



## 3 February 2023

[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

#### Floating Offshore Wind Shot

The U.S. Department of Energy (DOE) recently launched the [Floating Offshore Wind Shot](#) to help usher in a clean energy future by driving U.S. leadership in floating offshore wind design, development, and manufacturing. Register [here](#) for the first-ever [Floating Offshore Wind Shot Summit](#) on 22-23 February 2023 to learn more.

#### Marine Energy Video Series

[OES-Environmental](#) and Pacific Northwest National Laboratory recently published a series of animated videos on the effects of marine energy devices on ocean animals and habitats. Watch the series [here](#), and check out other [educational resources](#) on *Tethys* like our [coloring book](#).

#### Call for Abstracts

The Call for Abstracts for the [9th International Ocean Thermal Energy Conversion Symposium](#) is now open. Email your title, authors, and abstract (<500 words) [here](#). The event will take place 4-5 May 2023 in Houston, Texas, U.S., alongside the [Offshore Technology Conference](#).

The [Call for Abstracts](#) for the [15<sup>th</sup> European Wave and Tidal Energy Conference Series \(EWTEC 2023\)](#) has been extended to 11 February 2023. Full papers will be due 27 May 2023. EWTEC will take place on 3-7 September 2023 in Bilbao, Spain.

The Business Network for Offshore Wind has opened the [Call for Posters](#) for the [International Offshore Wind Partnering Forum \(IPF\)](#) through 17 February 2023. IPF will take place 28-30 March 2023 in Baltimore, Maryland, U.S.

The Partnership for Research in Marine Renewable Energy (PRIMaRE) has opened the [Call for Abstracts](#) for the [10th PRIMaRE Conference](#) through 10 March 2023. The conference will take place on 27-28 June 2023 in Bath, England.

### 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).

### Funding & Testing Opportunities

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. Department of Energy'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.

### Student & Employment Opportunities

Allegheny Science & Technology (AST) is looking for a [Marine Energy Environmental Scientist](#) to help lead development of an environmental research portfolio of a federal agency research program and collaborate as needed with inter-agency and intra-agency groups focused on issues of environmental impacts of marine energy.

YS Énergies Marines Développement is seeking two [Project Managers](#) to support the development of local wave and tidal energy projects.

Net Zero Atlantic is seeking fulltime [Project Managers](#) to support the successful delivery of projects in our renewable energy research portfolio. Applications are due 10 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.

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## Upcoming Events

### Upcoming Webinars

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 third webinar, “[Technology Acceptance Workshop Results: Acceptance](#)”, will take place on 9 February 2023 from 4:00-5:00pm EST (9:00-10:00pm UTC). Register [here](#).

NREL and REWI are also hosting the fourth webinar, “[Wind Wildlife Research Meeting Technology & Innovation Discussions Continued](#)”, on 16 February 2023 from 2:00-3:00pm EST (7:00-8:00pm UTC). Register [here](#).

### Upcoming Conferences

The [10<sup>th</sup> Annual World Ocean Summit & Expo](#) will take place from 27 February to 1 March 2023 in Lisbon, Portugal. Register [here](#).

The Pacific Ocean Energy Trust (POET) is hosting the [Northwest Offshore Wind Conference](#) from 28 February to 1 March 2023 in Portland, Oregon, U.S. Register [here](#).

Marine Energy Wales is hosting the [Marine Energy Wales Conference 2023](#) from 21-22 March 2023 in Swansea, Wales.

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## New Documents on *Tethys*

### Marine Energy

[Magnetic fields generated by submarine power cables have a negligible effect on the swimming behavior of Atlantic lumpfish \(\*Cyclopterus lumpus\*\) juveniles](#) – Durif et al. 2023

Submarine power cables carry electricity over long distances. The flow of current passing through these cables creates a magnetic field (MF) that can potentially affect marine organisms, particularly those that are magnetosensitive. The lumpfish (*Cyclopterus lumpus*) is a migratory species that is widely distributed in the North Atlantic Ocean and Barents Sea. It migrates between coastal spawning grounds and pelagic offshore feeding areas. We tested whether lumpfish respond to MFs of the same intensity as those emitted by high voltage direct current (HVDC) submarine power cables. Laboratory experiments were conducted by placing juvenile lumpfish in an artificial MF gradient generated by a Helmholtz coil system.

### **Enabling Indigenous innovations to re-centre social licence to operate in the Blue Economy**

– Lyons et al. 2023

Sustainable, inclusive and equitable development and expansion of the Blue Economy hinges on deliberative and responsible negotiations and an understanding of the distribution of benefits, resource ownership and risks within community and interest groups and Indigenous Peoples. In this review we examine questions of governance and mechanisms for Indigenous participation and inclusion in the distribution of economic benefits, and monitoring and managing environmental and cultural impacts of Blue Economy industries. We suggest a shift in practice of social licence to operate such that consent is granted by Indigenous groups based on their perspective of social licence at all stages of the project life-cycle and at each interface where new social and cultural risks and opportunities emerge.

### **Development and Dynamics of Sediment Waves in a Complex Morphological and Tidal Dominant System: Southern Irish Sea** – Creane et al. 2022

With the recent push for a transition towards a climate-resilient economy, the demand on marine resources is accelerating. For many economic exploits, a comprehensive understanding of environmental parameters underpinning seabed morphodynamics in tidally-dominated shelf seas, and the relationship between local and regional scale sediment transport regimes as an entire system, is imperative. In this paper, high-resolution, time-lapse bathymetry datasets, hydrodynamic numerical modelling outputs and various theoretical parameters are used to describe the morphological characteristics of sediment waves and their spatio-temporal evolution in a hydrodynamically and morphodynamically complex region of the Irish Sea.

## **Wind Energy**

### **Wind-energy development alters pronghorn migration at multiple scales** – Milliganm et al. 2023

We evaluated the effects of wind-energy development on pronghorn migration, including behavior and habitat selection, to assess potential effects on connectivity and other functional benefits including stopovers. We monitored GPS-collared female pronghorn from 2010 to 2012 and 2018 to 2020 in south-central Wyoming, USA, an area with

multiple wind-energy facilities in various stages of development and operation. Across all time periods, we collected 286 migration sequences from 117 individuals, including 121 spring migrations, 123 fall migrations, and 42 facultative winter migrations. While individuals continued to migrate through wind-energy facilities, pronghorn made important behavioral adjustments relative to turbines during migration.

### **Implications of offshore wind energy developments in coastal and maritime tourism and recreation areas: An analytical overview – Machado and Andrés 2023**

Offshore Wind Farms became promising investments to meet climate change targets while bringing autonomy and development to several coastal countries. However, these developments may cause externalities, primarily affecting users dependent on maritime space and its seascapes, such as Tourism and Recreation (T&R). The marine renewable expansion, in general, is expected by some of the actors involved to affect T&R with the prospect of decreasing local welfare and the number of visitors. Nonetheless, this influence over Coastal and Maritime T&R is not well addressed by academic papers. Here we assess this literature gap via a semi-systematic narrative meta-synthesis which expands on the methodology and results of two guiding reference studies.

### **Wind energy expansion and birds: Identifying priority areas for impact avoidance at a national level – Balotari-Chiebao et al. 2023**

Wind energy can harm birds through collision mortality, displacement, barrier to movements, and habitat loss or degradation with largely unknown consequences for their populations. Impact avoidance via appropriate site selection is the most effective means for preventing or alleviating damage from wind energy. Appropriate site selection requires a knowledge of landscape priorities. Here, we used a Spatial Conservation Prioritisation software to identify priority areas for bird conservation in relation to onshore wind energy in Finland, providing spatial guidance for impact avoidance at the national level. We showed that high bird priority areas are mainly concentrated in coastal and adjacent areas, thus entailing marked regional differences and responsibilities.

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## **News & Press Releases**

### **Marine Energy**

#### **Nova Doubles The Size of The Shetland Tidal Array – Nova Innovation**

In 2016, the array of three underwater tidal turbines was the first of its kind and has been powering homes and businesses in Shetland ever since. A fourth turbine (Eunice) was added in 2020. Now, with the installation of the 5th and 6th turbines, it becomes the array with the largest number of turbines anywhere in the world. Turbines 5 and 6, Grace and Hali Hope, are connected via a pioneering subsea ‘hub’, sending power to shore by a single export cable. This innovation delivers significant savings on subsea cables, further reducing the cost of tidal power, essential as the industry scales-up and Nova develops

larger sites with more turbines. In further proof of the commercial readiness of Nova's technology, the Shetland Tidal Array's years of operation has achieved the longest period of continuous monthly tidal stream power generation anywhere in the world.

### **Newcastle University outlines plans for North Sea wave energy demo – Offshore Energy**

Newcastle University has set sights on turning wave motion into a source of renewable energy with the latest project that will see the installation of a wave energy device prototype in the North Sea. Led by Newcastle University, the MU-EDRIVE project – short for Marinisation and upscaling of All Electric Drive Train – aims to demonstrate the marinization and upscaling of all electric drive trains for wave energy converters through the installation of a generator and power converter to a buoy mounted 3 kilometers off the Northumberland coast at Blyth. According to the tam of Newcastle University, which is developing the project with researchers from the University of Edinburgh, the deployment is expected to take place in spring 2024 for a 12-month period.

### **EVOLVE Project uncovers 70GW of viable ocean energy in GB, Ireland and Portugal, to unlock future net-zero energy systems – CorPower Ocean**

Official results from the pan-European EVOLVE project involving world-leading academics, research institutions and technology developers were recently released, providing a firm evidence base supporting the acceleration of ocean energy in Europe's future energy system. The spatial modelling study focused on three specific territories – Great Britain, Ireland and Portugal, identifying close to 60GW of practically viable wave energy and 10GW of tidal stream energy. More specifically, results show resources of 34.8GW in Great Britain, 18.8GW in Ireland and 15.5GW in Portugal. Projections further indicate that 10GW of ocean energy installed in Great Britain alone could save £1.46bn per year in power system dispatch costs.

### **Innovate UK funds wave energy scheme offshore Indonesia – Offshore Energy**

Innovate UK has selected a consortium, led by Ingene Wave Energy Systems, to receive funding support for the development of wave energy project offshore Indonesia. Selected as part of Innovate UK's Energy Catalyst Round 9 at the end of 2022, the project was supported with €170,000 that will be used for a feasibility study and design of initial power plant as a part of the wave energy scheme in the East Nusa Tenggara region of eastern Indonesia. After the initial stages, Ingene aims to complete a wave energy generation system on the coast of Indonesia within two to three years and implement a megawatt-level project five years later.

### **Minesto and SEV strengthen partnership for tidal energy build-out in the Faroe Islands – Minesto**

Minesto, leading ocean energy developer, and SEV, Faroese utility company, have renewed and expanded the collaboration agreement outlining respective roles and responsibilities related to tidal energy build out in the Faroe Islands, including the



ongoing electricity production in Vestmannastrandir and the first large scale tidal array in Hestfjord. An important add-on to the extended agreement stipulates the exclusive nature of the collaboration regarding the Hestfjord site development and build-out. This aspect facilitates and supports the ongoing work to create an attractive investment and the set-up of a Special Purpose Vehicle (SPV) to funnel project investments, Power Purchase Agreement (PPA), potential public funding (e.g., EU) and other assets.

## **Wind Energy**

### **Global offshore wind industry joins forces with the Carbon Trust to decarbonise and scale up sustainably – Carbon Trust**

Eleven offshore wind developers – bp, EnBW, Fred Olsen Seawind, Ørsted, Parkwind, RWE, Scottish Power Renewables, Shell, SSE Renewables, Total Energies and Vattenfall – are partnering with the Carbon Trust to make future offshore wind more sustainable. The developers design, build and operate wind farms globally, including across Europe, North America and Asia, and collectively represent around a quarter of global installed capacity. They will work in collaboration with the Carbon Trust as part of the new Offshore Wind Sustainability Joint Industry Programme to develop the first industry-backed methodology and guidance to measure and address the carbon emissions associated with offshore wind farms throughout their lifecycle, including emissions from the manufacturing of materials and installation of wind farms.

### **EMEC Floating Wind Demo Site Offers £690 Million Opportunity to UK – EMEC**

The European Marine Energy Centre (EMEC), based in Orkney, Scotland, concluded concept design for a new floating offshore wind test and demonstration site in 2022 and is aiming to secure a lease for a 100 MW site ~20 km west of Orkney. EMEC's proposed test site will comprise six individual berths and accommodate floating offshore wind turbines of up to 20 MW rated capacity. Four of the six berths will be grid-connected, while an additional two berths will be reserved for power-to-X applications. The site will offer floating wind developers the opportunity to prove performance and de-risk technologies in energetic metocean conditions, typical of ScotWind, Celtic Sea, Californian, and other commercially leased projects.

### **How undersea cables may affect marine life – BBC Future**

Tens of thousands of miles of cables crisscross our deep seas, ferrying data between continents and carrying renewable power from offshore energy platforms to the land. These snaking, artificial structures can serve as shelter to a vast array of bottom-dwelling sea life: corals, crabs and other invertebrates have been found to take up residence on or near undersea cables. But marine scientists believe we need a greater understanding of how electromagnetic fields generated by submarine power cables might affect some of these delicate creatures, many of which rely on their own internal sense of magnetic north to navigate or use electric fields to help them hunt. Given that the number of submarine

cables will only multiply as the marine renewable energy sector grows, what threats do they pose to life underwater, one of the last spots on Earth largely untouched by humans?

### **WindFloat Atlantic closes 2022, reaching 78GWh – WindFloat Atlantic**

WindFloat Atlantic, world's first semi-submersible floating offshore wind farm, that was connected to the grid by the end of 2019 and commissioned in 2020, now finishes its full second year in operation. After nearly 2 years and a half in fully operation, WindFloat Atlantic closes 2022 with an electricity production of 78GWh (+5% more than its first year). This production enables the supply of green energy to more than 25,000 households, as well as the avoidance of 33,000 tones of CO<sub>2</sub>. These favourable data show Portugal's potential on offshore wind energy, which is reflected in the annual availability of the wind farm, which was between 93-94%, as well as showing the success of WindFloat Atlantic's innovative technology, being a benchmark within the sector.

### **Researchers Work to Better Understand Wind Turbine Interactions with Other Turbines and the Atmosphere – U.S. DOE**

The American WAKE experiment (AWAKEN), an international, multi-institutional effort to gather the most comprehensive data-set to date on how individual wind turbines interact with one another and the atmosphere on a wind farm, is well underway. AWAKEN will use these data to better predict the future performances of wind farms, which could improve their overall efficiency. Instruments now installed at eight field sites across northern Oklahoma have been streaming real-time data since September 2022. The data are currently being uploaded in near-real time to DOE's [Atmosphere to Electrons Data Archive and Portal](#).