



Portal and Repository for Information on Marine Renewable Energy (PRIMRE)

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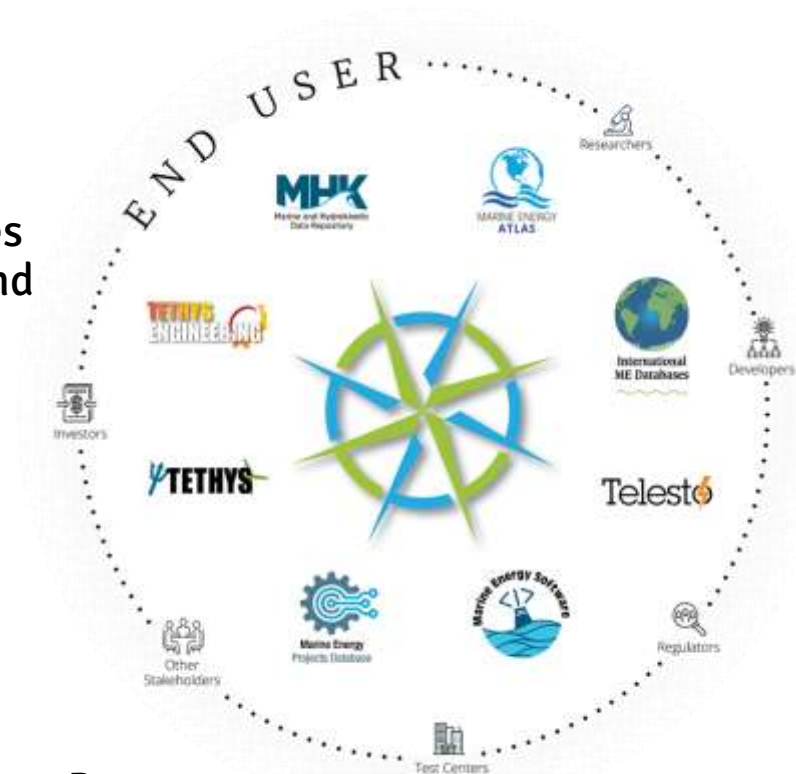
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The **Portal and Repository of Information on Marine Renewable Energy (PRIMRE)** provides access to marine energy data, information, and resources to help advance the industry.

- Knowledge Hubs
- Marine Energy Basics
- Events Calendar & Webinars
- Educational Resources
- Data, Tools, & Software

Funded by the US Department of Energy's Water Power Technologies Office and led by 3 national labs.

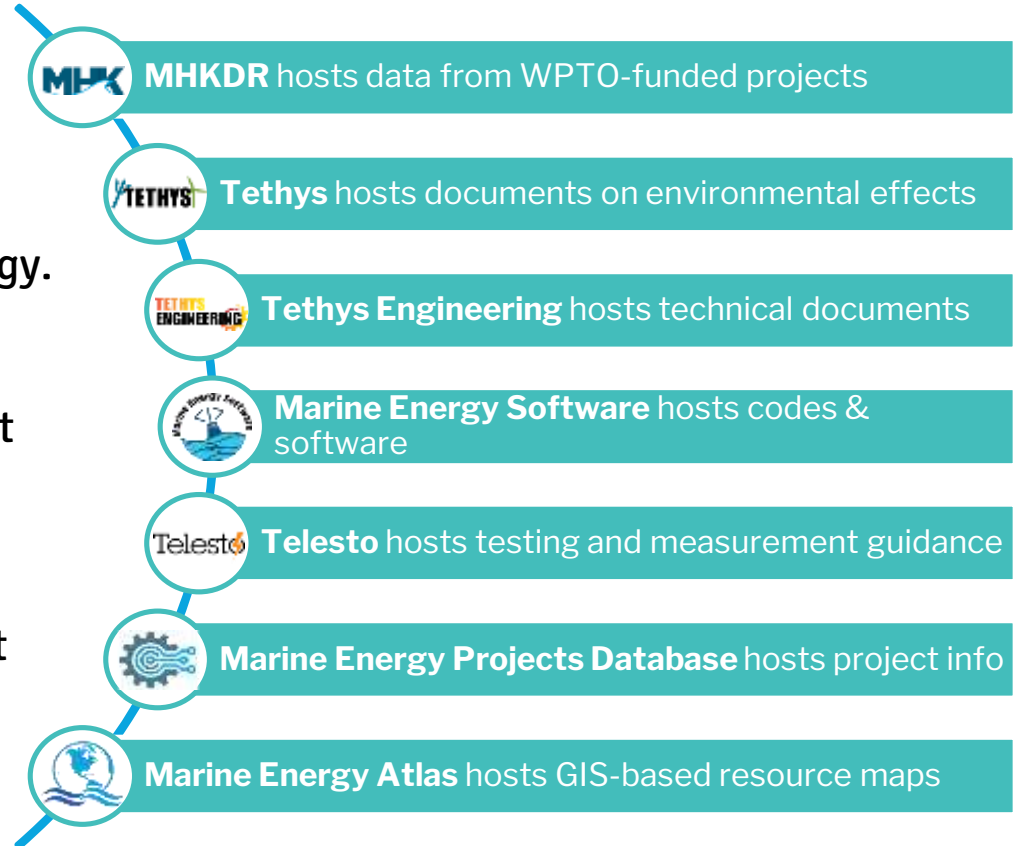


<https://primre.org/>



- Each **Knowledge Hub** houses a different type and format of information related to marine energy.
- Several Knowledge Hubs were developed under other projects, but all have been integrated and improved.
- PRIMRE has a **one-stop search** that allows users to find data and info throughout the system.

<https://primre.org/>



MHK Data Repository

- Repository for all research and testing data collected funded by the U.S. DOE Marine and Hydrokinetic Power Program.
- Over 300 datasets with more than 2,000 individual data resources
- Over 30 TB of data, from research, development, deployment and analysis efforts, downloaded over a 100,000 times.

<https://mhkdr.openei.org/>

The screenshot shows the MHK Data Repository website. At the top, there is a navigation bar with 'Data', 'Help', 'About', and 'Search' links. The main header features the MHK logo and the text 'Marine and Hydrokinetic Data Repository U.S. DEPARTMENT OF ENERGY'. Below this is a search bar and four filter buttons: 'Wave Energy', 'Wave Energy Price', 'Wave Energy Price', and 'Current Energy'. The 'Featured Data' section displays three data cards: 'Wave Energy Price' (with a '17 Submissions' badge), 'Data Lake' (with a '1 Data Lake' badge), and 'Underwater Mapping Results for Success in DFWB' (with a '1 Submission' badge). Each card includes a thumbnail image and a brief description. At the bottom, there is a 'My Recent Submissions' section with a 'View All My Submissions' link and a 'Submit Data' button.

Tethys



- Documents library with over 9,000 documents on the environmental effects of wind and marine renewable energy

- Additional features:

- Tethys Blast
- Events Calendar
- Archived Webinars
- Summaries & Fact Sheets
- Educational Resources
- Community Pages

<https://tethys.pnnl.gov/>



Educational Resources on Tethys



Home » Tools » Marine Renewable Energy Educational Resources

Marine Renewable Energy Educational Resources

EDUCATIONAL RESOURCES

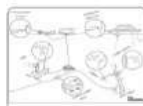
Environmental Effects of Marine Renewable Energy



Using clean, low-carbon energy sources is more important now than ever. As we combat climate change, marine renewable energy (MRE) has the potential to play an important role. However, we need to understand the impact tidal, wave, and ocean thermal energy devices may have on the environment in order to deploy MRE devices in a responsible manner.

OES-Environmental has compiled educational resources to increase awareness and understanding of MRE and associated environmental effects as well as support the future workforce. The materials and resources on this page can be used by students of all ages and educational backgrounds. Educators, schools, aquariums and zoos, science centers, etc., may also want to use this page for fun, educational content or to develop a classroom curriculum on environmental effects of MRE.

If you have any questions, suggestions, or would like to contribute to Tethys, please reach out to tethys@pnnl.gov.



Marine Energy Coloring Book



Marine Energy Video Series



Short Science Summaries



State of the Science Report



Marine Energy Brochure



Educational Webinar



Marine Energy Career Panel



Collision Risk Video Game



<https://tethys.pnnl.gov/marine-renewable-energy-educational-resources>





Tethys Engineering

- Documents library with over 7,800 documents on the technical aspects of marine renewable energy development
- Over 700 marine energy photos in the Tethys Engineering Photo Library



<https://tethys-engineering.pnnl.gov/>



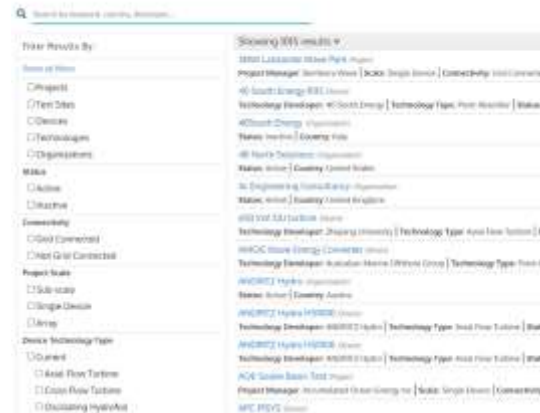
Marine Energy Projects Database

- ~1000 international marine energy projects, test sites, devices, and organizations
- Historic record of past deployments
- Allows for exploration of the relationships between organizations, projects, test sites, and devices
- Charts highlight interesting trends for the marine energy industry
- Anyone can add information

https://openei.org/wiki/PRIMRE/Databases/Projects_Database



The PRIMRE Marine Energy Projects Database provides information on marine energy projects, test sites, devices, and organizations in the U.S. and many other countries. Each of the pages in this database are automatically updated from data collected through a rich data structure to explore the relationships between energy deployment and the devices that they are deploying.



Telesto

- Wikis and databases which provide resources and guidance for marine energy planning, testing, measurement, and data processing
- Organized along the marine energy development pathway: Plan, Design & Build, Test, Deploy and Decommission
- Cross-cutting pages on Lessons Learned, Performance Metrics, Economics, Standards, and Compliance

<https://openei.org/wiki/PRIMRE/Telesto>



Telesto Marine Energy Development Pathway

In levels of technology, Telesto is a scale-based site for the presentation of stake holding or success. As a Knowledge Hub in PRIMRE, Telesto is home to wikis and databases which provide resources and guidance for marine energy planning, testing, measurement, and data processing. Information on these pages is based on experience, lessons learned from prior laboratory and field testing, industry standards, and recommended best practices. Telesto serves as a general information resource for the international marine energy industry. Performance metrics, lessons learned, completed standards, and economic viability will apply to any facility. Permitting and regulatory information, however, will be site specific, and alternative provide information on licensing pathways for 2015 member countries to ensure an alternative source of financing options.

Navigation on the knowledge hub is envisioned as a linear pathway from planning through decommissioning. Though the navigation may be envisioned as a linear process, in reality, any project will involve overlap with stakeholders plus the necessity of design and economic modeling, testing, and testing. In most cases, it will be an iterative, non-linear process where a setback in a single task might push designers off one milestone back to an earlier milestone and the planning phase. The pages Lessons Learned, Performance Metrics, Economics, Standards, and Compliance will apply to all project stages and is part of all stages of the pathway.

Telesto is hosted by the PRIMRE team, a partnership of Sandia National Laboratories, the National Renewable Energy Laboratory, and Pacific Northwest National Laboratory, on behalf of the U.S. Department of Energy's Office of Energy Efficiency and Energy Conservation Research.

Featured Content on Telesto



Marine Energy Software

- Driven by user needs and input
- Catalogues codes and software relevant to marine energy
- Including commercial and open access software
- New version launching very soon

<https://openei.org/wiki/PRIMRE/Software>

The screenshot shows the MRE CodeHub website. At the top, it says "MRE CodeHub" and "U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy". Below the header is a banner with the text "A wide range of open source software for the marine (renewable energy (MRE)) community".

There are three main sections on the left:

- Browse MRE Code Hub Repositories**: Browse the full list of registered MRE Code Hub repositories that have been contributed by the National Labs and the broader MRE community.
- Search MRE Code Hub Source Code**: Looking for specific code examples? Perform a full-text code search across all repositories in the MRE Code Hub.
- Register Your Software**: Click here to register your software so it can be discovered and shared with the MRE community.

On the right, there are two sections:

- Need help finding the right software tools for your MRE-related tasks?**
PRIMRE Code Catalog
Visit the PRIMRE Code Catalog to find software by technology, application and other key properties.
- Looking for other MRE resources?**
PRIMRE
Visit the Portal and Repository for Information on Marine Renewable Energy (PRIMRE).

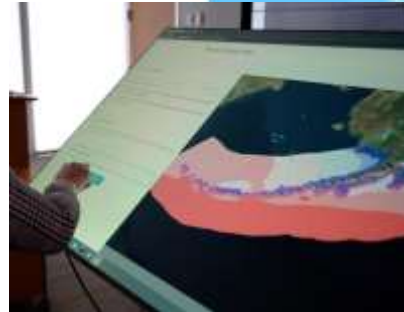
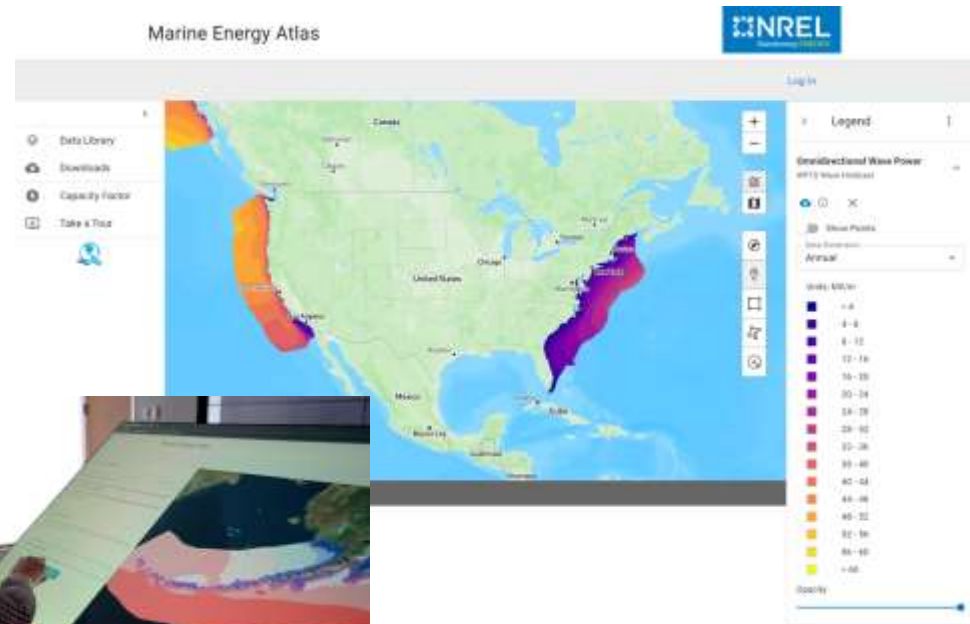
At the bottom, there is a "New Releases" section with three cards:

- BEMRosetta January**: Hydrodynamic coefficients solver and converter for Boundary Element Method solver Rosetta.
- SAM 2023.12.17.r0.ssc.208**: System Advisor Model (SAM).
- tsdat v0.7.5**: Time series data utilities for decoupling, accepting standardization, Q/C, and transformations to different formats.



Marine Energy Atlas

- Geographic Information System that houses marine energy resource characterization data
- Open-access, interactive mapping tool for marine energy
- Includes data layers on U.S. wave, tidal, riverine current, ocean current, and ocean thermal resources



<https://maps.nrel.gov/marine-energy-atlas/>

Updated Ocean Energy Systems GIS

- OES-GIS developed on platform in Europe, ported to PRIMRE Marine Energy Atlas system
- Hosts spatial data on marine energy facilities, resources, geospatial data, and environmental layers
- ~50 GB of data transferred to Marine Energy Atlas
- OES data live on Atlas spring 2023
- To be updated annually

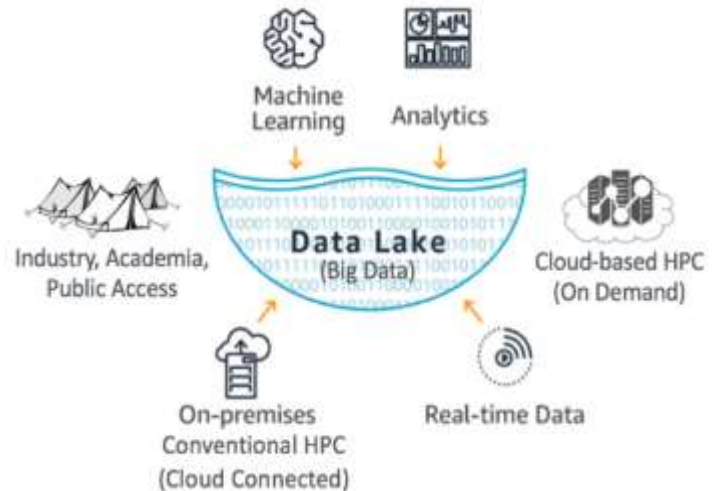


Marine Energy Data Lakes

- Universal access to data
- Data available to anyone with an internet connection
- Access no longer limited to national labs, large universities and organizations with HPCs
- Enabling collaboration with communities of all sizes
- Including smaller universities, high schools, startup companies, and other innovators



The Open Energy Data Initiative (OEDI) improves access to high-value data sets.



Contribute to PRIMRE



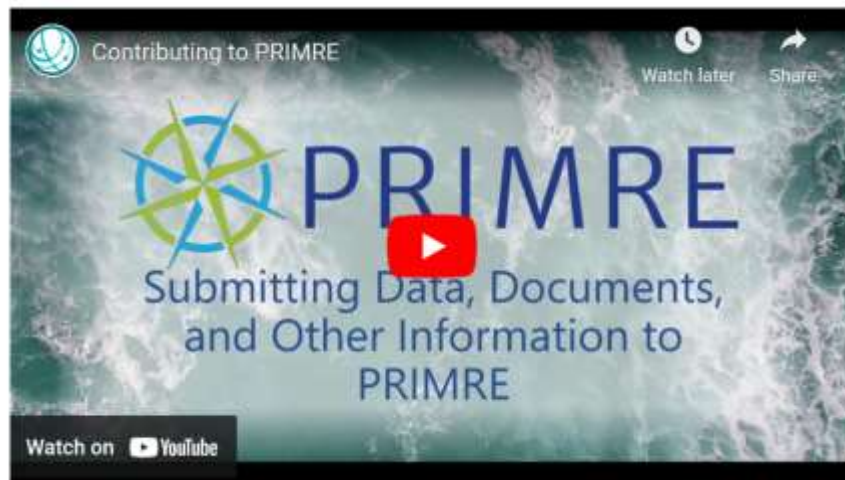
Contributing to PRIMRE

Submissions to PRIMRE from researchers, academics, and developers involved in the Marine Energy (ME) industry are highly encouraged. The table below helps identify the appropriate knowledge hub for each type of content. Any questions or requests for guidance on how to contribute content to PRIMRE can be directed to the PRIMRE Help email address.

Help me choose.

What would you like to contribute?

- A journal article or conference paper relevant to Marine Energy
- Data, including tabular data, time series data, videos, code, software, or APIs.
- New guidance, lessons learned, standards, or best practices.
- Information about a new project, device or organization operating in ME.
- Text, images or other content to one of the PRIMRE pages.



International Data Sharing Workshops

- On behalf of Ocean Energy Systems and the U.S. DOE, the PRIMRE team hosts annual international workshops to explore the potential for sharing marine energy data internationally.
- Each workshop features presentations on various marine energy resources available around the world (e.g., databases, portals, tools), followed by discussions focused on the values and barriers to data sharing, and solutions to overcome those barriers.
- The 2023 workshop highlighted MARENDATA and PRIMRE's interoperability and participant discussions focused on geospatial data sharing and to the Marine Energy Atlas.



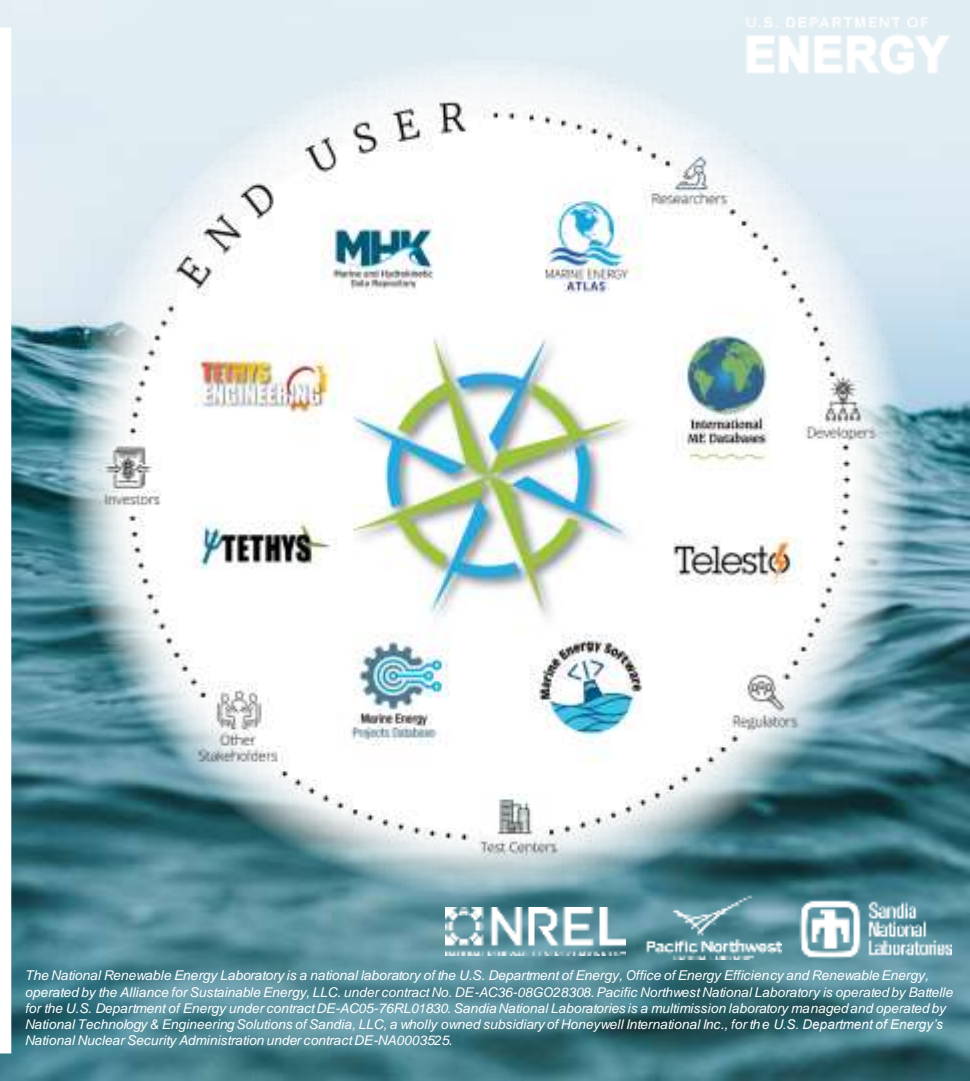
Thank You!

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- Sandia: Kelley Ruehl, Will Peplinski, and Megan Anderson



Sandia National Laboratories