Water Power Technologies Office (WPTO) Marine and Hydrokinetic

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

WAVE ENERGY PRIZE
U.S. DEPARTMENT OF ENERGY

Site and Resource Characterization Session

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Session Overview

Site and Resource characterization: Reduce Risk = Lower LCOE

Measure the resource – including test sites
Model for normal and extreme conditions
Design WEC and tidal devices to load conditions
Site your project and how to appropriate position arrays of devices
Forecast short term waves

➔***Saves Money*** for Investors – and continues to do so over the lifetime of the plant operations.

➔Aids in WEC Design & Development & site selection

The Challenge: Prior resource assessments = large scale
Lack of observations long term
How to identify sites
How to identify best modeling methods for those sites
Improve Models – extreme storms
No V & V process for modeling
Gaps in the analysis of the tidal sites.

2014 Peer review and response:

Little Industry involvement
Use pre-existing data sets – what is available?

Program Strategic Priorities

Technology Maturity

- Test and demonstrate prototypes
- Develop cost effective approaches for installation, grid integration, operations and maintenance
- Conduct R&D for Innovative MHK systems & components
- Develop tools to optimize device and array performance and reliability
- Develop and apply quantitative metrics to advance MHK technologies

Deployment Barriers

- *Identify potential improvements to regulatory processes and requirements*
- Support research focused on retiring or mitigating environmental risks and reducing costs
- Build awareness of MHK technologies
- Ensure MHK interests are considered in coastal and marine planning processes
- Evaluate deployment infrastructure needs and possible approaches to bridge gaps

Market Development

- Support project demonstrations to reduce risk and build investor confidence
- Assess and communicate potential MHK market opportunities, including off-grid and non-electric
- Inform incentives and policy measures
- Develop, maintain and communicate our national strategy
- *Support development of standards*
- Expand MHK technical and research community

Crosscutting Approaches

- Enable access to testing facilities that help accelerate the pace of technology development
- **Improve resource characterization to optimize technologies, reduce deployment risks and identify promising markets**
- **Exchange of data information and expertise**

Integrated Portfolio & Session Overview

The Program Result to the Challenge:

Hot spots, US Navy (DoD/Test Sites) = Refinement of Resource Assessments

30 year hindcast – instead of 51 months (also aids with extreme conditions)

Data Gathering Campaign - Gaps for data

Model Integration - Methodology to show which models to utilize in US waters / peer reviewed

Model Validation and Site Characterization for Early Deployment

Methodology for site identification – combine with loads, economics to show where to begin.

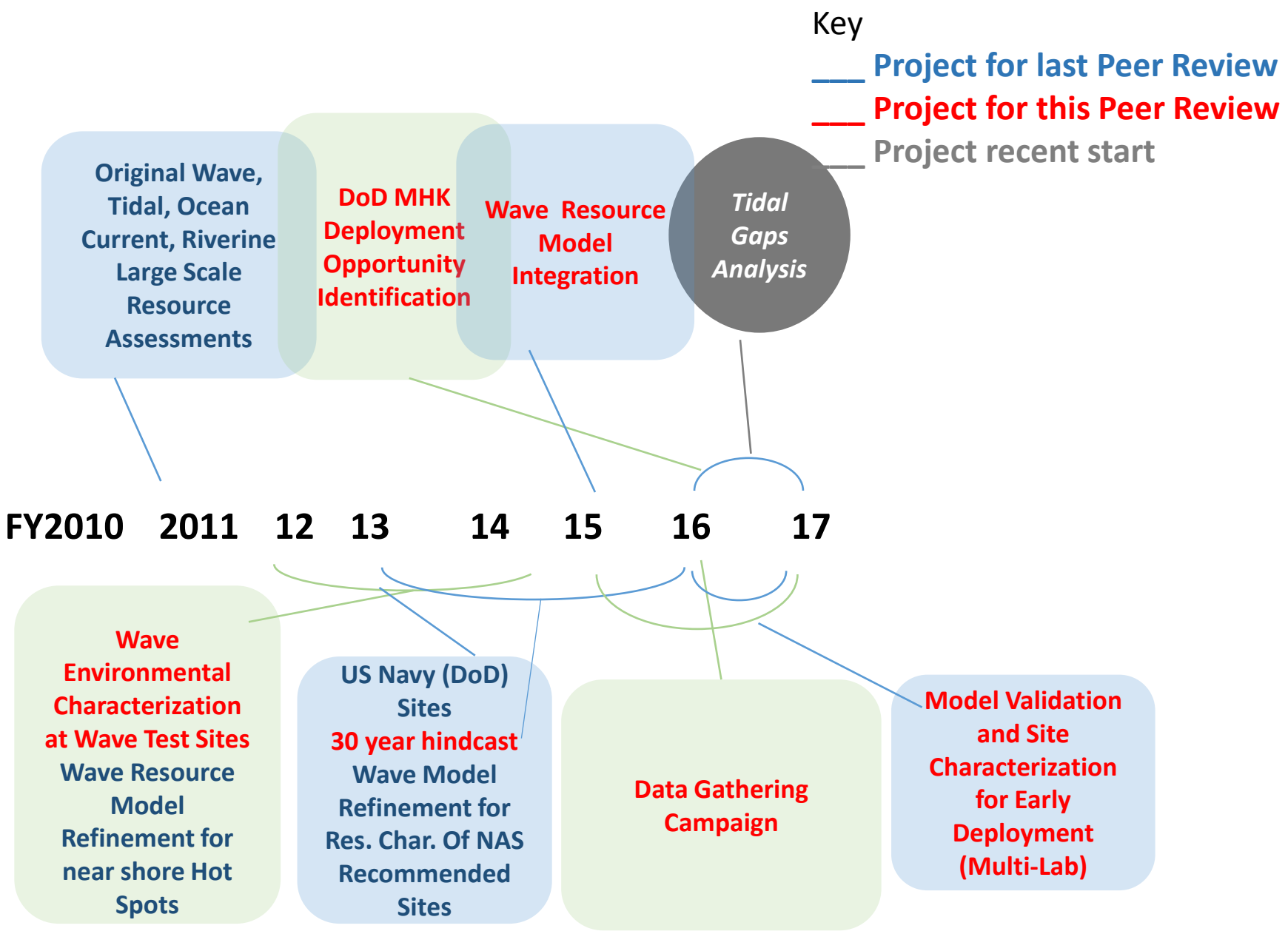
Wave Classification Scheme

Gaps in the analysis of the tidal sites.

Assimilation of Wave Imaging Radar Obs. For Real-time wave by wave fcstg.

2014 Peer review and response:

MEC Subcommittee – continuous dialog


Key
Project for last Peer Review
Project for this Peer Review
Project recent start
Original Wave, Tidal, Ocean Current, Riverine Large Scale Resource Assessments
DoD MHK Deployment Opportunity Identification
Wave Resource Model Integration
Tidal Gaps Analysis
FY2010
2011
12
13
14
15
16
17
Wave Environmental Characterization at Wave Test Sites
Wave Resource Model Refinement for near shore Hot Spots
US Navy (DoD) Sites
30 year hindcast
Wave Model Refinement for Res. Char. Of NAS Recommended Sites
Data Gathering Campaign
Model Validation and Site Characterization for Early Deployment (Multi-Lab)