



OES-Environmental Meeting of Country Analysts

March 31, 2020
Online Meetings

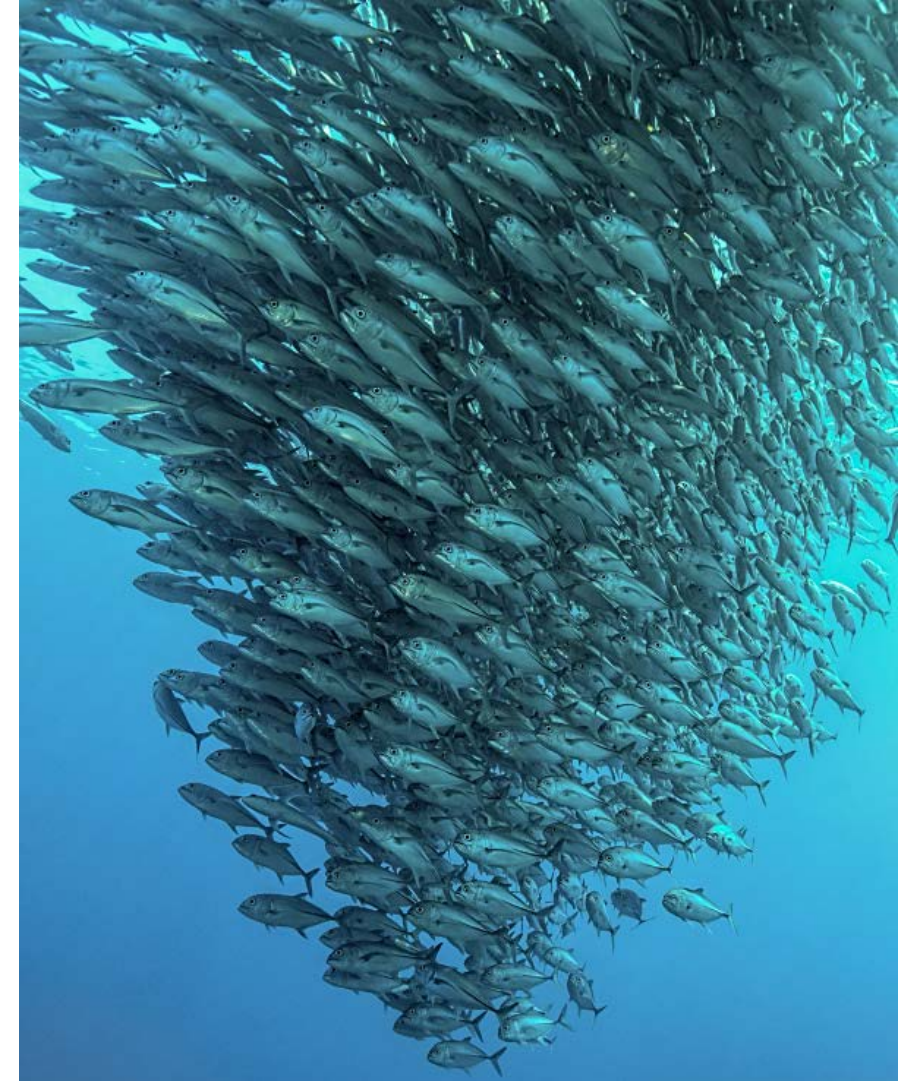


PNNL is operated by Battelle for the U.S. Department of Energy



Today...

- Update from:
 - United Kingdom
- State of the Science 2020 Update
- Monitoring Datasets Discoverability Matrix
- Next steps OES-E
- International Forum on MRE Environmental R&D
- OES-Environmental Activities
- Roundtable



Ocean Energy



working to accelerate
offshore consenting

ORJIP Ocean Energy

OES Environmental Analyst meeting

UK Update

31 March 2020



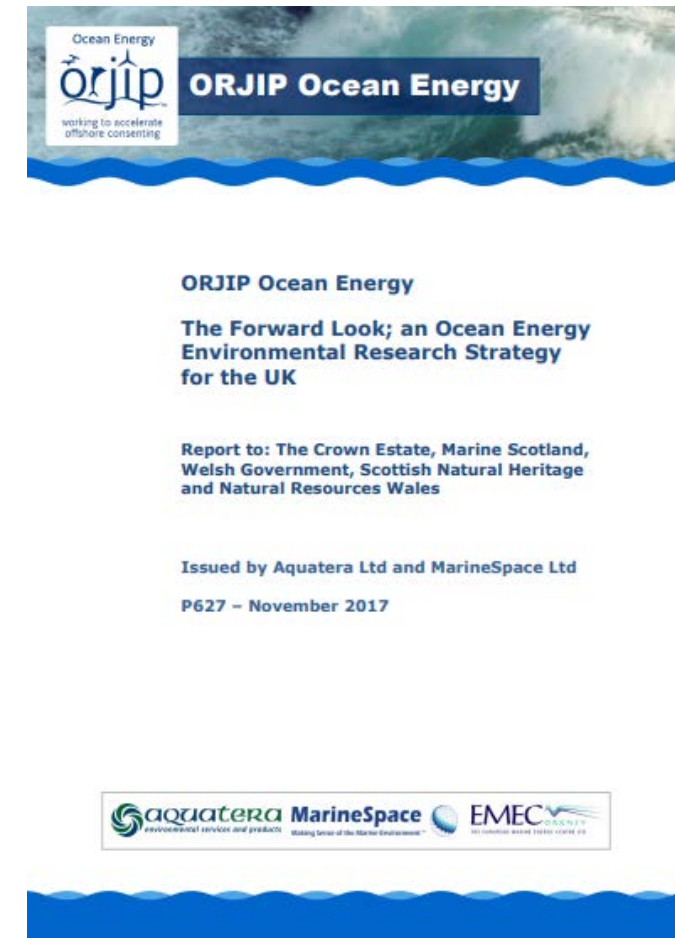


Introduction

- Consolidation of wave and tidal EIA / HRA issues and research priorities (2014)
 - Commissioned by The Crown Estate & completed by Aquatera
- ORJIP Ocean Energy pilot phase 2015- 2016
- Aim: Ensure that the principal EIA and HRA **consenting risks** for early array deployments in the wave and tidal sectors are addressed by facilitating a **strategic, coordinated and prioritised approach to monitoring and research** which is endorsed by industry, regulators and SNCBs.

The Forward Look

- A prioritised list of strategic research projects to address key EIA/HRA issues
- Sets out the purpose, required timing and broad scope of the research projects necessary to meet ORJIP Ocean Energy's overall aim.
- The objectives:
 - to inform the focus of ORJIP Ocean Energy;
 - ensuring that research is focused on priority consenting EIA/HRA issues for the wave and tidal sectors,
 - Ensuring that projects are coordinated to avoid duplication of effort, and key information and data gaps are addressed.





Engagement with other projects/ organisations

Organisation/ Project	Contact Name
Wave Energy in Southern Europe WESE	Ana Brito e Melo (WavEC)
EnFait	Simon Forrest
Marine Energy Wales	David Jones
ORE Supergen	Beth Scott
ORELG	TBD
MASTS	Beth Scott
NERC	Lizzie Hinchcliffe
SpORRaN/ ScotMER	Janelle Braithwaite
SEACAMS	Gemma Veneruso
Annex IV	Andrea Copping
SeaWAVE Project	Catrin Sutherland
Australian Marine Energy Taskforce	Stephanie Thornton
iMarDIS	David Mills
World Ocean Council Sustainable Ocean Summit	Paul Holthus
ORJIP Offshore Wind (The Carbon Trust)	Eloise Burnett
SEACORE	Michael Abundo
PRIMaRE	TBD

MeyGen

- Phase 1A
- 4 x 1.5MW turbines (3 Andritz Hydro Hammerfest AH1000 MK1 and one Atlantis Resources AR 1500)
- Consented Project- 86MW



Source: Simec Atlantis

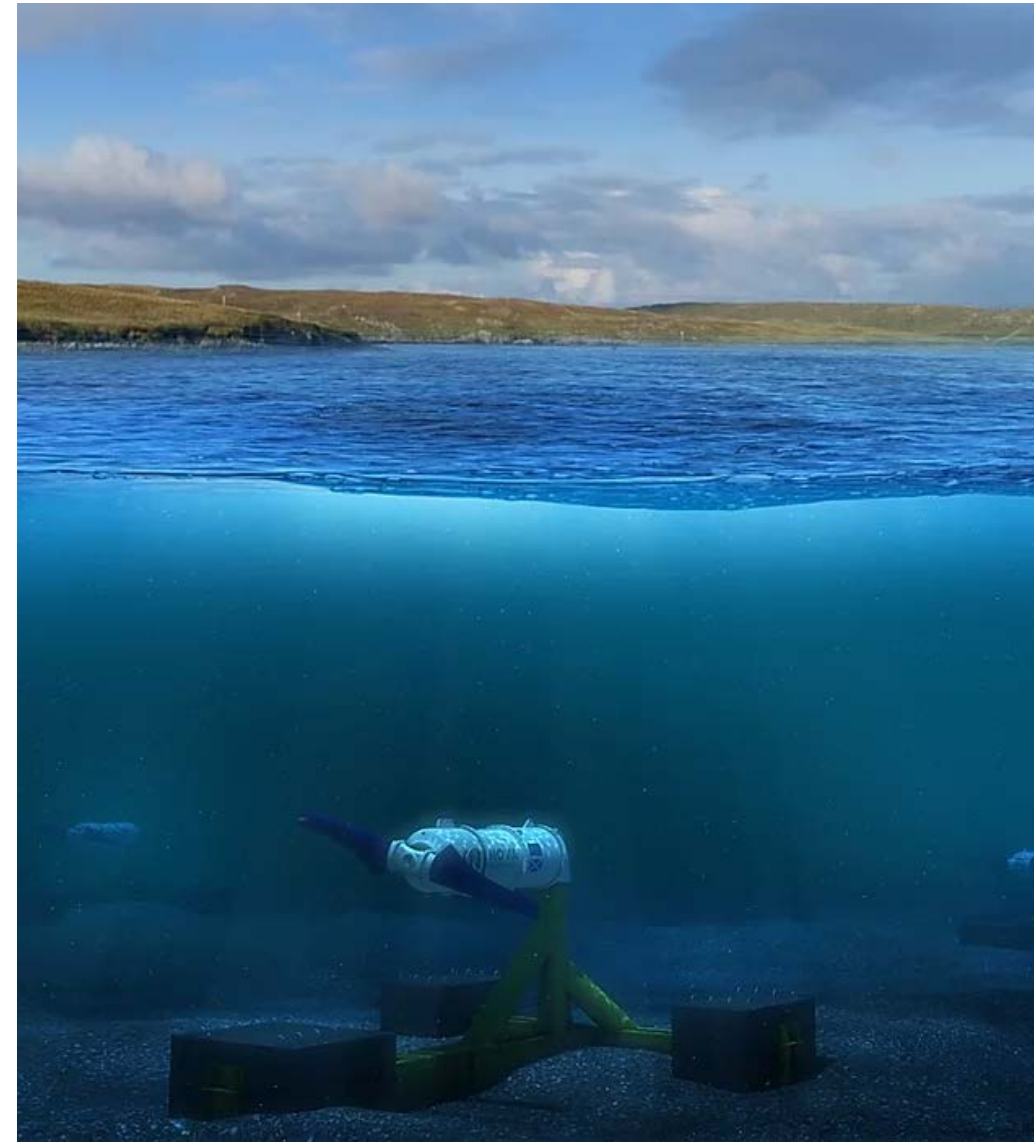


MeyGen

- Environmental monitoring
- Acoustic monitoring
- Seal telemetry study
- Aberdeen University & St Andrews University & Sea Mammal Research Unit
- FLOWBEC and SMRU Hiccup Platform
- Planned- NERC Plug 'n' Play Platform
- Results to be presented at EIMR replacement events

Nova Innovation Ltd

- Shetland Tidal Array, Bluemull Sound
 - 3 X Nova M100 tidal turbines (300 kW)
 - Operational since 2016
 - Consented expansion to 6 turbines (600 kW)
- Environmental monitoring
 - 20,000 hours of subsea video footage
 - 10 years' of vantage point data
 - Complementary 'collision risk' data sets
- Exploring transfer of Shetland knowledge to de-risk consenting at other sites (Wales and Canada)

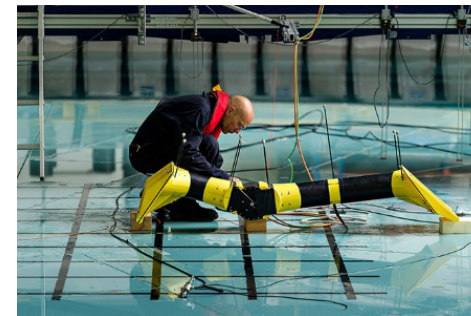


EMEC Test Site

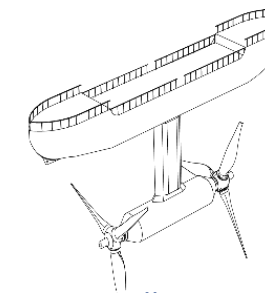
- Orbital Marine Power
 - SR2000
 - 3,250 MWh exported in 12 months
 - Orbital O2 in construction, due at EMEC in 2020
- Magallanes Renovables
 - 2MW device
- Wave deployments planned for 2020:
 - Wello
 - Mocean
 - AWS Ocean Energy



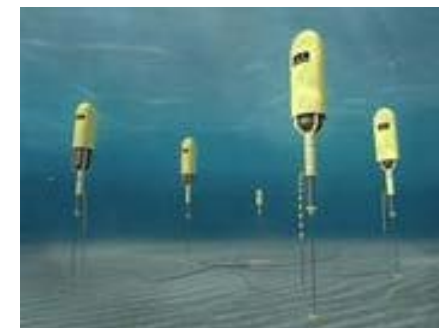
Source: Orbital Marine Power



Source: Mocean

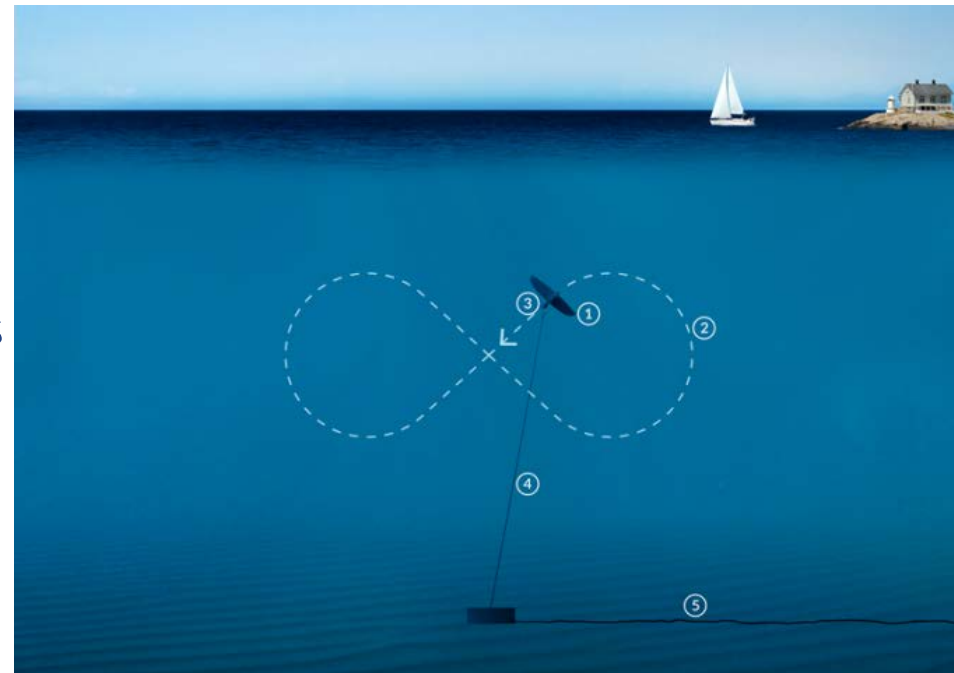


Source: Magallanes Renovables



Source: AWS Ocean Energy

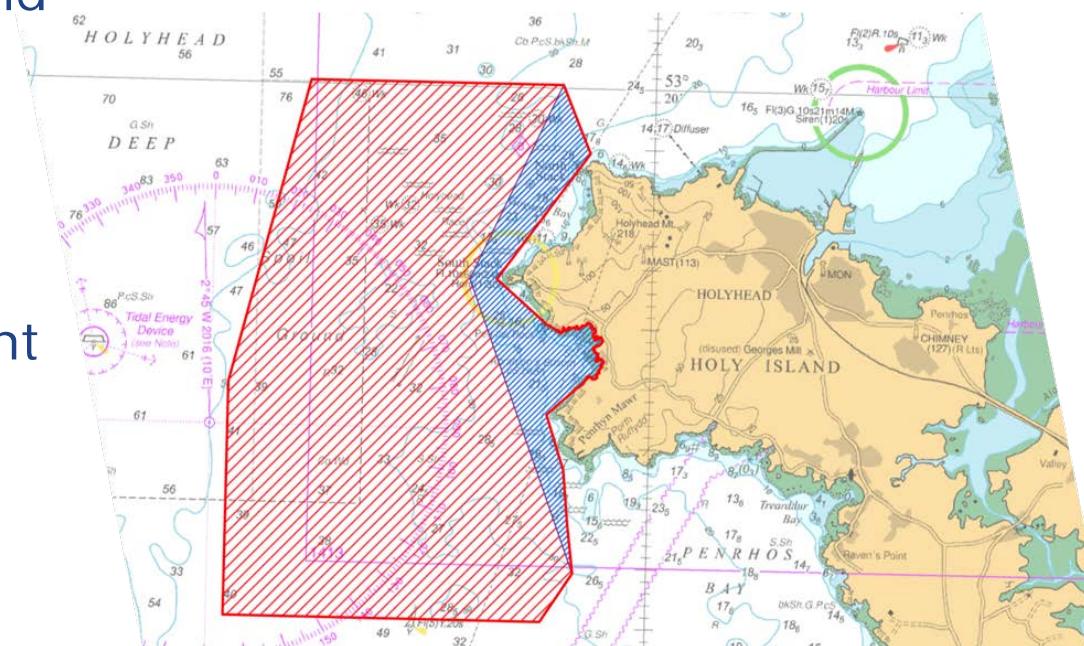
- Holyhead Deep, Wales
 - 0.5MW demonstrator, DG500 commissioned 2018
 - Ambition to expand site to 10MW
 - Long term plan to bring it to 80MW
 - Custom-designed PAM system for mammals
- Strangford Lough
 - Test site
- Faroe Islands
 - PPA with power generator and distributor SEV



Source: Minesto

Morlais

- Located off the coast of Anglesey, north Wales, UK
- Technology neutral pre-consented, grid-connected tidal test site
- Capacity up to 240 MW
- Series of 'berths' available for different technologies
- Consent applications submitted 2019
- Monitoring and adaptive management plan under development
- Planned timeline for onshore construction 2021-2022 and offshore works in 2023



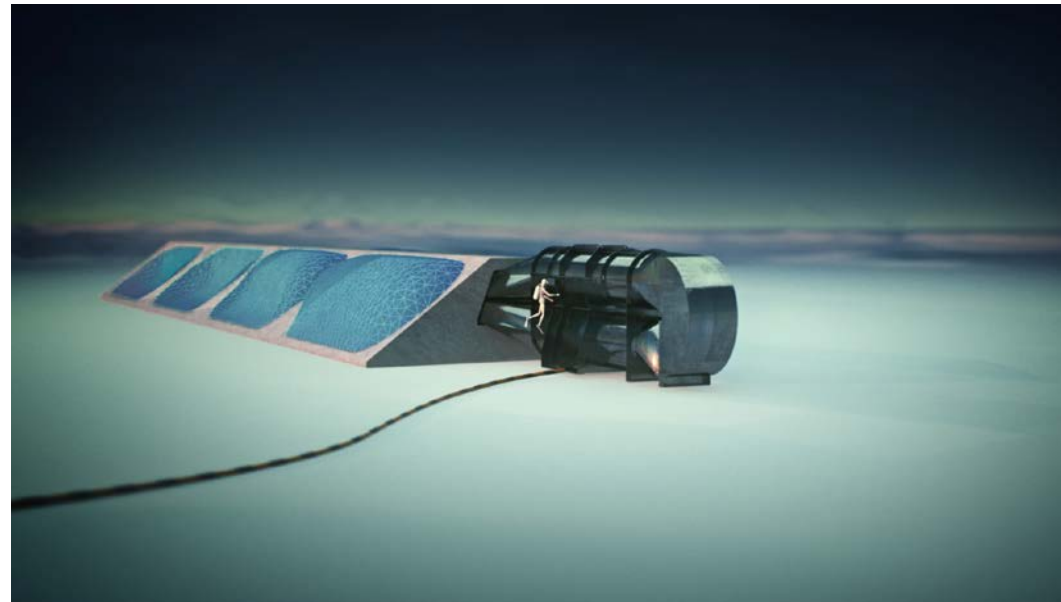
Source: Morlais Energy

Other Wales

- **MEECE**
 - Marine Energy Engineering Centre of Excellence (MEECE)
 - Collaboration between ORE Catapult and Welsh universities
- **META**
 - Wales' National Testing Facility
 - 8 pre-consented sites, non-grid connected
 - Protected and more exposed site offerings
 - Consenting is underway and aims to offer berths in 2020

Bombora

- mWave Pembroke project, south Wales
- 6-12 month test deployment of 1.5 MW seabed-based wave energy device
- Consented 2019, device under fabrication
- Monitoring
 - Underwater noise
 - Scour
- EMMP under development
- Pembroke project to be completed by 2022
- 2 MW Lanzarote mWave project under development



Source: Bombora

Data gathering

- Gap analysis of current knowledge and risks
- Call for evidence issued to stakeholders
- Critical analysis of mitigation and monitoring strategies



Co-funded by the European
Maritime and Fisheries Fund



Baited & unbaited camera survey



Consenting and licensing

- Scotland
 - ‘One Stop Shop’- Marine Scotland
 - Survey, Deploy and Monitor Policy
 - Statutory Nature Conservation Bodies (SNCBs)
- Wales
 - Welsh Government
 - Natural Resources Wales
 - Welsh European Funding Office (WEFO)
 - Marine Energy Wales (MEW)

marinescotland



Contact details



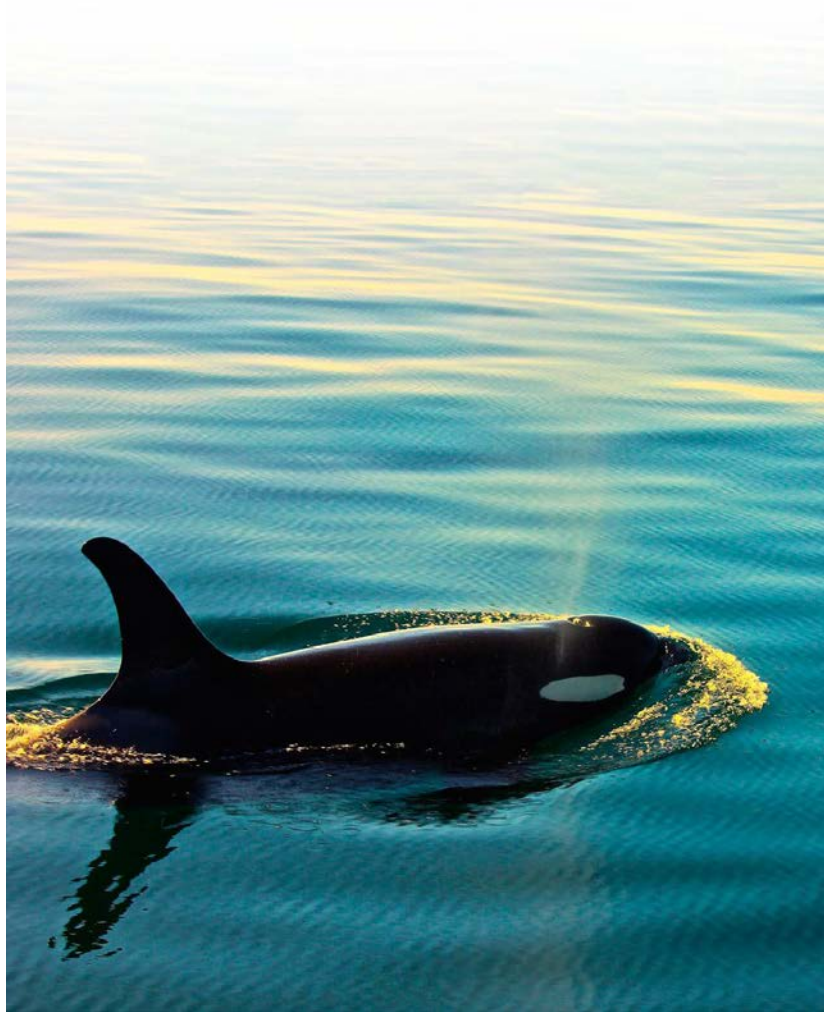
Jennifer.fox@aquatera.co.uk
Ian.hutchison@aquatera.co.uk
Kate.smith@Aquatera.co.uk
Tel: 01856 850 088



Jonny.Lewis@marinespace.co.uk
Rhianna.Roberts@marinespace.co.uk

www.orjip.org.uk

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 public draft in May or June 2020
- 60 day “comment period”, final in late summer 2020

State of Science Report Outline

Section	Chapter	Chapter Title
Executive Summary		
Introduction	1	Introduction
	2	Environmental Monitoring Questions
Section A – Current Knowledge of Key Device Interactions in the Marine Environment	3	Collision Risk for Animals around Turbines
	4	Underwater Sound Generated by MRE Devices
	5	EMF emitted from Electrical Cables and MRE devices
	6	Changes in Benthic and Pelagic Habitats
	7	Changes in Oceanographic Systems
	8	Encounters with Mooring Lines
	9	Social and Economic Data Collection
Section B – Environmental Monitoring	10	Environmental Monitoring Approaches and Technologies
Section C – Strategies for Accelerating Permitting/Consenting	11	Marine Spatial Planning
	12	Adaptive Management
	13	Retiring Risk
Section D – Summary and Path Forward	14	Path Forward

Review of State of the Science report

- Two rounds of review, document sent to:
- OES-E countries and US DOE
- OES ExCo and ~70 peer reviewers
- All comments logged and responses generated

Sneak Peek!

Review period	No. Reviewers	No. Countries	No. Comments
#1	21	7	501
#2	37	9	1407
Both	58	9	1908



Monitoring Datasets Discoverability Matrix

- Held webinars for US regulators and for ORJIP Steering Committee (UK regulators) in early February
- Received positive feedback from both groups
 - Useful tool to help consolidate and find relevant information
 - Reiterated that the regulators had in fact asked for this tool
 - Will increase in effectiveness as more data is available and included
- Suggestions
 - Case studies of data transferability would be helpful, especially to increase acceptability of transfer
 - As data increases, may want to increase the specificity of the Matrix

<https://tethys.pnnl.gov/monitoring-datasets-discoverability-matrix>

Pan American Marine Energy Conference (PAMEC)

- Great addition to EWTEC and AWTEC:
 - 200 participants, 18 countries
 - Workshops on environmental effects (OES-E), test centers, and data/modeling systems
 - Also keynote on environmental effects at main conference
- OES-E Workshop room was at capacity (30+), turned people away
 - Material was mostly state of science, a little risk retirement and data transferability
 - Also presenters from Chile, UK, Columbia, Canada on mapping tools
 - Good discussion groups on MRE environmental effects needs for tropics
 - Clearly as more tropical countries participate: we need to rethink some approaches



Next Steps OES-E

- 2019
 - Submitted Phase 4 proposal in September 2019
 - Presented at OES Executive Committee meeting in October 2019
- 2020:
 - Phase 3 ends in May 2020
 - OES Executive Committee was to vote on proposal after ICOE in May 2020
 - We have asked for guidance on how to proceed
 - I will reach out to OES-E nations, asking them to continue
 - Will recommend current analysts (unless you are not interested)



Call for OES-Environmental country input

Upcoming OES-Environmental Activities

- Peer review of *Tethys* completed: online survey and in depth review
 - Results at our next meeting
- Upcoming conferences
 - EIMR – postponed to April 2021
 - ICOE – postponed to 2021
 - AWTEC (Tasmania, September 2020) – **abstracts due 3/31**
- OES-Environmental Webinars/Workshops
 - April 21st, 22nd, 23rd webinars
 - AWTEC workshop
- Release full draft State of the Science report in May 2020

International Forum on MRE Environmental R&D

- Periodic update on ongoing R&D (modeled on November 2014 in Nova Scotia)
- Sponsored by OES-E and ORJIP
- Kickoff this year with alternative to EIMR Conference

- Intended audience: regulators, developers, researchers

- Week of April 23rd – Tues, Wed, Thurs; 8am – 10am PT (UTC-7)
 - Day 1: MRE project updates and environmental monitoring
 - Day 2: Integrated monitoring platforms and packages
 - Day 3: Wave projects and current research

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)
- 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)



Call for OES-Environmental country input

Round Table





Future Meetings

- June 2020 (tentatively, June 9th)
- September 2020 (date TBD)

PNNL Team

Andrea Copping
Andrea.copping@pnnl.gov
+1 206.528.3049

Mikaela Freeman
Mikaela.freeman@pnnl.gov

Alicia Gorton
Alicia.gorton@pnnl.gov

Lenaig Hemery
Lenaig.hemery@pnnl.gov

Jonathan Whiting, Lysel Garavelli, Hayley Farr,
Dorian Overhus, Deborah Rose, Levy Tugade,
Amy Woodbury