Geophysical Research Abstracts,
Vol. 10, EGU2008-A-05701, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-05701
EGU General Assembly 2008

Surface water heat transport in the South East Atlantic Ocean during Marine Isotope Stage 11

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Marine Isotope Stage (MIS) 11 has been the focus of much attention because of its similar orbital forcing to the Holocene, and because it was the first of the major 100ka interglacials to follow the Middle-Brunhes Transition. One of the possible explanations for the long duration of interglacial warmth during MIS-11 is a vigorous oceanic thermohaline circulation that was able to re-distribute heat and help to maintain interglacial conditions for 25-30 kyr. ODP-1085, located in the South East Atlantic Ocean (29.5^{o}S, 13.5^{o}E), has been studied because it is sensitive to the northwards transport of warm water within the Benguela Current, which in turn fuels density-driven overturning of surface waters in the northern North Atlantic. A new alkenone-derived sea-surface temperature record shows that deglacial warming during termination 5 had an amplitude of 7^{o}C in surface waters, and began at 448 ka, approximately 17 kyr before the onset of ice-volume change recorded in a coeval benthic foraminifera δ^{18}O record. The onset of sea-surface warming began coincidentally with a decrease in sub-surface temperatures, recorded in the δ^{18}O of the sub-surface dwelling foraminifera *Neogloboquadrina incompta*, suggesting a thinning of the surface warm layer and an increase in wind-driven heat transport from the SE to the NW Atlantic at this time. A 'thin' surface warm layer was maintained from roughly 428-390 ka, suggesting that northwards heat transport and an active THC remained in place after the initial increase in global ice-volume at a time of minimum northern hemisphere insolation at

397 ka. A comparison to published North Atlantic sites ODP-980 and MD01-2443, retuned to the same age-model, also suggests that millennial-scale North Atlantic cooling events correspond to short-term sub-surface cooling in the ODP-1085 *N. incompta* δ^{18}O record. This could be explained by an intensification of low-latitude trade-wind circulation increasing the transport of warm-surface water away from the SE Atlantic margin, in a similar fashion argued for nearby published sites during Greenland Stadial 1. This implies a strong millennial-scale teleconnection between the North and South Atlantic Ocean that was maintained throughout earlier glacial-interglacial cycles.