

Narwhal echolocation beams may be the most directional of any species

November 9 2016



Narwhal photographed in the Arctic, from above. Credit: Kristin Laidre

Analysis of some of the first recordings of wintering narwhals showed that they may have the most directional sonar of any species, according to a study published November 9, 2016 in the open-access journal *PLOS*

ONE by Jens Koblitz from Bioacoustics Network, Germany, and colleagues.

The narwhal is considered one of the Arctic's most sensitive marine mammals: more than 80 percent winter in one place—Baffin Bay—and their summering refuges include Lancaster Sound, which is expected to become a year-round shipping route as the ice retreats with climate change. To get a baseline of narwhal sonar and its use, the researchers recorded the species' echolocation beams at 11 pack ice sites in Baffin Bay, West Greenland, in 2013. Hydrophones were placed at depths between 3 and 18 meters.

The recordings revealed that narwhal clicks are the most directional sonar signal of any species, which may help to reduce echoes from the water or sea ice surface. The researchers also determined click intensities, and found that narwhals scan vertically with sonar during ascents and descents. Besides characterizing narwhal sonar to provide a reference for future acoustic monitoring in the region, the data gathered in this study might be used to distinguish narwhal sonar from that of belugas, the Arctic's other toothed whale. Knowing how narwhals use sound could inform future work on how they might be affected by a changing Arctic environment.

"The data collected in a most challenging environment show that the narwhal emits echolocation clicks with the most directional beam of all echolocators," says Jens Koblitz.

More information: Koblitz JC, Stolz P, Rasmussen MH, Laidre KL (2016) Highly Directional Sonar Beam of Narwhals (*Monodon monoceros*) Measured with a Vertical 16 Hydrophone Array. *PLoS ONE* 11(11): e0162069. [DOI: 10.1371/journal.pone.0162069](https://doi.org/10.1371/journal.pone.0162069)

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