Geophysical Research Abstracts, Vol. 9, 04268, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04268

A 1.1 Ma long record of sediment provenance at the southern Gardar Drift: implications for millennial-scale changes in subpolar deep water hydrography

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IODP Site U1314 of the North Atlantic paleoceanography study (IODP Expeditions 303 and 306) provides a new deep water (2800m water depth) sedimentary archive from the southern Gardar Drift that will allow to determine the long-term evolution of millennial-scale variability in ice sheet stability and thermohaline circulation over the last few million years. Sediment physical property records of the orbitally dated ODP Site 983 (northern Gardar Drift) and IODP Site U1314 (southern Gardar Drift) reveal a high similarity. Thus a detailed correlation of colour reflectance and magnetic susceptibility data from both sites allowed deriving a new age model of orbital resolution for the last 1.8 Ma at Site U1314. High resolution XRF - core scanning measurements of major elements K and Ti are used to track changes in terrigenous provenance during the last 1.1 Ma. Low K/Ti ratios are typical for interglacials and millennial scale warm events with sediment delivery mainly through the ISOW from the Icelandic basaltic province. On the other hand glacials and stadials are characterized by higher K/Ti indicating a dominance of acidic sediment sources which were likely transported by enhanced NEADW/LDW flow. A striking similarity between K/Ti at Site U1314 and the deep sea δ^{13}C record from ODP Site 607 on orbital time scales corroborates our interpretation of K/Ti as a proxy for deep water variability. Suborbital changes similar to Dansgaard/Oeschger and Bond oscillations are a pervasive feature of the K/Ti time series during and after the Mid Pleistocene Transition. Variance analyses indicate that enhanced millennial scale variability in siliciclastic supply and deep hydrography oc-

curs during ice growth phases when global benthic δ^{18}O is within the range of $\sim$4.1 to 4.6 per mil.