ARCTIC DOMAIN AWARENESS CENTER
A DEPARTMENT OF HOMELAND SECURITY CENTER OF EXCELLENCE

UNIVERSITY of ALASKA
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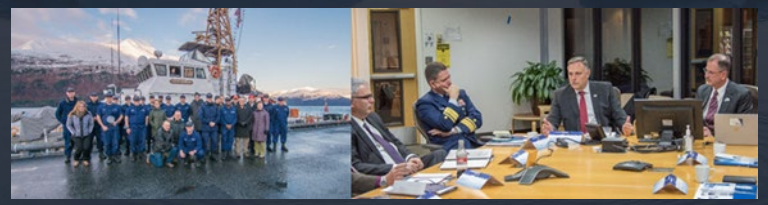
ARCTIC AND WESTERN ALASKA AREA COMMITTEE MEETING

November 1st, 2022

A presentation by

Jeff L. Libby, Executive Director, Arctic Domain Awareness Center






University of Alaska Anchorage

Applied Environmental Research Center

AERC

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UAA
UNIVERSITY of ALASKA ANCHORAGE

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Center for Strategic Partnerships and Research

Serving as the sponsor for registered apprenticeships

*Producing Federal and State Government employees
*Building the next generation of scientists
*Providing a pathway for our next leaders

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University of Alaska System

University of Alaska Anchorage

- College of Engineering
- College of Arts and Sciences
- College of Business and Public Policy
- College of Health
- Community and Technical College
- Kenai Peninsula College
- Kodiak College
- Mat-Su College
- Prince William Sound College

University of Alaska Fairbanks

- Bristol Bay Campus
- Chukchi Campus
- Community and Technical College
- Interior Alaska Campus
- Kuskokwim Campus
- Northwest Campus

University of Alaska Southeast (Juneau)

- Ketchikan Campus
- Sitka Campus

Other Local Partnerships:

ADAC's Research Network…of both current and completed investigations…contribute to building bridges and partnerships!

ADAC's Research Network has been crucial in helping the Center advance in Building Agency Partnerships

ADAC: Research for the Arctic Operator… For Today and For the Future

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ADAC at a Glance:

ADAC is hosted by the University of Alaska system, with work conducted at UA campuses in Anchorage and Fairbanks…and conducts research across a growing network of academic and industry partners.

Vision: The DHS Center of Excellence, providing networked and mission-focused support to the USCG in the High North.

Mission: To develop and transition technology solutions, innovative products and educational programs to improve situational awareness and crisis response capabilities related to maritime challenges within the Arctic.

Strategy: To advance knowledge in relevant science and technology through conducting research and development in close collaboration with our federal, state, tribal and municipal partners. The Center also develops future leaders for the DHS enterprise through structured and well-led programs.

ADAC's principal customer: USCG…in support of Arctic Search and Rescue, Humanitarian Assistance and Disaster Response. The Center collaborates with an array of federal, state, local, tribal, industry and academic partners to advance domain awareness of the Arctic region and help with developing solutions.

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Upfront: Addressing ADAC's contributions to Homeland Security

ADAC is a DHS S&T OUP Center of Excellence in Maritime Research, hosted by the University of Alaska.
ADAC is a research network with its hub located at the University of Alaska Anchorage.

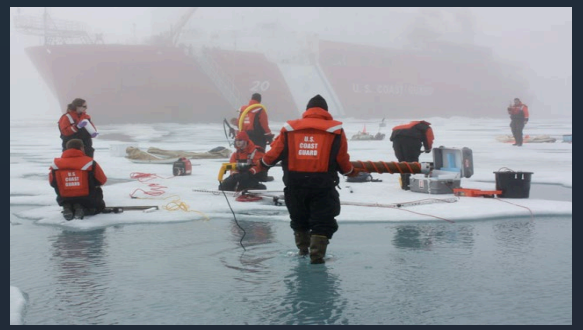
ADAC has advanced Arctic Science in the following categories of research:

- Geophysical environmental modeling;
- Marine robotics;
- Decision support science;
- Satellite support;
- Biological & marine environmental science;
- Civil engineering;
- Big data analytics;
- Social science…to include gaining insights from rural Alaska and Arctic communities.

Providing:

- "Operator driven research" to support the Arctic maritime mission of the U.S. Coast Guard…
- …and other U.S. federal maritime security and safety activities
- …and to support the public good.

Courtesy The Arctic Institute

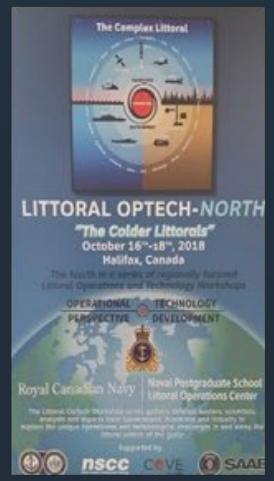


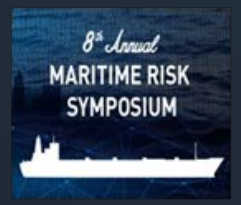
Courtesy NASA.gov

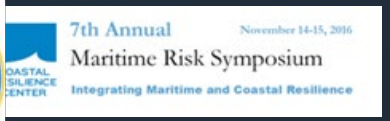
Courtesy The Alaska Eskimo Whaling Commission

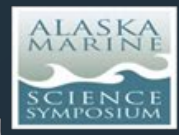
Presenting to the community of Arctic and Maritime Research

Throughout ADAC's eight year history Center leadership and research investigators presented and or participated in a large number of notable Arctic and/or Maritime Research or operator forums to advance Safety and Security.









ADAC: A networked team advancing S&T + R&D to *meet Arctic operator needs:*

- *Supporting* U.S Coast Guard, U.S. Army Corps of Engineers and Department of Defense initiatives.
- *Establishing* a growing collaboration with research scientists, government agencies and institutions of higher education.
- *Partnering* with DoD, NOAA & NWS and advancing cooperation across the U.S. federal family.
- *Developing* new research and methodology to support the needs of rural Alaska communities and indigenous populations along with state and federal agencies.
- *Creating* education and workforce development training opportunities and providing pathways for the next generation of Arctic researchers through collaboration with tribal schools and institutions of higher education.
- *Advancing* the capabilities and security of the Arctic and the residents that live in this region.
- *Conducting* research to create an operationally capable Community-based Observer Network in Arctic Alaska.
- *Envisioning* a long future as a National Center of Excellence continuing to support the needs of DHS, USCG while providing innovative Arctic research.

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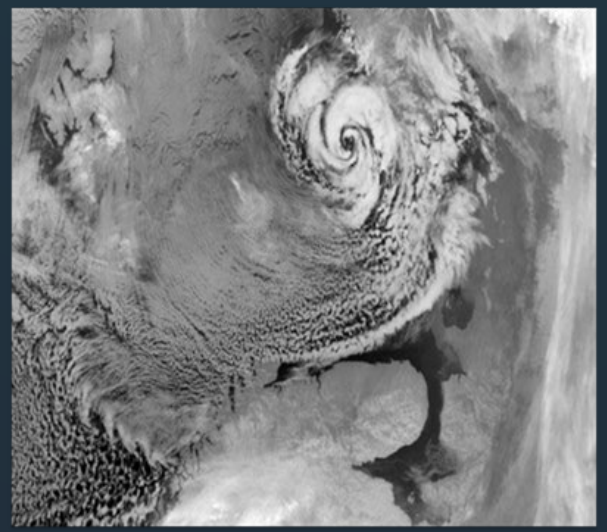
(Some) of the Challenges faced by the maritime operator

- Weather
- Illumination
- Distances
- Sea ice (its more complicated than one may think)
- Logistics
- Infrastructure
- Communications
- Bathymetry (what's below the waves?)



A polar low northeast of Scandinavia in the Barents Sea.
Credit: Erik Kolstad/flickr.

Helping the operator…means improving the…

- Ability to locate people who need help
- Ability to locating people who are doing illegal activities
- Ability to suitably respond to disasters
- Ability to identify threats and risks to our interests

- In sum…an ability to respond

Goal = Strengthening Research Partnerships in support of Operations

Accordingly…ADAC's Mission = an opportunity to help via:

- S&T Solutions
- Knowledge Products
- Convening experts to study, discern and propose
- Educate next generation of HSE professionals…steeped in science

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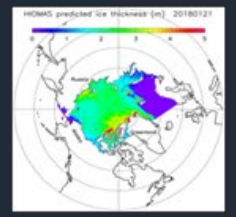
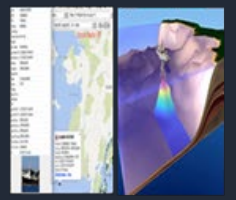
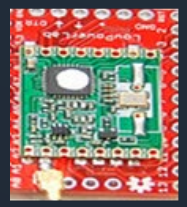
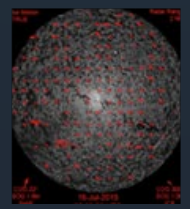
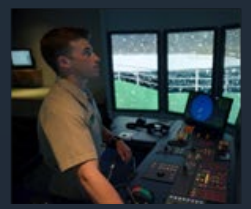
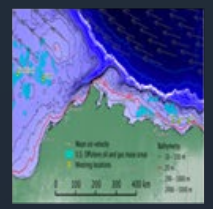
ADAC…operator driven science & technology…for the Arctic

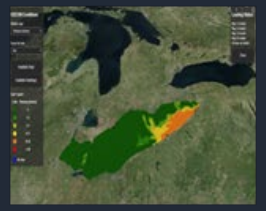
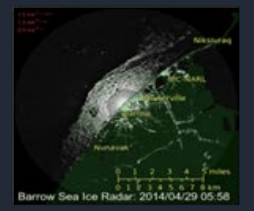
- **Models on the Physical Characteristics of the Arctic,** such as fine scale sea-ice characterization at various scales.
- **Decision support tools** for Marine operations in the Bering, Chukchi & Beaufort Seas and Great Lakes ice conditions characterized and tailored for vessel types.
- **Tactical tools** for mariner use based on localized sea-ice hazards.
- **Oil spill studies** to understand impact to Arctic mussels and copepods, & future Arctic spill modeling.
- **Induced polarization** to characterize oil spills within sea ice conditions.
- **Big Data analytics** to support NOAA bathymetric survey prioritized on vessel traffic.
- **Models to support disaster response:** Oil Spills in Arctic Ocean and Storm Surge in Western Alaska.
- **Long-range Autonomous Platforms** to support oil spill response characterization and other physical aspects.
- **Geo-spatially oriented data aggregation** for all hazards & geofencing for USCG command centers.
- **Support to small satellites** to improve Arctic communications.
- **Sensors, chemical isotope detection, smart camera development & community based observations**
- **Mariner training** in support of IMO polar code.



Goal: Advance knowledge and research in the Arctic

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ADAC's Arctic Summer Intern Project (ASIP)

National Science Foundation

Originally funded by DHS through 2021. Funding in 2022 was provided by and awarded to ADAC from NSF EPSCoR. ADAC has already been awarded funding from the UAA Chancellor Excellence Fundfor 2023 and has two other proposals currently pending approval to ensure this continues in 2023.

- Student orientation to U.S. Federal, and State of Alaska "Arctic oriented" mission agencies in Anchorage.
- One week "Arctic Field Research Mission"
- Follow-on, tailored programs for each student that includes one-on-one research efforts, aligned to student goals.









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ADAC: Continued Center Operations and Next Steps

ADAC Transitions to DHS Emeritus Center of Excellence:

- Ways to partner now and in the future include:
  - DHS Basic Ordering Agreement (BOA) issued through 2026
  - United States Army Corps of Engineers (USACE) Cooperative Agreement
  - Direct Contracting (May involve a bid process)
  - CRADA (Partnership with National Labs-PNNL, SNL, etc.)
  - Educational Services Agreement (ESA) (class initiatives)
  - Other Federal Partner initiatives:
    - Ted Stevens Center (TSC) for Arctic Security Studies
    - National Science Foundation (NSF)
    - National Park Service
    - Department of Defense
    - Department of Labor Apprenticeship Program via UAA
  - GSA is underway!

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We are here……

Thank you!
Question/Comments?

Contact information:

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