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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

Wind Technologies Tool

Working Together to Resolve Environmental Effects of Wind Energy ([WREN](#)) is requesting information on new technologies to include in the [Wind Energy Monitoring and Mitigation Technologies Tool](#) on *Tethys*. The free, online tool serves as a catalog of available technologies used to assess and reduce potential wind-wildlife effects, including related research on their use and effectiveness. Please complete this [short survey](#) to contribute technologies for consideration!

BOEM Seeks Public Comment

The U.S. Bureau of Ocean Energy Management (BOEM) is seeking public comments on the draft Environmental Impact Statements for the [Coastal Virginia Offshore Wind and Sunrise Wind projects](#) (due 14 February 2023) and [New England Wind project](#) (due 21 February 2023).

Call for Abstracts

The [Call for Abstracts](#) for the [15th European Wave and Tidal Energy Conference Series \(EWTEC 2023\)](#) is now open through 28 January 2023. Full papers will be due 27 May 2023. EWTEC will take place on 3-7 September 2023 in Bilbao, Spain.

Calls for Papers

The *Journal of Marine Science and Engineering* is accepting submissions for several Special Issues, including “[Wave, Tidal and Offshore Wind Energy Site Assessment and Monitoring](#)” (due 5 March 2023) and “[Interface between Offshore Renewable Energy and the Environment](#)” (due 25 April 2023).

The *International Council for the Exploration of the Sea (ICES) Journal of Marine Science* is accepting submissions for the Special Issue, “[Assessing the impact of expanding offshore wind energy](#)” (due 3 April 2023).

Funding & Testing Opportunities

The U.S. Department of Energy’s (DOE) Wind Energy Technologies Office has released a [funding opportunity](#) to lower costs and address barriers to deployment of wind energy. Topic areas include social science research and bat deterrent technology development. Concept papers are due 20 January and applications are due 10 March 2023.

The European Commission has launched two new [Calls for Proposals](#) under the European Maritime, Fisheries and Aquaculture Fund aimed at supporting careers and regional projects for a sustainable blue economy in EU sea basins. Proposals are due 31 January 2023.

The EMYN (Éoliennes en mer Îles d'Yeu et de Noirmoutier) GIS (Groupement d'Intérêt Scientifique) has launched a [Call for Proposals](#) to conduct environmental monitoring around offshore wind farms. Applications are due 1 March 2023.

The U.S. Testing and Expertise and Access for Marine Energy Research (TEAMER) program, sponsored by the U.S. DOE’s Water Power Technologies Office and directed by the Pacific Ocean Energy Trust (POET), is now accepting [Request for Technical Support 9](#) applications until 3 March 2023. Open Water Support applications may be submitted at any time.

The New York State Energy Research and Development Authority (NYSERDA) recently announced that nearly \$2.5 million is available to [support environmental and fisheries research](#) related to offshore wind energy development. Applications are due 13 March 2023.

The European Commission has also launched the third call for large-scale projects under the [European Union Innovation Fund](#). The call is open until 16 March 2023 for projects located in European Union Member States, Iceland, and Norway.

Spain’s Ministry for the Ecological Transition and the Demographic Challenge recently published the first call for aid from the [Renmarinas Demos Program](#) to promote test platforms and the demonstration of new prototypes in the field of marine renewable energy. Applications will be accepted between 31 January and 24 March 2023.

The Basque Energy Agency has published the [Call for Tenders](#) for its "TurboWave" Pre-Commercial Public Procurement program for the development of air turbines that will be

implemented in the Mutriku wave power plant. The call will open 16 February 2023. An informational webinar will be held on 31 January 2023 at 9:00am UTC.

Student & Employment Opportunities

The Center for Ocean Engineering at the University of New Hampshire is inviting applications for a tenure-track position at the [Assistant, Associate, or Full Professor](#) rank who can contribute to ocean renewable energy research and other focus areas. Applications are 22 January 2023.

Natural Power is recruiting a [Principal Environmental Consultant \(Offshore Ornithology / Marine Mammals\)](#) to join its team in Dublin, Ireland and support consultancy work for offshore wind projects. Applications are 25 January 2023.

The University of Plymouth is seeking a [Global Challenge Research Fellow](#) to conduct research that considers broader system benefits and local opportunities associated with floating offshore wind energy developments in the Celtic Sea. Applications are due 30 January 2023.

The European Marine Energy Centre (EMEC) is seeking a [Project Manager](#) to manage projects across EMEC's project portfolio, including wave, tidal, hydrogen, offshore wind, and integrated energy systems. Applications are due 31 January 2023.

The Environmental Research Institute (ERI) is recruiting for a [Research Fellow in Renewable Energy and the Environment](#) to advance understanding of the biophysical interactions of marine and offshore renewable energy with the environment. Applications are due 3 February 2023.

ERI is also recruiting for a [Research Fellow in Marine Sensing](#) to support design, development, and deployment of autonomous marine multi-sensor platforms to investigate the environmental effects of marine and offshore renewable energy. Applications are due 3 February 2023.

The University of Hull is inviting applications for a [PhD project](#) on fishing and very large scale offshore wind deployment in the North Sea. Applications are due 10 February 2023.

The Norwegian Institute for Nature Research is opening a [PhD position](#) on mapping major migratory flyways across Norway using data collected via meteorological radars and mobile avian radar systems to support offshore wind energy. Applications are due 15 February 2023.

Upcoming Events

Upcoming Webinars

The Partnership for Research In Marine Renewable Energy (PRIMaRE) is launching its new virtual [PRIMaRE Seminar Series](#) to showcase research and development. The first seminar, on 24 January 2023 from 1:00-2:00pm UTC, will feature presentations on a remote river energy system and the challenges and opportunities of bio-based turbine blades for marine energy.

The National Renewable Energy Laboratory (NREL) and Renewable Energy Wildlife Institute (REWI) are hosting a *Technology and Innovation in Wind Energy and Wildlife webinar series* to explore the evolution of turbine technology. The first webinar, "[The Future of Wind Energy Technology and Wildlife Considerations](#)", will take place on 26 January 2023 from 3:00-4:00pm EST (8:00-9:00pm UTC). Register [here](#).

NREL and REWI are also hosting the second webinar in the series, "[Technology Acceptance Workshop Results: From the Bench to the Field](#)", from 3:00-4:00pm EST (8:00-9:00pm UTC) on 31 January 2023. Register [here](#).

Upcoming Conferences

The Marine Alliance For Science and Technology For Scotland is hosting the [5th Symposium of the Scottish Marine Energy Research Programme \(ScotMER\)](#) from 31 January to 2 February 2023 online. An updated schedule is now available [here](#). Register for free.

The [12th Annual North Carolina Renewable Ocean Energy Symposium](#) will take place 20-21 March 2023 in Wanchese, North Carolina, U.S. Register [here](#) by 24 February 2023.

New Documents on *Tethys*

Marine Energy

[Marine renewable energy technologies on the high seas: challenges and opportunities to strengthen international environmental and renewable energy governance](#) – Soria-Rodríguez 2022

Marine areas beyond national jurisdiction (ABNJ) offer an extensive area of about half of the Earth's surface with an unparalleled potential for the use of marine renewable energy (MRE) technologies to provide energy security and competitiveness to States and in the fight against climate change. However, the expansion of MRE technologies into ABNJ as well as the environmental impacts associated with their development can entail risks and threats to security and biodiversity. This paper focuses on highlighting key regulatory and governing challenges associated with the deployment of MRE technologies in ABNJ as well as an initial exploration of regulatory alternatives and forms of governance that could provide an effective way to enhance the sustainable and secure development of the MRE industry in ABNJ.

[A decision framework for tidal current power plant site selection based on GIS-MCDM: A case study in China](#) – Shao et al. 2023

To reach carbon neutrality, renewable energy development will gradually accelerate. Tidal current energy, with high energy density, long-term predictability and potentially large reserves, is an important research direction. As the prerequisite for tidal current energy development, Tidal Current Power Plant Site Selection (TCPPSS) affects its

future benefits. Although some studies have been conducted on TCPSS, further work is still needed on criteria system, research scales and methods. In this paper, a three-stage decision framework is proposed based on Geographic Information System (GIS) and Multi-Criteria Decision Making (MCDM) to determine potential marine areas, extract and evaluate site alternatives. In this framework, a scientific criteria system with exclusion and evaluation criteria is established.

Social and Ecological Impacts of Marine Energy Development in Malaysia – Fadzil et al. 2022

The excessive usage of fossil fuels in Malaysia is increasing yearly to meet the increasing domestic demands. However, this will impact the environment as fossil fuels will emit hazardous gases into the atmosphere. The development of marine energy in Malaysia is still in early periods compared with China, the U.K, and America. Notably, the impact of marine energy extraction on shallow water regions is not yet fully understood, such as the changes in the topography, the effect on marine life, and the cost of development and maintenance for tidal stream energy. This paper is focused on the social and ecological impact of potential marine energy development in Malaysia. Significantly, this study relies on published data to analyse and identify potential sites for harnessing tidal stream energy.

Wind Energy

Organic matter processing in a [simulated] offshore wind farm ecosystem in current and future climate and aquaculture scenarios – Voet et al. 2023

The rapid development of blue economy and human use of offshore space triggered the concept of co-location of marine activities and is causing diverse local pressures on the environment. These pressures add to, and interact with, global challenges such as ocean acidification and warming. This study investigates the combined pressures of climate change and the planned co-location of offshore wind farm (OWF) and aquaculture zones on the carbon flow through epifaunal communities inhabiting wind turbines in the North Sea. A ¹³C-labelled phytoplankton pulse-chase experiment was performed in mesocosms (4 m³) holding undisturbed hard-substrate (HS) communities, natural sediment with infauna, and mobile invertebrate predators.

Understanding subjective and situational factors of wind turbine noise annoyance – Müller et al. 2023

One of the most relevant acceptance factors of local wind turbines (WTs) are noise emissions. To better understand why some residents experience stress effects from wind turbines a field study with strongly annoyed residents (SAR) was conducted. A convenience sample of residents (N = 148) in the proximity of a wind farm in Germany were interviewed using a standardised questionnaire. Objective features, such as number of visible WTs and distance to the nearest WT, could not explain the experienced noise annoyance substantially. Instead, SAR were characterised by a negative perception of

both procedural as well as distributive fairness, the assumed decrease of property value due to the WTs, a negative attitude towards the local wind farm (but not to WTs in general), and higher noise sensitivity.

Ecosystem Benefits of Floating Offshore Wind – Haberlin et al. 2022

The offshore renewable energy (ORE) sector is at a crucial moment with multiple governments enacting policies and legislation that will decisively accelerate the expansion of offshore renewable energy globally. Floating offshore wind energy will become increasingly important over the next decade and this report seeks to elucidate the potential ecosystem benefits of floating offshore wind energy developments. The known ecosystem impacts of ORE fall under 7 broad categories: (1) Changes to the atmosphere and ocean/energy removal; (2) Sound pollution; (3) Electromagnetic Fields (EMF); (4) Habitat modification - artificial reef effect; (5) Barrier effects; (6) Water quality – chemical pollution; and (7) Fisheries exclusion and displacement.

News & Press Releases

Marine Energy

Royal visit marks bid to develop world's largest tidal turbine blades – University of Edinburgh

A project aiming to maximise tidal energy generation has been launched in the presence of Her Royal Highness, The Princess Royal, at the University of Edinburgh's FastBlade facility. The Princess Royal, who is also Chancellor of the University, visited the testing facility and partners of the new MAXBlade project. The €10 million project – funded by the European Union and UK Research and Innovation – aims to deliver a range of innovations to improve the performance of tidal turbines and reduce costs. It will investigate the full lifecycle of tidal turbine blades, from materials, manufacture and operation, to decommissioning and recyclability. The project's long-term aim is to ensure the European composite sector becomes the international leader in tidal blade manufacture.

TEAMER Network Director Announces RFTS 8 Technical Support Recipients, More than \$10 Million Provided in Support of 100 projects – TEAMER

The U.S. TEAMER program has approved twelve projects through its eighth RFTS, reflecting a total of more than \$1.2 million. These Technical Support Recipients will receive support for testing expertise and access to numerical modeling, laboratory or bench testing, and tank/flume testing and expertise within the growing TEAMER Facility Network. With these approvals, the TEAMER Network Director has awarded more than \$10 million of total support across 100 marine energy projects since the program launched in May of 2020. Supported by the U.S. DOE and directed by POET, TEAMER accelerates the viability of marine renewables by providing access to the nation's best

facilities and expertise to solve critical challenges, build knowledge, foster innovation, and drive commercialization.

EMEC Streamline Wave Energy Consenting at Billia Croo – EMEC

EMEC has been awarded a site-wide section 36 consent at its grid-connected Billia Croo wave test site off the west coast of Orkney, Scotland. Subjected to the powerful forces of the North Atlantic Ocean, Billia Croo has some of the highest wave energy potentials in Europe with an average significant wave height of 2-3 m. The site consists of five cabled test berths in up to 70 m water depth. A near shore berth is situated closer to shore for shallow water projects. Marine Scotland has awarded EMEC with section 36 consent for the site, further streamlining the consenting process for EMEC's clients, reducing the time and cost associated with offshore demonstration. The site has also been expanded by an area of 2.6 km² to the north-west enabling access to deeper water.

New Generator Rolls into Ocean Energy – Pacific Northwest National Laboratory (PNNL)

Tsunamis, hurricanes, and maritime weather are monitored using sensors and other devices on platforms in the ocean to help keep coastal communities safe—until the batteries on these platforms run out of juice. Without power, ocean sensors can't collect critical wave and weather data, which results in safety concerns for coastal communities that rely on accurate maritime weather information. Replacing batteries at sea is also expensive. What if this could all be avoided by powering devices indefinitely from the energy in ocean waves? PNNL researchers are working to make this a reality with the development of a new cylindrical triboelectric nanogenerator—a small powerhouse that converts wave energy into electricity to power devices at sea.

Minesto reaches commercial milestone – sale of site development services in Asia – Minesto

Minesto recently announced that the company has received its first historic sales order of site development services for Dragon Class tidal energy powerplants to a major corporation in the Asian offshore energy sector. Minesto has been contracted to support a leading Asian corporation in the offshore energy sector for evaluation of a tidal-current site targeting deployment of Minesto Dragon Class tidal energy powerplants. The work is planned to be completed in the first quarter of 2023 and has an initial order value of EUR 35 000. Minesto offers a structured approach to site identification and evaluation based on hands-on experience from existing sites in Wales, U.K. and the Faroe Islands. Site development is the initial step for the offshore energy sector to enter the ocean renewable value chain.

Wind Energy

The Crown Estate seals landmark agreements for offshore wind energy to power 7 million homes – The Crown Estate

In a major milestone for the UK's energy security and net zero commitments, The Crown Estate recently announced it has signed Agreements for Lease for six offshore wind projects which could begin to generate green electricity by the end of the decade and have the potential to generate 8 GW of renewable electricity, enough for more than seven million homes. Signing these agreements represents a significant moment in the UK's response to climate change and energy security, and further bolsters the country's thriving offshore wind industry, reinforcing its position as the second largest offshore wind energy generator in the world. Three of the six projects are located off the North Wales, Cumbria and Lancashire coast, and three are located in the North Sea off the Yorkshire and Lincolnshire coast.

Interior Department Finalizes Offshore Wind Safety and Environmental Responsibilities – U.S. Department of the Interior

The Department of the Interior recently announced the transfer of regulations governing offshore renewable energy activities – including workplace safety and environmental compliance – from BOEM to the Bureau of Safety and Environmental Enforcement (BSEE). The establishment of BOEM and BSEE marked the culmination of an effort to reorganize the former Minerals Management Service following the Deepwater Horizon tragedy. This action recognizes that the scopes of the bureaus' roles and responsibilities have matured over the last decade and supports the Department's commitment to independent regulatory oversight and enforcement in the renewable energy program. The rulemaking does not make substantive changes to current regulatory requirements, nor does it impose additional regulatory burdens.

New 18-MW Model Takes Over as World's Largest Offshore Wind Turbine – Power Magazine

A subsidiary of the China State Shipbuilding Corp. (CSSC) has unveiled components for what would be the world's largest and most-powerful wind turbine, an 18-MW product that tops the recent launching of a 16-MW turbine developed by other Chinese companies. CSSC Haizhuang unveiled the new turbine in a ceremony at the Dongying City industrial park in China's Shandong province. The 18-MW unit will feature a 260-meter-diameter rotor that will power a modularized medium-speed geared drive train and permanent magnet generator. The new turbine is larger than designs from China Three Gorges, Goldwind, and MingYang—other Chinese companies—and also more powerful than current offerings from Siemens Gamesa, Vestas, and General Electric.

DOE Projects Will Accelerate Deployment of Small- and Medium-Sized Wind Turbines Across the United States – U.S. DOE

The U.S. DOE's NREL recently announced it plans to award \$2.9 million to 11 manufacturers of small- and medium-scale wind turbines. These awards will support technology innovation and mitigate market and regulatory barriers to deployment of distributed wind turbines for use by homeowners, farmers, businesses, and others under DOE's Competitiveness Improvement Project (CIP). Distributed wind energy—

especially when combined with distributed solar power and, if needed, energy storage—can support local electrification and bolster the distribution system by increasing grid resilience and reliability. Managed by NREL on behalf of DOE's Wind Energy Technologies Office, CIP awards cost-shared subcontracts and technical support to manufacturers of small- and medium-sized wind turbines.

India to annually invite bids for 8 GW wind power projects to 2030, govt order says – Reuters

India has set a target to annually auction 8 gigawatts (GW) of wind power projects to the end of 2030 to boost renewable energy capacity, a government order said. India, one of the world's biggest emitters of greenhouse gases, wants to boost its renewable energy generation to 500 GW by 2030 from a current output of about 120 GW according to government data. Previously the country had not set an annual wind power capacity target. The bidding model has also been modified from electronic reverse bidding where the participants could reduce their offer price to bag the contracts at the lowest bid. The industry had complained that led to an artificial lowering of prices. Bidders will now not be required to revise their quoted tariff for the sale of power - a key parameter for the award of the contract.