

## **The Nile floodplain, hydroclimatic variability, and its relation with cultural dynamics in ancient Thebes (Luxor, Egypt)**

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The western bank of the river Nile in the Luxor region (Egypt) separates New Kingdom divine temple complexes in the central axis of the river valley from contemporaneous sites on the desert edge and limestone plateau. The intermediate Nile floodplain features relatively few known archaeological sites, but played an important role in the ancient ritual landscape by connecting the focal region of the living (floodplain) with that of the dead (desert). All Royal Funerary Temple Complexes of the New Kingdom period (1539-1077 BCE), which played a central role in the cosmogonical landscape, are positioned within a confined 3.5 km long strip of land on the western edge of the present floodplain. This preferential location, together with contemporary textual sources and tomb scenes suggesting the nearby presence of canals, have led to the hypothesis that natural and human-made waterways may have once connected the main channel of the Nile with the desert edge.

Until the present research took place, no detailed study of pre-existing channel networks existed in the region, leaving a gap in current knowledge on the configuration and use of the ancient floodplain. This study presents the results of a multi-disciplinary study aimed at mapping and dating ancient waterways in the Theban region and aims to find evidence for the natural or human origin of such channels. Boreholes and Electric Resistivity Tomography (ERT) were carried out along a transect that connects the edge of the Holocene floodplain with the current position of the river Nile. Satellite imagery and textual sources were also used to augment the fieldwork. The data indicate the presence of an infilled abandoned channel of the Nile in the western distal part of the current floodplain, adjoining the Funerary Temple complexes. Over 2100 ceramic fragments were analysed from the sedimentary infilling of the silted-up river course, dating it to the end of the New Kingdom, and indicating that the channel and temples were contemporary. The abundance of ceramic material also allowed the reconstruction of sedimentation rates across the floodplain, which ranged between 0.8-2.2 mm/yr, largely in agreement with estimates from other studies. Importantly, there seems to have been a major decrease in sedimentation rates after the New Kingdom. Furthermore, the abandonment of the secondary channel of the Nile and the formation of a well-developed calcareous palaeosol (both of which could have been forced by drought and failing Nile floods) correlate with the demise of the New Kingdom. This suggests that regionally observed cultural and natural dynamics may have been driven by hydroclimatic variability in the larger Nile basin. A lower calcareous palaeosol, located at least 1m below the New Kingdom horizon, hints at a previous period of severe drought and its age is tentatively inferred as Old Kingdom. The age of this lower palaeosol needs to be confirmed by more precise dating, but could support the idea that cultural dynamics in ancient floodwater farming cultures are strongly linked to hydroclimatic change.