AHERC's Research Agenda

AHERC's research agenda is focused on information needed to accelerate development, acceptance, and deployment of hydrokinetic devices. AHERC research goals will be guided by input from industry, state and federal agencies, and community stakeholders to facilitate hydrokinetic power development in Alaska.

AHERC's initial research agenda will seek to:

1. Understand fish and marine mammals and their interaction with turbines, including the reduction of adverse interactions. This is a key issue for permitting as well as cultural acceptance of this technology by community and stakeholders concerned about environmental health.

2. Determine the key characteristics of specific river and tidal hydrokinetic resources that may impact installation and operation of hydrokinetic devices. This may include current dynamics, debris, ice, river or ocean bed conditions, sediment transport, fish and marine mammal populations.

3. Characterize the interactions that occur between hydrokinetic turbines and the aquatic environment after their installation (e.g., current dynamics, debris and ice, sediment, turbine and anchor performance, river or ocean bed modification, etc.).

4. Develop methods and instruments to characterize the hydrokinetic resource and its effect on turbine operations. This would include river/tidal dynamics turbulence, channel stability, sediment deposition erosion, ice problems and how they relate to performance of the turbine and eventual power output.

5. Develop tools to identify hydrokinetic resource site locations taking into account available power density, turbulence, river/ocean bed stability and susceptibility to scour or deposition, and community view.

6. Identify specific solutions and develop technology and methods that support the deployment of hydrokinetic technology. This currently includes turbine array placement & optimization, minimization of adverse fish/marine mammal interactions, debris mitigation, anchoring systems, ice effects and sediment impact. This also includes turbine modifications to handle these issues.

7. Assess and quantify turbine performance characteristics under unique Alaskan conditions including substantial and ever-changing river currents and stage, considerable debris, significant sediment transport, and ice formation and break up.

8. Design controls, models and tools to aid integration of turbine systems with electrical grid systems, especially isolated grids with high renewable energy penetration. This may also include integration with hydrokinetic, diesel, wind, solar, and electrical interties.

9. Define socio-economic impacts including creation of economic assessment systems for developing hydrokinetic power systems both separately and in combination with other power generation systems such as hydrokinetic/diesel hybrid systems.

10. Identify and implement outreach and education channels.