

TETHYS ENGINEERING BLAST



13 March 2020

[Tethys Engineering](#) is an online knowledge base that facilitates the exchange and dissemination of information on the technical and engineering aspects of marine renewable energy. The bi-weekly *Tethys Engineering Blast* highlights new publications in the [Tethys Engineering Knowledge Base](#); relevant announcements, opportunities, and upcoming events; and news articles of international interest.

[Announcements](#)
[Upcoming Events](#)

[New Documents](#)
[News & Press Releases](#)

Announcements

TEAMER

The Testing Expertise and Access for Marine Energy Research (TEAMER) program is preparing to announce its first open call for Requests for Technical Support (RFTS) and now has an official website and mailing list. To be notified of developments in the program, [visit the website](#) and subscribe to the mailing list. You can also follow TEAMER on [Twitter](#), [Facebook](#), [LinkedIn](#) and [Instagram](#). Questions about TEAMER can be directed to teamer@pacificoceanenergy.org.

Waves to Water Prize

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.

EIMR Cancelled

The [Environmental Interactions of Marine Renewables \(EIMR\)](#) Scientific Advisory Committee has been monitoring the coronavirus outbreak and has made the hugely difficult decision to cancel EIMR 2020. The plan is to reschedule EIMR in Oban on a similar date in 2021.

AWTEC Call for Abstracts Extended

Abstracts are currently being accepted for the [5th Asian Wave and Tidal Energy Conference \(AWTEC 2020\)](#), which will be held in Hobart, Australia from 8-12 November 2020. Abstracts must now be submitted through the presentation portal before 31 March 2020. Authors of accepted abstracts will then be required to submit a full paper through the conference portal before 20 June 2020.

Employment Opportunities

Sandia National Laboratories' Water Power Technologies Department is currently seeking a Graduate Summer Intern (ID: 671083), a Graduate Year-Round Intern (ID: 671088), and a Postdoctoral Appointee (ID: 671162). View all available positions [here](#).

Funding Opportunities

The U.S. Department of Energy's Water Power Technologies Office has partnered with the Economic Development Administration to provide \$35 million in funding across [three competitions](#), which seek to support entrepreneurship and accelerate company growth within the Blue Economy. Concept Proposals will be accepted through 24 March 2020 at 11:59pm EST.

The Supergen Offshore Renewable Energy (ORE) Hub has launched its [second round of Flexible Funding](#) which will award a total of up to £1.2 million to seed areas that complement existing research, fill gaps, or add cross cutting activities to explore the transfer of research findings between sectors within ORE. Expressions of Interest must be submitted by 3 April 2020 at 5:00pm GMT.

Upcoming Events

Upcoming Webinars

As part of the [GloFouling Webinar Series](#), Heriot Watt University will be hosting a [webinar](#) entitled, *Monitoring biofouling in the offshore renewable energy industry* on 17 March 2020 at 3:00pm CET. Register [here](#).

ETIP Ocean & DTOcean Plus will be hosting a [webinar](#) entitled, *Structured Innovation Design Tool* on 17 March 2020 at 4:00pm CET. Register [here](#).

The Offshore Energy Research Association (OERA) will be hosting a [webinar](#) entitled, *Updates in The Pathway: A program towards regulatory certainty for instream tidal energy projects* on 19 March 2020 from 1:00-2:00pm AST. Register [here](#).

Upcoming Workshop

In collaboration with MaRINET2, WaveC Offshore Renewables will be hosting a short course entitled, [Installation and O&M of Offshore Renewable Energy Systems](#). The short course will

take place in Viana do Castelo, Portugal from 13-14 May 2020. There is no registration fee, and travel & subsistence support is available to early-stage researchers and postgraduate students. Registration closes 7 April 2020.

Upcoming Conferences

The [Offshore Technology Conference 2020](#) will be held in Houston, Texas, U.S. from 4-7 May 2020.

The [8th International Conference on Ocean Energy \(ICOE 2020\)](#) will be held in Washington, D.C., U.S. from 19-21 May 2020. Registration rates increase on 8 April 2020.

New Documents on *Tethys Engineering*

[An assessment of the East Australian Current as a renewable energy resource](#) – Schaeffer et al. 2020

While global studies of Western boundary currents (including the East Australian Current, hereafter the EAC) have been conducted using numerical models, they have coarse resolutions and often underestimate kinetic energy, which is the specific resource that needs accurate assessment. Here we address this knowledge gap, using a range of current velocity observations from moorings, high frequency radar and satellite altimetry to investigate the potential of the EAC as a future renewable energy resource, at various latitudes along the east Australian coast.

[Nonlinear hydrodynamics analysis of a submerged spherical point absorber with asymmetric mass distribution](#) – Meng et al. 2020

In previous work, a frequency-domain model was developed from linear potential theory to investigate the oscillation modes and efficiency of a single-tether 3 degree-of-freedom submerged spherical point absorber with asymmetric mass distribution (SPAMD). In this study, the trajectory of the SPAMD was analysed to determine the dominant nonlinear hydrodynamic effect that degrades the performance of a fully submerged system. The analysis was conducted in a numerical wave tank experiment (NWT), based on the Navier-Stokes equation and using the computational fluid dynamic toolbox OpenFOAM and the open-source library OLAFLOW for wave generation and absorption.

[Impact of membrane orientation on the energy efficiency of dual stage pressure retarded osmosis](#) – Altaee et al. 2019

The performance of Dual Stage Pressure Retarded Osmosis (DSPRO) was analyzed using a developed computer model. DSPRO process was evaluated on Pressure Retarded Osmosis (PRO) and Forward Osmosis (FO) operating modes for different sodium chloride (NaCl) draw and feed concentrations. Simulation results revealed that the total

power generation in the DSPRO process operating on the PRO mode was 2.5–5 times more than that operating on the FO mode.

[A viscous vortex lattice method for analysis of cross-flow propellers and turbines](#) – Epps et al. 2019

Marine hydrokinetic turbines are a promising source of renewable energy, but the costs of existing cross-flow turbine designs are too high. In order to develop new designs with reduced costs, there exists a need for a low-order computational model that is simultaneously fast, accurate, and robust. Herein, we present a novel theoretical model for the analysis of cross-flow propellers and turbines based on the vortex lattice method (VLM). In order to overcome the limitation that the VLM ignores viscous effects (such as trailing-edge flow separation), we present a novel method to account for viscous-thickness-load coupling (VTLC).

[Dynamic analysis of wave action on an OWC wave energy converter under the influence of viscosity](#) – Wang and Ning 2020

In the present study, by introducing the artificial viscous terms into the dynamic free surface boundary condition and Bernoulli equation, a fully nonlinear numerical model based on higher-order boundary element method (HOBEM) is adopted to model the wave dynamics of an oscillating water column device. The viscosity effects on the wave force (i.e., ΔF) is investigated by comparing the predicted wave force by the numerical model with and without these viscous terms. The effects of the chamber geometry parameters, such as front wall draft, chamber width and opening ratio (i.e., air orifice width), on ΔF are investigated.

[Preliminary design of a 100 MW-net ocean thermal energy conversion \(OTEC\) power plant study case: Mentawai island, Indonesia](#) – Adiputra et al. 2019

Ocean thermal energy conversion is one of the promising renewable energy resources yet relatively unexplored due to its high capital cost for being utilized in commercial scale. In the aim to reduce the capital cost, this paper introduces a concept design of the floating structure from a converted oil tanker ship. To propose the design process, the general principles of designing a converted tanker FPSO is adapted and then modified to deal with ocean thermal energy conversion (OTEC) characteristic.

News & Press Releases

[Ecosse IP announces its Mass of Water Turbine, delivering cost-effective energy generation](#) – EIP

Ecosse IP Ltd (EIP), a Scottish company, recently announced the arrival of its latest product, Mass of Water Turbine (MOWT), designed to generate energy from slow-moving water. The MOWT technology, patent-pending, was developed by EIP to provide

a cost-effective method of generating energy from slow-moving water. MOWT is designed for use in rivers, estuaries and subsea current & tidal environments, offering an energy solution with minimal environmental impact. Currently, MOWT measures 5m long x 1m high, weighs less than 1 tonne, and can be fitted with an integrated battery pack and built-in Ambient lifting technology.

OPT PowerBuoy for Subsea Vehicle Residency – Marine Energy

Ocean Power Technologies, Modus Seabed Intervention and Saab Seaeye are working on a new solution for carbon-free subsea autonomous underwater vehicle (AUV) residency – long-term, persistent deployment without support from manned vessels. This novel system is designed for carbon-free autonomous offshore operations with the OPT PowerBuoy power and communications platform at its core. The autonomous resident AUV system concept has been jointly submitted for U.S. government development and demonstration project funding consideration.

First blade panels hit the water for biofouling tests – NEMMO

The NEMMO project has installed a set of tidal turbine blade panels made from fibreglass and a gel-coat coating for testing at the HarshLab facility. The samples, taken from the current Magallanes' turbine blade, will be submerged for six months to determine the level of biofouling on the surface. These results will then be used as a reference for the development of new blade materials and coatings. Check out the short video of the panels being installed at HarshLab's floating offshore laboratory.

Gravity Base Ballast Provides Tidal Turbines with a Sturdy Grip – Power Magazine

Tidal energy still requires innovations for both improving its reliability but also its cost competitiveness. As part of the system's potential improvement, the foundation can feature great innovations. Gravity-based foundations offer a stabilization solution highly appreciated for its easy installation in water depth of 20 meters to 80 meters, especially in challenging environments with tight operation windows, heavy currents, and high waves. Current projects with gravity-based foundations include HydroQuest, Meygen, Sabella, and Guinard Energies.

Government Unveils Plan for an Ocean Thermal Energy Park in Yabucoa – The Weekly Journal

The Department of Economic Development and Commerce recently unveiled a plan to develop the Puerto Rico Ocean Technology Complex (PROtech), a technological park to generate ocean thermal energy and promote other eco-friendly initiatives, at a price tag of \$300 million. The proposed plant, to be situated on the southeast area of the island, would produce 500 kilowatts of energy through a collaboration with the private sector, which would pick up the tab for the development, according to the government's proposal.