Tethys Blast

February 20, 2015

Welcome to the second February edition of the bi-weekly Tethys Blast!

Tethys Blasts will keep you updated with new information available on Tethys, new features on Tethys, and current news articles of international interest on offshore renewable energy. We hope that this becomes a valuable tool to help you stay connected to your colleagues and to introduce you to new research, new contacts, and ongoing milestones in renewable ocean energy development.

What Are Tethys Stories?

Tethys Stories are an opportunity to learn more about organizations, events, ideas, and news from the perspective of someone closely involved with the topic. In addition to sharing about the topic, these stories are meant to tie back in to the big picture of advancing the offshore renewable energy industry in an environmentally responsible manner. These stories are posted on Tethys, announced on social media, and featured on Tethys Blasts to reach as many members of the community as possible. Anyone is invited to post if you have an interesting story to tell, simply email tethys@pnnl.gov.

New Articles on Tethys

A total of 12 new documents have been added to Tethys in the last two weeks. These documents have been hand-selected for their relevance to the environmental effects of offshore renewable energy. The listings below are short introductions to several popular documents that can be accessed through the accompanying Tethys links:

Review of Consenting Processes for Ocean Energy in Selected European Union Member States - Simas et al. 2015

> Consenting is still generally regarded as a non-technological barrier to the progress of the marine renewable energy industry, caused by the complexity of consenting processes and the lack of dedicated legal frameworks. Existing consenting systems for ocean energy projects tend to be based on procedures designed for other sectors and are seen as inappropriate for the specific needs of ocean energy. Licensing procedures are also viewed by developers as time-consuming because regulators see ocean energy as a new activity with unknown or uncertain effects and consequently often apply strong interpretation of the precautionary principle.

Tradeoff Analysis of Energy Harvesting and Noise Emission for Distributed Wind Turbines - Shaltout et al. 2015

> One of the major environmental challenges hindering public acceptance for new wind power installations is the noise emission from wind turbines. Unfortunately, reducing the noise emission could lead to decreased wind energy harvesting. As a result of these conflicting goals, a tradeoff between power generation and noise emission arises.

Ocean Zoning for Conservation, Fisheries and Marine Renewable Energy: Assessing Trade-Offs and Co-Location Opportunities - Yates et al. 2015

> Oceans, particularly coastal areas, are getting busier and within this increasingly human-dominated seascape, marine biodiversity continues to decline. Attempts to maintain and restore marine biodiversity are becoming more spatial, principally through the designation of marine protected areas (MPAs). MPAs compete for space with other uses, and the emergence of new industries, such as marine renewable energy generation, will increase competition for space. Decision makers require guidance on how to zone the ocean to conserve biodiversity, mitigate conflict and accommodate multiple uses.

Evaluation of Behavior and Survival of Fish Exposed to an Axial-Flow Hydrokinetic Turbine - Amaral et al. 2015

> Previous studies have evaluated fish injury and mortality at hydrokinetic (HK) turbines, but because these studies focused on the impacts of these turbines in situ they were unable to evaluate fish responses to controlled environmental characteristics (e.g., current velocity and light or dark conditions). In this study, we used juvenile hybrid Striped Bass, Rainbow Trout *Oncorhynchus mykiss*, and White Sturgeon *Acipenser transmontanus* in a series of laboratory experiments to (1) evaluate the ability of fish to avoid entrainment through an axial-flow HK turbine, (2) evaluate fish injury and survival associated with turbine entrainment, and (3) compare the effects of different HK turbines on fish.

Evaluating Offshore Wind Energy Feasibility off the California Central Coast - Feinberg et al. 2014

> At the end of 2012, California ranked second among all states in installed wind power capacity with 5.549 Giga-watts (GW). However, none of that wind power is being generated offshore. Different obstacles exist off the California coast, where the Pacific Outer Continental Shelf (OCS) quickly drops off to waters deeper (greater than 50m) than conventional offshore platforms (e.g., monopile, jacket) can support wind turbines with economic efficiency.

Current News

Current news articles of international interest on offshore renewable energy include:

U.K. Approves World's Largest Offshore Wind Farm, Farthest Ever from the Coast

> The United Kingdom has approved what will become the world's biggest offshore wind farm, and one of the U.K.'s biggest power stations of any sort. When completed, the Dogger Bank Creyke Beck project will have a total generating capacity of 2.4 gigawatts, enough to power about 2.5 percent of the country's electricity needs. Made of up two separate 1.2-gigawatt farms of up to 200 turbines each, the project will be located about 80 miles off the coast and occupy up to 430 square miles.

World's first grid-connected wave energy array switched on in Perth

> Carnegie Wave Energy has officially switched on the onshore power station for its Perth Wave Energy Project, thus launching the world's first commercial-scale grid connected wave energy array and marking the first time in Australia that wave-generated electricity has been fed into the grid.

DOI Offshore Wind Energy Lease Sale Nearly Doubles Leased Acreage

> The DOI's fourth competitive renewable energy lease sale on the Outer Continental Shelf has nearly doubled the federal offshore acreage available for commercial-scale wind energy projects.

Gear Tech Lowers Cost of Wave Energy Farming

> CorPower Ocean's new wave energy system, which uses a gearbox design that KTH researchers helped develop, generates five times more energy per ton of device, at one third of the cost when compared to competing state-of-the art technologies. Energy output is three to four times higher than traditional wave power systems.