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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 Podcast Episode

Pacific Northwest National Laboratory's SciVIBE podcast recently published a new episode on [Marine Energy: Exploring Environmental Effects, Powering Ocean Observations with Andrea Copping](#). Listen to the full episode for free now!

Request for Information

The U.S. Department of Energy (DOE), in partnership with IDOM and Florida Atlantic University's Southeast National Marine Renewable Energy Center, is [soliciting feedback](#) from current energy converter technology developers and other stakeholders on design requirements and scope for a Mobile Test Vessel. Please email responses to [IDOM](#) by 18 February 2021.

BOEM Requesting Comments

The US Bureau of Ocean Energy Management (BOEM) is requesting public comments on its draft Environmental Assessments for offshore wind energy leasing within the [Gulf of Mexico](#) (through 9 February 2022) and [Humboldt Wind Energy Area](#) (through 10 February 2022).

Call for EMEC Earthshot Nominations

The European Marine Energy Centre (EMEC) is [seeking nominations](#) for [The Earthshot Prize](#), which aims to find new solutions to the world's biggest environmental problems. If you have a solution that is inspiring, inclusive, and impactful in one of the five Earthshot categories, please submit a nomination form to EMEC by 12:00pm UTC on 21 February 2022.

Biofouling Survey

As part of the GloFouling Partnerships Project, the World Ocean Council is conducting a [survey](#) to identify challenges, priorities, trends, and management practices related to biofouling and invasive species in various ocean industries, including offshore renewable energy. The deadline to submit responses is 28 February 2022.

BLUE DEAL for the Future

Interreg Mediterranean's BLUE DEAL project is launching "[BLUE DEAL for the Future](#)", an International Blue Energy contest, created to raise awareness and involve future generations in building a blue future. Participation is open to High School Institutions from European Members States and Instrument for Pre-accession Assistance countries. Proposals are due 30 April 2022.

Calls for Abstracts

The [Call for Abstracts](#) for the 9th Partnership for Research in Marine Renewable Energy (PRIMaRE) Conference is now open through 14 February 2022. The conference will take place in Cornwall, UK on 6-7 July 2022.

The [Call for Abstracts and Symposia](#) for the New York State Environmental Technical Working Group's [2022 State of the Science Workshop on Wildlife and Offshore Wind Energy](#) is now open through 14 March 2022. The hybrid event will be held on 26-28 July 2022 in New York, US.

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

The [Call for Abstracts](#) for the North American Wind Energy Academy (NAWEA) Symposium and International Conference on Future Technologies in Wind Energy (WindTech) is now open through 15 April 2022. The [NAWEA/WindTech 2022 Conference](#) will take place on 19-23 September 2022 in Delaware, US.

Funding & Testing Opportunities

The Horizon Europe Framework Programme has launched three funding opportunities, "[Wind Energy in the Natural and Social Environment](#)", "[Next generation of renewable energy technologies](#)", and "[Innovative foundations, floating substructures and connection systems for floating PV and ocean energy devices](#)". Proposals for all three are due 23 February 2022.

The US DOE recently launched the [Inclusive Energy Innovation Prize](#), which will provide cash prizes of up to \$250,000 to groups and organizations that support entrepreneurship and innovation in communities historically underserved in climate and energy technology funding. Phase One Submissions are due by 5:00pm EST (10:00pm UTC) on 25 February 2022.

The US National Offshore Wind Research and Development Consortium has released their [Innovations in Offshore Wind Solicitation 2.0](#). Concept papers for Round 2: Environmental Shared Use, Power Systems & Interconnection are due 9 March 2022.

The [US Testing Expertise and Access for Marine Energy Research](#) program, sponsored by DOE and directed by Pacific Ocean Energy Trust, is offering [open water support for marine energy testing](#) through its facility network. Open Water Support applications may be submitted at any time, while applications for its [6th Request for Technical Support](#) will be due 17 March 2022.

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

Student & Employment Opportunities

WavEC Offshore Renewables is recruiting an [Environmental Engineer](#) with experience in Life Cycle Assessment to conduct tasks related with data collection and analysis on the reduction of environmental impacts in the marine environment. Applications are due 13 February 2022.

The Environmental Research Institute, part of North Highland College, is recruiting an [Energy Research Associate](#) to join its multidisciplinary group working at the forefront of the energy transition across Scotland and internationally. Applications are due 2 March 2022.

Upcoming Events

Upcoming Workshops

The Ocean Power Innovation Network is hosting a [masterclass](#) on the possibilities and challenges of combining multiple renewable energy generation technologies in one offshore park from 9:00-10:00am UTC on 8 February 2022. The masterclass is based on early lessons learned during the European Scalable Offshore Renewable Energy Sources project. Register free [here](#).

The [12th Hawai'i Okinawa Clean Energy Workshop](#) will take place online on 15-24 February 2022. This year features four primary themes including, "Renewable Ocean Energy Utilization." Presentations will be available on-demand, and a real-time panel discussion will take place on 24 February 2022 at 3:00pm HST (1:00am UTC). Register for free [here](#).

OES-Environmental is hosting a two-part Innovation Session on the future of wave energy in Hawaii as part of the [2022 Ocean Sciences Meeting](#) (OSM) from 11:30am-1:30pm PST (7:30-9:30pm UTC) on 1-2 March 2022. The interactive event will use online breakout sessions,

engaging marine scientists to brainstorm what it would take to extract power sustainably and efficiently from waves in Hawaii. Register [here](#).

The National Renewable Energy Laboratory is hosting a workshop on 29 March 2022 to present recent progress in the development and validation of new eagle behavioral models, highlighting applications for wind-plant siting and operations. The workshop will feature a Q&A session to solicit feedback on model capabilities and future directions, and then a hands-on working session for those interested in exploring the models. Registration details coming soon.

Upcoming Webinars

As part of the [SEER project](#), the National Renewable Energy Laboratory and Pacific Northwest National Laboratory are hosting the [third of four webinars](#) on the environmental effects of offshore wind energy from 8:00-9:30am PST (4:00-5:30pm UTC) on 8 February 2022. The webinar will feature a presentation and panel discussion on bat and bird interactions with offshore wind energy. Register [here](#). Recordings of the past two webinars are available [here](#).

The New York State Energy Research and Development Authority is hosting a panel discussion on nature-based design enhancement for offshore wind from 1:00-2:00pm EST (6:00-7:00pm UTC) on 9 February 2022, as part of its *Learning from the Experts webinar series*. Register [here](#).

The US DOE Water Power Technologies Office (WPTO) is hosting a [WPTO R&D Deep Dive Webinar](#) on Marine Energy Testing Needs to Inform Infrastructure Investments from 3:00-4:00pm EST (8:00-9:00pm UTC) on 9 February 2022. A multi-lab team will share preliminary analyses on testing needs and discuss opportunities to provide feedback. Register [here](#).

The Dutch Marine Energy Centre and Hatch are hosting a webinar, “[Powering Sustainable Aquaculture with Marine Energy](#)”, from 2:00-3:30pm UTC on 15 February 2022. During the event, marine energy developers will pitch their solutions and companies from the aquaculture sector will join the discussion and draw a plan forward. Register [here](#).

Pacific Northwest National Laboratory’s [Triton Initiative](#) is hosting the first in its series of Triton Talks, a webinar series that features a behind-the-scenes look at its US environmental monitoring field trials campaigns, at 11:00am PST (7:00pm UTC) on 17 February 2022. Register [here](#).

The SEER team is also hosting its [final webinar](#) on the environmental effects of offshore wind energy from 8:00-9:30am PST (4:00-5:30pm UTC) on 24 February 2022. The webinar will feature presentations and panel discussions on the effects of electromagnetic fields and vessel collision on marine life. Register [here](#).

The US DOE’s WPTO is hosting its Semiannual Stakeholder Webinar from 1:00-2:00pm EST (6:00-7:00pm UTC) on 10 March 2022. During the webinar, WPTO leadership will review accomplishments, preview what’s yet to come, and discuss investments that will come from the Bipartisan Infrastructure Law. Register [here](#).

Upcoming Conferences

The [International Network on Offshore Renewable Energy](#) is hosting its 2021-2022 Annual General Meeting from 3:00-4:00pm UTC on 24 February 2022 online. Register [here](#).

EuropeWave is hosting its [1st Annual Conference & Brokerage Networking Event](#) from 22 February to 2 March 2022. The online event will present the Phase I projects and discuss how to accelerate the commercialization of wave energy technologies. Register for free [here](#).

Offshore Wind California and Infocast are hosting the [Pacific Offshore Wind Summit](#) on 28-30 March 2022 in San Francisco, US. Early bird registration is available [here](#) until 7 February 2022.

The US Advanced Research Projects Agency–Energy (ARPA-E) has rescheduled the 2022 ARPA-E Energy Innovation Summit to 23-25 May 2022 in in Denver, US. Register [here](#).

New Documents on *Tethys*

Marine Energy

[A life cycle assessment comparison of materials for a tidal stream turbine blade](#) – Walker & Thies 2022

Electricity generated from tidal streams via underwater turbines has significantly lower greenhouse gas emissions than fossil-fuel derived electricity. However, tidal stream turbine blades are conventionally manufactured from non-recyclable reinforced polymer composite materials. To address a growing waste management problem, this high-level study considers for the first time a range of conventional and bio-based materials, manufacturing methods, and end-of-life treatments to determine the blade materials and designs likely to have low environmental impact. A finite element model is used to develop material cases and Life Cycle Assessment is used to study the impacts of each over a ‘cradle to dock, dock to grave’ scope. The impact of material choices on cost and modifications to the wider turbine are considered.

[The Potential of Wave Energy Conversion to Mitigate Coastal Erosion from Hurricanes](#) – Ozkan et al. 2022

This study explores a green and sustainable approach to mitigating coastal erosion from hurricanes through wave energy conversion. A barrier island, Dauphin Island, off the coast of Alabama, is used as a test case. The potential use of wave energy converter farms to mitigate erosion due to hurricane storm surges while simultaneously generating renewable energy is explored through simulations that are forced with storm data using the XBeach model. It is shown that wave farms can impact coastal morphodynamics and have the potential to reduce dune and beach erosion, predominantly in the western portion of the island. The capacity of wave farms to influence coastal morphodynamics varies with the storm intensity.

An observational study of hydrodynamic impact on water mass transport due to tidal power generation – Kim et al. 2022

The world's largest Sihwa Tidal Power Plant (TPP), located on the west coast of Korea, was built in 2011 for the purpose of improving water quality and producing renewable energy. After several years of actual operation, most of the original purpose was achieved, but unexpected coastal environmental changes such as tidal flat damage and sediment accumulation also occurred. In this study, in order to understand the causes of these environmental changes, field observations were conducted near TPP, and spatial and temporal variability of flow structure and water exchange process were investigated. Three-dimensional velocity data were collected along the closed line surrounding the outside of the TPP for 11 h during spring tide and analyzed according to two discharge phases: power generation phase (PGP) and drainage phase (DP).

Wind Energy

Responses of birds and mammals to long-established wind farms in India – Kumara et al. 2022

Wind turbines have become a serious threat to migratory birds as they collide with the turbine blades in some regions across the globe, while the impact on terrestrial mammals is relatively less explored. In this context, we assessed the responses of birds and mammals to the wind turbines in central Karnataka, India from January 2016 to May 2018 using carcass searches to quantify animal collisions (i.e., birds and bats), fixed radius point count for bird population parameters, and an occupancy framework for assessing the factor that determines the spatial occurrence of terrestrial mammals. The mean annual animal fatality rate per wind turbine was 0.26/year. Species richness, abundance, and unique species of birds were relatively higher in control sites over wind turbine sites.

Potential impacts of floating wind turbine technology for marine species and habitats – Maxwell et al. 2022

Floating offshore wind has the potential to greatly expand our renewable energy portfolio, but with rapid expansion planned globally, concerns exist regarding impacts to marine species and habitats. Here, we outline the various floating wind turbine configurations, and consider the potential impacts on marine mammals, seabirds, fishes and benthic ecosystems. We focus on the unique risks floating turbines may pose with respect to: primary and secondary entanglement of marine life in debris ensnared on mooring lines used to stabilize floating turbines or dynamic inter-array cables; behavioral modification and displacement, such as seabird attraction to perching opportunities; turbine and vessel collision; and benthic habitat degradation from turbine infrastructure, for example from scour from anchors and inter-array cables.

Influencing Activity of Bats by Dimly Lighting Wind Turbine Surfaces with Ultraviolet Light – Cryan et al. 2021

Wind energy producers need deployable devices for wind turbines that prevent bat fatalities. Based on the speculation that bats approach turbines after visually mistaking them for trees, we tested a potential light-based deterrence method. It is likely that the affected bats see ultraviolet (UV) light at low intensities. Here, we present the results of a multi-month experiment to cast dim, flickering UV light across wind turbine surfaces at night. Our objectives were to refine and test a practical system for dimly UV-illuminating turbines while testing whether the experimental UV treatment influenced the activity of bats, birds, and insects. We mounted upward-facing UV light arrays on turbines and used thermal-imaging cameras to quantify the presence and activity of night-flying animals.

News & Press Releases

Marine Energy

[CorPower to begin ‘Ironman Tests’ ahead of ocean deployment](#) – CorPower Ocean

CorPower Ocean’s first commercial scale Wave Energy Converter (WEC) is set to undergo an intensive ‘Ironman Test’ proving performance and reliable operation ahead of ocean deployment. The next-generation C4 WEC has been through a rigorous dry-test program since mid-2021 and will experience continuous operation on the world’s largest wave energy test rig in Sweden. The dry-test program will involve exposure to all sea states including severe storm conditions in order to monitor its durability and unique ‘survival mode’, alongside high thermal stress. After completing tests, the WEC is then set to be transported to northern Portugal taking a central role in CorPower’s flagship HiWave-5 demonstration project.

[Feasibility study for Larantuka Strait tidal energy project gets go-ahead](#) – Offshore Energy

UK tidal energy project developer SBS has received approval to start the feasibility study for the Larantuka Strait tidal energy project in Indonesia. Following the signing of a memorandum of understanding (MoU) with state-owned electrical plant and power-transmission company Indonesia Power (IP), a proposal for a feasibility study was requested by IP from SBS which was submitted and has now been approved for immediate start. The feasibility study activity will include an offshore survey to gather primary tidal resource data in the Larantuka Strait, in accordance with IEC guidance, analysis of which will be included within the feasibility study report. The report is expected to be completed and submitted to IP within three months, according to SBS.

[EU Awards €17 million to ILIAD Project to Launch an Innovative Digital Twin of The Ocean](#) – Ocean Twin

The European Union has granted the ILIAD (Intra-Logistics with Integrated Automatic Deployment) Consortium €17 million to develop and launch a Digital Twin of the Ocean that will provide highly accurate predictions of future developments at global seas. The

ILIAD Project, which is comprised of 56 partners from 18 different countries in Europe, the Middle East and North Africa, has been awarded the funding as part of the EU the €1 billion European Green Deal. ILIAD will develop virtual models designed to accurately reflect changes and processes accruing at the ocean. ILIAD will commercialise an interoperable, data-intensive, and cost-effective model, capitalising the explosion of new data provided by many different earth sources, modern computing infrastructure including Internet of Things, social networking, Big Data, cloud computing and more.

SIMEC Atlantis Energy completes EASME pitch system project – Ocean Energy Europe

SIMEC Atlantis Energy, together with its partner Asturfeito, recently announced the successful completion of the European Commission’s Executive Agency for Small and Medium-sized Enterprises (EASME) tidal turbine pitch system development project. The pitch system connects the blades to the turbines rotor shaft and controls the blades pitch angle within the tidal flow. The new pitch system enables the rotor diameter and rated capacity of the turbine to increase, and the new pitch actuator system will increase system reliability. The testing was completed in December 2021 at Asturfeito’s site in northern Spain. Despite the significant challenges caused by the pandemic the successful completion of the project demonstrates what can be achieved through collaboration.

The Century-Old Renewable You’ve Never Heard Of – Eos

Ocean thermal energy conversion (OTEC) could power the world’s tropical islands, if it ever gets out of the “innovation valley of death.” The theoretical potential of OTEC is vast. It could produce at least 2,000 gigawatts globally, rivaling the combined capacity of all the world’s coal power plants on their best day. And unlike many renewables, OTEC is a baseload source, which means it can run 24/7 with no fluctuation in output. But the conditions necessary to make the process viable—at least a 20°C difference between surface and deep water—occur only near the equator, far from most of the world’s power demand and much of its wealth. That’s why, despite its simplicity and decades of small, successful demonstrations, OTEC has yet to take hold in the renewable power industry.

Wind Energy

£60 million boost for floating offshore wind – UK Department for Business, Energy & Industrial Strategy

Floating offshore wind projects will receive more than £60 million in public and private investment to develop new technologies that will enable turbines to be located in the windiest parts around the UK’s coastline. The UK government recently announced 11 successful projects that will each be awarded up to £10 million as it puts forward £31.6 million to boost the amount of clean renewable energy generated in the country. In addition to this, industry will match the investment bringing the total to over £60 million – driving green energy investment and levelling up parts of the country including in Aberdeen, Swansea and Yorkshire. Research will focus on areas such as how turbines are moored to the seabed, undersea cabling and developing foundation solutions.

Costa Rica Taking Steps Towards Its First Offshore Wind Project – Offshore Wind

The Costa Rican Electricity Institute is set to launch studies to identify the potential of offshore wind energy in the country as well as the challenges, risks and opportunities in the development, installation, and operation of offshore wind farms in the near future. The studies, which are expected to start during the second quarter of 2022 and to be completed within 18 months, are being supported by the Central American Bank for Economic Integration (CABEI) and the Republic of Korea through a USD 600,000 non-reimbursable technical cooperation grant from the Korea-CABEI Single Donor Trust Fund granted to ICE and the Government of Costa Rica. As part of this cooperation, support will be provided for the development of a preliminary environmental and social impact assessment.

AWWI Re-launches as REWI, Expands Scope to Include Solar – Renewable Energy Wildlife Institute

Founded in 2008, the American Wind Wildlife Institute (AWWI) has been instrumental in advancing the science regarding how wind energy affects wildlife and habitat. The organization recently re-launched itself as the Renewable Energy Wildlife Institute (REWI, pronounced “ree-Y”), to reflect a newly expanded scope that now includes solar. REWI conducts and supports scientific research to better understand the risks solar and wind energy may pose to wildlife and develop solutions to avoid, minimize, and offset those impacts. The organization leverages strong partnerships across stakeholders in the renewable energy industry, conservation and science communities, and wildlife management agencies to ensure that renewable energy and wildlife can both thrive.

World’s first full-scale offshore vessel charger to launch this year – Offshore Energy

Maersk Supply Service and Ørsted plan to launch the world’s first full-scale offshore charging station for vessels, at an offshore wind farm, in the third quarter of 2022. As part of the project, Maersk Supply Service has now launched its offshore vessel-charging venture, Stillstrom, to support the decarbonisation of the maritime industry by eliminating idle emissions. Stillstrom, meaning quiet power in Danish, is an early-stage technology spin-out, whose full-scale product launch will be the first-to-market in offshore charging, enabling idle vessels to power from clean electricity. Ørsted intends to make publicly available any intellectual property generated during the design of the buoy’s integration into the offshore wind asset, to maximise the potential uptake of this carbon-reducing innovation across the offshore wind sector.

Reducing Wind Turbine Wakes Could Save Wind Farms Millions – National Renewable Energy Laboratory

In the spring of 2022, researchers at the National Renewable Energy Laboratory (NREL) will launch an international, multi-institutional wind energy field campaign called the American WAKE experimeNt (AWAKEN). Funded by the U.S. Department of Energy

Wind Energy Technologies Office, the study will amass the world's most comprehensive dataset on a wind energy atmospheric phenomenon including wakes that can cost the average wind farm about 10% of its potential energy. Once complete, those data could help wind farms—and farmers who lease their land—produce even more energy and earn even more profits, too. “This field campaign,” said Patrick Moriarty, a senior engineer at NREL who is leading the AWAKEN project, “will give us the highest resolution observations of wind farm atmosphere interactions available in the world today.”