

## A Facies Interpretation of the Hominin Sites and Paleolakes Drilling Project West Turkana Core: Dynamic Fluctuations on a Shallow, Lacustrine Margin

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The West Turkana Kaitio leg of the Hominin Sites and Paleolakes Drilling Project targeted a lacustrine interval from ~2 Ma to 1.5 Ma. The conventional model of the geometry of the Turkana Basin projected that the drill site would primarily represent deep, lacustrine conditions. However, upon splitting and describing the cores it was discovered that the drill site was actually located on a shallow, highly dynamic margin. One of the goals of this project was to create a facies interpretation of the WTK13 core to assist in the interpretation of the paleoclimate and paleoenvironment by quantifying the sensitivity of this fluctuating lacustrine margin. Two facies models (Primary and Secondary) were produced from the data collected during the HSPDP-WTK13 sampling party in November 2013 (core images, smear slide descriptions, etc) and the stratigraphic column compiled by Henderek in May 2014. The Primary Facies model defines units on the basis of the lithology, sedimentary structures, and fossils present at the time of deposition. The Secondary Facies model goes into more detail by further distinguishing units based on secondary process, precipitation, reworking/concentration of existing material, or diagenesis that occurred post-primary disposition. This frequently subdivides Primary Facies units but gives a more complete picture of everything that the sediments have undergone since being deposited. Each unit was described in detail and the thickness to the centimeter was recorded in a spreadsheet to generate the facies models. Silts and clays (Lam Scram Primary facies) dominate the core with a few intervening sandy intervals. Evidence for erosion is fairly limited but the record does include some faults with cm-scale offset that are associated with a hydrothermal interval near the base of the core. From the Secondary facies model, 91 cycles of laminated lacustrine sediment (Lac Lam facies) to weakly pedogenically modified clays (Soil facies) are preserved in this core. This observation supports findings from a parallel outcrop section measured to the decimeter at Kaitio in the summer of 2013 which documented ~33 transitions from lacustrine clay to paleosols. However, the core presents the unique opportunity to resolve this record on a previously unprecedented scale. The environment interpreted as dynamic fluctuating lacustrine margin that was subaqueous during transgressive events but subaerially exposed and forming weak soils during regressions. Ultimately, this setting may prove extremely sensitive to fine-scale paleoclimate cycles that might have been obscured in a deeper water record.