



## Reducing Barriers to Testing

### Marine and Hydrokinetics Program

Tuesday, October 8, 2019

Steve DeWitt, Technology Manager

Water Power Technologies Office

## 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



# Reducing Barriers to Testing Presentations: Tuesday, October 8<sup>th</sup>

Start	End	Agenda Session	Presenter	Affiliation	Track
1:20 PM	1:40 PM	Overview of Reducing Barriers to Testing	Steve DeWitt	WPTO	Testing & Data
1:40 PM	1:50 PM	Introduce Lab Projects	Simon Gore	WPTO	Testing & Data
1:50 PM	2:20 PM	MHK Regulatory Initiatives Analysis	Bo Saulsbury	PNNL	Testing & Data
2:20 PM	2:50 PM	MHK Environmental Compliance Cost Assessment	Jesse Roberts	SNL	Testing & Data
2:50 PM	3:20 PM	Hydrodynamic and Acoustic Models for Quantitative Environmental Assessment	Jesse Roberts	SNL	Testing & Data
3:20 PM	3:35 PM	End-of-Session Networking Activity	All recent presenters	All recent presenters	Testing & Data
3:35 PM	3:50 PM	Coffee Break			
3:50 PM	4:00 PM	Introduce Lab Projects	Dana McCoskey	WPTO	Testing & Data
4:00 PM	4:30 PM	MHK Performance Measurement and Instrumentation	Rick Driscoll	NREL	Testing & Data
4:30 PM	5:00 PM	Video Analysis Software Development	Shari Matzner	PNNL	Testing & Data
5:30 PM	5:45 PM	End-of-Session Networking Activity	All recent presenters	All recent presenters	Testing & Data
5:45 PM	6:15 PM	Peer Reviewer Only Meetings			

# Reducing Barriers to Testing Presentations : Wednesday, October 9<sup>th</sup>

Start	End	Agenda Session	Presenter	Affiliation	Track
9:50 AM	9:55 AM	Introduce Mammal Study	Corey Vezina	WPTO	Testing & Data
9:55 AM	10:25 AM	Marine Mammal Behavioral Response to Tidal Turbine Sound	Brian Polagye	University of Washington	Testing & Data
10:25 AM	10:35 AM	Introduce Triton & FOA 1418	Dana McCoskey	WPTO	Testing & Data
10:35 AM	11:15 AM	Triton Initiative	Meg Pinza	PNNL	Testing & Data
11:15 AM	11:30 AM	Coffee Break			
11:30 AM	12:00 PM	NoiseSpotter: Cost-effective, Real-time Acoustic Characterization and Localization System	Kaus Raghukumar	Integral Consulting Inc.	Testing & Data
12:00 AM	12:30 PM	DAISY: A Drifting Acoustic Instrumentation System	Brian Polagye	University of Washington	Testing & Data
12:30 PM	1:15 PM	Lunch			

# Reducing Barriers to Testing Presentations: Wednesday, October 9<sup>th</sup>

Start	End	Agenda Session	Presenter	Affiliation	Track
1:15 PM	1:45 PM	A Combined Electric/Magnetic Field Instrument for MHK Environmental Monitoring	Alan Chave	Woods Hole Oceanographic Institution	Testing & Data
1:45 PM	2:15 PM	Benthic Habitat Monitoring Tools for MHK Environmental Assessments	Gene Revelas	Integral Consulting Inc.	Testing & Data
2:15 PM	2:45 PM	Long-Range Target Detection and Classification System for Environmental Monitoring at MHK Sites	Jim Dawson	BioSonics Inc.	Testing & Data
2:45 PM	3:00 PM	Coffee Break			
3:00 PM	3:30 PM	Unobtrusive Multi-Static Serial LiDAR Imager (UMSLI) for Wide-Area Surveillance and Identification of Marine Life at MHK Installations	Anni Dalglish	Florida Atlantic University	Testing & Data
3:30 PM	4:00 PM	Third-Generation Adaptable Monitoring Package (3G-AMP)	Brian Polagye	University of Washington	Testing & Data
4:00 PM	4:30 PM	End-of-Session Networking Activity	All recent presenters	All recent presenters	Testing & Data
4:30 PM	4:50 PM	End-of-Session Triton & 1418 discussion as a group	All attendees	WPTO	Testing & Data
4:50 PM	5:20 PM	Peer Reviewer Only Meetings			

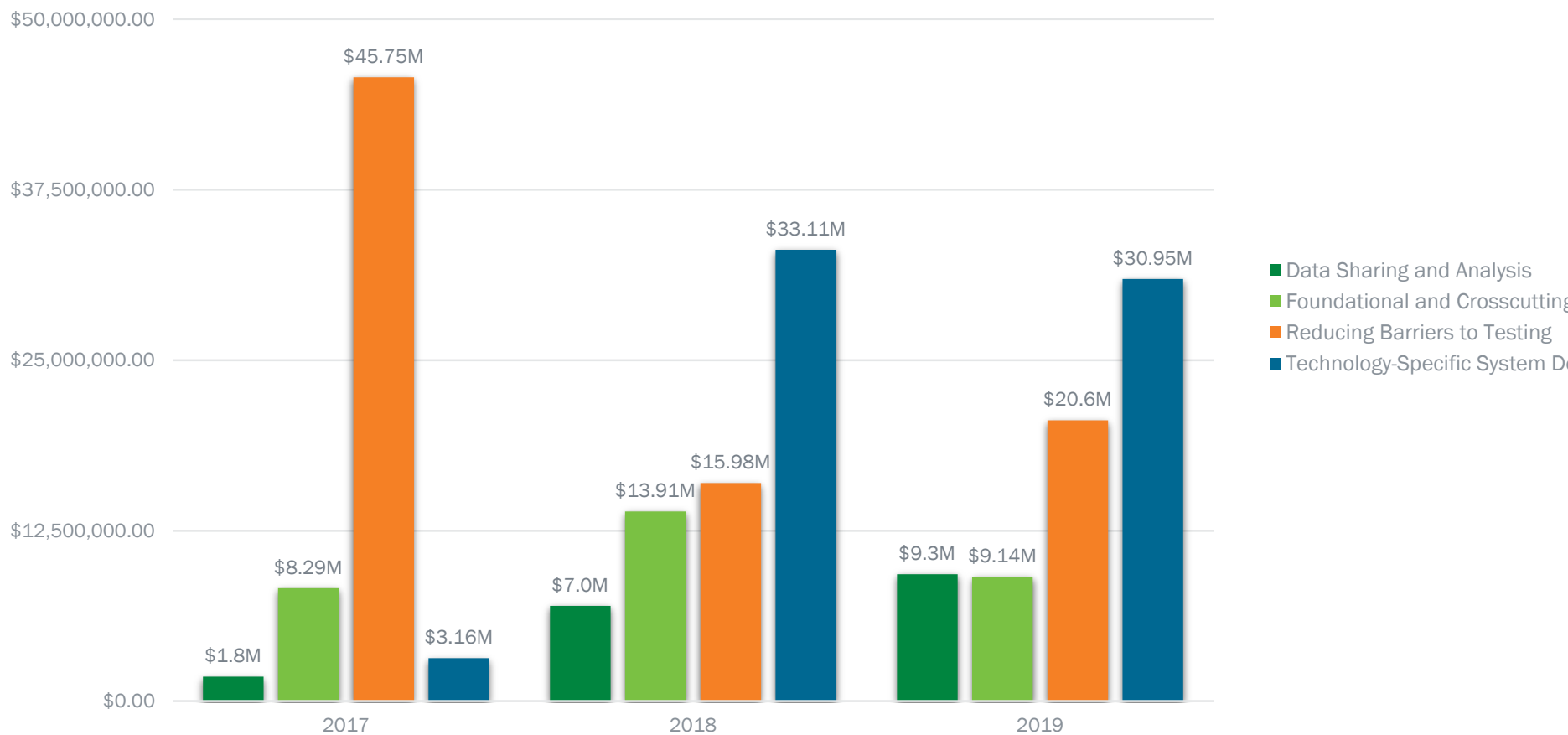


# Dating Sharing and Analysis Presentations: Thursday, October 10<sup>th</sup>

Start	End	Agenda Session	Presenter	Affiliation	Track
8:45 AM	9:05 AM	Overview of Data Sharing & Analysis and Introduction of Lab Projects	Hoyt Battey	WPTO	Testing & Data
9:05 AM	9:35 AM	Tidal Resource Gaps Analysis	Kevin Haas (on behalf of NREL)	NREL	Testing & Data
9:35 AM	10:05 AM	Model Validation and Site Characterization for Early Deployment MHK Sites and Establishment of Wave Classification Scheme	Levi Kilcher	NREL, PNNL, SNL	Testing & Data
10:05 AM	10:35 AM	International Environmental Data Sharing Initiative (OES-Environmental & Tethys Database)	Andrea Copping	PNNL	Testing & Data
10:35 AM	10:45 AM	Coffee Break			
10:45 AM	11:15 AM	Marine and Hydrokinetic Data Repository (MHKDR)	Jon Weers	NREL	Testing & Data
11:15 AM	11:45 AM	MHK Data Products and User Community Development	Kelley Ruehl	SNL, NREL, PNNL	Testing & Data
11:45 AM	12:05 PM	End-of-Session Networking Activity	All recent presenters	All recent presenters	Testing & Data
12:05 PM	12:25 PM	Closing Remarks on Testing & Data	Steve DeWitt	WPTO	Testing & Data
12:25 PM	1:15 PM	Lunch			

# Program Management Approach

## FY17-FY19 MHK Program Budget by Activity





## Fundamental R&D and Outreach

- *2010 – present* **Numerical Model Development** – Tools to evaluate MHK induced changes in current flow, wave height and direction, sediment transport and acoustic propagation
- *2010 – present* **Lab Experiments** – Acoustic impacts on fish, potential for and consequences of strike by tidal turbines for fish and marine mammals
- *2010 – present* **Tethys & OES Environmental (Formerly Annex IV)** – Aggregates global information on MHK environmental concerns
- *2010* **MHK Permitting Handbook** – Permitting Roadmap
- **Advanced Monitoring Technology Development**
- *2015 – present* **Triton Initiative** – Support the development and testing and evaluation of environmental monitoring technologies
- *2014-2017* **MHK Environmental Instrumentation FOA** - Initial development of MHK-specific environmental monitoring technology
- *2016 – present* **MHK Environmental Monitoring Technology Advancement FOA** – Refinement, cost reduction and testing of environmental monitoring technology

## Evaluation of Common Environmental Compliance Issues

- **2013- 2016 Environmental Effects Assessment and Monitoring FOA** – Literature reviews or field studies for common MHK environmental concerns
- **2016- present Environmental Compliance Cost Analysis** – Examine costs for permitting and environmental monitoring of MHK projects

## Improving Regulator Outreach

- **2014-2016 Regulator Workshops** – Engagement with regulators to discuss most recent science regarding environmental monitoring requirements
- **2017 - present MHK Permitting Handbook Update**
- **2018 - present MHK Data Dissemination FOA** – “Improving the Efficiency and Effectiveness for MHK Permitting: A Toolkit and Engagement for Success”

## Improving Testing Infrastructure

- **2017 - present PacWave Design-Construction-Operation FOA**
- **2019 - present TEAMER Testing Facility Network FOA**
- **2019 - present NMREC Testing Infrastructure Upgrades FOA**

- Multiple regulatory projects focused on more effective outreach with regulators
- Industry engagement via MEC transparency series and through individual projects outreach
- Project reports archived on Tethys and shared through Tethys Blasts
- Completed Draft License Application (DLA) for PacWave by engaging stakeholders through FERC Alternative Licensing Process





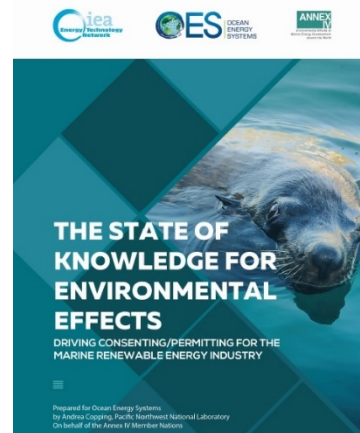
<https://triton.pnnl.gov/>



<https://tethys.pnnl.gov/>



**2016 State of the Science report**  
<https://tethys.pnnl.gov/publications/state-of-the-science-2016>



**Ocean Energy Systems (OES) position paper**  
<https://tethys.pnnl.gov/publications/state-knowledge-environmental-effects-driving-consenting-permitting-marine-renewable>

- MHK Permitting Handbook Update to be released soon
- OES-Environmental (Formerly Annex IV) State of the Science Report – public draft will be released at ICOE 2020
- Triton Field Trials (TFiT) commencing in 2020 to evaluate environmental monitoring methodologies/technologies and provide best practice recommendations to allow for greater data transferability among sites and technologies - dependent upon upcoming WEC installations
- Testing via TEAMER Testing Facility Network beginning soon
- Continue efforts to achieve PacWave accreditation as test laboratory for third party verification of IEC Technical Specifications