

## 16 May 2025

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

Announcements	Tethys Eng. Documents	Software Highlight
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#### Announcements

Tethys User Feedback Survey

We are seeking feedback on Tethys, which is one of seven PRIMRE Knowledge Hubs! Please complete this 3-minute <u>Tethys User Feedback Survey</u> to help us understand how the wind and marine energy communities use Tethys and determine how we can continue to improve the site.

Tethys User Feedback Survey
We are requesting feedback on <u>Tethys</u> , an online knowledge hub with information and resources on the environmental effects of wind and marine energy around the world. This short, 3-minute survey will cover the following topics:
<ul><li>User background</li><li>How Tethys is used</li><li>How Tethys can be improved</li></ul>
Please share this survey with any colleagues that may be able to provide additional information, and email <u>tethys@pnnl.gov</u> if you have any questions or additional feedback.
1. What is your role?
○ Researcher
O Developer
○ Regulator

#### Request for Information

Pacific Northwest National Laboratory (PNNL) is <u>requesting information</u> from developers, owners, and/or manufacturers of small-scale current energy devices capable of deployment and operation to power coastal aquaculture operations. Responses are due 6 June 2025.

#### Calls for Abstracts & Papers

The <u>Call for Abstracts</u> for the <u>Marine Renewables Canada 2025 Conference & Exhibition</u> is open until 16 May 2025. The event will take place 12-14 November 2025 in Halifax, Canada.

The Call for Proposals for sessions and town halls at the <u>2026 Ocean Sciences Meeting (OSM)</u> is open until 28 May 2025. OSM will take place on 22-27 February 2026 in Glasgow, Scotland.

POET is accepting panel and presentation submissions for the <u>2025 University Marine Energy</u> <u>Research Community (UMERC) Conference and Ocean Renewable Energy Conference (OREC)</u> through 31 May 2025. UMERC+OREC 2025 will take place 12-14 August 2025 in Corvallis, Oregon (USA). Early bird registration is also available through 31 May 2025.

#### Funding & Testing Opportunities

The Testing Expertise and Access for Marine Energy Research (TEAMER) program, sponsored by the U.S. Department of Energy and directed by the Pacific Ocean Energy Trust (POET), is accepting <u>Request for Technical Support (RFTS) 16</u> applications through 6 June 2025 to support marine energy testing and development projects. Open Water Support applications can be submitted any time. TEAMER also offers <u>Results Dissemination Support</u> (e.g., travel support).

The U.S. Department of Energy's <u>Energy Technology Innovation Partnership Project (ETIPP)</u>, which helps U.S. coastal, remote, and island communities become more energy resilient, has opened applications for new communities to join. Applications are due 27 June 2025.

#### Career Opportunities

University of Highlands and Islands (UHI) North, West and Hebrides is recruiting a <u>Research</u> <u>Associate in Active Acoustic Monitoring</u>, <u>Research Associate in Passive Acoustic Monitoring</u>, <u>Research Associate in Marine Sensing</u>, and <u>Research Associate in Algorithm Development and</u> <u>Data Science</u> to join the Environmental Research Institute (ERI) and work on environmental interactions and ecosystem effects of offshore renewable energy. Applications due 16 May 2025.

PNNL is seeking a <u>Post Doctorate Research Associate</u> to conduct coastal modeling research related to 1) marine energy resource modeling (wave, tide, ocean current and ocean thermal conversion) characterization using unstructured-grid models and 2) coastal biogeochemistry and plastic modeling. Applications due 22 May 2025.

PNNL is also seeking an <u>Operations Specialist</u> to assist with the safe conduct of operations associated with the PNNL Sequim Campus. The campus supports a variety of ocean-based

sectors including renewable energy development, coastal resilience and planning, and research and technology development. Applications due 28 May 2025.

PNNL is also looking for a <u>Marine Operations Manager</u> to manage marine operations and administration of research vessels and ensure the safe and efficient operations of equipment and personnel. Applications are due 9 June 2025.

Delft University of Technology (TU Delft) is looking for a <u>Postdoc on Climate Change Wave</u> <u>Modelling for Marine Renewable Energies</u>. The Postdoc will work on developing robust wave hindcasts/forecasts at high spatial resolutions, analyze long-term metocean conditions, and extreme events, with a particular focus in marine renewables. Submissions are due 4 June 2025.

TU Delft is also offering a <u>PhD Position on Impacts of Climate Change on Wave Energy</u> <u>Resources</u>. This PhD will focus on long-term impacts on wave resources in the European Seas as part of a European Project, looking into numerical wave modelling and adaptation of floating wind and wave energy converters. Submissions are due 4 June 2025.

The Fundy Ocean Research Centre for Energy (FORCE) is seeking a <u>Director of Science & Env</u> <u>Programs</u> to help shape FORCE's scientific direction and lead the development, implementation, and technical oversight of its strategic science initiatives and marine environmental programs.

## **Upcoming Events**

#### Upcoming Webinars

TEAMER has rescheduled its webinar, "<u>How to Write a Good Test Plan</u>", to 21 May 2025 from 11:00am-12:00pm PST (6:00-7:00pm UTC). During the webinar, PNNL mechanical engineer Dr. Rob Cavagnaro will discuss what makes up a good scientific test plan, including info specific to marine energy research and the TEAMER program. <u>Register here.</u>

The Marine Alliance for Science and Technology for Scotland (MASTS) is hosting an Open Forum Session, "<u>Anthropogenic Energy in the Marine Environment</u>", on 4 June 2025 from 10:00-11:00am BST (9:00-10:00am UTC). The session will include presentations on energy pollution from offshore wind, energy pollution by ships, and improving tidal energy capture by a partial-width array using Flow Alteration by Introduced Roughness (FLAIR). <u>Register here.</u>

#### Upcoming Conferences

The <u>16th European Wave and Tidal Energy Conference (EWTEC 2025)</u> will take place between 7-11 September 2025 in Madeira, Portugal. Early bird registration ends 20 June 2025.

The <u>Ocean Energy Europe Conference & Exhibition (OEE 2025)</u> will take place on 4-5 November 2025 in Brussels, Belgium. Early bird registration ends 31 July 2025.

### New Documents on Tethys Engineering

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

#### Advanced measuring techniques for tidal turbine blades during structural testing – Thanethirige et al. 2025

The validation of novel tidal turbine systems offers significant advantages to developers, enabling them to deploy the devices at various potential tidal sites worldwide with confidence that their designs will be able to withstand loading conditions during operation. A method used to help achieve this is to conduct a structural testing program of their tidal turbine blades, in accordance with DNV-ST-0164 and IEC DTS 62600-3 standards. Within this scope, developers are demanding accelerated, efficient, and reliable testing programs to de-risk innovative designs while traditional instrumentation methods have considerable disadvantages. Therefore, this study addresses these challenges by investigating the use of modern advanced measurement tools and offering recommendations to enhance the structural testing process of tidal turbine blades, aiming to improve testing effectiveness and deliver high-quality results within a shorter time frame.

#### **UMERC PTO and Controls Working Group Report** – Quinn et al. 2025

Drawing from expert suggestions from a series of workshops and working groups, this report lays out a coordinated strategy for the development of standardized, scalable, and certifiable power take-off (PTO) technologies that can serve a range of applications—from off-grid autonomous systems to large-scale grid-connected farms. Recommendations span nine critical focus areas including: standardizing PTO design processes and certification frameworks to streamline development and reduce costs, marinizing and weatherizing electrical machines for long-term reliability in ocean and riverine environments, developing power electronics for wide voltage ranges to enhance energy conversion efficiency and grid integration, and advancing survivability mechanisms to protect PTOs from extreme sea states and prolonged fatigue loads.

## From TPL assessment to design optimization: Wave energy converter control co-design applied to the RM3 – Gaebele et al. 2025

The Reference Model (RM) project developed six marine energy converter concepts using a sequential design methodology, which, while widely adopted in the industry, often overlooks interactions between system components, resulting in suboptimal designs. One such example is the Reference Model 3 (RM3), a two-body point absorber wave energy converter (WEC). An assessment using the Technology Performance Level (TPL) revealed that RM3's low power-to-cost ratio, partly due to expensive steel construction, limits its techno-economic performance. This study aims to redesign RM3 by reducing its scale and employing control co-design to integrate WEC and Power TakeOff (PTO) dynamics, constraints, and cost considerations within an optimization framework.

## **MHKDR Update**

The Marine Hydrokinetic Data Repository (<u>MHKDR</u>) is the repository for all data collected using funds from the U.S. DOE's WPTO, including results from tank tests and open sea trials.

#### **TEAMER:** Cross-flow Turbine Hydrodynamics – Athair et al. 2025

The objective of this work is to validate RANS and LES computations of cross-flow turbine hydrodynamics using laboratory scale measurements. Validation involves the comparison of time-and phase averaged performance metrics and flowfields across the widest practical range of turbine kinematics and geometry. Turbine performance was monitored use a series of six-axis load cells and flowfields were measured using a particle image velocimetry (PIV), both within the rotor and in the wake. Six test cases were chosen. Three involve operating a turbine with symmetric foils at a constant rotation rate and under intracycle speed control (both optimally and sub-optimally).

#### Wave Measurements taken NW of Culebra Island, Puerto Rico, 2023 - McVey et al. 2023

Wave and sea surface temperature measurements collected by a Sofar Spotter buoy in 2023. The buoy was deployed on July 27, 2023 at 11:30 UTC northwest of Culebra Island, Puerto Rico, (18.3878 N, 65.3899 W) and recovered on Nov 5, 2023 at 12:45 UTC. Data are saved in netCDF format, organized by month, and include directional wave statistics, GPS, and SST measurements at 30-minute intervals. Figures produced from these data are provided as well. They include timeseries of wave height/period/direction and SST, GPS location, wave roses, and directional spectra. Additionally, raw CSV files from the Spotter's memory card can also be found.

# <u>Fish Detection AI, sonar image-trained detection, counting, tracking models</u> – Gutstein et al. 2024

The Fish Detection AI project aims to improve the efficiency of fish monitoring around marine energy facilities to comply with regulatory requirements. Despite advancements in computer vision, there is limited focus on sonar images, identifying small fish with unlabeled data, and methods for underwater fish monitoring for marine energy. A Faster R-CNN (Region-based Convolutional Neural Network) was developed using sonar images from Alaska Fish and Games to identify, track, and count fish in underwater environments. Supervised methods were used with Faster R-CNN to detect fish based on training using labeled data of fish.

## **Marine Energy Software Highlight**

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

#### SAM 2025.4.16 Release

The <u>System Advisory Model (SAM)</u> is a free techno-economic desktop application for the analysis of energy technologies, including marine energy wave and tidal systems as well as battery storage. <u>SAM 2025.4.16</u> features the addition of drilling cost details in the geothermal cost model, a new counterflow heat exchanger option in the Industrial Process Heat models, and improvements to the electric battery degradation and dispatch models with the capability to incorporate retail rates for discharging batteries to the grid.

#### BEMRosetta v2025 April Release

<u>BEMRosetta</u> 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 users to view and visually compare the meshes from different BEM programs, like WAMIT, HAMS, Nemoh, Capytaine, and others. The <u>BEMRosetta v2025 April release</u> features a fix for a bug in the automatic generation of the lid mesh.

#### **Call for Contributions: Marine Energy Software**

Like most open-source resources, the more information users contribute, the better the resource becomes! The Marine Energy Software knowledge hub is no different. With each software addition to the knowledge hub, the better the resource becomes for users in the marine energy industry. Have a software you'd like to contribute to the Marine Energy Software knowledge hub? Visit the <u>Register Software</u> page to add your software!

### **News & Press Releases**

#### CorPower Ocean to develop UK's largest wave energy array at EMEC. - CorPower

CorPower Ocean has signed a berth agreement to build a 5 MW wave energy project at the European Marine Energy Centre (EMEC) in Orkney, Scotland. Scheduled for deployment in 2029, the 5 MW array is expected to become the UK's largest wave energy project. It will be deployed at EMEC's grid-connected Billia Croo wave energy test site and comprise of 14 wave energy converters (WECs), operating for up to 15 years. The WECs feature a 9 metre diameter spherical composite hull – one of the strongest shapes in nature – which drives the movement of the power take-off as it responds to passing waves. Key innovations include CorPower Ocean's WaveSpring technology, which amplifies the motion and power capture in regular sea states, and a proven storm protection system that locks down the device during extreme conditions and enables safe offshore access for maintenance.

#### Exowave completes factory acceptance test of its wave energy system (Video) – Offshore Energy

Danish wave energy technology company Exowave has completed the factory acceptance test (FAT) of its wave energy converter (WEC) power take-off (PTO) system, marking a step forward in its roadmap to deliver megawatt-scale wave energy plants in the Danish North Sea by 2030. The test was independently witnessed by DNV at Semco Maritime's facilities in Esbjerg. According to Exowave, the PTO system reached up to 78% efficiency across various system pressure settings, confirming its ability to convert wave-induced mechanical energy into hydraulic power. Just in March, the company revealed entering an important phase of developing its wave energy technology, as the power take-off (PTO) system is set for wet testing in the coming weeks.

#### SKF announces wave energy technology partnership with Carnegie Clean Energy – SKF

SKF announces a partnership with wave energy technology development company Carnegie Clean Energy Limited to deliver Carnegie's CETO's Power Take-Off (PTO) system. CETO is a unique, fully submerged, point absorber type wave energy technology where a submerged buoy sits a few metres below the surface of the ocean and moves with the ocean's waves. This motion drives a PTO system that converts it into electricity. As a first step towards a long-term technical partnership on the commercialisation of Carnegie's CETO wave energy technology, SKF and Carnegie are collaborating on the design and delivery of the PTO units. SKF provided early PTO bearing and shaft design activities under a Development Agreement between the companies.

#### <u>Atargis Energy trials indicate 1.96 MW potential for wave energy converter</u> – Offshore Energy

The U.S.-based renewable energy company Atargis Energy has unveiled results from its latest wave tank tests, claiming a step forward in utility-scale wave energy generation. According to the company, its 1:15-scale Cycloidal Wave Energy Converter (CycWEC) delivered shaft power generation of 150 W during recent trials. When scaled to full size, the system is estimated to achieve a power output of 1.96 MW, described by Atargis as "the highest power output ever recorded by a wave energy converter." The CycWEC system relies on lift-based hydrodynamics, a principle commonly used in wind turbines and propellers. Unlike point absorbers and attenuators, the CycWEC is designed as a wave termination device, aligned parallel to wave crests for improved energy capture.

## <u>TEAMER Network Director Announces RFTS 15 Technical Support Recipients</u> – TEAMER

On May 13, 2025, the U.S. TEAMER program announced the selection of 17 projects through its fifteenth RFTS, reflecting a total funding amount of over \$2.3 million. These

projects will receive support for testing expertise and access to numerical modeling, laboratory or bench testing, tank/flume testing, and expertise within the growing TEAMER Facility Network. Selected applicants, along with their supporting Facilities, will now submit their completed Test Plans, a requirement before assistance activities can commence. Applications for RFTS 16 are currently being accepted through June 6, 2025. Supported by the U.S. Department of Energy and directed by POET, TEAMER accelerates the viability of marine renewables by providing access to the nation's best facilities and expertise to solve critical challenges, build knowledge, foster innovation, and drive commercialization.