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Reconstruction of early human habitats in tectonically complex landscapes in the East African Rift

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Tectonically active regions play a key role in understanding the evolution and dispersal of our human ancestors. In Africa, the earliest findings of australopithecus, homo erectus and homo sapiens are associated with the tectonically active sectors of the East African Rift. But the landscapes inhabited by our ancestors have undergone massive changes over time, changes driven by environmental change or long-term geomorphological or tectonic processes. Rivers courses have changed, lakes expanded and then disappeared, and shorelines moved for tens of kilometers through tectonic motion and/or sea level changes. Analysis of tectonic and geomorphologic processes allows quantifying styles and rates of surface modification, which in turn can be used for reconstruction of ancient landscapes.

In this study we have reconstructed physical landscapes in tectonically active settings of the Kenya Rift, East Africa, and interpreted their relevance to archaeological interpretation. Using a combination of remote sensing data, field-based geological observations, and numerical fault modeling approaches we created a series of paleolandscape models at time slices critical for early human landscape inhabitance. We have focused on two key locations in East Africa. The first study region is located in the Olorgesailie-Magadi region in the southern Kenya Rift, a second study site is located in the Olduvai region in northern Tanzania. Both areas are well-known for their high abundance of Plio-Pleistocene early hominin sites Prelimiary results show that in both regions tectonic movements were the primary cause for landscape dynamics during and after human inhabitance implying that understanding the range of geological landscape features on both a regional and local scale allows a much broader understanding of how ancient landscapes may have been strategically exploited by our ancestors.