

TETHYS ENGINEERING BLAST



19 June 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 (MRE). 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

[New Triton Story](#)

[Researching the ocean is more difficult than studying space: Technical development with Nolann Williams](#) by Cailene Gunn

Meet Nolann Williams, an electrical engineer who joined Pacific Northwest National Laboratory's (PNNL) Marine Sciences Laboratory (MSL) in June 2019 and has spent the past year supporting the Triton Initiative, a program that is focused on developing and testing environmental monitoring technology and methods to remove barriers associated to MRE installations. Specifically, Nolann's contributions propelled Funding Opportunity Announcement (FOA) awardee technology development and are the focus of the first ever Triton Story! [Read more here.](#)

[TEAMER Test Facility Network](#)

The Testing Expertise and Access for Marine Energy Research (TEAMER) program is now accepting applications to add new facilities (both physical test infrastructure as well as expertise capabilities such as modelling and analysis services) to the [TEAMER Test Facility Network](#). Facilities looking to apply must submit the [facility questionnaire](#) by 17 July 2020 in order to be considered available for the 2nd Request for Technical Support testing and assistance period. See the [New TEAMER Facility Process page](#) for more information on how to apply as a facility.

Calls for Papers

The Journal of Marine Science and Engineering is accepting manuscript submissions for a [special issue](#) entitled, *Advances in Wave Energy Harvesting*. Manuscript submissions are due 26 June 2020.

The Marine Technology Society Journal has extended its manuscript submission deadline for the [special issue](#) entitled, *Utilizing Offshore Resources for Renewable Energy Development: Marine Renewable and Offshore Wind Energy*. Manuscript submissions are now due 17 July 2020.

Funding/Testing Opportunities

Interreg North-West Europe's [Ocean DEMO](#) (Demonstration Programme for Ocean Energy Pilot Farms and Supporting Technologies) project recently opened its [3rd Call for Applications](#). Successful applicants will receive free access to test their ocean energy products and services in real sea environments at the project's network of test centers. Applications close 18 September 2020 at 7:00pm CEST (5:00pm UTC). An informational webinar will be held on 30 June 2020 at 3:00pm CEST (1:00pm UTC) to present the application system and available support packages.

The U.S. Department of Energy's Water Power Technologies Office has issued a [funding opportunity](#), entitled "Marine Energy Foundational Research and Testing Infrastructure", to build marine energy research capabilities and leverage expertise to help the developing marine energy industry tackle complex scientific and technical problems. Full applications are due by 5:00pm ET (9:00pm UTC) on 7 July 2020.

The U.K. Research and Innovation's Engineering and Physical Sciences Research Council (EPSRC) has issued a [call to fund research grant proposals](#) in wave energy. EPSRC is looking to fund proposals in the key areas highlighted by the Supergen Offshore Renewable Energy Hub's Wave Energy Roadmap, including novel designs for niche applications, survivability and reliability of devices, and power take off and control systems. An [Intent to Submit](#) is due by 14 July 2020 and the full proposal stage closes on 23 September 2020.

Employment Opportunities

France Energies Marines is seeking a [Full Stack Engineer/Developer](#) for the RESCORE Project (RESource Center for Ocean Renewable Energy), which aims to establish a resource center based on a web-based tool allowing access to relevant information and other assets deemed valuable for the development of the ocean renewable energy sector in France. The application submission deadline has been extended to 30 June 2020.

Marine Power Systems is seeking a [Naval Architect](#) with expertise of the design, project engineering, development and construction of large marine structures, and a [Design Engineer](#) with expertise in the assembly and maintenance of very large, complex systems within CAD.

Upcoming Events

Upcoming Webinars

In the framework of European Union (EU) Sustainable Energy Week 2020, Ocean Energy Europe and the International Renewable Energy Agency will host a [joint webinar](#) on 19 June 2020 at 2:00pm BST (1:00pm UTC). The webinar will focus on new international developments, both in technology and support schemes, and examining the future of the global leadership role that Europe currently enjoys in ocean energy technology. Register [here](#).

The European Marine Energy Centre (EMEC) will host the first of a series of six [supply chain seminar events](#) as part of the TIGER (Tidal Stream Industry Energiser) project on 9 July 2020 at 9:30am BST (8:30am UTC). The first event, supported by the Ocean Power Innovation Network, will focus on subsea cables and connectors, aiming to integrate cross-sector supply chain capability and innovation into the development of world leading tidal energy projects. Register [here](#).

Event Updates

The [11th Association for Computing Machinery's International Conference on Future Energy Systems \(ACM e-Energy'20\)](#), originally scheduled for 22-26 June 2020 in Melbourne, Australia will now be held online. The ACM e-Energy'20 committee is offering registration waivers to students and postdocs.

The [7th PRIMaRE \(Partnership for Research in Marine Renewable Energy\) Conference](#) will be held online from 7-8 July 2020. The aim of the event is to cover a wide range of topics in marine renewable energy, including technology, policy, environment, hydrodynamics, resource characterization, materials, and operation and management.

The Pacific Ocean Energy Trust's (POET) [Ocean Renewable Energy Conference](#), originally scheduled for September 2020 in Portland, Oregon (U.S.), has been cancelled. Be sure to follow POET's Webinar Series to stay up to date on the latest issues surrounding MRE and its progress along the Pacific Coast.

OCEANS 2020 Singapore and OCEANS 2020 Gulf Coast will now be held as a single virtual conference, [Global OCEANS 2020: Singapore – U.S. Gulf Coast](#). Tentatively scheduled for 5-30 October 2020, the conference will feature a mix of live and on-demand events available to all registrants. Further details will be available in the coming weeks.

New Documents on *Tethys Engineering*

[Prediction and optimization of oscillating wave surge converter using machine learning techniques](#) – Liu et al. 2020

In this study, a scaled oscillating wave surge converter under regular waves is numerically investigated using the smoothed particle hydrodynamics method, which is validated against experimental data. With the random changes in nine typical design parameters (i.e., the wave period, wave height, water depth, width of bottom border of the flap, width of top border, flap height, hinge height, flap density, and damping of the power take-off system), a total of 379 cases are generated and simulated. Subsequently, the capture factors corresponding to each case are calculated to quantitatively describe the energy conversion efficiency.

The development, design and characterisation of a scale model Horizontal Axis Tidal Turbine for dynamic load quantification – Allmark et al. 2020

The paper describes the development and characterisation of three 0.9 m diameter lab-scale Horizontal Axis Tidal Turbines. The blade development process has been outlined and was used to generate a design specification. Each turbine houses instrumentation to measure rotor thrust, torque and blade root bending moments on each blade, in both ‘flapwise’ and ‘edgewise’ directions. Results from testing the pilot turbine at three differing facilities during the development process are presented. Lastly, the findings of a test campaign to characterise the performance of each of the three turbines are presented.

Application of reverse electro dialysis to site-specific types of saline solutions: A techno-economic assessment – Giacalone et al. 2019

The worldwide availability of salinity gradients is limited to those locations where water bodies at different salinity levels are present. The present work analyses a number of different scenarios worldwide, in locations where salinity gradients are naturally available or generated by anthropogenic activities. A techno-economic model of the Reverse Electro dialysis process is presented. The model is used to evaluate the energy that can be harvested in each real scenario using a reverse electro dialysis plant and relevant results are reported in terms of power densities and energy yields.

The effect of the coastal reflection on the performance of a floating breakwater-WEC system – Zhang et al. 2020

In this paper, the hydrodynamic performance of a floating breakwater-Wave Energy Converter (WEC) integrated system was investigated under the framework of the linear potential flow theory, with a focus on the effect of the coastal reflection. The reflection coefficient and capture width ratio were verified using the rule of wave energy flux conservation. By comparing to the cases without the coastal wall, the presence of the coastal wall led to the significant modifications of the hydrodynamic characteristics, efficiency and wave attenuation performance of the system.

Numerical simulation of the effects of passive flow control techniques on hydrodynamic performance improvement of the hydrofoil – Kundu 2020

Efficient hydrofoil design is a massive challenge for the current turbine blade designers. Flow separation on the suction side of the hydrofoil reduces the hydrodynamic performance of the current turbine. In this paper, the combined effects of dimple with vortex generators and dimple with tubes on S1210 hydrofoil is numerically studied and compared with baseline hydrofoil. The lift coefficient values increased at a higher angle of attack, and the stall angle is delayed from 10° to 12°. Maximum glide ratio increments are 132% and 144% at an angle of attack of 12° for outward dimple with tubes and outward dimple with vortex generators respectively.

[An innovative Organic Rankine Cycle \(ORC\) based Ocean Thermal Energy Conversion \(OTEC\) system with performance simulation and multi-objective optimization](#) – Wang et al. 2018

Based on multi-objective particle swarm optimization (MOPSO) algorithm, with considering levelized cost of energy (LCOE) and exergy efficiency as two different objective functions, an innovative Organic Rankine Cycle (ORC) model based Ocean Thermal Energy Conversion (OTEC) system is investigated for trade-off Pareto optimization. In the present study, six key parameters including evaporating temperature, condensing temperature, warm seawater temperature at the outlet of evaporator, cool seawater temperature at the outlet of condenser, degree of superheat, and depth of cool seawater have been selected as decision variables.

News & Press Releases

[MHKiT Offers Marine Renewable Energy Mavens Tools for Success](#) – National Renewable Energy Laboratory

The marine renewable energy community is stepping it up several notches thanks to recently launched open-source software called the Marine and Hydrokinetic Toolkit (MHKiT). Offering previously unavailable tools for data processing and handling, the searchable online software discovery platform and knowledge base is currently available on Github, as well as the MHK Portal and Repository for Information on Marine Renewable Energy (PRIMRE). PRIMRE serves as a clearinghouse for information on engineering and technologies, resource characterization, device performance, and environmental effects of MRE projects.

[Marine Energy Wales Welcomes Green Light for £60 Million Pembrokeshire Marine Energy Project](#) – Marine Energy Wales

A £60 million marine energy project that will help tackle climate change while reviving Pembrokeshire's economy in the wake of Covid-19 has been given the green light. The UK Government and Welsh Government have now approved the business case for the Pembroke Dock Marine project, which is expected to generate £73.5 million a year to the Swansea Bay City Region's economy. Pembroke Dock Marine is led by the private

sector, with support from Pembrokeshire County Council. The project is expected to generate more than 1,800 jobs in the next 15 years.

Blue Economy CRC Announces Commencement of its Research Program with Commissioning of 17 Scoping Projects – BECRC

The Blue Economy Cooperative Research Centre (BECRC) has taken its first steps in foundational work that will underpin its research agenda, with the announcement of 17 short-term scoping projects. These industry-focused projects involve collaboration between industry and research partners and will guide the CRC's future. The new projects are spread across the five BECRC research program areas, involving collaboration with 40 participant organisations across the world and running over the next six months. They are driven by the needs of industry partners and the end-users with whom they engage.

Selkie Project and Ocean Energy IE to collaborate on wave energy demo project – Ocean Energy Europe

The SELKIE cross-border project aiming to boost the marine energy industry in Wales and Ireland has announced that Ocean Energy is the successful wave energy company following a tender call for participation in a pilot demonstration project. Ocean Energy is a wave energy technology developer based in Cobh, Ireland. Ocean Energy has been following a careful technology development route resulting in a device of robust and practical design, with one moving part out of the sea-water. Early TRLs were covered through tank tests in Cork and Nantes. The progression up the TRL levels resulted in over 3 years of successful live sea trials at the Galway Bay Test Site resulting in proven survivability for the device.

Tidal energy: Riding a wave of optimism – Power Engineering International

According to the International Energy Agency's global marine energy technology initiative Ocean Energy Systems, the deployment of tidal and wave energy systems grew from just 5 GWh to over 45 GWh between 2009 and 2019. With current technologies capable of producing as much as 1,400 TWh per year, almost 9% of the currently estimated 16,000 TWh of electricity consumed globally, wave energy could supply a substantial part of the electricity demand of several European countries. What's even more exciting, however, is that these technologies are just on the point of maturing, and 2019 saw a spike in investments to help the resource tap into its potential.