



Comparative geochemistries of sediments from stations spanning the OMZ across the Arabian Sea margins of Pakistan, India and Oman

Greg Cowie, Steve Mowbray, Helen Mathesen, Rebecca McKenzie, Michelle Lewis, Amy Anderson, and Carol White

University of Edinburgh, Grant Institute, School of GeoSciences, Edinburgh, United Kingdom (glcowie@glg.ed.ac.uk, 44 (0)131 6683184)

Continental margins with oxygen minimum zones (OMZs) are typically sites of unusually organic matter (OM)-rich sediments. However, the extent to which O₂ depletion is the cause of sediment OM enrichment has been the subject of long-standing debate. We present the results of elemental, stable isotopic, biochemical and grain size analyses of sediments from sites spanning three different margins of the Arabian Sea. These margins differ in both productivity and hydrodynamic conditions, and thus in terms of bottom-water ventilation and O₂ depletion. The sediments in turn differ in terms of the redox conditions they experience, and therefore in geochemistry and faunal populations. All three margins show mid-slope OM enrichment, but to varying degree and with differing cross-OMZ trends. Notably, concentrations and measures of OM quality (degradation state) generally are not clearly related to bottom-water O₂ depletion. Other processes therefore contribute to observed OM distributions, and the role of O₂ exposure is discussed in relation to factors including productivity and OM source, and OM-mineral interactions and hydrodynamic sorting.