Research and Technology Workshop, University of Minnesota

ADAC Executive Director joined fellow DHS CoE Directors along with DHS Science and Technology Office of University Program Leadership at the McNamara Alumni Center in Minneapolis on 15 and 16 August. This particular workshop, hosted by the DHS Food Protection and Defense Institute, provided ADAC ED and the rest of the ADAC leadership via follow-on discussions, the chance to better understand and proactively plan to avoid missteps as technology matures and is ready to transition to development and acquisition. Also learned was the need to strategically plan and obtain diversified funding sources for Center research, as each DHS S&T OUP CoE will eventually need to transition away from DHS funding sources.

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:

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

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CenterNews

Quarterly Newsletter • October 2016

This edition of the Arctic Domain Awareness Center of Excellence features updates of research currently in progress by our increasing team of participants. The ADAC community now includes researchers, faculty, and students from universities and colleges located throughout the entire US, from Alaska to the East Coast, from Idaho to Texas. We're joined by industry experts in communication, rapid response in on-site data acquisition, and data display and integration… and working closely with researchers, staff, and officers of the US Coast Guard, NOAA, and DoD.

We concluded Year 2 with an international conference on Incidents of National Significance (IoNS-2016), which was focused on identifying what we know and don't know about responding to a disabled passenger ship in the High Arctic. What distinguished this effort from other types of planning exercises was the diversity of participant backgrounds—including cruise ship operators, researchers, local and regional emergency responders, and many others. One of our key purposes was to identify what improvements in modeling and prediction would help avoid dangerous situations, and identify those gaps in knowledge and procedures that might hinder successful rescue of people and equipment. Our findings form the basis for a recently advertised Request for Proposals (RFP) that solicits new approaches and research that will address the gaps and lack of knowledge.

Year 3 is now moving ahead and I'm excited about the progress we've made so far, and the very promising new directions in research and applications. Our newest member of the administrative staff, Clarice Conley, is working hard to develop new educational programs at the undergraduate and graduate level. We are increasing in the number of opportunities and areas of research inquiry available for student participation. Finally, we are planning for our 2016 Annual Meeting to be held this November in Washington DC, and focused on presenting current results and our plans for the coming year. We have a lot to look forward to, and I'm very impressed by what progress we've made in such short time.

Dr. Douglas Causey
ADAC Principal Investigator

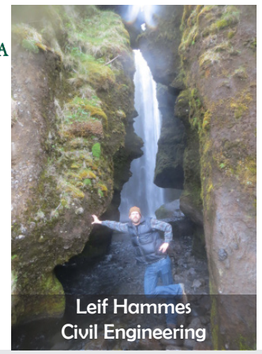
ADAC's Education Outreach and Workforce Development Director, Clarice Conley, with ADAC Fellows Christina Hoy, Kyle Alvarado, Matthew Ahlrichs, and Leif Hammes at the Arctic Chinook presentation to International Observers and Distinguished Visitors at the Joint Base Elmendorf Richardson on August 23, 2016

Student Spotlight

As a graduate student, Matthew Ahlrichs assumes many responsibilities as an ADAC fellow. Besides pursuing a master's degree in Civil Engineering Matt is assisting in the development and testing of an autonomous sensor network for remote areas. His involvement in this project addresses concerns regarding the cumulative environmental impact associated with this network. To accomplish these goals, Matt is developing a model that will estimate the number of sensors that will be needed and complete a Life Cycle Assessment (LCA). A LCA is aimed at quantifying the impact of these sensors on the environments they are looking to monitor and propose more sustainable solutions without sacrificing performance. Outside of his obligations at UAA, Matt can be found playing outside, cooking, and playing guitar.

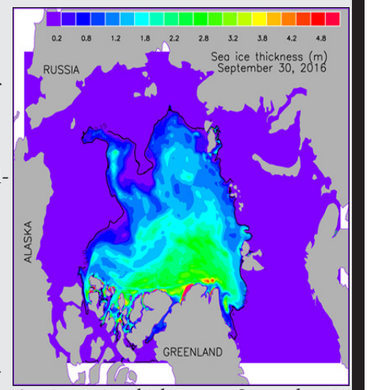
UAA UNIVERSITY of ALASKA ANCHORAGE.

Leif Hammes is a graduate student at UAA, pursuing a MS in Civil Engineering. Having completed a BS in Geology, he is interested in coastal erosion and hydro-geomorphic processes. His thesis focuses on a coastal erosion model along permafrost coasts. After spending several years away Leif was happy to return to Alaska. He and his wife had their first child, a baby girl, on September 22. In his spare time Leif enjoys hiking, camping, traveling and exploring Alaska's wild places.



Maritime Domain Awareness: High-Res Modeling of Arctic Sea Ice and Currents

The decline of the Arctic sea ice allows greater marine access to the Arctic Ocean than ever before. This presents challenges and opportunities in the region for a variety of economic activities such as fisheries, marine transportation, port operation, and resource exploration. Increased economic activities in the Arctic Ocean in turn pose challenges to the operations of the US Coast Guard. To meet these emerging challenges, it is important to enhance our ability to predict Arctic sea ice and currents over a range of time scales from days to months for various Arctic regions. This project aims to develop an accurate, High-resolution Ice-Ocean Modeling and Assimilation System (HIOMAS) for predicting sea ice and currents in the Arctic Ocean. Accurate, high-resolution prediction of ocean currents and sea ice conditions will assist the planning and management of economic activities. It will also enhance the Coast Guard's ability to prepare for and temperature, salinity, and velocity etc. are shown in the figure.



Arctic sea ice thickness on September 30, 2016 predicted by HIOMAS one month earlier. Black line represents the predicted ice edge with 0.15 ice concentration.

Tentative Calendar

November 2016
- Nov 9-10: ADAC Annual Meeting in Washington DC
- Nov 14-15: Coastal Resiliance Center Conerence

December 2016
- Dec 8: ADAC Customers and Partners Roundtable
- Dec TBD: ADAC Letters Review

Winter 2017
- Recruitment of ADAC Fellows for incoming year
- Poster Presentations by current ADAC Fellows
- ADAC Biennial Review
- ADAC Quarterly Review with Executive Counselors

Spring 2017
- ADAC Fellows Recognition
- May 4: ADAC Customers and Partners Roundtable
- May 30-31: ADAC Arctic-focused Medium-Long-Term Environment (MaLTE) Workshop

Arctic Chinook

22-26 August 2016

ADAC was honored and pleased to support US Coast Guard, District 17 on Exercise Arctic Chinook from 22-26 August, both in Anchorage and in Northwest Alaska, this year's edition of the Coast Guard's Arctic Shield Exercise series. The preliminary aspects of Arctic Chinook was established via a USCG District 17 Table Top Exercise conducted with an array of first responders from 13-14 April in Anchorage. Table Top "Northwest Passage" brought US, Canada, State of Alaska and Local responder professionals together, along with leadership of Crystal Cruises to think through challenges associated with a disabled ship in Arctic waters.

Andy Mahoney, PI of the Identifying, Tracking, and Communicated Sea-Ice Hazards in an Integrated Framework project, presenting at JBER on August 23, 2016

Following Northwest Passage, ADAC pulled together an array of operators and researchers from across Canada, the U.S., State of Alaska and industry to identify shortfalls in science and technology via the 21-22 June Arctic Incidents of National Significance (Arctic IoNS) workshop. Arctic Chinook planners, informed by prior efforts, established a crisis scenario of a fictitious disabled cruise ship (simulated by a USCG Cutter) to practice emergency rescue and recovery efforts from ship to shore, and onwards to "exercise" definitive care for simulated casualties.

ADAC supported International Observers and Distinguished Visitors at Joint Base Elmendorf Richardson (JBER) on 23 August by providing current and projected research, participated in exercise events in Kotzebue and (via the Community-Based Observer Network for Situational Awareness (CBON-SA) & the Field Information Support Tool (FIST) teams conducted field tests that resulted in community based observer generated information transmitted from Tin City and Wales Alaska, to USCG Anchorage Sector command center.

CBONS - FIST Field Test #1

The Forward Operating Base Command & Control Center that a CBONS community observer and Mr. Leonid Naboyshchikov set up in Tin City, Alaska where other forms of communication was non-existent.

Also during Arctic Chinook, a highly successful Field Test was executed in Alaska to demonstrate the integration of FIST into the CBONS operational environment. The FIST Team consisted of Mr. Leonid Naboyshchikov, (FIST Sr. Analyst and technology subject matter expert), along with a Wales based Community Observer, and Dr. Lilian Alessa, (Arctic Domain Awareness Center (ADAC) and the University of Idaho Leadership). The CBONS FIST System Field Test was executed in Wales, Alaska and surrounding areas; as well as the JBER Joint Operations Center in Anchorage, Alaska.

The CBONS FIST team successfully submitted over 75 field reports to the live FusionPortal, of which 16 were classified as "High" or "Critical" Alarming Reports. Eight additional field reports were submitted to the adhoc mobile Forward Operating Base/Control Center and the FIST Team successfully submitted or received 39 messages to/from the geographically dispersed simulated HQ Command and Control Center in Anchorage, Alaska and Orlando, Florida.

Most notable, was that the FIST Team successfully established a mobile Forward Operating Base/Control Center with highly portable and minimal equipment. The Field Test simulated the ability to rapidly deploy a Forward Operating Base/Control Center in the austere Alaskan environment during a simulated disaster and/or search and rescue (SAR) operation.

The After-Action Report can be found at http://adac.uaa.alaska.edu/home/project_1_cbons_sa.

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