TETHYS BLAST

16 October 2020

Tethys is an online knowledge base that facilitates the exchange and dissemination of information on the environmental effects of wind and marine renewable energy (MRE). The bi-weekly *Tethys* Blast highlights new publications in the *Tethys* Knowledge Base; relevant announcements, opportunities, and upcoming events; and news articles of international interest. ORJIP Ocean Energy has partnered with OES-Environmental to provide additional content. If you have specific content you would like circulated to the greater wind and MRE communities, please send it to tethys@pnnl.gov for consideration.

Announcements

Wildlife & Wind Webinar Series Recordings Available

Recordings of the first five webinars in the *Wildlife & Wind Energy Webinar Series,* hosted by National Renewable Energy Laboratory (NREL) and Defenders of Wildlife, are now available on *Tethys*.

WPTO-MHK Graduate Student Research Program

The Oak Ridge Institute for Science and Education (ORISE) is now accepting applications for the WPTO-MHK Graduate Student Research Program, which is designed to provide graduate thesis research opportunities in marine and hydrokinetics (MHK) at U.S. Department of Energy (DOE) laboratories and other DOE/WPTO-approved facilities. Applications are due by 5:00pm EST (10:00pm UTC) on 4 December 2020.

Collegiate Wind Competition

DOE's NREL recently released a request for proposals for student teams interested in competing in the Collegiate Wind Competition (CWC) in May of 2022. The competition challenges

students to design, build, and test a model wind turbine, and plan and financially analyze a wind power plant. Applications are due 8 December 2020.

Call for Abstracts/Proposals

The American Wind Energy Association (AWEA) is now accepting proposals for podium and poster presentations at CLEANPOWER 2021 in Indianapolis, Indiana (US) from 7-10 June 2021. The Call for Proposals closes 23 October 2020.

The University of Plymouth is now accepting abstract submissions for the 14th European Wave and Tidal Energy Conference (EWTEC 2021) in Plymouth, UK from 5-9 September 2021. Relevant EWTEC 2021 themes include resource characterization, environmental impact and appraisal, and more. Abstract submission closes on 1 November 2020.

Call for Papers

The *Journal of Ocean Technology* is inviting the submission of technical papers, essays, and short articles for its Spring 2021 Special Issue on Renewable Ocean Energy. Submissions are due 13 November 2020.

Funding/Testing Opportunities

The Marine Renewables Infrastructure Network (MaRINET2) has opened its fifth and final call for fully funded access to a world-leading network of testing and research infrastructures in Europe. An open call for virtual access to data sets and a free-of-charge training programme are also available through the project. Applications are due 16 October 2020. A webinar recording to assist candidates with their application and share updates on the process is available here.

The TEAMER (Testing Expertise and Access for Marine Energy Research) Program, which provides MRE developers with access to a network of U.S. testing facilities, will begin accepting applications for its second round of Requests for Technical Support (RFTS) on 9 November 2020. Applications will be due by 18 December 2020.

The European Commission has released a Call for Proposals focused on innovative land-based and offshore renewable energy technologies and their integration into the energy system. Submissions are due by 5:00pm CEST (3:00pm UTC) on 26 January 2021.

Employment Opportunities

The Department of Energy and Process Engineering at the Norwegian Institute for Nature Research (NINA) has a vacancy for a PhD Candidate interested in modelling biodiversity impacts of future energy systems in Norway. Applications are due by 28 October 2020.

The Fundy Ocean Research Centre for Energy (FORCE) is currently seeking a Board Director to support its mission as Canada's lead research facility for tidal stream technology.

Upcoming Events

Upcoming Workshop

New York State Energy Research and Development Authority (NYSERDA) is hosting the State of the Science Workshop on Wildlife and Offshore Wind Energy 2020: Cumulative Impacts online from 16-20 November 2020. Plenary presentations and Q&A panel discussions will occur throughout the week, with smaller taxon-specific working meetings in late 2020 and early 2021, and a final group webinar in the spring of 2021. Register for free here by 30 October 2020.

Upcoming Webinars

NREL and Defenders of Wildlife are hosting a nine-part webinar series, *Wildlife & Wind Energy Webinar Series: Considerations for monitoring and managing impacts*, through mid-November 2020. Register here for the seventh webinar, "Impact Reduction Strategies for Eagles and Bats", at 1:30pm EDT (5:30pm UTC) on 22 October 2020. Sign up here to receive updates on and invitations for all remaining webinars in this series. All webinars will be recorded and available on *Tethys*.

The Schatz Energy Research Center at Humboldt State University is hosting a five-part webinar series through mid-October 2020 on *Exploring the Feasibility of Offshore Wind Energy for the California North Coast*. Register here for the fifth and final webinar, "Reflections and Next Steps", at 2:00pm PDT (9:00pm UTC) on 19 October 2020.

Ørsted is hosting three Ocean Wind Virtual Open Houses for the public to learn directly from subject matter experts about environmental, economic, and technical aspects of the project and offshore wind in New Jersey (U.S.). The Open Houses will take place at 1:00pm EDT (5:00pm UTC) on 20 October, at 6:00pm EDT (10:00pm UTC) on 21 October, and at 10:00am (2:00pm UTC) on 24 October 2020. Register here.

Australia's Blue Economy Cooperative Research Centre (CRC) is hosting a webinar, "Harnessing Australia's offshore wind for a clean energy future", at 3:00pm AEDT (4:00am UTC) on 21 October 2020. Register here.

The Discovery of Sound in the Sea (DOSITS) Team is hosting a webinar, "How are Passive Acoustics Data Used to Inform the Decision-Making Process?", at 12:00pm EDT (4:00pm UTC) on 22 October 2020. Register here.

The Nova Scotia Offshore Energy Research Association (OERA) is hosting a webinar, "Real-time detection of marine mammals in high flow environments", at 1:00pm ADT (4:00pm UTC) on 22 October 2020. Register here.

Western EcoSystems Technology, Inc. (WEST) is hosting a webinar, "Machine Learning: New Tools in Studying Wildlife Interactions with Renewable Energy", at 11:00am MDT (5:00pm UTC) on 22 October 2020. RSVP here for conferencing details.

Mystic Aquarium is hosting a Virtual Tour and Panel Event on Renewable Ocean Energy at 7:00pm EDT (11:00pm UTC) on 27 October 2020. The event will include a virtual tour of Mystic's new exhibit space, as well as a presentation and live Q&A with experts from the U.S. Department of Energy, Ocean Power Technologies, and Vineyard Wind. Register here.

As part of the Pacific Ocean Energy Trust (POET) Webinar Series, the U.S. Department of Energy's Wind Energy Technologies Office (WETO) is presenting a webinar at 10:00am PDT (5:00pm UTC) on 29 October 2020. The webinar will feature presentations on federally funded research and development to advance floating offshore wind technology, analyze the techno-economic potential, and address siting, environmental, workforce development, and grid integration opportunities. Register here.

Upcoming Conferences

As part of the Singapore International Energy Week 2020, the Asia Clean Energy Summit 2020 will be held online from 27-30 October 2020. Register for a free visitor pass here.

RenewableUK's Global Offshore Wind 2020 will be held online from 28-30 October 2020. Register here.

New Documents on *Tethys*

Marine Renewable Energy

Renewable energy homes for marine life: Habitat potential of a tidal energy project for benthic megafauna – Taormina et al. 2020

> An increasing number of offshore structures are being deployed worldwide to meet the growing demand for renewable energy. Besides energy production, these structures can also provide new artificial habitats to a diversity of fish and crustacean species. This study characterises how concrete mattresses that stabilise the submarine power cable of a tidal energy test site can increase habitat capacity for benthic megafauna. A five-year monitoring, which relied on visual counts and video-based surveys by divers, revealed that these mattresses provide a suitable habitat for 5 taxa of large crustaceans and fish.

The international regulation for the protection of the environment in the development of marine renewable energy in the EU – Soria-Rodríguez 2020

> Marine renewable energy (MRE) technologies have been fostered in the European Union (EU) due to their potential contribution to achieving the EU's climate objectives and the decarbonization of the energy system. However, their development can pose severe environmental risks to marine ecosystems. Hence, the EU requires environmental protection and sustainable growth for the development of MRE in maritime spaces under the sovereignty or jurisdiction of EU Member States. This article analyses the main

international law instruments for the protection of the environment against the impacts associated with the deployment of MRE in the EU.

Automated Identification of Fish and Other Aquatic Life in Underwater Video – Blowers et al. 2020

Marine Scotland tasked MarynSol to provide an overview of the current state of computer vision technologies for automated detection of aquatic life in underwater video, the objective being to provide a development route for a tool to analyse the large amount of historic video footage without the need for human supervision. This task was split into two parts: the first being a review of the literature of the current technologies and the second being a case study incorporating some of the more promising candidates for this problem space.

Wind Energy

Assessing the exposure of three diving bird species to offshore wind areas on the U.S. Atlantic Outer Continental Shelf using satellite telemetry – Stenhouse et al. 2020

The United States Atlantic Outer Continental Shelf (OCS) has considerable offshore wind energy potential. Capturing that resource is part of a broader effort to reduce CO2 emissions. While few turbines have been constructed in U.S. waters, over a dozen currently planned offshore wind projects have the potential to displace marine birds, potentially leading to effective habitat loss. We focused on three diving birds identified in Europe to be vulnerable to displacement. Our research aimed to determine their potential exposure to areas designated or proposed for offshore wind development along the Atlantic OCS.

Estimation of spatiotemporal trends in bat abundance from mortality data collected at wind turbines – Davy et al. 2020

Renewable energy sources such as wind energy are an essential tool for reducing the causes of climate change, but wind turbines can pose a collision risk for bats. To date, the population-level effects of wind-related mortality have only been estimated for a single bat species. To estimate temporal trends in bat abundance, we considered wind turbines as opportunistic sampling tools for flying bats (analogous to fishing nets), where catch per unit effort (carcass abundance per monitored turbine) is a proxy for aerial abundance of bats, after accounting for seasonal variation in activity.

Beyond the beach: Tradeoffs in tourism and recreation at the first offshore wind farm in the United States – Smythe et al. 2020

Despite the growth of offshore wind energy and concerns that projects will harm tourism and recreation, there is a lack of empirical research on the effects of operating wind farms on tourism and recreation. The 30-MW Block Island Wind Farm, the first offshore wind farm in the United States, is located offshore an iconic tourism destination and provides a

laboratory for understanding interactions between offshore wind energy and the tourism and recreation sectors. We conducted an exploratory qualitative study through which tourism and recreation professionals and participants met in focus groups to discuss experiences with and observations of this project.

News & Press Releases

Marine Renewable Energy

Tocardo Acquires the Largest Tidal Array in the World – Tocardo

Tocardo has come to an agreement on the acquisition of the 1.25MW Oosterschelde Tidal Power Plant, the largest tidal array in the world installed on the Dutch icon Oosterscheldekering. The acquisition follows the successful technical due diligence phase during September 2020. The Oosterschelde Tidal Power Plant consists of five T-2 tidal turbines in one of the sluice gates of the Oosterschelde storm surge barrier, with the potential of scaling up. It serves as an international showcase for the tidal energy sector and climate adaptation solutions, combining clean energy production with existing infrastructures and making efficient use of scarce land area.

Bombora Leverages Apollo Expertise to Advance Floating Offshore mWave™ – Bombora

A recent study completed by Apollo has reinforced Bombora's research that mWave™ technology, when applied to a floating platform, can deliver utility scale energy solutions resulting in significant operational, economic, and environmental benefits. Experts in the field of offshore engineering, Apollo were appointed to support the development of the Floating mWave™, taking Bombora's utility scale wave energy converter into deeper waters. Apollo's marine and offshore engineering team advanced the design of the Floating mWave platform structure and provided supporting data for Bombora's Cost of Energy (COE) analysis.

Politecnico di Torino and Eni launch the joint research laboratory for the innovation of the renewable marine energy sector – Eni

Enhancing sea energy to its full potential is the goal of the Marine Offshore Renewable Energy Lab (MORE), a joint research laboratory recently developed by Politecnico di Torino and Eni. The work conducted in the lab will enable a widening of the field of operation in the study of all sea energy sources, from wave power to offshore wind and solar power, ocean and tidal currents, and salinity gradient. There are around 50 researchers involved with MORE Lab activities, including permanent staff, doctoral students and undergraduates of Politecnico.

Tidal test site off Brittany marks progress – Offshore Energy

Paimpol-Bréhat tidal energy test site, located off France's northern region of Brittany, is making great strides towards proving its sustainability, with one developer extending its trials until next year, and another announcing deployment for 2022. The OceanQuest tidal turbine is showing promising results, having been continually tested for 18 months without any reported damage, it was stated during the meeting. Therefore, HydroQuest decided to extend the testing until summer 2021. The Swedish tidal energy developer Minesto plans to deploy its Deep Green tidal kite technology at the Paimpol-Bréhat site in 2022, the working group for the test site informed.

ORE Catapult and ORCA Hub Join Forces to Advance Robotics in Offshore Renewables – Offshore Renewable Energy (ORE) Catapult

Two of the UK's leading research organisations in the development of robotics for use in offshore renewables are to collaborate to strengthen the relationship between applied academic research and industry need and further develop and amplify the sector's robotics opportunity. The ORE Catapult and the Offshore Robotics for Certification of Assets (ORCA) Hub, a collaboration led by the Edinburgh Centre for Robotics, with Imperial College London and the Universities of Oxford and Liverpool, will work together to translate UK robotics innovation and research expertise into products and services for the offshore renewables' industry and link key industry partners with academia based on specific needs and use cases.

Wind Energy

Offshore Wind Research Buoys Float into California's Waters – Pacific Northwest National Laboratory

Two offshore wind research buoys managed by the U.S. Department of Energy's (DOE's) Pacific Northwest National Laboratory (PNNL) were deployed recently off the coast of California. This marks the first time the buoys have been launched to gather meteorological and oceanographic measurements off the West Coast. The pair of buoys were deployed by DOE's Wind Energy Technologies Office, with this research funded by the Bureau of Ocean Energy Management (BOEM). BOEM is gathering data to support decisions on potential leasing of wind energy sites off California's coastline that will bring a new renewable energy source to the state.

Collaboration announced between Supergen ORE Hub and Floating Offshore Wind Centre of Excellence – Supergen ORE Hub

The Floating Offshore Wind Centre of Excellence (FoW CoE) and the Supergen Offshore Renewable Energy (ORE) Hub have agreed to collaborate together in order to support the development and delivery of a number of co-funded research and development projects, focused on floating offshore wind. The projects will look to involve both supply chain and academic partners working in close collaboration to tackle key research challenges identified by the FoW CoE and the Supergen ORE Hub Research Landscape. The format of the projects are therefore actively looking to support the development of strategic

relationships between academic partners and supply chain organisations, supporting the acceleration of the commercialisation of floating offshore wind.

Icebreaker Deal-Breaker Is No More – Offshore Wind

The Ohio Power Siting Board has removed a requirement for the Icebreaker Wind project in Lake Erie to shut down its wind turbines during nighttime hours from March through November. Back in May, the Board approved the construction of the Icebreaker Wind project with 33 conditions, one of which was that the project's six MHI Vestas 3.45 MW turbines must be shut down during nighttime hours from March until November, citing the wind farm's potential impact on birds and bats as the reason. Last month, the Board unanimously approved an amendment eliminating the nighttime turbine feathering condition and now that amendment was formally adopted.

Multiscale Framework Simulates Utility-Scale Wind Power Plant in Its Natural Environment – U.S. Department of Energy

Wind power plant performance depends on local environmental conditions—and understanding those conditions is crucial in determining wind power plant performance. However, most models used for wind power plant design and operation do not sufficiently account for environmental effects and their impacts on energy production potential. Scale separation—differences in spatial and temporal scales between diverse atmospheric physical processes—is a key challenge to simulating wind power plants in their natural environments. To meet this challenge, the Lawrence Livermore National Laboratory has partnered to develop and demonstrate a novel, mesoscale-to-microscale wind power plant modeling framework.

DNV GL to Certify 11 MW MingYang Offshore Wind Turbine – Offshore Wind

Chinese wind turbine manufacturer MingYang Smart Energy has signed an agreement with DNV GL for the Type Certification of MingYang's new MySE11-203 offshore wind turbine. MingYang's recently announced model has a rated power of 11 MW and a rotor diameter of 203 metres. The turbine's 99-metre carbon-glass hybrid blades, MySE11-99A1, provide a swept area of 32,365 square metres. According to MingYang, the MySE11-203 is the world's biggest hybrid drive wind turbine, offering a 31 per cent higher annual energy production compared to its predecessor.