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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.

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Announcements

2020 State of the Science Report & Webinars

OES-Environmental will be releasing the 2020 State of the Science Report on environmental effects of marine renewables just in time for World Oceans Day on 8 June 2020. In celebration of the release, OES-Environmental will be hosting the first of a [series of webinars](#) on 11 June 2020 at 8:00am and 5:00pm PT to provide an overview of the information presented in the report. Additional webinars will be hosted on 17, 22, and 24 June 2020 at 8:00am PT to highlight more detailed information presented in each chapter of the report.

Marine Energy Collegiate Competition

The U.S. Department of Energy's (DOE) first [Marine Energy Collegiate Competition: Powering the Blue Economy](#) is going virtual. The competition, designed to challenge interdisciplinary teams of undergraduate and graduate students to offer unique solutions to the burgeoning marine energy industry, will now be held as a series of virtual pitches on 19-20 May, 11-12 June, and 9-10 July 2020.

Reddit Ask Me Anything Panel

Pacific Northwest National Laboratory (PNNL) coastal scientists and engineers will be hosting a [Reddit Ask Me Anything](#) panel on the [blue economy](#) on 20 May 2020 from 3:00-5:00pm ET. The panel will discuss how science and technology are advancing the future of the blue economy and answer questions from the online community.

EMEC Consultation

The European Marine Energy Centre (EMEC) has opened a [consultation on the revised decommissioning programme](#) for Magallanes Renovables' 2 MW ATIR platform, which is currently deployed at the Fall of Warness test site. EMEC invites stakeholders and members of the public to provide responses via email (info@emec.org.uk) or phone by 9 June 2020.

Webinar Recording Available

A recording of the U.S. DOE's *Wind Energy Technologies Office Program Update and Research Priorities* webinar is now available. View the presentation slides and recording [here](#).

Funding Opportunities

The U.S. DOE announced up to \$38 million in funding for a new Advanced Research Projects Agency-Energy (ARPA-E) program, [Submarine Hydrokinetic And Riverine Kilo-megawatt Systems \(SHARKS\)](#). The program seeks to design economically attractive hydrokinetic turbines for tidal and riverine currents. Concept papers are due 27 May 2020 at 9:30am ET.

The UK Research and Innovation's [Innovate UK Smart Grants](#) fund for research and development projects that can make a significant impact on the UK economy across a variety of fields is still accepting applications. Applications are due 27 May 2020 at 12:00pm BST.

Vineyard Wind and Greentown Labs have partnered to launch the [Offshore Wind Challenge](#), a six-month accelerator program supporting innovations in responsible development of offshore wind energy. The Offshore Wind Challenge is focused on advances in marine mammal monitoring, specifically for data collection and real-time transmission or data analysis. Applications are due 31 May 2020.

Employment Opportunity

Simply Blue Energy is seeking an [Environmental Specialist](#) with experience in the offshore renewables industry to assist with the permitting of floating wind projects off the coast of Pembrokeshire, Wales.

Upcoming Events

Upcoming Webinars

The Wind Turbine Radar Interference Mitigation (WTRIM) Working Group will be hosting a [series of webinars](#) to discuss offshore wind turbine radar interference mitigation strategies and research needs for offshore wind development. The second webinar, which will take place on 18 May 2020 from 11:00am-1:00pm EST, will feature a discussion on the offshore wind project review and approval process in the United States from the WTRIM perspective. Register [here](#).

ETIP Ocean will be hosting a webinar entitled, *Solutions for environmental monitoring*, on 19 May 2020 at 4:00pm CEST. Register [here](#).

The Ocean Power Innovation Network (OPIN) and Marine Energy Alliance (MEA) will be hosting a [webinar](#) on 19 May 2020 from 10:00-11:30am CEST to discuss how standards and certification can accelerate the development of the offshore renewable energy sector.

The Nova Scotia Offshore Energy Research Association (OERA) will be hosting a webinar entitled, *Development of Acoustic Doppler Aquatic Animal Monitoring (ADAAM) for application to marine life movement in high-energy tidal channels*, on 21 May 2020 from 1:00-2:00pm ADT. Register [here](#).

Event Updates

In place of the cancelled CLEANPOWER 2020 Conference & Exhibition, AWEA will be hosting the [CLEANPOWER 2020: Stronger Together virtual event](#) from 1-5 June 2020. Registration is free and available [here](#).

[Brazil Windpower](#), originally scheduled for early June 2020 in São Paulo, Brazil has been rescheduled to 28-30 October 2020.

The International Partnering Forum (IPF) Together event, originally scheduled for mid-August 2020 in Rhode Island (US), [has been cancelled](#). Instead, beginning in June, the Business Network for Offshore Wind will launch a bi-weekly [IPF Livestream](#) seminar series, which will culminate on 18-20 August 2020 with an opening plenary, networking opportunities, a job fair, research poster sessions, and more. Full schedule coming soon.

New Documents on *Tethys*

Marine Renewable Energy

Potential Hydrodynamic Impacts and Performances of Commercial-Scale Turbine Arrays in the Strait of Larantuka, Indonesia – Orhan and Mayerle 2020

The Strait of Larantuka, with highly energetic tidal stream currents reaching speeds of up to 3–4 m/s, is a promising site for renewable electricity production from the ocean. This paper presents the results of an assessment regarding the potential hydrodynamic impacts, wake characteristics, and the performances of large scale turbine arrays in the strait. A high-resolution, three-dimensional baroclinic model is developed using the FLOW

module of the Delft3D modeling system to simulate tidal currents. Four different array layouts with rated capacities of up to 35 MW are considered.

[PelagiCam: a novel underwater imaging system with computer vision for semi-automated monitoring of mobile marine fauna at offshore structures](#) – Sheehan et al. 2020

The development of rapid, cost-effective and reliable remote underwater monitoring methods is crucial to supporting evidence-based decision-making by planning authorities and developers when assessing environmental risks and benefits of offshore structures. A novel, un-baited midwater video system, PelagiCam, with motion-detection software (MotionMeerkat) for semi-automated monitoring of mobile marine fauna, was developed and tested on the UK's largest offshore rope-cultured mussel farm in Lyme Bay, southwest England.

[The current state of marine renewable energy policy in China](#) – Yang et al. 2019

The advancement of the Marine renewable energy (MRE) industry will contribute to actualizing sustainable development in China. However, the Chinese MRE industry is still in its nascent stage. Therefore, effective policies are needed to improve the development of this emerging sector and facilitate its maturation. Focusing on MRE policies, this article provides constructive suggestions for the establishment and reform of Chinese MRE policy.

Wind Energy

[Isotopic analyses, a good tool to validate models in the context of Marine Renewable Energy development and cumulative impacts](#) – Raoux et al. 2020

An integrated ecosystem approach of two future offshore wind farm sites of the Eastern English Channel (Courseulles-sur-mer and Dieppe-Le Tréport) was developed to model the marine ecosystems before the OWF implementation. Such ecosystem models allow simulating the possible reef and reserve effects associated to the presence of the farm, and to character the overall changes in the food-web functioning. However, to use these models for management purpose, they need to be validated. In order to do so, stable isotope ratios of nitrogen were used for determining the accuracy of the effective trophic levels computed in these two models.

[Assessing the spatial distribution of avian collision risks at wind turbine structures in Brandenburg, Germany](#) – Bose et al. 2020

The risk of collision with wind turbines remains a critical issue for bird conservation. Undoubtedly, for the continued development of wind farms to increase the energy capacity, wind farm locations must be carefully chosen going forward. Through analyses of the Euclidean distances to the different land-use types, we utilized the random forest machine learning algorithm to model the distance-based impacts of wind turbine

locations on detected bird collisions for the frequently-hit groups of birds at wind turbines.

[Impact of substantial wind farms on the local and regional atmospheric boundary layer: Case study of Zhangbei wind power base in China](#) – Wang et al. 2019

Wind power has made contributions to emission reduction, but it is undeniable that the substantial wind farms have had a non-negligible impact on the local atmospheric boundary layer. This paper aims to provide a reliable methodological scheme and practical data for human beings to objectively understand the development of wind power. Based on the data from one of the Chinese gigawatt-scale wind power bases in Zhangbei County of Hebei Province, the mesoscale simulations were conducted to explore the impacts of substantial wind farms on the local and regional atmosphere.

News & Press Releases

Marine Renewable Energy

[Bombora and ORE Catapult develop co-located floating wave and wind technology](#) – Bombora

Wave energy developer Bombora has joined forces with the Offshore Renewable Energy (ORE) Catapult's Marine Energy Engineering Centre of Excellence (MEECE) in Wales to launch a cutting-edge floating wave technology research project. The research will carry out a techno-economic appraisal of extending Bombora's mWave™ technology into an offshore environment and will investigate the feasibility of co-location with floating wind structures. Bombora's patented membrane mWave wave energy converter offers a unique opportunity to rapidly develop a floating wave platform solution.

[How Australia could harness its tides for energy](#) – CNN

Australia is famous for its beaches and exhilarating surf. But the ocean offers more than just a surfer's paradise: its tides are also a source of renewable energy. Among those harnessing this tidal potential is Sydney-based Mako Energy. The company makes underwater turbines ranging between two and four meters in diameter. One turbine operating in constantly flowing water can produce enough electricity to power up to 20 homes. Their design enables them to generate electricity even in slow-flowing water, meaning they could be used in rivers and irrigation canals as well as the ocean.

[NewEast Energy eyes Minas Passage tidal demo](#) – Offshore Energy

NewEast Energy Corporation, a wholly owned subsidiary of New Energy Corporation, has applied to the Nova Scotia Department of Energy for a permit to deploy up to 800 kW of tidal power generation equipment in the Minas Passage at a location next to the existing Fundy Ocean Research Center for Energy (FORCE) Crown Lease Area.

Specifically, the setup will consist of an array of floating grid connected New Energy EnviroGen power generation systems. The project timeline consists of a 3-year development window and also up to a 15-year demonstration phase.

[An archipelago in the Atlantic wants to add tidal power to its energy mix by using kite-like tech](#) – CNBC

Situated in the wilds of the northeast Atlantic between Iceland and Scotland, the Faroe Islands are peaceful, remote and beautiful. The archipelago is also the site of a trial that, using tidal “kite” technology, could radically alter its energy mix and, in the long run, make it greener. At the beginning of April, Swedish firm Minesto announced that, together with the Faroese utility SEV, it had been granted the necessary permits and consents to install two grid-connected tidal kite systems in the Vestmannaasund strait, which is located in the northwest of the Faroe Islands.

[Tidal Hydrogen Production Storage and Offtake](#) – HydroWing

HydroWing, in partnership with Tocardo, is delighted to introduce the THyPSO (Tidal Hydrogen Production, Storage and Offtake), an innovative and novel concept that creates green hydrogen from the sea, contributing to the wider global decarbonisation of energy systems. THyPSO is a floating platform, housing 1 – 6 conventional bi-directional tidal turbines that convert tidal flows into electrical energy, which is then directed through an integrated hydrogen production unit, converting the unlimited supply of surrounding seawater into hydrogen, an energy-dense and versatile commodity.

Wind Energy

[Base selected for world’s largest offshore wind farm](#) – Equinor

Equinor and SSE Renewables, the two companies behind the world’s biggest offshore wind farm Dogger Bank, have announced plans to build a new Operations and Maintenance (O&M) Base at the Port of Tyne. Construction of the wind farm, led by SSE Renewables, began in January 2020 and as operator for the operations phase, Equinor will construct this new O&M base, and operate the wind farm for its expected life of more than 25 years. The overall wind farm comprises three 1.2 GW phases, with each phase located more than 130 km from the North East coast of England.

[Digital Twin Solution to Transform Offshore Wind Management](#) – ORE Catapult

The digital asset and data management specialist, JF AIS, has completed a critical research project with the Offshore Renewable Energy (ORE) Catapult, the UK’s leading technology innovation centre for offshore renewable energy, supporting new technologies with ground-breaking potential. Adopted by the supermajors in oil and gas, R2S produces virtual walk-throughs embedded with data, enabling personnel to remotely visit sites and easily access technical and operational data – saving time and cost, improving safety, and enhancing collaboration.

Van Oord installs world's first submerged Slip Joint successfully – Van Oord

On 25 April, the Slip Joint foundation was successfully installed at the Borssele Wind Farm Site V. It is the first time anywhere that a submerged Slip Joint was used on a full-sized offshore wind turbine on a fully commercial basis. The Slip Joint is an alternative connection between foundation elements, a monopile and a transition piece. It consists of two conical sections placed on top of each other. The Slip Joint is based on friction, with the weight ensuring firmness and stability. Unlike standard solutions, the Slip Joint makes a submerged connection possible, allowing for a more balanced weight distribution between monopile and transition piece.

Vestas Breaks Annual Wind Turbine Installation Record – Renewable Energy Magazine

Vestas became the first wind turbine manufacturer to install more than 10 GW of wind capacity in a single year (2019), according to new analysis from Wood Mackenzie. SGRE climbed to second position according to Wood Mackenzie's research, dominating the 1.9 GW UK offshore market and achieving over 1 GW of onshore installations in the US and Spain. GE grew its global dominance by connecting projects in 24 markets, with first-ever turbine installations in Greece, Oman, Jordan, Kazakhstan and Chile reaching 8.7 GW. This is a 60% increase on 2018.

Green Investment Group and RIDG partner to compete in the upcoming ScotWind Leasing Round – Green Investment Group

From their Edinburgh base, Macquarie's Green Investment Group (GIG) and Scottish offshore wind developer Renewable Infrastructure Development Group (RIDG) have announced their partnership to compete in ScotWind, the next round of seabed leasing for offshore wind development off the Scottish coast, which is due to be launched by Crown Estate Scotland shortly. GIG has supported 16 offshore wind projects representing over 4.5 GW of operating capacity to date.