



Assessment of relations between paleolithic sites and morpho-pedologic characteristics for archaeological site prediction in the Lake Manyara area, Northern Tanzania

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In this study we focus on the relation between archaeological sites and geomorphologic and pedologic settings in the area of Lake Manyara and the Makuyuni river basin, Northern Tanzania. This region is known for Middle and Lower Pleistocene fossil finds and artefacts. Non invasive field methods were used to assess environmental variables like the spatial distribution of soil characteristics. Detailed terrain analysis on a high resolution DTM provide information on the geomorphologic processes, forms and features. We applied advanced geostatistical methods to regionalize the given information. The methodology considers not only the characteristics of specific transects but implicitly also the related pedogenetic and morphogenetic processes including actual erosion, transport and deposition processes.

To analyze the spatial distribution of potential archaeological find locations we applied two different stochastic methodologies: i) statistical mechanics and ii) boosted regression trees. The first methods is able to handle presence-only datasets such as the archaeological find locations. The second one needs classified data. In this case we worked with different stone tool technology classes of the site locations. The spatial distributions of the find locations were collected in literature and by own field work over the last years. For the modeling we utilized environmental information such as spatially continuous layer of soils and substrates, topography (30m SRTM DEM), vegetation information as well as ASTER multispectral data as predictor variables. The results reveal the potential spatial distribution of the physiographic process dynamics and on the related distribution of paleontological/archaeological sites.