13 December 2019

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.

Announcements

New Short Science Summary Available

The Data Transferability Short Science Summary (SSS) is now available on *Tethys*. The SSS details the data transferability process which facilitates the examination and cataloging of data and information (such as reports, research studies, etc.) collected from already permitted/consented marine renewable energy projects.

Prize Competitions

The Powering the Blue Economy: Ocean Observing Prize, a joint prize between the Water Power Technologies Office at the U.S. Department of Energy and the Integrated Ocean Observing System program at the National Oceanographic and Atmospheric Administration, is now open. Submissions for the first of a series of competitions, which seeks novel concepts that integrate ocean observing technologies with marine energy systems to address end-user needs, are due 12 February 2020. An introductory webinar will be held 13 December 2019 at 9:00am PST.

The Water Power Technologies Office at the U.S. Department of Energy has also launched the second stage of the Waves to Water Prize, which seeks to accelerate technology innovation in wave energy powered desalination systems. Submissions are due 13 March 2020. An introductory webinar will be held 13 December 2019 at 11:00am PST.

Calls for Abstracts

Abstracts are being accepted for the 3rd World Seabird Conference in Hobart, Tasmania on 19-23 October 2020. Abstracts for symposia, contributed papers, and posters can be submitted here until 16 December 2019. Please consider submitting an abstract to the symposium entitled, Marine renewables and seabirds: How can behavioural and ecological insights inform sustainable planning and development.

The Environmental Interactions of Marine Renewable Energy Technologies (EIMR) Conference will be held in Oban, Scotland on 21-23 April 2020. Abstracts for oral presentations and posters can be submitted here until 13 January 2020 at 16:00 GMT.

MTSJ Special Issue

The Marine Technology Society Journal (MTSJ) is accepting manuscript submissions for a special issue entitled, U*tilizing Offshore Resources for Renewable Energy Development*. The deadline for manuscript submissions is 22 June 2020.

Funding Opportunities

The California Energy Commission has released a solicitation for applied research and development projects that facilitate the development of next-generation wind energy technologies and result in increased competitiveness, performance and reliability, while lowering the cost and the environmental and wildlife impacts of wind energy. The submission deadline is 13 December 2019.

The National Offshore Wind Research & Development Consortium continues to make funding available for technology innovations that will reduce the levelized cost of electricity for offshore wind in the United States. Proposal submissions will continue to be accepted until 31 December 2019, or until all funds are committed.

Additionally, Innovate UK will invest up to £1.5 million in UK companies partnering with US consortia to work on projects as part of the $40 million US National Offshore Wind Research and Development Consortium programme. Express an interest in applying by 15 January 2020.

The Marine Energy Alliance (MEA) will open their 2nd Call for Applications on 1 January 2020. The aim of MEA is to progress the technical and commercial maturity level of early-stage (TRL 3/4) marine energy technology companies with the overall goal of reducing the risk of device failure in subsequent demonstration phases. Applications are due 14 February 2020.

The European Maritime and Fisheries Fund has launched the Blue Economy Window call to support the sustainable development of small and mid-size enterprises across the European Union. The deadline of the call is 27 February 2020.

Upcoming Events

Upcoming Conferences

The 14th Arctic Frontiers Conference will be held in Tromsø, Norway on 26-30 January 2020. Early bird registration is available until 20 December 2019.

The 5th Asian Wave and Tidal Energy Conference will be held in Hobart, Australia on 8-12 November 2020. Abstracts are due 1 March 2020.

New Documents on *Tethys*

Marine Renewable Energy

Powering the Blue Economy: Exploring Opportunities for Marine Renewable Energy in Maritime Markets – LiVecchi et al. 2019

> The blue economy is an emerging sector that will require energy to allow many scientific and commercial endeavors to reach their potential. The U.S. Department of Energy's Water Power Technologies Office seeks to understand marine and coastal opportunities for which marine energy could fulfill those energy needs. This report can help direct analysis and research and development efforts by government, scientists, developers, and other stakeholders to more deeply understand and meet specific technical and economic requirements to power emerging opportunities in the blue economy.

Measuring the hydraulic effect of hydrokinetic energy extraction in the Tanana River, Alaska – Edgerly and Ravens 2019

> During two field seasons, a 1.93 m diameter, open-center style, hydrokinetic device was deployed from a pontoon barge in the Tanana River, in Alaska. Near-surface velocity was roughly 1.7 m/s and 2 m/s at the deployment site during September 2014 and July 2015, respectively. Velocity and turbulence were measured in the vicinity of the turbine location using an acoustic Doppler velocimeter (ADV) and an acoustic Doppler current profiler in order to characterize the impact of the turbine on river hydraulics and turbulence. ADV measurements showed velocities being 97.8% recovered within 18.1 turbine diameters and fully recovered within 20.7 turbine diameters.

Development of Wireless Control System With Underwater Fish-Eye Camera to Monitor Fish at the Test Site of Marine Renewable Energy – Yoshida et al. 2019

> To confirm the effect before and after installation of marine renewable energy device, we developed wireless monitoring system using an underwater fish eye camera. The camera system is composed of a dome-shaped fish eye lens, a container, and a float. In the current research, this system was developed to monitor underwater situation around

device remotely and in real time. We tested to monitor a target and fish in a fish case at the site off Kamaishi city. Effectiveness of this system was shown through the field test for real time monitoring around marine renewable energy device.

Wind Energy

Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England – Snyder et al. 2019

The development of offshore wind technology along the Atlantic coast of the United States has raised public concern about the potential effects of electric and magnetic fields (EMF) from undersea power cables on commercially and recreationally important fish species. This white paper provides a summary of the currently available science that addresses the potential effects of EMF from undersea power cables associated with offshore wind energy projects on fish species of concern. This summary has been developed to help the commercial and recreational fishing communities who have concern about the effect of EMF on fish.

Evaluation of an Acoustic Deterrent to Reduce Bat Mortalities at an Illinois Wind Farm – Romano et al. 2019

From 2014 to 2016, GE Renewable Energy and California Ridge Wind Energy tested an ultrasonic bat deterrent system during the autumn bat migration period at an operating wind farm in Illinois, USA. The deterrent system consisted of air-jet ultrasonic emitters mounted on nacelles and towers in a different configuration each year. Each year we conducted a randomized block experiment to determine whether the acoustic deterrent reduced bat mortalities at the wind farm. Effectiveness was based on estimates of bat mortalities during 3-day trials.

Wind farm repowering guided by visual impact criteria – Manchado et al. 2019

Within a repowering context, this paper opens a new field of application for visibility and Visual Impact Assessment (VIA) procedures in the decision-making process typical of the design stage of Wind Farms (WF). The proposed methodology presents a test capable of reporting on the visual sustainability of different layouts. It is called Equivalent Visual Impact (EVI). The paper shows how these ideas, EVI and HRD, were applied to a real repowering experience; the result was that the WF could sustain an increment in its power by 37.25% with no additional visual effects.

News & Press Releases

Marine Renewable Energy

Global tidal energy leader gets go ahead for major Canadian project in Nova Scotia – Nova Innovation

Nova Innovation has landed its biggest project to date, expanding its operation in North America. Nova has received a permit to develop a 1.5MW tidal array in Petit Passage, in the Bay of Fundy area of Nova Scotia. A careful phased approach starting with a single turbine in 2020, then three phases of 0.5MW will eventually see 15 new tidal stream turbines installed by 2023 on the seabed to generate clean electricity from the natural ebb and flow of the tide – enough to power 600 homes.

Swansea Bay tidal lagoon: Last-ditch bid to resurrect project – BBC

The company behind the stalled Swansea Bay tidal lagoon is making a last-ditch attempt to resurrect the project. Plans for what would be the world's first tidal power lagoon were thrown out by the UK government last year. Tidal Power plc's chief executive Mark Shorrock said the five-year planning consent awarded by the government in 2015 expires in June 2020 "unless material works have commenced". He said the company was trying to raise £1.2m to start work on land. The company will not be able to start work in the sea because it has not got a marine licence from Natural Resources Wales (NRW).

Portland-built wave energy device reaches Hawaii – Portland Business Journal

A giant wave energy converter built in Portland is in Hawaii after a 2,300-mile tow across the Pacific. The 826-ton OE35, developed by the Irish company Ocean Energy and built by Vigor Industrial on a $6.5 million contract, isn’t quite at its final destination, however. It’s at the U.S. Navy’s Ford Island wharf at Pearl Harbor, where a traditional Hawaiian blessing greeting was planned for Tuesday afternoon, according to Ocean Energy. After “post-tow remediation work,” it will head around Makapu’u Point to Oahu’s windward side for deployment at the grid-connected Department of Energy- and Navy-backed Wave Energy Test Site.

Wavepiston and Fiellberg Wrap Up Eurostars LOCWEC Project – Marine Energy

Fiellberg, supplier of hydraulic cylinders, and Wavepiston, developer of the Wavepiston wave energy converter, have worked together in the Eurostars LOCWEC project on improving the control of the loads on the Wavepiston energy collectors. The improved load control system will be demonstrated in relation to two full-scale projects. One at Plocan, Gran Canaria, supported by EU’s Horizon 2020 SME Instrument, and one at a small tourist island, Isola Piana, Sardinia, supported by EU’s Horizon 2020 Fast Track to Innovation Programme.

Port of Milford Haven and Bombora sign Memorandum of Understanding – Bombora

A Memorandum of Understanding has been signed between the Port of Milford Haven and Bombora, highlighting and strengthening their joint commitment to growing the marine energy industry in Pembrokeshire. Originating in Australia, Bombora opened

offices in Pembroke Dock in 2017. The company is currently constructing a 1.5 MW mWave wave energy converter to harness the potential of marine energy. mWave sits below the surface of the water where wave pressure causes its flexible rubber membrane to inflate and deflate pumping air through a turbine to generate electricity.

Wind Energy

Denmark plans $30 billion offshore wind island that could power 10 million homes - Reuters

Denmark is moving forward with plans to build an artificial island tying in power from offshore wind farms of up to 10 gigawatts (GW) of capacity, more than enough to supply all households, as part of efforts to meet ambitious climate change targets. The energy ministry is looking for the right location to build one or more islands surrounded by offshore wind farms with a total capacity of at least 10 GW - equivalent to 10 million European households' electricity consumption. But the plans could cost as much as 200-300 billion Danish crowns ($29.5-44.2 billion), the vast majority of which will be financed by private investors, according to the ministry.

DEEP Announces Selection of 804 MW of Offshore Wind Power from Park City Wind Project – DEEP

Connecticut Department of Energy and Environmental Protection (DEEP) Commissioner Katie Dykes announced that a bid from developer Vineyard Wind has been selected to advance to contract negotiations with the state's electric distribution companies to provide 804 megawatts (MW) of offshore wind through the development of the Park City Wind Project. The selection of this project, which will provide the equivalent of 14% of the state's electricity supply, represents the largest purchase of renewable energy in Connecticut's history.

Innovative deep-water offshore wind system, SpiderFLOAT, takes step toward commercialization – Renewable Energy World

Deep-water offshore wind installations located in ocean depths greater than 60 meters could supply more than 1,200 gigawatts of energy-generating capacity to the electric grid. But despite this resource potential, relatively high capital expenditures for deep-water wind installations challenge offshore wind's economic viability. The National Renewable Energy Laboratory's (NREL's) innovative SpiderFLOAT technology—named for its modular components that resemble spider legs—has the potential to reduce costs by simplifying the construction and maintenance logistics for deep-water wind systems in challenging offshore marine environments.

UK wind generation hits new record, households get paid to use energy – Renew Economy

Wind power in the United Kingdom set a new record on Sunday generating for the first time more than 16GW of electricity and providing over 40% of the country's power – so

much, in fact, that thousands of households were reportedly paid to use extra renewable electricity over the weekend. Overall, wind generation on Sunday provided 43.7% of British electricity – more than double that produced by nuclear power (which provided 20.5%): Gas supplied 12.8%, biomass 7.9%, imports 7.4%, coal 3.1%, hydro 1.7%, solar 1.3%, storage 1.1% and other sources 0.5%.

ENGIE inaugurates Egypt's largest wind farm - ENGIE

ENGIE and its consortium partners inaugurated today the 262.5 MW Ras Ghareb wind park, Egypt's first private and largest wind farm. Ras Ghareb project started commercial operation in October 2019, 6 weeks ahead of schedule. It is the first wind farm tendered on a Build-Own-Operate (BOO) scheme in the country and is part of the Egyptian government's drive to increase the share of renewables in the energy mix with a target wind generation capacity of 7 GW by 2022.