UPDATED: 24APR20 J. Woods

International Cooperative Engagement Program for Polar Research (ICE PPR)

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Office of Naval Research-Global
OPNAV N94

UNCLASSIFIED

WHAT IS ICE PPR?

- Multi-lateral framework to enable Mil-Mil and Mil-GOV RDT&E cooperation
  - ***THERE ARE NO EXISTING FRAMEWORK AGREEMENTS, THAT ADDRESS WHAT THE MOU PARTICIPANTS WANT TO ACCOMPLISH UNDER ICE-PPR!***
- Overarching framework agreement, led by an Executive Steering Council, with the ability to:
  - Establish Working Groups using Terms of Reference (TOR), for the purpose of **harmonizing requirements** to enable potential cooperative projects
  - Permit the **exchange** of RDT&E information and the establishment of Project Arrangements (PAs) with at least two of the nations
  - Enable Cooperative Project Personnel (CPP) and Equipment & Materiel Transfer Agreements (E&MTA)
  - Identify **opportunities** for Experimentation, Demonstration, Exercises (EDE)
- Enable **easier transition** of basic research to more applied research carried out by governments, academia, industry partners, etc..
- Focus on Cooperative Projects Agreements (PAs), Personnel Exchange and Demonstrations
  - More emphasis on activities and contributions than information exchange
- Partners include ALL Gov Agencies, Academia, Industry Partners
- Participants include Canada, Denmark, Finland, New Zealand, Norway and Sweden.

Potential Cooperation Activities

- The MOU Scope enables the development of projects in mutual areas of interest, such as:
  - Polar **Environmental Modeling**, prediction, and information sharing;
  - Polar **Sensors** and Remote Sensing techniques;
  - Polar **Communications** and Situational Awareness;
  - **Platform** Design and Performance for Polar Environments;
  - RDT&E **Infrastructure** in and for Polar Environments;
  - Experimentation and **Demonstrations** in Polar Environments;
  - **Education**, Training and Exercises;
  - Personnel **Exchange**s;
  - **Navigation** in Ice Conditions;
  - Logistics, including **Energy Generation** and Energy Efficiency, in Polar Environments;
  - Polar **Meteorology**, **Hydrography** and **Oceanography**;
  - Human Performance and Operations in Polar regions, e.g., medical, **physiology**
  - **Social Science** Research; and
  - **Operations Research**.

Working Groups will generate PAs, Personnel and Materiel Exchanges

WHY ICE PPR?

- Polar Regions remain challenging operating environments, with harsh climates, vast distances, and little infrastructure
  - These issues, coupled with limited operational experience, are just a few substantial challenges the **U.S. DoD** will have to overcome in Polar Regions
- Focus areas developed to help close any capability gaps for current Arctic operations
  - **Environmental** (Air/Ocean Observations, Modeling, Exercises, Charting)
  - **Human Performance** (Warfighter Performance/Sustainability, Food, Shelters)
  - **Platforms** (Land, Air, Sea, Subsurface, Manned, Autonomous)
  - **Situational Awareness** (Sensors, Satellites, Tactical Decision Aides)

Non ice-strengthened vessels working in ice covered waters and Sailors wearing Damage Control gear for cold weather protection

What the proposed MOU will cover

Research, Development, Test & Evaluation (RDT&E)						
RDT&E Budget (6.1-6.7)						
S&T Budget (6.1-6.3)						
6.1 Basic Research	6.2 Applied Research	6.3 Advanced Technology Development	6.4 Adv. Comp. Development & Prototypes	6.5 System Development & Demonstration	6.6 RDT&E Management Support	6.7 Operational System Development

RDT&E appropriations finance research, development, test and evaluation efforts performed by contractors and government installations to develop equipment, material, or computer application software; its Development Test and Evaluation (DT&E); and its Initial Operational Test and Evaluation (IOT&E). These efforts may include purchases of end items, weapons, equipment, components, and materials as well as performance of services – whatever is necessary to develop and test the system.

U.S. ICE PPR Team

Principal-RADM David Hahn (CNR/OPNAV 94)

XO-John Woods (ONR-G/N94)

Negotiator-Jack Fenwick (NIPO)

LEADS	WG Members
Environmental WG-John Woods (ONR-G)	ONR Code 32, CRREL, USA, USAF….
Human Performance WG-Dr. Mason (ONR Code 34)	ONR Code 34, CRREL, USA, USAF….
Platforms WG-Sturtevant/Webster (PEO Ships/NAVSEA)	ONR Code 33, NAVSEA, PEOs, USCG, USA, USAF….
Situational Awareness WG-Maj Gen Kee, ret (ADAC)	ONR Code 31, NGA, USA, USCG, USAF…

Continuously Recruiting Working Group Members from All Gov, Academia, Industry (NOAA, NASA, NSF, DoE, DoS…..)

Red=Vacant

U.S. Army Engagement

Multilateral Cold Regions Workshop

7-9 MAY 2019, U.S. Army Corps of Engineers, Cold Regions Research and Engineering Lab (CRREL), Hanover, New Hampshire

Participants: Finland, Norway, Sweden, U.S. Army

Objective: Build an S&T roadmap to address Defense technology gaps/requirements regarding military operations in extreme cold environments

S&T Topics:

- Biomedical Considerations in Human Performance Enhancement and Prediction (frostbite/injury prevention and treatment)
- Lethality (weapons/munitions performance in extreme cold weather)
- Manned and Unmanned Vehicles (Arctic mobility)
- Point and Remote Sensing (radars for snow/ice terrain)
- Soldier Sustainment and Performance (nutrition, hydration, clothing)
- Detection and Remediation of Hazardous Biologicals and Chemicals (permafrost pathogens CBRN)

ICE PPR Status Update

24APR20

- MOU Final Edits Approved by OSD
  - Ready to Sign version returned to partners for final approval 23APR20
  - MOU Signature mid-late JUN20

- ICE PPR 6th National Principals meeting in Nov 11-14, 2019 in Christchurch, New Zealand.
  - Cold Weather Clothing, NZ Polar Ship Design, Southern Ocean Waves Research Discussed
- Environmental and Human Performance Working Groups have been active
  - OP Nunalivut Participation (CAN, US)
    - Human Performance exercise executed by DRDC (Vaughn Cosman)
  - Arctic Buoy Airborne Deployments (CAN, DEN, US)
    - 3 High Arctic Buoy Drops (Over 50 Sensors Deployed); Plans Summer 2020 (COVID-Unknonw)
  - Danish Navy Surface Deployments/Iceberg Tagging Summer 2020 (COVID-Unknown)
- U.S. Army has joined ICE-PPR to leverage emerging Cold Regions Research
- WG/XO Meeting VTC 5-8 May ; Principals Meeting in Oslo, Nov 20
- Working Group POCs:
  - Environmental (US ONR turning over to….) - john.e.woods@navy.mil
  - Human Performance (ONR Code 34) - patrick.mason@navy.mil
  - Situational Awareness (Church Kee) – rakee@Alaska.edu
  - Platforms (US PEO Ships/NAVSEA)- glen.sturtevant@navy.mil james.s.webster@navy.mil

Contacts

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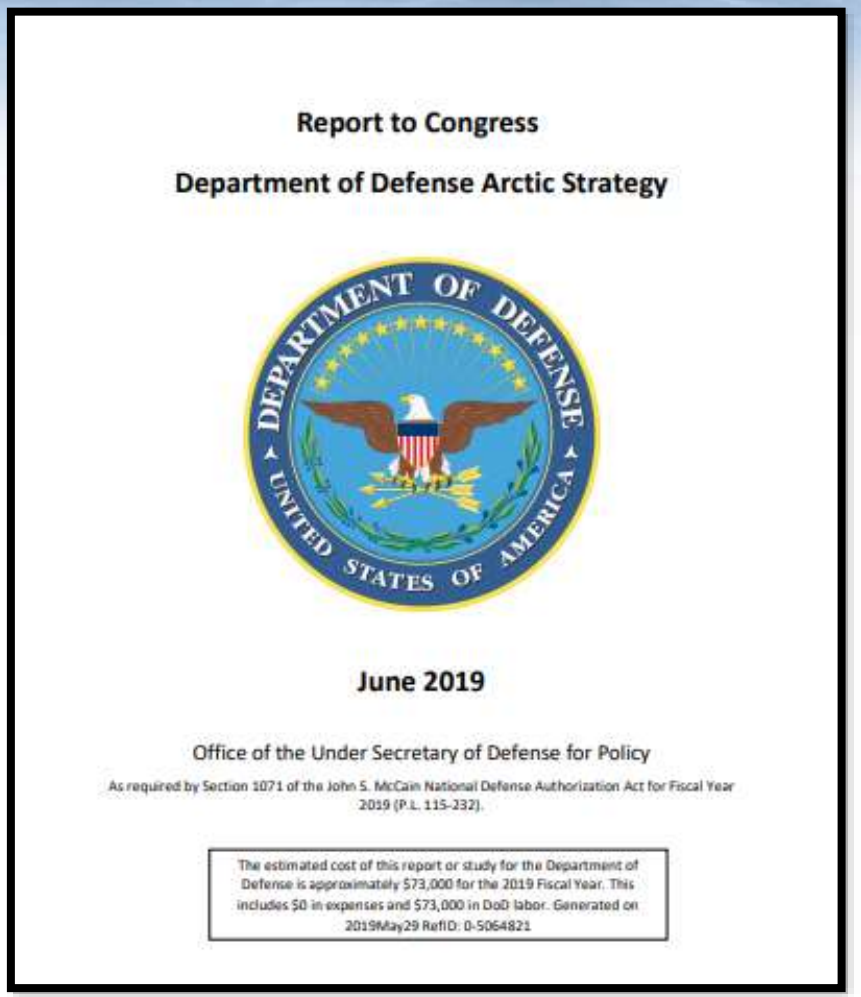
ICEPPR Videos

https://www.youtube.com/watch?v=MafkJMr5jCQ

https://www.facebook.com/FOIN.JTFN/videos/operation-nanook-nunalivut-2019-supports-scientific-research/1198891636953727/

US Arctic Strategies
DoD

- 3 Strategic Ways
  - **Building Arctic awareness**
  - **Enhancing Arctic operations**
  - Strengthening the rules-based order in the Arctic
- Supporting Objectives
  - Ensure security, support safety, and promote defense cooperation
  - Prepare for a wide range of challenges and contingencies



Report to Congress

Department of Defense Arctic Strategy

June 2019

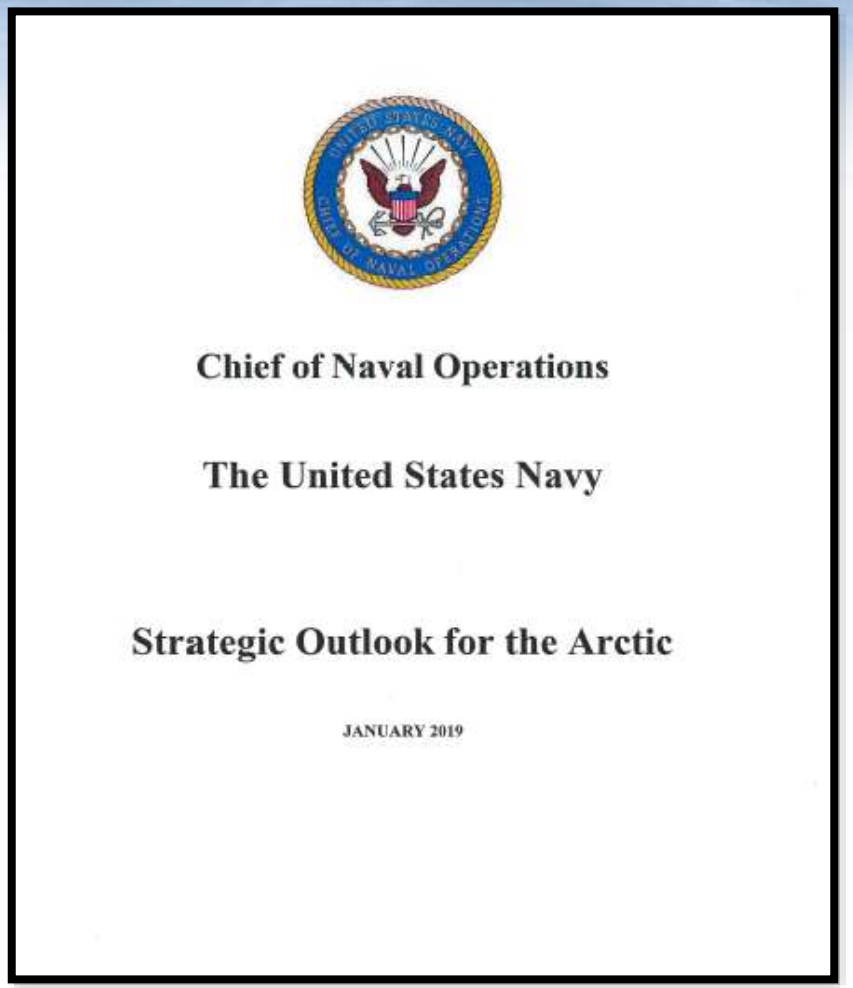
Office of the Under Secretary of Defense for Policy

As required by Section 1071 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (P.L. 115-232).

The estimated cost of this report or study for the Department of Defense is approximately $73,000 for the 2019 Fiscal Year. This includes $0 in expenses and $73,000 in DoD labor. Generated on 2019May29 RefID: 0-5064821

US Arctic Strategies
DoN

- Strategic Objectives
  - Defend U.S. sovereignty and the homeland from attack
  - Ensure the Arctic remains a stable, conflict- free region
  - Preserve Freedom of the Seas
  - Promote Partnerships within the U.S. Government and with allies and partners to achieve the above objectives
- **Interagency and International Cooperation**
  - USCG/NOAA/DOE/NASA/NSF/ USAF
  - NORAD/NATO


Chief of Naval Operations

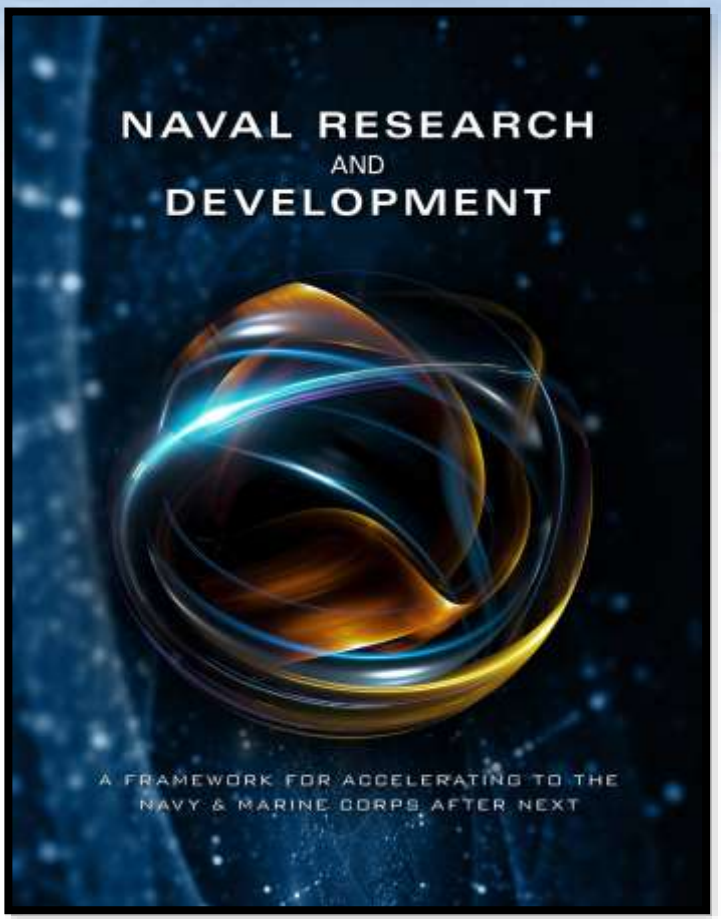
The United States Navy

Strategic Outlook for the Arctic

JANUARY 2019

USN R&D Arctic CNR

- Undersea Battlespace and Maritime Domain Access
  - Forecasting for safety of naval operations is also a critical mission that requires ongoing research to account for the changing dynamics in the open-ocean, **Arctic,** and littorals.
- Understanding and synthesis of **ocean-atmosphere-land processes and interactions**
- Real-time environmentally adaptive **sensors,** data processing and systems that can be **distributed** and operated effectively
- **Modeling support** for the maritime warfare areas such as sensing, tracking, navigation, communications, neutralization and exploitation



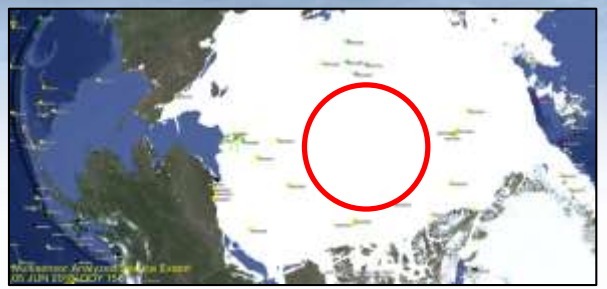
"Be first to field decisive capabilities"

ICE-PPR Exercises

- USN Reserves (ONR-RC) Participation in Operation Nunalivut 2019
  - Twin Otter Support from Inuvik (NWT)
  - Canadian Ranger Support from Tuktoyuktuk (NWT)
- Plan was to deploy Environmental Buoys on offshore sea ice
  - Challenging ice conditions; No multi-year sea ice within range
  - Aircraft issues
- Great Relationship Building
  - Beaufort Sea Science Partnerships
  - STEM Event

ICE-PPR Buoy Drops

- 3 Coordinated Airborne Arctic Buoy Deployments
  - International Arctic Buoy Program (IABP), Environment Climate Change Canada (ECCC), Defence Research and Development Canada (DRDC), US Navy ONR Reserve Component (ONR-RC)
- 2017-RDAF (Thule), 2018/19 RCAF (Resolute Bay)
- Filling Large Data Gaps over the Arctic Ocean
- Cost Savings approx. $.25M/year to allow for the purchase of more buoys (IABP)



Above: Large gap of environmental observations (red)
Below: Post ICEPPR flights buoys filling the voids (green)