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The Hominin Sites and Paleolakes Drilling Project (HSPDP): Understanding the paleoenvironmental and paleoclimatic context of human origins through continental drilling

Andrew S. Cohen (1), Christopher Campisano (2), Asfawossen Asrat (3), Ramon Arrowsmith (4), Alan Deino (5), Craig Feibel (6), Andrew Hill (7), John Kingston (8), Henry Lamb (9), Tim Lowenstein (10), Daniel Olago (11), R. Bernhart Owen (12), Robin Renaut (13), Frank Schabitz (14), and Martin Trauth (15) (1) Department of Geosciences, University of Arizona, Tucson, USA (cohen@email.arizona.edu), (2) Institute of Human Origins, Arizona State University, Tempe, USA (campisano@asu.edu), (3) Department of Earth Sciences, Addis Ababa University, Addis Ababa, Ethiopia (asfawossena@gmail.com), (4) School of Earth and Space Exploration, Arizona State University, Tempe, USA (ramon.arrowsmith@asu.edu), (5) Berkeley Geochronology Center, Berkeley, USA (adeino@bgc.org), (6) Department of Geological Sciences, Rutgers University, Piscataway, USA (feibel@eps.rutgers.edu), (7) Peabody Museum, Yale Unviersity, New Haven, USA (andrew.hill@yale.edu, (8) Department of Anthropology, University of Michigan, Ann Arbor, USA (jkingst@umich.edu), (9) Institute of Geography and Earth Sciences, University of Aberystwyth, Aberystwyth, UK (hfl@aber.ac.uk), (10) Department of Geological Sciences and Environmental Studies, Binghamton University, Binghamton, USA (lowenst@binghamton.edu), (11) Department of Geology, University of Nairobi, Nairobi, Kenya (dolago@uonbi.ac.ke), (12) Department of Geography, Hong Kong Baptist University, Hong Kong (owen@hkbu.edu.hk), (13) Department of Geological Sciences, University of Saskatchewan, Saskatoon, Canada (robin.renaut@usask.ca), (14) Seminar for Physical Geography and Education, University of Cologne, Cologne, Germany (ape15@uni-koeln.de), (15) Department of Geosciences, University of Potsdam, Potsdam, Germany ([trauth@uni-potsdam.de](mailto:trauth@uni-potsdam.de))

The influence of climate and environmental history on human evolution is an existential question that continues to be hotly debated, in part because of the paucity of high resolution records collected in close proximity to the key fossil and archaeological evidence. To address this issue and transform the scientific debate, the HSPDP was developed to collect lacustrine sediment drill cores from basins in Kenya and Ethiopia that collectively encompass critical time intervals and locations for Plio-Quaternary human evolution in East Africa. After a 17 month campaign, drilling was completed in November, 2014, with over 1750m of core collected from 11 boreholes from five areas (1930m total drilling length, avg. 91% recovery). The sites, from oldest to youngest, include 1) N. Awash, Ethiopia (∼3.5-2.9Ma core interval); 2) Baringo-Tugen Hills, Kenya (∼3.3-2.5Ma); 3) West Turkana, Kenya (∼1.9-1.4Ma); L. Magadi, Kenya (0.8-0Ma) and the Chew Bahir Basin, Ethiopia (∼0.5-0Ma). Initial core description (ICD) and sampling for geochronology, geochemistry and paleoecology studies had been completed by mid2014, with the two remaining sites (Magadi and Chew Bahir) scheduled for ICD work in early 2015. Whereas the primary scientific targets were the lacustrine deposits from the hominin-bearing basin depocenters, many intervals of paleosols (representative of low lake stands and probable arid periods) were also encountered in drill cores. Preliminary analyses of drill core sedimentology and geochemistry show both long-term lake level changes and cyclic variability in lake levels, both of which may be indicative of climatic forcing events of interest to paleoanthropologists. Authors of this abstract also include the entire HSPDP field team.