



North Atlantic deep water sources and export since MIS3: implications from Nd isotopes

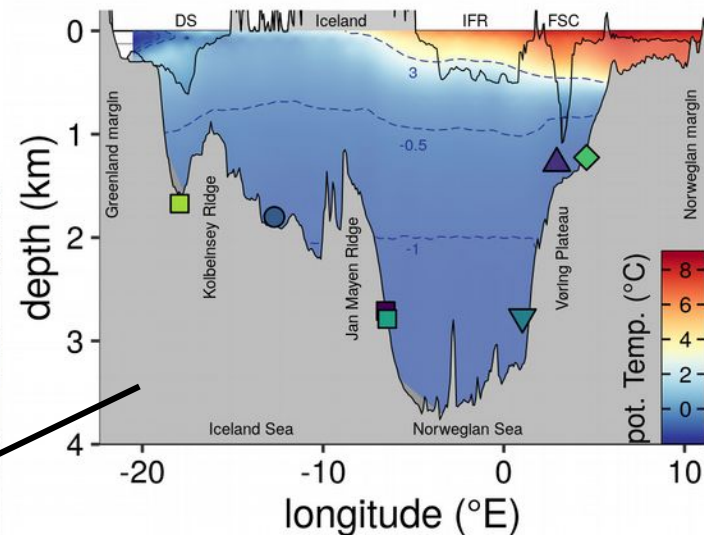
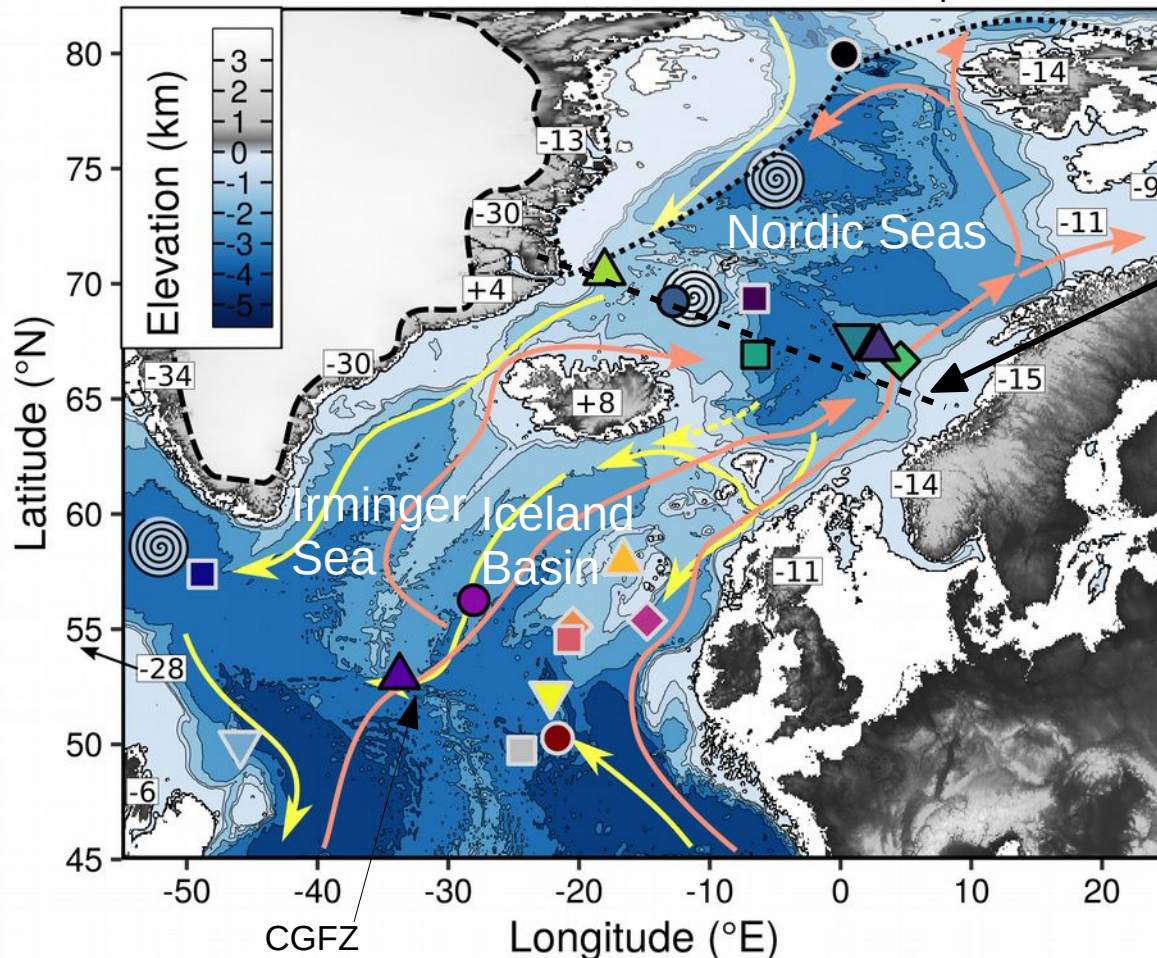
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Jörg Lippold



North Atlantic and Nordic Seas ϵ Nd

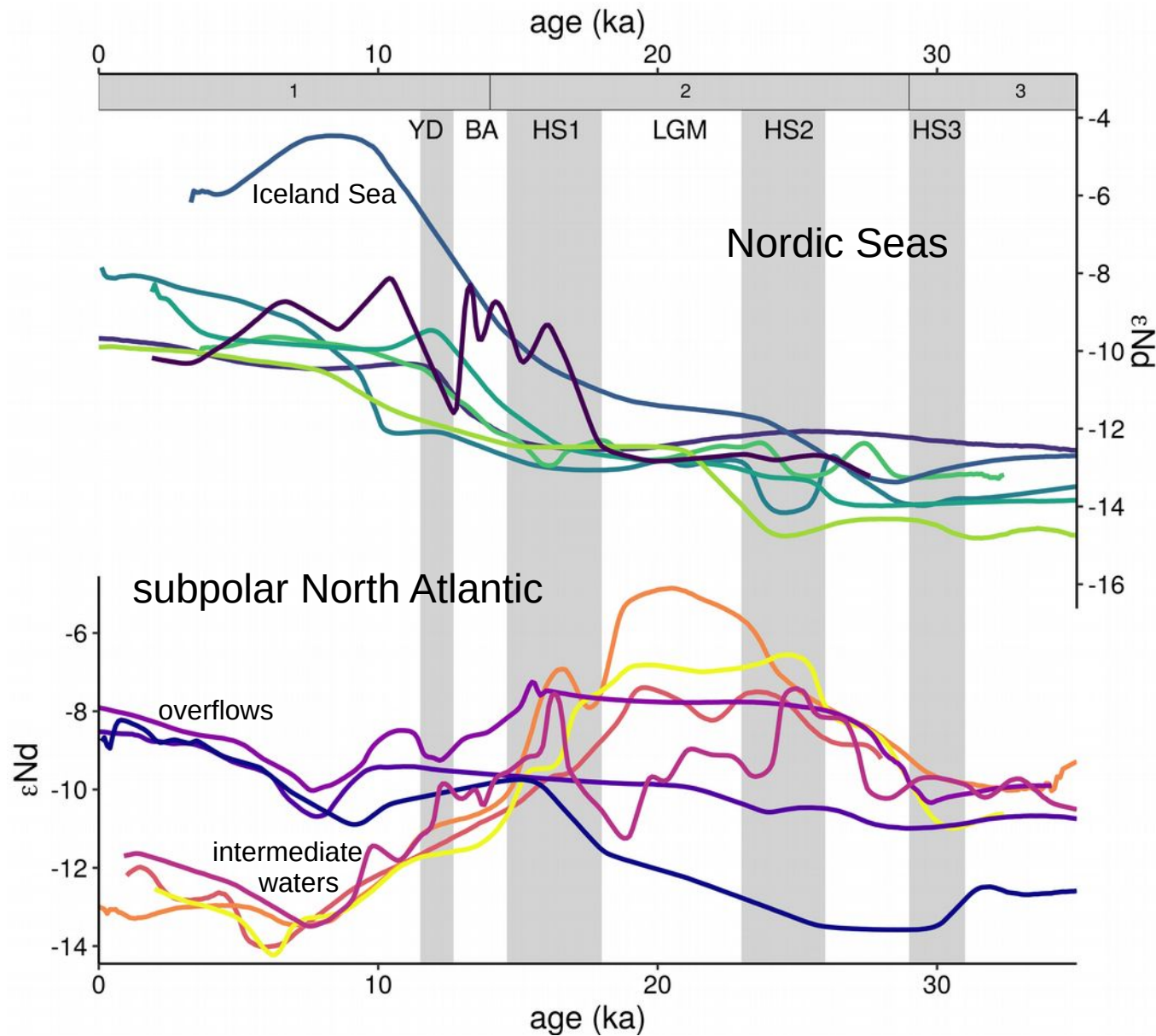
Sites with authigenic ϵ Nd data:

symbol borders: published (grey) and this study (black)
numbers: ϵ Nd of local rocks, arrows: surface and deep water flows



Interpretations of ϵ Nd in subpolar North Atlantic and Nordic Seas are complicated by reactive sediments, an enormous diversity of rock isotopic signatures and complex hydrography

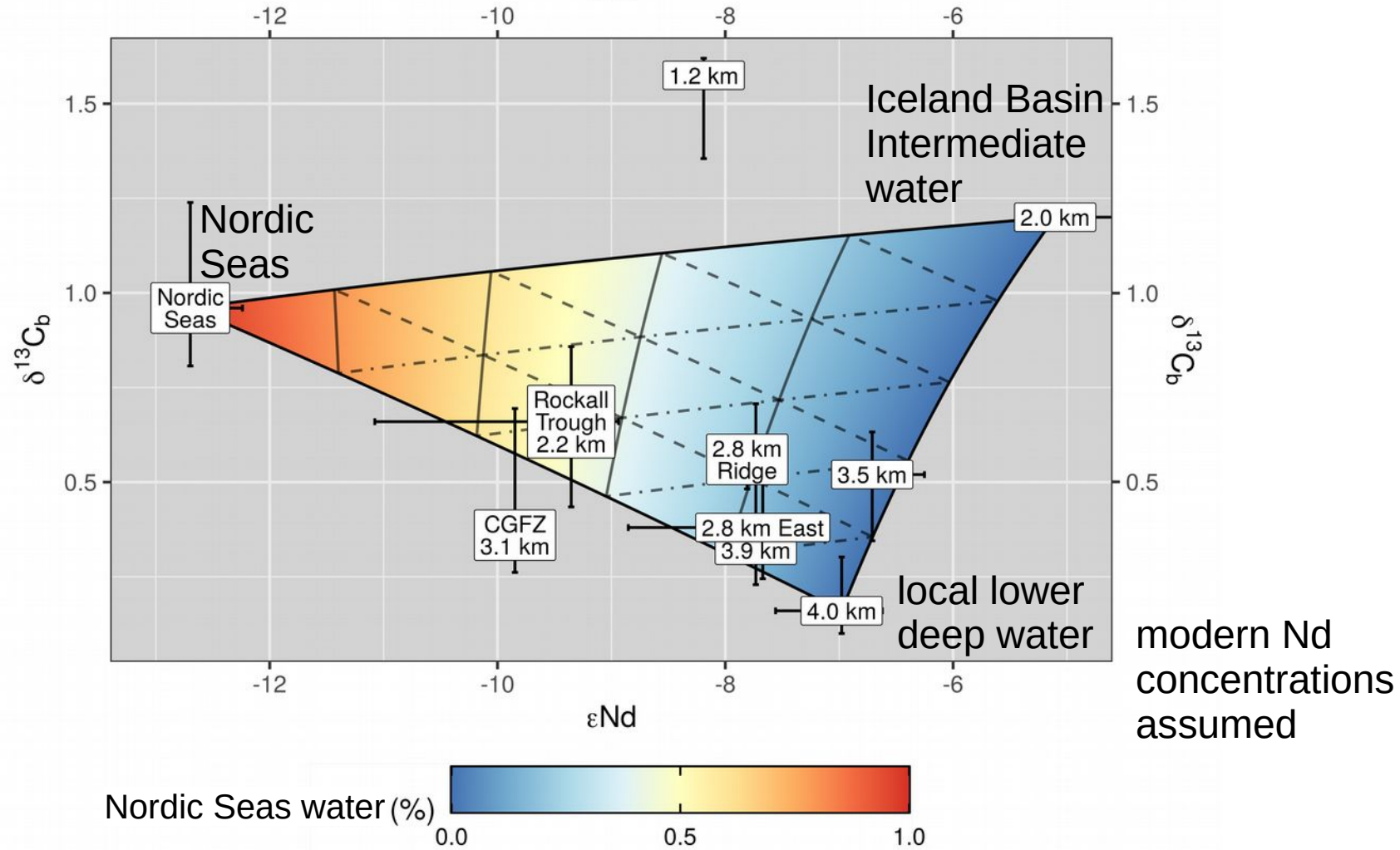
North Atlantic and Nordic Seas ϵ_{Nd}



- unradiogenic and homogeneous Nordic Seas during MIS 2 & 3
- radiogenic intermediate waters in SPNA during LGM
- unradiogenic deep waters west of MAR and in CGFZ
- absence of strong overflows during MIS 2

LGM: three water masses in the SPNA

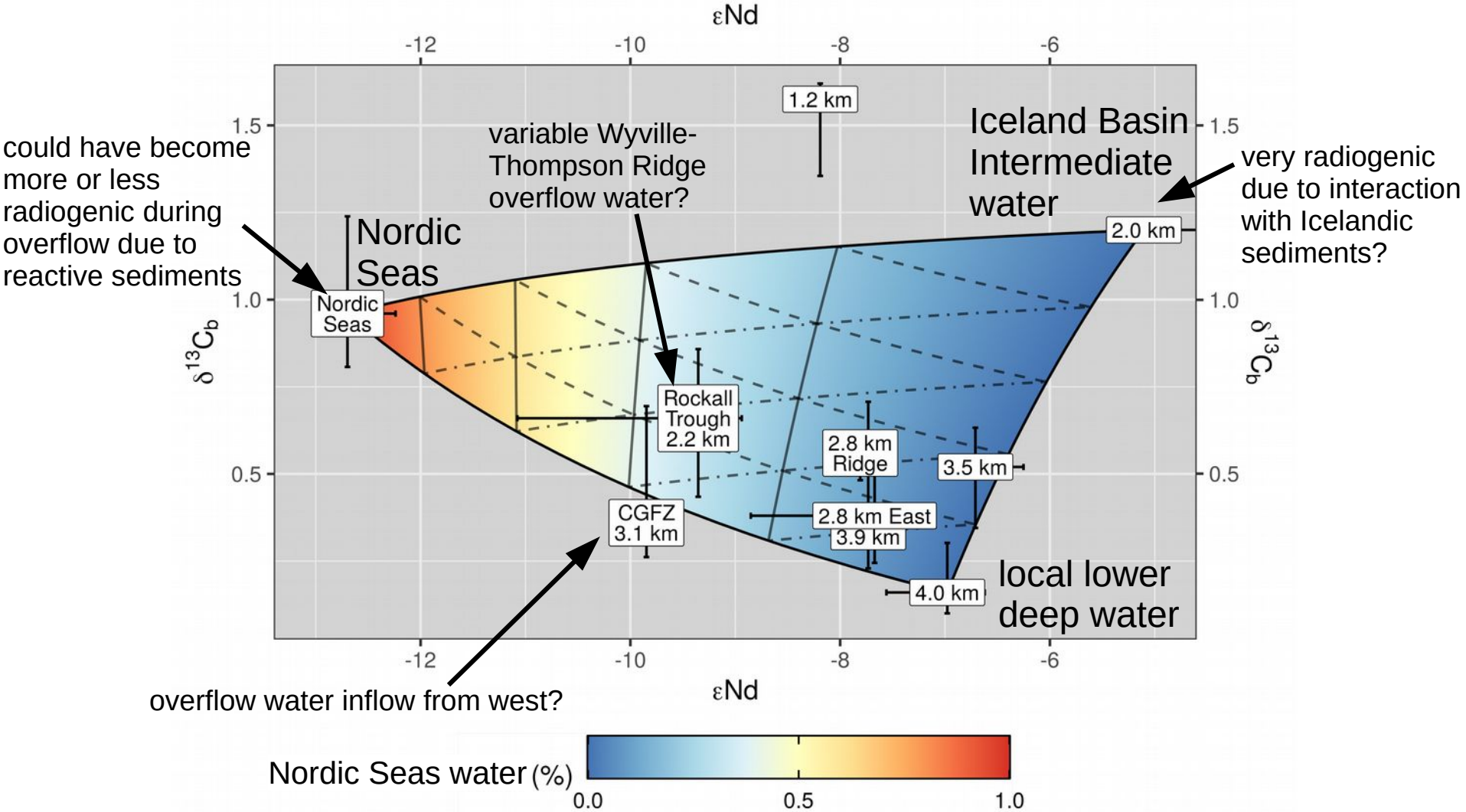
Combining $\delta^{13}\text{C}$ and ϵNd to disentangle three component water mass mixing



benthic $\delta^{13}\text{C}$ either from the same or inferred from nearby sites

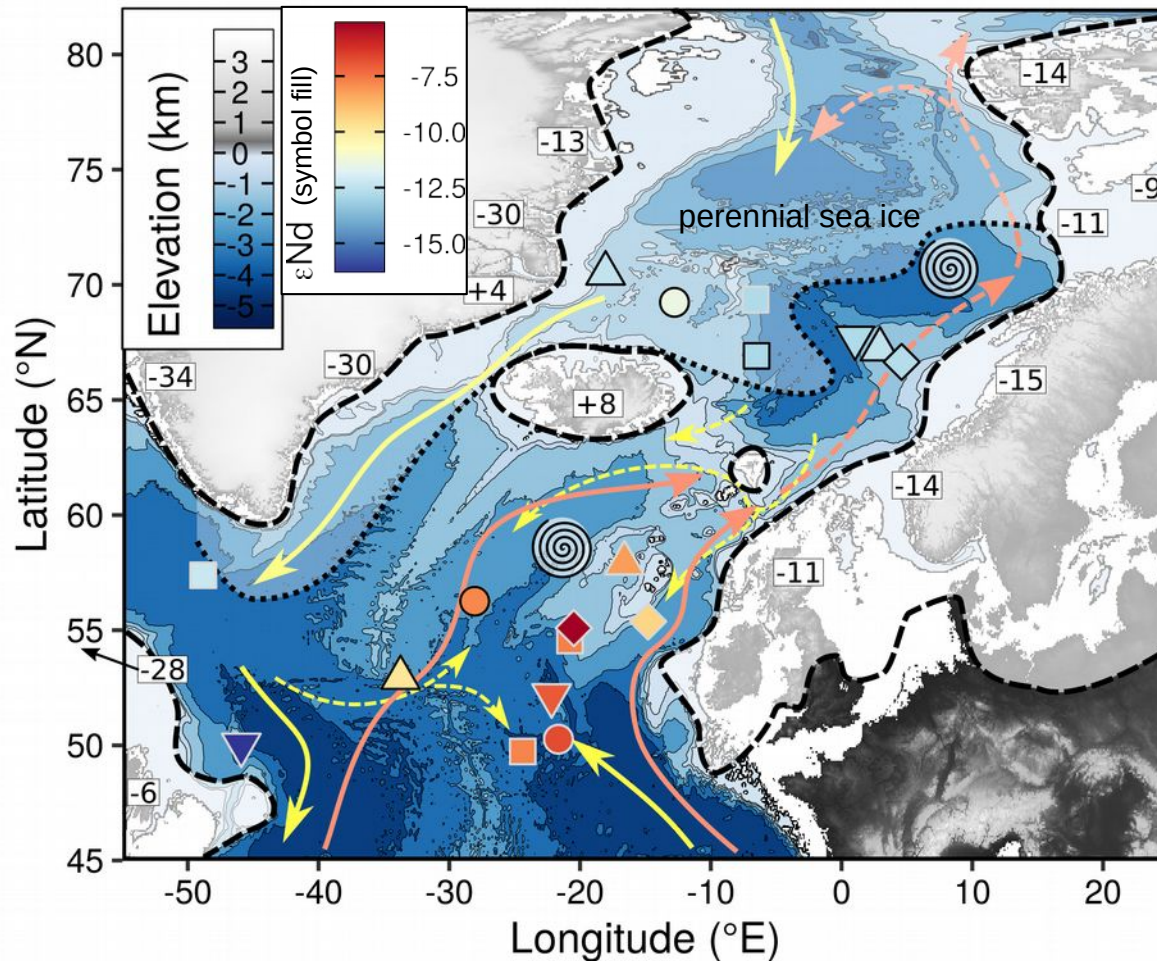
LGM: three water masses in the SPNA

2 x modern Nd concentrations for Nordic Seas assumed



benthic $\delta^{13}C$ either from the same or inferred from nearby sites

Inferred LGM water mass flows



- deep water formation in Norwegian Sea and Iceland Basin
- significant overflows into Irminger Sea
- overflow into Iceland Basin restricted, but import through CGFZ
- Iceland margin sediments could have led to very radiogenic intermediate water
- ➔ export of radiogenic intermediate and less ventilated unradiogenic deep water