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Surface water mass distribution, ocean chemistry changes and sea ice conditions in the central Fram Strait over the last 47ka

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Surface water mass distribution, its chemical and physical parameters and sea ice conditions play a critical role in the atmosphere - ocean surface interaction and climate development in the Arctic region. In the Fram Strait a complex oceanography and a highly variable sea ice margin have been responsible for abrupt climate and oceanic circulation shifts in the northern North Atlantic region during the Marine isotope stage (MIS) 3, MIS 2 and MIS 1. In the present study, we use a multiproxy approach to reconstruct changes in sea surface conditions and sea ice variability over the last 47 kyr BP. Core HH12-946MC was taken from 2637 m water depth in the central part of the Fram Strait (78°53' N'; 00°14' W), in the area between the limits of average summer minimum sea ice extent and the winter maximum sea ice extent. We infer near surface temperature from planktonic foraminiferal counts, Mg/Ca and oxygen isotopes of Neogloboquadrina pachyderma. In addition, we examine calcite dissolution and carbonate chemistry changes using counts of shell fragments of planktonic foraminifera, % $CaCO_3$ content of the sediment and shell weights of two dominant species N. pachyderma and Turborotalita quinqueloba in narrow size fractions (100-125 and 150-180 μm).
Our preliminary results indicate that temperatures increased during ice-rafting events to peak interstadial values as ice-rafting terminated. Dissolution proxies indicate very good preservation of calcite shells of planktonic foraminifera from mid MIS 3 to the onset of the Last Glacial Maximum with maximum shell weights during warm (near) sea surface conditions and increased deposition of IRD. The most poorly preserved shells are found in the Holocene except for a short-lasting improvement at 6-7 kyr BP.