Geophysical Research Abstracts,
Vol. 10, EGU2008-A-12334, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-12334
EGU General Assembly 2008

A Quaternary record of aeolian dust in the Scotia Sea?

B.A. Maher (1), R. Pugh (2, 3), C.D. Hillenbrand (2), N. McCave (3), Gerd Kuhn (4)

1. Lancaster Environment Centre, Lancaster University, UK (b.maher@lancs.ac.uk / Fax: +44 1524 510269)
2. British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET, UK
3. Department of Earth Sciences, University of Cambridge, Downing Street, Cambridge CB2 3EQ, UK
4. Alfred Wegener Institute for Polar and Marine Research, Am Alten Hafen 26, D-27568 Bremerhaven, Germany

Artificial iron fertilization experiments in the Southern Ocean – a high nutrient, low chlorophyll (HNLC) region of the world oceans – indicate that productivity and subsequent drawdown of carbon dioxide from the atmosphere can be enhanced with increases in bioavailable iron supply. The past record of terrestrial dust flux to the Southern Ocean thus carries potential significance in the context of whether this region was a significant glacial sink for CO_2due to enhanced biological productivity (through iron fertilisation by increased glacial dust fluxes) and lock-up of CO_2 in the deep Southern Ocean. Debate exists regarding the presence of dust in Southern Ocean sediments. The supply of detrital minerals to the Southern Ocean has so far been attributed dominantly to glacigenic processes, with glacial erosion of mafic magmatic rocks in distinct source areas, seaward transport of the glacigenic debris by glaciers and ice streams, and offshore transport by current and turbidite activity and ice-rafting. Here, prompted by the close resemblance between the downcore magnetic susceptibility of Scotia Sea sediments and the dust flux record in Antarctic ice cores, we examine if there is a glacial/interglacial signal of changes in terrestrial dust flux in sediment cores from the Southern Ocean, based on analyses of sediment particle size, iceberg-rafted debris content, and magnetic mineralogy and magnetic grain size.