

The Hominin Sites And Paleolakes Drilling Project (HSPDP): A progress report on documenting the paleoenvironmental context of human origins through scientific drilling

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Understanding the possible linkages between environmental history and human evolution requires a detailed record of climatic, tectonic and hydrographic history for the regions of interest. In eastern Africa, thick lacustrine deposits often occur in close proximity to some of the most important fossil hominin and artifact localities, providing an opportunity to reconstruct paleoenvironmental conditions at high temporal resolution in the same basins where the hominins have been found or in nearby basins. HSPDP was developed to collect high quality drill core samples of these records, unaffected by surface weathering, from some of the most important fossil hominin and artifact localities in Kenya and Ethiopia. The five drilling areas chosen for this research are (from oldest to youngest): 1) The Northern Awash River Basin, Ethiopia (~3.6-2.9Ma), where lake beds of the Hadar Fm. will provide an environmental record through the evolutionary history of *Australopithecus afarensis*; 2) The Baringo Basin/Tugen Hills, Kenya (~3.5-2.5Ma) where the Chemeron Fm. has yielded the oldest fossils of our own genus *Homo*; 3) The west side of the Turkana Basin, Kenya (~2.3-1.4Ma), where lakebeds of the Nachukui Fm. are coeval with rich archaeological finds, where some of the earliest/most complete specimens of *H. erectus* have been found, and covering the time window when hominins first expanded their range outside of Africa; 4) The Chew Bahir Basin, Ethiopia (~0.7-0.0Ma) a modern but seasonally dry basin near the oldest known fossils of anatomically modern *Homo sapiens*, and; 5) The Lake Magadi Basin, in southern Kenya (0.7-0.0Ma), adjacent to key archaeological sites that document the technological transition into the Middle Stone Age.

Drilling began at the Tugen Hills and West Turkana, Kenya sites in May, 2013, will resume at the Ethiopian sites from November 2013 to February, 2014, and will conclude at L. Magadi in June 2014. ICD and sampling of the cores (stored at LacCore) will begin in November, 2013. The Tugen Hills and West Turkana sites both yielded high quality cores (228 and 216m respectively) with excellent (>90%) core recovery. Down hole and MSCL logs, which can be preliminarily correlated to nearby outcrops, show that strong environmental signals driven by lake level fluctuations are archived in these cores.