



The response of canyon-fan benthic foraminifera to changing sedimentary regimes since the Last Glacial Maximum

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Benthic foraminiferal assemblages were examined in two piston cores collected from the northern and southern bank of the lower Nazaré canyon. Whereas sedimentation on the southern bank is predominantly hemipelagic, the northern bank is greatly influenced by terrigenous sediment transport through the canyon. Over time this has resulted in construction of a levee of locally up to 1 km high. We investigated the response of benthic foraminifera to a variable supply of terrigenous sediment from the Last Glacial Maximum (LGM) to present.

The age models of the two piston cores were based on $\delta^{18}\text{O}$ of *Globigerina bulloides*, tuned to the record of Shackleton et al. (2000), and three ^{14}C AMS dates. In addition, the coiling ratio of planktonic foraminifera *Neogloboquadrina* spp., *Globorotalia truncatulinoides* and *Globorotalia hirsuta* together with magnetic susceptibility patterns were used to construct a stratigraphic framework.

The results to date indicate a significant decrease in the sediment transport since the LGM; sedimentation rates in both cores were considerably higher at the LGM. The northern core experienced even greater terrigenous input at the LGM than at present, whereas the sediment in the southern core was always more marine in origin. The organic carbon content fluctuated in both cores, with maximum values occurring in the deglaciation phase and minimum values during the Holocene climatic optimum. C/N ratios, generally higher in the northern core, confirm that the organic material deposited on the northern bank is enriched in terrestrial components, compared to

more marine organic material on the southern bank. The foraminiferal assemblages varied through time, and between the coring locations. The surface sediments of the southern core were dominated by species associated with marine phytodetritus, including *Epistomella exigua*. These were also found in the northern levee, but in less significant numbers. On the northern levee the relative abundance of shallow water foraminifera (e.g. *Elphidium* spp.) was relatively higher during the Younger Dryas, indicating greater sediment transport from the continental shelf at this time. The total number of foraminifera was lower in both cores at the LGM. This may be partly due to greater sediment transport and thus dilution of specimens with the bulk material.