



**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 28 university, private industry, and government partners

**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

- Communications, crisis and disaster response decision support
- Hazard mitigation and recovery planning
- 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

1901 Bragaw Street, Suite 120  
Anchorage, AK 99508



[uaa.adac@alaska.edu](mailto:uaa.adac@alaska.edu)



<http://adac.uaa.alaska.edu/>



(907) 786-0708

## 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 **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 Sea Life Center, AK  
Memorial University, Canada  
Monterey Bay Aquarium Research  
Institute, CA  
Stevens Institute of Technology, NJ  
Texas A&M University, TX  
Trent University, Canada  
University of Houston Borders, Trade  
and Immigration Institute, TX  
University of Idaho, ID  
University of New Hampshire Coastal  
Resilience Center, NH  
University of New Mexico, NM  
University of Texas El Paso, TX  
University of Washington, Applied  
Physics Laboratory, WA  
Woods Hole Oceanographic  
Institution, MA

## Enterprise Partners

Aleut International Association  
ASRC Federal  
Axiom Data Science  
Kestrel Technologies Group  
Lockheed Martin Corporation  
Marine Exchange of Alaska  
NOVA DINE Corporation  
Pacific Northwest Laboratory  
Sandia National Laboratory  
Sitnasuak Native Corporation  
U.S. Department of Defense  
U.S. Federal Bureau of Investigation  
U.S. National Oceanic and  
Atmospheric Administration  
U.S. National Aeronautics and Space  
Administration



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  
[hsuniversityprograms.org](http://hsuniversityprograms.org)



## Impacts



### Targeting oil spills to improve response times

ADAC created a unique long range autonomous underwater vehicle (AUV) 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 a 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.