POTENTIAL ENVIRONMENTAL IMPACTS OF FLOATING OFFSHORE WIND IN CALIFORNIA'S FEDERAL LEASE AREAS

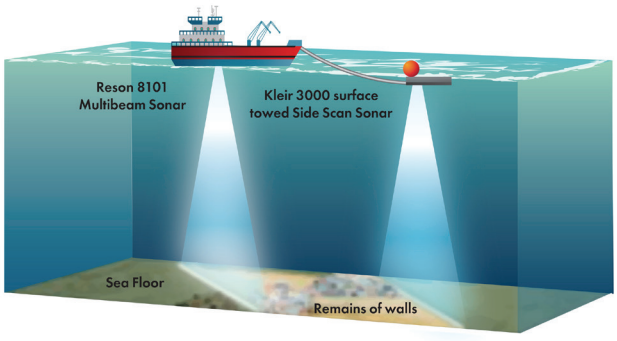
Impacts to Marine Mammals from Pre-Construction Surveys

CALIFORNIA OCEAN SCIENCE TRUST

OFFSHORE WIND ENERGY developers conduct geophysical surveys to inform project siting and design. Marine geophysical surveys are widely used by marine industries for activities such as seafloor mapping, identification of hazards to navigation, locating marine debris, shipwrecks, or archaeological sites, and oil and gas exploration. During these environmental imaging surveys both sound sources (active acoustics) and sound receivers (passive acoustic monitoring) are towed behind a boat or mounted on an autonomous underwater vehicle.[1,2] Because many of these techniques produce sound, they have the potential to displace or harm species, like whales and dolphins, that use sound to communicate, navigate, hunt for prey, and avoid predators.[3] (See Fact Sheet 4. Impacts to Marine Mammals).

Research Shows

- Some of the most intense geophysical survey types, such as **air-gun surveys used in oil and gas exploration, can pose physical risk of hearing damage (auditory injury) because they are loud (high output amplitude) and produce a wide range of pitches (wide frequency bandwidth) within marine mammal hearing ranges.[4] Air-gun surveys are not permitted by federal agency guidelines for pre-construction offshore wind energy surveying in California** and will not be used.[1,2]



Credit: BOEM. Geological and Geophysical Surveys. 2018. Examples of geophysical survey equipment include multibeam echo sounders and side scan sonars

- The **geophysical survey equipment most likely to be used in California's offshore wind energy pre-construction surveys are various different types of** multibeam echo sounders, side-scan sonars, or sub-bottom profilers, all of which produce active sound to map the seafloor. Magnetometers, which passively measures magnetic signatures, might also be used but likely pose no tangible risk of impacts.[1,2]
- **The survey types allowed in the Morro Bay and Humboldt lease areas, which are subject to rigorous environmental permitting rules under the National Environmental Policy Act (NEPA[1,2] are likely to pose few to no direct physical risks (of injury) to marine mammals** because they are relatively quiet and/or are at high frequencies out of the hearing range of many marine mammals, which also limits the distance the sound can travel from its sources.[4-6]

This document was reviewed by scientific experts for consistency with best available science in June 2024.

RESEARCH SHOWS CONTINUED

- While independent scientists have growing confidence and understanding of the physical risks that these imaging surveys pose to marine mammals,[7,8] understanding their behavioral responses is more complicated and might include leaving normal habitat or temporarily stopping feeding. **The behavioral responses to noise from pre-construction surveys are expected to be minimal** (because they are relatively quiet and high frequency), **but more study is needed, especially given the unique environment and species in these largely undeveloped offshore areas.**[11]

- The federal environmental report on site assessment activities within the Humboldt and Morro Bay wind energy areas determined that **marine mammal species within about 50 meters (m) of geophysical survey equipment have a potential for injury, and within about 500m have a potential for disturbance, meaning that they may react or change their behavior in some way.**[1,2] They also concluded that the likelihood of these interactions are low given that **survey vessels are required to have trained observers onboard, maintain 500m distance from any sighted marine mammals, and stop operations if any protected species are sighted within 500m.**[1,2]

- **Increased vessel traffic associated with geophysical surveys has a minor potential to impact marine mammals through strikes and disturbance, but this is expected to be mitigated by observers and operator training.**[2,10]

- **Strategies to reduce the risk of impacts on marine life include** avoiding any unnecessary survey effort, thoroughly evaluating any protected species and ecosystems that may be present in the survey area during proposed survey periods, avoiding important breeding or feeding times/seasons, ensuring that personnel are trained on survey protocols, and developing and communicating clear mitigation techniques.[10] Given the limitations of visual observations, especially for some cryptic and sensitive species (e.g., deep-diving beaked whales), **additional monitoring approaches may include using listening sensors to understand both baseline distribution as well as potential exposure and reaction during surveys.**[10]

References

1. BOEM 2022, https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Humboldt-EA.pdf
2. BOEM 2022. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/2022-MorroBay-FinalEA.pdf
3. NOAA 2024. https://www.fisheries.noaa.gov/insight/understanding-sound-ocean 2024.
4. Ruppel et al., 2022. https://doi.org/10.3390/jmse10091278
5. MacGillivray et al., 2013. https://doi.org/10.1121/1.4838296
6. Lurton 2016. https://doi.org/10.1016/j.apacoust.2015.07.012
7. Southall et al., 2008. DOI 10.1578/AM.45.2.2019.125
8. Southall et al., 2019. DOI 10.1578/AM.45.2.2019.125
9. Southall et al., 2021. DOI 10.1578/AM.47.5.2021.421
10. Nowacek and Southall 2016. https://sea-inc.net/wp-content/uploads/2019/10/Nowacek-Southall_2016_IUCN-Seismic-manual.pdf.
11. BOEM 2018. https://www.boem.gov/gandg-overview

MORE FACT SHEETS AVAILABLE AT:

https://www.oceansciencetrust.org/our-work/offshore-energy