

Manipulating mud: (re-)constructing cosmogonical landscapes in the Nile Valley, Thebes, Egypt

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The Egypt Exploration Society / Uppsala Universitet Theban Harbours and Waterscapes Survey (THaWS) has carried out four seasons, working on the east and west bank of the Nile in Luxor (Graham 2012; Graham *et al.* 2012; 2013; 2014). The principal goal of the project is to elucidate the technical ability of ancient Egyptians to manipulate the floodplain through canal and basin construction. Contemporary pictorial and written evidence from Egypt suggests that canals and basins used as harbours were associated with the temples to the cult of the deceased kings on the west bank at Thebes (Jaritz 2005; Lacau and Chevrier 1977; Schlüter 2009), and they may also have played a key role in the festival processions of Thebes. Reconstructing them would thus help further our understanding of the sacred landscape. Canals would also have enabled the transportation of construction

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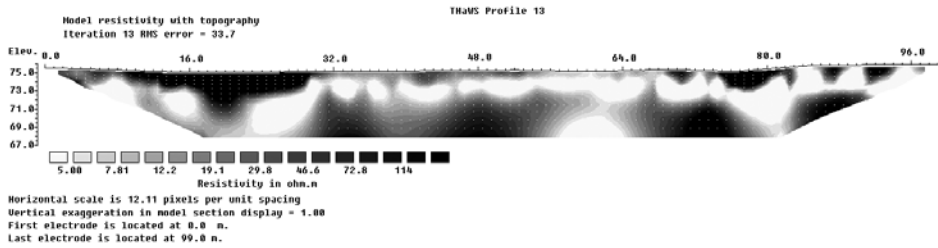


Fig. 1. ERT profile (P13) across the Second Court of Amenhotep III's Temple of Millions of Years at Kom el-Hettan, showing the presence of a rubble-filled channel between profiles at 8 m and at 32 m; feature verified in an archaeological section approximately 50 m northwest of the profile at the rear of the Second Court. The elevation of the channel shows that it post-dates the reign of Amenhotep III

stone and monoliths weighing hundreds of tonnes to temples (Kitchen 1991; Wehausen *et al.* 1988). Furthermore, the massive spoil mounds surrounding Birket Habu (Kemp and O'Connor 1974) and the smaller more enigmatic 'Birket el-Hubeil/Birket Luxor' (Graham *et al.* 2012) provide important evidence for the infrastructure of anthropogenic basins, but their dimensions and navigability have never been established. This paper presents a brief discussion of the survey methodology, as well as some of the results of the ongoing project, including those from the 2015 season.

The scope of this interdisciplinary project allows for the integration of geomorphological, archaeological and geophysical lines of inquiry, with a methodology that combines geophysical survey (principally electrical resistivity tomography (ERT) and ground penetrating radar (GPR) complemented by magnetometry) with geoarchaeology (using an Eijkelkamp hand auger and percussion corer) to ground-truth the geophysical survey data and construct geological transects across the floodplain. Total Station and global positioning system (GPS/GNSS) equipment is used to georeference all of the work and record elevations relating to historical and recent datums, information that is essential for relating results to the ancient Nile floods. Ceramic fragments found in the augering and percussion coring have been used to date the facies presented in the geoarchaeological data. The project is collaborative, with the survey and borehole fieldwork being conducted closely with a number of other archaeological projects in the area.

Other sources have also been drawn on to help with the analysis and interpretation of the field data. Maps from the last 200 years (from the Napoleonic map to the Survey of Egypt maps of the area) provide evidence for broad changes in the course of the Nile in this period. Satellite imagery, including CORONA, Landsat, and high resolution Quickbird imagery, together with airborne photography (including photos from the Franco-Egyptian Centre), have also facilitated the mapping of geomorphological and archaeological features for comparison with the results of the geophysics and borehole surveys.

Initial findings have revealed key archaeological discoveries at the edge of the floodplain at Thebes, including the important discovery of a natural paleo-channel of the Nile lying within a few hundred metres of the modern-day desert edge, close by the Ramesseum and the Colossi of Memnon. This may well have been associated with access to the funerary complexes and the immense harbour of Birket Habu to the south. Infrastructure leading to the entrance to

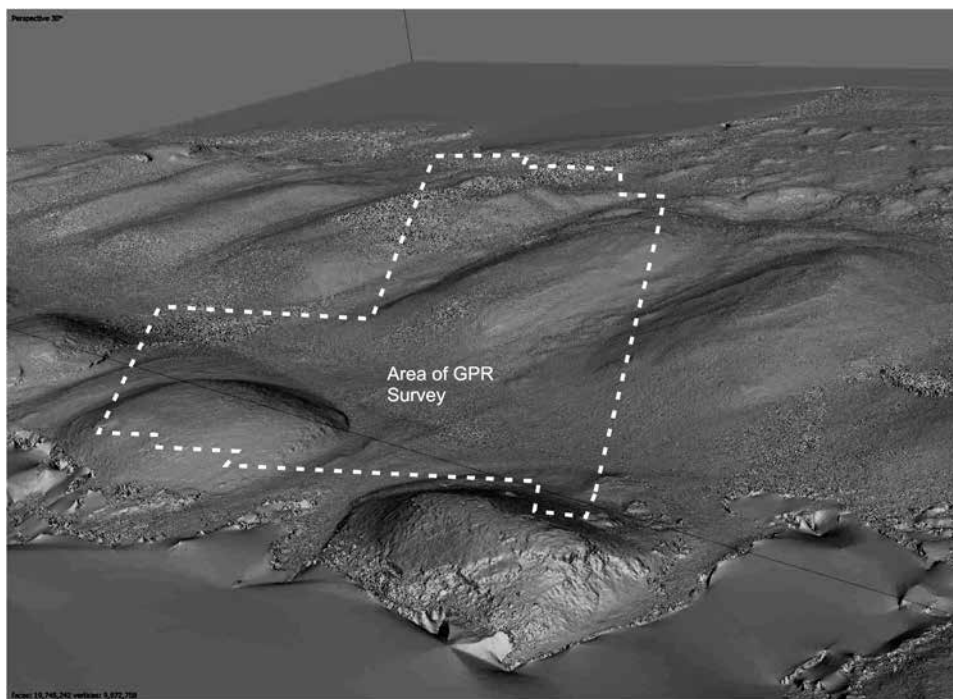


Fig. 2. A 3D photogrammetric image of the spoil mounds to the west of Birket Habu with the GPR survey area shown in Fig. 3 marked on the image

the Royal Cult temple of Thutmose III has also been confirmed by magnetometer and GPR surveys, whilst in 2012 ERT confirmed the existence of recent former channels and canals as recorded by John Gardner Wilkinson in the 1830s, as well as a channel within a courtyard of Amenhotep III's Temple of Millions of Years (Fig. 1). Work close to the Colossi of Memnon has also revealed evidence of remains of the different courts of the temple. Work along the western side of the harbour at Birket Habu has allowed the 3D mapping of the mounds through photogrammetry (Fig. 2), and GPR across the mounds has provided insight into the construction of these substantial features (Fig. 3). In addition, survey work at Karnak on the east bank of the Nile has revealed important evidence of the deposits underlying the temple, with GPR outlining possible foundations of one the ramps lying west of the vast temple complex of Amun (Graham *et al.* 2013).

Whilst not of primary importance on the project, the four seasons of fieldwork to date have also highlighted a number of points associated with technical and logistical aspects of the survey. The aridity and salinity of areas of the landscape have affected the use of geophysical survey techniques, especially GPR and ERT, and the integration of non-intrusive survey results with borehole survey data has also underlined issues of analysis and interpretation between diverse datasets of differing resolution and depth.

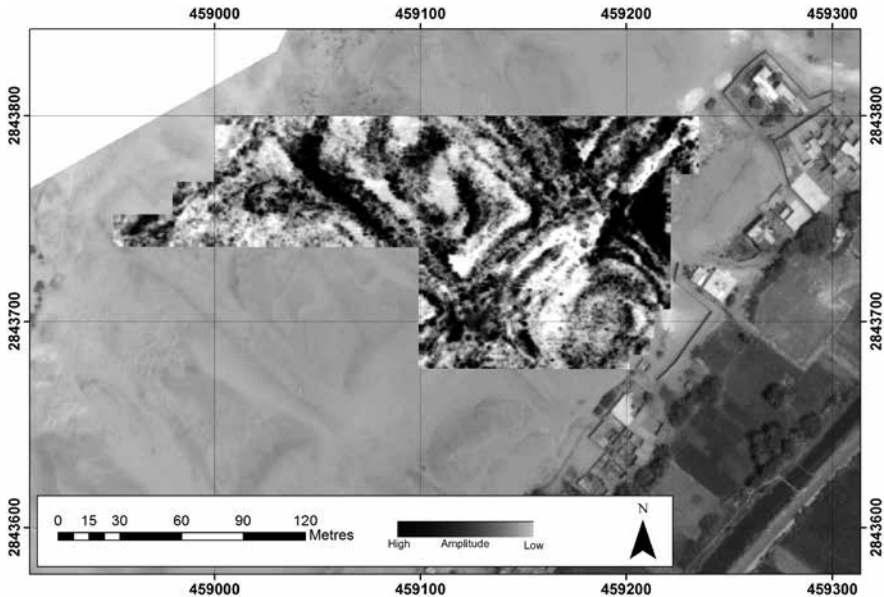


Fig. 3. Results of the GPR survey across the mounds at Malqata, showing the presence of retaining walls for terraces in the mound construction

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