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The expression of MIS 11 palaeolcimate in a lacustrine record: An annually resolved archive from Marks Tey, eastern England

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Due to the similarity of orbital forcing patterns during both interglacials, MIS 11 is argued to be one of the most appropriate climatic analogues for the Holocene. Climate records for MIS 11 should therefore enable us to understand how the climates of Holocene-like interglacials would evolve in the absence of anthropogenic forcing. However, understanding terrestrial response to climate change during an interglacial is difficult, due to the fragmentary nature of many terrestrial archives. Marks Tey, a lacustrine basin located in eastern England, is a crucial site for studying climatic variability during MIS 11 as; 1) The pollen record indicates that the lacustrine sequence preserved at this site spans the entire interglacial, and 2) It has the potential to be annually-laminated (varved) throughout a large part of the sequence (Turner, 1970).

This poster presents the work that has been undertaken on a new core recovered from the Marks Tey basin in 2010, as well as a summary of proposed future work. Detailed sedimentology, including micromorphology, particle size analysis, carbonate content and organic carbon content has been undertaken in order to place abiotic and biotic proxy variability within a sedimentary framework. High-resolution pollen and diatom analysis will be undertaken, with particular focus on demonstrating the annual nature of the laminations. Furthermore, an oxygen isotope record will be constructed through the sequence to determine the climatic structure of the interglacial, as well as to investigate the presence and magnitude of abrupt climatic changes. Quantitative temperature reconstructions will also be developed using chironomids and biomarkers. Through detailed thin-section micromorphology and micro-XRF analysis (ITRAX), a varve chronology for the annually laminated section will be constructed, in addition to a tephro-stratigraphy, which will support current chronological understanding of the site and allow for regional correlations. The poster concludes by comparing the record of MIS 11 preserved at this site with the palaeoclimatic record of this interglacial in other long, continuous records such as the EPICA Dome C deuterium record and stacked marine benthic δ^{18}O records, such as SPECMAP.

References

Turner, C., 1970. The Middle Pleistocene deposits at Marks Tey, Essex. *Philosophical Transactions of the Royal Society of London*, B257, 373-440.