and the Labrador Sea water (LSW). A total of 29 box cores, 19 piston cores, 6 kasten cores, 9 short gravity cores and 20 CTD casts as well as 28 surface water samples were collected during the cruise. The cruise was dedicated to the NERC RAPID Climate Change programme but one of its objectives was also to gather modern data from water and surface-sediment samples.

Here we focus on the box-core tops and water samples collected from the CTD casts. The box corer was a 50x50x50-60cm spade corer. Each box core was sub-sampled with two 110 mm core liner tubes. The top 2 cm of the remainder of the box-core surface was then sampled as a "surface scrape". The sub-sampled cores were further sampled at 0.5 or 1.0 cm resolution. Sediment samples were disaggregated on an end-over-end wheel, wet sieved at >63 um, and dry sieved to 63-150 and >150 um. The >150 um fraction was split until approximately 300 foraminifera remained and counted for number of lithic grains, benthic foraminifera, planktonic foraminifera and foraminifera fragments. From the counts we calculated the planktonic fragmentation index (FRAG= (fragment/8)/((fragment/8)+whole planktonic foraminifera)) and benthic abundance (BENTH =benthic foraminifera/(benthic foraminifera + planktonic foraminifera) as a measure of post mortem dissolution. FRAG ranged from 0.5 to 11% whereas BENTH ranged from 0 to 64%. In all but the shallowest sample (Greenland rise, 761m water depth) benthic foraminifera constituted less than 2% of the total >150 um fraction of the sample. Geochemical analyses (stable isotopes and trace elements) of both benthic and planktonic foramnifera are related to temperature and carbonate ion data from each site to improve current benthic and planktonic calibrations. Accelerator Mass Spectrometer (AMS) radiocarbon dating was done for each core top based on between 900-1600 monospecific planktonic foraminifera (*Globigerina bulloides* or *Neogloboquadrina pachyderma* (sinistral)).

P 1-64
GREENHOUSE TO ICEHOUSE TRANSITION: RECORDS OF COOLING AND ICE GROWTH ACROSS THE EOCENE-OLIGOCENE BOUNDARY

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The Eocene-Oligocene climate transition (~34 Ma) represents the first major step from greenhouse conditions towards our modern glaciated world. This transition is recorded as a ~1.5‰ increase in deep-sea benthic foraminifer oxygen isotope ($\delta^{18}O$) records. Paradoxically, published foraminiferal Mg/Ca records display no evidence of cooling across the Eocene-Oligocene transition (Lear et al., 2000; Billups and Schrag, 2003; Lear et al., 2004). However, the deep-sea Mg/Ca records may be compromised by the increased carbonate saturation state associated with the climate transition (Elderfield et al., 2006; Rea and Lyle, 2005; Coxall et al., 2005; Lear et al., 2004).

Here we present planktonic and benthic foraminiferal stable isotope and trace metal records from Eocene-Oligocene hemipelagic clays collected by the Tanzanian Drilling Program. These exceptionally well preserved foraminifera deposited well above the calcite compensation depth provide the first evidence for global cooling during the initial phase of early Cenozoic glaciation. This resolves the apparent paradox that extensive ice sheet growth occurred without climatic cooling, and permits interpretation of oxygen isotope records without invoking extensive Palaeogene continental-scale ice sheets in the northern hemisphere.

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P 1-65
HIGHER FREQUENCY OF TURBIDITES DURING ABRUPT CLIMATIC "HEINRICH" AND "DANSGAARD -OESCHGER" EVENTS – EVIDENCE FOR SLOPE INSTABILITY ON THE PORTUGUESE MARGIN

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Slope instability on the Portuguese Margin is induced by minor sea level variations caused by abrupt climate changes. A higher frequency of turbidites emplaced in a levee located between the Lisbon and the Setubal submarine canyons, at a depth of 4602 mwd, occurs at rapid climatic events such as the last six cold Heinrich-events and possibly Dansgaard-Oeschger stadials. Nonetheless, larger sea level changes consequent of orbital scale changes also generate higher turbidity frequency during the last glacial Marine Stage 2 than interglacials as widely known in the geological record. Our climate record covers the last 65 kyr.

P 1-66 (S)
EASTERN PACIFIC MID-DEPTH WATER MASS CHANGES AND HYDROLOGICAL PROPERTIES INFERRED FROM BENTHIC FORAMINIFERAL STABLE ISOTOPES

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We present oxygen and carbon stable isotopic ratios measured on the epibenthic foraminifer species Cibicidoides wuellerstorfi in core MD02-2529, retrieved in the Panama Basin during the IMAGES VIII / MONA cruise (08°12.33'N; 84°07.32'W; 1619 m water depth). The core is situated at the edge of two contrasted water masses in terms of nutrients and salinity. The $d^{13}C$ measured on C. wuellerstorfi are compared with measurements of sedimentary content of organic carbon, alkenones and carbonates as well as of $d^{13}C$ measured on the coexisting endobenthic foraminifer species Uvigerina peregrina in the same core for the last 150 kyr BP. Our results indicate that the $\delta^{13}C$ of *C. wuellerstorfi* reflects the $\delta^{13}C$ of dissolved inorganic carbon, and was not influenced by secondary processes such as organic matter supply to the seafloor, carbonate dissolution or even upward diffusion of ^{13}C-depleted pore waters.

Temporal variations of $\delta^{13}C$ of *C. wuellerstorfi* indicate high-amplitude fluctuations of up to 1‰ at both glacial-interglacial and millennial to centennial timescales. By comparing MD02-2529 $\delta^{13}C$ to other downcore epibenthic foraminifera $\delta^{13}C$ records from the eastern tropical Pacific (Stott et al., 2000; Mix et al., 1991), we show that the $\delta^{13}C$ of *C. wuellerstorfi* at MD02-2529 core location can be interpreted as a mixture of two relatively stable water masses: a Northern, nutrient-rich component and a Southern, nutrient depleted component. By computing MD02-2529 centennial-scale *C. wuellerstorfi* $\delta^{13}C$ and $\delta^{18}O$ anomalies from a 5-pt running average, we detect centennial-scale positive $\delta^{13}C$ anomalies of up to 1‰ that are closely related to negative $\delta^{18}O$ anomalies of up to 0.4‰ (most likely to represent regional salinity changes) during the Marine Isotope Stage 3 (MIS3). In view of present-day hydrological patterns, this result implies that the meridional salinity gradients in the Eastern Pacific at ~1500m was reversed during the last glacial period. Moreover, these types of anomalies also occur during short time intervals lasting a few millennia (e.g. at core-top, within Terminations I and II and possibly at glacial inceptions during the MIS5e-d, MIS5c-b and MIS5-4 transitions).

Recent modelling experiments suggest that abrupt climate changes triggered by input of freshwater in the North Atlantic could lead to rapid interhemispheric reorganisations of oxygen and/or nutrients (Schmittner et al., in press) as well as salt (Saenko et al., 2004) within the Pacific Ocean for the upper 2000m water depth. Our results confirm that major rearrangements of interhemispheric salinity contrasts in the Eastern tropical Pacific at mid-depth could occur at the centennial timescale, and could last a few centuries to a few millennia. However our dataset also suggests that these changes in salinity latitudinal gradients mainly occur at MIS transitions, plausibly in response to major thermohaline circulation rearrangements.

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P 1-67
PALEOMAGNETIC AND ENVIRONMENTAL MAGNETIC STUDY OF CORES MD052927 AND MD052928