PRIMRE BLAST

14 July 2023

The Portal and Repository for Information on Marine Renewable Energy (PRIMRE) provides access to marine energy data, information, and resources in the U.S. and internationally. The bi-weekly PRIMRE Blast highlights relevant announcements and upcoming events; new content in the Knowledge Hubs; and international marine energy news. Email us to contribute!

Announcements

Request for Information

Pacific Northwest National Laboratory is requesting information from developers, owners, and/or manufacturers of wave energy converters (WECs) capable of deployment and operation of their WEC to power offshore aquaculture operations. The Request for Information is open through 11 August 2023.

WES Competition

Wave Energy Scotland (WES) is looking for continuous cost reduction opportunities to follow in the footsteps of the current cohort of wave energy technologies on their path towards commercial projects, and is inviting wave energy specialists, concept designers, and solution architects to enter the Direct Generation Concept Design Competition. Pre-proposals are due 18 August 2023.

InDEEP Applications

The U.S. Department of Energy's (DOE) Water Power Technologies Office (WPTO) has launched the Innovating Distributed Embedded Energy Prize (InDEEP), which will award up to $2.3 million to competitors investigating novel technologies for harnessing and converting the power of ocean waves into usable types of energy. Phase I applications are due 25 August 2023.

Calls for Abstracts

The American Geophysical Union (AGU) has opened the Call for Abstracts for the AGU Fall Meeting 2023 through 2 August 2023. The meeting will take place on 11-15 December 2023 in San Francisco, CA, U.S. and online. Please consider submitting an abstract to Marine Energy to Power the Blue Economy session.

The Call for Abstracts for the Argentine Meeting on Marine Energies (ENAEM) and 8th Center for Ocean Energy Research (COER) Wave Energy Workshop is now open through 13 August 2023. ENAEM-COER 2023 will take place on 6-8 November 2023 in Buenos Aires, Argentina.

The Call for Abstracts for the 104th American Meteorological Society (AMS) Annual Meeting is now open through 24 August 2023. The event will take place from 28 January to 1 February 2024 in Baltimore, Maryland, U.S.

The Call for Abstracts for the Ocean Sciences Meeting (OSM 2024) is now open through 13 September 2023. OSM will take place 18-23 February 2023 in New Orleans, Louisiana, U.S.

Calls for Papers

The *Journal of Marine Science and Engineering* is accepting submissions for several Special Issues, including "Advanced Marine Energy Harvesting Technologies" (due 31 August 2023), "State-of-the-Art in Ocean Wave Energy Conversion" (due 20 September 2023), and "Tidal and Wave Energy" (due 1 October 2023).

Energies is accepting submissions for several Special Issues, including "Recent Advances in Marine and Offshore Renewable Power Generation Technologies" (due 31 August 2023), "Tidal Energy: Latest Advances and Prospects of Tidal Current Turbine" (due 20 September 2023), and "The Advances in Wave Energy Extraction Systems" (due 13 October 2023).

Funding & Testing Opportunities

The U.S. Testing Expertise and Access for Marine Energy Research (TEAMER) program, sponsored by the DOE's WPTO, is now accepting Request for Technical Support (RFTS) 10 applications until 14 July 2023.

The Horizon Europe Framework Programme has launched a Call for Proposals focused on the development of innovative power take-off and control systems for wave energy devices. Submissions are due 5 September 2023.

The U.S. Department of Commerce and National Oceanic and Atmospheric Administration (NOAA) recently announced the Ocean-Based Climate Resilience Accelerators program, which will foster public-private partnerships to help support small businesses that are developing sustainable technologies, including renewables. Applications are due 11 September 2023.

The National Science Foundation and U.S. DOE WPTO recently announced a special funding focus on new science and engineering proposals submitted to the Engineering Research Initiation (ERI) solicitation focused on marine energy and powering the blue economy. ERI supports eligible new researchers, educators, and innovators. Proposals are due 15 September 2023.

Career Opportunity

Pacific Northwest National Laboratory is seeking a Post Masters Research Associate - Marine Technology Electrical Engineer to join a multidisciplinary team developing and assessing technology for the marine environment, including marine energy and environmental monitoring systems. Applications are due 7 August 2023.

Upcoming Events

Upcoming Webinars

The University of Marine Energy Research Community (UMERC) is hosting a webinar, "Energy Harvesting for the Persistent Presence of Oceanographic Instrumentation", on 19 July 2023 from 10:00-11:00am PDT (5:00pm UTC). The webinar will provide an update on work by the Monterey Bay Aquarium Research Institute. Register here.

The PRIMRE team is hosting a webinar on 23 August 2023 from 10:00-11:00am MDT (4:00-5:00pm UTC). During the webinar, the Modular Ocean Data Acquisition (MODAQ) system, Marine Energy Data Pipeline, and Marine and Hydrokinetic ToolKit (MHKiT) teams will provide a demonstration of how these three national lab developed data collection and processing tools can be utilized together collect, process, standardize, and analyze data. Register here.

Upcoming Workshop

The U.S. DOE WPTO is hosting a Water-Energy Nexus Strategy Workshop on 25 July 2023 from 11:00am-5:00pm EDT (3:00-9:00pm UTC) to discuss the interdependent linkage of water and energy resources. Join to learn more about WPTO's strategy development and to provide input on the objectives, questions, and directions being explored.

Upcoming Conferences

The International Conference on Composite Materials (ICMM 2023) will take place from 30 July to 4 August 2023 in Belfast, Northern Ireland. Register here.

The 15th European Wave and Tidal Energy Conference (EWTEC 2023) will take place on 3-7 September 2023 in Bilbao, Spain. Register here.
Upcoming Symposium

The International Network on Offshore Renewable Energy (INORE) is hosting the 24th INORE Symposium on 7-11 November 2023 in Viana do Castelo, Portugal. Symposium activities, food,

and lodging are free; attendees cover travel. Graduate students, early-stage researchers, and young professionals in offshore renewable energy can apply to attend through 31 July 2023.

New Documents on Tethys Engineering

Tethys Engineering hosts thousands of documents on the technical aspects of marine energy research and development, including journal articles, conference papers, and reports.

[A hybrid model for online short-term tidal energy forecasting](#) – **Monahan et al. 2023**

> A hybrid model is proposed for the short-term online prediction of tidal currents. The harmonic residual analysis (HRA) model is designed to augment the numerical schemes employed by tidal energy installations by forecasting the residual error of existing methods. Using a combination of techniques from Information and Fractal Theory, a novel component selection criterion for singular spectrum analysis (SSA) is used to remove true noise from the residual time series and to decompose the signal into components that are appropriate for linear-recurrent forecasting (LRF) and high order fuzzy time series (HOFTS) respectively. The performance of the HRA method is evaluated using a combination of simulated and real data from sites in the United Kingdom and the United States.

[The potential of salinity gradient energy based on natural and anthropogenic resources in Sweden](#) – **Essalhi et al. 2023**

> This paper presents assessment of natural and anthropogenic sources of blue energy within Swedish territory to identify suitable spots for implementing new projects. The natural energy potential of salinity gradients was found to be higher in southwest Sweden, and a national energy resource potential of 2610.6 MW from seawater/river water mixing will be reduced to a technical potential ranging from 1044.3 MW to 1825.4 MW considering technical and environmental constraints. It has been found that the theoretical extractable energy potential in Sweden is equivalent to 13% of the total electricity consumption and 6.2% of the total final energy consumption by energy commodities. Anthropogenic water sources were also highlighted as promising low and high-concentration solutions for SGE extraction.

[Optimization of the Hydrodynamic Performance of a Wave Energy Converter in an Integrated Cylindrical Wave Energy Converter-Type Breakwater System](#) – **Ding et al. 2023**

> Wave energy converters (WECs) are built to extract wave energy. However, this kind of device is still expensive for commercial utilization. To cut down the cost of WECs by sharing the construction cost with breakwaters, an integrated cylindrical WEC-type breakwater system that includes a cylindrical WEC array in front of a very long breakwater is proposed to extract wave energy and attenuate incident waves. This paper aims to optimize the performance of the integrated cylindrical WEC-type breakwater system. A computational fluid dynamics tool, openfoam®, and a potential flow theory-

based solver, HAMS®, are utilized. openfoam® provides viscosity corrections to a modified version of HAMS® in order to accurately and efficiently predict the integrated system's performance.

Marine Energy Software Highlight

Marine Energy Software is a collection of commercial and open-source software relevant to marine energy development, including simulating devices, and processing and analyzing data.

Capytaine v2.0 Release

Capytaine is a Python package for the simulation of the interaction between water waves and floating bodies in frequency domain. It is built around a full rewrite of the version 2 of the open source Boundary Element Method (BEM) solver Nemoh for the linear potential flow wave theory. Capytaine v2.0 features directly setting the wavelength or wavenumber of a problem, reconstructing the fluid velocity in post-processing, improved consistency of the physical conventions within the code, and bug fixes and performance improvements. It also includes a major update of the build toolchain, including release of precompiled binaries on PyPI (pip).

BEMRosetta Release

BEMRosetta allows users to load Boundary Element Method (BEM) hydrodynamic coefficients from one format and save them in another. In addition, it allows users to compare the results obtained between programs, the results between similar geometries and the same geometry with different discretization levels. BEMRosetta allows to view and visually compare the meshes from different BEM programs, like WAMIT, HAMS, Nemoh, Capytaine, and others. New features of BEMRosetta include loading quadratic transfer function (QTF) data from Nemoh.

Next-Generation Marine Energy Software Needs Assessment

A team led by Sandia National Laboratories (SNL) and the National Renewable Energy Laboratory (NREL) recently published the Next-Generation Marine Energy Software Needs Assessment report. The purpose of the Next-Generation Marine Energy Software effort is to understand the existing software landscape, and to prioritize development of the next-generation of WPTO-sponsored software that will best support the needs of the marine energy community. To better understand the marine energy software landscape, a review of existing software applicable to marine energy was completed. This software landscape was then presented during two workshops, led by SNL and NREL, to frame discussions regarding existing software gaps and identify areas of need. This report details the findings from the needs assessment, and highlights opportunities for future marine energy software development. The authors of the report welcome feedback from the broader marine energy community on the needs assessment.

Telesto Highlight

[Telesto](#) *provides information and guidance for testing, measurement, and data analysis for marine energy research, development, and demonstration, as well as additional resources.*

[Marine Energy Environmental Toolkit for Permitting and Licensing](#)

The Marine Energy Environmental Toolkit for Permitting and Licensing is a one-stop shop for the marine energy community to access, review, and compile relevant regulatory and spatial information and available literature to increase the efficiency and effectiveness of the marine energy permitting and licensing process in the United States. The Toolkit compiles and distills environmental, spatial, regulatory, and scientific data into one web-based platform that features a data catalog and mapper, regulatory guidelines and flowcharts, searchable documents, and a reporting tool that compiles information based on user input. The latest addition to the Toolkit is the Biological Assessment (BA) Repository, which currently contains BAs from several U.S. marine energy projects.

News & Press Releases

[France boosts tidal energy sector with €65M for FloWatt project](#) – **Offshore Energy**

The government of France has committed to provide at least €65 million of funding and dedicated revenue support for the pioneering tidal energy farm FloWatt, in an effort to support the commercialization of tidal energy industry. Announced by the French minister for energy transition, Agnès Pannier-Runacher, the move signals a huge step forward for the tidal energy sector in France, and lights the way for other EU member states to follow. Flowatt will be the biggest tidal farm in the world, with the most turbines and largest capacity – a true flagship project. Due to start operating in 2026, France's first tidal pilot farm will meet the electricity needs of 20,000 people for 20 years. Building on a successful two-year test program in Paimphol-Bréhat, the 7 2.5MW turbines will be installed in one of the most powerful tidal sites in the world, Normandy's Raz Blanchard.

[Eco Wave Power's Jaffa Port Wave Energy Station Receives Final Grant Funding from Israeli Ministry of Energy, Marking the Official Completion of the Project](#) – **Eco Wave Power**

Eco Wave Power recently announced that its landmark EWP-EDF One wave energy power station in the Port of Jaffa, Israel, has received the final grant funding from the Israeli Ministry of Energy, marking the official completion of the project. The wave energy project, executed in collaboration with EDF Renewables IL, and with co-funding from the Israeli Ministry of Energy, which recognized the Eco Wave Power's technology as a "Pioneering Technology", is set to be Israel's first onshore wave energy power station, officially connected to the national electrical grid. The EWP-EDF One power

station has an installed capacity of 100 KW and is made up of 10 floaters along the Port of Jaffa's pre-existing breakwater.

[Sea Grant and U.S. Department of Energy Fund Projects Seeking to Advance Energy Transitions in Remote and Island U.S. Communities](#) – **U.S. DOE**

For island and remote communities in the United States, developing resilient electricity infrastructure and energy systems can be fraught with challenges. These locations often rely on expensive, unreliable energy systems that are vulnerable to volatile energy supplies and costs, natural disasters, and impacts from climate change. That's why the NOAA's National Sea Grant College Program, in partnership with the U.S. DOE's WPTO, is supporting three projects in Alaska, Guam, and Hawai'i that will examine how adoption of ocean renewable energy could support sustainable energy systems. Sea Grant and DOE selected and recommended three projects for a total of $800,000 in funding to conduct community engagement activities that will help illuminate community values, perceptions, and cultural contexts around energy innovation and resilience.

[£7.5m of new funding for the Supergen ORE Impact Hub](#) – **Supergen Offshore Renewable Energy (ORE) Hub**

The Supergen ORE Hub, led by the University of Plymouth, has secured £7.5m of Engineering and Physical Sciences Research Council (EPSRC) funding that will reinforce its position at the forefront of the UK's net zero revolution. The Supergen ORE Impact Hub has been awarded £7.5million by EPSRC – part of UK Research and Innovation – to accelerate the impact of current and future ORE devices and systems and to drive the UK towards its net zero commitments. The investment forms part of a £53million investment by UK Research and Innovation designed to boost knowledge, innovation and new technologies that will decarbonise the energy sector. The Impact Hub will build on work carried out by the existing Supergen ORE Hub, created in July 2018 to champion and maintain the UK's wave, tidal and offshore wind expertise.

[Carnegie Clean Energy moves forward with EuropeWave project](#) – **Offshore Energy**

Carnegie Clean Energy, through its wholly owned subsidiary CETO Wave Energy Ireland (CWEI), has applied to the tender for the third phase of EuropeWave project, requesting approximately €3.75 million to deliver a CETO wave energy prototype at a European test site. The EuropeWave PCP Program is an innovative and competitive stage-gate program designed to advance promising wave energy converter systems and targeted to prove technical and commercial viability for large scale deployment for future national/regional development programs and/or private investment. CWEI recently submitted Phase 2 deliverables, including deliverables from the tank testing campaign in which Carnegie's reinforcement learning controller was successfully demonstrated in collaboration with Hewlett Packard Enterprise, a first for the wave energy industry.