ACEP

Alaska Center for Energy and Power

GRASSROOTS TO RIVERBANKS

RESEARCHER SHOWCASE

Jeremy Kasper

BACKGROUND

Dr. Jeremy Kasper is a Research Assistant Professor with the University of Alaska Fairbanks Institute of Northern Engineering, Alaska Center for Energy and Power, and is currently the Director of the Alaska Hydrokinetic Energy Research Center (AHERC). He holds a PhD in Oceanography from UAF. Prior to his current appointments, Dr. Kasper was a postdoctoral investigator with the Department of Physical Oceanography at the Woods Hole Oceanographic Institution.

Jeremy has always seen energy as central to all facets of life in the Arctic and subArctic. With an academic focus on marine and river environments, hydrokinetic energy research was a natural fit. All of his current research revolves around the nexus of energy, climate and sustainability.

RESEARCH

Dr. Kasper has multiple on-going research projects including: 1) an in-situ and modeling based assessment of wave energy in the nearshore zone off of Yakutat Alaska 2) an assessment of river borne debris, riverine hydrodynamics, debris mitigation strategies and the potential for fisheries interactions with in-river hydrokinetic energy generation devices in Alaska's Tanana River 3) a long-term oceanographic monitoring program in Alaska's Beaufort Sea 4) a pilot study to develop low-cost GPS "drifters" capable of measuring small scale sea ice deformation and in the event of an oil spill, tracking oiled ice 5) a project to expand UAF's capacity to conduct river- and sea-bed morphology measurements and to understand suspended sediment transport resulting from processes such as coastal and river bank erosion 6) a Department of Energy funded multi university research consortium with Oregon State and the University of Washington "Advanced Laboratory and Field Arrays (ALFA) for Marine Energy."

ENERGY RELATED PROJECTS

- Alaska Hydrokinetic Energy Research Center
- Yakutat Wave Energy: Resource Assessment
- Modeling in Support of the Yakutat Alaska Wave Energy Deployment
- Field Research Sonar System to Characterize River and Marine Environments
- River Debris Characterization and Mitigation
- Development of Low Cost Ice Drifters for Tracking Oiled Ice
- Arctic Nearshore Impact Monitoring in the Development Area

RELEVANT PUBLICATIONS

Johnson, J.B., Schmid, J., Kasper, J.L., Duvoy, P., Seitz, A.C., Toniolo, H., Protection of In-river Hydrokinetic Power Generating Devices From Surface Debris in Alaskan Rivers, Final Report to Alaska Power and Telephone, the Denali Commission and the Alaska Energy Authority.

Johnson, J.B., Schmid, J., Duvoy, P., Kasper, J.L., Kulchitsky, A., Seitz, A.C., 2014 Surface debris characterization, mitigation strategies and their impact on the operation of river energy conversion devices on the Tanana River at Nenana, Draft Final Report to Alaska Energy Authority

EDUCATION

- PhD Oceanography. University of Alaska Fairbanks, 2010
- B.A. Physics. Reed College, 1999

LEADERSHIP ROLES

- Director of the Alaska Hydrokinetic Energy Research Center
- Co-Director of the Northwest National Marine Renewable Energy Center
- Advisor to Summer Interns Conducting Research Related to Hydrokinetic Energy

ACEP Alaska Center for Energy and Power

Fostering development of innovative solutions to Alaska's energy challenges through applied energy research at the University of Alaska.

The Alaska Center for Energy and Power (ACEP) is an applied energy research program based at the University of Alaska Fairbanks. ACEP provides leadership in developing energy systems for islanded, non-integrated electric grids and their associated oil-based heating systems. Integration is a central feature of our program. Because many of the issues related to implementing innovative energy solutions are complex, our program must not only address the technical integration of renewables with these small isolated diesel-based energy systems, but must also look at integration from a broader perspective: integration of solutions into the social realities of a community, integration of the cultural fabric into sustainable energy solutions, integration of university researchers across disciplines and with community partners; and integration of our facilities and resources with those of our national partners.

Our Mission: Develop and disseminate practical, cost-effective, and innovative energy solutions for Alaska and beyond.

Our Vision: Alaska leading the way in innovative production, distribution, and management of energy.

ACEP is a gateway for energy related activity at the University of Alaska. Working across campuses and pulling from the University's extensive resources and expertise, ACEP is interdisciplinary, needs-driven, and agile.

ACEP has also developed a wide range of partnerships outside the University at the local, state, national and international level to ensure research conducted through ACEP will be relevant, current and world class.

ALASKA HYDROKINETIC ENERGY RESEARCH CENTER

HYDROKINETIC ENERGY- WHY IS IT IMPORTANT?

Alaska has approximately 40% of the total river energy, approximately 90% of the total tidal energy and approximately 60% of the total wave energy in the U.S. Because of the high cost of power in Alaska, many communities are considering whether accessing these “hydrokinetic” energy resources to generate electric power is economically feasible and environmentally sustainable.

AHERC is housed within the Alaska Center for Energy and Power (ACEP) at the University of Alaska Fairbanks (UAF). AHERC and ACEP are based in the Institute of Northern Engineering (INE), the research and development arm of the College of Engineering and Mines (CEM) at UAF.

THE ROLE OF AHERC

The Alaska Hydrokinetic Research Center (AHERC) focuses on applied research and engineering to help communities, developers and other stakeholders address the questions of whether emerging hydrokinetic energy technologies are economically, technologically and environmentally sustainable.

To this end, AHERC conducts environmental and technical studies evaluating available hydrokinetic energy resources, turbulent flows and their effects on device power output and longevity, fisheries and marine mammal studies, habitat studies, approaches to anchoring hydrokinetic infrastructure and debris mitigation, and other issues pertinent to developing an Alaska hydrokinetic power industry.

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