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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

MHK Graduate Student Research Program

The US Department of Energy (DOE) Water Power Technologies Office is now accepting applications for the [Marine and Hydrokinetic \(MHK\) Graduate Student Research Program](#). The program is open to doctoral students at US institutions and is designed to advance their research by providing expertise, resources, and capabilities. Applications are due 10 December 2021.

BOEM Seeking Comments

The US Bureau of Ocean Energy Management (BOEM) is [accepting public comments](#) to inform the preparation of an Environmental Impact Statement for the Atlantic Shores Offshore Wind projects offshore New Jersey through 1 November 2021.

Call for Contributions

The Joint Nature Conservation Committee is collecting information for the second version of the [Offshore Wind Environmental Evidence Register](#), a register of all environmental evidence gaps and current research projects relating to offshore wind in the UK, until 1 November 2021.

Calls for Abstracts

The Call for Abstracts for the [WindEurope Annual Event 2022](#) is now open through 31 October 2021. The event will take place in Bilbao, Spain on 5-7 April 2022.

The [Call for Student Research Posters & Videos](#) for the [Marine Renewables Canada 2021 Annual Conference](#) has been extended to 1 November 2021. Marine Renewables Canada 2021 will take place in Halifax, Nova Scotia on 24-25 November 2021.

The Call for Abstracts for the [Floating Wind Solutions Conference & Exhibition \(FWS 2022\)](#) will close on 1 November 2021. FWS 2022 will take place in Houston, US on 1-3 March 2022.

The Call for Abstracts for the [6th International Conference on Wind Energy and Wildlife Impacts \(CWW 2022\)](#) will close on 11 November 2021. CWW 2022 will take place in Egmond aan Zee, Netherlands on 4-8 April 2022. Early bird registration is now open until 31 January 2022.

Funding & Testing Opportunities

Bat Conservation International has launched a Request for Proposals for the [Student Research Scholarship for Global Bat Conservation Priorities](#), which aims to provide financial support to graduate student researchers for bat conservation research. Proposals are due 31 October 2021.

The US DOE has announced a plan to provide \$37 million for small businesses pursuing climate and energy R&D projects through its Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Letters of intent for the [SBIR/STTR Phase 2 Release 1 FOA](#) are due by 5:00pm EST (10:00pm UTC) on 9 November 2021.

The US DOE's National Renewable Energy Laboratory has opened a [Request for Proposals](#) to support research into behavior of bats at wind turbines and responses by bats to deterrent stimuli. Goals for awarded projects include understanding bat-turbine interactions to help minimize collisions and improving deterrent effectiveness. Awardees will receive \$450k to \$700k each to fund the research. Applications are due 8 December 2021.

The US California Energy Commission recently released a Grant Funding Opportunity titled, "[Propelling Offshore Wind Energy Research](#)", which will fund R&D projects to demonstrate, test, and validate innovative floating offshore wind components and tools. Applications are due 15 December 2021.

The US Testing Expertise and Access for Marine Energy Research (TEAMER) Program is now offering limited [open water support for marine energy testing](#) through its facility network. Applications for the next TEAMER Request for Technical Support are due 16 December 2021.

The European Maritime, Fisheries and Aquaculture Fund has launched a Call for Proposals to support strategic collaboration in the Atlantic, Black Sea, and Western Mediterranean. Proposals for Topic 1, "[Innovative multi-use projects combining offshore renewable energy with other activities and/or with nature protection in the Atlantic](#)", are due 12 January 2022.

Student & Employment Opportunities

The Pacific Marine Energy Center at Oregon State University is recruiting a [Post-Doctoral Scholar](#) to support its cutting-edge wave and offshore wind renewable energy research, development, and testing programs. Applications are due 1 November 2021.

The University of Plymouth is seeking an [ORE Integration Research Fellow](#) to investigate the integration of offshore renewable energy (ORE) using hydrogen and comparative analysis of the socioeconomic and environmental aspects. Applications are due 21 November 2021.

The Environmental Research Institute at the University of the Highlands and Islands (UK) are recruiting for a [Research Fellow - Offshore Renewable Energy and the Environment](#) to work with Ørsted to design novel environmental and ecological monitoring techniques and next-generation oceanographic measurement platforms. Applications are due 22 November 2021.

Upcoming Events

Upcoming Workshops

The University Marine Energy Research Community ([UMERC](#)), a new initiative funded by the US DOE and administered by the Pacific Ocean Energy Trust, is hosting a [Workshop Series](#) to engage with the community and develop a Research Landscape. The first workshop will take place on 3 November 2021 from 9:00-11:00am PDT (4:00-6:00pm UTC). Register [here](#).

The SEAWave (Strategic Environmental Assessment of Wave Energy Technologies) project is hosting a final knowledge sharing workshop on 2 December 2021 from 2:00-4:30pm GMT. The workshop will focus on challenges in environmental monitoring campaigns for deployed marine energy technologies. Please contact ORJIP@aquatera.co.uk for more information.

Upcoming Webinars

Interreg North-West Europe's Ocean Power Innovation Network is hosting a webinar titled, "[How internationalisation can support collaborative innovation](#)", on 5 November 2021. The webinar will present PLOCAN's (The Oceanic Platform of the Canary Islands) experience on how international collaboration has supported projects. More information coming soon.

The American Wind Wildlife Institute is hosting a webinar titled, "[Minimizing Collision Impacts for Bats at Operational Wind Facilities, Part 2: Deterrence](#)", from 12:30-2:00pm EST (5:30-7:00pm UTC) on 9 November 2021. Register [here](#).

The International Energy Agency (IEA) Technology Collaboration Programme on Ocean Energy Systems (OES) is hosting a webinar at 9:00am UTC on 10 November 2021. The webinar is the third in a series focused on IEA-OES Member Countries and will provide an outlook on the latest initiatives and projects in China, Japan, and Australia. Register [here](#).

Upcoming Conferences

The Leibniz Institute for Zoo and Wildlife Research is hosting the [1st International Bat Research Online Symposium: Towards solving the wind energy-bat conflict](#) on 2 November 2021. Register [here](#) by 31 October 2021.

The National Offshore Wind Research & Development Consortium is hosting the [National Offshore Wind R&D Symposium 2021](#) online on 8-10 November 2021. Register for free [here](#).

The [VII Marine Energy Conference](#), which focuses on innovations in offshore renewable energies in the Basque Country, will take place on 9 November 2021 in Bilbao, Spain.

The American Geophysical Union (AGU) is hosting the [AGU Fall Meeting 2021](#) online and in New Orleans, US on 13-17 December 2021. Early bird registration ends 3 November 2021.

Event Update

The [2022 Ocean Sciences Meeting](#), originally scheduled as a hybrid event, will now take place fully virtually between 27 February and 4 March 2022. Registration will open in December.

New Documents on *Tethys*

Marine Energy

[Environmental Impacts of Tidal and Wave Energy Converters](#) – Hutchison et al. 2021

Understanding the complexity of environmental impacts of tidal and wave energy converters (TECs, WECs) still presents a major challenge to the expansion of the marine renewable energy (MRE) industry, particularly for new developments. Using the stressor-receptor framework, we broadly introduce the main environmental effects and potential impacts that are considered for TEC and WEC developments. We first provide an overview of the legislation that governs the need to consider the environmental impacts, and the diverse approaches taken to assess them. We then outline potential effects of relevance to the abiotic and biotic environment in the vicinity of TECs and WECs.

[Renewable electricity generation for off grid remote communities; Life Cycle Assessment Study in Alaska, USA](#) – McCallum et al. 2021

Many remote communities are reliant on fossil fuels to produce electricity and/or heat. The environmental impact from these generation systems in remote regions have significant emissions from the transportation of fuel to the generation site and only exacerbate the effects of climate change on these communities. A life cycle assessment for the deployment of a renewable electricity generation device (ORPC, Rivgen®) in Alaska, USA as a case study comparison against the existing diesel electricity generation method was analysed using ReCiPe methodology. The kg CO₂ eq/MWh is shown to

decrease from 1345.45 kg CO₂ eq/MWh with diesel electricity generation to 17.49 kg CO₂ eq/MWh after a 20-year Rivgen® deployment.

Communicating climate change in marine renewable energy – Trueworthy & DuPont 2021

As scholars in the field of marine energy, we often engage with the topic of climate change as a motivation for our work. When we do, we are constructing a relationship between climate change and marine energy. The relationship which we construct impacts our ability to effectively address the crisis. In this paper, we perform a textual analysis of papers from the 13th European Wave and Tidal Energy Conference (2019) to characterize the common construction of climate change among marine renewable energy scholars. We then examine how that construction is reflected in marine renewable energy technological design. We show that marine renewable energy scholars typically engage with climate change in a way which assumes that marine renewable energy is a potential part of a solution by its very nature as a renewable energy source.

Wind Energy

Oceanic records of North American bats and implications for offshore wind energy development in the United States – Solick & Newman 2021

In this review, we synthesize historic and contemporary accounts of bats observed and acoustically recorded in the North American marine environment to ascertain the spatial and temporal distribution of bats flying offshore. We incorporate studies of offshore bats in Europe and of bat behavior at land-based wind energy studies to examine how offshore wind development could impact North American bat populations. We find that most offshore bat records are of long-distance migrating bats and records occur during autumn migration, the period of highest fatality rates for long-distance migrating bats at land-based wind facilities in North America. We summarize evidence that bats may be attracted to offshore turbines, potentially increasing their exposure to risk of collision.

Virtual Forum on Prairie Grouse and Wind Energy: 2021 Synthesis – American Wind Wildlife Institute 2021

In 2020, the American Wind Wildlife Institute, with support from the National Renewable Energy Laboratory and the Department of Energy, facilitated a virtual stakeholder forum on prairie grouse and wind energy. This synthesis summarizes priority research needs, challenges, and potential solutions discussed during the forum and through a series of sector-specific (industry, non-governmental organizations, and state and federal agencies) follow up calls in 2021. The synthesis centers on the intersection between wind energy development and conservation of grouse in the grasslands and shrub-steppe of the central and western United States.

Local climatic and environmental effects of an onshore wind farm in North China – Luo et al. 2021

To explore the possible local climatic and environmental impacts of an onshore wind farm in North China, meteorological observation and satellite remote sensing data around the wind farm were collected, and the soil chemical composition within and outside of the wind farm was determined. Our analysis revealed changes in the spatial patterns of wind, air temperature (Ta), ground surface temperature (Ts), land surface temperature (LST), evapotranspiration (ET), and the normalized difference vegetation index (NDVI) from before to after the construction of the wind farm. The two datasets of meteorological observations showed that wind speed decreased after the construction of the wind farm, with one dataset indicating a significant decrease.

News & Press Releases

Marine Energy

[£1.7BN Blue Eden Project Announced for Swansea](#) – Marine Energy Wales

A £1.7 billion project creating thousands of well-paid jobs and placing Wales at the forefront of renewable energy innovation has been announced by an international consortium. The ground-breaking project proposed for Swansea's waterfront will include a newly designed tidal lagoon, featuring state-of-the-art underwater turbines generating 320 megawatts of renewable energy from the 9.5km structure. The lagoon is part of the larger proposed Blue Eden project that's being led by Bridgend-based DST Innovations and a number of business partners, with support from Swansea Council and Associated British Ports. Made possible by funding from the private sector, the innovative and economy-boosting Blue Eden will be delivered in three phases over 12 years.

[Marine Renewables Canada launches education initiative 'Our Current Future'](#) – Marine Renewables Canada

In the lead up to COP26 and in response to the need for more clean electricity to meet net-zero by 2050 targets, Marine Renewables Canada has launched "Our Current Future," an initiative aimed at providing education about renewable energy from tides and rivers. Tidal and river energy technologies offer a clean electricity solution that has been largely untapped. Unlike dams, which span entire waterways and force water through a turbine, tidal and river stream devices use the natural, passive flow of water. The 'Our Current Future' initiative includes a microsite with facts and links to information about tidal and river energy, as well as a newsletter that will allow subscribers to stay up to date on tidal and river energy research, technology, and projects.

[Carnegie Launches MoorPower Project](#) – Carnegie Clean Energy (Carnegie)

Carnegie has been awarded funding and launched of the MoorPower™ Scaled Demonstrator project in conjunction with prominent research institute, the Blue Economy Cooperative Research Centre (Blue Economy CRC). MoorPower™ is a CETO derived wave energy product designed for moored vessels and offers a solution to the challenge

of securing clean and reliable energy for offshore activities, reducing reliance on diesel generation. The initial target market for MoorPower™ is offshore vessels such as feeding barges for the aquaculture sector, but the future market is broader and includes the many other offshore operations that require energy.

Turning the Tide for Renewables in Alaska: NREL Tidal Research Reveals Opportunities for Rebuilding Alaska's Economy with Renewable Energy – NREL

A highly energetic corner of the Pacific Ocean, Cook Inlet holds one of the greatest tidal resources on Earth. All that energy has the potential to reduce Alaska residents' dependence on declining oil and gas production and provide excess renewable energy that could stimulate the Alaskan economy. That is why researchers from the National Renewable Energy Laboratory (NREL) submerged their moorings in Cook Inlet; the data they collected will help identify important details of the opportunities and challenges that come with turning these surging waters into a reliable and renewable power source for Alaskans living on the nearby shore.

Wavepiston's power generation and desalination units arrive to Gran Canaria – Offshore Energy

Danish wave energy company Wavepiston has transported all parts of its wave power generation and desalination units to Gran Canaria where they will be assembled and installed in the following months. Work can now start to get the infrastructure installed and system in the water at the Oceanic Platform of the Canary Islands (PLOCAN) test site in 2022, according to Wavepiston. The company will shortly begin with the assembly of the system, whose parts include pressure pipe, riser hose, riser base, cast iron shells and much more. In parallel with the assembly work, Wavepiston is progressing with the updated design for its energy collectors based on valuable information from the initial pre-installation at the beginning of 2021.

Wind Energy

KOWL: World's largest floating windfarm fully operational – Principle Power

The world's largest floating windfarm is now fully commissioned and delivering green electricity to Scotland's grid. The 50 MW Kincardine Offshore Windfarm is located 15 km off the coast of Aberdeenshire, in water depths ranging from 60 m to 80 m. The project consists of five Vestas V164-9.5 MW and one V80-2 MW turbine, each installed on WindFloat® semi-submersible platforms designed by Principle Power. The Kincardine project was started back in 2014 by Allan MacAskill and Lord Nicol Stephen, now both directors of Flotation Energy plc. In 2016 Cobra Group became the main investor in Kincardine Offshore Windfarm Ltd. (KOWL).

Global leadership grows: Siemens Gamesa solidifies offshore presence in U.S. with Virginia blade facility – Siemens Gamesa

Siemens Gamesa Renewable Energy recently held a launch ceremony with representatives from state and local government authorities and wind industry partners in Virginia for what will be the first offshore wind turbine blade facility in the United States. This is also the first commitment by a global offshore wind turbine manufacturer in a U.S.-based supply chain. Siemens Gamesa will develop more than 80 acres/32 hectares at the Portsmouth Marine Terminal in Portsmouth, Virginia upon execution of a firm order for the 2.6-GW Coastal Virginia Offshore Wind Commercial Project with Dominion Energy. Representing a cost of more than \$200 million dollars, the facility would perform finishing of patented Siemens Gamesa Offshore IntegralBlades.

Wind turbines made with fabric: a new frontier for efficiency and sustainability – Enel Green Power

Enel Green Power has launched a partnership with the startup ACT Blade to develop a new type of innovative wind turbine made of fabric, capable of generating more energy, reducing costs and making it easier to recycle its component materials. ACT Blade specializes in the production of innovative wind turbines covered with a special technical fabric, based on the principles adopted for the sails used by boats competing in the America's Cup. The turbine blades are lighter because they have a slender supporting structure made of composite material that is completely covered with the technical fabric. The new blades with the same weight as conventional ones are longer and therefore ensure an increased production of electricity.

A 300 MW offshore wind farm 'Mar de Ágata' is planned in Levante Almeriense, Spain – BlueFloat Energy

A joint venture between BlueFloat Energy and SENER is developing Mar de Ágata, one of the first floating offshore wind farms in Andalusia, which will be located in the Mediterranean Sea, off the eastern coast of Almería, between the municipalities of Níjar and Carboneras. This wind farm will have an installed capacity of 300 MW (corresponding to 28% of the current electricity consumption in the province of Almería). The wind farm will be equipped with 20 floating offshore wind turbines, 15 MW each. The maximum estimated height of each wind turbine will be 261 meters above sea level, which will be located more than 15 kilometers away from the main viewpoints of Cabo de Gata (La Amatista and La Isleta del Moro).

World's first: RWE builds wind turbines on a sea dike dam in the Netherlands – RWE

The Oostpolderdijk Wind Farm in the Dutch province of Groningen will consist of three turbines. This is the first time that such a project has been undertaken. Due to limited space at the site of the dike a climbing crane is being used to install the top turbine components. In recent years, RWE and Water Board Noorderzijlvest have conducted meticulous research into the construction process and dike safety, as well as the impact of the project on the local environment. The most important aspect of the design has been to guarantee the safety of the dike and its dam function. Wind Farm Oostpolderdijk, with a total installed capacity of 7.5 MW, is expected to be operational by the end of 2021.