High resolution marine records of the last glacial/interglacial transition

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It is increasingly apparent that the last glacial-interglacial transition (the Lateglacial period) may provide insights into the underlying processes acting within our planet's ocean-climate system. Short-lived, but severe climatic anomalies, such as the Younger Dryas cold phase (*c.* 11–10 ka BP), indicate the importance of oceanic circulation and particularly changes in the rate of thermo haline overturn in the North Atlantic during deglaciation. Such anomalies, which can only be resolved from high sedimentation rate sites, challenge our perceptions of long-term changes in incident solar radiation forcing climate change and illustrate the internal discontinuities to which the system is prone. Recent work points to the reorganisation of ocean circulation (reduced NADW formation) due, in part, to freshwater input as the key to understanding climate feedback mechanisms.

The oxygen isotope records of benthic foraminifera in continental shelf sediments provide a record of temperature and salinity variations. Faunal changes, quantified by principal component analysis, help us to distinguish the periods of climatic amelioration. Stable isotope measurements of the eurythermal, epilithic benthic species *Cibicides lobatulus*, which spans the entire Lateglacial period from the continental margin of N.W. Scotland, are largely coincident with changes in the first principal component scores. We interpret this faunal and isotopic record as reflecting water temperature variation immediately adjacent to the Atlantic seaboard of N.W. Scotland. Water temperature variation from the shelf records confirm the pattern and timing of North Atlantic Polar Front movement as seen in the open ocean records.

Similarly, detailed Lateglacial records of the open ocean are currently under investigation from the adjacent continental slope of the Barra Fan. Bulk sediment geochemistry, including excess ^{230}Th, data are presented and we discuss the merits of radionuclide scavenging *vs.* dilution models in the light of AMS radiocarbon chronology, known Icelandic tephra stratigraphy, sedimentological analyses and faunal/isotopic data. Combined tephra and AMS radiocarbon chronologies allow us to discuss the marine reservoir corrections for this period and to extend our palaeoceanographic correlations to the Greenland Ice Core records. The stable isotope records of different planktic species and the associated faunal assemblage changes show very rapid oscillations in the position of the North Atlantic Polar Front. We illustrate this instability by examining palaeoceanographic changes associated with the onset and termination of the Younger Dryas stadial.