

U.S. DEPARTMENT OF ENERGY WATER POWER TECHNOLOGIES OFFICE

DE-EE0008634 – Improving the Efficiency and Effectiveness for Marine Energy Permitting: A Toolkit and Engagement for Success

Reporting Tool 🏛 Regulations More

REPORTING TOOL

Create and share a summary report of information from existing marine energy projects, academic publications, regulatory documents, management measures, and spatial information based on your area and topics of interest.

→ CREATE REPORT

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Project Overview

Project Summary

 The permitting and licensing process for marine energy in the U.S. may take up to seven years for even small demonstrations or pilots despite existing resources. The <u>Marine Energy Environmental Toolkit</u> is a one-stop shop for existing environmental, spatial, regulatory, and scientific data that allows users to access disparate sources of data through a series of tags and spatial queries. The Toolkit builds upon prior WPTO investments by pulling from WPTO-funded and outside resources to facilitate the permitting and licensing process, informs technology developers of required permits, and disseminates the latest knowledge of the environmental effects of these devices to regulators.

Intended Outcomes

- A complete Marine Energy Environmental Permitting Toolkit that provides regulators and developers with information that includes the best available, most current science in a transparent manner.
- A greater understanding from federal and state regulators of the current state of the science and access to studies and monitoring/adaptive management plans from other projects.
- An ability for regulators to easily and rapidly evaluate and provide guidance on studies, mitigation and monitoring and adaptive management plans, and confidently issue permit authorizations in a more efficient and effective manner by easily accessing information in a user-friendly manner.

Project Information

Principal Investigator(s)

- Anna West, Kearns & West
- Craig Jones, Integral Consulting

Project Partners/Subs

- Sandia National Laboratories
- Integral Consulting
- H. T. Harvey & Associates
- EcoQuants
- Electric Power Research Institute
- Ocean Renewable Power Company
- Pacific Energy Ventures
- European Marine Energy Centre

Project Status

Ongoing

Project Duration

- 07/01/2019
- 06/30/2022

Total Costed (FY19-FY21)

\$1,351,593

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Project Objectives: Relevance

Relevance to Program Goals:

- The ME Toolkit improves access to information that can directly help reduce the cost, time, and uncertainty for permitting.
- Specifically enhances DOE's approach to the following challenges for Marine Energy:
 - Prolonged Permitting, Design and Environmental Testing Cycles
 - Reduces barriers to permitting and licensing process to get steel in the water.
 - Helps reduce complexity of environmental monitoring
 - Lack of available, accessible information and data
 - Aggregates and disseminates data for technology developers and decision makers
 - Leverages expertise, technologies, data, methods, and best practices from international marine energy and other offshore sectors
- Intermediate Outcomes: Reduced cost/time and greater certainty with permitting
- Long-term Outcomes:
 - Reduced environmental risks for marine ecosystems and biodiversity for large-scale deployments
 - Improved management of marine resources
 - Enhanced communication and transparency in renewable energy permitting

Approach:

- Collaborative user-centered design, outreach and engagement to develop the Toolkit
 - Six in-person regulator workshops (AK, OR, CA, MA, D.C., and FL)
 - Six virtual workshops with all stakeholders (regulators and marine energy community, including members of industry and academia)
- Open-source development of Toolkit back-end
- Utilize Tethys tagging taxonomy and apply to other data sources
 - MarineCadastre (spatial)
 - FERC E-Library (regulatory)
- Populate PRIMRE Wiki (OpenEI) with regulatory resources for Toolkit sustainability

Project Objectives: Expected Outputs and Intended Outcomes

Outputs:

- Marine Energy Environmental Toolkit
- Regulatory Diagrams and Additional Resources on the Toolkit and PRIMRE Wiki (OpenEI)
- Recorded Subject Matter Expert Presentations on Environmental Interactions
- FERC Documents with Tethys Glossary Tags

Outcomes:

- Reduced Time and Cost to Permit/License Marine Energy
- Regulators Increased Understanding
 of Potential Impacts
- Data-based Permitting and Licensing Negotiations
- More Projects in the Water!

Project Timeline



Project Budget

Total Project Budget – Award Information							
DOE	Cost-share	Total					
\$1,600K	\$0K	\$1,600K					

FY19	FY20	FY21	Total Actual Costs FY19–FY21
Costed	Costed	Costed	Total Costed
\$526K	\$705K	\$120K	\$1,351K

- Two no-cost time extensions (+ 1 year)
- Reorganization of Outreach to Virtual Workshops (covid19 impacts moving travel costs to additional Toolkit functionality and design)
 - Front-end Toolkit design
 - FERC document tagging application
 - "How-to" videos
 - Reporting bug functionality

End-User Engagement and Dissemination

- A key focus of Toolkit development was engaging future users to conduct user-centered design.
- Initial outreach was regulator focused
 - Subject matter experts invited to share state-of-the-science on stressor-receptor interactions
 - Obtain feedback on Toolkit content and functionality
- Developer viewpoint was incorporated in BP2 and through teaming partners (ORPC and PEV)
- All workshops were recorded and are stored on a YouTube playlist
- By the numbers
 - 197 Workshop Participants
 - 18 Interviews
 - 20 Toolkit Demonstrations
 - Five Conferences
 - 675 Users (Jan 1 May 26, 2022)
- Back-end development strategies and technical information dissemination
 - OpenEl Regulatory Information: <u>https://openei.org/wiki/MarineEnergyApp</u>
 - Open-source GitHub Repository: <u>https://github.com/marineenergy/help</u>

Performance: Accomplishments and Progress

- Online publication of the Marine Energy Environmental Toolkit for Permitting and Licensing (Toolkit)
 - First ever comprehensive Toolkit that distills existing environmental, spatial, regulatory, and scientific data into one web-based platform
 - Easily accessible, consistently tagged, relevant environmental documents for permitting ME projects that provide developers and regulators with examples and precedents for permitting requirements
 - Positive user feedback and continued engagement determined via Google Analytics
 - 89% of post-workshop survey respondents believed the Toolkit would improve the efficiency and effectiveness of permitting
 - 82% of post-workshop survey respondents would support use of the Toolkit for permitting and licensing
 - Nearly 6,000 logged engagement events (e.g., views, clicks, downloads; Jan 1 May 26 2022)
 - Developed a fully functional, interactive web-based Toolkit
 - Integrated multiple disparate datasets
 - Applied consistent tags across data types and with PRIMRE databases
 - Uses all open-source software (PostGIS, R Studio, Shiny, Rmarkdown)
 - 'Containerized' software using Docker for quick cloud access and spin-up (github.com/marineenergy/server)
 - Application Programming Interface (API) to generate reports (api.marineenergy.app)
 - All code for server setup, interactive applications, and website are publicly available (github.com/marineenergy)

Performance: Accomplishments and Progress (cont.)

- Highlighted in FY21 WPTO Accomplishments Report
- 2022 Offshore Technology Conference Paper and Presentation
 - Barr, Zach W., Best, Ben, Peplinski, William J., Jones, Craig, Chang, Grace, Roberts, Jesse D., and Sharon Kramer. "Novel Marine Energy Environmental Compliance Reporting Application Summarizes Disparate Content by Tags and Location." Paper presented at the Offshore Technology Conference, Houston, Texas, USA, May 2022. doi: <u>https://doi.org/10.4043/31946-MS</u>
- Testimonials
 - "Yes (this Toolkit is useful in the permitting and licensing process). It is very useful in the planning stages and to populate resource assessments with existing information and to identify where needed information is missing from an assessment." - Ian Lundgren, NMFS HQ
 - "Yes (this Toolkit is useful in the permitting and licensing process). It seems it will bring resources to light that may not otherwise be known. The breakdown of stressors and receptors will also be useful." – State Regulator, Mid-Atlantic Region
 - "The [Toolkit] would be extremely helpful for technology developers on the front end with siting and generating information to provide regulators. The regulatory diagram also helps identify what agencies you need to engage." – Marcus Lehmann CalWave
 - "Working from the same knowledge base that everyone buys into is an immense help to the industry. With this Toolkit, developers and regulators will be able to focus on small details that are not well known rather than larger questions. The Toolkit also helps with staff turnover at the agencies to keep processing moving forward rather than stalling." Dan Hellin OSU

Future Work

- Pilot Testing Process
 - Engage developers/regulators with preliminary permits
 - Gather direct feedback on the usability of the Toolkit during permitting/licensing
- Future Maintenance and Outreach under PRIMRE
 - Additional Pilot Testing
 - Toolkit Virtual Workshop
 - Additional Ingestion of Spatial Datasets
 - Spatial Datasets Visualization
- Biological Evaluations Repository
- Continued coordination with PRIMRE and Tethys teams to ensure consistency across Marine Energy resources

