG icebreakers.²²⁵
- Planning priorities for 2016 CCG Arctic operations included: escort and icebreaking for commercial vessel traffic, icebreaking in support of community resupply, navigational aid maintenance.²²⁶
- "Planning for Arctic Operations is carried out throughout the year but the new season officially starts with the opening of the Marine Communications and Traffic Services (MCTS) Centre in Iqaluit."²²⁷
- "The Canadian Coast Guard is expanding its Arctic season in 2017-2018 and will continue to gradually increase its presence over the next several years."²²⁸
 - In October 2017, Canadian officials reported that, "The Coast Guard is forecasting that it will add 21 additional operational days in the Arctic in coming years to fit the increasingly extended shipping season."²²⁹
- Creation of a Coast Guard Auxiliary in the Arctic is promised as part of Canada's new \$1.5 billion oceans protections plan, unveiled in November 2016 by three federal government departments.²³⁰ See "Canadian Coast Guard Auxiliary expansion to the Arctic" for update.

3. Recurring Operations and Exercises

"The Canadian Government had ceased conducting Arctic military exercises at the end of the Cold War in 1989; however, in 2002, the Canadian Government was one of the first Arctic states to recommend these exercises amidst a growing concern led by a succession of Canadian Forces Northern Commanders."²³¹

Current Canadian National Defence Minister Harjit S. Sajjan, under the Trudeau government, has named the protection of Arctic borders as a key security priority for Canada. Training exercises enhance troops' ability to quickly respond to threats and domestic emergencies, such as natural disasters, extreme weather events and other hazards.²³²

Operations Occurring Annually

NANOOK

The largest of three major sovereignty operations conducted annually in Canada's North, Operation NANOOK takes place in several locations across the Northwest Territories and Nunavut, in the high and eastern arctic. The objectives of Operation NANOOK are:

²²² SIPRI, referencing: DeSilva-Ranasinghe, S., Interview (with Major General Alan Howard), *Jane's Defence Weekly*, 12 Jan. 2011, p. 34. DeSilva-Ranasinghe (note 16), p. 34; Prime Minister of Canada (note 14); and Huebert (note 10). O'Dwyer, D. and Pugliese, D., 'Canada, Russia build Arctic forces', *Defence News*, 6 Apr. 2009. Huebert (note 9), p. 9; Huebert (note 10); and 'Canada's Arctic strategy', CBC News, 27 July 2009, <http://www.cbc.ca>

²²³ Lajeunesse, Adam, "The Canadian Armed Forces in the Arctic: Purpose, Capabilities, and Requirements," Canadian Global Affairs Institute, May 2015, <http://www.cgai.ca>

²²⁴ Lajeunesse, Adam, "The Canadian Armed Forces in the Arctic: Purpose, Capabilities, and Requirements," Canadian Global Affairs Institute, May 2015, <http://www.cgai.ca>

²²⁵ "Canadian Coast Guard Arctic Operations 2016," Government of Canada, 29 July 2016, <http://news.gc.ca>

²²⁶ "Canadian Coast Guard Arctic Operations 2016," Government of Canada, 29 July 2016, <http://news.gc.ca>

²²⁷ "Canadian Coast Guard Arctic Operations 2016," Government of Canada, 29 July 2016, <http://news.gc.ca>

²²⁸ "Canadian Coast Guard 2017 Arctic season underway," 19 June 2017, Newswire, <https://www.newswire.ca>

²²⁹ Sevunts, Levin, "Canadian Coast Guard wraps up busy Arctic season," Radio Canada International, 17 October 2017, <http://www.rcinet.ca>

²³⁰ "Arctic will share in Canada's new \$1.5 billion oceans protection plan," Nunatsiaq News, 8 November 2016, <http://www.nunatsiaqonline.ca>

²³¹ Rob Huebert, "The Newly Emerging Arctic Security Environment," Canadian Defence and Foreign Affairs Institute, March 2010, <http://www.cdfai.org>

²³² "Canadian Army conducts training to maintain arctic readiness," army-technology.com, 10 February 2016, <http://www.army-technology.com>

- To assert Canada's sovereignty over its northernmost regions;
- To enhance the Canadian Forces' ability to operate in Arctic conditions;
- To improve coordination in whole-of-government operations; and
- To maintain interoperability with mission partners for maximum effectiveness in response to safety and security issues in the North.²³³

The operation involves personnel and assets from across Canada, and may be drawn from Navy, Army, Air Force, and the Canadian Special Operations Forces Command. The size and make-up of the operation vary, but always include:

- 1st Canadian Ranger Patrol Group, a Reserve formation of the Canadian Army headquartered in Yellowknife, with 60 patrol units distributed in communities across the North, and
- 440 "Vampire" Transport Squadron, an RCAF unit based in Yellowknife, flying the CC-138 Twin Otter, a utility transport aircraft designed for short take-off and landing.²³⁴

Conducted annually since 2007, the operation has also involved international military partners, mainly from the US, Canadian federal government departments and agencies, provincial, territorial, and municipal governments, as well as non-governmental agencies. It typically involves simultaneous activities at sea, on land and in the air, and the number of personnel has ranged from about 650 to more than 1,250.

Operation NANOOK 2017 (running from 14 – 25 August 2017) involved “two separate task forces operating over 2,000 kilometres apart: the Joint Task Force North responding to a hazardous chemicals fire in Rankin Inlet, Nunavut, and Joint Task Force Atlantic responding to a more conventional security scenario in the vicinity of Goose Bay, Labrador.”²³⁵ This was the 10th iteration of Operation NANOOK.²³⁶

NEVUS

- Annual operation to maintain and repair the microwave communication system across Ellesmere Island that links the Canadian Forces Station Alert to Eureka (400 km south of Alert) through the High Arctic Data Communications System (HADCS).²³⁷

NUNALIVUT

- One of three major sovereignty operations conducted annually in Canada's North, Operation NUNALIVUT takes place in the high Arctic.
- Last occurred February 23 - March 21, 2018.²³⁸
- “Some 350 Canadian Forces soldiers — along with the Princess Pats, the Arctic Response Company Group from 38 Canadian Brigade Group and the 1st Canadian Ranger Patrol Group are part of the operation, which runs through March 23 — have spent the month conducting Arctic survival training, sovereignty patrols and scientific research while Royal Canadian Navy personnel tested their abilities in diving under ice.”²³⁹
- Initiated in 2007, Operation NUNALIVUT is an annual operation in the High Arctic to provide an opportunity for the CAF to operate in northernmost regions of Canada, to demonstrate the ability to operate in the harsh winter environment in remote areas, and to enhance the CAF's capability to respond to a variety of situations in northern Canada.²⁴⁰
- The objectives of *Operation NUNALIVUT* are:²⁴¹
 - Annual exercise involving the Rangers;
 - To assert Canada's sovereignty over its northernmost regions;
 - To enhance the Canadian Forces' ability to operate in Arctic conditions; and

²³³ “Operation NANOOK,” National Defence and the Canadian Armed Forces, last modified 29 September 2016, <http://www.forces.gc.ca>

²³⁴ “Operation NANOOK,” National Defence and the Canadian Armed Forces, last modified 29 September 2016, <http://www.forces.gc.ca>

²³⁵ Levun, Sevunts, “Arctic exercise focuses on responding to hazardous chemicals fire in Inuit hamlet,” Radio Canada International, 23 August 2017, <http://www.rcinet.ca>

²³⁶ “Operations Update – September 2017,” National Defence and the Canadian Armed Forces, 7 September, 2017, <http://www.forces.gc.ca>

²³⁷ “Operation NEVUS,” National Defence and the Canadian Armed Forces, last modified 7 June 2016, <http://www.forces.gc.ca>

²³⁸ “Operation NUNALIVUT 2018 begins in the High Arctic,” Government of Canada, Last modified 23 February 2018, <https://www.canada.ca>

²³⁹ Pugliese, David, “Frostbite and fuel shortages: The logistical challenges of a military operation in Canada's Arctic,” National Post, 21 March 2017, <http://nationalpost.com>

²⁴⁰ Pugliese, David, “Canadian military Arctic operation wraps up – three hunters rescued,” Ottawa Citizen, 10 March 2017, <http://ottawacitizen.com>

²⁴¹ “Operation NUNALIVUT,” National Defence and the Canadian Armed Forces, 16 May 2016, <http://www.forces.gc.ca>

- To maintain interoperability with mission partners for maximum effectiveness in response to safety and security issues in the North.

NUNAKPUT

A “whole-of-government” operation that emphasizes aid to law enforcement in the north and takes place in the Mackenzie River, Great Slave Lake and Beaufort Sea region of the western Arctic.²⁴²

Conducted annually since 2007, Operation NUNAKPUT 2016 took place from July 5-20 and “consisted of a series of maritime patrols, training opportunities, and community engagements”.²⁴³

STALWART GOOSE

An annual exercise aimed at qualifying Canadian troops to operate in the North.

Exercise STALWART GOOSE 16: Soldiers from the 5th Canadian Division’s Arctic Response Company Group (ARCG) traveled again to Goose Bay, Newfoundland, and Labrador to test their survival skills and enhance their combat skills in extreme cold weather. The 2016 exercise consisted of long range snowmobile patrols, building improvised shelters and defence structures, as well as ice roads and aircraft landing strips. Canadian Rangers continue to support the soldiers with their expertise in this area.²⁴⁴

FIRST RUN

Located on Lake Winnipeg, First Run is an annual exercise for members of the Arctic Response Company Group (ARCG). It’s held in preparation for Exercise ARCTIC RAM in Resolute Bay.²⁴⁵ First Run usually occurs annually in January, and last occurred January 17-26, 2018.²⁴⁶

“Some of the skills that were covered over the weekend are winter navigation, taking part in ground search and rescue scenarios, basic winter survival training, and patrols both on foot and on snowmobiles. These are the skills the soldiers will be needing when they go to the Arctic,” explained the 2018 exercise’s Commanding Officer.²⁴⁷

Operations Occurring Biannually

BOXTOP

Usually twice a year to resupply Canadian Forces Station Alert²⁴⁸

Operations Occurring Biennially

ARCTIC BISON

Exercise Arctic Bison 2017: A biennial winter exercise that is designed to “train members of the Regular and Reserve Forces of the Canadian Army in conducting long-range patrols, ground search and rescue, and casualty evacuation in the unforgiving environment of Canada’s North.”²⁴⁹

Exercise ARCTIC BISON 2017 went from February 17-26 in Gimli, MB, including 200 soldiers in total.²⁵⁰ 100 members of the Arctic Response Company Group (ARCG) traveled by snowmobile from Gimli to Berens Island on Lake Winnipeg, with the rest remaining at headquarters in Gimli for supportive roles.²⁵¹

²⁴² “Operation NUNAKPUT,” National Defence and the Canadian Armed Forces, 24 November 2014, <http://www.forces.gc.ca>

²⁴³ “Operation Nunakput,” National defence and the Canadian Armed Forces, 5 August 2016, <http://www.forces.gc.ca>

²⁴⁴ David Pugliese, “Soldiers from Arctic Response Company Group head to Goose Bay for winter exercises,” Ottawa Citizen, 4 March 2016, <http://ottawacitizen.com>

²⁴⁵ “3rd Canadian Division Exercises and Operations,” Government of Canada, <http://www.army-armee.forces.gc.ca>

²⁴⁶ “Army reservists preparing for upcoming Arctic operations,” Net News Ledger, 21 January 2018, <http://www.netnewsledger.com>

²⁴⁷ “Army reservists preparing for upcoming Arctic operations,” Net News Ledger, 21 January 2018, <http://www.netnewsledger.com>

²⁴⁸ “Operation Boxtop,” National Defence and the Canadian Armed Forces, last modified 11 May 2017, <http://www.forces.gc.ca>

²⁴⁹ Sevunts, Levon, “Canadian Army Exercise ARCTIC BISON 2017 challenged by winter thaw,” 18 February 2017, <http://www.rcinet.ca>

²⁵⁰ Pugliese, David, “Canadian Army’s Exercise Arctic Bison to start on Friday,” Defense Watch, 16 February 2017, <http://ottawacitizen.com/news/national/defence-watch/canadian-armys-exercise-arctic-bison-to-start-on-friday>

²⁵¹ Sevunts, Levon, “Canadian Army Exercise ARCTIC BISON 2017 challenged by winter thaw,” 18 February 2017, <http://www.rcinet.ca>

ARCTIC RAM

It is the largest and most complex Army-led exercise that takes place in the Canadian Arctic. It exists to ensure Canadian Army members are able to operate in extreme cold and harsh conditions in order to safeguard Canada's sovereignty. Resolute Bay offers a significant high arctic location to deploy to, further testing CAF capabilities.²⁵²

Exercise ARCTIC RAM 2016, bringing one hundred army reservists in the Arctic Response Company Group to Resolute Bay, Nunavut, marks the farthest north the Company has ever travelled for training.²⁵³

NOREX

Norex is designed "to test the mobility, sustainability and survivability" of 4th Canadian Division's Arctic Response Company Group and to maintain an Arctic response capability," said the Canadian Department of Defense.

Occurred first in 2015²⁵⁴ and most recently in February 2018, in Resolute Bay, Nunavut.²⁵⁵

²⁵² Pugliese, David, "Canadian Army to conduct winter warfare exercises in Arctic and Quebec," Ottawa Citizen, 20 January 2016, <http://ottawacitizen.com/>

²⁵³ "Army reservists test their mettle in high Arctic," CTV Winnipeg, 13 February 2016, <http://winnipeg.ctvnews.ca>

²⁵⁴ Canadian Army "Norex 2015," Government of Canada, last modified 20 March 2015, <http://www.army-armee.forces.gc.ca>

²⁵⁵ "Exercise Norex 2017 gets underway in Nunavut's High Arctic," 20 March 2017, Nunatsiaq News, <http://www.nunatsiaqonline.ca>

1. Security Assets available for Operations in the North

1.1 Bases (including stations, naval facilities, radar sites, etc.)

1.1.1 Air

Eielson Air Force Base (near Fairbanks)²⁵⁶

- 354th Fighter Wing
- 354th Operations Group
- Includes airborne early warning
- Hosts National Guard Air Refuelling Wing
- Air Force Technical Applications Center
- Arctic Survival School
- Rescue Squadron
- Training Squadron
- DOD Report, May 2011:
“Eielson Air Force Base serves as home to a fighter wing and an Air National Guard air refuelling wing. The base provides significant aerial throughput capacity and can support SAR missions that extend north of the Alaska Range.”²⁵⁷
- April 2016: “The Department of Defense has asked Congress to fund seven construction projects at Eielson for fiscal 2017, which starts Oct. 1, 2016.”²⁵⁸ This request came as a response to the Air Force’s announcement of plans to begin stationing 54 F-35s at the base near Fairbanks in 2020.²⁵⁹ A release from US Congress representative Don Young’s office lists projects planned for 5 sites in Alaska, including updates at Eielson Air Force Base related to the planned basing of F-35 fighter jets.²⁶⁰
 - \$500 million in new construction is planned for Eielson Air Force Base alone to support the upcoming deployment of the F-35 Fighters.²⁶¹
 - As of May 2017, construction of the new facilities at Eielson is well underway. For instance, “work is just getting under way on a \$22 million building...that will enable pilots of the new F-35 fighters that are coming here to train in a computer-simulated environment.”²⁶²
 - As of October 2017, “two squadrons of F-35A fighter jets are scheduled to arrive at Eielson in 2020. The aircraft are expected to bring 3,500 airmen, civilian employees, contractors and their families to the Fairbanks North Star Borough.”²⁶³

Elmendorf Air Force Base (near Anchorage):²⁶⁴

- Combined with Fort Richardson to form Joint Base Elmendorf-Richardson (JBER) in 1 October 2010.²⁶⁵ Hosts the Alaskan NORAD Region
- Aerospace warning
- Hosts the 11th Air Force

²⁵⁶ US Air Force - <http://www.eielson.af.mil/units/index.asp>

²⁵⁷ “Report to Congress on Arctic Operations and the Northwest Passage,” Department of Defense, May 2011, <http://www.defense.gov>

²⁵⁸ “Congress split over funding for F-35 infrastructure at Eielson Air Force Base,” The Associated Press, 15 April 2016, <http://www.adn.com>

²⁵⁹ “Congress split over funding for F-35 infrastructure at Eielson Air Force Base,” The Associated Press, 15 April 2016, <http://www.adn.com>

²⁶⁰ Bross, Dan, “Congress passes bills of Alaska military projects,” Alaska Public Media, 19 May 2016, <http://www.alaskapublic.org>

²⁶¹ Bross, Dan, “Eielson Air Force Base has new construction plan for incoming F-35 fighters,” Alaska Public Media, 19 August 2016, <http://www.alaskapublic.org>

²⁶² Ellis, Tim, “Construction at area’s Air Force installations to inject \$1.5 billion into Interior economy,” Alaska Public Media, 27 April 2017, <http://www.alaskapublic.org>

²⁶³ Baird, Kevin, “F-35A fighter jet arrives at Eielson, where a pilot will put it to the test,” Fairbanks Daily News-Miner, 18 October 2017, <http://www.newsminer.com>

²⁶⁴ US Air Force - <http://www.iber.af.mil/units/index.asp>

²⁶⁵ “Welcome to JBER,” Military.com, date referenced 19 May 2017, <http://www.military.com>

- Mission: “Provide ready warriors and infrastructure for homeland defense, decisive force projection, and aerospace command and control.”
- The joint Elmendorf-Richardson base maintains “three wings (22 aircraft each) of fighters for air defence. The older F-15s that equipped these wings are gradually being replaced with new F-22 raptors. Ultimately, the Americans plan to deploy up to 1/5 of their fleet of new F-22s in Alaska.”²⁶⁶
- From May 2011 DOD Report to Congress:

“In the Anchorage area, Joint Base Elmendorf-Richardson contains a combined military population of more than 12,000 and serves as home to a U.S. Air Force fighter wing, a C-17-equipped air transport unit, an Army Brigade Combat Team, and support units. Additionally, an active duty C-130 squadron will be established in Fiscal Year 2011, with expected initial operational capability in August 2011. The base provides significant capacity such as runways, ramp space, air space command and control, and fuel infrastructure to support throughput for aircraft, mid-air refuelling operations, aerial command and control, ISR operations, and weather forecasting. The move of the 176th Wing (Alaska Air National Guard), with its C-130s and helicopters, from Kulis Air National Guard Base in 2011 added significant search and rescue capabilities as well. The resident Air Force and Army support units provide extensive capabilities in communications, logistics, engineering, ground transportation, and medical support, including a 60-bed hospital.”²⁶⁷

Eareckson Air Station²⁶⁸

- Oriented toward supporting Pacific operations
- Located on the Island of Shemya
- North Warning System
- Alaska’s northern coast is lined with 4 long-range and 3 short-range radars of the North Warning System (the main portion of the system spans the north of Canada).

Air Station, Kodiak²⁶⁹

- US Coast Guard Station
- Helicopters and HC-130J Hercules aircraft based on Kodiak Island operate over the Bering Sea and into the Arctic, and northern Alaska

Pacific Spaceport Complex Alaska (PSCA) (formerly known as Kodiak Launch Complex)

- “PSCA is a launch range owned and operated by AAC, an agency of the State of Alaska. PSCA is located at Narrow Cape on Kodiak Island, Alaska and occupies over 3,700 acres. The complex provides integration, checkout, and launch facilities to Government and commercial customers desiring to launch suitably sized vehicles. The launch site is focused on providing responsive and efficient launch capability for polar, sun synchronous, and high inclination orbits.”²⁷⁰
- An Alaska Public Media report in August 2016 announced that PSCA will be active again by end of month after a launch failure damaged the complex in 2014.²⁷¹

Air Station, Sitka

- US Coast Guard, south Alaska
- The unit maintains a 24-hour search and rescue alert crew which utilizes three Sikorsky MH-60T Jayhawk helicopters
- Also environmental response capabilities²⁷²

²⁶⁶ Huebert, Rob; Exner-Pirot, Heather; Lajeunesse, Adam; Gullede, Jay, “Climate Change and International Security: The Arctic as a Bellwether,” Center for Climate and Energy Solutions, May 2012, <http://www.c2es.org/docUploads/arctic-security-report.pdf>

²⁶⁷ “Report to Congress on Arctic Operations and the Northwest Passage,” Department of Defense, May 2011, <http://www.defense.gov>

²⁶⁸ “Eareckson Air Station,” GlobalSecurity.Org, last modified 20 July 2011, <http://www.globalsecurity.org>

²⁶⁹ US Coast Guard - http://www.uscg.mil/bsukodiak/general_info.asp

²⁷⁰ “Pacific Spaceport Complex – Alaska,” Alaska Aerospace Corporation, no date, <http://akaerospace.com>

²⁷¹ Desroches, Kayla, “Alaska Aerospace Corporation launches into new period on island,” Alaska Public Media, 18 August 2016, <http://www.alaskapublic.org>

²⁷² US Coast Guard - <http://www.uscg.mil/d17/airstasitka/Mission.asp>

Thule Air Base in Greenland

- According to SIPRI's 2016 Background Paper, this base is the "most northerly US air base but it currently houses only a large intercontinental ballistic missile (ICBM) detection radar and no aircraft."²⁷³ It is located 750 miles into the Arctic Circle.²⁷⁴
- According to the US Air Force, "Thule Air Base is home to the 21st Space Wing's global network of sensors providing missile warning, space surveillance and space control to North American Aerospace Defense Command and Air Force Space Command."²⁷⁵
- "In the vicinity of Baffin Bay, Thule Air Base, Greenland, is home to a BMEWS radar and Air Force satellite control network ground site. The base provides significant basing capacity such as a deep water port, a 10,000-foot runway, ramp space, radar approach control, and 20-million gallon fuel infrastructure to support throughput for aircraft, mid-air refuelling operations, aerial command and control, SAR operations, and weather forecasting. The resident Air Force support units provide capabilities in communications, logistics, engineering, ground transportation, and medical support, including an 8-bed hospital. Thule Air Base supports military, government, and Allied missions in the eastern Arctic."²⁷⁶
- According to CBS News in May 2017, "Thule's \$250 million radar just received a \$40 million software upgrade--one of six early-warning systems like this around the world being improved. More than 3,500 antennas can see 3,000 miles into space."²⁷⁷
- An upcoming consolidation effort will reduce the base by 40 percent. The U.S. Army Corps of Engineers will achieve this through, "demolishing 31 old buildings and building new structures closer together in the central area of the base where essential services are located including the airfield and hangars, dining facility and hospital."²⁷⁸

Refurbishing air base at Keflavic, Iceland

- Pentagon's 2017 budget proposal includes \$22 million request for refurbishing installations at Keflavic
- Plans to house American personnel as well as new anti-submarine reconnaissance aircraft, Boeing P-8 Poseidon
- This base was considered a valuable piece of American defences during the Cold War era, but had been slowly closing down in the years since.²⁷⁹

1.1.2 Land

Fort Greely²⁸⁰

- Hosts US BMD mid-course interceptors²⁸¹
- "Fort Greely is the site of the 49th Missile Defense Battalion (ARNG), which operates the BMDS ground-based interceptors at both Fort Greely and Vandenberg AFB, California.... Fort Greely also houses the support for the contractor logistics that sustains the missile system."²⁸²
- "Boasts 33 missile interceptors standing at 60ft with "kill vehicles" fixed at the tip, designed to blast enemy warheads out of the sky...The Pentagon, which has already spent more than £31billion [\$54 billion CAD] on the Ground-based Midcourse Defence system (GMD), has pledged to deploy eight additional missile interceptors at Fort Greely."²⁸³
 - The Pentagon announced in 2017 that it will pump \$440 million in extra funds for missile defense, which will include "\$128 million to begin a new expansion of the missile interceptor force in Alaska. That includes \$81 million to begin increasing the number of interceptors from 44 to 64, and \$47 million to begin buying parts for 10 of the additional 20 underground silos in which the interceptors are installed."²⁸⁴

²⁷³ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

²⁷⁴ "Arctic air base gets \$40 million upgrade in face of increasing missile threats," CBS News, 30 May 2017, <http://www.cbsnews.com>

²⁷⁵ US Air Force - <http://www.peterson.af.mil/units/821stairbase/index.asp>

²⁷⁶ "Report to Congress on Arctic Operations and the Northwest Passage," Department of Defense, May 2011, <http://www.defense.gov>

²⁷⁷ "Arctic air base gets \$40 million upgrade in face of increasing missile threats," CBS News, 30 May 2017, <http://www.cbsnews.com>

²⁷⁸ Castagna, JoAnne, "Base improvements underway at northernmost missile defense post," Homeland Security Today, 2 February 2018, www.hstoday.us

²⁷⁹ Lanteigne, Mark, "Return to Keflavik?" The Arctic Journal, 31 March 2016, <http://arcticjournal.com>

²⁸⁰ Powers, Rod, "Fort Greely, Alaska," About.com, date not available, <http://usmilitary.about.com>

²⁸¹ Currently Fort Greely hosts 26 of 30 interceptors based there and in California. In March the US announced plans to increase the combined total of interceptors in California and Alaska to 44 from 30, as a response to DPRK declarations. Shanker, Thom; Sanger, David, E.; Fackler, Martin, "U.S. Is Bolstering Missile Defense to Deter North Korea," New York Times, 15 March 2013. <http://www.nytimes.com>

²⁸² "Report to Congress on Arctic Operations and the Northwest Passage," Department of Defense, May 2011, <http://www.defense.gov>

²⁸³ Awford, Jenny, "This World War II army base in Alaska will have to protect America against invading Russian troop AND North Korean nukes." 31 May 2017, The Sun, www.thesun.co.uk

²⁸⁴ Burns, Robert, "Pentagon pumping millions more into missile defense," Associated Press, 6 October 2016, <http://www.alaskajournal.com>

- “The 2018 National Defense Authorization Act, signed by President Donald Trump in mid-December, allocates \$699 billion to Defense agencies in the coming year... the NDAA calls for 20 new intercontinental ballistic missile, or ICBM, interceptors at Fort Greely... The latest round of interceptors is in addition to 14 the Pentagon decided to add in 2013 to the original 26 at Fort Greely. The last of those 14 were installed last November.”²⁸⁵
- The U.S. army has also begun decommissioning the Cold War-era nuclear power plant at Fort Greely that has been out of use since 1972.²⁸⁶

Cold Regions Test Center (Fort Greely)

- The U.S. Department of Defense's “only extreme natural cold weather test facility”.²⁸⁷

Fort Wainwright²⁸⁸

- Infantry combat team
- Combat aviation brigade
- While the US Army is in the process of cutting 80,000 troops from its ranks (going from 570,000 to 490,000 within the years 2013-2019), Fort Wainwright’s troop strength will increase slightly from 6,300 to 6,852, although the focus of that force is the Asia-Pacific region.²⁸⁹
- DOD Report to Congress 2011:
 - “Fort Wainwright is home to an Army Brigade Combat Team and aviation task force, and can provide services such as air support operations and emergency medical care. Together with Fort Greely, Fort Wainwright also serves as a cold weather test and training center.”²⁹⁰
- 128 extra soldiers were assigned to the base in 2015 to follow the Gray Eagle missile-equipped combat drone unit’s arrival, according to an announcement from Alaska’s congressional delegation.²⁹¹
 - First Grey Eagle took inaugural flight on 11 April 2016²⁹²
- “Construction of a \$47 million unmanned aerial vehicle hangar [in] Ft. Wainwright is also in the U.S. House approved appropriations bill. The hangar is for the post’s new Grey Eagle intelligence, surveillance and reconnaissance unit.”²⁹³

Fort Richardson (joint base with Elmendorf AFB)²⁹⁴

- Alaskan Command centre for 21,000 Alaskan military personnel
- US Army Alaska (USARAK)²⁹⁵
- Not specifically earmarked for Arctic operations According to numbers released by the U.S. army in 2015, Joint Base Elmendorf-Richardson is to lose 2,631 soldiers, or 59 percent of its personnel due to White House budget cuts²⁹⁶.

Northern Warfare Training Centre²⁹⁷

- Black Rapids, Alaska
- Conducts “relevant training to the leaders of USARAK units so that they can fight and win in demanding cold weather and mountain environments”²⁹⁸
- The training centre has 15 instructors and 35 support personnel.²⁹⁹

²⁸⁵ Brehmer, Elwood, “Missile defense gets major boost from latest bill,” Alaska Journal of Commerce, 17 January 2018, www.alaskajournal.com

²⁸⁶ Ellis, Tim, “Army begins decommissioning Fort Greely’s Cold War-era nuclear powerplant,” KUAC, 5 March 2018, <http://fm.kuac.org>

²⁸⁷ Schauer, Mark, “U.S. Army Cold Regions Test Center automotive test track benefits military and civilian customers,” 26 May 2016, U.S. Department of Defense, <https://www.army.mil>

²⁸⁸ “Fort Wainwright Alaska: Units and Support,” US Army, last updated 23 February 2013, <http://www.wainwright.army.mil>

²⁸⁹ Friedman, Sam, “Fort Wainwright to grow as Army shrinks,” Newsminer.com, 25 June 2013, <http://www.newsminer.com>

²⁹⁰ “Report to Congress on Arctic Operations and the Northwest Passage,” Department of Defense, May 2011, <http://www.defense.gov>

²⁹¹ Hollander, Zaz, “U.S. Army to add 9 combat drones at Fort Wainwright,” Alaska Dispatch News, 5 June 2015, <http://www.adn.com>

²⁹² Sgt. Brady, Sean, “First Gray Eagle Flight Expands Army Aviation Capability in Alaska,” PACOM News, 20 April 2016, www.pacom.mil

²⁹³ Bross, Dan, “Congress passes bills of Alaska military projects,” Alaska Public Media, 19 May 2016, <http://www.alaskapublic.org>

²⁹⁴ US Air Force, Joint Base - <http://www.iber.af.mil/units/index.asp>

²⁹⁵ “USARK Organizations”, U.S. Army Alaska, no date listed, <http://www.usarak.army.mil>

²⁹⁶ “Army Announces troop cuts; Alaska not spared,” Daily News-Miner, 9 July 2015, <http://www.newsminer.com>

²⁹⁷ “Northern Warfare Training Centre,” U.S. Army, <http://www.wainwright.army.mil/nwtc/>

²⁹⁸ “Northern Warfare Training Centre,” U.S. Army, <http://www.wainwright.army.mil/nwtc/>

²⁹⁹ Robson, Seth, “Northern Warfare Training Center tests troops' mettle in harshest conditions,” Stars and Stripes, 5 March 2015, <https://www.stripes.com>

Kotzebue (Seasonal/Forward Operating Base of the U.S. Coast Guard):

- The Coast Guard annually sets up a forward operation location here for a summer of activity, including Operation Arctic Shield.³⁰⁰

Dutch Harbor

- “Dutch Harbor, in the Aleutian Island chain, is strategically located on the North Pacific shipping lanes between North America, East Asia, and the Bering Sea. With its 40-foot deep harbor, the Unalaska Marine Center, and U.S. Coast Guard dock, Dutch Harbor provides vessel berthing, containerized cargo loading, warehousing, and passenger and port services. The seaport is primarily oriented toward supporting the fishing industry, but is ice-free year round and can provide limited berthing and support for larger, deep draft vessels. However, with a runway less than 4,000 feet in length and harsh weather conditions, the Unalaska airport provides only limited multimodal port capabilities.
- The Coast Guard’s “National Security Cutters” – it is in the process of acquiring eight of these 418 foot armed vessels – are capable of operating in open Arctic waters and are refueled primarily at Dutch Harbor.³⁰¹

Adak facility closed

- “Adak lies near the southern tip of the Aleutian Islands, about 450 miles west of Dutch Harbor. Although Adak was an important operations and supply location for the U.S. military during the Cold War, it was closed in 2000 as a result of the Base Realignment and Closure (BRAC) Act of 1995.”³⁰²

Base at Keflavik, Iceland possibly reopening

- Within the Pentagon’s 2017 budget proposal was a request for \$22 million to refurbish the installations at Keflavik in order to house American personnel as well as Boeing P-8 Poseidon aircraft.³⁰³

1.1.3 Sea

Not applicable

- The United States has no naval bases in Alaska (although naval forces use other port facilities)
- The US has no deep water port in Alaska, although the need for such a port is repeatedly raised³⁰⁴ and the Alaskan Department of Transport and the Army Corps of Engineers are currently engaged in a three-year Alaska Deep Draft Arctic Ports Study to evaluate potential locations for such a port.³⁰⁵ In January 2013 a draft report from the Army Corps of Engineers identified the Nome/Port Clarence region as the best location for a deep water port.³⁰⁶
- In July 2013 the US Naval War College launched an “Arctic Regional Studies Group” in order “to help the Navy prepare for future operational and strategic challenges in the Arctic.”³⁰⁷

Update on Alaska Deep Draft Arctic Ports Studies

- In February 2014 the study group pointed out that “no one port was likely going to be sufficient.” Multiple possibilities are now under consideration and the recommendation will be delayed, with the Alaska US Army Corps of Engineers, the technical lead on the project, suggesting that a useable port is unlikely to be ready before 2030.³⁰⁸
- The US Army’s 2015 Draft Feasibility Report noted that, “The additional annual cost of operation and maintenance for the Tentatively Selected Plan is estimated at \$244,000. Estimated associated costs include \$61.0 million in

³⁰⁰ Restino, Carey, “Coast Guard sets up seasonal base in Kotzebue again,” The Arctic Sounder, 23 June 2017, <http://www.thearcticsounder.com>

³⁰¹ “United States Coast Guard Arctic Strategy,” United States Coast Guard, May 2013, http://www.uscg.mil/seniorleadership/DOCS/CG_Arctic_Strategy.pdf

³⁰² “Report to Congress on Arctic Operations and the Northwest Passage,” Department of Defense, May 2011, <http://www.defense.gov>

³⁰³ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

³⁰⁴ O’Rourke, Ronald, “Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress,” US Congressional Research Service, 10 December 2012, <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

³⁰⁵ “Alaska Department of Transportation and Public Facilities/Statewide Design and Engineering Services: Arctic Port Study,” State of Alaska, no date listed, <http://www.dot.state.ak.us/stwddes/desports/arctic.shtml>

³⁰⁶ Lockyer, Ellen, “Study Names Nome, Port Clarence as Best Region For Deep Water Arctic Port,” Alaska Public Media, 31 January 2013, <http://www.alaskapublic.org>

³⁰⁷ Pettersen, Trude, “US Navy to study the Arctic,” The Barents Observer, 1 August 2013 <http://barentsobserver.com>

³⁰⁸ “Caryey Restino, Arctic port study delayed past March,” The Arctic Sounder, 14 February 2014, <http://www.thearcticsounder.com>

non-Federal costs for development of local service facilities and \$15,700 for navigation aids (a U.S. Coast Guard expense).”³⁰⁹

1.2 Equipment

1.2.1 Air

Aircraft Carriers

- “While not specifically adapted to ice conditions, the many US aircraft carriers, other major combat ships and amphibious warfare ships are generally capable of operating in northern weather conditions.”³¹⁰

MQ-1C Gray Eagle Unmanned Aerial System³¹¹



Photo Credit: MQ-1C Gray Eagle, General Atomics Aeronautical
<http://www.ga-asi.com/gray-eagle>

- Arrived in Alaska late 2015 to “enhance the tactical capabilities of commanders in USARAK Aviation, Stryker and Airborne units, along with joint partners”.
- Gray Eagle took inaugural flight in Alaskan airspace on 11 April 2016
- “The versatility of Gray Eagle gives units in Alaska the ability to train for wartime tasks with real-world combat assets. The aircraft is the newest addition to UATF’s inventory, capable of operating in extreme cold regions across the globe.”

S-92 SAR helicopter³¹²



Credit: S-92 Helicopter, Skip Robinson, Sikorsky
<https://americansecuritytoday.com>

- Alaska’s North Slope Borough (NSB) received its first S-92 SAR helicopter in September 2016.
 - “According to the U.S. Census Bureau, NSB has a total area of 94,796 square miles of which 88,695 are land and 6,101 are water, thus the need for a long-range, all-weather capable aircraft.”

³⁰⁹ “Alaska Deep-Draft Arctic Port System Study,” U.S. Army Corps of Engineers, February 2015, <http://www.poa.usace.army.mil/Portals/34/docs/civilworks/arcticdeepdraft/ADDMainReportwithoutappendixes.pdf>

³¹⁰ Wezeman, Siemon, T., “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012.

³¹¹ Brady, Sean, “Alaska Aviation Task Force expands Army Aviation capability,” US Army, 18 April 2016, <http://www.army.mil>

³¹² Waitt, Tammy, “Sikorsky delivers AK’s first S-92 Search and Rescue helicopter,” American Security Today, 30 September 2016, <https://americansecuritytoday.com>

HC 130 Aircraft³¹³

- “While the USA has over 200 long-range maritime patrol aircraft, only a few US Coast Guard HC-130 aircraft based on Kodiak Island operate over the Bering Sea and the Arctic.”

Small unmanned aircraft systems (sUAS)

- “The U.S. Coast Guard is starting to augment its fleet of cutters and rotary-wing aircraft with small unmanned aircraft systems.
 - “The first installed sUAS, on National Security Cutter Stratton, assisted with the interdiction or disruption of four go-fast boats carrying 5,000 pounds of contraband on its inaugural deployment. A request for proposal for sUAS capability to outfit the full NSC fleet is planned for release by the end of this fiscal year.”³¹⁴

MQ-4C Triton UAV



Photo credit: MQ-4C Triton, Northrop Grumman, photo by Alex Evers
<https://www.flickr.com/photos/usnavy/8906719846/>

- “The U.S. Navy is pairing its P-8s with the Triton – a new high altitude, long endurance (HALE) unmanned aircraft developed by Northrop Grumman– and is working an integrated approach between the two.”³¹⁵
- “Northrop Grumman has received a \$9.6 contract to install the Automatic Response Module of the Airborne Collision Avoidance System X into the MQ-4C Triton’s avionics system.”³¹⁶
- Used in combination with the P-8 aircraft, they will replace the aged P-3 Orion.³¹⁷
- Provides “real-time intelligence, surveillance and reconnaissance (ISR) over vast ocean and coastal regions.”³¹⁸

Polar Scout smallsats³¹⁹

- Two small Polar Scout satellites have been developed for the U.S. Department of Homeland Security. “The satellites have flexible radio frequency receivers to help search and rescue teams locate emergency beacons in remote areas, such as the Arctic.”
 - Scheduled to be launched into lower Earth orbit later this year

1.2.2 Land

As of May 2014, the U.S. Army’s Ground Combat Vehicle programme has been terminated. Alternative options are being considered.

1.2.3 Sea

Underwater drone research³²⁰

³¹³ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

³¹⁴ Haring, Loretta, “U.S. Coast Guard looks to drones to expand its reach,” The Maritime Executive, 14 August 2017, <https://maritime-executive.com>

³¹⁵ Laird, Robbin, “NATO allies and North Atlantic maritime threats,” Vol. 14, No. 4, FrontLine Defence, 30 September, 2017, <http://www.sldinfo.com>

³¹⁶ Broderick, Tim, “The U.S. Navy is preparing the MQ-43 Triton drone for service in the pacific,” 7 December 2017, The National Interest, <http://nationalinterest.org>

³¹⁷ Laird, Robbin, “NATO allies and North Atlantic maritime threats,” Vol. 14, No. 4, FrontLine Defence, 30 September, 2017, <http://www.sldinfo.com>

³¹⁸ “MQ-4C Triton,” Northrop Grumman, no date, <http://www.northropgrumman.com>

³¹⁹ “Raytheon builds small satellites for Department of Homeland Security,” PR Newswire, 18 April 2018, <https://www.prnewswire.com>

³²⁰ Osborn, Kris, “The Navy is using drones to prep for future tensions with Russia in the Arctic,” Business Insider, 22 March 2017, <http://www.businessinsider.com>

- “Navy scientists are using unmanned underwater autonomous robots, or drones, to examine what’s called the marginal ice zone – the portion of frozen ocean’s packed ice that meets open water.”
- Purpose of the drones is “to assess how quickly the ice is melting and understand how soon the U.S. and Russia will be competing for new strategic waterways in the region.”

Submarines

- “Most of the approximately 53 US nuclear attack submarines [which do not now carry nuclear weapons since the September 1991 Bush-Gorbachev agreement³²¹] (but not the SSBNs [which do carry strategic range nuclear weapons]) are known to be able to operate under the Arctic ice and break through the ice from below; they regularly transit under the Arctic ice or break through the ice and surface near the North Pole.”³²²
- US Navy Adm. Mark Ferguson commented that, due to decommissioning and budget decisions, that figure will drop to 41 by the late 2020s.³²³
- A research note on US SSNs in Canadian Arctic Waters from 1960-1986 confirms that SSNs did traverse Canadian Arctic waters, but also indicates that these were not secret voyages but taken “with the full knowledge and support of the Canadian government”³²⁴
- “In 2009 the United States deployed at least three submarines to the Arctic, including for the first time one of its newest Virginia class SSN submarines—the USS *Texas*.”³²⁵
- “In April 2011 two US nuclear attack submarines participated in Ice Exercise (ICEX) 2011, operating under the Arctic ice.”³²⁶
- Recently, in April 2016, US attack submarines Hampton and Hartford participated in Ice Exercise (ICEX) 2016. The US Navy determined that the primary objectives of submarine force readiness were met.³²⁷
- US SSBNs³²⁸ are assumed not to be specifically designed for Arctic deployment, according to analysts, and are not known to be deployed there,³²⁹ but firm confirmation is not available.
- Starting in 2031, 12 new SSBN(X) submarines will be introduced. “Each of these nuclear-powered vessels, the largest submarines the Navy has ever built, will carry up to 16 Trident ballistic missiles fitted with multiple nuclear warheads. All in all, this new submarine fleet is expected to deploy about 1,000 nuclear warheads — 70 percent of the U.S. government’s strategic nuclear weapons.”³³⁰ It is not specified whether these submarines will be deployable in the Arctic.

Offshore Patrol Vessels

- “The US Coast Guard regularly deploys OPVs [offshore patrol vessels] in or near the Arctic.”³³¹

*Offshore Patrol Cutter (OPC) program*³³²

- An acquisition project of the US Coast Guard. The project aims to build a series of 25 new Coast Guard vessels, with the production contract awarded to Eastern Shipbuilding in September 2016. The project is expected to cost up to \$2.4 billion.³³³
- OPC program will replace the 270-foot and 210-foot medium-endurance cutters that are 25 to 50 years old.³³⁴
- Saab’s Sea Giraffe MMR – “a 3D, electronically scanned phased array radar” will be used on these cutters.³³⁵

³²¹“The Presidential Nuclear Initiatives (PNIs) on Tactical Nuclear Weapons at a Glance,” Arms Control Association, August 2012, <http://www.armscontrol.org/factsheets/pniglance>

³²² Wezeman, Siemon, T., “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012, p. 13.

³²³ Scuitto, Jim, Top Navy Official: Russian sub activity expands to Cold War level,” CNN, 19 April 2016, <http://www.cnn.com>

³²⁴ Lajeunesse, Adam, “Research Note: American SSNs in Canadian Arctic Waters, 1960-1988,” Laurier Centre for Military Strategic and Disarmament Studies, <http://www.canadianmilitaryhistory.ca>

³²⁵ Climate Change and Arctic Security Report

³²⁶ Wezeman, Siemon, T., “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012, p. 13.

³²⁷ “US meets primary objectives of submarine force readiness exercise in Arctic,” Sputnik News, 25 March 2016, <http://sputniknews.com>

³²⁸ “The U.S. fleet of ballistic missile submarines consists of 14 Trident (Ohio-class) submarines, each equipped to carry 24 Trident missiles. With two submarines in overhaul, the operational fleet of 12 submarines currently carry around 1,100 warheads,” They operate from two bases, King’s Bay on the Atlantic and Bangor on the Pacific. Amy F. Woolf, “U.S. Strategic Nuclear Forces: Background, Developments, and Issues,” US Congressional Research Service, 14 January 2013. <http://www.fas.org/sgp/crs/nuke/RL33640.pdf>

³²⁹ Wallace, Michael, Stables, Steve, “Ridding the World of Nuclear Weapons: A Task Long Overdue,” Canadian Pugwash Group and the Rideau Institute, March 2010, <http://www.arcticsecurity.org/docs/arctic-nuclear-report-web.pdf>

³³⁰ Lawrence S. Winter, “Opinion: New nuclear submarine arms race poses great danger,” Times of Trenton, 12 August 2014, <http://www.nj.com>

³³¹ Wezeman, Siemon, T., “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012, p. 13.

³³² Marcario, John C., “Coast Guard to focus on Arctic, Recapitalizing the fleet,” SEAPOW Magazine, 6 July 2016, <http://www.seapowermagazine.org>

³³³ Carlson, Stephen, “Saab receives \$16.8M contract for Coast Guard patrol cutter radars,” United Press International, 25 September, 2017, www.upi.com

³³⁴ Marcario, John C., “Coast Guard to focus on Arctic, Recapitalizing the fleet,” SEAPOW Magazine, 6 July 2016, <http://www.seapowermagazine.org>

³³⁵ “Saab to Provide Multi-Mode Radar for US Coast Guard Offshore Patrol Cutter,” Business Insider, 3 October 2017, <http://markets.businessinsider.com>

- First cutter to be ready by 2021³³⁶

Legend-class National Security Cutters

- “The new Legend (also known as National Security Cutter, NSC) class large OPVs have been designed partly to be able to operate in Arctic weather conditions better than the previous Hamilton class, but they are not ice-strengthened.”³³⁷
- As of June 2017, seven of the eight cutters have been completed.³³⁸
- “Of the Coast Guard’s white-hull patrol cutter fleet, the NSC is the largest and most technologically sophisticated”³³⁹
 - “With robust Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) equipment, stern boat launch and aviation facilities, as well as long-endurance station keeping, the NSCs are afloat operational-level headquarters for complex law enforcement and national security missions”
- Manufactured by Huntington Ingalls Shipyards for a crew of 148.³⁴⁰

Sentinel-class Cutters

- The US Coast Guard commissioned its second cutter of this kind in June 2017. It will be harboured in Ketchikan alongside the first cutter of this kind, commissioned in April.³⁴¹

Icebreakers

- Addressing the limited icebreaking capability of the US Coast Guard has been an issue for a number of years, with all the US’s icebreakers nearing the end of their lives. In 2012, the Congressional Research Service noted the following about its icebreaking capacity:

“The reactivation of *Polar Star* will result in an operational U.S. polar icebreaking fleet consisting for the next 7 to 10 years of one heavy polar icebreaker (*Polar Star*) and one medium polar icebreaker (*Healy*).”
- New icebreaker acquisition is a growing priority:
 - As of March 2016, the US Coast Guard is moving ahead with an acquisition strategy for a new heavy icebreaker to “mitigate a possible three- to six-year heavy icebreaker capacity gap³⁴² as the agency’s lone active ice breaker *Polar Star* nears the end of its service life,” says the US Government Accountability Office.³⁴³ The icebreaker is expected to cost up to \$1 billion and the process of accepting proposals will start in 2017 with a contract award set for 2019, and building starting in 2020.³⁴⁴
 - In early November 2016, a Request for Information was issued by the Coast Guard which “detailed the Coast Guard’s plans to use a single shipyard to build three icebreakers over the next decade”. The Coast Guard put forward an estimate that six icebreakers would satisfy the strategic needs of the U.S. in the polar regions.³⁴⁵ According to U.S. Coast Guard Commandant Adm. Paul Zukunft in remarks before the Center for Strategic and International Studies, the Trump administration’s budget request to Congress will include a first payment of \$150 million for the first of six Coast Guard icebreakers, to be delivered by 2023.³⁴⁶
 - 3 heavy and 3 medium³⁴⁷

³³⁶ Thornton, David, “Workforce focus, fleet upgrades propel Coast Guard toward modernization,” Federal News Radio, 20 October 2017, <https://federalnewsradio.com>

³³⁷ Wezeman, Siemon, T., “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012, p. 13.

³³⁸ “Acquisition Update: Coast Guard Christens Seventh National Security Cutter,” United States Coast Guard, last modified 7 March 2017, <https://www.uscg.mil/hq/CG9/newsroom/updates/nsc030617.asp>

³³⁹ “National Security Cutter,” Military.com, no dated listed, <http://www.military.com>

³⁴⁰ “National Security Cutter,” Military.com, no dated listed, <http://www.military.com>

³⁴¹ “Coast Guard commissions second Alaska cutter,” Daily News-Miner, 18 June 2017, <http://www.newsminer.com>

³⁴² According to a June 2016 GOA report, projections show that the US Coast Guard will likely face a 3- to 6-year gap in its heavy icebreaker capability before a new one is ready.

³⁴³ Nicholas, Scott, “GAO: Coast Guard to address Arctic regional operation capacity gaps,” ExecutiveGov, 14 July 2016, <http://www.executivegov.com>

³⁴⁴ Pugliese, David, “U.S. Coast Guard Moves Ahead on New Icebreaker,” Ottawa Citizen, 29 January 2016, <http://ottawacitizen.com>

³⁴⁵ Martinson, Erica, “Coast Guard advances plans to build 3 icebreakers,” The Arctic Sounder, 5 November 2016, <http://www.thearcticsounder.com>

³⁴⁶ Grady, John, Coast Guard Commandant continues to call for more U.S. icebreakers,” USNI News, 3 May 2017, <https://news.usni.org/>

³⁴⁷ Villasanta, Arthur D., “US, Russia Arming their Icebreakers as War in the Arctic Looms,” China Topix, 19 May 2017, <http://www.chinatopix.com>

- “Analysts said the Coast Guard will likely receive approval from the Pentagon to arm these new icebreakers with medium caliber naval guns and probably even anti-ship missiles and cruise missiles.”³⁴⁸ Congress had previously declined funding for the project.³⁴⁹
- “According to a September 2017 Congressional Research Service report, the Coast Guard’s current icebreaker program sets out to procure three new heavy polar icebreakers: delivered in the fourth quarter of FY2023, the second quarter of FY2025, and the second quarter of DY2026, respectively. Only one of these ships is now partially funded.”³⁵⁰
- As of June 2017, the U.S. Coast Guard has expressed interest in the *Aiviq*, the Edison Chouest anchor handling supply tug, as “an interim icebreaker while the Coast Guard builds new polar ships”.³⁵¹
 - In April 2018, Admiral Paul Zukunft asserted that, “The 2019 US budget authorizes \$750 million for a third icebreaker, with the goal of eventually expanding the US fleet to six.”³⁵²
 - In mid-October 2017, the US Navy and Coast Guard released a joint [draft request for proposal](#) for one heavy polar icebreaker, with the option of two more.³⁵³ In mid-November 2017, the US House of Representatives approved a bill that allows the military to build a new heavy icebreaker for the Coast Guard, funding contingent.³⁵⁴
 - In March 2018, the Coast Guard released its request for proposals to five potential vendors.³⁵⁵
- According to Business Insider in February 2018, “The Homeland Security Department's proposed budget for fiscal year 2019 requests \$2 billion to recapitalize the Coast Guard's surface fleet — notably \$750 million to design and build the US's "first new heavy polar icebreaker in over 40 years.”³⁵⁶ It is slated for delivery in 2023.³⁵⁷
- The latest Government Accountability Office report – “Status of Coast Guard's Heavy Polar Icebreaker Acquisition” – states a \$9.827 billion maximum for the project, which would include “acquisition, operations, and maintenance costs for the three heavy polar icebreakers over their entire 30-year lifecycle.”³⁵⁸

³⁴⁸ Villasanta, Arthur D., “US, Russia Arming their Icebreakers as War in the Arctic Looms,” China Topix, 19 May 2017, <http://www.chinatopix.com>

³⁴⁹ Todaro, Chelsea, Congress Declines to Help Coast Guard Fund New Polar Icebreaker,” Military News – National Defense, 17 September 2014, <http://www.military.com/>

³⁵⁰ Gronning, Ragnhild, “US Senate bill includes funding for new icebreakers,” High North News, 28 September, 2017, <http://www.highnorthnews.com>

³⁵¹ Moore, Kirk, “Coast Guard may observe Aiviq icebreaker trials,” Workboat, 8 June 2017, www.workboat.com

³⁵² “Expanding 2-ship U.S. icebreaker fleet becomes top national priority,” Sputnik News, 13 April 2018, <https://sputniknews.com>

³⁵³ Woody, Christopher, “The US Navy and Coast Guard are looking to play catch up in the Arctic,” Business Insider, 19 October 2017, <http://uk.businessinsider.com>

³⁵⁴ Malakoff, David, “Massive U.S. defense bill includes bevy of research-related provisions,” Science Magazine, 14 November 2017, <http://www.sciencemag.org/>

³⁵⁵ Larter, David, B., “U.S. Coast Guard to release new heavy icebreaker RFP,” Defense News, 1 March 2018, <https://www.defensenews.com>

³⁵⁶ Woody, Christopher, “The Coast Guard is asking for \$15 million to keep its only heavy icebreaker afloat – and \$750 million to finally build a new one,” Business Insider, 14 February 2018, <http://www.businessinsider.de>

³⁵⁷ McGarry, Brendan, “Coast Guard budget would fund 1st new heavy icebreaker in 40 years,” Military.com, 12 February 2018, <https://www.military.com>

³⁵⁸ “GAO reports on status of heavy polar icebreaker acquisition,” Marline Log, 16 April 2018, <https://www.marinelog.com>

Polar Star



Photo Credit: Polar Star, United States Coast Guard

<http://gcaptain.com/ship-photos-u-s-icebreaker-polar-star-reaches-mcmurdo-station-antarctica/>

- Commissioned in 1976³⁵⁹, deactivated in 2010, and back in operation by 2013 to resume its mission.³⁶⁰
- 399 feet long, with a crew of 134, it can break 6 feet of ice at 3 knots, and can break 21 feet of ice by backing and ramming.³⁶¹
- Set to retire no later than 2022³⁶²
- Mission is break ice and maintain waterways
- Home-ported in Seattle
- Available for service in Antarctic as well as Arctic, one report suggests that it will spend most of its time in Antarctica clearing waterways to resupply the McMurdo Research Station in a yearly mission, Operation Deep Freeze.³⁶³
- Likely to be used as scientific platform as well.³⁶⁴

Healy



Photo Credit: Healy, United States Coast Guard

[http://commons.wikimedia.org/wiki/File:USCGC_Healy_\(WAGB-20\)_north_of_Alaska.jpg](http://commons.wikimedia.org/wiki/File:USCGC_Healy_(WAGB-20)_north_of_Alaska.jpg)

- A 420 foot vessel capable of breaking 4.5 feet of ice at three knots, and eight feet by backing a ramming.³⁶⁵
- “The Coast Guard’s third polar icebreaker—*Healy*—entered service in 2000. Compared to *Polar Star* and *Polar Sea*, *Healy* has less icebreaking capability (it is considered a medium polar icebreaker), but more capability for supporting scientific research. The ship is used primarily for supporting scientific research in the Arctic.³⁶⁶
- In August 2017, the U.S. Coast Guard re-established dive capabilities to *Healy*.³⁶⁷

³⁵⁹ Ortega-Welch, Marissa, and Miller, Craig, “Life Aboard a Polar Roller,” 6 November 2014, KQED Science, <https://ww2.kqed.org>

³⁶⁰ “History,” United States Coast Guard, last modified 21 December 2016, <https://www.uscg.mil>

³⁶¹ Starr, Terrell Jermaine, “The Naval Crisis in the Arctic that America Refuses to Fix,” Foxtrot Alpha, 16 February 2017, foxtrotalpha.jalopnik.com

³⁶² Starr, Terrell Jermaine, “The Naval Crisis in the Arctic that America Refuses to Fix,” Foxtrot Alpha, 16 February 2017, foxtrotalpha.jalopnik.com

³⁶³ Carlsen, Audrey, “Polar Star Headed for Arctic Ice Trials,” Unalaska Community Broadcasting, 23 June 2013, <http://kucb.org>

³⁶⁴ Restino, Carey, “Coast Guard: Refurbished icebreaker heads north,” AlaskaDispatch, 6 July 2013, <http://www.alaskadispatch.com>

³⁶⁵ Restino, Carey, “Coast Guard: Refurbished icebreaker heads north,” AlaskaDispatch, 6 July 2013, <http://www.alaskadispatch.com>

³⁶⁶ O'Rourke, Ronald, “Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress,” US Congressional Research Service, 10 December 2012, <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

³⁶⁷ “Diving ops resumed in Arctic: Coast Guard had stopped diving there after 2006 accident,” Ketchikan Daily News, 19 August, 2017, <http://www.ketchikandailynews.com>

1.3 Organizations and Operational Units (personnel)

US Coast Guard

- Runs seasonal Arctic operations out of Kotzebue³⁶⁸
- In May 2013 the Coast Guard released a new “Arctic Strategy”³⁶⁹ report:
 - Perhaps one of the more striking features of the report is that it does not call for major or near-term moves towards building up an Arctic infrastructure. Rather than building up a year-round infrastructure, the focus will continue to be on seasonal deployments.³⁷⁰ The report³⁷¹ identifies improvements in domain awareness as a key priority: “Coast Guard operations require precise and ongoing awareness of activities in the maritime domain. Maritime awareness in the Arctic is currently restricted due to limited surveillance, monitoring, and information system capabilities. Persistent awareness enables identification of threats, information-sharing with front-line partners, and improved risk management.”
- In discussing its Arctic “presence,” the Coast Guard identifies “strategic priorities to achieve effective presence,” including:
 - The development of “an adaptable mix of cutters, boats, aircraft (including unmanned aerial systems), and shore infrastructure to enable effective seasonal operations”;
 - “Expanding capacity to respond to emergency and other time critical events”;
 - “Maintain a scalable presence commensurate with risks posed by increasing activity”;
 - “Develop the appropriate capabilities and competencies, with sufficient capacity, to execute missions at an acceptable level of risk, and in a manner that is adaptive to changes in environmental conditions”; and
 - “Proceed with a risk-based, phased approach to resourcing to address the highest operational needs, including the establishment of infrastructure and communications systems to support operations”.
- The report also includes a useful appendix on “U.S. Coast Guard Forces and Assets” (elements, such as Dutch Harbor and Adak Facility).
- June 2014 – Admiral Tom Ostebo is joining Coast Guard District 17 as a new commander, bringing with him Arctic experience. “During Ostebo’s tenure, the Coast Guard launched seasonal operations in the Arctic, where shipping traffic is on the rise. When a winter storm prevented a fuel delivery to Nome in 2012, he sent the icebreaker Healy to clear a path for a Russian tanker. He also supervised the Coast Guard’s response to the grounding of the Shell drill rig Kulluk near Kodiak in early 2013.” Ostebo says that there is still a lot of work that needs to be done in the Arctic.³⁷²
- August 2014 – The U.S. Coast Guard Research and Development Centre “is leading a multiagency team to support Arctic Shield 2014, a 17th Coast Guard District initiative. The purpose of their month-long evaluation is to improve USCG capabilities in the Arctic region, specifically in the areas of boat operations, communications, navigational safety and oil spill response.”³⁷³
- April 2016 – In April, the U.S. Coast Guard participated in The Northwest Passage Tabletop Exercise, a mass joint tabletop exercise to “test and evaluate interagency cooperation and focus on the response to a cruise ship experiencing progressive flooding in a remote Arctic region in the vicinity of the U.S./Canadian border.”³⁷⁴

³⁶⁸ Grueskin, Zoe, “Coast Guard wraps up seasonal operations out of Kotzebue,” Alaska Public Media, 30 October 2017, <https://www.alaskapublic.org>

³⁶⁹ “United States Coast Guard Arctic Strategy,” U.S. Coast Guard, May 2013, http://www.uscg.mil/seniorleadership/DOCS/CG_Arctic_Strategy.pdf

³⁷⁰ McDermott, Jennifer, “Arctic to remain part-time pursuit of Coast Guard,” The Day, 21 May 2013, <http://theday.com>

³⁷¹ “United States Coast Guard Arctic Strategy,” U.S. Coast Guard, May 2013, http://www.uscg.mil/seniorleadership/DOCS/CG_Arctic_Strategy.pdf

³⁷² Kelly, Casey, “New Coast Guard District 17 commander brings Arctic Experience,” KTOO, 14 June 2014, <http://www.ktoo.org>

³⁷³ Haun, Eric, “Coast Guard Preps for Arctic Research,” MarineLink, 1 August 2014, <http://www.marinelink.com>

³⁷⁴ “Coast Guard, partners, industry conduct mass rescue tabletop exercise in Anchorage, Alaska,” US Coast Guard Newsroom, 22 April 2016, <http://www.uscgnews.com>

- June 2016 – Coast Guard has leased a facility in coastal town of Kotzebue, Alaska, to house two MH-60 Jayhawk helicopters for the next 5 years. Will also be seasonal home base for Operation Arctic Shield.³⁷⁵ USCG will lease from May 1st to September 30th each year.³⁷⁶
- Increase in Coast Guard’s need for large-scale rescue exercises³⁷⁷
 - As a result of increased cruise-based tourism like the Crystal Serenity cruising the Northwest Passage in August 2016, the U.S. Coast Guard has had to increase its level of response-preparedness for mass emergencies along that route.
 - A successful rescue exercise in Northern Alaska was completed in early August as the Crystal Serenity was preparing to leave port.
- May 2017 – “A draft proposal of the [2018] budget obtained in March called for the Coast Guard to be cut 14 percent to \$7.8 billion to help pay for Trump’s proposed southern border wall, but the idea was later scrapped in favor of level funding of about \$9.1 billion.”³⁷⁸

National Guard Arctic Interest Council

- A preliminary charter was signed in February 2017 in Utqiagvik (Barrow). “The goal is to coordinate and, at times, combine Arctic operations, share expertise and, if needed, stage joint responses with personnel trained and equipped for Arctic conditions.”³⁷⁹

Arctic Executive Steering Committee³⁸⁰

- In 2015, Obama issued an executive order aimed at coordinating federal action on the Arctic, called the Arctic Executive Steering Committee (AESC).
- “The AESC convenes at the Deputy Secretary level to guide the development of department and agency plans to assure that Federal activity is well-coordinated and better communicated to partners such as the State of Alaska, Alaska Native communities, the U.S. Congress, the business community, international partners, and other stakeholders.”³⁸¹
- As of May 2017, the AESC remains operation under the Trump administration.³⁸²

Coast Guard Arctic Craft Project

- Part of the Coast Guard’s Arctic Strategy is to ensure that it is ready to respond. Part of the project includes broadening “the Coast Guard’s understanding of Arctic waters and how best to prepare for the challenges the region presents.” Part of the project is to evaluate each piece of equipment the Coast Guard uses, deciding what equipment is most often used and whether the equipment is up to par with leading technologies.³⁸³
 - No updates since 2014.

U.S. Navy Arctic Roadmap³⁸⁴

- In 2009 the US Navy established a Task Force on Climate Change (TFCC) in order to develop Navy roadmaps, first for the Arctic and later for more general responses to global climate change. The October 2009 Arctic Roadmap was for the period FY2010-FY2014. Rather than setting out Arctic plans and policies, it set out a schedule for the development and implementation of such plans and policies. As such it called for things like the development strategic objectives and command structure requirements, and assessments of current Navy Arctic capabilities.³⁸⁵

³⁷⁵ Andrews, Laurel, “Coast Guard launches seasonal home base in Kotzebue,” 26 June 2016, Alaska News, <http://www.adn.com>

³⁷⁶ “USCG takes control of Kotzebue aviation facility,” 24 June 2016, KTUU, <http://www.ktuu.com>

³⁷⁷ Bergman, Julia, “Mass Rescue Exercise Tests Response Capabilities in Arctic,” Military.com, 25 August 2016, www.military.com

³⁷⁸ Lamothe, Dan, “Trump pledges to build icebreakers but doesn’t say how he’ll pay for them,” Alaska Dispatch News, 18 May 2017, <https://www.adn.com>

³⁷⁹ Rosen, Yareth, Increased activity in warming Arctic piques interest of Lower 48 National Guard leaders,” Alaska Dispatch News, 6 February 2017, www.adn.com

³⁸⁰ Ruskin, Liz, “Obama Issues Executive Order on Arctic Co-ordination,” Alaska Public Media, 21 January 2015, www.alaskapublic.org

³⁸¹ “The Arctic as a national imperative,” Brown University, 31 May 2016, <https://www.brown.edu>

³⁸² Rosen, Yareth, “With Trump administration intentions unclear, Alaskans might have to fill the void on Arctic policy,” Alaska Dispatch News, 22 May 2017, www.adn.com

³⁸³ Petty Officer 1st Class Eggert, Shawn, “Coast Guard Arctic Craft Project looks to older technologies to tackle new challenges in Arctic,” DVIDS, 19 August 2014, <http://www.dvidshub.net>

³⁸⁴ “U.S. Navy Arctic Roadmap 2014-2030,” U.S. Navy, February 2014, www.navy.mil

³⁸⁵ O’Rourke, Ronald, “Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress,” US Congressional Research Service, 10 December 2012, p. 63-65, <http://www.fas.org/spp/crs/weapons/RL34391.pdf>

- **U.S. Navy Arctic Roadmap for 2014 – 2030:** “Over the last four years, Task Force Climate Change, in consultation and collaborating with the broader governmental and private scientific communities, has concluded that ice conditions in the Arctic Ocean are changing more rapidly than first anticipated. This updated U.S. Navy Arctic Roadmap prepares the U.S. Navy to respond effectively to future contingencies, delineates in the U.S. Navy’s Arctic Region leadership role with the Defense Department, and articulates the Navy’s support to national priorities.”³⁸⁶

Deployment of 330 US Marines in Norway³⁸⁷

- The Norwegian government announced in October 2016 the US initiative to station 330 US Marines on rotation around 1,000 kilometres (600 miles) from the Russian border starting in January 2017.
- According to the Norwegian Defence Ministry, “they will be engaged in training and manoeuvres in almost Arctic conditions.”
- As of January, the six month deployment of marines began.³⁸⁸

2. Recurring Operations and Exercises

Operations occurring Annually

ARCTIC EAGLE

- Annual exercise led by the Alaska National Guard³⁸⁹
- Arctic Eagle 2017 was in preparation for Arctic Eagle 2018, “a major emergency response exercise that... will test the capabilities and effectiveness of a multi-national, multi-agency response to a major incident in the state.”³⁹⁰
- Arctic Eagle 2018 took place in February and March at multiple sites including Valdez, the Donnelly Training Area, and Anchorage,³⁹¹ and the goals of Arctic Eagle 2018 were, “for participating forces to operate in a joint, interagency, intergovernmental and multinational environment; assess ability to conduct sustained operations in arctic conditions, and integrate new and emerging capabilities.”³⁹²

“As part of Arctic Eagle 2018, Alaska National Guardsmen trained on how to identify a potential cyber threat.”³⁹³ ARCTIC PEGASUS

- US Army Alaska’s annual joint exercise³⁹⁴
- Testing rapid-deployment readiness in Arctic conditions³⁹⁵
- Arctic Pegasus last took place in March 2018 as part of a series of exercises associated with Arctic Edge 2018.³⁹⁶

ARCTIC SHIELD

- An operation of the US Coast Guard which began in 2012 and occurs annually to increase the agency’s Arctic awareness and preparedness.³⁹⁷
- A series of exercises for developing responses of catastrophic events (e.g. earthquake) in Alaska, involving military and civilian agencies.³⁹⁸

³⁸⁶ “U.S. Navy Arctic Roadmap 2014-2030,” U.S. Navy, February 2014, www.navy.mil

³⁸⁷ L’Agence France Presse, “US to deploy 330 troops in Norway,” Yahoo, 24 October 2016, www.yahoo.com

³⁸⁸ “Norway welcomes 300 US Marines for first time since the Second World War,” The Independent, 17 January 2017, <http://www.independent.co.uk>

³⁸⁹ Lt. Col. Olmstead, Candis, “Alaska National Guard trains to respond to state emergencies,” Alaska National Guard Public Affairs, 7 March 2017, <https://www.dvidshub.net>

³⁹⁰ Lt. Col. Olmstead, Candis, “Alaska National Guard trains to respond to state emergencies,” Alaska National Guard Public Affairs, 7 March 2017, <https://www.dvidshub.net>

³⁹¹ Friedman, Sam, “Alaska National Guard completes largest state exercise since 2014,” The Fairbanks Daily News-Miner, 8 March 2018, <http://www.newsminer.com>

³⁹² Olmstead, Lt. Col. Candis, “Alaska National Guard’s exercise Arctic Eagle 2018 conducts field training in Valdez,” Defense Visual Information Distribution Service, 16 February 2018, <https://www.dvidshub.net>

³⁹³ Siemedel, Joseph, “Alaska National Guard Hones in on Efficient Cyber Security during Arctic Eagle 2018,” Alaska Native News, 2 March 2018, <http://alaska-native-news.com>

³⁹⁴ Friedman, Sam, “Fort Wainwright’s Strykers strike out for the Arctic,” News Miner, 5 November 2015, <http://www.newsminer.com>

³⁹⁵ Friedman, Sam, “Fort Wainwright’s Strykers strike out for the Arctic,” News Miner, 5 November 2015, <http://www.newsminer.com>

³⁹⁶ Oliver, Shady Grove, “Arctic Pegasus brings military ops to Deadhorse Airport,” The Arctic Sounder, 23 March 2018, <http://www.thearcticsounder.com>

³⁹⁷ Andrews, Laurel, “Coast Guard launches seasonal home base in Kotzebue,” 26 June 2016, Alaska News, <http://www.adn.com>

³⁹⁸ Alaska Shield 2012 focused on winter storm response: <http://ready.alaska.gov/press/Statewide%20Exercise%20Prepares%20Alaska%20for%20Big%20Winter%20Storm.pdf>

- As of July 2016, its seasonal home will be established in Kotzebue, Alaska.³⁹⁹
 - “In prior Arctic Shield Operations years, the Coast Guard had skipped from town to town each summer — from Kotzebue to Barrow to Prudhoe Bay. A permanent forward operation location will allow for more flexibility, [Coast Guard Chief Petty Officer Shawn] Eggert said.”
- Arctic Shield 2017 launched 1 July 2017 and ran until the end of October.⁴⁰⁰

DEEP FREEZE

- The U.S. military’s annual logistical support of the National Science Foundation’s U.S. Antarctic Program
- The mission includes breaking through Antarctic ice to resupply McMurdo Station, a large US Antarctic research station.
- Operation Deep Freeze 2016 used Coast Guard Cutter Polar Star to create a 13-mile channel allowing two supply vessels to reach McMurdo Station.

ARCTIC CARE

- Operation occurring annually since 1995⁴⁰¹, and last occurred in April 2018.⁴⁰²
- Joint military exercise between reservists of all branches of the United States Armed Forces, along with Alaska Army National Guard and Canadian Forces to provide care to underserved communities in Northwest Alaska.⁴⁰³
- This group also conducts “critical mission training and logistical movements to maintain currency needed to support future military/civilian humanitarian operations” during Arctic Care.⁴⁰⁴

Operations occurring Biennially

ICE EXERCISE (ICEX)

- Biennial exercise coordinated by ASL and aimed at assessing operational capacity of the submarine force in the Arctic while advancing scientific research
- Reflects the USA’s national security and homeland defense interests in the region
- A five-week exercise with over 200 participants from four nations.
- **ICEX 2018**⁴⁰⁵
 - ICEX 2018 occurred in the Arctic Ocean in March following construction of the temporary US Ice Camp SKATE.

NORTHERN EDGE

- The biennial exercise is a training event involving US Air Force, Navy, Army and National Guard.⁴⁰⁶
- “It is Alaska’s premier joint training exercise designed to practice operations, techniques and procedures, and enhance interoperability among the services. Over 6,000 participants from all the services, Airman, Soldiers, Sailors, Marines and Coast Guardsmen from active duty, reserve and national guard units are involved [in the 2011 exercise].”⁴⁰⁷
- Northern Edge, which normally runs every two years, was cancelled in 2013 and ran for the first time since 2011 from June 15-26 2015.⁴⁰⁸
- Exercise Northern Edge 2017 took place May 1-12 at Joint Base Elmendorf-Richardson in Anchorage, Alaska.⁴⁰⁹
 - Lingering concern from coastal communities in Alaska about the environmental impacts of Northern Edge 2015 made plans for 2017 controversial.⁴¹⁰

³⁹⁹ Andrews, Laurel, “Coast Guard launches seasonal home base in Kotzebue,” 26 June 2016, Alaska News, <http://www.adn.com>

⁴⁰⁰ Andrews, Laurel, “Coast Guard launches seasonal home base in Kotzebue,” 26 June 2016, Alaska News, <http://www.adn.com>

⁴⁰¹ “Operation Arctic Care”, National Guard, retrieved 27 April 2018, <https://www.nationalguard.com>

⁴⁰² Simms, Capt. Joseph, “Joint military exercise provides care for underserved regions of the Northwest Alaska,” DVIDS, 12 April 2018, <https://www.dvidshub.net>

⁴⁰³ Simms, Capt. Joseph, “Joint military exercise provides care for underserved regions of the Northwest Alaska,” DVIDS, 12 April 2018, <https://www.dvidshub.net>

⁴⁰⁴ Simms, Capt. Joseph, “Joint military exercise provides care for underserved regions of the Northwest Alaska,” DVIDS, 12 April 2018, <https://www.dvidshub.net>

⁴⁰⁵ Submarine Force Pacific, “Navy’s Arctic Ice Exercise Features Multinational Participation,” 8 March 2018, U.S. Department of Defense, <https://www.defense.gov>

⁴⁰⁶ Northern Edge 2011 - <http://www.jber.af.mil/alcom/northernedge/northernedge2011.asp>

⁴⁰⁷ Northern Edge 2011 - <http://www.jber.af.mil/alcom/northernedge/northernedge2011.asp>

⁴⁰⁸ “Northern Edge joint military training exercise,” Alaska Dispatch News, 23 June 2015, <http://www.adn.com>

⁴⁰⁹ Klouda, Naomi, “Northern Edge exercise takes to Alaska skies, seas,” Alaska Journal of Commerce, 3 May 2017, <http://www.alaskajournal.com>

⁴¹⁰ “Alaska senator says Navy has explaining to do,” RCinet, 21 September 2016, www.rcinet.ca

Other exercises

ARCTIC EDGE

- U.S. Northern Command conducts this exercise in cooperation with the State of Alaska Division of Homeland Security and Emergency Management and other federal, state and local agencies. It provides training in interagency disaster response and DOD responses to requests for assistance from U.S. civil authorities.⁴¹¹
 - Arctic Edge 18 was the largest joint exercise scheduled in Alaska in 2018, and was linked to Arctic Eagle, Arctic Pegasus, and ICEX, which occurred leading up to Arctic Edge in February and March.⁴¹² “Brought more than 1,500 U.S. military personnel from 20-plus units together to train in arctic conditions throughout the Alaska range.”⁴¹³
 - Army Lt. Col. Joshua Gaspard, Joint Training and Readiness chief at Alaskan Command noted that, “Arctic Edge 18 focused on defending the homeland in extreme cold weather conditions found in Arctic environments,” whereas in previous years, the exercise focused on, “defense support to civil authorities following a natural disaster”.⁴¹⁴

NOAA and U.S. Coast Guard: Simulation Based Research Exercise

- The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Coast Guard (USCG) carried out a simulation-based research exercise in 2014. The aim was to strengthen security and environmental protection in the Arctic. “USCG researchers aboard the Healy cutter are set to simulate an oil spill and test unmanned airborne and underwater sensing technologies...”⁴¹⁵

RED FLAG – ALASKA (RFA)⁴¹⁶

- “A multi-service, multi-national, air combat training exercise sponsored by the Pacific Air Forces of the US Air Force”
- Began in 1976 in the Philippines as “Cope Thunder”, and moved to Eielson Air Force Base (AFB) in Alaska in 1992. Renamed “Red Flag – Alaska” in 2006.
- While “the main objective of the exercise has been to improve the ability of aircrew to handle high-stress combat situations”, the aim has expanded to “overwhelm the senses with combat simulations”, according to Lt Col Reggie Smith of the 353rd Combat Training Squadron (CTS).
- Exercises occur up to four times per year, with the 2017 series of field training exercises concluding on 11 August 2017.⁴¹⁷

SPARTAN PEGASUS

- A joint Army-Air Force rapid-deployment exercise occurring near Deadhorse, Alaska, that includes paratroopers from Joint Base Elmendorf-Richardson (JBER) and Stryker Brigade soldiers, as well as equipment from Fort Wainwright.⁴¹⁸
- “Intended to demonstrate the ability of paratroopers and Strykers to deploy quickly to and operate in the Arctic.”⁴¹⁹
- Most recent exercise wrapped up in February 2017.⁴²⁰
 - Spartan Pegasus 15 was the largest U.S. airborne mission north of the Arctic Circle in more than a decade.⁴²¹

⁴¹¹ Arctic Edge - <http://www.jber.af.mil/alcom/arcticedge/>

⁴¹² Davis, Capt. Phillip, “Arctic Edge Exercise dates announced,” Defense Visual Distribution Service, 12 February 2018, <https://www.dvidshub.net>

⁴¹³ Miller, Kiona, Navy Petty Officer 1st Class, “Special Operations Forces exercise in Arctic conditions,” U.S. Department of Defense, 16 March 2018, <https://www.defense.gov>

⁴¹⁴ “Arctic Conditions Provide Valuable Lessons in Alaska Exercise,” U.S. Department of Defense, 20 March 2018, <https://www.defense.gov>

⁴¹⁵ Clemens, Jay, “NOAA, Coast Guard test systems for Arctic Response Missions,” ExecutiveGov, 15 Aug. 2014, <http://www.executivegov.com>

⁴¹⁶ Fence Check, <http://www.fencecheck.com>

⁴¹⁷ Whitman, Cassie, “Final Red Flag – Alaska of 2017 provides joint, multi-domain, multinational and fast combat training,” Eielson Airforce Base, 28 July, 2017, <http://www.eielson.af.mil>

⁴¹⁸ Ellis, Tim, “Exercise near Deadhorse to test paratroopers’ ability to operate in cold,” Alaska Public, <http://www.alaskapublic.org>

⁴¹⁹ Ellis, Tim, “Exercise near Deadhorse to test paratroopers’ ability to operate in cold,” Alaska Public, <http://www.alaskapublic.org>

⁴²⁰ Ellis, Tim, “Exercise near Deadhorse to test paratroopers’ ability to operate in cold,” Alaska Public, <http://www.alaskapublic.org>

⁴²¹ Smith, Jeffrey, “Exercise Spartan Pegasus demonstrates joint military partnership,” 26 February 2015, <https://www.army.mil>

RUSSIA

1. Security Assets available for Operations in the North

1.1 Bases (including stations, naval facilities, radar sites, etc.)

As of January 2017, it is reported that Russia has “6 military bases, 16 deepwater ports, and 13 airbases”.⁴²² In addition, “Russia has been active in (re)opening a number of search-and-rescue (SAR) centers along the [Northern Sea] route. Out of 13 planned centers, about half have been completed. Originally all 13 were expected to be open by 2017; now Russia is saying they’ll be completed by 2020.”⁴²³

Northern Fleet Naval Bases

*Note: Russian Vice Admiral Nikolai Yevmenov reported in 2017 that, “Every Arctic island where there are bases of the Northern Fleet is being outfitted with all-season airfields which will be able to host different types of aircraft including heavy transport planes and fighter jets.”*⁴²⁴ Severomorsk (Northern Fleet Headquarters)

- “As of 1996 the fleet provided home ports for thirty-seven nuclear submarines, twenty-two other submarines, forty-seven principal surface combatants, and ten coastal and smaller ships. The naval aviation contingent included a complement of twenty Su-39 fixed-wing aircraft and ten antisubmarine warfare helicopters on board the Admiral Kuznetsov, which heads the air defense of the Barents Sea. Shore-based naval aviation included 200 combat aircraft and sixty-four helicopters. The Northern Fleet has two naval infantry brigades, one coastal defense regiment, and an air defense missile regiment.”⁴²⁵
- The largest of Russia’s five naval fleets is the Northern Fleet, stationed on the Kola Peninsula and along the coasts of the Barents and White Seas

Russia Joint Strategic Command North (JSCN), created in 2014 as overarching command structure for the developing arctic force, has headquarters at Severomorsk.⁴²⁶ Bases on the Kola Peninsula^{427 428}

- Gremikha – Naval Base
- Olenya – Airfield & Search and Rescue Base
- Severomorsk – Northern Fleet Headquarters
- Vidyayevovo – Naval Base
- Zapadnaya Litsa – Naval Base
- Gadzhiyevovo – Naval Base
- Pechenga – Infantry Base
- Kandalaksha – Naval Base

Wrangle Island – Electronic Warfare & Radar, Pacific Fleet Naval Base, Airfield & Search and Rescue Base⁴²⁹

- In the midst of significant build-up. 68 new bases to be built on Wrangle Island and Cape Schmidt by end of 2017.⁴³⁰

⁴²² ⁴²² Starr, Terrell Jermaine, “Russia’s Icebreakers Make it King of the Arctic and America is Just a Pauper,” Foxtrot Alpha, 26 January 2017, <http://foxtrotalpha.jalopnik.com>

⁴²³ Thompson, John, and Ohanyan, Narine, “Casting a Cool Eye on Russia’s Northern Sea Route Ambitions,” News Deeply, 3 May, 2017, www.newsdeeply.com

⁴²⁴ “Russian military to boost Arctic presence: commander,” Digital Journal, 3 November 2017, <http://www.digitaljournal.com>

⁴²⁵ “Northern Fleet,” GlobalSecurity.Org, last modified 21 September 2014, <http://www.globalsecurity.org/military/world/russia/mf-north.htm>

⁴²⁶ Poulin, Andrew, “5 ways Russia is positioning to dominate the Arctic,” International Policy Digest, 24 January 2016, <http://intpolicydigest.org>

⁴²⁷ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴²⁸ Air bases in the Kola Peninsula that were decommissioned at the end of the Cold War have been reopened.

⁴²⁹ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴³⁰ Staalesen, Atle, “New Arctic military base is declared ready for operation,” The Barents Observer, 14 December 2016, <https://thebarentsobserver.com>

- Sopka-2 radar complex:
“A new radar array complex Sopka-2 entered service on Wrangel Island in 2016. The main mission of the radar is acquiring, generalizing and analyzing of aerial situation in the Arctic region,” said Russian’s Eastern Military District’s spokesman Alexander Gordeev.⁴³¹

Cape Schmidt – Naval Base, Airfield & Search and Rescue Base⁴³²

- Located in Cape Schmidt in the eastern Chukotka region⁴³³
- The autonomous base is shaped like a five-point star and built in environmentally protected territories⁴³⁴
- According to Lt. Col. Sergei Surovikin, plans for construction of a drone detachment and an airport on the cape were to be completed by 2015⁴³⁵
- According to a press release issued in December of 2014 by Russia's Federal Ministry of Special Construction, the facility was to include the following: a “sauna, psychological evaluation room and sports facilities, as well as eating, sleeping and medical quarters.”⁴³⁶
- In November of 2015, it was announced by Russian company Rusaliance Stroy that the federal Agency for Special Construction had halted funding, and therefore construction, of the Cape Schmidt base upgrade.⁴³⁷
- As of 2017, a number of news articles indicate that construction has continued and Cape Schmidt is in the midst of significant build-up.
 - In fact, 68 new bases are to be built on Wrangle Island and Cape Schmidt by end of 2017.⁴³⁸
 - The Barents Observer noted in June 2017 that, “Seventeen new buildings, power generation stations and a fresh water well are under construction in Cape Schmidt.”⁴³⁹

Franz Joseph Land – “Arctic Trefoil” – Airfield & Search and Rescue Base x2, Electronic Warfare & Radar, Naval Base⁴⁴⁰

- Located at 80 degrees north on Alexandra Land Island in Nagurskoye⁴⁴¹
- Known as the “Arctic Trefoil” complex and is the second base completed so far in the Putin-era⁴⁴².
- The complex is the largest building in the high Arctic and the largest human made structure so far north⁴⁴³
- With 14,000 square metres it is capable of providing living and working conditions for 150 servicemen to live for one-and-a-half years without outside support.⁴⁴⁴
- The completed base was unveiled in mid-April 2017⁴⁴⁵ and is currently in operation, with 1000 soldiers now serving on the sites.⁴⁴⁶
- “According to new Northern Fleet Commander Nikolay Yevmenov, the new base will house a fleet of either MiG-31 or Su-34 fighter aircrafts, as well as refuelling tankers Il-78.”⁴⁴⁷
- Building of an airfield to receive aircraft has entered an active phase and will be completed in 2018 to allow for year-round air operations.⁴⁴⁸ The project includes a landing strip and airfield service facilities.⁴⁴⁹

⁴³¹ “Russia deploys Arctic radar array on Wrangel Island,” RT News, 5 January 2017, www.rt.com

⁴³² Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴³³ Bodner, Matthew, Eremenko, Alexey, “Russia Starts Building Military Bases in the Arctic,” The Moscow Times, 8 September 2014, www.themoscowtimes.com/

⁴³⁴ Bodner, Matthew, Eremenko, Alexey, “Russia Starts Building Military Bases in the Arctic,” The Moscow Times, 8 September 2014,

<http://www.themoscowtimes.com/>

⁴³⁵ “Russian Military Opens 2nd Arctic Base,” The Moscow Times, 27 November 2014, <http://www.themoscowtimes.com/>

⁴³⁶ “Russia Builds New Arctic Military Base,” The Moscow Times, 8 December 2014, <http://www.themoscowtimes.com/>

⁴³⁷ Staalesen, Atle, “Arctic army base construction put on hold,” The Barents Observer, 6 November 2015, <http://www.thebarentsobserver.com>

⁴³⁸ Staalesen, Atle, “New Arctic military base is declared ready for operation,” The Barents Observer, 14 December 2016, <https://thebarentsobserver.com>

⁴³⁹ Staalesen, Atle, “Navy reports progress on building of east Arctic base,” The Barents Observer, 8 June 2017, <https://thebarentsobserver.com>

⁴⁴⁰ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁴¹ Thomas Nilsen, “Russia erects huge military trefoil on Franz Joseph Land,” The Barents Observer, 20 October 2015, <http://www.thebarentsobserver.com>

⁴⁴² Thomas Nilsen, “Russia erects huge military trefoil on Franz Joseph Land,” The Barents Observer, 20 October 2015, <http://www.thebarentsobserver.com>

⁴⁴³ Thomas Nilsen, “Russia erects huge military trefoil on Franz Joseph Land,” The Barents Observer, 20 October 2015, <http://www.thebarentsobserver.com>

⁴⁴⁴ “Take a glimpse inside Russia’s high-tech Arctic army base,” Press TV, 19 April 2016, <http://presstv.ir>

⁴⁴⁵ Collins, Danny, “The new Cold War,” The Sun, 18 April 2017, <https://www.thesun.co.uk>

⁴⁴⁶ Staalesen, Atle, “Defense Minister Shoigu sums up a year of Arctic buildup,” The Barents Observer, 3 January 2018, <https://thebarentsobserver.com>

⁴⁴⁷ Staalesen, Atle, “Fighter jets for Russia’s new Arctic base,” The Barents Observer, 22 April 2016, <http://thebarentsobserver.com>

⁴⁴⁸ Staalesen, Atle, “Defense Minister Shoigu sums up a year of Arctic buildup,” The Barents Observer, 3 January 2018, <https://thebarentsobserver.com>

⁴⁴⁹ “Spetsstroy starts construction of airfield on Franz Josef Land,” The Arctic, 26 October 2016, www.arctic.ru

Kuril Islands – Naval Base⁴⁵⁰

Barneo (temporary ice base)

- Annual temporary base for scientific research, Arctic expeditions and tourism
- Set up each spring “89° N – 100 kilometers from the North Pole” and is usually operation for one month⁴⁵¹
- For the first time in modern Russian history, paratroopers landed on a drifting floe in the Arctic Ocean, Barneo.
 - In early April 2014, “more than 90 paratroopers from the Ivanovo-based 98th Airborne Division jumped from an Ilyushin Il-76 to the drifting research station Barneo close to the North Pole. On Barneo the soldiers have set up a camp and will be conducting drills on operations in extreme climatic conditions. The ground temperature on Barneo is around 30 degrees below zero. Load-carrying platforms with materials, supplies, fuel and lubricants were also dropped on the polar base. The plane took off from the Olenya military airfield in Olenegorsk on the Kola Peninsula, where the paratroopers had been training for transfer to the Arctic. The drop on Barneo comes only three week after Russia dropped 350 paratroopers from the 98th Airborne Division over the far northern New Siberian Islands.”⁴⁵²

Novaya Zemlya (Rogachevo Air Base) – Airfield & Search and Rescue, Air Defense⁴⁵³

Anderma 2020⁴⁵⁴ - Airfield & Search and Rescue⁴⁵⁵

- New military unit to be stationed in Anderma near the Kara Sea by 2020, said Russian Deputy Defense Minister Army General Dmitry Bulgakov in February 2016
- Kotelny Island– **Airfield & Search and Rescue**⁴⁵⁶A federal nature reserve that is now hosting a new military base with an airfield able to accommodate Ilyushin Il-76 aircraft all year long⁴⁵⁷
- Called the “Northern Shamrock”, it is Russia’s northernmost and largest Arctic military base. ⁴⁵⁸A September 2016 military rehearsal took place at new military complex on Kotelny Island. ⁴⁵⁹
 - The Rubezh missile complex fired two Termit cruise missiles, firing was made from Pantsir-S1, and destroyer *Vice Admiral Kulakov* launched its short-range surface-to-air missile system Kinzhal and its artillery complexes AK-100 and AK-630.
- Base became ready for use in 2016⁴⁶⁰

Alakurtti Village – Electronic Warfare & Radar⁴⁶¹

- “The 80th Independent Motorized Infantry Brigade was established in Alakurtti in 2015, near the Finnish border. In addition, two electronic warfare units, the 331st and 332nd Radio-Technical Regiments, have also been placed in Alakurtti.”⁴⁶²

⁴⁵⁰ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁵¹ Pettersen, Trude, “Russian paratroopers conquer North Pole,” The Barents Observer, 10 April 2014, <http://barentsobserver.com>

⁴⁵² ⁴⁵² Pettersen, Trude, “Russian paratroopers conquer North Pole,” The Barents Observer, 10 April 2014, <http://barentsobserver.com>

⁴⁵³ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁵⁴ “Military Unit to Be Deployed in Russia’s Kara Sea in Arctic by 2020,” Sputnik News, 26 February, 2016, <http://sputniknews.com>

⁴⁵⁵ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁵⁶ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁵⁷ “Russian Military Opens 2nd Arctic Base,” The Moscow Times, 27 November 2014, <http://www.themoscowtimes.com/>

⁴⁵⁸ Haun, Eric, “Russia Ramping Up Arctic Push,” Marine Link, 30 January 2017, <http://www.marinelink.com/>

⁴⁵⁹ Staaleson, Atle, “Shooting cruise missiles from Arctic archipelago,” The Barents Observer, 20 September 2016, <http://barentsobserver.com>

⁴⁶⁰ Staaleson, Atle, “New Arctic military base is declared ready for operation,” The Barents Observer, 14 December 2016, <https://thebarentsobserver.com>

⁴⁶¹ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁶² Korpela, Aleks, “Of fire and ice: Russia’s militarization of the Arctic,” The Nato Association of Canada, 4 February 2016, <http://natoassociation.ca>

Severnaya Zemlya – Airfield & Search and Rescue⁴⁶³

- March 2014: The Ministry of Defence of the Russian Federation has commissioned the setting up of “another Arctic Sea Defence Base” on the islands of the Severnaya Zemlya archipelago. ⁴⁶⁴

Sabetta (FSB Arctic Complex) – Airfield & Search and Rescue⁴⁶⁵

- The new complex includes “a housing block for several tens of specialists, garages for special equipment, as well as a separate building for accessories”. ⁴⁶⁶
- The new border guard office is meant to bolster security along Russia’s Arctic frontiers, according to regional leaders of the FSB in a press release. ⁴⁶⁷
- Built by Yamal LNG company along with regional authorities⁴⁶⁸

Naryan-Mar – Airfield & Search and Rescue⁴⁶⁹

Vorkuta – Airfield & Search and Rescue⁴⁷⁰

Nadym – Airfield & Search and Rescue⁴⁷¹

Yamal-Nenets – Infantry Base⁴⁷²

Alykel – Airfield & Search and Rescue⁴⁷³

Tiksi – Airfield & Search and Rescue, Air Defense⁴⁷⁴

Pevek – Airfield & Search and Rescue⁴⁷⁵

Provideniya – Airfield & Search and Rescue⁴⁷⁶

Anadyr-Ugolny – Airfield & Search and Rescue, Electronic Warfare & ⁴⁷⁷

⁴⁶³ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁶⁴ “Russia Setting Up Another Arctic Sea Defence Base,” MarineLink, 2014, <http://www.marinelink.com>

⁴⁶⁵ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁶⁶ Staalesen, Atle, “FSB opens new military complex,” The Barents Observer, 9 August 2016, <http://barentsobserver.com>

⁴⁶⁷ Staalesen, Atle, “FSB opens new military complex,” The Barents Observer, 9 August 2016, <http://barentsobserver.com>

⁴⁶⁸ Staalesen, Atle, “FSB opens new military complex,” The Barents Observer, 9 August 2016, <http://barentsobserver.com>

⁴⁶⁹ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁷⁰ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁷¹ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁷² Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁷³ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁷⁴ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁷⁵ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁷⁶ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

⁴⁷⁷ Gramer, Robbie, “Here’s What Russia’s Military Build-Up in the Arctic Looks Like,” The Cable, 25 January 2017, <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>

Reactivation of Cold War Bases

- Russia is “reactivating Cold War bases and deploying some 6,000 military personnel along the length of the arctic frontier.”⁴⁷⁸ The US Naval Institute reports that Russia is planning a series of “dual use” naval facilities across the entire Arctic coast that will be available to commercial craft, the border service, and the navy’s Northern Fleet. From West to East, the possible sites are: Murmansk, Archangelsk, Naryan-Mar, Vorkuta, Nadym, Dudink, Tiksi, Pevek, Provideniya, Anadyr. These may be co-located with a string of “emergency rescue centres” which had earlier been announced.⁴⁷⁹

Research Station in development⁴⁸⁰

- Russian Armed Forces have plans to develop an Arctic research station with branches in Arkhangelsk, Priozersk, and St. Petersburg.

Counterterrorism Headquarters in Murmansk⁴⁸¹

- “In December 2015, plans were announced to found a counterterrorism headquarters in Murmansk.”

The North Pole research platform

- Key investment noted in Russia’s revised Arctic Program (covering years present – 2020)⁴⁸²
- Ice-class drifting platform to be used by Russian Armed Forces for Arctic research⁴⁸³
- “The platform has a preliminary price tag of seven billion rubles and will consequently consume more than half of the program budget.”⁴⁸⁴
- As of October 2017, the Admiralty Yard in St. Petersburg was bidding for the contract.⁴⁸⁵

Forward Military Infrastructure⁴⁸⁶

- According to Russian Northern Fleet command spokesman Andrey Korablev, “We [the Russian Northern Fleet] plan to create a military infrastructure on virtually all of the archipelagos and islands of the Arctic Ocean in order to create a unified system of monitoring above-water and underwater environments.”
- Putin said, “Moscow must safeguard every part of Russian Arctic shelf.” Further, Putin urged the strengthening of military infrastructure, saying “we should strengthen the military infrastructure. Specifically, I’m referring to the creation of a united system of naval bases for ships and next-generation submarines in our part of the Arctic.”⁴⁸⁷

Forward Arctic Aerodrome Upgrade

- According to Commander-in-Chief of the Russian Air Force, Col.-General Viktor Bondarev upgrades are planned for a Russian Arctic aerodrome “to receive Ilyushin Il-76 heavy military transport planes. Plans are afoot to make the Temp aerodrome on the Kotelny Island of the New Siberian Islands archipelago off Yakutia suitable for Il-76 aircraft.”⁴⁸⁸

New Arctic Territory Discovered - Yaya Island

- Located in the Laptev Sea, a tiny island named Yaya Island was discovered. The island is approximately 500 square meters in size and now part of Russian territory. The claim of Yaya Island is another step towards Russia’s presence and resurgence on the arctic.⁴⁸⁹ Russian pilots discovered the location of the island in October 2014, and the location was confirmed by the Admiral Vladimirskiy research ship.⁴⁹⁰

⁴⁷⁸ Rogoway, Tyler, “Russia Annexes and Deploys Forces to Tiny but Strategic Arctic Island,” Foxtrot Alpha blog, 26 October 2014, <http://foxtrotalpha.jalopnik.com>

⁴⁷⁹ Adomanis, Mark, “Russia Plans Massive Arctic Expansion,” USNI, 9 August 2012, <http://news.usni.org>

⁴⁸⁰ Brown, Daniel, “Russia is planning to build an Arctic military research centre to further its polar buildup,” Business Insider, 27 May 2017, <http://www.businessinsider.com>

⁴⁸¹ Korpela, Aleks, “Of fire and ice: Russia’s militarization of the Arctic,” The Nato Association of Canada, 4 February 2016, <http://natoassociation.ca>

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⁴⁸⁵ Staalesen, Atle, “Russian Arctic research on thin ice,” 9 October 2017, The Independent Barents Observer, <https://thebarentsobserver.com>

⁴⁸⁶ “A military infrastructure will be created in the Arctic archipelagos of Russia,” Arctic Info, 21 May 2014, <http://www.arctic-info.com/>

⁴⁸⁷ “Russia to create united naval base system for ships. Subs in Arctic-Putin,” RT News, 22 April 2014, <http://rt.com>

⁴⁸⁸ “Russian Arctic island to serve as base for military transport planes,” ITAR TASS Russia News Agency, 2014, <http://en.itar-tass.com>

⁴⁸⁹ Rogoway, Tyler, “Russia Annexes and Deploys Forces to Tiny but Strategic Arctic Island,” Foxtrot Alpha blog, 22 October 2014, <http://foxtrotalpha.jalopnik.com>

⁴⁹⁰ Su, Reissa, “Russia to Reactivate Former Soviet Union Bases in Arctic Border in Response to NATO,” International Business Times, 22 October 2014, <http://www.ibtimes.com>

Emergency rescue centres⁴⁹¹

- “According to the Ministry of Civil Defense, Emergencies and Disaster Relief (EMERCOM), which oversees the centers, Russia currently operates four centers in the Arctic located in Murmansk, Arkhangelsk, Dudinka, and Naryan-Mar, which opened between 2013-2016.”
- “Russia announced plans to open two additional emergency rescue centers along the Northern Sea Route (NSR). The new centers will be located in Pevek and Anadyr in the Chukotka region and will provide additional search and rescue capabilities along the Arctic shipping route.”

Military logistics base in Arkhangelsk⁴⁹²

- Will provide navy support for increasingly challenging engagement in the Arctic
- Will be built on 140 acre plot outside of sea port of Ekonomia
- Due to be completed by 2020

1.2 Equipment

1.2.1 Air

The Russian governmental military-industrial commission proposes to deploy, beginning in 2016, a series of airships in Arctic regions, designed for surveillance of oil installations and military objects. The airships would be equipped with thermal cameras, laser devices, radio locators and video cameras. The commission promotes the idea as a highly cost-efficient means of monitoring Arctic developments.⁴⁹³

In late 2013 the Russian Northern Fleet late opened the airfield at Kotelny, one of the main islands at the archipelago, which had housed a research station that was abandoned in 1993. The new base will protect offshore oil and gas resources in the area and keep an eye on the growing number of ships sailing along the Northern Sea Route. In March 2014, 350 Paratroopers were dropped on the island of Kotelny to demonstrate Russian capacity to operate in Arctic conditions.⁴⁹⁴

Russia’s new Northern Fleet battalion has been launched and unmanned aerial vehicles are flying over Russian Arctic waters. They have ranges of 10 to 150 km. “Thanks to advanced video and photo equipment, the drones can give their operators accurate information about the movements of enemy forces both at daytime and night time”, the Northern Fleet reports.⁴⁹⁵

Russia is currently testing a new unmanned helicopter that “can perform both reconnaissance and combat functions for use by the Russian army... The new machine is built on a co-axial scheme and has a take-off weight of up to 500 kg (1,102 pounds). It is equipped with a diesel engine.” According to the head of Russian Helicopters, “The new helicopter can be useful for ice exploration of the Northern Sea Route and other similar routes that pass through the Arctic region. We see a great demand for it already, so we hope that a [civilian] series production of the new model will be started during the next 1 to 1.5 years.”⁴⁹⁶

⁴⁹¹ Humpert, Malte, “Two new Arctic emergency centres open along the Northern Sea Route,” high North News, 30 January 2017, <http://www.highnorthnews.com>

⁴⁹² Staalesen, Atle, “As Navy steps up Arctic operations, a military logistics base is built in Arkhangelsk,” The Barents Observer, 30 November 2017, <http://barentsobserver.com>

⁴⁹³ Staalesen, Atle, “Airships for Russian Arctic patrol,” The Barents Observer, 12 March 2014, <http://barentsobserver.com>

⁴⁹⁴ Staalesen, Atle, “Arctic here we come! Russia drops 350 paratroopers over the far northern New Siberian Islands in one of the country’s biggest airdrop operations in the Arctic ever,” The Barents Observer, 17 March 2014, <http://barentsobserver.com>

⁴⁹⁵ Staalesen, Atle, “First Northern Fleet drones taking off,” The Barents Observer, 4 April 2014, <http://barentsobserver.com>

⁴⁹⁶ Gerden, Eugene, “Russia is Testing a Powerful New Unmanned Helicopter,” Rotor & Wing International, 15 March 2018, <http://www.rotorandwing.com>

Northern Fleet Aircraft⁴⁹⁷

Su-33 Fighter (18)



Photo Credit: Su-33 Fighter,
http://commons.wikimedia.org/wiki/File:Russian_Navy_Sukhoi_Su-33.jpg

Su-30SM (2)

“Compared with its predecessors, the Su-30SM has a far bigger flight range.”⁴⁹⁸



Photocredit: Su-30SM
<http://www.airforce-technology.com/projects/su-30sm-multirole-fighter-aircraft/>

Su-25 Ground Attack Fighters (5)



Photo Credit: Su-25 UB, used for combat and training,
http://commons.wikimedia.org/wiki/File:Russian_Air_Force_Su-25.jpg

⁴⁹⁷ “The Military Balance 2012,” IISS, 7 March 2012, <https://www.iiss.org>

⁴⁹⁸ Staalesen, Atle, “New fighter jets for Northern Fleet,” The Barents Observer, 3 January 2017, <http://barentsobserver.com>

Tu-142 Anti-Submarine Warfare (13)



Photo Credit: Sergey Krivchikov, *Tu-142 Anti-Submarine Warfare*,
<http://www.airliners.net/photo/India--Navy/Tupolev-Tu-142/1184007/L/>

- “It is expected that the Navy pilots of the Northern Fleet in 2018 will significantly expand the geography of the Arctic flights.”⁴⁹⁹
 - “In the course of 2017, more than 70 air patrols with aircrafts Tu-142 and Il-38 were conducted over Arctic waters, [the press services of the Northern Fleet informs](#).”⁵⁰⁰

Tu-160M2 Blackjacks 2023



Photocredit: *Military-today.com*, *Tu-160M2*
<http://www.military-today.com>

- “In 2015 it was announced that Russian MoD plans to relaunch production of the Tu-160. Newly build bombers will be fitted with new engines, new radars and new avionics.”⁵⁰¹
- “Serial production of the Tu-160M2 is to be implemented starting from 2023,” said Russian deputy defence minister Yury Borisov in July of 2015.⁵⁰²
- Update November 2017: “We plan that the aircraft will be built already in 2019. Serial deliveries should begin in 2023 while we plan to carry out the first flight of the Tu-160M2, which has been rolled out of the workshop today, in February next year,” said Deputy Prime Minister Dmitry Rogozin reported to President Vladimir Putin.⁵⁰³

⁴⁹⁹ Staalesen, Atle, “Russian Navy announces it will significantly expand Arctic air patrols,” *The Independent Barents Observer*, 2 January 2017, <https://thebarentsobserver.com>

⁵⁰⁰ Staalesen, Atle, “Russian Navy announces it will significantly expand Arctic air patrols,” *The Independent Barents Observer*, 2 January 2017, <https://thebarentsobserver.com>

⁵⁰¹ “Tupolev TU-160 Blackjack,” *Military-Today.com*, <http://www.military-today.com>

⁵⁰² Novichkov, Nikolai, “Russia’s future PAK DA bomber to be delayed by Tu-160M2 production,” *IHS Janes Defence Weekly*, 21 July 2015, <http://www.janes.com>

⁵⁰³ “Russia’s upgraded Tu-160 strategic bomber to make debut flight in February 2018,” *TASS*, 16 November 2017, <http://tass.com>

Il-38 Maritime Patrol (14)

Il-20 Electronic Warfare and Electronic Intelligence

Il-112V Light Military and Transport plane⁵⁰⁴



Photo Credit: Marina Lystseva, TASS, Mock-up of the Il-112V
<http://tass.com/defense/948235>

- “Russia will begin the trials of its new Ilyushin Il-112V military transport plane at the end of this year...”
- “The plane is expected to be rolled out in two modifications: for civil aviation (the Il-112T) and military transport aviation (the Il-112V). It was reported earlier that the Russian Defense Ministry wanted to order 62 such planes.”

Tu-134 Transport



Photo Credit: Gennady Misko, Tu-134 Transport
http://commons.wikimedia.org/wiki/File:MAGAS_Kosmos_Tupolev_Tu-134_Misko.jpg

Ka-27 Anti-Submarine Warfare Helicopters



Photo Credit: US Navy, Ka-27 Anti-Submarine Warfare Helicopter
http://commons.wikimedia.org/wiki/File:Kamov_Ka-27PS.JPG

⁵⁰⁴ “Russia to begin trials of new military transport plane in late 2017,” TASS, 29 May 2017, <http://tass.com>

Ka-29 Transport Helicopters

- Aircraft in the Russian Arctic support the Northern Fleet or northern Russia
- Many do not have the range to operate in the Arctic area beyond Russian territory

Mil Mi-8AMTSh-VA rotorcraft



Photo Credit: Mark Agnor, Sputnik News, Mil Mi-8AMTSh-VA rotorcraft
<http://sputniknews.com/russia/20160319/1036576005/russia-helicopter-arctic.html>

- In March 2016, the Northern Fleet accepted its first polar-optimised Mil Mi-8AMTSh-VA rotorcraft, with capability to operate in temperatures down to -40°C and fly out to 1,300km using auxiliary fuel tanks.⁵⁰⁵
- “Compared to the basic version of the MI-8 helicopter, the Arctic model has better thermal isolation, and is equipped with cutting-edge navigation and radio equipment (including an inertial navigation system that does not rely on a satellite signal), and engine and transmission heating systems for starting helicopter engines in temperatures below -40C .”⁵⁰⁶
- The Russian military will reportedly receive 5 more in 2017, which are custom-made for Arctic conditions.⁵⁰⁷ As of July 2017, 2 of 5 were already received.
- “The contract for the helicopters was signed in February 2015 and is being fulfilled via the Ulan-Ude Aviation Enterprise, in a deal that will provide helicopter deliveries until 2020, according to Tass.”⁵⁰⁸

Mil Mi-38 rotorcraft⁵⁰⁹

- Russian military is launching new Mil Mi-38 helicopters, the first (an Mi-38T) to be delivered by 2018.
- “They will have an explosion-proof fuel system, extra fuel tanks for longer range, special communications systems, and maritime SAR equipment.”

Tu-142 and Il-38 maritime Reconnaissance Aircraft resumed regular missions near or over the Arctic in 2007⁵¹⁰

- Long-range Tu-22 bombers resumed patrols beyond Russia in 2007⁵¹¹, currently 100-120 in service in Northern Fleet.⁵¹²
- In 2012 Russia announced its intention to return to Arctic airfields that were closed after the end of the Cold War
 - Novaya Zemlya
 - Naryan-Mar
 - Graham Bell Island⁵¹³
 - These plans were later modified – earlier plans to base MiG-31 aircraft in Novaya Zemlya were reversed in February 2013.⁵¹⁴
- A squadron of Mig-31 long-range fighter interceptors are to be stationed on the Novaya Zemlya archipelago in the Arctic.⁵¹⁵

⁵⁰⁵ Stevenson, Beth, “Russian military accepts Arctic Mi-8”<https://www.flightglobal.com/news/articles/russian-military-accepts-arctic-mi-8-rotorcraft-419559/>

⁵⁰⁶ “Russian Defense Ministry gets two helicopters designed for the Arctic,” The Arctic, 7 July 2017, <http://arctic.ru>

⁵⁰⁷ Ziezulewicz, Geoff, “Russia getting helicopters for Arctic operations,” 25 May 2016, United Press International, <http://www.upi.com>

⁵⁰⁸ Ziezulewicz, Geoff, “Russia getting helicopters for Arctic operations,” United Press International, 25 May 2016, <http://www.upi.com>

⁵⁰⁹ “Russian military becomes launch customer for Mi-38,” Russian Aviation Insider, 26 August 2017, <http://www.rusaviainsider.com/russian-military-becomes-launch-customer-mi-38/>

⁵¹⁰ Wezeman, Siemon, T., “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012, p. 9.

⁵¹¹ Huebert, Rob, Exner-Pirot, Heather, Lajeunesse, Adam, and Gullledge, Jay, “Climate Change and International Security: The Arctic as a Bellwether,” Center for Climate and Energy Solutions, 2012, <http://www.c2es.org/docUploads/arctic-security-report.pdf>

⁵¹² Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

⁵¹³ “Russia to Reopen Arctic Airbases,” RIANOVOST, 30 May 2012. http://en.rian.ru/military_news/20120530/173757083.html

⁵¹⁴ Pettersen, Trude, “Russia drops Arctic air force plans,” The Barents Observer, 4 February 2013, <http://barentsobserver.com>

⁵¹⁵ Kislyakov, Andrei, “Russia deploys Arctic troops,” RBTH, 2 November 2012, <http://rbth.ru>

Forward S-400 Triumf anti-aircraft weapon system

- A new regiment of air defense missile systems for the newly-created Arctic Command
- Deployed in 2015 on the Novaya Zemlya archipelago:
 - An officer from the Russian General Staff told TASS during the 5th Arctic Today and Tomorrow International Forum that, "Two S-400 regiments have been activated and deployed to the Novaya Zemlya Archipelago and the city of Tiksi in Yakutia this year under the program on reinforcing the 2014-formed Arctic force, with the program dubbed Northern Fleet - Unified Strategic Command."⁵¹⁶
- Early in 2014 an air defense unit based in the Kola Peninsula was equipped with S-400 missile systems.⁵¹⁷
 - Russian Armed Forces inform that, in 2017, another unit equipped with the S-400 will become operational on the Kola Peninsula.⁵¹⁸
- Two S-400 anti-aircraft missile systems have been moved towards the Finnish border "to replace the older S-300 rockets".⁵¹⁹

Forward Deployment of MiG-31 Interceptors



Photo Credit: Dmitry Pichugin Russian Air Force MiG-31 BM,
<http://www.airliners.net/photo/Russia---Air/Mikoyan-Gurevich-MiG-31BM/2126525/L/>

- Russia is deploying its fastest interceptors, the MiG-31, to a Northern air base. According to RIA Novosti: "Starting from 2017, the Russian Air Force will base MiG-31 interceptor jets and tactical aircraft at a Russian Arctic airfield in the urban settlement of Tiksi in northernmost Sakha Republic, Commander Col. Gen. Viktor Bondarev said Wednesday."⁵²⁰

SA-22 Pantsir-S1 Short-range air defence system



Photocredit: military-today.com, SA-22 Pantsir-S1
<http://www.military-today.com/missiles/pantsvr.htm>

- As of August 2015, TASS reported that Russia is building up, and already operating, an advanced tracking system to monitor air and water movement. The system is already widely used by Russian military but has been modified to withstand extreme Arctic conditions.⁵²¹

⁵¹⁶ "Russia deployed two S-400 air defence missile regiments in Arctic in 2015 – General Staff," TASS, 8 December 2015, <http://tass.ru>

⁵¹⁷ "Russia to deploy regiment of S-400 launchers on Novaya Zemlaya 2015," TASS, 30 December 2014, <http://tass.ru>

⁵¹⁸ Staalesen, Atle, "Missile complex S-400 on guard in Kola Peninsula," The Barents Observer, 11 January 2017, <http://barentsobserver.com>

⁵¹⁹ "Russia moves missiles to Finnish border," RCINet, 23 September 2016, <http://www.rcinet.ca/>

⁵²⁰ Ballaban, Michael, "Russia is Deploying Its Fastest Interceptors To The Arctic Full-Time," Foxtrot Alpha blog, 16 October 2014, <http://foxtrotalpha.jalopnik.com/>

⁵²¹ Howell, Kellen, "Russia planting new anti-aircraft missiles in Arctic," The Washington Times, 19 August, 2015, <http://www.washingtontimes.com>

- "By the end of this year [2016] already the first samples of the new Pantsir-SA self-propelled anti-aircraft complex designed for combat actions in the Arctic conditions will become operational in the Aerospace Forces and the Northern Fleet," Lt. Gen. Viktor Gumenny told the Russian News Service radio station.⁵²²
- Range of 19 miles and able to function in temperatures as low as -58F⁵²³
- "The newly modified system will likely be mounted on a new chassis developed for [Russia](#)'s third-generation Armata tank", FMSO reported.⁵²⁴

Arctic version of Tor short-range air defense missile system

- Russia is developing, and already operating, an advanced tracking system to monitor air and water movement. The system, developed by Russian defense manufacturer Almaz-Antey, specializes in short-range counterattacks on air and sea missiles.⁵²⁵ Radio-radar units and an air defense [missile regiment](#) equipped with S-300 missile systems were put on combat duty on the Franz Joseph Land, Novaya Zemlya, Severnaya Zemlya and New Siberian Islands archipelagos.⁵²⁶
- In Russia's process of transitioning to the Tor-M2DT anti-missile system for Arctic applications, fire trials were successfully completed in February of 2018.⁵²⁷

Complex Arctic monitoring and control system by 2025⁵²⁸

- RTI Systems Corporation developing a system that can monitor air, water, underwater and land.
- Cost of system estimated at \$93M

Sukhoi T-50s

- "...while flight-testing is not yet complete, UAC expects to sign a contract with the Russian Aerospace Forces to begin serial production of the T-50 in the fall of this year," according to the Russian-language daily *Izvestia*.
- Deliveries of 12 new stealth fighters are set to begin in 2017. Depending on the results of operational testing for these 12, Moscow may decide to invest in more.

Over-the-horizon (OTH) radar technology

- "In 2017, the Russian Defense Ministry plans to buy several radar units for the Navy. They will be deployed in the Arctic, as well as in southern and western Russia," said RTI CEO Sergei Boyev."⁵²⁹
 - Russia will complete its Arctic radar coverage by "deploying state-of-the-art Konteiner and Podsolnukh over-the-horizon radars. These systems will establish a radar field 900 miles to 1,200 miles deep beyond the country's borders, providing protection against surprise aerial and sea-surface attacks."⁵³⁰
- "...simultaneously detects, tracks and identifies up to 300 naval and 100 air targets in automatic mode, calculates their coordinates and guides ship-borne weapons and air defense systems toward them."⁵³¹
 - "It is immune to stealth technology and uses a gigantic antenna array up to five kilometers long and five meters tall, to identify aerial targets 500 kilometers away and sea targets up to 400 kilometers away."⁵³²VRT-300 system (rotorcraft UAVs)⁵³³Russian Helicopters (part of Rostech Corp.) is prototyping helicopter drones for the purpose of Russian ice observation and operation in the Arctic.
 - Designed in two versions:
 - Arctic Supervision has side-looking radar and is designed for the purpose of developing the Northwest Passage's transport system
 - Opticvision is capable of increased flying range is designed to improve "diagnostic assessment, prevention, and liquidation of emergency situations in exploration and transportation of energy sources".

⁵²² "Russian army to get Pantsir-SA systems for Arctic in late 2016," TASS, 20 August 2016, <http://tass.com>

⁵²³ Howell, Kellen, "Russia planting new anti-aircraft missiles in Arctic," The Washington Times, 19 August, 2015, <http://www.washingtontimes.com>

⁵²⁴ Howell, Kellen, "Russia planting new anti-aircraft missiles in Arctic," The Washington Times, 19 August, 2015, <http://www.washingtontimes.com>

⁵²⁵ "Russia building new Tor missile for Arctic defence, TASS reports," Radio Free Europe, 3 March 2016, <http://www.rferl.org>

⁵²⁶ Staalesen, Atle, "Russia deploys S-300 in Novaya Zemlya," The Barents Observer, 9 December 2015, <http://www.thebarentsobserver.com>

⁵²⁷ "Russia: successful Arctic fire trials of Tor-M2DT anti-aircraft missiles," Army Recognition, 16 February 2018, <https://www.armyrecognition.com>

⁵²⁸ "Drones and satellites: Russia to create Arctic complex monitoring system by 2025," RT News, 7 August 2015, <https://www.rt.com>

⁵²⁹ "Russian Defense Ministry to deploy Arctic radar in 2017," 27 June 2016, The Arctic, <http://arctic.ru/>

⁵³⁰ Sevryugin, Sergei, "Russia strengthens its radar defenses in the arctic," Russia Beyond the Headlines, 10 February, 2017, <http://rbth.com>

⁵³¹ "Russian Defense Ministry to deploy Arctic radar in 2017," 27 June 2016, The Arctic, <http://arctic.ru/>

⁵³² "All Seeing Eye: Russia Builds Gigantic Military Radar in Arctic," Sputnik News, 29 October 2016, <https://sputniknews.com>

⁵³³ Zhukovsky, "New Russian helicopter drone for Arctic exploration unveiled at MAKS airshow," TASS, 18 July 2017, <http://tass.com>

1.2.2 Land

Russian Defense Minister Sergei Shoigu has ordered increased numbers of new vehicles to the Arctic armed forces. As of April 2016, the ministry has announced “the beginning of shipments of a number of modern and advanced vehicles, including the Taifun, the Bulava, the Bulat, the Volk, and the Tigr-M military multipurpose vehicles.”⁵³⁴

Airfield Reconstruction

- By year 2018, Russia intends to have a total of nine operative Arctic airfields, some of which are under modernization, some under total reconstruction.⁵³⁵

Anti-Missile Radar System in Vorkuta

- Construction of an anti-missile early warning radar station began in September of 2015, and is set to be completed by 2020.
- Can detect any launch from any direction, according to Chief of Staff of the Main Centre for Missile Warning of the Russian Aerospace Forces, Colonel Viktor Tymoshenko⁵³⁶
- To supplement stations in Pechora and Olenegorsk⁵³⁷

The Frigate (UAV)⁵³⁸

- “The Frigate unmanned aerial vehicle (UAV), being developed by the St. Petersburg-based Kronshtadt Group, is expected to become part of the Russian aviation force, which will be deployed in the Arctic region.”
- Currently undergoing trials, and went through first test flight in Moscow region

Possible New Russian Tanks Stationed in Arctic

- Mass production of the T-14 Armata tank will begin in 2018.⁵³⁹ The battle tank is “equipped with a special blend of steel to extremely low temperatures” and is equipped with 44S-SV-SH armor.⁵⁴⁰ The Russian Defense Ministry has not openly declared to locate the tanks in the Arctic, though considering the tank’s technology and the competition for Arctic resources, there is reason to believe they will be deployed there.
- Russia’s 2017 May 9 Victoria Day parade will showcase Arctic modifications to the T-72B3M tank.⁵⁴¹

Forward Radar and Ground Guidance Systems

- Russia plans to “establish radar and ground guidance systems for Cape Schmidt’s Wrangel Island and Franz Josef Land.”⁵⁴²

Forward Drone Squadron

- November 2014 – “A squadron of unmanned aerial vehicles will be deployed in Russia’s Arctic region within a month. The drone grouping will be stationed in the Chukotka autonomous area to serve the control zone in Russia’s Eastern Military District...”⁵⁴³ The first trial flights of the Orlan-10 drones is planned for early 2015. “The drones will ensure sea navigation security and conduct coastal air reconnaissance over Russian territorial waters.”⁵⁴⁴
- November 2015 – “Orlan-10 and Forpost (Outpost) unmanned aerial vehicles are already deployed close to the regional capital of Chukotka, said chief spokesman of the Eastern Military District Alexander Gordeyev.”
 - “The unit will be soon replenished with new airborne devices capable of performing tasks at a distance of more than 1,500 kilometres,” he told TASS.”⁵⁴⁵

⁵³⁴ “Heavy-duty” A look at Russia’s Arctic Forces’ Military Vehicles,” Sputnik News, 10 April 2016, <http://sputniknews.com/tp://www.thebarentsobserver.com>

⁵³⁶ “Russian missile warning system can detect mass launch of ballistic missiles,” Sputnik News, 15 August 2015, <http://sputniknews.com>

⁵³⁷ “Russia begins construction of Anti-Missile Radar in Arctic,” Sputnik News, 3 October 2015, <http://sputniknews.com>

⁵³⁸ “Flight model of Russia’s heavy duty transformer drone undergoes trials,” RT News, 16 May 2016, <https://www.rt.com>

⁵³⁹ “Russia to start churning out Armata tanks in 2018,” Sputnik News, 7 February 2017, <http://sputniknews.com>

⁵⁴⁰ Denis Kungurov (14 November 2014), “Secret new Russian tank could be deployed to Arctic zones,” Russia Beyond the Headlines, <http://rbth.com/>

⁵⁴¹ “Russia rules out arms race in the Arctic but stands firm on its interests,” Sputnik News, 9 April 2017, <http://sputniknews.com>

⁵⁴² Su, Reissa, “Russia to Reactivate Former Soviet Union Bases in Arctic Border in Response to NATO,” International Business Times, 22 October 2014, <http://www.ibtimes.com>

⁵⁴³ “Russia to deploy drone grouping in Arctic region by yearend,” TASS, 27 November 2014, <http://itar-tass.com>

⁵⁴⁴ “Russia’s Arctic group to get Orlan-10 drones by year end,” TASS, 29 December 2014, <http://itar-tass.com>

⁵⁴⁵ “New drone squadron protects Russian interest in the Arctic,” The Siberian Times, 23 November 2016, <http://siberiantimes.com>

Arctic KAMAZ-5350 Trucks

- “Russia's Defense Ministry will get the first 30 KAMAZ trucks for the Arctic in 2018...” which have been adapted for extreme cold climates.⁵⁴⁶

DT-3PM off-roaders

- “Designed for Arctic operations, the DT-3PM two-section tracked armored transporter launched state trials on December 1 2017, an insider told Mil.Today.”⁵⁴⁷
- “DT-3PM was designed for transportation of personnel, weapons and military hardware, towage of artillery systems and army trailers in extremely severe climatic conditions like virgin snows, tundra, woods, swamps, and mountains.”⁵⁴⁸
- Will likely be certified by the end of 2018⁵⁴⁹

Aleut GAZ-3344 amphibious articulated all-terrain vehicles⁵⁵⁰

- “Features high cross-country capability, low average ground pressure, and high power-to-weight ratio.”
- Used by a motor rifle brigade of the Northern Fleet

Arctic version of the BAZ-69092 heavy high-mobility military vehicle⁵⁵¹

- “The arctic option considerably differs from previous Voshchina-1 chassis. It has upgraded life-support systems, chassis and hull constructions for successful operations in the Extreme North and the Arctic.” It is built to work in eternal frost conditions.
- Testing of the vehicle will begin mid-2018 in Yakutia.

Forward 13 Airfields and Air-Ground Firing Range

- October 2014 – The head of the National Defense Management Centre, Lt. Gen. Mikhail Mizintsev, said: ““We are planning to build 13 airfields, an air-ground firing range, as well as ten radar and vectoring posts..” According to the Russian news Izvestia, construction for military facilities has already started.⁵⁵²
- February 2016 – 6 of the 13 airbases have been operational since December 2015. “These are the Nagurskoye and Rogachevo airbases in Russia’s western Arctic, and Sredny Ostrov, Temp, Mys Shmidta, and Zvyozdny airbases in eastern parts.”⁵⁵³

1.2.3 Sea

Russian President Putin, in warning of growing threats of terrorism in the Arctic, has signed into law a new measure to permit oil companies to establish their own armed security forces.

“According to the new legislation, the Russian oil companies will from now on be entitled to establish their own protection units. Newspaper Rossiiskaya Gazeta believes the companies will end up hiring not “one hundred security guards”, but rather “thousands of well-armed people, equipped with automatic weapons, vehicles, vessels and aircrafts”. Most of the people are likely to be former military personnel, police officers and special forces agents, the newspaper writes. President Putin said Russia “will continue to invest significant means in the Arctic, strengthen security and resolve problems connected with the social and economic development of the region.”⁵⁵⁴

In April of 2016, commander-in-chief of Russia’s Navy, Admiral Vladimir Korolyov, stated that, “the total strength of Russia’s naval forces in the Arctic and the World Ocean currently stands at 100 combat and logistics ships.”⁵⁵⁵

⁵⁴⁶ “Russian Defense Ministry to get first 30 Arctic KAMAZ trucks in 2018,” The Arctic, 24 August 2017, <http://arctic.ru>

⁵⁴⁷ “Arctic tractor with new engine kicked off state trials.” Mil.Today , 12 December 2017, <http://mil.today>

⁵⁴⁸ “Arctic tractor with new engine kicked off state trials.” Mil.Today , 12 December 2017, <http://mil.today>

⁵⁴⁹ “Second Arctic Rover to Complete Trials by Yearend,” Military Today, 20 April 2018, <http://mil.today>

⁵⁵⁰ “Russian military beefs up all-terrain capabilities,” Army Recognition, 18 March 2018, <http://www.armyrecognition.com/>

⁵⁵¹ “Arctic prototype of the BAZ-69092 soon to be tested in Russia,” Army Recognition, 12 April 2018, <http://www.armyrecognition.com/>

⁵⁵² Nilsen, Thomas, “Arms the Arctic with 13 new airfields,” The Barents Observer, 29 October 2014, <http://barentsobserver.com>

⁵⁵³ Korpela, Aleks, “Of fire and ice: Russia’s militarization of the Arctic,” The Nato Association of Canada, 4 February 2016, <http://natoassociation.ca>

⁵⁵⁴ Staalesen, Atle, “Russian military builds four more Arctic bases,” The Barents Observer, 23 October 2015, <http://www.thebarentsobserver.com>

⁵⁵⁵ “Russian Naval Presence in the Arctic, World Ocean goes up to 100 ships – commander,” TASS, 21 April 2016, <http://tass.ru>

Naval vessels assigned to the Northern Fleet

The Northern Fleet holds 42 of Russia's 72 submarines, including 8 of its 13 ballistic missile submarines (SSBNs), 4 of its 9 cruise missile submarines (SSGN), and 38 major surface combatants, including Russia's largest aircraft carrier, the Kuznetsov and the large cruiser Pyotor Veliki.⁵⁵⁶

Submarines

Vice Admiral Clive Johnstone, Commander of NATO's Maritime Command, reported in February 2016 that NATO is seeing Russian submarine activity in the North Atlantic return to Cold War levels. NATO's top naval commander also noted that Russian submarines have made a major jump in technical capability.⁵⁵⁷

SSBN (nuclear powered and nuclear armed ballistic missile subs – 9)

- Developments:
 - More active since 2009 (when one broke up through ice and launched a ballistic missile)⁵⁵⁸
 - Some SSBNs are being modernized, while major new construction is underway
 - Modernized vessels:
 - In late 2017, the first of the four upgraded Borei-class submarines (Project 955A) the *Knyaz Vladimir*, was floated out to join the existing Delta-IV subs in the Northern Fleet. It will start sailing with the navy by the end of 2018.⁵⁵⁹
 - New vessels:
 - According to official data in March 2017, there are two new Borei-class submarines — the Yuri Dolgoruky and the Vladimir Monomakh — in service with the Northern Fleet. One entered the Northern Fleet in January 2013, and the second entered in December 2013.⁵⁶⁰
 - Both operate out of the Northern Fleet's main nuclear submarine base in Gadzhiiyevo.⁵⁶¹
 - "Starting 2020, the Borei-class submarines will be the main naval component in the Russian nuclear strategic deterrence forces,"⁵⁶² and will replace the aging Typhoon, Delta-3 and Delta-4 class boats.⁵⁶³
 - Planning eight Borey subs by 2020, each to carry 16 to 20 missiles (each missile containing 6 nuclear warheads).⁵⁶⁴
 - Two nuclear submarines of the Russian Northern Fleet held an underwater torpedo duel in the Barents Sea. Yuri Dolgoruky dueled against the multipurpose Obninsk submarine in a combat training in March 2017.⁵⁶⁵

SSN (nuclear powered attack subs, not nuclear armed – 13)

- Developments:
 - September 2014 – Russia is building new Yasen-class submarines. The first Yasen joined the Northern Fleet in June and is called the Severodvinsk. Three additional vessels are supposed to follow, which will phase out the Soviet-era Akula and Alfa-class attack submarines⁵⁶⁶
 - In December 2012 the first of its new Yasen Class cruise missile SSN's undertook a new round of sea trials⁵⁶⁷
 - Can potentially carry nuclear armed missiles
 - Will likely be one of the vessels equipped with the new Futlyar torpedo Russia is testing⁵⁶⁸

⁵⁵⁶ "Many of these vessels are not based in the Northern Fleet for Arctic strategic/security purposes, but rather relate to Russia's engagements more broadly, e.g. its SSBNs." <https://www.state.gov/documents/organization/262585.pdf>

⁵⁵⁷ De Larrinaga, Nicholas, "Russian submarine activity topping Cold War level," 2 February 2016, IHS Jane's Defence Weekly, <http://www.janes.com>

⁵⁵⁸ Huebert, Rob; Exner-Pirot, Heather; Lajeunesse, Adam; Gullidge, Jay, "Climate Change and International Security: The Arctic as a Bellwether," Center for Climate and Energy Solutions, May 2012, p. 18, <http://www.c2es.org/docUploads/arctic-security-report.pdf>

⁵⁵⁹ Nilsen, Thomas, "First upgraded Borei-class submarine ready for launch," The Independent Barents Observer, 6 November 2017, www.thebarentsobserver.com

⁵⁶⁰ "Russian nuclear submarines hold underwater torpedo 'duel' in Arctic," Sputnik News, 12 March 2017, <https://sputniknews.com>

⁵⁶¹ Pettersen, Trude, "Two new nuclear-powered submarines to Northern Fleet, The Barents Observer, 3 January 2013, <http://barentsobserver.com>

⁵⁶² "Borei-class submarines: Principal component of Russia's nuclear triad," Sputnik News, 15 December 2016, <https://sputniknews.com>

⁵⁶³ Pettersen, Trude, "Two new nuclear-powered submarines to Northern Fleet, The Barents Observer, 3 January 2013, <http://barentsobserver.com>

⁵⁶⁴ Digges, Charles, "Launch of new Russia sub class to put more nuclear missiles at sea, The Bellona Foundation, 14 January 2013, <http://www.democraticunderground.com>

⁵⁶⁵ "Russian nuclear submarines hold underwater torpedo 'duel' in Arctic," Sputnik News, 12 March 2017, <https://sputniknews.com>

⁵⁶⁶ Bodner, Matthew, Eremenko Alexey, "Russia Starts Building Military Bases in the Arctic," The Moscow Times, 8 September 2014, <http://www.themoscowtimes.com/>

⁵⁶⁷ Huebert, Rob; Exner-Pirot, Heather; Lajeunesse, Adam; Gullidge, Jay, "Climate Change and International Security: The Arctic as a Bellwether," Center for Climate and Energy Solutions, May 2012, p. 32, <http://www.c2es.org/docUploads/arctic-security-report.pdf>

⁵⁶⁸ Staalesen, Atle, "Navy takes on new torpedo," 30 June, 2016, The Barents Observer, <http://thebarentsobserver.com/>

- Sea trials to date have disclosed extensive flaws in a ship experiencing missed deadlines and cost over-runs⁵⁶⁹
- The operational radius of the northern submarine fleet has been expanded to include much of the Arctic Ocean⁵⁷⁰



Photo Credit: US Navy, Russian Northern Fleet Victor III, [http://commons.wikimedia.org/wiki/File:Victor III class submarine 1997.jpg](http://commons.wikimedia.org/wiki/File:Victor_III_class_submarine_1997.jpg)

SSK (attack submarines with anti-submarine warfare capability – not nuclear powered – 7)

SSAN (submersible auxiliary support vessel – nuclear powered – 7)

SSGN (cruise missile attack submarines)

SSA (submersible auxiliary support vessel – not nuclear powered)

- Much of Russia's naval redevelopment is focused on capabilities for operations in the north, but not necessarily focused on Arctic patrols.

Nuclear-powered research submarine

- "Russian Navy to commission Project 09852 KS-139 Belgorod special mission submarine in 2018"⁵⁷¹
- "Can be used for both military and civilian purposes along the Arctic shelf"⁵⁷²

Strategic nuclear warheads based in the Arctic (192)

In March 2012, reporting under the New START agreement, Russia indicated that there are 6 Delta IV SSBNs deployed with the Northern Fleet

- Each is capable of carrying 16 missiles for a total of 96 missiles
- Each missile is capable of carrying 4 nuclear warheads for a total of 384
- Because 3 of the Delta IV subs were then undergoing overhauls, a total of 192 nuclear warheads were deployed in Russia's Arctic at the time.⁵⁷³

According to TASS, "Podmoskovye (NATO reporting name Delta-IV) was launched on 11 August 2015 after undergoing "in-depth modernization" at the Zvezdochka shipyard in Severodvinsk since 1999."⁵⁷⁴

⁵⁶⁹ Digges, Charles, "Shaky Severodvinsk nuclear sub sets to sea for trials – again," The Bellona Foundation, 5 November 2012, <http://www.bellona.org>

⁵⁷⁰ Huebert, Rob; Exner-Pirot, Heather; Lajeunesse, Adam; Gulledge, Jay, "Climate Change and International Security: The Arctic as a Bellwether," Center for Climate and Energy Solutions, May 2012, p. 32, <http://www.c2es.org/docUploads/arctic-security-report.pdf>

⁵⁷¹ "Project 09852 Belgorod," Naval Forces News, 27 April 2017, <http://www.navyrecognition.com>

⁵⁷² Nilsen, Thomas, "Now, Russia builds a submarine even bigger than the Typhoon," The Barents Observer, 3 May 2017, <https://thebarentsobserver.com>

⁵⁷³ "Russian strategic nuclear forces: Current Status", RussianForces.org, last modified March 2012, <http://russianforces.org/navy/>

⁵⁷⁴ Pettersen, Trude, "Russian nuclear submarine launched after modernization," The Barents Observer, 13 August 2015, <http://barentsobserver.com>

- “Podmoskovye” will probably be used as carrier for the “*Losharik*” deep diving titanium submarine.⁵⁷⁵ “Russia resumed testing of the submarine-launched ballistic missile Bulava this summer. The country’s two newest strategic nuclear-powered submarines will start trials as soon as the ice conditions in the White Sea will allow.” The



Photo Credit: US Navy, Submarine Delta IV class

http://commons.wikimedia.org/wiki/File:Submarine_Delta_IV_class.jpg

Vladimir Monomakh and *Alexander Nevsky* “will conduct four single launches of the Bulava missiles this summer. The test will be conducted from the usual exercise area in the White Sea to the Kura test site in Russia’s far-eastern Kamchatka territory, ITAR-TASS reports.” A September 2013 launch failed and further trials were then halted. “Test launches of the Bulava have been experiencing significant problems. Of the 19 or 20 test launches that have been done since 2004 eight have been officially declared unsuccessful. However, some analysts suggest that in reality the number of failures is considerably higher.”⁵⁷⁶ September 2016 - Vladimir Monomakh, the third ballistic missile submarine of the Project 955 class, “was expected to conduct a salvo launch of Bulava missiles in June 2016, but it has left without launching the missiles. It is possible that it will launch the missiles from the Pacific, but maybe it won’t - at the time Alexander Nevskiy arrived in the Pacific it was reported that it will conduct a launch from there, but it didn’t.”⁵⁷⁷ The first November 2015 launch was not successful as one of the missiles was reported to have malfunctioned.⁵⁷⁸

Russia has increased the operational radius of its Northern Submarine Fleet by re-establishing its Northern Fleet base in Alakurtti, the small town located about 50 km from the border to Finland. The base will be home to about 3000 radioelectronics experts. Since 2009 the base has hosted only a border guard unit. A key objective for the new base personnel will be to keep track of international air activities in the Arctic, according to a report in *Izvestia*.⁵⁷⁹ For more information see ‘Forward Military Base – Alakurtti Village’.

Project 23120 – Elbrus class⁵⁸⁰

- Lead vessel in this class joined the Northern Fleet in April 2018.
 - “From now on, the ship is listed in the group of support vessels of the united strategic command of the Northern Fleet,” said Captain First Class Vadim Serga
- Combines rescue tug and transport ship capabilities

Underwater Drones

Klavesin-2R-PM⁵⁸¹

- Russia’s new underwater drone for Arctic waters announced in Rubin Central Design Bureau of Marine Technology’s 2015 annual report
- Can dive 6,000 meters and is intended for research

⁵⁷⁵ Pettersen, Trude, “Russian nuclear submarine launched after modernization,” *The Barents Observer*, 13 August 2015, <http://barentsobserver.com>

⁵⁷⁶ Pettersen, Trude, “Russia to resume Bulava tests,” *The Barents Observer*, 15 April 2014, <http://barentsobserver.com>

⁵⁷⁷ “Vladimir Monomakh begins transfer to the Pacific,” *Russian Strategic Nuclear Forces*, last modified 16 August 2016, <http://russianforces.org>

⁵⁷⁸ “Salvo Bulava launch from Vladimir Monomakh - second attempt expected in June,” *Russianforces.org*, 11 March 2016, <http://russianforces.org>

⁵⁷⁹ Staalesen, Atle, “Moving 3000 intelligence officers to Finnish border,” *The Barents Observer*, 14 March 2014, <http://barentsobserver.com>

⁵⁸⁰ “Elbrus logistics support ship joins Russia’s Northern Fleet,” *The Arctic*, 10 April 2018, <https://arctic.ru>

⁵⁸¹ Nilson, Thomas, “This is Russia’s new unique underwater drone for Arctic waters,” *The Barents Observer*, 12 July 2016, <http://thebarentsobserver.com>

- “6,5 m long, 1 metre diameter, has a weight of 3,7 tons and a maximum cruising range of 50 km from its mother vessel,” according to a livejournal blog discussing Russian military news.
- Rubin Director Igor Villeneuve says Klavesin-2R-PM has “increased autonomy and depth in addition to surveillance and search functions.”

Surface Ships

Aircraft Carriers

- Russia’s Navy currently only has one aircraft carrier, *Admiral Kuznetsov*, which is part of the Northern Fleet⁵⁸²
 - Will be getting upgrades in 2017, including advanced electronics, radar, and onboard navigation gear.⁵⁸³



Photocredit: Rubin Design Bureau
<http://thebarentsobserver.com>

- Additionally, plans for the building of a new vessel to replace the Kuznetsov have formed. However, the contract to build the Shtorm (heavy aircraft carrier) is on hold and likely won’t be signed until 2025.⁵⁸⁴
- There are plans for “five or six carrier battle groups,” most of which would be based in northern waters.⁵⁸⁵
 - These new carriers are to be smaller than Russia’s current ship, a more versatile combat ship, say some reports, that could include drones.⁵⁸⁶
 - *Admiral Gorshkov*, the first ship of Project 22350, is one example of these new aircraft carriers. She weighs 500 tons and is 135 meters long⁵⁸⁷, and will be commissioned into the Northern Fleet in August 2018.⁵⁸⁸
 - “The Admiral Gorshkov was designed with universality in mind, with the “capability to combat surface ships and submarines with equal effectiveness, attack land-based targets with high-precision weapons, resist aircraft of the probable enemy, carry out reconnaissance by taking advantage of its low visibility characteristics, and much more.”⁵⁸⁹
 - Admiral-series vessels are expected to become the backbone of the navy’s presence of the coming years, according to Sputnik News.⁵⁹⁰

⁵⁸² “Phasing NATO out of the Arctic: Russia arming up Northern Fleet with new weapons,” Sputnik News, 1 June 2017, <https://sputniknews.com>

⁵⁸³ “Phasing NATO out of the Arctic: Russia arming up Northern Fleet with new weapons,” Sputnik News, 1 June 2017, <https://sputniknews.com>

⁵⁸⁴ “Phasing NATO out of the Arctic: Russia arming up Northern Fleet with new weapons,” Sputnik News, 1 June 2017, <https://sputniknews.com>

⁵⁸⁵ Huebert, Rob; Exner-Pirot, Heather; Lajeunesse, Adam; Gullede, Jay, “Climate Change and International Security: The Arctic as a Bellwether,” Center for Climate and Energy Solutions, May 2012, p. 18, <http://www.c2es.org/docUploads/arctic-security-report.pdf>

⁵⁸⁶ Litovkin, Viktor, “Russian Navy plans further expansion,” Russia and India Report, 14 January 2013, <http://indrus.in>

⁵⁸⁷ Staalesen, Atle, “Rogozin: Aircraft carrier will be ready for long-distance mission,” The Barents Observer, 10 March 2016, <http://www.thebarentsobserver.com>

⁵⁸⁸ “How new Admiral-series super-frigates will help project Russian naval power,” Sputnik News, 17 February 2018, <https://sputniknews.com/>

⁵⁸⁹ “How new Admiral-series super-frigates will help project Russian naval power,” Sputnik News, 17 February 2018, <https://sputniknews.com/>

⁵⁹⁰ “How new Admiral-series super-frigates will help project Russian naval power,” Sputnik News, 17 February 2018, <https://sputniknews.com/>

Amphibious Assault Ships



Photo Credit: BPS Dixmude

http://commons.wikimedia.org/wiki/File:BPC_Dixmude.jpg

- Russia ordered Mistral class amphibious assault/helicopter carriers from France in 2010 and 2011 (“the first will be based with the Pacific Fleet and the second with the Northern Fleet”)
- Russia has however cancelled or postponed plans to build two more under licence from France⁵⁹¹
- Designated Vladivostok Class by the Russians, each of the ships is to carry:
 - 30 helicopters
 - Anti-missile cannons
 - Anti-aircraft missiles
 - Grenade launchers
 - 450 marines⁵⁹²
 - The two ships are expected to be delivered in October 2013 and October 2014.⁵⁹³
- As of September 2014, in the wake of the Ukraine crisis, France halted the delivery of a Vladivostok warship to Russia. Following France’s decision, Russia’s Deputy Defence Minister Yury Borisov said, “Although of course it is unpleasant and adds to certain tensions in relations with our French partners, the cancelling of this contract will not be a tragedy for our modernisation.”⁵⁹⁴

Kirov-Class Battlecruiser

Kirov Class (1144.2)⁵⁹⁵



Photo Credit: US Navy, Kirov-class battlecruiser,

http://commons.wikimedia.org/wiki/File:Kirov-class_battlecruiser.jpg

- Ship has capacity for three Kamov Ka-27PL or Ka-25RT helicopters

⁵⁹¹ “Russia postpones building 2 Mistral class amphibious assault ships locally,” Defense Update Blog, 26 December 2012, <http://defenseupdates.blogspot.ca>

⁵⁹² “The Vladivostok Class,” The Strategy Page, 2 April 2013, <http://www.strategypage.com>

⁵⁹³ “Russia’s first Mistral-class ship stern launched,” RT.Com, 26 June 2013, <http://rt.com/news/mistral-ship-stern-russia-261/>

⁵⁹⁴ “Ukraine crisis: France halted warship delivery to Russia,” BBC News, 3 September 2014, <http://www.bbc.com>

⁵⁹⁵ “Kirov Class (Tye 1144.2) (Peter the Great), Russia,” NavalTechnology.com, no date listed, <http://www.naval-technology.com>



Photo Credit: Russian International News Agency, Russian battlecruiser Pyotr Velikiy

http://en.wikipedia.org/wiki/File:RIAN_archive_669522_Long-distance_voyage_of_Pyotr_Veliky_nuclear-powered_cruiser.jpg

- Heavy missile cruiser and flag ship of Russians Northern Fleet
- Ship part of naval patrols to monitor shipping routes in Russian territory
- In 2016, it re-entered service in the Barents Sea after 2 years of reparations. A source from the Russian shipbuilding industry reported that Pyotr Velicky should undergo armament modernization in 2019-2022⁵⁹⁷.

Admiral Nakhimov



Photo Credit: US Navy, Kalinin 1991 now known as Admiral Nakhimov cruiser

http://commons.wikimedia.org/wiki/File:BCGN_Kalinin_1991.jpg

Currently undergoing repairs, but will join the Northern Fleet upon completion.⁵⁹⁸

Admiral Grigorovich-class frigate



Photo Credit: United Shipbuilding Corporation

<http://www.janes.com/article/58801/russian-navy-receives-first-admiral-grigorovich-class-frigate>

- The lead ship of Russia's Project 11356M frigate class, *Admiral Grigorovich*, was commissioned into service March 11 2016.
- Expected to be shipped from the Yantar Shipyard in Kaliningrad to join the Black Sea Fleet in Sevastopol.

⁵⁹⁶ Kramer, Andrew, "Russia Preparing Patrols of Arctic Shipping Lanes," New York Times, 14 September 2013, <http://www.nytimes.com/>

⁵⁹⁷ Pettersen, Trude, "Battle cruiser "Pyotr Veliky" is back in the Barents Sea," Barents Observer, 18 May 2016, <http://www.thebarentsobserver.com>

⁵⁹⁸ "Phasing NATO out of the Arctic: Russia arming up Northern Fleet with new weapons," Sputnik News, 1 June 2017, <https://sputniknews.com>

- Igor Ponomarev, vice president of United Shipbuilding Corporation (Yantar's parent company), said that the second and third ships of the class, *Admiral Essen* and *Admiral Makarov*, will also be commissioned in 2016. A total of six Admiral Grigorovich-class frigates have been ordered by the Russian Navy, but construction on the final three has been suspended because they rely on Ukrainian-built turbines.⁵⁹⁹

Yury Ivanov⁶⁰⁰



Photocredit: GlobalSecurity.org,
<http://www.globalsecurity.org>

- Russia's biggest information-gathering ship successfully transferred from Baltic to Northern Fleet in 2015.
- Permanently stationed at Severomorsk naval base, it is 312 feet (95 meters) long and 53 feet (16 meters) wide, with a displacement of 4,000 tons.
- Most important function is to penetrate US missile defence system.

Project 22120 Purga-Class Patrol Ship⁶⁰¹

- "The Russian Federal Security Service (FSS) has ordered a new Arctic patrol ship to assist in its northern operations with the vessel expected to be delivered at the end of October 2018."
- vessel is tailored for patrolling icy waters and is able to cut through 0.5m of sea ice with its strengthened hull.
- Likely to be based in Murmansk, whereas two previous existing Project 22120 vessels stationed in the Russian far east.

Marshal Ustinov (Slava-class destroyer) back in operation⁶⁰²

- Docked for upgrades from 2011- 2016 but declared ready for action again as of April 2017
- Part of the Northern Fleet and considered among the most powerful ships in the Russian Navy

Icebreakers

- Russia "has a fleet of about half a dozen [nuclear powered icebreakers] in operation, along with a larger fleet of less powerful, diesel-powered icebreakers."⁶⁰³
 - Russia is the only country producing nuclear powered icebreakers.
- Only the Northern Fleet is capable of breaking thick ice.⁶⁰⁴
- The Kremlin has a total of approximately 40 icebreakers in use with 11 more in production⁶⁰⁵, and more than 20 civilian icebreakers operating in Arctic⁶⁰⁶

Heavy

- One large "50 Let Pobedy" icebreaker (thick ice-breaking capacity) belongs to the Northern Fleet⁶⁰⁷

⁵⁹⁹ De Larrinaga, Nicholas, "Russian Navy receives first Admiral Grigorovich-class frigate," IHS Jane's Defence Weekly, 16 March 2016, <http://www.ianes.com>

⁶⁰⁰ Rusakova, Tatyana, "Spy ship to track US missile defence system in Arctic," Russia Beyond the Headlines, 19 November 2016, <http://rbth.com>

⁶⁰¹ Mladenov, Alex & Grozev, Krassimir, "Russia orders new patrol ship," 7 november 2016, Shephard Media, <https://www.shephardmedia.com>

⁶⁰² Staalesen, Atle, "After 5 years of upgrade, destroyer «Marshal Ustinov» is back in Barents Sea," The Barents Observer, 23 May 2017, <http://barentsobserver.com>

⁶⁰³ Conan, Eve, "Breaking the Ice: Russian Nuclear-Powered Ice-Breakers," Scientific American Blog, 8 September 2012, <http://blogs.scientificamerican.com>

⁶⁰⁴ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁶⁰⁵ Starr, Terrell Jermaine, "Russia's Icebreakers Make it King of the Arctic and America is Just a Pauper," Foxtrot Alpha, 26 January 2017, <http://foxtrotalpha.jalopnik.com>

⁶⁰⁶ Staalesen, Atle, "New icebreakers open way for Russia in Arctic," The Barents Observer, 5 May 2015, <http://barentsobserver.com>

⁶⁰⁷ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

- The LK-2, Project 22600 will be the world’s most powerful diesel-engined icebreaker, at 146,8 meters long and 22258 tons.⁶⁰⁸ The project has experienced delays and the launch has been pushed from 2015 to late 2017/early 2018.⁶⁰⁹
- In 2012, Russia began the construction of a new record-breaking icebreaker:⁶¹⁰
 - 170 meters long and 34 meters wide.
 - To be “powered by two “RITM-200” compact pressurized water reactors generating 60MWe
 - “Designed to blast through ice more than 4 meters thick and tow tankers of up to 70,000 tons displacement through Arctic ice fields.”
 - Other reports say it will go through 3 meters of ice and will be able to escort vessels through the Northern Sea Route year-round⁶¹¹
- More recently, in 2016, design for an icebreaker-class more powerful than ever – the Lider-class nuclear-powered icebreaker – was announced.⁶¹²
 - Project 10510 was announced by Deputy Prime Minister Dmitry Rogozin at a conference entitled International Cooperation in the Arctic: New Challenges and Vectors of Development
 - Icebreaker would have 110 MW power unit and could navigate ice 4-5 meters thick, making the Northern Sea Route accessible year round.
 - “Three more next-generation Lider-class vessels will be constructed in 2023 to 2025, Vice-Premier Dmitry Rogozin told [Russian media](#).”⁶¹³
 - These three icebreakers will join the three current-generation icebreakers—the *Arktika*, *Ural* and *Sibir*—scheduled to be commissioned in 2019–2021.⁶¹⁴
- The Arktika, Project 22220



Photo Credit: Atomflot, “A mock up of the Arktika”

<http://bellona.org/news/arctic/russian-nuclear-icebreakers-fleet/2014-05-russia-trumpets-victory-new-super-modern-nuclear-icebreaker>

- Russia launched the first of three Arktika-class nuclear powered icebreakers in June 2016, ahead of its planned 2017 launch, according to Sputnik News and the shipyard where the Arktika was built.⁶¹⁵ The ship reportedly cost \$1.74 billion.⁶¹⁶
- First of three “new generation of ‘super modern’ universal-use icebreakers” built by St. Petersburg’s Baltic Shipyard at a tender of \$2.3 billion.⁶¹⁷ The Arktika is the lead ship of “Project 22220” and it was expected that at least two of its kind would be built by 2020, but the launch of the second vessel – the Ural – is likely going to occur much later.⁶¹⁸ Project 22220 vessels will be capable of breaking through 13 feet of ice⁶¹⁹ and will be 173 meters long and 34 meters wide.⁶²⁰

⁶⁰⁸ Staalesen, Atle, “New icebreakers open way for Russia in Arctic,” The Barents Observer, 5 May 2015, <http://barentsobserver.com>

⁶⁰⁹ “Baltiysky Zavod to deliver 25MW icebreaker Victor Chernomyrdin (Project 22600) in late 2017 – early 2018,” Port News, 17 June 2016, <http://portnews.ru/>

⁶¹⁰ Conan, Eve, “Breaking the Ice: Russian Nuclear-Powered Ice-Breakers,” Scientific American Blog, 8 September 2012, <http://blogs.scientificamerican.com>

⁶¹¹ Pettersen, Trude, “Three new nuclear icebreakers in the pipeline,” The Barents Observer, 4 November 2012, <http://barentsobserver.com>

⁶¹² “Russia starts designing a super-icebreaker,” The Arctic, 13 October 2016, <http://arctic.ru/>

⁶¹³ Peck, Michael, “Russia has a plan to dominate the arctic,” The National Interest, 6 January 2018, <http://nationalinterest.org/>

⁶¹⁴ Peck, Michael, “Russia has a plan to dominate the arctic,” The National Interest, 6 January 2018, <http://nationalinterest.org/>

⁶¹⁵ Domonoske, Camila, “Russia Launches World’s Biggest, Most Powerful Icebreaker”, NPR, 16 June 2016, www.npr.org

⁶¹⁶ Starr, Terrell Jermaine, “Russia’s Icebreakers Make it King of the Arctic and America is Just a Pauper,” Foxtrot Alpha, 26 January 2017, <http://foxtrotalpha.jalopnik.com>

⁶¹⁷ Staalesen, Atle, “World’s biggest icebreaker on the water,” The Barents Observer, 16 June 2016, <http://thebarentsobserver.com>

⁶¹⁸ Charled Digges (9 May 2014), “Russia trumpets victory in new ‘super modern’ nuclear icebreaker project,” <http://bellona.org/>

⁶¹⁹ Domonoske, Camila, “Russia Launches World’s Biggest, Most Powerful Icebreaker”, NPR, 16 June 2016, www.npr.org

⁶²⁰ Staalesen, Atle, “World’s biggest icebreaker on the water,” The Barents Observer, 16 June 2016, <http://thebarentsobserver.com>

- February 2017: Russia's nuclear icebreaker port Atomflot confirmed in February 2017 that the Arktika would be commissioned a year behind schedule for a launch date of 2019 due to unpaid bills and sanctions from the west.⁶²¹
- June 2017: "Russia's lead icebreaker, the Arktika, will be commission in June 2019, Deputy Prime Minister Dmitry Rogozin said during Prime Minister Dmitry Medvedev's meeting with his deputies. Two other sister ships are to enter service in 2020 and 2021, respectively, TASS reports."⁶²²

Medium / Light Icebreakers

- Four small "Project 97" icebreakers (thin ice-breaking capability)⁶²³
- Ilya Muromets, Project 21180
 - Russia's first ice-breaking patrol ship to be deployed to the Arctic was commissioned on November 30, 2017.⁶²⁴
 - "The Ilya Muromets is an 85-meter (280-foot) long electric-diesel powered icebreaker with a deadweight of 6,000 tons and is designed to help the deployment of the navy in icy conditions as well as escort or tow other ships."⁶²⁵
 - Launched on 10 June 2016⁶²⁶.
- "Polyarnaya Zvezda" is the first of two vessels of Project 22100 Okean-class ice-going patrol vessels⁶²⁷ In January 2017, it made the trip to its permanent base at the port of Murmansk.⁶²⁸
 - The Polyarnaya Zvezda is 93 meters long, 15 meter wide and has a deadweight of 3,200 tons. It has a top speed of 20 knots and can operate autonomously for up to 60 days.⁶²⁹
 - Both vessels are expected to be delivered in Murmansk by December 2019.⁶³⁰
- In April 2016, two Project 23550 Ice-class patrol ships were ordered by the Russian Navy for delivery by 2020. They are capable of operating in up to 1.5-metre-thick ice.⁶³¹
 - Project 23550, being called 'combat icebreakers', will differ from international competitors in that "they are capable of carrying heavy missiles that can strike targets hundreds of miles away, whereas these other ships are used more for localized security and ice navigation missions".⁶³² They also carry lasers that can cut through ice.⁶³³
 - The keel was laid for Ivan Papanin, the first of the two patrol icebreakers, in mid-April 2017.⁶³⁴
 - Will be 114 meters long and able to displace 7,000 tons. It is also designed to be able to go 6,000 naval miles without resupply.⁶³⁵
- The first of [four icebreakers of the 21180 project](#) for the Ministry of Defence was launched in 2016 and will be commissioned in 2017.⁶³⁶
- "Four Project-03182 'Small Arctic Sea Tanker' icebreaking support ships for use in the Arctic were ordered in 2015 and production of the first two started in October 2015."⁶³⁷
- The three diesel-engined Project 21900M vessels are in service, the last setting off on its debut voyage in February 2017⁶³⁸. This project was developed for large-scale oil tanker assistance, as well as towing, transportation and rescue missions in icy waters.⁶³⁹

⁶²¹ Digges, Charles, "Nuclear icebreaker roll out delayed by unpaid bills and sanctions over Ukraine," Bellona, 6 March 2017, <http://bellona.org>

⁶²² "Lead icebreaker Arktika to enter service in June 2019," The Arctic, 20 June 2017, <http://arctic.ru>

⁶²³ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁶²⁴ "PHOTO: Icebreaker Ilya Muromets Joined Russian Navy," Mil.Today, 1 December 2017, <http://mil.today>

⁶²⁵ "Russia unveils new Navy icebreaker in Arctic military focus," Defence News, 11 June 2016, <http://www.defensenews.com>

⁶²⁶ "Russia unveils new Navy icebreaker in Arctic military focus," Defence News, 11 June 2016, <http://www.defensenews.com>

⁶²⁷ Pettersen, Trude, "New Vessels for Russia's Coast Guard," The Barents Observer, 2 June 2015, <http://barentsobserver.com>

⁶²⁸ "Polyarnaya Zvezda border patrol ship arrives at duty station in Murmansk," The Arctic, 30 January 2017, <http://arctic.ru>

⁶²⁹ Staalesen, Atle, "This is the FSB's new Arctic vessel," The Barents Observer, 30 January 2017, <http://barentsobserver.com>

⁶³⁰ "Project 21100 Okean," GlobalSecurity.Org, last modified 21 September 2016, www.globalsecurity.org

⁶³¹ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁶³² Rogoway, Tyler, "This is Russia's warship Built Specifically For Arctic Fighting," Time Inc., 27 March 2017, <http://www.thedrive.com>

⁶³³ "Laser-armed nuclear icebreakers: what Russia has in store for Arctic," Sputnik News, 17 July 2017, <https://sputniknews.com>

⁶³⁴ "Keel laid for Russian Navy's first patrol icebreaker," The Arctic, 19 April 2017, <http://arctic.ru>

⁶³⁵ "Russia lays down icebreaker patrol boat to bolster Navy's Arctic presence," RT News, 19 April 2017, www.rt.com

⁶³⁶ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁶³⁷ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁶³⁸ Lanteigne, Marc, "U.S. wary of Russia's Arctic military buildup," News Deeply, 13 February 2017, <https://www.newsdeeply.com>

⁶³⁹ Staalesen, Atle, "New icebreakers open way for Russia in Arctic," The Barents Observer, 5 May 2015, <http://barentsobserver.com>

Soveitsky Soyuz, Arktika-class twin-reactor icebreaker⁶⁴⁰

- Could be new Arctic headquarters, offered to the Ministry of Defence by Rosatom State Atomic Energy Corporation.
- The vessel has been undergoing modernization work after being laid-up at Atomflot north of Murmansk since 2006.
- Was expected to be ready for service by end of 2016.

Forward Coast Guard Ships

- The coast guard division of Russia's Federal Security Service plans to "deploy four new warships" in the Arctic by 2020
- These will complement the 11 border protection facilities designated for the Arctic
- The official goal is to "protect its political and economic interests in the Arctic, including military, border, and coast guard units," according to RIA Novosti.⁶⁴¹
- The *Predanny*, a second rank border patrol vessel, arrived in Murmansk in October 2017 to support a wide range of coast guard tasks, including "patrolling the territorial waters in the close and distant maritime zones, protecting the state border and the continental shelf, carrying out rescue operations and providing disaster relief".⁶⁴²

Bastion-P Coastal Defence System

- Russian Defense Minister Sergei Shoigu plans to equip the Northern Fleet with four systems annually, as part of a plan to re-equip their coastal missile units by 2021.⁶⁴³
- Bastion systems, designed for coastal defense, have the capacity to engage various surface ships at ranges out to 300 kms.⁶⁴⁴
- The Russian Navy's Pacific Fleet formally deployed the K-300P Bastion-P (SSC-5 'Stooge') mobile coastal defence missile system in the Kuril Islands in 2016. This followed live firing trials of the system at a training range in the Primorye Territory in July 2016.⁶⁴⁵

1.3 Organizations and Operational Units (personnel)

- According to SIPRI's 2016 Background Paper:⁶⁴⁶
 - "Russia's ground forces in the Arctic region include naval infantry and an army brigade on the Kola Peninsula."
 - The brigade on the Kola Peninsula was established in January 2015 and are "winter-trained but are organized and equipped for operations in the north of Russia, not in the more inhospitable regions of the Arctic".
 - In addition to the brigade on the Kola Peninsula, there is another currently being established in Yakutia. Plans for both brigades were announced 2011, a few years after Russia announced a plan for a special military force to protect Arctic interests in March 2009.
- In October 2015, Russian defence minister Sergei Shoigu announced that a Russian military unit will be permanently stationed in the Arctic by 2018.⁶⁴⁷

45th Air Force and Air Defense Army of the Northern Fleet

- Formed in December 2015, reported by Russian Defense Minister Sergey Shoigu.⁶⁴⁸

80th Independent Rifle Brigade⁶⁴⁹

- The *Barents Observer* reports that, "the unit in Alakurtti was established in January 2015 as part of Russia's increased Arctic ambitions".

⁶⁴⁰ "Russian icebreaker could be Arctic HQ," MarEx, 1 February 2016, <http://www.maritime-executive.com>

⁶⁴¹ "Russia to Deploy Four New Warships By 2020 to Protect Nation's Arctic Zone," RIA Novosti, 28 May 2013, <http://en.ria.ru>

⁶⁴² "New boarder patrol ship Predanny arrives in Murmansk," The Arctic, 16 October 2017, <http://arctic.ru>

⁶⁴³ "Russian Navy to receive five bastion missile defense systems in 2015", Sputnik News, 9 September 2015, <http://sputniknews.com>

⁶⁴⁴ Novichkov, Nikolai, "Russia Navy Pacific Fleet deploys Bastion-P to Kuril Islands," IHS Jane's 360, 4 August 2016, <http://www.janes.com>

⁶⁴⁵ Novichkov, Nikolai, "Russia Navy Pacific Fleet deploys Bastion-P to Kuril Islands," IHS Jane's 360, 4 August 2016, <http://www.janes.com>

⁶⁴⁶ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁶⁴⁷ "Russia to station military unit in Arctic by 2018," The Associated Press, 22 October 2015, <http://www.armytimes.com>

⁶⁴⁸ Petterson, Trude, "Northern Fleet gets own air force, air defence forces," The Barents Observer, 1 February 2016, <http://www.thebarentsobserver.com>

⁶⁴⁹ Pettersen, Trude, "Northern Fleet plans large Arctic exercise in 2015," The Barents Observer, 3 June 2015, <http://barentsobserver.com>

200th Independent Motor Rifle Brigade⁶⁵⁰

- Became part of the Northern Fleet's ground forces in December 2012 and is based in Pechenga.

Arctic Brigade

- In 2011 Russia announced the establishment of an Arctic Brigade at Pechenga, about 10 kilometers from the Russian-Norwegian border and 50 kilometers from the Norwegian town of Kirkenes. "This brigade will be specially equipped for military warfare in Arctic conditions. It will be set up with DT-30P Vityaz tracked vehicles, in addition to multi-service army equipment, other armored vehicles and tanks." The *Barents Observer* reported that the *Nezavisimaya Gazeta* commented that "the U.S. and Canada are already establishing similar brigades, and the new Russian Polar Brigade will be located close to the border of Norway and Finland 'to balance the situation'."⁶⁵¹
- The Pechenga motorized infantry brigade "would be re-organized to become an Arctic brigade specially equipped for military warfare in Arctic conditions." It was anticipated that it would be operational by 2015, and later it was announced that the brigade would become part of the Northern Fleet.⁶⁵²
- "According to the Russian Minister of Defence, Anatoly Serdyukov, plans for two Arctic brigades, including their size, armament and location, were still being worked out in July 2011."⁶⁵³
- "Russian military has begun to assemble two Army brigades and Special Forces units that will specialize in Arctic warfare and guard oil and gas infrastructure and Russian interests in the region."⁶⁵⁴
- In 2012 the Brigade became part of the Northern Fleet.⁶⁵⁵
- In 2013 the *Barents Observer* reported on equipment testing by the Brigade at Pechenga: "The brigade in Pechenga is now being used as a testing field for new snow and swamp-going vehicles GAZ-3351, TTM-3P and DT-3P, the Ministry of Defense's web site reads.
"GAZ-3351 is a two-tiered belted vehicle capable of driving in snow and swamp. It can carry 16 persons or 2500 kilos of cargo. TTM-3P is a light amphibious personnel vehicle.
"DT-3P is an amphibious armored vehicle capable of going "where there are no roads, only directions", as *Rossiskaya Gazeta* puts it. It can run for 700 kilometers without stopping and reach a speed of 60 kilometers per hour."⁶⁵⁶
- The Russian Arctic Brigade was formally established in early 2015, says the *Barents Observer*. "The brigade is based partly on the 80th Independent Motor Rifle Brigade in Alakurtti and the 200th Independent Motor Rifle Brigade in Pechenga, both of them located near the borders to Norway and Finland."⁶⁵⁷
- "Russian Army Arctic brigades will be equipped with all-terrain Grad and Smerch MLRS Multiple Launch Rocket System carried by Vityaz DT-30PM and DT-10PM all-terrain tracked cross-country vehicles..."⁶⁵⁸

Arctic Joint Strategic Command

- Established on December, 1st, 2014.
- The Northern Fleet is the mainstay of the new strategic formation.
- Area of responsibility includes Russian territories in the Arctic.⁶⁵⁹
- It is comprised of Russian ground, naval, and air forces, and its headquarters are located in Arkhangelsk.⁶⁶⁰

Forward Arctic Military Command 2017

- With the aim to defend national interests in the Arctic, Russia "will establish a military command structure with two brigades of mechanized infantry supported by snowmobiles and hovercraft by 2017..." According to Colonel General Oleg Salyukov, "The new specially trained and outfitted military brigades will patrol Russia's Arctic coastline, protect current and future military installations along the shore and in the Russian Arctic, ensure free

⁶⁵⁰ Pettersen, Trude, "Northern Fleet plans large Arctic exercise in 2015," *The Barents Observer*, 3 June 2015, <http://barentsobserver.com>

⁶⁵¹ Pettersen, Trude, "Russia to establish Polar Spetsnaz on border to Norway," *The Barents Observer*, 16 March 2011, <http://barentsobserver.com>

⁶⁵² Pettersen, Trude, "Testing equipment for Arctic Brigade," *The Barents Observer*, 19 March 2013, <http://barentsobserver.com>

⁶⁵³ Wezeman, Siemon, T., "Military Capabilities in the Arctic," SIPRI Background Paper, SIPRI, March 2012, p. 9.

⁶⁵⁴ Huebert, Rob; Exner-Pirot, Heather; Lajeunesse, Adam; Gullede, Jay, "Climate Change and International Security: The Arctic as a Bellwether," Center for Climate and Energy Solutions, May 2012, p. 32, <http://www.c2es.org/docUploads/arctic-security-report.pdf>

⁶⁵⁵ Pettersen, Trude, "Motorized infantry brigade to Northern Fleet," *The Barents Observer*, 26 November 2012, <http://barentsobserver.com>

⁶⁵⁶ Pettersen, Trude, "Testing equipment for Arctic Brigade," *The Barents Observer*, 19 March 2013, <http://barentsobserver.com>

⁶⁵⁷ Staalesen, Atle, "Arctic Brigade on snow," *The Barents Observer*, 22 February 2016, <http://thebarentsobserver.com>

⁶⁵⁸ "Russian army Arctic brigade will be equipped with Grad & Smerch MLRS on DT-30PM," *Army Recognition*, 10 February 2018, <https://www.armyrecognition.com>

⁶⁵⁹ Peterson, Trude, "Northern Fleet gets own air force, air defence forces," *The Barents Observer*, 1 February 2016, <http://www.thebarentsobserver.com>

⁶⁶⁰ Korpela, Aleks, "Of fire and ice: Russia's militarization of the Arctic," *The Nato Association of Canada*, 4 February 2016, <http://natoassociation.ca>

passage of the Northern Sea Route and — perhaps most important of all — demonstrate to other Arctic nations Russia's military presence in the increasingly contested region...⁶⁶¹

New Arctic air division established in 2018

- New Arctic air division will be established in 2018, to cover the territory from Novaya Zemlya to Chukotka which will help protect against attack from the North Pole.⁶⁶²

Russian Coast Guard division to be deployed in Chukotka region 2018⁶⁶³

- Will be equipped with all-terrain vehicles to patrol the coast.
- Will fulfill “a number of tasks aimed at patrolling the Chukotka’s coast and defending from possible enemy’s troops landed in the northeastern Russia’s region”.
- A revival of a motorized rifle division deployed in Chukotka in the 1980s that was disbanded after collapse of the Soviet Union.

Russian Emergencies Ministry in the Arctic⁶⁶⁴

- Facilities in Vorkuta, Murmansk, Naryan-Mar, Arkhangelsk and Dudinka, as well as an Arctic SAR training center Vytegra in the Vologda Region
- Adding paratroopers to its Arctic group in 2017

2. Recurring Operations and Exercises

Testing of Ballistic Missiles

- October 2016 testing of 3 ballistic missiles: Russia launched 3 ballistic missiles in October 2016, 2 of which were off of submarines. “Russia’s Ministry of Defense says the first launch took place from the Pacific fleet’s nuclear powered submarine Svyatoy Georgiy Pobedonosets. The missile successfully hit its target at Chizha test range on the Kanin Peninsula, one of the most remote areas in the European Russian north. Another missile was launched from the Northern fleet’s Delta-IV class submarine Novomoskovsk from a submerged position in the Barents Sea. The missile hit the Kura test range in the Far East after a flight across the Arctic.”⁶⁶⁵
- November 2014 Nuclear Triad Test: Russia carried out a nuclear triad test including strategic bombers, strategic submarines, and the launch of a Topol-M ballistic missile. Four Tu-95 strategic bombers, accompanied by four Il-78 tankers, were approaching Norway from the Northeast. A few days later another group of four strategic bombers and four tanker aircrafts were flying south along Norway’s northern coast. “After scrambling fighter jets from Norway and Great Britain, NATO said in a statement that the Russian bombers pose a risk to civilian air traffic,” especially since the bomber and tanker aircrafts from Russia did not “maintain radio contact with civilian air traffic control authorities.” Russia also tested its submarine based ballistic missiles (SLBMO) “when ‘Yury Dolgoruky’ launched a Bulava missile from submerged position in the Barents Sea.” This was the first operational test launch of Bulava in relation to combat training as well as the first time a Borey-class submarine carried a full set of missiles on board.⁶⁶⁶
- Russia has significantly increased its missile testing in the Arctic. In late October 2017, “four ballistic missiles were tested in what turned out to be one of the most massive nuclear missile drills in post-Soviet history,” according to The Independent Barents Observer.⁶⁶⁷
- As of March 2018, a new hypersonic “Sarmat” intercontinental ballistic missile (ICBM), known as Satan 2 by NATO, which is capable of overcoming missile defense systems, has completed tests. It will replace the SS-18 Satan ICBM.⁶⁶⁸
- According to a Russian defense source, “the missile will enter service by 2021, with serial production beginning in 2020.”⁶⁶⁹

⁶⁶¹ The Moscow Times (1 October 2014), “Russia to Form Arctic Military Command by 2017,” <http://www.themoscowtimes.com>

⁶⁶² Staaleson, Atle, “Russia builds Arctic air defense shield,” The Independent Barents Observer, 20 February 2017, <https://thebarentsobserver.com/en/security/2017/02/russia-builds-arctic-missile-shield>

⁶⁶³ “Russian division in Chukotka will be equipped with all-terrain vehicles,” Sputnik News, 26 August 2016, <http://sputniknews.com>

⁶⁶⁴ “Emergencies Ministry to add paratroopers to the Arctic group in 2017,” The Arctic, 10 March 2017, <http://arctic.ru>

⁶⁶⁵ “Russia tests ballistic missiles in Arctic,” Maritime executive, 12 October 2016, <http://www.maritime-executive.com>

⁶⁶⁶ Nilsen, Thomas, “Russia plays nuclear war-games in Barents Region,” The Barents Observer, 1 November 2014, <http://barentsobserver.com>

⁶⁶⁷ Nilsen, Thomas, “Russia plays massive nuclear war games across Arctic,” The Independent Barents Observer, 26 October 2017, <http://barentsobserver.com>

⁶⁶⁸ “Russia's new hypersonic Sarmat ICBM has begun active testing – Putin,” RT News, 1 March 2018, <https://www.rt.com>

⁶⁶⁹ “Russia tests new nuclear intercontinental ballistic missile ‘Sarmat,’” Global Village Space, 2 April 2018, <https://www.globalvillagespace.com>

Airborne Military Drills 2014

- “The Russian Airborne Troops on Thursday para-dropped a 350-strong battalion at a landing site on the New Siberian Islands in the Arctic as part of ongoing military drills.” The drills included the battalion from the 98th Guards Airborne Division. “The 98th division started large-scale exercises involving 4,000 troops, 36 military transport aircraft and an unspecified number of combat vehicles on March 11.”⁶⁷⁰

Naval Exercises

- October 2016 – Russia’s Northern and Pacific fleets conducted first joint drills in the Arctic. This was also the first time all of Russia’s Arctic archipelagos were visited in one mission.⁶⁷¹
- May 2016 – “Russia’s Northern Fleet launched an exercise in the Barents Sea, involving 10 warships and support vessels, including the flagship of the Russian Navy - Project 11442 heavy nuclear-powered missile cruiser Pyotr Velikiy (Peter the Great) and planes and helicopters of the Northern Fleet’s Air Force and Air Defense Army, the fleet’s press service reported.”
 - “The maneuvers are taking place as part of the annual practical training of students of the Russian General Staff Military Academy.”⁶⁷²



Photo Credit: US Navy, Russian Destroyer Admiral Levchenko

http://commons.wikimedia.org/wiki/File:RFNS_Admiral_Levchenko_DD-605.jpg

The Ladoga 2013 Exercise

In March 2013 Russian forces undertook two major air force drills in its northwest region. The Ladoga 2013 Exercise took place below the Arctic Circle at Lake Ladoga near the border with Finland. The exercise involved about 2,000 personnel, 500 weapons systems, and 50 front-line aircraft.⁶⁷³ Aircraft used in the exercise were to include “MiG-31 Foxhound and Su-27 Flanker fighters, MiG-25RB Foxbat interceptors, Su-24M Fencer attack aircraft, Su24MR reconnaissance aircraft and Mi-8 Hip multirole helicopters and Mi-24 Hind attack helicopters.”⁶⁷⁴

- The Russian Defence Minister visited Finland in May 2013 to promote greater military cooperation between the two countries and to urge Finland to buy Russian military equipment, including jet fighters.⁶⁷⁵
- Additional tactical drills took place in the Karelia⁶⁷⁶ region involving 1,000 personnel and 70 aircraft in exercises in mid-air refuelling, reconnaissance, air protection.⁶⁷⁷

In April 2013 the newspaper *Svenska Dagblat* reported on Russian Air Force maneuvers in the Baltic focused on simulated actions against Sweden’s two most important military bases.⁶⁷⁸

- Russia notified Sweden in advance of the March 2013 simulation of air attacks on Sweden.⁶⁷⁹
- It was a routine training exercise that took place entirely in international air space, but with flights routed between the Swedish Baltic Sea Islands of Oland and Gotland,⁶⁸⁰
- when Sweden was not able to respond, NATO scrambled fighter aircraft out of Lithuania, though also not in time to monitor the Russian exercise.⁶⁸¹

⁶⁷⁰ “Russia Paradraps Airborne Battalion in Arctic,” Sputnik News, 14 March 2014, <http://en.ria.ru>

⁶⁷¹ Staalesen, Atle, “Northern and Pacific fleets conduct first joint drills in Arctic,” The Barents Observer, 10 October 2016, <http://www.thebarentsobserver.com>

⁶⁷² “Russian missile cruiser joins Northern Fleet drills in Barents Sea,” TASS, 27 May 2016, <http://tass.ru>

⁶⁷³ “Russian Air Force conducts air defence exercises,” Airforce-Technology.Com, 22 March 2013. <http://www.airforce-technology.com>

⁶⁷⁴ “Russian Air Force Readies for Massive Drills,” RiaNovost, 19 March 2013. http://en.rian.ru/military_news/20130319/180118617.html

⁶⁷⁵ Staalesen, Atle, “Arctic on Russian-Finnish military agenda,” The Barents Observer, 29 May 2013, <http://barentsobserver.com>

⁶⁷⁶ Pettersen, Trude, “Russia starts air force drills in Karelia,” The Barents Observer, 20 March 2013, <http://barentsobserver.com>

⁶⁷⁷ “Russian Air Force conducts air defence exercises,” Airforce-Technology.Com, 22 March 2013. <http://www.airforce-technology.com>

⁶⁷⁸ “Russians practiced attack on Sweden, but no Swedish response” Radio Sweden, 22 April 2013, <http://sverigesradio.se>

⁶⁷⁹ O’Dwyer, Gerard, “NATO Rejects Direct Arctic Presence,” Defence News, 29 May 2013, <http://www.defensenews.com>

⁶⁸⁰ Bennett, Mia, “Why NATO isn’t establishing an Arctic presence,” AlaskaDispatch, 6 June 2013, <http://www.alaskadispatch.com>

⁶⁸¹ “Swedish Air Force fails to counter mock Russian attack,” AlaskaDispatch, 22 April 2013, <http://www.alaskadispatch.com>

- the Swedish Foreign Minister downplayed the incident, saying Russia’s security threats are not in Sweden and that “the Russian military has neither the will nor the capacity to attack Swedish territory”⁶⁸²

Expedition: High North Geophysical Surveys

- Nuclear icebreakers “nuclear icebreakers 'Akademik Fedorov' and 'Yamal' have conducted an entire complex of geophysical research at the North Pole.... The main purpose of the expedition is assessment of the hydrocarbon potential of the Russian shelf outside the 200-mile zone. Also, the objective remains to collect data to establish the continental nature of the Mendeleev and Lomonosov Ridges, which will form the basis of Russia's claims to the UN Commission about the borders of the continental shelf.”⁶⁸³

Forward Arctic Expedition 2015

- December 2014: According to the Russian Defense Minister, a major Arctic expedition is planned for 2015. The expedition will target Russia’s island formations, including Wrangel Island, Kotelny Island on the New Siberian Islands, Sredny Island, Novaya Zemlya, Franz Josef Land and Schmidt Cape. Members of the Public Council under the defense agency as well as cultural personalities will participate.⁶⁸⁴

Forward Expeditions: Russian Navy

- A number of expeditions are planned by the Russian Navy to the Arctic, exploring the region and Russia’s place in it. According to Northern Fleet Admiral Andrei Korablev, ships will be sent to Franz Josef Land, Severnaya Zemlya, the Novosibirsk Islands archipelago and Wrangel Island. Russia also plans “to install military infrastructure on almost all of the islands and archipelagos of the Arctic Ocean to create a unified system of monitoring air, surface and subsurface conditions, Korablev said, RIA Novosti reported”.⁶⁸⁵

2017 expedition to Kotelny Island⁶⁸⁶

- The expedition from mainland Russia to Kotelny Island aims to test new military equipment and weapons in Arctic conditions. The total distance covered came to 1,140 kilometers.
- “Members of the Defense Ministry expedition were the first in the world to cross from the mainland to Kotelny on board vehicles,” said Deputy Defense Minister Dmitry Bulgakov in March 2017.

Annual naval Arctic expedition⁶⁸⁷

- “Russia’s Northern Fleet started voyages along the Northern Sea Route in 2012.”
- In 2017, for the sixth annual Arctic voyage, a convoy with four warships and three support vessels left the Northern Fleet’s main base Severomorsk on August 10th to the port of Dudinka.
- Purpose is to practice joint maneuvers

Zapad⁶⁸⁸

- Quadrennial exercise
- Zapad-2017 was a joint strategic military exercise of the armed forces of the Russian Federation and Belarus, taking place over the course of six days in mid-September, taking place in Belarus as well as the Karelian area in the Russian Arctic.

Vostok

Snap Check

⁶⁸² O’Dwyer, Gerard, “NATO Rejects Direct Arctic Presence,” Defence News, 29 May 2013, <http://www.defensenews.com>

⁶⁸³ Backwell, George, “Russia Conducts High North Geophysical Surveys,” MarineLink, 20 August 2014, <http://www.marinelink.com>

⁶⁸⁴ “Russia Defense Ministry plans to send major expedition to Arctic in 2015,” TASS, 24 December 2014, <http://itar-tass.com>

⁶⁸⁵ Bodner, Matthew, “Russian Navy is Planning Summer Expeditions to Contested Arctic Region,” The Moscow Times, 21 May 2014, <http://www.themoscowtimes.com>

⁶⁸⁶ “Russians First in the World to Reach Island in Arctic on Military Equipment,” Sputnik News, 12 March 2017, <https://sputniknews.com>

⁶⁸⁷ Nilsen, Thomas, “Warships of Russia’s Northern Fleet sail to Arctic waters,” The Barents Observer, 15 August 2017, <https://thebarentsobserver.com>

⁶⁸⁸ Brown, Daniel, “Russia just finished the Zapad military exercises that freaked out NATO – here’s what we know,” Business Insider, 25 September 2017, <http://www.businessinsider.com>

NORWAY

1. Security Assets available for Operations in the North

1.1 Bases (including stations, naval facilities, radar sites, etc)

- Norwegian Armed Forces headquarters now in Reitan, near Bodo, just north of the Arctic Circle.⁶⁸⁹
- In August 2009, Norway became the first Arctic state to headquarter its operations in the High Arctic when it moved its centre of military operations from Jatta in Southern Norway approximately 1,000 miles North to Reitan, outside Bodo. Bodo is also home to Norway's main air force base. Norway has 13 military bases above the Arctic Circle.⁶⁹⁰ Army headquarters are even further north, in Bardufoss.⁶⁹¹
- While Navy headquarters are south, in Bergen, Coast Guard headquarters moved to the north, in Sortland, in 2010.⁶⁹²
- “Norway’s Defence Minister Ine Sørreide Eriksen, in her long-term plan for the Armed Forces, suggested in January 2016 that Norway close nine military bases all over the country, 2 of which are above the Arctic Circle (Harstad and Andoya). “The final proposals for a long-term plan will be delivered to the Norwegian Parliament in the beginning of June,” news source Dagens Næringsliv reports.⁶⁹³

Bodo⁶⁹⁴

- National Joint Headquarters
- Norway’s largest military airport
- Fighter aircraft at 24/7 readiness for NATO

Harstad⁶⁹⁵

- Hosts the Navy’s Task Force
- Allied Training Centre North

Evenes (ved Harstad)

- Army garrison

Bjerkvik⁶⁹⁶

- Technical workshop
- Maintenance on Armed Forces Vehicles and Weapons

Sortland⁶⁹⁷

- Navy’s Coast Guard Squadron

Andoya/Andenes⁶⁹⁸

- Andoya Air Station
- The only base for the P-3 Orion maritime patrol aircraft
- Approximately 300 people work here every day in the department 133 Air Wing

Setermoen⁶⁹⁹

- Armoured battalion
- Artillery battalion
- Medical battalion
- Intelligence battalion

⁶⁸⁹ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

⁶⁹⁰ “Norwegian Military Bases,” Norwegian Armed Forces, no date listed, <http://mil.no>

⁶⁹¹ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

⁶⁹² Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

⁶⁹³ Pettersen, Trude, “Norwegian military faces major cuts,” The Barents Observer, 21 April 2016, <http://www.rcinet.ca>

⁶⁹⁴ “Norwegian Military Bases: Bodo,” Norwegian Armed Forces, no date listed, <http://mil.no>

⁶⁹⁵ “Norwegian Military Bases: Harstad,” Norwegian Armed Forces, no date listed, <http://mil.no>

⁶⁹⁶ “Norwegian Military Bases: Bjerkvik,” Norwegian Armed Forces, no date listed, <http://mil.no>

⁶⁹⁷ “Norwegian Military Bases: Sortland,” Norwegian Armed Forces, no date listed, <http://mil.no>

⁶⁹⁸ “Norwegian Military Bases: Andoya/Andenes,” Norwegian Armed Forces, no date listed, <http://mil.no>

⁶⁹⁹ “Norwegian Military Bases: Setermoen,” Norwegian Armed Forces, no date listed, <http://mil.no>

- Training centre

Skjold⁷⁰⁰

- Army 2nd battalion
- Army Engineer battalion

Bardufoss⁷⁰¹

- 139 Air Wing stationed at air field
- Norway's main helicopter base since 2012

Sorreisa⁷⁰²

- Surveillance of north Norway air space, 24 hours a day, 365 days a year
- Includes localising and identifying all air activity over and close to national airspace and NATO territory

Banak

- Air field, operated by Royal Norwegian Air Force
- Serves detachment of the 330 Squadron
- Search and rescue helicopter squadron (linked to Porsanger)

Porsanger⁷⁰³

- Porsanger "hunter squadron"
- "World's northernmost army department"

Sor-Varanger/Kirkenes⁷⁰⁴

- Guards the 196 km border with Russia
- Employs boats, snowmobiles, skies, and foot patrols
- Parliament member Frank Bakke-Jensen, representing the Conservative Party in Norway's coalition government, announced in June 2016 that Norway will place a new Ranger Company with the Garrison of Sør-Varanger
 - Annual budget of about 180 million kroner is expected to increase with 50 million kroner when the new Ranger Company becomes operative⁷⁰⁵

Possible re-opening of Olavsvern⁷⁰⁶

- A study group that has looked into the new challenges arising from Russia's growing submarine presence in the Arctic has presented the suggestion to re-open Olavsvern base.
 - "The former Royal Norwegian Navy base at Olavsvern is ideal for supporting submarine operations in the extreme North Atlantic and Arctic Seas," reads the recommendation made in July 2016.
- State Secretary Øistein Bø disapproves any current possibilities to reopen Olavsvern.

⁷⁰⁰ "Norwegian Military Bases: Skjold," Norwegian Armed Forces, no date listed, <http://mil.no>

⁷⁰¹ "Norwegian Military Bases: Bardufoss," Norwegian Armed Forces, no date listed, <http://mil.no>

⁷⁰² "Norwegian Military Bases: Sorreisa," Norwegian Armed Forces, no date listed, <http://mil.no>

⁷⁰³ "Norwegian Military Bases: Porsanger," Norwegian Armed Forces, no date listed, <http://mil.no>

⁷⁰⁴ "Norwegian Military Bases: Sor-Varanger/Kirkenes," Norwegian Armed Forces, no date listed, <http://mil.no>

⁷⁰⁵ Nilsen, Thomas, "Norway creates new Army unit on border to Russia," The Barents Observer, 17 June 2016, <http://thebarentsobserver.com>

⁷⁰⁶ Nilsen, Thomas, "Report encourages Norway to reopen Olavsvern submarine support base," The Barents Observer, 28 July 2016, <http://thebarentsobserver.com>

1.2 Equipment

1.2.1 Air⁷⁰⁷

F-16 Fighters



Photo Credit: Forsvaret/Lars Magne Hovtun, F-16,
<http://www.newsinenglish.no/2011/10/27/new-fighter-jets-lack-arctic-abilities/>

- Approximately 60 in operation⁷⁰⁸
- Based at Bodo, on 24/7 alert⁷⁰⁹
- Without tankers for air-to-air refuelling the F-16 (and the coming F-35s) have little capacity beyond Norway's northern air space boundaries.⁷¹⁰

F-35 Fighters



Photo Credit: Tom Bech, F-35
http://commons.wikimedia.org/wiki/File:F-35_and_Boats.jpg

- Defence chief Adm Haakon Bruun-Hanssen revealed a strategic defence review in October 2015 that committed to full requisition of 52 F-35 joint strike fighters.⁷¹¹
- To be based mainly at Ørland Main Air Station in central Norway, but with a Forward Operating base at Evenes in northern Norway.⁷¹²The first of the aircraft were expected to be delivered to Norway in 2017, and Norway plans to have all 52 delivered by 2025.⁷¹³
- SIPRI reports that without air refuelling they will have no capability beyond Norwegian airspace⁷¹⁴
- No plans for air-to-air refuelling

⁷⁰⁷ "Norwegian Military Bases: Sor-Varanger/Kirkenes," Norwegian Armed Forces, no date listed, <http://mil.no> and "The Military Balance 2012," IISS, 7 March 2012, p. 142, <https://www.iiss.org>

⁷⁰⁸ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁷⁰⁹ "New Fighter Jets Lack Arctic abilities," News in English, 27 October 2011, <http://www.newsinenglish.no>

⁷¹⁰ "New Fighter Jets Lack Arctic abilities," News in English, 27 October 2011, <http://www.newsinenglish.no>

⁷¹¹ Stevenson, Beth, "Oil price, weak currency challenge Norwegian F-35 buy", Flightglobal, 21 January 2016, <https://www.flightglobal.com>

⁷¹² "F-35 Lightning II Wins Norway's (Fake) Competition," Defense Industry Daily, 17 June 2012, <http://www.defenseindustrydaily.com>

⁷¹³ Nilsen, Thomas, Lockheed Martin unveils Norway's first F-35," The Barents Observer, 22 September 2015, <http://barentsobserver.com>

⁷¹⁴ Wezeman, Siemon, T., "Military Capabilities in the Arctic," SIPRI Background Paper, March 2012, p. 7.

P-3C and P-3N Anti-Submarine Warfare and Long-Range Patrol⁷¹⁵(6)



Photo Credit: P-3N Orion from the Royal Norwegian Air Force,
http://commons.wikimedia.org/wiki/File:Bergen_Air_Show_009.jpg

- Peacetime surveillance and intelligence gathering
- Wartime anti-submarine warfare and anti-surface ship warfare
- Orion reconnaissance UAV P-3N can carry a pay load of up to 660 pounds and travel for at least 24 hours.⁷¹⁶
- 26 years old and due for modernizing. According to SIPRI's 2016 Background Paper, these are to be retired between 2017 and 2028 and replaced by "satellite-based sensors, four new surveillance aircraft and six long-range UAVs. The new aircraft and UAVs are to be operational by 2024."⁷¹⁷

Boeing CO P-8A

- "Norway plans to order five Boeing Co P-8A Poseidon maritime patrol planes to maintain its surveillance capacity and meet future security challenges, the NATO country's Defence Ministry said."⁷¹⁸
- Ordered in November 2016, "the submarine-hunting patrol planes will replace Norway's current fleet of six P-3 Orion and three DA-20 Jet Falcon aircraft and are expected to be delivered in 2021 and 2022."⁷¹⁹
 - Together, with the new Triton UAV, the two aircrafts will replace the P-3C Orion.⁷²⁰

Falcon 20C electronic warfare (3)

C-130J Hercules Transport (4)

MFI-15 Safari Training



Photo Credit: Tom Strom, Norway Airforce - Saab MFI-15 Safari
<http://www.airliners.net/search/photo.search?id=0591096>

⁷¹⁵ Smol, Robert (4 April 2014), "The Norwegian juggernaut," National Post, <http://www.nationalpost.com/index.html>

⁷¹⁶ "Warriors of Steel: Meet Russia's robot army," Sputnik News, 29 May 2016, sputniknews.com

⁷¹⁷ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁷¹⁸ Dagenborg, Joachim, "Norway plans \$1.15 billion order for five Boeing Poseidon military aircraft," Reuters, 28 November 2016, www.reuters.com

⁷¹⁹ "Norway in \$A1.54b military aircraft order," Gold Coast Bulletin, 28 November 2016, <http://www.goldcoastbulletin.com.au/>

⁷²⁰ Laird, Robbin, "NATO allies and North Atlantic maritime threats," Vol. 14, No. 4, FrontLine Defence, 30 September, 2017, <http://www.sldinfo.com>

Lynx MK86 Anti-Submarine Warfare Helicopters (6)

Bell-412SP Helicopters (18)

Sea King Search and Rescue Helicopters (12)

NASAMS II

Land-Based Surface to Air Anti-Aircraft System

1.2.2 Land

Army⁷²¹

CV9030 Tank

Leopard 2A4 Heavy Tank

Archer Self-Propelled Artillery

M-113 Family of Light Tanks

BV 206 Tracked Vehicle

1.2.3 Sea

Frigates or destroyers⁷²² (last of which was delivered in Jan 2011)⁷²³

- Five new Frigates or destroyers
- Fridjof Nansen class
- New Arctic capability
- Have the US Aegis combat system
- Will host NH90 helicopters⁷²⁴

Coastal Patrol Vessels

- Six coastal patrol vessels
- Skjold class
- 76mm gun, anti-ship and anti-air missiles
- IISS refers to these as Patrol and Coastal Combatants
- As of September 2016 Norway's Coast Guard has ordered new patrol vessels to be built three at a time and costing €221 million each.^{725 726}

⁷²¹ "About," Norwegian Armed Forces, date not listed, <http://mil.no>

⁷²² The Military Balance 2012 counts them as destroyers.

⁷²³ Norway's navy ships are not capable of breaking ice, but some have increased capacity for Arctic operations, notably newly-acquired Fridtjof Nansen class frigates.

⁷²⁴ Wezeman, Siemon, T., "Military Capabilities in the Arctic," SIPRI Background Paper, March 2012, p. 8.

⁷²⁵ Nilsen, Thomas, "Vanishing sea ice gives Norway more waters to patrol, orders new Coast Guard vessels," The Barents Observer, 29 September 2016, <http://thebarentsobserver.com>

⁷²⁶ See "Coast Guard" section for more details.

Marjata IV, Intelligence Vessel



Photocredit: Atle Staalesen/The Independent Barents Observer, Marjata IV at port in Kirkenes
<http://www.rcinet.ca>

- A new Norwegian military intelligence vessel, the “Marjata,” the same name that was given to all three earlier vessels in this role over a 60-year period, entered into service in April 2016⁷²⁷. The Marjata IV will be substantially larger than the others, being 126 meters (413 feet) long and 23.5 meters (77 feet) wide, and will have costed Norwegian military approximately \$170 million.⁷²⁸ Norway will keep the Marjata IV’s predecessors in service, doubling Norway’s capability, and *IHS Jane’s 360* reports that this vessel “has already deployed to take up surveillance and reconnaissance duties, alongside other NATO vessels, in and around the Arctic region”.⁷²⁹

Submarines

- Six Ula class (SIPRI) to be replaced starting in mid-2020⁷³⁰
 - Minister of Defence, Ine Eriksen Sørreide, has announced a “Norwegian-German strategic partnership for purchase and lifetime management for four new submarines.”⁷³¹
 - “The plan is to sign a common contract for new submarines in 2019. This will enable delivery of new submarines from the mid-2020s to 2030.”⁷³²
- Six mine-clearance vessels
- Three minesweepers
- Three mine-hunting
- One of these usually with NATO’s mine-clearance force
- Logistics vessel
 - 14 vessels: diving, training, survey, intelligence, oceanographic surveillance, supply, and Royal yacht⁷³³
- Planning a large logistic support ship to be commissioned in 2017 (HNoMS Maud)⁷³⁴
- “...operates a large ‘research ship’ with electronic and signals intelligence equipment, which is capable of operations in thin ice. A replacement was ordered in 2010.”⁷³⁵
- “None of Norway’s warships or patrol ships can break ice.”⁷³⁶

Combat support ship⁷³⁷

- “A large combat support ship, the first ever for Norway, was ordered in 2013 and is to be delivered in 2016. It will give the [Nansen] frigates a substantial increase in range and endurance.”

⁷²⁷ Nilsen, Thomas, “Norway’s new Arctic giant spyship,” *The Barents Observer*, 17 March 2014, <http://barentsobserver.com>

⁷²⁸ “Vikings Striking: Norway to Double its Warships to Track Russian Fleet”, *Sputnik News*, 4 April 2016, <http://sputniknews.com>

⁷²⁹ Jones, Bruce, “Norway’s new surveillance ship arrives, deploys quickly to support NATO operations,” *IHS Janes 360*, 22 April 2016, <http://www.janes.com>

⁷³⁰ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” *SIPRI Background Paper*, SIPRI, October 2016.

⁷³¹ Nilsen, Thomas, “Norway teams up with Germany for new submarines,” 3 February 2017, *The Barents Observer*, <https://thebarentsobserver.com>

⁷³² Nilsen, Thomas, “Norway teams up with Germany for new submarines,” 3 February 2017, *The Barents Observer*, <https://thebarentsobserver.com>

⁷³³ “The Military Balance 2012,” *IISS*, 7 March 2012, p. 142., <https://www.iiss.org>

⁷³⁴ “A COMPARISON OF HMCS QUEENSTON AND HNoMS MAUD,” *Canadian Defence Matters*, April 7, 2017, <http://jgmjgm516.blogspot.ca/2017/04/the-queenston-class-is-class-of-naval.html>

⁷³⁵ Wezeman, Siemon, T., “Military Capabilities in the Arctic,” *SIPRI Background Paper*, March 2012.

⁷³⁶ Wezeman, Siemon, T., “Military Capabilities in the Arctic,” *SIPRI Background Paper*, March 2012.

⁷³⁷ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” *SIPRI Background Paper*, SIPRI, October 2016.

Kronprins Haakons – New oceanographic icebreaker

- Has launched at Fincantieri's shipyard in Muggiano, La Spezia and was completed and delivered in 2017.⁷³⁸
- Can accommodate 55 people, cruise at up to 15 knots, break ice up to 1 metre thick, and is equipped with 2 helicopters in the bow.⁷³⁹
- Vessel is owned by the Norwegian Polar Institute for the Norwegian Government and will be used also by the Institute of Marine Research (IMR), the Norwegian governmental body for oceanographic research and fishing, and by the University of Tromsø.⁷⁴⁰
- The vessel's first research voyage is to begin 9 July, 2018, where it will map the northern parts of the Barents Sea as part of the Nansen Legacy project.⁷⁴¹

1.2 Organizations and Operational Units (personnel)

The Navy's "coastal squadron" is its operational force, and the Navy's Coast Guard "in peacetime are the government's primary authority at sea and the Armed Force's most important resource for handling incidents in the Norwegian territorial waters."⁷⁴²

Coast Guard

- Ministry of defence says Coast Guard has 13 vessels of various size⁷⁴³
 - IISS says Norway's Coast Guard has 14 Patrol and Coastal Combatant ships
 - The ice capable Svalbard Coast Guard vessels (entered into service in 2002)
 - 57mm gun
 - NBC protected
- The "Coastguard operates four large but lightly armed OPVs capable of operations in icy conditions, including three with a helicopter hangar, and four other large ocean-going OPVs."
- The Coast Guard operates ice-capable ships equipped with anti-ship and anti-air weapons.
- "Prime Minister Erna Solberg and Defence Minister Ine Eriksen Sørreide proudly announced that Norway will not only order one, but three at a time, new Coast Guard vessels."⁷⁴⁴
 - Vessels with have ice-breaking capabilities as well as helicopter and longer sailing range.
 - "Will replace the 30 years old North Cape class today consisting of the vessels "Nordkapp", "Senja" and "Andenes".

Brigade Nord⁷⁴⁵

- Since 2009, the Brigade Nord is "the largest active unit of the Norwegian Army. The Brigade is stationed in the north of Norway, above the Arctic Circle, though one of its two heavy battalions is stationed near Oslo. It is winter-trained but is organized as a heavy mechanized unit and is equipped for operations in Norway.
- Currently its tanks and armored vehicles are being modernized and there are plans to both modernize and expand the brigade's air defence.
- Norway's 2015 strategic defence review noted plans to base part of the brigade at Porsanermoen Camp.

Home Guard-17 District⁷⁴⁶

- Located in Finnmark
- According to Norway's 2015 Strategic Defence Review, the Norwegian Home Guard-17 District will be "reinforced to safeguard territorial responsibility and receive reinforcements. The district will also be given capacity for anti-tank and electronic warfare. Rapid response units will be reinforced from 3 000 to 3 250 and will be able to mobilise rapidly to other parts of the country."

⁷³⁸ Haun, Eric, "Norway's New Oceanographic Icebreaker Launched," Marine Link, 28 February, 2017, www.marinelink.com/news/oceanographic-icebreaker422636

⁷³⁹ Haun, Eric, "Norway's New Oceanographic Icebreaker Launched," Marine Link, 28 February, 2017, www.marinelink.com/news/oceanographic-icebreaker422636

⁷⁴⁰ Haun, Eric, "Norway's New Oceanographic Icebreaker Launched," Marine Link, 28 February, 2017, www.marinelink.com/news/oceanographic-icebreaker422636

⁷⁴¹ Eilertsen, Av Hege, "The Nansen Legacy project gets the go-ahead," High North News, 15 December 2017, <http://www.highnorthnews.com>

⁷⁴² "About," Norwegian Armed Forces, no date listed, <http://mil.no>

⁷⁴³ Wezeman, Siemon, T., "Military Capabilities in the Arctic," SIPRI Background Paper, March 2012.

⁷⁴⁴ "Norway orders new Coast Guard vessels as vanishing sea ice increases areas needing patrol," RCINet, 30 September 2016, www.rcinet.ca

⁷⁴⁵ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁷⁴⁶ Admiral Haakon Bruun-Hanssen, "Norwegian Armed Forces in Transition," Norwegian Armed Forces, 2015.

https://forsvaret.no/en/ForsvaretDocuments/Strategic_Defence_Review_2015_abridged.pdf

MARPART project⁷⁴⁷

- Maritime Preparedness and International Partnership in the High North (MARPART project)
- Financed by the Norwegian Ministry of Foreign Affairs, with participation from approximately 20 organizations from Norway, Russia, Iceland and Greenland
- “MARPART emphasizes the responsibility of the governments for preparedness as to safety, security and environmental protection in the High North. The main purpose of this project is to assess the risk of the increased maritime activity in the High North and the challenges this increase may represent for the preparedness institutions in this region.”

2. Recurring Operations and Exercises

Operations occurring Annually

Annual military exercises in cooperation with NATO and regional partners like Sweden are designed to enhance capacity for large-scale operations in winter conditions.

COLD RESPONSE

- Norwegian run with significant NATO and regional participation
- 7-10,000 troops
- Annual, mid-March
- Training for large-scale operations in winter conditions
- Last occurred in March 2016

DYNAMIC MONGOOSE⁷⁴⁸

- Largest annual anti-submarine warfare exercise
- Last occurred in July 2017
 - Participation included “a total of 11 surface ships, eight maritime patrol aircrafts, five submarines, and more than 2,000 sailors and airmen from ten allied nations”, according to the Norwegian Navy.⁷⁴⁹
 -

JOINT VIKING⁷⁵⁰

- A national Norwegian exercise that, in 2017, included approximately 700 soldiers from the United States Marine Corps, United States Army and the British Royal Marines and took place in Finnmark.
- Main goals are to practice crisis management and the defense of northern Norway.

Operations occurring Biennially

ARCTIC CHALLENGE (ACE)

- Norwegian-run biennial exercise with significant NATO participation, including “forces from Germany, Britain, France, the Netherlands and the United States, as well as non-Nato allies Finland, Sweden and Switzerland.”⁷⁵¹
- “Largest of its kind” aviation exercise, with approx. 100 aircraft and 4,000 servicemen taking part⁷⁵²
- Biennial, held in May⁷⁵³
- Last occurred May 22 – June 2, 2017, organized by Norway, Sweden and Finland with over 11 countries participating.⁷⁵⁴

⁷⁴⁷ “Maritime Preparedness and International Partnership in the High North (MARPART project),” The University of the Arctic, 20 May 2016, <http://www.uarctic.org>

⁷⁴⁸ “Anti-submarine warfare exercise ‘Dynamic Mongoose’ starts off Norwegian coast,” NATO, 4 May 2015, <http://www.nato.int>

⁷⁴⁹ Staalesen, Atle, “NATO trains in anti-submarine warfare in northern waters,” 24 July 2017, The Independent Barents Observer, <https://thebarentsobserver.com>

⁷⁵⁰ Nilsen, Thomas, “Norway kicks off exercise in Finnmark,” The Barents Observer, 3 March 2017, <https://thebarentsobserver.com>

⁷⁵¹ Oliphant, Roland, “Russia and NATO launch rival war games,” The Telegraph, 26 May 2015, <http://www.telegraph.co.uk>

⁷⁵² Oliphant, Roland, “Russia and NATO launch rival war games,” The Telegraph, 26 May 2015, <http://www.telegraph.co.uk>

⁷⁵³ “Sweden, Norway and Finland will participate in Europe’s largest fighter jet drills, dubbed the Arctic Challenge Exercise 2015 (ACE 2015),” Sputnik News, 25 May 2015, <http://sputniknews.com>

⁷⁵⁴ Nilsen, Thomas, “Arctic Challenge 2017 set for take off,” The Barents Observer, 16 May 2017, <https://thebarentsobserver.com>

DENMARK

1. Security Assets available for Operations in the North

In June 2016, Denmark announced a proposed increase in defense spending in the Arctic. The released budget reflected a modest increase in spending – \$18 million added to a budget of \$3 billion. Monies will enable Denmark to increase surveillance as well as boost their coast guard capacity to honour its commitment as an Arctic Council member.⁷⁵⁵

1.1 Bases (including stations, naval facilities, radar sites, etc.)

Greenland and Faroes Military Bases

- A combined command, headquartered in Nuuk, Greenland⁷⁵⁶
 - Headquarters has about 85 personnel & coordinates Danish military unit deployments across the Arctic and North Atlantic
- Surveillance and sovereignty
- Fisheries inspection
- Search and rescue
- Support for scientific expeditions

Gronnedal in Southwest Greenland

- Detachments:
 - Northeast Greenland National Park
 - Station Nord (Northern Greenland)
 - Luftgruppe Vest I Sondre Stromford/Kangerlussuaq (Western Greenland)
 - Forsvarets Vagt I Mestersvig (Eastern Greenland)

Thule Air Base (North-Western Greenland)

- Currently dormant as an airforce base⁷⁵⁷

Island Command Faroes

- Near Torshavn⁷⁵⁸

1.2 Equipment

1.2.1 Air

F-16 Fighter (45)



Photo Credit: RDAF F-16 MLU

[http://commons.wikimedia.org/wiki/File:F-16_MLU_of_Royal_Danish_Air_Force_\(reg._ET-199\),_static_display,_Radom_AirShow_2005,_Poland.jpg](http://commons.wikimedia.org/wiki/File:F-16_MLU_of_Royal_Danish_Air_Force_(reg._ET-199),_static_display,_Radom_AirShow_2005,_Poland.jpg)

- F-16s have used Kangerlussuaq (Sonder Stromfjord) airport in west Greenland, some to be based there for short periods
- Thule Air Base, now dormant as an airforce base, could be used again
- 27 F-35A combat aircraft were selected in 2016 to replace the 30 currently operational F-16s after 2020.⁷⁵⁹

⁷⁵⁵ McGwin, Kevin, "Keeping the Peace: Neither armed nor dangerous," The Arctic Journal, 27 June 2016, <http://arcticjournal.com>

⁷⁵⁶ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁷⁵⁷ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

⁷⁵⁸ "Tasks in the Arctic and the Northern Alliance," Forsvarsministeriet Ministry of Defence, 27 March 2015, <http://www.fmn.dk>

⁷⁵⁹ Wezeman, Siemon, T., "Military Capabilities in the Arctic: A New Cold War in the High North?," SIPRI Background Paper, SIPRI, October 2016.

C-130J Hercules Transport (4)

CL-604 Challenger Passenger Transport (3)



Photo Credit: Danish Air Show,
<http://danishairshow.dk/en/aircrafts/aircraft/danske-flyvevaben>

Saab T-17 Supporter Training (27)



Photo Credit: Picture of Saab MFI-17 Supporter, Radom Air Show 2007,
http://commons.wikimedia.org/wiki/File:MFI-17_Supporter,_Radom_Air_Show_2007.jpg

Super Lynx (MK90B) Anti-Submarine Warfare Helicopters (8)

AS550 Fennec Maritime Reconnaissance Helicopters (8)

EH101 Merlin Transport Helicopters (14)

Surveillance Nanosatellite Ulloriaq⁷⁶⁰

- The Danish Defence Acquisition and Logistics Organization (DALO), the Technical University of Denmark (DTU) and GomSpace signed an agreement on June 10 to develop and deploy a nanosatellite as part of a surveillance demonstration for the Arctic. The satellite, measuring 30x20x10 cm, is expected to launch by the end of 2017.

1.2.2 Land

Not available

1.2.3 Sea

Destroyer (1)

- 2 more on order⁷⁶¹

⁷⁶⁰ "Gomspace ApS: Nanosatellite from GomSpace for Surveillance Demonstration for the Arctic," BusinessWire, 10 June 2016, <http://www.businesswire.com>

⁷⁶¹ "The Military Balance 2012," IISS, 7 March 2012, <https://www.iiss.org>

Thetis class (300 ton) Multi-Role OPV/Frigates (4)⁷⁶²

- Commissioned in the early 1990s, designed for patrols in the North Atlantic and off Greenland, capable of breaking ice up to 1 metre thick
- Larger MH-60R helicopters are replacing the Lynx helicopters used on Thetis class frigates

Ice-Capable Patrol Vessels (5)

- 2 Abasalon- and 3 Iver Huitfeldt-class
- 2 Absalon vessels are the largest ever built by the Royal Danish Navy and are considered both command and support ships⁷⁶³
- Can travel through ice up to a meter thick, equipped with 76mm guns, and could add Harpoon and Sea Sparrow anti-air and anti-ship missiles and anti-submarine torpedos. For patrols in North Atlantic and off Greenland.⁷⁶⁴

Patrol and coastal combatant ships DIANA Class (6)⁷⁶⁵ Arctic Patrol Ships Knud Rasmussen class (2)

- Dedicated for patrols off Greenland
- “A third Rasmussen OPV was ordered in late 2013 and is to enter service in 2017 or 2018.”⁷⁶⁶

Ice-strengthened AGDLEK class large patrol craft (1)⁷⁶⁷

- Only, HDMS Tulugaq, remains active, operates from Greenland
- Being replaced by larger Knud Rasmussen class patrol ships

Mine warfare and mine countermeasures (7)

Logistics and support (22)

- Ministry of Defence says of North Atlantic:
 - Two types of ships operate in the North Atlantic
 - Large THETIS-class patrol vessels
 - new KNUD RASMUSSEN-class inspection vessels
 - These ships are based at Naval Base Frederikshavn
 - Under operational control of Island Commander Faroe Islands and Island Commander Greenland⁷⁶⁸

1.3 Organizations and Operational Units (personnel)

The Arctic Command⁷⁶⁹

- “The Arctic Command was established on 31st October 2012, when the Island Command Greenland and the Island Command Faroes were united into a joint Arctic Command.”
- Headquarters is in the Greenland capital of Nuuk. Also has a minor liaison element in Tórshavn in the Faroe Islands.
- The primary tasks of the Defence are maritime surveillance and enforcement of sovereignty.
- The Defense has initiated the acquisition of a KNUD RASMUSSEN class vessel, and nine ship-based SEAHAWK helicopters to replace the aging LYNX helicopters.
- Due to increased military spending⁷⁷⁰ in Denmark in the coming years, the military is establishing a light infantry battalion that can be deployed to support the operations of the Arctic Command if necessary, among other national and international deployments.⁷⁷¹

⁷⁶² Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016

⁷⁶³ “Absalon L16,” MilitaryFactory.com, last modified in 2016, <http://www.militaryfactory.com>

⁷⁶⁴ Huebert, Rob; Exner-Pirot, Heather; Lajeunesse, Adam; Gullledge, Jay, “Climate Change and International Security: The Arctic as a Bellwether,” Center for Climate and Energy Solutions, May 2012, p. 18, <http://www.c2es.org/docUploads/arctic-security-report.pdf>

⁷⁶⁵ “Facts and Figures: The Danish Armed Forces,” Danish Defence, 2011, <http://forsvaret.dk>

⁷⁶⁶ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016

⁷⁶⁷ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016

⁷⁶⁸ “North Atlantic,” Danish Defence, no date listed, <http://forsvaret.dk>

⁷⁶⁹ “Tasks in the Arctic and North Atlantic,” Forsvarsministeriet Ministry of Defence, last modified 12, December 2016, <http://www.fmn.dk/eng/allabout/Pages/TasksintheArcticandtheNorthernAtlantic.aspx>

⁷⁷⁰ According to High North News in February 2018, “The new Defense Settlement for 2018-2023 provides a significant increase in Danish defense investments. The parties have agreed to increase allocations for 2018 by DKK 800 million and by 2023, they will increase to DKK 4.8 billion, which equals an annual increase of more than 20 percent.” (<http://www.highnorthnews.com/denmark-increases-defense-spending-and-prepares-for-submarine-chase/>)

⁷⁷¹ O’Dwyer, Gerard, “Special forces, allies to benefit from Denmark’s defense spending deal,” Defense News, 5 February 2018, <https://www.defensenews.com>

Fromandskorps (Frogman Corps)

- Navy SEAL- like unit made up of armed divers⁷⁷²
- Special forces unit based in Greenland⁷⁷³
- Can operate in Arctic and expanding from 130 – 150 troops⁷⁷⁴

Jaeger special forces⁷⁷⁵

- Based in Denmark
- Available for Arctic duties and expanding from 200 – 300 troops

Small Sledge Patrol (Slaedepatrulje Sirius) in Greenland⁷⁷⁶

- The defence ministry says “the Sledge Patrol SIRIUS monitors the uninhabited coastline of approximately 2100 km.” Patrol is by dog sleds in the winter and coastal boats in the summer.
- The area also patrolled by aircraft and helicopter.
- Sovereignty patrols, as well as wildlife management (animal census and ringing birds)

2. Recurring Operations and Exercises

Search and Rescue

- In Greenland Sea in 2012
- 1000 personnel from Arctic Nations
- A live full-scale search and rescue exercise
- Participating countries
 - Canada
 - Denmark
 - Iceland
 - Norway
 - Russia
 - USA⁷⁷⁷

⁷⁷² “Denmark’s Arctic Assets and Canada’s Response – Sovereignty and Strategic Resources of the High Arctic,” CASR, May 2005, <http://www.casr.ca>

⁷⁷³ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

⁷⁷⁴ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

⁷⁷⁵ Wezeman, Siemon, T., “Military Capabilities in the Arctic: A New Cold War in the High North?,” SIPRI Background Paper, SIPRI, October 2016.

⁷⁷⁶ “North Atlantic,” Danish Defence, no date listed, <http://forsvaret.dk>

⁷⁷⁷ “Greenland Command/ISCOMGEENLAND: Search and Rescue Exercise Greenland Sea 2012, Final Exercise Report,” Island Commander Greenland, 2012, http://www.institutenorth.org/assets/images/uploads/attachments/SAREX_Greenland_Sea_2012_Final_Exercise_Report.pdf

JOINT EXERCISES

The incidence of Arctic wide exercises has decreased significantly in recent years, reflecting difficult east-west relations.

AMALGAM DART⁷⁷⁸

“Amalgam Dart is a NORAD training exercise in aerospace detection and defence.” Taking place in May and June of 2015, the operation “involved Canadian and American aircraft (fighter aircraft, air-to-air refuelling tankers, and AWACS airborne warning and control aircraft) operating out of Canadian forward operating locations and US air bases in Alaska, as well as a mobile radart system out of Resolute.”

ARCTIC ANVIL

A major Pacific joint training effort between US and Canada.⁷⁷⁹

- Arctic Anvil 2016⁷⁸⁰
 - Hosted in Alaska for the first time from July 22 – Aug 3 2016
 - Consisted of live-fire and force-on-force training
 - Canadian participation included 100 members from the 1st Battalion, Princess Patricia’s Canadian Light Infantry
 - Total participation reached 8, 000 troops

ARCTIC CHINOOK

This joint SAR exercise sponsored by both the U.S. Coast Guard and Alaska Command occurred for the first time from 22-25 August, 2016. The exercise, which was open to all Arctic Council nations, took place in Kotzebue, Alaska. Rear Adm. Michael F. McAllister, commander, 17th Coast Guard District reported that, “this is one of the first opportunities we’ve had to exercise our International Maritime Search and Rescue Agreement forged between the Arctic Council nations”. Coast Guard Alaska’s official blog described the exercise as the following: “a scenario consisting of an adventure-class cruise ship with approximately 250 passengers and crew that experiences an incident which degrades to become a catastrophic event. The exercise simulated a decision to abandon ship resulting in passengers and crew with a mix of critical, serious and minor injuries, as well as the deployment of life rafts.”⁷⁸¹

Before the exercise began, Alaska Native News reported that the 17th Coast Guard District, Alaska National Guard, State of Alaska agencies, Alaska Native organizations, and Canadian Forces were all to be involved in the exercise.⁷⁸²

Communications technology known as the Next Generation Incident Command System (NICS), a web-based system developed by the Department of Homeland Security Science and Technology Directorate in collaboration with Massachusetts Institute of Technology’s Lincoln Laboratory and the Coast Guard R&D Center, was tested and evaluated during this exercise. This technology will continue to be helpful for SAR operations in remote locations, like the Arctic, during large-scale maritime incidents.⁷⁸³

Arctic Council SAR Table Top Exercise

In October 2011 a two-day exercise in Whitehorse experts from the eight Arctic Council States (involving 32 delegates and 60 observers) “examined the strategic and operational aspects of the Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic, signed in Nuuk, Greenland, on May 12, 2011.” Aeronautical and maritime SAR scenarios were addressed and delegates agreed that “because of each country’s limited SAR resources and large areas of responsibility, an international response is needed.”⁷⁸⁴ A report by the Munk-Gordon Arctic Security Program and OpenCanada provides graphics and documentation of publicly reported search and rescue operations since 2010 to ask whether Canada is ready to meet its obligations under the Search and Rescue agreement.⁷⁸⁵

⁷⁷⁸ Regehr, Ernie, “When Bears Still Fly: Responding to Russian Bomber Patrols in the Arctic”, The Simons Foundation, 10 November 2016, <http://thesimonsfoundation.ca>

⁷⁷⁹ Pugliese, David, “Canadian troops headed to Alaska for Exercise Arctic Anvil,” Ottawa Citizen, 22 July 2016, <http://ottawacitizen.com>

⁷⁸⁰ Pugliese, David, “Canadian troops headed to Alaska for Exercise Arctic Anvil,” Ottawa Citizen, 22 July 2016, <http://ottawacitizen.com>

⁷⁸¹ Colclough, Bill, “Arctic Chinook 2016,” Coast Guard Alaska Official Blog, 2 September 2016, <http://alaska.coastguard.dodlive.mil/>

⁷⁸² Colclough, Bill, “USCG to participate with AK Command in Arctic Chinook Exercises,” Alaska Native News, 23 August 2016, <http://alaska-native-news.com>

⁷⁸³ U.S. Coast Guard Research and Development Center, “Coast Guard Research and Development Center Completes Arctic Communications and Next Generation Incident Command System Evaluation,” Defence Media Activity, 2 September 2016, www.dvidshub.net

⁷⁸⁴ “Arctic Council Search and Rescue Table Top Exercise,” Foreign Affairs and International Trade Canada, no date listed, <http://www.international.gc.ca>

⁷⁸⁵ “Are We Ready,” OpenCanada.Org, 6 May 2013. <http://opencanada.org>

BARENTS RESCUE

Barents Rescue is a biennial cross-boundary emergency exercise for the Barents Euro-Arctic Region and has been held since 2001. The BEAC described Barents Rescue 2011 as including four practical field exercises that included scenarios involving “a train accident, rescue operations of trapped people in a collapsed industrial building and in a tunnel, and a chemical emission in a densely populated area.” Emergency actors and organizations from all the Barents Region countries took part, with an implementation of the 2009 Agreement on Emergency Prevention Preparedness and Response among Sweden, Finland, Norway and Russia.⁷⁸⁶ Exercise Barents 2014 was carried out successfully⁷⁸⁷, and a photo gallery posted by *The Barents Observer* confirms that the exercise occurred again in 2015, despite its normal routine of occurring every second year.⁷⁸⁸

- The most recent Barents Rescue exercise began on May 29 2017 and lasted for three days. According to The Arctic Institute’s summary, it went off without a hitch.⁷⁸⁹
 - “This year, the Northern Fleet’s rescue tug Nikolai Chiker, the new multirole modular speedboat Spasatel Kononenko, as well as search-and-rescue aircraft, will take part...”
 - “Norway will use ships, boats, Coastal Administration and Royal Navy Coast Guard ships, and some patrol aircraft from Royal Norwegian Air Force bases. Norwegian air traffic control centers and agencies in northern coastal cities and other state agencies will also take part.”

CTBTO – The Comprehensive Test Ban Treaty Organization

The International Monitoring System of the CTBTO includes seismic, infrasound, and radionuclide monitoring facilities across the Arctic, involving all of the circumpolar states, designed to detect any nuclear weapon test explosion.⁷⁹⁰

COLD RESPONSE

Cold Response is a major annual Norwegian-led exercise with significant participation from NATO states. In 2012 the fifth such exercise included operations in Swedish territory as well and involved “more than 16,000 sailors, soldiers, airmen, and Marines representing 15 nations.”⁷⁹¹ The focus of the exercise is “to improve and practise capabilities in high intensity and multi-threat operations during cold weather conditions.”⁷⁹² The exercise included a crisis response in the context of a UN Chapter VII mandate. Russia is not included in the exercise, leading critics to note the concern that “old twentieth century divisions are being re-ignited” by the exercise.⁷⁹³

- Cold Response 2016 included activities ranging from land, to sea, to air.⁷⁹⁴ As noted in *The Barents Observer* in March 2016, “this year’s Cold Response includes around 15,000 troops from 14 countries, 40 helicopters, 30 fighter jets and 10 other aircrafts, among them three B-52 bombers. On the maritime side, 30 vessels will participate, while 1000 vehicles will be present on land.”⁷⁹⁵ A Russian inspection took place again this year, which was expected according to the Norwegian Defence Ministry representative, as Russia has requested inspections at all recent major Norwegian exercises with allied participation.⁷⁹⁶

FRUKUS

Operation FRUKUS is took place in 2013, with four vessels of the Russian Northern Fleet joining French, Norwegian and US navies in exercise linked to Partnership for Peace⁷⁹⁷, but was said to be cancelled in 2014 due to tensions with Russia.⁷⁹⁸

- “The U.S. administration plans to cancel participation in the Northern Eagle and FRUKUS naval exercises as part of political and economic measures against Russia following the recent events in Ukraine.”⁷⁹⁹

⁷⁸⁶ “Barents Rescue Exercise: Making the Barents Region a safer place,” BarentSaga, no date listed, <http://www.beac.st/?DeptID=20413>

⁷⁸⁷ “Multifunction MPSV07 salvage vessel “Spasatel Kavdeikin” took part in the international SAR exercise “Barents 2014”, Marine Engineering Bureau, 6 September 2016, www.meb.com.ua

⁷⁸⁸ “Exercise Barents 2015,” *The Barents Observer*, last modified 9 June 2016, <http://barentsobserver.com>

⁷⁸⁹ Muzik, Val, “The Arctic this Week Take 5: Week of May 29, 2017,” *The Arctic Institute*, 2 June 2017, <http://www.thearcticinstitute.org>

⁷⁹⁰ “Whole World,” CBTO, last modified 17 June 2016, <http://www.ctbto.org/map/#ims>

⁷⁹¹ Lundquist, Edward H., “Exercise Cold Response Participants Get Chilly Reception in Norway,” 22 March 2012, <http://www.defensemianetwork.com>

⁷⁹² “Press Release: Exercise Cold Response 2012,” Norwegian Joint Headquarters Public Affairs Office, no date listed,

<http://www.norge.fi/PageFiles/591341/IEPR%20-%20Exercise%20Cold%20Response%202012.pdf>

⁷⁹³ “NATO Exercise ‘Cold Response 2012’: A Crisis Response Operation or a Provocation to Russia?” NATO Watch, 3 May 2012, <http://www.natowatch.org>

⁷⁹⁴ “CR-16,” Danish Defence, no date listed, <http://forsvaret.dk>

⁷⁹⁵ Staalesen, Atle, “Russian inspectors at Cold Response,” *The Barents Observer*, 3 March 2016, <http://thebarentsobserver.com>

⁷⁹⁶ Staalesen, Atle, “Russian inspectors at Cold Response,” *The Barents Observer*, 3 March 2016, <http://thebarentsobserver.com>

⁷⁹⁷ U.S. Naval Forces Europe-Africa/U.S. 6th Fleet Public Affairs, “Frukus 2013 wraps up,” Navy News Service, 3 July 2013, <http://www.navy.mil>

⁷⁹⁸ Pettersen, Trude, “USA cancels joint exercises with Russia,” *The Barents Observer*, 5 March 2014, <http://barentsobserver.com>

⁷⁹⁹ Pettersen, Trude, “USA cancels joint exercises with Russia,” *The Barents Observer*, 5 March 2014, <http://barentsobserver.com>

Forward Joint Navy Exercise: U.S., Russia, and Norway

There were plans for a joint Navy exercise summer 2014, which would include the United States, Russia and Norway.⁸⁰⁰ June 2016: There is no evidence of this occurring.

Forward Rosneft Arctic Projects

Rosneft, Russia's leader in the petroleum industry, produced a report "Russia and Norway: Prospects for Cooperation in the Arctic," published by the Fridtjof Nansen Institute. Artur Chilingarov, a Russian polar explorer and representative of President of the Russian Federation on international cooperation in the Arctic and Antarctic, said that "Russia and Norway provide an example of how disputed issues may be constructively resolved on the sole basis of national and international laws." Natural resources in the Arctic are a sought after commodity, Chilingarov believes that there should be "no problem in the Arctic that could not be resolved on the basis of good relations and constructive dialog."⁸⁰¹

Greenland SAR Exercise

In 2012 Greenland conducted a live, full-scale search and rescue exercise in the Greenland Sea with 1000 personnel from Arctic Nations, including Canada, Denmark, Iceland, Norway, Russia, and USA⁸⁰²

Iceland Airborne Surveillance

Canada, Denmark, Norway, and the United States, the four Arctic States within NATO, are among NATO states making periodic contributions to "Airborne surveillance and interception capabilities to meet Iceland's peacetime preparedness needs."⁸⁰³ NATO reports that since 2008 it has maintained a periodic presence (usually, three to four weeks, three times a year) of fighter in Keflavik: "The air defense flying training missions over Iceland are conducted with the aircraft in an unarmed configuration in accordance with standard NATO practice. The single exception to this rule is that a onetime capability demonstration is conducted during every deployment. This involves arming and disarming NATO aircraft before and usually after a quick-reaction training "scramble", which is conducted to exercise the air surveillance and control system, and other Icelandic support personnel from Keflavik."

In March 2013 Canada announced that, for a second time, the Royal Canadian Air Force would deploy a detachment of six Canadian CF-18 fighters. The operation was dubbed "Operation Ignition."⁸⁰⁴ When deployed, Canada's Task Force Iceland consists of about 160 Canadian Armed Forces personnel, including a detachment of up to six CF-188 Hornet fighter aircraft and a support element located in the security zone at Keflavik International Airport, about 50 km from Reykjavik, Iceland.⁸⁰⁵

Past deployments include Task Force Iceland 2013 and Task Force Iceland 2011. There are currently no forces deployed on Operation Ignition.⁸⁰⁶

Joint Tabletop Review for Crystal Serenity's Arctic voyage

An international rescue tabletop exercise was conducted in Iceland April 6-7 2016 to test and evaluate coordinated response procedures to a simulated incident aboard a luxury cruise ship. 56 participants took part in the exercise, including members of the U.S. Coast Guard and Canadian Coast Guard who were heavily involved. According to the Arctic Journal, "The exercise was aimed at strengthening the cooperation and exchange of knowledge between the Arctic cruise industry and SAR service providers, and focused on mass rescue operations relative to potential passenger ship accidents in Arctic waters."⁸⁰⁷

NANOOK

Operation Nanook is a Canadian-led arctic sovereignty operation. It has been conducted annually since 2007 by Canada, and has also involved international military partners, Canadian federal government departments and agencies, and

⁸⁰⁰ "U.S. Navy eyes greater presence in the Arctic," Reuters, 2014, <http://www.reuters.com/>

⁸⁰¹ Fonesca, Joseph R., "Report on Rosneft Arctic Projects," Marline Link, 19 December 2014, <http://www.marinelink.com>

⁸⁰² "Greenland Command/ISCOMGEENLAND: Search and Rescue Exercise Greenland Sea 2012, Final Exercise Report," Island Commander Greenland, 21 August 2012, http://www.institutenorth.org/assets/images/uploads/attachments/SAREX_Greenland_Sea_2012_Final_Exercise_Report.pdf

⁸⁰³ "Iceland's 'Peacetime Preparedness Needs'," NATO, no date listed, <http://www.aco.nato.int/icelands-peacetime-preparedness-needs.aspx>.

⁸⁰⁴ "CF-18s to Patrol Iceland's Airspace," Defence Watch, 26 March 2013, <http://blogs.ottawacitizen.com>

⁸⁰⁵ "Operation Ignition," National Defence and the Canadian Armed Forces, 21 November 2014, <http://www.forces.gc.ca>

⁸⁰⁶ "Operation Ignition," National Defence and the Canadian Armed Forces, 21 November 2014, <http://www.forces.gc.ca>

⁸⁰⁷ Association of Arctic Expedition Cruise Operators, "Arctic cruise industry and rescuers participate in joint search and rescue exercise," The Arctic Journal, 17 April 2016, <http://arcticjournal.com>

provincial, territorial, and municipal governments. It typically involves simultaneous activities at sea, on land, and in the air, and the number of personnel has ranged from about 650 to more than 1,250.⁸⁰⁸

According to CBC in 2016, “Operation Nanook is viewed as the most important for asserting Canadian sovereignty over its northern reaches while giving the military and other federal departments experience operating in the region.”⁸⁰⁹

Northern Eagle Naval Exercises

Russia, Norway, and the US have held four annual joint exercises to develop joint manoeuvring and communications capabilities, as well as joint rescue operations. In 2012 the exercises were held in the Norwegian and Barents Seas.⁸¹⁰

- The 2014 joint exercise Northern Eagle was “cancelled until further notice” after the US cancelled all military-to-military cooperation with Russia to protest Russian actions in Ukraine. As of June 2016, the exercise has not restarted.⁸¹¹

Exercise Polar Roar

An American-led joint exercise to demonstrate and test their “long-range global-strike capability”. In July 2016, it involved 10 different NATO allies⁸¹² as well as B-52 and B-2 bomber training flights to the Arctic, Northern Pacific, and the Baltic Sea. NORAD reported that Canadian CF-18 aircraft and other American aircraft trained in intercept and safe passage procedures as part of the overall exercise.⁸¹³

POMOR

Exercise POMOR is a joint Russian-Norwegian annual naval exercise. The purpose of the exercise is described by the Norwegian Armed Forces as follows: “to practice maritime security operations and to further develop the good relationship between the Norwegian and the Russian military.”⁸¹⁴ POMOR 2012 was described by the *Barents Observer*: “This year’s exercise will take place on four locations – one in Russia and three in Norwegian waters. The drills will focus on anti-terror and anti-piracy operations, interception of fast-speed boats illegally crossing the state borders, search and rescue operations. The exercise will also include joint manoeuvring, live artillery firing, anti-aircraft defense and detection of submarines. Norwegian coastal rangers and Russian naval infantry are also planned to take part in POMOR-2012.”⁸¹⁵

Due to Norway suspending military cooperation with Russia, Operation POMOR was cancelled in 2015 and has not occurred since.⁸¹⁶

US Air National Guard exercise in Finland

The first instance of US military aircraft using Finnish bases to conduct exercises, approved in November 2015, will occur in May 2016. A wing of F-15 fighter jets from the US Air National Guard will run drills mainly out of Rissala air base in central Finland. Approximately 100 US service personnel and 8 unarmed F-15s will participate in the drills, which are expected to last 2 weeks. Finnish Foreign Minister Soini stated that the request to hold the exercise came from the US and not Finland, yet Finnish Defence Ministry official Mika Varvikko describes the US as “the most important bilateral companion” of Finland’s Air Force.⁸¹⁷

VIGILANT EAGLE

In 2011 “Russian Federated Air Force, the USAF and Canadian Air Force worked a training exercise that simulated terrorists hijacking a Boeing 757 in the Alaskan region of the North American Aerospace Defense Command. Other aircraft involved in the exercise were F-22’s that were involved in interception and investigation. On the Russian side

⁸⁰⁸ <http://www.cjoc-coic.forces.gc.ca/cont/rec-eng.asp>

⁸⁰⁹ Berthiaume, Lee, “Trudeau ends Harpers tradition of attending Arctic military exercise,” 29 August 2016, CBC, www.cbc.ca

⁸¹⁰ “The Russian Navy held joint military exercises with Norway and the US in the Norwegian Sea, 21 August 2012,” Arctic Info, 21 August 2012, <http://www.arctic-info.com>

⁸¹¹ Nilsen, Thomas, “Crimea crisis puts Barents naval exercise on hold,” The Barents Observer, 14 March 2014, <http://barentsobserver.com>

⁸¹² Swartz Phillip, “Air Force refueling sorties on top of the world: They’re ‘like an organized chaos’,” 7 August 2016, Air Force Times, <http://www.airforcetimes.com>

⁸¹³ Pugliese, David, “US shows off its strategic muscle with bomber flights to Arctic and Baltic Sea, CF- 18s involved,” Ottawa Citizen, 01 August 2016.

<http://ottawacitizen.com>

⁸¹⁴ <http://mil.no/exercises/pomor2011/Pages/default.aspx>

⁸¹⁵ Pettersen, Trude, “POMOR-2012 starts in one month,” The Barents Observer, 15 April 2012, <http://barentsobserver.com>

⁸¹⁶ Pettersen, Trude, “Norway suspends military cooperation with Russia until end of 2015,” RCI Net, 12 December 2014, <http://www.rcinet.ca>

⁸¹⁷ Staalesen, Atle, “U.S. Fighter Jets over Finnish Laplands,” The Barents Observer, 9 February 2016, <http://www.thebarentsobserver.com>

the aircraft was intercepted and investigated by three SU-27 jet fighters, a MIG-31, and two more SU-27's. The three countries worked together on the air terrorism exercise. Operation Vigilant Eagle is also an American law-enforcement effort headed by the FBI aimed at preventing political violence by "lone wolf" terrorists. The operation was first mentioned in the Wall Street Journal in April 2009.⁸¹⁸ Pugliese describes an Operation Vigilant Eagle exercise in 2010 as a joint exercise by Canada, Russia, and the US held in 2010, that involved military personnel operating from command centres in Russia and the US and fighter aircraft to follow and intercept a 'hijacked' plane.⁸¹⁹

- Operation Vigilant Eagle suspended in 2014 due to tensions between Canada/US and Russia and, as of June 2016, has not restarted.⁸²⁰

VIGILANT SHIELD

Vigilant Shield is an annual Canada-US exercise to practice joint responses to various scenarios positing threats to North America, including in the high Arctic. Most recently, from October 17-22 2016, the exercise involved deployment of Canadian CF-18s to Inuvik and American F-15s to Yellowknife.⁸²¹ According to the Canadian DND, "The exercise provides valuable and concrete field training, involving multiple NORAD regions and the deployment of air assets to locations in northern Canada and the United States, allowing NORAD to maintain a credible, flexible, and ready capability to respond to a variety of threats and situations."⁸²²

CLEAN UP OF ANDREYEVA BAY ⁸²³

The clean-up involves, as just part of the challenge, "some 22,000 spent fuel assemblies...stored in the tanks, coming from 90-100 reactor cores powering the Soviet Navy's Cold War submarines sailing out from the Kola Peninsula from the late 1950s till 1982." The work is funded by Sweden, Finland, Belgium, France, Canada, Germany, the Netherlands, Norway, Italy and the United Kingdom through the Northern Dimension Environmental Partnership.⁸²⁴ "13 countries have provided €165m in funding since 2003 for nuclear decommissioning in Russia's north-west. There have also been a number of bilateral projects, with Britain, Norway and other countries funding a long project to help clean up Andreeva Bay."

⁸¹⁸ "OPERATION VIGILANT EAGLE: Air Terror Drill Intercepts, Investigates Hijacking in Simulated Air Terrorist Operation", GlobalConflictMaps.Com, 3 January 2011. <http://www.globalconflictmaps.com>

⁸¹⁹ Pugliese, David, "Selling Canada on the need for fighters," Ottawa Citizen, 12 December 2010, <http://www2.canada.com>

⁸²⁰ Carpenter, Dan, "Joint Russia-U.S. Military Training Mission on Hold," KTUU-TV, 9 September 2016, <http://www.ktuu.com>

⁸²¹ Thatcher, Chris, "NORAD exercise puts defence of northern airspace to the test," SKIES, 26 October 2016, <http://skiesmag.com>

⁸²² Canadian Department of National Defence, "NORAD begins annual Vigilant Shield exercise," Government of Canada, 17 October 2016, <http://news.gc.ca>

⁸²³ Walker, Shaun, "Russia begins cleaning up the Soviets' top-secret nuclear waste dump," The Guardian, 2 July 2017, www.theguardian.com

⁸²⁴ Thomas Nilsen, "In 2023, the risky part of Andreeva Bay nuclear cleanup starts," *The Independent Barents Observer*, 08 December 2017.

<https://thebarentsobserver.com/en/ecology/2017/12/2023-risky-part-andreeva-bay-nuclear-cleanup-starts>

ARCTIC FORUMS

Besides the **Arctic Council**, the core regional Arctic forum with a Secretariat in Tromsø, Norway, there is a growing number of forums (some are listed here)⁸²⁵ involving Arctic populations at state, sub-state, and non-governmental levels. They collectively represent a significant intent to cooperate, and while most neither directly nor indirectly address traditional, or hard, security issues (the exception is the meetings of the Chiefs of Defence), they do all have the potential to contribute to a pan-Arctic climate of mutuality and interconnectedness which in turn does have huge implications for security. And while there may be hints of forum envy emerging, the key reality is that these various forums reflect a fundamental recognition that the Arctic is indeed a place that basically rewards cooperation.⁸²⁶

- Iqaluit hosted the 2015 Arctic Council ministerial gathering in April 2015. The meeting set the objectives for 2015-2017.
- The next ministerial gathering occurred in May 2017 in Fairbanks, Alaska, where the United States handed the council chairmanship over to Finland, who presented its action plan priorities for 2017-2019.⁸²⁷
- Canada's position as the chair of the Arctic Council came to an end in 2015.⁸²⁸

The Arctic Circle⁸²⁹

"The Arctic Circle is designed to increase participation in Arctic dialogue and strengthen the international focus on the future of the Arctic. Participating organizations will maintain their full institutional independence, identity and decision-making abilities."

If the Arctic Five is criticized for being non-inclusive, the "Arctic Circle" is the opposite, casting a wide net for the purpose of facilitating dialogue in one large "open tent" among a broad range "of global decision-makers from all sectors, including political and business leaders, indigenous representatives, nongovernmental and environmental representatives, policy and thought leaders, scientists, experts, activists, students and media." Led by Iceland, the "Arctic Circle aims to support, complement and extend the reach of the work of the Arctic Council by facilitating a broad exchange of ideas and information at an open gathering held in mid-October of each year."

According to Iceland President Olafur Grimsson, "China, India, Singapore and other countries far from the Arctic Circle could be part of a new global forum to widen the discussion about the fate of the planet's Far North."⁸³⁰

The 2016 Assembly was held October 7-9 in Reykjavik, Iceland⁸³¹ and the 2017 Assembly will take place in Reykjavik from October 13-15.⁸³²

Arctic Coast Guard Forum

- Officially established in October 2015⁸³³
- "...an operationally-focused, consensus-based organization with the purpose of leveraging collective resources to foster safe, secure and environmentally responsible maritime activity in the Arctic. Membership includes Canada, Denmark, Finland, Iceland, Norway, Sweden, the Russian Federation and the United States."⁸³⁴
- The heads of the eight Arctic nations' coast guards met in June 2016,⁸³⁵ and again in March 2017,⁸³⁶ to deepen their collaboration in the north.
 - In March 2017, the heads of coast guard services met to sign a joint agreement outlining shared protocols for emergency maritime response and combined operations in the Arctic.⁸³⁷

⁸²⁵ Exner-Pirot, Heather, "The Arctic Circle, Wayne Gretzky, and the Future of Arctic Cooperation," Eye on the Arctic, 19 April 2013, <http://eyeontheartctic.rcinet.ca>

⁸²⁶ "NATO has 'no intention' to up presence in Arctic," The Local: Norway's News in English, 8 May 2013. <http://www.thelocal.no>

⁸²⁷ "Arctic Council meets in Alaska to discuss regional cooperation," The Arctic, 9 March 2017, <http://arctic.ru/>

⁸²⁸ "2015 Arctic Council ministerial meeting," Global Affairs Canada, 4 November 2015, <http://www.international.gc.ca>

⁸²⁹ Arctic Circle - <http://www.thearcticcircle.org>

⁸³⁰ Zabarenko, Deborah, "China, India, Singapore could join new Arctic Circle forum," Reuters, 16 April 2013, <http://in.reuters.com>

⁸³¹ "About," Arctic Circle, last modified 9 June 2016, <http://arcticcircle.org>

⁸³² "2017 Arctic Circle Assembly", UArctic, no date listed, <http://www.uarctic.org/>

⁸³³ Braynard, Katie, "Establishment of the Arctic Coast Guard Forum," Coast Guard Compass, 30 October 2015, <http://coastguard.dodlive.mil>

⁸³⁴ Braynard, Katie, "Establishment of the Arctic Coast Guard Forum," Coast Guard Compass, 30 October 2015, <http://coastguard.dodlive.mil>

⁸³⁵ Sevunts, Levon, "Arctic nations deepen Coast Guard cooperation," RCINet, 10 June 2016, <http://www.rcinet.ca>

⁸³⁶ "Arctic coast guard services coordinate procedures for cooperative maritime activity," The Arctic, 23 March 2017, <http://arctic.ru>

⁸³⁷ "Arctic coast guard services coordinate procedures for cooperative maritime activity," The Arctic, 23 March 2017, <http://arctic.ru>

- The Arctic Coast Guard Forum held a multi-lateral search-and-rescue (SAR) exercise (Arctic Guardian) in September 2017.⁸³⁸
- The ACGF met in March 2018 to prepare for the second live exercise to be held in Finland in early 2019.⁸³⁹
- An automated information exchange system (AIES) will be shared amongst Arctic countries' border services. Start date TBD.⁸⁴⁰
 - "The AIES is a new step forward towards the establishment of effective information exchange between the member-states of the Arctic Coast Guard Forum," a FSB spokesperson explained."
 - The AIES was developed by the Russian Federal Security Service and has already been applied to the northern Pacific border agencies since 2005.

Arctic Economic Council

"The Arctic Economic Council is an independent organization that facilitates Arctic business-to-business activities and responsible economic development through the sharing of best practices, technological solutions, standards and other information. The Arctic Economic Council held its first meeting in Iqaluit, Nunavut on September 2-3, 2014."⁸⁴¹

The Arctic Council "recognizes the central role of business in the sustainable development of the Arctic". As a result, the Arctic Economic Council was formed, which was previously associated with the Task Force to Facilitate the Circumpolar Business Forum (TFCBF). The Arctic Economic Council will focus on the following:

- foster business development in the Arctic,
- engage in deeper circumpolar cooperation, and provide a business perspective to the work of the Arctic Council.⁸⁴²

The AEC has "three thematic working groups on Arctic Stewardship, Responsible Resource Development and Maritime Transportation. Additionally, AEC representatives have delivered more than 40 outreach presentations around the world and met with business leaders seeking partnerships to promote responsible economic development in the Arctic" said Canadian Tom Paddon, the outgoing Chair of the AEC.⁸⁴³

Arctic Five

The five Arctic coastal states (Canada, Greenland, Norway, Russia, United States) met in Ilulissat in 2008 to jointly declare that "the law of the sea provides for important rights and obligations concerning the delineation of the outer limits of the continental shelf, the protection of the marine environment, including ice-covered areas, freedom of navigation, marine scientific research, and other uses of the sea." Their declaration included a "commit[ment] to this legal framework and to the orderly settlement of any possible overlapping claims."⁸⁴⁴ A second meeting, in Chelsea in 2010,⁸⁴⁵ reiterated the commitment to the peaceful settlement of overlapping claims in the Arctic and pledged cooperation and, as the Canadian hosts reported, "discussed the value of having our national agencies responsible for public safety issues consider these and other potential challenges in the Arctic and explore ways Arctic Ocean coastal states can share information and strengthen cooperation, consistent with national law."

Whether the group will be formalized as the Arctic G5, as the *Barents Observer* put it,⁸⁴⁶ remains to be seen, given the criticisms it has faced for excluding the other three Arctic states and representatives of indigenous peoples. But consultation among the five, is likely to continue for the simple reason, as the Russian Foreign Minister said in his summary of the Chelsea meeting, the Arctic Ocean states have a "special responsibility...for the state of affairs in the region."⁸⁴⁷ Arctic Defence Chiefs

The Defence Chiefs of the eight Arctic Council states have begun to meet annually to share information their respective Arctic military capabilities, especially related to capacity in support civilian search and rescue and other missions. The

⁸³⁸ Torruella, Anika, "Arctic Coast Guard Forum to hold search-and-rescue exercises," IHS Jane's Navy International, 13 April 2017, <http://www.janes.com/>

⁸³⁹ Sevunts, Levon, "Arctic nations develop coast guard co-operation," The Barents Observer, 13 March 2018, <https://thebarentsobserver.com>

⁸⁴⁰ "An automated information system to be introduced in the Arctic," The Arctic, 4 July 2017, <http://arctic.ru>

⁸⁴¹ "Backgrounder," Arctic Economic Council, last modified in 2016, <http://arcticeconomiccouncil.com>

⁸⁴² Arctic Economic Council, "Arctic Council, 28 January 2014, <http://www.arctic-council.org>

⁸⁴³ "Arctic Economic Council selects new Chair and establishes Secretariat," Arctic Economic Council, 23 April 2015, <http://arcticeconomiccouncil.com>

⁸⁴⁴ "The Ilulissat Declaration", Arctic Ocean Conference, 27 – 29 MAY 2008, http://www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf

⁸⁴⁵ Cannon, Lawrence, "Arctic Ocean Coastal States meeting, Chelsea: Summary," Foreign Affairs Minister of Canada, 29 March 2010, <http://www.arctic-report.net/wp-content/uploads/2012/01/2010.03-Arctic-Ocean-Coastal-States-meeting-Chelsea-Canada-March-2010.pdf>

⁸⁴⁶ Staalesen, Atle, "Formalizing the Arctic G5," The Barents Observer, 30 March 2010, <http://barentsobserver.com>

⁸⁴⁷ "Outcome of the Second Ministerial Meeting of the Arctic Ocean Coastal States, Chelsea, Canada, Press Release," The Embassy of the Russian Federation in Canada 1 April 2010, <http://www.rusembassy.ca>

first meeting was held in April 2012 in Goose Bay, Labrador and hosted by the Canadian Chief of Defence Staff. "The primary objective of the two-day conference was to build upon Canada's existing defence relationships in the region by offering attendees an informal opportunity to conduct direct multi- and bilateral discussions focused on Northern issues. Topics discussed included the sharing of knowledge and expertise about dealing with regional operational challenges posed by geography, climate and vast distances; responsible stewardship; and support to civil authorities."⁸⁴⁸

They met again in June 2013 in Ilulissat, Greenland. According to [defensenews.com](http://www.defensenews.com),⁸⁴⁹ the Defence Chiefs agreed to "strengthen cooperation in marine surveillance and expand joint military exercises. "Moreover, defense commanders agreed to identify and appraise the military and civilian capabilities in each country that can be used to support civilian missions in the Arctic over the next 12 months. "The new strategy, following a two-day meeting of defense commanders in the coastal Greenland town of Ilulissat that ended June 12, will focus on how the eight Arctic nations can bolster defense and security cooperation in the Arctic and how military resources can be better deployed to support civilian needs across borders."

In addition:

"A consensus was reached by the military chiefs of Denmark, the US, Canada, Russia, Finland, Sweden, Norway and Iceland to work toward a common goal in which all countries adhere to the Maritime Safety & Security Information System (MSSIS), a near real-time data collection and distribution network operated by 60 countries that shares information sourced from the marine tracking Automatic Identification System, coastal radar units and other maritime-related monitoring systems.

"MSSIS-based cooperation would mean the eight militaries could operate from a level playing field of knowledge and work with a common situational picture when collaborating on cross-border tasks in the Arctic."

Arctic Frontiers⁸⁵⁰

According to its website, "Arctic Frontiers is organised as an independent network and a leading meeting place for pan-arctic issues." Established in 2006, its mission is:

- To increase attention and commitment to sustainable development of the Arctic, particularly from the corporate sector.
- To build new partnerships across sectors, generations and ethnic groups,
- To offer a forum for delivering state of the art science to the public and at the same time bringing the sociological, political and economic framework for management of the Arctic to the attention of science.
- To provide open access to everyone to the annual conferences through a live broadcast on the Internet, simultaneously interpreted in English and in Russian.
- To develop new approaches and solutions to environmental challenges caused by human activity.

The Arctic Frontiers secretariat is located in Tromsø, Norway and is responsible for day-to-day operations and for the organisation of the annual conference. The next conference will be in January 2017.⁸⁵¹

International Cooperative Engagement Program for Polar Research (ICE-PPR⁸⁵²)

"Defense officials and scientists from partner nations with Arctic and Antarctic interests, including the United States, Canada, Denmark, Finland, Norway and Sweden met in Helsinki to advance collaboration on polar research that could prove pivotal to not only scientific understandings but also U.S. and international naval operations."

"The meeting answers the recent call from Chief of Naval Operations Adm. John Richardson to rapidly accelerate learning and provide new capabilities to the fleet. The "Design for Maintaining Maritime Superiority" specifically calls for expanding and strengthening the Navy and Marine Corps network of partners, including a directive to "prioritize key international partnerships through information sharing, interoperability initiatives and combined operations."

⁸⁴⁸ "General Natynczyk and fellow northern Chiefs of Defence discuss shared Arctic interests", DND News Release, 13 April, 2012, <http://www.forces.gc.ca>

⁸⁴⁹ O'Dwyer, Gerard, "Arctic Nations Set Cooperation Guidelines," Defence News, 27 June 2013, <http://www.defensenews.com>

⁸⁵⁰ Arctic Frontiers - <http://www.arcticfrontiers.com>

⁸⁵¹ "Home," Arctic Frontiers, last modified 9 June 2016, [arcticfrontiers.com](http://www.arcticfrontiers.com)

⁸⁵² Haun, Eric, "Senior Defence Officials discuss Polar priorities," MarineLink.com, 1 March 2016, <http://www.marinelink.com>

This meeting represents “a first-ever gathering of senior defense officials to coordinate science and technology research in high latitudes.”

Northern Forum⁸⁵³

Founded⁸⁵⁴ in 1991, the Northern Forum’s mission is “to improve the quality of life of Northern peoples by providing Northern regional leaders a means to share their knowledge and experience in addressing common challenges; and to support sustainable development and the implementation of cooperative socio-economic initiatives among Northern regions and through international fora.”

“Membership is available to regional and sub-regional governments, municipalities (where there is no regional entity) businesses, non-profit and non-governmental organizations,” and “member regions are represented by their Governor, Premier, President or highest executive, or his/her duly mandated delegate.” Its Secretariat is in Russia and the corporate office is in the United States. An extensive website points to a wide variety of programs and activities.

⁸⁵³ Northern Forum - <http://www.northernforum.org>

⁸⁵⁴ “The founding members included: Yukon Territory, Canada; Heilongjiang Province, Peoples' Republic of China; Lapland, Finland; Hokkaido, Japan; Dornod, Mongolia; Trondelag and Tromso, Norway; Chukotka Autonomous Okrug, Kamchatka Oblast', Magadan Oblast', Russian Federation; Republic of Korea; and the state of Alaska, U.S.A.”

OTHER PROJECTS INVOLVING THE ARCTIC

Arctic Fibre⁸⁵⁵

“Arctic Fibre is a fibre optic telecommunications project developing one of the largest subsea cable networks in the world. The cable connects Asia to Western Europe via the southern portion of the North West Passage through the Canadian and Alaskan Arctic. In addition to providing transoceanic connectivity directly between the two continents, Arctic Fibre will be bringing affordable high speed Internet Access to the Arctic for the first time where bandwidth is currently limited. The introduction of high speed Internet will enable Arctic governments to deliver improved health and education services more cost effectively, spur economic development and empower local businesses, and allow consumers to access video and high speed applications.”

China and the Arctic

China is one of the most important rising powers, displaying an increasing interest in the Arctic. Chinese Rear Admiral Yin Zhuo said, ““The Arctic belongs to all the people around the world as no nation has sovereignty over it...” China has an interest in Greenland’s mineral resources, exploration and research of Arctic (‘scientific diplomacy’), and the Northern Sea Route.⁸⁵⁶

March 2016: During the 2015 Arctic Circle conference, Wang Yi, China’s foreign minister, delivered a message via live stream emphasising China’s felt investment as a “near-Arctic state” and its strong historical ties as a result of the Svalbard Treaty in 1925.⁸⁵⁷

June 2017: A new paper co-released by China’s National Development and Reform Commission and the State Oceanic Administration outlines how the Arctic’s Northern Sea Route may be increasingly considered a crucial part of China’s “Belt and Road” trade initiative.⁸⁵⁸

October 2017: China’s “*Vision for Maritime Cooperation under the Belt and Road Initiative* lists three sea passages...The third passage is the Arctic route, joining the Indian Ocean route to form China’s trade and investment circle.”⁸⁵⁹

Chinese Icebreaker Xuelong

Chinese icebreaker Xuelong, or Snow Dragon, embarked on its sixth expedition in July 2014. “It is estimated that the vessel, capable of breaking ice 1.2 meters thick, will travel over 11,057 nautical miles during its 76-day voyage, said Qu Tanzhou, the team leader and head of the Chinese Arctic and Antarctic Administration.”⁸⁶⁰ At the moment the Snow Dragon is the only Chinese icebreaker although, “bidding for construction of China’s second polar research ship will start by the end of April, says Hu Keyi, technical director at Jiangnan Shipyard. The ship’s estimated budget will be more than one billion yuan (\$154 million) and construction is expected to take about two years.”⁸⁶¹

July 2017: The Xuelong began its eighth arctic journey this week. “The expedition will be the first Chinese attempt to traverse the Northwest Passage. Researchers on board the Xuelong, or Snow Dragon, plan to study the acidification of the Arctic Ocean, as well as the presence of microplastics in Arctic waters, Shanghai Daily reports... This year’s route will see it depart Shanghai, traverse the Northeast Passage and then continue on to the Northwest Passage.”⁸⁶²

October 2017: Vessel completed its journey on 10 October 2017, having travelled “20,000 nautical miles in 83 days, including 1,995 nautical miles through ice formations,” according to the Polar Research Institute of China.⁸⁶³

⁸⁵⁵ Arctic Fibre - <http://arcticfibre.com/>

⁸⁵⁶ Humberto Zorro Cuervo, Mario, “China and the Arctic: The Ice Dragon,” The News Hub, 29 November 2014, <https://www.the-newshub.com>

⁸⁵⁷ Kjetland Fjeldsbø, Tore Andre, “Peripheral Kingdom,” The Arctic Journal, 2 December 2015, <http://arcticjournal.com>

⁸⁵⁸ Lanteigne, Marc, “China loops the Arctic into its Belt and Road vision,” News Deeply, 30 June 2017, <https://www.newsdeeply.com>

⁸⁵⁹ Kenderdine, Tristan, “Arctic link reveals the full scope of China’s belt and road ambitions,” South China Morning Post, 20 October 2017, <http://www.scmp.com>

⁸⁶⁰ “Chinese icebreaker heads for 6th Arctic expedition,” Xinhuanet News, 11 July 2014, <http://news.xinhuanet.com>

⁸⁶¹ “Bidding to start on China’s new ice breaker,” Maritime Executive, 13 March 2016, <http://www.maritime-executive.com>

⁸⁶² “Executive Summary for July 21st,” Arctic Deeply, 21 July 2017, <https://www.newsdeeply.com/arctic>

⁸⁶³ “China’s science vessel returns from Arctic,” China Daily, 11 October 2017, <http://www.phnompenhpost.com>

European Union

France has urged the European Union to “seize influence on the Arctic Council, the organisation that brings together the eight nations with sovereign territory in the resource-rich Arctic region.” The EU’s claim to influence would be that ‘five of the eight permanent members [of the Arctic Council] are European countries.’”⁸⁶⁴

In 2016, the European Commission released *An Integrated EU Policy for the Arctic*, which “contains 39 actions to further develop the EU’s policy towards the Arctic”.⁸⁶⁵

“A three-year, €6.5 million (\$7.7 million) research project has been launched to address safety and efficiency in Arctic ship operations. Funded by the EU’s Horizon 2020 program, SEDNA sets out to develop a risk-based approach to Arctic navigation, ship design and maritime operations.”⁸⁶⁶

IMO: Adopts Polar Code Safety Requirements

The International Maritime Organization (IMO) “finalized the Polar Code and adopted amendments to the International Convention for the Safety of Life at Sea, or the SOLAS, which will create mandatory safety requirements for ships operating in Arctic and Antarctic waters.” The code will be in effect January 1, 2017 and cover topics such as training, certification, navigation, and operational assessments.⁸⁶⁷

IMO Arctic Training

The International Maritime Organization (IMO) has finalized training requirements for mariners traveling to the Arctic and Antarctic. This means that “masters and navigating officers must complete special training in order to navigate ships in ice.”⁸⁶⁸

Interactive Arctic Risk Map

DNV GL has developed an interactive Arctic risk. “The map presents multiple dimensions, such as the seasonal distribution of ice, metocean (physical environment) conditions, sea-ice concentrations, biological assets, shipping traffic and oil and gas resources, in a user-friendly, single layout. It also includes a Safety and Operability Index, showing the variation in different factors that impact the risk level depending on the season and their location in the Arctic. In addition, a location- and season-specific index has been developed showing the environmental vulnerability of marine resources with respect to oil spill as an external stressor.”⁸⁶⁹

Arctic Risk Map - <http://www.dnvgl.com/technology-innovation/strategic-projects/arctic/resources.aspx>

Japan and the Arctic:

Japan released its first Arctic Policy in October 2015, which advocated a key role in the future formulation of international rules for Arctic development.⁸⁷⁰

Japan: Independent underwater vehicle Urashima developed by JAMSTEC⁸⁷¹

The Japanese government “will launch a project to develop an autonomous underwater vehicle capable of collecting oceanographic data on ice distribution in the Arctic Ocean, The Yomiuri Shimbun learned Friday. The data will be used to ensure the safe passage of vessels carrying liquefied natural gas and other energy resources from Russia to Japan through the ice-covered Arctic Ocean....The Arctic Ocean route has the potential to be used for the transport of oil from Siberia in Russia, and for the export and import of automobile parts via Rotterdam, where leading European ports are located.”

Robot Army to Study the Arctic

The U.S. Navy funds robots to be used to study the Arctic Ocean. The robot, a seaglider, can “surf the ocean currents for up to a year at a time.” For example, the robots are used to study how quickly the ice is melting, water temperature, and

⁸⁶⁴ Synon, M.E., “France wants EU Empire to Expand into Arctic Circle,” Breitbart News Network, 18 July 2014, <http://www.breitbart.com>

⁸⁶⁵ “An Integrated EU Policy for the Arctic,” European Commission, 27 April 2016, <http://europa.eu>

⁸⁶⁶ Haun, Eric, “EU Project Aims to Improve Arctic Shipping Safety,” 14 August 2017, Marine Link, <https://www.marinelink.com>

⁸⁶⁷ Keefe, Joseph, “IMO adopts Polar Code Safety Requirements,” Marine Link, 9 December 2014, <http://www.marinelink.com>

⁸⁶⁸ Fonesca, Joseph R., “IMO Training for Mariners in the Arctic Finalised,” MarineLink, 10 February 2015, www.marinelink.com

⁸⁶⁹ Turander, Elinor, “DNV GL launches interactive Arctic Risk Map to communicate region’s complex risk picture,” DNVGL, 26 August 2014, <http://www.dnvgl.com/>

⁸⁷⁰ Lakshmi, Aiswarya, “Japan, Finland Cooperation for Arctic,” MarineLink.com, 14 March 2016, www.marinelink.com

⁸⁷¹ “Unmanned Vessel to Explore Arctic,” The Japan News, 11 July 2014, <http://the-japan-news.com/>

general changing conditions. This will help the Navy to prepare its crew and equipment, with the plan to be fully operational in the Arctic by 2030.⁸⁷²

⁸⁷² Brumfiel, Geoff, "Navy Funds A Small Robot Army To Study The Arctic," NPR, 15 February 2015, www.npr.org