Goldschmidt 2000
September 3rd–8th, 2000
Oxford, UK.

Journal of Conference Abstracts
Volume 5(2), 717

Orbital Forcing of Dust Supply to the North Canary Basin over the Last 250 kyrs

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This study is a multidisciplinary approach to reconstruct the Northwest African palaeo-climate in terms of aridity and wind strength over the last 250 kyrs. A strong interaction between the atmospheric and ocean circulation systems exists in this region. Trade winds drive seasonal coastal upwelling and dust storm outbreaks from the neighbouring Sahara desert are the major source of terrigenous sediment to the basin.

Recently, several studies have linked dust input to climate variation in the source areas, thus providing a low-latitude climate response to solar radiation. Matthewson et al., (1995) and Tiedemann et al., (1989) interpret increments in dust supply by an increase in aridity at the source, which would be controlled by precession. This hypothesis is based in the relation between the humidity/aridity cycles and the low-latitude insolation forcing of the African monsoon. However, after the results from General Circulation Models (GCM) it has been proposed that ice sheets can affect African climate via changes in sea surface temperatures over the North Atlantic Ocean (de Menocal et al., 1995). Then, the role played by the orbital forcing as a driving mechanism in dust input fluctuations is still a matter of debate.

To investigate the forcing mechanisms for dust input and wind strength in the North Canary Basin, the temporal variability pattern of both sedimentological and geochemical proxy records has been analysed in two sediment cores between latitudes 30º30'N and 31º40'N. Spectral analysis of the dust proxy records indicates that insolation changes related to eccentricity and precession are the main periods of temporal variation in the record. Si/Al and grain-size of the terrigenous fraction show an increase in glacial-interglacial transitions while Al concentration and Fe/Al ratio are both in phase with precession minima. Hence, the results obtained show that the strength of wind transporting dust was intensified at Terminations. At times of precession minima, when the African monsoon was enhanced, the North Canary Basin also received higher dust input. These results suggest that the moisture brought by the monsoon may have increased the availability of dust in the source region.

Matthewson AP, Shimmield GB, Kroon D & Fallick AE, *Paleoceanography*, **10**, 677-692, (1995).

Tiedemann R, Sarnthein M & Stein R, *Proceedings of the Ocean Drilling Program, Scientific Results. Ruddiman W & Sarnthein M (Eds.)*, **108**, 241-261, (1989).

de Menocal P, *Science*, **270**, 53-59, (1995).