



7 April 2023

The Portal and Repository for Information on Marine Renewable Energy ([PRIMRE](#)) provides access to marine energy data, information, and resources in the United States 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](#)
[Upcoming Events](#)

[Tethys Eng. Documents](#)
[Telesto Highlight](#)

[Atlas Update](#)
[News & Press Releases](#)

Announcements

MECC Applications Open

The U.S. Department of Energy's (DOE) Water Power Technologies Office (WPTO) has opened applications for the 5th annual [Marine Energy Collegiate Competition \(MECC\)](#), which challenges multidisciplinary teams to develop solutions for ways marine energy can help power the blue economy. Both U.S. and non-U.S. institutions can apply, but only U.S. institutions are eligible for WPTO funding. Applications are due 24 April 2023. Applications for the 2nd [Hydropower Collegiate Competition \(HCC\)](#) are also open.

Internship Applications Open

The U.S. DOE's Office of Science has opened applications for the [Science Undergraduate Laboratory Internships \(SULI\)](#) program, [Community College Internships \(CCI\)](#) program, and [Visiting Faculty Program \(VFP\)](#). Informational webinars will take place in April. Applications are due by 5:00pm EDT (9:00pm UTC) on 25 May 2023.

New Wave Energy Prize

The U.S. DOE's WPTO recently 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.

Request for Information

On behalf of the Mowachaht/Muchalaht First Nation, Barkley Project Group is releasing a [Request for Information](#) to determine wave energy converter technologies that are capable of integrating with a microgrid system at Yuquot (Nootka Island, British Columbia). Interested respondents should provide detailed information on how they propose to engage with the Yuquot Microgrid Project within the [summary document](#) by 5:00 pm PDT on 14 April 2023.

Calls for Abstracts

The Pan American Marine Energy Conference (PAMEC) Association is now accepting [Expressions of Interest](#) to submit an extended abstract for presentation at [PAMEC 2024](#) through 15 April 2023. Extended abstracts will be due 26 June 2023. PAMEC will take place on 22-24 January 2024 in Barranquilla, Colombia, with pre-conference workshops on 19-20 January 2024.

The [Call for Abstracts](#) for [Clean Currents 2023](#) is now open through 15 April 2023. Clean Currents will take place 10-13 October 2023 in Cincinnati, Ohio, U.S. Opportunities include classroom presentations, technology/innovation sessions, poster presentations, and workshops.

The [Call for Abstracts](#) for [OCEANS 2023 Gulf Coast](#) is now open through 17 April 2023. OCEANS 2023 Gulf Coast will take place 25-28 September 2023 in Biloxi, Mississippi, U.S.

The [Call for Abstracts](#) for the [University Marine Energy Research Community \(UMERC\) 2023 Conference](#) is now open through 23 April 2023. UMERC 2023 will take place on 4-6 October 2023 in Durham, New Hampshire, U.S. Apply for travel/registration support by 15 June 2023.

The [Call for Abstracts](#) is now open for the [Structures in the Marine Environment \(SIME\) 2023 Conference](#) until 12 May 2023. SIME 2023 will take place on 28 June 2023 in Glasgow, Scotland.

The [Call for Sessions and Town Hall Proposals](#) for Ocean Sciences Meeting 2024 is now open through 24 May 2023. Ocean Sciences Meeting 2024 will take place from 18-23 February 2024 in New Orleans, Louisiana, U.S. and online.

Funding & Testing Opportunities

The Sustainable Blue Economy Partnership, a Horizon Europe co-funded partnership, recently announced its first [Joint Transnational Call](#) to support transnational research and innovation projects related to the blue economy. Pre-proposals are due 14 April 2023.

The U.S. DOE has opened applications for the [Energy Transitions Initiative Partnership Project \(ETIPP\)](#) for remote and island communities seeking technical assistance to transform their energy systems and increase energy resilience. An [informational webinar](#) will take place at 1:00pm MDT (7:00pm UTC) on 11 April 2023. Applications are due 19 May 2023.

The U.S. DOE's Office of Clean Energy Demonstrations [recently announced](#) \$300 million for projects that increase energy affordability and promote climate resilience and \$15 million for the [Energizing Rural Communities Prize](#) to help rural communities build capacity needed for clean energy development and deployment. Concept papers for the [funding opportunity](#) are due 14 April 2023, and submissions for the first round of the prize are due 24 May 2023.

Student & Employment Opportunities

Pacific Northwest National Laboratory is seeking a [Blue Economy Specialist](#) with a strong background in the blue economy to support regional and national maritime sectors accelerate maritime innovation and sustainability. Applications are due by 29 April 2023.

The University of Strathclyde is offering a [funded PhD position](#) for a UK student to contribute to the project, AI-Based Approaches for Ocean Forecast and Development of Ensemble Ocean Climate Data. Applications are due 23 May 2023.

Upcoming Events

Upcoming Webinars

Pacific Northwest National Laboratory and National Renewable Energy Laboratory are hosting a Marine Energy Career Panel to highlight staff across various disciplines (engineering, biology, science communications, etc.) to discuss their marine energy careers including their background, education, career path, and current projects. The webinar will be held on 10 April 2023 at 3:00pm PDT (10:00pm UTC). Register [here](#).

The European Technology & Innovation Platform for Ocean Energy (ETIP Ocean) is hosting a [webinar](#) on 27 April 2023 at 3:00pm CEST (1:00pm UTC). During the webinar, speakers from the Tidal Stream Industry Energiser Project (TIGER) project will share guidelines for project permitting in the UK and France. Register [here](#).

Upcoming Workshops

[PRIMRE](#) is hosting a workshop focused on geospatial and permitting and licensing tools for U.S. marine energy projects on 18 April 2023 from 9:00-11:00am PDT (4:00-6:00pm UTC). The workshop will feature presentations on the [Marine Energy Environmental Toolkit for Permitting and Licensing](#), the [Marine Energy Atlas](#) and other geospatial data within PRIMRE, and PRIMRE capabilities to support marine energy projects. Register [here](#).

After successful Ocean Energy Systems ([OES](#)) Workshops on Marine Energy Data Sharing in 2021 and 2022, the U.S.-based [PRIMRE](#) team is hosting a third online workshop on 2 May 2023 from 3:00-5:00 PM UTC. We are particularly looking for those who develop or manage marine energy databases, portals, and/or tools around the world. If you are interested in attending, please email tethys@pnnl.gov.

Upcoming Conference

[OCEANS 2023 Limerick](#) will take place on 5-8 June 2023 in Limerick, Ireland. Early bird registration is available [here](#) before 25 April 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.

[Practical power absorption assessment limits for generic wave energy converters](#) – Zou et al. 2023

There lacks a generic representation of the wave power absorption of devices across dimensions, shapes, and resource conditions. A conventional resource assessment approach only evaluates the wave power based on wave characteristics, which is insufficient to capture the practical power absorption variations between WEC archetypes. In this paper, a novel WEC net power assessment (WNPA) method is proposed and is generally applicable to any arbitrary WECs design. Two theoretical upper bounds of wave power absorption are adopted and derived for different types of WECs. Numerical simulations are conducted to apply this novel technique to assess the net power available to different WECs at the Wave Energy Test Site (WETS), Hawaii and the PacWave site, Oregon over 11 years.

[Temporal and spatial characterisation of tidal blade load variation for structural fatigue testing](#) – Lam et al. 2023

To achieve the full potential of tidal stream energy, developers are incentivised to use larger blades on tidal turbines. This requires validation of blade structural designs through full-scale blade fatigue tests to de-risk the engineering process. However, the loading scenarios encountered in testing facilities and those in reality could be significantly different, which induces errors in blade loads and fatigue damage. Here we characterise the unsteady tidal blade load variation through model-scale experiment. It was found that the standard deviations of thrust load range between 200% and 637% of condition without waves. This results in an increase of predicted fatigue damage between 6% and 18%.

[Theoretical analysis on extraction-ejection combined power and refrigeration cycle for ocean thermal energy conversion](#) – Zhang et al. 2023

This study proposes a novel extraction–ejection combined power and refrigeration cycle for ocean thermal energy conversion (OTEC). Ammonia-water is utilized as the working fluid. By introducing a steam-turbine extraction-gas-driven ejector between the evaporator and the absorber, the gas flows into the absorber after it is cooled, thereby enabling the cycle to recover pressure-difference energy and produce both power and

cooling outputs. A mathematical model is established for the energy and exergy analyses, and a genetic-algorithm-based optimal design was developed to determine the maximum exergy efficiency. Furthermore, a comparative study of traditional OTEC cycles is conducted. The results showed that at seawater temperatures of 30 °C and 5 °C, the refrigeration temperature reached -20 °C.

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.

[Lessons Learned Collected from the Marine Energy Sector](#)

The PRIMRE team recently conducted a series of interviews with marine energy subject matter experts to collect lessons learned from past and present marine energy research, development, and deployment projects in the United States. The study sought to capture these lessons to help ensure that knowledge is not lost, past mistakes are avoided, and that the sector can capitalize on hard-won successes. The team has now published an interactive page on PRIMRE that outlines the methods for data collection and analysis, presents the lessons learned, and highlights links to relevant resources. Overall, the lessons learned, challenges, and successes identified fit into 17 themes that span the entire marine energy development lifecycle (e.g., funding, environmental monitoring).

Marine Energy Atlas Update

The [Marine Energy Atlas](#) is an interactive mapping tool that maps high-resolution, spatially comprehensive data on global wave, tidal, riverine, ocean current, and ocean thermal resources.

[Recent Updates to the Marine Energy Atlas](#)

PRIMRE's geospatial Knowledge Hub, the Marine Energy Atlas, now features new data and a revamped user interface. International data on marine energy projects at different phases are now accessible through the Atlas. Users can quickly get information about projects that are in planning, operational, or dormant phases that utilize wave, tidal, salinity gradient, and ocean thermal energy conversion technologies. The streamlined user interface on the Atlas also makes it easier to preview data and metadata before downloading any data through updated query tools. Downloading data is more efficient as well – users can download data by clicking on a layer and selecting parameters of interest, or use custom Python code to download large chunks of data.

News & Press Releases

History in Israel: National Electric Company and Eco Wave Power Enter into Country's First-Ever Wave Energy Power Purchase Agreement – Eco Wave Power

Eco Wave Power Global recently announced it has entered into an official Power Purchase Agreement with the Israeli National Electric Company, based on the official Feed-in Tariff which was set for the Company's newly-installed wave energy project at the Port of Jaffa in Tel Aviv, Israel. With the Power Purchase Agreement in place, a private examiner has successfully approved the technology's grid synchronization. Next, the Israeli Electric Company will perform its own synchronization test and then will officially connect the EWP-EDF One wave energy project to Israel's energy grid. Once connected, the EWP-EDF One Project will represent the first time in the country's history that electricity produced by the power of waves will be transmitted to Israel's national electric grid.

One Year Later, Finalists Reflect On the Waves to Water Prize – U.S. DOE WPTO

The Waves to Water Prize, funded by the U.S. DOE WPTO, challenged innovators to develop small, modular, wave energy-powered desalination systems. In April 2022, four teams visited North Carolina's Outer Banks to deploy their wave-powered desalination prototypes. In the end, all four devices produced desalinated water and weathered the waves of the Atlantic Ocean. To celebrate the one-year anniversary of the prize's final event, called the DRINK Finale, WPTO asked the four finalists—Oneka Technologies, WATER BROS, MarkZero SeaPower (MZSP), and Project 816—to reflect on the experiences, impacts, and inspirations the prize ignited. The finalists shared insights from the competition and what they're doing one year later.

InfinityWEC to demonstrate performance with enhanced model-based predictive control in scale 1:3 sea trials – Ocean Harvesting

Ocean Harvesting is collaborating with experts in model-based predictive control to implement recent research and increase the performance of InfinityWEC in the upcoming scale 1:3 sea trials. Use of predictive control strategies in a point-absorbing wave energy converter (WEC) greatly increases the annual energy production compared to non-predictive reactive control. During 2023, Ocean Harvesting will implement the new controller and optimize InfinityWEC's performance through numerical simulations. The controller will then be implemented in a high-fidelity simulation environment, and in the real-time control system in our scale 1:10 PTO test rig, in preparation for the scale 1:3 sea trial project planned to start in January 2024.

Historic wave and tidal energy legislation presented for California – Offshore Energy

The California Senate Bill 605 for wave and tidal energy, introduced by senator Steve Padilla of Chula Vista, aims to promote and facilitate the development and growth of the marine energy industry in California. The bill, introduced by senator Padilla on February 15, 2023, calls for a comprehensive and collaborative study to evaluate the feasibility and benefits of using wave energy and tidal energy. It also requires the state's Energy

Commission to develop a strategic plan for the deployment of wave and tidal energy technologies, infrastructure, and facilities. The SB 605 bill recognizes the vast benefits that marine energy provides, saying that if developed and deployed at scale, wave and tidal energy ‘can provide economic and environmental benefits to the state and the nation’.

Bluenergy launches its tidal energy Proof of Value project off Raffles Lighthouse – Bluenergy

Bluenergy Solutions recently announced the launch of its Proof of Value (POV) project. The POV project, which entails a ‘Plug and Play’ solution that covers clean energy generation, storage and distribution, is located offshore – near the Raffles Lighthouse on Pulau Satumu, about 14 kilometres south of the main island of Singapore. Projected to run for a period of six months, the key objectives of the POV project are (i) the supply of clean tidal energy to the Raffles Lighthouse (ii) the replacement of diesel consumption with clean tidal energy, generated in the waters near Raffles Lighthouse (iii) the reduction of carbon footprint through the decarbonization of port waters and islands, and (iv) the proof of the technology’s commercial viability.