TETHYS BLAST

18 October 2019

The bi-weekly *Tethys* Blast highlights new publications on *Tethys*, opportunities in wind and marine renewable energy, and news articles of international interest. ORJIP Ocean Energy has partnered with OES-Environmental to provide additional content. We hope you find this a valuable tool to keep you connected to new research, opportunities, and industry milestones.

Announcements

Funding Opportunities

Applications are being accepted for the National Science Foundation's Graduate Research Fellowship Program (GRFP), which will provide three years of support for the graduate education of individuals who have demonstrated their potential for significant research achievements in STEM or STEM education. Applications are due 21-25 October 2019 (depending on discipline) and can be submitted here.

The €13 million OceanDEMO project has announced the 2nd call for applications. The project aims to accelerate ocean energy's transition from single prototypes to multi-device farms by providing access to world-leading test centers. Applications close 31 January 2020.

Upcoming Events

Upcoming Workshop

OES-Environmental (formerly Annex IV) and ORJIP Ocean Energy invite you to join a workshop on 4 December 2019 from 10:00-15:30 AEST at the Aerial UTS Function Centre in Sydney, Australia. The purpose of the workshop is to provide a state of the science on environmental effects of marine renewable energy and to examine pathways for determining data needs, monitoring requirements, and possible mitigation measures for working towards risk retirement of two stressors—electromagnetic fields and underwater noise—for permitting small installations of tidal and wave energy converters. For more information, please visit the workshop's event page on *Tethys.*

Upcoming Webinars

The Ocean Energy Research Association (OERA) will be hosting a webinar entitled, "Using radar data to evaluate seabird abundance and habitat use at the Fundy Ocean Research Centre for Energy site near Parrsboro, NS" from 1:00-2:00pm ADT on 24 October 2019. Register here.

ETIP Ocean and OES-Environmental will be hosting a webinar on marine spatial planning opportunities and challenges in the ocean energy sector on 7 November 2019 at 7:00am PST.

Upcoming Conferences

OCEANS'19 Seattle will be held in Seattle, Washington on 27-31 October 2019. The preliminary technical program is now available here. Register here.

The 10th Ocean Energy and Economic Development Symposium will be held in Kona, Hawaii on 8-9 November 2019. Additional details coming soon.

The Environmental Interactions of Marine Renewable Energy Technologies (EIMR) Conference will be held in Oban, Scotland on 21-23 April 2020. Additional details coming soon.

New Documents on *Tethys*

Baseline Presence of and Effects of Tidal Turbine Installation and Operations on Harbour Porpoise in Minas Passage, Bay of Fundy, Canada – Tollit et al. 2019

> Harbour porpoise echolocation activity within and outside of the FORCE tidal turbine demonstration area in Minas Passage of the upper Bay of Fundy, Nova Scotia, has been monitored by up to eight bottom-moored (30-80 m depth) C-POD click train detectors across 1,210 days between May 2011 and May 2018. Detections occurred on almost every day (98.9% of days), averaging 86.5% across C-PODs, at a median of seven detection positive minutes per day and for a maximum of 44 minutes per day, noting that porpoise detection probabilities using buoy-mounted C-PODs should be considered minimum estimates. No confirmed dolphin click detections were documented.

Modelling the Effects of Wind Farming on the Local Weather Using Weather Research and Forecasting (WRF) Model – Jawaheer et al. 2019

> In this work, an attempt is made to study whether the wind farm situated at Roches Noires (operational since January 2016), in the north-east part of the island of Mauritius, creates such changes within a sufficiently large space around the farm. The Weather Research and Forecasting (WRF) numerical model is employed for this endeavour due to the unavailability of measured weather data in regions close to the farm. Analysis of results for two selected locations (one upstream and one downstream) around the Roches Noires wind farm demonstrates a slight decrease both in wind speed and precipitation, one year after installation of the farm.

Management of Coastal Erosion Under Climate Change Through Wave Farms – Bergillos et al. 2020

> In this chapter, the efficiency of wave farms in coastal protection under sea-level rise is investigated. A wave farm formed by 11 wave energy converters was modelled off Playa Granada, a gravel-dominated coast in Southern Spain, under three sea-level rise scenarios: the current water level and the water level in 2100 according to a low- and high-emission scenario. In order to explore the effects produced by the wave farm, the natural scenario without wave farm was also studied. The results highlight that wave farms are able to decrease beach erosion (shoreline retreat) even under sea-level rise scenarios.

Red bat fatality: Geographic extents through deuterium and niche models – Murtaugh et al. 2019

> We used deuterium ratio analysis combined with genetic algorithm for rule-set prediction and the web-based isoscapes modeling, analysis, and prediction in a geographic information system environment as a novel approach. Our objectives were to explore the utility of these methods together and map the geographic extents of eastern red bat (*Lasiurus borealis*) specimens salvaged in 2008–2010 from a single, 92-km^2 wind energy facility in Illinois, USA. Results indicate that combining these methods can be successful and support their use with species where ranges may be less well defined.

Life Cycle Assessment of Ocean Energy Technologies: A Systematic Review – Paredes et al. 2019

> The implementation of ocean energy is increasing worldwide. However, the use of these technologies is not exempt from the generation of potential environmental impacts throughout their life cycle. In this context, life cycle assessment (LCA) is a holistic approach used to evaluate the environmental impacts of a product or system throughout its entire life cycle. In this paper, a systematic review was conducted and 18 LCA studies of ocean energy technologies (OET) were analyzed. Finally, the critical stages of the systems evaluated were identified, together with, the opportunity areas to promote an environmental management for ocean energy developers.

Effects of wind turbine noise on the surrounding soundscape in the context of greater-prairie chicken courtship vocalizations – Whalen et al. 2019

> We assessed sound levels near a 36-turbine wind energy facility in a contiguous grassland in Brown County, Nebraska, USA, using a grid sampling design. Greater prairie-chickens (*Tympanuchus cupido pinnatus*), a bird species of special conservation concern, occupy the landscape near the wind facility. We evaluated the variation in wind turbine noise in the landscape at 296 Hz, the average peak frequency of the critically important courtship (‘boom’) vocalization of male prairie-chickens. Our results

demonstrate the variation of wind turbine noise in the soundscape and suggest a protocol for evaluating effects of wind turbine sound on sound-sensitive wildlife.

News and Current Events

Marine Renewable Energy

Game-Changing Tidal Energy Project Approved for Channel Regions – European Marine Energy Centre

Interreg France (Channel) England Programme has approved the biggest ever Interreg project that will prove to be game-changing for the European tidal stream energy sector. The Tidal Stream Industry Energiser Project, known as TIGER, is an ambitious €46.8m project, of which €28m (69%) comes from the European Regional Development Fund via the Interreg France (Channel) England Programme. The project aims to drive the growth of tidal stream energy by installing up to 8 MW of new tidal capacity at sites in and around the Channel region thus driving innovation and the development of new products and services.

Leask Marine launch tidal energy platform – The Orcadian

Leask Marine has successfully completed the fabrication of the first ever tidal energy platform to be built in Orkney. The Marinus platform was launched into Kirkwall Bay on Monday, having been officially named by Karen Leask, director of the company. Leask Marine were awarded the contract for the manufacture and supply of the surface floating platform by Instream Energy Systems Corp of Canada. The project will utilise vertical axis hydrokinetic turbine technology developed by Canadian technology developer Instream Energy Systems and technology defence specialists BAE Systems.

New Opportunities for OTEC in India – Marine Energy

The Ministry of New and Renewable Energy in India has declared that ocean energy is officially a renewable energy source and now falls under Renewable Purchase Obligations (RPO). This recent policy change offers new opportunities for ocean thermal energy conversion (OTEC) in India. The RPO states power suppliers are required to procure a part of their power from renewable sources. By including ocean power as a renewable source, investing in OTEC is made more attractive. This development stimulates research and funding.

Vigor Completes Construction of Massive Wave Energy Buoy – Renewable Energy Magazine

Vigor Industrial of Portland, Oregon, has completed construction of the 826-ton “OE Buoy” for Irish company, Ocean Energy. The buoy was preparing for launch from the company's Swan Island shipyard on Thursday, October 10, to begin its journey to Oahu,

Hawaii. The buoy, which measures 125 x 59 feet with a draft of 31 feet, has a potential rated capacity of up to 1.25 MW in electrical power production. According to Ocean Energy, each deployed commercial device could reduce CO_2 emissions by over 3,600 tons annually, which for a utility-scale wave farm of 100 MW could amount to over 180,000 tons of CO_2 in a full year.

Tocardo Declares Bankruptcy – Marine Energy

Tocardo Tidal Power has been declared bankrupt by the court. In recent months, Tocardo has sought to acquire new projects in the Netherlands and in the United Kingdom. In addition to acquire new projects, Tocardo has tried to find a partner that can support the company in the production of turbines and foundations and can also invest in the further development and roll-out of tidal energy. Although all efforts the liquidity position could not prevent the company filing for bankruptcy.

Wind Energy

The World's Biggest Turbines and No Subsidies: How Offshore Wind Is Entering a New Era – Fortune

The days when any sort of wind power needed a subsidy to be commercially viable may soon be over. In one country, they already are. Three weeks ago, the U.K. launched a third auction in five years aimed at bolstering the share of green energy sources in its electricity supply. The government was offering so-called Contracts for Differences to providers of renewable energy, part of the U.K.'s plan to be carbon-neutral by 2050. The winning bidders were the prospective operators of a new generation of offshore wind farms that will match nuclear power plants in their generating capacity, powering not thousands, but millions of homes, all developed without subsidies.

BOEM greenlights Coastal Virginia – reNEWS

Dominion Energy has received two key approvals from the Bureau of Ocean Energy Management (BOEM) for the design, fabrication and installation of the 12 MW Coastal Virginia offshore wind project. BOEM has reviewed and responded to the two filings with a 'no objection' determination, making it the only fully permitted offshore wind project in U.S. federal waters. The decision from the agency is a necessary in order for the wind farm to move forward with offshore construction, which is on track for the summer of 2020, said Dominion.

Investing in Hywind Tampen development – Equinor

Equinor and the Snorre and Gullfaks partners have made a final investment decision for the Hywind Tampen offshore wind farm development. The oil and gas platforms will be the first ever powered by a floating offshore wind farm. The wind farm will be located some 140 kilometres from shore in 260-300 metres of water between the Snorre and Gullfaks platforms. The wind farm will consist of 11 wind turbines based on the Hywind

technology developed by Equinor. The 8 MW turbines will have a total capacity of 88 MW, capable of meeting about 35 percent of the annual power demand of the five Snorre A and B, Gullfaks A, B and C platforms.

Serbia's largest wind farm is now operational – Renewable Energy World

Last week in Mramorak, Serbia, the country's largest wind farm – a 158-MW plant – came online. Construction on Čibuk 1 was completed last April and the wind farm is now fully operational. The EUR 300 million wind farm uses 57 GE wind turbines and was supported by the Green for Growth Fund (GGF) and Motion GmbH. The GGF is a B lender to the European Bank for Reconstruction and Development (EBRD), who together with the International Finance Corporation (IFC), led the structuring of the transaction. This is one of four wind projects, culminating in 216 MW of power generation, that the GGF has supported in Serbia's 500 MW plan.

UK opens offshore wind Round 4 – reNEWS

The Crown Estate has officially opened the Round 4 offshore wind leasing competition for the rights to develop 7GW of new capacity off England and Wales with the issuance of the pre-qualification questionnaire (PQQ). PQQ is the first stage of the Round 4 leasing process and is designed to assess bidders' capability to deliver an offshore wind project, based on a set of financial, legal and technical criteria. The questionnaire is available via The Crown Estate's eTendering Portal with the deadline for submissions on 29 November 2019.