

Geochronological correlation of Turkana Basin core and outcrop. Paleoclimate and environmental reconstruction in Early-Middle Pleistocene East Africa.

Mark Sier (1, 4), Catherine Beck (2), Jeroen Van der Lubbe (3), Josephine Joordens (4,3), Guillaume Dupont-Nivet (5), Cor Langereis (1), Hubert Vonhof (3), Andrew Cohen (6), Dan Olago (7), Chris Campisano (8), Craig Feibel (9) and HSPDP WTK science team members

(1) Utrecht University, Utrecht, The Netherlands ([m.j.sier@uu.nl](mailto:m.j.sier@uu.nl)) (2) Hamilton College, Clinton (NY), USA, (3) VU University Amsterdam, The Netherlands (4) Leiden University, Faculty of Archaeology, Leiden, Netherlands (5) CNRS, France, (6) University of Arizona, Tucson (AZ), USA, (7) University of Nairobi, Nairobi, Kenya, (8) Arizona State University, Tempe (AZ), USA, (9) Rutgers University, Piscataway (NJ), USA

The Hominin Sites and Paleolakes Drilling Project (HSPDP) has collected around 2000 metres of cored lake sediments in five paleoanthropological key localities in East Africa in order to better understand paleoenvironmental/paleoclimatic context of human evolution. One of the five localities is West Turkana (Kenya) where a core (WTK-13) was drilled in the sediments of paleolake Lorenyang. The WTK-13 site is near the location where the famous *Homo erectus* skeleton of “Turkana boy” was found. The 216 metres of cored sediments can be correlated to the rich paleontological and archaeological sites found in outcrops around the Turkana Basin. A parallel outcrop record along the Kaitio lagga (dry river bed), close to the Turkana drill site, has 180 meters of exposed sediments and is also being investigated.

We present a geochronological correlation between the WTK core and the Kaitio outcrop. Correlation of the records is based on the identification of the top of the Olduvai subchron (C2N) at 1.78 Ma, six tephrostratigraphic markers, magnetic susceptibility and key marker beds. Our research shows a lithostratigraphic record with first order transition from deeper but highly fluctuating lake environments to lake margin and finally deltaic settings. Very notable is that the correlation shows a clear loss of quality of the paleomagnetic data from core to outcrop due to weathering. The unexposed core sediments not only preserve a better paleomagnetic signal, but also enable reconstruction of an excellent climate and environmental record (biomarkers, phytoliths, pollen etc). The detailed record of climate and environmental change is closely linked to the rich paleontological and archaeological discoveries from nearby sites and around the Turkana Basin. Our data will contribute to understanding the influence of climate and environmental change on the occurrence of key adaptive changes in anatomy, morphology, and/or behaviour (such as the earliest Acheulean stone tool use) of our hominin relatives during that period.