

Understanding Ocean Sounds & Whales



New York is transitioning from fossil fuel energy infrastructure to renewable energy. Our state has a goal of 70% renewable energy by 2030 and 100% carbon-free electrical generation by 2040. Offshore wind will play an integral part in meeting these critical goals. Some of the strongest and most consistent winds in the country are off our coasts. This *sea change* will make New York a national leader in offshore wind over the coming decade.

There are currently 5 offshore wind farms moving through the permitting process in New York. Additional projects are also underway for other states. Each wind farm is required to perform pre-survey, known as "Geotechnical & Geophysical surveys". These surveys are conducted to map the geology of the seafloor and subsurface. The results of these surveys are used for several important reasons:

- Allow for the proper siting and design of marine infrastructure including wind turbines, cables and offshore substations
- Minimize impacts to sensitive fishing habitat
- Minimize impacts to sensitive ecological features
- Minimize impacts to sensitive archaeological features
- Map other infrastructure to avoid, such as shipwrecks and other energy infrastructure that is currently present in the ocean



The public has questions about offshore wind mapping and the technology used for this process. An important point of clarification is that these surveys are performed with technology that is dramatically different than the seismic airgun blasting used in the exploration of oil and natural gas.



Oil & Natural Gas Seismic Airgun Blasting

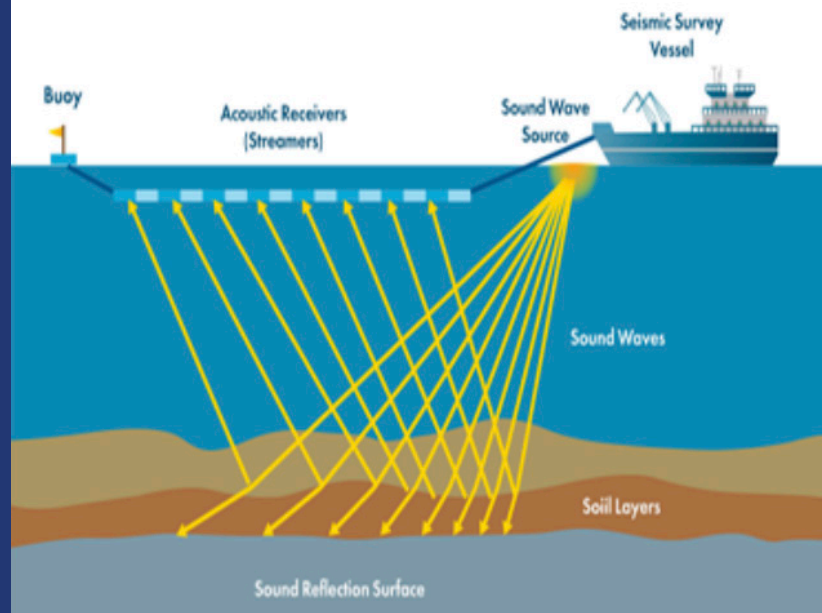
Oil and gas exploration requires tools such as seismic air guns that can penetrate miles deep into the seafloor to search for oil reserves. During seismic surveys for oil and gas, airguns towed by ships release pressurized blasts of air through the ocean and into the seafloor. Blasts are repeated as often as every 10 seconds for days, weeks, or months at a time.

The surveying needs for offshore wind are very different from oil and gas exploration. Seismic air guns are never used for offshore wind siting.

Seismic airguns create one of the loudest manmade sounds in the ocean. This damaging noise is harmful to marine life and can disturb, injure, or kill marine species from zooplankton, the base of the food web, to large marine mammals including whales. During seismic surveys for oil and gas, ships tow large arrays of airguns that release blaring pressurized blasts of air through the ocean and into the seafloor. Seismic airguns produce sounds that can travel underwater for several miles. At 220–250 decibels, the pulses produced by these air guns are louder than a Saturn V rocket during launch. Blasts are repeated as often as every 10 seconds for days, weeks, or months at a time. Airgun noise can reduce catch rates for fish and disrupt essential behaviors in marine mammals, like dolphins and whales. For marine animals, sound plays an essential role in feeding, mating, communicating, and avoiding predators.¹

According to a study published in *Nature News*, even microscopic animals can be impacted and killed from seismic air gun blasting. Researchers have found that the noise from air-gun blasts can kill zooplankton at distances of up to 3,937 feet away — more than two orders of magnitude farther than previously thought. Researchers fear that damage to these animals, collectively known as zooplankton, could harm top predators and commercially important species of fish that depend on such species for food.²

According to the *Bureau of Ocean Energy Management (BOEM)*, oil and gas surveys are conducted by vessels towing an array of airguns that produce low frequency sound pulses that penetrate deep into the subsurface and are then reflected and recorded by receivers to image deep geological features. **These types of surveys are not appropriate for siting renewable energy structures. Deep penetration seismic airgun surveys are not used for offshore wind energy projects.**³



¹ *Seismic Airgun Blasting*. Oceana USA. (August 31, 2022). <https://usa.oceana.org/our-campaigns/seismic-airgun-blasting/>

² *Air Guns Used in Offshore Oil Exploration Can Kill Tiny Marine Life*. *Nature News*. (June 29, 2017). <https://www.nature.com/articles/nature.2017.22167>

³ *Offshore Wind Activities and Marine Mammal Protection*. Bureau of Ocean Energy Management. (February 2023). <https://www.boem.gov/renewable-energy/state-activities/offshore-wind-activities-and-marine-mammal-protection>

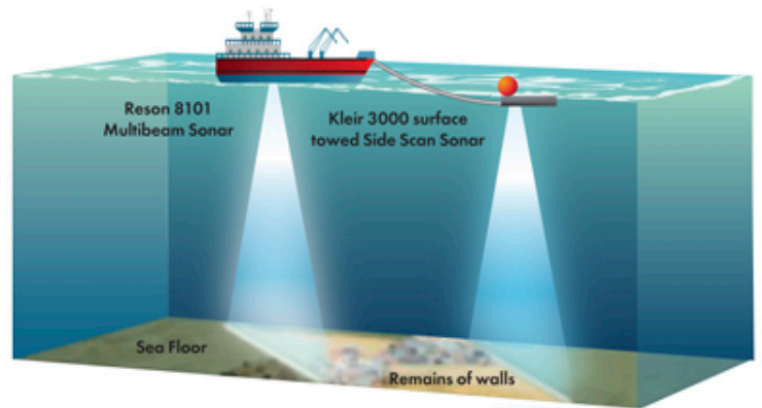


Offshore Wind Survey Work

In siting offshore wind, High Resolution Geophysical surveys or HRG surveys are conducted. *Because the depth of interest below the seafloor for an offshore wind project is much shallower than oil and gas exploration (where reserves may be miles below the seafloor) the acoustic equipment used in HRG surveys for offshore wind are much less impactful.*

Offshore wind surveys use sound waves that are reflected off subsea structures to collect data on conditions both at the seafloor and the shallow subsurface. HRG equipment generally includes off-the-shelf marine sonars and survey equipment (e.g., multi-beam echo sounders, side scan sonars, sub-bottom profilers), technology like the fish-finders and depth-finders found on most recreational boats. **HRG systems use higher frequencies than those used in seismic airgun surveys and image smaller structures with a high level of detail.**⁴

HRG sound sources generally operate in discrete frequency bands and for shorter durations than seismic airgun surveys. Although different marine mammal species can be classified as low, mid, and high frequency hearers, no marine mammals



hear frequencies above 200 kHz, so only a few HRG sources are detectable by marine mammals. **Most of the equipment used cannot be heard by humpback whales.**

Acoustic equipment used in HRG surveys is less powerful than seismic airguns and use narrower beams of sound. Therefore, since size of the area covered by sound is much smaller, there is less chance an animal will be exposed and typically the animal would have to be very close for there to be any potential impact (less than 200m). The sound has also been shown to diminish rapidly with distance from the sound source.

Physical attributes of HRG sources – such as beamwidth, exposure duration, and frequency – **make them significantly unlikely to result in harm of marine mammals.**⁵

⁴ *Geological and Geophysical (G&G) Surveys*. Bureau of Ocean Energy Management. <https://www.boem.gov/sites/default/files/about-boem/BOEM-Regions/Atlantic-Region/GandG-Overview.pdf>

⁵ *Geological and Geophysical (G&G) Surveys*. Bureau of Ocean Energy Management. <https://www.boem.gov/sites/default/files/about-boem/BOEM-Regions/Atlantic-Region/GandG-Overview.pdf>



What does "Incidental Take Authorization" mean?

"Taken" does **NOT** mean that the marine mammal was killed or even harmed. It is important to know that the federal agency called National Oceanic and Atmospheric Administration (NOAA) established and governs a process called "Incidental Take". All offshore wind companies conducting survey work in the ocean must receive this permit from NOAA. These permit requests are routine and are also issued to other ocean exploration activities including research vessels.⁷ "Incidental Take Authorization" refers to a permissible level of "harassment," or action which elicits a behavioral response, that may occur incidentally during a project activity.

A "take" is a means to estimate how many marine mammals might be exposed to a potential impact during project activity. If an animal is exposed to a potential impact, it is said to be "taken" because it met the minimum criteria for harassment that was analyzed for the project.

In summary, there is no permitted allowance for killing whales or other marine mammals, only extensive measures to protect these species from harm.

The take authorizations from National Marine and Fisheries Service (NMFS) are assessed by agency scientists to ensure that any impact is minimal. The reasonably expected impacts from the proposed activities are based on noise exposure thresholds that can potentially elicit a behavioral response and are categorized as Level B takes under the Marine Mammal Protection Act.

What Precautions are Taken When Conducting Offshore Wind Survey Work?

Federal regulations require strict protective measures when the offshore wind industry conducts activities offshore, including:

- **Exclusion zones around vessels.** Operators must monitor an "acoustic exclusion zone" for geophysical surveys, so that the zone is clear of any marine mammals and sea turtles for a certain amount of time before acoustic sound sources can be operated.
- **Visual monitoring by trained third-party, known as independent Protected Species Observers.** Protected Species Observers are trained professionals that look for marine mammals so that the possibility of vessel strikes is minimized and to shut down any sound sources if marine mammals are detected within established acoustic exclusion zones.
- **Independent reporting by Protected Species Observers during geophysical surveys.** Any interactions with protected species are immediately reported to NOAA Fisheries and BOEM.⁶



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⁶ *Offshore Wind Activities and Marine Mammal Protection*. Bureau of Ocean Energy Management. (February 2023). <https://www.boem.gov/renewable-energy/state-activities/offshore-wind-activities-and-marine-mammal-protection>

⁷ *Incidental Take Authorizations Under the Marine Mammal Protection Act*. NOAA Fisheries. (March 3, 2023). <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>