

# Archaeology and shoreline displacement in the Lake Manyara Basin

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In 2002-2005 the University of Helsinki Department of Archaeology's "Cultural ecology of the East African savanna environment in a long-term historical perspective" project has studied the past of the northern Tanzanian Rift Valley and its environs. The main research emphasis has been on the vast Late Iron Age (LIA) Engaruka complex, but in the course of the fieldwork also several new archaeological sites dating to other periods were encountered.

The article examines the new archaeological observations made in the northern Lake Manyara Basin in the context of geological studies of the ancient lake level changes. The combined archaeological and geological data provide the basis for inference of four suggested Pleistocene and Holocene water level stages for the ancient lake within the basin.

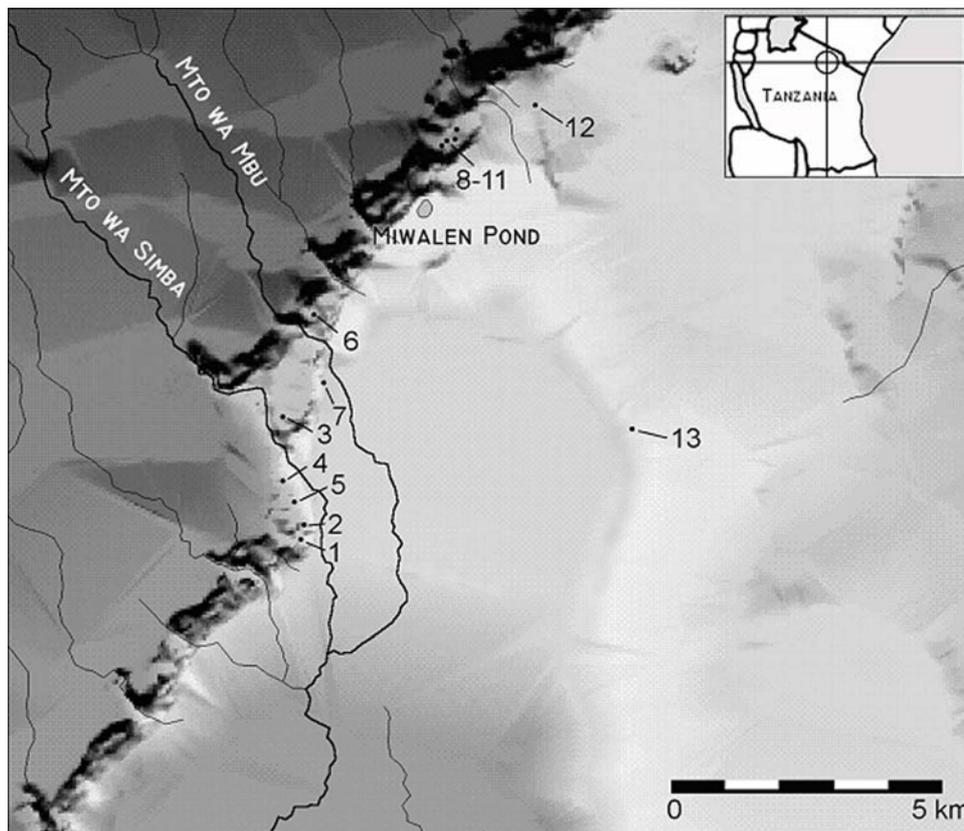


Fig. 1. The archaeological sites in the northern Lake Manyara Basin.

The archaeological fieldwork in the Lake Manyara basin concentrated around the Mto wa Mbu and Mto wa Simba river gorges and the Miwalen Pond area (fig. 1). Previous archaeological studies in the area have exclusively dealt with LIA irrigation agricultural remains. While documenting the formerly known LIA remains, 13 new sites were encountered. These date from the Middle Stone Age (MSA) to the historical times.

One of these new sites, Misfortune Hill (fig. 1:1), was test excavated in 2004. Excavations revealed a rich preceramic Late Stone Age (LSA) site (radiocarbon dated to  $9280 \pm 60$  BP [Hela-

1013]), which was superimposed by remains of (possibly) Pastoral Neolithic as well as Iron Age cultural groups. Interesting are *e.g.* the possible Tana (TIW) sherds encountered well outside their currently known distribution area (fig. 2). Generally the ceramic chronology in and around the current study area is poorly known, and local variation of more widespread ceramic types (*e.g.* Tana) may exist in the current archaeological assemblages. (Seitsonen 2004, in prep.)

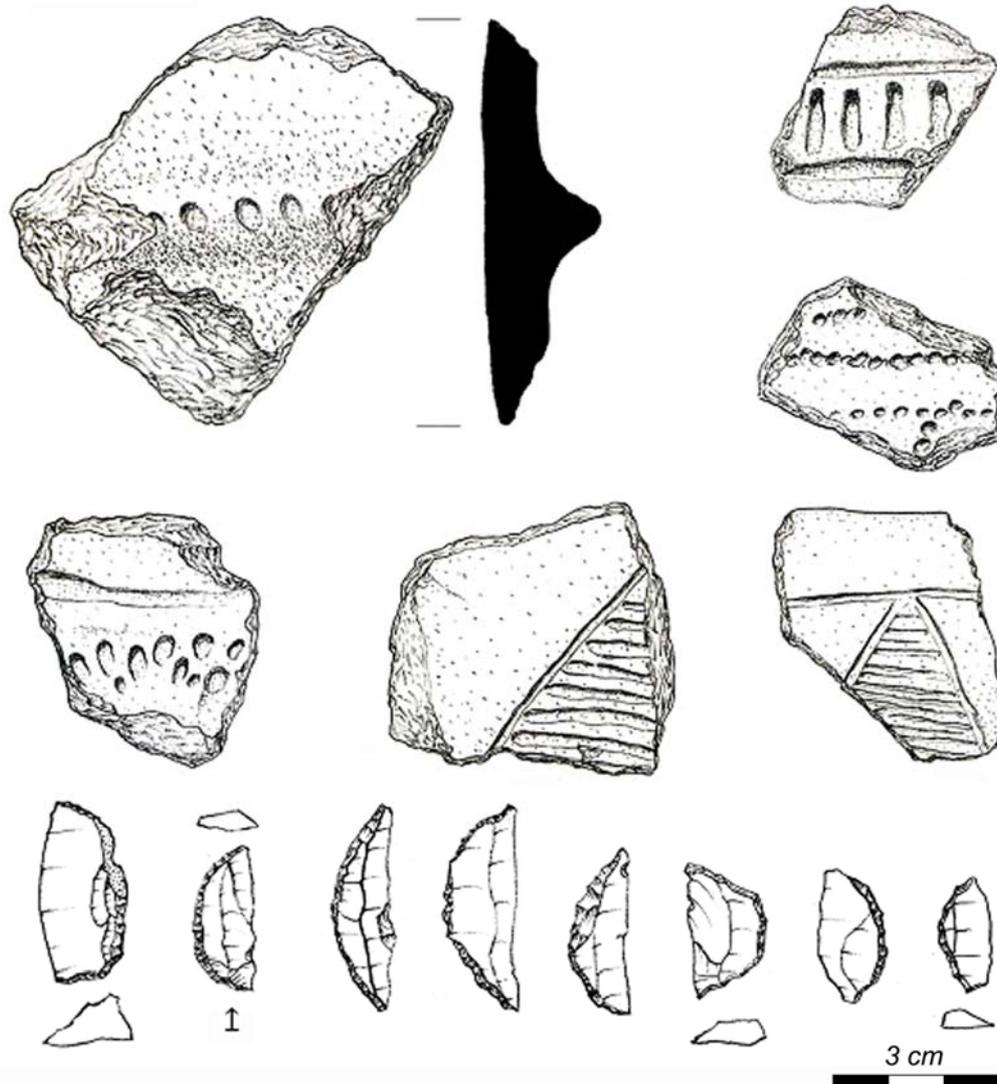


Fig. 2. Ceramics from various sites in the northern Lake Manyara Basin and microliths from Misfortune Hill.

The new sites are recurrently situated on various shoreline formations at elevations situated ca. 1030-1120 meters above sea level (m asl). This supports the interpretation presented by Keller *et al.* (1975) that various geological formations along the basin margins reflect the fluctuations of the ancient Lake Manyara while it was retreating from its maximum extension.

Keller and his colleagues (1975) described eight main terraces and numerous beach formations situated between the present lakeshore and ca. 1098 m asl in the east-central part of the lake and examined the stratigraphy at three locations. On the basis of the relatively shallow soil profiles, the good preservation of terraces and raised beaches, and the connected archaeological material, it appears that the maximum extent of Lake Manyara was a comparatively recent event. The limited drainage area of Lake Manyara suggests a long depositional period based on the degree and extent of the lacustrine sediments. Thus the wide and shallow basin would have caused the ancient lake to have a large evaporation surface relative to its depth. Thus the included lake would have been

a sensitive indicator of long-term and short-term variation in the runoff and groundwater as controlled by climatic and tectonic factors. (Ibid. 367-374.)

The combined archaeological and geological data provide the basis for inference of four suggested lake level stages presented in the figure 3. The oldest lacustrine deposits described from the area are Pleistocene beds encountered near the village of Makuyuni (Kent 1942; Keller *et al.* 1975). The faunal assemblage collected from these horizontally bedded clays is assumed to date to the Middle Pleistocene, so at that time Lake Manyara might have reached all the way to east to the Makuyuni area (ibid.). Water levels might have been comparable with the suggested lake stage 1 (ca. 1098 m asl), which is connected to the highest terrace formations along the basin reported by Keller et.al. (1975). Also the archaeological assemblages collected on terraces above 1100 m asl seem to have MSA characteristics, although this is uncertain based only on survey observations.

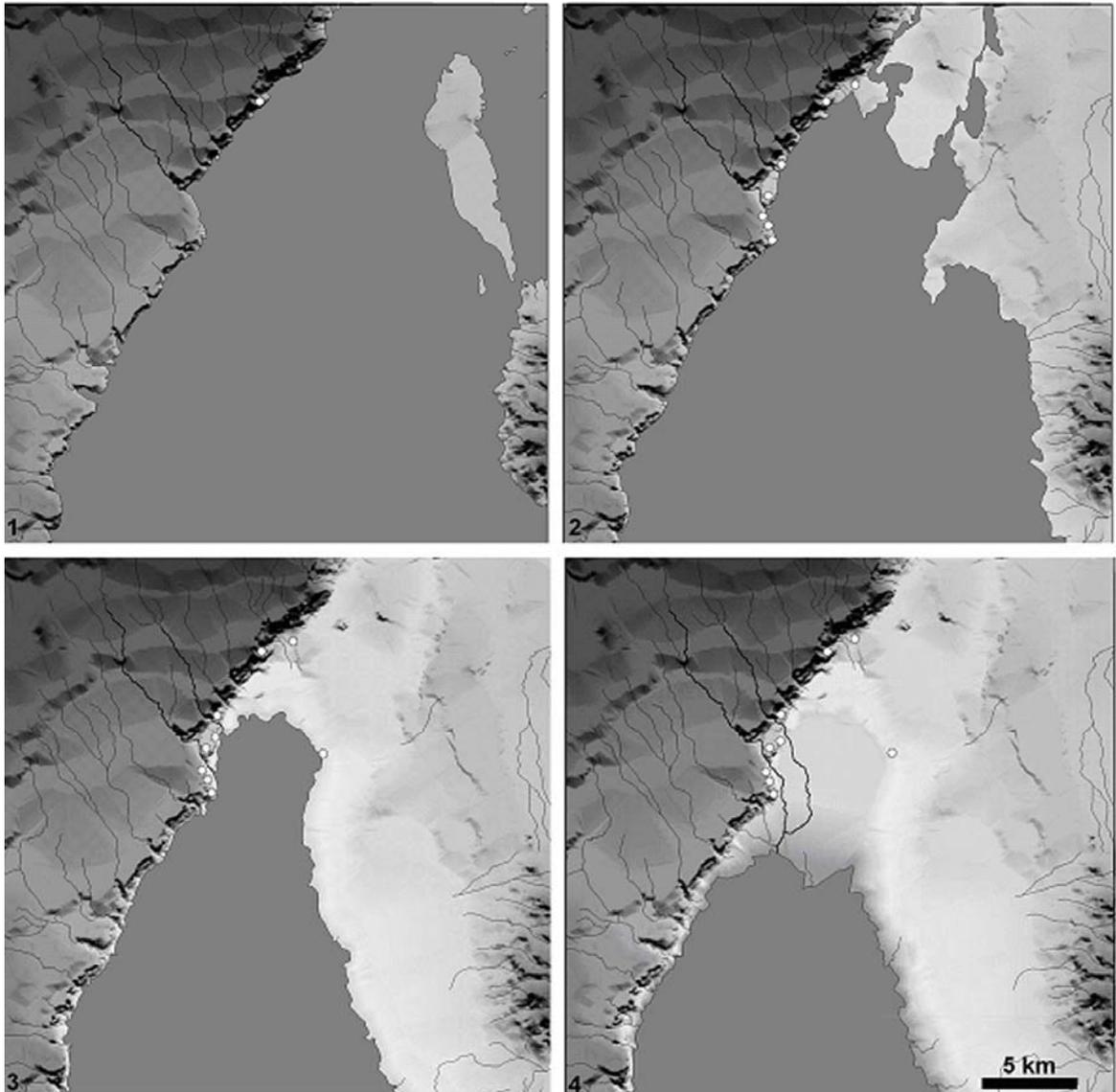


Fig. 3. The suggested lake level stages for Lake Manyara. The archaeological sites are presented with white spots.

If the maximum extent of the lake is connected to the Middle Pleistocene, the lake level might have subsided notably in the Late Pleistocene before rising again ca. 13 000 – 10 000 during the wetter climatic phase of the Pleistocene-Holocene boundary (cf. Ryner 2004; Ryner et.al. in press); there are exclusively LSA observations made below 1050 m asl. The lake during the Pleistocene-Holocene boundary might have been comparable to the stage 2 in the figure 3 (ca. 1030 m asl). In the

course of Holocene the lake level fluctuated and withdrew through time to its present level, possibly at times even lower. The terrace formation at circa 980 m asl with connected (late?) LSA and Iron Age finds could represent e.g. the final high water level stage during the Little Ice Age (stage 3 in the fig. 3, ca. 980 m asl). No archaeological sites were observed at the terraces below this elevation, and thus the lake stage 4 is reconstructed on the basis of the lowermost terraces observed by Keller and other (1975) (ca. 960 m asl). Further geological and ecological studies are needed in the future to support the tentative interpretations presented here. It is necessary to get e.g. exact leveling data for the shoreline formations observed by our project as well as those reported by Keller et.al. (1975) to establish their relative elevations and to create a more detailed diagram of the shoreline displacement. Further ways to approach the study of lake level changes would be studying the diatom and pollen data. Once the geological and ecological data will be connected to datable archaeological occurrences, we will be able to put together a fairly clear image of the shoreline displacement history of the Lake Manyara.

*References:*

- Keller C.M., Hansen C. & Alexander C.S. 1975: Archaeology and paleoenvironments in the Manyara and Engaruka Basins, northern Tanzania. *The Geographical Review*, vol. 65, no. 3, pp. 364-376.
- Kent P.E. 1942: A note on Pleistocene deposits near Lake Manyara, Tanganyika. *Geol. Mag.*, vol. 79, pp. 72-77.
- Ryner M.A. 2004: Vegetation change in Empakaai Crater, northern Tanzania, between ~14,700 and 9,200 cal yr BP. Unpublished Licentiate of Philosophy dissertation, Department of Geography, University of Stockholm.
- Ryner M.A., Bonnefille R., Holmgren K. & Muzuka A. in press: Vegetation change in Empakaai Crater, northern Tanzania, between ~14,700 and 9,200 cal yr BP. To be published in *Review of Palaeobotany and Palynology*.
- Seitsonen O. 2004: *Stone Age sequence, lithic technology and ancient lake level changes in the North Tanzanian Rift Valley area*. Unpublished Licentiate of Philosophy dissertation, Department of Archaeology, Institute for Cultural Studies, University of Helsinki.
- Seitsonen O. in prep.: Archaeological research in the northern Lake Manyara Basin, Tanzania 2003-2004.