

Time Series Analysis of the HSPDP Drill Core from the Tugen Hills, Kenya to Determine Effects of External Forcing on Local Climate in the Context of Hominin Evolution

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The Hominin Sites and Paleolakes Drilling Project (HSPDP) is an international collaboration aimed at collecting high-resolution record of paleoclimate and paleoenvironmental changes from East African Rift paleolake deposits, and through these records, develop a more comprehensive understanding of the environmental context of human origins. As part of this project, a 227 m drill core was collected from the Tugen Hills in the Baringo Basin of the Central Kenya Rift Valley.

The upper 130 m of the Baringo Basin core record transgressive and regressive phases of paleolakes, with diatomites and mudstones indicative of deep lake phases and silty, sandy and gravelly beds (often with paleosol alteration) indicating changes to fluvial and terrestrial environments. The core spans a period of between approximately 3.33-2.55 Ma. Magnetic susceptibility, gamma density, color greyscale, and total inorganic/organic carbon content have been analyzed for this core and reveal variability in hydrologic patterns which correlate well with diatomite cycles observed in the upper portion of the core. We are currently conducting time series analyses of the geophysical log and TOC/TIC data to characterize cyclicities that may be related to specific external forcings, such as fluctuations in insolation, and global climate events, such as the onset of Northern Hemisphere glaciation, which may have influenced the climate of equatorial Africa and ultimately lacustrine cycling in the Baringo Basin.