PP11F-07: Providing the climatic component in human-climate interaction studies: 550,000 years of climate history in the Chew Bahir basin, a key HSPDP site in southern Ethiopia.

Monday, 11 December 2017
09:16 - 09:27
New Orleans Ernest N. Morial Convention Center - 343

As a contribution towards an enhanced understanding of human-climate interactions, the Hominin Sites and Paleolakes Drilling Project (HSPDP) has cored six predominantly lacustrine archives of climate change spanning much of the last ~3.5 Ma in eastern Africa. All six sites in Ethiopia and Kenya are adjacent to key paleoanthropological sites encompassing diverse milestones in human evolution, dispersal, and technological innovation. The 280 m-long Chew Bahir sediment core, recovered from a tectonically-bound basin in the southern Ethiopian rift in late 2014, covers the past ~550 ka of environmental history, an interval marked by intense climatic changes and includes the transition to the Middle Stone Age and the origin and dispersal of modern *Homo sapiens*.

We present the outcome of lithologic and stratigraphic investigations, first interpretations of high resolution MSCL and XRF scanning data, and initial results of detailed multi-indicator analysis of the Chew Bahir cores. These analyses are based on more than 14,000 discrete samples, including grain size analyses and X-ray diffraction. An initial chronology, based on Ar/Ar and OSL dating, allows temporal calibration of our reconstruction of dry-wet cycles. Both geochemical and sedimentological data show that the Chew Bahir deposits are sensitive recorders of climate change on millennial to centennial timescales. Initial statistical analyses identify phases marked by abrupt climatic changes, whereas several long-term wet-dry oscillations reveal variations mostly in the precession (~15-25 kyr), but also in the obliquity (~40 kyr) and eccentricity frequency bands (~90-120 kyr).

The Chew Bahir record will help decode climate variation on several different time scales, as a consequence of orbitally-driven high-latitude glacial-interglacial shifts and variations in greenhouse gases, Indian and Atlantic Ocean sea-surface temperatures, as well as local solar irradiance. This ~550 ka record of environmental change in eastern Africa will ultimately be used to test hypotheses regarding the impact of climate variability on human evolution, dispersal and technological innovation.

Plain Language Summary

Authors

Verena E Foerster *
University of Cologne

Asfawossen Asrat
Addis Ababa University

Christopher Bronk Ramsey
University of Oxford

Melissa S Chapot
Aberystwyth University

Andrew S Cohen
Univ of Arizona

Jonathan R Dean
University of Hull

Daniel Deocampo
Georgia State University

Alan L Deino
Berkeley Geochronology Center

Cristina Guenter
University of Potsdam

Annett Junginger
University of Tübingen

Henry F. Lamb
Aberystwyth University

Melanie J Leng
British Geological Survey

Helen M Roberts
Aberystwyth University

Frank Schaebitz
University of Cologne

Martin H Trauth
Universitaet Potsdam

Find Similar

View Related Events

Day: Monday, 11 December 2017