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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

New SEER Research Brief

The U.S. Offshore Wind Synthesis of Environmental Effects Research ([SEER](#)) effort recently published a new educational research brief, [Electromagnetic Field Effects on Marine Life](#), on *Tethys*. Recordings from all SEER webinars are also available [here](#).

OES-Environmental Brochure

OES-Environmental recently published a new brochure, "[Marine Renewable Energy: An Introduction to Environmental Effects](#)", that provides an overview of the latest scientific information on the potential impacts of installation and operation of marine energy devices.

BOEM Seeking Comments

The U.S. Bureau of Ocean Energy Management (BOEM) is seeking public comments on the proposed sale notice for wind energy projects offshore [California](#) (due 1 August 2022), the Draft Environmental Impact Statement for a proposed wind energy project offshore [New Jersey](#) (due 8 August), the Notice of Intent to prepare a Programmatic Environmental Impact Statement for the [New York Bight](#) Lease Areas (due 15 August), two draft Wind Energy Areas in the [Gulf of Mexico](#) (due 19 August), and the [Draft Fisheries Mitigation Guidance](#) (due 22 August).

Calls for Abstracts

The Marine Alliance for Science and Technology for Scotland (MASTS) has opened the Call for Abstracts for its [12th Annual Science Meeting \(ASM\)](#) through 19 August 2022. MASTS 2022 ASM will take place 8-10 November 2022 in Glasgow, Scotland.

The American Meteorological Society (AMS) has opened the [Call for Abstracts](#) for the [103rd AMS Annual Meeting](#). Submission deadlines vary for the conferences and symposia, but most abstracts are due 24 August 2022. The event will place 8-12 January 2023 in Denver, U.S.

Energy Technology Partnership (ETP), an alliance of 14 Scottish universities, has opened the [Call for Abstracts](#) for the [ETP Annual Conference 2022](#) through 16 September 2022. The ETP Conference will take place on 1 November 2022 in Edinburgh, Scotland.

WindEurope has opened the [Call for Abstracts](#) for the [WindEurope Annual Event 2023](#) through 30 September 2022. The event will take place 25-27 April 2023 in Copenhagen, Denmark.

Funding & Testing Opportunities

The European Commission is launching the Innovation Fund's second [Call for Small Scale Projects](#) in renewable energy, energy-intensive industries including substitute products, energy storage, and carbon capture, use and storage. Applications are due 31 August 2022.

The U.S. Testing and Expertise for Marine Energy Research (TEAMER) program is now accepting [Request For Technical Support \(RFTS\) 8](#) applications through 14 October 2022. Developers can apply for support in numerical modeling and analysis, bench/lab or tank/flume testing, and open water activities. Visit the [TEAMER website](#) for RFTS updates.

Student & Employment Opportunities

MaREI, a research centre within University College Cork's Environmental Research Institute, is inviting applications for a [Senior Post-Doctoral Researcher](#) to work on the planning and environmental aspects of two innovative technology projects, including a project that aims to accelerate the commercial deployment of floating tidal energy. Applications due 29 July 2022.

Wave Energy Scotland is advertising a 3-6 months [Placement Opportunity](#) for a candidate to report on the opportunities for ocean energy in Scottish waters, with a particular focus on wave energy. Applications are due 5 August 2022.

France Energies Marines is inviting applications for a [PhD position](#) that will focus on providing predictions of potential impacts of offshore windfarms under contrasted climate change and fishing pressure scenarios. Applications are due 30 August 2022.

The Department of Terrestrial Ecology at Norwegian Institute for Nature Research (NINA) is seeking a [Research Scientist](#) to support on-going research on onshore and offshore wind energy, power lines, and their effects on the environment. Applications are due 31 August 2022.

Upcoming Events

Upcoming Webinars

American Clean Power is hosting a webinar, “[Standardizing the Prediction of Wind Turbine Sound Levels: A new ANSI/ACP Standard](#)”, on 27 July 2022 from 1:00pm-2:00pm EDT (5:00-6:00pm UTC). The webinar will provide an overview of a new methodology for predicting sound power levels that will be issued as a new standard in the spring of 2022. Register [here](#).

Pacific Northwest National Laboratory’s [Triton Initiative](#) is hosting the next webinar in its *Triton Talks* series on 27 July 2022 from 11:00am-12:00pm PDT (6:00-7:00pm UTC). During the webinar, the Triton Team will present Triton’s research on the environmental effects of underwater noise and anthropogenic light associated with marine energy. Register [here](#).

National Renewable Energy Laboratory is hosting a webinar, “New Functionality and Water Power Technologies Office Wave Hindcast Data in the Marine Energy Atlas”, on 24 August 2022 from 10:00-11:00am MDT (4:00-5:00pm UTC). Access the Atlas [here](#). Register [here](#).

Upcoming Workshop

On behalf of the New York State Environmental Technical Working Group, the New York State Energy Research and Development Authority is hosting the [3rd State of the Science Workshop on Wildlife and Offshore Wind Energy](#) on 26-28 July 2022 in Tarrytown, U.S. and online. In-person registration has closed but virtual registration is available here until 26 July 2022. Register [here](#).

Upcoming Conferences

CEMIE-Océano (Centro Mexicano de Innovación en Energía Océano) is hosting the [2nd International Congress on Marine Energy](#), a hybrid scientific and technical forum on the advancement of marine energies in Mexico and in the rest of the world, from 22-24 August 2022 in Mexico City, Mexico and online.

The University Marine Energy Research Community (UMERC) and the Marine Energy Technology Symposium (METS) are hosting a joint [UMERC+METS 2022 Conference](#) on 13-14 September 2022 in Portland (US). Register [here](#).

Directly after the UMERC+METS 2022 Conference, the Pacific Ocean Energy Trust is hosting the [Ocean Renewable Energy Conference \(OREC\) 2022](#) on 14-15 September 2022 in Portland (US). The conference agenda is now available. Register [here](#).

New Documents on *Tethys*

Marine Energy

[Practical Approaches for Providing Empirical Data on Seabird Behavior and Prey Assemblages in Tidal Channels](#) – Fraser et al. 2022

Increasingly sophisticated technological approaches to environmental monitoring can have fundamental non-trivial shortcomings for environmental impact assessment (EIA), whilst substantial practical and financial costs of deployments can prevent their application. For the tidal stream energy (TSE) sector, there is a need for practical and cost-effective methods that can provide site-specific information on predator behavior and associated prey assemblages. Considering existing knowledge of animal communities in tidal channel environments, a proportional approach using shore-based observation and baited fish trap methods was developed. During April 2021, a trial of these methods was conducted in tidal channel environments in Shetland, UK.

[Quantifying Background Magnetic Fields at Marine Energy Sites: Challenges and Recommendations](#) – Grear et al. 2022

Unknowns around the environmental effects of marine renewable energy have slowed the deployment of this emerging technology worldwide. Established testing methods are necessary to safely permit and develop marine energy devices. Magnetic fields are one potential cause of environmental effects and are created when electricity is generated and transmitted to shore. Further, the existing variation of the background magnetic field at sites that may be developed for marine energy is largely unknown, making it difficult to assess how much additional stress or impact the anthropogenic magnetic field may have. This study investigates two instruments for their ability to characterize the background magnetic fields at a potential marine energy site in Sequim Bay, WA.

[Acoustic characteristics of a horizontal axis micro hydrokinetic turbine](#) – Wang et al. 2022

A micro hydrokinetic turbine is a device for extracting energy from rivers or tides, and this device represents one of the frontiers for renewable energy technology. A detailed analysis of the acoustic characteristics of these turbines is of great significance for their cleaner production, further development, and use. Based on the Ffowcs Williams and Hawkings integration method, the acoustic characteristics of the horizontal axis of a micro hydrokinetic turbine are numerically studied in this work, with emphasis on the acoustic distribution, the acoustic spectrum in the time and frequency domains, and the acoustic directivity in different regions. It is found that the noise of a horizontal axis micro hydrokinetic turbine mainly occurs at the leading edge and tip of the blade due to the appearance and separation of vortices at these locations.

Wind Energy

[Study to Examine how Seabird Collision Risk, Displacement and Barrier Effects Could be Integrated for Assessment of Offshore Wind Developments](#) – Searle et al. 2022

Collision and displacement/barrier impacts for seabirds interacting with offshore wind farms (OWFs) are currently assessed using separate modelling methods. This means collision mortality is estimated separately from displacement and barrier effects, and the effect sizes are subsequently combined. However, there is concern with this approach because the parameters used in both assessments are not equivalent, making integration subject to error. Secondly, there is concern about double counting of mortalities: an individual seabird is potentially vulnerable to displacement and collision, yet it cannot be vulnerable to both simultaneously. Accordingly, the objective of this project was to develop a framework within which collision, displacement and barrier effects can be aggregated into a single overall assessment of combined impacts in a way that is internally consistent, scientifically defensible, and practically useful.

[Distance to hedgerows drives local repulsion and attraction of wind turbines on bats: Implications for spatial siting](#) – Leroux et al. 2022

We assessed how wind turbines alter bat activity in their immediate vicinity when located at different distances from hedgerows. We acoustically quantified bat activity for two guilds (short- and long-range echolocators) and two species/species group (*Pipistrellus pipistrellus* and *Pipistrellus kuhlii/nathusii* from the mid-range echolocators guild) in open areas from 10 to 283 m from hedgerows using a paired sampling design (i.e. recordings conducted simultaneously in areas with and without wind turbines). Sixty-five pairs were sampled over 23 nights during the migration period (i.e. from late summer to late fall) in France. Overall, in the absence of wind turbine, we found that bat activity decreased with increasing distance to hedgerows for all guilds, as widely reported in the literature. Yet, this pattern was no longer observed under wind turbine.

[Environmental Compatibility of the Parc Tramuntana Offshore Wind Project in Relation to Marine Ecosystems](#) – Diez-Caballero et al. 2022

Parc Tramuntana is the first offshore wind project being promoted in the Catalanian waters, and due to this newness, it has generated a strong social debate surrounding expected environmental and socioeconomic impacts traditionally associated to marine wind farms, as there are no relevant references in this area. The objective of this report is to provide a specific analysis of some of the main potential impacts, based on detailed information and quantitative data, in order to place these impacts in a realistic context and determine their actual magnitude. This analysis is fed by diverse and detailed studies carried out over the last two years to assess the environmental impact of the project, in accordance with current regulations.

News & Press Releases

Marine Energy

Bombora begins final test and assembly of world's most powerful Wave Energy Converter

– Bombora

Bombora Wave Power (Bombora) is entering the final test and assembly phase of the ground-breaking 1.5MW Pembrokeshire Demonstration Project, as it prepares to validate the world's most powerful Wave Energy Converter (WEC). Rigorous testing of the key sub-systems is currently underway as the ocean energy specialist prepares to deliver the £20million project, financially supported by the European Regional Development Fund via the Welsh Government. The cell modules, a key element of the firm's iconic 'membrane-based' WEC system, mWave™, are now being operated through their final round of design limit testing, before being fitted into the steel foundation structure in Pembroke Dock.

Minesto's tidal power plant in grid-connected operation - commercial performance verified

– Minesto

The first tidal power plant from Minesto's product line Dragon Class, Dragon 4 (100 kW), has been commissioned in Vestmannastrandir, Faroe Islands, in early summer. The first phase of electricity generation shows that predicted performance is achieved in line with Minesto's previous forecasts and simulation results. "We are very pleased to have completed the commissioning of Dragon 4 and that the electricity generation is fully in line with our predictions. We are now moving into operational mode and continuing to implement planned upgrades in parallel," says Bernt Erik Westre, CTO of Minesto. The progression in Vestmanna creates positive effects for the coming scale-up, and the work of realizing the first full-scale tidal energy array in Hestfjord, Faroe Islands, proceeds according to plan.

Verification Research of Feasibility and Dissemination of Ocean Thermal Energy Conversion in Mauritius Selected for NEDO Project - Accelerating Commercialization of Ocean Renewable Energy, Following Project Now in Operation in Okinawa – MOL

Mitsui O.S.K. Lines, Ltd. (MOL) recently announced that its verification research of feasibility and dissemination of combined use of deep ocean water with Ocean Thermal Energy Conversion (OTEC) in Mauritius, in cooperation with Xenosys Inc., and Saga University, was selected by Japan's New Energy and Industrial Technology Development Organization (NEDO) as part of an initiative to verify the effectiveness of energy technologies that contribute to the realization of stable supply, economic efficiency, environmental compatibility, and safety under overseas environments and to promote their use in Japan and overseas. MOL has accumulated knowledge in this field by participating since April of this year in the operation of a 100kW-class OTEC demonstration facility in Kumejima Town, Okinawa.

Successful Completion of AMOG's Sea-Saw Wave Energy Converter Model Testing at Flowave – AMOG (Australian Marine and Offshore Group) Consulting

AMOG recently announced the successful completion of model testing of the Sea-Saw Wave Energy Converter (WEC) at the FloWave circular tank facility within the University of Edinburgh, Scotland. The tests took place as part of the EuropeWave Pre-commercial Procurement (PCP) programme. The AMOG Sea-Saw WEC, designed and built at model scale, includes integrated power take off units to enable direct power take off measurements. AMOG is pleased to announce that this was one of the most successful power-producing tests to date, and these tests will now underpin our development of a grid scale wave energy converter. The testing campaign included a series of International Electrotechnical Commission regular wave and irregular wave specification tests, along with robustness checks on quartering conditions.

EU Energy Commissioner talks energy security & independence at Dutch tidal power plant – Ocean Energy Europe

European Energy Commissioner Kadri Simson recently visited a trailblazing tidal energy project at the Eastern Scheldt Tidal Power Plant in Zeeland. The power plant has been supplying 100% predictable and renewable power since 2016 and is a prime example of what Europe can achieve with its indigenous wave and tidal resources. Commissioner Simson and her delegation arrived at the plant on tidal-powered electric bikes – offering a glimpse of a future where tidal energy is an everyday part of EU citizens' lives. The visit was organised by Ocean Energy Europe, together with Tocardo and the Dutch Marine Energy Centre, to illustrate how tidal energy is already producing clean and reliable electricity and can be a key part of Europe's future energy mix. The tidal power produced here is used locally to balance variable wind and solar plants, so that residents and businesses can benefit from a 100% renewable energy supply.

Wind Energy

Government approves 8GW of offshore wind in major milestone for renewable energy – The Crown Estate

Plans for the UK to meet its net zero and energy security commitments have recently received a major boost as six fixed offshore wind projects, with the potential to generate renewable electricity for more than 7 million homes, have been given the green light by the Secretary of State for Business, Energy and Industrial Strategy to enter into an Agreement for Lease with The Crown Estate. In April, following the completion of a Habitats Regulations Assessment - an assessment of the potential impacts on the most valuable environmental habitats in the UK - The Crown Estate gave notice to the UK and Welsh Governments of its intent to proceed with the Offshore Wind Leasing Round 4 plan on the basis of a 'derogation'. The Secretary of State for Business, Energy and Industrial Strategy has now provided agreement that The Crown Estate can proceed with the plan, and the Welsh Government has not raised any objections to the notice.

Department of the Interior Announces Next Steps for Offshore Wind Energy in Gulf of Mexico – U.S. Department of the Interior

In response to the President’s call to advance offshore wind development and accelerate the transition to a clean energy economy, the Department of the Interior recently announced next steps to bring the opportunity of offshore wind energy to the Gulf of Mexico. The Bureau of Ocean Energy Management (BOEM) works under its renewable energy competitive leasing process to identify the offshore locations that appear most suitable for development, taking into consideration potential impacts to resources and ocean users. BOEM is seeking public input on the identification of two potential wind energy areas (WEAs) in the Gulf of Mexico Outer Continental Shelf. The first draft WEA is located approximately 24 nautical miles (nm) off the coast of Galveston, TX. The second draft WEA is located approximately 56 nm off the coast of Lake Charles, LA.

10 GW of new wind farms a year: German Parliament adopts new onshore wind law – WindEurope

The German Parliament has adopted a new Onshore Wind Law (WindLandG) which aims to expand onshore wind by a massive 10 GW a year from 2025. It’s part of an “Easter Package” of measures which also enshrines the principle that the expansion of renewables is a matter of “overriding public interest”. Last week the German Government passed the so-called “Easter Package”, including a new onshore wind law (WindLandG). It aims to ramp up the expansion of renewables. It mandates Germany to achieve an 80% share of renewables in electricity by 2030 and a completely climate-neutral energy system by 2045. The Parliamentarians deleted a proposed 100% renewables target in electricity by 2035 from the final text.

Partnerships Explore Coexistence of Bats and Wind Energy – National Renewable Energy Laboratory

The National Renewable Energy Laboratory (NREL) has awarded three industry teams funding to support research on bats and wind energy projects. Selected through the NREL Enabling Coexistence Options for Wind Energy and Wildlife (ECO Wind) program’s first competitive request for proposals, which was opened in October 2021, the awardees will receive a portion of the \$1.1 million total to research how bats behave near wind turbines and wind power plants. The awardees will track bat movements at operating wind energy facilities over the next two years. All three teams will conduct their research using thermal imaging, which uses a special kind of video camera to capture the heat signature of bats’ bodies so they can be detected at night without adding any light.

Ørsted awarded contract for world’s single biggest offshore wind farm – Ørsted

The UK Department for Business, Energy and Industrial Strategy has awarded Ørsted a contract for difference for its Hornsea 3 offshore wind farm. With a capacity of 2,852 MW, Hornsea 3 will produce enough low-cost, clean, renewable electricity to power 3.2 million UK homes, making a significant contribution to the UK Government’s ambition

of having 50 GW offshore wind in operation by 2030 as part of the British Energy Security Strategy. Hornsea 3 will play a key role in the ongoing development of a larger and sustainably competitive UK supply chain to support the next phase of the UK's offshore wind success story. Ørsted has already announced a multi-million pound agreement for Hornsea 3 to be the first and lead customer at SeAH Wind's monopile factory in Teesside, underpinning SeAH's investment decision to establish a new, globally competitive monopile factory in the UK.

EMEC and West of Orkney Windfarm Kick Off Major Offshore Wind R&I Programme – European Marine Energy Centre (EMEC)

EMEC, based in Orkney, has signed a ground-breaking agreement with the West of Orkney Windfarm to kick-start a major research and innovation (R&I) programme – tasked with increasing the competitiveness of the windfarm and enhancing R&I capacity in the north of Scotland. Rights to develop the 2-gigawatt West of Orkney Windfarm were secured in January by a joint venture consisting of Corio Generation, TotalEnergies and Renewable Infrastructure Development Group. The project will be located 30 km off the west coast of Orkney and aims to start producing renewable power by 2030. Building upon its core strengths in technical research programme delivery, this partnership will be the first with a large-scale, commercial offshore wind farm and will support further diversification of the organisation.