# MRE Regulator Survey:
# *JAPAN*

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July 2021

# Table of Contents

## Introduction

As marine renewable energy (MRE) is still a new industry, there are many unknowns about the potential environmental effects of MRE deployments. These concerns are largely based in the uncertainty of how wave and tidal devices interact with the environment, or how marine animals behave around devices. This uncertainty makes permitting processes for MRE projects difficult, often requiring extensive monitoring and data collection. This cautious approach may limit the implementation of MRE technologies or create financial barriers to development.

To better understand the viewpoint of regulators involved in permitting MRE devices, a survey was conducted among multiple OES Environmental countries. The survey was intended to understand the familiarity of regulators with MRE technologies, their perceptions of environmental risk, and their recommendations on best approaches to MRE development, including permitting and the potential for data transferability. The survey also included some questions to gather *Tethys* user data. This report summarizes the results from the survey of regulators in Japan, distributed in 2019.

## Participants

The regulator survey for Japanese regulators was translated to Japanese, printed and completed during an in-person workshop, and then entered into SurveyMonkey by the OES-Environmental analyst. Four regulators completed the survey. The regulators that responded to what type of agency they represent (n=2) indicated that they were from a municipal agency and a private company. Participants were asked to indicate the top focus of their agency and their own role in consenting MRE developments. The top environmental focus across all regulators was fish (Figure 1). Of the three regulators who noted their own role, 2 indicated that they were subject experts and one indicated that they advise policy level decisions. None of the regulators that completed the survey indicated that they have participated in permitting an MRE device.

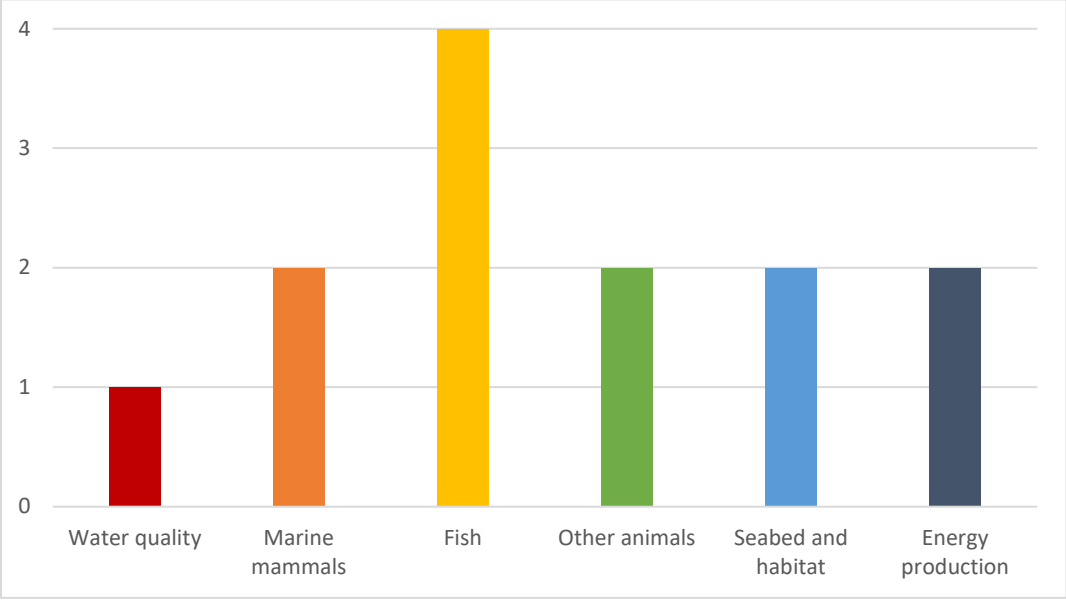
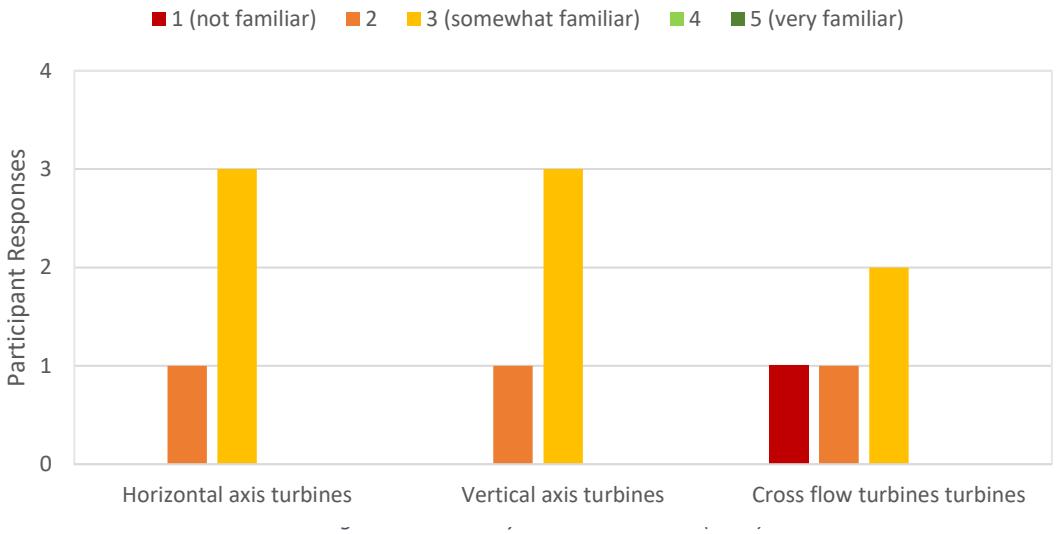
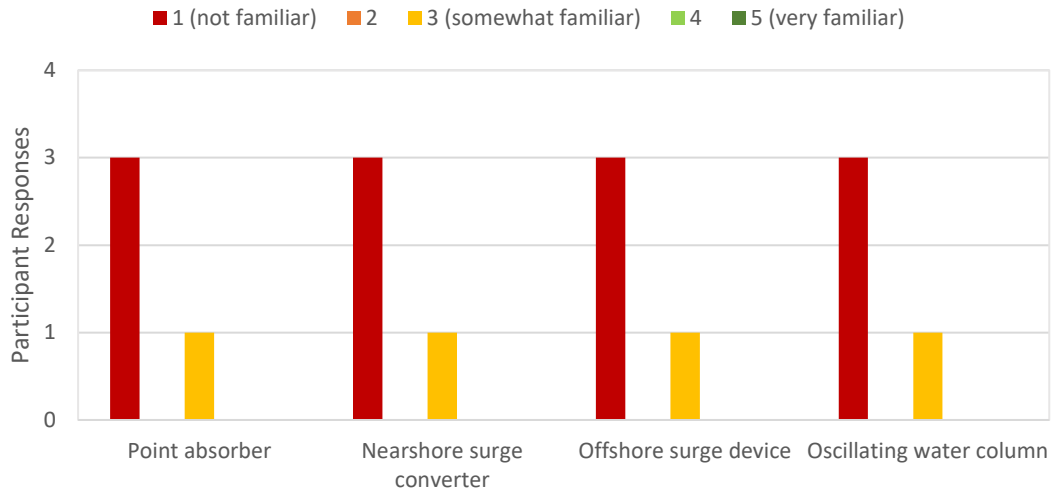



*Figure 1. Top focus of agency. Participants instructed to select all that apply. (n = 4)*

## Familiarity with MRE Technologies

Regulators were also asked to rate their familiarity with tidal and wave energy technologies on a scale of 1 (not familiar) to 5 (very familiar). The results for tidal energy devices are shown in Figure 2 and the results for wave devices are shown in Figure 3. Regulators in Japan are more familiar with tidal devices than wave devices, though none are very familiar with either technology.



## Top Challenges and Perceptions

Regulators were asked to rank the following challenges from 1 (most important) to 7 (least important) for permitting projects with single marine energy devices and for arrays.

- Benthic habitat
- Collision
- Chemicals and water quality
- Electromagnetic field (EMF)
- Underwater noise
- Avoidance, attraction, and/or displacement
- Energy removal and flow impacts
- Entanglement

The average ranking of each challenge was calculated by SurveyMonkey, such that the answer choice with the largest average ranking is the top challenge.[1]

### Single Device

The results for **single devices** are shown in Figure 5 (n = 2). The top two concerns were benthic habitat and collision.

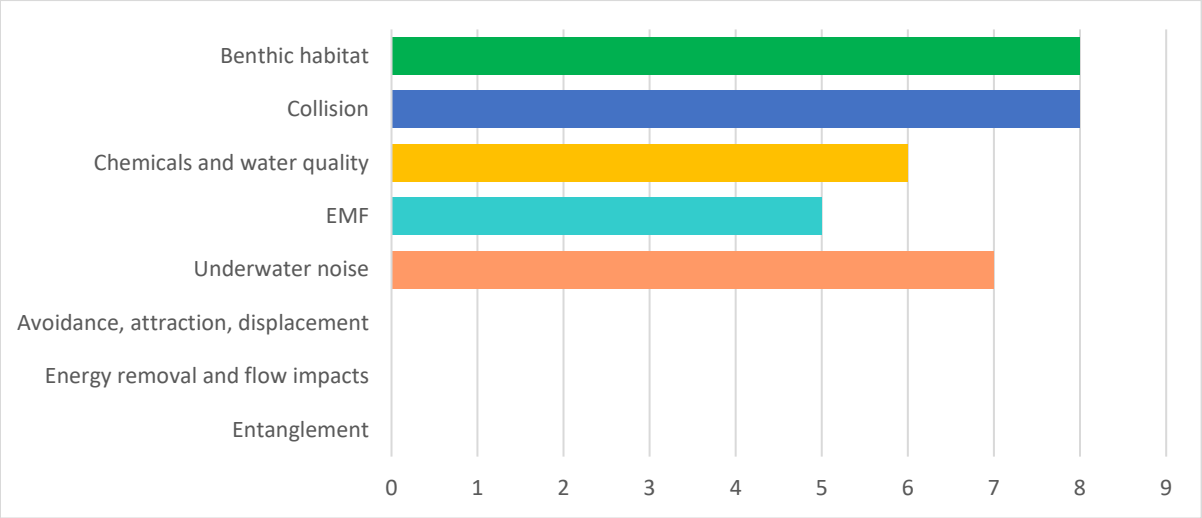



*Figure 5. Ranking of challenges for single devices. (n = 2)*

[1] Method used to calculate average rank uses the equation below, where w is the weight of the ranked position and x is the response count for each answer choice.

$$\frac{x_1w_1 + x_2w_2 + x_3w_3 \ldots x_nw_n}{Total\ Response\ Count\ (n)}$$

Regulators were also asked to respond to several statements about permitting for **single devices** with respect to their top ranked challenge:

1. Sufficient field data are needed to determine risks and reduce uncertainty of MRE development.
2. Numerical models play an important role in environmental permitting.
3. Policy guidance is needed to interpret risk and uncertainty.
4. Staff need to be knowledgeable and trained on technologies, projects, interactions, etc.

The results of this question are summarized in the heat map below (Table 1). All participants agreed or strongly agreed with all statements, except one regulator was neutral about the need for additional training.

*Table 1. Response to statements regarding single devices. (n = 2)*

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| **1. Sufficient field data** | 0 | 0 | 0 | 1 | 1 |
| **2. Numerical models** | 0 | 0 | 0 | 1 | 1 |
| **3. Guidance** | 0 | 0 | 0 | 0 | 2 |
| **4. Training** | 0 | 0 | 1 | 0 | 1 |

## Arrays

The results for device **arrays** are shown in Figure 6 (n =2). Benthic habitat and collision are still the top concerns.

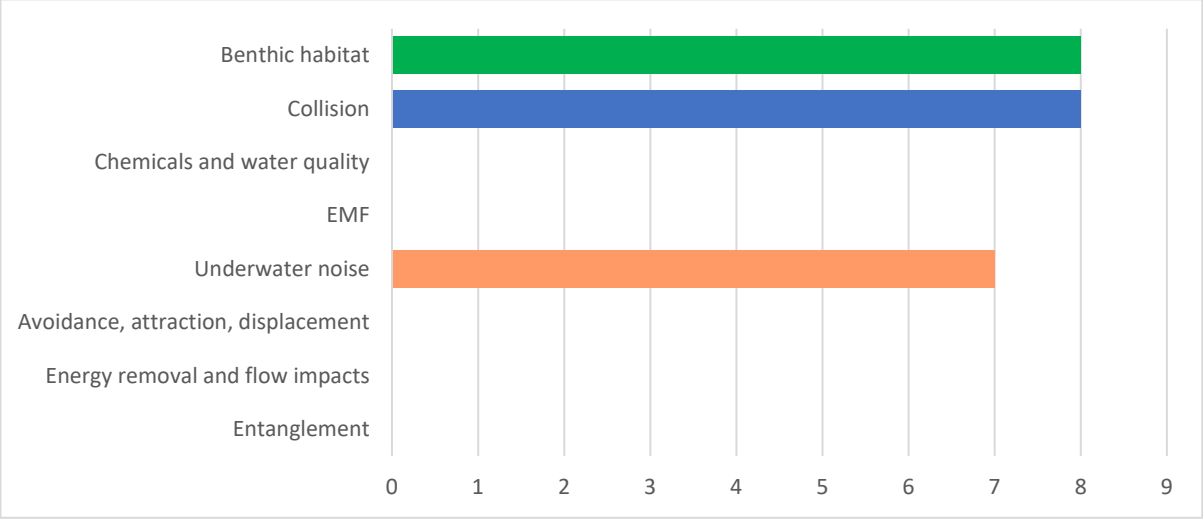



*Figure 6. Ranking of challenges for device arrays. Note that due to an error in survey design, Entanglement was not presented as an option for arrays. (n = 2)*

Regulators were also asked to respond to the same statements as previously about consenting for an **array** of devices with respect to their top ranked challenge:

1. Sufficient field data are needed to determine risks and reduce uncertainty of MRE development.
2. Numerical models play an important role in environmental permitting.
3. Policy guidance is needed to interpret risk and uncertainty.
4. Staff need to be knowledgeable and trained on technologies, projects, interactions, etc.

The results of this question are summarized in the heat map below (Table 2). The responses for both were the same, with the most support for policy guidance for both single devices and arrays.

*Table 2. Response to statements regarding device arrays. (n = 2)*

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| **1. Sufficient field data** | 0 | 0 | 0 | 1 | 1 |
| **2. Numerical models** | 0 | 0 | 0 | 1 | 1 |
| **3. Guidance** | 0 | 0 | 0 | 0 | 2 |
| **4. Training** | 0 | 0 | 1 | 0 | 1 |

## Data Transferability

Regulators were asked to respond to the question: "Can data collected from other locations be applied towards environmental permitting within your jurisdiction?" Participants were given the option of 'Never', 'Maybe', and 'Absolutely'. One regulator selected 'Never' and two selected 'Maybe'. No additional comments were left.

## Best Approach to MRE Development

Regulators were asked, "Which of the following approaches best describes your vision of how the MRE industry should develop? (Choose one)". The options as provided to regulators in the survey are listed below:

- *Precautionary Principle:* The deployment and operation of marine renewable energy can have high uncertainties and potential negative consequences. Measures should be taken to avoid negative consequences by proceeding with the project very carefully or by discontinuing the project.
- *Mitigation Hierarchy:* Location and / or mitigation measures need to systematically limit the impact of risk in order to avoid, minimize, mitigate, and / or compensate for it.
- *Step-by-step approach:* Stand-alone equipment should be deployed first, then gradually scaled up to array scale as potential risks become better understood and managed.
- *Adaptive Management:* Learning-based management approaches should be applied, including adapting monitoring and mitigation over time to understand risk, reduce uncertainty and mitigate impact
- *Survey, Deploy, Monitor:* The area of a proposed project should be surveyed before deployment, coupled with monitoring around the device before deployment can proceed.

- *Implement promptly:* Development may proceed as the risk of the marine environment is almost certainly low.

One regulator selected survey, deploy, monitor and two regulators selected adaptive management as their preferred approaches.

## Use of *Tethys*

In addition to questions about permitting of MRE devices, regulators were asked about their awareness and use of the *Tethys* database. Regarding awareness of the *Tethys* platform, two regulators responded that they had never hear of it, and the one who had heard of it was only aware of it for less than 6 months.

Regulators were also asked about their use of the following functions of *Tethys:*

- To find papers and reports on MRE environmental issues
- To learn more about the 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* events calendar

The single regulator who uses *Tethys* uses it to find papers and reports on environmental issues and to learn more about the environmental impact of the MRE industry, and said it was very useful.

## Conclusion

Overall, the regulators surveyed in Japan were unfamiliar with MRE devices, though they were slightly more familiar with tidal devices than wave. None of the regulators that completed the survey indicated that they have participated in permitting an MRE project. As most of the questions were answered by only two out of the four regulators, it is difficult to get a sense of the true attitudes of Japanese regulators toward risks and moving the industry forward. Based on their preferred approaches to MRE development (adaptive management and survey, deploy, monitor) the regulators surveyed are accepting of some level of risk and uncertainty before deployment. However, it appears that the Japanese regulators may not be supportive of data transferability and the lack of comments does not help to understand why data transferability may not be supported by all regulators in Japan.

The results of this survey suggest that increased OES-Environmental outreach is needed to provide educational materials about MRE devices, data transferability, and the resources available on *Tethys* to better support Japanese regulators. Only one of the regulators that responded had heard of *Tethys* and found it very useful, but the rest had never heard of it. It is also recommended that additional regulators be surveyed who have been involved in MRE, but this may be difficult due to the status of the industry in Japan. As the industry progresses, it will be useful to remain in contact with Japanese regulators and any changes on perspectives regarding environmental permitting of MRE.