

Multi-decadal ocean-atmosphere interactions in the Western Arctic Ocean - Insights from a marine sediment core from Herald Canyon

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Multi-decadal to centennial scale variability in the natural climate system is particularly difficult to assess, but required to properly assess anthropogenic forcing. While a number of recent studies have identified multi-decadal variability in historical sea-ice records, supporting evidence of this is lacking from most marine geological studies. In 2014, the Swedish, Russian, US Arctic Ocean Investigation of Climate, Cryosphere, Carbon Interactions (SWERUS-C3) expedition on icebreaker Oden recovered a remarkable sediment core (SWERUS-4PC1) from the Herald Canyon in the western Arctic Ocean. This record, obtained from a drift deposit in Herald Canyon, contains a persistent and strong, multi-decadal signal of bottom-water current speed over the past 3000-4000 years. These variations may be related to either upwelling of Atlantic waters into Herald Canyon, or brine rejection during periods of intense sea ice growth in the Chukchi and East Siberian Seas. Here we present the initial sedimentological and oceanographic framework for the core, and using preliminary results from radiocarbon dating investigate the frequency of variability and potential links to external climate forcing.