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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

Tethys Community

Did you know that the [Tethys Community](#) page lists a diverse group of researchers, developers, regulators, and other stakeholders working in the field of and/or interested in wind and marine energy. The list is defined by registered users within *Tethys* who have given permission to share their professional contact information with other registered users. [Log in](#) or [register for an account](#) to share your profile and stay connected with the wind and marine energy communities!

WREN Horizon Scan

The WREN Environmental [Horizon Scan](#) is live! To participate in the scan and help us assess wind energy and environmental priority issues over the next 5-10 years, please visit <https://forms.gle/G6GRF58NFJSQgPb59>. The scan covers both land-based and offshore wind energy and should take approximately 20-30 minutes to complete. Please complete the scan by 6 May 2021.

New WREN Short Science Summary

WREN recently published a new [Short Science Summary on European Migratory Soaring Birds and Wind Energy Development](#). Check it out on *Tethys* now!

Marine Energy Collegiate Competition

The application period for the U.S. Department of Energy's (DOE's) [2022 Marine Energy Collegiate Competition \(MECC\): Powering the Blue Economy](#) is now open. The MECC encourages multidisciplinary teams of undergraduate and graduate students to unlock the power of the ocean, rivers, and tides to develop, design, and test the technologies that build resilient coastal communities and provide power at sea. Applications will close 7 May 2021. Register [here](#) for the MECC Applicant Webinar at 2:30pm MDT (8:30pm UTC) on 21 April 2021.

Calls for Abstracts

The Partnership for Research In Marine Renewable Energy (PRIMaRE) is now accepting abstracts for the [8th PRIMaRE Conference](#). Submissions are due by 30 April 2021. The 8th PRIMaRE Conference will take place online on 29-30 June 2021.

The North American Wind Energy Academy (NAWEA) and Center for the Research in Wind (CReW) are now accepting abstracts for the NAWEA Symposium and International Conference on Future Technologies in Wind Energy (WindTech) through 14 May 2021. [NAWEA/WindTech 2021](#) will take place in Newark, Delaware on 22-24 September 2021.

Call for Papers

Animals is currently inviting submissions for a Special Issue entitled "[Bat Biology in Relation to Wind Energy Development](#)". This Special Issue focuses on advancements in the methodologies used to assess bat populations, technologies used to study bat activity and behavior, and physiological characteristics that relate to how bats respond to various stimuli (e.g., audio, visual, electromagnetic) that may serve as either attractors or deterrents to wind turbines. Manuscript submissions are due 30 September 2021.

Funding & Testing Opportunities

The Interreg Atlantic Area's Blue-GIFT has extended the deadline for the [Third Call for Applications](#) to test MRE technologies at the project's test sites. This access will allow developers to perform low-cost tests and validation of their floating offshore wind, wave, tidal, or floating solar energy technologies in real sea environments. Applications now close at 5:00pm UTC on 23 April 2021.

The U.S. [Testing Expertise and Access for Marine Energy Research \(TEAMER\) program](#), sponsored by the U.S. DOE and directed by the Pacific Ocean Energy Trust, is now accepting applications for its third Request for Technical Support (RFTS) through 9 May 2021. Beginning

with RFTS3, TEAMER will allow for longer access periods of up to nine months to complete an RFTS. The access period for RFTS 3 will be from roughly September 2021 through June 2022.

The U.S. Northeast Sea Grant Consortium, in partnership with the National Oceanic and Atmospheric Administration's Northeast Fisheries Science Center and the U.S. DOE's Wind Energy Technologies Office and Water Power Technologies Office, is [seeking proposals](#) to improve understanding of the effects of ocean renewable energy development on coastal communities, including the fishing industry. Pre-proposals from eligible Northeast researchers are due 14 May 2021 and full proposals are due 16 July 2021 by 5:00pm EDT (9:00pm UTC).

The Ocean Startup Project has launched its second [Ocean Startup Challenge](#), which will provide funding to support innovators who are leveraging Canadian ocean assets and capabilities to develop solutions to ocean industry challenges, including offshore energy. Applications close 1 June 2021. Register [here](#) for an info session at 11:00am PDT (6:00pm UTC) on 4 May 2021.

Upcoming Events

Upcoming Webinars

The Portal and Repository for Information on Marine Renewable Energy ([PRIMRE](#)) is hosting two webinars for the Marine Energy Data Pipeline team, led by the Pacific Northwest National Laboratory, to discuss data standards and introduce the development of the new marine energy data pipeline. The first webinar, "Marine Energy Data Standards", will take place at 11:00am PDT (6:00pm UTC) on April 20, 2021 and will focus on recently developed [data standards](#). Register [here](#). The second webinar, "Marine Energy Data Pipeline", will take place at 11:00am PDT (6:00pm UTC) on May 11, 2021 and will focus on the demonstration of the open source time series data utility that can be used to convert raw data to standardized format. Register [here](#).

Australia's Blue Economy Cooperative Research Collective is hosting a webinar, "Multipurpose Platform and Co-location of Aquaculture & Wind Farms", on 21 April 2021 at 4:00pm AEST (6:00am UTC). The webinar will feature presentations on multipurpose platform design for floating offshore wind operation and maintenance, and an aquaculture-wind-wave offshore multipurpose platform currently being tested off the coast of Italy. Register [here](#).

As part of its [Learning from the Experts webinar series](#), the New York State Energy Research and Development Authority's (NYSERDA) Offshore Wind Team is hosting a webinar on 28 April 2021 at 1:00pm EDT (5:00pm UTC). During the webinar, Bill Flynn from the Harris Beach law firm will discuss how Article VII of the New York State Public Service Law sets forth a review process for offshore wind projects seeking to deliver power to New York's electricity grid. Register [here](#).

The International Integrated Wave Energy Research group (IIWER) is hosting its second webinar at 9:00am PDT (4:00pm UTC) on 30 April 2021. During the webinar, Dr. Zhaoqing Yang from the Pacific Northwest National Laboratory will present on "Wave resource

characterization at regional and nearshore scales using a multi-resolution modeling approach”. Register [here](#) by 28 April 2021 to receive the meeting link.

As part of the MarineData4Asia international event, Copernicus Marine Service is hosting a webinar, “Dive into the Copernicus Marine Service”, on 4 May 2021 at 7:00am UTC, and a two-day workshop, "Let's go further with the Copernicus Marine Data", on 11-12 May 2021. Learn more and register [here](#).

Upcoming Conferences

The Business Network for Offshore Wind's [2021 International Partnering Forum \(IPF\)](#) will be held as a two-part series: virtual and in-person. IPF Virtual will be held online on 22 April, 13 May, and 17 June 2021. The main conference, IPF Together, will be held 24-26 August 2021 in Richmond, Virginia. Register [here](#).

The [International Conference on Ocean Energy \(ICOE\)](#) will be held online from 28-30 April 2021. The theme for ICOE 2021 is “Energizing a Powerful Blue Economy”. Register [here](#).

New Documents on *Tethys*

Marine Energy

[Variability of sediment processes around a tidal farm in a theoretical channel](#) – Auguste et al. 2021

Sediment transport plays a crucial role in coastal ecosystems and is one of the least known parameters in high energy sites. The recent development of tidal energy projects challenges the scientific community to better understand this natural phenomenon and the interactions with tidal turbines. Using MIKE21/3 software from DHI, a benchmark for sediment transport model was developed with simulations with and without a tidal farm in idealised two and three-dimensional tidal channels. Results reveal that a 2D approach is sufficient for regional scale morphological assessments, however 3D models allow for a closer examination of influences around the tidal farm.

[The Use of Animal-Borne Biologging and Telemetry Data to Quantify Spatial Overlap of Wildlife with Marine Renewables](#) – Isaksson et al. 2021

The growth of the marine renewable energy sector requires the potential effects on marine wildlife to be considered carefully. The aim of this study was to develop an analysis workflow to extract utilization distributions from animal-borne biologging and telemetry data explicitly for use in assessment of animal spatial overlap with marine renewable energy development areas. We applied the method to European shags (*Phalacrocorax aristotelis*) in relation to tidal stream turbines. While shag occurrence in the tidal development area was high (99.4%), there was no overlap (0.14%) with the smaller tidal lease sites within the development area.

[Life cycle assessment of a wave energy converter: Uncertainties and sensitivities](#) – Zhai et al. 2021

Producing electricity from renewable energy does not necessarily mean cleanness and sustainability, hence the associated with environmental impacts should be paid attention to and thoroughly investigated. This study presents a life cycle assessment (LCA) of the prototype buoy-rope-drum (BRD) wave energy converter (WEC), and systematic uncertainty and sensitivity analyses, to increase understanding of the uncertainties and sensitivities of the life cycle impact variations to the inputs, method choices, as well as changes of selected key issues. The IMPACT 2002+ method is used for a full LCA, including mid-point, end-point and single-score impact assessments.

Wind Energy

[Relative energy production determines effect of repowering on wildlife mortality at wind energy facilities](#) – Huso et al. 2021

Reduction in wildlife mortality is often cited as a potential advantage to repowering wind facilities, that is, replacing smaller, lower capacity, closely spaced turbines, with larger, higher capacity ones, more widely spaced. Wildlife mortality rates, however, are affected by more than just size and spacing of turbines, varying with turbine operation, seasonal and daily weather and habitat, all of which can confound our ability to accurately measure the effect of repowering on wildlife mortality rates. We investigated the effect of repowering on wildlife mortality rates in a study conducted near Palm Springs, CA. We found that avian and bat mortality rate was constant per unit of energy produced, across all sizes and spacings of turbines.

[Optimistic with reservations: The impacts of the United States' first offshore wind farm on the recreational fishing experience](#) – Smythe et al. 2021

We conducted a mixed-methods study, comprising interviews and a survey, to assess the impacts of the United States' first offshore wind farm (OWF) on recreational anglers' experiences. Interview findings revealed anglers' enjoyment of the OWF as an enhanced fishing location, due to catch and non-related aspects of the experience. Anglers also reported concerns about increased crowding around the OWF and raised concerns about potential fishing access restrictions around this and future projects. Survey data confirms that anglers, particularly those who fished at the wind farm, believe the wind farm has benefitted fishing. Respondents also value the wind farm as symbolic of progress towards green energy.

[Behavioral patterns of bats at a wind turbine confirm seasonality of fatality risk](#) – Goldenberg et al. 2021

Bat fatalities at wind energy facilities in North America are predominantly comprised of migratory, tree-dependent species, but it is unclear why these bats are at higher risk. In

this study, we examined video imagery spanning one year in the state of Colorado in the United States, to characterize patterns of seasonal and nightly variability in bat behavior at a wind turbine. The seasonal and nightly patterns we observed were consistent with the possibility that wind turbines invoke investigative behaviors in bats in late summer and autumn coincident with migration and that bats may return and fly close to wind turbines even after experiencing potentially disruptive stimuli like moving blades.

News & Press Releases

Marine Energy

[ORPC Marine Energy Turbines Will Increase Performance at Reduced Cost Via Initiative with Ireland's ÉireComposites](#) – Ocean Renewable Power Company (ORPC)

ORPC, Inc. and its subsidiary ORPC Ireland are partnering with a European consortium to create a new generation of marine renewable energy turbines that increase reliability and performance while reducing manufacturing costs. The ORPC team along with ÉireComposites of Galway and National University of Ireland Galway are collaborating on the effort, known officially as the Commercialization of a Recyclable and Innovative Manufacturing Solution for an Optimized Novel (CRIMSON) Project. Funding is provided by the European Commission via its Fast Track to Innovation program. The total project is valued at €3.9 million.

[Sweetch Energy gets €5.2M boost for osmotic power prototype](#) – Offshore Energy

French-based osmotic power pioneer Sweetch Energy has secured €5.2 million to develop its first full-scale osmotic power prototype and start the industrialisation phase for the novel clean power source. Naturally available from the difference in the salt concentration when river fresh water meets sea water, osmotic power provides a non-intermittent and abundant source of clean energy. Sweetch Energy's proprietary system combines recent breakthroughs in nanofluidic sciences with low-cost eco-friendly materials to create next-generation membranes, coupled with specifically engineered electrodes and innovative cell designs.

[CorPower agrees landmark deal with world's largest heat treatment specialist Bodycote](#) – CorPower

CorPower has agreed a landmark deal with the world's largest heat treatment specialist Bodycote. The thermal processing specialist – present in 23 countries – improves the properties of metals and alloys, extending the life of vital components for a wide range of industries. The gateway deal opens Bodycote to the ocean energy sector using its Corr-I-Dur® solution to simultaneously improve corrosion resistance and wear properties of CorPower's next-generation C4 Wave Energy Converters. The firm is now ramping up operations for its flagship HiWave-5 demonstration project in northern Portugal to propel

its wave technology to a bankable product offering by 2024 – proving the survivability, performance and economics of a grid-connected array of WECs.

Swedish Energy Agency funds NoviOcean wave energy prototype – Offshore Energy

Swedish Energy Agency has approved funding support of SEK 5.6 million (€550,000) for the project looking to advance Novige’s NoviOcean wave energy device. The funding will provide means for further fine-tuning of the float and power take off system and machinery, to increase effectiveness and prolong lifetime for various components, according to Swedish wave energy developer Novige. The company will contribute SEK 1.35 (€133,000) to the project, while KTH Royal Institute of Technology and Uppsala University will share SEK 1.1 million (€108,000) of project funding to research the various aspects of the novel NoviOcean concept.

Marine-i supports pioneering marine renewable energy project for the Isles of Scilly – Marine-i

Marine-i has agreed to support a year-long research programme to identify the potential for wave, tidal and floating wind technologies to be deployed around the Isles of Scilly. It is expected that this will lead to long-term economic, societal and environmental benefits for the communities living on the islands. The project will build a new databank of wave and tidal resource data from around the Isles of Scilly, including data sets on wind speed, wave height, wave period, tidal stream velocities and tidal range parameters. This comprehensive databank will enable the Isles of Scilly to engage with technology developers to scope new renewable energy projects for the Isles of Scilly.

Wind Energy

NOAA signs data-share agreement with offshore wind energy company – U.S. National Oceanic and Atmospheric Administration (NOAA)

NOAA recently announced a Memorandum of Agreement (MOA) with Ørsted Wind Power North America LLC, an offshore wind development company, to share physical and biological data in Ørsted-leased waters subject to U.S. jurisdiction. The MOA is the first of its kind between an offshore wind developer and NOAA, and it paves the way for similar data-sharing agreements with other developers. NOAA anticipates that Ørsted’s data will fill gaps in ocean science areas, particularly in ocean mapping and observing, to help meet NOAA missions related to climate adaptation and mitigation, weather-readiness, healthy oceans, and resilient coastal communities and economies.

Dynamic Wind Farm Flow Control project launched – CrossWind

Together with TU Delft, Siemens Gamesa Renewable Energy, Shell, Eneco and GROW Foundation, CrossWind has started the work on the “Dynamic Wind Farm Flow Control” project. This project, focused on reducing the wake effect by using real-time data, is one of CrossWind’s five innovations that will contribute to a more constant electricity

production. The project will develop and implement two technologies: “closed-loop active wake steering” and “HELIX active wake mixing”. The wake steering involves the yaw control of the individual turbines, which will divert the wake, so it does not impact the next wind turbine. The wake mixing technology involves letting one turbine turn quicker, which leaves more wind for the turbine behind it.

ESB Announces GREEN ATLANTIC at Moneypoint – ESB

In line with the Irish Government’s ambition of reaching net zero emissions by 2050, ESB recently announced Green Atlantic @ Moneypoint. Under the ambitious programme, ESB’s Moneypoint site in County Clare will be transformed into a green energy hub, helping Ireland to become a leader in green energy production. A floating offshore wind farm of 1,400MW will be developed off the coast of Counties Clare and Kerry in two phases by ESB and joint venture partners, Equinor – a world leader in floating offshore wind technology. Once complete, the wind farm will be capable of powering more than 1.6 million homes in Ireland.

Nekkar Secures Funding for Disruptive Wind Turbine Installation Solution – Nekkar

Nekkar has been awarded a NOK 21 million grant from Innovation Norway to progress with the development of a disruptive installation technology that could significantly reduce the cost and environmental footprint associated with wind turbine installations. The solution – called SkyWalker – uses active heave compensation derived from offshore lifting systems combined with digital solutions that allows for remote controlled and automated solutions. SkyWalker reduces the environmental impact of installing wind turbines by considerably reducing the footprint in nature and CO2 emissions from transportation. SkyWalker is being developed as a zero emissions system.

Money pouring into wind energy despite COVID, but are there enough projects out there? – WindEurope

Europe confirmed €43bn of investments in new wind farms in 2020, the second highest amount on record and 70% up on 2019. €17bn was for onshore wind, covering 13 GW of new capacity. €26bn was for offshore wind, covering 7 GW of new capacity. Large projects boosted the offshore numbers, including Dogger Bank in the UK which will be Europe’s largest wind farm when completed and Hollandse Kust Zuid in the Netherlands. But this is much less than what Europe needs to deliver its 2030 climate and energy goals. The main problem is the slow rate of permitting of new wind farms. The money’s out there, but not enough new projects are coming through.