



# **CIRCUMPOLAR MILITARY FACILITIES OF THE ARCTIC FIVE**

Ernie Regehr, O.C.  
Senior Fellow in Arctic Security  
The Simons Foundation

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## Introduction

In 2011 the Canadian Senate Committee on Security and Defence, in its interim report on Arctic sovereignty and security, asked this question: “Is the region again becoming militarized?”<sup>1</sup> It is that question that prompts the following compilation of current military facilities in the circumpolar region. 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.

A simple listing of military bases, facilities, and equipment, either based or available for deployment in the Arctic Region, does not itself answer the question of militarization, but the listing is intended to contribute to the informed consideration of it, and to informed assessments of the likely security implications of particular military procurement programs and developments. The objective is to aid efforts toward a better understanding of the extent and nature of current and planned military capacity in the Arctic. A later paper will address the “militarization” question more directly.

What follows relies on a broad range of media, governmental, academic, and research centre sources, all of which are indicated in the footnotes. Of particular value and importance have been and are the following:

Rob Huebert, “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>.

Rob Huebert, Heather Exner-Pirot Adam Lajeunesse, Jay Gulledge, “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>

*Defence Watch*, the column/blog of David Pugliese in the *Ottawa Citizen*.

<http://blogs.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](http://books.sipri.org/product_info?c_product_id=442)

This is necessarily a “work in progress.” The lists are not complete and will be added to as new information becomes available or is brought to our attention (the April 2, 2013 edition includes a first set of updates). The lists will be regularly updated to accommodate new information and changes in military posture and engagement relative to the Arctic.

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<sup>1</sup> 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>

It is also a work in progress inasmuch as information pertaining to the other three states of the Arctic Council, as well as non-Arctic states, such as China, with significant ambitions regarding operations in the Arctic, is yet to be added.

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

Ernie Regehr  
Senior Fellow in Arctic Security  
The Simons Foundation  
Mobile: 519-591-4421  
Home Office: 519-579-4735  
Email: [eregehr@uwaterloo.ca](mailto:eregehr@uwaterloo.ca)

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## I. CANADA

### 1. Military and Coast Guard Bases/Facilities/Equipment

#### a) Located in the North

##### Northwest Territories (NWT)

###### *Yellowknife:*

- Joint Taskforce North (JTFN)<sup>2</sup>
  - headquartered in Yellowknife, with detachments in Whitehorse, Yukon, and Iqaluit, Nunavut;
  - 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;
- 1<sup>st</sup> Canadian Ranger Patrol Group (under JTFN) headquartered in Yellowknife<sup>3</sup>
  - encompasses Nunavut, Yukon, Northwest Territories, and Northern British Columbia.<sup>4</sup>
- 440 Transport Squadron (under JTFN):
  - 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 not a dedicated search and rescue unit;
  - 440 Squadron operates four Canadian-designed and -produced CC-138 Twin Otters:
    - approximately 55 aircrew and technicians, who are a mixture of Regular Force and Reserve Force members,
    - also maintains capability for "off-airport" operations on skis in the winter and on tundra tires in the summer;<sup>5</sup>
- JTFN also hosts a small army reserve unit (well short of 100) based in Yellowknife;
- There has been a permanent military command in Yellowknife since 1970.

##### Yukon

###### *Whitehorse:*

- JTFN detachment<sup>6</sup>

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<sup>2</sup> 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/cont/regions/jfn-foin-eng.asp>

<sup>3</sup> <http://www.army.forces.gc.ca/land-terre/cr-rc/na-an/crpg1-gprc1-eng.asp>

<sup>4</sup> <http://www.army.forces.gc.ca/1crpg/patrols-patrouilles-eng.asp>

<sup>5</sup> <http://www.rcf-arc.forces.gc.ca/17w-17e/sqns-escs/page-eng.asp?id=413>

<sup>6</sup> <http://www.cfna.dnd.ca/units/detyu-main-eng.asp>

## **Nunavut**

### ***Alert:***<sup>7</sup>

- Canadian Forces Station Alert (since the late 1950s):
  - collects signal intelligence;
  - High Frequency and Direction Finding (HFDF) facilities to support search and rescue;
  - usually about 25 Canadian Forces personnel stationed there, plus 30 civilian support personnel and up to four Environment Canada staff;
  - Operation Boxtop – usually twice a year to resupply Alert;
  - Operation Nevus – annual operation to maintain and repair the microwave communication system across Ellesmere Island that links Alert to Eureka (400 km south of Alert) through the High Arctic Data Communications System (HADCS).<sup>8</sup>

### ***Eureka:***

- A link between Alert and Ottawa for the High Arctic Data Communications System II (HADCS II) between Eureka and Alert 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.”<sup>9</sup>

### ***Iqaluit:***

- JTFN detachment<sup>10</sup>

### ***Nanisivik:***

- Naval berthing/docking and refuelling facility (intended initially to be fully operational by 2015, with initial operating capacity in 2012 – now delayed to 2016).<sup>11</sup>
  - in March 2012 Defence Watch reported a major scaling back of plans for the facility:<sup>12</sup>
    - will now be a 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.

### ***Resolute Bay:***

- Canadian Forces Arctic Training Centre<sup>13</sup>

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<sup>7</sup> <http://www.rcaf-arc.forces.gc.ca/8w-8e/alert/index-eng.asp>

<sup>8</sup> <http://www.cjoc-coic.forces.gc.ca/cont/nevus/index-eng.asp>

<sup>9</sup> <http://www.commelec.forces.gc.ca/inf/new-bul/vol53/article-11-eng.asp>

<sup>10</sup> <http://www.cfna.dnd.ca/units/detnu-main-eng.asp>

<sup>11</sup> Col. (Retd) Sylvain Lescoutre, “Forward Operating Location Nanisivik: Halifax's Gateway to Canada's Arctic,” 24 April 2012, Royal United Services Institute of Nova Scotia. [http://www.rusi.ca/rusi\\_sac.htm](http://www.rusi.ca/rusi_sac.htm)

<sup>12</sup> David Pugliese, “DND significantly cuts back on Harper’s much-ballyhooed plan to build a naval facility at Nanisivik,” Defence Watch, Blogs.OttawaCitizen.com, 22 March 2012. <http://blogs.ottawacitizen.com/2012/03/22/dnd-significantly-cuts-back-on-harpers-much-ballyhooed-plan-to-build-a-naval-facility-at-nanisivik/>

- “will be used year-round for both winter warfare and Arctic training, and routine operations
- “can also be used as a command post for emergency operations and disaster response
- “a location to pre-position equipment and vehicles”<sup>14</sup>
- training up to 100 people
- emergency operations command post<sup>15</sup>
- prepositioning equipment and vehicles
- DND exploring a major expansion in Resolute Bay
  - paved runway
  - hangars
  - fuel installations
  - would support DND and SAR operations in north,<sup>16</sup> though would not be, as reported by the CBC, the permanent search and rescue base for which northerners have been calling.<sup>17</sup>
    - the CBC report quotes a DND official:
      - “instead of a facility dedicated solely to protecting Canadian Arctic sovereignty, soldiers there will learn how to respond to accidents and disasters in the High Arctic...My focus is mainly building a training facility but to also have a facility where we can conduct operations.”
    - it is to include:
      - a warehouse for 40 snowmobiles and ATVs
      - accommodations for 140 people
      - a small infirmary
      - an operations centre
      - classrooms
    - cost of \$18 million
    - scheduled to be complete by 2013.

## Other

### **Rangers**

- As noted above, Joint Task Force North (JTFN) is home to **1st Canadian Ranger Patrol Group (1 CRPG)** and encompasses Nunavut, Yukon, Northwest Territories, and Northern British Columbia.<sup>18</sup>
- “Nationally there [are] currently [last updated February 2012] 4711 Canadian Rangers located in 173 patrols in Canada. Throughout the North, 1 CRPG has 1572 Rangers in 58

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<sup>13</sup> “It’s Arctic spring exercise season for Canada’s military: Operation Nunalivut to kick off April 10,” 09 April 2012, Nunatsiq News. [http://www.nunatsiaqonline.ca/stories/article/65674its\\_arctic\\_spring\\_exercise\\_season\\_for\\_canadas\\_military/](http://www.nunatsiaqonline.ca/stories/article/65674its_arctic_spring_exercise_season_for_canadas_military/)

<sup>14</sup> <http://www.cfna.dnd.ca/nr-sp/09-002a-eng.asp>

<sup>15</sup> March 2011 Interim Senate Report 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>

<sup>16</sup> David Pugliese, “Royal Canadian Air Force mulling major Nunavut base expansion, documents show,” Postmedia News, 26 December 2011. <http://news.nationalpost.com/2011/12/26/royal-canadian-air-force-mulling-major-nunavut-base-expansion-documents-show/>

<sup>17</sup> “Ottawa moves ahead with High Arctic military centre,” CBC News, 27 November 2011. <http://www.cbc.ca/news/canada/north/story/2011/11/27/north-high-arctic-military-centre.html>.

<sup>18</sup> <http://www.army.forces.gc.ca/land-terre/maps-cartes/1CRPG-1GPRC-txt-eng.asp>

hamlets across the three territories. These consist of 25 patrols in Nunavut, 22 in Northwest Territory, 11 in Yukon Territory and 1 in Atlin, BC.”<sup>19</sup>

-the DND website includes an interactive map showing all locations along with brief descriptions of each unit’s activities.<sup>20</sup>

-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.”<sup>21</sup>

-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.”<sup>22</sup>

-In February 2013 a Ranger died while on an exercise<sup>23</sup>

-Donald Anguyoak died while taking part in Exercise Polar Passage, which was to run from Feb. 9 to March 3. The cause of death was not immediately known.

-“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.”<sup>24</sup>

-Operation NUNALIVUT is an annual exercise involving the Rangers

-in April 2012 “more than 150 soldiers, divers and Canadian Rangers” participated in Operation Nunavut out of Resolute Bay.<sup>25</sup>

-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.”<sup>26</sup>

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<sup>19</sup> <http://www.army.forces.gc.ca/1crpg/patrols-patrouilles-eng.asp>

<sup>20</sup> Interactive Map of Canadian Ranger Operations: <http://www.army.forces.gc.ca/land-terre/maps-cartes/1CRPG-1GPRC-int-eng.asp>

<sup>21</sup> <http://www.army.forces.gc.ca/land-terre/maps-cartes/1CRPG-1GPRC-txt-eng.asp>

<sup>22</sup> DND - BG #09.002a17, April 2009  
The Canadian Forces in the North. <http://www.cfna.dnd.ca/nr-sp/09-002a-eng.asp>

<sup>23</sup> “Canadian Ranger dies during Arctic military exercise,” CTV News, 19 February 2013. <http://www.ctvnews.ca/canada/canadian-ranger-dies-during-arctic-military-exercise-1.1162531#ixzz2LTq6uti>

<sup>24</sup> March 2011 Interim Senate Report, p7.

<sup>25</sup> “It’s Arctic spring exercise season for Canada’s military: Operation Nunavut to kick off April 10,” 09 April 2012, Nunatsiaq News. [http://www.nunatsiaqonline.ca/stories/article/65674/its\\_arctic\\_spring\\_exercise\\_season\\_for\\_canadas\\_military/](http://www.nunatsiaqonline.ca/stories/article/65674/its_arctic_spring_exercise_season_for_canadas_military/)

<sup>26</sup> P. Whitney Lackenbauer, St. Jerome’s University, University of Waterloo, cited in the March 2011 Interim Senate Report, p. 9.

## **Forward Operating Locations (FOLs) for CF-18s:**

- Inuvik
- Yellowknife
- Iqaluit
- Rankin Inlet

## **North Warning System**

- 11 long-range and 36 short-range radars along Arctic coast of Canada
- these are the main part of a “radar buffer zone” 4,800 kms long and 320 kms wide (from the Alaska border to across Baffin Island to Greenland and down the Labrador Coast)<sup>27</sup>
  - 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 in the high Arctic
- “The Canadian part of the North Warning System is operated and maintained by Pan Arctic Inuit Logistics” (PAIL).<sup>28</sup>
  - PAIL<sup>29</sup> 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). The NWS work is done through a joint venture between PAIL and ATCO Structure and Logistics,<sup>30</sup> 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.”<sup>31</sup>

## **Northern Canada Vessel Traffic Services (NORDREG)**

Vessels over 300 tons (or over 500 tons combined of a vessel towing or pushing another vessel) and 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.<sup>32</sup> The compulsory reporting reinforces Canada’s sovereignty claims but, on the other hand, draws attention to the lack of enforcement capacity.<sup>33</sup> The 2011 Senate Committee Report describes NORDREG in this way:

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<sup>27</sup> <http://www.forces.gc.ca/site/news-nouvelles/news-nouvelles-eng.asp?id=4564>

<sup>28</sup> March 2011 Interim Senate Report  
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>

<sup>29</sup> <http://www.pail.ca>

<sup>30</sup> <http://www.atcosl.com/en-ca/>

<sup>31</sup> March 2011 Interim Senate Report:  
<http://www.parl.gc.ca/Content/SEN/Committee/403/defe/rep/rep07mar11-e.pdf>

<sup>32</sup> [http://www.ccg-gcc.gc.ca/eng/MCTS/vtr\\_Arctic\\_Canada](http://www.ccg-gcc.gc.ca/eng/MCTS/vtr_Arctic_Canada)

<sup>33</sup> Heather Exner-Pirot, “What’s In a Name? NORDREG Becomes Mandatory,” Eye on the Arctic, 12 July 2010. <http://eyeontheartctic.rcinet.ca/blog/136-heather-exner-pirot/284-whats-in-a-name-nordreg-becomes-mandatory>



“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.”<sup>34</sup>

### **The Arctic Security Working Group<sup>35</sup>**

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.”<sup>36</sup>

### **Forward transportation hubs**

-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.”<sup>37</sup>

-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.<sup>38</sup>

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<sup>34</sup> March 2011 Interim Senate Report, p. 15

<sup>35</sup> <http://www.cfna.forces.ca/news/nws-12032012-eng.asp>

<sup>36</sup> March 2011 Interim Senate Report

<sup>37</sup> Tony Balasevicius, “Towards A Canadian Forces Arctic Operating Concept,” Canadian Military Journal. <http://www.journal.forces.gc.ca/vo11/no2/05-balasevicius-eng.asp>

<sup>38</sup> Allan Woods, “Canada looking at building military bases in Arctic,” The Star, 14 July 2011. <http://www.thestar.com/news/canada/article/1024675--star-exclusive-canada-looking-at-building-military-bases-in-arctic>.

## **1.b) Southern-based operations/equipment available for Arctic operations (current)**

### ***Ships (Coast Guard):***

- 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”,<sup>39</sup>
  - they also support Canadian Navy ships on Arctic voyages, as well as commercial ships.
  - perform research roles
- The Coast Guard is able to provide Arctic icebreaking service only during the summer months (beginning in late June and going into November)<sup>40</sup>
- The Coast Guard fleet includes:
  - two heavy icebreakers (CCGS Louis S. St-Laurent; CCGS Terry Fox)
  - four medium icebreakers (CCGS Amundsen [a research vessel<sup>41</sup>], CCGS Des Groseilliers, CCGS Henry Larsen, CCGS Pierre Radisson)
  - seven light icebreakers (high-endurance multi-tasked vessels which can operate only in the Western Arctic).<sup>42</sup>
- A new polar icebreaker (CCGS John G. Diefenbaker) is in the works
  - a design contract has been issued
  - new ship to be delivered in 2017 and will be operated by Canadian Coast Guard<sup>43</sup>
  - original plan was for 3 armed icebreakers.<sup>44</sup>

### ***Ships (Navy):***

- The Canadian Navy has a fleet of 33 vessels (3 Destroyers, 12 Frigates, 2 Supply Ships, 12 Coastal Defence; 4 submarines)<sup>45</sup>
  - While the Destroyers and Frigates are “ice-strengthened” and have the range to sail in the Arctic, they do not have icebreaking capabilities

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“...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.”

<sup>39</sup> <http://www.ccg-gcc.gc.ca/Icebreaking-Services>

<sup>40</sup> <http://www.ccg-gcc.gc.ca/Performance-Targets>

<sup>41</sup> <http://www.amundsen.ulaval.ca/index.php?url=1>

<sup>42</sup> <http://www.ccg-gcc.gc.ca/CCG-Icebreakers>

<sup>43</sup> David Pugliese, “Polar Icebreaker Design Launched with Awarding of Contract to STX Canada,” *Defence Watch*, Ottawa Citizen Blog., 08 February 2012. <http://blogs.ottawacitizen.com/2012/02/08/polar-icebreaker-design-launched-with-awarding-of-contract-to-stx-canada/>.

<sup>44</sup> Jordan Press, “PM talks up need for Arctic military presence,” *Vancouver Sun*, PostMedia News, 25 August 2012. <http://www.vancouversun.com/news/talks+need+Arctic+military+presence/7144484/story.html>

<sup>45</sup> [http://www.navy.forces.gc.ca/cms/1/1\\_eng.asp](http://www.navy.forces.gc.ca/cms/1/1_eng.asp)

-the home ports are Maritime Forces Atlantic (MARPLANT) in Halifax, and Maritime Forces Pacific (MARPAF) in Esquimalt, B.C.

-Arctic/Offshore Patrol Ship (AOPS) procurement

-6 to 8 ships (but no firm commitment on the number)

-first ship is due in 2018<sup>46</sup>

-announced as a \$3.1 billion project, now estimated to cost \$40 million more<sup>47</sup>

- “Between six and eight Arctic/offshore patrol ships are to be built for the Navy, to operate part of the time in the Arctic; these are currently at the project definition stage (with a design contract announced in March 2013<sup>48</sup>, with the first to be launched in 2015;”<sup>49</sup>

-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.”<sup>50</sup>

### ***Aircraft:***<sup>51</sup>

-CP-140 (P-3C) Aurora<sup>52</sup>

-capable of 17 hour flights and a range of almost 10,000 kms (patrols average 10 hours and 5,000 kms) without refuelling.

-18 in operation,

-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),

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<sup>46</sup> The Hidden Transcript, “Is Canada’s Navy Ready to Claim the Arctic?” <http://thehiddentranscript.com/2012/05/10/choi-nwp/>

<sup>47</sup> Jordan Press, “PM talks up need for Arctic military presence,” Vancouver Sun, PostMedia News, 25 August 2012. <http://www.vancouversun.com/news/talks+need+Arctic+military+presence/7144484/story.html>

<sup>48</sup> “AOPS Design Contract Awarded But MacKay and Ambrose Still Can’t Say How Many Ships Will Be Built,” Defence Watch, 7 March 2013. <http://blogs.ottawacitizen.com/2013/03/07/aops-design-contract-awarded-but-mackay-and-ambrose-still-cant-say-how-many-ships-will-be-built/>

<sup>49</sup> March 2011 Interim Senate Report  
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>

<sup>50</sup> Murray Brewster, “Navy planners trying to sell Ottawa on submarine replacement plan,” *Globe and Mail*, 20 August 2012. <http://www.theglobeandmail.com/news/politics/navy-planners-trying-to-sell-ottawa-on-submarine-replacement-plan/article4490900/>

<sup>51</sup> RCAF aircraft listed at <http://www.rcf-arc.forces.gc.ca/v2/equip/index-eng.asp>

<sup>52</sup> <http://www.rcf-arc.forces.gc.ca/v2/equip/cp140/index-eng.asp>

- landed at Alert for the first time in 2011,
- CP-140 has been modernized,<sup>53</sup> to broaden capabilities beyond its initial anti-submarine warfare role, and to extend the operational life on 10 aircraft,<sup>54</sup> through the Aurora Incremental Modernization Project (AIMP) and the Aurora Structural Life Extension Project (ASLEP);<sup>55</sup>
- they are primary northern surveillance and sovereignty patrol vehicle;
- the 18 CP-140 patrol aircraft to be replaced by 10-12 new aircraft from 2020.<sup>56</sup>

*CF-18 fighter aircraft*<sup>57</sup>

- based in Cold Lake, Alberta and Bagotville, Quebec
- controlled out of Canadian Air Defence Sector (CADS) in North Bay
- in September 2010 two CF-18s flew over Alert, assisted by a CC-150T Polaris air-to-air refuelling tanker
- modernization completed in 2010 extends the operational life, says DND, to at least 2020<sup>58</sup>
- 77 operational (59 CF-18AM or F/A-18A, and 18 CF-18BM or F/A 18B)<sup>59</sup>

*Supply and Search and Rescue aircraft*<sup>60</sup> (in addition to the 4 CC-138 Twin Otters based in North)

- CC-177 Globemaster III<sup>61</sup>
  - made its first landing in Resolute Bay in July 2010<sup>62</sup> (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)<sup>63</sup>
- CC-115 Buffalo
  - “All six Canadian Forces CC-115s are employed by 442 Transport and Rescue Squadron out of Comox, BC. 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

<sup>53</sup> Siemon T. Wezeman, “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012.

<sup>54</sup> “IMP Aerospace rolls out first CP-140 Aurora aircraft with new wings for the Royal Canadian Air Force,” Canada Newswire, HALIFAX 9 December 2011 – “IMP Group Limited, Aerospace Division announced today that it will be rolling out the first re-winged CP-140 Aurora aircraft for the Royal Canadian Air Force (RCAF). These aircraft are receiving new wings as part of a mid-life structural upgrade being carried out by IMP Aerospace....IMP has been contracted by the RCAF to refit ten CP-140 Aurora aircraft under the ASLEP program.” <http://www.newswire.ca/en/story/892979/imp-aerospace-rolls-out-first-cp-140-aurora-aircraft-with-new-wings-for-the-royal-canadian-air-force>

<sup>55</sup> “National Defence Minister marks completion of first structural upgrades on Aurora,” Government of Canada, Canada News Centre, 9 February 2011. <http://news.gc.ca/web/article-eng.do?nid=644179>

<sup>56</sup> Siemon T. Wezeman, “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012.

<sup>57</sup> <http://www.rcaf-arc.forces.gc.ca/v2/equip/cf18/index-eng.asp>

<sup>58</sup> <http://www.rcaf-arc.forces.gc.ca/v2/equip/cf18/index-eng.asp>

<sup>59</sup> according to IISS, *The Military Balance*, 2012, p. 52.

<sup>60</sup> Descriptions of the following aircraft available at: <http://www.rcaf-arc.forces.gc.ca/v2/equip/index-eng.asp>

<sup>61</sup> <http://www.rcaf-arc.forces.gc.ca/v2/equip/cc177/index-eng.asp>

<sup>62</sup> <http://www.rcaf-arc.forces.gc.ca/8w-8e/nr-sp/index-eng.asp?id=10928>

<sup>63</sup> <http://www.rcaf-arc.forces.gc.ca/8w-8e/nr-sp/index-eng.asp?id=10928>

Pacific Ocean. With a maximum load of 2727 kg—or 41 fully equipped soldiers—the Buffalo has an operational range of 2240 km.”<sup>64</sup>

-CC-130 Hercules

-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 refueling (AAR), and aircrew training. It can carry more than 17, 000 kilograms (about 38, 000 pounds) of fuel for tactical AAR.”<sup>65</sup>

-The IISS reports 5 operate as tankers, KC-130H<sup>66</sup>

-CC-130J

-17 new CC-130J Super Hercules

-all delivered by 2012

-made first landing in Alert in Sept 2010<sup>67</sup>

-“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”<sup>68</sup>

-“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.”<sup>69</sup>

-CC-150 Polaris

-“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.”<sup>70</sup>

-Canada operates 3 CC-150 (2 are in tanker role)

-CC-150T (refuelling tanker)

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<sup>64</sup> <http://www.rcf-arc.forces.gc.ca/v2/equip/cc115/index-eng.asp>

<sup>65</sup> <http://www.rcf-arc.forces.gc.ca/v2/equip/cc130/index-eng.asp>

<sup>66</sup> IISS, *The Military Balance*, 2012, p. 52.

<sup>67</sup> <http://www.rcf-arc.forces.gc.ca/v2/page-eng.asp?id=1512>

<sup>68</sup> “Canada welcomes final CC-130J Hercules,” CC-130J website, 8 June 2012. <http://cc-130j.ca/2012/canada-welcomes-final-cc-130j-hercules/>

<sup>69</sup> <http://www.rcf-arc.forces.gc.ca/v2/equip/cc130j/index-eng.asp>

<sup>70</sup> <http://www.rcf-arc.forces.gc.ca/v2/equip/cc150/index-eng.asp>

-“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.”<sup>71</sup>

-2 in this role enable an Arctic role for the F-18<sup>72</sup>

#### -Fixed-Wing Search and Rescue Aircraft Replacement Project<sup>73</sup>

-“The new fleet of fixed-wing SAR aircraft will replace an ageing fleet of six CC-115 Buffalo aircraft and 13 CC-130 Hercules aircraft that are currently being used for SAR duties.”<sup>74</sup>

-the project is currently in the “project definition” stage

-A study by Michael Byers and Stewart Webb makes two key recommendations for an acquisition that they say needs to be much more transparent than it has been:

-“The Canadian government should clearly articulate a Statement of Operational Requirements (SOR) for Fixed-Wing Search and Rescue aircraft that recognizes the different requirements on Canada’s West Coast and the necessity of a mixed fleet.

-“The Canadian government should ensure the SOR does not preclude consideration of made-in-Canada aircraft.”<sup>75</sup>

#### Helicopters

##### -CH-146 Griffon helicopter (Bell 412)

-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.”<sup>76</sup>

##### -CH-149 Cormorant

-the Air Force’s only dedicated search and rescue (SAR) helicopter

-a range of over 1000 km without refueling

-equipped with a full ice protection system<sup>77</sup>

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<sup>71</sup> <http://www.rcaf-arc.forces.gc.ca/v2/equip/cc150/index-eng.asp>

<sup>72</sup> SIPRI, March 2012, p. 3.

<sup>73</sup> 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. “We now have the path forward. We have the information required and we going to proceed in a way that will see us purchase new fixed wing aircraft in the very near future.” P. 13

<sup>74</sup> <http://www.forces.gc.ca/site/pri/2/pro/9/index-eng.asp>

<sup>75</sup> Michael Byers and Stewart Webb, “Search and Replace: The Case for a Made-in-Canada Fixed-Wing Search and Rescue Fleet,” Canadian Centre for Policy Alternatives and The Rideau Institute, June 2012.

[http://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2012/06/Search\\_and\\_Replace.pdf](http://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2012/06/Search_and_Replace.pdf)

<sup>76</sup> <http://www.rcaf-arc.forces.gc.ca/v2/equip/ch146/index-eng.asp>

<sup>77</sup> <http://www.rcaf-arc.forces.gc.ca/v2/equip/ch149/index-eng.asp>

- CH-124 Sea King
  - 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 Cyclone<sup>78</sup>
- CH-248 Cyclone
  - 28 are on order from Sikorsky, but this is a highly troubled program
    - more than 5 years behind schedule
    - cost over-runs
  - Canadian forces now have four interim versions of the Cyclone for pilot training<sup>79</sup>
  - 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.”<sup>80</sup>
- Medium to Heavy Lift Helicopter
  - “As part of the Government’s commitment to strengthen the Canadian Forces, the Department of National Defence is acquiring 15 Medium-to-Heavy Lift Helicopters, Canadian F model Chinook (also known as CH-147F).”<sup>81</sup>
  - 15 ordered and to be delivered monthly in 2013-2014
  - “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.”<sup>82</sup>
  - “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.”<sup>83</sup>

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<sup>78</sup> <http://www.rcaf-arc.forces.gc.ca/v2/equip/ch124/index-eng.asp>

<sup>79</sup> “Feds re-negotiating helicopter contract with Sikorsky Aircraft,” Canadian Press, 11 October 2012. <http://thechronicleherald.ca/canada/146829-feds-re-negotiating-helicopter-contract-with-sikorsky-aircraft>

<sup>80</sup> <http://www.rcaf-arc.forces.gc.ca/v2/equip/ch148/index-eng.asp>

<sup>81</sup> <http://www.forces.gc.ca/site/news-nouvelles/news-nouvelles-eng.asp?cat=00&id=3678>

<sup>82</sup> <http://www.forces.gc.ca/site/news-nouvelles/news-nouvelles-eng.asp?cat=00&id=3678>

<sup>83</sup> “Canada’s newest generation of Chinook helicopters,” Flightglobal/Airspace Forum, 13 January 2013. <http://www.flightglobal.com/airspace/forums/canadas-newest-generation-of-chinook-helicopters-91766.aspx>

## *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 1995<sup>84</sup>

-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.<sup>85</sup>

-Project Polar Epsilon:

-“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....The Polar Epsilon project enhances CF situational knowledge through its ability to provide all-weather day/night surveillance in areas where other sensors are limited or unable to operate. The project represents an important step toward strengthening Canada’s Arctic sovereignty and security....”<sup>86</sup>

-Current stage of Polar Epsilon went fully operational in August 2011.<sup>87</sup>

-RadarSat-2 launched in 2007

-a \$495 million project that is behind schedule<sup>88</sup>

### RADARSAT Constellation

-plans for three new RADARSAT satellites were awarded in Jan 2013<sup>89</sup>

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<sup>84</sup> Canadian Space Agency. <http://www.asc-csa.gc.ca/eng/satellites/radarsat1/>

<sup>85</sup> Canadian Space Agency. <http://www.asc-csa.gc.ca/eng/satellites/radarsat2/>

<sup>86</sup> “A new step for the Polar Epsilon project,” *The Maple Leaf*, 21 July 2010 (Vol. 13, No. 24), Department of National Defence. <http://www.forces.gc.ca/site/commun/ml-fe/article-eng.asp?id=6335>.

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.”

<sup>87</sup> “Polar Epsilon keeps watch over Canada’s coastal waters,” MDA Information Systems Website. [http://is.mdacorporation.com/mdais\\_canada/News/FeaturedStories/fs012012.aspx](http://is.mdacorporation.com/mdais_canada/News/FeaturedStories/fs012012.aspx).

<sup>88</sup> Jordan Press, “PM talks up need for Arctic military presence,” Vancouver Sun, PostMedia News, 25 August 2012. <http://www.vancouversun.com/news/talks+need+Arctic+military+presence/7144484/story.html>

<sup>89</sup> “MacDonald, Dettwiler and Associates sign \$706M Radarsat deal,” CBC.



- MacDonald, Dettwiler and Associates Ltd. (MDA) awarded \$706-million contract with the Canadian Space
- the company will build, launch and provide initial operations for what is planned to be a constellation of three satellites.
  - build on technology that MDA has developed through the Radarsat-1 and Radarsat-2 missions.
- to provide complete coverage of Canada's land and oceans with launches planned for 2016 and 2017
- 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."<sup>90</sup>

### *Uninhabited aerial vehicles*

- 5 Heron CU-170 leased for 3 years (no indication they can be used in north)<sup>91</sup>
- SIPRI says acquisition plans for Arctic use include "the second phase of the \$1.5 billion (\$1.5 Billion – US) Joint Uninhabited Surveillance and Target Acquisition System (JUSTAS) project for 6 unmanned aerial vehicles (UAVs) for maritime and Arctic patrol."<sup>92</sup>
- David Pugliese:

"Northrop Grumman has made a presentation to the Canadian government about selling a fleet of Global Hawk UAVs capable of patrolling the Arctic.

Canada has a plan to eventually purchase UAVs, but Northrop's proposal would see the acquisition of Global Hawks outside of that project. Canadian government sources said the purchase is being considered by the Conservative Party government as a way to show it is delivering on its promise to project Canada's sovereignty over its Arctic territories.

Northrop official Dane Marolt said the company has proposed the purchase of at least three UAVs, dubbed Polar Hawks.

"One Polar Hawk can fly the entire Northwest Passage five or six times in a single mission," said Marolt, director of international business development for the company's Global Hawk program.

"With three aircraft, you can do coverage 24 hours a day, seven days a week. That gives you situational awareness of what's going on, so if something's identified, then action can be taken by the government," Marolt said.

The price would be about \$150 million to \$170 million for each UAV, plus long-term maintenance."<sup>93</sup>

-"Canadian acquisition plans include air assets specifically for Arctic use. This includes the second phase of the 1.5 billion Canadian dollar (\$1.5 billion) Joint

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<http://www.cbc.ca/news/politics/story/2013/01/09/radarsat-deal.html>

<sup>90</sup> "MDA awarded \$706 million contract to build three radar satellites, 9 January 2013. <http://www.mdacorporation.com/corporate/news/>

<sup>91</sup> March 2011 Interim Senate Report

<sup>92</sup> (SIPRI March 2012)

<sup>93</sup> Referred to by David Pugliese, "Canada Ramps Up Arctic Arsenal," 25 January 2012, <http://www.defensenews.com/apps/pbcs.dll/article?AID=2012306250001>.

Uninhabited Surveillance and Target Acquisition System (JUSTAS) project for 6 unmanned aerial vehicles (UAVs) for maritime and Arctic patrol.”<sup>94</sup>

-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.<sup>95</sup>

#### ***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.”<sup>96</sup>

-in April 2012 Operation Nunavut included diving operations off of Devon Island to install “undersea surveillance devices.”<sup>97</sup>

#### **-Amphibious ship to shore craft**

-acquisition a matter of some discussion

-David Pugliese reports 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.”<sup>98</sup>

#### ***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 armored 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.

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<sup>94</sup> SIPRI referencing: David Pugliese, “Canada rethinks intel strategy”, *Defense News*, 25 Jan. 2012.; and Huebert, R., *The Newly Emerging Arctic Security Environment* (Canadian Defence and Foreign Affairs Institute: Calgary, Mar. 2010), p. 8.

<sup>95</sup> 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/vol11/no4/doc/Page%2024%20Bond%20Article%20English.pdf>

<sup>96</sup> March 2011 Interim Senate Report

<sup>97</sup> “It’s Arctic spring exercise season for Canada’s military: Operation Nunavut to kick off April 10,” 09 April 2012, Nunatsiq News.  
[http://www.nunatsiqonline.ca/stories/article/65674its\\_arctic\\_spring\\_exercise\\_season\\_for\\_canadas\\_military/](http://www.nunatsiqonline.ca/stories/article/65674its_arctic_spring_exercise_season_for_canadas_military/)

<sup>98</sup> Referred to by David Pugliese, “Canada Ramps Up Arctic Arsenal,” 25 January 2012,  
<http://www.defensenews.com/apps/pbcs.dll/article?AID=2012306250001>.

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.”<sup>99</sup>

### ***Stealth Snowmobiles***

-David Pugliese:

“The Special Operations Forces Command also has an eye on developing equipment for the Arctic. 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.”<sup>100</sup>

### ***Army Personnel***

-“a special small battalion-sized (500 troops) regular army unit for Arctic operations is to be set up”<sup>101</sup>

-“Canada also is creating a 500-member Army response capability for the Arctic”<sup>102</sup>

-Canadian reserves unit in Yellowknife to be increased to 100 by 2019<sup>103</sup>

- “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.”<sup>104</sup>

-“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 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

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<sup>99</sup> Referred to by David Pugliese, “Canada Ramps Up Arctic Arsenal,” 25 January 2012, <http://www.defensenews.com/apps/pbcs.dll/article?AID=2012306250001>.

<sup>100</sup> Referred to by David Pugliese, “Canada Ramps Up Arctic Arsenal,” 25 January 2012, <http://www.defensenews.com/apps/pbcs.dll/article?AID=2012306250001>.

<sup>101</sup> Siemon T. Wezeman, “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012.

<sup>102</sup> Referred to by David Pugliese, “Canada Ramps Up Arctic Arsenal,” 25 January 2012, [www.defensenews.com](http://www.defensenews.com).

<sup>103</sup> Siemon T. Wezeman, “Military Capabilities in the Arctic,” SIPRI Background Paper, March 2012.

<sup>104</sup> M2ISR = March 2011 Interim Senate Report  
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>

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.”<sup>105</sup>

### 1.c) Recurring Operations

-“*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.*”<sup>106</sup>

#### *Operation 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:

- 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.

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:

- 1<sup>st</sup> 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.

Conducted annually since 2007, the operation has also involved international military partners, Canadian federal government departments and agencies, and 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.<sup>107</sup>

In 2010 Operation Nanook the Americans and Danes joined in “conducting disaster response training and patrols in Canada’s territorial waters,” the first time foreign militaries participated in the operation.<sup>108</sup>

#### *Operation NUNALIVUT*

*This is a similar exercise that takes place in the high and central arctic (conducted annually since 2007). In 2013 Operation NUNALIVUT runs throughout April and is designed to “exercise Canadian sovereignty and*

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<sup>105</sup> 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’, *Defense 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/news/canada/story/2009/07/27/arctic-sovereignty-map.html>>.

<sup>106</sup> Rob Huebert, “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>.

<sup>107</sup> <http://www.cjoc-coic.forces.gc.ca/cont/rec-eng.asp>

<sup>108</sup> Marc V. Schanz, “Air Sovereignty Never Sleeps,” *Air Force Magazine*, December 2010, pp. 54-56. <http://www.airforce-magazine.com/MagazineArchive/Pages/2010/December%202010/1210sovereignty.aspx>

to demonstrate the Canadian Armed Forces' capability projection in the High Arctic during winter."<sup>109</sup> It will involve approximately 120 Canadian Armed Forces personnel under Joint Task Force (North) and will take place in the northwestern portion of the Arctic Archipelago, including Mould Bay (Northwest Territories) and Isachsen and Resolute Bay (Nunavut).

#### *Operation NUNAKPUT*

A "whole-of-government" operation that emphasizes aid to law enforcement in the north (conducted annually since 2007).<sup>110</sup>

#### *Exercise Arctic Bison 2013<sup>111</sup>*

Troops of the Arctic Response Company Group (ARCG) were in training in winter survival, search and rescue, surveillance, and patrolling, in partnership with Canadian Rangers, near Prince Albert, Saskatchewan in February. The group has been on winter exercises annually since 2008.<sup>112</sup> The ARCG is made up of reservists and the Arctic Bison 2013 exercise involved 113 Reservists, 3 regular force soldiers, and 10 Canadian Rangers (and 65 snowmobiles).

#### *Exercise Polar Sound<sup>113</sup>*

This 2012 operation involved a team of Canadian Rangers on patrol from Gjoa to Cambridge Bay in the Northwest Territories, a distance of 200 kms. Billed as a "whole of government" approach, the Rangers worked with government and non-governmental agencies while carrying out a routine sovereignty patrol.

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<sup>109</sup> Operation NUNALIVUT 2013, 6 March 2013. <http://www.jtfn-foin.forces.gc.ca/ops/nunalivut-eng.asp>

<sup>110</sup> <http://www.cjoc-coic.forces.gc.ca/cont/rec-eng.asp>

<sup>111</sup> [http://www.army.gc.ca/lfwa/ex\\_arctic\\_bison13-eng.asp](http://www.army.gc.ca/lfwa/ex_arctic_bison13-eng.asp)

<sup>112</sup> David Pugliese, "Photos From Exercise Arctic Bison 13: Arctic Response Company Group In Action," Defence Watch, 24 February 2013. <http://blogs.ottawacitizen.com/2013/02/23/photos-from-exercise-arctic-bison-13-arctic-response-company-group-in-action/>

<sup>113</sup> Jennifer Wright, "Canadian Rangers assist other government and civilian agencies during Exercise Polar Sound 12," Public Affairs, Joint Task Force (North). <http://www.jtfn-foin.forces.gc.ca/articles/2012/03/03-eng.asp>

## II. USA

### 1. Northern Military Bases

#### *Air:*

Eielson Air Force Base (near Fairbanks):<sup>114</sup>

- 354<sup>th</sup> 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

Elmendorf Air Force Base:<sup>115</sup>

- shares the base with the Fort Richardson Army Base
- hosts the Alaskan NORAD Region
- aerospace warning
- hosts the 11<sup>th</sup> Air Force
- 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.”<sup>116</sup>

Eareckson Air Station:<sup>117</sup>

- 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 systems spans the north of Canada).

Air Station, Kodiak<sup>118</sup>

- 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

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 capabilities<sup>119</sup>

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<sup>114</sup> US Air Force: <http://www.eielson.af.mil/units/index.asp>

<sup>115</sup> US Air Force: <http://www.jber.af.mil/units/index.asp>

<sup>116</sup> Climate Change and Arctic Security Report. Rob Huebert, Heather Exner-Pirot Adam Lajeunesse, Jay Gullede, “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>

<sup>117</sup> GlobalSecurity.Org: <http://www.globalsecurity.org/space/facility/shemya.htm>

<sup>118</sup> US Coast Guard: [http://www.uscg.mil/bsukodiak/general\\_info.asp](http://www.uscg.mil/bsukodiak/general_info.asp)

### Thule Air Base in Greenland

- US uses it now for a BMD radar
- 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.”<sup>120</sup>
- no aircraft currently based there

### **Land:**

#### Fort Greely<sup>121</sup>

- hosts US BMD mid-course interceptors<sup>122</sup>

#### Fort Wainwright<sup>123</sup>

- Infantry combat team
- combat aviation brigade

#### Cold Regions Test Center (in Fort Wainwright)

#### Fort Richardson (joint base with Elmendorf AFB)<sup>124</sup>

- Alaskan Command centre for 21,000 Alaskan military personnel
- US Army Alaska (USARAK)<sup>125</sup>
- not specifically earmarked for Arctic operations

#### Northern Warfare Training Centre<sup>126</sup>

- Black Rapids
- conducts “relevant training to the leaders of USARAK units so that they can fight and win in demanding cold weather and mountain environments”<sup>127</sup>

### **Sea:**

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 raised<sup>128</sup> 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

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<sup>119</sup> US Coast Guard: <http://www.uscg.mil/d17/airstasitka/Mission.asp>

<sup>120</sup> US Air Force: <http://www.peterson.af.mil/units/821stairbase/index.asp>

<sup>121</sup> <http://usmilitary.about.com/od/armybaseprofiles/ss/greely.htm>

<sup>122</sup> 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. Thom Shanker, David E. Sanger, and Martin Fackler, “U.S. Is Bolstering Missile Defense to Deter North Korea,” New York Times, 15 March 2013. [http://www.nytimes.com/2013/03/16/world/asia/us-to-bolster-missile-defense-against-north-korea.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2013/03/16/world/asia/us-to-bolster-missile-defense-against-north-korea.html?pagewanted=all&_r=0)

<sup>123</sup> US Army: <http://www.wainwright.army.mil/sites/tenants/unitsTenants.asp>

<sup>124</sup> US Air Force, Joint Base: <http://www.jber.af.mil/units/index.asp>

<sup>125</sup> USARAK Organizations: <http://www.usarak.army.mil/main/units.asp>

<sup>126</sup> US Army: <http://www.wainwright.army.mil/nwtc/>

<sup>127</sup> <http://www.wainwright.army.mil/nwtc/>

<sup>128</sup> Ronald O'Rourke, Specialist in Naval Affairs, “Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress,” December 10, 2012, US Congressional Research Service. <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

locations for such a port.<sup>129</sup> 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.<sup>130</sup>

The Arctic Submarine Laboratory:

-is described as Fleet Support Detachment of the Commander of Submarine Forces U.S. Pacific Fleet

-“it is the ‘center of excellence’ for arctic matters for the U.S. Submarine Force and is responsible for developing and maintaining expertise in arctic specific skills, knowledge, equipment, and procedures to enable its force to safely and effectively operate in the unique Arctic Ocean environment.”

-“support(s) the submarine force in safely, securely, and effectively operating in the demanding arctic environment”<sup>131</sup>

Submarines:

-“Most of the approximately 53 US nuclear attack submarines [which do not now carry nuclear weapons<sup>132</sup>] (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.”<sup>133</sup>

-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”<sup>134</sup>

-“In April 2011 two US nuclear attack submarines participated in Ice Exercise (ICEX) 2011, operating under the Arctic ice. In the same exercise a camp was established 150 nautical miles (278 kilometres) north of Prudhoe Bay, Alaska.”<sup>135</sup>

-“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*.”<sup>136</sup>

-US SSBNs<sup>137</sup> are assumed not to be specifically designed for Arctic deployment, according to analysts, and are not known to be deployed there,<sup>138</sup> but firm confirmation is not available.

Aircraft carriers:

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<sup>129</sup> “Alaska Department of Transportation and Public Facilities/Statewide Design and Engineering Services: Arctic Port Study.” <http://www.dot.state.ak.us/stwddes/desports/arctic.shtml>

<sup>130</sup> Ellen Lockyer, “Study Names Nome, Port Clarence as Best Region For Deep Water Arctic Port,” Alaskapublic.org, KSKA, Anchorage. <http://www.alaskapublic.org/2013/01/31/study-names-nome-port-clarence-as-best-region-for-deep-water-arctic-port/>

<sup>131</sup> Submarine Force US Pacific Fleet. <http://www.csp.navy.mil/asl/>

<sup>132</sup> Which have not been armed with nuclear weapons since the September 1991 Bush-Gorbachev agreement. “The Presidential Nuclear Initiatives (PNIs) on Tactical Nuclear Weapons at a Glance,” Arms Control Association. <http://www.armscontrol.org/factsheets/pniglance>

<sup>133</sup> SIPRI, p. 13

<sup>134</sup> Adam Lajeunesse, “Research Note: American SSNs in Canadian Arctic Waters, 1960-1988,” Laurier Centre for Military Strategic and Disarmament Studies. <http://www.canadianmilitaryhistory.ca/research-note-american-ssns-in-canadas-arctic-waters-1960-1986-by-adam-lajeunesse/>

<sup>135</sup> SIPRI, p. 13

<sup>136</sup> Climate Change and Arctic Security Report

<sup>137</sup> “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 carries around 1,100 warheads.” The 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>

<sup>138</sup> Michael Wallace and Steve Stables, “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>



-“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.”<sup>139</sup>

#### Offshore patrol vessels

-“The US Coast Guard regularly deploys OPVs [offshore patrol vessels] in or near the Arctic.”<sup>140</sup>

-“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. Eight are planned, the first two of which were commissioned in 2010–11.”<sup>141</sup>

### **US Coast Guard:**

#### Icebreakers:

-The US has limited icebreaking capability, according to the Congressional Research Service (one heavy and one medium polar icebreaker):

-“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*). The new polar icebreaker for which initial acquisition funding is requested in the FY2013 budget would replace *Polar Star* at about the time *Polar Star*'s 7- to 10-year reactivation period ends.”<sup>142</sup>

-SIPRI summarizes US icebreaking capacity as follows:

-“The US Coast Guard operates three large, unarmed icebreakers capable of breaking Arctic ice; two have reached the North Pole in summer periods. These ships have a mainly scientific role in both the Arctic and Antarctic region. One of the ships is being modernized in the period 2009–13 and one has been out of service since 2010 and is scheduled for decommissioning due to budget constraints. Ideas for new vessels are under consideration, and the Coast Guard's budget for 2013–17 is to include \$860 million for one large icebreaker.”<sup>143</sup>

-The Congressional Research Service on future icebreaking plans:

-“The Coast Guard's proposed FY2013 budget includes \$8 million in acquisition funding to initiate survey and design activities for a new polar icebreaker. The Coast Guard's Five Year Capital Investment Plan includes an additional \$852 million in FY2014-FY2017 for acquiring the ship.

-“The Coast Guard's two existing heavy polar icebreakers—*Polar Star* and *Polar Sea*— have exceeded their intended 30-year service lives, and neither is currently operational. *Polar Star* was placed in caretaker status on July 1, 2006. Congress in FY2009 and FY2010 provided funding to repair it and return it to service for 7 to 10 years; the Coast Guard expects the reactivation project to be completed in December 2012.

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<sup>139</sup> SIPRI, p. 13

<sup>140</sup> SIPRI, p. 13

<sup>141</sup> SIPRI, p. 13.

<sup>142</sup> Ronald O'Rourke, Specialist in Naval Affairs, “Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress,” December 10, 2012, US Congressional Research Service. <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

<sup>143</sup> SIPRI, p. 13.

-“On June 25, 2010, the Coast Guard announced that *Polar Sea* had suffered an unexpected engine casualty; the ship was unavailable for operation after that. The Coast Guard placed *Polar Sea* in commissioned, inactive status on October 14, 2011.  
-“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.<sup>144</sup>

### ***Exercises:***

#### **-Northern Edge:**

-The annual exercise is a training event involving US Air Force, Navy, Army and National Guard.<sup>145</sup>

-“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].”<sup>146</sup>

-Northern Edge 2013 is to run from June 17-28.

#### **-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.<sup>147</sup>

#### **-Alaska Shield:**

-a series of exercises for developing responses of catastrophic events (e.g. earthquake) in Alaska, involving military and civilian agencies.<sup>148</sup>

### ***2009 Navy Arctic Roadmap:***<sup>149</sup>

-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 is for the period FY2010-FY2014. Rather than setting out Arctic plans and policies, it sets out a schedule for the development and implementation of such plans and policies. As such it calls for things like the development strategic objectives and command structure requirements, and assessments of current Navy Arctic capabilities.<sup>150</sup>

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<sup>144</sup> Ronald O'Rourke, Specialist in Naval Affairs, “Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress,” December 10, 2012, US Congressional Research Service. <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

<sup>145</sup> <http://www.jber.af.mil/alcom/northernedge/northernedge2011.asp>

<sup>146</sup> <http://www.jber.af.mil/alcom/northernedge/northernedge2011.asp>

<sup>147</sup> <http://www.jber.af.mil/alcom/arcticedge/>

<sup>148</sup> Alaska Shield 2012 focused on winter storm response: <http://ready.alaska.gov/press/Statewide%20Exercise%20Prepares%20Alaska%20for%20Big%20Winter%20Storm.pdf>

<sup>149</sup> [http://www.navy.mil/navydata/documents/USN\\_artic\\_roadmap.pdf](http://www.navy.mil/navydata/documents/USN_artic_roadmap.pdf)

<sup>150</sup> Ronald O'Rourke, Specialist in Naval Affairs, “Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress,” December 10, 2012, US Congressional Research Service, pp. 63-65. <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

### III. RUSSIA

#### Northern Fleet naval bases:

- Severomorsk (Northern Fleet Headquarters)
- Kola
- Motovsky
- Gremikha
- Ura Guba<sup>151</sup>

-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

#### Northern Fleet Aircraft:<sup>152</sup>

- Su-33 Fighter (18)
- Su-25 Ground Attack Fighters (5)
- Tu-142 Anti-Submarine Warfare (13)
- Il-38 Maritime Patrol (14)
- Il-20 Electronic Warfare and Electronic Intelligence
- Tu-134 Transport
- Ka-27 Anti-Submarine Warfare Helicopters
- 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
- Tu-142 and Il-38 maritime reconnaissance aircraft resumed regular missions near or over the Arctic in 2007<sup>153</sup>
- long-range Tu-22 bombers resumed patrols beyond Russia in 2007,<sup>154</sup>
- 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 Island.<sup>155</sup>
- these plans were later modified:
  - earlier plans to base MiG-31 aircraft in Novaya Zemlya were reversed in February 2013<sup>156</sup>
- A squadron of Mig-31 long-range fighter interceptors are to be stationed on the Novaya Zemlya archipelago in the Arctic.<sup>157</sup>

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<sup>151</sup> GlobalSecurity.Org: <http://www.globalsecurity.org/military/world/russia/mf-north.htm>

<sup>152</sup> The Military Balance, 2012, IISS, p. 198.

<sup>153</sup> SIPRI, p. 9

<sup>154</sup> Rob Huebert, Heather Exner-Pirot Adam Lajeunesse, Jay Gullede, "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>

<sup>155</sup> "Russia to Reopen Arctic Airbases," RIANOVOST, 30 May 2012. [http://en.rian.ru/military\\_news/20120530/173757083.html](http://en.rian.ru/military_news/20120530/173757083.html)

<sup>156</sup> Trudy Pettersen, "Russia drops Arctic air force plans," Barents Observer, 4 February 2013. <http://barentsobserver.com/en/security/2013/02/russia-drops-arctic-air-force-plans-04-02>

<sup>157</sup> Andrei Kislyakov, "Russia deploys Arctic troops," 2 November 2012. [http://rbth.ru/articles/2012/11/02/russia\\_deploys\\_arctic\\_troops\\_19711.html](http://rbth.ru/articles/2012/11/02/russia_deploys_arctic_troops_19711.html)

**Navy:**

-Naval vessels assigned to the Northern Fleet:<sup>158</sup>

**-Submarines:**

- SSBN (nuclear powered and nuclear armed ballistic missile subs – 9)
- SSGN (cruise missile) attack submarines
- SSN (nuclear powered attack subs, not nuclear armed – 13)
- SSK (attack submarines with anti-submarine warfare capability – not nuclear powered – 7)
- SSAN (submersible auxiliary support vessel – nuclear powered – 7)
- 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.

**-192 strategic nuclear warheads based in the Arctic:**

- 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.<sup>159</sup>

-Russia's strategic interests are global and its key ports are in the north (Kola Peninsula) owing to its geography and its need for access to the North Atlantic and beyond.

-SSBNs, or nuclear armed ballistic missile submarine developments:

- more active since 2009 (when one broke up through ice and launched a ballistic missile)<sup>160</sup>
- some SSBNs are being modernized, while major new construction is underway
  - In January 2013 a new Borey-class SSBN was put into operational service (with a capacity for 16 strategic missiles, each capable of carrying up to 10 independently targeted nuclear warheads)
  - Another new SSBN was set afloat, and a third is said to be due soon
  - Borey Class subs are to replace Typhoon and Delta subs
  - plan eight Borey subs by 2020, capable of carrying 148 missiles<sup>161</sup>
  - each to carry 16 to 20 missiles<sup>162</sup>

-SSNs, or nuclear powered attack submarines

- building new ones<sup>163</sup>
- the operational radius of the northern submarine fleet has been expanded to include much of the Arctic Ocean<sup>164</sup>

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<sup>158</sup> The Military Balance, 2012, IISS, p. 198.

<sup>159</sup> "Russian strategic nuclear forces," Current Status, March 2012. <http://russianforces.org/navy/>

<sup>160</sup> Climate Change and International Security, p. 18

<sup>161</sup> Viktor Litovkin, "Russian Navy plans further expansion," Russia and India Report, 14 January 2013. [http://indrus.in/articles/2013/01/14/russian\\_navy\\_plans\\_further\\_expansion\\_21601.html](http://indrus.in/articles/2013/01/14/russian_navy_plans_further_expansion_21601.html)

<sup>162</sup> Charles Digges, "Launch of new Russia sub class to put more nuclear missiles at sea, The Bellona Foundation, 14 January 2013. <http://www.democraticunderground.com/1002227359>

<sup>163</sup> Climate Change and International Security, p. 18

<sup>164</sup> Climate Change and International Security, p. 32

-in December 2012 the first of its new Yasen Class cruise missile SSN's undertook a new round of sea trials

-can potentially carry nuclear armed missiles

-sea trials to date have disclosed extensive flaws in a ship experiencing missed deadlines and cost over-runs<sup>165</sup>

-Russia has announced plans to increase the operational radius of its northern submarine fleet.<sup>166</sup>

### ***Surface Ships:***

-Aircraft carriers:

-there are plans for "five or six carrier battle groups," most of which would be based in northern waters<sup>167</sup>

-these new carriers are to be smaller than Russia's current ship, a more versatile combat ship, say some reports, that could include drones<sup>168</sup>

-amphibious assault ships:

-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 France<sup>169</sup>

-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."<sup>170</sup>

-Russia has begun the process for the construction of what promises to be the world's largest icebreaker:

-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."<sup>171</sup>

-other reports say it will go through 3 meters of ice and will be able to escort vessels through the Northern Sea Route year-round<sup>172</sup>

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<sup>165</sup> Charles Digges, "Shaky Severodvinsk nuclear sub sets to sea for trials – again," The Bellona Foundation, 5 November 2012. [http://www.bellona.org/articles/articles\\_2012/severodvinsk\\_more\\_delays](http://www.bellona.org/articles/articles_2012/severodvinsk_more_delays)

<sup>166</sup> Roberick Kefferputz, "On Thin Ice? (Mis)interpreting Russian Policy in the High North," CEPS Policy Brief, February 2010. <http://www.ceps.eu/book/thin-ice-misinterpreting-russian-policy-high-north>

<sup>167</sup> Climate Change and International Security, p. 18

<sup>168</sup> Viktor Litovkin, "Russian Navy plans further expansion," Russia and India Report, 14 January 2013. [http://indrus.in/articles/2013/01/14/russian\\_navy\\_plans\\_further\\_expansion\\_21601.html](http://indrus.in/articles/2013/01/14/russian_navy_plans_further_expansion_21601.html)

<sup>169</sup> "Russia postpones building 2 Mistral class amphibious assault ships locally," Defense Update Blog, 26 December 2012. <http://defenseupdates.blogspot.ca/2012/12/russia-postpones-building-2-mistral.html>

<sup>170</sup> Eve Conan, "Breaking the Ice: Russian Nuclear-Powered Ice-Breakers," Scientific American Blog, September 8, 2012. <http://blogs.scientificamerican.com/guest-blog/2012/09/08/breaking-the-ice/>

<sup>171</sup> Eve Conan, "Breaking the Ice: Russian Nuclear-Powered Ice-Breakers," Scientific American Blog, September 8, 2012. <http://blogs.scientificamerican.com/guest-blog/2012/09/08/breaking-the-ice/>

<sup>172</sup> Trude Pettersen, "Three new nuclear icebreakers in the pipeline" Barents Observer, 4 November 2012. <http://barentsobserver.com/en/arctic/three-new-nuclear-icebreakers-pipeline-14-11>

- other existing icebreakers include:
  - one large “50 Let Pobidy” icebreaker (thick ice-breaking capacity)
  - four small “Project 97” icebreakers on (thin ice-breaking capability) serve
  - more than 20 civilian icebreakers operate in Arctic

***Dual use naval facilities:***

-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.<sup>173</sup> 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.

**Arctic Brigade:**

***Naval exercises:***

- In 2013 Russia’s Northern Fleet will undertake international exercises in cooperation with other states in the Barents and Norwegian Seas and the Atlantic Ocean
  - Barents – promotes interoperability between Russian and Norwegian search and rescue,
  - Pomor – Russian antisubmarine ship joins Norwegian Navy and aircraft from both countries in “joint air defense exercises...coming to the assistance of a vessel in distress, rescuing people in the water, and joint maneuvers during day and night”, and
  - FRUKUS – four Russian vessels join French, Norwegian and US navies in exercise linked to Partnership for Peace<sup>174</sup>
- In October Russia’s Command Post Exercise troops were landed on an uninhabited Island, Kotelny in the Novosibirsk Archipelago, on a training and equipment testing exercise focused on protecting civilian infrastructure. More than 7,000 personnel involved.<sup>175</sup>

**Land:**

- “Russia’s ground forces in the Arctic region include naval infantry and an army brigade on the Kola Peninsula
- “winter-trained but are organized and equipped for operations in the north of Russia, not in the more inhospitable regions of the Arctic.
- “in March 2009 Russia announced a plan for a special military force to protect Arctic interests.
- “in May 2011 it was reported that Russia’s first Arctic special forces brigade had been unveiled, based at Pechenga on the Kola Peninsula.
- In March 2011 Russia announced that the Pechenga (near the border with Norway) 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

<sup>173</sup> Mark Adomanis, “Russia Plans Massive Arctic Expansion,” USNI, August 9, 2012. <http://news.usni.org/news-analysis/news/russia-plans-massive-arctic-expansion>

<sup>174</sup> “Russia’s Northern Fleet Looks Ahead to International Drills,” RIANOVOSTI, 4 January 2013. [http://en.rian.ru/military\\_news/20130104/178576971.html](http://en.rian.ru/military_news/20130104/178576971.html)

<sup>175</sup> Andrei Kislyakov, “Russia deploys Arctic troops,” 2 November 2012. [http://rbth.ru/articles/2012/11/02/russia\\_deploys\\_arctic\\_troops\\_19711.html](http://rbth.ru/articles/2012/11/02/russia_deploys_arctic_troops_19711.html)

operational by 2015, and later it was announced that the brigade would become part of the Northern Fleet.<sup>176</sup>

-“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.”<sup>177</sup>

-“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.”<sup>178</sup>

**Air:**

In March 2013 Russian forces were preparing for the Ladoga 2013 Exercise, to take place in the north-west, centred below the Arctic Circle at Lake Ladoga near the border with Finland. 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.”<sup>179</sup>

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<sup>176</sup> Trude Pettersen, “Testing equipment for Arctic Brigade,” Barents Observer, 19 March 2013. <http://barentsobserver.com/en/security/2013/03/testing-equipment-arctic-brigade-19-03>

<sup>177</sup> (SIPRI, p. 9)

<sup>178</sup> Climate Change and International Security, p. 32

<sup>179</sup> “Russian Air Force Readies for Massive Drills,” RiaNovost, 19 March 2013. [http://en.rian.ru/military\\_news/20130319/180118617.html](http://en.rian.ru/military_news/20130319/180118617.html)

## IV. NORWAY

- Norwegian Armed Forces headquarters are now in Reitan, near Bodo, just north of the Arctic Circle.<sup>180</sup>
- Army headquarters further north, in Bardufoss.
- Navy headquarters are in Bergen
- Coast Guard headquarters are in the north, in Sortland

### **Military Bases:**

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:<sup>181</sup>

#### Bodo:

- National Joint Headquarters
- Norway's largest military airport
- fighter aircraft at 24/7 readiness for NATO

#### Harstad:

- Hosts the Navy's Task Force
- Allied Training Centre North

#### Evenes (ved Harstad):

- army garrison

#### Bjerkvik:

- technical workshop
- maintenance on Armed Forces Vehicles and Weapons

#### Sortland:

- Navy's Coast Guard Squadron

#### Andoya/Andenes:

- Andoya Air Station
- the only base for the P-3 Orion maritime patrol aircraft

#### Setermoen:

- armoured battalion
- artillery “
- medical “
- intelligence “
- training centre

#### Skjold:

- Army 2<sup>nd</sup> battalion
- Army Engineer battalion

#### Bardufoss:

- air field
- Norway's main helicopter base

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<sup>180</sup> <http://mil.no/organisation/about/norwegianjointheadquarters/Pages/default.aspx>

<sup>181</sup> Following taken from the Norwegian Armed Forces website: <http://mil.no/organisation/about/norwegianmilitarybases/Pages/default.aspx>



**Sorreisa:**

- surveillance of north Norway air space

**Banak:**

- air field
- search and rescue helicopter squadron (linked to Porsanger)

**Porsanger:**

- Porsanger “hunter squadron”
- “world’s northernmost army department”

**Sor-Varanger/Kirkenes:**

- guards the 196 km border with Russia
- employs boats, snowmobiles, skies, and foot patrols

**Navy**

The Navy’s “coastal squadron” is its operational force, and the Navy’s Coast Guard “in peacetime is the government’s primary authority at sea and the Armed Force’s most important resource for handling incidents in the Norwegian territorial waters.”<sup>182</sup>

- five new frigates or destroyers<sup>183</sup> (last of which was delivered in Jan 2011)<sup>184</sup>
  - Fridtjof Nansen class
  - new Arctic capability
  - have the US Aegis combat system
  - will host NH90 helicopters<sup>185</sup>
- six coastal patrol vessels
  - Skjold class
  - 76mm gun, anti-ship and anti-air missiles
  - not ice-capable
  - IISS refers to these as Patrol and Coastal Combatants
- submarines:
  - six Ula class (SIPRI)
- 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 yacht<sup>186</sup>
- planning a large support ship to be available by 2015
- “...operates a large ‘research ship’ with electronic and signals intelligence equipment, which is capable of operations in thin ice. A replacement was order in 2010.”<sup>187</sup>

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<sup>182</sup> Norwegian Armed Forces: <http://mil.no/organisation/about/navy/Pages/default.aspx>

<sup>183</sup> The Military Balance counts them as destroyers.

<sup>184</sup> 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.

<sup>185</sup> SIPRI p.8

<sup>186</sup> The Military Balance, 2012, IISS, p. 142.

<sup>187</sup> SIPRI

-“None of Norway’s warships or patrol ships can break ice.”<sup>188</sup>

### **Coast Guard**

- ministry of defence says Coast Guard has 13 vessels of various size
  - IISS says Norway’s Coast Guard has 14 Patrol and Coastal Combatant ships
- the Svalbard ice capable 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.”<sup>189</sup>
- the Coast Guard operates ice-capable ships equipped with anti-ship and anti-air weapons.

### **\*Air Force:**<sup>190</sup>

- F-16 fighters based at Bodo (57)
  - without tankers for air-to-air refueling the F-16 (and the coming F-35s) have little capacity beyond Norway’s northern air space boundaries
- F35: plans to buy 56, to be based mainly at Ørland Main Air Station in central Norway, but with a Forward Operating base at Evenes in northern Norway.<sup>191</sup>
- SIPRI reports that without air refueling they will have no capability beyond Norwegian airspace<sup>192</sup>
- no plans for air-to-air refuelling.
- P-3C and P-3N anti-submarine warfare and long-range patrol(6)
  - 20 years old and due for modernizing
  - no word on a replacement<sup>193</sup>
  - peacetime surveillance and intelligence gathering
  - wartime anti-submarine warfare and anti-surface ship warfare
- Falcon 20C electronic warfare (3)
- C-130J Hercules transport (4)
- MFI-15 Safari training
- 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

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<sup>188</sup> SIPRI

<sup>189</sup> SIPRI

<sup>190</sup> Norwegian Armed Forces: <http://mil.no/organisation/about/airforce/Pages/default.aspx> and The Military Balance, 2012, IISS, p. 142.

<sup>191</sup> “F-35 Lightning II Wins Norway’s (Fake) Competition,” Defense Industry Daily, 17 June 2012. <http://www.defenseindustrydaily.com/f35-lightning-ii-faces-continued-dogfights-in-norway-03034/>

<sup>192</sup> SIPRI, p. 7.

<sup>193</sup> (SIPRI, p. 7)

**Army:**<sup>194</sup>

- CV9030 Tank
- Leopard 2A4 Heavy Tank
- Archer self-propelled artillery
- M-113 family of light tanks
- BV 206 tracked vehicle

**Military exercises:**<sup>195</sup>

- 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
- Annual military exercises in cooperation with NATO and regional partners like Sweden are designed to enhance capacity for large-scale operations in winter conditions.

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<sup>194</sup> Norwegian Armed Forces: <http://mil.no/organisation/about/army/Pages/default.aspx>

<sup>195</sup> Norwegian Armed Forces: <http://mil.no/exercises/coldresponse2012/Pages/about.aspx>

## V. DENMARK

Denmark has announced the establishment of an Arctic Task Force and Arctic Command, and “The Danish forces are being outfitted for a combat capability with the clear intention that most of its forces will be able to operate in or near Arctic waters.”<sup>196</sup>

### ***Greenland and Faroes military bases:***

- a combined command
- 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)
- Island Command Faroes
  - near Torshavn<sup>197</sup>

### **Navy:**

#### ***Ships:***<sup>198</sup>

- Destroyer (1)
  - 2 more on order<sup>199</sup>
  - Thetis class (300 ton) multi-role frigates (4)
    - ice-capable patrol vessels that can travel through ice up to a meter thick, equipped with 76mm guns, and cold add Harpoon and Sea Sparrow anti-air and anti-ship missiles and anti-submarine torpedos,
    - for patrols in North Atlantic and off Greenland
    - now building large ships: 2 Abasalon and 3 Iver Huitfeldt (may have ice capacity), equipped with 127mm gun and missiles and torpedos<sup>200</sup>
- Patrol and coastal combatant ships DIANA class (6)
  - Arctic Patrol Ships Knud Rasmussen class (2)
    - dedicated for patrols off Greenland
  - Arctic patrol cutter AGDLEK class (1)
    - ice-strengthened patrol craft operates from Greenland
- Mine warfare and mine countermeasures (7)

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<sup>196</sup> Rob Huebert, “The Newly Emerging Arctic Security Environment,” Canadian Defence & Foreign Affairs Institute, March, 2010.  
<http://www.cdfai.org/PDF/The%20Newly%20Emerging%20Arctic%20Security%20Environment.pdf>

<sup>197</sup> Ministry of Defence, “Tasks in the Arctic and the Northern Alliance.”  
<http://www.fmn.dk/eng/allabout/Pages/TasksintheArcticandtheNorthernAtlantic.aspx>

<sup>198</sup> Military Balance 2012, p. 106, Climate Change and International Security, Danish Armed Forces Facts and Figures, February 2011.  
[http://forsvaret.dk/FKO/eng/Documents/Fakta%20om%20Forsvaret\\_UK.pdf](http://forsvaret.dk/FKO/eng/Documents/Fakta%20om%20Forsvaret_UK.pdf)

<sup>199</sup> Military Balance, 2012.

<sup>200</sup> Climate Change and International Security.

- 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 Greenland<sup>201</sup>

### **Airforce**

- F-16 fighter (45)
  - F-16s have used Kangerlussuaq (Sonder Stromfjord) airport in west Greenland, with some to be based there for short periods
  - Thule Air Base, now dormant, could be used again
  - likely to replace F-16 with F-35
- C-130J Hercules transport (4)
- CL-604 Challenger passenger transport (3)
- Saab T-17 Supporter training (27)
- Super Lynx (MK90B) anti-submarine warfare helicopters (8)
- AS550 Fennec maritime reconnaissance helicopters (8)
- EH101 Merlin transport helicopters (14)

### **Land**

- Fromandskorps (frogman corps), a small special forces unit, can operate in Arctic
- also a small sled patrol (Slaedepatrolje Sirius) in Greenland:
  - 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)<sup>202</sup>

### **Exercise**

- 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
    - USA<sup>203</sup>

<sup>201</sup> <http://forsvaret.dk/SOK/eng/National/Pages/NorthAtlantic.aspx>

<sup>202</sup> <http://forsvaret.dk/SOK/eng/National/Pages/NorthAtlantic.aspx>

<sup>203</sup> Greenland Command/ISCOMGEENLAND: Search and Rescue Exercise Greenland Sea 2012, Final Exercise Report. Island Commander Greenland. [http://www.institutenorth.org/assets/images/uploads/attachments/SAREX\\_Greenland\\_Sea\\_2012\\_Final\\_Exercise\\_Report.pdf](http://www.institutenorth.org/assets/images/uploads/attachments/SAREX_Greenland_Sea_2012_Final_Exercise_Report.pdf)

**General**

- SIPRI reports that Denmark adopted a “special Arctic strategy” in 2011<sup>204</sup>
- Arctic Command to be headquartered in Nuuk, Greenland
- plans to create “a modular Arctic Response Force composed of different parts of the Danish armed forces...”

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<sup>204</sup> (SIPRI March 2012, pp 5-6):

## JOINT EXERCISES

The growing number of joint exercises by Arctic states indicates a significant level of security cooperation in the region.

### 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.<sup>205</sup>

### Operation 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 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.”<sup>206</sup> 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.<sup>207</sup>

### 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.”<sup>208</sup>

### Operation NANOOK

Operation Nanook, has been conducted annually since 2007 by Canada, and has also involved international military partners, Canadian federal government departments and agencies, and 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.<sup>209</sup>

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<sup>205</sup> “The Russian Navy held joint military exercises with Norway and the US in the Norwegian Sea, 21 August 2012.” *Arctic Info*. <http://www.arctic-info.com/News/Page/v-norvejskom-more-prohodat-sovmestnie-yenia-vms-rossii--norvegii-i-ssa->

<sup>206</sup> OPERATION VIGILANT EAGLE: Air Terror Drill Intercepts, Investigates Hijacking in Simulated Air Terrorist Operation, GlobalConflictMaps.Com, 3 January 2011. <http://www.globalconflictmaps.com/2011/01/03/operation-vigilant-eagle-air-terror-drill-intercepts-investigates-hijacking-in-simulated-air-terrorist-operation/>

<sup>207</sup> David Pugliese, “Selling Canada on the need for fighters,” *Ottawa Citizen*, 12 December 2010. <http://www2.canada.com/ottawacitizen/news/story.html?id=581f5e63-5feb-4983-9d70-f2d8cd0cc4fa&p=2>

<sup>208</sup> “Arctic Council Search and Rescue Table Top Exercise,” Foreign Affairs and International Trade Canada, [http://www.international.gc.ca/polar-polaire/northstrat\\_searchandrescue-stratnord\\_searchandrescue.aspx?view=d](http://www.international.gc.ca/polar-polaire/northstrat_searchandrescue-stratnord_searchandrescue.aspx?view=d)

<sup>209</sup> <http://www.cjoc-coic.forces.gc.ca/cont/rec-eng.asp>

## **Exercise POMOR**

A joint Russian-Norwegian annual naval exercise, the purpose of Exercise Pomor is described by the Norwegian Armed Forces as being to “practice maritime security operations and to further develop the good relationship between the Norwegian and the Russian military.”<sup>210</sup> 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 maneuvering, 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.”<sup>211</sup>

## **Operation FRUKUS**

Operation FRUKUS is planned for 2013, with four vessels of the Russian Northern Fleet joining French, Norwegian and US navies in exercise linked to Partnership for Peace<sup>212</sup>

## **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 USA<sup>213</sup>

## **Operation 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.”<sup>214</sup> The focus of the exercise is “to improve and practise capabilities in high intensity and multi-threat operations during cold weather conditions.”<sup>215</sup> 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.<sup>216</sup>

## **Barents Rescue**

Barents Rescue is a cross-boundary emergency exercise for the Barents Euro-Arctic Region and has been held in 2001, 2005, 2007, 2009, and 2011. 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 a on

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<sup>210</sup> <http://mil.no/exercices/pomor2011/Pages/default.aspx>

<sup>211</sup> Trude Pettersen, “POMOR-2012 starts in one month,” *Barents Observer*, 15 April 2012  
<http://barentsobserver.com/en/security/pomor-2012-starts-one-month>

<sup>212</sup> “Russia’s Northern Fleet Looks Ahead to International Drills,” RIANOVOSTI, 4 January 2013.  
[http://en.rian.ru/military\\_news/20130104/178576971.html](http://en.rian.ru/military_news/20130104/178576971.html)

<sup>213</sup> Greenland Command/ISCOMGEENLAND: Search and Rescue Exercise Greenland Sea 2012, Final Exercise Report. Island Commander Greenland.  
[http://www.institutenorth.org/assets/images/uploads/attachments/SAREX\\_Greenland\\_Sea\\_2012\\_Final\\_Exercise\\_Report.pdf](http://www.institutenorth.org/assets/images/uploads/attachments/SAREX_Greenland_Sea_2012_Final_Exercise_Report.pdf)

<sup>214</sup> Edward H. Lundquist, “Exercise Cold Response Participants Get Chilly Reception in Norway,” *defensemedianetwork*, 22 March 2012.  
<http://www.defensemedianetwork.com/stories/exercise-cold-response-participants-get-chilly-reception-in-norway/>

<sup>215</sup> Press Release: Exercise Cold Response 2012. <http://www.norge.fi/PageFiles/591341/IEPR%20-%20Exercise%20Cold%20Response%202012.pdf>

<sup>216</sup> :NATO Exercise ‘Cold Response 2012’: A Crisis Response Operation or a Provocation to Russia?” NATO Watch, 03 May 2012.  
<http://www.natowatch.org/node/635>



implementation of the 2009 Agreement on Emergency Prevention Preparedness and Response among Sweden, Finland, Norway and Russia.<sup>217</sup>

### **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.”<sup>218</sup> 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 one time 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. Dubbing it “Operation Ignition,” the Canadian aircraft, supported by about 160 Canadian military personnel, were scheduled to provide 24-7 surveillance and interception capabilities for several weeks.<sup>219</sup>

### **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.<sup>220</sup>

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<sup>217</sup> “Barents Rescue Exercise: Making the Barents Region a safer place,” BarentSaga, the News letter of the International Barents Secretariat. <http://www.beac.st/?DeptID=20413>

<sup>218</sup> “Iceland’s ‘Peacetime Preparedness Needs’,” NATO, <http://www.aco.nato.int/icelands-peacetime-preparedness-needs.aspx>.

<sup>219</sup> Defence Watch, “CF-18s to Patrol Iceland’s Airspace,” 26 March 2013. <http://blogs.ottawacitizen.com/2013/03/26/cf-18s-to-patrol-icelands-airspace/>

<sup>220</sup> The CTBTO’s website includes a map showing all of its facilities. <http://www.ctbto.org/map/#ims>