ADAC Project ASIP: Arctic Summer Intern Program

• Project Principal Investigators:
  • Malla Kukkonen, University of Alaska Anchorage (UAA) [Lead]
  • Dr Andy Mahoney, University of Alaska Fairbanks (UAF)
  • Dr Craig E. Tweedie, University of Texas at El Paso (UTEP)

• Student Participation (12 total):
  • Graduate and undergraduates selected from national competition
  • ~5 participants from under-represented minorities
  • 2 Navy midshipmen

• Project Champion ~ DHS S&T OUP Education POC
• Project Support ~ ADAC partners, Leveraged funding/support ~ NSF, NASA, NOAA, DOE-SNL, UICS
• Project Description:
  • STEM education and workforce development for the HS Enterprise (HSE) is core mission of ADAC – with unique arctic focus
  • Based out of UAA-ADAC and includes ASIP and MSIP 10-week internship and ~2 week field research experience in Utqiaġvik (formally Barrow) Alaska (NEW for ADAC Year 4)
    • ASIP ~ 5 students, based at UAA, 10-week program
    • MSIP ~ 5 students, mentored from UAF, UTEP, and other ADAC partners (expanded for ADAC Year 4)

• Baseline:
  • Recruitment through ADAC partners, DHS S&T OUP communications, and leading US Arctic and Minority E&O organizations
Project ASIP: Relevance and Method

• Relevance to DHS and USCG:
  • Train/prepare future workforce and increase awareness of HSE
  • Increase representation of minorities in the HSE
  • Develop a training program that could synergize with and catalyze future efforts within ADAC

• Research Approach
  • ASIP – continue proven success of this program
  • MSIP – expanded for ADAC Year 4 Activity base
  • ~2 week field based experience, new for ADAC Year 4
  • Key goal is to establish a sustainable field based experience for ADAC fellows in Year 5 and beyond
Project ASIP: Leadership ~ Malla Kukkonen

- ADAC Education and Administrative Manager, UAA
- Expertise:
  - International relations, governance, and resource management policy around the Circumpolar North
- Experience:
  - 8 years of resource management and social science research for the AK Dept of Fish and Game (ADF&G) ~ in collaboration with federal, state and/or Alaska Native partners
- Domain Expertise: North America and Scandinavia
- Education Expertise:
  - Training of local research assistants in rural Alaska communities to enable complex household surveys
• Research Assistant Professor, UAF
• **Expertise:**
  • Sea ice geophysics, radar remote sensing, polar field research
• **Experience:**
  • 17+ years of academic research in the polar regions including over 50 field excursions involving icebreakers, aircraft and dogsleds.
• **Domain expertise:**
  • North American Arctic including Alaska, Nunavut and Greenland
• **Education expertise:**
  • Co-teaching 3 sea ice field schools in Utqiaġvik, Alaska
• **ADAC partnership:** Co-investigator on ICECON and Developing Sea-Ice and Weather Forecasting Tools
Project ASIP: Leadership ~ Dr Craig E. Tweedie

- Professor/Director, Dept. Biology. Env Sci. & Eng, UTEP
- **Expertise:**
  - Arctic coastal systems, ecosystem science, permafrost, biogeochemistry, spatial ecology, cyberinfrastructure
- **Experience:**
  - Arctic, Antarctic, US SW Deserts, Borneo, NE Australia
- **Domain expertise:**
  - North Slope, Seward Peninsula, Chukotka, Baffin Island
- **Education expertise:**
  - Field research, study abroad trips to the Arctic, Borneo, Antarctica
- **ADAC partnership:** AIFC, Storm surge and erosion
Project ASIP: Schedule

• Current year schedule and milestones:
  • Fall 2017
    • 2 Hispanic minority fellows at UTEP
    • Recruiting – AGU, ADAC partners, Arctic/minority-focused organizations
  • Spring 2018
    • Selection, forward planning, logistics, permitting, project development
  • Summer 2018
    • Internship at UAA-ADAC
    • Capstone field program 11-23 June for 7 students
  • Fall 2019
    • Mentoring and evaluation
Project ASIP: Capstone Field Experience

- Orientation and introduction

Permitting

Field Safety

Familiarization

Field Training

Lab

Planning

Lodging

Team work

ADAC: Research for the Arctic Operator...For Today and For the Future
Project ASIP: Capstone Field Experience

- Local and cultural mindfulness and links to domain awareness – change, utilization, importance

Cultural Center
Education
Oral Histories
Art
Subsistence Harvest
Food
Archeology
Festivities
Project ASIP: Capstone Field Experience

- Domain awareness stakeholder engagement – beneficiaries and providers

USCG

NSB-SAR

Volunteer Search and Rescue
Project ASIP: Capstone Field Experience

• Ongoing research relevant to domain awareness
Project ASIP: Capstone Field Experience

- Terrestrial environment

Permafrost

Vegetation

Instrumentation

Historic Research

Hydrology

Wildlife

Remote Sensing

Data

ADAC: Research for the Arctic Operator...For Today and For the Future
Project ASIP: Capstone Field Experience

- Coastal environment

Coastal Geomorphology

Sea State

Erosion

Remote Sensing

Sediment Characterization

Instrumentation

Data
Project ASIP: Capstone Field Experience

- Marine environment

Sea Ice

Land Fast Ice

Topobathy & Water Chemistry

Subsistence

Instrumentation

Remote Sensing

Data

ADAC: Research for the Arctic Operator...For Today and For the Future
Project ASIP: Capstone Field Experience

• Research project – to be aligned with student interest, alignment with ongoing research, prevailing conditions....

• Example projects:
  • Analyze SAR records to determine dangerous times of the year, locations, etc and model such conditions to ascertain likely trends in SAR in the future.
  • Ground truth Arctic observing sensors – buoys, radar, satellite, UAVs etc.
  • Analyze SAR imagery and AIS records to determine if navigation choices made by captains on the water can be determined from imagery.
  • Using novel digital image analysis software, determine the utility of low cost time lapse cameras for detecting environmental phenomenon and change.
Project ASIP: Capstone Field Experience

- Research project – to be aligned with student interest, alignment with ongoing research, prevailing conditions....
- Example projects:
  - Using sonar surveys of ice gouges on seafloor, determine the risk for submarine infrastructure.
  - Conduct measurements of water quality and compare these between different locations including contaminated sites.
  - Assess how TEK/LEK could enhance USCG/FEMA response scenarios to likely events of significance.
  - Assess which sites of archeological significance are most threatened by coastal erosion.
  - Collect field data to parameterize or validate models generated by ADAC projects.
Questions

Feedback...

• What are we missing?
• What can we improve?
• Who should we connect with to improve odds of success?
• Will there be USCG activities in Barrow in June 2018?