

WBS: 2.4.1.701

Marine and Hydrokinetics Program

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Kelley Ruehl, Sandia Andrea Copping, PNNL Rick Driscoll, NREL

Project Overview



Project Summary

The Portal and Repository for Information on Marine Renewable Energy (PRIMRE) provides centralized access, standardization, community building, and integration of WPTO-funded marine energy data repositories and knowledge bases. By bringing key databases together knowledge will be increased by reducing redundancy and improving search and analysis efficiencies.

Project Objective & Impact

PRIMRE seeks to overcome data and information barriers to technology, research, design, and testing in support of the Marine Renewable Energy (MRE) stakeholders by:

- Supporting the development, integration, and maintenance of the "PRIMRE Knowledge Hubs" and including the MHK Data Repository, *Tethys*, and *Tethys Engineering*.
- Meet the needs for accessibility of technical documents by developing *Tethys Engineering*.
- Improving the connectivity and discoverability of information in Knowledge Hubs, and creating linkages to new sources of information to support the MRE industry.

Project Information

Project Principal Investigator(s)

Kelley Ruehl, Sandia Andrea Copping, PNNL Rick Driscoll, NREL

WPTO Lead

Allison Johnson

Project Partners/Subs

- Sandia National Laboratories
- Pacific Northwest National Laboratory
- National Renewable Energy Laboratory

Project Duration

- Begin: FY17
- End: FY21

Alignment with the Program

Marine and Hydrokinetics (MHK) Program Strategic Approaches

Data Sharing and Analysis

Foundational and Crosscutting R&D Technology-Specific Design and Validation

Reducing Barriers to Testing

Alignment with the MHK Program



Data Sharing and Analysis

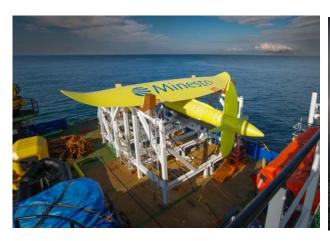
- Provide original research to assess and communicate potential MHK market opportunities, including those relevant for other maritime markets
- Aggregate and analyze data on MHK performance and technology advances, and maintain information sharing platforms to enable dissemination
- Support the early incorporation of manufacturing considerations/information into design processes
- Leverage expertise, technology, data, methods, and lessons from the international MHK community and other offshore scientific and industrial sectors

PRIMRE contributes to WPTO's priority to facilitate <u>Data Sharing and Analysis</u> by providing broad access for all stakeholders to information on marine energy engineering, resource characterization, and environmental science.

This project ensures that stakeholders, regardless of their financial status or experience, have equal access to federally funded research and analysis that can be used to advance marine energy technologies.

Project Budget

| | FY17 | FY18 | FY19 (Q1 & Q2 Only) | Total Project Budget (FY17–FY19 Q1 & Q2) | |
|--------|--------|--------|---------------------------|---|------------------|
| Lab | Costed | Costed | Costed | Total Costed | Total Authorized |
| Sandia | \$73K | \$151K | \$96K | \$320K | \$621K |
| PNNL | \$94K | \$155K | \$164K | \$412K | \$637K |
| NREL | \$58K | \$193K | \$72K | \$323K | \$596K |
| TOTAL | \$225K | \$499K | \$332K | \$1,055K | \$1,854K |

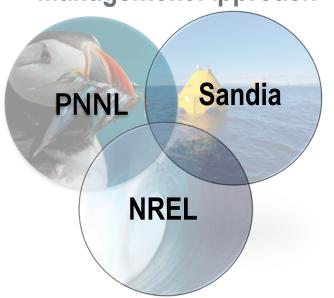






Management and Technical Approach

Management Approach



Milestones

| | FY | Q 1 | > | Q2 | > | Q3 | Q4 | |
|---------------|------|--|--------|---|---|---|--|--------|
| | FY17 | PRIMRE multi-lab team kickoff meeting | \sum | Establish MHK Steering Committee | | Review and evaluation of relevant MHK databases report | MHK Steering Committee kickoff meeting and PRIMRE yearend report | \ / |
| \geq | FY18 | FY18 stakeholder engagement plan | | Launch updated Water Power Gateway on OpenEI | | Improve MHKDR data discovery and Tethys map viewer | PRIMRE yearend analytics report and execution of stakeholder engagement plan | \ / |
| $\overline{}$ | FY19 | FY19 stakeholder engagement plan and establish <i>Tethys</i> | \sum | Publish data guidelines and best practices document | | Soft launch of Tethys Engineering | PRIMRE yearend analytics, execution of stakeholder engagement plan, and launch MHK | \ |

Technical Approach

- Assess MRE community needs
- Inventory WPTO databases
- Develop integrated interoperable system
- Stand up new knowledge hub (TE)
- Test, assess, take advice from SC, community

Critical Success Factors

- Close coordination among 3 labs
- Ongoing involvement of Steering Committee
- Strong data and systems administration skills
- Active outreach and engagement program

Challenges

- Ensuring we understand needs of MRE community
- Creating user friendly interoperability among KHs

End-User Engagement and Dissemination Strategy









User Needs

- Through surveys, in person meetings at conferences, workshops
- Designed PRIMRE to meet those needs

Steering Committee

- Reps from industry, academia, test centers, regulators
- Quarterly meetings to provide feedback and guidance

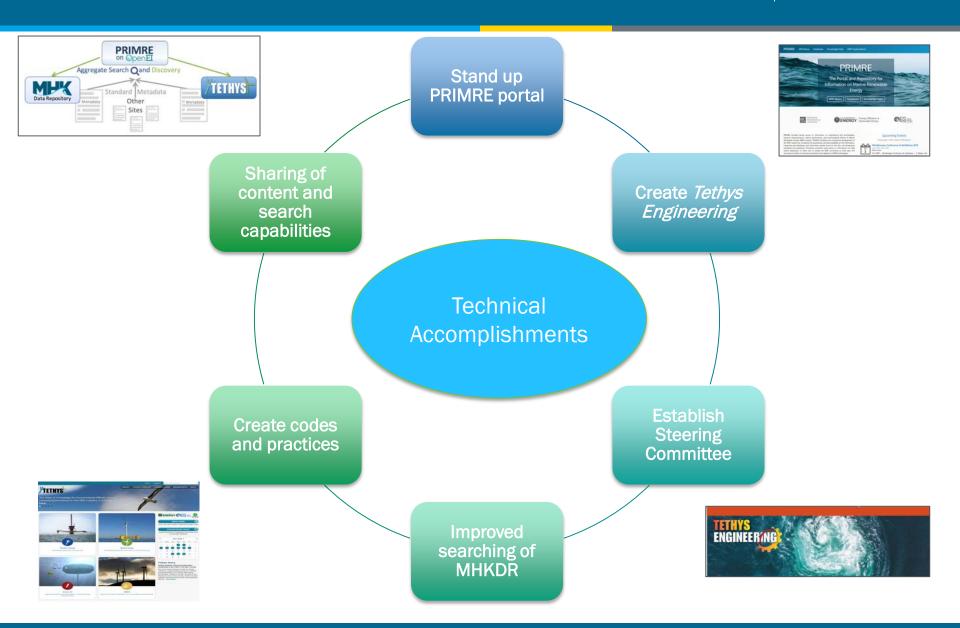
Outreach Activities

- Acquaint MRE community with PRIMRE
- Presentations, workshops, papers, webinars

Reaching Further

- Future linkages to other ocean data portals
- Proposing linkage to international data through OES

Technical Accomplishments



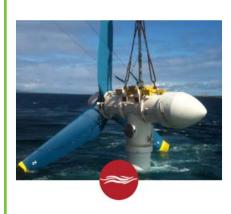
Technical Accomplishments

| | FY17 | FY18 | FY19 (Q1&Q2) |
|------------------------------------|---|---|--|
| Webinars | • Apr 18 – MEC | Feb 27 – Data & Information Sharing Oct 3 – Data Needs & PRIMRE | Mar 18 - MECAug 7 - Intro to Tethys Engineering |
| Papers, Presentations, & Workshops | Apr 4 – IEA OES Meeting May 5 – METS Workshop Aug 29 – EWTEC Workshop | May 1 - METS extended abstract May 2 - METS Workshop Sep 13 - AWTEC paper | May 9 – OTC paper Sept 2 – EWTEC Workshop Sep 6 – EWTEC paper Sept 12 – OREC Workshop |
| Steering Committee | None | 4 meetings | 2 meetings |
| Papers added to Tethys | 363 papers | 423 papers | 1008 papers* |
| Papers added to Tethys Engineering | N/A | N/A | 3043 papers* |
| Data added to MHKDR | 883 files, 284 GB | 137 files, 20 GB | 95 files, 64 GB* * Stats through August 26 |

Progress Since Project Summary Submittal



Launch of Tethys Engineering



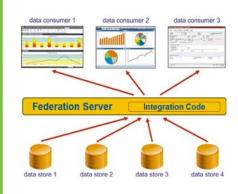
- Soft launch July 2019
- Now holds over 3000 documents

Guidelines and Best Practices



- Draft document developed
- Vetting process undertaken

Data Federation



Increased availability of data from MHKDR and Tethys

Future Work

FY19

Complete Codes & Practices document

Launch of updated MHK Technology Database

STEM content on PRIMRE

End of year webinar

FY20 & FY21

PRIMRE Content Development Development of: Tethys Engineering, MHK Technology Database, integration of new and legacy Knowledge Bases, and highlight WPTO Projects on PRIMRE

PRIMRE
Development
and
Maintenance

Continued operation and increased capabilities and functionality that include enhanced interconnections between knowledge bases, centralized MRE data search, support for ORCID ID and DOI tags on PRIMRE

Stakeholder Engagement Demos and webinars, PRIMRE Steering Committee Meetings, Tethys Engineering blasts, and coordination with international stakeholders, including members of Ocean Energy Systems (OES)

Proposed International Engagement Act on a proposal if funded by OES, to begin the process of connecting national nodes to PRIMRE through the process of defining data formats, points of contact, and data retrieval and federating methods.