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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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Do you have questions about *Tethys*? Visit the [Frequently Asked Questions](#) and [Tips for Tethys](#) pages to learn more about *Tethys* content, features, and how to contribute!

[WREN Environmental Horizon Scan](#)

Working Together to Resolve Environmental Effects of Wind Energy (WREN) has launched the 2nd iteration of the [WREN Environmental Horizon Scan](#). This follow-up survey will rank the specific stressors and receptors identified in the first survey for both land-based and offshore wind energy development to help us assess wind energy and environmental priorities over the next 5-10 years. Please complete the scan by 15 September 2021.

[Marine Energy Survey](#)

Mindseed and OceanEnergy are conducting a [survey](#) in association with the European Space Agency and Dutch Marine Energy Centre to investigate the potential use of remote sensing space data for marine energy project development.

DTOcean+ Software Suite Now Available

The DTOceanPlus project has released its final suite of advanced design tools for the selection, development, and deployment of ocean energy systems. The DTOcean+ open-source software suite and associated documentation are now available on [GitLab](#). Additional resources concerning the DTOceanPlus project are available [here](#).

Calls for Abstracts

The abstract deadline for the [Ocean Sciences Meeting \(OSM 2022\)](#) has been extended to 29 September 2021. Please consider submitting an abstract to Scientific Session OT15: Measuring, Modeling, and Mitigating Environmental Effects of Ocean Renewable Energy. OSM 2022 will take place online and in Honolulu, US from 27 February to 4 March 2022.

The International Oceanographic Data Exchange is accepting abstracts for the [International Ocean Data Conference 2022 - The Data We Need for the Ocean We Want](#), which will take place online and in Sopot, Poland on 14-16 February 2022. Abstracts are due 29 October 2021.

Funding & Testing Opportunities

Interreg North-West Europe launched the 4th Ocean DEMO (Demonstration Programme for Ocean Energy Pilot Farms and Supporting Technologies) [Call for Applications](#). Successful applicants will receive free access to test their ocean energy products in real sea environments at the project's network of test centers. Applications are due 10 September 2021.

The Blue Climate Initiative is welcoming applications from innovators and entrepreneurs for the [Ocean Innovation Prize](#), which is designed to inspire, fund and support innovations that mitigate climate change through ocean-related strategies. Applications are due 15 September 2021.

The US Testing Expertise and Access for Marine Energy Research (TEAMER) program is now accepting applications for its 4th Request for Technical Support (RFTS) through 16 September 2021. Applications will now be reviewed on a quarterly basis and those submitted after the due date will be considered for the next RFTS. Visit the [TEAMER website](#) for more details.

The US National Offshore Wind Research and Development Consortium (NOWRDC) released a competitive solicitation entitled [Innovations in Offshore Wind Solicitation 2.0](#). Concept papers for Round 1: Supply And Logistics, Operations & Maintenance are due 16 September 2021. Concept papers for Round 2: Environmental Conflicting Use Mitigation, Power Systems & Interconnection are due 9 March 2022. Visit the [NOWRDC website](#) for more details.

The Oceanic Platform of the Canary Islands (PLOCAN) has opened its [Summer Access Call for 2021](#). Applicants interested in accessing PLOCAN facilities and services are encouraged to contact PLOCAN before submitting their proposal. Applications due 20 September 2021.

The Sustainable Energy Authority of Ireland and Lir National Ocean Test Facility are offering free-of-charge access to research and testing facilities for offshore renewable energy developers through the [Industry Access Programme](#). Applications are due 24 September 2021.

EuropeWave has launched its Pre-Commercial Procurement (PCP) programme, which aims to accelerate the design, development, and demonstration of cost-effective wave energy converters. The [Request for Tenders](#) for EuropeWave's PCP is open until 1 October 2021.

The Horizon Europe Framework Programme has launched the [European Innovation Council \(EIC\) Accelerator Challenges](#) to support small and medium enterprises developing game-changing innovations, including renewable energy. Applications due by 6 October 2021.

The Danish Energy Agency recently opened a [Technology Neutral Tender](#) of aid for electricity generated by onshore wind turbines, open door offshore wind turbines, wave power plants, hydroelectric power plants, and solar installations. The deadline for bids is 22 October 2021.

The Horizon Europe Framework Programme has also recently launched a [Call for Proposals](#) titled, Wind Energy in the Natural and Social Environment, to ensure that turbines retain a low environmental impact and gain more popular support. Applications are due 23 February 2022.

Student & Employment Opportunity

The Environmental Research Institute at the University of the Highlands and Islands is 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 measurement platforms. Applications are due 20 September 2021.

Upcoming Events

Upcoming Workshops

As part of the Pacific Ocean Energy Trust's Ocean Renewable Energy Conference ([OREC 2021](#)), the Portal and Repository for Information on Marine Renewable Energy ([PRIMRE](#)) team is hosting a free, online workshop on 24 September 2021 from 8:00-10:00am PDT (3:00-5:00pm UTC). The workshop will provide an overview of PRIMRE, its Aggregate Search, and ways to contribute, as well as live demonstrations of the newest Knowledge Hubs, the Marine Energy Atlas and MRE Software. Registration information coming soon.

OES-Environmental is also hosting a free, online workshop as part of [OREC 2021](#), on 24 September 2021 from 10:30am-12:30pm PDT (5:30-7:30pm UTC). The workshop will examine the scientific evidence from key stressor-receptor interactions to discuss risk retirement and move towards application in a regulatory context. The workshop will include presentations, discussions, and breakout groups, as well as an overview of the OES-Environmental guidance documents and their application in permitting processes. Registration information coming soon.

Upcoming Webinars

The Global Wind Energy Council (GWEC) is hosting a [webinar](#) from 11:00-12:00 CEST (9:00-10:00am UTC) on 10 September 2021 to accompany the release of its third annual Global Offshore Wind Report 2021. During the webinar, the report authors and leading experts will unpack key findings and discuss challenges and opportunities to ramp up offshore wind installations. Register [here](#).

The New York State Energy Research & Development Authority's Offshore Wind Team is hosting a webinar titled, "Regional Collaboration on Wildlife & Fisheries Research", from 1:00-2:00pm EDT (5:00-6:00pm UTC) on 15 September 2021, as part of its [Learning from the Experts webinar series](#). Register [here](#).

The US DOE Water Power Technologies Office (WPTO) is hosting a webinar titled, "WPTO in Alaska", from 5:00-6:00pm EDT (9:00-10:00pm UTC) on 15 September 2021, as part of its [R&D Deep Dive Webinar Series](#). During the webinar, WPTO representatives will share the work they're doing and offer insights into what could be next for water power in Alaska. Register [here](#).

The European Technology and Innovation Platform for Ocean Energy is hosting a webinar titled, "Environmental data transfer: the role of test centres", from 10:00-11:00am BST (9:00-10:00am UTC) on 16 September 2021. During the webinar, two European leading ocean energy test centres will discuss the potential, challenges, and opportunities of data transfer. Register [here](#).

Upcoming Conferences

Island Innovation is hosting the [Virtual Island Summit 2021](#), which aims to connect islands committed to implementing creative solutions, on 6-12 September 2021. Register for free [here](#).

The Association of Fish and Wildlife Agencies (AFWA) is hosting its [111th AFWA Annual Meeting](#) on 8-14 September 2021 online and in Providence, US. Register [here](#).

RenewableUK and Scottish Renewables is hosting the [Floating Offshore Wind Conference 2021](#) on 15-16 September 2021 online and in Aberdeen, UK. Register [here](#).

Event Update

The [2021 North American Wind Energy Academy/WindTech Conference](#) is postponed to 2022 due to the COVID-19 pandemic. An [Interim Webinar Series](#) is offered in its place with high-level presentations on a variety of wind energy topics. Sign up [here](#) for updates and reminders.

New Documents on *Tethys*

Marine Energy

Are fish in danger? A review of environmental effects of marine renewable energy on fishes
– Copping et al. 2021

Many fish species are threatened worldwide by overfishing, contamination, coastal development, climate change, and other anthropogenic activities. Marine renewable energy (MRE) is under development as a sustainable alternative to carbon-based energy sources. Regulators and stakeholders worry that MRE devices will add another threat to fish populations already under pressure. This paper reviews the current knowledge of potential effects of MRE development on fish. These may include collision with devices that may lead to injury or death; underwater noise generated by MRE devices that may affect fish behavior and health; electromagnetic fields from power cables and other electrical infrastructure that may lead sensitive fish species to approach or avoid them; and changes in critical fish habitat, including nursery, feeding, and spawning grounds.

Effects of a Wave Power Park with No-Take Zone on Decapod Abundance and Size
– Bender et al. 2021

Past studies have revealed higher levels of biodiversity, total abundance, and size of individuals around offshore installations of renewable energy. This study investigated the effects of Lysekil wave power park (area 0.5 km²) on the abundance and carapace size of decapods at the Swedish west coast. For that purpose, decapods were caught with cages during four consecutive summers. Two types of cages were applied to catch a wide range of decapod species and sizes. The abundance and size of decapods were not significantly different within the wave power park and up to a distance of 360 m outside of it. The catch rate, i.e., number of decapods caught in 24 h, was not significantly different among sampling locations but revealed inter-annual variation for both cage types.

Bayesian network modelling provides spatial and temporal understanding of ecosystem dynamics within shallow shelf seas – Trifonova et al. 2021

Understanding ecosystem dynamics within shallow shelf seas is of great importance to support marine spatial management of natural populations and activities such as fishing and offshore renewable energy production to combat climate change. Given the possibility of future changes, a baseline is needed to predict ecosystems responses to such changes. This study uses Bayesian techniques to find the data-driven estimates of interactions among a set of physical and biological variables and a human pressure within the last 30 years in a well-studied shallow sea (North Sea, UK) with four contrasting regions and their associated ecosystems. A hidden variable is incorporated to model functional ecosystem change, where the underlying interactions dramatically change, following natural or anthropogenic disturbance.

Wind Energy

Behavioural reactions of harbour porpoises *Phocoena phocoena* to startle-eliciting stimuli: movement responses and practical applications – Hiley et al. 2021

Acoustic deterrent devices are frequently used as a mitigation method to exclude harbour porpoises *Phocoena phocoena* from areas of potential harm, such as wind farm construction sites. However, there is increasing evidence that the devices themselves have the capacity to cause hearing damage. Here, we investigated the response of harbour porpoises to a 15 min sequence of 200 ms sound (peak frequency 10.5 kHz, range 5.5-20.5 kHz, 27 sounds total), which elicits the acoustic startle reflex. We used a duty cycle (0.6%) and sound exposure level that were significantly lower than in conventional acoustic deterrent devices. Harbour porpoises were exposed to startle sounds from a small vessel, and groups were visually tracked during 13 sound exposure sequences and 11 no-sound control trials.

[Post-construction bird and bat fatality monitoring studies at wind energy projects in Latin America: A summary and review](#) – Agudelo et al. 2021

Most post-construction fatality monitoring (PCFM) studies to date have focused on North America and Europe, and this information has been used to assess the impacts of large-scale wind energy on birds and bats. A comprehensive review of wind-wildlife fatality information is still lacking for Latin America; however, given the current installed capacity and the projected increase of wind energy production across Latin America, it is important to fill in the knowledge gap on impacts to wildlife. To provide a current summary of known impacts to birds and bats in Latin America and to identify gaps on this important information, we compiled, reviewed, and synthesized bird and bat fatality information at wind energy projects in the region.

[Introducing offshore wind energy in the sea space: Canary Islands case study developed under Maritime Spatial Planning principles](#) – Abramic et al. 2021

In this study, we define a novel methodological approach for introducing Offshore Wind Energy (OWE) facilities into sea space, determining the most suitable locations with regard to the five clusters: oceanographic potential; environmental sensibility; restrictions related to marine conservation; Land–Sea interactions; and avoiding potential conflict with current maritime and coastal activities. The methodology was tested along 1.583 km of the Canary Islands coastline and across more than 50 000 km² of related offshore areas. We have identified marine areas that have significant wind & depth potential, minimal impact on the marine environment, compatibility with marine conservation and conflict avoidance with operative economic maritime and coastal sectors (such as coastal tourism, fisheries, aquaculture, maritime transport, etc.).

News & Press Releases

Marine Energy

[EU-SCORES Project aims to deliver ‘world-first’ bankable hybrid offshore marine energy parks](#) – Dutch Marine Energy Centre (DMEC)

The €45 million marine energy project—European SCalable Offshore Renewable Energy Sources (EU-SCORES)—will pave the way for bankable hybrid offshore parks across Europe by 2025. Under the project lead of the DMEC, EU-SCORES will unlock the large-scale potential of wind, wave and offshore solar systems. Kicking off in September 2021, the project partners will jointly build on two highly comprehensive and impactful demonstrations: (1) A 3MW offshore solar system by Oceans of Energy off the Belgian coast co-located with a bottom fixed windfarm and; (2) A 1.2MW wave energy array by CorPower Ocean in Portugal co-located with a floating wind farm. The demonstrations in EU-SCORES aim to showcase the benefits of continuous power output by harnessing complementary power sources including wind, sun and waves.

Interactive Environmental Mapping and Evidence Packages for Wales Now Available for Wave Energy and Tidal Stream Energy – Marine Energy Wales

Produced through the European Maritime and Fisheries Fund’s Sustainable Management of Marine Natural Resources (SMMNR) project, the storyboards are available [here](#). For each focus sector, the online storyboards present mapping of natural resources and environmental opportunities and associated sensitivities, supported by commentary on key ecological considerations. The storyboards also provide contextual information on relevant policy, legislation and sources of guidance and an overview of consenting (including key consents and environmental assessments) relevant to the sector. Over the past three years, SMMNR has mapped natural resources and associated ecological sensitivities and considerations in relation to the tidal stream, wave energy and aquaculture sectors.

CalWave to kick off wave device pilot in mid-September – Offshore Energy

California-based wave energy company CalWave Power Technologies will launch an open-water wave energy pilot off the pier of the Scripps Institution of Oceanography in mid-September. The submerged pressure differential device is scheduled to be installed in September as part of a 2017 U.S. Department of Energy-funded R&D project. The scaled device will be installed around 300 metres from the pier, and will then be connected to the shore via a temporary cable landing on the pier to supply the energy produced. The pilot device will be operating fully submerged in around 26-metre water depth for six months, and according to the developers, the deployment will be the first-ever in-sea demonstration of a fully submerged wave energy system in California.

Launch of New Wave Energy Converter in King George Sound, Albany Project – Blue Economy Cooperative Research Centre (Blue Economy CRC)

The Blue Economy CRC is pleased to announce the launch of its latest project Seeding Marine Innovation with the M4 Wave Energy Demonstrator in Albany. The University of Western Australia’s (UWA’s) Wave Energy Research Centre, with headquarters in Albany, is leading the \$4.8 million marine innovation project on the Great Southern coast. The project – nicknamed M4 and aimed at demonstrating the region’s wave energy potential to power the local aquaculture industry – is jointly supported by the Western

Australian Government and the Blue Economy CRC. The UWA project will include a feasibility study with the industry-led Australian Ocean Energy Group to develop the world's first Ocean Wave Energy Market Demonstration Site – or 'Marketplace' – in Albany that links customers with a suitable renewable energy microgrid solution.

Welsh marine energy test centre secures Crown Estate lease for open water sites – Offshore Energy

Marine Energy Test Area (META), Wales' national test centre, has officially signed a lease with The Crown Estate, launching the opening of its open water test sites. After initially securing seabed rights with The Crown Estate back in 2020, the signing of a full lease now enables wave and tidal energy testing to take place in more energetic sites on Pembrokeshire's south coast. META has now secured all licenses and consents to be a fully operational test centre, and forms one key stepping stone in the Welsh test centre network, the centre informed. The test sites, offering moderate to high energy areas for operational 'real-sea' testing, include Warrior Way tidal site; Dale Roads wave test site; and East Pickard Bay wave and floating offshore wind component test site.

Wind Energy

Addressing the effect of offshore windfarms on marine ecosystems – Natural Environment Research Council (NERC)

A new research programme has been launched to address the critical gap in understanding how marine ecosystems will respond to the continued growth of offshore wind farms. The £7 million programme, known as ECOWind, is a joint initiative led by NERC in partnership with The Crown Estate and the Department for Environment, Food and Rural Affairs. The four-year programme will fund leading-edge research into how offshore windfarms affect the marine environment, alongside other growing pressures on UK ecosystems. This includes climate change and human activities such as fishing. In particular, the programme will focus on how populations and inter-species interactions are responding to offshore wind deployment and how marine observations can be enhanced through innovative technologies to improve our understanding.

Sofia the first UK project to use novel bird monitoring technique – Sofia Offshore Wind Farm

Sofia will be the first UK offshore wind farm to integrate both light detection and ranging (LiDAR) and traditional digital aerial surveys in a single aircraft for its pre-construction ornithology surveys. Two UK consultancies—airial survey experts APEM and specialist ornithological consultants NIRAS—have been engaged by Sofia, 100% owned by RWE, to develop the project's Ornithology Monitoring Plan and carry out the innovative work, which is now seen as the most accurate and precise way to measure seabird flight heights offshore. Twelve surveys, gathering data on potentially thousands of birds, will be carried out over two years before the 1.4 GW wind farm's offshore construction begins on

Dogger Bank in late 2023. The surveys will look at kittiwakes during their breeding season although data on other bird species and marine mammals will also be collected.

Interior Department Announces Environmental Review of Proposed Wind Energy Facility in the North Atlantic – US Department of the Interior

As part of the Biden-Harris administration's goal to deploy 30 gigawatts of offshore wind energy by 2030, the Department of the Interior recently announced that the Bureau of Ocean Energy Management (BOEM) plans to conduct an environmental review of a proposed commercial-scale wind project offshore New York. The project proposes to build up to 122 wind turbines, which would generate 880 to 1,300 megawatts of renewable energy and power nearly 600,000 homes. The project would help New York meet its clean energy goal of achieving 70 percent electricity from renewable sources by 2030. The lease area is in federal waters approximately 31 miles east of Montauk, New York. BOEM's Notice of Intent opens a 30-day public comment period on the proposed Construction and Operations Plan submitted by Sunrise Wind, LLC.

LearnWind: WindEurope launches educational hub to tackle skills gap – WindEurope

Wind energy now employs 1.2 million people globally. But the transition from fossil fuels to renewables has only just begun. With the launch of the new educational hub 'LearnWind', WindEurope aims to inspire the talents of tomorrow to pursue a career in wind energy. The new hub offers basic explanations about wind energy, a new book on job profiles in clean energy, teaching resources and hands-on activities. LearnWind includes a variety of educational materials for children of different age groups. Dedicated books and pictures illustrate basic concepts of climate change, renewable energy and the functioning of modern wind turbines to younger kids. Teaching resources enable parents and teachers to explain the advantages of wind energy to young students.

New leasing process to decarbonise oil & gas and boost innovation – Crown Estate Scotland

Crown Estate Scotland will launch a new leasing process for offshore wind farms to help decarbonise Scotland's oil and gas sector. In addition to enhancing the role that offshore wind can play in reducing the carbon emissions associated with North Sea energy production, this leasing will also help develop Scotland as a destination for increased innovation and supply chain opportunities linked to offshore renewable energy. This process is entirely separate to the ScotWind Leasing round currently under way for commercial scale offshore wind projects across Scotland, and is specifically designed for offshore wind farms which support the decarbonisation of the oil and gas sector, as well as small scale innovation projects of less than 100MW. Crown Estate Scotland plans to open the leasing process for applications in early 2022.