4 September 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	MRE Documents	MRE News
Upcoming Events	Wind Documents	Wind News

Announcements

Risk Retirement Webinar

OES-Environmental will be hosting a webinar on risk retirement for MRE from 8:00-9:30am PDT (3:00-4:30pm UTC) on 24 September 2020. The webinar will provide an overview of the risk retirement process, its development, and several related tools, including the data transferability process and monitoring datasets discoverability matrix. OES-Environmental's outreach and engagement efforts in the development of the risk retirement and data transferability processes will also be highlighted, as well as the feedback received from the greater MRE community on risk retirement for underwater noise, electromagnetic effects, and habitat change. Register here.

Collegiate Wind Competition

The U.S. Department of Energy's (DOE's) National Renewable Energy Laboratory (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. Interested students and faculty can learn more

about the competition and the application process during an informational webinar at 11:30am PDT (6:30pm UTC) on 30 September 2020. Register here.

UK Consultation

The UK Department for Business, Energy & Industrial Strategy (BEIS) has launched a consultation on how the government can support MRE projects, such as floating offshore wind, tidal, and wave energy. The consultation invites views from developers and other interested parties on project funding and costs, environmental impacts, and supply chain benefits. The consultation closes at 11:45pm BST (10:45pm UTC) on 30 September 2020.

Webinar Recordings Now Available

The National Wind Coordinating Collaborative (NWCC) and NREL recently held a webinar entitled, "Updated Wind Energy Development Scenarios in the U.S.: Tools to Understand Potential Wind-Wildlife Interaction". View the recording here.

NWCC also recently held a webinar entitled, "Preliminary Results of Research on Wind Operational Impact Minimization Technologies: DOE-Funded Technology Development & Innovation Projects". View the recording here.

The Bureau of Ocean Energy Management (BOEM) recently held a webinar entitled, "Investigate Your Ocean Neighborhood with OceanReports". View the recording here.

Funding/Testing Opportunities

Interreg North-West Europe's Ocean DEMO (Demonstration Programme for Ocean Energy Pilot Farms and Supporting Technologies) project has opened its 3rd Call for Applications. Successful applicants will receive free access to test their ocean energy products and services in real sea environments at the project's network of test centers. Applications are due by 18 September 2020 at 7:00pm CEST (5:00pm UTC). An informational webinar is now available.

The Offshore Wind Growth Partnership (OWGP) has issued two calls to enable diversification, improve competitiveness, and drive innovation across the UK offshore wind supply chain. The Cross-Sector Support Call closes 18 September 2020 at 5:00pm BST (4:00pm UTC).

The Swedish Energy Agency recently opened a call for the development of cost-effective and sustainable marine energy systems. The call is open for project proposals related to generation, reliability and survivability, environmental impact, operational and maintenance strategies, and testing and demonstration. Applications are due 21 September 2020.

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 Interreg Atlantic Area funded [PORTOS (Ports Towards Energy Self-Sufficiency) Project](#), which aims to promote the implementation of wave, tidal, and wind energy at Atlantic Area ports, has opened its 2nd call for renewable energy device testing. Applications are due by 2 October 2020.

Upcoming Events

Upcoming Workshops

The Triton Field Trials Team will be hosting a [virtual workshop](#) from 4:00-8:00pm UTC on 12 October 2020 as part of the [Global OCEANS 2020 Conference & Exhibition](#). The goal of the workshop is to engage with MRE stakeholders, focusing on regulators, legislators, and developers, to gather information toward creating MRE environmental monitoring guidelines. Register [here](#).

The Responsible Offshore Development Alliance, National Marine Fisheries Service, and BOEM are convening a virtual workshop, [State of the Science: Fisheries and Offshore Wind Interactions](#), on 15, 16, and 30 October 2020. The workshop will engage key experts, including fishermen, fishing industry and agency representatives, wind energy developers, relevant fisheries managers, and expert scientists and academics to build and refine a regional fisheries and offshore science agenda, including through the Responsible Offshore Science Alliance. Sign up to receive more information [here](#).

Upcoming Webinars

BOEM is pleased to present the [West Coast Renewable Energy Science Exchange](#), a series of webinars about scientific research off the U.S. West Coast. The sixth webinar in the series will be held on 9 September 2020 at 10:00am PT (5:00pm UTC) and will provide an overview of BOEM-funded research about benthic habitats and geohazards on the West Coast.

NREL and Defenders of Wildlife are hosting a free, nine-part webinar series, *Wildlife & Wind Energy Webinar Series: Considerations for monitoring and managing impacts*, through mid-November 2020. Register for the third webinar in the series, "Grouse - Considerations for developing wind energy in grouse habitat", on 16 September 2020 at 11:00am PDT (6:00pm UTC) [here](#). 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*.

Upcoming Conferences

Island Innovation's [Virtual Island Summit](#), an event designed to connect global islands to share their common experiences, will be held online from 7-13 September 2020. Register for free [here](#).

The American Wind Energy Association's [Wind Project Siting and Environmental Compliance Virtual Summit](#) will be held online from 30 September to 2 October 2020. Register [here](#).

New Documents on *Tethys*

Marine Renewable Energy

[Succession in epibenthic communities on artificial reefs associated with marine renewable energy facilities within a tide-swept environment](#) – Taormina et al. 2020

Although colonization of artificial structures by epibenthic communities is well-documented overall, our understanding of colonization processes is largely limited to low-energy environments. In this study, we monitored epibenthic colonization of different structures associated with a tidal energy test site located in a high-energy hydrodynamic environment. Using four years of image-based underwater surveys, we characterized changes through space and time in the taxonomic composition of epibenthic assemblages colonizing two kinds of artificial structures, as well as the surrounding natural habitat.

[Integrating Hydroacoustic Approaches to Predict Fish Interactions with In-stream Tidal Turbines](#) – Viehman et al. 2020

A key challenge facing the global marine renewable energy sector is the ability to effectively answer the critical question of the safety of in-steam tidal energy turbines for fish, a key component of the marine environment. The Fundy Ocean Research Center for Energy (FORCE) and its partners have been using hydroacoustics to collect information on fish use of the Minas Passage. Two data collection methods have been used: downward-looking, mobile surveys, and upward-looking, stationary surveys. The goal of this project was to use each of these two complementary methods to inform our understanding of the results from the other.

[Application of the actuator disc theory of Delft3D-FLOW to model far-field hydrodynamic impacts of tidal turbines](#) – Ramos et al. 2019

Accurate knowledge of tidal turbine impacts on the far-field hydrodynamic conditions, which extend from 3 to 20 diameters downstream the turbine, is essential for the estimation of tidal resource, farm layout design and environmental impact. For this purpose, tidal turbine operation is modelled within coastal models, as enhanced bottom friction, or momentum sinks. In Delft3D-FLOW, a state-of-the-art coastal model, turbine operation is usually represented via momentum losses, using the Porous Plate tool. However, the Porous Plate tool presents significant limitations to accurately represent energy extraction and geometry of tidal turbines.

Wind Energy

[IEA Wind White Paper on A Risk-Based Approach for Addressing Wind and Wildlife Interactions Using Ecosystem-Based Management Values](#) – **Copping et al. 2020**

> This paper explores the use of ecological risk-based management (RBM) in wind energy development for land-based and offshore wind installations. The application of risk as a development and management tool is addressed, including multiple aspects of project risk, many of which are driven by or associated with ecological risk. The nature of how risk is taken into account in consenting/permitting wind projects on land and at sea are reviewed, and a series of risk management tools and approaches surveyed. This paper also explores the adaptation of ecosystem-based management to wind energy development through a series of case studies, and sets forth a framework and best management practices for applying risk-based principles to wind energy.

[An evaluation of bird and bat mortality at wind turbines in the Northeastern United States](#) – **Choi et al. 2020**

> Researchers and managers have made major efforts to chronicle bird and bat mortality associated with wind facilities, but few studies have examined the patterns and underlying mechanisms of spatial patterns of fatalities at wind facilities. Understanding the horizontal fall distance between a carcass and the nearest turbine pole is important in designing effective search protocols and estimating total mortality. We explored patterns in taxonomic composition and fall distance of bird and bat carcasses at wind facilities in the Northeastern United States using publicly available data and data submitted to the US Fish and Wildlife Service under scientific collecting and special purpose utility permits for collection and study of migratory birds.

[How to model social-ecological systems? – A case study on the effects of a future offshore wind farm on the local society and ecosystem, and whether social compensation matters](#) – **Haraldsson et al. 2020**

> Models of social-ecological systems (SES) are acknowledged as an important tool to understand human-nature relations. However, many SES models fail to integrate adequate information from both the human and ecological subsystems. With an example model of a future Offshore Wind Farm development and its effects on both the ecosystem and local human population, we illustrate a method facilitating a "balanced" SES model, in terms of including information from both subsystems. We use qualitative mathematical modeling, which allows to quickly analyze the structure and dynamics of a system without including quantitative data, and therefore to compare alternative system structures based on different understandings of how the system works.

News & Press Releases

Marine Renewable Energy

[BigMoon clinches Canadian tidal slot](#) – **reNEWS**

BigMoon Power has been awarded its second contract with the Canadian province of Nova Scotia, which will see it provide 4MW of tidal energy, after an open competition. The license and power purchase agreement will also give BigMoon a berth at FORCE in Nova Scotia and will pay it CAD$475/MWh. As part of the award, BigMoon is responsible to remove a turbine abandoned at FORCE Berth D after OpenHydro and Cape Sharp Tidal Ventures went out of business. BigMoon was required to put security in place to guarantee the turbine's removal. The company says that after 3 successful years of prototype testing in the Bay of Fundy it is now ready to install its first grid-connected commercial unit in the next 6 months.

[PB3 PowerBuoy® Achieves New Operational Milestone](#) – **Ocean Power Technologies (OPT)**

The PB3 PowerBuoy® operating in the Adriatic Sea has surpassed 600 days of continuous operation for Eni's Phase 1 resident autonomous underwater vehicle (AUV) project. Initially leased by Eni, one of the world's largest energy companies, in 2018 for an 18-month mission to convert wave energy into electricity for powering underwater vehicles, the PB3 PowerBuoy® lease was extended in March 2020 for an additional 18 months. To date, this PB3 PowerBuoy® has produced more than 2.7 MWh since it was deployed. The power takeoff – OPT's patented wave energy conversion system that converts ocean wave motion into rotary motion to drive a generator – has made more than 3.5 million cycles.

[Sabella set to deploy D10 tidal device off France](#) – **Offshore Energy**

French marine energy developer Sabella will deploy its D10-1000 tidal turbine next week in the Fromveur Passage off Brittany's shore and connect it to Ushant Island grid. This is a further step in the demonstration of the French turbine, which will allow the continuation of learning and knowledge acquisition. Sabella's D10-1000 turbine was the first device of its kind to be connected to the French grid. The D10 tidal turbine will run until 2021, after which the commissioning of the PHARES project, led by AKUO Energy, including two Sabella tidal turbines, an onshore wind turbine, solar energy and energy storage will be installed.

[Successful offshore operation for ADCP installation on Paimpol-Bréhat tidal test site, under the watchful eyes of dolphins!](#) – **Tidal Stream Industry Energiser (TIGER)**

TIGER partners SEENEOH and Bretagne Développement Innovation recently launched a current and acoustic measurement campaign at the Paimpol-Bréhat tidal test site as part of their role in the TIGER project. The teams launched two acoustic doppler current profiler's (ADCP) and acoustic recorders, which will collect data over a period of two months. The information gathered will be used to validate the power curve of the 1 MW

HYDROQUEST turbine which is submerged and connected to the public electricity distribution network in Bretagne. The data will also be valuable to gain a better understanding of the environmental parameters and the energy resource of this test site for future tidal technology developers looking to deploy at Paimpol-Bréhat.

[Faroe Islands project update](#) – **PR Newswire**

Minesto recently announced that the company plans to continue commissioning activities in its tidal energy project in Vestmannasund, Faroe Islands in mid-October. Dr Martin Edlund, CEO of Minesto said, "We have generated valuable flight data and control system data, and we have verified the chain of electricity distribution to shore. The marine operations, with towing and installation, went as planned which is also very good." Minesto has also verified the area for the first proposed array installation of its tidal kite technology in the Faroe Islands.

Wind Energy

[ORE Catapult and Advance Northumberland to Develop New Prototype Turbine Test Facility](#) – **ORE Catapult**

The Offshore Renewable Energy (ORE) Catapult and Advance Northumberland are working in partnership to develop a new facility for testing the next generation of advanced offshore wind turbines, in a move designed to attract inward investment into the County linked with the rapidly expanding offshore renewable energy sector. The Energy Central Offshore Wind Demonstrator project is being proposed in addition to Energy Central's £30m Energy Park that is already under development. The site will be designed to host one large prototype turbine for testing at a time, in an easily accessible location, hoping to attract the sector's leading equipment manufacturers to test innovations at the component level.

[Community wind set to combat Europe's permit crisis](#) – **Reuters Events**

The financial closure of Europe's largest community wind farm shows how local stakeholders can expedite permitting and lure investors, project partners told Reuters Events. In June, a Dutch cooperative of 200 local farmers, residents and investors, closed the financing and turbine supply contracts for the 322 MW Zeewolde wind repowering project near Amsterdam. Due online in 2021-2022, Zeewolde will be the largest onshore wind farm in the Netherlands and the largest community-owned wind farm in Europe. Denmark's Vestas will replace 220 turbines at the site with 83 larger turbines of capacity 2 MW and 4 MW, tripling the energy output.

[£500k to support sustainable offshore wind development in Scotland](#) – **Crown Estate Scotland**

Crown Estate Scotland recently announced £0.5m for the sustainable development of offshore wind in Scotland, helping work towards meeting net zero targets. Earlier this

year, Crown Estate Scotland launched ScotWind Leasing, the first offshore wind leasing round in Scottish waters for a decade, designed to deliver a multi-billion-pound investment opportunity as part of Scotland's green recovery. The funds comprise £300k for Scottish Offshore Wind Energy Council (SOWEC) projects and £200k for environmental research. Specifically, Crown Estate Scotland is co-funding five research projects with Marine Scotland to better our understanding of the potential environmental impacts of offshore wind projects on birds and marine mammals.

[Total and Macquarie Partner to Develop 2GW Floating Offshore Wind Portfolio in South Korea](#) – **Total**

Total and Macquarie's Green Investment Group (GIG) have concluded a 50/50 partnership to develop a portfolio of 5 large floating offshore wind projects in South Korea with a potential cumulated capacity of more than 2 gigawatts (GW). Located off the Eastern and Southern coasts of the country (Ulsan and South Jeolla Provinces), the projects have commenced on-site comprehensive wind data collection campaign. The partners aim to launch construction of the first project of around 500 megawatts by end 2023. With the announcement of the "Green New Deal" plan last July 14th, South Korea has re-affirmed its strong ambitions to develop renewable energies which shall reach at least 20% of the power mix by 2030, including 12 GW of offshore wind capacities.

[New Open-Source Modeling Tool Enables Design of Large, Flexible Wind Turbines](#) – **National Renewable Energy Laboratory (NREL)**

As wind turbines continue to increase in size, turbine designers need modeling tools that can provide accurate representations of the forces acting on larger turbine blades that cause them to flex and bend as they rotate. NREL recently released cOnvecting LAgrangian Filaments (OLAF), a new wake module included in NREL's OpenFAST wind turbine simulation tool. OLAF models the turbine wake using particles connected via filaments and is programmed to generate realistic representations of the wakes of large, flexible turbine blades, providing users an alternative to traditional aerodynamic models.