**In situ preservation**

The unique importance of waterlogged archaeological deposits results both from the exceptional preservation of organic remains, including wooden structures and artefacts, and palaeoenvironmental evidence, such as pollen and plant macrofossils. These provide the opportunity to enhance our understanding of landscape use and management, (Figure 1) vegetation change/succession, and importantly, social interactions (Williams 2009), including the organic fraction of prehistoric ‘material culture and structures’ (Bruning 2007) not preserved at dryland sites (Coles and Coles 1986).

**Project Rationale**

Archaeological remains and their context are a ‘non-renewable resource’ (Matthews 2003). Research into how these remains are preserved in situ, potential threats to preservation, and the nature of the burial environment, are therefore central issues in heritage management.

Threats to preservation may be readily identifiable, for example due to peat abstraction, or drainage, but more importantly, can also occur unnoticed within the burial environment (Matthews 2003). Monitoring is therefore essential to inform conservation strategies, and to ensure that archaeological resources are preserved for future generations and new research questions (Matthews 2003).

**Research Objectives**

This is a collaborative, interdisciplinary research project examining in situ preservation at two internationally important sites in the Somerset Levels, the Iron Age site of Glastonbury Lake Village, and the southern section of the Neolithic Sweet Track (Figure 2). The overall objective is to increase our understanding of the chemical, hydrological and sedimentological nature of the burial environment at these sites, through analysis of the sediment context, and monitoring spatial and temporal variability in water chemistry and water table depth. This information will be used to enhance our knowledge of the impacts of these variables on the current, and future, in situ preservation potential of the inorganic and organic resources preserved at these sites.

Monitoring spatial, (both across the site and with depth) and temporal variability in water chemistry, is crucial to characterising burial environments and hence preservation potential, because any changes may adversely impact on the long term preservation of artefacts, for example, though altering variables including redox potential (Douterelo et al 2009), the stability of corrosion layers on metal artefacts (Edwards 1998), the pH of the groundwater (Braviner 1998), or the microbiology of the burial environment (Powell et al 2001). These monitoring techniques are being combined with sediment analysis which includes particle size analysis, X-ray diffraction (mineralogy), X-ray fluorescence (multi-element chemistry), and loss on ignition (organic matter content), to characterise and identify the sediment sequence more fully.

**Initial Results – Sweet Track**

The basic sediment sequence (Figure 4) comprises a thin topsoil, humified degraded peat, sphagnum and reed peats with varying quantities of wood, a humic silty clay interpreted as a buried soil horizon, and at the base, estuarine grey clays. This sequence is further complicated at the edge of the burile (sand island) by the presence of sand lenses and thinner silty sand horizons.

During excavations the Sweet Track was identified ~150cm beneath the ground surface (Coles et al 1973) and located within ‘healthy’ peat below the upper humified horizon. Crucially, however, peat wastage in this area (Figure 5) may have altered the depth of peat, and therefore the depth of the trackway beneath the ground surface. Although these appear positive findings this is therefore not conclusive evidence that the preservation state of the trackway is good. In addition, without this monitoring it would not be possible to identify any potential impacts on preservation due to any variability in water table depth, water chemistry, pH or redox potential.

**Conclusion**

Monthly monitoring of both sites, and analysis of samples between visits is ongoing. Samples have been collected over ten months and this data is now being integrated to start interpreting and understanding these results. It is possible however that patterns in the data, particularly those for the water table depth, may not become apparent until monitoring has continued over at least a whole year.

**References**

4. Coles, J. M., Hibbert, F. A. and Orme, B. J. (1973) Prehistoric Roads and Tracks in Somerset, England: 3. The route of the trackway from the Burtle is located within ‘healthy’ peat below the upper humified horizon, and at the base, estuarine grey clays. This sequence is further complicated at the edge of the burile (sand island) by the presence of sand lenses and thinner silty sand horizons.
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**Figure 4:** Simplified cross section of the sediment sequence at the Sweet Track, including a piezometer tube (cap removed) used to monitor water table depth and collect samples for chemical analysis.

**Figure 5:** Section of a bog clab exposed by peat wastage at the Burtle site of the Sweet Track, Somerset. Length: 1.2m. (Photograph: Louise Jones).