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


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

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

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
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.