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375-5: THE CHEW BAHIR DRILLING PROJECT (HSPDP). FROM MUD, GRAINS AND CRYSTALS TO >500,000 YEARS OF CONTINUOUS CLIMATE HISTORY IN SOUTHERN ETHIOPIA

Wednesday, 25 October 2017
09:00 AM - 06:30 PM
Washington State Convention Center - Halls 4EF

Through Continental Scientific Drilling, six sites in Ethiopia and Kenya, all adjacent to key paleoanthropological sites have been investigated as part of the Hominin Sites and Paleolakes Drilling Project (HSPDP), aiming at an enhanced understanding of climatic influences on human physical and cultural evolution. Together the sites cover the last ~3.5 Ma of climate change. Initial results show that sediment core records archive environmental change during diverse milestones in human evolution, and times of dispersal and technological and cultural innovation. The 280 m-long Chew Bahir lacustrine record, recovered from a tectonically-bound basin in the southern Ethiopian rift in late 2014, covers the past ~550 ka of environmental history, a time period that includes the transition to the Middle Stone Age, and the origin and dispersal of modern *Homo sapiens*.

To develop a continuous climate history based on sediment core composition is challenging due to the complex relationship between climate and sedimentary deposits. Our composite core record represents >90% recovery, verified through multi-proxy inter-core correlation, together with high-resolution µXRF, XRD, and sedimentological data. Initial results suggest mineralogical and geochemical proxies are potential climate indicators of wet, dry and hyper-arid climate intervals. Mineral assemblages include salinity indicators such as zeolitic alteration and authigenic clay minerals. Understanding mineral alteration in the Chew Bahir records will enable interpretation of µXRF-derived proxies (e.g. K indicating aridity), and provide direct paleohydrologic data. The high quality geochronology, nearly continuous record, and our growing understanding of site-specific proxy formation will provide a robust environmental history on decadal to orbital timescales. This will enable us to test current hypotheses of the impact of climate change and variability on human evolution and dispersal.

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