

A large, vibrant blue photograph of a wave crashing, serving as the background for the main title section.

# Ocean Sciences Meeting 2020

16-21 February 2020 in San Diego, Calif.

## ABOUT OCEAN SCIENCES MEETING 2020

The Ocean Sciences Meeting (OSM) is the flagship conference for the ocean sciences and the larger ocean-connected community. As we approach the UN Decade of Ocean Science for Sustainable Development, beginning in 2021, it is increasingly important to gather as a scientific community to raise awareness of the truly global dimension of the ocean, address environmental challenges, and set forth on a path towards a resilient planet.

# HE44D-2146 - Variability of topographic Rossby waves observed on the shelfbreak of the Chukchi Sea



Thursday, 20 February 2020

16:00 - 18:00

SDCC - Poster Hall C-D

## Abstract

One-year-long current measurements from August 2014 at 193 m in the Chukchi Sea shelfbreak (74.80°N, 167.89°W) showed subinertial topographic Rossby waves (TRWs) around 35-hour period. The mooring was equipped with an upward-looking acoustic Doppler current profiler (ADCP, RDI WHS 600 kHz) at 58 m and a downward-looking ADCP (RDI WHS 300 kHz) at 63 m, 29 temperature sensors, and four salinity sensors. The observations reveal a feature of TRWs such as bottom-intensified up-slope current fluctuations significantly coherent with near-bottom temperature fluctuations with a phase lag of approximately 90° at 35 h. Theoretical estimates of wavelength, angle of wavenumber vector, and bottom-trapping depth confirm that the observed near 35-h TRWs are plausible in the study area. Energetic TRWs are observed in September and October, during the sea-ice free season, while weak TRWs in other sea-ice covered months. Overall, TRW events coincide with strong wind-stress events around the study area, suggesting that the TRWs are triggered by atmospheric forcings. These findings imply that increasing sea-ice loss can result in the generation of more energetic TRWs, which could play an important role in water exchange between the shallow continental shelf and deep ocean.

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