Geophysical Research Abstracts,
Vol. 11, EGU2009-1763, 2009
EGU General Assembly 2009

IODP – ICDP Interactions: Comparing and contrasting the drilled paleoclimate records on the African continent with the ODP records offshore

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The Saharan dust records obtained from ocean drill sites off northwest and northeast Africa stood for years as the icons of African climate. They nicely illustrated a progression in aridification and in the dominant orbital forcing of aridity at precessional frequency prior to 2.8 Ma, then to obliquity forcing from 2.8 to 1.0 Ma, and finally to the eccentricity forcing of the past million years. African climate, in essence, was thought to be responding primarily to the ice sheet dynamics of the Northern Hemisphere. ICDP-sponsored drilling programs on Lake Malawi, East Africa and Lake Bosumtwi, West Africa, have revealed startling new insights into the history of tropical Africa, at least for the past few hundred thousand years. While the conditions of the last glacial maximum were relatively cool and dry, the aridity of the LGM paled in comparison to the megadroughts that occurred in the African tropics prior to 60,000 years ago, with strong precessional (not eccentrical) frequency. Paleotemperature records from East African lakes are a relatively new addition to our knowledge of past African climate, and they are providing surprising, new results as well. They indicate, for example, much cooler temperatures in marine isotope stage IV than during the LGM. High-resolution records derived from XRF scans of the Malawi core indicate strong evidence for D-O – scale variability in the climate of this region, at least in terms of wind and aridity, indicating a tropical role in the "bi-polar see-saw." Promising new records of climate change on the African continent have been coming out of marine sediment cores from the major river deltas of Africa – the Congo, the Nile, in the Gulf of Guinea, and the Zambezi. The results of these studies can nicely complement the lacustrine records, for example by reflecting regions on the African continent where lake sequences are not available. Future drilling by IODP into these marginal settings around the African continent will provide insightful contrasts with the records to be derived from new drilling in the lakes and selected outcrops on the African continent.