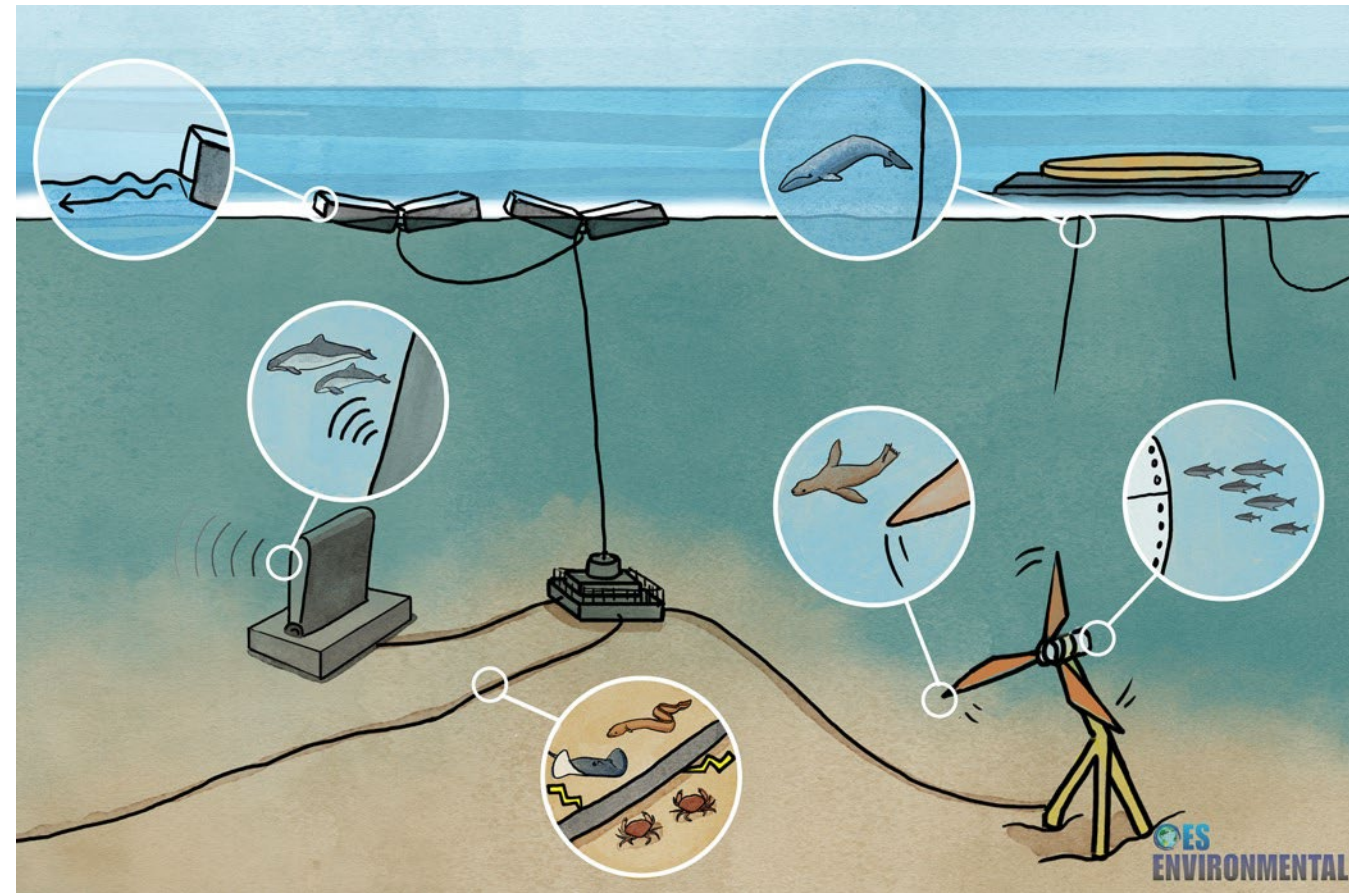


2.4.1.602 International Environmental Data Sharing Initiative (OES Environmental Project)



Andrea Copping, PhD - PNNL
andrea.copping@pnnl.gov

Lysel Garavelli, PhD - PNNL
lysel.garavelli@pnnl.gov

July 21, 2022

Project Overview

Project Summary

This project examines the environmental effects of marine energy development to facilitate siting and permitting. PNNL leads the OES-Environmental initiative (IEA Ocean Energy Systems task) that aims at gathering, synthesizing, and disseminating current research efforts on the environmental effects of marine energy. This information is used to reduce the scientific uncertainty that has slowed the development of marine energy projects. OES-Environmental represents the most comprehensive effort to gather data and bring together the marine energy community on potential environmental effects of marine energy development worldwide.

Intended Outcomes

This project builds on available knowledge on environmental effects from the international marine energy community and engages practitioners from all aspects of the marine energy industry to overcome barriers associated with marine energy development. The outcomes of this project support the advancement of reliable and cost competitive marine energy technologies by providing access to the data and information needed to reduce critical permitting barriers.

Project Information

Principal Investigator(s)

Andrea Copping, PhD (PNNL)

Project Partners/Subs

Partners:

- 15 OES-Environmental nations

Subcontractors:

- Aquatera Limited (United Kingdom)
- Graphic designer (Robyn Ricks)

Project Status

Ongoing

Project Duration

- 10/01/2010
- 09/30/2024

Total Costed (FY19–FY21)

\$3,375,087

Project Objectives: Relevance

Data access, analytics, and workforce development



- * Facilitates the exchange of information and data on the environmental effects of marine energy
- * Used by developers to inform design and operational parameters to reduce potential environmental effects and facilitate permitting

Development of STEM resources to increase understanding of marine energy and associated environmental effects and support the future workforce



Reducing barriers to testing



Collaboration with U.S. stakeholders and OES-Environmental analysts:

- * To curate and disseminate relevant information on environmental effects of marine energy
- * To inform permitting processes



Work with other OES-Environmental nations to identify and fill knowledge gaps on environmental effects of marine energy



Interactions with marine energy developers, advisors, regulators, and researchers to inform and facilitate permitting and licensing processes through data synthesis, workshops, webinars, and outreach

Project Objectives: Approach

Understand and resolve the environmental risks of marine energy development and operation to the marine environment to accelerate the deployment of devices in a responsible manner



Continuous international collaboration with OES-Environmental analysts to support international effort and leverage international knowledge expertise



Data collection and curation



Dissemination of knowledge and information

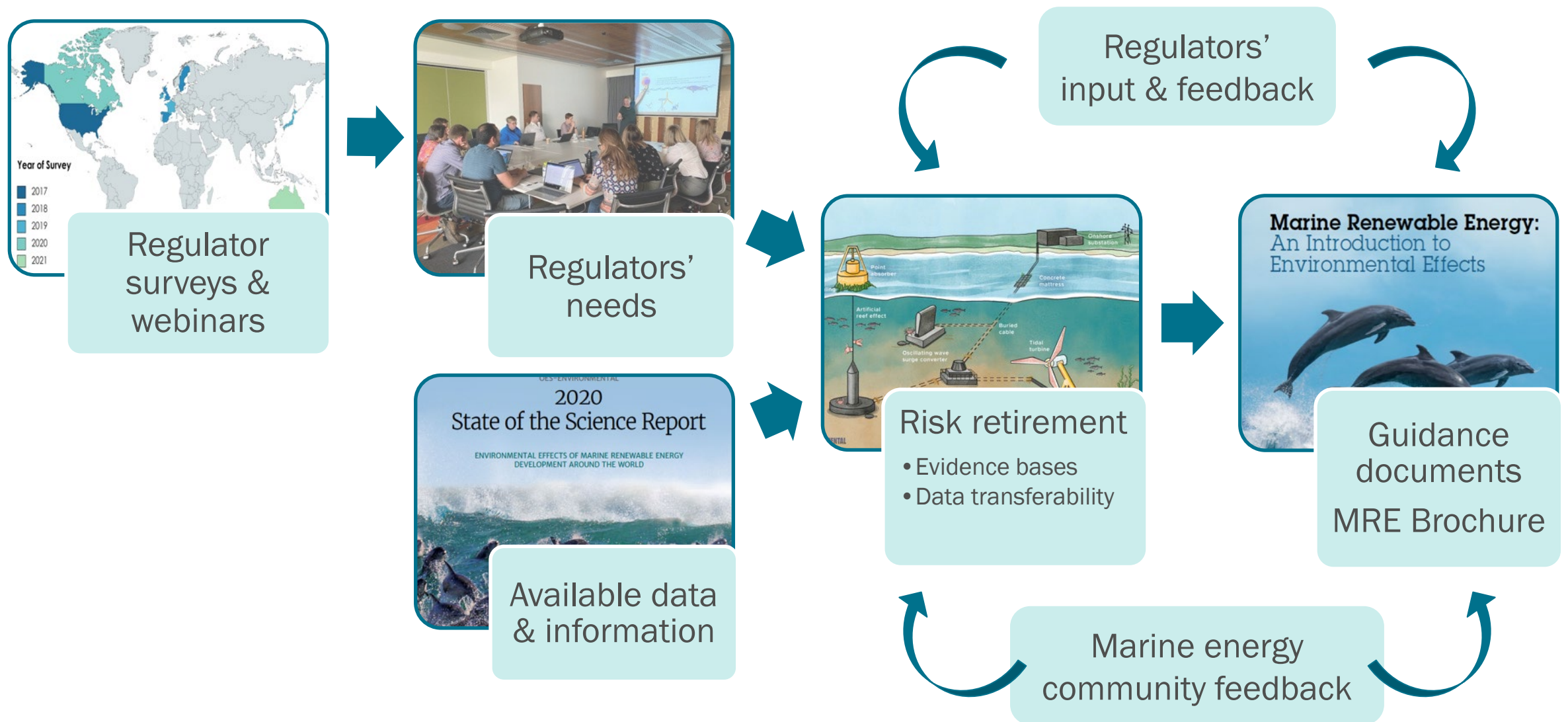


International engagement with stakeholders, developers, advisors, and regulators



Advancing the development of marine energy in the US by learning from international studies and projects

Project Objectives: Approach



Project Objectives: Risk Retirement

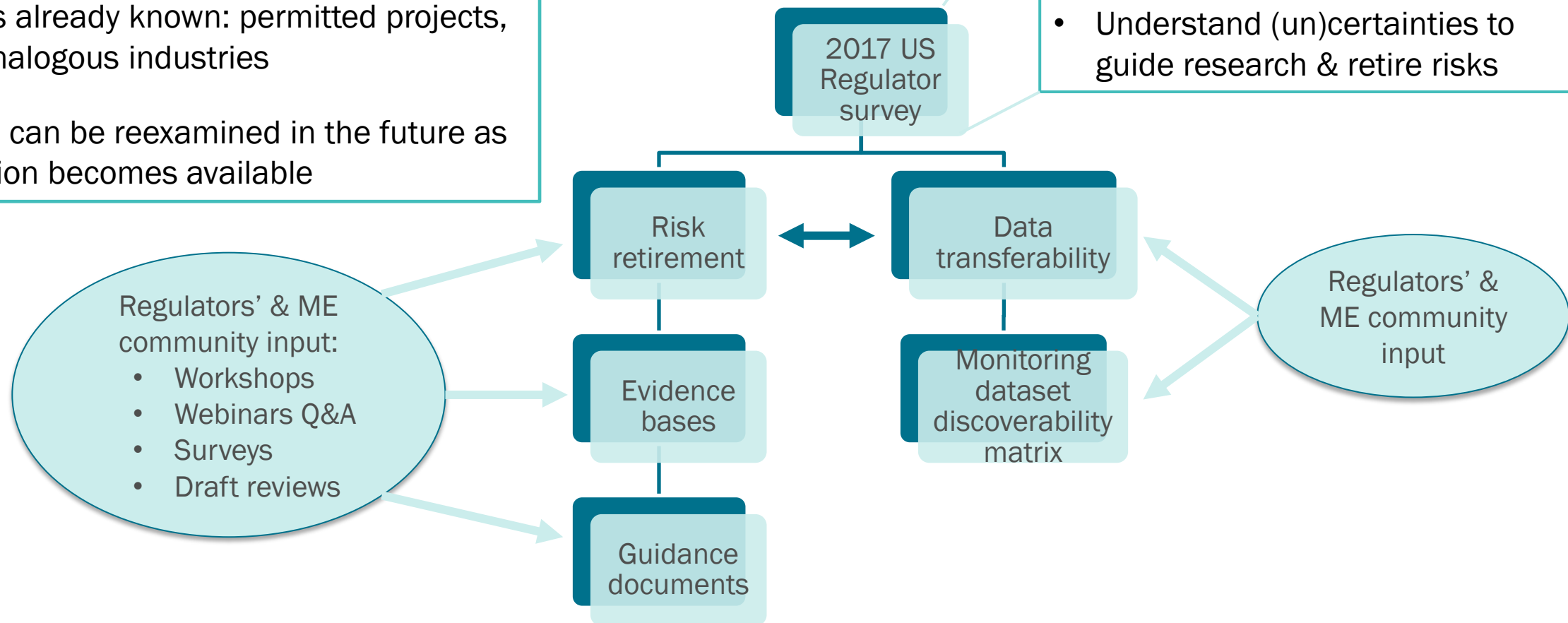
For certain interactions, potential risks need not be fully investigated for every project (1-4 devices)

Rely on what is already known: permitted projects, research, or analogous industries

A “retired risk” can be reexamined in the future as more information becomes available

Provide mechanisms to:

- Transfer existing ME data and knowledge to new projects
- Understand (un)certainties to guide research & retire risks



Risk retirement does not replace or contradict any regulatory processes

<https://tethys.pnnl.gov/risk-retirement>

Project Objectives: Expected Outputs and Intended Outcomes

Expected Outputs



2020 State of the Science (SoS) Report

+ Derivatives

Public webinars, workshops, publications, social media, podcasts



Risk retirement pathway

+ Guidance documents

Outreach & communication



Intended Outcomes

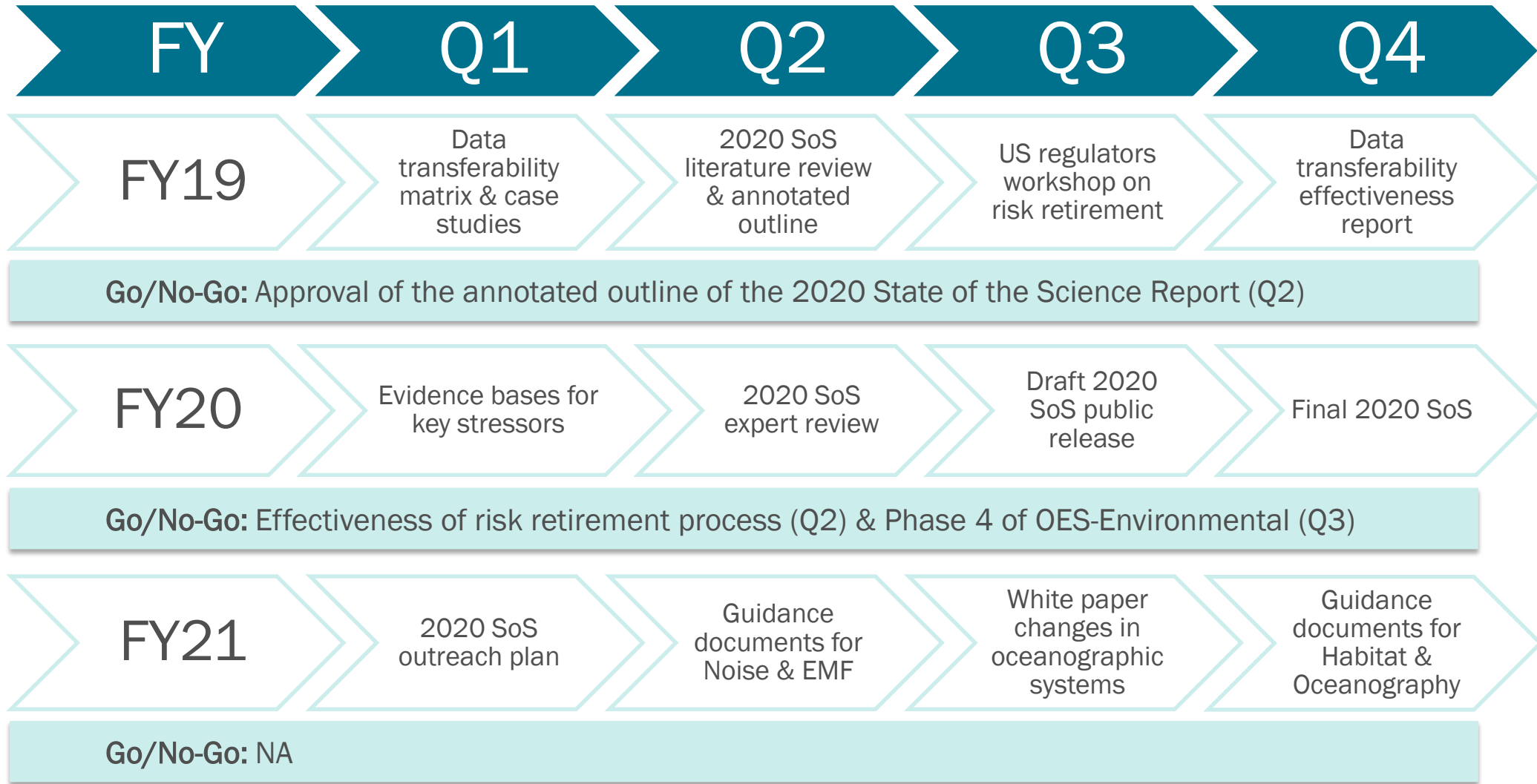
Easy access to all available information on environmental effects of marine energy via *Tethys*

Increased awareness about environmental effects of marine energy

Accelerate permitting processes of marine energy projects

Valuable source of information and available materials from other countries

Project Timeline



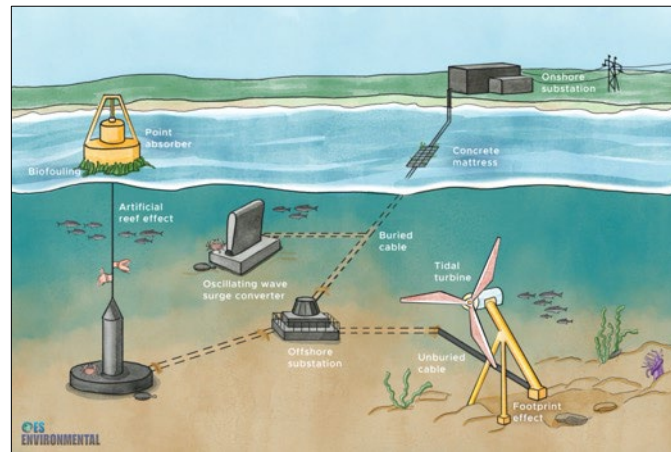
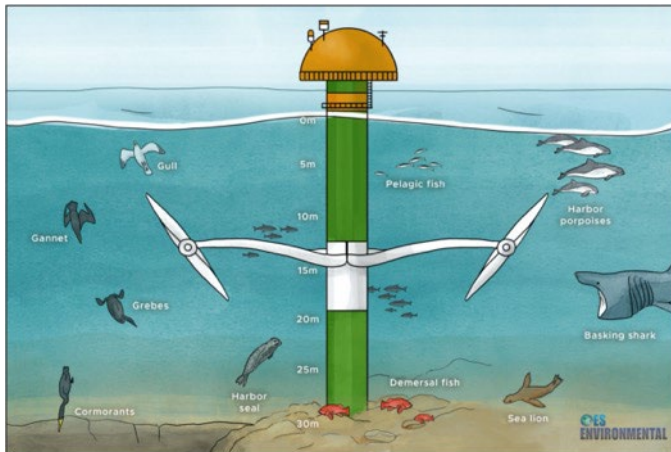
Constant activities: analyst coordination, technical workshops, public webinars, conference presentations

Project Budget

Total Project Budget – Award Information		
DOE	Cost-share	Total
\$3,375,087	*90K€ (\$95K)	\$3,470,087

FY19	FY20	FY21	Total Actual Costs FY19–FY21
Costed	Costed	Costed	Total Costed
\$997,907	\$1,351,660	\$1,025,520	\$3,375,087

* From Ocean Energy Systems. In addition, 15 other collaborating nations provide in-kind support for country analysts



There have been no project modifications, costs overruns, or missed milestones FY19-FY21

End-User Engagement and Dissemination



OES- Environmental Analysts

- Quarterly meetings
- Technical contributions (*Tethys*, 2020 State of the Science, OES white papers, peer-reviewed publications)

Regulators

- Surveys
- Outreach programs and continued engagement
- Webinars and online workshops
- *Tethys* Blasts
- Targeted material (MRE brochure, guidance documents)

Researchers

- Provide up to date science through *Tethys*
- Workshops and webinars to advance knowledge and share outcomes
- Project metadata
- *Tethys* Blasts

Developers & Consultants

- U.S. Marine Energy Council (MEC)
- Information on *Tethys*
- Engage at workshops for developer perspective
- Project metadata

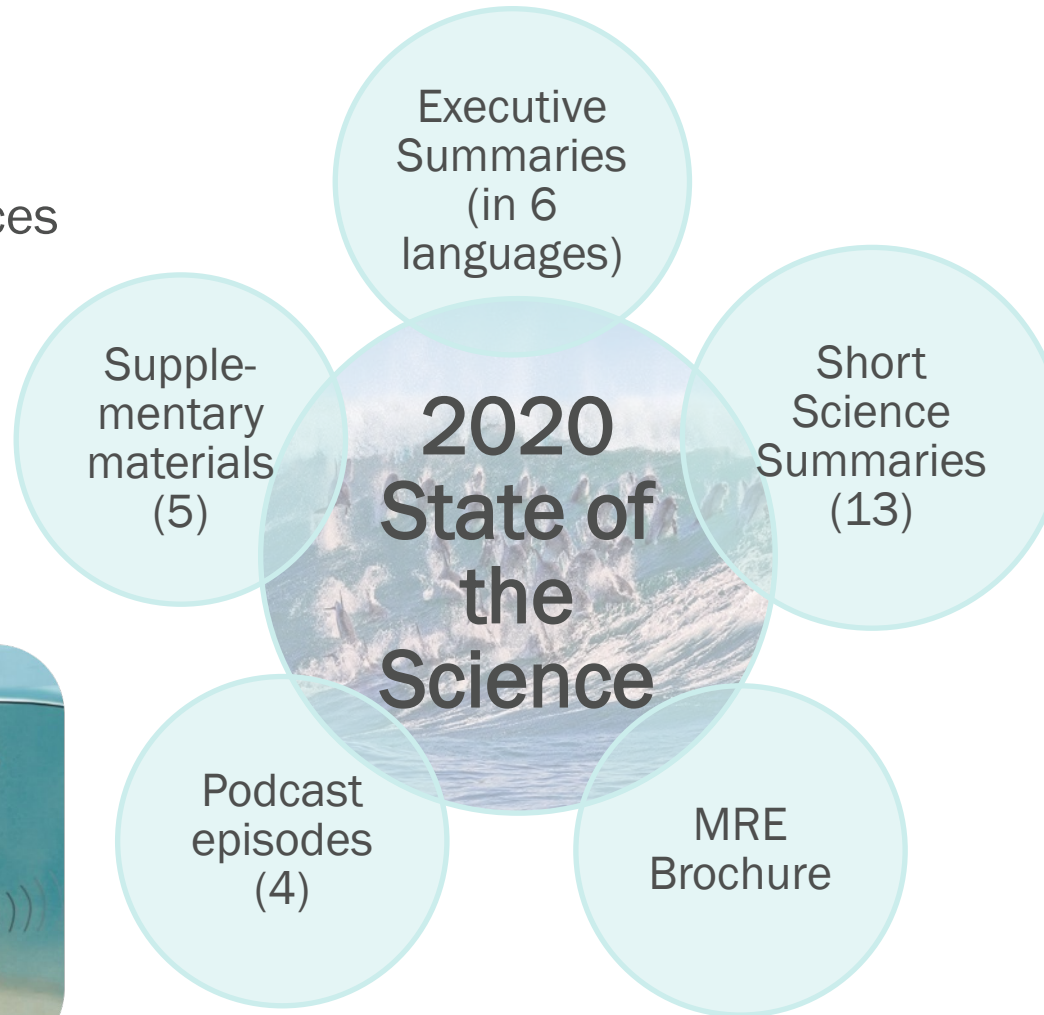
Public

- Create materials for broader audiences
- Engage STEM students and teachers (Educational Resources page, coloring pages)
- Produce content for general public (podcasts)

Performance: Accomplishments and Progress

Risk Retirement

- 4 stressors retired for small numbers of devices
- 4 guidance documents
- 4 evidence bases
- Discoverability matrix
- Data transferability



Outreach & Engagement

- 13 webinars
- 10 conference presentations
- 9 workshops
- 6 journal publications
- 4 conference papers
- 3 conference tracks

Performance: Accomplishments and Progress (cont.)



As of FY22, *Tethys* is now under PRIMRE



Overall increases year over year

Large increases in FY20 & FY21 associated with SoS

Tethys Accomplishments

FY19

49.8% ↑
in *Tethys* Visits from FY18

240 New *Tethys* Blast
Subscribers

281 New MRE Documents

247 New Social Media
Followers

FY20

16.9% ↑
in *Tethys* Visits from FY19

340 New *Tethys* Blast
Subscribers

737 New MRE Documents

329 New Social Media
Followers

FY21

44.3% ↑
in *Tethys* Visits from FY20

~300 New *Tethys* Blast
Subscribers

537 New MRE Documents

270 New Social Media
Followers

Ongoing activities FY22

Knowledge Collection and Curation



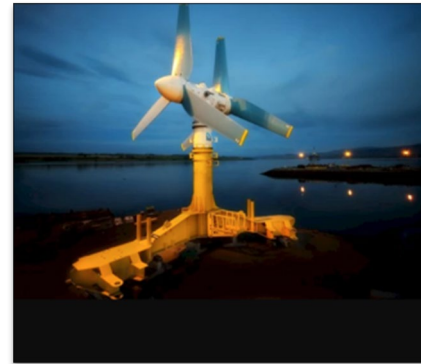
- OES-Environmental metadata forms
- Management measures tool
- Tropical/subtropical

Risk Retirement



- Evidence bases for entanglement and collision risk
- Guidance documents for entanglement and collision risk
- Country specific guidance documents

New Research Topics



- Scaling up to arrays
- Ecosystem effects
- Cumulative effects
- Displacement

Outreach & Engagement



- Existing audiences
- STEM (coloring pages)
- Public audiences (YouTube videos, podcasts)
- Webinars, workshops

Future Work

FY23



- Risk retirement
- Initiate 2024 SoS
 - Literature review
 - Report outline
 - Draft chapters
- Continue new topics
- Strong focus on collision risk
- General outreach

FY24



- Proposal Phase 5 OES-Environmental
- Complete 2024 SoS
 - Expert reviews
 - Chapter revisions
 - Draft release
 - Final release
- Outreach 2024 SoS

Q&A