



PAMEC 2024 Workshop: International Data Sharing for Marine Renewable Energy (PRIMRE)

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January 20, 2024

9:00 AM- 11:00 AM

Agenda

- Introductions
- What is PRIMRE?
- Discussion on Data Sharing
 - Levels of Data Sharing
 - Progress Towards International Marine Energy Data Sharing
- Breakout Discussions
- Closing

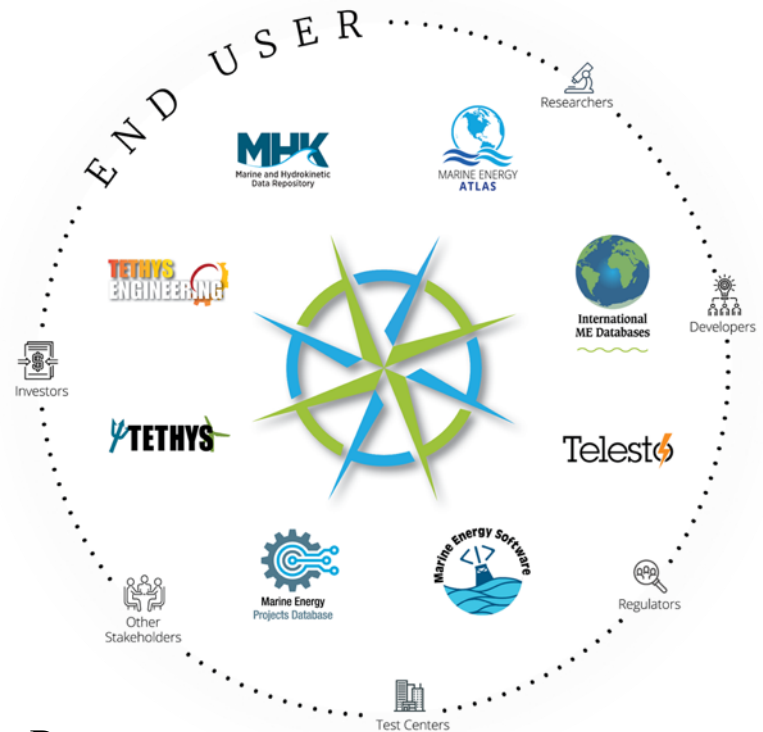




The **Portal and Repository of Information on Marine Renewable Energy (PRIMRE)** provides access to marine energy data, information, and resources to help advance the industry.

- 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.

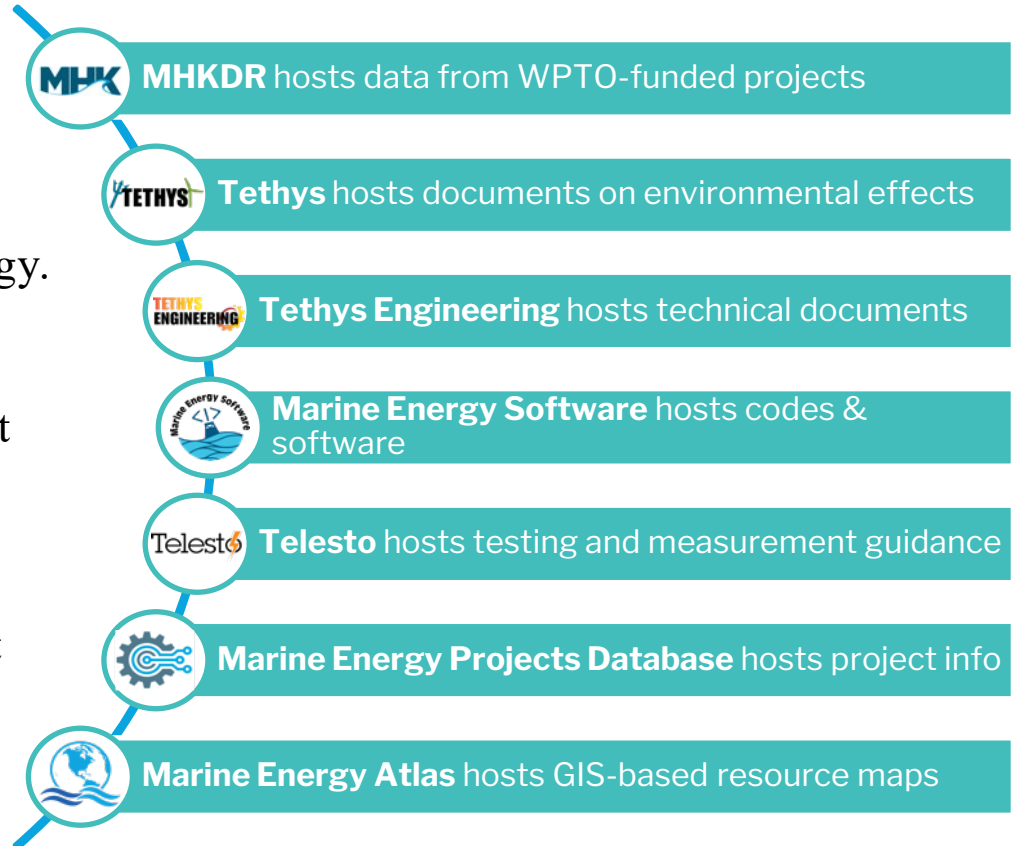


<https://primre.org/>



- 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.

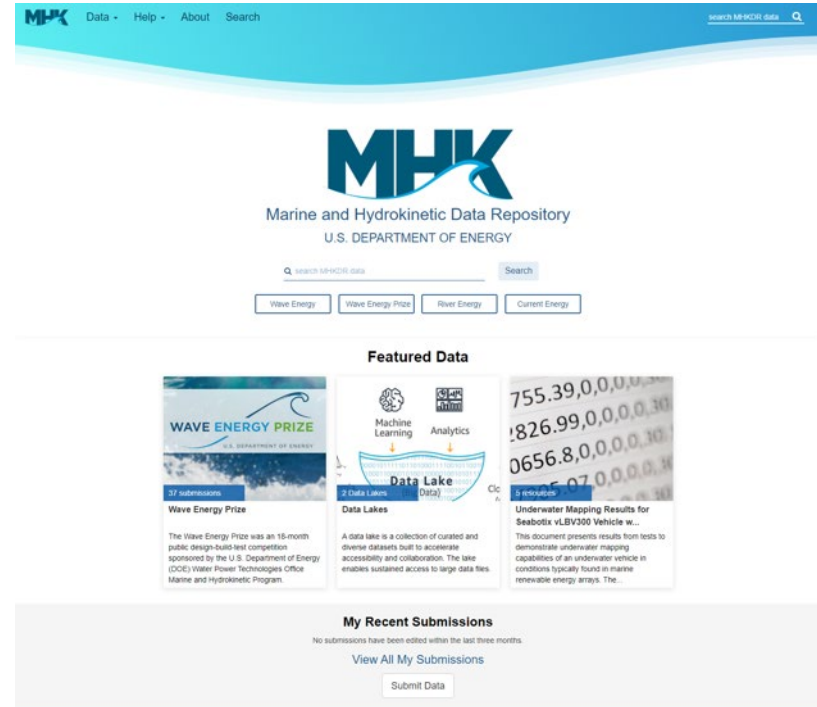
<https://primre.org/>



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 interface. At the top, there is a navigation bar with 'Data', 'Help', 'About', and 'Search' links, along with a search input field. Below the navigation bar is the MHK logo and the text 'Marine and Hydrokinetic Data Repository U.S. DEPARTMENT OF ENERGY'. A search bar is present with a 'Search' button. Below the search bar are four buttons: 'Wave Energy', 'Wave Energy Prize', 'River Energy', and 'Current Energy'. The main content area features a 'Featured Data' section with three cards: 'Wave Energy Prize' (37 submissions), 'Data Lakes' (7 Data Lakes), and 'Underwater Mapping Results for SeaBotix vLEAP50 Vehicle...' (507 submissions). Each card includes a brief description of the data. At the bottom, there is a 'My Recent Submissions' section with 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/>

Log in | Register

ABOUT - CONTENT - TOOLS - CONNECTIONS - BROADCASTS - HELP

TETHYS
Environmental Effects of Wind and Marine Renewable Energy

NEW: The U.S. Offshore Wind Synthesis of Environmental Effects Research (SEER) project has launched the Pacific Coast Offshore Wind Environmental Research Project Finder!

GET STARTED
If you are new to Tethys, start here to learn more.

KNOWLEDGE BASE
Access thousands of publications and more, all in a searchable database.

Jan 2024

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Recent Tethys Story
Producing Productive Species Density Maps in Potential Wind Energy Development Areas
In support of the United States' goal to deploy 30 gigawatts of offshore wind energy by 2030, the Department of Energy (DOE) Wind Technologies Office recently announced \$15 million for two

Security & Privacy | Visit Tethys Engineering

U.S. DEPARTMENT OF ENERGY | PRIMRE | ESI | NREL

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

The screenshot shows the PRIMRE Marine Energy Projects Database interface. At the top, there's a navigation bar with links like 'About', 'Knowledge Hubs', 'Tools', 'Basics', 'Events', 'Prizes', 'Signature Projects', and 'STEM'. Below this is a search bar and a list of filter options. The main content area displays a list of projects, with a callout box for the 'King Island Wave Swell Project'. The callout box contains a photograph of the project and a brief description: 'The unit was installed at Grassy, King Island, on January 10, 2021. It has since been commissioned, exporting its first power into the King Island grid on June 18, 2021. These are significant events for WSE's shareholders and stakeholders. WSE has worked with Hydro Tasmania, the island's energy and network provider, to connect the unit to the local grid, and is now delivering energy from the project into the existing network. Hydro Tasmania will separately monitor the energy produced by the unit to ensure it meets the requirements of the King Island grid. The wave energy produced will complement Hydro Tasmania's existing hybrid grid, further diversifying the renewable sources and reducing diesel consumption on King Island.'

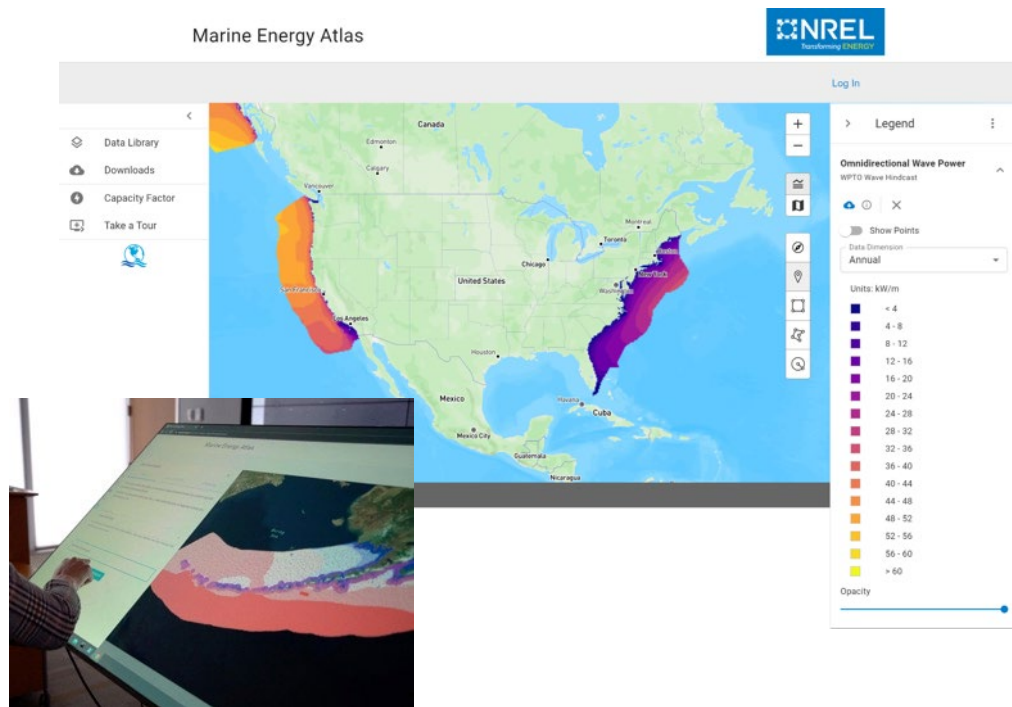
https://openenergydata.org/databases/Projects_Database



Marine Energy Atlas

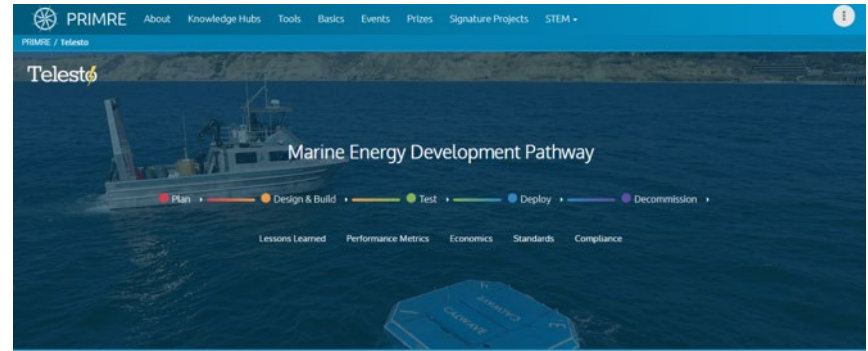
- Geographic Information System that houses marine energy resource characterization data
- Open-access, interactive mapping tool for marine energy
- Includes data layers on U.S. wave, tidal, riverine current, ocean current, and ocean thermal resources

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



- 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 Greek mythology, Telesto is a water-being who is the personification of divine blessing 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 strives to provide information pertinent to the international marine energy industry. Performance metrics, internationally accepted standards, and economic viability will apply in any locale. Permitting and regulatory information, however, will be site specific and although we provide information on consenting pathways for OES member countries it is more an informative summary than legal guidance.

Navigation on this knowledge hub is envisioned as a marine energy project pathway, from planning through decommissioning. Though the navigation may be envisioned as a linear process, in reality, any project will involve co-design with stakeholders plus the interplay of design with numerical modeling, building, and testing. In most cases, it will be an iterative, non-linear process where a setback in a single task might push designers of new technology back to rebuilding prototypes and the planning stage. The pages Lessons Learned, Performance Metrics, Economics, Standards, and Compliance will apply in all project stages and as such fall outside of the pathway.

Telesto is curated 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 Water Power Technologies Office.

Featured Content on Telesto



Lessons Learned
The BRIDGE Team implemented a series



LCOE
Featured Part of Economics in a series



IEC TC 114
International Electrotechnical

Marine Energy Development Pathway



2020 State of the Science Report

NREL

Status	Percentage
Planned	41.9%
Operational	16.1%
Decommissioned	20%
Canceled	12.9%

TETHYS

Cross Cutting Topics



Lessons Learned

Performance Metrics

Economics

Standards

Compliance

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

Marine Energy Software

- Driven by user needs and input
- Catalogues codes and software relevant to marine energy
- Including commercial and open access software
- Launching new version this year!

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

The screenshot shows the MRE Code Hub website. At the top right, it features the U.S. Department of Energy logo and the text 'Energy Efficiency & Renewable Energy' with a 'Contact Us' link. The main header reads 'MRE Code Hub' and includes a tagline: 'A collection of open-source software for the marine renewable energy (MRE) community'. Below this, there are three main sections: 'Browse MRE Code Hub Repositories' (with a folder icon), 'Search MRE Code Hub Source Code' (with a document and search icon), and 'Register Your Software' (with a document and arrow icon). To the right, there is a section for 'Need help finding the right software tools for your MRE-related tasks?' which points to the 'PRIMRE Code Catalog'. Below that, it asks 'Looking for other MRE resources?' and points to 'PRIMRE'. At the bottom, there is a 'New Releases' section with three cards: 'BEMRosetta January', 'SAM 2023.12.17.r0.ssc.288', and 'tsdat v0.7.5'. Each card lists the software name, version, a brief description, and links for 'Code' and 'Documentation'.

Waves of Data

2012

- “Every day, we create 2.5 quintillion bytes of data — so much that 90% of the data in the world today has been created in the last two years alone. ”

- IBM: “What is big data?” IBM: Bringing big data to the enterprise. IBM. 12 Feb. 2012 Web. <http://www-01.ibm.com/software/data/bigdata/what-is-big-data.html>.

2024

- Amount of data increasing exponentially,
- Higher resolution sensors
- Data increasing in size and complexity
- Innovative corporate data strategies
- Changes in research data paradigms (“Data Lakes”)
- Strategic data partnerships (“Data Trusts”)
- Growing need for new data sharing best practices

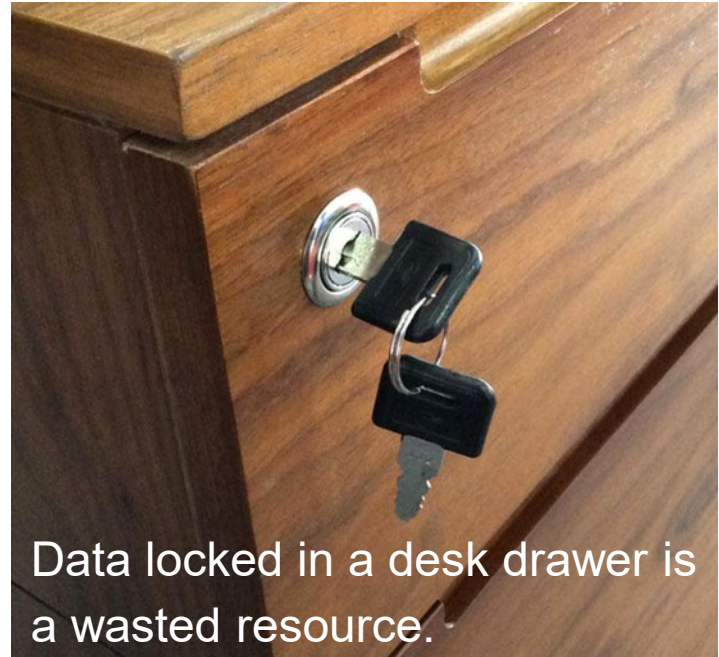
Value of Data Sharing

“Success should be measured not when a project is completed or an experiment concluded, but when scientific and technical information is disseminated.”

- DOE Strategic Plan, May 2011, p. 43-44

Put Your Data to Work for You

- Advance, Innovate, and Collaborate
- Advance the adoption of MRE technologies
- Enable innovation through the sharing of data
- Create new business partnerships and opportunities for collaboration



Data locked in a desk drawer is a wasted resource.

Levels of Data Sharing

Linking

Linking to the homepage of another database, as an additional resource.

Deep Linking

Linking directly to relevant content on another database, instead of the homepage.

Federation

Metadata federation maps structured content from multiple databases, allowing for smart content, filters, remote searches, and other forms of integration in both directions.

Linking

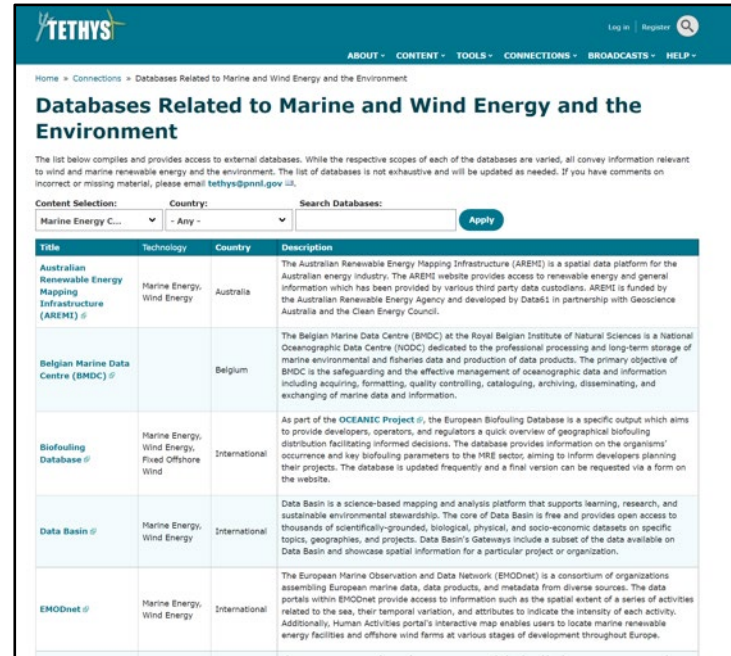
Definition: Linking to the homepage of another database, as an additional resource.

Advantages:

- Extremely low effort
- Improves search rankings (SEO)
- Encourages link exchanges

Disadvantages:

- Limited benefit
- Not user friendly (often no clear relevance)



The screenshot shows the TETHYS website interface. At the top, there is a navigation bar with the TETHYS logo and links for Home, Content, Tools, Connections, Broadcasts, and Help. Below the navigation bar, the page title is "Databases Related to Marine and Wind Energy and the Environment". The page content includes a search bar with "Content Selection" set to "Marine Energy C..." and "Country" set to "- Any -". Below the search bar is a table with the following data:

Title	Technology	Country	Description
Australian Renewable Energy Mapping Infrastructure (AREMI) [Ⓜ]	Marine Energy, Wind Energy	Australia	The Australian Renewable Energy Mapping Infrastructure (AREMI) is a spatial data platform for the Australian energy industry. The AREMI website provides access to renewable energy and general information which has been provided by various third party data custodians. AREMI is funded by the Australian Renewable Energy Agency and developed by Data61 in partnership with Geoscience Australia and the Clean Energy Council.
Belgian Marine Data Centre (BMDC) [Ⓜ]		Belgium	The Belgian Marine Data Centre (BMDC) at the Royal Belgian Institute of Natural Sciences is a National Oceanographic Data Centre (NODC) dedicated to the professional processing and long-term storage of marine environmental and fisheries data and production of data products. The primary objective of BMDC is the safeguarding and the effective management of oceanographic data and information including acquiring, formatting, quality controlling, cataloguing, archiving, disseminating, and exchanging of marine data and information.
Biofouling Database [Ⓜ]	Marine Energy, Wind Energy, Fixed Offshore Wind	International	As part of the OCEANEC Project [Ⓜ] , the European Biofouling Database is a specific output which aims to provide developers, operators, and regulators a quick overview of geographical biofouling distribution facilitating informed decisions. The database provides information on the organisms' occurrence and key biofouling parameters to the HRE sector, aiming to inform developers planning their projects. The database is updated frequently and a final version can be requested via a form on the website.
Data Basin [Ⓜ]	Marine Energy, Wind Energy	International	Data Basin is a science-based mapping and analysis platform that supports learning, research, and sustainable environmental stewardship. The core of Data Basin is free and provides open access to thousands of scientifically-grounded, biological, physical, and socio-economic datasets on specific topics, geographies, and projects. Data Basin's Gateways include a subset of the data available on Data Basin and showcase spatial information for a particular project or organization.
EHODnet [Ⓜ]	Marine Energy, Wind Energy	International	The European Marine Observation and Data Network (EHODnet) is a consortium of organizations assembling European marine data, data products, and metadata from diverse sources. The data portals within EHODnet provide access to information such as the spatial extent of a series of activities related to the sea, their temporal variation, and attributes to indicate the intensity of each activity. Additionally, Human Activities portal's interactive map enables users to locate marine renewable energy facilities and offshore wind farms at various stages of development throughout Europe.

<https://tethys.pnnl.gov/databases?content=466>

Deep Linking

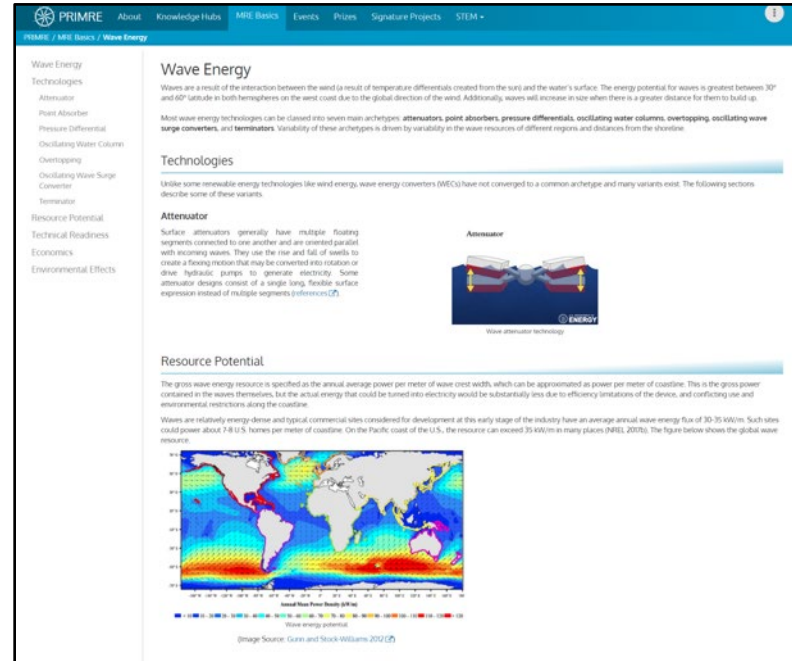
Definition: Linking directly to relevant content on another database, instead of a homepage.

Advantages:

- Improves search rankings (SEO)
- Improves user experience

Disadvantages:

- Requires planning to be intentional
- Difficult to maintain, links may often break



The screenshot shows the PRIMRE website's 'Wave Energy' page. The page has a blue header with the PRIMRE logo and navigation links: About, Knowledge Hubs, MRE Basics, Events, Prizes, Signature Projects, and STEM. Below the header is a sidebar menu with links to Wave Energy, Technologies, Attenuator, Point Absorber, Pressure Differential, Oscillating Water Column, Overlapping, Oscillating Wave Surge Converter, Terminator, Resource Potential, Technical Readiness, Economics, and Environmental Effects. The main content area is titled 'Wave Energy' and includes a definition of waves, a list of technologies, a section on 'Attenuator' with a diagram of a wave attenuator technology, and a section on 'Resource Potential' with a world map showing wave energy potential. The map is color-coded by energy potential, with a legend below it. The legend shows energy potential in kW/m², ranging from 0 to 100. The map shows high potential in the North Atlantic, the North Pacific, and the Southern Ocean. The page also includes a citation: (Image Source: Gunn and Stock-Williams, 2012).

https://openei.org/wiki/PRIMRE/MRE_Basics/Wave_Energy

Metadata Federation

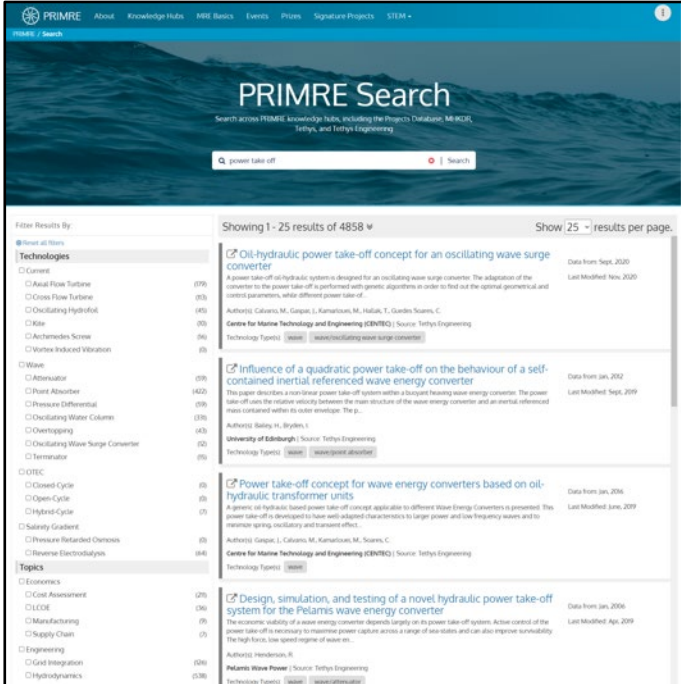
Definition: Metadata federation allows structured content from multiple autonomous databases to be mapped and integrated in both directions.

Advantages:

- Improves the reach of your content
- Enhances the quality and scope of your content
- Improves your user experience
- Improves search rankings (SEO) significantly
- Coordinates terminology
- Easier to maintain long term

Disadvantages:

- Large initial effort (metadata translation and coding)



The screenshot displays the PRIMRE Search website. The search bar contains the text "power take off". The results are filtered by "Technologies" and show a list of search results. The first result is titled "Oil-hydraulic power take-off concept for an oscillating wave surge converter" and is dated from Sept, 2020. The second result is "Influence of a quadratic power take-off on the behaviour of a self-contained inertial referenced wave energy converter" dated from Jan, 2012. The third result is "Power take-off concept for wave energy converters based on oil-hydraulic transformer units" dated from Jan, 2016. The fourth result is "Design, simulation, and testing of a novel hydraulic power take-off system for the Pelamis wave energy converter" dated from Jan, 2006. The interface includes a navigation menu at the top, a search bar, and a list of results with filters on the left.

<https://openi.org/wiki/PRIMRE/Search?q=power+take+off>

Ex. of Metadata Federation on PRIMRE

Appendix B. PRIMRE Metadata Schema

The table below details the metadata schema used by sites within the PRIMRE community to support interoperability with each other and to register their assets in the centralized PRIMRE search. Only publicly-available metadata should be provided to PRIMRE. The following are examples where the PRIMRE API has already been created:

- M-HDR: <https://mhdr.openei.org/api?action=getSubmissionsForPRIMRE&modifiedDate=2022-04-01>
- Tethys: https://tethys.pnnl.gov/api/primre_export?modifiedDate=2022-04-01
- Tethys Engineering: https://tethys-engineering.pnnl.gov/api/primre_export?modifiedDate=2022-04-01

Field	Definition	Required
URI	The primary, unique identifier that represents the content on your site. Also a permanent, resolvable web address leading directly to the content. Example: URI: " https://mhdr.openei.org/data/123 "	yes
type	Overarching category to describe the content (e.g., Dataset, Document). Type should be provided as an array of Strings. These categories are controlled and managed by PRIMRE. For more detail, you may also specify one or more subtypes. <ul style="list-style-type: none"> • Dataset • Document • Code • Multimedia <ul style="list-style-type: none"> • Dataset/Data • Dataset/Map (e.g. Shapefile or other GIS data) • Dataset/Image • Dataset/Video • Dataset/Audio • Dataset/OnlineTool (e.g. Web Application or Website) • Dataset/Archive (e.g. zip file) • Document/JournalArticle • Document/Report • Document/Presentation • Document/ConferencePaper • Document/Thesis • Document/Diagram (e.g. Schematic or Blueprint) • Code/API • Code/PublicRepo (e.g. public git repo) • Code/CommercialSoftware • Code/Script (e.g. uploaded file) Example: types: ["Document", "Dataset/Video"]	yes

<https://openei.org/wiki/PRIMRE/Guidelines#appendB>

```

@:
  URI: "https://tethys-engineering.pnnl.gov/node/18829"
  type:
    0: "Document"
    1: "Document/Report"
  landingPage: "https://tethys-engineering.pnnl.gov/publications/Local-flow-turbulence-tidal-energy-conversion-installation-near-pier-estuarine-bridge"
  sourceURL: "https://ui.adsabs.harvard.edu/abs/2019APS..DFM2008W/abstract"
  title: "Local flow and turbulence at a tidal energy conversion installation near a pier of an estuarine bridge"
  description: "Estuarine bridges could serve as ideal locations to deploy marine hydrokinetic (MHK) energy conversion systems. The hydrokinetic resource is typically strong at these narrow locations, the bridge piers can serve as supporting structure for both the bridge and turbines, and synergies exist in the permitting processes. The "Living Bridge Project" installed a hydrokinetic turbine on a floating platform at Memorial bridge in Portsmouth, NH. The location is well-suited as a tidal energy test site, reaching tidal current speeds greater than 2.5 m/s during spring ebb tides. In tidal estuaries the currents can vary significantly in space and time. Measurements were conducted with two acoustic Doppler current profilers (ADCP), mounted on the bow and stern of the platform, and with two acoustic Doppler velocimeters, mounted in various locations. The ADCPs indicated higher maximum current velocities and mean kinetic power density than prior nearby resource assessments. The ADV measurements yielded turbulence time and length scales consistent with estuary scales, e.g., width of the river and distances between the bridge piers. The tidal flow-turbulence characteristics, such as the size and occurrence of coherent structures, affects the loading on the tidal turbine."
  author:
    0: "Wosnik, M."
    1: "Chancey, K."
  organization:
    0: "University of New Hampshire"
    1: "US Department of Energy (DOE)"
  originationDate: "2019-11-01"
  spatial:
    coordinates:
      0: "43.078569000000"
      1: "-70.752946000000"
    extent: "point"
  technologyType:
    0: "Current/Current"
    1: "Current/Tidal"
  tags:
    0: "Engineering"
    1: "Substructure"
    2: "Site Characterization"
    3: "Field Data"
  modifiedDate: "2022-05-02 10:24:54"
  signatureProject: []
  1:
    URI: "https://tethys-engineering.pnnl.gov/node/18830"
    type:
      0: "Document"

```

https://tethys-engineering.pnnl.gov/api/primre_export?modifiedDate=2022-05-01

Ex. of Metadata Federation on PRIMRE

PRIMRE Search
Search across PRIMRE knowledge hubs, including the Projects Database, MHKDR, Tethys, and Tethys Engineering

Q power take off

Filter Results By: [Reset all filters](#)

- Technologies**
 - Current
 - Asul Flow Turbine (179)
 - Cross Flow Turbine (81)
 - Oscillating Hydrofoil (45)
 - Kite (38)
 - Archimedes Screw (96)
 - Vortex Induced Vibration (8)
 - Wave
 - Attenuator (59)
 - Point Absorber (452)
 - Pressure Differential (59)
 - Oscillating Water Column (131)
 - Overtopping (43)
 - Oscillating Wave Surge Converter (12)
 - Terminator (78)
 - OTEC
 - Closed-Cycle (8)
 - Open-Cycle (17)
 - Hybrid-Cycle (1)
 - Salinity Gradient
 - Pressure Retarded Osmosis (64)
 - Reverse Electrodialysis (17)
- Topics**
 - Economics
 - Cost Assessment (26)
 - OLCOE (36)
 - Manufacturing (9)
 - Supply Chain (17)

Showing 1 - 25 results of 4858

Show 25 results per page.

- Oil-hydraulic power take-off concept for an oscillating wave surge converter**
A power take-off oil-hydraulic system is designed for an oscillating wave surge converter. The adaptation of the converter to the power take-off is performed with genetic algorithms in order to find out the optimal geometrical and control parameters, while different power take-off...
Data from Sept, 2020
Last Modified: Nov, 2020
Author(s): Calvino, M., Gaspar, J., Karamfous, M., Vallas, T., Quaresima, S., C.
Centre for Marine Technology and Engineering (CENTEC) | Source: Tethys Engineering
Technology Types: [wave](#) | [wave/oscillating wave surge converter](#)
- Influence of a quadratic power take-off on the behaviour of a self-contained inertial referenced wave energy converter**
This paper describes a non-linear power take-off system within a buoyant heaving wave energy converter. The power take-off uses the relative velocity between the main structure of the wave energy converter and an inertial referenced mass contained within its outer envelope. The...
Data from Jan, 2012
Last Modified: Sept, 2019
Author(s): Bialik, H., Bryden, I.
University of Edinburgh | Source: Tethys Engineering
Technology Types: [wave](#) | [wave/point absorber](#)
- Power take-off concept for wave energy converters based on oil-hydraulic transformer units**
A generic oil-hydraulic based power take-off concept applicable to different Wave Energy Converters is presented. This power take-off is developed to have well adapted characteristics to larger power and low frequency waves and to minimize spring, oscillatory and transient effects...
Data from Jan, 2016
Last Modified: June, 2019
Author(s): Gaspar, J., Calvino, M., Karamfous, M., Soares, C.
Centre for Marine Technology and Engineering (CENTEC) | Source: Tethys Engineering
Technology Types: [wave](#)
- Design, simulation, and testing of a novel hydraulic power take-off system for the Pelamis wave energy converter**
The economic viability of a wave energy converter depends largely on its power take-off system. Active control of the power take-off is necessary to maximize power capture across a range of sea-states and can also improve survivability. The high-force, low speed regime of wave...
Data from Jan, 2016
Last Modified: Apr, 2019

TETHYS ENGINEERING

ABOUT - CONTENT - CONNECTIONS - BROADCASTS - HELP

Log In Register

Search All of MHK Data Repository

You are now viewing content in MHK Data Repository through the integrated PRIMRE search. Clicking on titles will take you to the content on the integrated database. Partial word matches are returned (e.g. "data" finds "database"), but every entered term must be found. If you don't find any results, try reducing the number of words entered. Filters to the right can help narrow your search.

Showing Results for

Tethys Engineering Tethys MHKDR

Search All: test Search

Clear All Filters

Current Search

196 results found

Type

- Dataset (196)
- Archive (98)
- Report (92)
- Data (69)
- OnlineTool (41)
- Video (13)
- Presentation (7)
- Script (4)
- Diagram (2)
- Image (1)
- PublicRepo (1)

Technology

- Wave (114)
- Current (31)
- Pressure Differential (19)
- Point Absorber (12)
- Surge Converter (10)
- Attenuator (7)
- Terminator (4)
- Overtopping (2)

(Show less)

Tags

- MHK (195)

Wave Energy Prize - 1/50th Testing - SEWEC Attenuator

... This submission of data includes all the 1/50th scale testing data completed on the Wave Energy Prize for the SEWEC team, and includes: - 1/50th test data (raw & processed) - 1/50th test data video and pictures - 1/50th Test plans and testing documents - SSTF_Submission ...

Wave Energy Prize - 1/50th Testing - AquaHarmonics Point Absorber

... This submission of data includes all the 1/50th scale testing data completed on the Wave Energy Prize for the AquaHarmonics team, and includes: - 1/50th test data (raw & processed) - 1/50th test data video and pictures - 1/50th Test plans and testing documents - SSTF_Submission ...

Wave Energy Prize - 1/20th Testing - SEWEC Attenuator

... Data from the 1/20th scale testing data completed on the Wave Energy Prize for the SEWEC team, including the 1/20th scale test plan, raw test data, video, photos, and data analysis results. The top level objective of the 1/20th scale ...

Wave Energy Prize - 1/20th Testing - AquaHarmonics Point Absorber

... Data from the 1/20th scale testing data completed on the Wave Energy Prize for the AquaHarmonics team, including the 1/20th scale test plan, raw test data, video, photos, and data analysis results. The top level objective of the 1/20th scale ...

Wave Energy Prize - 1/50th Testing - 10sec Point Absorber

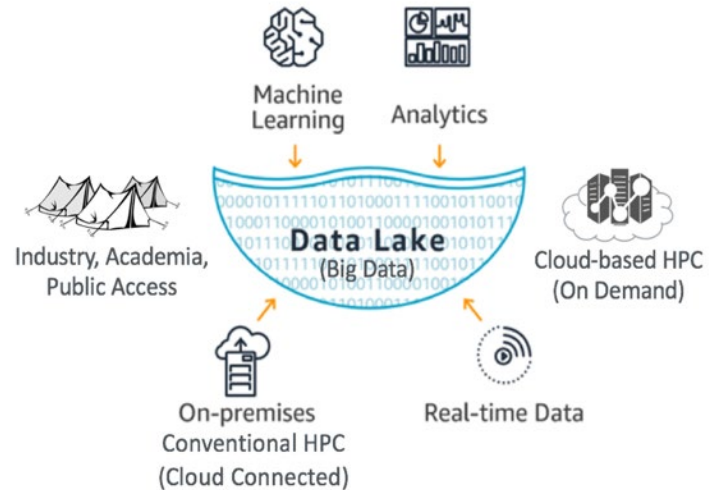
... This submission of data includes all the 1/50th scale testing data completed on the Wave Energy Prize for the 10sec team, and includes: - 1/50th test data (raw & processed) - 1/50th test data video and pictures - 1/50th Test plans and testing documents - SSTF_Submission ...

Marine Energy Data Lakes

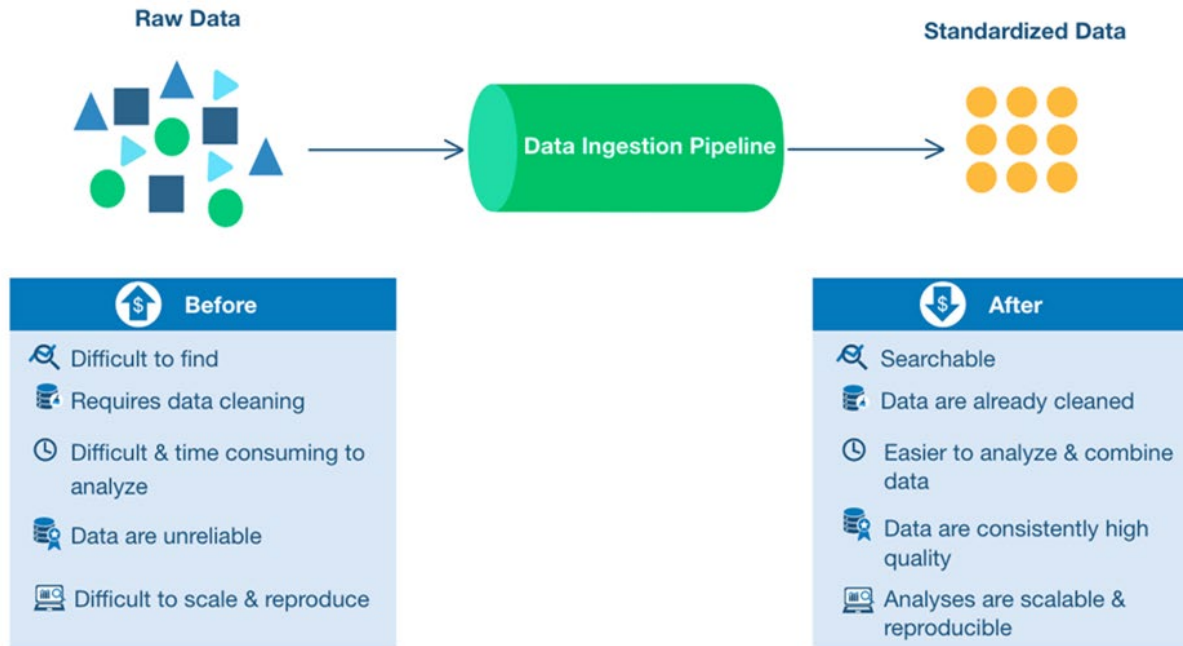
- Universal access to data
- Data available to anyone with an internet connection
- Access no longer limited to national labs, large universities and organizations with HPCs
- Enabling collaboration with communities of all sizes
- Including smaller universities, high schools, startup companies, and other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



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

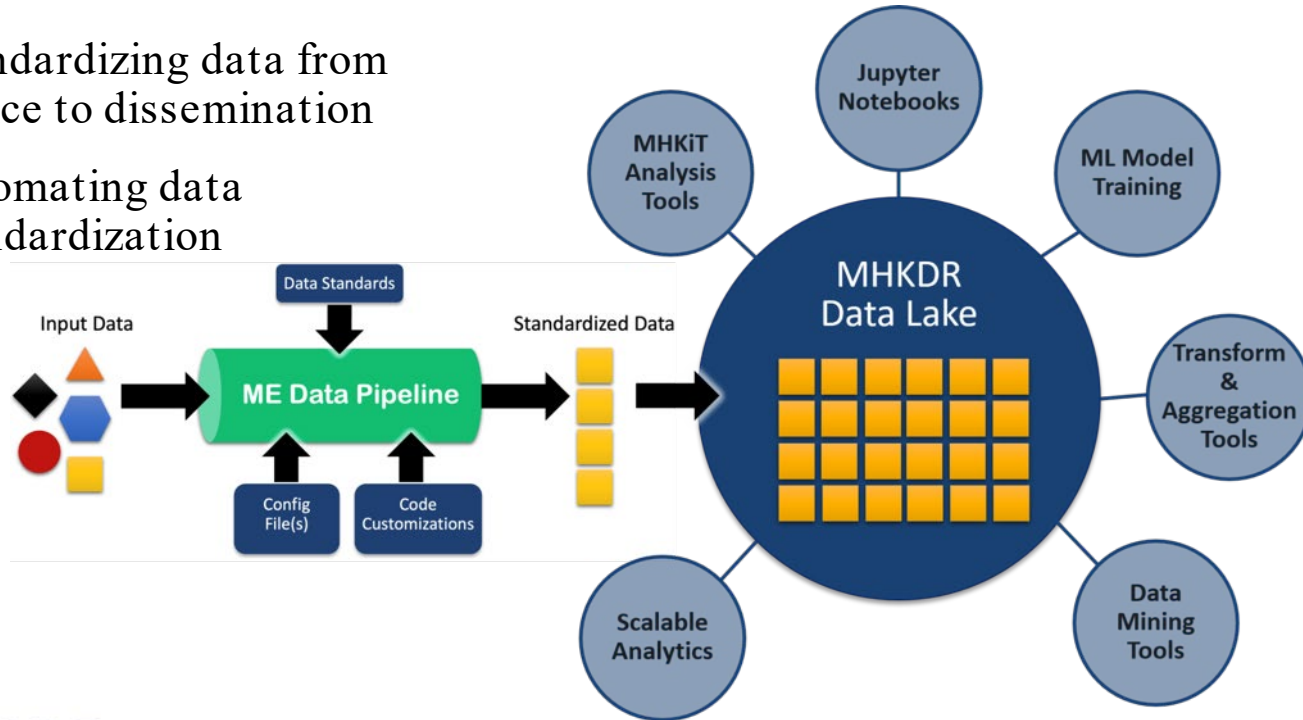


Data Standardization



Marine Energy Data Pipeline

- Standardizing data from device to dissemination
- Automating data standardization



Barriers to Data Sharing

Technological

- Data transfer speeds
- Data storage limits
- Universal access
- High compute requirements

Organizational

- Proprietary data
- Non-disclosure agreements
- (Outdated) Institutional policies

Financial

- Data storage and compute costs
- Data organization, transformation, anonymization

Cultural

- My data is my asset



Barriers to Data Sharing

Technological

- Data transfer speeds
- Data storage limits
- Universal access
- High compute requirements

PRIMRE's Approach

- State-of-the-art cloud architecture
- (supports 1GB/sec uploads)
- Infinitely scalable drives
- Data lakes

Organizational

- Proprietary data
- Non-disclosure agreements
- (Outdated) Institutional policies

- Standards for data sharing
- Data Trusts
- Protections for proprietary data
- Cross-cutting policy revisions

Financial

- Data storage and compute costs
- Data organization, transformation, anonymization

- Partnerships with cloud providers
- Enabling free access to big data in the cloud

Cultural

- My data is my asset

- Trainings, webinars, and data sharing success stories.



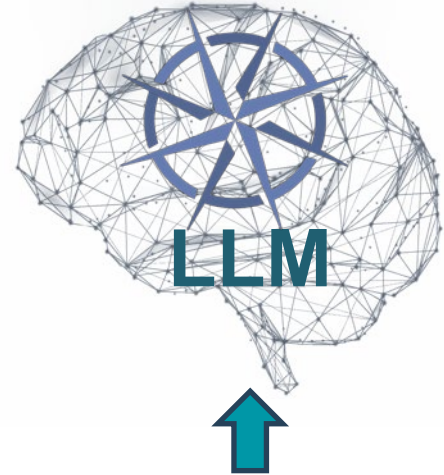
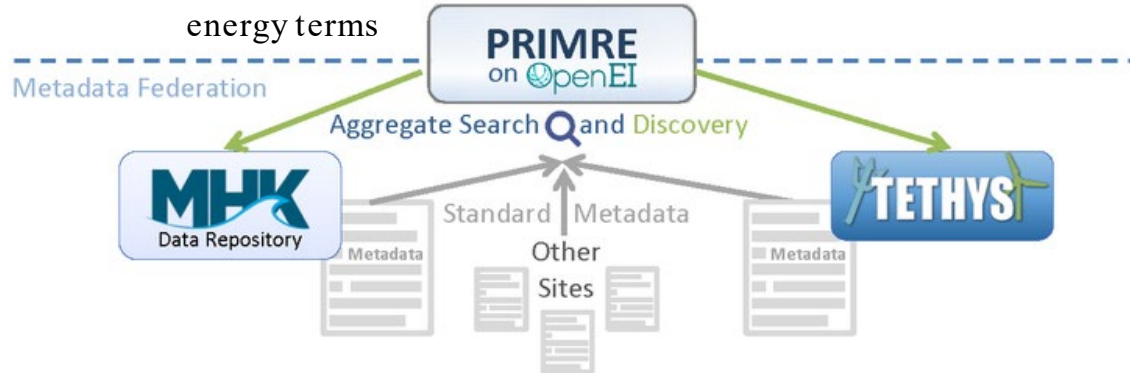
Benefits of Data Sharing

- Data access contributes to the scientific community
- Reduces duplication of effort (avoids reinventing the wheel)
- Improves discoverability and impact of your data
- Advertises the successes of your work and of those on your platform
- For federated metadata, secures proprietary interests while sharing key research, which:
 - Increases visibility into your work
 - Shares whether a problem has been solved (or not)
 - Establishes a contact for further questions or collaboration



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



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

Breakout Discussions

Discussion Questions

-

Closing

Thank You!

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