



**29 April 2022**

[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](mailto:tethys@pnnl.gov) to contribute!

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## Announcements

### New SEER Research Brief

The U.S. Offshore Wind Synthesis of Environmental Effects Research ([SEER](#)) effort recently published a new educational research brief, [Presence of Vessels: Effects of Vessel Collision on Marine Life](#), on *Tethys*. Recordings from all SEER webinars are also available on *Tethys* [here](#).

### Tethys Engineering Fact Sheet

A new [Tethys Engineering Fact Sheet](#) is now available that highlights the site's latest content and features, such as the [Knowledge Base](#), [Map Viewer](#), and [Photo Library](#). If you have documents or photos you wish to add to *Tethys Engineering*, simply email [tethys@pnnl.gov](mailto:tethys@pnnl.gov) to let us know!

### 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.

## OES Workshop on Marine Energy Data Sharing

After a successful Ocean Energy Systems ([OES](#)) Workshop on Marine Energy Data Sharing in May 2021, the US-based Portal and Repository for Information on Marine Renewable Energy ([PRIMRE](#)) team is hosting a second online workshop on 11 May 2022 from 3:00-5:00 PM UTC. We are particularly looking for those who develop or manage marine energy databases, portals, and/or tools to participate. If you are interested in attending, please email [tethys@pnnl.gov](mailto:tethys@pnnl.gov).

## Marine Energy Collegiate Competition

The US Department of Energy (DOE) has opened the application period for the [2023 Marine Energy Collegiate Competition](#), which challenges interdisciplinary teams of undergraduate and graduate students to offer unique solutions to the marine energy industry that can play a role in powering the blue economy. Applications are due 8 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. For more information, join the [informational webinar](#) at 2:00pm EDT (6:00pm UTC) on 3 May 2022. Applications are due 1 June 2022.

## BOEM Seeking Comments

The US Bureau of Ocean Energy Management (BOEM) is now [accepting public comments](#) on the draft Morro Bay Wind Energy Area Environmental Assessment through 6 May 2022.

## NOAA Fisheries & BOEM Seeking Comments

The US National Oceanic and Atmospheric Administration (NOAA) Fisheries and BOEM recently released a [Draft Federal Survey Mitigation Implementation Strategy](#) that describes the approach NOAA Fisheries and BOEM will use to mitigate the impacts of offshore wind energy on NOAA Fisheries surveys in Northeast and Mid-Atlantic regions. The agencies are [seeking public comment](#) on the strategy until 6 May 2022.

## Calls for Abstracts

The Call for Abstracts for the [University Marine Energy Research Community \(UMERC\) and Marine Energy Technology Symposium \(METS\) joint conference](#) is now open through 1 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 [19th International Bat Research Conference and 50th Annual North American Symposium on Bat Research](#) is open until 1 May 2022. The event will take place on 7-12 August 2022 in Austin, US.

The [Call for Speakers](#) for [Clean Currents 2022](#) is now open until 1 May 2022. The Clean Currents Tradeshow and Conference will take place 18-20 October 2022 in Sacramento, US.

The [Call for Abstracts](#) for Structures in the Marine Environment (SIME 2022) is now open until 6 May 2022. SIME 2022 will take place on 7 June 2022 in Edinburgh, Scotland.

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 [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 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.

### Funding & Testing Opportunities

The UK Department for Business, Energy & Industrial Strategy has launched Phase 9 of the [Energy Entrepreneurs Fund](#), which aims to support the development and demonstration of green energy technologies. Applications are due 11 May 2022.

The Sustainable Energy Authority of Ireland National Energy [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.

The European Commission is launching the Innovation Fund's second [Call for Small Scale Projects](#) in renewable energy, energy-intensive industries including substitute products, energy storage, and carbon capture, use and storage. Applications are due 31 August 2022.

## Student & Employment Opportunities

Menter Mon Ltd is accepting applications for an [Environmental Monitoring & Mitigation Plan Project Manager](#), a [Project Support Officer](#), and a [Selkie Project Coordinator](#). Applications for all positions are due 4 May 2022.

The University of Plymouth is accepting applications from eligible UK students for a funded PhD project titled, [Hybrid Oscillating Water Column-Overtopping Wave Energy Converter for Clean Energy and Coastal Protection](#). Applications are due 4 May 2022.

The National University of Ireland Galway is accepting applications for [5 PhD research positions](#) available through the TIDAL-GES (Tidal Energy – A transition to affordable and clean energy that can achieve ‘Good Environmental Status’ in coastal and marine waters) project. Applications are due 9 May 2022.

Marine Energy Wales, a longstanding Pembrokeshire Coastal Forum programme, is seeking a [Floating Wind Project Manager](#). Applications are due 9 May 2022.

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## **Upcoming Events**

### Upcoming Summit

The Australian Ocean Energy Group is hosting the [Australian Ocean Energy Market Summit](#) on 10-11 May 2022 in Hobart, Australia and online. The event aims to create information-based connections between Australian market representatives and industry leaders. Register [here](#).

### Upcoming Webinar

The Discovery of Sound in the Sea (DOSITS) team is hosting a webinar on acoustic propagation modeling from 12:00-1:00pm EDT (4:00-5:00pm UTC) on 12 May 2022. Register for free [here](#).

### Upcoming Workshops

The Dutch Marine Energy Centre is hosting an [Ocean Power Innovation Network \(OPIN\) Masterclass on Environmental Impact and Monitoring](#) from 9:00-10:00am BST (8:00-9:00am UTC) on 3 May 2022. The class will feature experts from WavEC; the Institute for Systems and Computer Engineering, Technology, and Science; and Bluespring. Register for free [here](#).

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](#).

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## **New Documents on *Tethys***

### **Marine Energy**

#### **[Offshore Aquaculture: A Market for Ocean Renewable Energy](#) – Freeman et al. 2022**

Ocean renewable energy (ORE) and offshore aquaculture are two industries that are likely compatible for colocation; ORE has the potential to provide power for offshore aquaculture and can decrease the environmental impact of operations by providing power at sea and replacing the reliance on diesel. This report defines co-location as the sharing of marine space between aquaculture and ORE as well as ORE providing power to aquaculture operations. Overall, this report provides a comprehensive look into offshore aquaculture as a market for ORE by identifying ORE technologies to be used, aquaculture energy demands, case studies and lessons learned, opportunities and challenges, and finally recommendations to advance the potential for co-location.

#### **[Wave Energy in the Pacific Island Countries: A New Integrative Conceptual Framework for Potential Challenges in Harnessing Wave Energy](#) – Posterari & Waseda 2022**

Even though the wave energy resource in the Pacific has been studied, there is limited knowledge on the potential obstacles when inserting this new energy source into a unique and unexplored environment. Pacific Island countries (PICs) have distinctive characteristics that can become barriers to this technology, especially considering that local coastal and marine systems are fundamental for subsistence and local development. Thus, the success of a project relies on local acceptance. The current study developed an integrative conceptual framework for the PICs (ICFPICs) that derived from the integration of the elements of a political, economic, social, technological, environmental and legal (PESTEL) structured approach and further combined with a strengths, weaknesses, opportunities and threats (SWOT) approach to create a matrix that included relevant internal and external factors influencing a project.

#### **[Environmental Effects from Wave Power: Artificial Reefs and Incidental No-take Zones](#) – Bender 2022**

This thesis deals with environmental effects from heaving point-absorber wave energy converters developed at Uppsala University and deployed on the Swedish west coast at the Lysekil research site and the Sotenäs Project wave power park over a period of four years. The scope was the investigation of artificial reef effects from wave power foundations on local mobile, mega and macrofauna during visual inspections using scuba diving on the first hand. On the second hand, the effects from the incidental no-take zone on decapods and two sea pen species were investigated applying cage fishing and ROV seabed surveys. A third focus was on environmental monitoring around MRE sites and monitoring of MRE installations, both in an experimental and theoretical approach.

## Wind Energy

### [The Effects of Anthropogenic Electromagnetic Fields \(EMF\) on the Early Development of Two Commercially Important Crustaceans, European Lobster, \*Homarus gammarus\* \(L.\) and Edible Crab, \*Cancer pagurus\* \(L.\) – Harsanyi et al. 2022](#)

Proposed offshore windfarm sites could overlap with the brooding and spawning habitats of commercially important crustacea, including European lobster, *Homarus gammarus* and Edible crab, *Cancer pagurus*. Concerns have been raised on the biological effects of Electromagnetic Fields (EMFs) emitted from subsea power cables on the early life history of these species. In this study, ovigerous female *H. gammarus* and *C. pagurus* were exposed to static (Direct Current, DC) EMFs (2.8 mT) throughout embryonic development. Embryonic and larval parameters, deformities, and vertical swimming speed of freshly hatched stage I lobster and zoea I crab larvae were assessed. EMF did not alter embryonic development time, larval release time, or vertical swimming speed for either species.

### [Dynamic land use implications of rapidly expanding and evolving wind power deployment – Harrison-Atlas et al. 2022](#)

The expansion of wind power poses distinct and varied geographic challenges to a sustainable energy transition. However, current knowledge of its land use impacts and synergies is limited by reliance on static characterizations that overlook the role of turbine technology and plant design in mediating interactions with the environment. Here, we investigate how wind technology development and innovation have shaped landscape interactions with social and ecological systems within the United States and contribute to evolving land area requirements. This work assesses trends in key land use facets of wind power using a holistic set of metrics to establish an evidence base that researchers, technology designers, land use managers, and policymakers can use in envisioning how future wind-intensive energy systems may be jointly optimized for clean energy, social, and environmental objectives.

### [ThermalTracker-3D Offshore Validation Technical Report – Matzner et al. 2022](#)

The Department of Energy's Wind Energy Technology Office has funded the development of technology for understanding wildlife impacts to accelerate the development of offshore wind energy in the US. The ThermalTracker-3D (TT3D) technology was developed by the Pacific Northwest National Laboratory (PNNL) with DOE funding as a method for continuously monitoring bird and bat activity at remote locations, such as those offshore. Its detection and 3-D tracking capabilities were validated on land in 2019. To validate its performance offshore, in 2021 a marinated prototype TT3D was integrated with a Wind Sentinel™ buoy and deployed offshore. This report describes that initial offshore validation of the TT3D system for monitoring and quantifying bird and bat activity at offshore wind energy sites.

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## News & Press Releases

### Marine Energy

#### [Advancing Marine Energy: An Abundant, Untapped Renewable Resource](#) – US DOE

An abundant, untapped renewable energy resource is constantly surging and churning through rivers and oceans. This power—called marine energy—is dependable and widely available. It's in the rivers flowing through American cities and towns, along the coastlines where nearly 40% of Americans live, and even in the depths of the oceans that cover more than 70% of the planet. Over the last year, the U.S. Department of Energy's Water Power Technologies Office (WPTO) supported many efforts to advance promising marine energy research and technologies, which convert the power in waves, tides, and ocean and river currents into clean electricity. The recently published WPTO 2020–2021 Accomplishments Report features a selection of the WPTO-supported marine energy advances from universities, industry partners, and national laboratories in the last year.

#### [Could Anglesey's tidal energy project drive a new energy revolution?](#) – The Guardian

On the stunning and craggy coastline of Holy Island in north Wales, work has started on a construction project to generate energy from one of the world's greatest untapped energy resources: tidal power. The Morlais project, on the small island off the west of Anglesey has benefited from £31m in what is likely to be the last large grant for Wales from the European Union's regional funding programme. It will install turbines at what will be one of the largest tidal stream energy sites in the world, covering 13 square miles of the seabed. The project won planning permission from the Welsh government last December and is designed to power more than 180,000 homes once fully operational. A range of tidal projects, costing billions of pounds to develop, are now being proposed, and could put Wales at the forefront of a marine energy revolution.

#### [Video: C-Power's TigerRAY wave power system gets wet](#) – Offshore Energy

Built for the University of Washington's Applied Physics Lab's research project, the next-generation SeaRAY wave power system – developed by C-Power – has gotten wet during a recent test deployment operation. A collaborative team from the University of Washington and Oregon State University have integrated several technologies to test a prototype system that harnesses the power of ocean waves to send electricity to an ocean observing vehicle. The TigerRAY was built as part of a US Navy-sponsored R&D project to investigate at-sea charging of unmanned underwater vehicles. Initially conceived during a U.S. Department of Defense project, the SeaRAY autonomous offshore power system (AOPS) provides in-situ power, energy storage, and real-time data and communications support that could advance the marine economy toward a future of autonomous, connected and resident technologies.

#### [The Ocean Comes to Colorado: NREL's First Wave Tank Could Fast-Track Novel Marine Energy Technologies](#) – National Renewable Energy Laboratory (NREL)

Ocean energy, also known as marine energy, is renewable power generated from the motion of ocean waves, currents, and tides. But no marine energy technology has achieved commercial success—yet. That is where NREL comes in. At the laboratory’s Flatirons Campus, NREL researchers help shepherd marine energy prototypes from abstract concept to the market. And the laboratory just installed a new tool that fills a critical gap in that soup-to-nuts support. “There was still a big piece missing,” said Rebecca Fao, a research engineer in NREL’s water power technology group. “We still couldn’t fully emulate the conditions that these devices will experience when they go offshore.” Now, they can—well, almost. Thanks to funding from the U.S. Department of Energy’s Water Power Technologies Office, Fao and her team installed their first wave tank in Spring 2022.

### **[Crown Estate Scotland shares offshore energy data with the world](#) – Offshore Energy**

Through a new website, Crown Estate Scotland has made available the information on offshore wind farms, wave and tidal energy sites, along with cable and pipeline agreements as free open datasets for the public. Crown Estate Scotland manages property – including buildings, land, coastline, and seabed – on behalf of the Scottish people. Together, these assets and property form the Scottish Crown Estate. The estate’s purpose is to invest in property, natural resources, and people to generate lasting value for Scotland. To make data widely available, Crown Estate Scotland has launched a dedicated website – the [Crown Estate Scotland Spatial Hub](#) – that provides access to data layers that can be added to personal GIS applications, and to downloadable datasets in formats such as PDF, CSV, and GIS shapefile.

## **Wind Energy**

### **[Biden-Harris Administration Advances Offshore Wind Energy Leasing on Atlantic and Pacific Coasts](#) – US Department of the Interior**

The Department of the Interior today announced that the Bureau of Ocean Energy Management (BOEM) will publish two separate Calls for Information and Nominations for possible leasing in areas that are determined to be suitable off the coast of Oregon and in the Central Atlantic. Scheduled to publish in the *Federal Register* on April 29, each Call will initiate a separate comment period during which the public can submit relevant information on site conditions, marine resources, and ocean uses near or within the Call Areas. Concurrently, wind energy companies can nominate specific areas they would like to see offered for leasing. BOEM is seeking information on six distinct areas in the Central Atlantic comprising almost 3.9 million acres. The closest point to the shore of any of the areas is approximately 20 nautical miles off the Central Atlantic coast.

### **[The Crown Estate confirms intention to proceed to the final stage of Offshore Wind Leasing Round 4](#) – The Crown Estate**



The Crown Estate has marked an important step towards helping the UK meet its net zero and energy security commitments by completing its work on the Plan-Level Habitats Regulations Assessment (HRA) for Offshore Wind Leasing Round 4 – which has the potential to deliver up to 8GW of vital new offshore wind capacity (enough to power up to 7 million more homes). This has resulted in The Crown Estate giving notice to the UK and Welsh Governments of its intent to proceed with the Round 4 plan on the basis of a ‘derogation’. The notice confirms the intention to progress all six of the offshore wind projects which form the Round 4 plan to the final stage of the leasing process – the award of an Agreement of Lease – subject to any environmental impacts being fully offset through environmental compensatory measures.

### **[NREL Tool Aims To Predict Interactions Between Soaring Eagles and Wind Turbines](#) – National Renewable Energy Laboratory (NREL)**

Golden eagles, like many raptors, know how to take the path of least resistance. When they spread their wings and take to the skies, they typically look for updrafts to assist their flight, letting them soar to greater altitudes without expending much energy. However, those updrafts and associated high winds are also valuable for generating clean energy, making wind turbines more of a potential risk to eagles and other flying animals. A new software—the Stochastic Soaring Raptor Simulator (SSRS)—developed at NREL with support from the U.S. DOE Wind Energy Technologies Office endeavors to predict the most likely long-distance flight paths of individual golden eagles as they ride updrafts. An SSRS user can choose the site, then either provide the wind conditions or ask for a specific date and time. The model, which is publicly accessible on GitHub, will simulate the likely routes golden eagles would take as they travel through the site.

### **[These whales are on the brink. Now comes climate change — and wind power.](#) – The Washington Post**

With only about 300 left, the North Atlantic right whale ranks as one of the world’s most endangered marine mammals. Nearly annihilated centuries ago by whalers, the slow-swimming species is said to have earned its name because it was the “right” whale to hunt. Old-fashioned harpoons have yielded to other threats. Humans are still killing right whales at startlingly high numbers — but by accident. Waters free from whalers now brim with ships that strike them, and ropes that entangle them. The latest challenges come in a changing climate. Rising temperatures are driving them to new seas. And soon, dozens of offshore wind turbines — part of President Biden’s clean energy agenda — will encroach their habitat as the administration tries to balance tackling global warming with protecting wildlife.

### **[GE Renewable Energy inaugurates 3D printing facility that will research more efficient ways to produce towers for wind turbines](#) – GE**

GE Renewable Energy recently held a ribbon-cutting ceremony to inaugurate a new research and development facility that will conduct research on how to 3D print the concrete base of towers used in wind turbines. The research will enable GE to 3D print

the bottom portion of the wind turbine towers on-site at wind farms, lowering transportation costs and creating additional employment opportunities at the wind farms where the technology will be used. The research being conducted in the Bergen facility is supported in part by a grant from the US Department of Energy. A team of 20 people will continue to work on optimizing the 3D printing technology with first applications in the field anticipated within the next five years.