

Opportunity to Plan and Develop a Comprehensive US Arctic Research Infrastructure Network Hub at the Prudhoe Bay Area



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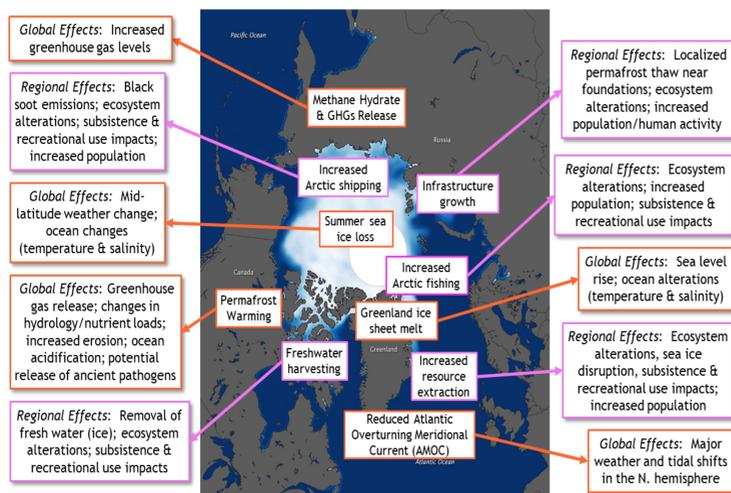
Pending Workshops and Conference Sessions:

- Wilson Center Ice-Diminished Arctic Symposium (July 2019, Washington, DC)
- NSF HARC Workshop for science need (Fall 2019, Fairbanks, AK)
- NAS-PRB HARC Workshop for agencies coordination (Late 2019, Wash., DC)
- ASM2019 Pan-Am Arctic research coordination (Dec. 2019, Halifax, Canada)

Introduction: Arctic Change → Response → Opportunity

US High Arctic Research Center (USHARC):

Need and Opportunity: The rapidly changing Arctic will change the world... physically, economically, politically, and in many ways. U.S. interests are increasingly vulnerable due to these changes. To respond as a resilient nation, a proper research infrastructure throughout the US Arctic is needed.



Examples of **Global** and **Regional** Effects resulting from Arctic Change

Concept: Connect need with the opportunity to develop a comprehensive multi-agency US High Arctic research Center (USHARC) as a national asset.

Vision: USHARC shall be a national asset to support a comprehensive Arctic science and security network that addresses the needs of many stakeholders. A proper network will enable research of Arctic environmental change, infrastructure, emergency response, search and rescue, domain awareness, and technologies that support these – leading to economic development, environmental protection, and national security improvements.

USHARC → Leveraging Resources for Arctic Research

Large region + high costs = Leverage resources to realize greatest benefits

“It’s all about sharing at the end of the day and having the ability to maneuver. It’s expensive to work in the Arctic and sharing resources makes sense.”

Mike Kristjansen; Logistics Manager, Canada Polar Continental Shelf Program (shared with Armed Forces Canada Arctic Training Center)

R&D partnership between stakeholders in the Arctic are compatible from an operational, economic, and research perspective.

- Support field surveys, lab analysis, testing and logistics for science and security.
- Maintain a supply chain between Arctic activities and sub-Arctic resources.
- Share best practices, advise and help provide contacts for services and additional support.
- Expand training and routine operations via pre-position equipment; support emergency operations in support of civilian authorities.
- Create synergies, coordinate multiple projects to increase feasibility of individual projects.
- Strategic contingency location to stage appropriate response when needed across the High Arctic.



USHARC + Arctic Network → Opportunities

Fill gaps in research and operating capability in the U.S. Arctic

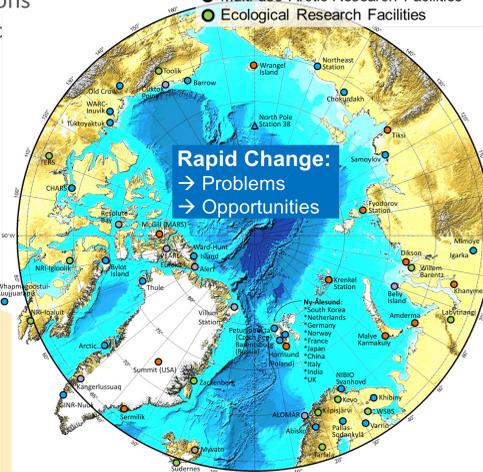
Data Sparsity: Research stations perform an important function to enable research and understand rapid changes in the observation-sparse Arctic.

High Arctic Research Infrastructure Network: While the U.S. operates several facilities in Alaska, they are constrained in their missions, which limits our ability to support safe, secure and sustainable development of the Arctic.

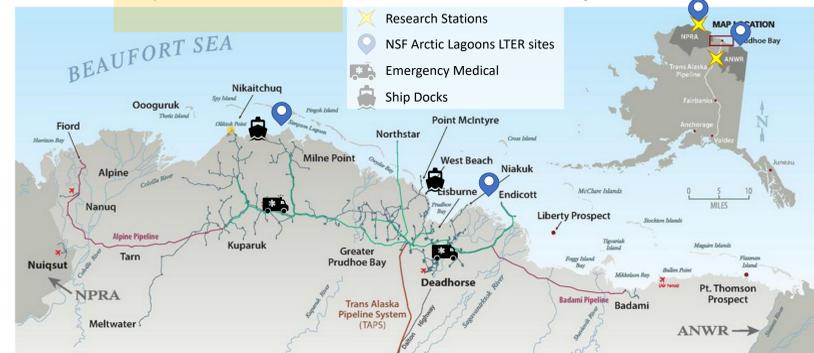
Partnering: Public and Private stakeholders for comprehensive and responsible solutions to address mutual needs and interests, including:

- State and Federal Government agencies
- Military/Defense/Emergency Response
- Non-Government Organizations
- Pan-American and Pan-Arctic
- Research Institutions
- Local Communities
- Law/Constabulary
- Industry

- Cryo-Hydro Meteorological Facilities
- Ice Drifting Station (changed annually)
- Atmospheric Research Facilities
- Multi-use Arctic Research Facilities
- Ecological Research Facilities



Prudhoe Bay Context



USHARC → Increase U.S. Presence in the High Arctic

U.S. has the smallest active presence in the Arctic among Arctic Nations (and less than some non-Arctic Nations)

USHARC can increase the U.S. Arctic presence:

- Permanent, year-round facility
- Infrastructure for Arctic research, technology, and training
- Shoreline location for campaigns across land, sea, air, ice
- Increase domain awareness (and research for same)
- Increase logistic capabilities (and research for same)
- Increase communications (and research for same)



Arctic Shield 2015: The Oliktok Point site and controlled airspaces were used to conduct the USCG search and rescue exercise. An unmanned aerial vehicle (UAV) was launched from Oliktok Point, which was “handed off” to the USCG cutter Healy to locate simulated “survivors” in Arctic ice-covered waters. Manned aircraft were then dispatched via coordination of government and private assets.

Prudhoe Bay Area → Location, Assets and Experience

Alaska Arctic Stations and Oliktok Point Controlled Airspaces



Location: Access to coastal, marine and terrestrial environments. Connections via road and air to connect a network of Arctic facilities.

Road Access: Very rare in U.S. Arctic! Dalton Highway connects to sub-Arctic Alaska and the contiguous U.S. for deliveries and global services.

Controlled Airspace: At Oliktok and toward the North Pole enables coordinated terrestrial + marine + aerial research and operations.

Unmanned Aircraft Systems (UAS): UAS Facility at the Station operated by UAF, with an airstrip and hangar; to serve research, testing, and development.

Communications and Data: Broadband fiber-optic cable is fully operational. A secured/classified communications SCIF is also present.

Infrastructure and Services: UAF and Sandia relationships offer equipment, skills and services; including medical facilities and emergency response teams.

Collaboration: Spaces and systems for Arctic stakeholders at USHARC will connect to a Network of Arctic Stations for coordinated projects.

Research Support: Station will include lab spaces, logistic and operational support, prep areas, UAS facilities, utility systems, and lodging. Atmospheric data from an adjacent DOE facility**.

Human Development: At intersection of natural Arctic and human development for study of human development impacts on environmental sustainment.

**While some continued presence of the current DOE-ARM facility is anticipated, future plans are uncertain. Changes could affect the extent of DOE assets and possible need to replace some ARM instruments, if desired.

USHARC Facility

USHARC is to adapt and evolve through phased development:

- **Master Plan:** Adaptive plan to align investments with evolving priorities
- **Phase 1:** Master Plan; construct roads, pads, infrastructure
- **Phase 2:** Core facility for basic year-round capability of small scale operations:
 - Commons core, Lodging, Lab, UAS Center, Maintenance & Support Center: ~50,500 sq.ft. total
- **Phase 3:** Update Master Plan; expand facility scale, systems, and capabilities:
 - Marine dock and support facilities, marine vessels, portable lab trailer, portable shelter(s): ~14,000 sq.ft. added building area, new pads
- **Phase 4+:** Future phases, dictated by subsequent evaluations and Master Plans

