TETHYS BLAST

September 15, 2017

The bi-weekly Tethys Blast will update you with new information on Tethys, news article of international interest, and opportunities in wind and marine renewable energy. We hope you find this a valuable tool to keep you connected to colleagues, new research, opportunities, and industry milestones.

Upcoming Webinars

WREN is hosting a public webinar on September 20 about *Upscaling Wind and Wildlife Individual Interactions to Population-Level Impacts*. The webinar will discuss how populations are defined, impacts measured, predicted and verified, and how impact thresholds can be applied for decision making in the context of wind energy development. Login instructions are available on Tethys.

Annex IV is hosting a public webinar on September 21 about *Information Collection and Consenting Processes for Wave and Tidal Deployments - Lessons from the Field*. One presenter will focus on consenting wave projects in Sweden and the other on consenting tidal projects in Canada. Login instruction are available on Tethys.

Request for Proposals

The National Renewable Energy Laboratory's (NREL's) Technology Development and Innovation for Addressing Wind Wildlife Operational Challenges has released a request for proposals calling for low- to mid-technology readiness level wildlife detection and/or deterrent mitigation solutions, with a focus on levels 3 through 5. National Wind Technology Center's facilities and expertise will support the research and development of these technologies, which may include stand-alone systems, integrated, multicomponent systems, or integrated solutions into standard turbine controls. Proposals are due by October 13.

Learn more about the request for proposals at FedBizOpps.gov:
https://www.fbo.gov/spg/DOE/NREL/NR/RAT-7-70326/listing.html

Upcoming Seminar

The Wind Power and Biodiversity Seminar will be held in Artigues-près-Bordeaux, France on November 21-22. The seminar provides an opportunity to draw up a state of knowledge on the potential impacts of wind farms and how to assess and mitigate them in order to reconcile the development objectives of renewable energies with the appropriate protection of wildlife. You can find more information and register here.

New Documents on Tethys

New documents are regularly added to Tethys, hand-selected for their relevance to the environmental effects of wind and marine renewable energy. Short introductions to new or popular documents are listed below, accessible by the accompanying Tethys links:

A Framework for Regulating Underwater Noise During Pile Driving - Andersson et al. 2017

> Pile driving is a common technique used during the construction of bridges, offshore wind power, and underwater infrastructure or shoreline structures. It is the process by which a foundation, beam or pole is hammered or vibrated down into the bottom, which can generate extremely loud noise that propagates throughout the surrounding water and sediment. The noise can reach such high levels that marine animals are at risk of disturbance, injury or even death. Sweden currently lacks established thresholds stating the level at which underwater noise potentially disturbs or injures marine animals.

Bird Detection and Species Classification with Time-Lapse Images around a Wind Farm: Dataset Construction and Evaluation - Yoshihashi et al. 2017

> Collisions of birds, especially endangered species, with wind turbines is a major environmental concern. Automatic bird monitoring can be of aid in resolving the issue, particularly in environmental risk assessments and real-time collision avoidance. For automatic recognition of birds in images, a clean, detailed, and realistic dataset to learn features and classifiers is crucial for any machine-learning-based method. Here, we constructed a bird image dataset that is derived from the actual environment of a wind farm and that is useful for examining realistic challenges in bird recognition in practice.

Regional-Scale Patterns in Harbour Porpoise Occupancy of Tidal Stream Environments - Waggitt et al. 2017

> As harbour porpoises *Phocoena phocoena* are abundant within tidal stream environments, mitigating population-level impacts from tidal stream energy extraction is considered a conservation priority. An understanding of their spatial and temporal occupancy of these habitats at a regional-scale will help steer installations towards locations which maximize energy returns but reduce the potential for interactions with populations. This study quantifies and compares relationships between the presence of harbour porpoise and several hydrodynamic characteristics across four tidal stream

environments in Anglesey, UK—a region that has been earmarked for extensive industrial development.

Current and Wave Effects around Windfarm Monopile Foundations - Miles et al. 2017

Laboratory measurements were undertaken to investigate wave and current velocities in the vicinity of a wind turbine monopile foundation, in order to inform environmental impact assessments and to quantify flow variability in the region of the power take off cable. Flow measurements were made up to 15.5 pile diameters (D) downstream of the pile. Measurements were also taken around the perimeter of the pile (~0.75 D from the pile centre) at the approximate representative height of the power cable.

Boosting Blue Growth in a Mild Sea: Analysis of the Synergies Produced by a Multi-Purpose Offshore Installation in the Northern Adriatic, Italy - Zanuttigh et al. 2015

In the near future, the oceans will be subjected to a massive development of marine infrastructures, including offshore wind, tidal and wave energy farms and constructions for marine aquaculture. The development of these facilities will unavoidably exert environmental pressures on marine ecosystems. It is therefore crucial that the economic costs, the use of marine space and the environmental impacts of these activities remain within acceptable limits. Moreover, the installation of arrays of wave energy devices is still far from being economically feasible due to many combined aspects, such as immature technologies for energy conversion, local energy storage and moorings. Therefore, multi-purpose solutions combining renewable energy from the sea (wind, wave, tide), aquaculture and transportation facilities can be considered as a challenging, yet advantageous, way to boost blue growth.

Ocean Energy ORJIP working to accelerate offshore consenting

ORJIP Ocean Energy is a UK-wide collaborative programme of environmental research with the aim of reducing consenting risks for wave, tidal stream and tidal range projects. Partnering with Annex IV, ORJIP provides content input to Tethys Blasts. ORJIP wishes to make you aware of the following opportunities:

- FORESEA (Funding Ocean Renewable Energy through Strategic European Action) programme has opened its third call for support package applications, giving free access to a network of test sites. The call runs until 29 September 2017.
- The European Commission Joint Research Centre has launched a Call for Expressions of Interest for clean energy technology studies.

News and Current Events

Marine Renewable Energy

Grid connection secured for 3,240MW Cardiff Tidal Lagoon - Tidal Lagoon Power

> Tidal Lagoon Power has secured the grid connection for a 3,240MW capacity tidal lagoon expected to generate among the cheapest electricity of all new power stations built in the UK. The project, located between Cardiff and Newport, has been selected as the first to employ at full-scale the blueprint being established by the pathfinder Swansea Bay Tidal Lagoon, a consented, world-first project awaiting final sign off by the UK Government in the coming weeks.

Tidal energy site in Orkney in hydrogen 'first' - BCC

> A Scottish test and research centre has claimed a world "first" by generating hydrogen gas from tidal energy. The European Marine Energy Centre (EMEC) said it achieved the feat at its tidal energy test site in Orkney late last month. It added that it demonstrated the potential for a clean replacement for polluting fuels. EMEC's investment in hydrogen production capability was backed by the Scottish government. Funding of £3m was made available through Highlands and Islands Enterprise.

Wärtsilä inks cooperation agreement with wave energy leader - Marine Log

> Wärtsilä has signed a cooperation agreement Finnish-based AW-Energy covering sales and delivery of WaveRoller, a wave energy technology developed by AW-Energy, on a turn-key basis across the life-cycle. The cooperation is based on AW-Energy's patented and certified technology and Wärtsilä Energy Solutions' global project execution, services and integration capabilities.

Laminaria raises €2 million for wave energy development - Water Power Magazine

> Wave energy generation company Laminaria has raised €2 million from new investors, QBIC II and PMV, and existing investor CEIP, with the funds to be used to further support Laminaria’s wave energy generation technology and initiate a full-scale demonstration project at the European Marine Energy Centre (EMEC) in Orkney, Scotland. Laminaria successfully tested a 1 in 5 scale energy producing version of its wave device in the North Sea in 2015.

MaRINET2 awards €1.3m to develop the next-generation of offshore renewables - EMEC Press Release

> The MaRINET2 project has awarded €1.3m to 34 technology development teams through a competitive call for proposals. This support will accelerate the next generation of offshore renewable energy technologies towards the marketplace by providing technology testing at MaRINET2’s network of world-leading testing facilities.

Wind Energy

University of Maine's innovative floating offshore wind turbine design passes ABS review - Wind Power Engineering

> ABS, a leading provider of classification and technical services to the offshore and marine industries, has completed the design review of the Front End Engineering and Design (FEED) documentation for the VolturnUS, a floating offshore wind turbine (FOWT), developed by the University of Maine Advanced Structures and Composites Center.

DONG Energy To Build World's Largest Offshore Wind Farm At 1,386 MW - Clean Technica

> The Danish wind energy giant is making news once again after being awarded the contract to build what will be the world's largest offshore wind farm, the 1,386 MW Hornsea Project Two, at a record UK-low strike price of £57.50 per MWh. The UK Department for Business, Energy and Industrial Strategy (BEIS) announced the results of its latest Contracts for Difference (CfD) competitive auction, which has garnered much attention for new record low offshore wind prices that subsequently made offshore wind cheaper than gas and nuclear energy.

GE Renewable Energy Unveils Largest Onshore Wind Turbine - Clean Technica

> GE Renewable Energy unveiled its largest onshore wind turbine this week, a 4.8 megawatt turbine which is able to generate enough electricity at low to medium wind sites for the equivalent of 5,000 homes.

China to call on Denmark to help build offshore wind farm - Reuters

> China will tap Denmark, home to some of the world's largest offshore energy companies, to help it build a wind farm, Denmark's energy minister said on Monday. Speaking after meeting the head of China's National Energy Administration (NEA), minister Lars Christian Lilleholt said that size, timing and suppliers for the wind farm had not yet been decided but he was convinced it would be built.

How DONG Energy Dismantled The World's First Offshore Wind Farm - North American Wind Power

> The dismantling process for the world's first offshore wind farm has now been completed, DONG Energy has announced. The Vindeby Offshore Wind Farm, located near Lolland in the southeast of Denmark, was constructed in 1991 as a demonstration project to prove whether it was possible to generate clean energy offshore. According to DONG Energy, the project was, indeed, a success, but after more than 25 years of operation, the turbines were worn down, and DONG Energy decided to decommission the project.