



**24 March 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!

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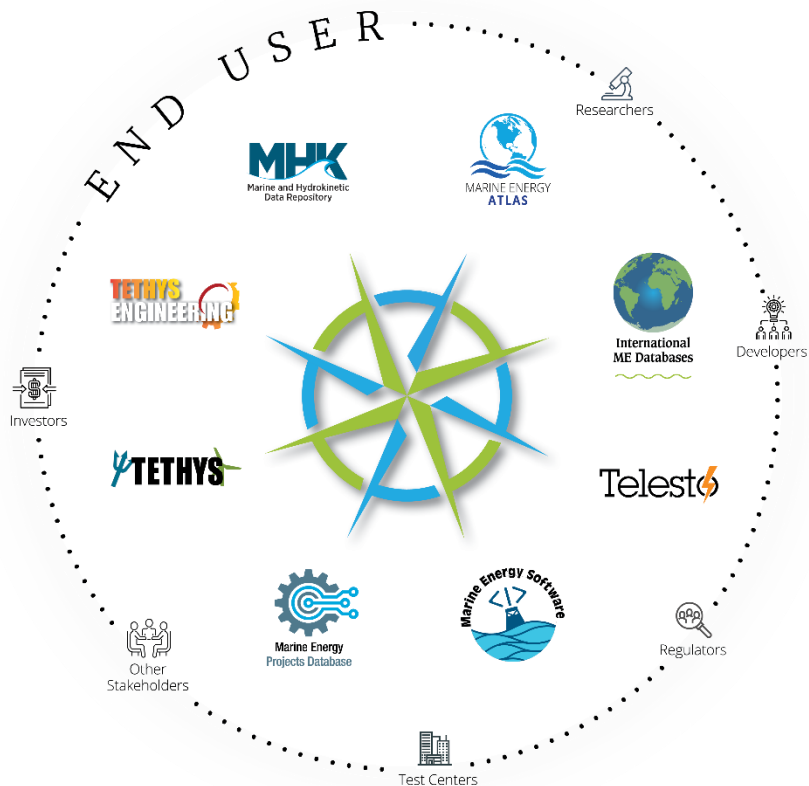
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## Announcements

### Introducing the PRIMRE Blast

In order to highlight more of the data, information, and resources available within [PRIMRE](#), we expanded the Tethys Engineering Blast to feature additional content from the other PRIMRE [Knowledge Hubs](#) as well. For more information on PRIMRE, watch our 2-min [overview video](#)!



## New Wave Energy Prize

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.

## MECC Applications Open

The U.S. DOE's 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 March and April. Applications are due by 5:00pm EDT (9:00pm UTC) on 25 May 2023.

## Waves to Water Documentary

The National Renewable Energy Laboratory (NREL) and U.S. DOE released a short documentary, "[From Waves to Water: Securing Our Future Through Wave-Powered Desalination](#)," that showcases how the Waves to Water Prize encouraged innovators to develop small, modular, wave-energy-powered desalination systems that could help address water scarcity issues around the world.

## 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 31 March 2023.

## Request for Stakeholder Input

The Minister of Fisheries, Oceans and the Canadian Coast Guard and the Treasury Board of Canada Secretariat are inviting input from ocean industry stakeholders on the [Blue Economy Regulatory Review](#). Interested respondents can provide their input on five blue economy themes, including marine renewable energy and environmental protection, through 31 March 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.

## 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 (PNNL) is seeking a [Coastal Modeler](#) to conduct numerical simulations using wave and coastal circulation models and analyze remotely sensed, in-situ collected, and numerically modeled datasets. Applications are due 24 March 2023.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is looking for a [Chief of Section](#) to lead, coordinate, and organize the activities of the Intergovernmental Oceanographic Commission Ocean Science Section. Applications are due 10 April 2023.

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## Upcoming Events

### Upcoming Webinars

NREL is hosting a webinar on 24 March 2023 at 11:00am MDT (5:00pm UTC) will provide an overview of the three competitions ([Collegiate Wind Competition](#), [Hydropower Collegiate Competition](#), and [Marine Energy Collegiate Competition](#)), and present opportunities for interested schools to get involved, and invite attendees to discuss their school's interest and ability in participating in these competitions. Register [here](#).

The European Marine Board is organizing a webinar to launch its Future Science Brief n°9, "[European offshore renewable energy: Towards a sustainable future](#)", on 4 April 2023 from 2:00-3:30pm CET (12-1:30pm UTC). The webinar will discuss the state-of-the-art of the offshore renewable energy sector globally and in Europe, gaps, and impacts. Register [here](#).

The U.S. DOE WPTO is hosting its next Semiannual Stakeholder Webinar on 4 April 2023 from 2:30-4pm EDT (6:30-8pm UTC). Staff and leadership will dive into current and future funding opportunities; other accomplishments, news, and updates; and the office's newly released [2021-2022 Accomplishments Report](#). Register [here](#).

The U.S. DOE WPTO is also hosting a WPTO R&D Deep Dive, "Shaping the Future of the Marine Energy Atlas", on 6 April 2023 from 11:00am-12:00pm MST (5:00-6:00pm UTC). The interactive webinar will include a demonstration of the [Marine Energy Atlas](#) and a discussion on what data and features should be added or changed to this open-access tool. Register [here](#).

PNNL and NREL 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](#).

### Upcoming Training

Centrale Nantes and the University of Nantes, in collaboration with the West Atlantic Marine Energy Community (WEAMEC), are hosting a [training module on the hydrodynamics of marine renewable energy technologies](#) on 13-14 April 2023 in Nantes, France.

### Upcoming Workshop

The Portal and Repository for Information on Marine Renewable Energy ([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](#).

## Upcoming Conferences

The [9th International Ocean Thermal Energy Conversion \(OTEC\) Symposium](#) will take place on 4-5 May 2023 in Houston, Texas, U.S. Register [here](#).

The Pacific Ocean Energy Trust is hosting the [Ocean Renewable Energy Conference \(OREC 2023\)](#) on 21-22 June 2023 in Portland, Oregon, U.S. Registration is now open [here](#).

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## **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.*

### **OES Annual Report: An Overview of Ocean Energy Activities in 2022 – Ocean Energy Systems (OES) 2023**

IEA-OES is a Technology Collaboration Programme (TCP) on Ocean Energy Systems within a framework created by the International Energy Agency (IEA). The work of the IEA-OES covers all forms of energy generation in which sea water forms the motive power through its physical and chemical properties, i.e. wave, tidal range, tidal and ocean currents, ocean thermal energy conversion and salinity gradients. This Annual Report showcases the key achievements and recent outcomes of the IEA-OES collaborative efforts on a global scale, as well as updates on ocean energy policy, research, and deployment advancements in all participating countries.

### **Estimating annual energy production from short tidal current records – Xu et al. 2023**

Deploying Tidal Energy Converters for electricity generation requires prior-knowledge of the potential Annual Energy Production (AEP) at the site. Ideally, using a year-long tidal current record at the proposed site to minimize uncertainty. However, such records are often unavailable. Fortunately, using the periodic nature of tidal variability, the International Electrotechnical Commission Technical Specification for tidal energy resource assessment requires AEP calculation using at least 90 days of tidal current records at each turbine location. The sensitivity of AEP to different record durations has not been fully assessed. This is the goal of our study.

### **Numerical investigations of a pivoted point absorber wave energy converter integrated with breakwater using CFD – Yang et al. 2023**

Wave energy resources are enormous and widely distributed worldwide and evaluated as resources to replace fossil fuels. One of the methods to collect wave energy is using a point absorber device, which is a device designed to react sensitively to the movement of the water surface for harnessing wave energy. This paper is about the influence of a fixed breakwater on a Wavestar-shaped pivoted point absorber wave energy converter (WEC) using computational fluid dynamics (CFD). The fixed breakwater may generate a

stationary wave and this phenomenon helps to enlarge the movement of the water surface. The numerical model based on CFD was validated against the available published data and verified to prove the accuracy of the numerical solution.

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## **MHKDR Data Highlights**

*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.*

### **[Small Scale WEC Performance Modeling Data](#) – National Renewable Energy Laboratory (data from 2021, last updated 2022)**

Small Scale WEC Performance Modeling Data is performance data from downscaled models of common wave energy converter (WEC) devices and their calculated performance outputs. This data is used by the Small WEC interactive modeling tool hosted by PRIMRE. The devices include a point absorber, a two-body point absorber (Reference Model 3), an oscillating surge device (OSWEC), and an attenuator type device (McCabe Wave Pump). One of the primary use cases for this work is to give an easy way to compare power output for a variety of WECs and model sizes.

### **[RANS Simulation ADM of the NREL Phase VI wind turbine modeled as MHK Turbine](#) – University of Washington (data from 2016, last updated 2021)**

Attached are the .cas and .dat files for the Reynolds Averaged Navier-Stokes (RANS) simulation of a single lab-scaled DOE Reference Model 1 turbine implemented in ANSYS FLUENT CFD-package. In this case study the flow field around and in the wake of the NREL Phase VI wind turbine, modeled as MHK turbine, is simulated using Actuator Disk Model (ADM) (a.k.a Porous Media) by solving RANS equations coupled with a turbulence closure model. The effect of turbine rotating blades are modeled using the Actuator Disk Theory.

### **[20 Year Daily Average Modeled Velocity and Discharge for Openwater Season at Five Communities on Kuskokwim River, Alaska](#) – University of Fairbanks Alaska (data from 2022, last updated 2023)**

This dataset includes modeled velocity and discharge at five communities in the middle Kuskokwim River region: Aniak, Chuathbaluk, Crooked Creek, Red Devil and Stony River. Modeled velocities and discharge represent daily averages calculated for the open water season (OWS) from June 1 - October 18 over the 20 year period 2000-2019 using the raw data included in this archive. Raw data (discharge and stage) are included in this archive for two additional communities: Lower Kalskag and Sleetmute, where modeled velocities were not calculated due to equipment failure or loss.

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## MRE Software Release

*[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.*

### [MHKiT-Python v0.6.0 Release](#)

The Marine and Hydrokinetic Toolkit ([MHKiT](#)) is open-source software, developed in Python and MATLAB, for rapid data processing, visualization, quality control, resource assessment, and device performance. [MHKiT-Python](#) and [MHKiT-MATLAB](#) provide robust and verified functions in both Python and MATLAB that are needed by the MRE community to standardize data processing. MHKiT v0.6.0 features a new module for combined oceanic and meteorological resource data analysis, analysis capabilities from Acoustic Doppler Current Profiler and Acoustic Doppler Velocimeter data, and updated wave resource calculations adhering to International Electrotechnical Commission technical guidelines. MHKiT is developed as a collaboration between NREL, PNNL, and Sandia National Laboratories.

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## News & Press Releases

### [Nova Deploys in France](#) – Nova Innovation

Nova Innovation (Nova) has successfully installed its world-leading tidal energy technology at the Étel Estuary, bringing its turbines to France for the first time. This tidal energy trial proves that Nova's world-leading tidal technology can be deployed in rivers and estuaries as well as seas and ocean, opening up a whole new global market to supply towns and cities near rivers with clean, green electricity. The Étel Estuary deployment is Nova's first outside of Scotland, ahead of further international deployment in Canada this summer. Nova's seabed-mounted turbines create no visual impact or navigational hazard, so the community using the Étel, ranging from oyster fishermen to kayakers, are unaffected by the turbines.

### [Orbital Marine Power unveils new 30MW tidal energy project in Orkney waters](#) – Orbital Marine Power

Orbital Marine Power (Orbital), the renewable energy company focused on the commercial deployment of its innovative floating tidal turbine technology, announced it has been awarded an Option Agreement from Crown Estate Scotland for a new tidal energy project in the Westray Firth. Orkney-headquartered Orbital also confirmed it has a grid connection in place to service the pioneering project, which is located adjacent to the European Marine Energy Centre (EMEC) facility, where Orbital has already deployed the 2MW O2, the world's most powerful tidal turbine, under commercial operation. The Option Agreement is for 30MW, which would equate to approximately 12 Orbital devices installed across the site.

## **The Kingdom of Tonga Chooses Seabased Wave Power for Renewable Transition – Seabased**

The Kingdom of Tonga and SIDS DOCK Executive Council met Tuesday in New York with Small Island Developing States (SIDS) Ambassadors and Permanent Representatives to the United Nations and representatives from Bermuda. These leaders convened to discuss the promise of Seabased wave energy technology as a solution for small island states' energy insecurity, debilitating fuel costs, and renewable transition challenges. His Excellency Va'inga Tōnē added his signature to a Memorandum of Understanding (MoU) that was signed in February between His Majesty's Government of the Kingdom of Tonga, SIDS DOCK and Seabased, to develop a 10 MW Wave Power Park in Tongatapu, Tonga.

## **First Minister announces £750,000 fund for tidal lagoon research – Welsh Government**

First Minister Mark Drakeford has announced £750,000 for the Tidal Lagoon Challenge. The money will be available for at least 3 research projects focusing on the deployment of tidal lagoon technology. The research will help address the barriers that have prevented the development of the technology and give more insight into the benefits it could bring to Wales. The work will advance the future development of a tidal lagoon project in Welsh waters. A tidal lagoon is a power station that generates electricity from the natural rise and fall of the tides. A large volume of water is captured behind a man-made structure which is then released to drive turbines and generate electricity.

## **France creates largest European sea trial center for marine renewables – Offshore Energy**

The largest European center for sea trials entirely dedicated to floating wind power and marine renewable energies, called the OPEN-C Foundation, has been set up in France by major industry players. The creation of OPEN-C Foundation has been announced by 10 public and private founders including Ifremer, Centrale Nantes, ITE France Énergies Marines, EDF, RTE, TotalEnergies, Technip Energies, Valorem, Valeco, and Énergie de la Lune. The OPEN-C Foundation represents the culmination of three years of collective work, and will be tasked with coordinating, developing and managing sea trials with a multi-technological dimension for floating wind turbines, tidal turbines, wave power, hydrogen at sea, and floating photovoltaic.