



Time-slice reconstructions of ocean circulation changes at the continental margins of the Nordic and Barents Seas during the last 16,000 cal yr BP

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Ocean circulation changes along the continental margins of the Nordic and Barents Seas have been investigated in order to reconstruct the changes in the inflow of Atlantic water (AW) through the last 16,000 cal yr BP. We have selected five time-slices representing the late glacial (16,000-15,000 cal yr BP), the Bølling-Allerød warm interstadials (14,500-13,500 cal yr BP), the Younger Dryas cold stadial (12,500-11,500 cal yr BP), the early Holocene (9500-7500 cal yr BP) and the late Holocene (4000-2000 cal yr B.P.). For this study, we have compiled twelve previously published records of the distribution of benthic foraminifera faunas and ice-rafted debris. The results show that the earliest (16,000-15,000 cal yr BP) sign of Atlantic inflow was recorded at the northern Iceland shelf. The inflow of warm AW to the Nordic Seas has been persistent since then, but with a highly variable strength and spatial pattern. The eastern margin of the Nordic Seas and the Icelandic shelf exhibit a seesaw pattern in the strength of the Norwegian Atlantic Current (NwAC) and the Irminger Current (IC) during the late glacial, Bølling-Allerød and Younger Dryas periods. During the Holocene, no zonal differences in the inflows of NwAC and IC are observed. Instead, a strong meridional gradient is observed with warmer conditions at lower latitudes and relatively cold conditions at the high northern latitudes. The general warming of the entire water column over the shelf areas in the early Holocene, with temperatures higher than today, indicates that the warming was not only an effect of the high solar

insolation, but was also a result of increased flux of AW to the Nordic seas