##### 168

##### Beck, C., van der Lubbe, J., Feibel, C. S., Joordens, J., Boyd, M., Cohen, A. S., Campisano, C. J. (2018). Using Facies and Grain-size Analyses to Assess Feasibility of a Bentonite to Tephra Correlation in the Kaitio Member, West Turkana, Kenya. AGU Fall Meeting, Washington, D.C.

Robust chronology is essential for establishing ties between broader paleoenvironmental and paleoclimatic records and specific hominin evolutionary events. In East Africa, tephrachronology provides a robust temporal framework for age models using both Ar/Ar dating of feldspar crystals and single shard geochemical analysis. However, when tephra are too distal to contain crystals and/or so fine-grained that they devitrify, the resulting bentonite is of limited use as a stratigraphic marker. This study couples high-resolution facies descriptions and grain-size analyses to assess paleoenvironmental similarities between a known tephra and a devitrified bentonite in Kaitio, West Turkana, Kenya. Specifically, we compared the facies and grain-size of sediment samples 0.5 m below and above the KBS Tuff to samples from the same stratigraphic interval around a bentonite bed. The KBS Tuff is a significant stratigraphic marker in the Turkana Basin that has been recalculated to an age of 1.875 ± 0.007 Ma (Lupien et al., 2017). The bentonite has been hypothesized to represent a lateral equivalent to the KBS Tuff (Van der Lubbe et al, 2018). The KBS Tuff was sampled in two outcrops within the Kaitio locality. The bentonite potentially represents a lateral equivalent to the KBS as determined by its stratigraphic position in the section. This bed was sampled in one location from Kaitio outcrop and from the HSPDP-WTK13 core drilled <400 m to the southwest. Both the KBS Tuff and the bentonite are underlain by pedogenically modified clays and overlain by silty sediment, providing first order equivalency. This comparison is particularly important for the age model of WTK13, as demonstrating the presence of the KBS-equivalent bentonite would provide an additional age tie point near the base of the core. This study tests the hypothesis that a fault with ~ 40 m of offset has thickened the Kaitio outcrop section while the un-faulted WTK13 core records the true stratigraphic thickness for the lower part of the Kaitio Member in the Nachukui Formation.