TETHYS BLAST

6 September 2019

The bi-weekly *Tethys* Blast highlights new information on *Tethys*, news articles of international interest, and opportunities in wind and marine renewable energy. We hope you find this a valuable tool to keep you connected to colleagues, new research, opportunities, and industry milestones.

New *Tethys* Story

Wave Swell Energy's Oscillating Water Column (OWC) Technology and 200 kW King Island Renewable Energy Integration Project By Dr. Tom Denniss

Wave Swell Energy Ltd (WSE) is currently developing a 200 kW wave energy project to demonstrate its state-of-the-art unidirectional Oscillating Water Column (OWC) technology called the UniWave, and to demonstrate the commercial viability of the technology when deployed at large scale (read more).

New *Tethys Engineering* Blast Coming Soon

Be sure to keep an eye out for our new newsletter, the *Tethys Engineering* Blast! Similar to the *Tethys* Blast, the bi-weekly *Tethys Engineering* Blast will highlight new information on the *Tethys Engineering* website, news articles of international interest, and opportunities in marine renewable energy.

Calls for Abstracts

Abstracts are being accepted for the Ocean Sciences 2020 meeting in San Diego on 16-21 February 2020. Consider submitting an abstract to the *Ocean Renewable Energy and Synergies with Ocean Technologies* session (84377). The session is looking for a broad range of papers on marine renewables and offshore wind that address environmental effects; resource characterization; modeling of device interactions; and potential for co-design of devices with ocean observation platforms, AUVs, and aquaculture facilities. For more information please contact Andrea Copping (andrea.copping@pnnl.gov), Zhaoqing Yang (zhaoqing.yang@pnnl.gov), Simon Neill (s.p.neill@bangor.ac.uk), or Reza Hashemi (reza_hashemi@uri.edu). Abstracts are due 11 September 2019 and can be submitted here.

Abstracts are being accepted for the International Conference on Ocean Energy (ICOE) in Washington D.C. on 19-21 May 2020. The theme for ICOE 2020 is "Energizing a Powerful Blue Economy." The event will showcase innovations in ocean energy technology research and development, prepare ocean renewable energy to benefit the larger "Blue Economy" and the electrical grid, and identify research needed to further advance the state of the technology. Abstracts for poster and oral presentations are due by 11 October 2019 and can be submitted here. Please contact icoespeakers@conferencemanagers.com for more information.

Funding Opportunity

Wave Energy Scotland has launched a call for feasibility studies on Quick Connection Systems (QCS). The overall objective of the QCS programme is to reduce the duration, cost, and risk of offshore operations for early stage wave energy converters. This call focuses on the technology and operations used to make the connection between a wave energy device and its moorings and/or electrical system. Applications are due by 16 September 2019 at 12:00 GMT. More information on the application process can be found here.

Upcoming Webinar

The National Wind Coordinating Collaborative (NWCC) will host a webinar on 2 October 2019. Presenter Michael Speerschneider, Senior Director of Permitting Policy and Environmental Affairs for the American Wind Energy Association (AWEA), will provide background on wind project siting and operation, including discussing opportunities and constraints for wind energy from the perspective of permitting, engineering, and economics. Register for the webinar here.

New Documents on *Tethys*

New documents are regularly added to *Tethys*, hand-selected for their relevance to the environmental effects of wind and marine renewable energy. Short excerpts from new or popular documents are listed below, accessible by the accompanying *Tethys* links:

Characteristics of the soundscape before and after the construction of the Block Island Wind Farm – Tripathy et al. 2018

> The Block Island Wind Farm (BIWF) south of Rhode Island is the first offshore windfarm in the United States. As part of the Ocean Special Area Management Plan, acoustic data were collected before the construction in the fall of 2009. Noise budgets were estimated based on this data and showed the dominant sources of sound in a 1/3-octave band centered at 500 Hz were shipping and wind. Data were again collected during and after construction of the wind farm and will be presented and compared to pre-construction levels.

An artificial neural network model of coastal erosion mitigation through wave farms - Rodriguez-Delgado et al. 2019

In this work, a novel approach based on artificial intelligence (AI) to assess the efficiency of wave energy converter (WEC) farms in coastal protection is developed. We consider as a case study a beach subjected to severe erosion: Playa Granada. More specifically, we analyse the changes in the dry beach area with and without wave farm protection by means of an Artificial Neural Network (ANN) model. Once validated, this ANN model is applied to optimize the design and position of the wave farm. The results confirm that ANN models are a useful design tool for hybrid wave farms.

Geographic context affects the landscape change and fragmentation caused by wind energy facilities – Diffendorfer et al. 2019

Wind energy generation affects landscapes as new roads, pads, and transmission lines are constructed. Limiting the landscape change from these facilities likely minimizes impacts to biodiversity and sensitive wildlife species. We examined the effects of wind energy facilities' geographic context on changes in landscape patterns using three metrics: portion of undeveloped land, core area index, and connectance index. Utilizing existing development and carefully placing turbines may provide opportunities to minimize the impacts of new wind energy facilities.

Development of epibenthic assemblages on artificial habitat associated with marine renewable infrastructure – Sheehan et al. 2018

Offshore marine renewable energy installations (MREI) introduce structure into the marine environment and can locally exclude destructive, bottom trawl fishing. These effects have the potential to aid restoration of degraded seabed habitats but may be constrained by timescales of ecological succession following MREI construction, and the removal of infrastructure during decommissioning. To inform managers about appropriate decommissioning strategies, a 25 km cable and associated rock armouring (Wave Hub, UK), installed on rocky reef, was monitored up to 5 years post-deployment.

Predictable shorebird departure patterns from a staging site can inform collision risks and mitigation of wind energy developments – Howell et al. 2019

High quality staging sites are critical for long distance migratory shorebirds to rest and refuel but are under threat from human development, including expansion in wind energy projects. However, predicting migration timing and movements in relation to weather conditions at staging sites can increase our understanding and mitigate effects of wind turbine collisions. Here we assessed northward migration timing and orientation in relation to environmental conditions at an inland staging area in Saskatchewan, Canada with active and proposed wind energy developments.

Increased integration between innovative ocean energy and the EU habitats, species and water protection rules through Maritime Spatial Planning – van Hees 2019

This article investigates whether Maritime Spatial Planning (MSP)–which promotes the integrated planning and management of seas and oceans–can play a role in creating increased integration between the EU's renewable energy policy and the potentially conflicting rules on the protection of habitats, species, and water. The article focuses on innovative ocean energy (tidal stream, wave, and salinity gradient energy). It can be said that there is a possible lack of integration between the Renewable Energy Directive and the EU rules on the protection of habitats, species and water.

News and Current Events

Marine Renewable Energy

Marine Power Systems Completes Testing and Sea Trials of WaveSub Device – Marine Power Systems

UK marine energy technology development company Marine Power Systems (MPS) has successfully concluded a programme of sea testing for its prototype wave energy generator, WaveSub. Taking place in Cornwall at the marine test site FaBTest over the last 12 months, the test results prove the functionality of the 1:4 scale device across a range of sea states and – crucially – that it is able to generate zero-carbon electricity from ocean waves. The results pave the way for MPS to progress with the design, manufacture and testing of a full-scale version of the WaveSub in the coming months.

Global Partnership for Ocean Wave Energy Technology Formed – Marine Energy

The Global Partnership for Ocean Wave Energy Technology (GPOWET) is a United Nations – Multi-Stakeholder Partnership formed to bring commercially-viable, utility scale ocean wave energy conversion (WEC) technology solutions. The GPOWET vision is to enable the Small Island Developing States (SIDS) and other disadvantaged communities to establish training, manufacturing, and operation and maintenance facilities for SurfWEC systems and export units to other locations in their regions in support of all 17 United Nations – Sustainable Development Goals (SDG).

Wavegem hits the water for testing - reNEWS

Geps Techno-led IHES has installed its floating wave and solar demonstrator Wavegem at the SEM-REV test site located 30km off the coast of Brittany, western France. The device includes 120kW of wave and 30kW of solar capacity and will stay in the water for up to 18 months. The consortium is hoping to soon sign contracts for commercial devices in France and abroad which could go online in 2021. The medium-power autonomous energy harvesting Wavegem platform has been designed to generate clean energy for offshore and subsea activities that require a power supply.

A Vision for Next-Generation Animal Telemetry: CubeSats – Bureau of Ocean Energy Management (BOEM)

BOEM's decision-making process is based on the best available science, and this month's Science Note highlights a new BOEM video that showcases the potential for small satellites to improve our ability to protect endangered and vulnerable marine species. BOEM has partnered with NASA on the concept, which envisions a state-of-the-art network of small, open source satellites, combined with autonomous vehicles in the air and sea, to enhance and potentially replace current methods of collecting animal telemetry data.

£3.4m funding for world's most powerful tidal turbine – Orbital Marine

Scottish Government funding of £3.4 million has been awarded to help build the world's most powerful floating tidal turbine. Scottish engineering company Orbital Marine Power (Orbital) has been awarded the money as the first recipient of the Scottish Government's £10 million Saltire Tidal Energy Challenge Fund. The funding will be used to deliver the next generation O2 2MW Floating Tidal Energy Turbine, capable of powering more than 1,700 homes per year.

Wind Energy

Shipping wind turbines is not a breeze – FreightWaves

You'd think motorists driving down the highway would be able to see an oversize flatbed trailer carrying a massive 240-foot wind turbine blade. You'd think – wrong. "We've had people literally drive under the blade, not realizing the blade was there," said Gene Lemke, vice president of projects at ATS, a Minnesota-based carrier. Contending with hapless motorists is just one of the many challenges associated with transporting monster wind turbine shipments, a business that has soared in the past few years as wind farm installations have increased.

NREL Announces Project Selections to Address Wind-Wildlife Operations Challenges – NREL

The National Renewable Energy Laboratory (NREL) has selected a new project to receive a U.S. Department of Energy (DOE)-funded Technology Development and Innovation (TD&I) subcontract. The recipient will collaborate with researchers and technology developers to advance early-stage wildlife monitoring and minimization technologies for use at wind energy facilities. The TD&I program matches technology developers with NREL facilities and expertise to develop, validate, and engineer emerging technologies that detect and deter birds and bats at wind farms.

France looks to wind for island energy autonomy – Wind Power Monthly

After a period of zero growth, wind deployment is beginning to take off again in France's overseas territories, but will need to speed up further to achieve the government's 2030 target. In 2009, France passed a law calling for its overseas territories to be self-sufficient in meeting their energy needs by 2030. While achieving energy autonomy is a major

challenge for these "non-interconnected zones (ZNI), it is perfectly possible, and would save money in the long run, according to a recent study by the French environment and energy management agency, Ademe.

Sulzer Schmid and NNAISENSE Partner on AI Engine for Automated Blade Damage Detection – Renewable Energy Magazine

Sulzer Schmid, a Swiss company pioneering unmanned aerial vehicle (UAV) technology for rotor blade inspections, and NNAISENSE, an artificial intelligence (AI) specialist, have partnered to develop an AI engine to automatically detect rotor blade damages on wind turbine. According to the companies, this technology is expected to bring the twin benefits of improving the productivity and consistency of blade inspection processes. With this new development effort, the two partners are aiming to build the industry's most powerful AI engine able to recognize damages based on inspection image material.

Department of Energy to Fund Natural Power to Develop and Test Smart Curtailment System to Protect Bats while Minimizing Power Loss – U.S. Department of Energy

In August 2019, the U.S. Department of Energy (DOE) announced a new smart curtailment research project for award negotiation. Natural Power of Saratoga Springs, New York will develop a novel technology to reduce bat fatalities using real-time data on bat presence and wind speed, which can easily integrate with any wind turbine control system. This work builds upon a current portfolio of smart curtailment research funded by the DOE Wind Office.

Ocean Energy
ORJIP
working to accelerate offshore consenting

ORJIP Ocean Energy is a UK-wide collaborative programme of environmental research with the aim of reducing consenting risks for wave, tidal stream, and tidal range projects. Partnering with Annex IV, ORJIP provides content input to *Tethys* Blasts and wishes to make you aware of the following opportunities:

- The 4th MaRINET2 Transitional Access Call for offshore renewable testing is open until 30 September 2019. The project offers free access to a world-leading network of testing and research infrastructures, including the European Marine Energy Centre's test sites, and is open to offshore wind, wave, and tidal energy technology developers.