Geophysical Research Abstracts
Vol. 15, EGU2013-10268, 2013
EGU General Assembly 2013

Landscape archaeological research and 3D modelling of the Neolithic site of Barcin Höyük, Northwest Turkey

Mark Groenhuijzen (1), Sjoerd Kluiving (1), Fokke Gerritsen (2,3)

(1) Institute for Geo- and Bioarchaeology, VU University Amsterdam, (2) Netherlands Institute in Turkey, Istanbul, (3) Faculty of Arts, VU University Amsterdam

Barcin Höyük is a dwelling mound in the Yenişehir valley in Northwest Turkey. It is found to be one of the oldest farming communities in the region, with an archaeological record stretching from the Neolithic up to the Roman period, with some finds dating to the Byzantine period. An earlier geoarchaeological study was performed in 2009, revealing interesting deposits from a marsh or lake, and two possible small rivers or streams. The current study forms a continuation of the previous research, aimed at improving our understanding of the interrelationship of the site and the landscape, especially around the early neolithisation process. The following research questions have been investigated: is it possible to bring more detail into the knowledge of the landscape around the site through denser and more detailed coring, can a manner of time-control on the sedimentation be found, and is a 3D-model a suitable tool for storing and analysing data to improve our understanding of the landscape and the site?
Data was gathered from hand auger corings placed in the vicinity of the excavation site. Soil samples were systematically gathered from these corings, of which a selection was subjected to laboratory analyses. The methods used here are grain size analysis, thermogravimetric analysis and end-member analysis. Spatial analytical tools, such as ArcMap and ArcScene were used to store and analyse all data, more specifically in order to construct the 3D-subsurface model.
The deepest sedimentary unit encountered in the corings can be ascribed to a lacustrine environment, inferring that a lake might have been present at the site location prior to the first Neolithic habitation of Barcin Höyük. Two subsequent layers of gravel and coarse sand are found within the lacustrine unit and can be correlated around the site. In the 3D-subsurface model constructed for the site, these layers show a distinct elevation with a relief of almost 2.5 metres. These results can be interpreted as a presence of a large lake prior to the site, with the coarse layers representing beach deposits at the edge of the lake. The first habitation phase occurred on a natural elevation in the landscape left after a lake retreat, represented by the elevation in the coarse layers. A large amount of archaeological material was discovered in the corings, providing an opportunity for linking sedimentation with the archaeological record.
The presence of a natural elevation near a lake edge might be a reason for the first habitation phase to begin. The archaeological material found in the corings proved useful in relative dating some of the layers and provides an indication of the sedimentation speed. The 3D-model of the subsurface is successful in providing more insight into the horizontal and vertical distribution of the deposits around the site of Barcin Höyük, and is also useful for combining and comparing data from this research with other sources.