

Dataset title: Surface (sea floor) and near-surface (box cores) sediment mineralogy in Baffin Bay

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Abstract:

To better understand the glacial history of the ice sheets surrounding Baffin Bay and to provide information on sediment pathways, samples from 82 seafloor grabs and core tops, and from seven box cores were subjected to quantitative X-ray diffraction weight percent (wt.%) analysis of the <2 mm sediment fraction. The samples were collected between 67°N and 78°N, in water depths of 155 to 2375 m and were retrieved on cruises between A.D. 1964 and 2009. Grain size, magnetic characteristics, and colour reflectance data were also obtained on many of the samples.

Twenty-one non-clay and 10 clay mineral species were identified; the average wt.% of the non-clay minerals was 70% and was dominated by quartz, various feldspars, and dolomite, whereas the dominant clay minerals were 1 M illite, biotite, and chlorite. Cluster analysis on principal component scores identified three main mineral groups, which also had strong associations with grain size and sediment magnetic properties. Box cores from the deep central basin (>2000 m) all show an abrupt drop in calcite wt.% (post-5 cal ka BP?) following a major peak in detrital carbonate (mainly dolomite). This dolomite-rich detrital carbonate (DC) event in JR175BC06 is possibly coeval with the Younger Dryas cold event.

Four possible glacial-sourced end members were employed in a compositional unmixing algorithm to gain insight into down core changes in sediment provenance at the deep central basin. Estimates of the rates of sediment accumulation in the central basin are only in the range of 2 to 4 cm/cal ka, surprisingly low given the glaciated nature of the surrounding land.