78. Minkara, K.E., Rabideaux, N.M., Deocampo, D.M., Kingston, J.D. and Cohen, A.S., 2016, Minerals as climate change proxies: a paleoenvironmental interpretation of the BTB Tugen Hills drill core; part of the Hominin Sites and Paleolakes Drilling Project. Geo. Soc. Amer. Ann. Mtg., Denver, CO 26-29 Sept., 2016.

Equatorial East Africa has many localities with important archeological and paleontological deposits. Reconstructing paleoenvironmental conditions will help us to better understand how hominin evolution was affected by environmental change during the Pliocene and Pleistocene. Using X-ray diffraction (XRD) analysis of lacustrine sediments obtained from core material recovered during the HSPDP campaign at Lake Baringo-Tugen Hills in central Kenya, a sequence that has yielded numerous paleontological and archeological discoveries, we can reconstruct a high-resolution record of paleoclimatic and tectonic histories from the lake sediments. XRD analysis allows us to uncover the mineralogical trends from the ~227m core, which can be employed to understand the geochemical evolution of the basin. We want to test whether ~23-kyr precessional cyclicity is the primary driver of environmental change at Lake Baringo, and how that change influenced vertebrate and hominin evolution. Our goals are to understand how the paleolake basin geochemically evolved over time and how the mineralogical characteristics are related to climate change. This will improve our understanding of the environmental context of hominin evolution, especially with respect to hypothesized influences of Milankovich-scale orbital variations. Preliminary results indicate discrete zones of carbonate and zeolite mineral occurrence, suggesting possible paleoclimate indicators of humidity versus aridity. Continued work will be required to distinguish primary lacustrine carbonate, as opposed to secondary or pedogenic carbonate that is not carrying a lacustrine signal. Quartz-rich intervals and diatomaceous sequences are distinct from zeolitic zones, suggesting a mineralogical record of varying salinity. Furthermore, hkl reflections of clay-rich bulk samples suggest varying relative abundances of kaolinite and smectite. As we extract clay fractions and analyze the clay mineralogy in detail, this ratio may provide an indicator of paleoweathering intensity in the basin. This mineralogical approach to paleolimnology will provide important data to complement the many other paleolimnological proxies being investigated by the team.