Geophysical Research Abstracts
Vol. 15, EGU2013-1294, 2013
EGU General Assembly 2013

A 500,000-year record of equatorial Indian Ocean upper water-column structure

Clara T. Bolton (1,2), Liao Chang (1,3), Steven Clemens (4), Kazuto Kodama (5), Minoru Ikehara (5), Martin Medina-Elizalde (1,6), Greig A. Paterson (1,7), Andrew P. Roberts (8), Eelco J. Rohling (1), and Xiang Zhao (1)

(1) School of Ocean and Earth Science, University of Southampton, Southampton, United Kingdom, (2) Now at: University of Oviedo, Geology Department, Oviedo, Spain (cbolton@geol.uniovi.es), (3) Now at: Department of Earth Sciences, Utrecht University, Utrecht, The Netherlands, (4) Department of Geological Sciences, Brown University, Providence, Rhode Island, USA, (5) Center for Advance Marine Core Research, Kochi University, Kochi, Japan, (6) Now at: Centro de Investigación Científica de Yucatán, UCIA, Cancún, México, (7) Now at: Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China, (8) Research School of Earth Sciences, Australian National University, Canberra, Australia

The Indian Summer Monsoon (ISM), a subsystem of the Asian summer monsoon, is a large-scale and highly dynamic ocean-atmosphere-land interaction centered on the Indian subcontinent. It directly affects over a billion people. Here, we present new records of palaeoceanographic variability that span the last 500,000 years from the northeast equatorial Indian Ocean, a relatively under-sampled area of ISM influence. We have generated carbon and oxygen stable isotope records from three foraminiferal species in a single sample set, from Ocean Drilling Program Site 758 (5°N, 90°E), to investigate the oceanographic history of this important region. We interpret our resultant $\Delta\delta$18O (surface-thermocline) record of upper water-column stratification in the context of past ISM variability, and compare orbital phase relationships in our Site 758 data to other climate and monsoon proxies in the region. Results suggest that upper water-column stratification at Site 758, dominated by variance at precession frequencies (23, 19 and 11 kyr), is forced by both local insolation and ISM winds. In the precession band, stratification minima at Site 758 lag northern hemisphere summer insolation maxima (P min) by 9 kyr, consistent with Arabian Sea ISM phase estimates and suggesting a common wind forcing in both regions. Additionally, we find evidence of possible overprinting of millennial-scale events during glacial terminations on our stratification record, which suggests an influence of remote abrupt climate events on ISM dynamics.