Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08771, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08771
EGU General Assembly 2008

Paleoclimate change in the Nakuru basin, Kenya, at 119 - 109 ka: Derived from $\delta^{18}O_{diatom}$ and diatom assemblages and $^{40}Ar/^{39}Ar$ geochronology

Andreas G.N. Bergner1*, Joanna L. Thorpe2, Alan L. Deino3, Melanie J. Leng4,5, Anson W. Mackay2, Hilary J. Sloane4

1 Institut für Geowissenschaften, Universität Potsdam, K.-Liebknecht-str. 24-25, Hs. 27, D-14476 Potsdam-Golm, Germany.

2 Environmental Change Research Centre, University College London, London, U.K.

3 Berkeley Geochronology Center, Berkeley, CA, U.S.A.

4 NERC Isotope Geosciences Laboratory, British Geological Survey, Nottingham, U.K.

5 School of Geography, University of Nottingham, Nottingham, U.K.

* Corresponding author. E-mail: bergner@geo.uni-potsdam.de. Tel: +49 331 977.5843. Fax: +49 331 977.5700

A 4.5m-thick diatomite bed deposited during the cold interval of the penultimate interglacial at ∼118 - 108 ka documents a period in which a deep freshwater lake filled the Nakuru basin in the Central Kenya Rift (CKR), East Africa. Palaeohydrological conditions of the basin are reconstructed for the paleolake highstand using $\delta^{18}O_{diatom}$ and characterization of diatom assemblages. The age of the diatomite deposit is established by precise $^{40}Ar/^{39}Ar$-dating of intercalated pumice tuffs. The paleolake experienced multiple hydrological fluctuations on sub-orbital (∼1,500 to 2,000 years) time scales. The magnitude of the $\delta^{18}O_{diatom}$ change (+/- 3‰) and significant changes in the plankton-littoral ratio of the diatom assemblage (+/- 25%) suggest that the paleolake record can be interpreted in the context of long-term climatic change in East Africa. Using $^{40}Ar/^{39}Ar$ age control and nominal diatomite-sedimentation rates we establish a simplified age model of paleohydrological vs. climatic change, from which

we conclude that paleohydrological conditions in equatorial East Africa during the late Pleistocene were primarily influenced by the latitudinal displacement of the inter-tropical convergence zone (ITCZ). Extreme insolation at eccentricity maximum and weakened zonal air-pressure gradients in the tropics favored intensified convection over East Africa and deep-freshwater lake conditions.