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Humpback whale song vocalization behavior and temporo-spatial distributions in the Norwegian and Barents Sea observed with a coherent hydrophone array

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The vocalization behavior of humpback whales in the Norwegian and Barents Seas is examined based on recordings of a large-aperture, densely-populated coherent hydrophone array system. The passive ocean acoustic waveguide remote sensing (POAWRS) technique is employed to provide detection, bearing-time estimation, time-frequency characterization and classification of the humpback whale vocalizations. The song vocalizations, composed of highly structured and repeatable set of phrases, were detected throughout the diel cycle between February 18

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based on inter-pulse intervals and time-frequency characteristics, verified by visual inspection. The song structure is compared for humpback whale vocalizations recorded at three distinct regions off the Norwegian coast, Alesund, Lofoten and Northern Finmark. Multiple bearing-time trajectories for humpback songs were simultaneously observed indicating multiple singers present at each measurement site. Humpback whale received call rates and temporo-spatial distributions are compared across the three measurement sites. Geographic mapping of humpback whale calls from their bearing-time trajectories is accomplished via the moving array triangulation technique.

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