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[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 to contribute!

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Announcements

PRIMRE Highlight

The [Portal and Repository for Information on Marine Renewable Energy \(PRIMRE\)](#) amasses marine energy data and information from multiple knowledge hubs into one centralized site. To learn more about how PRIMRE can help everyone, from startups to universities, get the data they need to advance the marine energy industry, check out "[A Rising Tide Lifts All Boats](#)".

SULI & CCI Applications

The U.S. Department of Energy (DOE) Office of Science is now accepting applications for the [Science Undergraduate Laboratory Internships \(SULI\)](#) program and the [Community College Internships \(CCI\)](#) program. Interns will work directly with national laboratory scientists and engineers that support the DOE mission. The application deadline is 10 January 2023.

BOEM Seeks Public Comment

The U.S. Bureau of Ocean Energy Management (BOEM) is seeking public comments on [two proposed guidelines](#) that clarify the requirements that offshore wind lessees must include in Construction and Operation Plans (due 12 December 2022), on proposed Wind Energy Areas in the [Central Atlantic](#) (due 16 December 2022), and the draft environmental analysis for the [Empire Wind Project](#) off New York (due 17 January 2023).

Earthshot Prize Nominations

The European Marine Energy Centre (EMEC) is continuing its role as an Official Nominator for [The Earthshot Prize](#), which is seeking innovations that will help repair and regenerate the planet. EMEC has launched an [open call inviting submissions](#) for consideration until 17 January 2023.

New LCA Tool

Researchers from the University of Exeter have developed a new tool to streamline the Life Cycle Assessment of tidal turbine deployments. The [ETTIE \(Exeter Tidal Turbine Impact Estimator\)](#) allows developers to estimate the greenhouse gas emissions of a tidal turbine deployment based on early-stage design information. Learn more [here](#).

Calls for Abstracts

The [Call for Abstracts](#) for [OCEANS 2023 Limerick Conference & Exhibition](#) is now open through 20 December 2022. The event will take place on 5-8 June 2023 in Limerick, Ireland.

American Clean Power (ACP) is [accepting submissions](#) for panel and poster presentations opportunities at [CLEANPOWER 2023 Conference & Exhibition](#) through 30 December 2022. The event will take place on 22-25 May 2023 in New Orleans, U.S.

The [Call for Abstracts](#) for the [15th European Wave and Tidal Energy Conference Series \(EWTEC 2023\)](#) is now open through 28 January 2023. Full papers will be due 27 May 2023. EWTEC will take place on 3-7 September 2023 in Bilbao, Spain.

Funding & Testing Opportunities

ProtoAtlantic is now accepting applications for the [ProtoAtlantic Customized Scale Start-Ups Support Program](#) at the Lir-National Ocean Test Facility in Ireland. The program will provide free facilities access to marine technology (wave, wind, tidal, floating solar, biotechnology, robotics) developers across the Atlantic Area. Applications are due 23 December 2022.

The U.S. DOE has opened applications for the [Small Business Innovation Research \(SBIR\) and Small Business Technology Transfer \(STTR\) Program](#), which offers grants to small businesses to support technological innovation. Letters of intent are due 3 January and applications are due 21 February 2023.

The U.S. DOE Wind Energy Technologies Office has released a [funding opportunity](#) to lower costs and address barriers to deployment of wind energy. Topic areas include social science research and bat deterrent technology development. Concept papers are due 20 January and applications are due 10 March 2023.

The European Commission has launched two new [Calls for Proposals](#) under the European Maritime, Fisheries and Aquaculture Fund aimed at supporting careers and regional projects for a sustainable blue economy in EU sea basins. Proposals are due 31 January 2023.

The New York State Energy Research and Development Authority recently announced that nearly \$2.5 million is available to [support environmental and fisheries research](#), and may be related to offshore wind energy development. Applications are due 13 March 2023.

The European Commission has also launched the third call for large-scale projects under the [European Union Innovation Fund](#). The call is open for projects located in European Union Member States, Iceland, and Norway until 16 March 2023.

Student & Employment Opportunities

Floating Power Plant is offering an [opportunity for candidates holding a Ph.D.](#) to join its business developing floating wind, wave, and hydrogen platforms for island communities. Applications are due 31 December 2022.

The University of Hull's Aura Centre for Doctoral Training in Offshore Wind Energy and the Environment is offering a [PhD scholarship](#) on the effects of very large scale offshore wind deployment on physical processes in the North Sea. Applications are due 4 January 2023.

The University of Hull is also inviting applications for a [PhD project](#) on fishing and very large scale offshore wind deployment in the North Sea. Applications are due 10 February 2023.

Upcoming Events

Upcoming Webinars

The European Technology & Innovation Platform for Ocean Energy and the Demonstration Programme for Ocean Energy Pilot Farms and Supporting Technologies are hosting a webinar at 2:00pm UTC on 14 December 2022. During the webinar, Mocean Energy, AWS, and CorPower Ocean will share lessons learnt from wave energy deployments. Register [here](#).

The New York State Energy Research and Development Authority (NYSERDA) is hosting a New York Offshore Wind Public Webinar from 12:00-1:00pm EST (5:00-6:00pm UTC) on 15 December 2022, which will focus on NYSERDA's recent activities in supply chain, workforce development, and environmental and fisheries research and engagement. Register [here](#).

Upcoming Conferences

The Marine Alliance For Science and Technology For Scotland is hosting the 5th Symposium of the Scottish Marine Energy Research Programme (ScotMER) from 31 January to 2 February 2023 online. Register for free [here](#).

The Pacific Ocean Energy Trust (POET) is hosting the [Northwest Offshore Wind Conference](#) from 28 February to 1 March 2023 in Portland, Oregon, U.S. Register [here](#).

New Documents on *Tethys*

Marine Energy

[Evaluation of environmental sustainability matrix of Deepgen tidal turbine](#) – Rashedi et al. 2022

Tidal energy is a reliable, consistent and abundant source of renewable energy. However, there are many concerns with different tidal energy devices relating to their environmental impacts over the lifetime. It is essential to address these issues by assessing the environmental impacts of these technologies throughout all phases of life cycle. In this context, a cradle to grave life cycle assessment (LCA) study is performed hereby on 1 MW Deepgen tidal turbine. ReCiPe LCA method has been used to evaluate 18 different environmental impacts. According to the findings, steel, copper and glass fibre reinforced plastic carry the highest contributions across all impact categories.

[Environmental Information for Siting and Operation of Floating Tidal Turbines in U.S. Waters](#) – Copping et al. 2021

The deployment and operation of a floating tidal technology in the United States require assessing environmental conditions and satisfying all environmental permitting requirements. Two locations in the United States are chosen to evaluate the potential for deployment of the Orbital Marine Power Ltd. floating technology: San Juan Islands (Washington) and Western Passage (Maine). This report describes the information gathered on logistical, regulatory, and environmental conditions for siting and deploying the technology in the two locations. In each location, the state and federal regulations required for deploying are defined, and the additional requirement for social license.

[Experimental study of bed level changes in the vicinity of flap-type wave energy converters](#) – Taheri et al. 2022

Details are given herein of the bed level changes in vicinity of the oscillating flap by means of physical modelling. Experiments were performed in a wave flume with a movable bed. Based on the results, changing the flap rotation angle (α) from a constant to an oscillating state caused less bed level changes (reduced range and length). Increasing the h/L (h =water depth, L =wave length) decreases the range of bed level change profile and was effective on bed form. The H/h (H =wave height) only affects the range of bed level changes profile in such a way that increasing this parameter first raise and then decreases the bed level changes.

Wind Energy

[Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea](#) – Daewel et al. 2022

The wind wake effect of offshore wind farms affects the hydrodynamical conditions in the ocean, which has been hypothesized to impact marine primary production. So far only little is known about the ecosystem response to wind wakes under the premisses of large offshore wind farm clusters. Here we show, via numerical modeling, that the associated wind wakes in the North Sea provoke large-scale changes in annual primary production with local changes of up to $\pm 10\%$ not only at the offshore wind farm clusters, but also distributed over a wider region. The model also projects an increase in sediment carbon in deeper areas of the southern North Sea due to reduced current velocities, and decreased dissolved oxygen inside an area with already low oxygen concentration.

[The species-specificity of energy landscapes for soaring birds, and its consequences for transferring suitability models across species](#) – Scacco et al. 2022

Soaring birds depend on atmospheric uplifts and are sensitive to wind energy development. Predictive modelling is instrumental to forecast conflicts between human infrastructures and single species of concern. However, as multiple species often coexist in the same area, we need to overcome the limitations of single species approaches. We investigate whether predictive models of flight behaviour can be transferred across species boundaries. We analysed movement data from 57 white storks, *Ciconia ciconia*, and 27 griffon vultures, *Gyps fulvus*. We quantified the accuracy of topographic features, correlates of collision risk in soaring birds, in predicting their soaring behaviour, and tested the transferability of the resulting suitability models across species.

[To study the effect on marine ecosystems of noise emitted by offshore wind farms during construction and operation phases, is it relevant to focus on a few species?](#) – Henry et al. 2022 (Also available in French)

Noise emissions generated by human activities can affect marine fauna. For several decades, underwater ambient noise has been increasing, in particular due to the growth of anthropogenic activities. Assessing the effects of these emissions on marine organisms is essential, especially as sound travels far more efficiently in water than in air. This task constitutes a methodological and scientific challenge. In this bulletin, experts emphasize the need to consider all species and to tend towards an ecosystem approach (i.e., considering all biological compartments) to assess the effects of noise emitted by anthropogenic activities, and in particular by offshore wind farms during their construction and operation phases.

News & Press Releases

Marine Energy

[Eco Wave Power Inks Historic Concession Agreement to build 77-Megawatt Power Station](#) – Eco Wave Power

Eco Wave Power recently announced that it has entered into an agreement with OREN Ordu Enerji, a fully owned subsidiary of Ordu Municipality, for the potential construction of an up to 77-megawatt (MW) wave energy installation in Ordu, Turkey – the largest agreement in the Company’s history. The estimated \$150 million power station would be Turkey’s first grid-connected wave energy station, and upon completion, would be the world’s largest wave energy power station. Ordu Enerji will assign nine suitable breakwaters for a period of 25 years from activation of the relevant pilot or power station, while Eco Wave Power will be responsible for constructing, and commissioning the power plant(s) and selling the electricity to be generated by the power plant.

Minesto signs collaboration agreements for Project Development in Nusa Tenggara Barat region, Indonesia – Minesto

Minesto has signed two collaboration agreements for development in the Nusa Tenggara Barat region, Indonesia today. A Memorandum of Understanding has been signed between Minesto and the regional Eco Regions Indonesia, as well as a Letter of Intent between Minesto and the Nusa Tenggara Barat region. The initiative in Indonesia is part of Minesto's broader market establishment in Southeast Asia. The collaboration agreements include feasibility studies on the natural resource, infrastructure, and finance, and are based on collaborative work to integrate Minesto’s technology as a part of the 100% renewable energy mix in the region, starting with the Special Economic Zone.

Spain adopts regulatory framework for €200M grant program for marine renewables – Offshore Energy

The Ministry for the Ecological Transition and the Demographic Challenge (MITECO) of Spain has published a document which sets out the regulatory bases for the allocation of state grants for the development of marine renewable energy pilot projects and associated infrastructure. Released on Spanish government’s official publication for legal notices by MITECO, the document outlines regulatory bases for the €200 million program that will provide grants for marine energy technology pilots, the improvements of existing test platforms and buildout of new ones, as well as for the adaptation of port infrastructures for marine renewable energy developments.

Schneider Electric and ORPC join forces to advance marine energy as a renewable energy source for remote communities – Ocean Renewable Power Company (ORPC)

Schneider Electric, a global leader in digital transformation of energy management and automation, and ORPC, an internationally recognized leader in marine energy technology, innovation and operational excellence, have signed a memorandum of understanding to collaborate on microgrid projects to advance marine energy as a commercially-viable renewable energy source. Through this collaboration, ORPC and Schneider Electric will install microgrid systems that include Schneider Electric’s energy storage and smart microgrid controllers integrated with ORPC’s RivGen® Power

Systems to provide communities worldwide with highly predictable baseload electricity in renewable energy form, enabling the global transition towards net-zero societies.

Consortium gets €3.5M boost to develop tropical storm-proof OTEC system – Offshore Energy

The European Union's key funding program for research and innovation, Horizon Europe, and UK Research and Innovation have awarded €3.5 million to a new consortium that aims to design an ocean thermal energy conversion (OTEC) system capable of surviving in tropical storm areas. The PLOTEC consortium was launched by seven partners across Austria, Italy, Portugal, Spain and the United Kingdom, specialising in OTEC, marine renewable energies, research and infrastructure, plastic composites engineering, renewable materials, policy, economics and environmental aspects and computational modelling tools.

Wind Energy

Biden-Harris Administration Announces Winners of California Offshore Wind Energy Auction – U.S. Department of the Interior

The Department of the Interior recently announced results from BOEM's wind energy auction for five leases offshore California. The lease sale represents the third major offshore wind lease sale this year and the first ever for the Pacific region. The sale drew competitive high bids from 5 companies totaling \$757.1 million, well exceeding the first lease sales that were held in the Atlantic. The interest and success of today's sale represents a significant milestone toward achieving President Biden's goal of deploying 30 gigawatts of offshore wind energy capacity by 2030 and 15 gigawatts of floating offshore wind capacity by 2035. The leased areas have the potential to produce over 4.6 gigawatts of offshore wind energy, enough to power over 1.5 million homes.

BOEM and NOAA announce joint strategy for fisheries surveys: Agencies aim to mitigate offshore wind development impacts – BOEM

BOEM and the National Oceanic and Atmospheric Administration (NOAA) Fisheries are announcing a joint strategy to address potential impacts of offshore wind energy development on NOAA Fisheries' scientific surveys. The Federal Survey Mitigation Strategy underscores the agencies' shared commitment to the Biden-Harris Administration's clean energy goals of responsibly advancing offshore wind energy production while protecting biodiversity and promoting ocean co-use. NOAA Fisheries' surveys are essential for sustainably managing our nation's fisheries. The strategy identifies the essential components of mitigating the impacts of offshore wind energy development on the surveys.

Ørsted and Eversource sign marine life research deal – reNEWS

Ørsted and Eversource have signed a multi-year research partnership with Mystic Aquarium to study the effects of offshore wind turbines on marine mammals and sea turtles. The research partnership is part of a \$1.25m grant Ørsted and Eversource awarded to Mystic Aquarium announced last year. Through this partnership, Aquarium scientists will conduct several studies related to marine mammals and sea turtles, including investigating the occurrence of marine mammal strandings before and after construction and operation phases of the two developers' three offshore wind farms: South Fork Wind, Revolution Wind, and Sunrise Wind.

Heerema, Vestas and Parkwind complete its first wind turbine installation using a revolutionary floating installation method – Parkwind

The first out of the 27 Vestas V174 – 9.5MW turbines has successfully been installed at the Arcadis Ost 1 wind farm. Using a unique floating installation method, Parkwind, together with Heerema Marine Contractors and Vestas, marks an industry premiere in wind turbine installation on commercial scale. The plan to use a floating installation method for Arcadis Ost 1 was announced for the first time in November 2019. Recently, after almost 3 years of development and engineering, we have successfully executed the floating installation of the first Arcadis Ost 1 turbine. This innovative method has two main advantages. The first is zero seabed interaction especially important in areas of significant water depth or challenging soil conditions. The second advantage is a shorter installation cycle.

WSP to study MarramWind, ChampionWind impacts – reNEWS

Consultancy WSP will assess the environmental impact of two proposed offshore floating wind farms secured as part of the Scotwind leasing process for ScottishPower Renewables and Shell. The two projects, MarramWind and ChampionWind, would be among the world's first large-scale commercial floating offshore wind WSP farms and could bring enough clean energy to power the equivalent of more than six million UK homes. To support the development and delivery of the offshore wind projects, WSP will provide key front-end services, including Environmental Impact Assessment, stakeholder engagement and consultation support, advising on onshore works as well as supporting wider consents and licensing requirements.