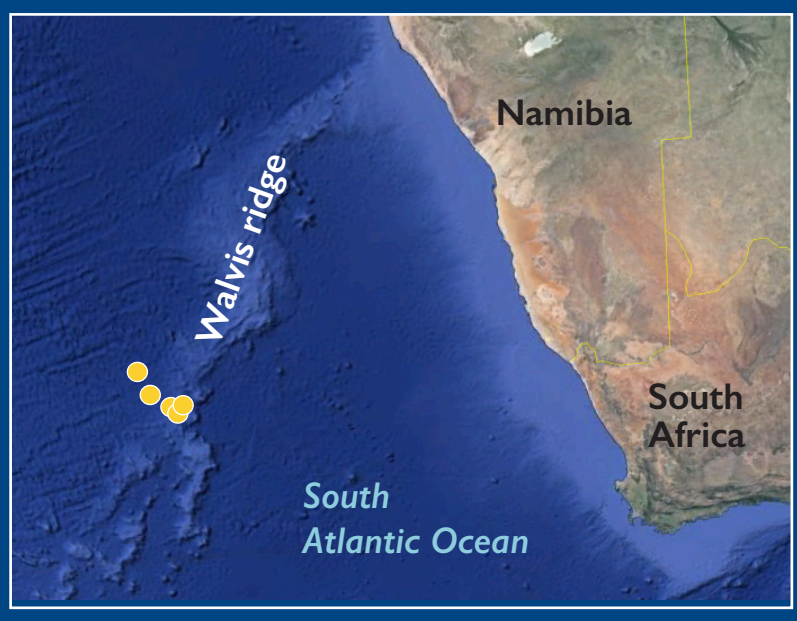
Paleocene-Eocene Thermal Maximum (56 Ma)

ODP Leg 208 Walvis Ridge

Spring 2003: Deep-sea marine sediments were retrieved from the Walvis ridge in South Atlantic by the drillship ***JOIDES Resolution***.

61 days
19 holes
3.7 km drilled
3.6 km of core recovered (97%)
Water depth: 2.5 - 4.8 km

Dynamic positioning
Length: 143 m
Beam: 21.3 m
Derrick (height): 62 m
112 berths (25 scientists)



Top
4896 m below sea level
141 m below seafloor

4890 m below sea level
140 m below sea floor

Limestone

Limestones are sedimentary rocks made of calcium carbonate ($CaCO_3$). They arise from the accumulation of skeletons or tests of planktonic microfossils. Their deposition and conservation depend on the physio-chemical conditions of the environment (ocean and atmosphere).

Claystone

Limestone

Eocene-Paleocene boundary

Claystones are sedimentary rocks essentially made of fine-grained clay minerals composed of silicon, aluminium and iron (Si- Al and Fe) oxides. These deposits are the result of very slow accumulation of clay sediments on the seafloor.

The abrupt change in the mineralogical composition (carbonate to clay) reflects a rapid change of the environment. Analyses of the geological samples collected during ODP Leg 208 have demonstrated a major climate warming event happened at the end of the Paleocene (56 My ago) and was probably due to a large release of greenhouse gas (methane) into the atmosphere. The consequences of this important event were a rise in temperature (between 4 and 8 °C over 10,000 years) and the acidification of the seawater, which resulted in the significant extinction of the plankton and a reduction in biodiversity at this time in the South Atlantic Ocean.

References: Zachos J, Kroon D, Blum P et al, 2004. Proc. ODP, Init. Repts., 208 - doi:10.2973/odp.proc.ir.208.2004

Plate tectonic reconstruction

Ocean Drilling Program Legacy (ODP)
http://www.odplegacy.org

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