Marine Energy Data, Organized – PRIMRE

Jon Weers[1], Andrea Copping[2], Cesar Castillo[3]

[1]National Renewable Energy Laboratory, [2]Pacific Northwest National Laboratory,
[3]Sandia National Laboratories

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DOE Data Days 2023

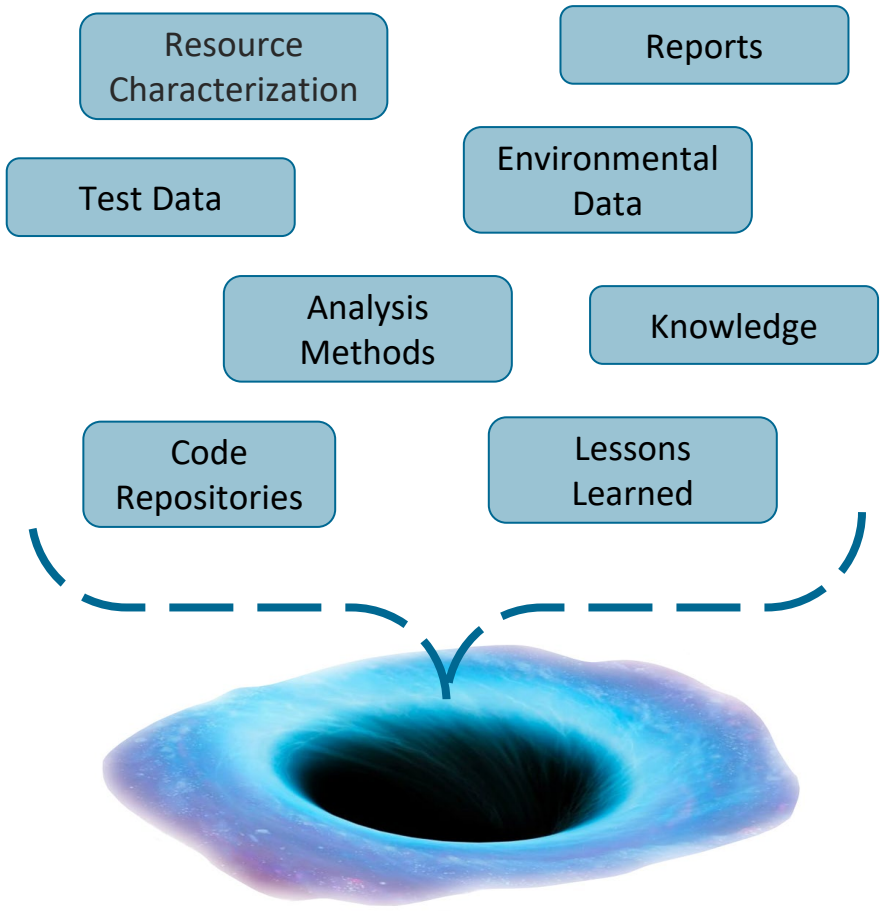
Availability of Marine Energy Knowledge

Data and information are:

- often not made public
- stored in many locations and diverse formats
- often not catalogued, described, accessible, or discoverable.

US Department of Energy developed:

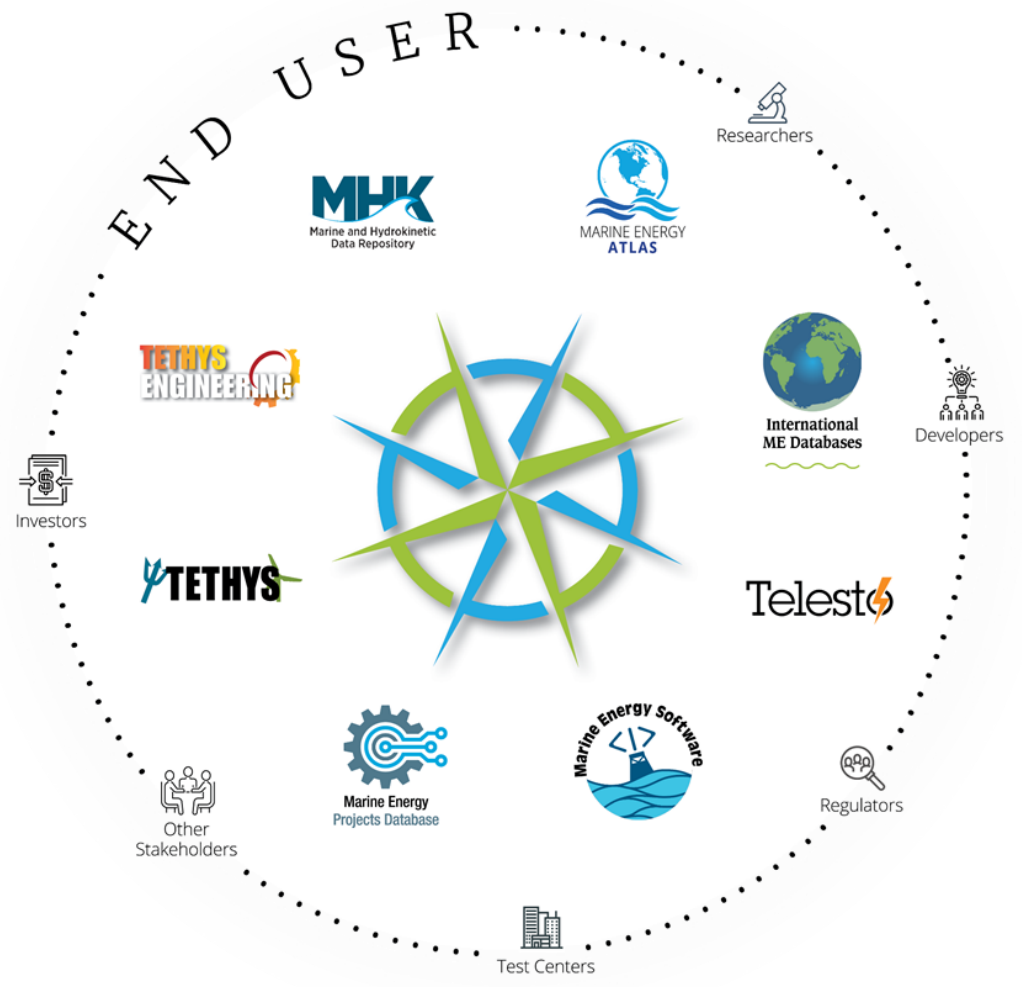
Portal and Repository for Information on Marine Renewable Energy (PRIMRE) to overcome data and information barriers to research, development, and testing in support of the US and international marine energy communities.



PRIMRE

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
- Archived Webinars
- Educational Resources
- Data, Tools, & Software

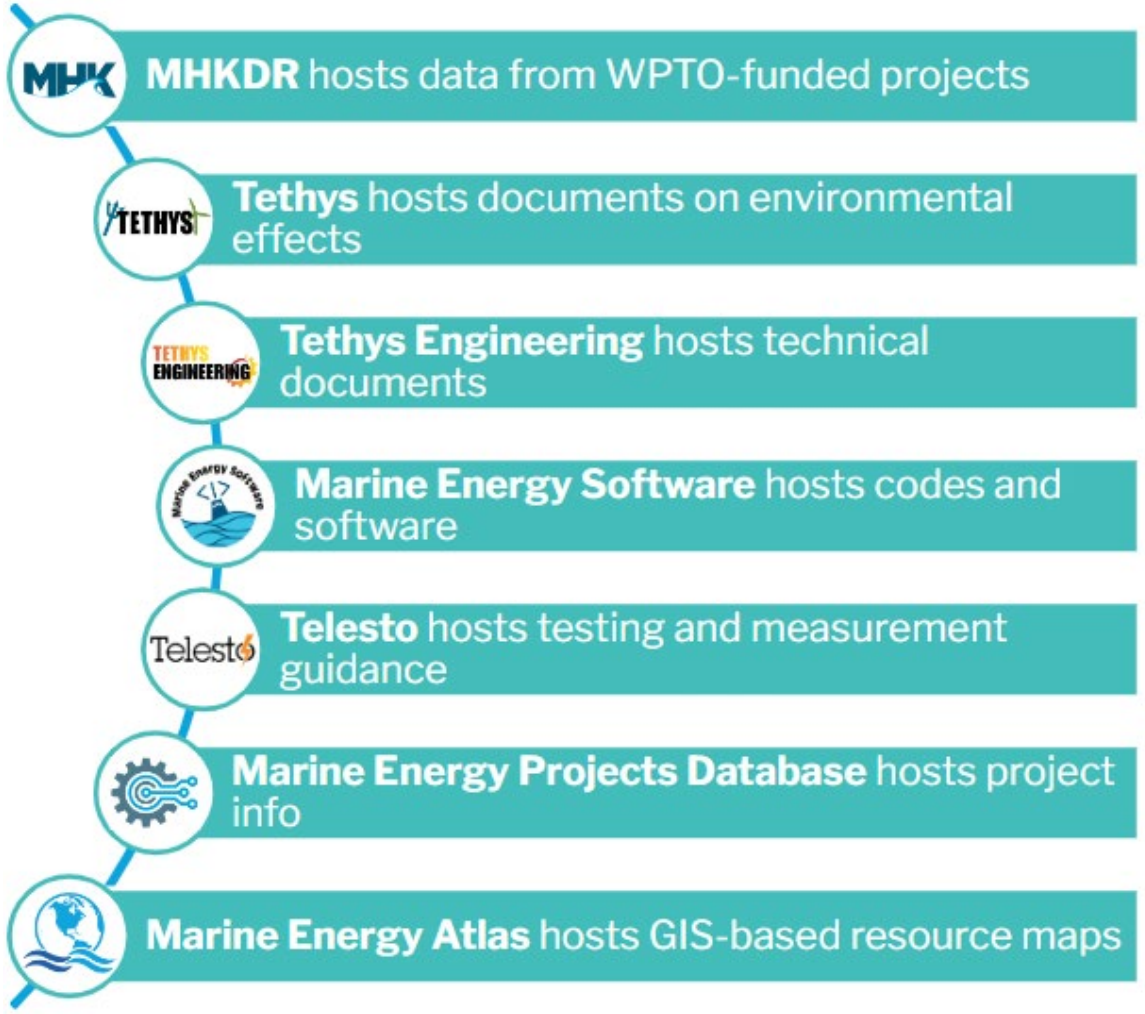


Funded by the US Department of Energy's Water Power Technologies Office and led by 3 national labs.

https://PRIMRE.org

PRIMRE Knowledge Hubs

- 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 information in any part of the system



MHKDR

Marine and Hydrokinetic 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/

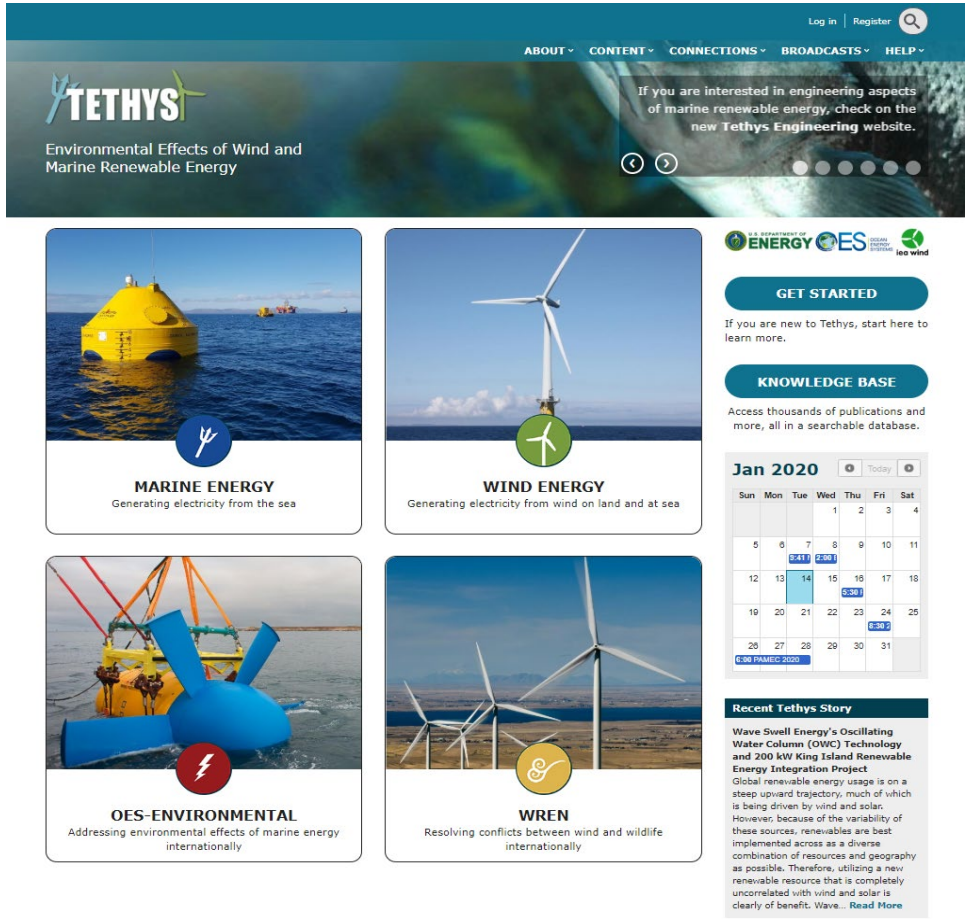
Tethys

- >8,900 Journal papers, reports, other media on environmental effects of wind and marine energy technologies

- Serves as a commons for practitioners, enhancing the connectedness of the marine energy community

Features:

- Knowledge Base & Map Viewer
- Glossary
- Events Calendar
- Broadcasts *(e.g., Tethys* Blasts, *Tethys* Stories, Webinars)
- *Tethys* Community



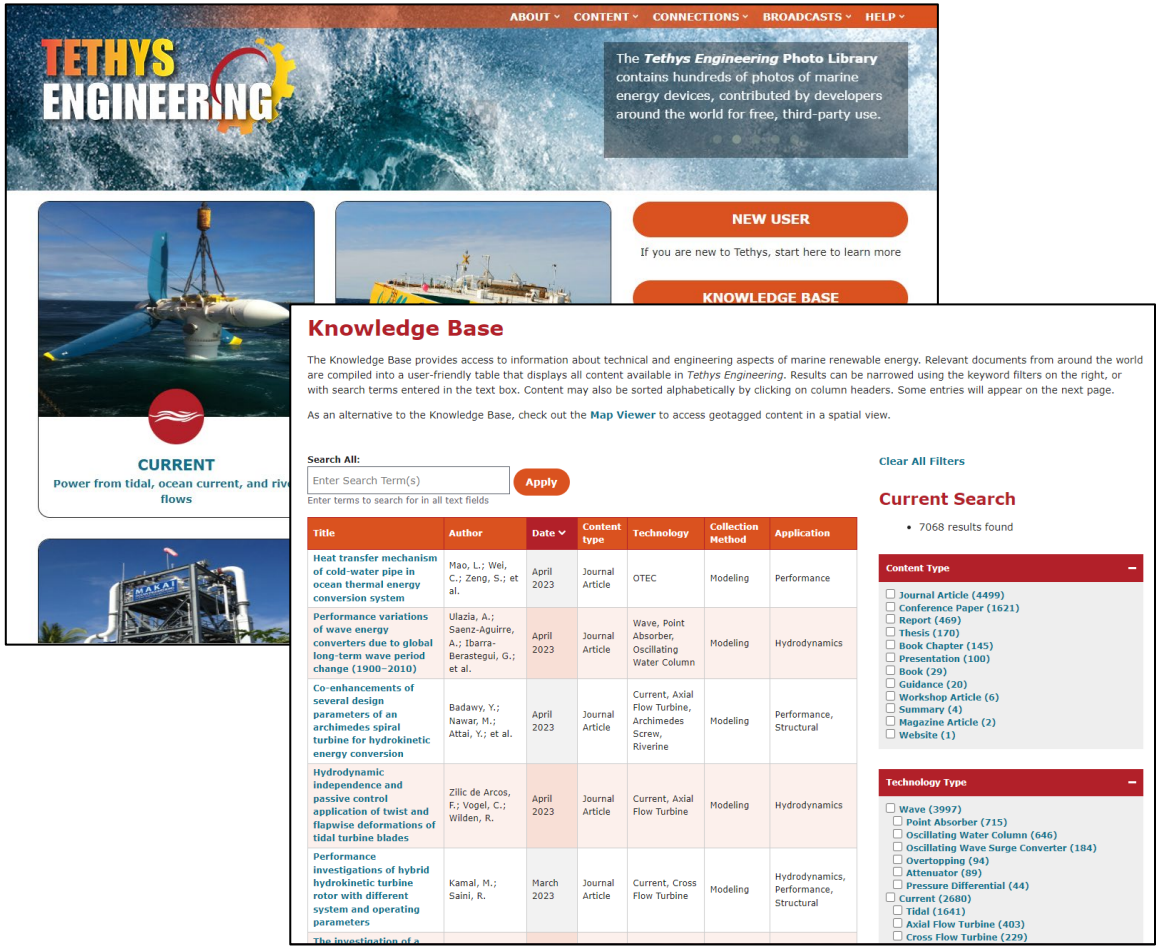
https://tethys.pnnl.gov/

Tethys Engineering

- >7,700 journal papers, reports, other media on marine energy engineering and technologies

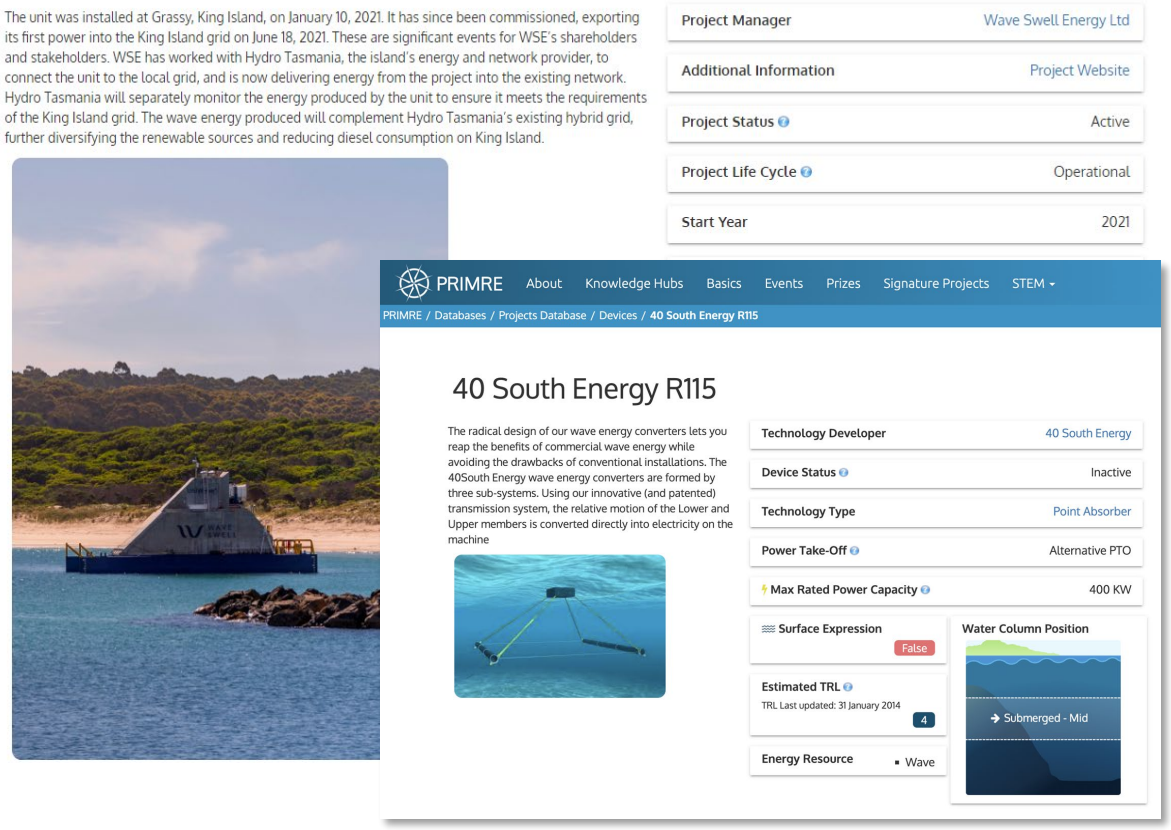
Features:

- Knowledge Base & Map Viewer
- Glossary
- Events Calendar
- Photo Library (>650 device images)
- *Tethys Engineering* Blasts
- *Tethys Engineering* Community



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

Marine Energy Projects Database

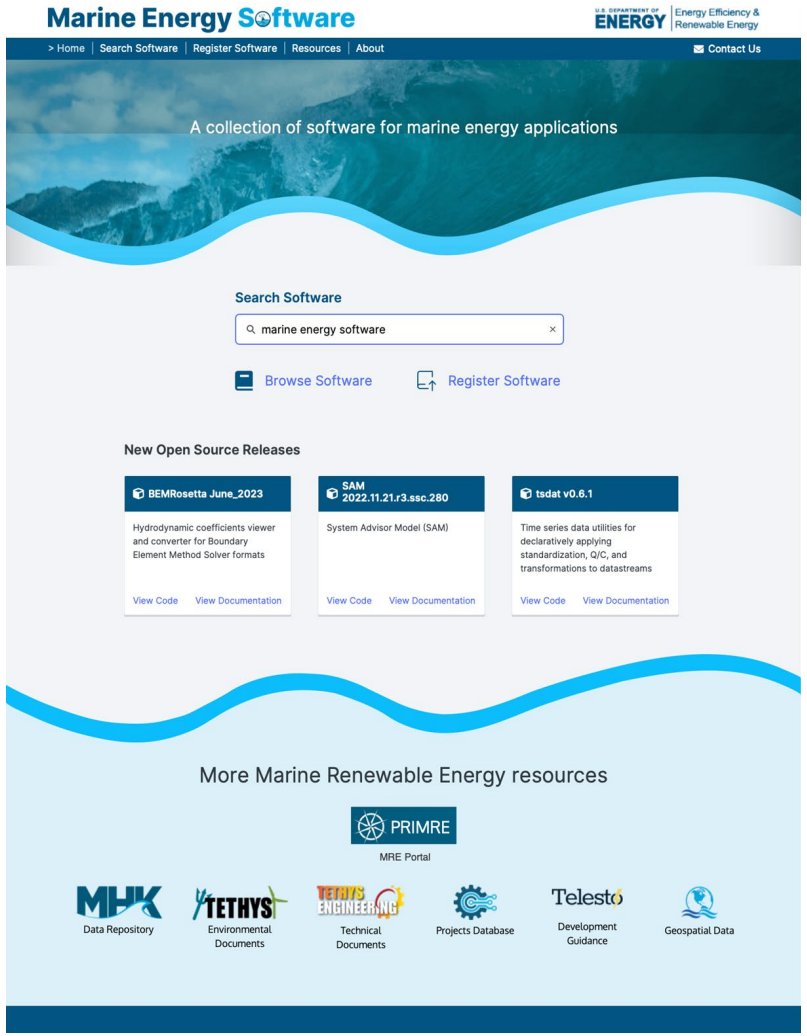


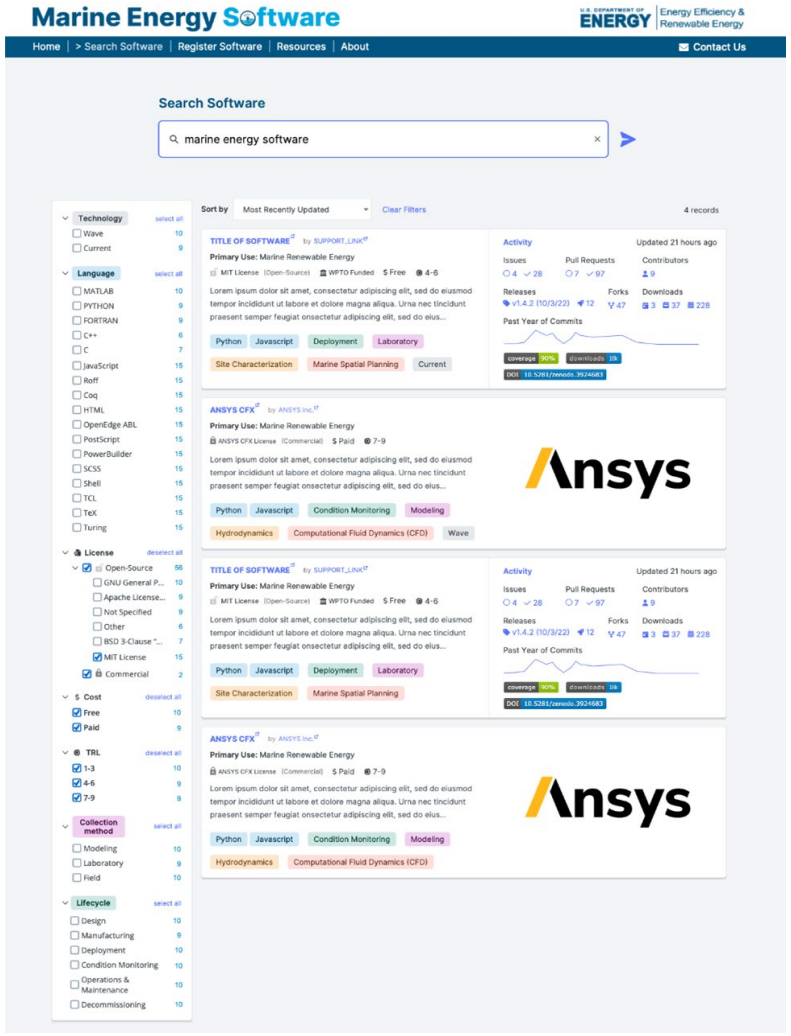
- >1,000 international marine energy projects, devices, test sites, and organizations
- Historic record of past deployments
- Database pages are linked to data, other parts of PRIMRE
- Allows for exploration of the relationships between organizations, projects deployments, and devices

https://primre.org/Databases/Projects_Database

Marine Energy Software

- Driven by user needs and input
- Catalogues codes and software relevant to marine energy
- Including commercial and open access software

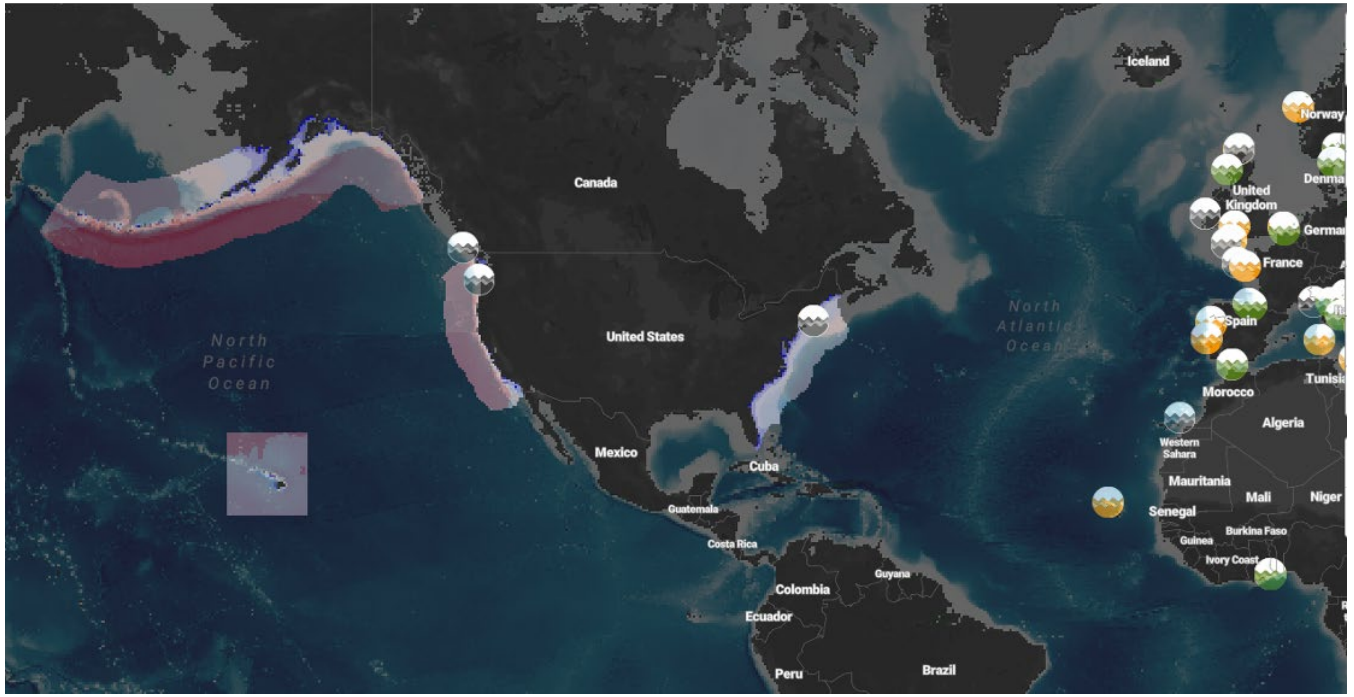




https://software.primre.org/

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

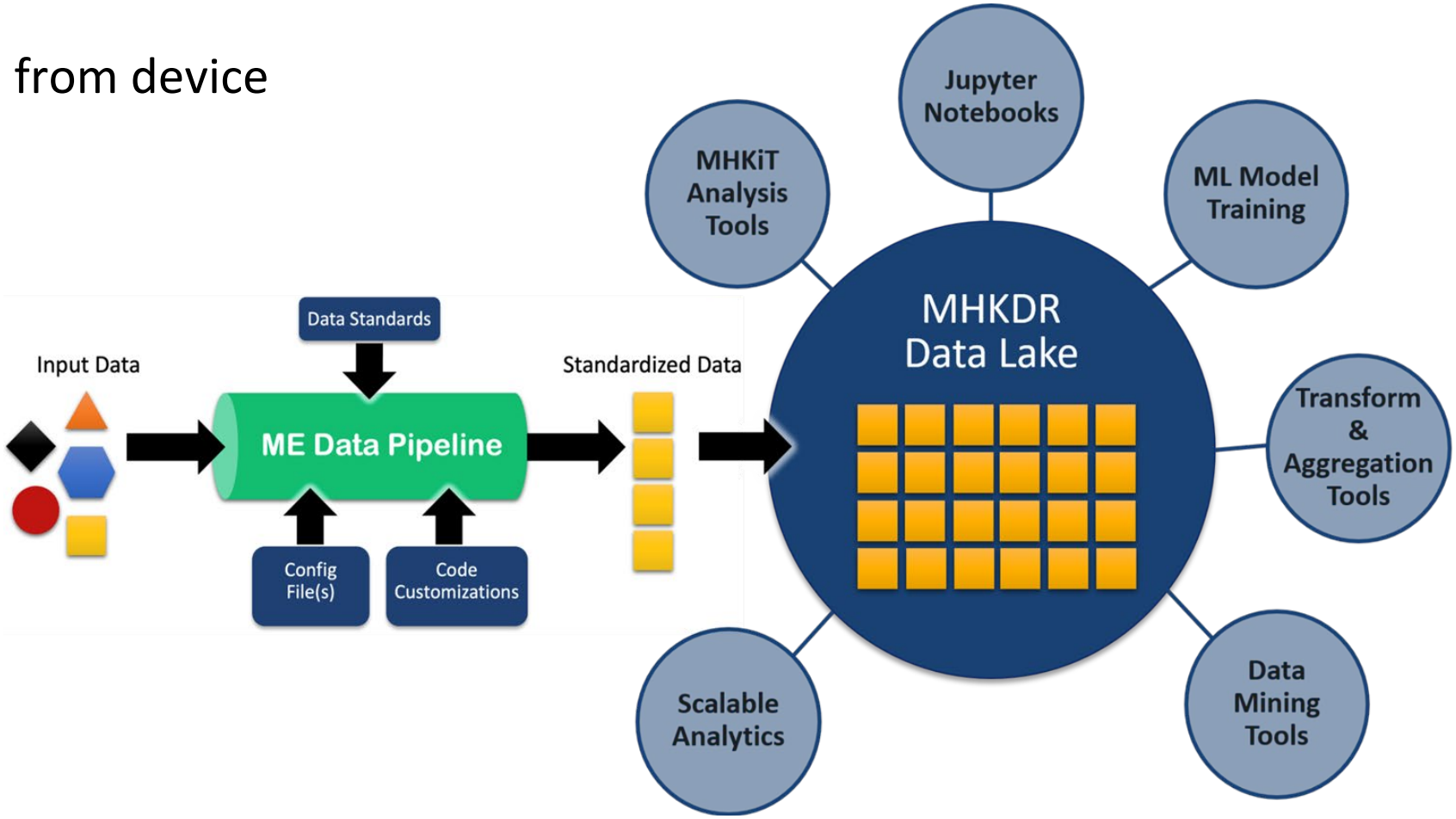


Significant wave height in US EEZs, wave project locations, bathymetry

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

Marine Energy Data Pipeline

- Standardizing data from device to dissemination
- Automating data standardization



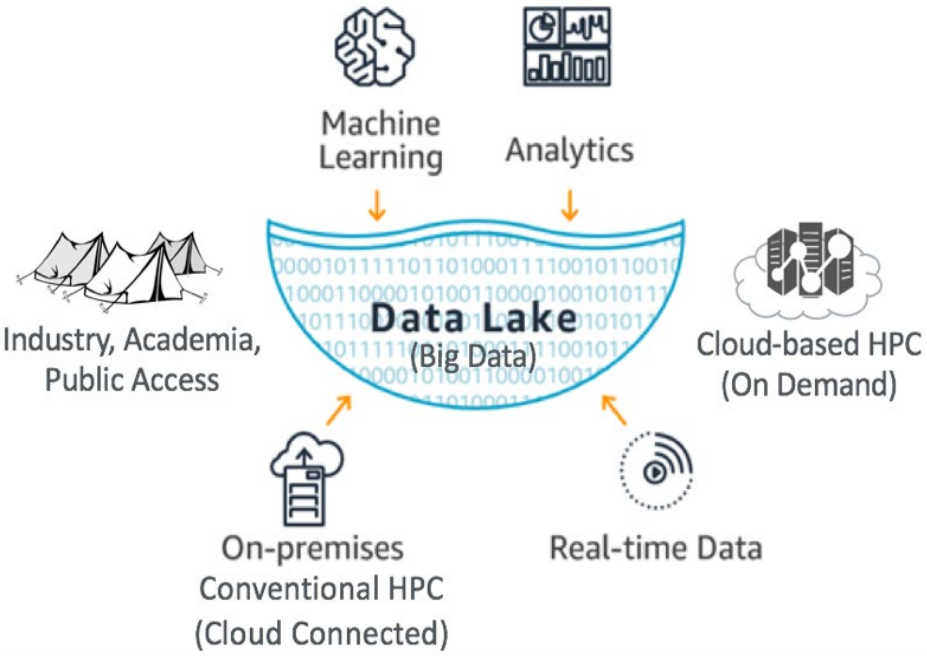
Marine Energy Data Lakes

Universal Access to Marine Energy 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

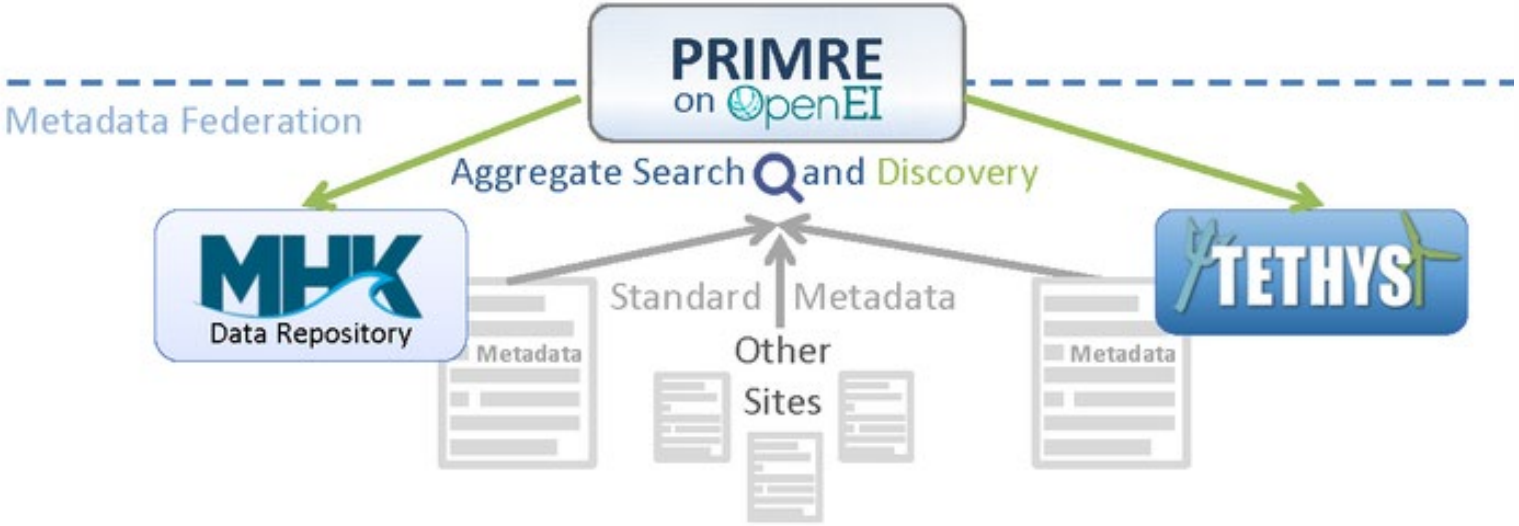
MHKDR + OEDI

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

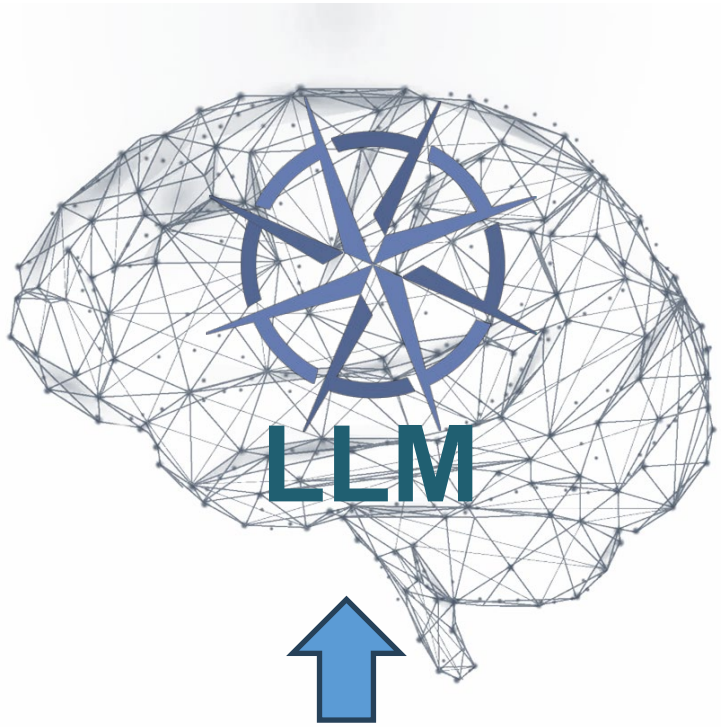


PRIMRE Centralized Search

- Search across all PRIMRE platforms and partners
- Data sharing across U.S. and international databases
  - Standard metadata units/formatting = data can be shared seamlessly between platform
- Uses a PRIMRE metadata schema based on DCAT + marine energy terms



https://primre.org/Search



- AI-powered search coming soon!
- Building a prototype LLM based on extensive library and metadata

Thank You! Questions?

PRIMRE Principal Investigators:

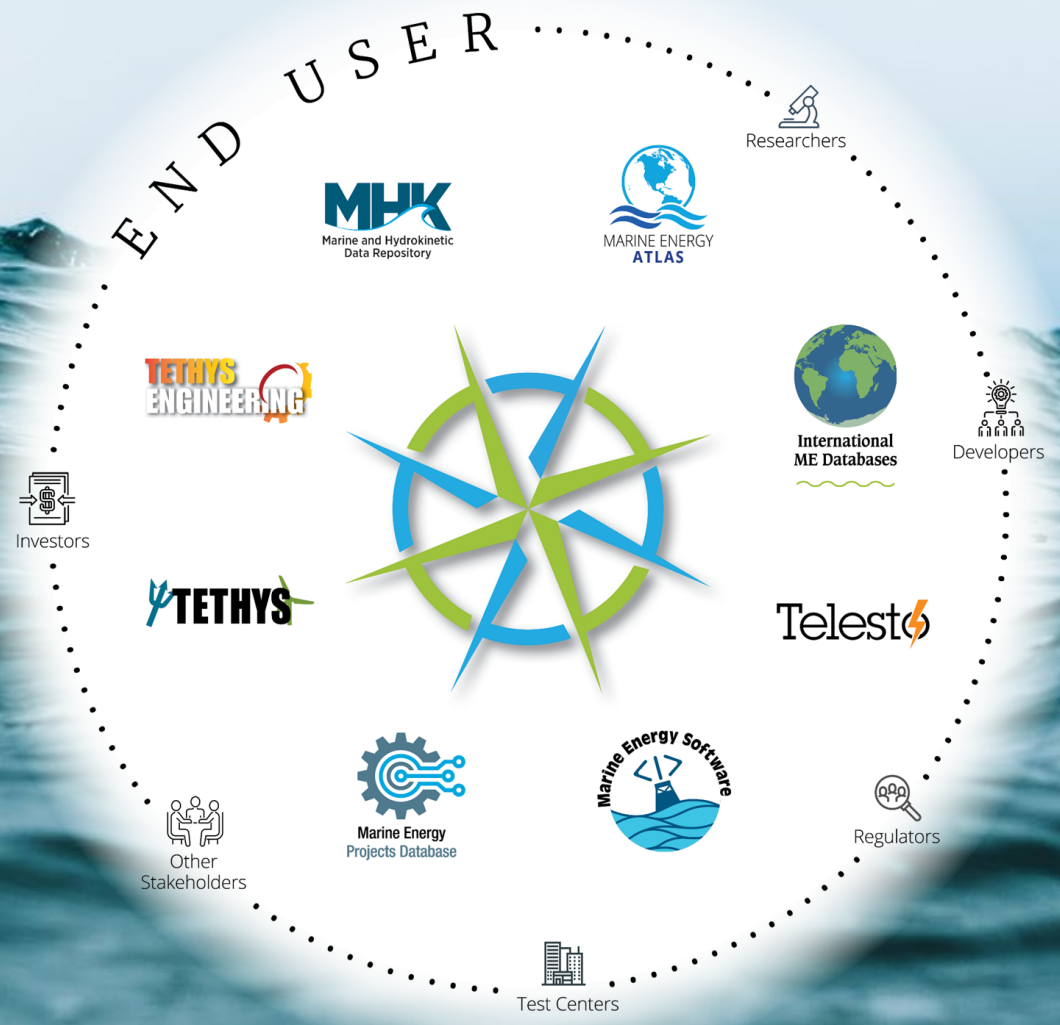
- Andrea Copping (andrea.copping@pnnl.gov)
- Jon Weers (jon.weers@nrel.gov)
- Cesar Castillo (cesar.castillo@sandia.gov)

PRIMRE Team:

- PNNL: Jonathan Whiting, Lysel Garavelli, Hayley Farr, and Fadia Ticona Rollano
- NREL: Lisa Temple, Katie Peterson, Hanna Fields, Erika Curry-Elrod, and Sean Morris
- Sandia: Kelley Ruehl, Will Peplinski, and Megan Anderson

PRIMRE Help

PRIMREHelp@groups.nrel.gov



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