

Environmental Effects of MRE Development: Regulator Survey Results and Next Steps

Presented by: Andrea Copping

November 2nd 2017

- ▶ Environmental effects of Marine Renewable Energy (MRE)
- ▶ 2017 Survey on Regulatory Needs for Environmental Effects of Permitting MRE
 - Background
 - Results
- ▶ Data transferability and collection consistency for permitting MRE
- ▶ Input from all of you



Environmental Effects of MRE

- ▶ Drivers of marine energy development are clear:
 - Need for reliable low carbon energy sources, mitigate CC
 - Renewable energy standards in many nations, regions
 - Secure energy generated locally

BUT

- ▶ Stakeholders have concerns about potential impacts
- ▶ Regulatory/consenting processes are still developing
- ▶ New, largely unknown technologies with unknown potential for harm
- ▶ New use of ocean space, many other users
- ▶ Insufficient knowledge of ocean environment in high energy areas
- ▶ Concerns about marine species already under stress

IMPROVED INFORMATION CAN:

- ▶ Simplify, shorten the time to permit deployment of devices and arrays, but site-specific knowledge will still be needed.





Annex IV is a collaborative initiative of the Ocean Energy Systems (OES), under the International Energy Agency (IEA) Technology Network. It is led by the US, with 11 partner nations.



ENVIRONMENTAL EFFECTS OF MARINE ENERGY DEVELOPMENT AROUND THE WORLD



Environmental Effects of MRE



- ▶ Scientific uncertainty drives much of the risk perceived now
 - more data collection and research can help to reduce uncertainty
- ▶ Most important and potentially highest risk interactions include:
 - Collision of animals with tidal turbines,
 - Underwater noise from MRE devices on animals,
 - EMF from cables and devices
- ▶ Generally little impact expected from single devices, larger arrays will require more investigation
- ▶ More detail on webinar from March (see [Tethys](#))

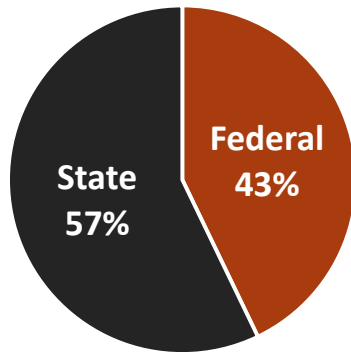
2017 Survey on Regulatory Needs for Environmental Effects of Permitting MRE

- ▶ **Goal: understand information needs and key uncertainties associated with permitting MRE developments**
- ▶ Emailed 200 state and federal regulators following first [Environmental Effects of Permitting MRE Regulator Webinar](#)
- ▶ 35 complete responses – THANK YOU!



Participant backgrounds

Breakdown of Participants by Agency



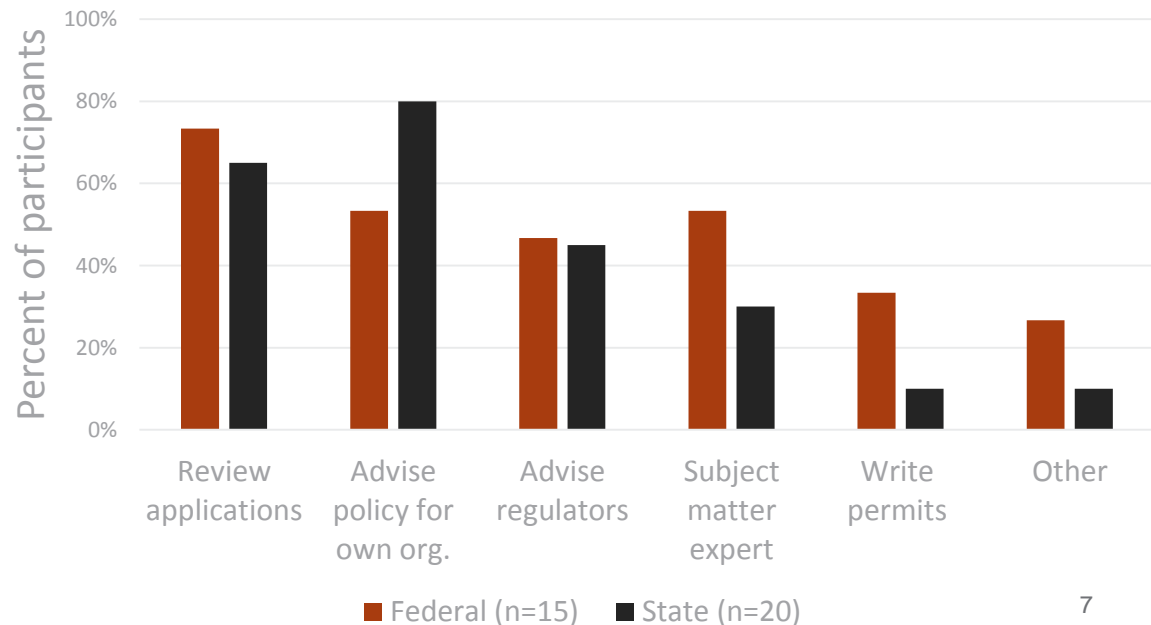
- ▶ Majority of participants have directly participated in the environmental permitting of an MRE device

■ 60% federal, 65% state

- ▶ Main agency focus:

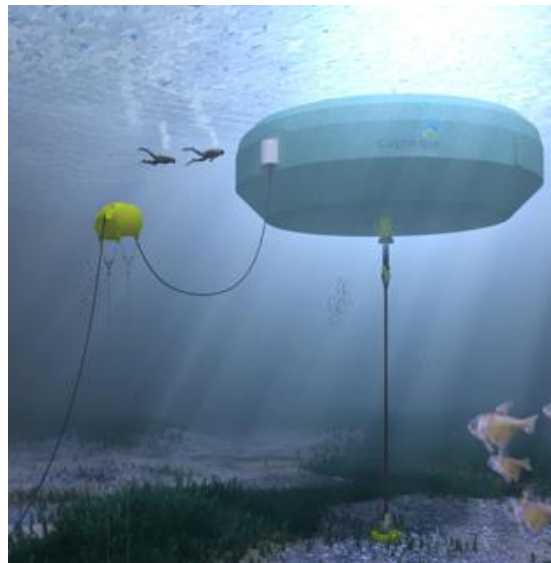
- Marine mammals
- Fish
- Seabed & habitat
- Other animals

Participant's Top Focus



Familiarity with MRE technologies

- ▶ Respondents were not very familiar with different wave and tidal technologies
- ▶ Offshore wind technologies were the most familiar to participants
- ▶ Overall, federal participants were more familiar with wave and tidal technologies than state participants



Challenges for Permitting MRE Devices

- ▶ Rank top challenges for permitting a single device and an array
 - 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

- ▶ Top challenges vary by federal or state agency, and by number of devices (single or array)

- ▶ Single device
 - Federal: “Effects of underwater sound emissions from devices on animals”
 - State: “Benthic/habitat destruction”

- ▶ Array
 - Both: “Avoidance, attraction, and/or displacement of animals”

Perceptions of Data Needs, Models, etc.

- ▶ How strongly do you agree or disagree with below statements (concerning their top challenge from the previous question)
 - Sufficient field data are needed to determine risks and reduce uncertainty of MRE development.
 - Staff need to be knowledgeable and trained on technologies, interactions, etc.
 - Numerical models play an important role in environmental permitting.
 - Agency/policy guidance are needed to interpret risk and uncertainty.

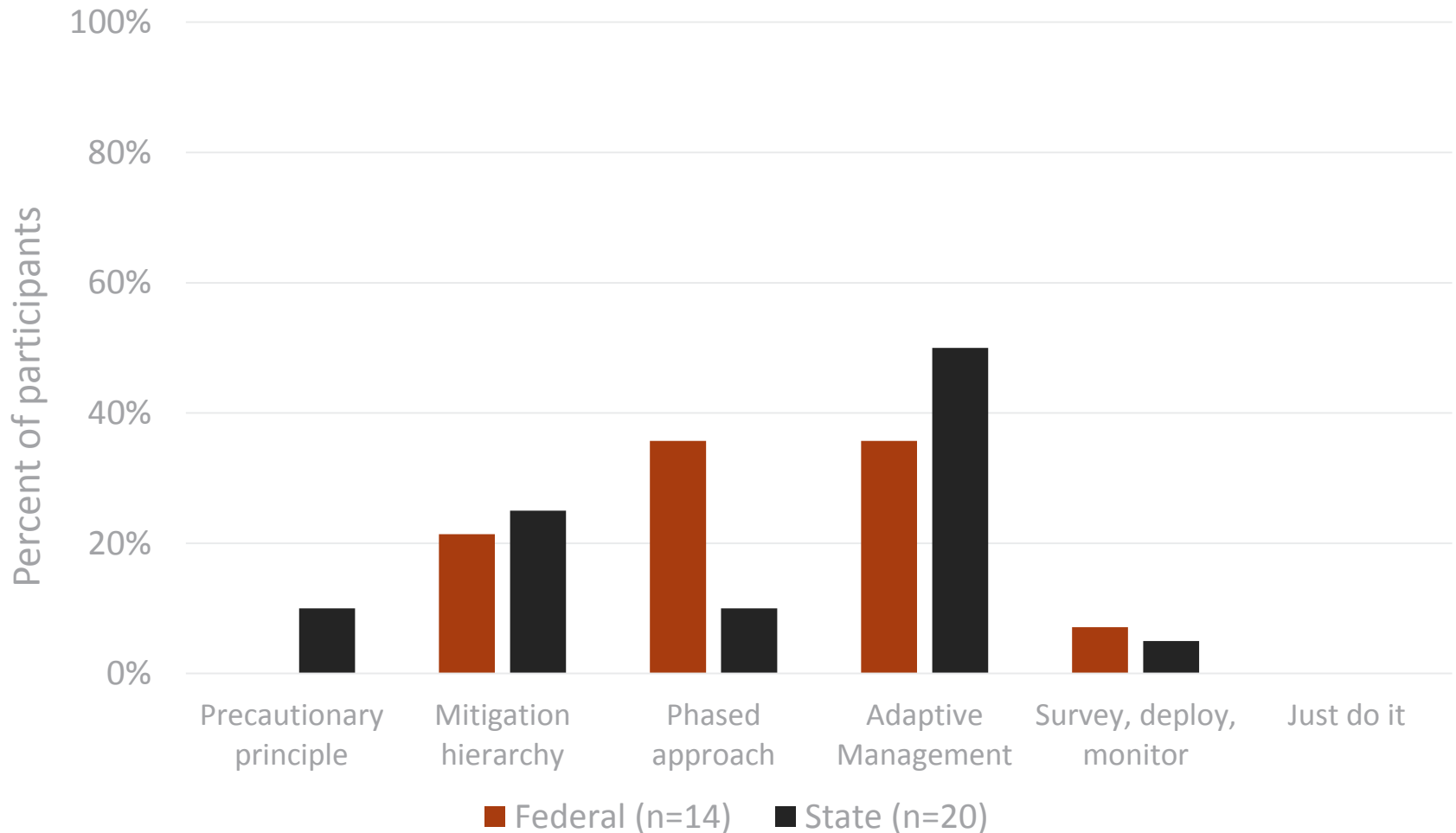
- ▶ No notable differences between fed/state or number of devices

- ▶ High level of agreement on all statements

- ▶ Two statements most agreed with:
 - Sufficient field data are needed to determine risks and reduce uncertainty of MRE development.
 - Staff need to be knowledgeable and trained on technologies, interactions, etc.

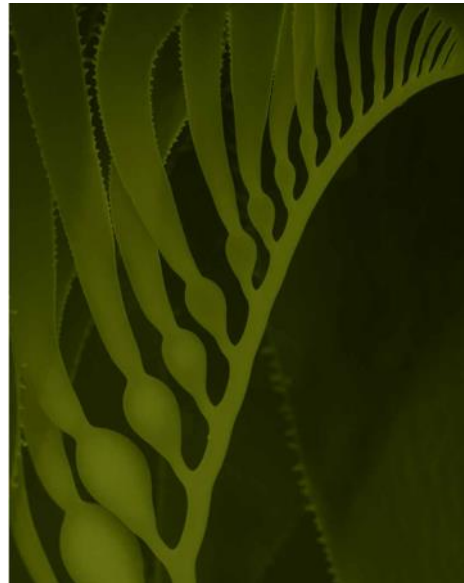
Best Approach to MRE Development

- ▶ Which approach best describes your vision of how the MRE industry should develop?



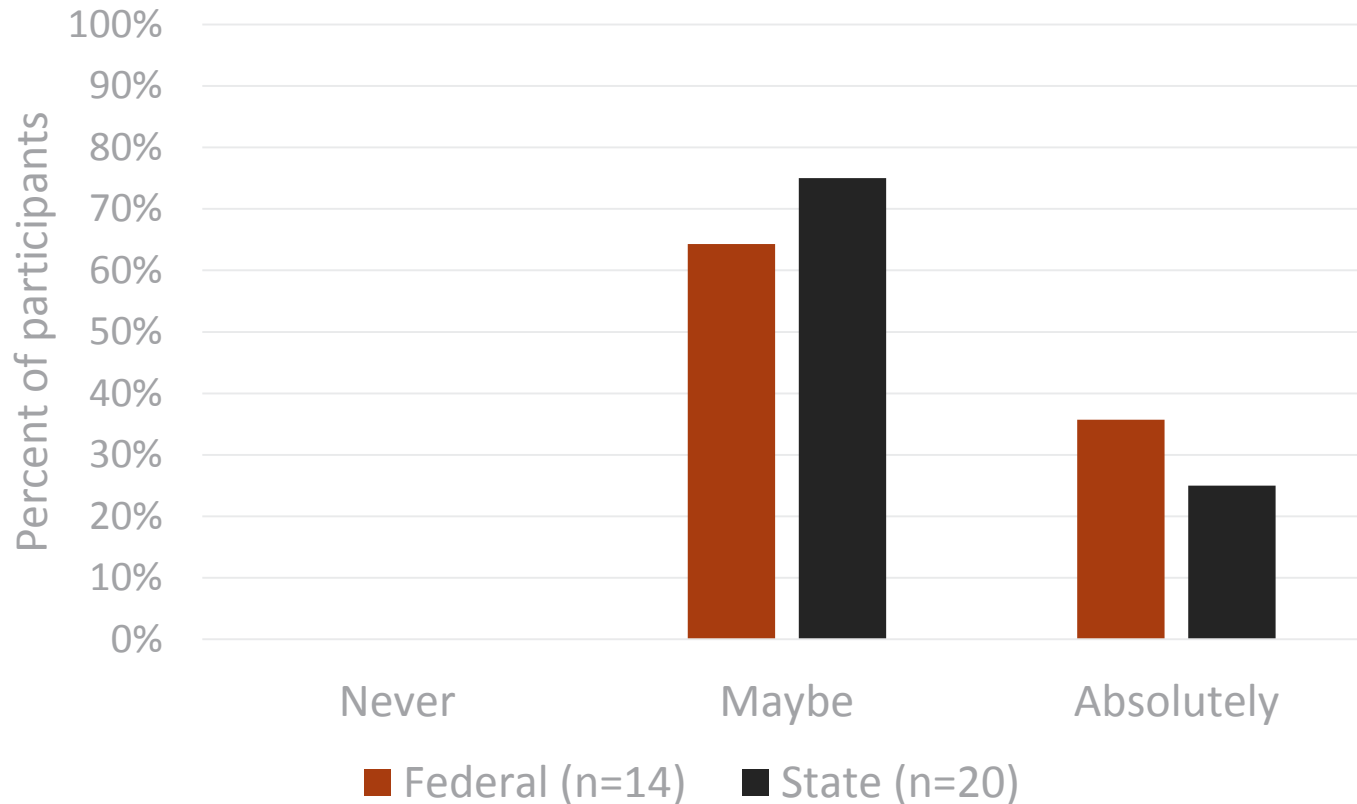
Additional Monitoring Data Needed

- ▶ Are additional monitoring data needed (to decrease scientific uncertainty)?
- ▶ State regulators felt more strongly (than federal regulators) that additional monitoring was necessary
- ▶ Large variability among these answers, so this finding should be interpreted with caution



Application of Data from Other Locations

- ▶ Can data collected from other locations be applied towards environmental permitting within your jurisdiction?



Conclusions of Survey

- ▶ Participants indicated:
 - perceived difference in impacts between single device and array
 - perceived risk increases with scale, but more data needed
- ▶ Data transferability should be further explored
 - No one answered “never”
 - 25% state regulators and 36% federal answered “absolutely”
- ▶ Limitations
 - “Wind energy” included, so may be driving answers due to familiarity with this technology
 - Some questions are hard to ask...



Continued Engagment

- ▶ Continued outreach – focused on familiarity with wave and tidal technologies
- ▶ Outreach and sharing knowledge on highly ranked challenges, especially where concerns may not be reflected in findings to date
- ▶ How much uncertainty is acceptable? How does this compare to other energy industries?
- ▶ Opportunities to discuss data transferability and collection consistency
- ▶ New research may be needed



- ▶ Current challenges:
 - Lack of access to synthesized and contextualized data from early stage projects
 - No mechanisms to apply data and information across geographically distinct projects
 - Lack of consistent methods for data collection
 - High investment risks for emerging industry and elevated levelized cost of electricity

- ▶ **Goal: to transfer research and monitoring from project to project**
 - Reduce costs for baseline environmental studies and post-installation monitoring
 - Decrease uncertainty and facilitate common understanding to accelerate permitting process

Next Steps on Data Transferability

- ▶ Define the challenge: review research and analogues from other marine industries, derive criteria for transferability and produce a white paper

- ▶ Convene focus groups with regional regulators
 - Informed by Regulator Survey results, discussion
 - Understand real-world challenges associated with applying data across multiple projects
 - What are your limitations and concerns with data transferability and collection consistency?

- ▶ Analyze outcomes from focus groups

- ▶ Explore researchers' perspective with a Data Transferability and Collection Consistency workshop at the International Conference on Ocean Energy (ICOE) in Normandy, France, June 2018

- ▶ Compile all information into a final report
 - Present findings via webinar to regulators, industry, and MRE research community
 - Associated web-content hosted on *Tethys* (<https://tethys.pnnl.gov/>)

Regional Regulator Focus Groups

We will start planning focus groups in early 2018 and we would like to have your participation in the focus groups.

- ▶ If you are interested in participating, please reach out to us.
 - Mikaela Freeman (mikaela.freeman@pnnl.gov)





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THANK YOU!

- ▶ If you would like to join the *Tethys* mailing list for information on environmental impacts, upcoming webinars and more, sign up at <https://tethys.pnnl.gov/tethys-blasts/join>

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ANNEX IV