



Impact of Meltwater Events on Detrital Fluxes along Melville Bay, Northwest Greenland

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The Greenland Ice Sheet (GIS) is the largest storage of freshwater in the Northern Hemisphere. Its development is closely coupled to the interaction between variations in global climate and ocean circulation. The feedback mechanism between ice sheet and interglacial warming climate is meltwater discharge and enhanced freshwater input into the ocean. The Baffin Bay is an important pathway for Arctic Ocean water and meltwater and therefore freshwater input into the Atlantic Ocean. Melville Bay, a sparsely investigated area within northeast Baffin Bay along the west coast of Greenland, is presently a focus of freshwater input and drains about 27% of the GIS runoff [1]. We investigate potentially changing provenances of silicate detrital material discharged by meltwater into Melville Bay throughout the Holocene. Signatures of radiogenic isotopes strontium (Sr), lead (Pb) and neodymium (Nd) serve as reliable provenance tracers based on their resistance to weathering and transport processes. Samples are taken from a gravity core collected during expedition MSM44 in southern Melville Trough. Isotope ratios vary from 0.7418 to 0.7667 ($^{87}\text{Sr}/^{86}\text{Sr}$), 18.16 to 19.41 ($^{206}\text{Pb}/^{204}\text{Pb}$) and -27.80 to -24.66 (ϵNd). The data indicate a shift in sediment sources before 8 ka BP with Sr isotope signatures becoming more radiogenic and Pb and Nd signatures becoming less radiogenic. We observe a gradual change towards less radiogenic values within the Sr isotope system and more radiogenic values within the Pb and Nd isotope systems from 8 ka BP onwards. Additionally, sediment leachates from the same samples have been analyzed to obtain a possible isotopic seawater signal and to enable comparison between potential changes in source contribution of detrital material discharged through meltwater events and material transported by distinct water masses throughout the Holocene. However, the extraction of a clear seawater signal in the region has to be further analyzed and tested for final accuracy of the results.

[1] Rignot & Kanagaratnam (2006), *Science* 311, 986-990