

Marine and Hydrokinetic Data Repository (MHKDR)

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Marine and Hydrokinetics Program

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National Renewable Energy Laboratory
(NREL)

Project Overview

Project Summary

The Marine and Hydrokinetic Data Repository (MHKDR):

- makes available data funded by WPTO,
- protects WPTO's investment in research,
- preserves and provides access to WPTO data,
- disseminates the findings of WPTO-funded research; and
- empowers the MHK community to build upon prior successes, avoid duplication of effort, reduce costs and risks associated with MHK development, and accelerate the rate of innovation.

Project Objective & Impact

Objectives:

- Protect WPTO's investment in research and development through proper management and dissemination of project data
- Improve access to knowledge gained
- Accelerate the adoption of MHK technologies by enabling others to build upon lessons learned and reduce duplication of effort

Impact:

- More than 700 data downloads per month
- Data used in analysis, research, and development activities
- Cited in journal articles, technical reports, and social media posts

Project Information

Project Principal Investigator(s)

Jon Weers

National Renewable Energy Laboratory
(NREL)

WPTO Lead

Bill McShane

Project Partners/Subs

None

Project Duration

Oct. 1, 2014 to Present
(Ongoing)

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

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

MHKDR reduces barriers to testing and accelerates the adoption of MHK technology by:

- **increasing the awareness of existing data, and**
- **allowing agencies to leverage the expertise, data, methods, successes and lessons learned of others.**



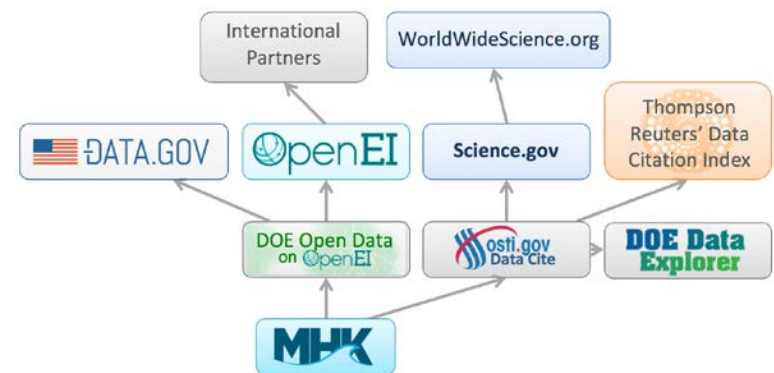
Wave Energy Prize Data on MHKDR

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**

The MHKDR:

- aggregates data from individual projects into organized, searchable datasets
- disseminates its data catalog to a network of data sharing partner sites
- allows the greater MHK community to leverage the expertise, data, methods, and lessons learned by others
- provides broad, equal access to federally funded research data




“built from the ground up to share data”

FY17	FY18	FY19 (Q1 & Q2 Only)	Total Project Budget FY17–FY19 Q1 & Q2 (October 2016 – March 2019)	
Costed	Costed	Costed	Total Costed	Total Authorized
\$132K	\$136K	\$40K*	\$308K	\$515K

* Majority of FY19 work planned for Q3 and Q4.

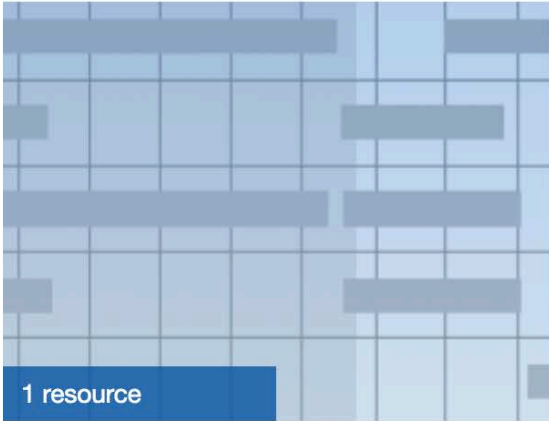
Featured Data



180 submissions

Wave Energy Prize


The Wave Energy Prize was an 18-month



1 resource

ALFA: SWIFT Buoy Data Under Extreme Wave Conditions at th...

Full data set (six deployments) from SWIFT



5 resources

Underwater Mapping Results for Seabotix vLBV300 Vehicle w...

This document presents results from tests to

Management and Technical Approach

Management Approach

A small, lightweight team of data management and MHK experts:



Jon Weers (PI)

Data Management Lead



Nicole Taverna

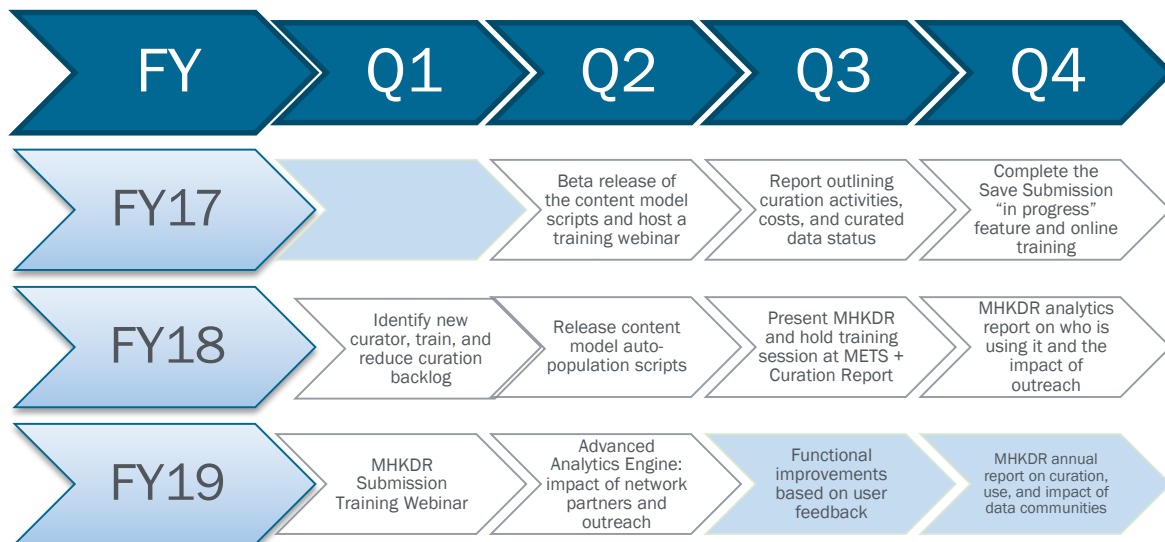
Data Curation Lead



Rick Driscoll

MHK Domain Expert

Milestones



Working With



Management and Technical Approach (Cont.)

Technical Approach

- Build upon prior success
- Provide equal access to all
- Secure sensitive data
- Design to disseminate

Primary Challenges

- Sharing Data
- Understanding the needs of the MHK community

Challenges of Sharing Data

Technological

Organizational

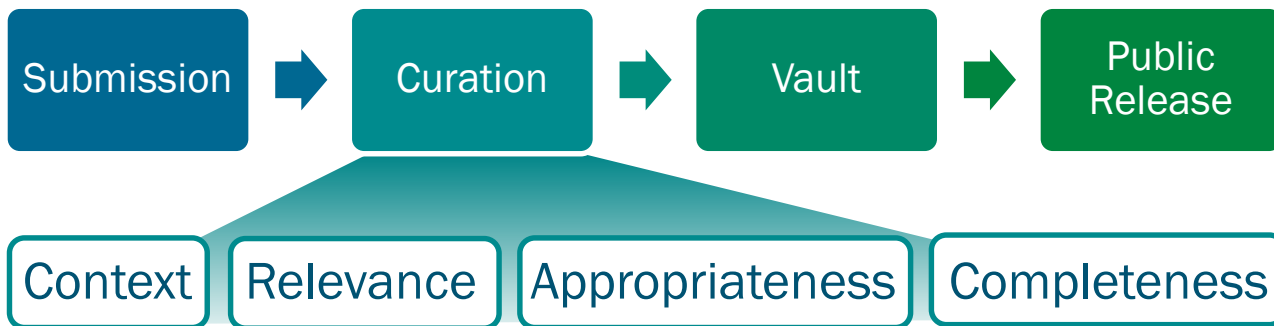
Financial

Cultural

Critical Success Factors

- Data Management Expertise
- Modern Data Dissemination and Discovery Strategy

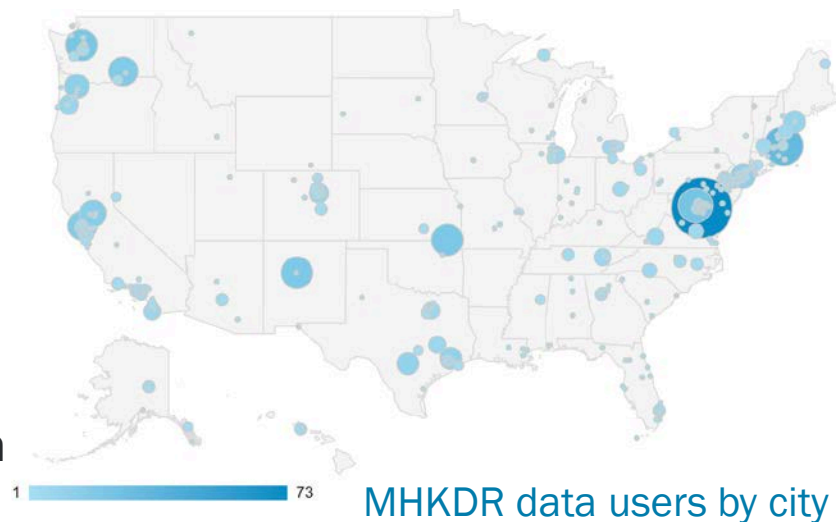
Data Submission Process



End-User Engagement and Dissemination Strategy

Engaging With Users

- Hosting online training webinars
- Presenting at industry conferences
- Responding to feedback
- Working one-on-one with data submitters



Academia

MIT, Oxford, Stanford, U. of Alaska, Washington, Hawaii, *and more*

Industry

Oscilla Power, Columbia Power, Verdant Power, Baker Hughes *and more*

National Labs

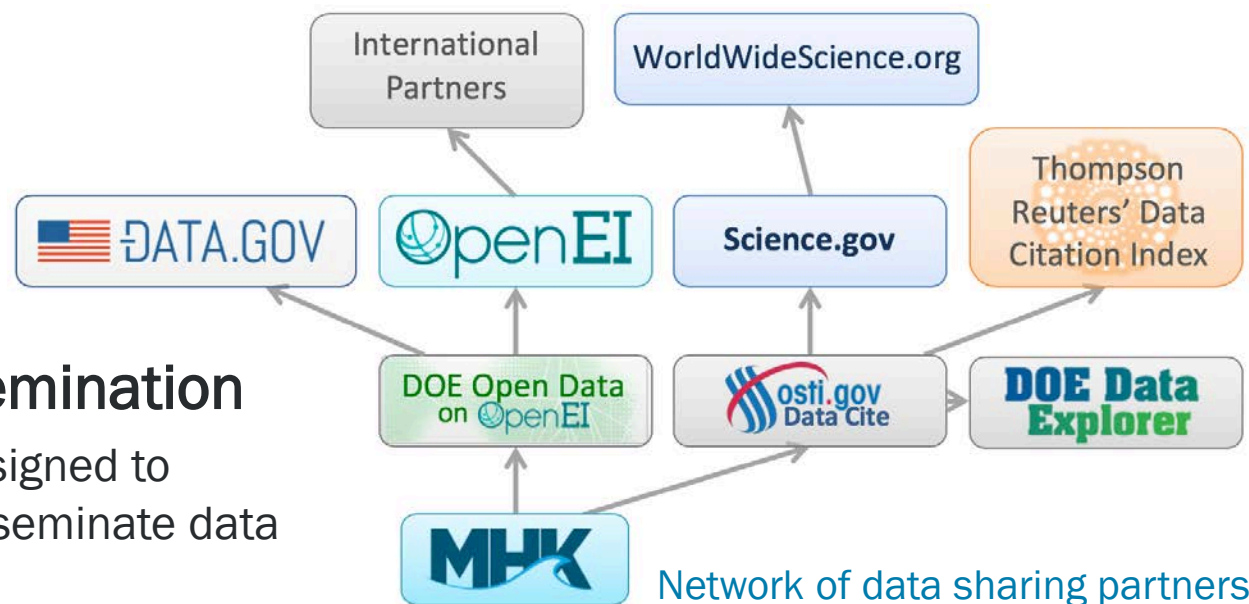
PNNL, Sandia, Argonne, Oak Ridge Berkeley, NREL *and more*

Government

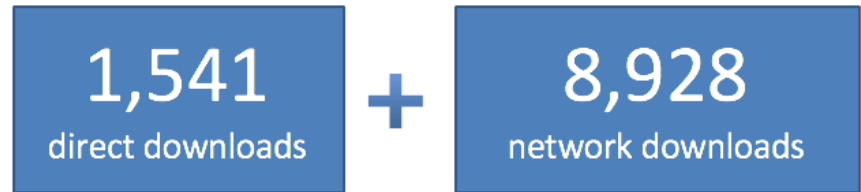
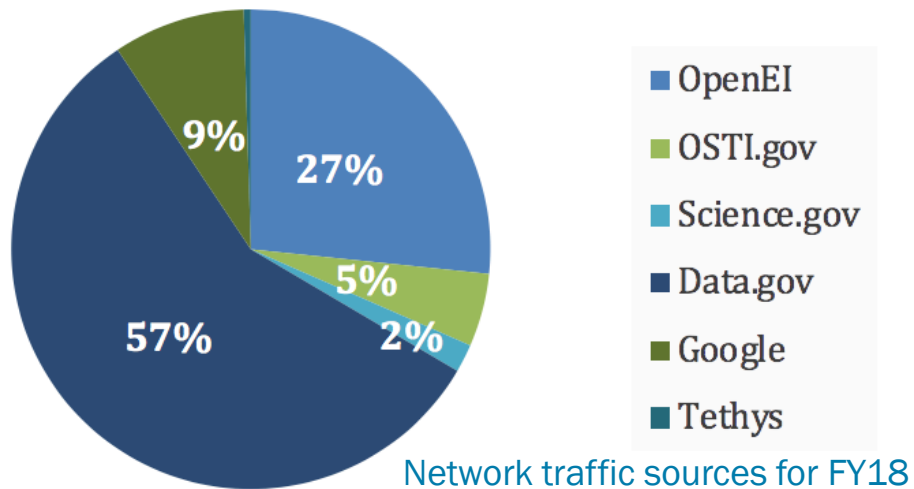
U.S. Navy, DOE, FEMA, Igiugig Village Council *and more*

Dissemination

- Designed to disseminate data

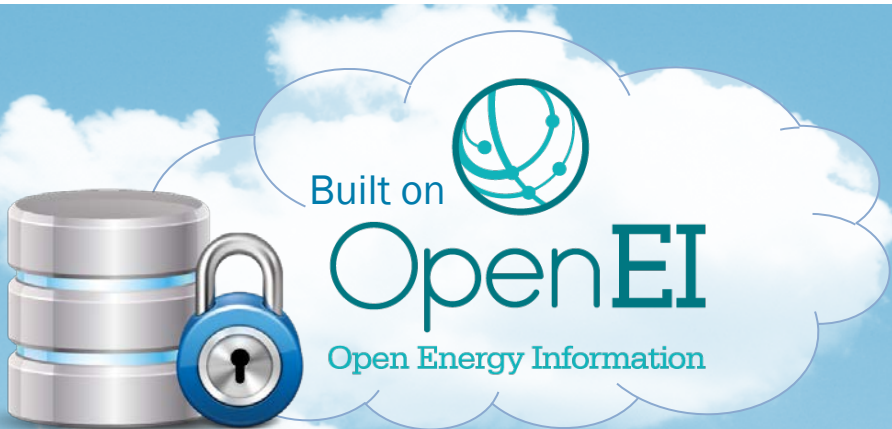


Impact of the Data Sharing Network



579% increase in exposure

Secure Cloud Environment



Disseminated Data

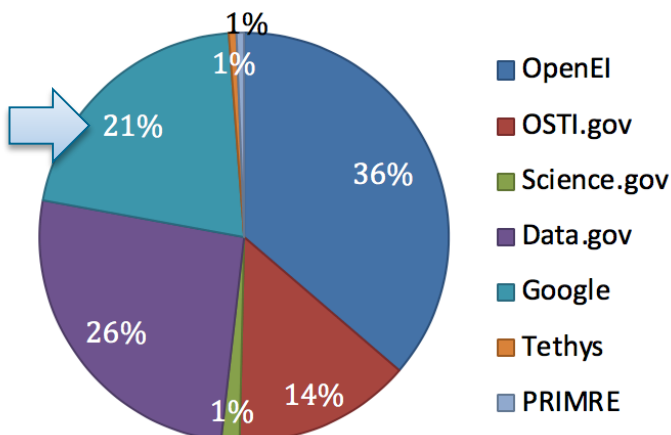
- 310 data sets
- 18,425 resources
- 523 GB of data
- downloaded more than 20,000 times

Progress Since Project Summary Submittal

Implemented functional improvements

- Incorporated user feedback
- Improved Search Engine Optimization (SEO)
- Improved MHKDR Search Facets
- Added ability to download an entire dataset
- Added interactive tutorial for submitters

Updated Analytics for Annual Report



Network traffic sources for FY19

Much Better SEO

- Better integration with search engines and external data search sites
- Traffic from search engines now 21%
 - Up 230% over FY18!



Recurring

- * Curate new data submissions and assign DOIs to each dataset
- Q4 Annual reports on analytics and impact

FY20

- Q1 Integrate with PRIMRE
- Q2 Expand the network of data sharing partners
- Q3 Implement additional improvements based on user feedback
- Q4 Integrate with DOE's Open Energy Data Initiative (OEDI)
 - a research-focused solution to storing big data in the cloud

