Maritime Technology —AIFC— Arctic Information Fusion Capability

AIFC is a two-step approach oriented in the near term to gain two dimensional geographic orientation of precision mapping data, near real-time and high resolution satellite imagery incorporated with available modeling, sensors, web-based communications and appropriate social networking feeds to gain domain awareness in support of operational decision-making and interface with humans and responders to the field. AIFC will also provide predictive models that can be used in preparing and planning for such events. For example, it will enhance the U.S. Coast Guard’s ability to prepare for and respond to oil spills in the Arctic Ocean, to more safely and reliably conduct search and rescue missions, and to support DHS efforts to prepare and plan for disasters caused by large coastal storms.

ADAC Mission

The Arctic Domain Awareness Center, led by the University of Alaska, 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.

Contact Information

CenterNews is presented quarterly by the Arctic Domain Awareness Center. Please provide feedback or questions via any of the following contact points:

Website: uaa.adac.edu  Email: uaa_ADAC@alaska.edu  Facebook: https://www.facebook.com/ADACAlaska

ADAC Hosts OPEN HOUSE for Interns

Reaching out to the University of Alaska student body, in early March, ADAC (the Center) held its first Open House in Anchorage, Alaska. The Center is proud to include students in leading-edge research projects, with volunteer opportunities for students pursuing degrees in STEM fields at UAA, UAF, and our University affiliates (University of Idaho, Woods Hole Oceanographic Institute, Embry-Riddle Aeronautical University) to become involved in ongoing research in Arctic Domain Awareness. Strongly committed to education and training the next generation of scientists and engineers, the Center’s, Dr. Douglas Causey and Executive Director, Randy “Church” Kee, presented programs and outlined opportunities for undergraduate students with the Arctic Domain Awareness Center.

Meet TWO of Our 2016 Interns

Christina Hoy and Alvaro Murillo will participate in the Maritime Security Center 2016 Summer Research Institute program at the Stevens Institute of Technology campus in Hoboken, NJ. The research program addresses critical issues in maritime domain awareness, emergency response, and maritime system resilience. Once there, they will attend talks by maritime industry and government experts, gain hands-on research, and participate in field visits to local ports and Department of Homeland Security (DHS) component agencies.

Christina Hoy is an undergrad currently studying Civil Engineering and plans to focus on Environmental and Water Resource Engineering. At UAA, she has been working on shoreline research in Barrow. She is an active member of the UAA Chapter of the Society of Women Engineers. Through the Center’s Maritime Security Center program, she hopes to gain understanding in the research process and add value to the research team.

With a passion for math and physics, Alvaro “Vito” Murillo is studying Mechanical Engineering at UAF. Vito enjoys being able to sit down and really think through a problem to find a solution, so naturally, engineering is a great fit. Outside of academics, his favorite activities are Brazilian Jiu Jitsu, boxing, and chess. This is Vito’s first internship and he is quite excited to be able to work alongside other engineers and graduate students.
Spotlight on ADAC

Dr. Douglas Causey, Principal Investigator

Douglas Causey, PhD is Principal Investigator for ADAC and a Professor of Biological Sciences at the University of Alaska Anchorage. Dr. Causey came to UAA in 2005 from Harvard University, where he was Senior Fellow at the Kennedy School of Government and Senior Biologist at the Museum of Comparative Zoology. In the late 90s, he represented the National Science Foundation at meetings leading to the formation of the Arctic Council and was NSF’s Arctic Representative during the Gore-Chernomyrdin negotiations on US-Russian Science Policy. Dr. Causey has published extensively on policy issues related to the Arctic environment, national security, and bioterrorism and public health. He has authored over 190 publications on topics including: Arctic marine birds, high Arctic coastal systems, and bat-borne diseases. His research focuses on the environmental correlates of Arctic climate change.

Dr. Larry Hinzman, Research Director

Dr. Larry Hinzman is Vice Chancellor for Research and a Professor of Civil and Environmental Engineering at the University of Alaska, Fairbanks. For the Center, Dr. Hinzman serves as Research Director. Prior, Dr. Hinzman served as the Director of the UAF International Arctic Research Center. Dr. Hinzman’s primary research interests involve permafrost hydrology and has conducted hydrological and meteorological field studies in the Alaskan Arctic. He has frequently collaborated on complementary research in the Russian and Canadian Arctic. Appointed to many Arctic-related boards, institutes, commissions and advisory committees in his career, he currently serves on the International Advisory Board for the Korea Polar Research Institute, and for the Canadian Changing Cold Regions Network (CCRNet). He is a member of the Scientific Steering Group for WCRP Climate and Cryosphere (CrySc) program and is vice-chair of the International Sustained Arctic Observing Network (SAON). He is an Advisory Committee Member for the Alaska Center for Energy and the Association of Polar Early Career Scientists (APECS). Dr. Hinzman serves as the US delegate and vice-president of the International Arctic Science Committee. Dr. Hinzman has served as a member of the U.S. Polar Research Board and now serves as an Ex-Officio member.

Randy “Church” Kee, Executive Director

Having served in many official capacities regarding Arctic policy, Major General “Church” Kee, USAF (retired), serves as the Executive Director of the Arctic Domain Awareness Center of Excellence. Following a 30-year career in the U.S. Air Force, Major General Kee came to the University of Alaska in January 2016. His relevant experience includes: having served as Vice Commander of the US Air Force’s Global Air Mobility Operations Center, contributed on U.S. Arctic Strategy and Policy development, supported domain awareness technology development, and contributed to Defense Support to U.S. Federal agencies on several Arctic Search, Rescue, and Humanitarian Assistance planning initiatives. Along with a Norwegian Director of Strategy, General Kee served as Co-Chair of the Multi-national Arctic Security Forces Roundtable. He culminated his military service as the Director of Strategy, Policy, Planning and Capabilities for U.S. European Command, in Stuttgart Germany.

ADAC is pleased to partner with the following:

- Alaska Command and Arctic NORAD Region
- Marine Exchange of Alaska
- Alaska Ocean Observation System
- Arctic Ocean Data
- DHS Centers of Excellence at Rutgers University and Stevens Institute
- Dubuy Business Services
- Emory Riddle University
- Headquarters US Coast Guard (USCG), USCG Research & Development Center, and USCG District 17
- Maine Maritime Academy
- National Oceanic and Atmospheric Administration
- National Weather Service
- NOVA Corporation*
- University of Idaho
- University of Washington
- Woods Hole Oceanographic Institute

Future Partners and Collaborators:

- ASRC Federal Solutions*
- Texas A&M University - Corpus Christi
- University of New Mexico**
- University of Texas - El Paso**
- Federally Designated Tribal Organization
- Federally Designated Minority Serving Institution

IONS Workshops

Where are the Gaps? What are the questions?

The Department of Homeland Security (DHS) is interested in pursuing research that will enable the United States Coast Guard (USCG) to achieve greater situational awareness and be prepared to respond with ready S&T solutions to incidents of national significance in the Arctic maritime domain. To that end, the Center will host a series of workshops.

The objectives of each workshop are to identify research and technology gaps and define research questions for merit competitions conducted by issuing requests for proposals (RFPs). These competitions will be administered by ADAC and DHS. Each workshop will address a specific Arctic Incidents of National Significance (IONS) scenario formulated by the USCG.

Our plan is to develop and execute the first workshop in the second year—June 20-22, 2016.

Canadian Department of National Defense (DND) Research Data Center opened the dialogue stating IONS workshops as a very useful way to gain understanding and potential partnership with U.S. colleagues to jointly develop Science and Technology useful for an array of bi-national efforts, including Arctic operations. DND RDC reaffirmed the value placed in IONS workshops, envisioning multiple categories of Science and Technology needs that could be identified as workshops proceed.

Canada Coast Guard participants reflected that Arctic-related IONS workshops which advance research in science and technology to areas related to search and rescue opens important opportunities to reduce risk and increase mission success. Canada Coast Guard did reflect that IONS workshops may help address items such as Maritime Search Planning and support to fleet exercises in locations such as the Arctic region. Canada Coast Guard reflected that participation of Joint Rescue Coordination Center Canada would be helpful for the IONS Work group.

The workshops will identify Science and Technology issues and questions aimed at closing the gaps with relevant research to support the USCG mission—well before an IONS has occurred.

During IONS an Incident Command System (ICS)-based response organization (similar to that set up during the (Arctic Zephyr) will be activated. For example, the USCG anticipates again being called upon to initiate an Inter-Agency Technology Assessment Program-type effort, in order to assist the Federal On-Scene Coordinator with the systematic assessment of technology-based support solutions.

Sample Scenario—What if?

During the June 2016 Workshop and in concert with the specific scenario and defined problems presented by USCG and other IONS operator work group members, ADAC will host a series of researchers to present the current body of knowledge related to the both scenario and problem. It could be that a commercial cruise ship touring in the Northwest Passage (with passengers) experiences engine failure in rough seas. What happens when the initial distress call is there damage? Are passengers at risk? Are nearby land locations equipped to receive (potentially) hundreds of people or deal with a potential spill? These workshops will engage academic experts and key government agencies to join efforts to plan for and create effective response mechanisms, in the event of a myriad of mishaps that have the potential to occur in the extreme elements of the Arctic.