



# OES-Environmental Meeting of Country Analysts

January 9, 2019  
Online Meetings

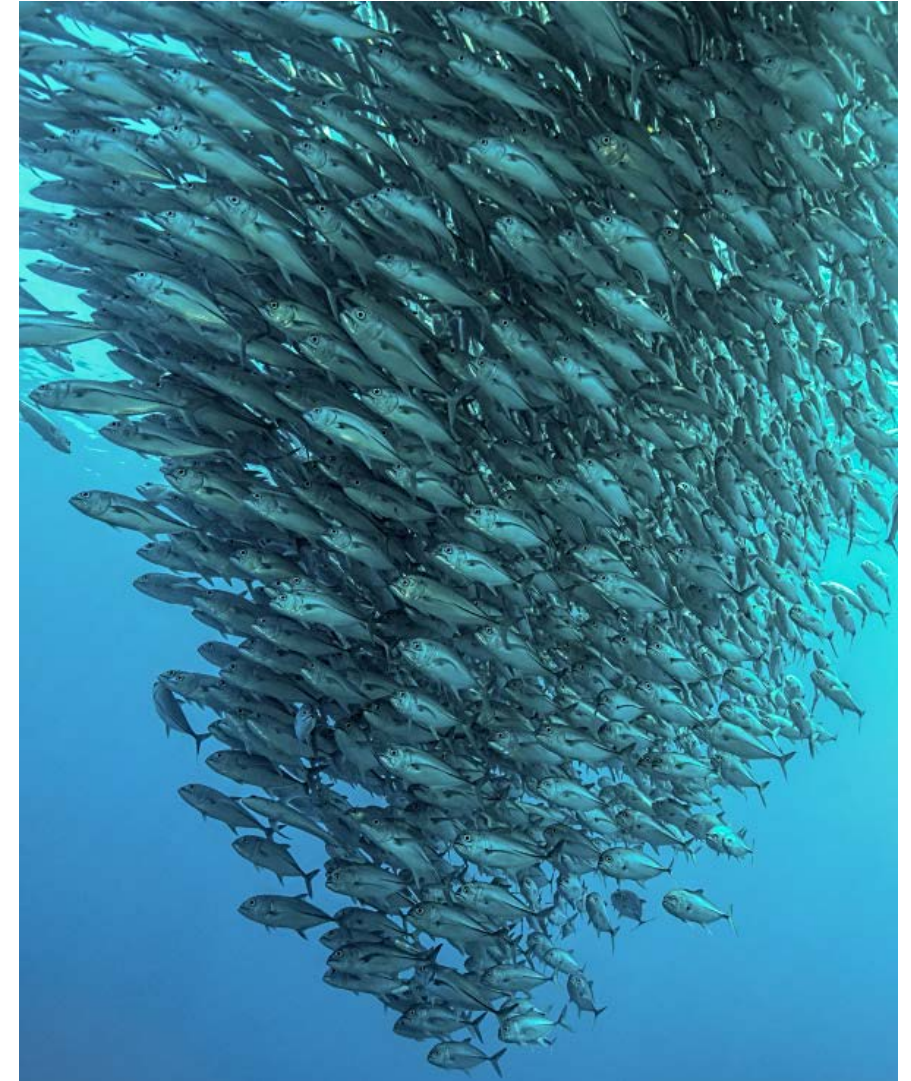


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## Today...

- Updates from:
  - Portugal
- State of the Science 2020 Update
  - Peer reviewers
- OES-E Workshop in Australia
- Risk Retirement – guidance documents
- *Tethys* Peer Review
- Data Transferability – matrix
- OES-Environmental Activities
  - Regulator Survey, Enhancing Outreach Activities, Social Media, Upcoming Activities
- Roundtable





**WavEC**  
*Offshore Renewables*

# MARINE RENEWABLE ENERGY IN PORTUGAL

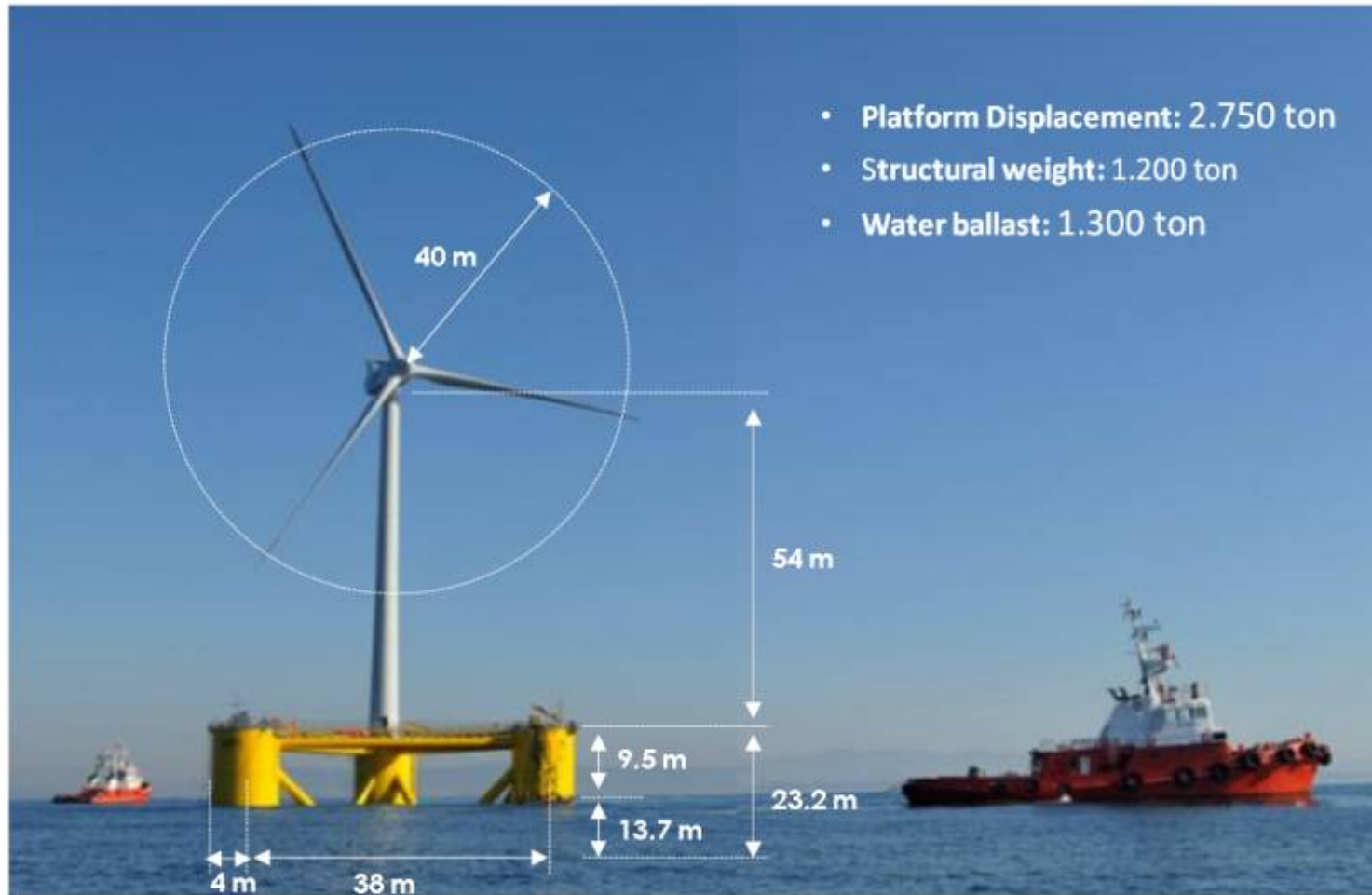
TECHNOLOGIES, PROJECTS AND INITIATIVES

TERESA SIMAS

07 JANUARY 2020

# OFFSHORE WIND IN PORTUGAL

## WINDFLOAT PROJECT



- 2 MW turbine located in Aguçadoura – Póvoa do Varzim

- WindPlus: Principal Power (US), EDP (PT), Repsol (SN), A. Silva Matos (PT), Vestas Wind Systems (DN) and InovCapital (PT)

- Delivered about 3 GWh onto the grid

- The turbine has shown resilience in extreme maritime conditions, having withstood storms with waves as tall as 15 m

The project partners applied for EU funding to build a 25MW offshore array

# OFFSHORE WIND IN PORTUGAL

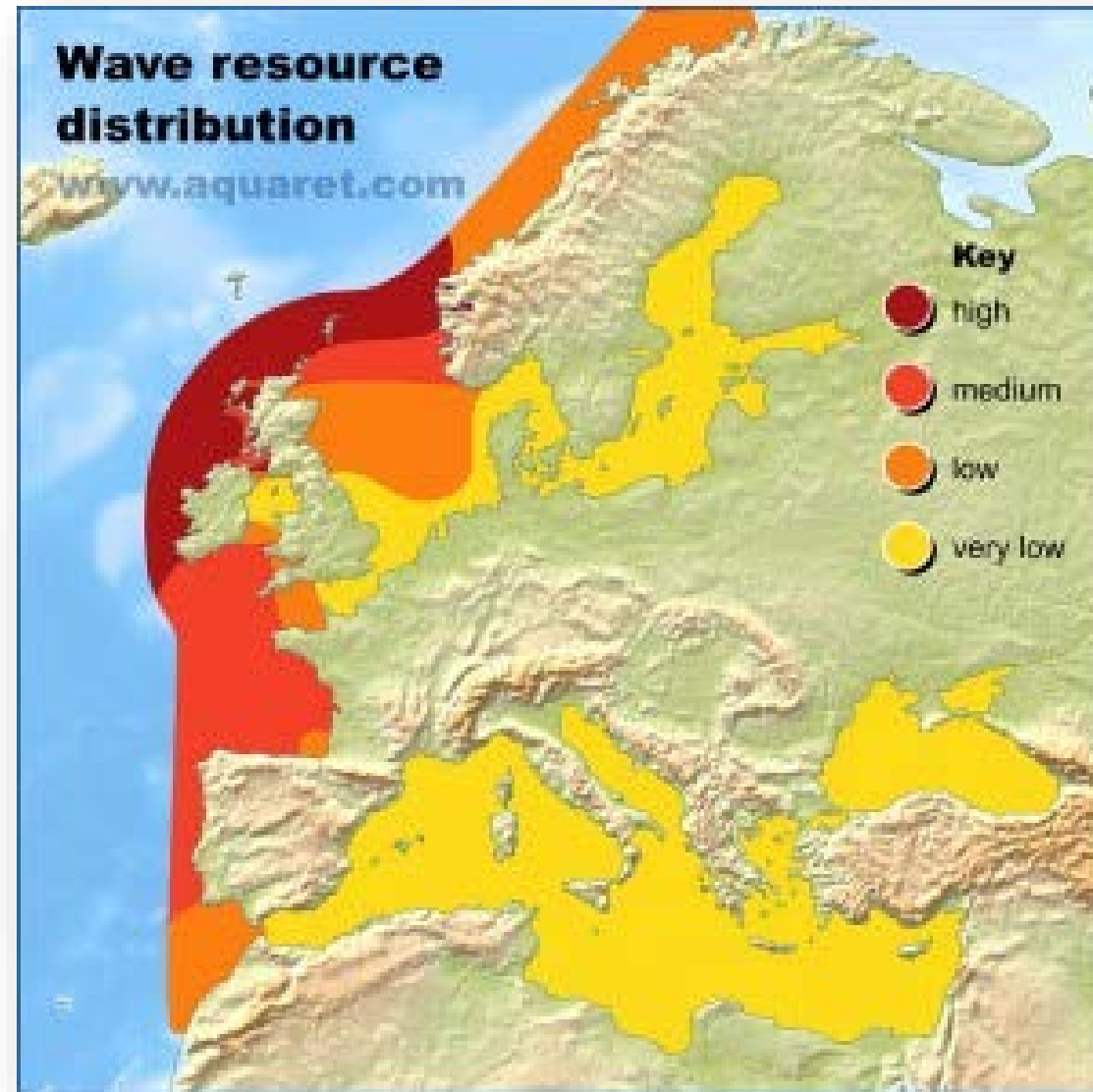
## WINDFLOAT ATLANTIC PROJECT



- Pre-commercial testing project
- 25 MW three turbines (8.4 MW each) located 15km offshore Viana do Castelo
- WindPlus: Principal Power (US), EDP (PT), Repsol (SN), A. Silva Matos (PT), Vestas Wind Systems (DN)
- The project has been installed and is producing electricity to the grid since the beginning of the month

# WAVE ENERGY IN PORTUGAL

- The best wave conditions for wave power are found at higher latitudes (away from the equator)
- In Europe a higher wave power resource is located in the Atlantic region



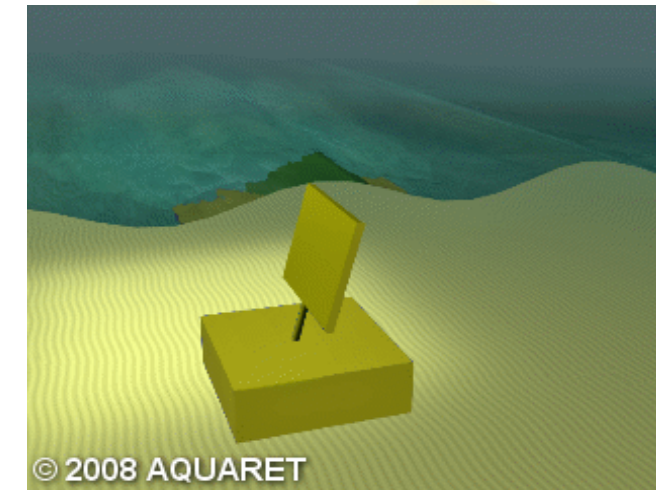
# WAVE ENERGY IN PORTUGAL

## WAVEROLLER PROJECT – PROTOTYPES 2002 - 2014



# ENERGIA DAS ONDAS EM PORTUGAL

## WAVEROLLER PROJECT



- AW Energy; Finish company
- 350 kW device installed at 820 metres offshore from Peniche
- Grid connected

<https://www.youtube.com/watch?v=Fu1ViwYz9jU>

<https://youtu.be/W0LceZOwi7k>

<https://www.youtube.com/watch?v=VuyrUfEiC-A>

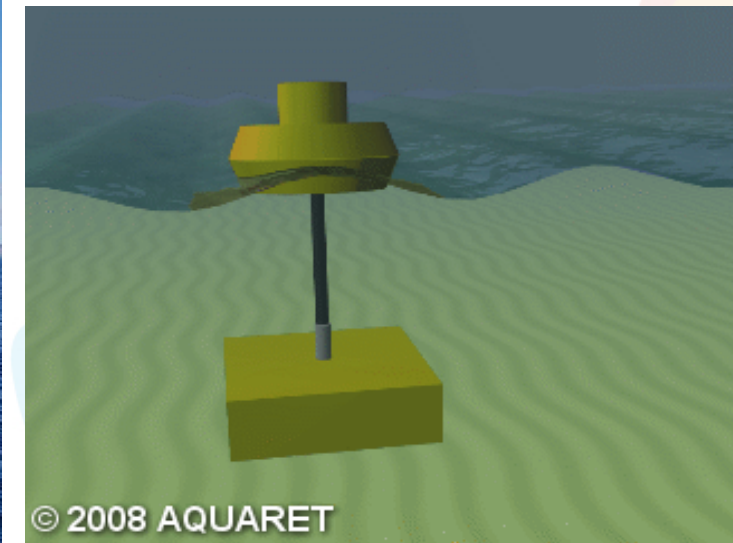
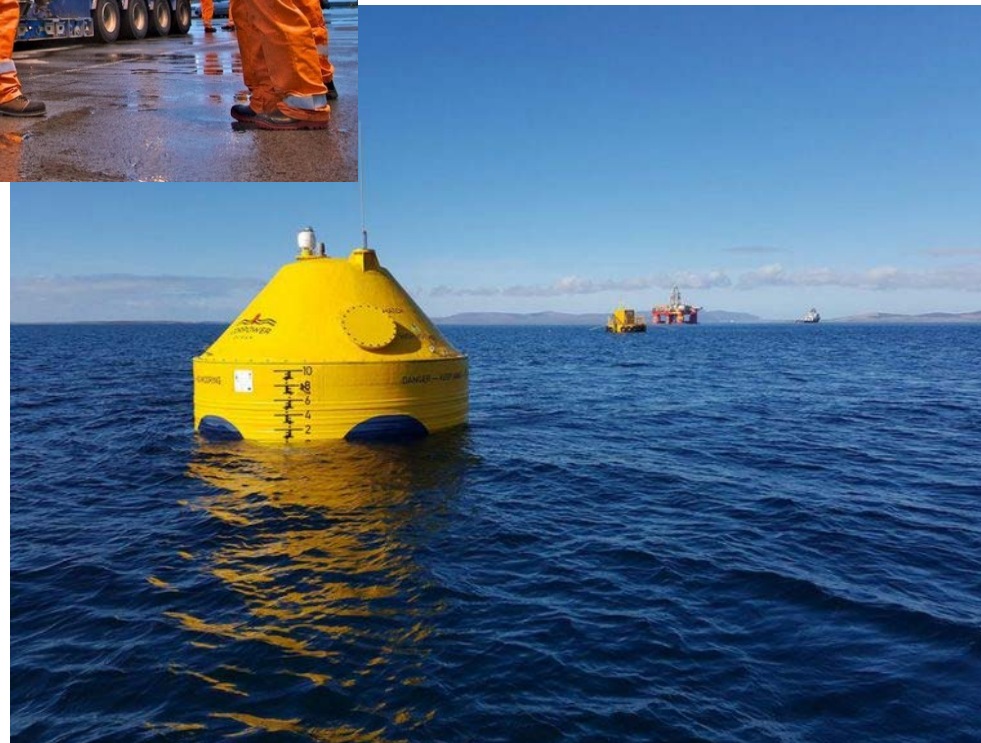


# ENERGIA DAS ONDAS EM PORTUGAL

## HYWAVE PROJECT



- Corpower; Swedish company
- Aguçadoura test site in 2020
- Three devices (first array)
- 300 kW each device
- Grid connected



Muito obrigada!



**WavEC**  
*Offshore Renewables*

CONTACTOS

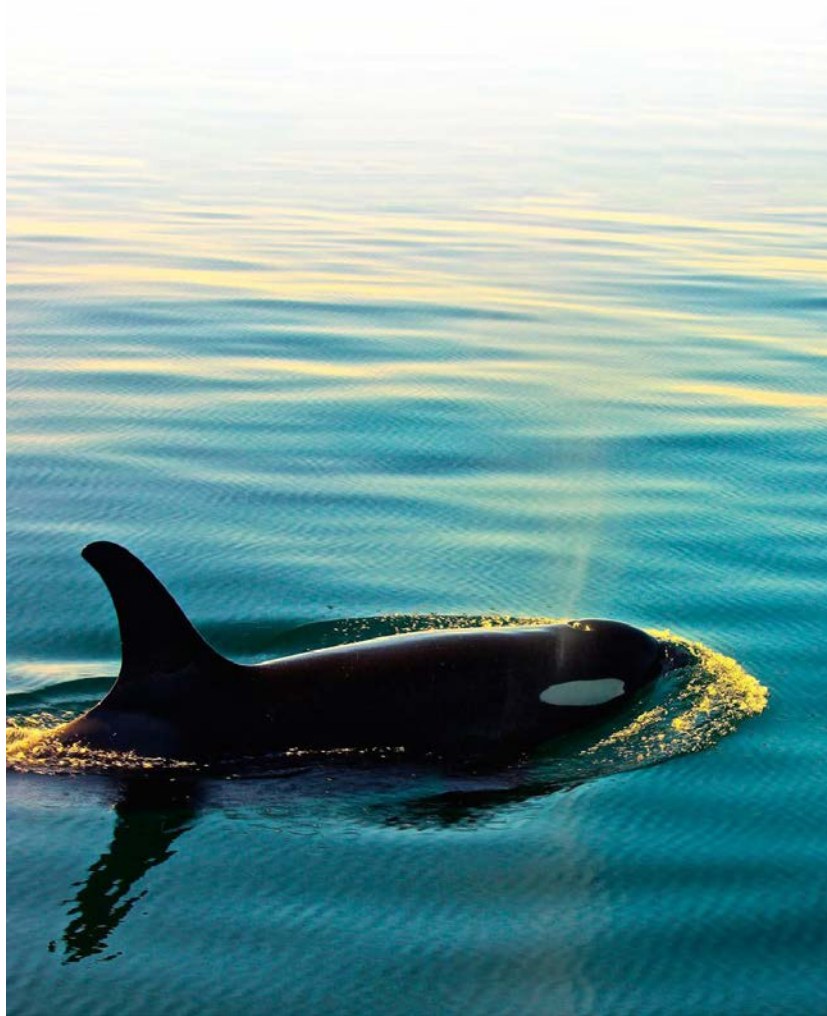
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[www.wavec.org](http://www.wavec.org)

# 2020 State of the Science



- Timeline

- Full outline in January 2019, a few changes since
- Chapter authors are drafting chapters, to be completed by June/July 2019
- Draft chapters by September-November 2019 for OES-Environmental review
- Authors revising chapters, to be completed by December 2019
- **January 2020 review by OES, peer reviewers**
- Finalize in mid-March 2020
- To be released as draft at ICOE in May 2020

# State of Science Report Outline

Section	Ch #	Chapter Title
Executive Summary		
Introduction	1	Introduction
	2	Key Environmental Questions
Section A – Current Knowledge of Key Device Interactions in the Marine Environment	3	Collision Risk for Animals around Turbines
	4	Risks to Marine Animals from Underwater Sound Generated by MRE Devices
	5	Effects of EMF on Marine Animals from Electrical Cables and MRE devices
	6	Changes in Habitats caused by MRE devices: benthic and pelagic habitats, reefing patterns
	7	Changes in Physical Systems: Energy Removal and Changes in Flow
	8	Encounters with MRE Device Mooring Lines by Marine Animals
	9	Social and Economic Data for Consenting/Permitting
Section B – Environmental Monitoring	10	Environmental Monitoring Approaches and Technologies
Section C – Strategies for Accelerating Permitting/Consenting	11	Marine Spatial Planning and Marine Renewable Energy
	12	Adaptive Management
	13	Retiring Risk
Section D – Summary and Path Forward	14	Path Forward

## 2020 SoS Peer Reviewers

- We are looking for peer reviewers to review the 2020 State of the Science
- Please send recommendations for peer reviewers to Andrea ([andrea.copping@pnnl.gov](mailto:andrea.copping@pnnl.gov)) or Lenaig ([lenaig.hemery@pnnl.gov](mailto:lenaig.hemery@pnnl.gov))  
by January 17<sup>th</sup>



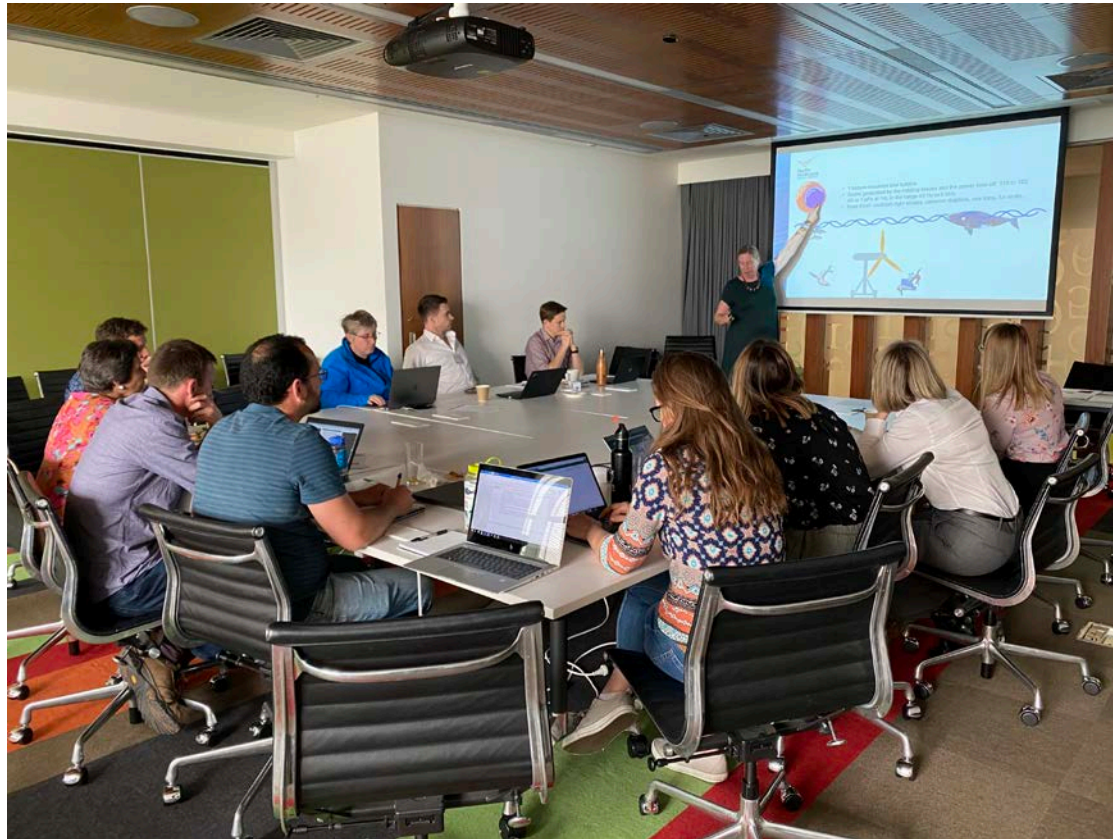
**Call for OES-Environmental country input**

# OES-E Workshop in Australia

- Sydney, Australia (Dec 4<sup>th</sup>)
- 16 participants from 4 countries
- Presented
  - State of the science on environmental effects
  - Risk Retirement
  - Data Transferability
  - Discussed from the perspective of wave devices/projects
  - Output to SoS
- Workshop report will be available on *Tethys*



## Workshop in Australia - feedback



- Both risk retirement and data transferability are valuable and provide a systematic analysis for regulators
- Agreed that risk from underwater noise could be retired for single devices or small arrays
  - But cumulative effects may be an issue
- Agreed that risk from EMF could be retired for single devices or small arrays
  - With an MRE deployment found burying cable was adequate to mitigate impacts
  - But concerned about impacts of EMF from arrays, larger developments may still require measurements

# Risk Retirement

- EWTEC, OREC, and Australia workshops feedback is being incorporated into SoS and guidance documents
- Guidance documents
  - General to apply to all countries with supplementary documents specific to each OES-Environmental country
  - 2020: underwater noise and EMF
  - 2021: habitat changes and changes in physical systems
- Currently developing a framework for the guidance documents





# Data Transferability

- Monitoring Dataset Discoverability Matrix is an interactive tool to guide data transfer
- Makes datasets from already permitted/consented projects accessible for regulators, developers, and MRE community to transfer data to a future project
- Webinar for US regulators and for ORJIP Steering Committee (UK regulators) in early February

[Demo of Matrix](#)

# *Tethys* Peer Review

- Begin conducting the annual *Tethys* Peer Review January 2020
- 2020 includes an in-depth review of *Tethys* by MRE experts
- Please nominate 3 experts from your country and send a list of reviewers to Jonathan ([jonathan.whiting@pnnl.gov](mailto:jonathan.whiting@pnnl.gov))



**Call for OES-Environmental country input**

# Regulator Survey

- Completed regulator surveys in US, UK, Sweden, Spain, Ireland, and France
  - Surveys in progress: Japan and Canada
- Compiled results for ICOE 2020 abstract – will share with you
- Goal: complete survey in all OES-Environmental countries
  - Please respond to follow-up email to let Mikaela know if you are able to help with the regulator survey
  - What we need from you:
    - ✓ Review and edit regulator survey questions to make sure they apply to your country
    - ✓ Provide a list of regulators (name and email)



**Call for OES-Environmental country input**

# Enhancing Outreach Activities

- Country presentations during Analyst meetings
  - 1-2 Analysts present at each meeting
    - ✓ Projects or studies
    - ✓ New MRE projects in your country
- Metadata Updates: emails from Cailene Gunn ([cailene.gunn@pnnl.gov](mailto:cailene.gunn@pnnl.gov))
- Continue to fill out Google Drive [Analyst Activities spread sheet](#)



**Call for OES-Environmental country input**

## Social Media



@tethys\_enviro



@tethys.pnnl.gov

- Posting several times a week to each platform to increase engagement
  - *Tethys* Blasts
  - New environmental effects journal articles
  - MRE and Wind industry news
- If you have any content, news, etc. to highlight please send to Dori Overhus ([dorian.overhus@pnnl.gov](mailto:dorian.overhus@pnnl.gov))



Call for OES-Environmental country input

# Upcoming OES-Environmental Activities

- Upcoming Conferences
  - PAMEC (Costa Rica, January 2020)
  - Ocean Sciences (US, February 2020)
  - EIMR (Scotland, April 2020) – **abstracts due 1/13**
  - ICOE (US, May 2020)
  - AWTEC (Tasmania, November 2020)
- OES-Environmental Workshops
  - PAMEC – Costa Rica, January 25<sup>th</sup>
  - EIMR – Scotland, April 24<sup>th</sup>
- **Release full draft State of the Science report at ICOE 2020**

# Round Table





## Future Meetings

- May 2020 (in-person at ICOE)
- June 2020 (tentatively, June 9<sup>th</sup>)
- September 2020 (date TBD)

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