



**18 March 2022**

[Tethys](#) is an online knowledge hub 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. Email [tethys@pnnl.gov](mailto:tethys@pnnl.gov) to contribute!

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## **Announcements**

### Coloring Pages

OES-Environmental recently published a free [Coloring Book](#) focused on the environmental effects of marine renewable energy. Visit the [Educational Resources](#) page on *Tethys* for more materials and resources aimed at educators and students of all ages.

### UMERC Member Portal

The [University Marine Energy Research Community](#) (UMERC), which aims to foster collaboration within the US marine energy research community and amplify the impacts of foundational research, recently launched its new Member Portal! Join the Community [here](#)!

### ITEG Survey

The Integrating Tidal Energy into the European Grid (ITEG) project is planning to develop and validate an integrated tidal energy and hydrogen production solution for clean energy generation to be demonstrated in Orkney, Scotland. As part of this effort, ITEG has launched a [survey](#) to measure the acceptance level within society towards renewable energy in general, marine renewable energy, and hydrogen energy.

## ETIPP Applications

The US Department of Energy (DOE) is accepting applications from remote, island, and islanded communities for technical assistance to transform their energy systems and increase energy resilience through the [Energy Transitions Initiative Partnership Project \(ETIPP\)](#). Applications are due 15 April 2022.

## BECS Proposals

The International Network on Offshore Renewable Energy's (INORE) [2022 Call for Blue Energy Collaborative Scholarships \(BECS\) Proposals](#) is now open through 15 April 2022. Sponsored by Ocean Energy Systems (OES), the BECS grant aims to advance research and promote collaboration amongst early-career professionals from diverse disciplines and nations.

## Calls for Abstracts

The [Call for Abstracts](#) for the [Pan-American Marine Energy Conference \(PAMEC 2022\)](#) is now open through 27 March 2022. PAMEC is scheduled for 19-22 June 2022 in Ensenada, Mexico, with workshops on 17-18 June 2022.

The [Call for Abstracts](#) for the International Conference on Ocean Energy (ICOE) and Ocean Energy Europe (OEE)'s annual event is now open until 31 March 2022. The Basque Energy Cluster and OEE will host [ICOE-OEE 2022](#) on 18-20 October 2022 in San Sebastián, Spain.

The [Call for Abstracts](#) for the [6<sup>th</sup> International Conference on The Effects of Noise on Aquatic Life \(AN2022\)](#) is open through 31 March 2022. AN2022 will take place on 10-15 July 2022 in Berlin, Germany.

The [Call for Abstracts](#) for [Floating Offshore Wind 2022](#) is open until 1 April 2022. Hosted by Scottish Renewables and RenewableUK, the conference will take place on 12-13 October 2022 in Aberdeen, Scotland.

The [Call for Research Posters](#) for Seanergy 2022 is now open. Poster information (name, organization, and poster title) is due 1 April, posters are due 2 May, and abstracts are due 13 May 2022. [Seanergy 2022](#) will take place 15-17 June 2022 in Le Harve-Normandy, France.

The [Call for Abstracts](#) for the North American Wind Energy Academy (NAWEA) Symposium and International Conference on Future Technologies in Wind Energy (WindTech) is now open through 15 April 2022. The [NAWEA/WindTech 2022 Conference](#) will take place on 20-22 September 2022 in Delaware, US.

## Calls for Papers

The *Journal of Marine Science and Engineering* is accepting submissions for several Special Issue, including "[New Technologies and Methods in Coastal Observing](#)" (due 15 April 2022), and "[Wind and Wave Climate](#)" (due 20 May 2022).

The *Marine Technology Society Journal* is accepting submissions for a Special Issue on “[Advancements in Buoy Technology to Support Ocean Observations, Maritime Safety, and Environmental Characterization](#)”. Manuscripts are due 20 June 2022.

### Funding & Testing Opportunities

The Oceanic Platform of the Canary Islands (PLOCAN) recently announced the launch of its [Winter Access Call](#) for the use of its facilities and services by public research groups and by the private sector, both national and international communities. Applications are due 20 March 2022.

The [US Testing Expertise and Access for Marine Energy Research](#) (TEAMER) program, sponsored by DOE and directed by Pacific Ocean Energy Trust, is offering [open water support for marine energy testing](#). Open Water Support applications may be submitted at any time, while applications for its [6<sup>th</sup> Request for Technical Support](#) are now available and due 24 March 2022.

The Horizon Europe Framework Programme launched a funding opportunity titled, “[Demonstration of innovative materials, supply cycles, recycling technologies to increase the overall circularity of wind energy technology and to reduce the primary use of critical raw materials](#)”. Proposals are due 26 April 2022.

The Centre for Advanced Sustainable Energy (CASE), an industry led, collaborative, sustainable energy research centre hosted at Queen’s University Belfast, is seeking applications from suitably qualified consortia for research and development funding to support the decarbonisation of the energy system. The [Call for CASE Project Applications](#) closes 13 May 2022.

### Student & Employment Opportunities

The Pacific Northwest National Laboratory is seeking a creative, collaborative, and talented [Post-Doctoral Research Associate](#) to conduct research on the effects of global change on coupled human-natural systems, and to develop innovative solutions to support climate and energy resilience for communities across the US. Applications are due 25 March 2022.

The Norwegian Institute for Nature Research (NINA) is advertising a [postdoctoral research fellowship](#) connected to the project “Marine spatial planning and cumulative impacts of blue growth on seabirds (MARCIS)”. The position will focus on Agent-Based Modelling of seabirds’ individual sensitivity to marine stressors. Applications are due 31 March 2022.

NINA is also advertising a second [postdoctoral research fellowship](#) connected to the MARCIS project, which will focus on the assessment of behavioural effects of floating turbines on seabirds and migrating birds. Applications are due 31 March 2022.

The National Renewable Energy Laboratory is seeking a [Year-Round Graduate Intern: Wildlife Biologist](#) to support the wind energy and wildlife research portfolio. The ideal candidate will be familiar with or actively researching species that commonly interact with land-based wind energy development. The intern will support several projects including advancing monitoring and minimization strategies, writing research briefs, and sharing information. Open until filled.

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## Upcoming Events

### Upcoming Workshop

ORJIP Ocean Energy is hosting a workshop, “Tidal Range in Wales: Critical Environmental Evidence Gaps and How to Address Them”, on 23 March 2022 at the [Marine Energy Conference](#) in Llandudno, Wales. To participate in the workshop, register for the conference [here](#).

### Upcoming Webinars

ETIP Ocean (European Technology and Innovation Platform for Ocean Energy) and APPA Renewables are hosting a [webinar on ocean energy in Spain](#) at 11:00am CET (10:00am UTC) on 22 March 2022. The webinar will discuss the recently published Spanish Marine Energy Roadmap and review the funding opportunities available for ocean energy. Register [here](#).

The California Energy Commission and Ocean Protection Council are hosting a [webinar](#) from 2:00-4:00pm PDT (9:00-11:00pm UTC) on 22 March 2022 to present a set of spatial models developed by the Conservation Biology Institute. The models were designed to synthesize information to help stakeholders and decision-makers assess the suitability of offshore wind energy development in federal waters off the coast of California. Join the webinar [here](#).

The National Renewable Energy Laboratory is hosting a webinar from 9:00am-12:30pm MDT (3:00-6:30pm UTC) on 29 March 2022 to present progress in the development and validation of new eagle behavioral models, highlighting applications for wind-plant siting and operations. The webinar will feature a Q&A session to solicit feedback on capabilities and future directions, and a hands-on working session for those interested. View the agenda [here](#). Register [here](#).

The [Portal and Repository for Information on Marine Renewable Energy \(PRIMRE\)](#) is hosting a webinar on the [Marine and Hydrokinetic Toolkit \(MHKiT\)](#) from 1:00-2:00pm EDT (5:00-6:00pm UTC) on 31 March 2022. During the webinar, National Renewable Energy Laboratory, Sandia National Laboratories, and Pacific Northwest National Laboratory will introduce new functionality in the open-source package and give demonstrations in Python. Register [here](#).

### Upcoming Conferences

The [6th Conference on Wind Energy and Wildlife Impacts](#) will take place 4-8 April 2022 in Egmond aan Zee, Amsterdam. View the final programme [here](#). Register [here](#).

The Ocean Power Innovation Network is hosting its [2022 Annual Symposium](#) on 10 May 2022 in Glasgow, Scotland. Agenda and registration details will be published soon.

The [19th International Bat Research Conference and 50th Annual North American Symposium on Bat Research](#) will take place 7-12 August 2022 in Austin, US. Registration is now open [here](#).

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## New Documents on *Tethys*

### Marine Energy

#### [Marine Mammal HiCUP: A High Current Underwater Platform for the Long-Term Monitoring of Fine-Scale Marine Mammal Behavior Around Tidal Turbines](#) – Gillespie et al. 2022

Arrays of tidal turbines are being considered for tidally energetic coastal sites which can be important habitat for many species of marine mammal. Understanding risks to marine mammals from collisions with moving turbine blades must be overcome before regulators can issue licenses for many developments. To understand these risks, it is necessary to understand how animals move around operational turbines and to document the rate at which interactions occur. We report on the design, and performance, of a seabed mounted sensor platform for monitoring the fine scale movements of cetaceans and pinnipeds around operational tidal turbines. The system comprises high-frequency multibeam active sonars, which can accurately track animals in the horizontal plane.

#### [Project Summary of Outcomes and Results of Wave Energy in Southern Europe \(WESE\) Project](#) – Bald et al. 2022

Wave energy converters (WECs) are still perceived by regulators and other stakeholders as risky, particularly for some groups of species and habitats. In many cases, this perception of risk is due to the high degree of uncertainty that results from a scarcity of data collected in the ocean as well as lack of differentiating between real and perceived risks. Launched in November 2018 and funded by the EU's European Maritime and Fisheries Fund (EMFF), the WESE project aims to improve the current knowledge on potential environmental effects and risks of wave energy, better inform decision-makers and managers on environmental risks, and reduce environmental consenting uncertainty. The WESE Consortium, led by the RD&I Basque center AZTI, has involved key MRE stakeholders from across Portugal and Spain to accomplish these goals.

#### [Use of Our Future Seas: Relevance of Spatial and Temporal Scale for Physical and Biological Indicators](#) – Trifonova et al. 2022

There is about to be an abrupt step-change in the use of our coastal seas, specifically by the addition of large-scale offshore renewable energy developments to combat climate change. Many trade-offs will need to be weighed up for the future sustainable management of marine ecosystems between renewables and other uses (e.g., fisheries, marine protected areas). Therefore, we need a much greater understanding of how different marine habitats and ecosystems are likely to change with both natural and anthropogenic transformations. This work will present a review of predictive Bayesian approaches from ecosystem level, through to fine scale mechanistic understanding of foraging success by individual species, to identify consistent physical and biological indicators of habitat and ecosystem change over the last 30 years within the North Sea.

## Wind Energy

### [Unravelling the ecological impacts of large-scale offshore wind farms in the Mediterranean Sea – Lloret et al. 2022](#)

The need for alternative energy systems like offshore wind power to move towards the Green Deal objectives is undeniable. However, it is also increasingly clear that biodiversity loss and climate change are interconnected issues that must be tackled in unison. In this paper we highlight that offshore wind farms (OWF) in the Mediterranean Sea (MS) pose serious environmental risks to the seabed and the biodiversity of many areas due to the particular ecological and socioeconomic characteristics and vulnerability of this semi-enclosed sea. The MS hosts a high diversity of species and habitats, many of which are threatened. We argue that simply importing the OWF models from the northern European seas, which are mostly based on large scale projects, to other seas like the Mediterranean is not straightforward.

### [A comprehensive estimate of life cycle greenhouse gas emissions from onshore wind energy in China – Xu et al. 2022](#)

Rapid deployment of wind energy plays an important role in China's proposed energy transition to carbon neutrality before 2060. Greenhouse gas (GHG) emissions are, however, unavoidable during the entire life cycle of wind energy from manufacturing to disposal. It is important to estimate these GHG emissions and the emission intensity for programs of energy transition. In this study, simplified life cycle assessment models and engineering-based models were developed to provide a comprehensive estimate of the GHG emission intensity from onshore wind energy in China at provincial and national scales. Results showed that in 2019, the GHG emission intensity per unit power generation was 19.88 g CO<sub>2</sub> eq/kWh.

### [Combining wind power and farmed fish: Coastal community perceptions of multi-use offshore renewable energy installations in Europe – Billing et al. 2022](#)

There is increasing competition for space in coastal seas as new industrial sectors, such as Marine Renewable Energy (MRE) and Aquaculture, seek to expand. Multi-Use - involving sharing of space and, in some cases, facilities - can lessen competition and reduce industry costs if societal and economic challenges can be overcome. An example societal challenge is that of gaining Social Licence to Operate (SLO) for 'Multifunctional Offshore Installations' (MOI) combining fish farming with MRE (from wind and waves) in a large floating structure. This article reports a mixed-methods study at two potential MOI deployment sites in 2019, aiming to understand the local context for SLO. A survey was carried out in Reggio Calabria, Italy, with 108 respondents, and in Islay, Scotland, with 127 respondents.

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## News & Press Releases

### Marine Energy

#### [Six Wave-Powered Prototypes to Set Sail: Ocean Observing Prize DESIGN Contest Winners Advance to BUILD Contest](#) – National Renewable Energy Laboratory

Six teams of marine energy innovators are angling to free their ocean-observing technologies from their tethers and set sail to test their recharging abilities. The multistage Powering the Blue Economy: Ocean Observing Prize challenges competitors to integrate marine renewable energy into ocean observation platforms. The end goal? To devise tomorrow's hurricane-monitoring devices and protect coastal communities from dangerous storms by revolutionizing the United States' ability to understand, map, and monitor the ocean. Over the course of a year, BUILD Contest competitors have been preparing to test their prototypes in the nation's largest wave tank at the U.S. Navy's Maneuvering and Seakeeping Basin in Carderock, Md., in the summer of 2022.

#### [Minesto to concentrate Dragon Class operations in the Faroe Islands in 2022](#) – Minesto

Minesto has decided to concentrate this year's operations with its Dragon Class marine energy converters at the established and grid-connected site in Vestmannastrandur, Faroe Islands. This plan will mitigate supply chain delays and at the same time allow Minesto to take advantage of significant synergies and new opportunities for more cost-effective operations, electricity production under an existing Power Purchase Agreement, and hence a quicker route to commercial roll out. Minesto's first D4 unit will go straight into continuous grid-connected operation in Vestmannastrandur, Faroe Islands during the first half of 2022 as originally intended. To optimise the timeline, Minesto has decided to install the second D4 (100 kW) and the larger D12 (1.2 MW) units in Vestmannastrandur during 2022, rather than deploying them for demonstration testing in France and Wales.

#### [Wave energy sees ripples of activity in the U.S.](#) – GreenBiz

Over the last three decades, the quest to develop wave energy has summoned enough imagination to fill an H.G. Wells novel. Inventors have conjured up enormous machines resembling sea serpents and submarine launchers, built giant mechanical oysters and even created a "wave dragon," all in hope of capturing the energy of waves and converting it to electricity. Unfortunately, things did not end well for this cast of characters. From Portland, Oregon to Porto, Portugal, from Scotland's Orkney Islands to the Australian coast south of Sydney, one by one these sea monsters met their watery demise. Still, the sector's long, turbulent history of trial and error hasn't been for naught. Marine energy technologies powered by currents, tides and waves are experiencing rapid innovation.

#### [New tidal turbines launched in Strangford Lough](#) – Queen's University Belfast

Researchers from the Centre for Advanced Sustainable Energy (CASE) have installed new turbines to harness the powerful tidal currents coursing through the mouth of the

Lough. The new turbines, installed in early 2022, rotate about a vertical axis, rather than the horizontal axis of conventional fan-like turbines – hence the name of the project: Vertical Axis Tidal Turbines in Strangford (VATTS). “Strangford Lough is ideally located for tidal testing”, says Dr Carwyn Frost, principal investigator on the project. This marks an important stage in the VATTS project, launched in 2021 with funding from CASE and Invest Northern Ireland, and to help spread the word, the team have launched a video on the project.

### **Assemblyman Robert Karabinchak and CEO of Eco Wave Power Visit Sites in New Jersey for a Potential First Wave Energy Project in the State – Eco Wave Power**

Eco Wave Power recently announced that it is advancing its efforts to bring wave energy to the State of New Jersey. On Friday, March 11, 2022, Assemblyman Karabinchak, alongside Eco Wave Power’s Founder and Chief Executive Officer, Inna Braverman, visited the Steel Pier and additional marine structures in the State to explore potential sites for a first-of-its-kind wave energy pilot deployment in the state of New Jersey. The site visit is a preparatory stage for the upcoming discussion regarding the promotion of wave energy technologies, which will be held at 10:00 a.m. EST on March 17, 2022, by the Assembly Special Committee on Infrastructure and Natural Resources of New Jersey, where Eco Wave Power and two additional marine energy companies will present their vision for generating clean electricity from the waves in the state.

## **Wind Energy**

### **Offshore wind will come to Australian waters – as long as we pave the way for this new industry – The Conversation**

Offshore wind is playing an important role in Europe’s shift to renewables. Australia’s excellent offshore resources now look like they are going to contribute to our own energy transition. Last week, the Victorian government announced ambitious targets for offshore wind capacity of 2 gigawatts (GW) by 2032, 4GW by 2035, and 9GW by 2040. If this is all built, it will produce somewhere in the region of 40 terawatt hours of power, close to all electricity used via the National Electricity Market in Australia’s second most populous state. Offshore wind offers another excellent renewable option as we decarbonise electricity. But more needs to be done to turn these plans into enormous turbines off our coast. We need to streamline regulations, introduce more targets, fund research and begin building a supply chain.

### **Innovative fish eDNA project launched at offshore wind farm – Natural Power**

Leading renewable energy consultancy and service provider Natural Power, along with project partners EDF Renewables and environmental DNA and nature specialist NatureMetrics, has kicked off a ground-breaking research project to validate offshore fish environmental DNA (eDNA) survey methods – the first of its kind to trial the use of eDNA to improve survey methods for offshore wind farm environmental impact assessments. In support of the initiative, EDF Renewables is providing access to the



Blyth Offshore Demonstrator (BOD) for the research project to take place. With support from EDF Renewables, and utilising NatureMetrics' eDNA experts, the research project will commence in March 2022. Surveys will be conducted using traditional fish trawling methods as well as eDNA sampling around the BOD site.

### **Germany has turned the corner on onshore wind – WindEurope**

The German Energy Regulator (Bundesnetzagentur) has announced the results of Germany's latest onshore wind auction. After almost two years of undersubscribed auctions it was the second consecutive auction that was oversubscribed. And that's not the only good news for onshore wind in Germany. The permitting numbers are up. And the new Government wants to scale up the build-out of new onshore wind. In its latest onshore wind auction the Bundesnetzagentur this week awarded 1,300 MW of new capacity. They had received 147 bids totalling 1,350 MW. This follows their last auction in September 2021 which was also (slightly) oversubscribed. The average winning price in this auction was €57.6/MWh, just below the price ceiling of €58.8/MWh. The lowest bid was €47.7/MWh.

### **Murphy Administration Announces Award of Funding for Offshore Wind Environmental Studies, Entry in Regional Science Collaborative – State of New Jersey**

The New Jersey Department of Environmental Protection (DEP) and New Jersey Board of Public Utilities (BPU) recently announced the award of funding for studies, and will release shortly a request for proposals, to provide enhanced scientific information on the impacts of offshore wind energy development off New Jersey's coastline as well as the state's entry into a regional offshore-wind science collaborative. These actions, identified as priorities by a diverse group of stakeholders, are the first funded through the Offshore Wind Research & Monitoring Initiative (RMI). This collaborative effort of the DEP and BPU is working to coordinate and expand research into impacts of offshore wind development on wildlife and fisheries. The projects are funded by two offshore wind farm developers through a fund administered by the state.

### **ZEBRA project achieves key milestone with production of the first prototype of its recyclable wind turbine blade – General Electric**

The ZEBRA (Zero waste Blade ReseArch) consortium is today marking a new step forward on the industry's transition to a circular economy with the production of the first prototype of its 100% recyclable wind turbine blade. The 62m blade was made using Arkema's Elium® resin, which is a thermoplastic resin well known for its recyclable properties together with the new high performance Glass Fabrics from Owens Corning. Launched in September 2020, the ZEBRA (Zero waste Blade ReseArch) project is a unique partnership led by French research center IRT Jules Verne and brings together industrial companies including Arkema, CANOE, Engie, LM Wind Power, Owens Corning and SUEZ. Its purpose is to demonstrate the technical, economic, and environmental relevance of thermoplastic wind turbine blades on a full scale, with an eco-design approach to facilitate recycling.