

International Environmental Data Sharing Initiative

Marine and Hydrokinetics Program

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Project Overview

Project Summary

This project examines environmental effects of MRE development to facilitate siting & permitting. Existing information is collected, curated, & made widely available on *Tethys*. PNNL implements OES-Environmental (IEA Oceans Energy Systems task) for DOE, gathering, analyzing, & disseminating up to date information on potential environmental risks of MHK devices & arrays. The information is used to reduce the scientific uncertainty that has slowed development and burdened MHK developers with significant data

Project Objective & Impact

Permitting of MHK devices continue to be slowed by long permitting timelines and requests by regulators for extensive data collection that are placing financial burdens on developers. This project addresses these barriers to development by making scientific information readily available through:

- Engaging with the international community to ensure that all knowledge is available to regulators and developers;
- Collating expert knowledge on environmental effects; and
- Analyzing data gaps and synthesizing information that works towards retiring risks for many interactions presently slowing permitting.

Project Information

Project Principal Investigator(s)

Andrea E. Copping, Ph.D. (PI)
Alicia M. Gorton, Ph.D., PMP (PM)

WPTO Lead

Samantha Eaves, Ph.D.
Tim Ramsey

Project Partners/Subs

Partners:

- 14 OES-Environmental nations
- BOEM
- NOAA

Subcontractors:

- Aquatera Limited (UK)
- Graphic designer (Robyn Ricks)

Project Duration

- Project Start Date: 10/1/2010
- Project End Date: 9/30/2020

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

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**

- PNNL developed and maintains *Tethys* (<https://tethys.pnnl.gov>) to disseminate environmental information from countries around the world. This information is used by device developers to inform design and operational parameters to reduce potential environmental effects and facilitate permitting.
- PNNL implements the OES-Environmental initiative, collaborating closely with 14 other countries engaged in developing MHK. This collaboration collates experience and advancements in other nations to assist developers, regulators, and researchers.

Reducing Barriers to Testing

- Enable access to world-class testing facilities that help accelerate the pace of technology development
 - **Work with agencies and other groups to ensure that existing data is well-utilized and identify potential improvements to regulatory processes and requirements**
 - **Support additional scientific research as needed, focused on retiring or mitigating environmental risks and reducing costs and complexity of environmental monitoring**
 - Engage in relevant coastal planning processes to ensure that MHK development interests are equitably considered
- Collaboration with U.S. stakeholders and OES-Environmental analysts from other nations to curate and disseminate relevant information on potential environmental effects of MHK, to enable permitting and testing opportunities for MHK devices and arrays.
 - Working with other OES-Environmental nations to identify and fill data gaps through analysis, expert workshops, and interactions with MHK developers, regulators, and researchers, to feed into permitting and licensing processes.

Project Budget

FY17	FY18	FY19 (Q1 & Q2 Only)	Total Project Budget FY17–FY19 Q1 & Q2 (October 2016 – March 2019)	
Costed	Costed	Costed	Total Costed	Total Authorized
\$663,166	\$686,450	\$328,740	\$1,678,356	\$2,525,795



Management and Technical Approach

Technical Approach



Knowledge
Collection
and Curation

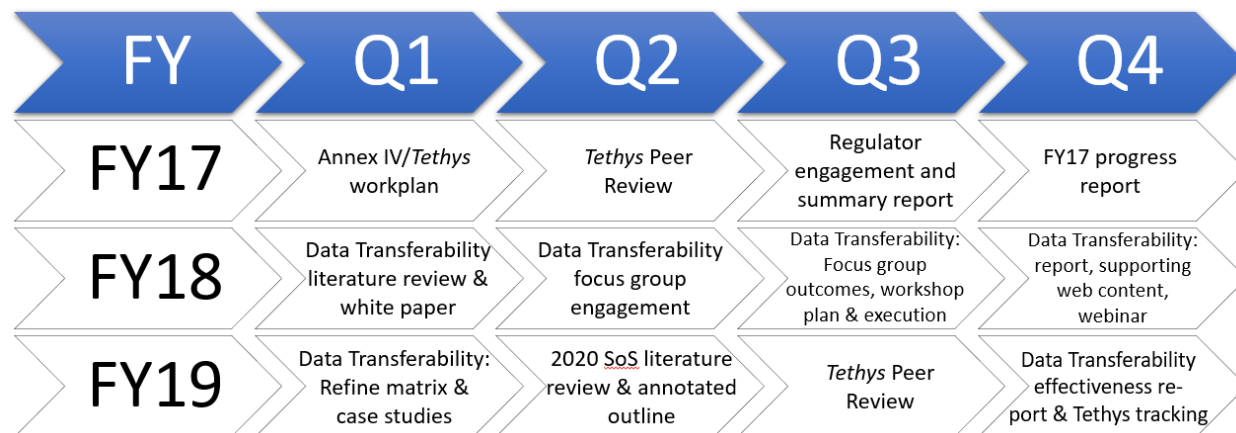
Data and
Information
Synthesis

Information
Dissemination
&
Engagement

Critical Success Factors

Successfully identify & fill data gaps in cooperation with international researchers, regulators, & developers through studies & monitoring programs to reduce uncertainty & accelerate the industry forward

Milestones



Challenges

- Active collaboration of nations, particularly in economic downturns
- Acquisition of new information, documents, especially relevant grey literature
- Engagement of international partners with few face to face meetings

Management Approach

- Continuous international collaboration through OES-Environmental
- Subcontracts to support international efforts and leverage international expertise
- International stakeholder engagement
- Leverage *Tethys* development across several DOE projects

End-User Engagement and Dissemination Strategy

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



OES- Environmental Analysts

- Quarterly online meetings, in person when possible
- Technical contributions (*Tethys*, State of the Science, OES white paper, peer-reviewed publications)

Regulators

- Surveys to determine knowledge
- Tailored outreach programs
- Webinars and online meetings
- Developing relationships with key regulators
- Workshops
- *Tethys* Blasts

Researchers

- Provide up to date science through *Tethys*
- Expert forums, workshops, and webinars to advance knowledge and share outcomes
- Project metadata
- *Tethys* Blasts

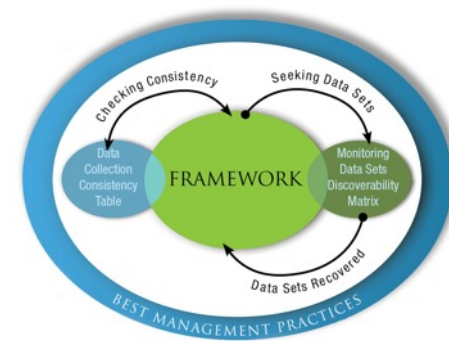
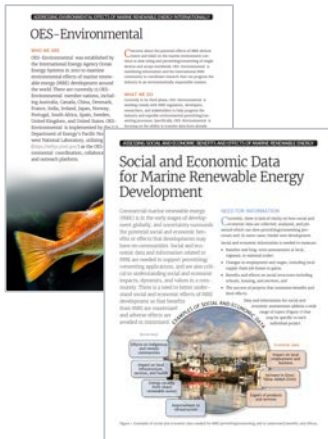
Developers & their Consultants

- U.S. Marine Energy Council (MEC)
- Information on *Tethys*
- Engage at workshops for developer perspective
- Project metadata

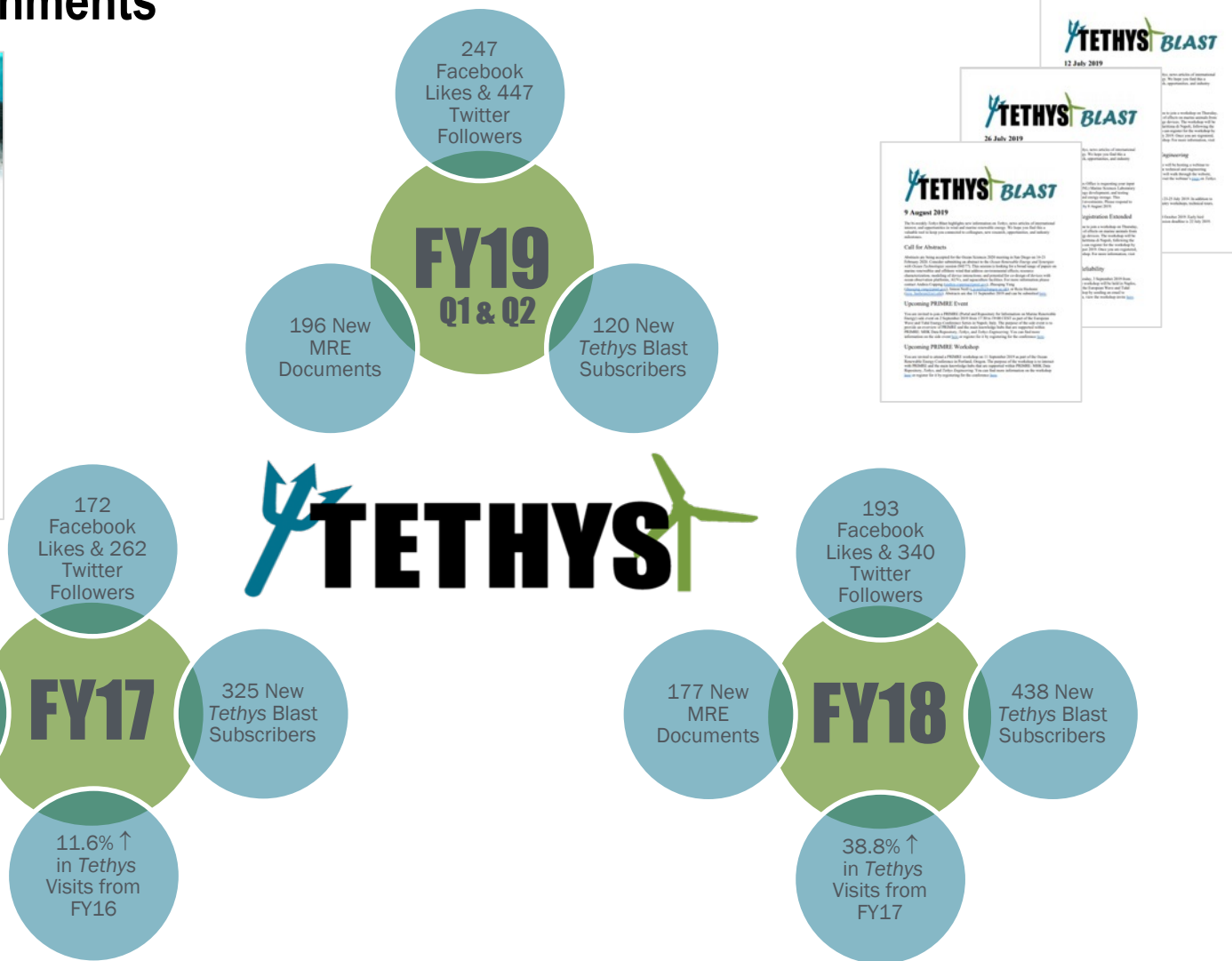
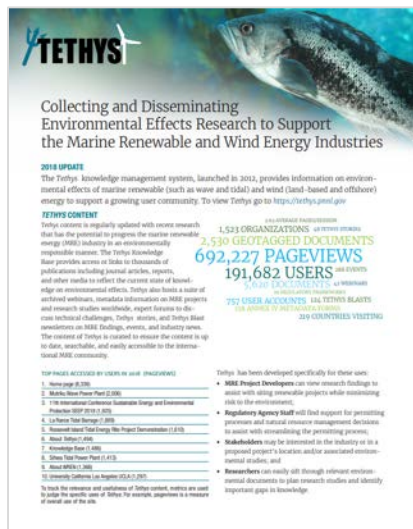
Technical Accomplishments

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ENERGY

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Renewable Energy



Tethys Accomplishments



Progress Since Project Summary Submittal

Risk Retirement Workshop



- International group of experts
- Focus on retiring risk of underwater noise and EMF
- Held at EWTEC 2019 in Naples, Italy

2020 State of the Science



- Developing updated report with new data, analyses, and insights since 2016
- Multiple review phases
- Final draft released at ICOE 2020

OES-Environmental Phase 4 Proposal



- Risk retirement for underwater noise, EMF, habitat changes, changes in physical systems
- Best Management Practices, guidance documents for regulators

