



Paleolimnological evidence for widespread late-18th century drought across equatorial East Africa.

I. Bessems and D. Verschuren

Research Group Limnology, Department of Biology, Ghent University, Ghent, Belgium

Ilse.Bessems@ugent.be / Fax: 32 9 264 53 43 / Phone: 32 9 264 52 63

A high-resolution climate reconstruction from Lake Naivasha in central Kenya documented a period of prolonged drought during the late-18th and early 19th century more severe than any drought recorded in historical times. To investigate the regional manifestation of this drought in equatorial East Africa we collected new sediment cores from selected crater and tectonic lakes along an equatorial transect between the moist western shoulder and dry eastern parts of the East African plateau. These lakes possess a good balance between climatic sensitivity (adequate hydrological response to decade-scale water-balance variations) and longevity (persistence of the offshore depositional environment during severe drought) and are thus most likely to have accumulated an eventful but still continuous high-resolution sediment archive of late-Holocene climate change.

Sedimentological analyses (visual lithostratigraphy; determination of organic, inorganic carbonate and mineral sediment fractions; magnetic susceptibility, and smear-slide analysis) supported by ¹⁴C and ²¹⁰Pb dating, permitted to derive the evolution of sedimentation conditions through time as controlled by climate-driven variations in lake level, mixing regime and water chemistry.

The sediment records of three fairly shallow study sites (two in western Uganda and one in Kenya) all display a clear desiccation horizon of stiff inorganic clays, capped by peaty swamp deposits representing the early phase of renewed lake filling. In all three lakes this lake-filling phase is dated to the early 19th century, i.e. coeval with early 19th-century lake-level rise in Lake Naivasha after pronounced drought. These results indicate that this climatic anomaly was regional in character, and may have affected the entire East African plateau.

References

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