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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

OES-Environmental Survey

OES-Environmental is conducting a short, online survey (in [English](#) and [Spanish](#)) to collect any existing information relevant to the environmental effects of marine renewable energy development in tropical and Southern Hemisphere countries. Please complete the survey by 13 May 2022, and share it with any colleagues that may be able to provide additional information.

BOEM Seeking Comments

The US Bureau of Ocean Energy Management (BOEM) has published two Calls for Information and Nominations for possible offshore wind leasing off the coast of [Oregon](#) and in the [Central Atlantic](#). Submissions are due 28 June 2022. BOEM has also extended the deadline to submit [public comments](#) on the draft Morro Bay Wind Environmental Assessment to 16 May 2022.

Collegiate Wind Competition

The US DOE is now accepting applications for the [2023 Collegiate Wind Competition](#), which challenges interdisciplinary teams of undergraduate students from a variety of programs to offer a unique solution to a complex wind energy project. Applications are due 1 June 2022.

Calls for Abstracts

The Call for Abstracts for the [University Marine Energy Research Community \(UMERC\) and Marine Energy Technology Symposium \(METS\) joint conference](#) has been extended to 16 May 2022. UMERC and METS will host the event on 13-14 September 2022 in Portland, US, in conjunction with the [Ocean Renewable Energy Conference \(OREC\)](#) on 14-15 September 2022.

The [Call for Abstracts](#) for the [International Conference on the Environmental Interactions of Marine Renewables \(EIMR 2022\)](#) is now open until 16 May 2022. The University of the Highlands and Islands and Heriot Watt University will host EIMR online on 4-6 October 2022.

The [Call for Abstracts](#) for [OCEANS 2022 Hampton Roads](#) is open through 16 May 2022. The hybrid event will take place on 17-21 October 2022 in Virginia Beach, US and online.

The [Call for Abstracts](#) for the Renewable Energy Wildlife Institute's [14th Wind Wildlife Research Meeting \(WWRM\)](#) is now open through 6 June 2022. WWRM 2022 will take place on 15-17 November 2022.

The New York State Energy Research and Development Authority has reopened its [Call for Poster Abstracts](#) for the [3rd State of the Science Workshop on Wildlife and Offshore Wind Energy](#) through 13 June 2022. The workshop will take place 26-28 July 2022 in Tarrytown, US.

The [Call for Abstracts](#) for the [5th International Marine Science Communication Conference \(CommOCEAN 2022\)](#) is now open through 15 June 2022. CommOCEAN 2022 will take place from 30 November to 1 December 2022 in Sète, France and online.

The Call for Abstracts for the [2nd GloFouling Research & Development Forum on Biofouling Prevention and Management for Maritime Industries](#) is now open through 31 July 2022. Submit your 250-word max abstract to glofouling@imo.org. The conference will take place on 11-14 October in London, UK.

Funding & Testing Opportunities

The Sustainable Energy Authority of Ireland National Energy (SEAI) [Research Development and Demonstration \(RD&D\) Funding Call](#) is now open for applications from eligible organizations based in Ireland. Applications are due 16 May 2022.

The French Government's Ministry of the Sea has launched the Maritime Intervention Fund's second [Call for Applications](#) to support the sustainable development of maritime activities, including coastal and blue economy development. Applications are due 31 May 2022.

The Interreg Europe programme, financed by the European Regional Development Fund, has launched its first [Call for Proposals](#) in the 2021-2027 period, and is looking for interregional cooperation projects that will support a greener Europe. Applications are due 31 May 2022.

SATT LUTECH, with support from the Sorbonne University Alliance and the Ocean Institute, recently launched a [Call for Projects](#) to help accelerate the development of sustainable marine innovations from researchers of the LUTECH cluster. Applications are due 3 June 2022.

The Interreg North-West Europe Programme has launched its first [Call for Projects](#) in the 2021-2027 period, and is looking for transnational cooperation initiatives that can deliver concrete results for the North-West Europe area. The Call for Projects will close on 15 June 2022.

Student & Employment Opportunities

Celtic Sea Power is seeking a [Planning and Compliance Coordinator](#) to support the delivery of the Pembrokeshire Demonstration Zone project, which seeks to accelerate the offshore renewable industry in Pembrokeshire, Wales. Applications are due 20 May 2022.

Le Havre Normandie University is seeking a [Post-Doctoral Fellow](#) to join a France Energies Marines project focused on modelling the marine dune dynamics and scour processes around offshore wind turbine monopiles. Applications are due 18 June 2022.

National Renewable Energy Laboratory has an opening for a [Wildlife Researcher](#) to support the wind energy and wildlife portfolio. The successful candidate will be responsible for leading and supporting projects advancing monitoring and minimization technologies to improve siting and operational decisions for wind turbines and wind energy facilities.

The Oceanic Platform of the Canary Islands (PLOCAN) has opened an [Employment Call](#) for several permanent job positions, including administrative and technical positions.

Upcoming Events

Upcoming Webinars

Pacific Northwest National Laboratory (PNNL)'s [Triton Initiative](#) is hosting the next webinar in its *Triton Talks* series on 19 May 2022 from 11:00am-12:00pm PDT (6:00-7:00pm UTC). During the webinar, Environmental Engineer Molly Greer will dive into how PNNL researchers are working to understand the field strength and spatial patterns associated with marine energy to determine how electromagnetic fields might be impacting the marine environment. Register [here](#).

Net Zero Atlantic is hosting a webinar, "[Advancing environmental monitoring capabilities for the tidal industry in the Bay of Fundy](#)", on 9 June 2022 from 1:00-2:00pm ADT (4:00-5:00pm UTC). During the webinar, partners from Net Zero Atlantic's Pathway Program will report on the work they carried out as part of collaborative initiative; share notable findings, successes, and lessons learned; and discuss next steps for the tidal industry and monitoring. Register [here](#).

The Marine Energy Data Pipeline effort, led by PNNL, recently released the latest version of [Tsdats](#), a data ingestion pipeline that can be used to read, process, run quality control, and convert raw data to standard formats. To learn more about Tsdats and its architecture, join the "[Marine](#)

[Energy Data Pipeline Updates](#)” webinar on 14 June 2022, from 12:00-1:00pm PDT (7:00-8:00pm UTC). A recording will be made available on the Portal and Repository for Information on Marine Renewable Energy ([PRIMRE](#)).

Upcoming Workshop

UMERC is hosting a workshop, [Power for Ocean Sensing: Creating Dialogue around Power Capabilities and Needs](#), from 10:00am-12:00pm PDT (5:00-7:00pm UTC) on 19 May 2022. During this workshop, marine energy developers will update oceanographers on new power technology development and discuss how to support big data in the ocean. Register for free [here](#).

Upcoming Conferences

The Pan American Marine Energy Association is hosting the [Pan American Marine Energy Conference \(PAMEC 2022\)](#) on 19-22 June 2022 in Ensenada, Mexico, with workshops on 17-18 June 2022. Register [here](#).

The American Geophysical Union is hosting the [Frontiers in Hydrology Conference](#) on 19-24 June 2022 in San Juan, Puerto Rico and online. Register [here](#).

The Partnership for Research in Marine Renewable Energy (PRIMaRE) and University of Exeter are hosting the [9th PRIMaRE Conference](#) on 6-7 July 2022 in Cornwall, UK. Register [here](#).

The [19th International Bat Research Conference and 50th Annual North American Symposium on Bat Research](#) will take place 7-12 August 2022 in Austin, US. Register [here](#).

New Documents on *Tethys*

Marine Energy

[A review of support tools to assess multi-sector interactions in the emerging offshore Blue Economy](#) – Turschwell et al. 2022

Multiple ocean sectors compete for space and resources, creating conflicts but also opportunities to plan for synergistic outcomes that benefit multiple sectors. Planning and management are increasingly informed by qualitative and quantitative methods for assessing multi-sector interactions to identify trade-offs and synergies among sectors and with the environment, but there is a need to critically review the alignment of these tools with the requirements of Blue Economy stakeholders. Through a systematic literature review, an operational maturity analysis, and a survey of Blue Economy stakeholders, we found that the most well-developed tools for assessing interactions between multiple Blue Economy industries, and with the environment, are spatial prioritization tools, such as Marxan and multi-criteria decision support tools; and spatial static tools, such as cumulative effect mapping.

Marine Renewable Energy (MRE) in the Tropics: An Overview of MRE Potential in Oaxaca, Mexico – Oman 2022

Conventional sources of energy, such as fossil fuels, produce carbon emissions and are depleting as global demand increases. Marine renewable energy (MRE) offers a cleaner way of generating electricity by using waves, tides, currents, and salinity or thermal gradient resources. Although tropical and subtropical regions have a great potential for some of these MRE resources, industry progress in these areas has been slow. One of the main barriers to the development of MRE is the uncertainty surrounding potential environmental and socioeconomic effects. This study focuses on Oaxaca, Mexico, and aims to describe the MRE resources available in the region and provide information on socioeconomic and biological aspects to consider for future MRE development.

The Ups and Downs of Using Active Acoustic Technologies to Study Fish at Tidal Energy Sites – Viehman et al. 2022

Active acoustic instruments (echosounders) are well-suited for collecting high-resolution information on fish abundance and distribution in the areas targeted for tidal energy development, which is necessary for understanding the potential risks tidal energy devices pose to fish. However, a large proportion of echosounder data must often be omitted due to high levels of backscatter from air entrained into the water column. To effectively use these instruments at tidal energy sites, we need a better understanding of this data loss and how it may affect estimates of fish abundance and vertical distribution. We examined entrained air contamination in echosounder data from the Fundy Ocean Research Center for Energy (FORCE) tidal energy test site in Minas Passage, Nova Scotia, where current speeds can exceed $5 \text{ m}\cdot\text{s}^{-1}$.

Wind Energy

Artificial hard-substrate colonisation in the offshore Hywind Scotland Pilot Park – Karlsson et al. 2022

Artificial substrates associated with renewable offshore energy infrastructure, such as floating offshore wind farms, enable the establishment of benthic communities with a taxonomic composition similar to that of naturally occurring rocky intertidal habitats. The size of the biodiversity impact and the structural changes in benthic habitats will depend on the selected locations. The aim of the study is to assess colonisation and zonation, quantify diversity and abundance, and identify any non-indigenous species present within the wind farm area, as well as to describe changes in the epifaunal growth between 2018 and 2020, with regards to coverage and thickness. This article is based on work undertaken within the offshore floating Hywind Scotland Pilot Park, the first floating offshore wind park established in the world, located approximately 25 km east of Peterhead, Scotland.

[Keep it local and bird-friendly: Exploring the social acceptance of wind energy in Switzerland, Estonia, and Ukraine](#) – Vuichard et al. 2022

The literature on social acceptance of wind energy has identified several important characteristics shaping the social acceptance of a planned project. These include distributional and procedural justice, as well as other project-related factors. Project characteristics do not exist in isolation and influence one another. Furthermore, social acceptance of wind energy is likely to vary geographically, due to cross-country differences. As a result, the need for more consistent cross-country comparisons has been highlighted in the literature as an important research gap. The current paper addresses this gap with the help of a large-scale cross-country analysis (N = 2003) that examines the social acceptance of wind energy projects in Switzerland, Estonia, and Ukraine through choice experiments.

[Anthropogenic Mixing in Seasonally Stratified Shelf Seas by Offshore Wind Farm Infrastructure](#) – Dorrell et al. 2022

The offshore wind energy sector has rapidly expanded over the past two decades, providing a renewable energy solution for coastal nations. Sector development has been led in Europe, but is growing globally. Most developments to date have been in well-mixed, i.e., unstratified, shallow-waters near to shore. Sector growth is, for the first time, pushing developments to deep water, into a brand new environment: seasonally stratified shelf seas. Seasonally stratified shelf seas, where water density varies with depth, have a disproportionately key role in primary production, marine ecosystem and biogeochemical cycling. Infrastructure will directly mix stratified shelf seas. The magnitude of this mixing, additional to natural background processes, has yet to be fully quantified. If large enough it may erode shelf sea stratification.

News & Press Releases

Marine Energy

[Sustainable Marine Delivers First Floating Tidal Power to Nova Scotia Grid](#) – Sustainable Marine

Sustainable Marine recently announced it has successfully harnessed the enormous tidal currents in Canada's Bay of Fundy, delivering the first floating in-stream tidal power to Nova Scotia's grid. It demonstrates that the Bay of Fundy's huge tidal energy resource - which contains more than four times the combined flow of every freshwater river in the world - can be effectively harnessed providing up to 2500MW of clean and predictable energy for Canada. Nova Scotia has allocated circa 30MW of capacity via demonstration permits and berths at FORCE (Fundy Ocean Research Center for Energy) for developers to demonstrate the effectiveness, cost and environmental effects associated with this new form of energy generation.

Aquantis Signs Up to EMEC Tidal Demo – European Marine Energy Centre (EMEC)

California-based tidal energy developer Aquantis, Inc has signed up to test its Tidal Power Tug at EMEC in Orkney, Scotland. Aquantis has signed a berth agreement for a six-month testing programme in 2023 at EMEC's Shapinsay Sound scale test site. Aquantis' Tidal Power Tug is a second generation floating tidal energy converter. The versatile spar-buoy platform supports a 10-meter diameter, two-bladed variable-pitch rotor and 160 kW drivetrain. By testing at EMEC's scale test site, Aquantis will gain experience of marine operations, while generating performance data to validate its loading and dynamics model, controller functionality and load mitigation techniques. EMEC will support Aquantis' testing with tidal resource monitoring and the provision of its Test Support Buoy enabling remote communications with the device.

Ocean Harvesting develops a new buoy made of high-strength concrete for its wave energy converter – Ocean Harvesting

Ocean Harvesting is developing a novel concrete hull for the prime mover (buoy) of the InfinityWEC wave energy converter, using high strength concrete with low environmental footprint and excellent durability. The solution allows for large scale production and results in a buoy with a weight similar to a conventional steel hull, but at 1/4 of the cost and 1/3 of the CO₂ footprint. Highly flowable concrete is poured into a mould with void fillers, forming the concrete shell and the internal honeycomb structure, one of the strongest structures in nature. Most of the raw materials will be sourced locally at the installation site, where the buoy is cast in a process common in civil engineering. The next development stage for Ocean Harvesting is a sea trial of InfinityWEC at scale 1:3, a project planned to start in November 2022.

CalWave and Launch Alaska Sign MOU to Advance Planning of Wave Energy Projects – CalWave Power Technologies (CalWave)

CalWave, a California-based wave energy developer, recently announced that it has signed a memorandum of understanding (MOU) with Launch Alaska, establishing a formal partnership to connect their technologies to real projects and opportunities in the state of Alaska. This agreement builds upon a mutually-identified pipeline of potential projects and CalWave is now planning to advance a region-specific deployment in the near future. The collaboration stems from CalWave's engagement with Launch Alaska's 2021-2022 Tech Deployment Track Program, an initiative focused on deploying global solutions to climate and environmental issues for applications in Alaska. Through the 6-month program, CalWave has met with Alaskan customers, investors, and other tech/subject matter experts to progress on customer discovery, market fit, and project plans to bring their scalable energy solutions to Alaska and beyond.

Danish company concludes floating wind and wave trials in Spain – Offshore Energy

Danish company Floating Power Plant (FPP) has completed basin tests of its hybrid floating wind and wave platform at IHCantabria facilities in Spain. FPP is developing a

commercial-scale version of the P80 platform – a floating semi-submersible platform that will at full scale host a single wind turbine from 4-10MW, to be further supported with 2-3.6MW of wave power. The P80 platform is anchored by using a standard turret mooring technology that has been proven, and is still used, by the oil and gas industry. The company recently completed the trials on the scaled platform at IHCantabria research institute's wave basin, which was overseen by the European Marine Energy Centre (EMEC) from Orkney which observed the behavior of FPP's platform under misaligned winds and waves during the trials.

Wind Energy

[Biden-Harris Administration Announces Winners of Carolina Long Bay Offshore Wind Energy Auction](#) – US Department of the Interior

The Department of the Interior recently announced results from its wind energy auction in the Carolina Long Bay area, the second major offshore wind lease sale this year and a significant milestone towards achieving the Biden-Harris administration's goal of deploying 30 gigawatts of offshore wind energy capacity by 2030. The Bureau of Ocean Energy Management's (BOEM) lease sale offered two lease areas covering 110,091 acres in the Carolina Long Bay area offshore North Carolina and South Carolina. If fully developed, the leases could result in about 1.3 gigawatts of offshore wind energy, enough to power about 500,000 homes. The sale drew competitive winning bids from two companies totaling \$315 million.

[Ørsted trials turning offshore wind turbine foundations into safe havens for corals](#) – Ørsted

Ørsted, the world's most sustainable energy company, is planning a world-first attempt to support coral reefs by growing corals on offshore wind turbine foundations. Together with Taiwanese partners, the company will test the concept in the tropical waters of Taiwan this summer. The aims are to determine whether corals can be successfully grown on offshore wind turbine foundations and to evaluate the potential positive biodiversity impact of scaling up the initiative. In 2020, biologists and marine specialists in Ørsted teamed up with private and academic coral experts to mature and test the concept. In 2021, the ReCoral team successfully grew juvenile corals on underwater steel and concrete substrates at a quayside test facility for the first time.

[Offshore construction begins on world's largest offshore wind farm with first export cable installation](#) – Dogger Bank Wind Farm

The team building Dogger Bank Wind Farm has officially marked the start of its offshore construction work with the installation of the first length of HVDC export cable off the Yorkshire coast. Tier one supplier NKT is leading the work to install the Dogger Bank A nearshore cable, that will connect the first phase of the windfarm more than 130km off the coast to a landfall point at Ulrome, in East Riding of Yorkshire. The campaign will continue during 2022, with work starting on the export cables for Dogger Bank B in East

Riding, and Dogger Bank C on Teesside, in the consecutive years. Dogger Bank Wind Farm will be the first HVDC connected wind farm in the UK, paving the way for other UK wind farms and suppliers to build on our experience transmitting renewable energy safely and efficiently across long distances while minimising potential losses.

California Is Betting Big on Offshore Wind Power – Gizmodo

Wind is picking up speed on the West Coast. California plans to produce 10 to 15 gigawatts of offshore wind energy by 2045—enough to power between 10 million and 15 million homes, according to a report by the state’s Energy Commission released on Friday. The goal is the biggest of any state so far, surpassing New York’s 9 gigawatt by 2035 pledge. California’s SB 100, signed into law 2018, mandates the state reach 100% renewable energy by 2045, and offshore wind is part of the plan to get there. Plus, nationally the Biden administration set a goal of 30 gigawatts of offshore wind energy by 2030. California’s draft plan includes a preliminary goal of 3 gigawatts of offshore wind for 2030—10% of the federal target. For context, California’s 3,437 miles of coastline make up just about 3% of the total U.S. shoreline mileage.

Fred. Olsen 1848 Proudly Introduces BRUNEL – A Pioneering Floating Foundation to Unlock the Potential of Floating Offshore Wind – Fred. Olson 1848

Fred. Olsen 1848 is dedicated to develop tomorrow’s energy solutions. The main challenge for floating offshore wind to become industrialized and respond to deployment at scale is the ability to manufacture and assemble floating foundations at a volume that is needed for the floating giga parks. In response, and after several years of development, Fred. Olsen 1848 now launches the Floating Foundation BRUNEL. The modular design enables BRUNEL to leverage the existing global supply chain and helps create a sustainable industry. BRUNEL enters the market at an advanced technological stage, with a final tank test successfully completed at SINTEF Ocean in February 2022. In parallel, BRUNEL successfully received DNV’s statement of feasibility in April 2022.