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Deglacial subsurface injections of Atlantic water into the Nordic Seas and its effect on interglacial climate development

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Using multi-proxy sediment records from two distant sites in the North Atlantic and the Nordic Seas, surface and bottom water changes were investigated over the past 135 ka with special emphasis on the last and present interglacial (Eemian and Holocene). The two interglacials exhibit a very similar developing structure during each preceding deglaciation (TI and TII) in the Nordic Seas by showing a pronounced cold–warm–cold variability. Like TI, also TII experienced a Younger-Dryas-like cold reversal (YDII), a preceding Bølling/Allerød-like (B/AII) and a H-event (H11). But unlike TI, the cold events during TII were associated with intermittent invasions of an Atlantic faunal component (Beella megastoma) which underscores a northward penetration of mid-latitude waters at the subsurface leaving a vertical water mass structure in the North which differed from that of TI. Very likely, this difference also affected the subsequent oceanic development because the main interglacials that followed not only reveal a regional antiphase, intra-interglacial behavior of peak ocean warmth between each other, they also verify strong contrasts in surface ocean hydrography. Moreover, colder Eemian than Holocene temperatures are noted in the Nordic Seas, and vice versa in the North Atlantic. A reduced intensity of Atlantic ocean heat transfer to the Arctic is therefore inferred for the Eemian, thus arguing for a reassessment of current Arctic paleoclimate models and a better reconciliation with empirical field data.