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PALEOENVIRONMENT OF THE CENTRAL RED SEA DURING THE LAST 370,000 YEARS

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The cores cover a time span of ca. 370,000 y. In the case of KL11, the isotopic record has to be read as a salinity signal, rather than temperature or ice-volume signals, reflecting the special situation of this desert-enclosed marginal sea. The global sea-level changes affect the water exchange through the Strait of Bab el Mandeb. The unusual enrichment in ^{18}O mainly reflects the pumping efficiency of the high evaporation conditions coupled with the monsoon-driven surface waters (in- and outflow) between the Gulf of Aden and the Red Sea. The large-scale salinity fluctuations imposed on an already extreme marine environment causes pronounced variation in the calcareous plankton production, thus shaping the carbonate content curve. Milankovitch cyclicity (here the precession) in terms of the monsoon index (Rossignol-Strick, 1983) coincides with dominances of *Globigerinoides ruber* in the central Red Sea, indicating nutrient-rich, intermediate water driven by the SE Monsoon.

SURFACE-WATER REGIMES AND GLACIOMARINE PROCESSES IN THE NORWEGIAN-GREENLAND SEA I: MODERN REGIMES

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Based on the principle of actualism, a set of specific sedimentological and micropaleontological parameters has been used to identify the imprint of modern surface-water masses and glaciomarine processes in surface sediments. Combined with signals from biologic activity and geochemical processes at the benthic boundary, a general facies concept of pelagic and glaciomarine deposits from the Norwegian-Greenland Sea has been developed. Application of this concept in deep-sea sediment cores allows back-tracing of surface-water regimes and reconstruction of ice-drift patterns in the past.

SURFACE-WATER REGIMES AND GLACIOMARINE PROCESSES IN THE NORWEGIAN GREENLAND SEA II: THE PAST 450 KY

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Using the facies concept presented by Henrich et al. (this volume), surface-water regimes and glaciomarine processes were reconstructed for the past 450 ky. Circulation patterns in the Norwegian-Greenland Sea were quite variable, responding to glacial/interglacial climatic changes. Relatively warm conditions in a wide extension of Atlantic waters into the eastern sector is recorded during the isotopic events 11.1, 5.5.1, 5.1 and 1. Temperate interglacials with rather small intrusions of Atlantic waters are indicated for the isotopic events 9.3, 7.5, 7.3 - 7.1, 5.4 and 5.3. During the interglacial stages 7.4 and 5.2 a strong cooling

is recorded by a drastic decrease in pelagic carbonate fluxes and by a moderate IRD input in the eastern sector of the basin.

Various glacial circulation patterns are discussed. Based on the sedimentological evidence, the authors favor a modified anti-estuarine circulation model. The major driving force would be strong catabatic winds at the boundaries of stable high pressures over the Scandinavian and the Greenland ice domes, which would be deflected by Coriolis force to the north on the eastern and to the south on the western side of the basin, resulting in a northward-bound Eastern Ice Drift Current and a southward-bound Western Ice Drift Current. In the center of the basin cyclonic gyres would connect the marginal ice-drift streams. Seasonal variations in sea-ice coverage and salt injection by a weak underflow of Atlantic waters in the southeastern-most areas could contribute to deep water formation. In detail, a more variable pattern is observed: very strong glaciations with peak supplies in IRD and almost basin-wide extension of glaciomarine diamictos (stages 12, 10 and 6); strong glaciations with high IRD input and diamictos restricted to the eastern and western basin sectors (stages 8, 4, 3, and 2); weak intrusions of Atlantic waters (events 8.6 - 8.5, 6.5 and 3.1).

LATE CRETACEOUS CALCAREOUS NANNOFOSSIL BIOCHRONOLOGY FROM THE ATLANTIC OCEAN.

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The rapidity of their evolution, wide geographic distribution and great abundance have made calcareous nannofossils one of the most used fossil groups for stratigraphic correlation of Mesozoic and Cenozoic marine sediments.

A quantitative study of calcareous nannofossils from four Deep Sea Drilling Project (DSDP) sites that span the late Cretaceous Atlantic Ocean from 37° N to 36° S has resulted in a dated subdivision for the latest approximately three million years of the Cretaceous. Six nannofossil events, three based on traditional markers and three new previously unused events have been calibrated to magnetostratigraphy. The ages of the stratigraphic markers are: First Occurrence (FO) of *Micula praemurus* 69.0 ± 0.2 Ma, FO of *Lithraphidites quadratus* 68.6 ± 0.1 Ma, Last Occurrence of *M. praemurus* 68.2 ± 0.3 Ma, FO of *Ceratolithoides kamptneri* 67.6 ± 0.2 Ma, and FO of *Micula murus* 67.2 ± 0.1 Ma. The use of *Nephrolithus frequens* as a marker was found here to be unreliable since its FO was diachronous. A refined uppermost Cretaceous calcareous nannofossil zonation from the middle Maastrichtian (upper part of *Arkhangelskiella cymbiformis* Zone) to the Cretaceous-Tertiary boundary is as follows: *Micula praemurus* Subzone, *Lithraphidites quadratus* Zone, *Cribrosphaerella ehrenbergii* Subzone, *Ceratolithoides kamptneri* Subzone, *Micula murus* Zone, and the *Micula prinsii* Zone.

²³⁰THORIUM AND ¹⁰BERYLLIUM STRATIGRAPHY OF TWO SEDIMENT CORES FROM THE ARCTIC SEA

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