

# Exhibit S



## Underwater Noise and Marine Life



NOAA is committed to improving our understanding and management of human-induced noise and ocean life.

### What is the problem?

Sound is a fundamental component of habitat that many ocean animals and ecosystems have evolved to rely on over millions of years. It is the most efficient means of communication over distance underwater. In just the last 100 years, **human activity has increased** along more coasts, further offshore, and in deep ocean environments. Noise from this activity travels long distances underwater, leading to increases and changes in ocean noise levels.

**Rising noise levels can negatively impact ocean animals and ecosystems in complex ways.**

Higher noise levels can reduce the ability of animals to communicate with potential mates, other group members, their offspring, or feeding partners. Noise can reduce an ocean animal's ability to hear environmental cues that are vital for survival, including those key to avoiding predators, finding food, and navigation among preferred habitats.

### What is NOAA's approach?

**NOAA's approach to managing ocean noise aims to reduce negative physical and behavioral impacts to trust species, as well as conserve the quality of acoustic habitats.** In 2010, NOAA committed to improving the tools used by the Agency to manage underwater noise impacts more comprehensively, including to better address cumulative impacts to whales, dolphins, and porpoises. This commitment led to two phases:

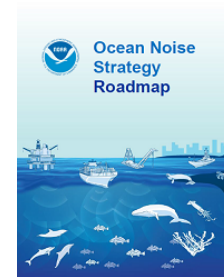
1. **Phase 1 — CetSound** develops two mapping tools, **CetMap** and **SoundMap**, which aim to improve our ability to visualize cetacean density and distribution, and man-made underwater noise, respectively.
2. **Phase 2 — The Ocean Noise Strategy**, following CetSound, identified NOAA's long-term ocean noise management goals, as well as science and policy mechanisms for NOAA to meet those goals. This phase continues through the development and implementation of plans to achieve Strategy goals by programs across the agency.

## Sound Clips

### Marine Life

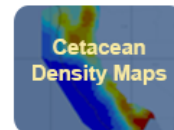
**\*NOAA Fisheries Issues Ocean Noise Strategy Policy and Procedural Directives (11/18/2016)\***

[Final NOAA Ocean Noise Strategy Roadmap \(September 2016\)](#)



## Resources

### Science Tools for Managers



### In the News

- [A rising tide of noise is now easy to see](#)
- [Underwater noise decreases whale communications in Stellwagen Bank sanctuary](#)
- [Motorboat noise gives predators a deadly advantage](#)
- [Silent oceans threaten world fish populations, researchers say](#)
- [Listen Up: Oysters May Use Sound to Select a Home](#)

### For further discussion

- [Blinded by the Noise](#)
- [Sound Check](#)
- [Just how loud is it out there?](#)
- [Sentinel Site National Issue: Noise](#)
- [Managing Noise in Marine Protected Areas: Listening to Our Sanctuaries](#)

### Other Resources

- [Discovery of Sound in the Sea](#)



## Human-Generated Sounds



- [US National Parks Service Natural Sounds Program](#)
- [Alaska seasonal vessel traffic activity](#)