

CONSENT FORM FOR RESEARCH PARTICIPATION

Pacific Northwest National Laboratory

Project Title: Environmental Data Sharing Initiative (Annex IV Project & Tethys Database)

Investigators: *Andrea Copping, PhD*

Protocol and Consent Title: Environmental Data Sharing Initiative (Annex IV Project & Tethys Database)

You are being asked to be a volunteer in a research study.

Purpose: The goal for conducting a survey includes gaining a clear understanding of key uncertainties and needs of regulators so that future Annex IV outreach and engagement efforts can be specifically tailored to reducing uncertainty and lowering barriers for environmental permitting of MRE devices.

Procedures: If you decide to be in this study, your part will involve participating in a short (<20 questions) online survey.

Risks or Discomforts: There are no anticipated risks to you from participating in this study.

Benefits: You are not likely to benefit in any way from joining this study. We hope that what we learn will help to enhance our understanding of key uncertainties and needs of regulators so that future Annex IV outreach and engagement efforts can be specifically tailored to reducing uncertainty and lowering barriers for environmental permitting of MRE devices.

Compensation to You: You will not be paid or reimbursed for your participation in this research study.

Confidentiality: Your participation in this research is confidential. We will take every precaution to ensure the security of your data. To minimize the risks to confidentiality, responses to surveys are not associated with names or contact information and will not be linked to an individual participant.

Participant Rights: Your participation in this study is voluntary. You do not have to be in this study if you don't want to be. You have the right to change your mind and leave the study at any time without giving any reason and without penalty.

Who to Call if You Have Questions

If you have any questions or concerns about the study, you may contact Andrea Copping, PhD at (206) 528-3049.

If you have any questions about your rights as a research participant, you may contact Susan Varnum at 509-371-7299 (susan.varnum@pnnl.gov) in Human Research Protection Program/Institutional Review Board.

1. Have you read the information above and do you consent to participate in this research study?

Yes

No

We invite you to participate in our survey on regulatory needs for environmental effects of marine renewable energy (MRE) development. This survey is designed for and tailored to regulators involved in permitting marine renewable energy developments, largely wave and tidal development.

The purpose of this survey is to understand how federal and state regulators view the risks and conflicts associated with potential environmental effects of MRE. We are interested in how you believe we can reduce risks and ensure that devices do not cause harm to marine animals or habitats. Please do your best to answer every question. We look forward to your responses as they will help inform the ongoing efforts of the international Annex IV initiative.

This survey should take approximately 30 minutes or less to complete.



2017 Survey on Regulatory Needs for Environmental Effects of Permitting Marine Renewable Energy

2. What level of government does your agency represent

- Federal
- State
- County
- Local

Other (please specify)

3. Please indicate your agency's focus in permitting MRE developments. Check all that apply.

- Water quality
- Marine mammals
- Fish
- Other animals
- Seabed and habitat
- Energy production

Other (please specify)

4. Please indicate your own role in permitting for MRE developments. Check all that apply.

- Write permits
- Advise regulators
- Review applications
- Advise policy level decisions in your agency
- Subject matter expert
- Other (please specify)

5. How familiar are you with the following **tidal energy** technologies and devices on a scale of 1 (not familiar) to 5 (very familiar)?

	1 (not familiar)	2	3 (somewhat familiar)	4	5 (very familiar)
Horizontal axis turbines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vertical axis turbines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross flow turbines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

6. How familiar are you with the following **wave energy converter** technologies and devices on a scale of 1 (not familiar) to 5 (very familiar)?

	1 (not familiar)	2	3 (somewhat familiar)	4	5 (very familiar)
Point absorber	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nearshore surge converter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Offshore surge device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oscillating water column	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

7. How familiar are you with the following **offshore wind energy** technologies and devices on a scale of 1 (not familiar) to 5 (very familiar)?

	1 (not familiar)	2	3 (somewhat familiar)	4	5 (very familiar)
Bottom mounted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Floating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

8. Have you directly participated in the environmental permitting of an MRE device?

- Yes
 No

For the following four questions, the first two questions (Questions 9-10) will address **single** MRE devices, while the next two questions (Questions 11-12) will address multiple MRE devices (**arrays**).

9. Please rank the following challenges for permitting developments of *single* MRE devices on a scale of 1 (most important) to 7 (least important).



Chemical releases and water quality degradation



Electromagnetic field (EMF) effect on animals



Benthic/habitat disturbance



Risk of animals colliding with underwater devices



Effects of underwater sound emissions from devices on animals



Avoidance, attraction, and/or displacement of animals



Energy removal and effects of changes in flow on the ecosystem



Entanglement of animals with lines and cables

10. Based on your top ranked response from Question 9, how strongly do you agree or disagree with the following statements for *single devices*?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Sufficient field data are needed to determine risks and reduce uncertainty of MRE development.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Numerical models play an important role in environmental permitting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agency/policy guidance are needed to interpret risk and uncertainty.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff need to be knowledgeable and trained on technologies, interactions, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

11. Please rank the following challenges for permitting developments of MRE **arrays** from 1 (most important) to 7 (least important).



Chemical releases and water quality degradation



Electromagnetic field (EMF) effect on animals



Benthic/habitat disturbance



Risk of animals colliding with underwater devices



Effects of underwater sound emissions from devices on animals



Avoidance, attraction, and/or displacement of animals



Energy removal and effects of changes in flow on the ecosystem



Entanglement of animals with lines and cables

12. Based on your top ranked response from Question 11, how strongly do you agree or disagree with the following statements for **arrays**?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Sufficient field data are needed to determine risks and reduce uncertainty of MRE development.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Numerical models play an important role in environmental permitting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agency/policy guidance are needed to interpret risk and uncertainty.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff need to be knowledgeable and trained on technologies, interactions, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

13. Can data collected from other locations be applied towards environmental permitting within your jurisdiction? Please answer based on your top priority for Questions 9 and 11.

- Never
- Maybe
- Absolutely

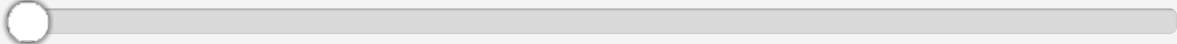
Please explain your answer.

14. Which of the following approaches best describes your vision of how the MRE industry should develop? (Choose one)

- Precautionary principle.** There is a high degree of uncertainty and potentially negative outcomes associated with MRE deployment and operation. Measures should be taken to avoid the negative outcome by proceeding very cautiously or not pursuing projects at all.
- Mitigation hierarchy.** Impacts or risks should be systematically limited by taking actions to avoid, minimize, mitigate and/or compensate for risks through siting and/or mitigation measures.
- Phased approach.** Single devices should be deployed first, followed by slowly ramping up to array scale after potential risks are better understood and managed.
- Adaptive management.** A learning-based management approach should be applied that includes adapting monitoring and mitigation over time to understand risks, decrease uncertainty, and mitigate for impacts.
- Survey, deploy, monitor.** The area of a proposed project should be surveyed before deployment, coupled with monitoring around the device before deployment can proceed.
- Just do it.** Risks to the marine environment are almost certainly low, so development should be able to move forward.

15. How strongly do you feel additional monitoring data are needed (to decrease scientific uncertainty)? Please respond based on your answers for Question 9 (single devices) and indicate by moving the cursor.

Need new datasets (high level of uncertainty)	There are sufficient data (very low uncertainty)
--------------------------------------------------	-----------------------------------------------------



16. How long have you been aware of *Tethys*, if at all?

- Haven't heard of it
- 0-6 months
- 7-12 months
- More than 12 months

2017 Survey on Regulatory Needs for Environmental Effects of Permitting Marine Renewable Energy

17. How do you use *Tethys*? Indicate all that apply.

- To find papers and reports on MRE environmental issues
- To learn more about environmental effects of the MRE industry.
- To participate in webinars and expert forums
- To review archived webinars and expert forums
- To receive the *Tethys* Blast newsletter
- To search the *Tethys* event calendar

18. How useful is *Tethys* for providing information on the environmental effects of MRE developments?

- Not useful
- Somewhat useful
- Moderately useful
- Very useful
- Extremely useful

19. Did you attend, or have you viewed online, the Environmental Effects of Permitting MRE Deployments webinar held on March 29, 2017?

Yes

No

2017 Survey on Regulatory Needs for Environmental Effects of Permitting Marine Renewable Energy

Thank you for taking the survey. We appreciate your contributions.

For additional information on environmental information and MRE consider visiting <https://Tethys.pnnl.gov>

If you would like to view the Environmental Effects of Permitting MRE Deployments webinar, you can find it here: <https://tethys.pnnl.gov/events/environmental-effects-permitting-mre-development-webinar>

If you would like to sign up for the Tethys mailing list and receive recent news and updates and emails about upcoming webinars, please visit <https://tethys.pnnl.gov/tethys-blasts/join>

To read more about the Annex IV initiative, please visit <https://tethys.pnnl.gov/about-annex-iv>