



Modes of interglacial sea-level change: evidence from a late Pleistocene highstand in the UK

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Interglacial sea-level extremes provide a useful analogue for future sea-level behaviour. The Holocene has been characterized by an overall stable sea level, but earlier interglacials, especially the Last Interglacial, are reported to have experienced meter-scale fluctuations (e.g. Rohling et al. 2008). Whether interglacial sea-level maxima are reached gradually or in 'steps' has serious societal implications, as the latter mechanism is associated with much higher rates of sea-level rise. Furthermore, the fluctuating Red Sea model of Last Interglacial sea-level change (Rohling et al. 2008) now underpins the high-end sea-level scenario ("High ++") adopted by the UK Climate Impact Programme. To better constrain interglacial sea-level behaviour, the iGlass consortium, funded by the UK Natural Environment Research Council, aims to constrain interglacial sea-level fluctuations from a variety of archives, e.g. corals, speleothems, marine isotopes and estuarine sediments. In this paper we investigate estuarine sediments and apply microfossil analyses, used widely to constrain Holocene sea-level changes, to sediments from interglacial deposits recovered from the Nar Valley, Norfolk, United Kingdom.

A coring transect, comprised of 8 cores in 6 locations, traces an interglacial transgressive sequence inland. The litho- and biostratigraphy (mainly foraminifera) record the nature of this transgression. Sediments are either MIS 9 or 11 in age and include freshwater peats and marine clays, buried by glacial sands and gravels. Previous palynological work (Ventris, 1996) has indicated the sediments represent the entire interglacial period. The top of the marine clays has been tracked laterally for ~15 km and was found to have (at least) a 18 m vertical range, up to ~18 m above present mean sea level. Foraminiferal assemblages are dominated by the shallow water dweller *Ammonia* spp, and suggest only one sequence of deepening and shallowing. We further constrain the chronology using amino acid racemization (AAR) performed on foraminifera and gastropod opercula. Further analyses will complement our findings, but so far our results support a gradually rising sea level, without major fluctuations, culminating in a highstand that reached ~20-25 m above present sea level (not corrected for vertical land motion).

Rohling, E.J., Grant, K., Hemleben, C., Siddall, M., Hoogakker, B.A.A., Bolshaw, M., Kucera, M., 2008. High rates of sea-level rise during the last interglacial period. *Nature Geoscience* 1, 38-42.

Ventris, P.A., 1996. Hoxnian interglacial freshwater and marine deposits in northwest Norfolk, England and their implications for sea-level reconstruction. *Quaternary Science Reviews* 15, 437-442.