Defining indicators for wet, dry and hyperarid climate intervals in the long Chew Bahir sediment records (Southern Ethiopia Rift). African Quaternary Association Meeting, Nairobi, Kenya, 14-22 July 2018

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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 intercore correlation, together with high-resolution µXRF, XRD, and sedimentological data. First results suggest mineralogical and geochemical proxies are potential climate indicators of wet, dry and hyper-arid climate intervals. Preliminary work suggests that the most extreme evaporative phases are represented by authigenic mineral assemblages, including euhedral analcime, Mg-enriched clays, and low-temperature authigenic illite. Understanding and determining the degree of authigenic mineral alteration in the Chew Bahir records will enable interpretation of µXRFderived proxies (e.g. K indicating aridity), and provide direct paleohydrologic data. Together with a high quality geochronology, our growing understanding of site-specific proxy formation and the establishment of climate proxies for Chew Bahir will provide a robust environmental history on decadal to orbital timescales.