Geophysical Research Abstracts,
Vol. 10, EGU2008-A-10345, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-10345
EGU General Assembly 2008

Millennial-scale response and impact of climate variability in the Gulf of California across the LGM/Holocene transition

E.L. McClymont (1), R. Ganeshram (2)

(1) School of Geography, Politics & Sociology, Newcastle University, Newcastle upon Tyne, NE1 7RU, United Kingdom (erin.mcclymont@ncl.ac.uk)

(2) School of Geosciences, University of Edinburgh, The King's Buildings, Edinburgh, EH9 3JW, U.K. (r.ganeshram@ed.ac.uk)

Ocean circulation in the Gulf of California is driven by a monsoon climate due to differential warming between land and sea, and seasonal variability in atmospheric circulation. As a result, pronounced seasonal variability in sea-surface temperatures, primary production, wind intensity and rainfall patterns are generated, and can be clearly detected in the annually laminated marine sediments that underlie the Gulf. The climate of the region is also affected by the inter-annual climate variability described by the El Niño/Southern Oscillation (ENSO) system, which affects both the intensity and duration of the winter (cool, dry) and summer (wet, warm) modes (Douglas et al. 2007). Despite evidence for past "ENSO-like" climate variability at a variety of timescales, the behaviour of the ENSO system under cooler climate states continues to be debated.

We address these issues by investigating both the marine and terrestrial signature of ENSO-like variability from the Gulf of California, across the transition from the LGM to the early Holocene. We present results from the analysis of a mm-scale (annually) laminated sediment core, MD02-2515, collected during the IMAGES MONA expedition. We investigate rapid (millennial-scale) variability in the eastern tropical Pacific across the climate transition, using a variety of organic geochemistry proxies. These include the U_{37}^{K}' and TEX_{86} indices (sea-surface temperature), pigment, alkenone and

sterol accumulation rates (bioproductivity) to investigate the intensity of the upwelling system. Terrestrial inputs from vascular plants (e.g. n-alkanols, n-alkanoic acids) and soils (BIT index) give insight into conditions onshore across the transition. Preliminary results show that millennial-scale variability in all records, which is superimposed upon a slight warming ($\sim$2°C) and reduced alkenone production from the LGM to the Holocene, but no clear long-term trend in terrigenous inputs.

References

R. Douglas, O. Gonzalez-Yajimovich, J. Ledesma-Vazquez, and F. Staines-Urias, F., 2007, Climate forcing, primary production and the distribution of Holocene biogenic sediments in the Gulf of California. *Quaternary Science Reviews* **26**, pp. 115-129.