

Dear Member of the Ocean Energy Community:

I would like to request your assistance in gathering information on potential environmental effects of tidal, wave, and ocean current energy to assist with the development of a publically-available database, housing information from around the world. This US-led data collection process, known as Annex IV, is part of an internationally funded initiative under the Ocean Energy Systems Implementing Agreement¹. Annex IV has two main goals; to produce a publicly accessible database to house ocean energy project information, and to use the database to analyze the current status of environmental issues important to marine renewable energy development worldwide.

The Annex IV effort consists of collecting metadata (general high level project information) on site-specific projects and experiments investigating potential environmental effects of ocean energy devices, mooring systems, anchors, and power cables on marine animals, habitats, and ecosystem processes. In the form below, we are requesting information regarding the types of environmental studies you are engaging in and a brief summary of the methodology, results, and status of those studies.

By choosing to participate in the Annex IV metadata collection process, you will assist the ocean energy industry, government agencies, and stakeholders by contributing to the compilation and analysis of environmental effects data in a single location. This will allow for:

- **Increased awareness** amongst developers and regulators (consenters) about existing projects, yielding cost effective investments into monitoring methods and mitigation strategies that have been demonstrated as effective;
- **Increased efficiency** of the permitting (consenting) process by precluding studies and evaluations that have been shown to yield few results or have little to no impact with technologies in comparable water bodies;
- **Reduced uncertainty** for targeted research on environmental effects by government agencies and other funding sources, further clarifying the permitting (consenting) process; and
- **Value added interpretation and knowledge** through the examination of key research findings in conjunction with project monitoring data, informing optimal siting and permitting.

An example form is provided to demonstrate the types of information requested. Also, please note:

- Fields that are not applicable can be left blank, or can be noted as NA (Not Applicable).
- Additional files, such as reports or journal papers, links to websites, and comments on these products are encouraged, but not required.

Please provide information by **April 30th 2012** about your projects, research investigations, or other information associated with environmental effects of ocean energy devices. Thank you in advance for your consideration and contribution to this valuable effort.

Please fill in the form below, save it and email to:

Dr. Andrea Copping
Pacific Northwest National Laboratory
Andrea.copping@pnl.gov

Any questions should also be directed to Dr. Copping

¹ (http://www.ocean-energy-systems.org/about_oes/work_programme/annex_iv/)

1 ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name of person filing the form (can opt to omit from on-line form)

Date submitted

Project name:

Project description:

Project Developer

Technology type

Resource (wave, tidal, wind)

Project scale (test site, prototype, array, commercial)

Installed capacity (MW)

Additional Description

Project Website

Location:

Ocean/Water body

Closest city

Country

Coordinates (please use Mercator)

Depth

Process status:

Current status of the project implementation and future developments.

Expected operation date (if project is under way please indicate the start date).

Licensing information (brief description):

Please provide a brief description listing the organizations involved, licenses needed and duration of consent process. One paragraph should suffice.

Key Environmental issues: *brief description on the most important environmental issues raised by the project (e.g. Sensitive species/habitats/areas that were of particular concern and/or received special protection) and how they were addressed.*

Environmental webpage: *link to project official environmental webpage (if available). You can also include here the contacts for the project environmental issues.*

Baseline and project effects studies:				
General description				
Receptor	Study description including question and/or objective (several can be listed per receptor)	Design and methods (brief description)	Results (brief description)	Status (planned, underway, completed, with dates)
Physical environment				
Benthos				
Fish and fisheries				
Large vertebrates				
Birds				
Marine uses / users				
Other (can be named)				
Reports and papers	<ul style="list-style-type: none"> - When possible the files themselves can be made available in downloadable PDF format, alternatively links to the files or project website can be provided when available e.g. SeaGen. - Key papers on the areas addressed should be listed here 			
Research projects	Past or on-going environmental research projects at the site			

Monitoring and adaptive management				
General description				
Receptor	Monitoring program description including question and/or objective (several can be listed per receptor)	Design and methods (brief description)	Results (brief description)	Status (planned, underway, completed, with dates)
Physical environment				
Benthos				
Fish and fisheries				
Large vertebrates				
Birds				
Marine uses/ users				
Other (can be named)				
Reports and papers	<ul style="list-style-type: none"> - When possible the files themselves can be made available in downloadable PDF format, alternatively links to the files or project website can be provided when available e.g. SeaGen. - Key papers on the areas addressed should be listed here 			

**Research
projects**

Past or on-going environmental research projects at the site

Example 1: Eastport tidal energy project

Project name: Eastport tidal energy project

Project description

Project Developer: ORPC, LLC

Technology type: cross flow turbine (OCGen Turbine Generator Unit – TGU)

Resource: tidal

Project scale: from single device (prototype) to array of devices

Installed capacity (MW): The total generating capacity of the project at the completion of Phase 3 would be 5 MW (see phases in the additional description below)

Additional Description: Project would consist of: **Phase 1** – a single 250-kilowatt (kW) hydrokinetic device with a gravity-based mooring in Cobscook Bay during Phase 1; **Phase 2** – four additional 250-kW devices with gravity-based moorings and a single positively buoyant 500-kW hydrokinetic device in Cobscook Bay during Phase 2; **Phase 3** – three additional 250-kW devices with gravity-based moorings and three additional positively buoyant 500-kW devices in Cobscook Bay, and a single positively buoyant 1-MW device in Western Passage during Phase 3; **Phase 4** – underwater bundled cables from each device that would interconnect with a control room and station located on shore, one at Western Passage and one at Cobscook Bay; **Phase 5** – a transmission line connecting the shore stations to the Eastport electrical grid; and **Phase 6** – appurtenant facilities for operating and maintaining the project. The proposed phasing and location of the devices may change as a result of the preliminary bathymetric and mooring studies; a finalized proposal will be included with the outstanding additional information when it is filed.

Project Website: <http://www.oceanrenewablepower.com/home.htm>

Location: Western Passage and Cobscook Bay in Eastport, Maine. The project would not occupy federal lands.

Process status: ORPC is gathering information from its Beta unit deployment (no grid connection) that is needed to provide adequate responses to some of the additional information requests made by staff in the September 23, 2009, AIR Letter. ORPC plan to file this additional information sometime in October, 2010. The installation of the commercial TidGen™ Power System is planned for late 2011, following FERC approval in the site.

Licensing information: Pilot licensing procedure; July 24, 2009 – Draft application filed ([Vol. 1](#), [Vol. 2.1](#), [Vol. 2.2](#), [Vol. 2.3](#), [Vol. 3](#)); September 23, 2009 – [AIR letter](#) issued; November 12, 2009 – [EOT request](#) filed for responses to some of the AIRs; November 23, 2009 – [Partial AIR response](#) filed; January 25, 2010 – [EOT response](#) issued; March 11, 2010 – Additional Information filed ([Part 1](#), [Part 2](#)).

Environmental survey issues: A total of 14 finfish and 1 shellfish species are currently designated as EFH species within the proposed project area. Several species of listed whales (Atlantic right, humpback, and fin whales) and sea turtles (leatherback and loggerhead) may occur in the proposed

project area. Proposed monitoring plans include: fish monitoring; post-deployment water temperature monitoring; underwater acoustic monitoring; benthic resources and biofouling monitoring; hydraulic monitoring; and marine mammal and diving bird monitoring.

Environmental webpage: (Not available in the project website)

Baseline and project effects studies: Eastport tidal energy project				
General description		Studies conducted in development of DLA		
Receptor	Study description	Design and methods	Results	Status
Physical environment	Marine Geophysical Survey	Detailed bathymetric mapping, side-scan sonar, sub-bottom profiling and magnetometer surveys. Data used to characterize the bottom and identify potential cultural resources and marine hazards	Preliminary results led ORPC to change deployment strategy of turbines primarily in Cobscook Bay due to severe outcroppings and drop-offs in Western Passage	-
	Water Velocity Surveys	-	-	Conducted in 2007, 2008, and 2009
	Underwater acoustic survey	-	Did not rise above ambient background noise observed during peak tidal events	Conducted during testing of 1/3 scale TGU in 2008
Marine mammals	Rare, Threatened and Endangered (RTE) species observation	-	Of the 68 observation periods of varying duration, 5 harbour porpoise and 7 harbour seals were observed in or adjacent to the project area	-
Reports or papers	-			
Research projects	-			

Monitoring and adaptive management: Eastport tidal energy project

General description				
Post-license monitoring plans				
Receptor	Study description	Design and methods	Results	Status
Physical environment	Underwater acoustic assessment	Measure near and far-field noise emitted by the modules.	Not available	-
	Water temperature variation	Collect water temperature data near-field of a deployed module and evaluate potential thermal effects using temperature loggers placed up-current and down-current of modules with data collection on 15-minute intervals.	Not available	-
Benthos	Benthic resources and biofouling study plan	Characterize benthic communities within project area and evaluate potential project effects on them. Determine if project structures have potential to allow biofouling accumulation that may alter the habitat within the deployment areas. Examine the recovery of benthic resources disturbed during the construction of the project.	Not available	-
Marine Mammal	Marine mammal observation Plan	Observe marine mammals and diving birds and document potential effects of the project on them	Not available	-
Birds	Birds observation Plan		Not available	-
Reports or papers	-			
Research projects	-			