Pacific Northwest National Laboratory Support for DOE Funding Opportunity Announcement: Marine and Hydrokinetic Energy Conversion and Environmental Monitoring Technology Advancement DE-FOA-0001418

WEBINAR 9 MARCH 2016
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Marine and Hydrokinetic Energy Conversion and Environmental Monitoring Technology Advancement

The FOA can be found on EERE-Exchange at: https://eere-exchange.energy.gov/Default.aspx#Foaldfb505ad6-19d6-42e7-8d46-5be0fd9f9a14

Questions will not be taken during this webinar. All questions must be submitted to MHKFOA1418@ee.doe.gov. Please note: all Q&As will be posted publically.
FOA Support

- Pacific Northwest National Laboratory
- Triton Initiative
- Site conditions
- Facilities
- Expertise
- Timeline
PNNL is one of Department of Energy’s national laboratories, managed by the DOE’s Office of Science

Based in Richland, with satellite offices in Seattle and Tacoma, WA; Portland, OR; Washington, DC

Marine Sciences Laboratory in Sequim, WA – the only marine facility within the DOE

Over 4,300 employees PNNL-wide, with 80 at MSL

Operated by Battelle Memorial Institute
Triton Initiative

- DOE funded capability to support FOA awardees and reduce environmental monitoring costs
- Based at Marine Sciences Laboratory
- Collaboration with universities, other national laboratories and industry
- Work together to develop better technologies and cheaper environmental monitoring solutions
Bathymetry Survey

Water depths: 12 m in channel
X m in Sequim Bay
Increases north from Travis Spit

Travis Spit
The Middle Ground
Depth in channel up to 12 m, ripple and high current features
Wider Area

Chart 18471
Approaches to Admiralty Inlet
ADCP Survey - Moored
Tide Model
ADCP Survey – Vessel Mounted
ADCP Survey – Vessel Mounted

- Track of vessel-mounted ADCP survey
- Establish distribution of flow during flood and ebb tides
ADCP Survey – Vessel Mounted

Normalized velocity field of flood tide in Sequim Bay Inlet

Normalized velocity field of ebb tide in Sequim Bay Inlet
Facilities - Vessels

- **RV Strait Science**
  - 28-foot research vessel
  - 1000 lb load A-frame
  - 500 ft stainless steel cable
  - Hydraulic davit
  - Up-to-date electronics
  - Sonar-equipped
  - Deck space 77 ft²
  - Cabin space 54 ft²
  - Power for equipment and computers
  - Max speed 35 knots
  - Can work in shallow water (>5 ft)

- **Surveys**
  - Side-scan and video surveys
  - Benthic grabs/Sampling nets
  - Equipment deployment and recovery
  - Dive operations
Facilities - Vessels

SAFE boat
- 23-foot
- 26 inch draft
- Cruising speeds > 30 knots
- Highly maneuverable
- Suited to shallow water
- Up-to-date electronics
- Sonar-equipped
- Open center console with storage cabinets = flexible uses
- Deck space 34 ft²

Surveys
- Hand-held sensor deployment
- Towing
- Observations
- Dive operations

Access to larger vessels in local area
Facilities – Dive Team

- Scientific dive team
  - Scientific surveys, equipment testing and sampling
  - Habitat assessment and restoration
  - Equipment deployment and maintenance
  - Photography and videography
Facilities - General

- Permits in place to undertake specific work
- Wireless network over water
- Pier with floating dock
- Boat ramp
- Power and data cables to end of pier
Facilities - General

- Met station
- Water level recorders
- Survey levels and equipment
- Outdoor experimental tanks
- Wet and dry lab facilities
- Anechoic tank
- Pumped seawater system
- Water supply and treatment system
Expertise

Acoustics
- Multiple previous field and laboratory studies
- Equipment to play and detect sounds
- Acoustically quiet platforms for instrument deployment
- Acoustic tanks
- Calibration equipment in Richland
- Acoustic modeling
- Software development for acoustic signals – detection and tracking

Electromagnetic fields
- Laboratory studies with fish, crab and lobster
- Helmholtz coil
- Modeling of EMF fields
- Magnetic anomaly surveys
Expertise

▸ Physical interaction
  ▸ Fish tag studies
  ▸ Development of tags
  ▸ JSATS
  ▸ Deployment of structures
  ▸ Deployment of instruments
  ▸ Video and diver observations
  ▸ AUV surveys
  ▸ Algorithm development for both video and acoustic signals
  ▸ Real-time analysis

▸ Combining sensors
  ▸ Extensive practical experience in deployments nearshore and offshore
  ▸ Instrument and battery development
  ▸ System integration
  ▸ System engineering
FOA Timeline

- **Year 1**: Testing at MSL 1
- **Year 2**: Development of technology, using PNNL expertise if appropriate, followed by Testing at MSL 2
- **Year 3**: Testing at high energy site
Questions

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Thank you

Please no direct contact during the FOA application stage

Pacific Northwest National Laboratory