PRIMRE BLAST

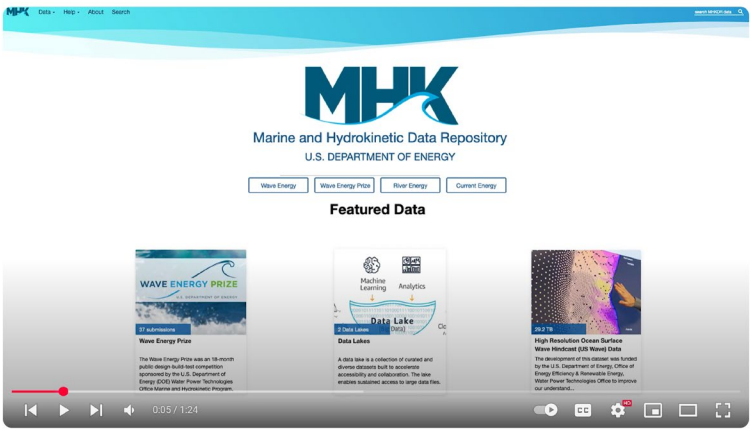
21 March 2025

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

New MHKDR Video

The PRIMRE team has released a new 2-minute video on the Marine and Hydrokinetic Data Repository (MHKDR) that highlights the Knowledge Hub's key features. Dive in to learn more!



Calls for Abstracts

The University Marine Energy Research Community (UMERC) has extended the deadline for the Call for Abstracts for the UMERC 2025 Conference until 21 March 2025 (TODAY). The conference will take place on 12-14 August 2025 at Oregon State University in Corvallis, Oregon, U.S. Reach out the UMERC Program if you can't reach the deadline.

The Call for Abstracts for the 12th Partnership for Research in Marine Renewable Energy (PRIMaRE) Conference is open through 30 March 2025. The conference will take place on 2-3 July 2025 at the University of Bristol in Bristol, England.

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 Request for Technical Support (RFTS) 16 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 Results Dissemination Support (e.g., travel support).

Career Opportunities

CorPower Ocean is looking to fill several vacancies, including a Composite Design Engineer, Marine Operations Engineer, Senior Mechanical Design Engineer, and Mechanical Design Engineer (Power Take-Off).

European Marine Energy Centre (EMEC) is looking for a Chemical Research & Development Specialist to support development and delivery of its synthetic fuels strategy and services and research and assess chemical, energy systems and synthetic fuel focused R&D and technical work on EMEC projects.

Upcoming Events

Upcoming Webinar

The Supergen Offshore Renewable Energy (ORE) Hub is hosting a webinar, "Community Perspectives of Wave Energy and Open-Water Testing at PacWave, Oregon", on 29 April 2025 from 4:00-5:00pm UTC. This session will explore the factors that influence public responses to new developments and help us to understand what may slow or hinder the planning and consenting processes. Register here.

Upcoming Conferences

The Supergen ORE Hub is hosting its Early Career Researcher Forum on 14 April 2025 and its Annual Assembly on 15 April 2025 at the University of Manchester in Manchester, England. Registration for both events is free.

The 44th International Conference on Ocean, Offshore and Arctic Engineering (OMAE 2025) will take place on 22-27 June 2025 in Vancouver, BC, Canada.

Upcoming INORE Symposia

The International Network on Offshore Renewable Energy (INORE) is hosting a North American Symposium in Boston, Massachusetts, U.S. on 9-13 June 2025 and a European Symposium in Aalborg, Denmark on 15-20 September 2025. Graduate students, early-stage researchers, or young professionals can apply to attend the events for free by 4 April 2025.

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.

Tidal stream energy resource characterization for powering the blue economy applications for Southeastern Alaska – Brand et al. 2025

> Southeastern Alaska is a remote coastal region characterized by many narrow tidal channels with significant potential tidal energy resources due to the large tidal range (4–6 m). Southeastern Alaska communities struggle with power reliability and often rely upon expensive and polluting diesel generators for electricity. Tidal energy is a reliable and renewable source of power that could be used to augment the region's power generation capacity. Previous regional-scale studies have found significant potential tidal energy resources in Southeastern Alaska; however, the resolution used in these studies is too coarse for detailed planning. In this study, we present a high-resolution (~50 m at the finest mesh size), validated model of tidal hydrodynamics for characterizing tidal energy resources for Southeastern Alaska.

Modeling and sea trial of a self-powered ocean buoy harvesting Arctic Ocean wave energy using a double-side cylindrical triboelectric nanogenerator – Jung et al. 2025

> Maximizing the output power of a triboelectric nanogenerator (TENG) system for ocean buoy applications requires an understanding of the effects of sea states and wave conditions on buoy motion. Previous studies have explored the hydrodynamics of buoys for wave energy harvesting using TENGs, but they often relied on simplified models that used a single wave period and pitch amplitude, which may not fully capture the complexity of real-world sea conditions. In this study, we present a numerical simulation model of Arctic-TENG buoy dynamics to predict and optimize its mechanical behavior in the Arctic Ocean. First, a local sea trial was conducted to collect empirical data on sea states and buoy motion. The data were used to validate the buoy simulation model, which agreed well with the sea trial results, with differences of 13.6 % and 13.2 % in root mean square angular displacement and angular velocity of buoy motion, respectively.

Experimental Study of the Wave Effects on a Ducted Twin Vertical Axis Tidal Turbine Wake Development – Linant et al. 2025

> Horizontal-axis turbines have been well-studied; however, there is a serious lack of information on the behaviour of vertical-axis turbines under unsteady operating conditions. Among unsteady flows, waves can cause significant mechanical fatigue and

modify the flow downstream of the tidal turbines. Consequently, this paper aims to characterize the effects of waves on the hydrodynamic performance and wake development of a 1/20 scale model of a ducted twin vertical axis 1 MW-rated demonstrator. Power measurements were taken from the turbine and the velocity measurements downstream of the machine using a three-component Laser Doppler Velocimeter. The results show that, in the presence of waves, the mean wake characteristics present greater average height and width compared to the current-only condition.

Telesto Highlight

Telesto provides information and resources about the development life cycle of marine energy, as well as information on lessons learned, metrics, economics, standards, and compliance.

Economics Page on Telesto

The Economics page on Telesto contains information pertinent to estimating the levelized cost of electricity (LCOE) for a marine energy project. A cost breakdown structure calls out all the different aspects, or items, of Capital Expenditures (CapEx) and Operational Expenditures (OpEx), which need to be estimated for the final calculation. Reference resources (wave period by wave height) are also included, which can be used to calculate Annual Energy Production (AEP) from a device of interest. Guidance from the U.S. Department of Energy's Water Power Technology Office on how to calculate LCOE is also available. Example calculations are also included, as well as a link to the National Renewable Energy Laboratory's (NREL) System Advisor Model (SAM), which can be used to estimate a value for AEP if the specific device design is not entirely complete. Further economic impact data can be obtained using NREL's Jobs and Economic Development Impacts (JEDI) model. Using the marine energy module of JEDI, users can estimate jobs created by a project during construction, operations, and maintenance. The economic impact on a community that hosts a marine energy project can be estimated as earnings from the new jobs and spending by those employees within the community.

Signature Projects Update

Signature Projects bring focus to a selection of research and development projects supported by the U.S. Department of Energy's Water Power Technologies Office and link to all the projects' reports, datasets, and associated papers.

Wave-SPARC (New Signature Project on PRIMRE)

For energy generation devices such as wave energy converters (WECs) and current energy converters (CECs), techno-economic performance should be considered early in the development process, when fundamental conceptual, operational and design choices have to be made. Sandia National Laboratories and the National Renewable Energy

Laboratory have developed assessment methods and identified technical challenges, both common and unique to the U.S. WEC and CEC industries. This effort, known as Wave-SPARC (Systematic Process and Analysis for Reaching Commercialization), has provided an opportunity for WEC and CEC technology developers to systematically improve their technologies to make them economically viable for the commercial market. The team will also deliver early stage concepts with high economic promise for the industry to further advance and commercialize.

News & Press Releases

CorPower Ocean and NTNU partner on AI-based wave energy project – CorPower Ocean

CorPower Ocean has secured financial backing from Vinnova, Sweden's national innovation agency, to adopt cutting-edge AI (Artificial Intelligence) and test its ability to drive performance and control in wave energy technology. The WACE (Wave energy AI-based Control Enhancement) Project is now underway and is set to run until November 2025. CorPower Ocean is being supported by project partner NTNU (Norwegian University of Science and Technology). It comes shortly after the Swedish tech developer secured EUR 32m Series B funding to support the commercial roll out of its technology taking wave energy towards a bankable mainstream energy source.

Dutch firm's wave energy tech delivers first kilowatts in North Sea – Offshore Energy

A wave energy device developed by Dutch wave energy company Slow Mill Sustainable Power has generated electricity from North Sea waves for the first time. According to Slow Mill Sustainable Power, the wave energy generator was tested off the coast of Scheveningen last week, marking a key milestone in its development. The technology, designed to work in the North Sea's relatively low waves, could complement offshore wind farms by utilizing existing infrastructure. The company said that it is now focusing on improving efficiency and further offshore testing. The Slow Mill 40 is a heave-and-surge wave energy converter (WEC) that uses the up-and-down and back-and-forth motion of the waves in the whole water column to produce clean power.

SHINES project launches to harness tidal and river energy potential in North-West Europe – Ocean Energy Europe

The SHINES project (Showcasing Hydrokinetic energy Innovations for Northwest European Energy Sovereignty)launches this week, bringing together 14 partners from France, Ireland, Belgium, the Netherlands, Switzerland, and Germany, with lead partner Fondation OPEN-C, and technology developers ORPC Ireland, SeaQurrent, and Inyanga Tech (Inyanga Marine Energy Group). Co-financed by Interreg North-West Europe under the 4th call for projects, SHINES is set to unlock the potential of tidal and river energy systems, an opportunity still largely untapped in the region. With a total budget of €10M, including 60% ERDF funding (€6M), this ambitious project led by OPEN-C Foundation will span from January 2025 to December 2028.

WaveGen Energy completes its wave energy technology testing in India, eyes next steps – Offshore Energy

> Renewable energy company WaveGen Energy has completed testing of its 200 W proof of concept (POC) at the National Institute of Technology Karnataka (NITK), demonstrating wave energy technology that could surpass current efficiency standards in the sector. According to WaveGen, its patented technology can generate electricity with a 52% efficiency rate, compared to the industry standard of 20%. In addition to power generation, the system is designed to desalinate seawater and serve as a coastal erosion barrier. The company is seeking investors and strategic partners to scale up the technology for commercial deployment.

Ocean Energy Is Almost Ready, But It Needs a Boost Over the Testing Barrier – National Renewable Energy Laboratory

> In a large room with concrete-block walls, a crane lifts what looks like a miniature lunar lander out of a water tank. Water drips from the metal contraption as the crane slowly lowers it onto the floor. Then, the clock starts ticking. "My colleagues and I were like, ‘OK, as soon as it touches the ground, were going to do this and this and this," said Brittany Lydon, a mechanical engineering graduate student at the University of Washington. Lydon, who likens that moment to a race car pulling up to have its tires changed midrace, will not be sending her machine to the moon. But she is prepping it for a similarly harsh environment: the ocean. Marine energy developers often start with a functional theoretical design. But even the best virtual designs cannot account for every invisible defect or ocean oddity. Developers need a lab-sized ocean to test those theories before they head to the big blue.