Title: Wildlife and Offshore Wind: Acoustic Interactions between Marine Animals and Offshore Wind Development

Time: 4 June 2025

Presenters: Aaron N. Rice, Cornell University, on behalf of the [Wildlife and Offshore Wind (WOW) Project](https://offshorewind.env.duke.edu/)

Abstract: As we look to sources of renewable energy to reduce reliance on fossil fuels and mitigate climate change, harnessing the steady and strong winds on the ocean can provide significant and consistent energy. Developing offshore wind farms, which started in Europe in the early 1990s, involves three primary sources of underwater noise: geotechnical surveys, construction, and operations. This webinar will explore what we know and what we don’t about the interactions between offshore wind development generated noise and marine animals, primarily mammals, based largely on the work done during the [DOE/BOEM funded WOW Project](https://offshorewind.env.duke.edu/).

Duration: a 40-minute presentation followed by a Q&A session

Audience: those interested in underwater noise generated during offshore wind energy development in general, and those involved in international decision-making community

Goal: inform public on various aspects of noise associated with offshore wind energy development in order to understand the complexities involved in potential interactions with animals as well as national and international regulations. The Global Alliance for Managing Ocean Noise (GAMeON) hosted a webinar on this topic, entitled ‘Practical Approaches for Reducing Ocean Noise Associated with Offshore Energy Renewable Energy Development’, the website for the webinar is [here](https://www.globalallianceoceannoise.org/offshore-energy) and the report is [here](https://www.globalallianceoceannoise.org/_files/ugd/62d341_15708380a15a4a4c9b9672645f9c750d.pdf).

Webinar outline:

* General introduction on sources of noise associated with offshore wind energy development
  + What are the characteristics of the noise associated with offshore wind energy development?
    - Geophysical/geotechnical surveys of the upper seabed to determine suitability for construction and cable laying
      * DOSITS How is sound used to research wind energy? <https://dosits.org/people-and-sound/examine-the-earth/how-is-sound-used-to-research-wind-energy/>
    - Installation of turbine foundations
      * DOSITS Animals > Effects > Pile Driving <https://dosits.org/animals/effects-of-sound/anthropogenic-sources/pile-driving/>
    - Noise created during operations
      * DOSITS Animals > Effects > Wind Turbine <https://dosits.org/animals/effects-of-sound/anthropogenic-sources/wind-turbine/>
* Geophysical/geotechnical surveys
  + What are the main noise sources?
    - * DOSITS Audio Gallery > Multibeam echosounder: <https://dosits.org/galleries/audio-gallery/anthropogenic-sounds/multibeam-echosounder/>
      * DOSITS Technology Gallery > Side scan sonar: <https://dosits.org/galleries/technology-gallery/observing-the-sea-floor/side-scan-sonar/>
      * DOSITS Technology Gallery > Sub-bottom profiler: <https://dosits.org/galleries/technology-gallery/observing-the-sea-floor/sub-bottom-profiler/>
  + What can we do to reduce machinery noise?
    - DOSITS > Animals > Effects > Moderate or Eliminate the Effects of Human Activities: <https://dosits.org/animals/effects-of-sound/moderate-or-eliminate-the-effects-of-human-activities/>
* Construction/installation noise
  + What are the methods for installing foundations: impact vs vibratory pile driving, and what we can do to mitigate them
    - Nosie mitigation systems
      * DOSITS Audio Gallery > Bubble curtain: <https://dosits.org/galleries/audio-gallery/anthropogenic-sounds/bubble-curtain/>
    - Impulsive vs continuous noise
      * DOSITS Animals > Effects > Impulsive Sound <https://dosits.org/animals/effects-of-sound/potential-effects-of-sound-on-marine-mammals/impacts-of-impulsive-sound/>
  + Dynamic positioning systems (DPS) for construction vessels
  + Local vessel noise increases
    - DOSITS > Animals > Effects > Commercial Vessel Traffic <https://dosits.org/animals/effects-of-sound/anthropogenic-sources/commercial-vessel-traffic/>
* Operational noise: spinning turbines and service vessels
* Outlook - How is the concern about offshore wind noise being addressed (by e.g. the EU, UK, and US)?

DOSITS resources:

[How does shipping affect ocean sound levels? – Discovery of Sound in the Sea](https://dosits.org/science/sounds-in-the-sea/how-does-shipping-affect-ocean-sound-levels/)

[Commercial Vessel Traffic – Discovery of Sound in the Sea](https://dosits.org/animals/effects-of-sound/anthropogenic-sources/commercial-vessel-traffic/)

[Ship Noise – Discovery of Sound in the Sea](https://dosits.org/resources/resource-categories/feature-sounds/ship-noise/)

[Ship Quieting Technologies – Discovery of Sound in the Sea](https://dosits.org/animals/effects-of-sound/moderate-or-eliminate-the-effects-of-human-activities/ship-quieting-technologies/)

[Webinar Archive: Marine Mammals and Vessel Noise – Discovery of Sound in the Sea](https://dosits.org/decision-makers/webinar-series/2023-webinar/marine-mammals-vessel/)

[Moderate or eliminate the effects of human activities – Discovery of Sound in the Sea](https://dosits.org/animals/effects-of-sound/moderate-or-eliminate-the-effects-of-human-activities/ship-quieting-technologies/)

[How is sound used to mitigate marine mammal/fisheries conflicts? – Discovery of Sound in the Sea](https://dosits.org/people-and-sound/investigate-marine-animals/how-is-sound-used-to-protect-marine-mammals/how-is-sound-used-to-mitigate-marine-mammal-fisheries-conflicts/)

Other resources:

[Underwater Noise from Large Commercial Ships—International Collaboration for Noise Reduction -](https://onlinelibrary.wiley.com/doi/full/10.1002/9781118476406.emoe056) [Southall - Major Reference Works - Wiley Online Library](https://onlinelibrary.wiley.com/doi/full/10.1002/9781118476406.emoe056)

[Frontiers | The Grand Challenges in Researching Marine Noise Pollution from Vessels: A Horizon Scan for](https://www.frontiersin.org/articles/10.3389/fmars.2017.00031/full) [2017 (frontiersin.org)](https://www.frontiersin.org/articles/10.3389/fmars.2017.00031/full)

[Frontiers | The Effects of Ship Noise on Marine Mammals—A Review (frontiersin.org)](https://www.frontiersin.org/articles/10.3389/fmars.2019.00606/full)

[Requirements for Reducing Underwater Noise From Ships | IEEE Journals & Magazine | IEEE Xplore](https://ieeexplore.ieee.org/abstract/document/7600360)