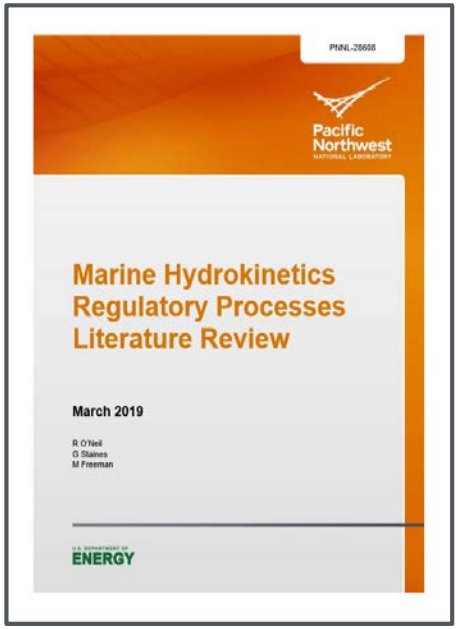
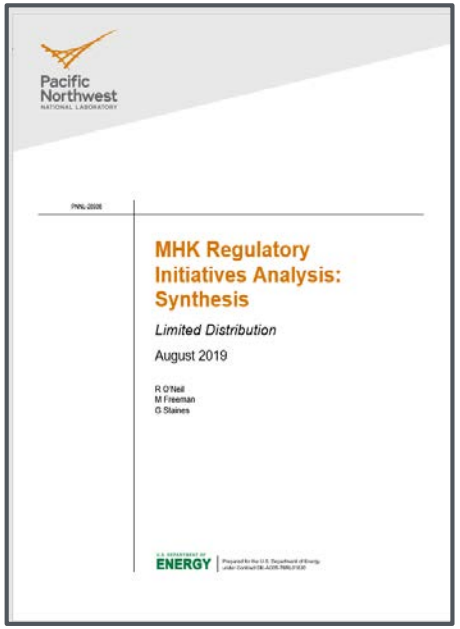
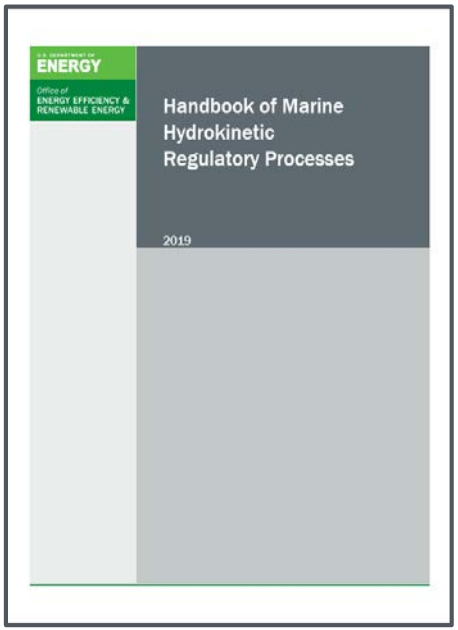



# MHK Regulatory Initiatives Analysis

## WBS# 2.3.2.603

## Marine and Hydrokinetics Program

October 8, 2019

**Bo Saulsbury**

Pacific Northwest National Laboratory

# Project Overview

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

## Project Summary

The Marine Hydrokinetic (MHK) Regulatory Initiatives Analysis project was created to review current regulatory conditions for MHK development, identify opportunities for greater regulatory success, and provide a set of recommendations for potential research and development that DOE might support in the near term to reduce the cost and time of regulatory activities.

## Project Impact

The project resulted in two Laboratory publications – a literature review and an internal report detailing 21 forward-looking regulatory research topics and several additional potential actions – as well as an update to an existing compendium of state and federal regulations governing MHK projects, the 2019 *Handbook of Hydrokinetic Regulatory Processes* (DOE-EE-1793).

## Project Information

**Project Principal Investigator(s)**

Rebecca O'Neil, PNNL
Bo Saulsbury, PNNL

**WPTO Lead**

Samantha Eaves
Hoyt Battey

**Project Partners/Subs**

None.

**Project Duration**

FY17 – FY19

# 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 Program



## Reducing Barriers to Testing

Work with agencies and other groups to ensure that existing data is well-utilized and identify potential improvements to regulatory processes and requirements

## Data Sharing and Analysis

Leverage expertise, technology, data, methods, and lessons from the international MHK community and other offshore scientific and industrial sectors

Project reports discuss the many ways in which pilot, demonstration, and phased approaches are addressed in regulatory processes, depending on the applied authority, as well as the strategic importance of early stage projects in improving regulatory conditions for more mature technologies and deployments.

Project reports illustrate the value and use of data acquisition, transferability, and analysis in the regulatory process, as well as provide specific regulatory research concepts on data development and sharing mechanisms that could benefit individual processes and general constructs.

# 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 |
| [$126.1K] | [$46.5K] | [$38.4K] | [$211K] | [$221.6K] |

- **Timeline:** Most of the project work was conducted in FY17 (draft literature review, template topics for the Synthesis, all of the interviews). In FY18 and FY19, the PI for the project performed a rotation with WPTO to support the hydropower program and had very limited availability. As a result, final deliverables within the project were significantly delayed into FY19, though the original budget remained intact for the original tasks.
- **Budget:** For the budget provided, PNNL produced an EERE publication and two laboratory publications. WPTO provided an additional $40K in FY19 for the follow-on state/federal agency review task for the updated handbook.
- **Team:** Key team members:
  - Rebecca O'Neil
  - Bo Saulsbury
  - Garrett Staines (Interviews, Literature review, Synthesis)
  - Mikaela Freeman (Literature review, Synthesis)

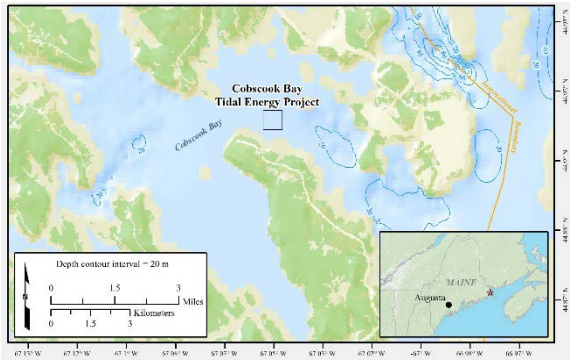
# Management and Technical Approach

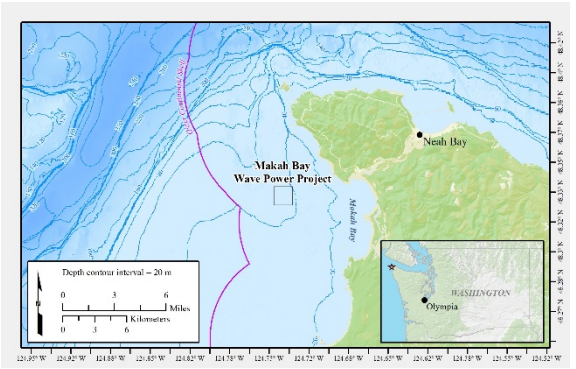


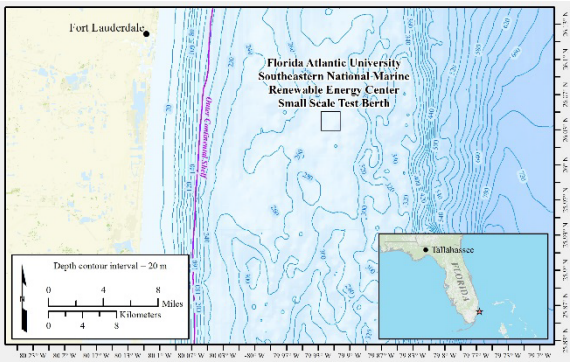
**The project consisted of four elements, conducted in sequence:**

1. <u>Literature Review (Laboratory publication)</u>

- Overview of both federal and state authorities with insight into how they developed into their current form;
- Regulatory case studies of three tidal developments (Roosevelt Island, Admiralty Inlet, Cobscook Bay), four wave developments (Makah Bay, WaveConnect, Reedsport, PMEC-SETS (now PacWave)), and one ocean current (Florida Atlantic-SNMREC) with associated maps and regulatory timelines;
- Summary of existing regulatory recommendations for MHK; and
- Appendices of all Federal Energy Regulatory Commission (FERC) permitting activity (including preliminary permits) and relevant federal laws.



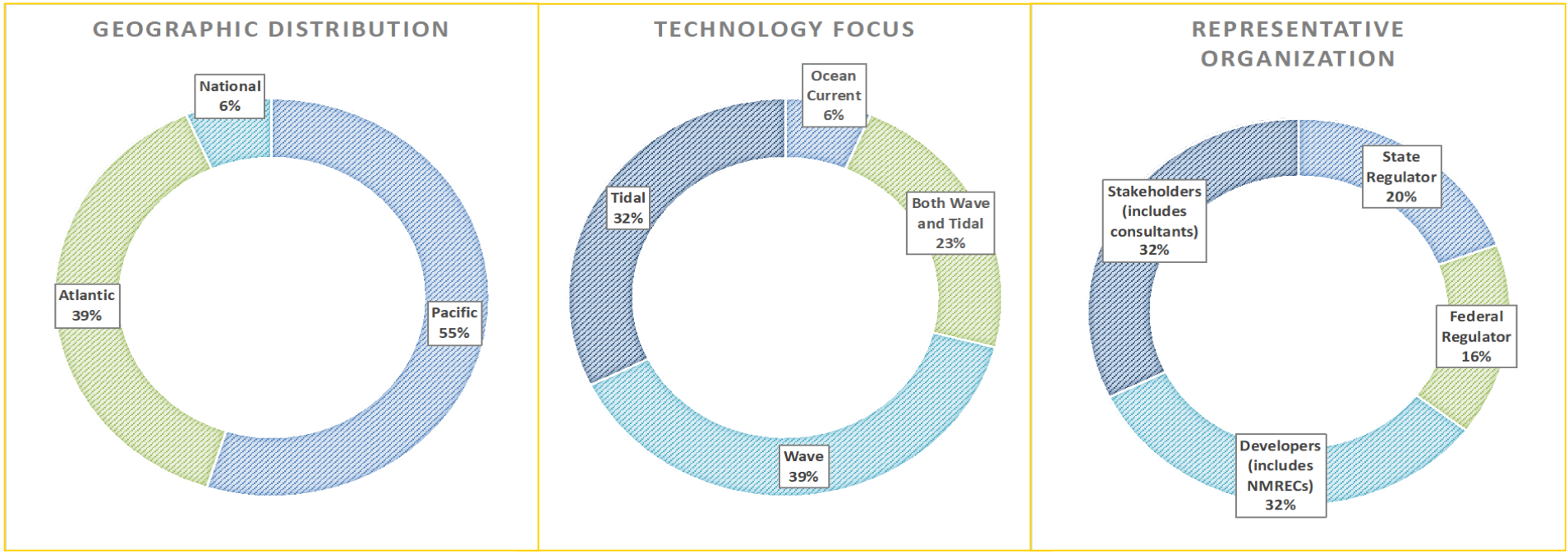



# Management and Technical Approach



2. Interviews. In 2017, PNNL conducted over 30 personalized interviews ranging from 1 to 2 hours. Interviewees were selected to achieve a reasonable range of geographic diversity (Atlantic or Pacific), technology diversity (tidal, wave, and ocean current), and representative organization (experience or affiliation as a regulator, developer, or stakeholder).



# Management and Technical Approach

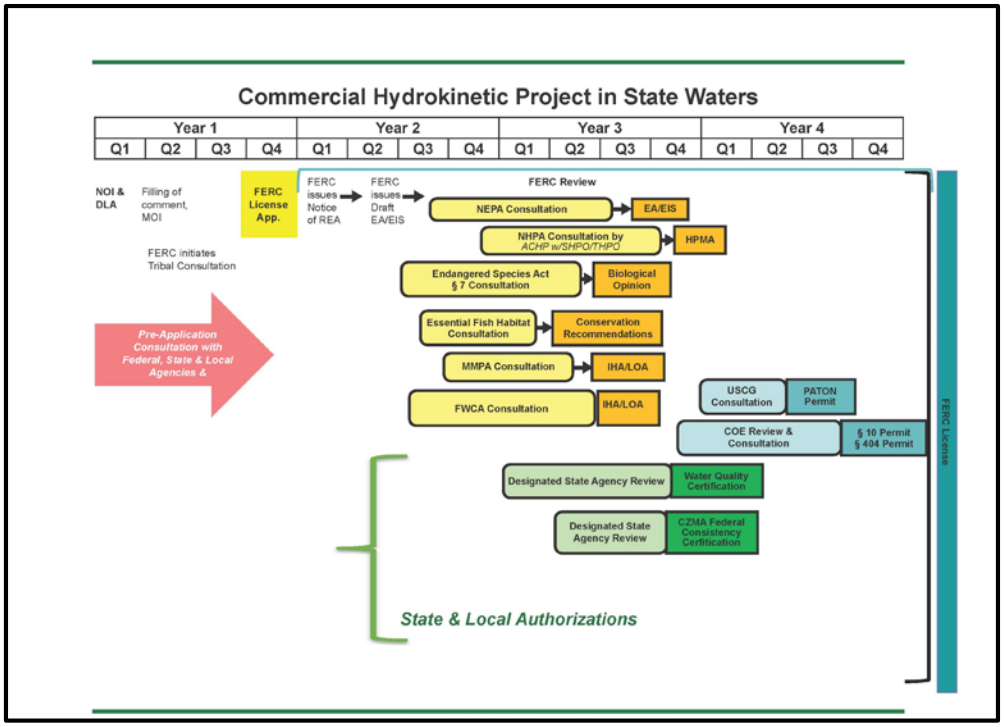


3. Synthesis (internal laboratory publication). The Synthesis report presents a summary set of research recommendations to improve regulatory processes and outcomes for the next generation of MHK developments. Recommendations are organized into regulatory research topics and prioritized based on the opportunity for research to influence a regulatory practice as well as the topic's importance and effect within regulatory processes.

| Permitting Design and Improvements | Effective Management of Risk | Environmental Effects | Companion Offshore Industries |
|---|---|---|---|
| Leveraging Precedent-Setting Projects | Construction Windows | Establishing Baseline Conditions | Performance Assurance and Insurance |
| Merchant Marine Act of 1920 (Jones Act) | Marine Spatial Planning | Transferability of Environmental Studies | Established Marine Industry Comparisons and Standards |
| Decommissioning Bonds | Risk-Based Approach | Environmental Monitoring | Telecommunications Cable Route Interactions |
| Pilots and Demonstrations | Adaptive Management | | |
| Compatibility with Non-Grid Marine Applications | Retiring Risk | | |
| Pre-Permitted Sites and Auctions | Navigation | | |
| Programmatic Review | | | |
| Distinguishing Research from Permitting Requirements | | | |
| Regulator Familiarity with Technology | | | |

# Management and Technical Approach

4. <u>Handbook of Hydrokinetic Regulatory Processes (EERE publication).</u> PNNL updated and refreshed a regulatory handbook that was originally prepared by Pacific Energy Ventures, LLC and published in 2009 as *Siting Methodologies for Hydrokinetics: Navigating the Regulatory Framework.* PNNL submitted the final updated handbook for publication by WPTO as the *Handbook of Hydrokinetic Regulatory Processes* (Publication Number DOE-EE1793).



# End-User Engagement and Dissemination Strategy



- The primary results of the work – a suite of recommended regulatory research topics – are internally-facing to DOE. PNNL/DOE intend to publish a public-facing overview of the Synthesis recommendations.
- A key benefit of the interviews is to ensure that the project is informed by the diverse and collective expertise of the MHK community.
- Externally-facing purposes of the project are:
  - Update and publish the MHK regulatory process handbook and
  - Engage MHK regulatory stakeholders in prioritizing regulatory research possibilities.
- Literature review and handbook will be published on Tethys.

# Technical Accomplishments



- O'Neil R.S., G.J. Staines, and M.C. Freeman. 2019. *Marine Hydrokinetics Regulatory Processes Literature Review*. PNNL-28608. Richland, WA: Pacific Northwest National Laboratory. https://tethys.pnnl.gov/publications/marine-hydrokinetics-regulatory-processes-literature-review

- O'Neil R.S., M.C. Freeman, and G.J. Staines. 2019. *MHK Regulatory Initiatives Analysis: Synthesis*. PNNL-28936. Richland, WA: Pacific Northwest National Laboratory. (Internal dissemination only.)

- U.S. Department of Energy, *Handbook of Hydrokinetic Regulatory Processes* (Publication Number DOE-EE1793). Anticipated publication fall 2019.

# Progress Since Project Summary Submittal



- **Published the internal report with detailed recommendations on regulatory research concepts in August 2019:**
  - O'Neil R.S., M.C. Freeman, and G.J. Staines. 2019. *MHK Regulatory Initiatives Analysis: Synthesis*. PNNL-28936. Richland, WA: Pacific Northwest National Laboratory.

- **DOE will publish the updated MHK Handbook in fall 2019:**
  - U.S. Department of Energy. 2019. *Handbook of Marine Hydrokinetic Regulatory Processes.* DOE-EE-1793. Washington, DC: DOE-EERE, Water Power Technologies Office.