



**Homeland
Security**

Science and Technology

Arctic Domain Awareness Center (ADAC)

A DHS Center of Excellence

ADAC develops and transitions technology solutions, innovative products, and educational programs to improve situational awareness and crisis response capabilities related to emerging maritime challenges posed by the dynamic Arctic environment.

LAUNCH ▶

2014

PARTNERS ▶

More than 50 university, private industry, and government partners. Government partners include U.S. Coast Guard, U.S. Department of Defense, U.S. National Oceanic and Atmospheric Administration, U.S. National Ice Center, and U.S. Arctic Research Commission.

EXPERTISE ▶

Marine robotics and unmanned vehicles, Arctic communication technologies, Arctic geophysical and maritime focused engineering, and environmental security

DHS ALIGNMENT ▶

U.S. Coast Guard

Research and Education Capabilities

- ③ Arctic communications, crisis and disaster response decision support
- ③ Arctic hazard mitigation and recovery planning
- ③ Education and training for the current and future homeland security workforce



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

A nationwide consortium led by:

University of Alaska

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Feedback from Our Partners

*"This is a strategic priority for our service, and for our nation, because our security and prosperity demand it....I am pleased to see the **ADAC's continued progress in enhancing our understanding of the challenges and opportunities** that we face in this critically important region."*

Admiral Charles Michel, Vice Commandant
U.S. Coast Guard, 2018

*"ADAC...**successfully captures the intellectual power of the nation's universities to develop multidisciplinary solutions, tools, technologies, training, and expertise** to meet the challenging operational needs of the U.S. Coast Guard, and federal partners."*

Dr. John Farrell, Executive Director
U.S. Arctic Research Commission, 2018



University Partners

Alaska Ocean Observation System,
AK
Alaska Sealife Center, AK
Monterey Bay Aquarium Research
Institute, CA
Stevens Institute of Technology, NJ
Texas A&M University, TX
Trent University, Canada
University of Alaska Anchorage
Business Enterprise Institute, AK
University of Alaska Fairbanks
Geophysical Institute, AK
University of Alaska Fairbanks
Northwest Campus, AK
University of Idaho, ID
University of Maryland, MD
University of New Hampshire Coastal
Resilience Center, NH
University of New Orleans, LA
University of Texas El Paso, TX
University of Washington Applied
Physics Laboratory, WA
Woods Hole Oceanographic Institute,
MA

Enterprise Partners

Arctic Research Consortium of the
United States
ASRC Federal
Axiom Data Sciences
Bigelow Laboratory for Ocean
Sciences
City of Nome, Alaska
Cold Regions Research and
Engineering Laboratory
Defense Research and Development
Canada
Interagency Arctic Research Policy
Committee
International Cooperative Engagement
Program for Polar Research
Intellisense Marine
Kawerak, Inc.
Marine Exchange of Alaska
National Science Foundation
National Weather Service
Pacific Northwest Laboratory
Royal Military College of Canada
Sandia National Laboratories
Sea Grant Alaska
Sitnasauk Native Corporation



For a complete list of partners
and more information, please visit
<http://adac.uaa.alaska.edu/>

For more information on DHS
Centers of Excellence, please visit
www.dhs.gov/science-and-technology/centers-excellence



Impacts

Targeting oil spills to improve response times

ADAC created a unique long range autonomous underwater vehicle for the U.S. Coast Guard to aid oil spill sensing and 3D mapping under Arctic Ocean icepack. In March 2017, ADAC's Arctic Oil Spill Modeling research team provided methane plume modeling to the National Ocean and Atmospheric Administration (NOAA) offices in Anchorage to help assess the environmental impact from a pipeline leak in Cook Inlet, Alaska, and to enable a quicker response.

Informing Arctic disaster response, search and rescue, and humanitarian assistance

ADAC-developed models for Arctic oil spills, ocean currents and sea ice, storm surge and coastal flooding provide decision support for Arctic disaster response, search and rescue, and humanitarian assistance. In 2017, the High-resolution Ice-Ocean Modeling and Assimilation System (HIOMAS) tool was used for modeling and predicting sea ice and currents in the Arctic Ocean by the North Slope Borough Search and Rescue Team. HIOMAS helped accurately predict where the whaling crew drifted while their vessel was dead in the water and contributed to the safe recovery of the crew.

Enabling successful navigation through sea ice

Sea ice in the Arctic persistently threatens to damage ocean vessels and block access for essential operations. ADAC created the Ice Conditions Index system (ICECON), which forecasts up to 120 hours into the future using data from circulation and ice models developed by NOAA. The ICECON system assists the U.S. Coast Guard and Great Lakes vessel captains in making wintertime transit decisions during demanding ice conditions.

Cultivating the next generation of Arctic scientists

ADAC educates the next generation of Arctic scientists through Workforce Development, Fellowship and Minority Serving Institution/Arctic Summer Internship programs (ASIP). Since the inception of the Arctic Summer Internship Program, 16 graduate and undergraduate interns and fellows participated in a three-week opportunity to visit multiple U.S. federal agencies in Anchorage, participate in ADAC research, and take part in Arctic field work in Utqiagvik, Alaska. ADAC's Fellowship program currently funds 8 undergraduate and 7 graduate fellows. 8 fellows graduated in ADAC's Program Year 5. These graduates will go on to become the nation's next top scientists and engineers in the Homeland Security sector.

