

Late Glacial and Holocene Environmental Change in Cappadocia, Turkey

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Background

Multi-proxy approaches to integrated regional studies of environmental variability during the late Glacial and Holocene can provide valuable insights into the ways that significant shifts in climate have affected natural ecosystems, landscapes and human activities over decadal, centennial and millennial timescales. For the eastern Mediterranean region in particular, there is current and active debate between past climatic variations and vegetation dynamics during the humid phase of the early Holocene as well as the impacts that punctuated aridification events during the Holocene had on cultural change in this region. The eastern Mediterranean also has a long history of human occupation, so these landscapes have also been transformed by human-induced land cover changes. The extent to which climate change in Anatolia has caused natural environment change over these millennia, and how these changes have influenced and interacted with the emergence – and in some cases decline – of complex societies and civilizations (e.g., Hittites)



Volcanic crater Nar Lake in Cappadocia, Turkey

and the extent to which complex societies and civilisations impacted upon the natural environment are questions that still need to be addressed by archaeologists, palaeoecologists and palaeoclimatologists. Addressing research questions such as these requires a multi-proxy approach where continuous and well-dated proxy records of climate and vegetation change from the same core sequence can be compared with systematic archaeological and historical records of human settlement. The Cappadocia region of Anatolia is well suited to this task. It contains an exceptionally rich and well-studied archaeological record, and also possesses crater lakes, which contain an important suite of deposited sediments which preserve an archive of climate variations, vegetation and land use, and soil erosion.

Aim

This PhD research project builds upon previous work at the sites of Eski Acıgöl and Nar Gölü (lake) in the Cappadocian Volcanic Province of Anatolia (Turkey). New, long sediment cores reaching back 21.5 m (~12,000 yrs)



Annually laminated lake sediments from Nar Gölü

retrieved from the key study site of Nar Gölü in 2010 and which are predominantly laminated, will allow a high precision record of late Glacial-Holocene climate changes to be reconstructed in order to examine climate-environment-human interactions. Previous work has already demonstrated the power of the Nar record for the late-Holocene, notably the Byzantine and Ottoman periods; for example documenting the effects of the 7th–10th AD Arab invasions on the landscape of central Anatolia (England *et al.*, 2008; Eastwood *et al.*, 2009). The research student will work as part of a collaborative research project between the Universities of Birmingham, Plymouth and Nottingham. Specifically, the PhD research student appointed at Birmingham will focus upon pollen and charcoal analyses as the key proxy indicators to investigate human-environment interactions although there is scope to study other allied proxies such as sulphur isotope composition and trace elements of lake carbonates. The resultant datasets will then be compared with the $\delta^{18}\text{O}$ reconstructed climate record. Excellent laboratory facilities are available in the School which include a recently upgraded palynological processing and microscopy laboratory. You will be offered training in relevant palaeoecological field and laboratory techniques. Opportunities will be provided to obtain teaching experience as part of the project.

References

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