

Geomatic Methods Supporting The Investigation Of Ancient History

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Extended Abstract

Nowadays working as an Archaeologist or an Ancient History Scientist also needs incorporating new methods from the Geomatics field. Only by using these methods an extension of the already realised findings could be reached. This could help the ancient scientist in getting more knowledge about living conditions and living ecology and interactions with environment or other humans of earlier times. This contribution will give an overview of the state of the art methods applied in order to get new approaches by combining the geomatics technology with the knowledge of ancient history scientist. This will be realized for the example of two different projects in that field.

Regarding the method combination, among this spectrum of methods, one is the recording of high-resolution geodata by modern Laserscanning or other spatial data recording instruments. Also photogrammetric survey, by drones (Unmanned Aerial Vehicles, UAV) will be included. On the other hand, it is also important to use geoprocessing methods by a GIS. With this tools, we might find a reconstruction of the former land surface in absolute heights as a product of accumulation or erosion, or the distribution of ancient land cover (hydrology, vegetation, soil etc.) by the analysis of old land use patterns. About the analysis of cost raster surfaces, deriving from Digital Elevation Models (DEM) or other attributes, a cost path analysis could be realized in order to get knowledge about accessibility or travel effort/time of the ancient inhabitants of former settlements (e.g. Vetter & Barnikel 2012). Another possibility is to provide the former geospatial data into a Web-GIS. Using the GIS Layer technologies, we can define layers for different purposes, e.g. different time periods (Hellenistic, roman, byzantine), former supposed land use scenarios, former simulated land surface situations, calculated runoff-scenarios etc (Vetter 2013). The novelty of this

method is the holistic point of view by this approach: the first geodetic survey of geo-data until the geodata storage, projection, adaptation, mapping, visualisation and GIS-analysis could be carried out by one geomatic specialist. For further analysis and interpretation, the expertise of an ancient historian is necessary.

In this contribution, the methodological approaches and first results of two projects will be presented. The first is the analysis of the Varus retreat of late summer AD 9. Here we will show an exemplary GIS-Workflow in order to reveal the marching routes which Varus possibly took, additionally possible places of combat and especially where Varus built his summer camp at the Weser. The significance of the assumptions will be discussed.

The second project refers the research on the site of the ancient city Metropolis (Ionia), today near Torbali, Turkey. In this area, we can find remains from Hellenistic, Roman and Byzantine epochs, lying on each other. For archeological understanding of former living conditions, it is necessary to separate the remains in different layers (in a GIS) and visualize the reconstructed ancient building structures in different thematic context (Zollhöfer et al. 2014). Moreover, in this area, possibly the remains of an ancient harbour could be assumed, which is attested in documents. Hence, a reconstruction of the hydrological catchment and water runoff path analysis have been carried out in order to find possible sites for the ancient harbour.

An open access web-based, map visualisation, realised with javascript based LEAFLET will be presented. Here we can find the important settlements, the relief situation, trade routes and river flows of the past. All this is in order to give scientists from other geographic regions or thematically other fields the opportunity to take advantage for own research or to give input for further examinations in a wider area of Ionia.

References

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