TETHYS BLAST

29 November 2019

The bi-weekly *Tethys* Blast highlights new publications on *Tethys*, opportunities in wind and marine renewable energy, and news articles of international interest. ORJIP Ocean Energy has partnered with OES-Environmental to provide additional content. We hope you find this a valuable tool to keep you connected to new research, opportunities, and industry milestones.

Announcements

Webinar Recording Available

A recording of the ETIP Ocean & OES-Environmental Webinar: Marine Spatial Planning and Ocean Energy Development is now available on *Tethys*. View the webinar here.

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 9:00 am PST.

The Water Power Technologies Office at the U.S. Department of Energy has 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 11:00 am PST.

U.S. Collegiate Wind Competition

The National Renewable Energy Laboratory has released a Request for Proposals (RFP) for students interested in competing in the U.S. Department of Energy's Collegiate Wind Competition in the spring of 2021. The RFP is open for applications until 9 December, 2019, and interested students and faculty can learn more about the competition and the application requirements here.

MHK Graduate Student Research Program

The U.S. Department of Energy's Water Power Technologies Office and Oak Ridge Institute for Science and Education (ORISE) are accepting applications for the Marine and Hydrokinetic Graduate Student Research Program. Applications are due by 9 December 2019 at 5:00 pm EST.

Calls for Abstracts

Abstracts are being accepted for the Environmental Interactions of Marine Renewable Energy Technologies (EIMR) Conference 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.

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.

JMSE Special Issue

The Journal of Marine Science and Engineering (JMSE) is accepting manuscript submissions for a special issue on the environmental interactions of marine renewables. The deadline for manuscript submissions is 27 June 2020.

GenEst Updates

The latest and greatest version of GenEst (v1.4.0), an R package for analysis of bird and bat mortality at wind energy facilities, is now available on CRAN and here. If you would like to receive future notices of GenEst software updates, please send a note to ddalthorp@usgs.gov.

Funding Opportunity

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.

Upcoming Events

Upcoming Webinar

The Ocean Energy Research Association (OERA) will be hosting a webinar entitled, "Developing Enhanced Marine Operations (DEMO) in High Flow Tidal Environments" from 1:00-2:00pm AST on 12 December 2019. Register here.

Upcoming Workshop

OES-Environmental (formerly Annex IV) and ORJIP Ocean Energy invite you to join a workshop on 4 December 2019 from 10:00 to 15:30 AEST at the Aerial UTS Function Centre in Sydney, Australia. The purpose of the workshop is to provide a state of the science on environmental effects of marine renewable energy and to examine pathways for determining data needs, monitoring requirements, and possible mitigation measures for working towards risk retirement of two stressors—electromagnetic fields and underwater noise—for permitting small installations of tidal and wave energy converters. For more information and to register for the workshop, please visit the workshop's event page on *Tethys*.

New Documents on *Tethys*

Evaluating the Environmental Impacts and Energy Performance of a Wind Farm System Utilizing the Life-Cycle Assessment Method: A Practical Case Study – Gomaa et al. 2019

> The objective of this research is to evaluate the environmental impacts and energy performance of wind farms. This study was conducted on a 38 Vestas V112 3-MW wind turbine located in the southern region of Tafilah in Jordan that is host to the country's first wind farm. The findings of this study indicate that the impacts of the transportation and installation phases were moderate, with the largest negative environmental impact deriving from the manufacturing phase.

Changes in Relative Fish Density Around a Deployed Tidal Turbine during on-Water Activities – Staines et al. 2019

> We attempted a Before-After-Control-Impact (BACI) study design to compare an index of fish density near and away from an marine hydrokinetic (MHK) tidal energy device deployed in Cobscook Bay, Maine. The index was mean volume backscattering strength (Sv) obtained from 24-hour stationary, down-looking hydroacoustic surveys. Data were collected several times per year at an "impact" site within 50–75 m of a device and at a "control" site approximately 1.6 km away, both before and after turbine installation in August 2012.

Assess risk of individual turbines to Golden Eagles – Miller 2019

> Golden Eagles are a federally protected species; therefore, when a wind facility is predicted to "take" Golden Eagles during normal operation, the facility is often legally required to attempt to avoid that take. If avoiding take is not possible, minimizing take is the next step. Minimizing take can be achieved by micro-siting wind turbines to avoid high risk areas. I applied existing models of predicted risk to low-flying Golden Eagles from wind energy, Golden Eagle habitat suitability, and wind turbine suitability to wind turbine locations at the Bluestone Wind Project.

Modeling Hydro-environmental Impacts of Tidal Range Renewable Energy Projects in Coastal Waters – Falconer et al. 2018

> In investigating the hydro-environmental impacts of such tidal energy schemes, both for regional and far field effects, a 2D numerical model has been refined to predict the hydrodynamic impacts, including wake effects and flood risk and hazard impacts, and changes in the concentration distribution of conservative and nonconservative solutes, including primarily salinity, turbidity, fecal indicator organisms, and phosphorous and nitrogen levels. The model has been applied to a number of key sites and particularly in the Severn Estuary, UK, which has the second highest tidal range worldwide.

Placing Green Energy in the Sea: Offshore Wind Farms, Dolphins, Oysters, and the Territorial Politics of the Intertidal Zone in Taiwan – Hung 2019

> In Taiwan, offshore wind farms have been heavily promoted as a way of meeting electricity demand. The planned site for offshore wind farms, mainly the intertidal zone along the coast of Changhua County, overlaps with both oyster farms and the habitat of Taiwanese humpbacked dolphins, categorized as a critically endangered species by the International Union for Conservation of Nature. This article reconsiders the politics of territorialization implied by the "green" label affixed to offshore wind farm projects and other forms of green energy in general.

Effects of impulsive noise on marine mammals: investigating range-dependent risk – Hastie et al. 2019

> Concerns exist about the impacts of underwater noise on marine mammals. These include auditory damage, which is a significant risk for marine mammals exposed to impulsive sounds such as explosions, pile-driving, and seismic air guns. Currently, impact assessments use different risk criteria for impulsive and non-impulsive sounds (e.g., ships, drilling). Despite management implications, a lack of data on range-dependent characteristics currently limits their inclusion in impact assessments.

News & Current Events

Marine Renewable Energy

Surge in Wave and Tidal Projects Expected in 2020 – The Maritime Executive

> The international network Ocean Energy Systems is predicting strong advances in ocean energy in 2020, driven by public and private sector funding. The network's last annual report highlights significant international investment including $25 million pledged by the U.S. Department of Energy to support 12 marine energy projects and Wave Energy Scotland committing £7.7 million ($10 million) in two wave energy machines next year. The European Commission is further investing in a broad set of initiatives and deployments to support this work.

Eco Wave Power enters Assembly Phase of the Jaffa Port Project – Eco Wave

> Eco Wave Power (EWPG Holding AB) commenced the assembly phase of the hydraulic land-located conversion unit for its first grid connected installation in Israel. This will be the first time that wave energy will connect to the national electric grid in Israel and a special Feed in Tariff (FIT) shall be determined for such purpose. The hydraulic works are expected to be finalized within 30 days. Once hydraulic works are finalized, Siemens will commence the electric installation works. Eco Wave Power is expected to initially install 1-2 large scale floaters, and after that install the full amount.

Marine Power Systems Awarded £4.3M to Accelerate Combined Wind & Wave Power Technology – Marine Power Systems

> Marine renewables technology developer Marine Power Systems (MPS) has been awarded £4.3 million by the European Regional Development Fund (EDRF) to accelerate the development of a floating offshore wind and wave technology that could transform the opportunities for energy generation in deep water locations. The EDRF funding, which is part of a £6.2 million project under the Cornwall and Isles of Scilly Local Enterprise Partnership scheme to promote research and innovation, will enable MPS to launch an extensive programme of work on the DualSub, which the company launched earlier this year.

Wave Energy Tech Is Ready to Plug Into a Real Grid – IEEE Spectrum

> In Hawaii, the OceanEnergy Buoy is slated to connect to the island of Oahu's electric grid next month. The 749-metric-ton device was recently towed from Portland, Oregon, to the U.S. Navy's Wave Energy Test Site, where the bright yellow buoy will undergo a year of performance tests. The project builds on a decade of research and several smaller iterations, including a quarter-scale model that was tested for three years in Ireland's Galway Bay. The 1.25-megawatt buoy will be moored to a 60-meter-deep berth and should withstand gale-force winds and extreme waves.

The World's Most Powerful Tidal Turbine – Advanced Science News

> Orkney is an archipelago in the North of Scotland and it is here that the company Orbital Marine Power will install its upcoming O2 2MW floating tidal turbine. It will be the world's most powerful tidal turbine when it enters operation at the European Marine Energy Centre (EMEC) in 2020. Orbital Marine Power's technology runs against the established logic of tidal turbines, which are commonly operated like underwater wind turbines built on the seabed.

Wind Energy

New England Offshore Wind Leaseholders Submit Uniform Layout Proposal to the U.S. Coast Guard – Vineyard Wind

The five New England offshore wind leaseholders - Equinor, Mayflower Wind, Ørsted/Eversource, and Vineyard Wind - announced a uniform turbine layout proposal submitted to the U.S. Coast Guard (USCG) with 1 nautical mile (nm) spacing between wind turbines. The leaseholders' proposal to the USCG addresses four principal concerns: (1) navigation safety; (2) the fisheries community's request for uniform and consistent spacing between turbines throughout the NE wind energy area; (3) creation of distinct transit corridors; and (4) the facilitation of search and rescue operations conducted by both vessel and aircraft.

Orsted plans 'world first' 5GW offshore wind energy island – Recharge

Orsted has unveiled plans for a 5GW offshore wind hub connecting Denmark, Poland, Sweden, and Germany, supporting large-scale production of green hydrogen and creating what it called "the world's first energy island" on Bornholm in the Baltic Sea. The global offshore wind pacesetter wants to kick-start the massive cluster with a 1GW wind farm in the Rønne Banke zone southwest of Bornholm, one of the areas already earmarked by Denmark for possible future development. The initial 1GW could later be expanded to 3-5GW, with interconnection extended to Sweden and Germany, said Orsted.

Investigations Kick Off at Australia's First Offshore Wind Project – Offshore Wind

Site investigations have commenced on the Star of the South offshore wind project in Australia. Two floating LiDARs and a wave buoy were deployed this week to collect data on the wind profile and conditions in the Bass Strait for what is to be Australia's first offshore wind farm. The wind and wave monitoring equipment will be out at sea for several years along with other investigations, including seabed studies to confirm sea depths and conditions, as well as baseline environmental surveys for marine life and birds.

Sweden is Becoming Europe's Texas for Wind Power – Bloomberg

In a remote area almost eight times the size of Manhattan covered by millions of young fir trees, Europe's biggest onshore wind park is emerging. Markbygden, as the site is called, may be the clearest sign yet of the industry's seismic shift away from subsidies and toward relying on markets that also set returns for traditional plants running on natural gas, coal or nuclear energy. The expansion of wind power sweeping northern Sweden has been likened to the Texan wind boom of the past few decades, which turned the state into the biggest producer in the U.S.

Can Whales Be Protected From NY's Colossal Offshore Wind Farms? – Gothamist

As whale populations have grown, the Wildlife Conservation Society and its collaborator, the Woods Hole Oceanographic Institution, have been monitoring them, with an eye toward mediating conflicts between marine life and the ocean's heaviest users: cargo ships, commercial trawlers and the U.S. military. Now, the whales are poised to get many

new, potentially disruptive neighbors: hundreds of skyscraper-high wind turbines, rising from the ocean floor. The New York Energy Research and Development Authority has issued two large contracts for offshore wind and anticipates more in the coming years.