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Tracing Pleistocene to Holocene meltwater events and provenance of sediments in Baffin Bay using radiogenic isotope signals

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Large meltwater discharge is the principal carrier of detritus from the continent into the ocean and the dispersion of this detritus by ocean currents is a measure for the spatially focused addition of freshwater in the ocean in the high latitude areas. To trace Greenland ice sheet dynamics and freshwater routing during late Pleistocene to Holocene climate transition, we generate strontium (Sr), neodymium (Nd) and lead (Pb) isotope records on sediment cores in the Baffin Bay: GeoTÜ SL 170, covering the last 18.000 years of climate history and GeoTÜ SL 174, covering 40.000 years. Sr, Nd and Pb isotopes are used as proxies for the provenance of continental detritus and seawater sources. Isotope analyses were performed on two separated fractions from the sedimentary core material: the chemically leached fraction and the remaining detritus. Leachates are supposed to represent Fe-Mn coatings formed on the surface of the sediment grains and to reflect the bottom water signal. The detrital fraction acts as a tracer for the meltwater event and weathering regime of the nearby continental masses. For the detrital fraction of the core SL 170, a pronounced shift can be observed in all three isotope systems at $\sim$ 12 ka, what coincides with the Younger Dryas cold event. For the detrital fraction the $^{87}Sr/^{86}Sr$ is around $\sim$0,72 before the event and reaches up to $\sim$0,74 after. Nd isotope composition (ε_{Nd}) changed from $\sim$-26 to $\sim$-32. The shift suggests a change in the continental sources from West and West-South Greenland to the Baffin Island and Canadian Archipelago. It can be explained by the ice sheet melting processes. The $^{206}Pb/^{204}Pb$ values for the detrital fraction range from $\sim$17 before the shift to $\sim$18 after. On the contrary, the leachates show pronounced radiogenic signatures with values changing from $\sim$21 to $\sim$23. The reason for such an unusual high values is most likely in the composition of the leached material, which doesn't seem to show the presence of Fe-Mn coatings as was suggested before. The work on the second core SL 174 is in progress. Up to now the results show similar patterns for isotope ratios as in the case of SL 170.