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[Tethys](#) is an online knowledge base that facilitates the exchange and dissemination of information on the environmental effects of wind and marine renewable energy (MRE). 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. If you have specific content you would like circulated to the greater wind and MRE communities, please send it to tethys@pnnl.gov for consideration.

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Announcements

WREN Horizon Scan

The International Energy Agency (IEA) Wind Task 34, also known as [WREN](#) (Working Together to Resolve Environmental Effects of Wind Energy), is conducting a horizon scan of priority environmental issues for land-based and offshore wind energy over the next 5 to 10 years. We seek expertise and geographic perspectives from a wide range of stakeholders. The results of the horizon scan will be publicly disseminated to help facilitate knowledge transfer and international collaboration. For more information, please review the [announcement](#).

2020 State of the Science Executive Summary Translations

Additional translations of the [OES-Environmental 2020 State of the Science Report](#)'s Executive Summary are now available on *Tethys*. Download the Executive Summary in English, Chinese, French, Japanese, Portuguese, or Spanish [here](#).

New Tethys Story

[The Pathway Program: Validating environmental monitoring solutions for marine renewable energy projects](#) by Luiz Faria

A major project risk in Canada for in-stream tidal energy project developers is the obligation to meet regulatory requirements related to Environmental Effects Monitoring (EEM). In response to this challenge, the Offshore Energy Research Association (OERA), in collaboration with the Fundy Ocean Research Centre for Energy (FORCE), established the Pathway Program—a technology development and testing program focused on identifying and validating preferred environmental monitoring solutions for marine renewable energy projects. Read more [here](#).

New Triton Newsletter

The U.S. Department of Energy (DOE) [Triton Initiative](#), which supports development of environmental monitoring technologies for MRE applications, recently launched its first newsletter! Subscribe [here](#) to keep up with Triton project updates, events, new Triton Stories, and notes from the field.

Industry Surveys

The EU-funded VALID (Verification through Accelerated testing Leading to Improved wave energy Designs) project has launched a short [survey](#) to gather stakeholder (e.g., developers, researchers, manufacturers, certification bodies) feedback on accelerated testing requirements for wave energy development.

The International Electrotechnical Commission System for Certification of Equipment for Use in Renewable Energy Applications (IECRE) has launched a [survey](#) to better understand the growing needs for certification in the marine energy sector. The survey closes 30 March 2021.

Calls for Papers

Frontiers in Marine Science is inviting contributions to a Research Topic entitled, “[Novel Technologies for Assessing the Environmental and Ecological Impacts of Marine Renewable Energy Systems](#)”. Abstracts are due 26 May 2021 and manuscripts are due 26 November 2021.

The *Journal of Marine Science and Engineering* is accepting manuscript submissions for several upcoming Special Issues, including "[Numerical Assessments of Tidal Stream and Wave Energy in Coastal Shelf Seas](#)" (due 12 April 2021) and "[Impacts of Offshore Wind Farms on Marine Ecosystems, Fisheries and Societies](#)" (due 31 October 2021).

Energies is accepting manuscript submissions for several upcoming Special Issues, including "[Women’s Research in Wind and Ocean Energy](#)" (due 1 September 2021) and "[Nearshore Wind and Wave Energy Potential](#)" (due 1 November 2021).

Funding/Testing Opportunities

The Supergen Offshore Renewable Energy Hub is inviting applications for the [Early Career Researcher \(ECR\) Research Fund](#). The fund is designed to be a flexible research fund for ECRs to support small activities that either supports and develops your existing research activities, or develops your skills further. Applications are due by 12:00pm UTC on 26 March 2021.

Sustainable Energy Authority of Ireland (SEAI) has launched a €10 million funding call to support innovative energy research, development, and demonstration (RD&D) projects, including ocean energy, offshore wind, and green hydrogen-related developments. Applications for the [SEAI RD&D Funding Programme Call](#) are due by 3:00pm BST (2:00pm UTC) on 29 March 2021.

The U.S. DOE has also allocated \$100 million in funding through the Advanced Research Projects Agency-Energy's (ARPA-E) 2021 [OPEN Funding Opportunity](#) to support the development of potentially disruptive new technologies across the full spectrum of energy applications. Concept papers are due by 9:30am EDT (1:30pm UTC) on 6 April 2021.

The Sustainable Ocean Alliance (SOA) recently opened applications for its [Ocean Solutions Accelerator Program](#) 4th and 5th Cohorts. Applications are due 12 April 2021.

In collaboration with Innovate UK, the Department for Business, Energy and Industrial Strategy (BEIS) will soon launch the next opportunity for businesses in England, Wales and Northern Ireland to bid for funding from the [Industrial Energy Transformation Fund](#) (IETF). IETF [Phase 1: Spring 2021](#) opens to applications on 8 March 2021 and runs to 14 July 2021.

INORE (the International Network on Offshore Renewable Energy) recently announced the 2021 [Call for BECS \(Blue Energy Collaborative Scholarships\) proposals](#) sponsored by OES (Ocean Energy Systems). The BECS grant, up to 1000€, will enable collaboration between INOREans and can be put towards travel expenses and accommodation, or to fund remote work. The call closes on 9 April 2021.

Employment Opportunities

The Environmental Research Institute (ERI) at the University of the Highlands and Islands (UHI) is recruiting for a [Research Fellow in Marine Renewable Energy and the Environment](#) to join the multi-disciplinary team working across engineering, marine sensing, hydrodynamics and robotics to study environmental and bio-physical interactions. Applications are due 5 April 2021.

Tetra Tech is seeking an [Ecologist/Project Manager](#) to join its team in supporting renewable energy projects on the U.S. West Coast.

Vineyard Wind is looking for a [Manager of Environmental Affairs](#) and a [Senior Manager of Environmental Affairs](#) to join its team in support of the company's efforts to develop and permit well-sited offshore wind projects with minimal environmental impact.

Upcoming Events

Upcoming Workshop

The U.S. DOE's National Renewable Energy Laboratory (NREL) and the Hydropower Foundation will host a STEM to Marine Energy Dialogue Workshop from 5:00-7:00pm EST on 9 March 2021 to discuss the Marine Energy Collegiate Competition (MECC). The dialogue will review the structure and requirements of the first two MECCs to gather feedback and lessons learned that can be used to structure future competitions. Register [here](#).

Upcoming Webinars

The U.S. Bureau of Ocean Energy Management (BOEM) and the Oregon Department of Land Conservation and Development's introductory webinar on the [Oregon Offshore Wind Mapping Tool \(OROWindMap\)](#) has been rescheduled to 11 March 2021 from 10:00-11:30am PST (6:00-7:30pm UTC). OROWindMap is a planning tool within the [West Coast Ocean Data Portal](#) that accesses relevant datasets and provides data visualization capabilities to inform the planning process for offshore wind energy leasing in federal waters offshore Oregon. Register [here](#).

The National Offshore Wind Research & Development Consortium is hosting a webinar, "Research Portfolios in Europe, the UK, and the US", from 8:00-9:00am PDT (2:00-3:00pm UTC) on 23 March 2021. During the webinar, speakers from research institutes on both sides of the Atlantic will discuss their current offshore wind research agendas. Register [here](#).

The Offshore Energy Research Association of Nova Scotia (OERA) is hosting a webinar entitled, "[Automating the post-processing of noisy hydroacoustic fish surveying for monitoring tidal turbines](#)", from 1:00-2:00pm ADT (4:00-5:00pm UTC) on 25 March 2021. Register [here](#).

ETIP Ocean (the European Technology & Innovation Platform for Ocean Energy) is hosting a webinar entitled, "[Decommissioning bonds - learnings on best practices](#)", at 2:00pm UTC on 23 March 2021. During the webinar, speakers from the European Marine Energy Centre and Fundy Ocean Research Centre for Energy will share their experiences with bonds, decommissioning, and finding the right balance between risk and reward. Register [here](#).

The DOSITS (Discovery of Sound in the Sea) Team is hosting a free, four-part [webinar series](#) on underwater sound. The first webinar, "Passive Acoustic Monitoring Overview – Applications for Marine Mammals and Fishes", will take place at 12:00pm EDT (4:00pm UTC) on 8 April 2021. Register [here](#).

New Documents on *Tethys*

Marine Renewable Energy

Life Cycle Assessment of an Oscillating Wave Surge Energy Converter – Apolonia & Simas
2021

So far, very few studies have focused on the quantification of the environmental impacts of a wave energy converter. The current study presents a preliminary Life Cycle Assessment (LCA) of the MegaRoller wave energy converter, aiming to contribute to decision making regarding the least carbon- and energy-intensive design choices. The LCA encompasses all life cycle stages from “cradle-to-grave” for the wave energy converter, including the panel, foundation, PTO and mooring system, considering its deployment in Peniche, Portugal. Background data was mainly sourced from the manufacturer whereas foreground data was sourced from the Ecoinvent database (v.3.4).

Hydrodynamics of a hyper-tidal estuary influenced by the world's second largest tidal power station (Rance estuary, France) – Rtimi et al. 2021

The Rance estuary is a relatively small low-discharge steep-sided ria, located along the Brittany coast in northern France, with a maximum spring tidal range of 13.5 m. In this study, hydrodynamics and tidal wave patterns were analyzed in this anthropogenically influenced estuarine system. A two-dimensional depth-averaged numerical model of the Rance estuary was developed. Two scenarios without the tidal power plant involving the dam's pre- and post-construction bathymetry (1957 and 2018 respectively) and present-day conditions scenarios were designed, to highlight the impact of bed evolution and the tidal power station on hydrodynamics and tidal asymmetry.

Against the Tide: Potential for Marine Renewable Energy in Eastern and Southern Africa
– Belletti & McBride 2021

This paper discusses the potential for marine renewable energy (MRE) electricity generation in Eastern and Southern Africa (ESA), and how to overcome some of the barriers to its development and implementation. The discussion addresses the concerns that are often associated with electricity generation in developing countries, such as equity, accessibility, and affordability. An analysis of the energy mix in the ESA region shows that MRE could fill some of the electricity supply gaps. The largest barriers to MRE are not technological, but rather linked to policy design and financing capacity. Three complementary solutions are outlined to set a working framework for MRE deployment in ESA.

Wind Energy

The biodiversity-wind energy-land use nexus in a global biodiversity hotspot – Kati et al.
2021

Wind energy is the leading renewable technology towards achieving climate goals, yet biodiversity trade-offs via land take are emerging. Thus, we are facing the paradox of impacting on biodiversity to combat climate change. We suggest a novel method of spatial planning that enhances windfarm sustainability: investments are prioritized in the

most fragmented zones that lie outside the Natura 2000 network of protected areas. We showcase it in Greece, a biodiversity hotspot with a strong climate policy and land conflict between conservation and wind energy schemes.

Offshore Wind Energy and Benthic Habitat Changes: Lessons from Block Island Wind Farm – Hutchison et al. 2020

The Block Island Wind Farm (BIWF), situated offshore of Block Island, Rhode Island, is the first commercial offshore wind farm (OWF) in the United States. We briefly review pre-siting studies, which provide contextual information about the benthic habitats and fish in the Block Island Sound area before the BIWF jacket foundations were installed in 2015. We focus on benthic monitoring that took place within the BIWF. This monitoring allowed for assessments of spatiotemporal changes in sediment grain size, organic enrichment, and macrofauna, as well as the colonization of the jacket structures, up to four years post-installation.

Behavioral Response of Grouse to Wind Energy Turbines: A Quantitative Review of Survival, Habitat Selection, and Lek Attendance – LeBeau et al. 2020

Grouse populations are adversely affected by anthropogenic features on the landscape but an overall understanding of the specific effects of wind energy development is lacking. Given the trend in wind energy development, and to better understand and manage grouse species in response to energy development, a quantitative review of studies is necessary. We reviewed studies that evaluated the effect of wind energy facilities on grouse. Our objective was to determine the magnitude of effects of wind turbines on grouse habitat selection, lek attendance, and survival at various distances from wind turbines. We used 10 studies, resulting in 22 study-result combinations, in our meta-analysis.

News & Press Releases

Marine Renewable Energy

TEAMER Network Director announces RFTS 2 Awards – TEAMER

The U.S. Testing Expertise and Access to Marine Energy Research (TEAMER) program has selected 23 projects through its second Request for Technical Support (RFTS) for testing expertise and access to numerical modeling, lab testing, and tank/flume testing within an expanded facility network. Applicants will now work with the facilities to submit their completed Test Plans prior to commencement of their assistance activities. Supported by the DOE and directed by the Pacific Ocean Energy Trust (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.

SafeWAVE project launch, addressing environmental concerns of emerging wave energy technologies – SafeWAVE project

A €1.5 million project has been funded by European Maritime and Fisheries Fund programme of the European Union, which addresses environmental concerns of emerging wave energy technologies. The project SafeWAVE – Streamlining the assessment of environmental effects of wave energy – aims to overcome non-technological barriers that could hinder the future development of one of the main pillars of the EU Blue Growth strategy: ocean energy. The Consortium, led by AZTI, includes a multidisciplinary team of partners aiming to involve the wider community of ocean energy key stakeholders from across Portugal, Spain, France, and Ireland.

DTOceanPlus Tools Ready for Demonstration – Wave Energy Scotland

The development of the standalone beta versions of the DTOcean+ suite of the design tools for ocean energy systems is now completed. The beta versions are now ready for full integration and the demonstration phase against real scenarios. That means that the suite will be run to showcase the applicability of the tools to concept generation and selection, technology development, plus farm deployment and optimisation. A workshop and several virtual training sessions will be organised to promote a deeper understanding of the tools and engage with potential users to facilitate adoption and usage of DTOcean+ suite. The final open source version of the suite and detailed documentation will be available in August 2021.

Coalition of energy companies invest €1.85 million into demonstrating wave power for subsea projects – Ocean Energy Europe

Scottish wave power experts Mocean Energy and energy storage developers EC-OG have joined forces with Chrysaor, Modus, OGTC and Baker Hughes to fund the demonstration of a wave powered renewable energy system for running subsea equipment. The programme will demonstrate how wave power coupled with underwater energy storage can be used to cost-effectively lower the carbon footprint of providing power to subsea oil and gas production equipment and autonomous underwater vehicles. The demonstrator will be tested onshore at EC-OG's facility in Aberdeen in July and August 2021, with ambitions to test the system at sea later in the year.

Researchers use drones to pinpoint tidal energy sweetspots – Offshore Energy

Researchers in the north of Scotland and Wales are trialling a new method of measuring tidal currents with the help of drones in a project that could revolutionise the marine renewables industry. The project, led by scientists from the University of the Highlands and Islands, will use drones to film the movement of water then apply algorithms to determine its speed. The team will run tests in the Pentland Firth in Scotland and the Ramsey Sound in Wales in various weather conditions. It is hoped the technique could provide a simple, effective way to identify locations for underwater tidal turbines which

will reduce costs for renewable energy developers and generate opportunities for developing countries.

Wind Energy

[Simply Blue Energy Launches the Western Star Floating Offshore Wind and Wave Energy Project](#) – Ocean Energy Europe

Simply Blue Energy is announcing Western Star, a proposed co-developed floating offshore wind farm and wave energy conversion array off Ireland's West Coast. Western Star Wind, 'Project Ilen', named after a working sailboat with connections to Shannon Foynes, is a 1.1GW floating offshore wind project located at least 35km offshore Co. Clare. Western Star Wave, 'Project Saoirse', named after a sister vessel to Ilen, also built in Baltimore West Cork, is a pre-commercial demonstration wave energy conversion project located 4-6km offshore Co. Clare, starting with 5MW of capacity. Simply Blue Group is working with CorPower Ocean and EIT Innoenergy to develop the project.

[Energy company to breed endangered California condors to replace birds killed by turbine blades](#) – The Los Angeles Times

After a decades-long effort to rescue the California condor from the brink of extinction, government officials say the critically endangered vultures are now at risk of being killed by spinning turbine blades. Although there has yet to be a documented case of a wind turbine injuring or killing a condor, the U.S. Fish and Wildlife Service says condor collisions are inevitable if the population continues to balloon. Now, federal wildlife authorities are taking the unprecedented and controversial step of helping a wind energy company breed the scavengers in captivity, so that they can replace any birds that are killed by the massive wind converters.

[Triton Knoll Offshore Wind Farm generates first power](#) – Triton Knoll

The Triton Knoll Offshore Wind Farm has successfully generated renewable electricity for the first time. First generation follows the installation of the first of the project's 90 wind turbines in January 2021 and the successful energisation of the project's transmission system including the offshore substation platforms, offshore export cable, onshore cables and onshore substation. Triton Knoll Offshore Wind Farm will have a maximum installed capacity of 857 megawatts. Once fully operational it will be the most powerful in the RWE global fleet, capable of powering the equivalent of over 800,000 UK homes and helping decarbonise the UK's energy infrastructure.

[On U.S. East Coast, Has Offshore Wind's Moment Finally Arrived?](#) – Yale Environment 360

The fledgling U.S. offshore wind industry is finally poised to become a commercial reality off the northeast and mid-Atlantic coasts within the next five years, thanks to robust commitments to buy its power from seven coastal states, new support from the

Biden administration, and billions of dollars in investment by an industry that sees a huge market for electric power in Eastern states. New York, New Jersey, Virginia, Massachusetts, Connecticut, Rhode Island, and Maryland have together committed, through legislation or executive action, to buying about 30,000 megawatts (MW) of offshore electricity by 2035 — enough to power roughly 20 million homes. Projects totaling 11,000 MW have been awarded so far.

Offshore Wind to Power Europe's Largest Power-to-X Plant – Offshore Wind

Denmark's Copenhagen Infrastructure Partners (CIP) has unveiled plans to build a Power-to-X plant in Esbjerg which will convert power from offshore wind turbines to green ammonia. Consisting of 1 GW electrolysis, the plant will be Europe's largest production facility of CO₂-free green ammonia, CIP said. The ammonia will be used by the agriculture sector as CO₂-free green fertilizer and by the shipping industry as CO₂-free green fuel. The excess heat will be used to provide heating for around one-third of the local households in Esbjerg. The announcement is made in collaboration with companies within the agriculture and shipping industries including Arla, Danish Crown, DLG, A. P. Moller – Maersk, and DFDS.