



**21 January 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!

---

[Announcements](#)  
[Upcoming Events](#)

[Marine Energy Documents](#)  
[Wind Energy Documents](#)

[Marine Energy News](#)  
[Wind Energy News](#)

---

## **Announcements**

### SEER Research Briefs Now Available

The first two educational research briefs published as part of the U.S. Offshore Wind Synthesis of Environmental Effects Research ([SEER](#)) project, [Underwater Noise Effects on Marine Life Associated with Offshore Wind Farms](#) and [Risk to Marine Life from Marine Debris and Floating Offshore Wind Cable Systems](#), are now available on *Tethys*.

### ETIPP Accepting Applications

The US Department of Energy (DOE) and National Renewable Energy Laboratory [recently announced](#) that the [Energy Transitions Initiative Partnership Project \(ETIPP\)](#) is accepting applications from remote, island, and islanded communities for technical assistance to transform their energy systems and increase energy resilience. Interested applicants are invited to attend the [ETIPP Webinar](#) on 16 February 2022 at 12:00 pm MST. Applications are due 15 April 2022.

### 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).

## Calls for Abstracts

The [Call for Abstracts](#) for the [Frontiers in Hydrology Meeting](#) is open through 26 January 2022. The meeting will take place online and in San Juan, Puerto Rico on 19-24 June 2022.

The [Call for Abstracts](#) for the 9<sup>th</sup> 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.

## Funding & Testing Opportunities

The Selkie project has teamed up with the Lir-National Ocean Test Facility in Ireland to provide a [free tank testing opportunity](#) to Irish and Welsh wave and tidal energy developers within the Selkie Network. Applications are available [here](#) and are due 31 January 2022.

The Horizon Europe Framework Programme has launched two funding opportunities titled, “[Next generation of renewable energy technologies](#)” and “[Innovative foundations, floating substructures and connection systems for floating PV and ocean energy devices](#)”. Proposals for both 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 Conflicting Use Mitigation, Power Systems & Interconnection are due 9 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

The University of the Highlands and Islands is seeking interdisciplinary candidates for a [fully-funded PhD studentship](#) focused on the impacts of floating offshore wind infrastructure on the distribution and behaviour of fish and marine mammals. Applications are due 31 January 2022.

The US DOE’s recently launched [Clean Energy Corps](#) is now recruiting 1,000 employees to help research, develop, demonstrate, and deploy solutions to climate change. DOE is looking for candidates in a wide range of career fields and positions are available across the country.

---

## **Upcoming Events**

## Upcoming Workshops

OES-Environmental is hosting a workshop on the future of wave energy in Hawaii as part of the [2022 Ocean Sciences Meeting \(OSM\)](#). This interactive session will use live and online breakout sessions, engaging marine scientists to extract power sustainably and efficiently from waves in Hawaii. OSM 2022 will take place from 24 February to 4 March 2022 online. Register [here](#). Workshop details coming soon.

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 [here](#).

The [12<sup>th</sup> 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](#).

## 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 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. 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](#).

## Upcoming Hackathon

The [Blue-Cloud Hackathon](#), an open invitation to marine scientists, data scientists, innovators, students, and anyone who is passionate about the ocean to explore and test Blue-Cloud, will take place 7-9 February 2022. Blue-Cloud is a new, Open Science platform for the marine domain offering a wealth of data, analytical tools, and computing power. Register [here](#).

## Upcoming Conferences

The International Energy Agency Ocean Energy Systems (IEA-OES) is hosting a Funders' Summit: Adoption of the IEA-OES Evaluation and Guidance Framework for Ocean Energy Technology on 26 January 2022 at 7:30am UTC (register [here](#)) and 4:00pm UTC (register [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.

---

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

### **Marine Energy**

#### **[A Review of Modeling Approaches for Understanding and Monitoring the Environmental Effects of Marine Renewable Energy](#) – Bueanau et al. 2022**

Understanding the environmental effects of marine energy (ME) devices is fundamental for their sustainable development and efficient regulation. However, measuring effects is difficult given the limited number of operational devices currently deployed. Numerical modeling is a powerful tool for estimating environmental effects and quantifying risks. It is most effective when informed by empirical data and coordinated with the development and implementation of monitoring protocols. We reviewed modeling techniques and information needs for six environmental stressor–receptor interactions related to ME: changes in oceanographic systems, underwater noise, electromagnetic fields (EMFs), changes in habitat, collision risk, and displacement of marine animals. This review considers the effects of tidal, wave, and ocean current energy converters.

#### **[Interactions between tidal stream turbine arrays and their hydrodynamic impact around Zhoushan Island, China](#) – Zhang et al. 2022**

Tidal currents represent an attractive renewable energy source particularly because of their predictability. Prospective tidal stream development sites are often co-located in close proximity. Under such circumstances, in order to maximise the exploitation of the resource, multiple tidal stream turbine arrays working in tandem would be needed. In this paper, a continuous array optimisation approach based on the open source coastal ocean modelling framework Thetis is applied to derive optimal configurations for four turbine arrays around Zhoushan Islands, China. Alternative optimisation scenarios are tested to investigate interactions between the turbine arrays and their hydrodynamic footprint. As for the potential environmental impact, it is found that the turbine array around Taohua Island would affect a larger area than turbine arrays around Hulu Island.

#### **[Insights into the behavioural responses of juvenile thornback ray \*Raja clavata\* to alternating and direct current magnetic fields](#) – Albert et al. 2021**

As part of energy transition, marine renewable energy devices (MRED) are currently expanding in developed countries inducing the deployment of dense networks of

submarine power cables. Concern has thus raised about the cable magnetic emissions (direct or alternating current) because of potential interference with the sensorial environment of magneto-sensitive species, such as sharks and rays. This study sought to assess the short-term behavioural responses of juvenile thornback rays (*Raja clavata*) (n = 15) to direct and alternating (50 Hz) uniform 450- $\mu$ T artificial magnetic fields using 1 h focal-sampling design based on a detailed ethogram. Careful control of magnetic fields' temporal and spatial scales was obtained in laboratory conditions through a custom-made Helmholtz coil device.

## Wind Energy

### Offshore wind energy development: Research priorities for sound and vibration effects on fishes and aquatic invertebrates – Popper et al. 2022

There are substantial knowledge gaps regarding both the bioacoustics and the responses of animals to sounds associated with pre-construction, construction, and operations of offshore wind (OSW) energy development. A workgroup of the 2020 State of the Science Workshop on Wildlife and Offshore Wind Energy identified studies for the next five years to help stakeholders better understand potential cumulative biological impacts of sound and vibration to fishes and aquatic invertebrates as the OSW industry develops. The workgroup identified seven short-term priorities that include a mix of primary research and coordination efforts. Key research needs include the examination of animal displacement and other behavioral responses to sound, as well as hearing sensitivity studies related to particle motion, substrate vibration, and sound pressure.

### Flight Altitudes of Raptors in Southern Africa Highlight Vulnerability of Threatened Species to Wind Turbines – McClure et al. 2021

Energy infrastructure, particularly for wind power, is rapidly expanding in Africa, creating the potential for conflict with at-risk wildlife populations. Raptor populations are especially susceptible to negative impacts of fatalities from wind energy because individuals tend to be long-lived and reproduce slowly. A major determinant of risk of collision between flying birds and wind turbines is the altitude above ground at which a bird flies. We examine 18,710 observations of flying raptors recorded in southern Africa and we evaluate, for 49 species, the frequency with which they were observed to fly at the general height of a wind turbine rotor-swept zone (50–150 m). Our results highlight that threatened raptor species, particularly vultures, might be especially impacted by expanded wind energy infrastructure across southern Africa.

### Engaged minority or quiet majority? Social intentions and actions related to offshore wind energy development in the United States – Fleming et al. 2022

This research examines the possibility of spatial variability of resident social action relative to the potential for offshore wind energy development in a subregion of the United States. Data were collected via a random household survey within coastal populations of North and South Carolina adjacent to proposed offshore wind energy

development. Cluster analysis is used to create subgroups based on awareness, support level, and intended action. Perceived impacts, place attachment, and demographic characteristics are then examined between these spatial clusters. Residents of cluster 1 are more likely to be aware of and opposed to offshore wind energy development efforts, as well as more likely to have engaged in past action and intend action than residents of cluster 2.

---

## **News & Press Releases**

### **Marine Energy**

#### **[Eco Wave Power Enters into a Collaboration Agreement with AltaSea at the Port of Los Angeles – Eco Wave Power](#)**

Eco Wave Power will work with AltaSea, a nonprofit that accelerates scientific collaboration and advances an emerging blue economy, to locate and submit grants to implement Eco Wave Power's technology. Already taking action, both organizations participated in a grant submission led by the Los Angeles Economic Development Corporation, which was chosen as a finalist in the Economic Development Administration Build Back Better Regional Challenge. In addition, Eco Wave Power plans to implement a pilot program on the AltaSea campus, located in the Port of Los Angeles. Together, Eco Wave and AltaSea will look to secure other locations for future implementation. Eco Wave Power will also participate in AltaSea's outreach activities.

#### **[CalWave's xWave prototype emerges as platform for various environmental monitoring ops – Offshore Energy](#)**

The recently deployed xWave wave energy prototype, developed by U.S.-based company CalWave Power Technologies, has served as a platform for several environmental research operations led by Pacific Northwest National Laboratory's Triton initiative. In collaboration with CalWave, the Triton team has conducted two separate field trials around the xWave prototype device to test Integral Consulting's NoiseSpotter technology and an underwater camera used to monitor changes in habitat around the wave energy converter's anchors. The xWave is a fully operational, submerged wave energy device – deployed in September 2021 in California – for a period of six months for performance testing, providing an opportunity to collect valuable environmental monitoring data.

#### **[EC-OG supplies Halo intelligent battery system for world-first autonomous offshore power trials in Hawaii – EC-OG](#)**

EC-OG, a specialist in intelligent energy management and storage technologies for the energy industry, has achieved a significant company milestone with the first commercial delivery of its Halo subsea battery storage system. The lithium-ion based device will be part of a world-first autonomous offshore power sea trial in Q1 2022 at the US Navy Wave Energy Test Site, off the coast of the Hawaiian island of Oahu. Aberdeen-based

EC-OG's Halo system will be integrated into the sea trial in which Columbia Power Technologies, Inc. (C-Power), a leader in ocean energy systems, will demonstrate its Autonomous Offshore Power System in partnership with the US Department of Energy, as well as companies such as Saab, BioSonics and Franatech.

### **The PAV and the València City Council collaborate in the installation of a pilot device for generating electricity from waves – Port Authority of Valencia**

The Port Authority of Valencia (PAV) and the city council of Valencia have signed an agreement for the installation of a device for the generation of electrical energy from waves to be in the Marina of Valencia. Through this agreement, the Port of Valencia grants the City Council of Valencia the authorisation to occupy the port public domain for the installation of a device for the generation of wave energy. In this case, the City Council's proposal is made within the framework of the H2020 MAtchUP demonstration project financed by the European Commission, which plans to develop an innovative and sustainable technological solution to produce energy by harnessing the action of waves, with great social and environmental repercussions.

### **ADCP's deployed at Raz Blanchard tidal energy site – Tidal Stream Industry Energiser (TIGER)**

Four subsea frames supporting flow measurement devices, also known as Acoustic Doppler Current Profilers (ADCP's) have been successfully been deployed on two tidal sites at Raz Blanchard in France, as part of the Interreg France (Channel) England funded TIGER project. The ADCP's used in the operation were supplied by project partner the European Marine Energy Centre (EMEC) and installation of the ADCPs was co-ordinated by Normandy Hydroliennes with support from HydroQuest, DynamOcean, AD Normandy and the University of Caen. The four ADCP frames will remain on site collecting flow and wave data until March 2022, after which the units will be recovered and the data post processed by Oceanographers at EMEC, before it is distributed among the TIGER project partners.

## **Wind Energy**

### **ScotWind offshore wind leasing delivers major boost to Scotland's net zero aspirations – Crown Estate Scotland**

Crown Estate Scotland has recently announced the outcome of its application process for ScotWind Leasing, the first Scottish offshore wind leasing round in over a decade and the first ever since the management of offshore wind rights were devolved to Scotland. The results coming just months after Glasgow hosted the global COP26 climate conference show the huge opportunity that Scotland has to transform its energy market and move towards a net zero economy. 17 projects have been selected out of a total of 74 applications, and have now been offered option agreements which reserve the rights to specific areas of seabed. This is just the first stage of the long process these projects will

have to go through before we see turbines going into the water, as the projects evolve through consenting, financing, and planning stages.

### **Interior Department Announces Historic Wind Energy Auction Offshore New York and New Jersey – US Department of the Interior**

Secretary of the Interior Deb Haaland recently announced that the Bureau of Ocean Energy Management (BOEM) will hold a wind auction next month for more than 480,000 acres offshore New York and New Jersey, in the area known as the New York Bight. The Feb. 23 auction will allow offshore wind developers to bid on six lease areas – the most areas ever offered in a single auction – as described in BOEM’s Final Sale Notice. Leases offered in this sale could result in 5.6 to 7 gigawatts of offshore wind energy, enough to power nearly 2 million homes. Collectively, New York and New Jersey have set the nation’s largest regional offshore wind target of installing over 16 GW of offshore wind by 2035.

### **Pattern Energy Completes Construction of Largest Single-Phase Renewable Energy Project in U.S. History – Pattern Energy**

Pattern Energy recently announced it has completed construction and begun commercial operation of its suite of Western Spirit Wind power projects. Western Spirit Wind is comprised of four wind power facilities totaling more than 1,050 megawatts located in Guadalupe, Lincoln, and Tarrant Counties in central New Mexico. “Western Spirit Wind is a groundbreaking megaproject that demonstrates large-scale renewables can be developed and built in the United States,” said Mike Garland, CEO of Pattern Energy. “Western Spirit brought over 1,100 construction jobs to New Mexico, generated local spending, tax revenue and landowner payments in a remote area of New Mexico, and is now delivering enough renewable energy to meet the electricity needs of more than 900,000 Americans.”

### **EDF Renewables UK partners with DP Energy to deliver up to 1 GW ‘Gwynt Glas’ floating offshore wind project in the Celtic Sea – DP Energy**

EDF Renewables, one of the UK’s leading renewable energy companies, is announcing a joint venture partnership with international renewable project developer DP Energy, to generate up to 1GW of low carbon green energy in the Celtic Sea. The project is likely to span English and Welsh waters. The floating offshore wind project called ‘Gwynt Glas’ will provide power for approximately 927,400 homes. This will contribute a significant part of the Crown Estate’s ambitions for 4GW of capacity in the Celtic Sea. Work including identification of a refined area of search and detailed constraint studies for the proposed location of the project are already underway. An area of interest encompassing some 1,500km<sup>2</sup> has been identified, approximately 70km from the shore, with initial remote aerial surveys for marine mammal and birds taking place since Spring 2021.

### **RWE announces further milestone for Triton Knoll Offshore Wind Farm – RWE**



Turbine commissioning at Triton Knoll Offshore Wind Farm has been successfully completed. The wind farm, constructed by RWE on behalf the project partners, has reached this milestone on time, overcoming the challenges posed by the global pandemic. Once fully operational, the power output of Triton Knoll will be 857 megawatts, making it one of the world's largest offshore wind farms. Standing at 164 meters tall, full operations of the 90 turbines are expected in the first quarter of 2022. Triton Knoll will make an important contribution to the UK's energy system, generating sufficient electricity to meet the needs of around 800,000 homes each year. The project represents an investment of around £2 billion that includes construction of the wind farm and the grid connection.