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Workshop on Data Transferability and Collection Consistency

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900 – 1230
Cherbourg, France

OES OCEAN ENERGY SYSTEMS

ANNEX IV

Ocean Energy orjip™
working to accelerate offshore consenting

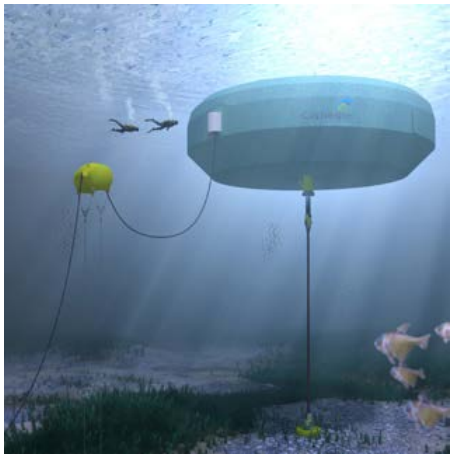
Agenda

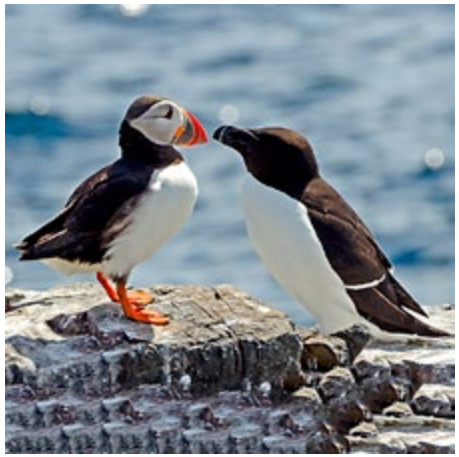
900 – 920	Introductions
920 – 930	Challenges and introduction to data transferability, and collection consistency
930 – 1000	Brainstorm data transferability/best practices needs
1000 – 1030	Data Transferability Framework and Best Management Practices
1030 – 1045	Break
1045 – 1145	Breakout sessions: 1. Minimum requirements for data transferability 2. Data collection consistency table 3. Best Management Practices
1145 – 1200	Report out from breakout sessions
1200 - 1220	Brainstorm implementation of BMPs
1220 - 1230	Next steps and closing remarks

Challenges to the MRE industry and the need for Data Transferability and Collection Consistency

Barriers to Consenting

- MRE industry perceptions
- Our perceptions of the regulatory community
- Annex IV working to bridge these gaps
  - 2018 theme: Data Transferability and Collection Consistency
- Learning as we go…





Engaging Regulators

- 2017
  - Held two regulator webinars(largely US):
    - Environmental Effects of Permitting MRE Development
    - Environmental Effects of MRE Development: Regulator Survey Results and Next Steps
  - Regulator Survey
- 2018
  - Data Transferability Workshops in US
    - In-person: Portland, OR, US
    - Online: East and West Coast of US
  - ICOE workshop
- What do we mean by “data”?
  - We really mean data and information:

Could be raw or quality controlled data but *more likely* analyzed data, synthesized data to reach some conclusion, reports, etc.

Conclusions of Survey

- Participants indicated:
  - Difference in impacts between single device and array
  - 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”

Data Transferability and Collection Consistency

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- Challenges:
  - Lack of access to data from early stage projects
  - Lack of consistent methods for data collection
  - No mechanisms to apply data/information between projects
- Goal: to transfer learning from early projects to inform future projects
- To consider transfer from, necessary that data are collected with similar methodologies, measurements, etc.

Working with US Regulators

- Data can be transferred from:
  - Research studies and established projects (monitoring)
  - Other industries with similarities
- Site specific data collection could be reduced
- Data for “transferring” need to be collected consistently for comparison
- 5 Data Transferability Workshops (~2 hours)
- Share MRE data, understand regulators’ needs and willingness to transfer data
- Gather feedback on our data transferability framework

Sample data from regulator workshops

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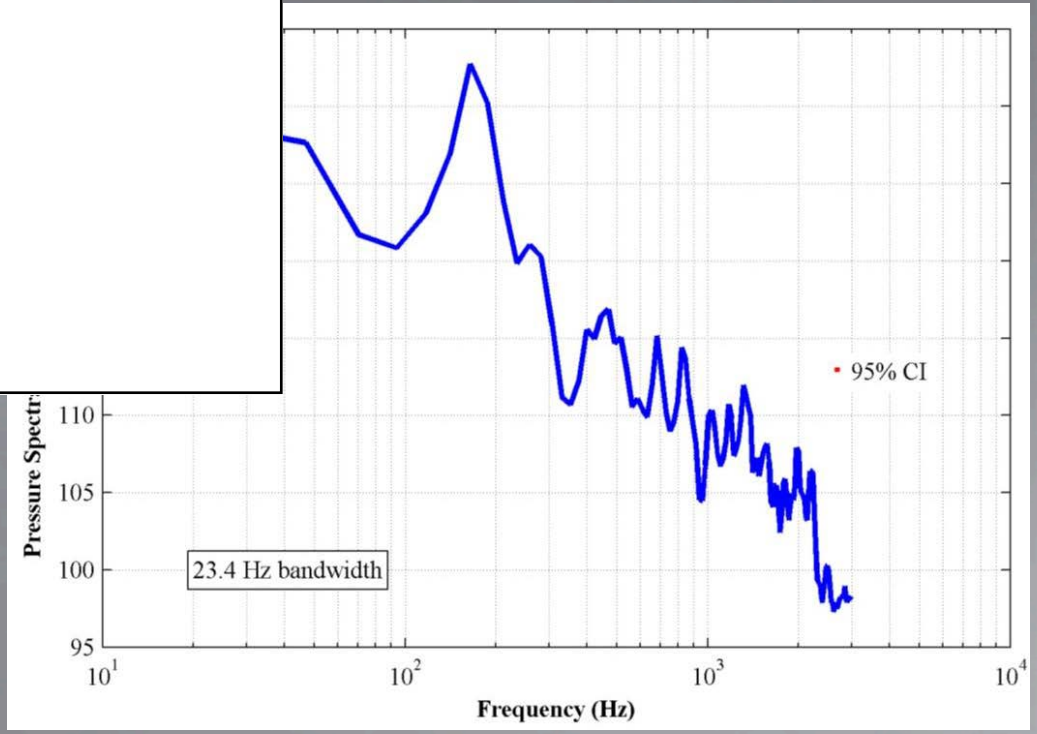
Tidal turbines at EMEC



Sample data from regulator workshops

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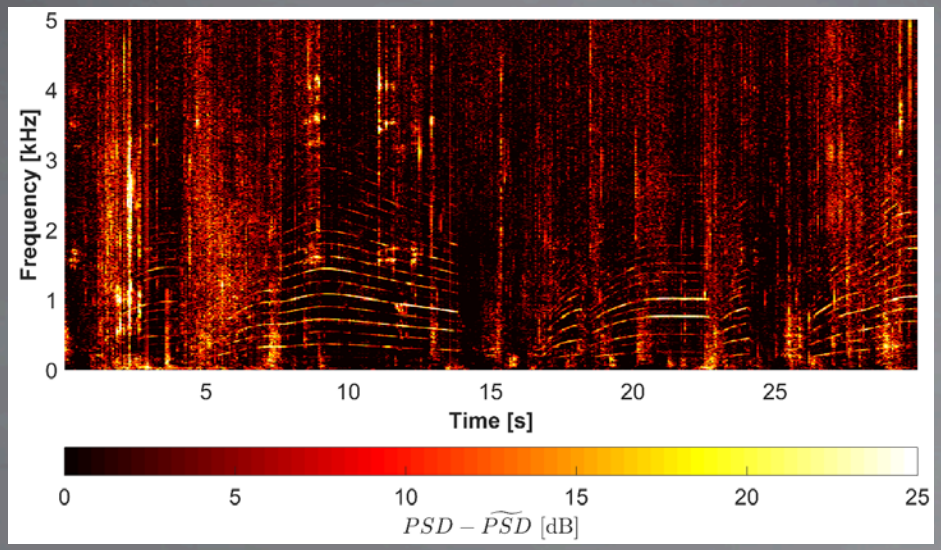
WECs at WETS (Hawaii)



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Data Transferability Framework and Best Management Practices

Annex IV proposes: Framework for Data Transferability

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- Develop common understanding of data types and parameters to address potential effects of MRE development.
- Create best practices for consistent collection of data.
- Engage regulators to test framework, solicit input on acceptance for data transfer.
- Guide implementation of best practices for siting, permitting, post-installation monitoring, and mitigation.

Framework:

1. Method for describing environment, evaluating the comparability of data sets (MRE project archetypes);
2. Description for applying framework; and
3. Method for implementing framework, to support regulatory processes

Key Interactions (Stressors) for Data Transferability

Stressors	MRE Technology
Collision Risk	Tidal
Underwater Noise	Wave and tidal
EMF	Wave and tidal
Changes in Benthic Habitat	Wave and tidal
Physical Systems	Wave and tidal

Marine Renewable Energy Project Archetypes

- Archetypes =
  - A very typical example
  - Imitation of an original
- Learned from other industries – economics, transportation, ecology, and land system science

- Marine Renewable Energy Project Archetypes = MREPAs
- "Like" MREPAs have highest potential for data transferability
- MREPA defined by 4 variables:
  - Stressor
  - Site Conditions
  - MRE technology types
  - Receptor groups

Collision Risk MREPAs (22 archetypes)

Site Condition	Technology	Receptors
Shallow and Narrow Channels	Tidal Device, Bottom-Mounted	Marine Mammals
		Fish
		Diving Birds
	Tidal Device in the Water Column	Marine Mammals
		Fish
		Diving Birds
Shallow and Wide Channels	Tidal Device, Bottom-Mounted	Marine Mammals
		Fish
		Diving Birds
	Tidal Device in the Water Column	Marine Mammals
		Fish
		Diving Birds
Deep and Wide Channels	Tidal Device, Bottom-Mounted	Marine Mammals
		Fish
	Tidal Device in the Water Column	Marine Mammals
		Fish
		Diving Birds
Deep and Narrow Channels	Tidal Device, Bottom-Mounted	Marine Mammals
		Fish
	Tidal Device in the Water Column	Marine Mammals
		Fish

Shallow channels < 40m; Deep channels > 40 m;
Narrow < 2 km; Wide > 2 km

Applying the Data Transferability Framework

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1. Characterize the MREPA of the future project

Stressor
- Collision Risk

Site Conditions
- Shallow & Narrow Channels

Technology
- Tidal, Bottom-Mounted

Receptor
- Marine Mammals

MRE Project Archetype

Applying the Data Transferability Framework

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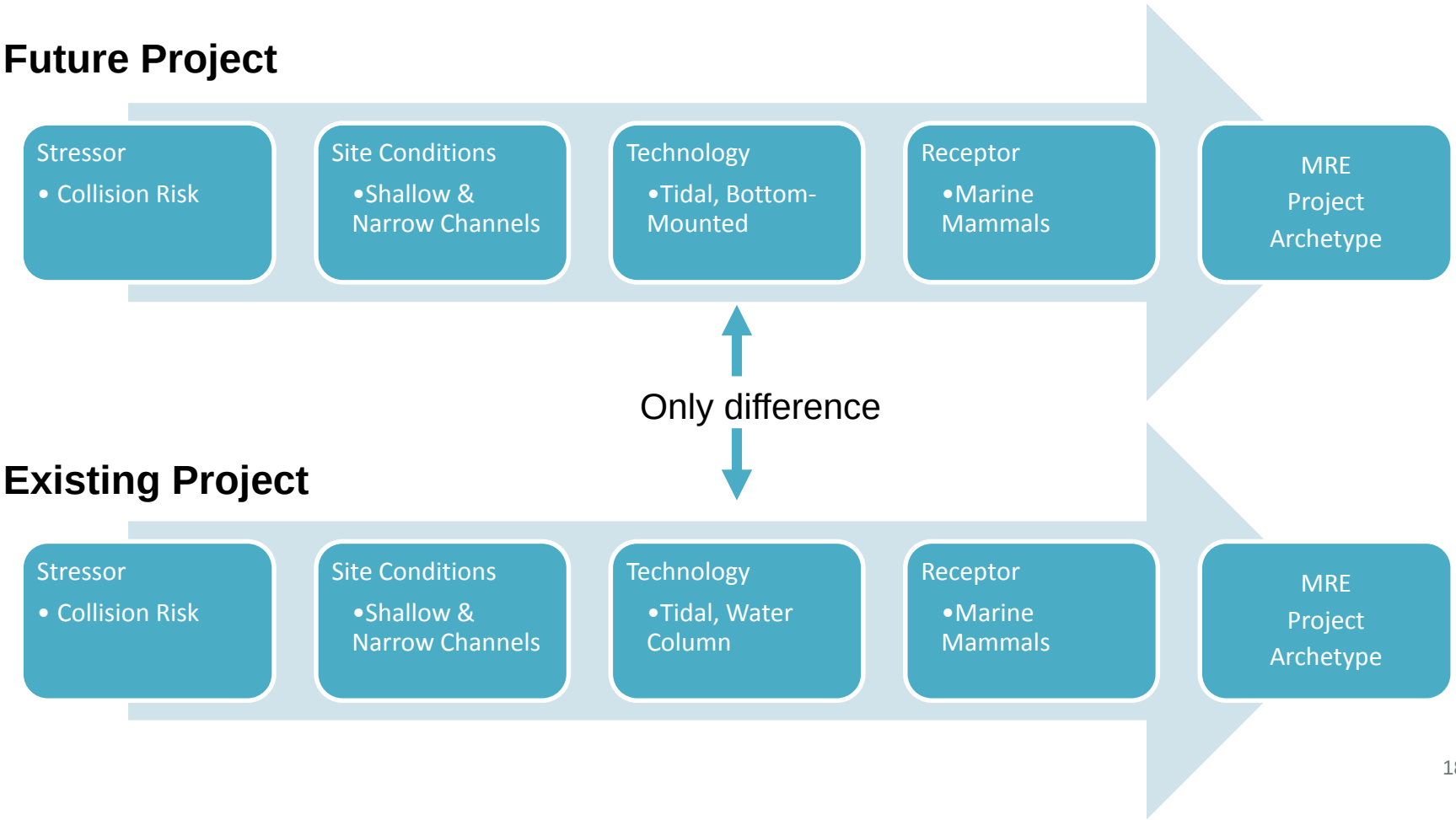
2. Compare MREPA of the future project with those of existing projects, to determine similarity



Applying the Data Transferability Framework

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3. Evaluate transferability potential

Evaluation Hierarchy

Necessary
- Same MREPA

- Same receptor species (or closely related)

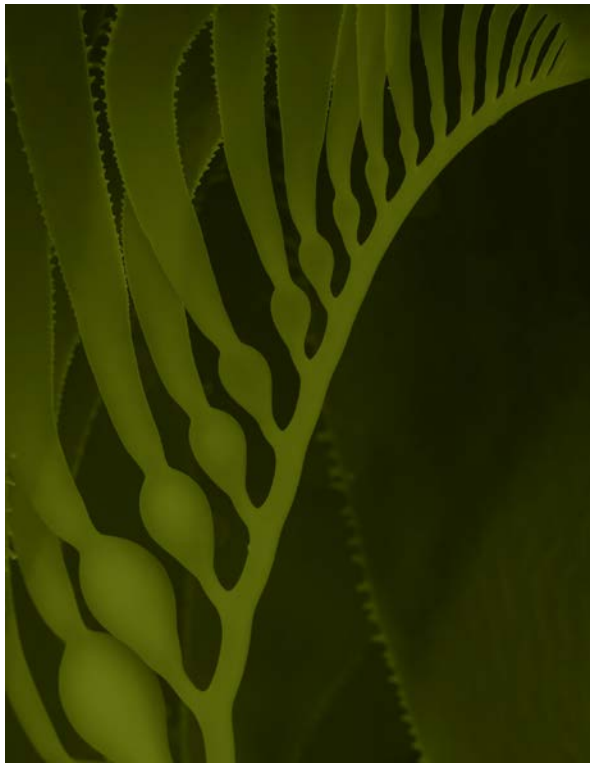
Preferred
- Similar technology and project size

- Similar wave/tidal resource

Optional
- Close geographical proximity

Monitoring Dataset Matrix

- Under development
- Used to classify all existing monitoring datasets by an MREPA
  - List key metadata features of each dataset
- Allows for:
  - Datasets to be easily found, based on MREPA
  - Evaluation of data consistency
  - Evaluation of transferability between existing project datasets for future projects



Best Management Practices (BMPs)

- "practices or procedure, that are qualitative and flexible" (EPA 1993)

- 3 phases:
  1. Planning
  2. Development and Implementation
  3. Evaluation and reevaluation

Creating BMPs for data transferability and collection consistency

- Planning – regulator workshops and Data Transferability Framework

- Development
  - Draft BMPs
  - Examination/improvement of BMPs
  - Develop implementation plan

Focus today

Minimum Requirements for Data Transferability

- Based on the Data Transferability Framework
- Minimum requirements:
  1. Projects share the same MREPA (preferable to share several steps in the *Evaluation Hierarchy*)
  2. Data collected in a consistent manner

Collecting Data in a Consistent Manner

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- To transfer data, need to understand similarities of data
- Encourage use of consistent data collection processes and units
  - Increase confidence in transfer of data/information/learning
- For qualitative data – evaluate based on trustworthiness of data

Quality Criteria	Definition
Credibility	Establishes whether the research findings represent plausible information drawn from the participants' original data and are a correct interpretation of the participants' original views.
Transferability	The degree to which the results of qualitative research can be transferred to other contexts or settings with other respondents.
Dependability	The stability of findings over time. Includes participants' evaluation of the findings, interpretation and recommendations of the study such that all are supported by the data as received from participants of the study.
Confirmability	The degree to which the findings of the research study could be confirmed by other researchers and the findings are clearly derived from the data.
Reflexivity	The process of critical self-reflection about oneself as researcher (biases, preferences, preconceptions), and the research relationship (how the relationship affects participant's answers to questions).

Data Collection Consistency

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Stressor/ Interaction	Process or Measurement Tool	Reporting Unit	Analysis or Interpretation
Collision Risk	Sensors include: - acoustic only, - acoustic + video, - other	Number of visible targets in field of view, number of collisions.	Number of collisions and/or close interactions of animals with turbines used to validate collision risk models.
Underwater Noise	Fixed or floating hydrophones	Amplitude dB re 1µPa at 1 m Frequency: broadband or specific frequencies	Sound outputs from MRE devices compared against regulatory action levels. Generally broadband noise unless guidance exists for specific frequency ranges.
EMF	Source: - cable; - other; - shielded or unshielded	AC or DC; voltage; amplitude	Measured EMF levels used to validate existing EMF models around cables and other energized sources.
Habitat Change	Underwater mapping with sonar; video; other Habitat characterization from mapping; existing maps	Area of habitat altered, specific for each habitat type.	Compare potential changes in habitat to maps of rare and important habitats, to determine if these are likely to be harmed.
Changes in Physical Systems	Modeling, with or without validation	No units. Indication of datasets used for validation, if any.	Data collected around arrays should be used to validate models.

BMPS for Data Transferability

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1. Meet the minimum requirements to be considered for data transfer.
   - *Determine MREPA(s) for future project, search for similar MREPA(s), and choose datasets that match.*

2. Determine likely data sets that meet data consistency needs.
   - *Determine if collection methods are sufficiently similar*.

3. Use models in conjunction with and/or in place of datasets.
   - *Once sufficient data exists, models should be created to describe interactions, which can take place of larger field data collection. In some cases, models may be used prior to collection of field data.*

4. Provide context and perspective for datasets to be transferred.
   - *Collect ancillary datasets when available to provide context (i.e., behavioral studies of animals, habitat maps, etc.).*

Breakout sessions

Discuss:

- Minimum requirements for Data Transferability
- Data Collection Consistency Table
- Best Management Practices

Report out

Implementation

- Desirable to have support from all parties involved in permitting/consenting MRE devices
  - Regulators
  - Device and Project Developers
  - Researchers and Consultancies

- Brainstorm steps to implement:
  1. Data Transferability Framework
  2. Collection Consistency
  3. Best Management Practices

Next Steps

- Continue to seek input from regulators in US and other Annex IV country
- Finalize BMPs for data transferability and collection consistency
- Develop steps for implementation
- Present findings via web-based tool on *Tethys*

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Thank you for joining us today!

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Energy Efficiency & Renewable Energy