

Tanzania Onshore Paleogene Integrated Coring (TOPIC): Workshop funded by ICDP by Professor Paul Pearson

ICDP have just announced funding for a workshop to develop a full proposal for this UK-led initiative. The workshop will probably be held in Tanzania in September 2014, and further details will be posted here in due course. The objective of the workshop is to plan a full proposal for ICDP, whereupon the various national contingents (seven of them are already involved) will apply for drilling and scientific support from their respective funding bodies. The proposal abstract is given below. Anyone interested in participating in TOPIC is welcome to contact Paul Pearson at pearsonp@cardiff.ac.uk. We are especially looking for research ideas that expand the scope of the proposal in some way.

The science case

We aim to investigate tropical climatic and biotic change through the Eocene epoch by coring a 1200m stratigraphic and paleoclimatic reference section in the hemipelagic marine mudstones (Kilwa Group) of southern coastal Tanzania. Our drilling targets include critical intervals of extreme climate and major climate change including the Paleocene/Eocene Thermal Maximum, the Early and Middle Eocene Climatic Optima, the Middle/Late Eocene biotic turnover, and the Eocene / Oligocene Transition. The Kilwa Group sediments are well known for their exceptionally well-preserved microfossils and organic biomarkers and have proven potential for the application of a wide range of marine and terrestrial paleoclimate proxies that allow us to reconstruct conditions in the low-latitude ocean, atmosphere, and the adjacent African continent. We will produce new high-resolution records of the evolution of atmospheric carbon dioxide and sea surface and sub-surface temperatures through the entire Eocene and compare our data to the output of General Circulation Models with Eocene paleogeography and greenhouse forcing. This will allow us to address the critical question of climate sensitivity in the Eocene and assess the performance of the models at reconstructing a range of greenhouse climate states. The cores will be subject to sedimentological, biostratigraphic, paleomagnetic, and chemostratigraphic characterization, and down-hole logging will be used to obtain a cyclostratigraphic record. Therefore the cores will provide a world-class reference section for Eocene integrated stratigraphy and geochronology. Detailed investigation of the following fossil groups is planned: planktonic foraminifera, benthic foraminifera (including transported larger benthic foraminifera from the shelf), calcareous nannoplankton, dinoflagellate cysts, pollen and spores (from the adjacent continent), ostracodes, and a variety of other groups (echinoderms, gastropods etc.). The following paleoclimate proxies will be employed: oxygen and carbon isotopes, boron isotopes, foraminiferal trace elements including Mg/Ca and B/Ca, higher plant and soil bacterial biomarkers, GDGTs including the TEX 86 and MBT/CBT paleotemperature proxies, bulk-rock geochemistry and clay-mineral analysis. Our proposal is formally linked to Integrated Ocean Drilling Program Full Proposal 778 (graded 'excellent' by IODP) and has combined and complementary scientific objectives.