



National
Defence

Défense
nationale

ASSISTANT DEPUTY MINISTER (SCIENCE AND TECHNOLOGY)

Director General Air Force and Navy (DGSTAN)



CANADIAN
ARMED FORCES

International Cooperative Engagement Program for Polar Research (ICE-PPR)



**Baffin Bay Observatory System
Ottawa, Ontario**

28 Feb-1 Mar 2017

Dale F. Reding

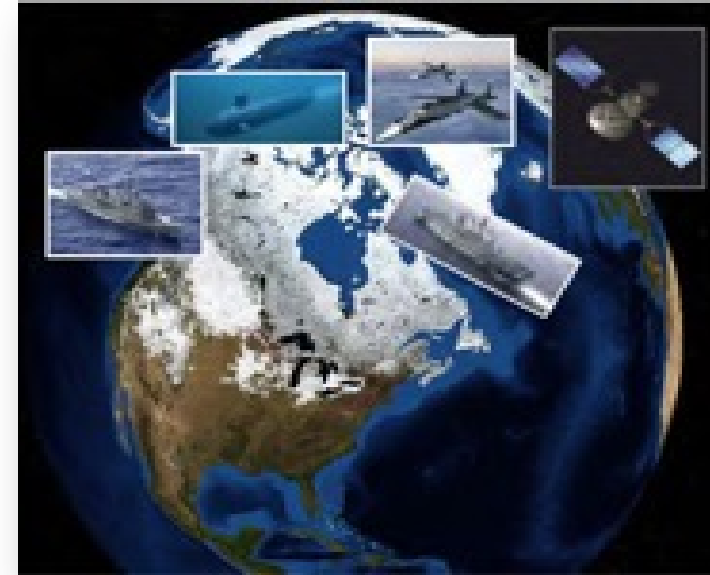
Director General S&T Air Force and Navy

Canada



- **DND's Strategic Arctic Priorities:**

- Provide surveillance of Canada's territory, sea and air northern approaches
- Exercise Canadian sovereignty;
- Support other government departments (OGDs) operating in the region;
- Demonstrate Canadian presence both on land and at sea;
- Provide 24/7 Search and Rescue (SAR);
- Ensure continental defence including through
- Create new and build upon existing defence partnerships throughout the Arctic region



- **Defence S&T Cooperation**

- Traditionally, bilateral collaboration with the United States, Norway and Sweden has been most prevalent with direct contribution to Defence objectives (S&T and Operations).
- Through either NATO (including the Centre for Maritime Research and Experimentation (CMRE)) or The Technical Cooperation Panel, DRDC works extensively with many (but not all) potential ICE-PPR nations.



The Canadian Armed Forces PRESENCE IN THE ARCTIC

1 RADAR-SAT 2

data is used by National Defence's Polar Epsilon program to support Arctic and maritime surveillance and provide near real-time ship detection.

12 Maritime Coastal Defence Vessels

are multi-role vessels with a primary mission of coastal surveillance and patrol including general surveillance operations and exercises, search and rescue, law enforcement, resource protection, and fisheries patrols.

4 CC-138 Twin Otters

transport aircraft can land on water, land, snow, and ice. Powered by twin turboprop engines, the Twin Otter is highly maneuverable and has a range of 1,427 km.

47 radar stations form the North Warning System

to detect and warn of aerospace challenges to North America's northern approaches.

3 NORAD Forward Operating Locations

are maintained by the CAF for the North American Aerospace Defence Command (NORAD) at Yellowknife, Iqaluit, and Inuvik.

8,276,554 Square kilometres

are covered by Op QIMMIQ, the surveillance and presence operation led by Joint Task Force North. The area includes the Hudson Bay, Arctic Ocean, and all Canadian territory north of the 69th parallel.

250 personnel work for Joint Task Force North

headquartered in Yellowknife, they plan, command, support and execute operations in the North.

1,800 Canadian Rangers

providing sovereignty patrols and support to ground search and rescue across over 60 different communities.

77 CF18 Jets

make up Canada's fighter jet fleet, some of which are tasked with patrolling Canada's Arctic and approaches.

1 CAF Arctic Training Centre

provides the CAF with access to a state-of-the-art cold weather training facility.

1 Fort Eureka

provides communications capabilities and weather monitoring.

1 Canadian Forces Station Alert

as the most northern CAF outpost, provides situational awareness and exercises Canadian sovereignty in the High Arctic.

18 CP-140 Aurora Long Range Patrol Aircraft

perform a wide variety of domestic sovereignty roles, including surveillance of the Atlantic, Pacific, anti-surface warfare, and search and rescue missions.

1 Nanisivik Naval Facility

and deep water port will offer refueling and logistic support to GC activities.

4 Northern Exercises

conducted by the Canadian Army each year exercise sovereignty and provide Arctic training.

5-6 Arctic Offshore Patrol Ships

will conduct armed sea-borne surveillance in Canada's Exclusive Economic Zone and enhance the government's situational awareness and control over the Arctic. Construction began in 2015.

28 CH-148 Cyclones

will conduct surface and subsurface surveillance and control, utility transport and, search and rescue missions.

4 Immediate Reaction Units and 4 Arctic Response Company Groups

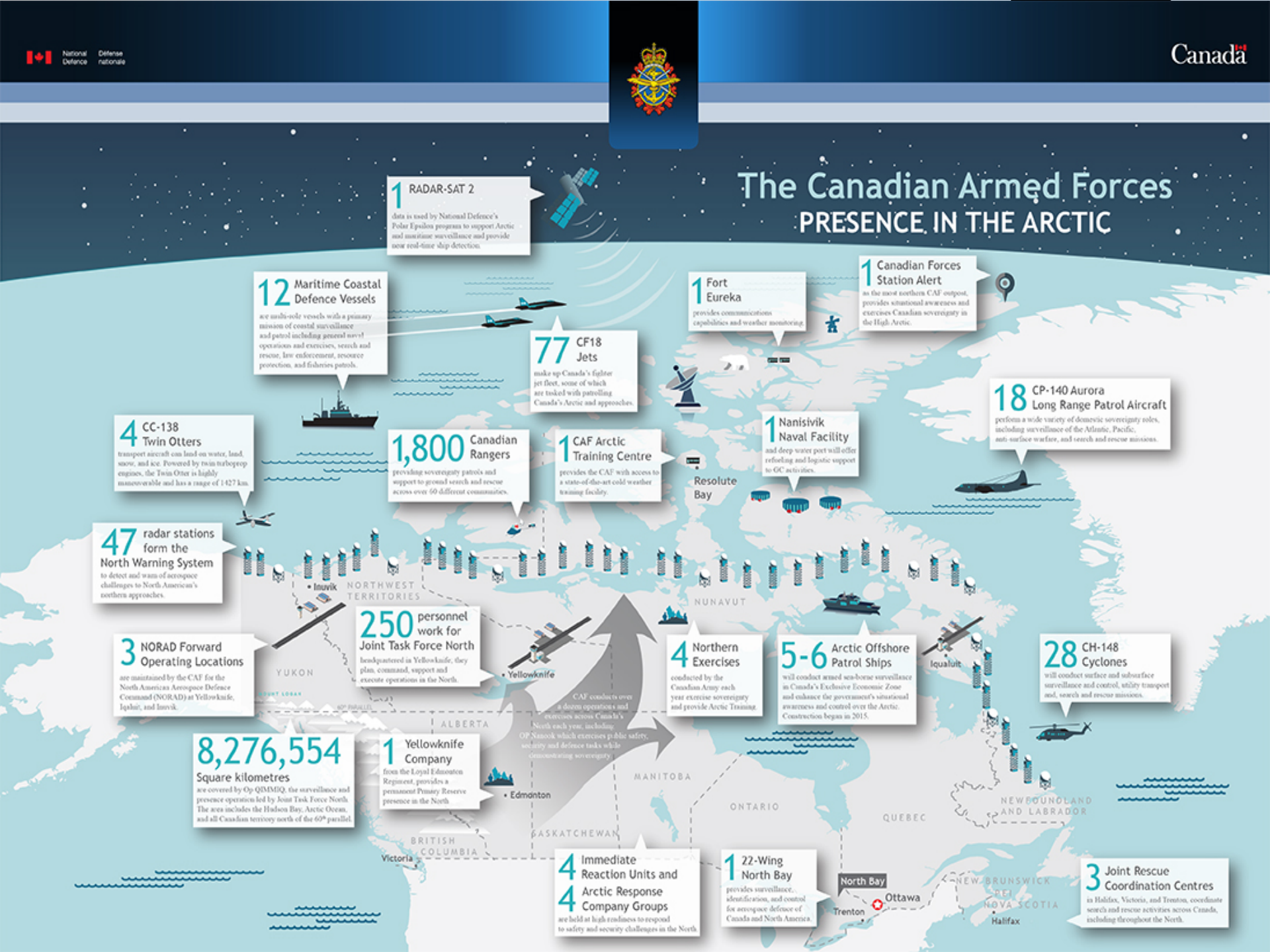
are held at high readiness to respond to safety and security challenges in the North.

1 22-Wing North Bay

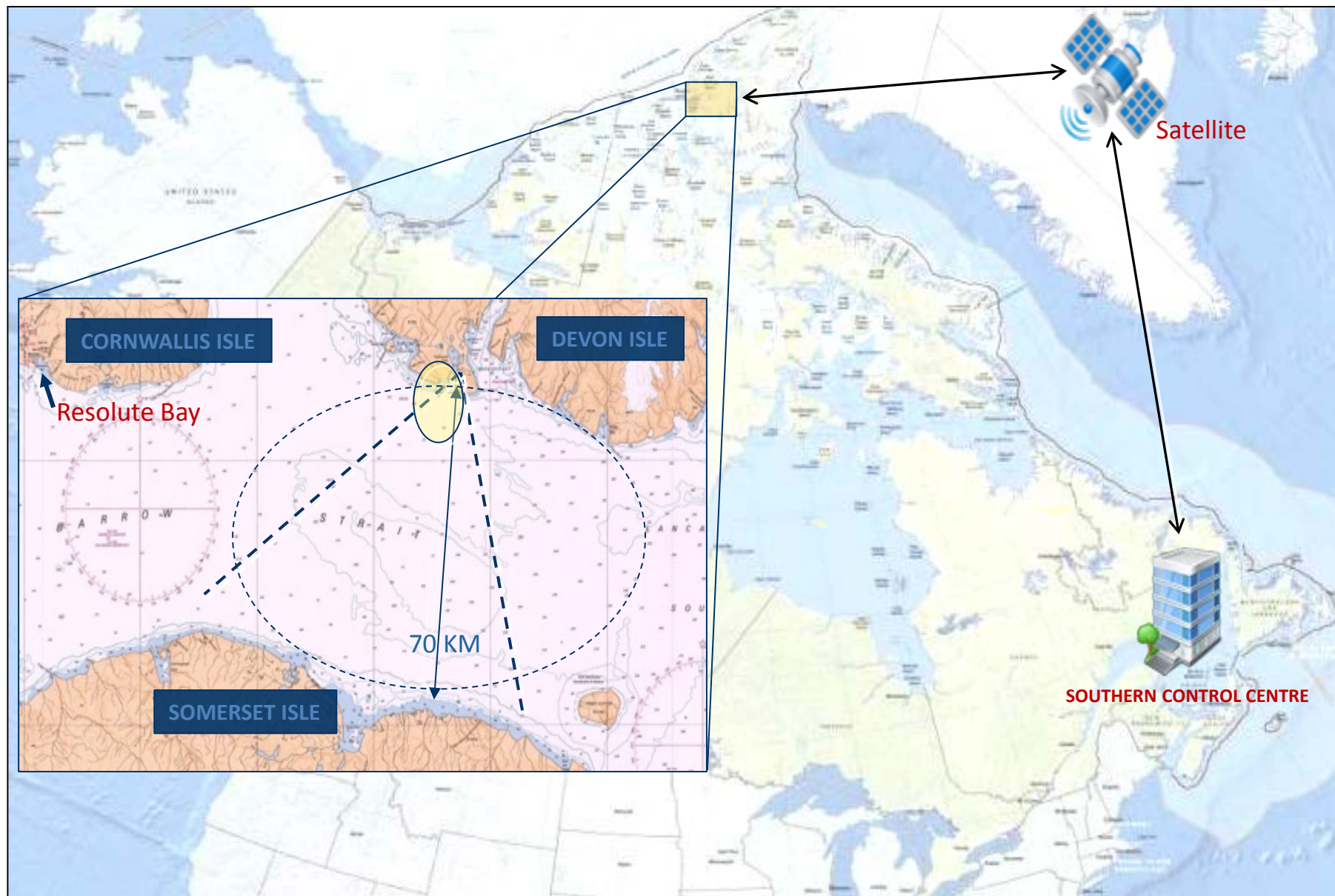
provides surveillance, identification, and control for aerospace defence of Canada and North America.

3 Joint Rescue Coordination Centres

in Halifax, Victoria, and Trenton, coordinate search and rescue activities across Canada, including throughout the North.



Final Northern Watch Arctic trial: Gascoyne Inlet

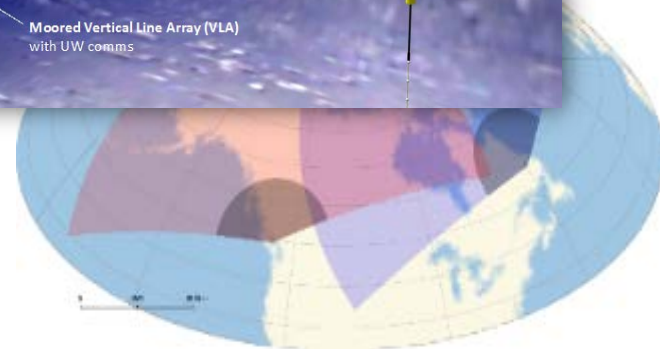
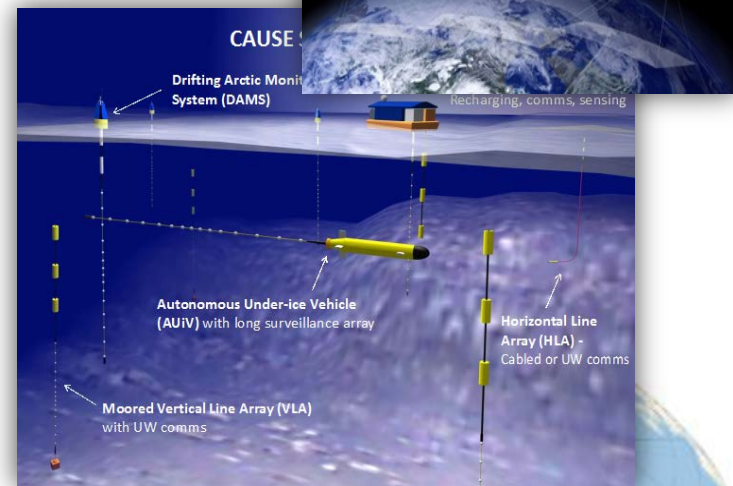
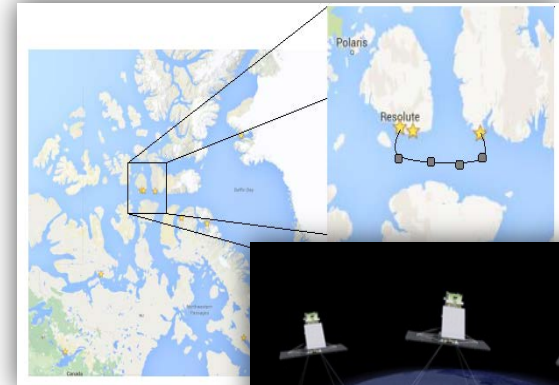




- **All Domain Situational Awareness (ADSA)**

- Aerospace warning extending deep North;
- Awareness of surface maritime traffic approaching or in Northern waters; and
- Awareness of subsurface activity approaching or in Canada's North.
- Activities

- Canadian Arctic Underwater Sentinel Experimentation
- Long Endurance Autonomous Under-Ice Vehicle
- TCPED – Space Based Maritime Domain Awareness
- OTHR – Aerospace Surveillance
- Analysis of Alternatives





- **Participants:**

Finland

Canada

United States

New Zealand

Iceland

Sweden

Norway

Denmark

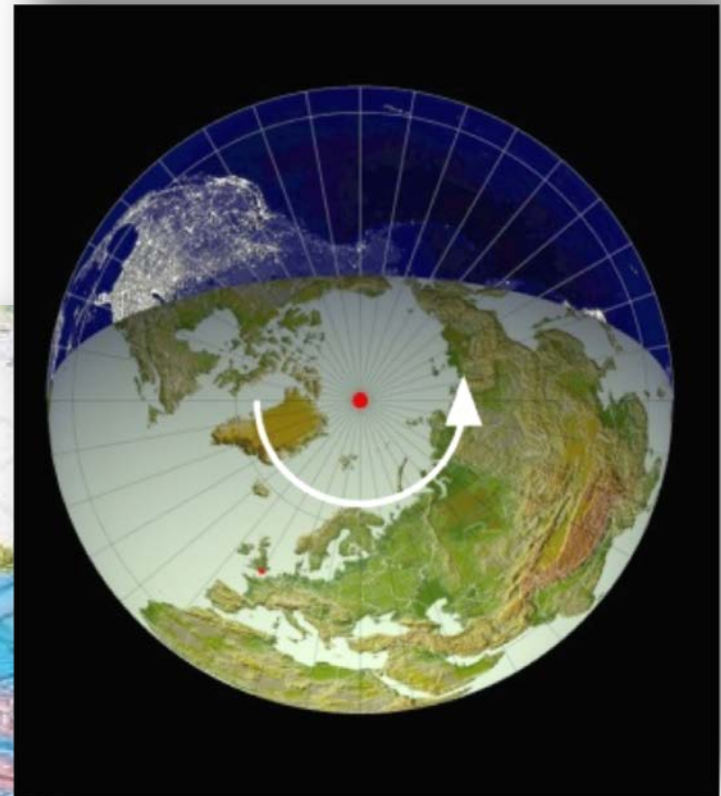


- *“ICE-PPR offers **polar nations** with interests in **cold-weather operations** an opportunity to identify and align defence priorities in order to ensure maximum impact on participating nations’ security.”*
- Navy to Navy focus



Our interest in BBOS

- Environmental characterization
- Surveillance





- **ICE-PPR #1 - Feb 2016**

- Finland hosted
 - Helsinki, Finland
- Inaugural meeting, started MOU negotiations

- **ICE-PPR #2 - Oct 2016**

- Canada hosted
 - Yellowknife, NWT
- Developed focus areas and lead nations
- Assigned supporting tasks
- Further work on MOU: format complete, details under review

- **ICE-PPR #3- Spring 2017**

- Denmark hosting
 - Nuuk, Greenland
- Focus Session:
 - Situational Awareness
- Status Update on All Areas

- **ICE-PPR #4- Fall 2017**

- US hosting
 - Hanover, NH- tentative
- Focus Session:
 - The Environment
- Status Update on All Area
- Anticipated MOU signature



Working Groups

Topic Areas	WG National Leads
Situational Awareness	Lead Nation: DEN
Human Performance	Lead Nation: CAN
Platforms	Lead Nation: FIN
The Environment	Lead Nation: US
Experimentation, Demonstrations, and Exercises	Lead Nation: CAN
Technical Topic Information Repository	Lead Nation: CAN

- Technical Topic Information Repository
 - Begin populating with relevant, sharable information



- **Environmental Data sets- YOPP (2017-2019)**
 - Additional Polar Regions (e.g. Canadian Basin, Baffin Bay, North of Norway, Baltic, Southern Ocean, etc)
 - Example: SODA (Canadian Basin- US lead)- 2018
 - Potential for non-defense coordination lead
- **Observing System Demo (US Lead)**
 - Arctic Mobile Observing System (AMOS) Demo (2019)
 - Request for nations to define and propose activities by Fall 2017
- **Work ahead ...**
 - Articulate the value proposition of ICE-PPR
 - Map the ecosystem of polar actors in your nation
 - Prepare and support the path for MOU staffing and finalization
 - Have technical experts actively participate in working groups to define multi-lateral project opportunities
 - Identify and plan for technology demonstrations (either stand-alone or in exercises)



Questions?

