AGU FALL MEETING
San Francisco | 12–16 December 2016

PP23A-2313: Paleoenvironmental Interpretation of drill core from Tugen Hills, Kenya through X-ray Diffraction

Tuesday, 13 December 2016
13:40 - 18:00
Moscone South - Poster Hall

Paleoenvironmental reconstruction in regions of significant archeological and paleontological discoveries can be used to help better understand early hominin history in relation to environmental changes. Using X-ray diffraction (XRD) analysis of lacustrine sediments obtained from core material recovered during the Hominin Sites and Paleolakes Drilling Project (HSPDP) campaign at the Tugen Hills drilling site in central Kenya we can reconstruct a high-resolution record of paleoclimate and tectonics from the lake sediments during the Plio-Pleistocene. XRD analysis enables us to identify 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 geochemically evolved over time and how the mineralogical characteristics are related to climate change. Preliminary results indicate discrete zones of carbonate and zeolite mineral occurrence, suggesting possible paleoclimate indicators of humidity versus aridity. Geochemical and sedimentological analysis will be required to distinguish primary lacustrine carbonate versus secondary or pedogenic carbonate, which does not carry a lacustrine signal. Quartz-rich intervals and diatomaceous sequences are distinct from zeolitic zones, suggesting variable salinities. 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 further detail, this ratio may provide an indicator of paleoweathering intensity within the basin.

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