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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!

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Announcements

User Review Surveys

The [PRIMRE](#) team is requesting feedback on two of its Knowledge Hubs: the [Marine Energy Atlas](#) and the [Marine Energy Projects Database](#). Whether you are a new or experienced user, please complete the [Atlas User Review Survey](#) and/or [Projects Database User Review Survey](#) to help us continue to expand and improve these resources.

InDEEP Applications

The U.S. Department of Energy's (DOE) Water Power Technologies Office (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.

Calls for Abstracts

The [Call for Extended Abstracts](#) for the [Pan American Marine Energy Conference \(PAMEC 2024\)](#) is now open through 26 June 2023. PAMEC 2024 will take place on 22-24 January 2024 in Barranquilla, Columbia.

The [Call for Short Abstracts](#) for the [3rd International Congress on Marine Energy CEMIE-Océano](#) is now open through 30 June 2023. Extended abstracts will be due by 18 August 2023. The conference will take place 5-7 September 2023 in Puerto Morelos, Mexico.

The [Call for Abstracts](#) for the International Conference on Oceanography and 19th French-Japanese Symposium of Oceanography ([COAST CAEN](#)) is open through 7 July 2023. The event will take place on 24-27 October 2023 in Caen, France.

Funding & Testing Opportunities

The U.S. DOE WPTO has released a [funding opportunity](#) to support two projects focused on advancing the tidal and current energy industry, including a pilot technology demonstration site in state waters ([topic area 1](#)) and a community-led development project ([topic area 2](#)). Concept papers are due by 5 June 2023 and 13 July 2023, respectively.

The Marine Alliance for Science and Technology for Scotland (MASTS) has launched a [Call for Proposals from Early Career Researchers](#) to lead research on Nature Enhancement at Marine Offshore Energy Sites (NEMOES). Proposal submissions are due 9 June 2023.

The U.S. Ocean Energy Safety Institute has launched a [Request for Proposals](#) focused on marine and offshore wind energy solutions that enhance safety, security, and sustainability. Submissions are due 19 June 2023 (for marine energy) and 24 July 2023 (for wind energy).

The Lir-National Ocean Test Facility (Lir NOTF), in collaboration with the Sustainable Energy Authority of Ireland, has launched a [Call for Scaled Physical Testing](#) of offshore renewable energy devices, including wave, wind, and tidal. Applications are due 30 June 2023.

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 7 July 2023. Applications for Open Water Support may be submitted at any time and will be reviewed as soon as possible.

The Horizon Europe Framework Programme recently 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.

Student & Employment Opportunities

NoviOcean is seeking a [Chief Commercial Officer](#) to join its team in Sweden and support commercial development of the NoviOcean Wave Energy Converter.

The University of Hull is looking for a [Senior Lecturer in Offshore Wind / Renewable Energy](#) with expertise in either environmental impacts, environmental economics or carbon management. Applications are due 5 June 2023.

Crown Estate Scotland is seeking to appoint a [Consultant to Manage Wave and Tidal Operators Panel](#) who will act as a technical authority to support decision making on how the Panel should progress and day-to-day management activities. Applications are due 19 June 2023.

Pembrokeshire Coastal Forum is hiring a [Communications Coordinator – Marine Energy](#) who will work with the Marine Energy Wales team and deliver the marketing and communications strategy for the pre-consented Marine Energy Test Area. Applications are due 19 June 2023.

The University of Strathclyde is advertising a [PhD studentship position](#) that will contribute to the project: AI-Based Approaches for Ocean Forecast and Development of Ensemble Ocean Climate Data. Applications are due 31 August 2023.

Upcoming Events

Upcoming Webinars

The European Technology & Innovation Platform for Ocean Energy (ETIP Ocean) is hosting a webinar, “Resources & tools for faster permitting of ocean energy”, on 5 June 2023 at 4:00pm CEST (2:00pm UTC). During the webinar, OES-Environmental will present the guidance and resources currently available and how both regulators and developers can use this information to accelerate the permitting of ocean energy. Register [here](#).

Sandia National Laboratories is hosting a “[WEC Design, Modeling, Control, and Testing Workshop Information Session](#)” on 6 June 2023 to provide details on an [upcoming workshop](#) that will take place on 27-28 September 2023 in Bethesda, Maryland, U.S. at the Naval Surface Warfare Center – Carderock. Register for the information session [here](#).

The International Energy Agency's Ocean Energy Systems (IEA-OES) is hosting a webinar, “[Ocean Energy Outlook in Europe](#)”, on 27 June 2023 at 11:00am UTC. During the webinar, OES speakers will provide valuable insights into the ocean energy landscape in Europe, including the latest developments, challenges, and opportunities. Register [here](#).

Upcoming Workshop

As part of the Ocean Renewable Energy Conference ([OREC 2023](#)), OES-Environmental is hosting a [workshop](#) on 22 June 2023 to identify the key components of effective and efficient programs for environmental monitoring around marine energy projects, and explore whether there are elements that could be standardized among projects nationwide and worldwide. OREC will take place on 21-22 June 2023 in Portland, Oregon, U.S.

Upcoming Conferences

The Partnership for Research in Marine Renewable Energy (PRIMaRE) is hosting the [10th PRIMaRE Conference](#) on 27-28 June 2023 in Bath, England. Register [here](#) by 5 June 2023.

The Supergen Offshore Renewable Energy Hub is hosting its [Early Career Researcher Forum](#) on 11 July 2023 and the [Supergen ORE Annual Assembly](#) on 12 July 2023 in Southampton, England. Register for the Forum [here](#), and for the Assembly [here](#).

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.

[Multi-decade high-resolution regional hindcasts for wave energy resource characterization in U.S. coastal waters](#) – Yang et al. 2023

Long-term, high-resolution, regional wave hindcast datasets were generated using unstructured-grid Simulating WAVes Nearshore (SWAN) models for the U.S. coastal waters to support nearshore wave energy development in the U.S. including those bordering U.S. territorial islands. The model domains resolved the entire U.S. exclusive economic zones, with a spatial resolution of approximately 200 m nearshore. The regional SWAN models were driven by the global WAVEWATCH III® model outputs and run for a 42-year period from 1979 to 2020. Extensive model validations were performed using buoy observations and altimeter data. Regional resource characterization was performed based on hindcast data points at 2 km from shore and along the 100 m isobath. Aggregations of wave resource parameters were produced, and spatial and seasonal variations were analyzed for all the regions.

[Research on the blockage correction of a diffuser-augmented hydrokinetic turbine](#) – Du et al. 2023

The performance of a hydrokinetic turbine may be significantly overestimated in a confined domain due to blockage effects. Therefore, the performance data needs to be corrected to obtain the unconfined results. Although many studies on blockage correction are performed, most of them are only developed for conventional hydrokinetic turbines. And the effectiveness of these methods for a diffuser-augmented hydrokinetic turbine is still unclear. For this investigation, seven different blockage correction methods are evaluated for a diffuser-augmented hydrokinetic turbine. A blade-resolved Computational-Fluid-Dynamics simulations is performed and then verified with the experiment data. The results show that the methods presented by Barnsley and Wellicome, Houlby et al. and Maskell-inspired's method have the best performance based on both the relative errors analysis and the ease of application of each method.

[Assessment of the stiffened panel performance in the OTEC seawater tank design: Parametric study and sensitivity analysis](#) – Lutfi et al. 2023

Ocean thermal energy conversion (OTEC) is a process of generating electricity by exploiting the temperature difference between warm surface seawater and cold deep seawater. Due to the high static and dynamic pressures that are caused by seawater circulation, the stiffened panel that constitutes a seawater tank may undergo a reduction in ultimate strength. The current paper investigates the design of stiffening systems for OTEC seawater tanks by examining the effects of stiffening parameters such as stiffener sizes and span-over-bay ratio for the applied combined loadings of lateral and transverse pressure by fluid motion and axial compression due to global bending moment. The

ultimate strength calculation was conducted by using the non-linear finite element method via the commercial software known as ABAQUS.

MHKDR Highlight

The Marine Hydrokinetic Data Repository ([MHKDR](#)) 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.

[Triton Field Trials \(TFiT\) underwater noise - University of New Hampshire Living Bridge turbine Processed Data](#) – Pacific Northwest National Laboratory (data from 2021, last updated 2023)

In July 2021, a commercial-off-the-shelf hydrophone was deployed in a free-drifting configuration to measure underwater acoustic emissions and characterize a 25 kW-rated tidal turbine at the University of New Hampshire's Living Bridge Project in Portsmouth, New Hampshire. Sampling methods and analysis were performed in alignment with the recently published IEC 62600-40 Technical Specification for acoustic characterization of marine energy converters. Results from this study indicate acoustic emissions from the turbine were below ambient sound levels and therefore did not have a significant impact on the underwater noise levels of the project site. As a component of Pacific Northwest National Laboratory's Triton Field Trials (TFiT), this study provides a valuable use case for the IEC 62600-40 Technical Specification framework and further recommendations for cost-effective technologies and methods for measuring underwater noise at future current energy converter project sites.

[Modeled Hourly Tidal Current Velocities, Directions, and Heights from May 1 - September 1, 2005 at Two Points Near East Forelands and Tyonek in Cook Inlet, Alaska](#) – University of Alaska Fairbanks (data from 2022, last updated 2023)

This dataset includes modeled tidal current velocities, direction and depth at two locations in East and North Forelands (60.716, -151.434 and 61.024, -151.157) near Nikiski and Tyonek, respectively, in Cook Inlet, Alaska. Data from two grid cells were provided by the Pacific Northwest National Laboratory based on a tidal hydrodynamic model that characterized the tidal stream resources in Cook Inlet for a period from May 1 to September 1, 2005 (Wang and Yang 2020). The model grid size had a horizontal spatial resolution of 100 m at East Forelands and 200 m at Tyonek; mean sea level (MSL) depth was 47.9 m and 23.7 m at each respective site, and there were 10 depth bins that ranged in size with the tide from 4.3-5.2 m and 1.9-2.8 m, respectively (Wang and Yang 2020).

[Emrgy 2022 Hydrokinetic Turbine Data - TEAMER Post Access Submission](#) – Emrgy, Inc. (data from 2022, last updated 2022)

The data herein contains all data collected and used for the Performance Characterization Testing and Model Calibration of a Vertical Axis Hydrokinetic Turbine. The data

includes performance data and durability data for the Hydrokinetic Turbine. The device performance data contains shaft RPM, turbine RPM, power output, flow velocity, pressure, and pressure drop across the turbine. The mechanical durability data includes stress and strain at varied depths and velocities. There is also an FEA analysis included. This TEAMER project was awarded to Emrgy, Inc. in collaboration with Alden Research Laboratory LLC.

MRE Software Highlight

[MRE 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.

[WecOptTool v2.5.0 Release](#)

The Wave Energy Converter Design Optimization Toolbox ([WecOptTool](#)) is an open-source software for conducting optimization studies of wave energy converters (WECs). The software uses a co-design approach where the system and control design for the WEC are considered synchronously. WecOptTool v2.5.0 features differentiable PTO impedance and updated tutorials. WecOptTool is written as a Python package and is developed by Sandia National Laboratories.

[Tsdats v0.6.0 Release](#)

[Tsdats](#) is an open-source Python framework developed by the Pacific Northwest National Lab (PNNL) that makes creating pipelines to process and standardize time-series data easier, clearer, and quicker to stand up, so that you can spend less time data-wrangling and more time on data analysis. Tsdats v0.6.0 features data transformation methods adapted from the Atmospheric Radiation Measurement (ARM) User Facility, new methods for data ingestion, and updated data quality checks.

[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.

News & Press Releases

[LR issues world's first IECRE Feasibility Statement for a renewable energy converter – Lloyd's Register \(LR\)](#)

Flex Marine Power has been awarded the world's first IECRE Feasibility Statement by LR for its SwimmerTurbine™ SW2 tidal energy convertor, following successful completion of the Technology Qualification process in accordance with IEC TS 62600-4. This is the first time the International Electrotechnical Commission for Renewable Energy (IECRE) has awarded a Feasibility Statement for a renewable energy technology. The award was presented by Alistair MacKinnon, IECRE Chair in the presence of Wolfram Zeitz, Executive Secretary of the IECRE and Jonathan Colby, IECRE Convenor for the Marine Energy Sector Working Group, at an award ceremony at LR's office. LR is currently the only certification body that can award Statements or Certificates for Marine Energy converters through the IECRE conformity assessment system.

[California's Senate approves wave and tidal renewable energy bill – Offshore Energy](#)

The California State Senate has unanimously approved a bill that aims to put the state on the path to developing wave and tidal energy as a new source of renewable energy that will help meet its carbon-free targets while bolstering the power grid. The measure, SB 605 by Senator Steve Padilla (D-Chula Vista), directs the California Energy Commission to work with relevant state agencies to study the feasibility and potential for wave and tidal energy development in California, and sets deadlines to report its findings to the Legislature and Governor. The SB 605 states that if developed and deployed at scale, offshore wave and tidal energy have the potential to provide economic and environmental benefits to the state and the nation. The bill now moves to the Assembly for consideration.

[First phase of offshore installation Dragon 12 completed in Vestmanna, Faroe Islands – Minesto](#)

Minesto, leading ocean energy developer, has recently successfully completed the first phase of Dragon 12 (1.2 MW) offshore installation in Vestmanna, Faroe Islands. The 3.4 km main subsea cable was laid on the seabed, from the onshore grid connection point to the offshore installation node. After transit across the North Atlantic Ocean to Vestmanna, the cable installation work was commenced and was successfully completed today. The cable installation was completed in a 22-hour operation. A standard offshore supply vessel was adapted by Minesto's subcontractor Inyanga for the cable laying to provide a cost-efficient vessel solution for the marine operations. The cable was manufactured by JDR in the UK and loaded onto the installation vessel in Hartlepool prior to transiting to the Faroe Islands.

[C-Power wraps up in-harbor trials of SeaRAY device – Offshore Energy](#)

US-based marine energy company C-Power has completed in-harbor operational trials of the SeaRAY autonomous offshore power system (AOPS) ahead of its deployment offshore Hawaii. C-Power's 2kW SeaRAY AOPS is set for testing at US Navy's Wave Energy Test Site. In Hawaii, project partners, including Saab, one of the world-leading companies in electric underwater robotics, the National Oceanic and Atmospheric Administration, and BioSonics, will pair the SeaRAY AOPS with their electronics, which collect data on methane and carbon levels, fish activity, and more. The demonstration will also feature Verlume's first commercial Halo battery system, which represents a scalable storage solution and 'gateway' for renewable energy to high-value assets able to provide a reliable, uninterrupted power supply predominantly for use in the harsh subsea environment.

SELKIE Draws the Curtain on 4 Years Project Operation – SELKIE

After four years of operation, the SELKIE project has reached its conclusion. This collaborative endeavour between two universities and four industry partners aimed to advance the development and deployment of marine renewable energy technologies in Wales and Ireland. One of the notable achievements of the SELKIE project is the creation of a suite of open-source decision support tools. These tools address common challenges faced by marine energy technology developers in the early stages of their projects. They provide valuable decision support information and recommendations on optimal site selection, foundation and mooring design, array layout, and data collection. By sharing these tools freely, the SELKIE project has facilitated cost-effective and efficient development in the marine renewable energy sector.

Bermuda Expands Legal Framework to Incorporate Wave Energy – Seabased

The Government of Bermuda has approved regulations for innovative licenses to provide electricity to the island, further clearing a regulatory path for Seabased's planned wave energy park. Bermuda, and Minister of Home Affairs, the Hon. Walter H. Roban, have provided an example to countries and communities everywhere for creating a legal and regulatory process to incorporate wave power into their renewable energy mix. Minister Roban, was quoted as saying "This important milestone in Bermuda's efforts towards sustainable energy development will encourage innovation among energy creators while ensuring grid stability and ultimately benefitting our island and our people." Seabased CEO Laurent Albert noted that the focus of innovation in renewable energy often centers on the technology. "But," he said, "the regulatory piece is just as important, and requires the support of an entire community."