PROJECT TITLE
Cultural change in its environmental context: exploring, interpreting and managing archaeologically rich, large-scale cultural landscapes in the Mediterranean Basin

INVESTIGATOR(S)

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ANSTO Investigators
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Specialist Committee
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SCIENTIFIC OBJECTIVES

This project aims to build an integrated picture of cultural and environmental change in SE Bulgaria, drawing on high-resolution archaeological surveys, remote sensing and palaeoenvironmental investigations. Specifically, the project will: 1) locate and document new archaeological sites; 2) test remote sensing techniques for archaeological reconnaissance; 3) reconstruct Late Quaternary environmental change; 4) analyse shifts in settlement patterns in relation to the rise of complex societies; and, 5) determine the timing and impact of early agriculture. The project promises to make a substantial contribution to understanding the long-term interactions between environmental change and human subsistence in the wider Mediterranean Basin.

PROGRESS REPORT and RESEARCH OUTCOMES

The overall scientific objectives of this project are being met on schedule: (1) Four field seasons of archaeological surface survey in two study areas (Kazanluk and Elhovo) have identified and documented dozens of new mortuary and settlement sites, as well as use areas beyond site boundaries. (2) An award from the GeoEye foundation provided 600 sq km of IKONOS high resolution imagery in the Kazanluk region that has been analysed for suspect features, followed by ground control for confirmation. Two smaller QuickBird images purchased for the Elhovo region and similarly analysed. (3) Environmental samples were taken from mountain lakes near both research areas, as well as from the Atolovo Mire. It is this last activity that the AINSE award was applied to, supplementing pollen, charcoal, and mineral magnetism analysis of these samples.

AMS radiocarbon dates provided through the AINSE award have been used to establish the chronology of an important palaeoecological record from the Atolovo Mire. This pollen record is the longest and most complete late Quaternary pollen record from the Thracian Plain, and portrays very clearly the changes in vegetation, fire regimes and grazing that occurred since the Last Glacial Maximum. Like previous pollen data from Bulgaria and the Black Sea region, the Atolovo diagram indicates a phase of slow early-Holocene reforestation following the arid climates of the terminal Pleistocene. The large quantity of microscopic charcoal present in the early Holocene sediments suggests that natural fires or human-induced burning may have prevented forest expansion. An analogous phase of burning and grazing follows a major deforestation event approx. 6300 cal. BP. Perhaps the most interesting aspect of the Atolovo record is that it demonstrates that the adoption of agriculture on the Thracian Plain probably occurred in a landscape that was becoming increasingly forested.

(4) Preliminary analysis of survey and sondage results indicates that during the Neolithic Period habitation was divided between tells and dispersed flat sites, traces of the latter being recovered from the lowest levels of our
sondages (little Neolithic pottery was found on the surface). Tells continue into the Bronze Age while flat sites shift locations; excavations revealed intermittent reoccupation without continuous stratigraphy. A great deal of continuity exists in Early Iron Age through Medieval settlements, especially in the Elhovo region. Although these settlements show horizontal stratigraphy in both study areas, it is particularly pronounced in the Kazanluk region where sites show a greater degree of spatial displacement. Settlements hierarchies are limited to one or two tiers until after the Macedonian conquest (fourth century BC), and even thereafter are punctuated mostly by Hellenistic foundations of regional importance, with rural sites remaining small and homogenous. This last pattern, which argues against social complexity, contradicts both the written evidence (Thucydides) and conventional interpretations based largely on burial remains. Reconciling the evidence from settlement patterns and mortuary sites represents one of the biggest challenges for our project going forward.

(5) The picture of 7-6th millennium BC agriculture derived from the Atolovo pollen diagram is subtle and indicates small scale hoe agriculture/tree-throwing/gardening linked with animal husbandry, typical for early period of farming throughout Europe (Milisauskas 1989). The timing of agriculture at this early stage is obscured by the lack of absolute dates from excavated sites. Pollen evidence from Atolovo dating to 5-4th millenia provides a more pronounced picture of human impact on the environment: after the burst of forest growth, the subsequent trend of deforestation suggests increased human activity linked with slash and burn, environmental degradation and natural resource exploitation. All of these phenomena are likely related with the archaeologically attested emergence of Chalcolithic cultures, flourishing in the Black Sea coastal zone. The pollen record suggests that these societies exercised significant control over their environment and expanded much deeper into the Balkan interior than previously thought.

DATA

We received five AMS C14 dates through this grant (two additional dates (5570+/-40 and 8980+/-50 had earlier been acquired through a commercial laboratory). The dates we received included:

<table>
<thead>
<tr>
<th>Depth</th>
<th>Years BP</th>
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<tbody>
<tr>
<td>60</td>
<td>8675 +/-45</td>
</tr>
<tr>
<td>160</td>
<td>16000 +/-80</td>
</tr>
<tr>
<td>260</td>
<td>27090 +/-190</td>
</tr>
<tr>
<td>360</td>
<td>26080 +/-150</td>
</tr>
<tr>
<td>460</td>
<td>29040 +/-150</td>
</tr>
</tbody>
</table>

These dates were critical to the interpretation of our pollen diagram:
A summary of the Atolovo pollen diagram, including the new radiocarbon dates, is shown above. During the Last Glacial Maximum, the lands around Atolovo were covered with steppe vegetation. Oak (*Quercus*) began to expand at the beginning of the Holocene in landscapes that were relatively open, grazed and frequently burnt (indicated by dung-fungal spores such as *Sporormiella* and *Sordaria*, as well as abundant microscopic charcoal particles). Forests then expanded until approx. 6300 cal. BP, when a major deforestation event occurred and burning and grazing resumed.

**PUBLICATIONS / REPORTS arising as a result of your work.**

We have not incorporated the AMS C14 dates from this award into a publication yet, although several are being prepared. In the meantime, the project as a whole generated the following publications in 2010:


The paper based on this research has been delayed because there appear to be problems with C14 dates (they seem to be coming up too old to correspond properly to the geology and palaeoecology). We are having a series of bulk organics dates done and expect the results in the next week or two. After those are back and the problems with the dates resolved one way or the other, we will submit our article (to QSR, we think). We are also publishing a final report of the entire project, including palaeoecology at Atolovo, with British Archaeological Reports. It should be out in 2012.

**PhD STUDENTS**

Adela Sobotkova, University of Michigan, USA, August 2011, *The Emergence of Social Complexity in 1st millennium Thrace*.

Barbara Weissova, Charles University, Prague, CZ May 2012, *Spatial Analysis of Iron Age Burial Mounds in Central and South eastern Thrace*.

Drago Garbov, New Bulgarian University, Sofia, BG, May 2014, *Settlement Pattern Analysis of Late Antique sites in the Struma Valley, Bulgaria*. 