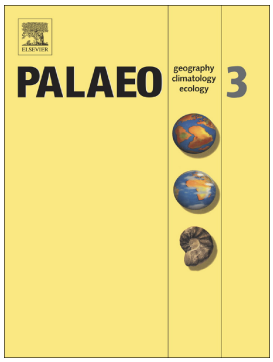

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Meltwater and seasonality influence on Subpolar Gyre circulation during the Holocene.

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Abstract

Dinoflagellate cyst assemblages in a marine sediment core from the Iceland Basin were used to carry out qualitative and quantitative assessments of upper ocean conditions in the northern branch of the Subpolar Gyre (SPG) during the Holocene. The data revealed that the early Holocene, i.e. prior to ~6.8 kyr B.P., experienced elevated summer sea surface temperatures (SST). In contrast, winter SST was lower compared to modern conditions. This stronger-than-present seasonality revealed by our data thus shows the influence of the early Holocene insolation forcing. Higher seasonality also dominated the reconstructed sea surface salinity (SSS) in the same period, with lower salinity during both summers and winters. The lower SSS suggests freshwater advection into the SPG, and the dinoflagellate cyst content from this interval indicates a dominant sourcing from