The 2016–2017 deep-water Canada Basin Acoustic Propagation Experiment (CANAPE): An overview

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Abstract

The Arctic Ocean is undergoing dramatic changes in the ice cover and ocean structure. The 2016–2017 deep-water Canada Basin Acoustic Propagation Experiment (CANAPE) was designed to understand the effects of changing Arctic conditions on low-frequency, long-range propagation and ambient noise. Five acoustic transceivers were deployed in a pentagon with a sixth transceiver at the center, forming an ocean acoustic tomography array with a radius of 150 km in the central Beaufort Sea. The transceivers had broadband sources centered at approximately 250 Hz located at 175-m depth in the Beaufort Duct and 15 Hydrophone Modules spanning 135 m located above the sources. A Distributed Vertical Line Array receiver with 60 Hydrophone Modules spanning 540 m was embedded within the tomographic array to provide measurements of acoustic time fronts and their fluctuations. The tomographic array was largely in open water during summer, in the marginal ice zone as it transitioned across the array during the spring and autumn, and under complete ice cover during winter. The tomographic data, together with moored data from Sea-Bird MicroCATs, Acoustic Doppler Current Profilers, ice-profiling sonars, and precision temperature sensors, will help characterize the large-scale oceanographic variability throughout the year, aiding in the interpretation the acoustic data.