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[Tethys](#) is an online knowledge base that facilitates the exchange and dissemination of information on the environmental effects of wind and marine energy. 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 marine energy communities, please send it to tethys@pnnl.gov for consideration.

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Announcements

DOE Request for Information

The United States (US) Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy recently released a [Request for Information](#) to understand the current barriers and actions needed to make its funding opportunities and innovation and entrepreneurship activities more inclusive, just, and equitable. Responses are due by 5:00pm EDT (9:00pm UTC) on 6 August 2021.

NYSERDA State of the Science Final Workgroup Reports Now Available

To improve understanding of cumulative biological impacts from offshore wind development, the New York State Energy Research and Development Authority (NYSERDA) convened seven topical [State of the Science](#) workgroups in November 2020 focused on [marine mammals](#), [sea turtles](#), [birds](#), [bats](#), [fishes and mobile invertebrates](#), [benthos](#), and [environmental change](#). The goal for the workgroups was to identify a list of priority studies that could be implemented in the next five years to position the stakeholder community to better understand cumulative impacts as the offshore wind industry develops in the eastern U.S. The final reports are now available on *Tethys* at the links above, and a recording of the culmination webinar is available [here](#).

Calls for Abstracts

The American Geophysical Union (AGU) is accepting abstracts for the [AGU Fall Meeting 2021](#), which will take place online and in New Orleans, Louisiana (US) on 13-17 December 2021. [Session GC074 - Renewable Energy: Marine and Hydrokinetic](#) and [Session GC076 - Renewable Energy: Wind](#) will focus on the science, technology, and policy issues of marine renewable and wind energy resources, technologies, and impacts, respectively. Abstracts due by 4 August 2021.

The European Energy Research Alliance (EERA) Joint Programme (JP) on Wind Energy and the SETWind project are now accepting abstracts for the [EERA JP Wind & SETWind Annual Event 2021](#). The hybrid event will take place online and in Amsterdam, Netherlands on 20-24 September 2021. Abstracts due by 8 August 2021.

The Marine Technology Society and Oceanic Engineering Society are now accepting abstracts for [OCEANS 2022 Chennai](#). The conference and exposition will take place in Chennai, India on 21-24 February 2022. Abstracts due by 15 August 2021.

Funding & Testing Opportunities

The Offshore Renewable Energy (ORE) Catapult's Marine Energy Engineering Centre of Excellence (MEECE) has launched an [Innovation Challenge](#) to support United Kingdom (UK)-based applicants developing monitoring methodologies for tracking underwater species behavior in and around tidal stream turbines. Applications are due 11 August 2021.

The US DOE has issued a Funding Opportunity Announcement (FOA) titled "[Advancing Wave Energy Technologies through Open Water Testing at PacWave](#)" to support research and development at PacWave South and advance wave energy technologies toward commercial viability. Concept papers are due 13 August 2021 and full applications are due 5 October 2021. View the FOA for more details [here](#).

Innovate UK has launched another round of [Smart Grants](#) for eligible UK organizations to apply for a share of up to £25 million for game-changing and commercially viable research and development innovation. Applications are due by 10:00am UTC on 25 August 2021.

The Oceanic Platform of the Canary Islands (PLOCAN) has opened its [Summer Access Call for 2021](#). Applicants interested in accessing PLOCAN facilities and services are encouraged to contact PLOCAN before submitting their proposal. Applications due 20 September 2021.

Student & Employment Opportunities

The Environmental Research Institute (ERI), part of North Highland College, are now seeking to recruit a dynamic [Researcher](#) to support their ecology work within the [ROBINSON project](#) and to expand their portfolio of ornithology-related research. The project is developing an integrated energy system to help decarbonise industrialised islands, and part of ERI's contribution is to evaluate its ecological effects. Applications are due by 28 July 2021.

The University of the Highlands and Islands, Scotland, are seeking an [Energy Knowledge Exchange Coordinator](#) to be the primary university interface into the energy business community enabling collaborative research projects. Applications are due by 30 July 2021.

Upcoming Events

Upcoming Course

In collaboration with MaRINET2, EMEC, WavEC Offshore Renewables, and the Marine Engineering Institute – Italian National Research Council, are organizing an online course entitled “[Methods and environmental data collection in Marine Renewable Energy sites](#)” on 30 July and 3 September 2021. Register for free [here](#).

Upcoming Symposium

The Royal Academy of Engineers’ Frontiers program is hosting a virtual symposium, “[From seeds to needs: Regenerating ecosystems services to halt the biodiversity crisis](#)”, from 27 September to 8 October 2021. The event will bring together early- and mid-career researchers, innovators, and practitioners to scope out the challenges that would most benefit from engineering solutions, with a focus on marine, freshwater, and terrestrial themes. Register [here](#).

Upcoming Webinars

As part of its *Learning from the Experts* series, NYSERDA is hosting a webinar, “Offshore Wind Stakeholder Engagement”, at 1:00pm EDT (5:00pm UTC) on 28 July 2021. During the webinar, Kris Ohleth with the Special Initiative on Offshore Wind will provide an overview of the roles of federal, state, and private entities in offshore wind stakeholder engagement and compare successful engagement approaches. Register [here](#).

As part of its *R&D Deep Dive Webinar Series*, the US DOE Water Power Technologies Office is hosting a webinar, “Contributing Data and Information to PRIMRE”, at 3:00pm EDT (7:00pm UTC) on 28 July 2021. This webinar will provide a brief introduction to [PRIMRE](#) (Portal and Repository for Information on Marine Renewable Energy), WPTO’s centralized system for storing, curating, and disseminating data and information for all aspects of marine energy, and then focus on how you can contribute your data to the various knowledge hubs that make up PRIMRE, including the *MHK Data Repository*, *Tethys*, and *MRE Software*. Register [here](#).

Upcoming Conferences

The Supergen programme is hosting the [Supergen Net Zero Conference](#) online on 1-3 September 2021. Register for free [here](#).

American Clean Power is hosting the [Offshore WINDPOWER 2021 Conference & Exhibition](#) on 13-15 October 2021 in Boston, Massachusetts (US). Register [here](#).

New Documents on *Tethys*

Marine Energy

[Water quality modeling in subtropical shallow waters to predict environmental impacts of ocean thermal energy conversion](#) – Oshimi et al. 2021

Year-round generation of electricity by an ocean thermal energy conversion (OTEC) plant requires that it be installed in tropical and subtropical regions, where the surface water has a high temperature and low nutrient content. However, the water discharged from an OTEC plant will have the opposite characteristics of low water temperature and high nutrients, as well as a low pH. One of the most concerning environmental impacts of this discharged water is its influence on corals, which are important species in tropical and subtropical marine ecosystems. In this study, we developed an ecosystem model for a subtropical shallow-water region; the model combines a pelagic submodel, a chemical equilibrium submodel, and a benthic submodel, and successfully reproduces the observed variation in pH.

[Unbalanced sediment transport by tidal power generation in Lake Sihwa](#) – Kim et al. 2021

An in-situ observational study was conducted to understand the sediment transport processes disturbed by the flood generation type of Sihwa tidal power plant (TPP). A surface mooring was deployed in Lake Sihwa (inside of TPP) to collect time-series data of the current velocity and suspended sediment concentration (SSC). A TPP with a capacity of 254 MW has four sequential phases (power generation–standby–drain–standby) of operation. The SSC during power generation was one order of magnitude higher than that during drain, which led to heavily unbalanced sediment fluxes. The total residual sediment flux was always negative (into the lake), which was attributed to the mean advection processes associated with the discharge.

[Interdisciplinary Research Collaborative Trains Students to See Through Turbulent Systems](#) – Cammen et al. 2021

Despite the availability of interdisciplinary academic training programs, the practice of environmental science is often hampered by a lack of convergence across diverse disciplines. In response, we developed and implemented a training, research, and communication framework to provide undergraduates with an authentic operative experience working at the interface of interdisciplinary science and public decision-making within a case study of marine renewable energy. Application of this framework demonstrates that the process of integrating data from biological (visual and acoustic monitoring of fish and marine mammals), physical (hydrodynamics), and social (local ecological knowledge) sciences can provide a more complete understanding of complex and turbulent ecosystems for better informed decision-making.

Wind Energy

[Life-cycle impacts of wind energy development on bird diversity in Norway](#) – May et al. 2021

While wind energy remains a preferred source of renewable energy, understanding the full spectrum of impacts are vital to balance climate-related benefits against their costs to biodiversity. Environmental impact assessments often fail to assess cumulative effects at larger spatial scales. In this respect, life cycle assessments are better suited, but have to date mainly focused on greenhouse gas emissions and energy accounting. Here, we adapt a recent global life-cycle impact assessment (LCA) methodology to evaluate collision, disturbance and habitat loss impacts of onshore wind energy development on bird species richness in Norway. The advantage of a local model for Norway is that it enables employing species distribution models to more accurately estimate the potential distribution area of species.

[Modeling Small Scale Impacts of Multi-Purpose Platforms: An Ecosystem Approach](#) – Serpetti et al. 2021

With the constant expansion of aquaculture production, it is expected that farms might be established further offshore in more remote areas, as high-energy conditions offer an opportunity to generate more power locally using Marine Renewable Energy (MRE) devices. A proposed solution is the co-location of MRE devices and aquaculture systems using Multi-Purpose Platforms (MPPs) comprising offshore wind turbines that will provide energy for farm operations as well as potentially shelter the farm. Disentangling the impacts, conflicts and synergies of MPP elements on the surrounding marine ecosystem is challenging. Here we created a high-resolution spatiotemporal Ecospace model of the West of Scotland, in order to assess impacts of a simple MPP configuration on the surrounding ecosystem and how these impacts can cascade through the food web.

[Vibrational noise from wind energy-turbines negatively impacts earthworm abundance](#) – Velilla et al. 2021

Wind energy turbines are a fast-growing potential source of anthropogenic vibrational noise that can affect soil animals sensitive to vibrations and thereby alter soil community functioning. Larger soil animals, such as earthworms (macrofauna, > 1 cm in size), are particularly likely to be impacted by the low-frequency turbine waves that can travel through soils over large distances. Here we examine the effect of wind turbine-induced vibrational noise on the abundance of soil animals. We measured vibrational noise generated by seven different turbines located in organically-farmed crop fields in the Netherlands. Vibratory noise levels dropped by an average of 23 ± 7 dB over a distance of 200 m away from the wind turbines. Earthworm abundance showed a strong decrease with increasing vibratory noise.

News & Press Releases

Marine Energy

Seven Innovative Water Power Technologies Selected for Research and Development Funding – US DOE

The US DOE announced funding for continuing research and development projects in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) program, including \$8.1 million for seven hydropower and marine energy projects. The Water Power Technologies Office, within the Office of Energy Efficiency and Renewable Energy, selected these small businesses—from California, Washington, Utah, Massachusetts, and New York—to advance to Phase II of the SBIR/STTR program based on their progress during Phase I and their potential to accelerate marine energy and hydropower technologies. The seven selected small business-led projects will each receive Phase II grants ranging from \$1.1-1.5 million to explore the technical feasibility of innovative solutions in hydropower and marine energy.

EMEC Prepare for Summer Acoustic Monitoring Programme – EMEC

The European Marine Energy Centre (EMEC) has designed a programme of acoustic surveys to determine the potential impact that marine renewable developments may have on local species and habitats. This summer, EMEC will deploy a series of acoustic surveys designed to monitor noise levels of marine energy technologies at its ocean energy test sites in Orkney, Scotland. The acoustic survey programme will attempt to monitor wave energy converters demonstrated by Mocean Energy and AWS Ocean Energy at EMEC's Scapa Flow scale wave energy test site, via the European Maritime and Fisheries Fund SEA Wave project, and tidal energy technologies demonstrated by Orbital Marine Power and Magallanes Renovables at EMEC's Fall of Warness tidal energy site, funded by Horizon 2020 projects, FloTEC and MaRINET2.

ESA - DMEC Marine Energy Tender: 3 studies under implementation – DMEC

Following the closure of the Marine Energy Tender issued by European Space Agency (ESA) in cooperation with Dutch Marine Energy Centre (DMEC), three studies are under implementation and respectively led by Wave for Energy, Dublin Offshore Consultants Ltd and Mindseed Limited. The three teams are working on feasibility studies in the field of space technology and data to accelerate the roll-out of marine energy. The feasibility studies will eventually establish a roadmap towards demonstration projects that would start in 2022. The Marine Energy Tender is part of the cooperation between DMEC and ESA Space Solutions and gives an opportunity for space companies and marine energy developers to work together on the commercial and technical development of innovative space-based solutions addressing the marine energy sector.

[A first data acquisition at sea for SafeWAVE with RTSYS – SEM-REV](#)

Last June, as part of the SafeWAVE project, an offshore operation was conducted at SEM-REV with the project partner RTSYS, with the objective of collecting data near the WAVEGEM wave platform. The objective of the SafeWAVE project is to remove some non-technological barriers that could limit the development of ocean energy. Several tests are being carried out on different marine renewable energy demonstrators deployed in European countries. These tests aim to improve our understanding of the effects of these structures in their environment and to develop solutions to remedy any negative effects. Since 2019, the SEM-REV has been hosting GEPS Techno's prototype, WAVEGEM, a hybrid platform for wave energy recovery. The environmental monitoring operations of the SafeWAVE project are conducted around this platform.

[Wavepiston acs FATs for power generation and desalination units – Wavepiston](#)

Danish wave energy company Wavepiston has completed the factory acceptance test (FAT) for its wave energy power generation and desalination units that will be deployed off Canary Islands. Steen Grønkjær Thomsen, Wavepiston's chief technology officer, said: "We have reached a milestone since the large amount of our budget is dedicated to developing power generation and reverse osmosis units. The result of the test was very positive. We connected the power generation unit to the public grid at Horsens, passing on the energy we produced to the public consumers". Thomsen added the next step will be to ship the system to Gran Canaria, where it will be installed at the Oceanic Platform of the Canary Islands (PLOCAN) test site.

Wind Energy

[ScotWind secures major interest in Scotland's offshore wind potential](#) – Crown Estate Scotland

Launched in June 2020, Scotwind Leasing has the potential to deliver enough green electricity to power every home in Scotland and help the country take a major stride towards net zero. It is also set to deliver major investment into Scotland's economy. Crown Estate Scotland recently confirmed that 74 applications have been received from developers looking for the rights to build projects across the 15 areas of seabed available for development through the Scottish Government's Sectoral Marine Plan for Offshore Wind Energy. Also confirmed is the timeline for next steps. This includes a target of making initial offers for the first option agreements to successful applicants in January 2022, with those agreements then finalised following that.

[Are Wind Turbines a Danger to Wildlife? Ask the Dogs.](#) – The Atlantic

As turbines proliferate across the country, understanding their effect on wildlife is more important than ever. In the early days of turbines, scientists had focused on the danger they posed to eagles and other raptors—but it turns out those big bird carcasses were simply the easiest for humans to spot. "Truth was, people are terrible at finding bats and

small birds,” says K. Shawn Smallwood, a biologist who has worked on wind farms in California. Smallwood told me he was initially skeptical of using dogs to monitor turbine fatalities, but the data simply blew him away. In one study he conducted, dogs found 96 percent of dead bats, whereas humans found just 6 percent. Biologists have long worked with scent-detection dogs to track animals including turtles and grizzly bears. Now wind farms provide the dogs and their handlers with steady and more predictable work.

Siemens Gamesa puts decarbonization, recyclability and technological education at heart of ambitious new sustainability strategy – Siemens Gamesa

Siemens Gamesa strives to operate as an environmentally sustainable and responsible business to better serve all its stakeholders, from investors to customers and communities. The company has raised the bar, recently launching an ambitious Sustainability Vision towards 2040 to ensure its contribution has the most significant impact on the future. Among the numerous projects and initiatives, the plan outlines a way to help achieve a decarbonized economy with the goal of reaching net-zero emissions by 2040, including emissions produced by the company’s whole value chain. Previously, the net-zero target was 2050. The company also announced an ambitious goal to redesign all its turbines to ensure a 100% recyclable turbine marketed by 2040 and fully recyclable blades by 2030.

Big-scale floating wind is kicking off in France – WindEurope

France has closed the world’s first-ever auction for a commercial-sized floating offshore wind farm. The future wind farm will be located in the Atlantic Ocean south of Brittany and will have a capacity of 250MW. France will then auction two other floating projects of a similar size over the next year. These will be in the in the Mediterranean Sea which also has good conditions for floating wind. This auction is a big step in the upscaling and commercialisation of floating wind technology. Commercialisation will bring down costs for floating wind as it has done for other technologies. The auction has a cap price of €120/MWh and the winning price is expected to be under €100/MWh – much lower than previous test projects for floating offshore wind.

Wind Turbine Blades Get Recycled Into Auto Parts and Sports Gear – Bloomberg Green

A quarter of a billion revolutions made through gale-force winds to scorching sunshine have left their mark on the turbine blades of the 24 year-old Paderborn wind farm on a hillside in Germany. Its end-of-life phase is approaching. When the wind farm is dismantled, the blades may end up in landfill or as feedstock for cement making, but a more innovative and sustainable reincarnation could see them instead recycled into material for automotive parts, skis or even shower trays. Early-stage ventures from Tennessee in the U.S. to Cambridge in the U.K. are researching ways to use heat and nanoparticles to improve the economics of recycling fibers from wind turbine blades. Yet costs must come down for recycling to be a feasible option for the industry. At the same time, the opportunity for recyclers is about to get very big.