Tidal energy technology and ORPC's projects in Cook Inlet

Presented to NOAA/AEA stakeholder meeting

August 24,2011

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OCEAN RENEWABLE POWER COMPANY

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ORPC Alaska LLC

Ocean Renewable Power Company Overview

- Developer of technology and projects that convert river, tidal, and ocean currents into emission free electricity

- Founded in 2004 with executive offices in Portland, Maine and project offices in
  - Anchorage, AK (ORPC Alaska, LLC)
  - Eastport, Maine (ORPC Maine, LLC)
- Project sites in Cook Inlet and Nenana, AK, and Eastport, ME
- Beta TIdGen™ Power System deployed and tested March - December 2010

ORPC Philosophy

- Community driven and focused
- Technology development and environmental considerations are intrinsically connected

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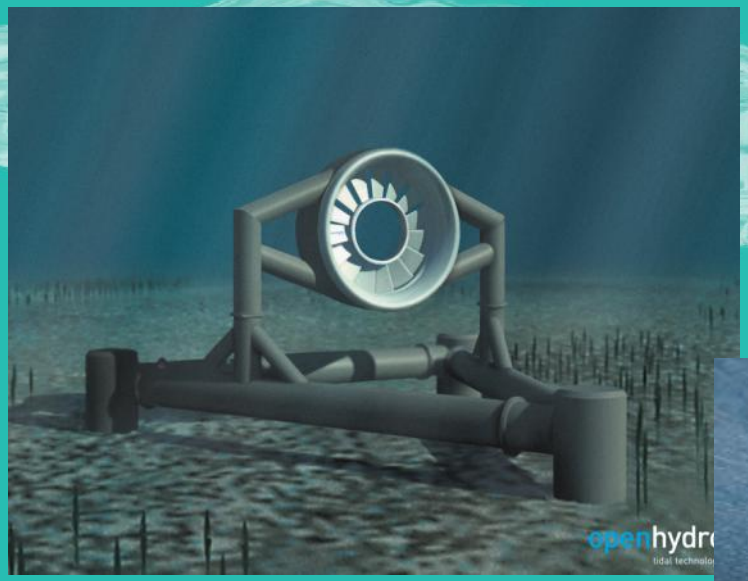
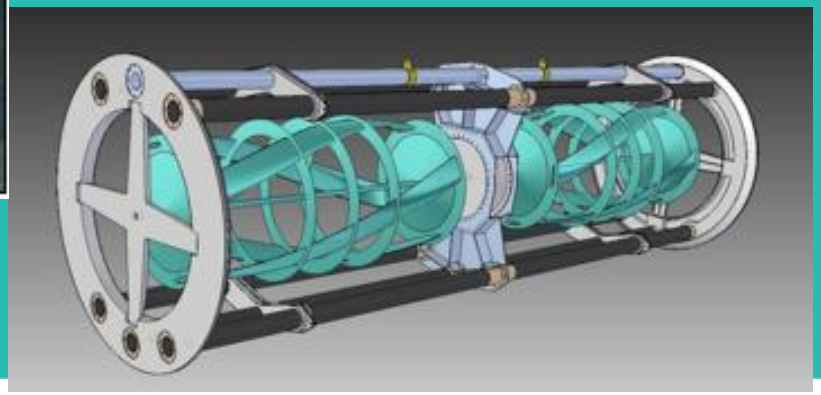
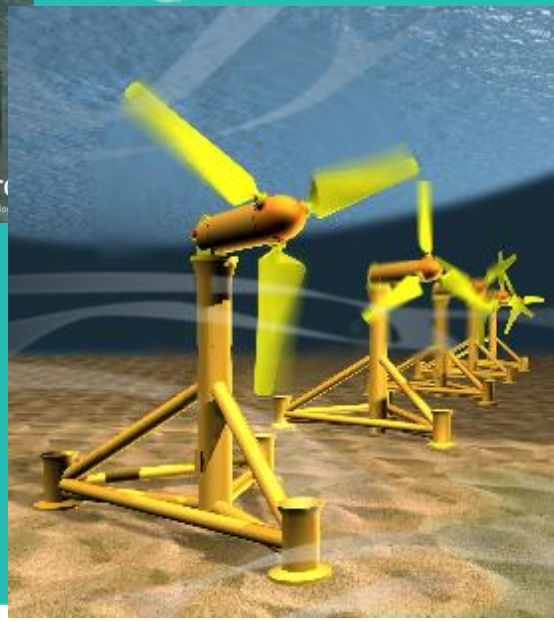
Tidal energy technology 5- 10 years ago …







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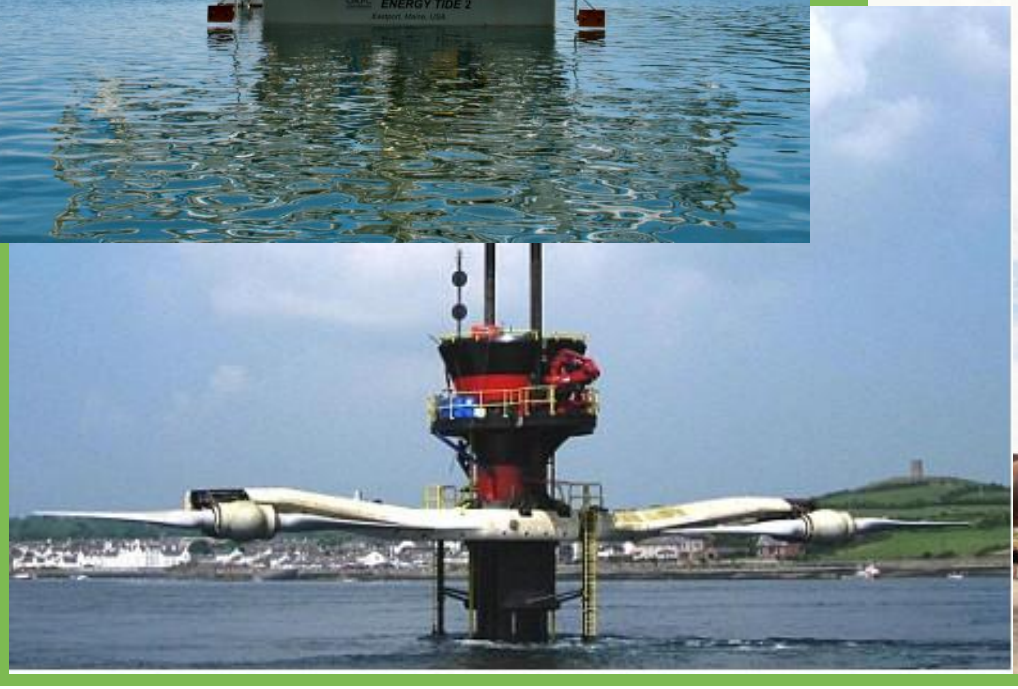
Today …



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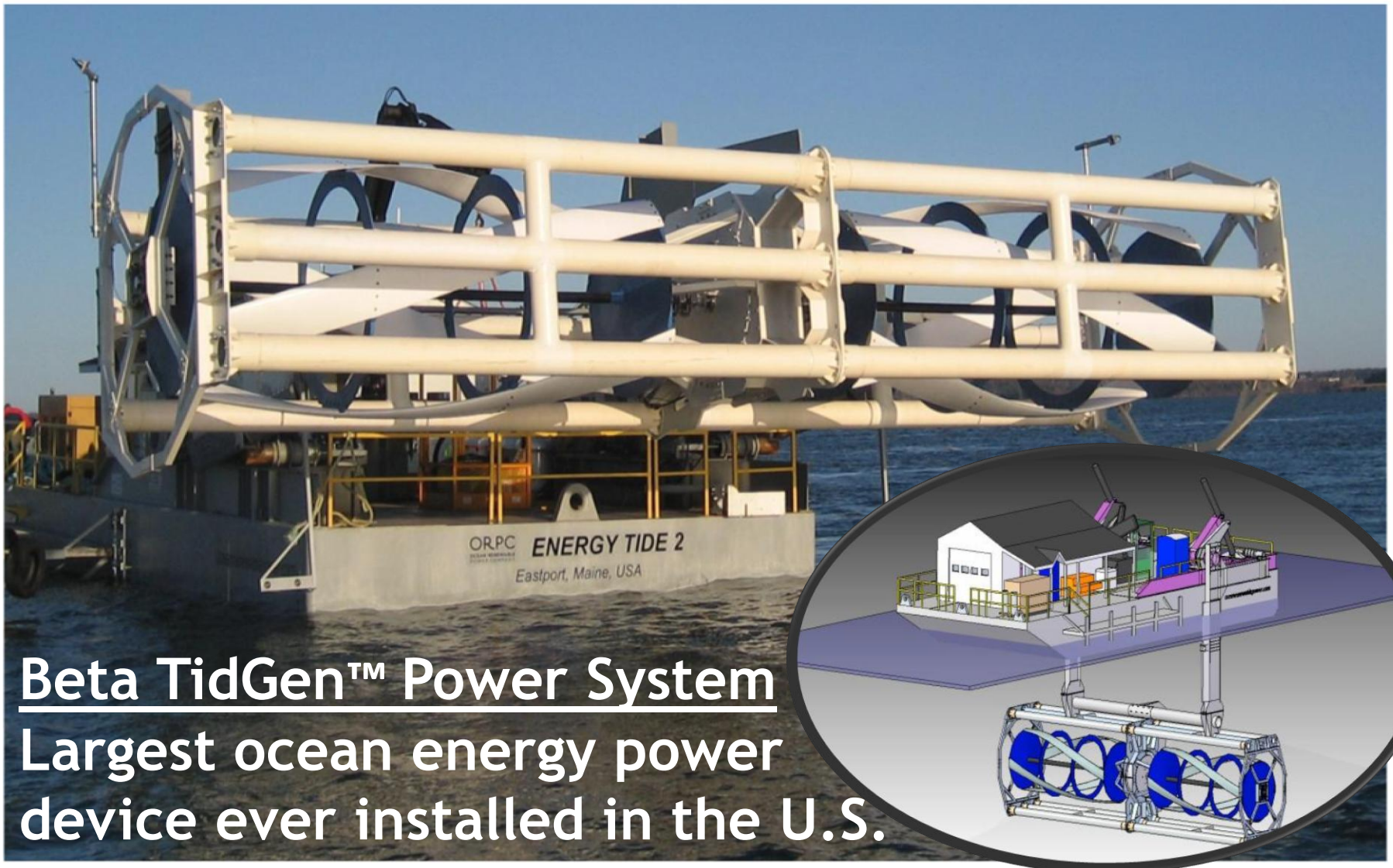
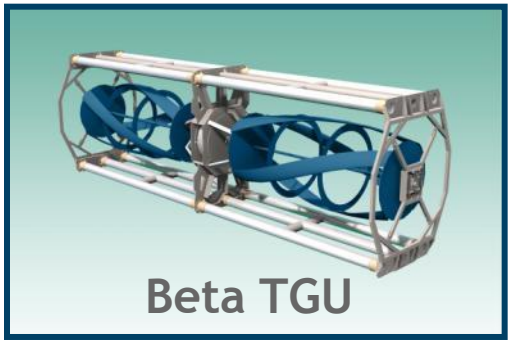


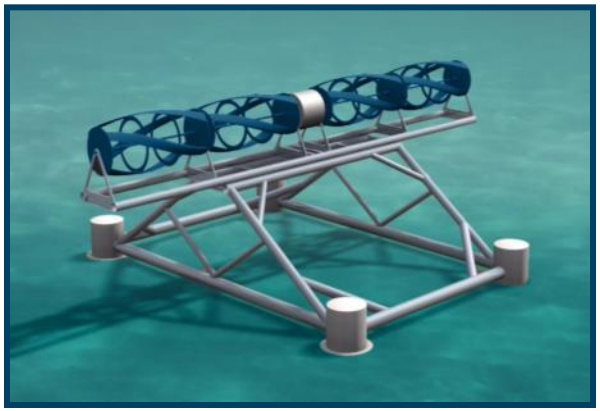
Beta TidGen™ Power System

Largest ocean energy power device ever installed in the U.S.

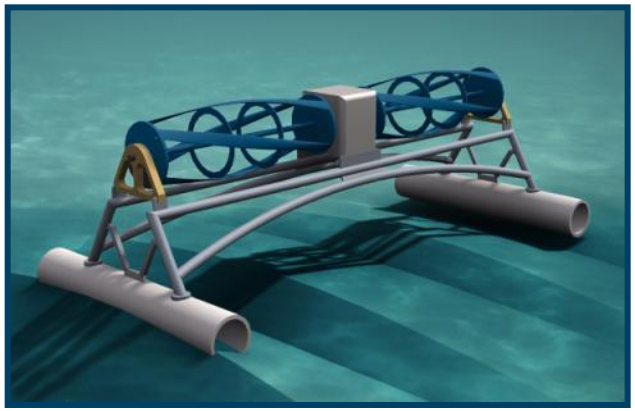
ORPC Power Systems



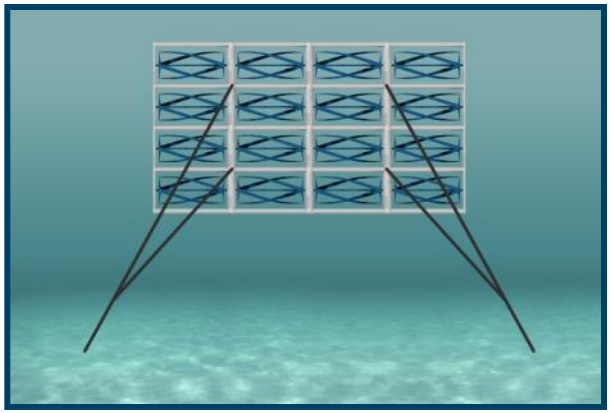
TidGen™



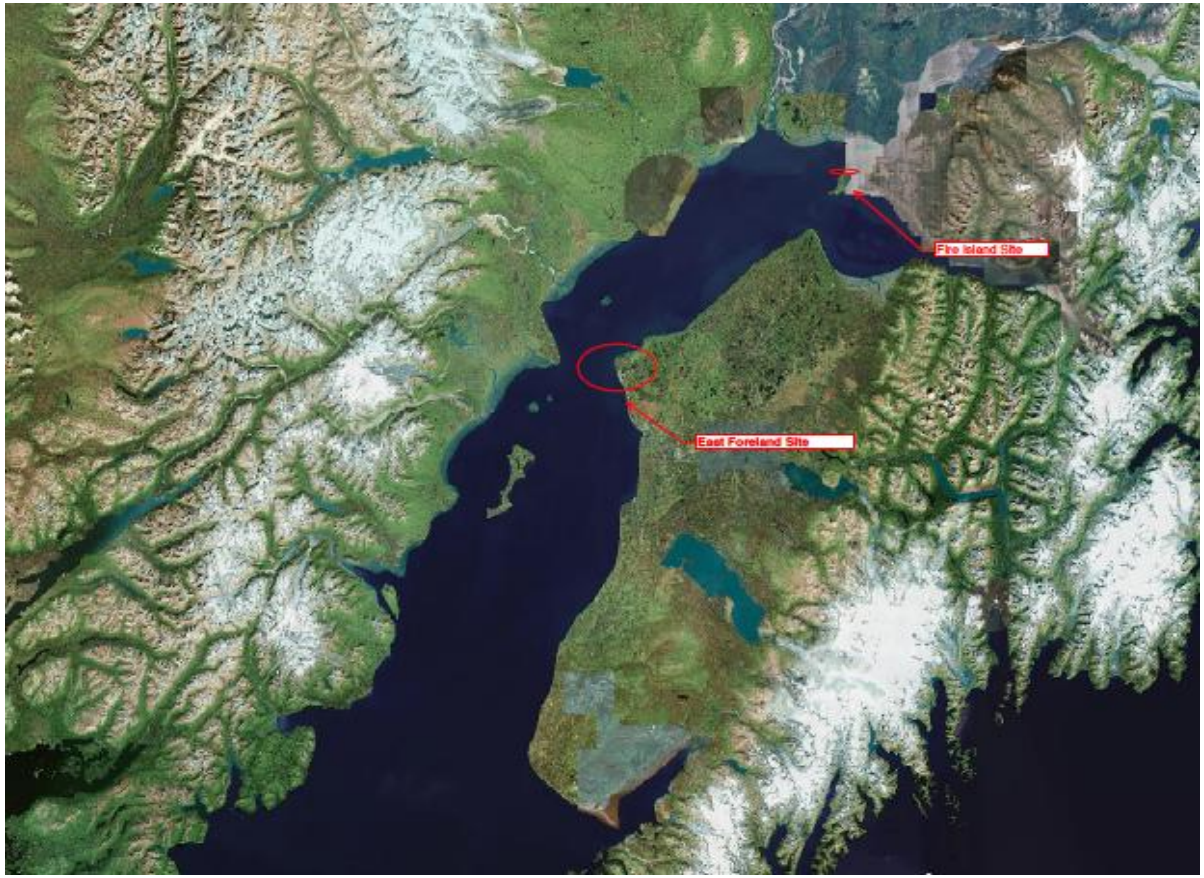
RivGen™



OCGen™



ORPC Alaska's Cook Inlet project sites



Why Cook Inlet?

- 4th largest tidal range in the world up to 12 meters (40 feet)
- Current velocities up to 10 knots
- Tidal resource is in the vicinity of electrical infrastructure - the Railbelt Grid

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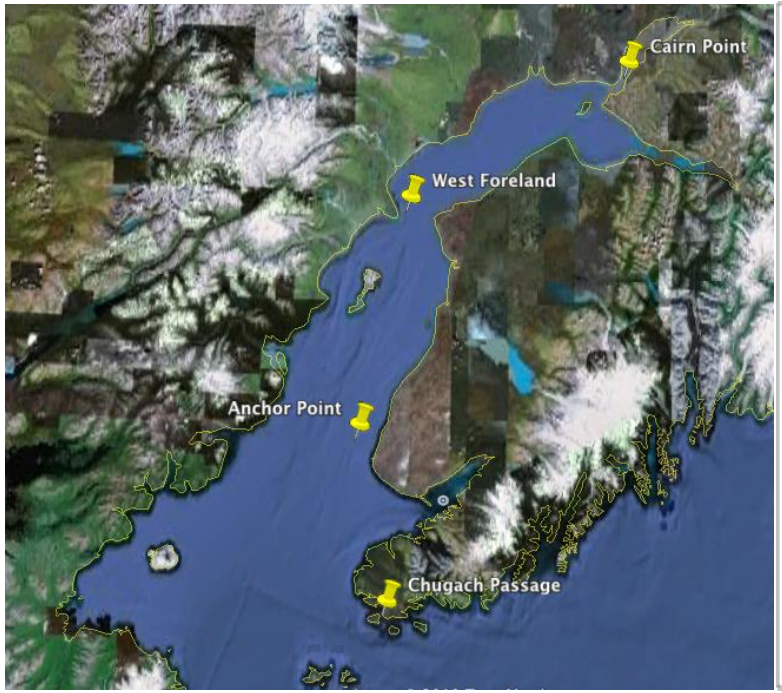
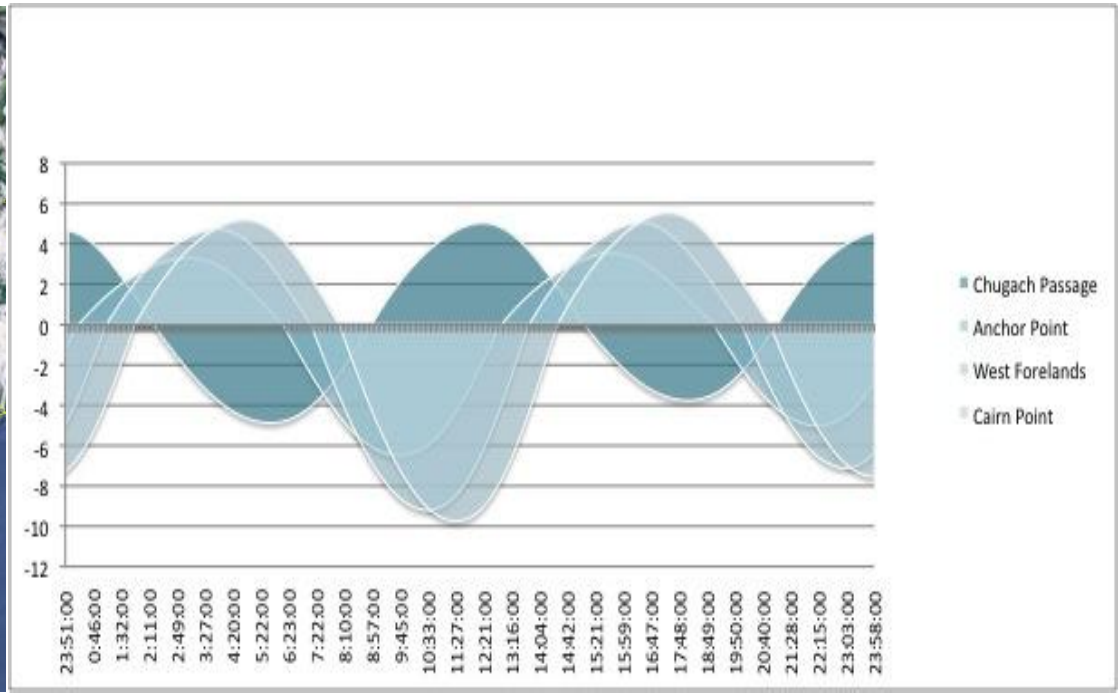
Cook Inlet Tidal Current Phases





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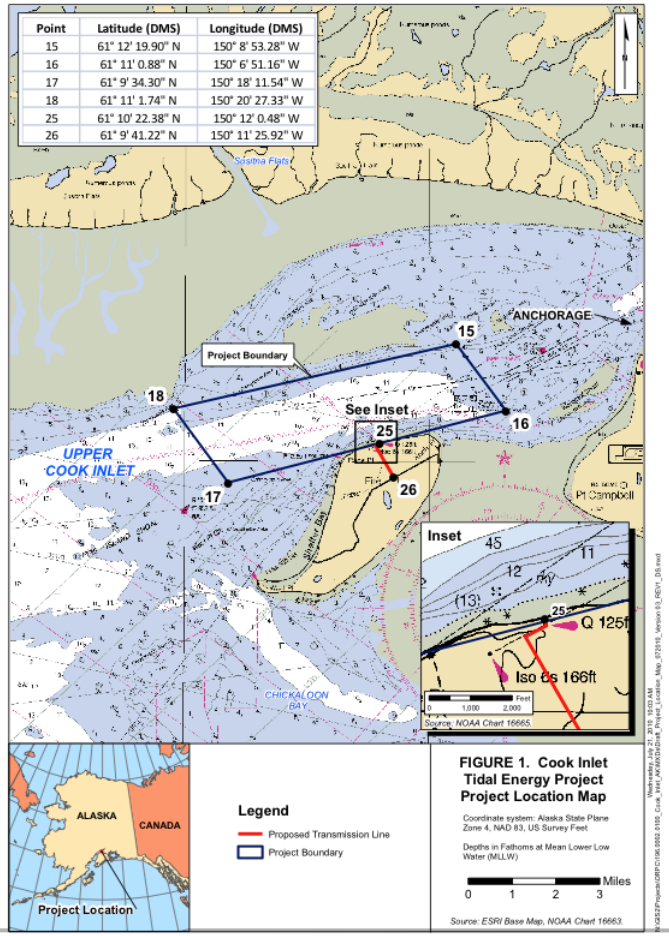
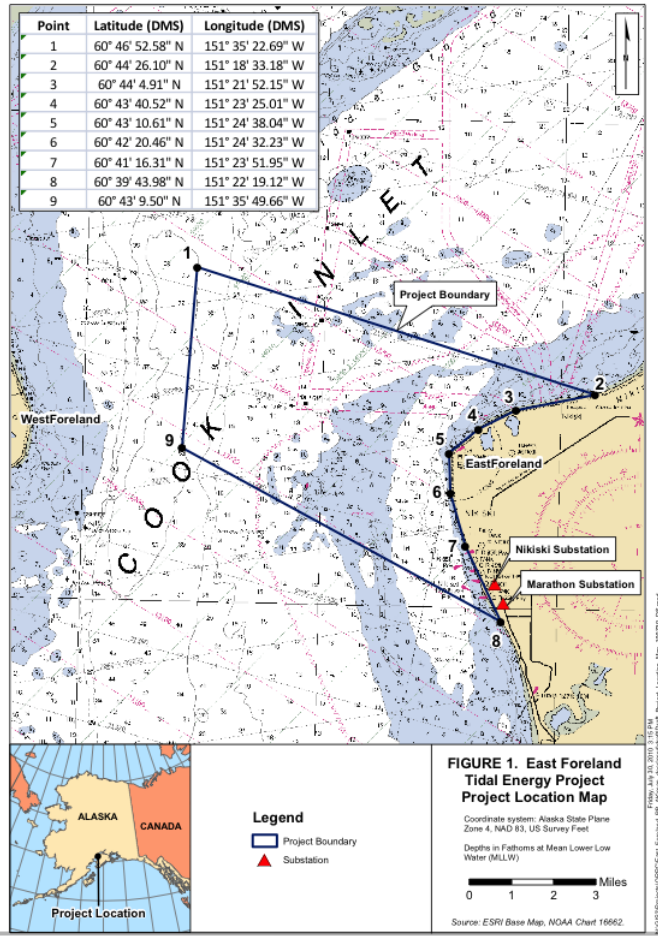
- Cook Inlet Tidal Energy Project
2nd Preliminary Permit issued 10/13/10



- East Foreland Tidal Energy Project
Preliminary Permit issued 3/13/11



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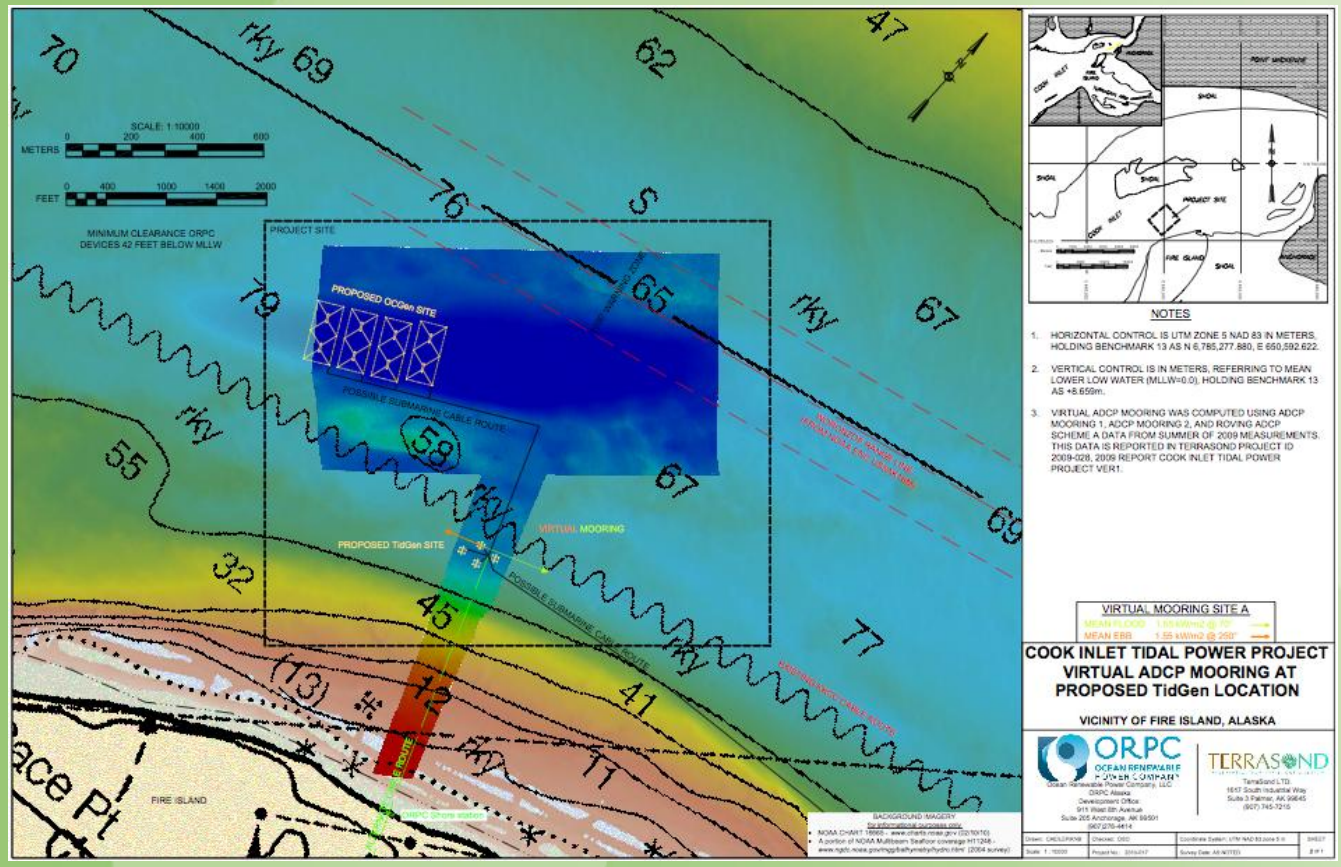
Fire Island



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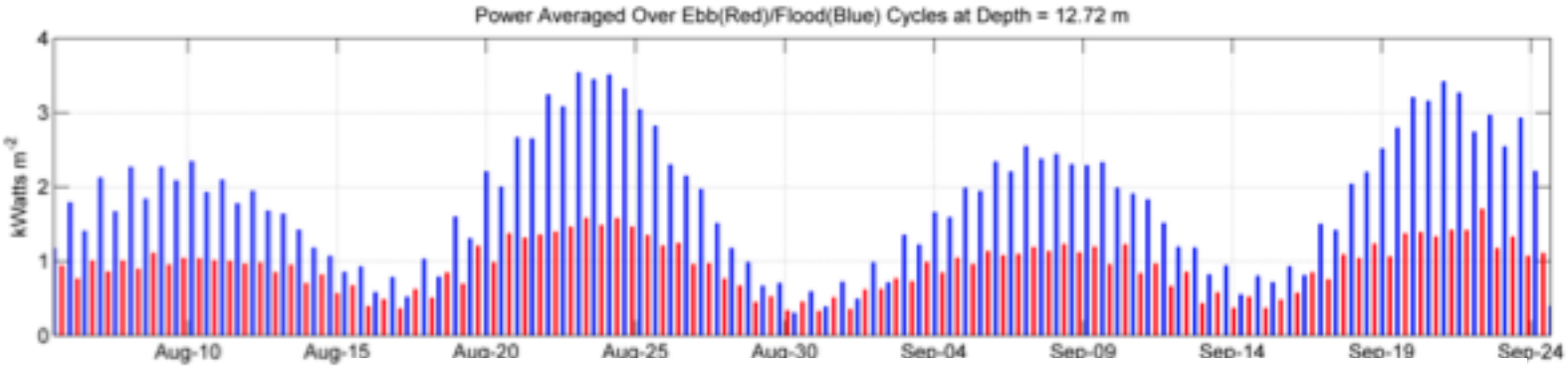
Resource at Fire Island Site



Summary Statistics

Reported at middle of water column

Site	ADM-1	ADM-2	ADM-3	Cook
Velocity				
Mean speed (m/s)	1.05	1.08	1.12	1.28
Max sustained speed (m/s)	2.73	2.93	2.91	2.78
Ebb/flood asymmetry	0.97	0.95	0.96	0.85
Vertical shear (m/s per m)	0.0108	0.0236	0.0178	0.028
Power				
Mean power density (kW/m^2)	1.28	1.51	1.34	1.71
Ebb/flood asymmetry	0.91	0.91	0.88	0.55
Direction				
Principle axis (deg)	139	132	137	66
Standard deviation (deg)	11	6	12	4
Ebb/flood asymmetry (deg)	15.1	4.1	26.3	6.2

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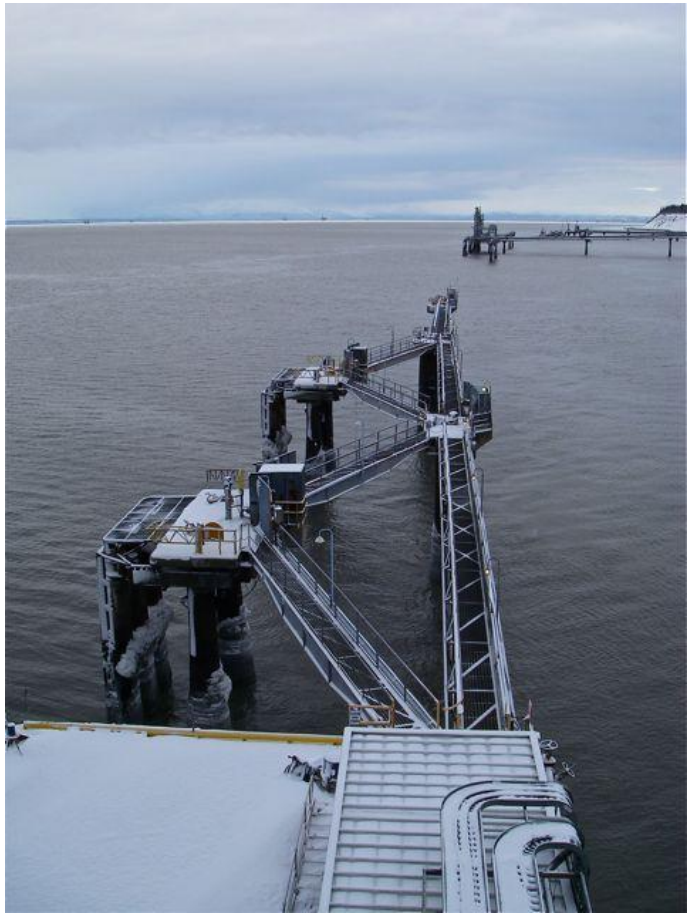
East Foreland Cook Inlet Tidal Energy Pilot Project Site – Project Development



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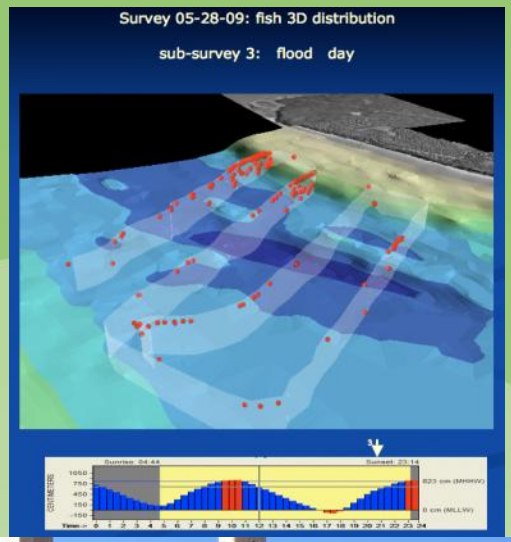
Cook Inlet Environmental Studies

- Pre and post deployment fish studies
- Pre and post deployment Beluga monitoring
  - Visual monitoring
  - Passive Acoustic Monitoring
- Sediment transport modeling
  - Working with UAA researchers to develop modeling and study plan



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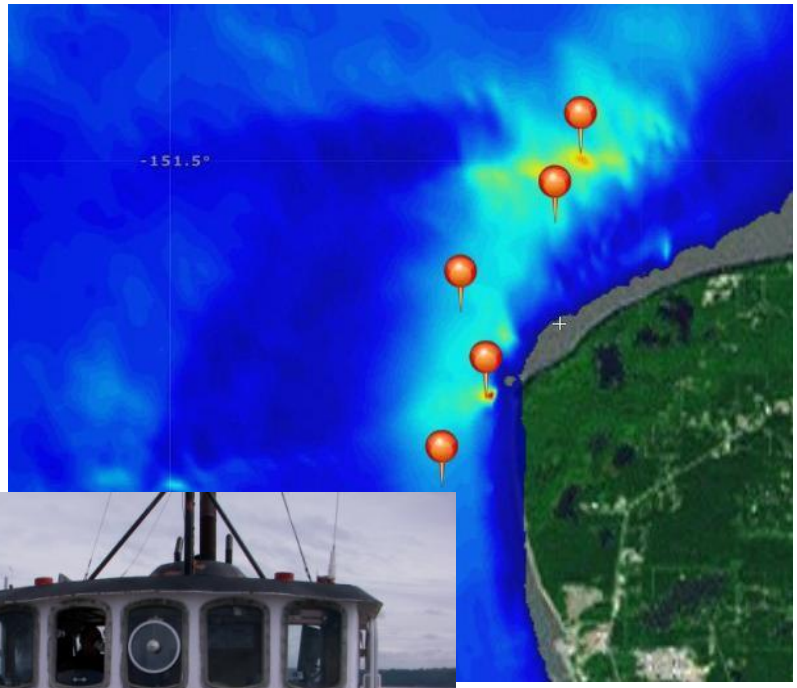
Work Planned for 2011-2012 at East Foreland

- Circulation modeling performed at UAA
- Stationary ADCP survey for full lunar cycle (28 days)
- Scoping and initiation of environmental studies
- Geophysical and geotechnical data collection including detailed multibeam bathymetry, sidescan, sub bottom profiler



Economic Benefits

- High quality, sustainable Jobs
- Money to local economies
- Out of state investment
- Exportable expertise
- New materials & fabrication techniques

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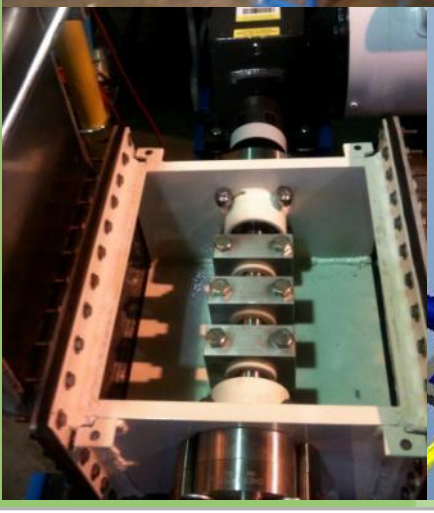
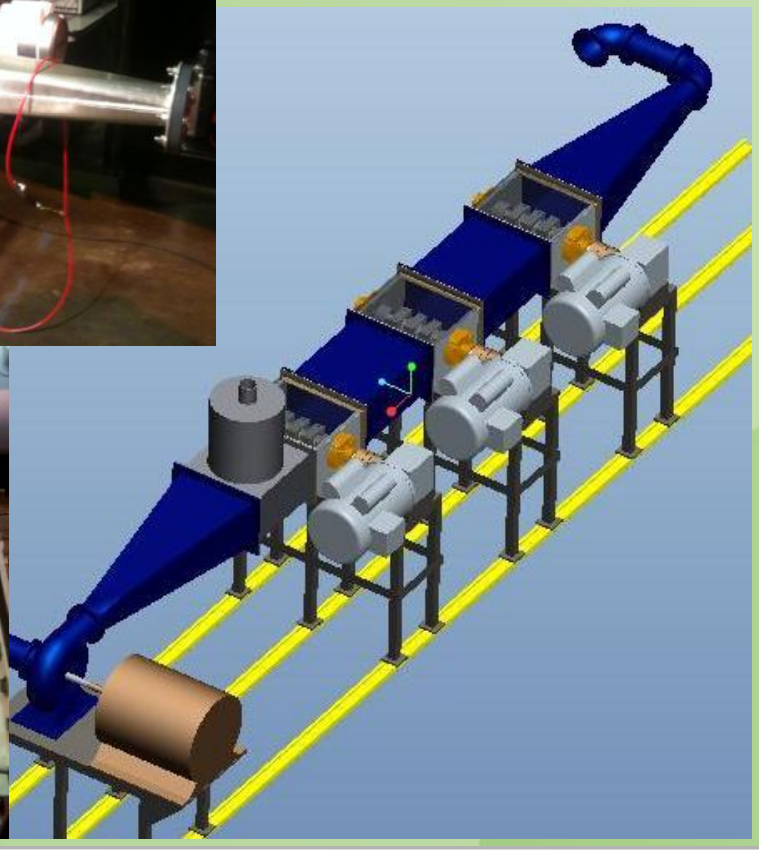
Bringing investment to Alaska





- $600,000 (DOE): beluga monitoring
- $240,000 (DOE): Flume at UAA to circulate high silt content water and test critical device components
- $830,000 (Denali Commission EETG funds): Phase 1 of the Nenena RivGen™ Project
- Over $1,000,000 private capital invested in ORPC projects in Alaska

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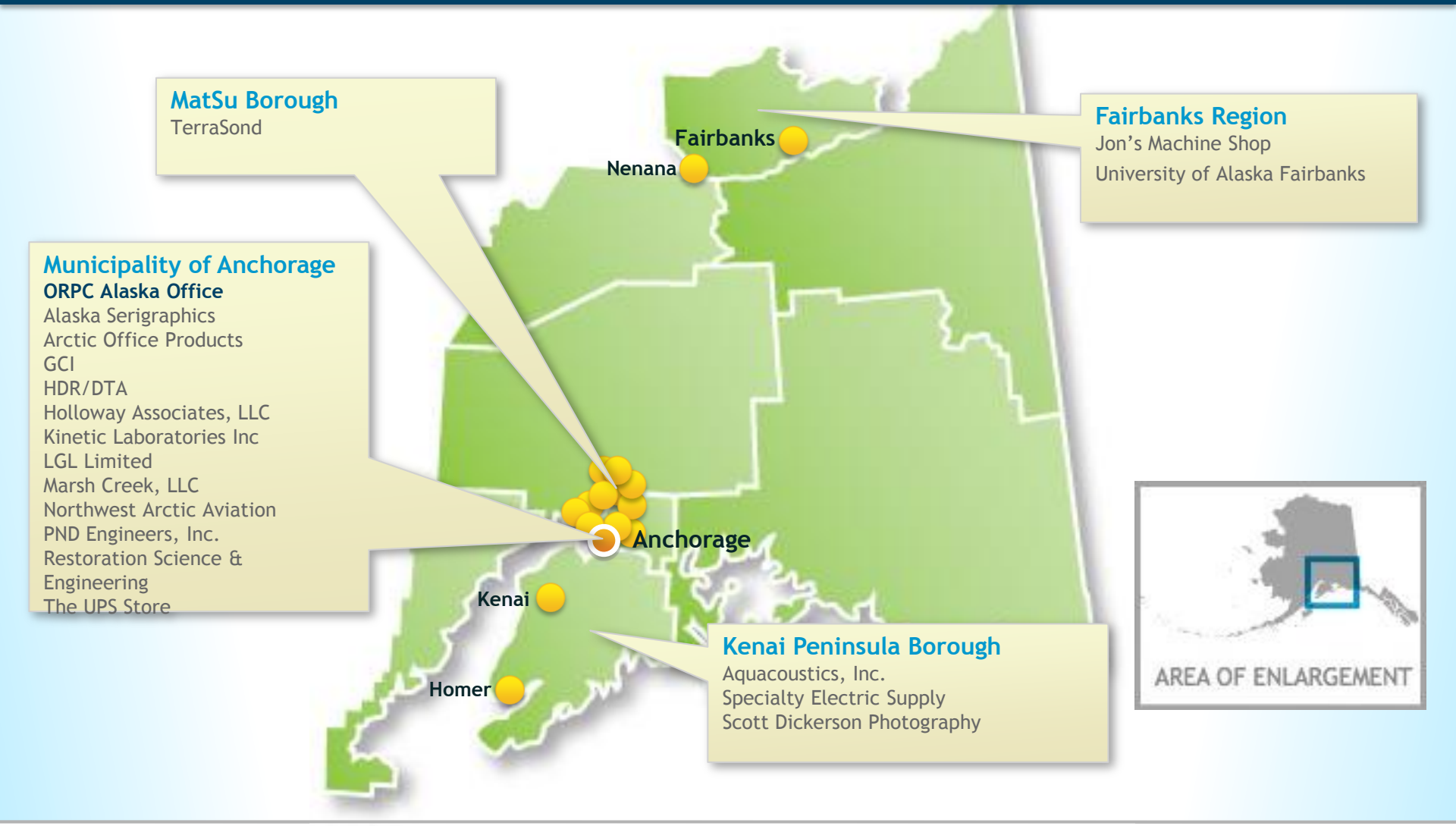
Economic Impact *Central Alaska Partners, Contractors, Vendors and Consultants*



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Tidal Energy in Alaska is possible, working together we can help make it a reality

Questions?

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