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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

New Educational Resources on *Tethys*

OES-Environmental recently launched an [Educational Resources](#) page on *Tethys* to support students and educators within the context of environmental effects of marine renewable energy!

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 [Mayflower Wind Proposal](#) through 1 December 2021. BOEM is also seeking public input on proposed lease sales in the [Gulf of Mexico](#) through 16 December 2021 and the [Carolina Long Bay](#) area through 3 January 2022.

USFWS Seeking Comments

The US Department of the Interior [recently announced](#) a series of actions to ensure that the Migratory Bird Treaty Act conserves birds today and into the future. As part of this effort, the US Fish and Wildlife Service (USFWS) is [seeking public comments](#) to help develop proposed regulations to authorize the incidental take of migratory birds through 3 December 2021.

MHK Graduate Student Research Program

The US Department of Energy (DOE) Water Power Technologies Office Oak Ridge Institute for Science and Education are now accepting applications for the [Marine & Hydrokinetic \(MHK\) Graduate Student Research Program](#). The program is open to doctoral students at US institutions and provides access to relevant expertise and resources. Applications are due 10 December 2021.

Call for Abstracts

The [Call for Abstracts](#) for the [WindEurope Annual Event 2022](#) has been extended to 15 November 2021. The event will take place in Bilboa, Spain on 5-7 April 2022.

Calls for Papers

The *Journal of Marine Science and Engineering* is accepting manuscript submissions for several Special Issues, including "[Renewable Energies and Ocean Technologies: Challenges to the Green and Blue Economy](#)" (due 31 December 2021), "[Offshore Renewables for a Transition to a Low Carbon Society](#)" (due 1 February 2022), and "[Impacts of Offshore Wind Farms on Marine Ecosystems, Fisheries and Societies](#)" (due 15 March 2022).

Frontiers in Energy Research is accepting manuscript submissions for several Research Topics, including "[Wind Turbine Wakes and Wind Farms](#)" (due 28 January 2022), "[Offshore Wind Energy: Modeling and Measurements](#)" (due 28 January 2022), and "[Offshore Wind and Wave Energy and Climate Change Impacts](#)" (due 23 February 2022).

Funding & Testing Opportunities

The Natural Environment Research Council and The Crown Estate are co-funding the Ecological Consequences of Offshore Wind research ([ECOWind](#)) programme, which will fund eligible UK organizations to research how UK ecosystems respond to offshore wind development and inform marine policy and management solutions. Proposal outlines are due 25 November 2021.

The US DOE's National Renewable Energy Laboratory (NREL) 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

Natural Resources Wales is recruiting for a [Senior Marine Advisor](#) to support its Offshore Renewable Energy Programme. Applications are due 16 November 2021.

The European Marine Energy Centre is looking for an [Environmental Officer](#) to carry out environmental monitoring services. Applications are due by 1:00pm UTC on 17 November 2021.

Pacific Northwest National Laboratory (PNNL) is seeking two [Post Doc Research Associates](#) to conduct modeling projects in several topic areas, including offshore wind, wave, tidal stream, and ocean current energy. Applications are due 19 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 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 Workshop

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

As part of the US Offshore Wind Synthesis of Environmental Effects Research ([SEER](#)) project, PNNL and NREL are hosting the [first of four webinars](#) on the environmental effects of offshore wind energy from 8:00-9:30am PST (4:00-5:30pm UTC) on 30 November 2021. The webinar will feature presentations and panel discussions on underwater noise and entanglement risk considerations for offshore wind farms. Register [here](#).

Marine Energy Wales and Marine Renewables Canada are hosting a joint [webinar](#) from 3:00-5:00pm UTC on 1 December 2021 to promote international shared learning across the marine renewable energy sector. Register [here](#).

The US DOE's Water Power Technologies Office is hosting a webinar from 11:30am-1:00pm EST (4:30-6:00pm UTC) on 7 December 2021 to present the relevant [Phase 1 Release 2 Topics](#) for its [Small Business Innovation Research and Small Business Technology Transfer programs](#), which provide financial support for climate and energy R&D projects. Register [here](#).

Upcoming Conferences

The International Network on Offshore Renewable Energy (INORE) is hosting the [2021 INORE Virtual Symposium](#) on 18 November 2021. Register [here](#).

Marine Renewables Canada is hosting the [Marine Renewables Canada 2021 Annual Conference](#) on 24-25 November 2021 in Halifax, Nova Scotia. Register [here](#).

American Clean Power is hosting the [CLEANPOWER 2021 Conference & Exhibition](#) on 7-8 December 2021 in Utah, US. Register [here](#).

New Documents on *Tethys*

Marine Energy

[Harbour porpoise \(*Phocoena phocoena*\) presence is reduced during tidal turbine operation](#) – Palmer et al. 2021

Uptake of tidal turbine technology to generate renewable energy has been partly limited by poor understanding of ecological impacts, including the potential for collisions between cetaceans and rotating turbine blades. To address this concern, it is necessary to identify whether cetaceans behaviourally respond to operating turbines. A turbine in Scotland was instrumented with hydrophones to detect cetacean vocalizations. A generalized additive model was used to investigate temporal variability in harbour porpoise presence close to the turbine. As there were incidentally periods when the turbine was not operating, it was possible to determine the effect of blade rotation, whilst accounting for the potentially confounding effect of tidal flow.

[Assessing impacts of tidal power lagoons of a consistent design](#) – Mackie et al. 2021

The implementation of tidal lagoons will impact the tidal conditions and hydrodynamics of the surrounding coastal system. Impact assessments in the academic literature have generally investigated working proposals from industry of various shapes and sizes. As such, differences between the impacts arising from considered power plants in varying sites are in part influenced by the individual scheme characteristics, potentially masking the influence of site-specific factors. In this study, scheme design consistency is

maintained, providing a basis to focus solely on the merits of the selected locations with regards to any associated impacts. The simulated tidal power lagoons are located in the Bristol Channel and Irish Sea, two distinct but tidally connected regions on the British coastline with contrasting marine environment characteristics.

[The challenges of engaging island communities: Lessons on renewable energy from a review of 17 case studies](#) – Kallis et al. 2021

Islands have attracted growing attention as sites of renewable energy generation, both for generating commercial low-carbon energy and to improve local energy conditions. However, significant challenges exist in achieving fair distribution in the benefits and costs of developments located on or around islands and in engaging local communities on proposals for installations. A broad literature exists on the merits of different community engagement techniques but important gaps remain in understandings of the particular challenges of engaging with island communities on energy issues. Based on a thematic literature review, this article examines general principles and considerations for community engagement on energy developments, features of islands that can affect community engagement, and how past engagement processes have sought to encourage community participation, gain trust, and manage conflicts over developments.

Wind Energy

[NOAA and BOEM Minimum Recommendations for Use of Passive Acoustic Listening Systems in Offshore Wind Energy Development Monitoring and Mitigation Programs](#) – Van Parijs et al. 2021

Passive acoustic monitoring (PAM) represents a newer technology that has become one of several methods of choice for monitoring trends in the presence of species, the soundscape, mitigating risk, and evaluating potential behavioral and distributional changes resulting from offshore wind activities. Federal and State regulators, the offshore wind industry, and environmental advocates require detailed information on PAM capabilities and techniques needed to promote efficient, consistent, and meaningful data collection efforts on local and regional scales. The recommendations in this paper aim to support this need as well as to aid the development of project-specific PAM Plans by identifying minimum procedures, system requirements, and other important components for inclusion, while promoting consistency across plans.

[Modelling potential visibility of wind turbines: A geospatial approach for planning and impact mitigation](#) – Alphan et al. 2021

Spatial modelling of the potential visibility of wind turbines holds strategic information for wind power siting decisions. The visibility information is critical to breaking trade-offs between energy production and protecting the visual amenity of landscapes. Currently, public attention to the visual impacts of wind turbines tends to rise in countries with high wind power capacities. Decreases in property values due to wind turbine visibility and negative impacts on scenery are among the factors that draw public

attention. These implications make it necessary to use spatial analysis and develop mitigation strategies based on the geospatial outputs. This paper aims to produce Potential Visibility Models (PVM) to analyse wind turbine visibility from candidate observation locations where the scenery is an important asset.

[Year-round distribution of Northeast Atlantic seabird populations: applications for population management and marine spatial planning](#) – Fauchald et al. 2021

Tracking data of marine predators are increasingly used in marine spatial management. We developed a spatial data set with estimates of the monthly distribution of 6 pelagic seabird species breeding in the Northeast Atlantic. The data set was based on year-round global location sensor (GLS) tracking data of 2356 adult seabirds from 2006-2019 from a network of seabird colonies, data describing the physical environment and data on seabird population sizes. Tracking and environmental data were combined in monthly species distribution models (SDMs). Cross-validations were used to assess the transferability of models between years and breeding locations. The analyses showed that birds from colonies close to each other used the same nonbreeding habitats, while birds from distant colonies used colony-specific and, in many cases, non-overlapping habitats.

News & Press Releases

Marine Energy

[Harnessing the energy of the ocean to power homes, planes and whisky distilleries](#) – The Washington Post

In the far north of Scotland, an audacious experiment is underway on a stormy archipelago. Inventors dream of a tomorrow powered by waves and tides. When you first look at the ideas for ocean-energy devices, it does look a little...*sci-fi*. Underwater corkscrews. Oscillating hydrofoils. Tidal kites? Seriously. And it gets more out there. In Scotland, they want to plug this ocean energy into shoreside electrolyzers, which separate water into oxygen and green hydrogen, and use the gas bubbles to power... whisky distilleries. And someday to heat homes and schools — and power passenger ferries and planes that hop between islands. Over the years, the Orkney Islands have hosted 34 experimental marine energy devices, more machines than anywhere else in the world.

[Five Portuguese institutions join efforts to boost open sea tests of ocean technologies](#) – WavEC

Five Portuguese institutions—CEiiA, +ATLANTIC CoLAB, Fórum Oceano, INESC TEC, and WavEC—have decided to take a decisive step in the joint effort they started in 2020, and have come together to create OceanACT, a 100% Portuguese consortium that aims to promote the testing of innovative ocean technologies in Portugal. The main objective of this Consortium is to create the OceanACT-Atlantic Lab for Future Technologies, a development, test, demonstration, and qualification centre for

technologically innovative services and products within the framework of the Blue Economy, which will be responsible for managing and boosting the offshore demonstration infrastructures available in the country.

Scotland's tidal titans team up to turbo charge the tidal energy industry – Nova Innovation

Nova Innovation and Atlantis Energy are delighted to announce they have entered a collaboration agreement with the goal of delivering more UK-built tidal turbines in the water, turbo charging the tidal industry. The focus initially is on the commitment to deliver Nova and Atlantis turbines at the MeyGen site. The Atlantis owned, operated, and developed MeyGen site is the largest fully consented and operational tidal stream site in the world. Between the companies, they have delivered over half of the tidal stream devices operational worldwide and are developing sites in the UK, Canada, Japan and France. Both companies deploy subsea turbines which generate predictable, renewable power with no visual impact.

Triton-C wave energy device taking final shape ahead of Hawaii splash – Offshore Energy

U.S.-based company Oscilla Power has made progress with final assembly operation of its Triton-C wave energy device that will soon be deployed offshore Hawaii. Oscilla Power's team has been hard at work in Hawaii, working closely with the company's local contractors to assemble the eight separate parts forming the Triton-C wave energy device, that were shipped to Hawaii a few weeks ago. The Triton-C, rated at 100kW, will be installed at the U.S. Navy's Wave Energy Test Site site, a pre-permitted location that includes all required infrastructure, such as the subsea grid connection and moorings. Furthermore, Oscilla Power has raised over \$200,000 in an ongoing crowdfunding campaign on StartEngine platform, whose goal is to collect \$3 million to fund the development and deployment of its first utility-scale megawatt-size system in India.

North to the Future: WPTO Helps Alaskan Partners Pursue a Clean Energy Future With Water Power – US DOE Water Power Technologies Office

With support from the U.S. Department of Energy's (DOE) Water Power Technologies Office (WPTO), Alaska's remote villages, and even bustling urban communities, could tap a massive renewable energy source rushing through their state: water. Throughout 2021, WPTO has invested in several marine energy and hydropower projects in Alaska, working closely with community members to learn how to best serve their energy needs while respecting their culture. By tapping the largest tidal energy resource in the world, filling microgrids with clean marine energy, and building grids that can withstand avalanches, earthquakes, and cyberattacks, DOE aims to help Alaska—and the nation—transition to a clean, resilient energy future.

CorPower named finalist in \$1Million Ocean Innovation Prize – CorPower Ocean

CorPower has reached the finals of the US\$1 Million Ocean Innovation Prize organised by the Blue Climate Initiative (BCI). A total of 21 semi-finalists have been selected for

their ‘creative and innovative approach’ to help solve the climate crisis, after being whittled down from 236 applications from more than 60 countries. Endorsed by the United Nations Decade of Ocean Science for Sustainable Development 2021-2030 (‘the Ocean Decade’), the BCI is hosting the Ocean Innovation Prize in conjunction with the Sustainable Ocean Alliance, in the framework of the Ocean Decade. Coming from all corners of the globe, the finalists include clean energy and desalination from sea waves and solar technologies; carbon dioxide removal such as through gasification of algae biomass, electrochemistry and alkalinity enhancement; and many more.

Wind Energy

[The Crown Estate develops proposals for floating wind in Celtic Sea, outlining 4GW opportunity](#) – The Crown Estate

The Crown Estate has published further detail on its plans for floating wind leasing in the Celtic Sea, confirming its ambition to unlock up to 4GW of new clean energy capacity in England and Wales and help establish a new industrial sector for the UK. The leasing process will deliver enough new capacity to provide clean power for almost four million more homes, in support of the UK’s net zero target, as well as creating opportunities for significant new investment in jobs, skills, and infrastructure. The proposals, published today, follow engagement with government, stakeholders and the market, and include a focus on two key project categories: early-commercial scale projects (of circa 300-350MW) and full-commercial scale projects (of up to 1GW).

[Siemens Gamesa’s groundbreaking pilot project hits key milestone as first green hydrogen is delivered to zero emission vehicles](#) – Siemens Gamesa

Earlier this summer, Danish authorities granted Siemens Gamesa’s Brande Hydrogen test site status as official regulatory test zone, allowing activities here to operate outside the existing electricity regulations and enabling research into how to develop an island-mode capable system of offshore hydrogen production at turbine level. The pilot project now celebrates a new milestone, producing its first green hydrogen as part of the testing and commissioning phase. Project partner Everfuel is distributing this to hydrogen stations in Denmark, enabling a growing number of zero emission vehicles, such as fuel cell taxis, to operate on a 100% green fuel supply. The Brande Hydrogen setup couples an existing onshore Siemens Gamesa SWT 3.0-113 DD wind turbine with an electrolyzer stack from electrolysis partner Green Hydrogen Systems.

[GWEC and UN Sign Global Compact to Advance Offshore Renewable Energy](#) – Global Wind Energy Council

On Ocean Day at COP 26, the United Nations (UN) Global Compact launched a roadmap to advance offshore renewable energy using a climate-smart approach to ocean management, together with the offshore wind industry and the marine planning community. Offshore wind is one of the most promising clean energy sources, but faces challenges slotting into an increasingly busy marine space which is suffering ecosystem

and biodiversity pressures. Leaders from the Global Wind Energy Council (GWEC) and IOC-UNESCO joined the UN Global Compact to voice their support for the roadmap and discuss ways to intensify collaboration between the industry, government authorities and the marine spatial planning community.

UK Department for Transport and offshore wind industry launch initiative to decarbonise North Sea maritime operations – Offshore Renewable Energy (ORE) Catapult

The UK Department for Transport and the ORE Catapult have unveiled the Department's 'Operation Zero', which aims to accelerate the decarbonisation of offshore wind operations and maintenance vessels working in the North Sea's offshore wind farms. At an event as part of COP26 in Glasgow, Maritime Minister Robert Courts announced the initiative, which will convene a coalition of 28 founding signatories from across the offshore wind supply chain from the UK, Germany, Sweden, Denmark, the Netherlands and Belgium. The vision of 'Operation Zero' is for zero-emission vessels to be deployed at North Sea offshore windfarms by 2025, while also taking into consideration the land-side infrastructure solutions needed to upscale and maintain the operation of the vessels.

California Pilot Project progressing towards Environmental Impact Report – BW Ideol

BW Ideol is pleased to announce that its planned offshore floating wind pilot-project in California has progressed to the environmental assessment stage, representing the next milestone in a permitting process for what may become one of the first wind farms off the coast of California. The 40 MW+ pre-commercial floating wind project based on BW Ideol's Damping Pool® technology, will be installed off Vandenberg Space Force Base (formerly Vandenberg Air Force Base), located in Santa Barbara County, California. On 21 October, the California State Lands Commission formally authorized the solicitation of Statements of Interest for consultant services for the preparation of environmental documentation and mitigation monitoring for the proposed wind farm.

Supergen Offshore Renewable Energy Hub launches a new children's adventure book to communicate offshore renewable energy – Supergen Offshore Renewable Energy Hub

A new children's adventure book in offshore renewable energy (ORE) has been launched by the Supergen ORE Hub as part of their COP26 activities. The Supergen ORE Hub is an Engineering and Physical Sciences Research Council funded project which provides research leadership to connect academia, industry, policymakers and the public, inspire innovation and maximise societal value in offshore renewable energy. The book aims to communicate the often-complex subject of offshore wind, wave and tidal energy to 4-6 year olds and those reading with them, as well as encouraging girls and those from other underrepresented groups to consider a career in engineering. The book has been developed as a response to an equality, diversity and inclusion scoping study, which reported that gender beliefs and stereotypes are often embedded at an early age.