



# Introducing Offshore Wind Environmental Metadata on Tethys

10 October 2023  
Online Webinar

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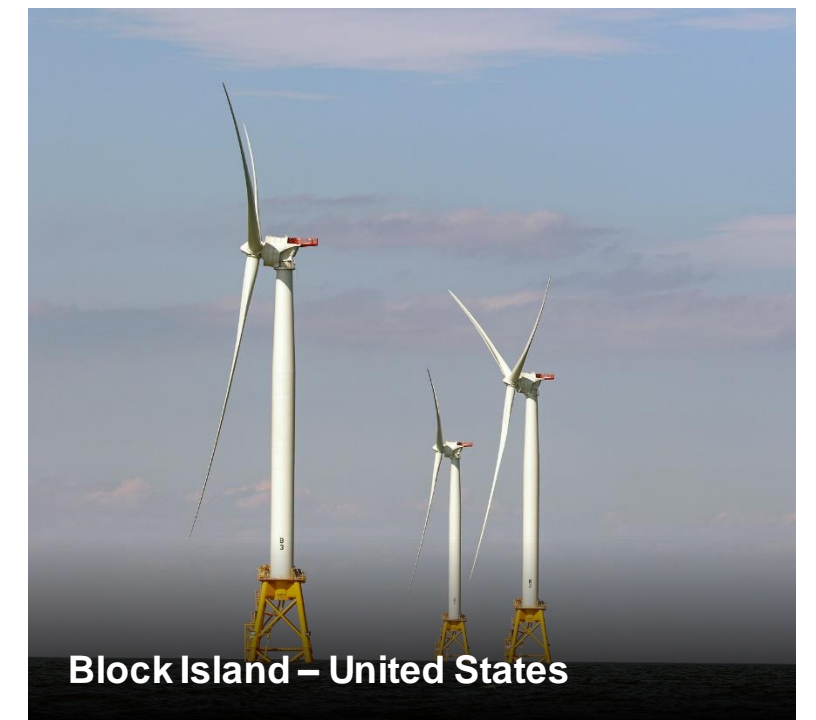
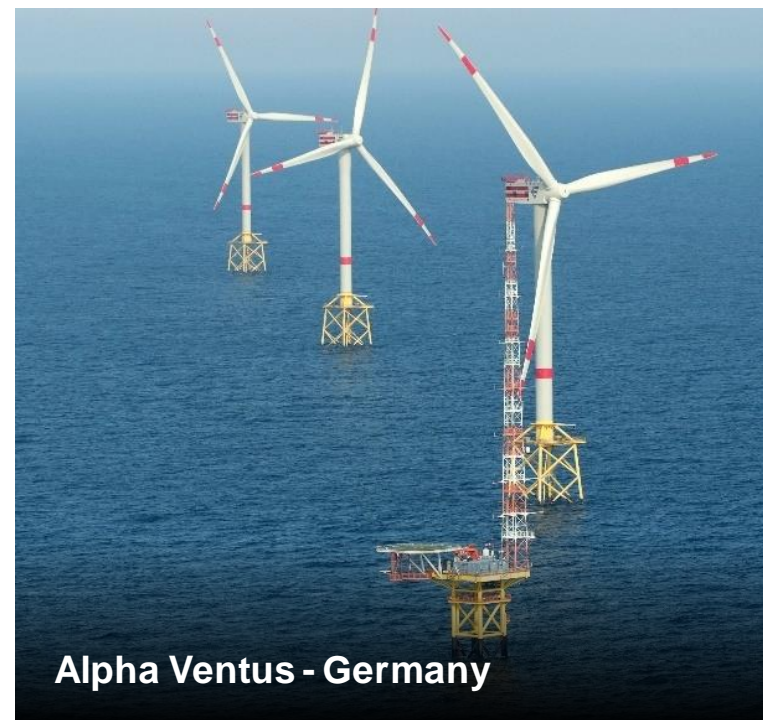
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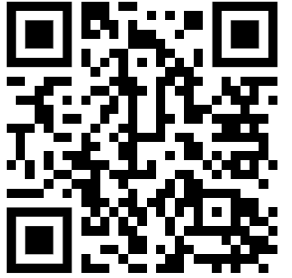
# Today's Presentation

- Main Takeaway
- Introductions
- Challenges and Opportunities
- Offshore Wind Metadata
- Progress Update
- Live Demo
- Quick Data Conversation
- Next Steps



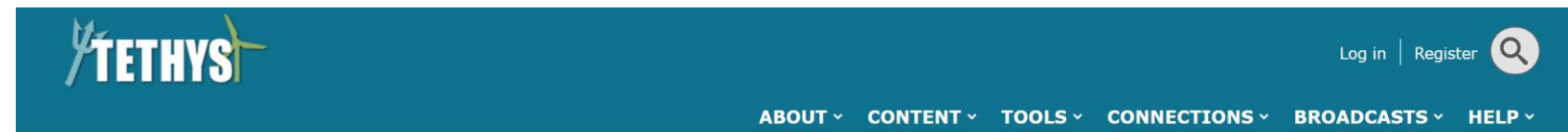
# Introducing Offshore Wind Metadata on Tethys

## New Resource: Offshore Wind Monitoring



The Tethys Team has launched a new resource that details environmental monitoring information for offshore wind farms around the world

<https://tethys.pnnl.gov/offshore-wind-metadata>



### Offshore Wind Metadata

The Tethys team has partnered with IEA Wind's **WREN Initiative** to collect information, or metadata, on environmental monitoring conducted at offshore wind energy projects around the world. By making this information widely available, Tethys and WREN aim to advance global understanding of these effects and progress the industry in an environmentally responsible manner. Annual updates are sought from project developers to ensure the information is reliable and accurate. If you would like to submit a project, please fill out an **Offshore Wind Metadata Questionnaire** and send it to [tethys@pnnl.gov](mailto:tethys@pnnl.gov).

**Technology:** 
**Country:** 
**Status:** 
**Project Scale:**

**Search Metadata:**

| Title ^                            | Technology          | Project Manager                                | Country                  | Status       | Project Scale   | Installed Capacity                        |
|------------------------------------|---------------------|--|--------------------------|--------------|-----------------|---|
| <b>Alpha Ventus</b>                | Fixed Offshore Wind | Deutsche Offshore - Testfeld und Infrastructur | Germany                  | In Operation | Commercial Farm | 60 MW                                     |
| <b>Beacon Wind</b>                 | Fixed Offshore Wind | BP, Equinor                                    | United States of America | Planned      | Commercial Farm | 1230 MW first phase, similar second phase |
| <b>Beatrice Offshore Wind Farm</b> | Fixed Offshore Wind | Equitix Limited                                | United Kingdom           | In Operation | Commercial Farm | 588 MW                                    |
| <b>Block Island Wind Farm</b>      | Fixed Offshore Wind | Ørsted   | United States of America | In Operation | Commercial Farm | 30 MW                                     |

# Introducing Offshore Wind Metadata on Tethys

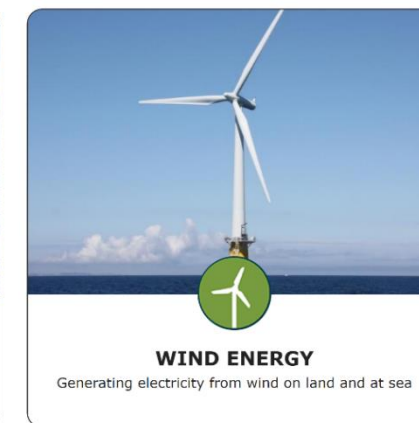
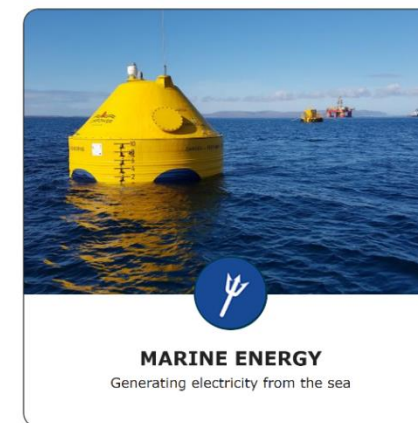
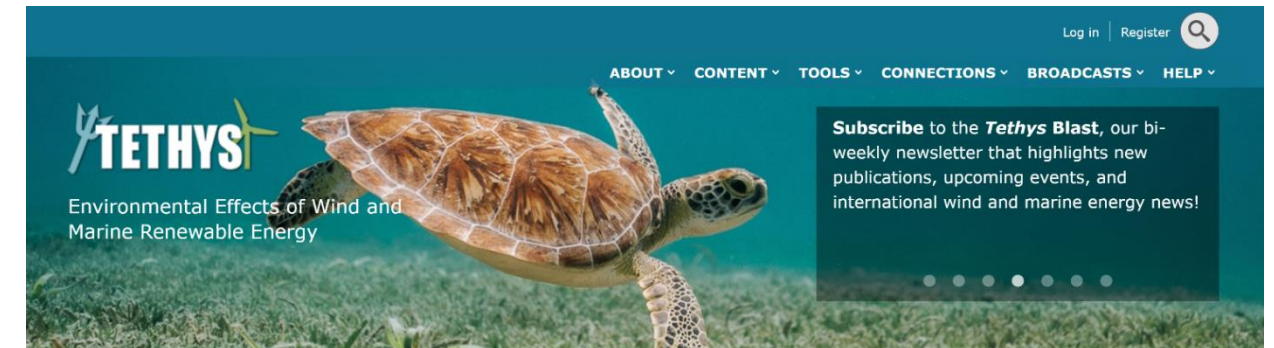
## Who is doing this work?

### What is Tethys?

- Free knowledge hub with information and resources on environmental effects of wind and marine energy, includes 8,900+ documents
- Managed by the U.S. Department of Energy's Pacific Northwest National Laboratory
- <https://tethys.pnnl.gov>

### What is WREN?

- “**W**orking together to **R**esolve the environmental effects of wind **E**nergy” is a task under the International Energy Agency Wind Technology Collaboration Program
- Produces short science summaries, webinars, and online tools, all hosted on Tethys
- <https://tethys.pnnl.gov/about-wren>



**GET STARTED**

If you are new to Tethys, start here to learn more.

**KNOWLEDGE BASE**

Access thousands of publications and more, all in a searchable database.

**Aug 2023** Today

| Sun | Mon | Tue                        | Wed          | Thu                        | Fri | Sat |
|-----|-----|----------------------------|--------------|----------------------------|-----|-----|
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| 6   | 7   | 8                          | 9<br>12:00   | 10<br>6:00 Young Coastal S | 11  | 12  |
| 13  | 14  | 15                         | 16<br>6:00 f | 17                         | 18  | 19  |
| 20  | 21  | 22<br>4:00 f               | 23<br>5:00 f | 24<br>6:00 f               | 25  | 26  |
| 27  | 28  | 29<br>6:00 APAC Offshore v | 30           | 31                         |     |     |

**Recent Tethys Story**

**Producing Predictive Species Density Maps in Potential Wind Energy Development Areas**

In support of the United States' goal to deploy 30 gigawatts of offshore wind energy by 2030, the Department of Energy (DOE) Wind Technologies Office recently announced \$15 million for five projects, co-funded by the Bureau of Ocean Energy Management (BOEM), that will provide critical environmental and wildlife data to aid offshore wind development. As part of that effort, the Marine Mammal... [Read More](#)

# Introducing Offshore Wind Metadata on Tethys

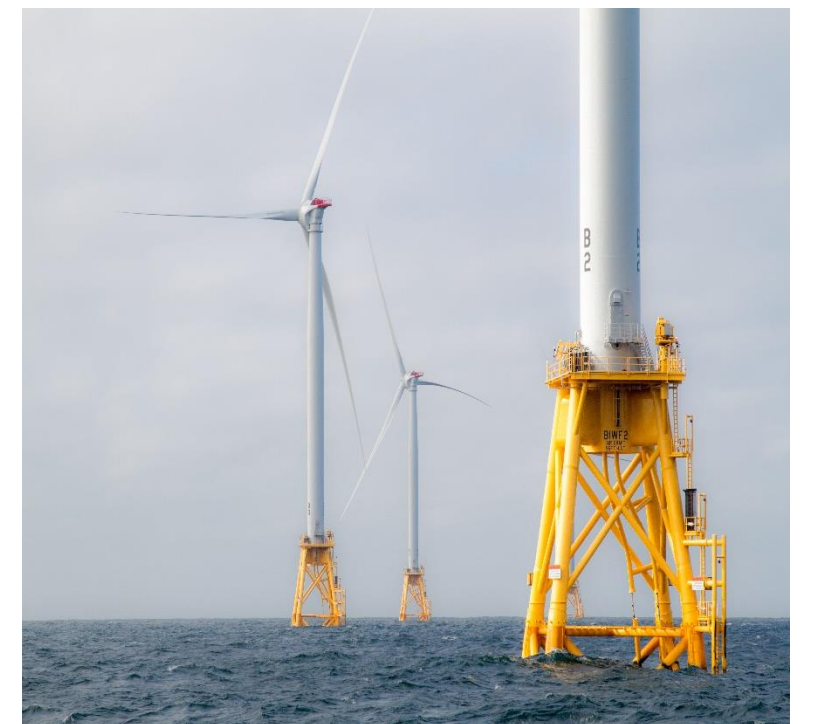
## Challenges & Opportunities

### Challenges

- Difficult to find environmental monitoring reports and data
- Monitoring reports are often lost
- Data is often distributed or not available
- Differing levels of data consolidation and sharing by country

### Opportunity

- International trust for Tethys and WREN
- Can aggregate reports and data across multiple platforms
- 11 years of experience with marine energy metadata
- New offshore wind industry in the United States



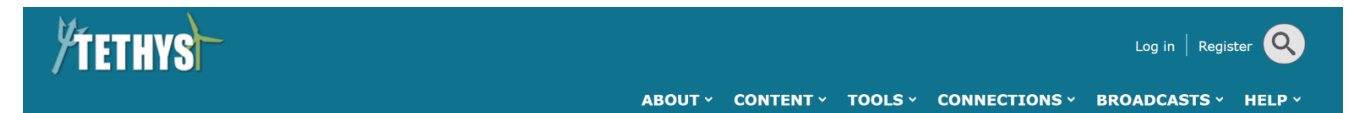
# Introducing Offshore Wind Metadata on Tethys

## What are Offshore Wind Metadata?



Partnering with WREN, the Tethys team is collecting information on environmental monitoring conducted at offshore wind energy projects around the world.

- Project description and development timeline
- Physical site details (location, water depth)
- Project details (capacity, turbine model, etc.)
- Related environmental papers and reports
- Short summaries of environmental monitoring conducted during baseline assessments, construction, operations, & decommissioning
- Links to relevant documents and publicly available datasets



Home » Content » Offshore Wind Metadata » Hornsea 2 Offshore Wind Farm

Partnering with [WREN](#), questionnaires are sent to offshore wind energy developers around the world who are involved in environmental monitoring. This page provides contextual project information and highlights environmental monitoring, providing links to available data and reports. Content is updated annually.

### Hornsea 2 Offshore Wind Farm

#### Description

Hornsea 2 was the world's largest wind farm when it came online on August 31st, 2022, with 165 Siemens Gamesa SG 8.0-167 DD turbines and monopile foundations made by EEW, for a total capacity of 1.32 GW. The farm covers an offshore area of 462km<sup>2</sup> and is located directly next to Hornsea 1.

#### Location

Hornsea 2 is located 89 km (55.302 miles) off the Yorkshire coast in the North Sea, adjacent to Hornsea 1. Hornsea 2 is located 55 miles east of the Port of Grimsby. The cable makes landfall at Lincolnshire's Horseshoe Point beach.

#### Licensing Information

- 2020: Department for Business, Energy & Industrial Strategy (BEIS); Safety Zone Permit
- 2019: Department for Business, Energy & Industrial Strategy (BEIS); Decommissioning Programme
- 2018: Department for Business, Energy & Industrial Strategy (BEIS); Development Consent Order (DCO) Amendment
- 2016: Department for Business, Energy & Industrial Strategy (BEIS); Development Consent Order (DCO)
- 2016: Marine Management Organisation (MMO), Deemed Marine Licences (DML)

#### Project Timeline

- August 2022: Hornsea Two becomes fully operational
- October 2020: Offshore construction begins
- April 2019: Onshore cable installation work begins
- July 2018: Construction of onshore substation commenced
- April 2018: Site investigations offshore and enabling works on the onshore substation commenced
- September 2017: Contract for Difference awarded to the Project and Final Investment Decision made
- August 2016: Secretary of State grants Development Consent Order
- October 2012: Environmental Impact Assessment Scoping Report

#### Environmental Papers and Reports

- [Hornsea 3 Environmental Monitoring Plan for Impacts Associated with Cable Protection](#) (Royal Haskoning DHV 2021)
- [Hornsea Project Two Offshore Wind Farm Decommissioning Programme](#) (Ørsted 2019)
- [Report on the Implications for European Sites Proposed Hornsea Offshore Wind Farm \(Zone 4\) - Project Two](#) (The Planning Inspectorate for England and Wales 2015)
- [Hornsea Project 2 Environmental Impact Assessment](#) (Smart Wind 2012)
- [Behavior of Scandinavian Bats During Migration and Foraging at Sea](#) (Ahlen et al. 2009)
- [Co-Occurrence of Cetaceans and Seabirds in the Northeast Atlantic](#) (Skov et al. 1995)
- [60 Minutes Video](#)



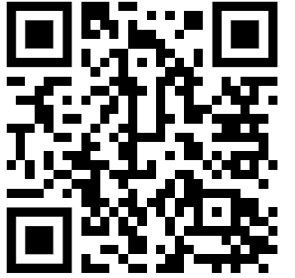
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4. [Project Timeline](#)
5. [Environmental Papers and Reports](#)
6. [Baseline Assessment: Hornsea 2 Offshore Wind Farm](#)
7. [Post-Construction Monitoring: Hornsea 2 Offshore Wind Farm](#)

| Wind Project Site          |  |
|----------------------------|--|
| <b>Title:</b>              | Hornsea 2 Offshore Wind Farm                     |
| <b>Status:</b>             | In Operation                                     |
| <b>Project Manager:</b>    | Ørsted   |
| <b>Turbine Developer:</b>  | Siemens Gamesa                                   |
| <b>Website:</b>            | <a href="#">External Link</a>                    |
| <b>Construction Start:</b> | October 2, 2020                                  |
| <b>Operation Start:</b>    | August 31, 2022                                  |
| <b>Info Last Updated:</b>  | July 13, 2023                                    |
| <b>Contact:</b>            | Info<br><small>(login for email address)</small> |

# Introducing Offshore Wind Metadata on Tethys

## Progress to Date



### Developing Metadata Forms

- Format reviewed by the U.S. Department of Energy, the U.S. Bureau of Ocean Energy Management, and WREN members
- Forms drafted by PNNL researchers using publicly available information (e.g., project websites, reports, papers, news articles)
- Reviewed by project developers (annually)

### Project Count

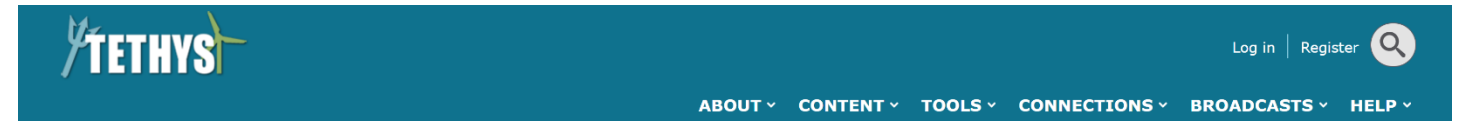
- 20 project sites included so far, including most planned or underway projects in the U.S.
- Additional projects from a mix of countries
- Aiming to highlight key and unique projects, including the largest developments, the first floating farms, and decommissioned farms



# Introducing Offshore Wind Metadata on Tethys

## Live Tour

<https://tethys.pnnl.gov/offshore-wind-metadata>

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### Offshore Wind Metadata

The Tethys team has partnered with IEA Wind's **WREN Initiative** to collect information, or metadata, on environmental monitoring conducted at offshore wind energy projects around the world. By making this information widely available, Tethys and WREN aim to advance global understanding of these effects and progress the industry in an environmentally responsible manner. Annual updates are sought from project developers to ensure the information is reliable and accurate. If you would like to submit a project, please fill out an [Offshore Wind Metadata Questionnaire](#) and send it to [tethys@pnnl.gov](mailto:tethys@pnnl.gov).

Country:  Technology:  Project Scale:  Status:

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| Name                                  | Project Manager   | Country                  | Technology             | Project Scale                  | Capacity  | Status             |
|---------------------------------------|---|--------------------------|------------------------|--------------------------------|---|--------------------|
| Alpha Ventus                          | Deutsche Offshore - Testfeld und Infrastruktur                | Germany                  | Fixed Offshore Wind    | Commercial Farm                | 60 MW   | In Operation       |
| Atlantic Shores Offshore Wind South   | EDF Renewable Energy, Shell Renewables and Energy Solutions   | United States of America | Fixed Offshore Wind    | Commercial Farm                | >2500 MW (1500 MW currently under contract to New Jersey) | Planned            |
| Beacon Wind                           | BP, Equinor   | United States of America | Fixed Offshore Wind    | Commercial Farm                | 1230 MW first project, similar second project             | Planned            |
| Beatrice Offshore Wind Farm           | Equitix Limited   | United Kingdom           | Fixed Offshore Wind    | Commercial Farm                | 588 MW  | In Operation       |
| Block Island Wind Farm                | Ørsted  | United States of America | Fixed Offshore Wind    | Commercial Farm                | 30 MW   | In Operation       |
| Coastal Virginia Offshore Wind (CVOW) | Dominion Energy   | United States of America | Fixed Offshore Wind    | Demonstration, Commercial Farm | 12 MW pilot, 2.6 GW commercial                            | Under Construction |
| Empire Wind                           | BP, Equinor   | United States of America | Fixed Offshore Wind    | Commercial Farm                | 2070 MW   | Planned            |
| Firefly Floating Wind Farm            | Equinor   | Korea South              | Floating Offshore Wind | Commercial Farm                | 750 MW  | Planned            |
| Hornsea 1 Wind Farm                   | Ørsted  | United Kingdom           | Fixed Offshore Wind    | Commercial Farm                | 1218 MW   | In Operation       |
| Hornsea 2 Offshore Wind Farm          | Ørsted  | United Kingdom           | Fixed Offshore Wind    | Commercial Farm                | 1320 MW   | In Operation       |
| Kitty Hawk North Wind                 | Avangrid Renewables   | United States of America | Fixed Offshore Wind    | Commercial Farm                | 1000 MW   | Planned            |
| Moray East Offshore Wind Farm         | Diamond Green Limited, Ocean Winds, Three Gorges Dam          | United Kingdom           | Fixed Offshore Wind    | Commercial Farm                | 950 MW  | In Operation       |
| Ocean Wind 1                          | PSEG Power, Ørsted  | United States of America | Fixed Offshore Wind    | Commercial Farm                | 1100 MW   | Planned            |
| Park City Wind                        | Avangrid Renewables, Copenhagen Infrastructure Partners (CIP) | United States of America | Fixed Offshore Wind    | Commercial Farm                | 804 MW  | Planned            |
| Revolution Wind                       | Eversource, Ørsted  | United States            | Fixed Offshore         | Commercial Farm                | 704 MW  | Planned            |

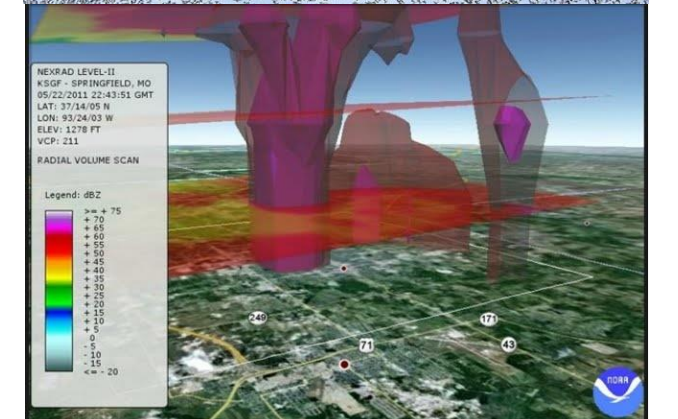
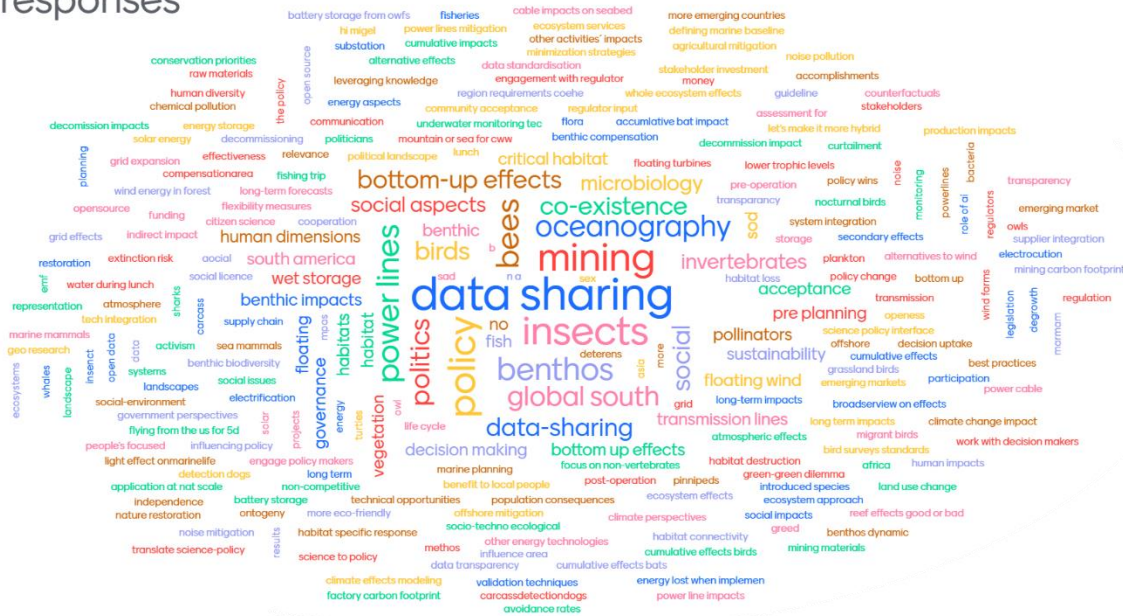


# Introducing Offshore Wind Metadata on Tethys

## Quick Data Discussion

- Sharing challenges are not just technical
- Don't forget discoverability!
- Reports ≠ data
- The value of raw data

Are there any topics you think were missing from this year's conference?  
401 responses





# Introducing Offshore Wind Metadata on Tethys

## Next Steps



### Tethys Team's Next Steps

- Adding more offshore wind metadata
- Seeking annual updates on forms
- Exploring data sharing architectures

### We Need Your Help!

- We encourage feedback on the format or content
- We need developer contacts on projects with generic emails
- We are seeking reports and publicly-available datasets

If you would like to submit a project, please fill out the metadata form template and email [tethys@pnnl.gov](mailto:tethys@pnnl.gov)!



# Thank you!

## Project Team

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