

IMAGES SciCOM REPORT 2004

The INETI - DGM contribution for the period January 2004 to December 2004

The Portuguese Status

On 4th March, 2004 the Instituto Geológico e Mineiro (IGM) was incorporated into the Instituto Nacional de Engenharia, Tecnologia e Inovação (INETI) whereby the Departamento de Geologia Marinha (DGM) was kept as individual department. Like in the previous years, the Portuguese participation in IMAGES has been funded exclusively by the DGM through PIDDAC money.

IMAGES Cruise related Scientific Activities

Cruises IMAGES I and "Pole-Ocean-Pole (POP)" – Portuguese Margin

In cores MD95-2040 and MD95-2041, multi-species stable isotope measurements and some AMS ^{14}C dates have been obtained for the time slices of marine isotope stage (MIS) 2 and MIS 4 (PI: A. Voelker). Multi-species planktonic isotope data also exist for MIS 6 in core MD95-2040 (PI: L. de Abreu). Glacial-Interglacial hydrographic changes off SW Portugal based on cores MD95-2040, -2041, and -2042 in combination with core MD01-2443 are being studied in high-resolution by L. de Abreu. A manuscript by de Abreu *et al.* with a detailed study of MIS 10 and 11 in core MD01-2443 was submitted in 2004.

Cruise IMAGES II – SW Africa

In core MD96-2086, the diatom abundance for the last 300 kyr and high-resolution studies of diatom and Corg concentrations for Terminations 1 and 2 and the base of MIS 6 are performed by S. Vaqueiro for her PhD thesis.

IMAGES V – leg 5 Portuguese Margin

Cores MD99-2336 and MD99-2339 are being studied in high-resolution to reconstruct changes in the Mediterranean Outflow and the upper water column during the last 110 and 48 kyr, respectively. The laboratory work for the multi-proxy study including benthic and planktonic stable isotopes, planktonic foraminifera faunal changes, grain size (Coulter and Sedigraph), physical properties, XRF element concentrations, and radiogenic isotope measurements (like for ^{230}Th excess) is nearly completed for both cores and the work is now in the summarizing phase with several publications to follow in 2005 and 2006 (PI's: A. Voelker, S. Lebreiro, F. Abrantes; C. Veiga-Pires from Uni. Algarve).

In core MD99-2339, 3 deep-sea corals were dated by ^{14}C and U/Th (the later by A. Schroeder-Ritzrau, Heidelberger Akademie der Wissenschaften). In addition, a trace element study on benthic and some planktonic is underway by P. Martin (U Chicago) in collaboration with A. Voelker and S. Lebreiro.

Heinrich event productivity changes

High-resolution studies in the time slices of Heinrich events 1 and 4 in North Atlantic cores, including MD95-2008, MD95-2014, MD95-2027, MD95-2034, and MD95-2037, are underway

to investigate the impact of iceberg discharges on the hydrology and the related biochemical response (PhD thesis S. Nave).

Additional activities that relate to some of the IMAGES working groups include regional transfer functions based on planktonic foraminifera (PhD thesis E. Salgueiro) and diatoms (PhD thesis C. Lopes) and multi-proxy studies of the climate during the last 2000 years in the North Atlantic region (PI: F. Abrantes; several PhD students).

Cruise Participations by Members of the DGM

•**CANYONS 2004** May 2004 on RV Pelagica

Sediment samples and TOBI data from the Lisbon-Setubal and Nazare canyon regions

•**MD140/ PRIVILEGE** and **MD141/ ALIENOR** on RV Marion Dufresne (May – June 2004)
participation of L. de Abreu as Portuguese observer

•**TTR 14** July-August 2004 on RV Logachev

Seismic recording and sediment samples from the Gulf of Cadiz with focus on the mud-volcano fields (partly related to Euromargins program MVSEIS)

•**SWIM 04** Cruise on RV Urania (late August - September 2004)

among other things recovery of a surface/ water interface core at IMAGES site MD99-2339 in the western Gulf of Cadiz; cruise related to Euromargins programs SWIM and MVSEIS.

•**IODP leg 303**: North Atlantic Climate 1 (September - November 2004)

participation of L. de Abreu (with English funding)

Conference Presentations

Results obtained from IMAGES or other cores have been presented at several international meetings including the Iberian IGBP meeting (April 2004), the EU-Conference on Paleoclimate (July 2004), the International Geological Congress (August 2004), the 8th International Conference on Paleoceanography (September 2004), and the AGU Fall Meeting (December 2004).

Publications

Tzedakis, P.C., Roucoux, K.H., **de Abreu, L.**, Shackleton, N.J. (2004). The duration of forest stages in Southern Europe and interglacial climate variability. *Science*, 306, 2231-2235.

Tzedakis, P.C., Frogley, M., Lawson, I.T., Preece, R.C., Cacho-Lascorz, I., **de Abreu, L.** (2004). Ecological thresholds and patterns of millennial-scale climate variability: the response of vegetation in Greece during the last Glacial. *Geology*, 32, 2, 109-112.

Abrantes, F., Lebreiro, S., Gil, I., Rodrigues, T., Bartels-Jónsdóttir, H., Ferreira, A., Kissel, C., Grimalt, J. (in press). Shallow marine sediment cores record climate variability and earthquake activity off Lisbon (Portugal) for the last 2000 years. *Quaternary Science Reviews*.

de Abreu, L., Abrantes, F.F., Shackleton, N.J., Tzedakis, P.C., McManus, J.F., Oppo, D.W., Hall, M.A. (in press). Ocean climate variability in the Eastern North Atlantic during interglacial MIS 11: A partial analogue to the Holocene? *Paleoceanography*.

Roucoux, K.H., Tzedakis, P.C., **de Abreu, L.**, Shackleton, N.J. (in press). The response of NW Iberian vegetation to North Atlantic climate oscillations during the last 65,000 years. *Quaternary Science Reviews*.

Other Activities

Antje Voelker was involved in the preparation of a new glossy for the IMAGES project and compiled several figures with IMAGES related results, which are planned to be made available as transparencies through the IMAGES server.

Alfragide, 7th February, 2005

Antje Voelker