Geophysical Research Abstracts, Vol. 9, 10122, 2007
SRef-ID:

Fluid flow associated ecosystems of the Nile deep-sea fan, Eastern Mediterranean (MEDIFLUX)

A Boetius (1), JP Foucher (2), de Lange (3), S Duperron (4), S Dupre (5), S Kholeif (6), J Mascle (7), A Stadnitskaia (8) and the BIONIL Team

(1) MPI for Marine Microbiology, Bremen, Germany, (2) IFREMER Centre Brest, Plouzane, France, (3) University of Utrecht, Utrecht, The Netherlands, (4) UMR 7138, Pierre et Marie Curie University, Paris, France, (5) Vrije Universiteit Amsterdam, Amsterdam, The Netherlands, (6) National Institute of Oceanography and Fisheries, Kayt Bay, Alexandria, Egypt, (7) Geosciences-Azur, UMR 6526, Villefranche-sur-Mer Cedex, France, (8) NIOZ Royal Netherlands Institute for Sea Research, Den Burg, Texel, The Netherlands. aboetius@mpi-bremen.de

Several fluid flow structures on the Nile deep-sea fan have been investigated during the last four years in the EUROCORES EUROMARGIN project MEDIFLUX. The expedition BIONIL (Nov 2006) was dedicated to quantitative investigations of the distribution and functions of the Nile fan seep ecosystems. We combined near-field mapping of selected habitats using the AUV ASTERX (IFREMER) equipped with a Multibeam system (Geosciences-Azur), followed by detailed geochemical in-situ measurements and specific sampling of mud, fluids, carbonates and biota along geochemical gradients using the ROV QUEST (MARUM). We focused on the mud volcanoes “Amon” and “Isis” of the eastern Nile fan province, and on the central area characterized by a high density of pockmarks and carbonate pavements. At all sites we found indications of substantial methane and sulfide seepage as well as active microbial communities profiting from these energy sources. A surprising finding is the multitude of small-scale habitats at the investigated mud volcanoes and pockmark systems, possibly explaining the high microbial and animal diversity of the Nile deep sea fan. Active gas and sulfide seepage was not only detected in the center of mud volcanoes and pockmarks but also at the rise of mud volcanoes and the flat, cemented seafloor between pockmark structures. We suggest that the Nile deep-sea fan is a fascinating natural laboratory to study fluid flow and gas emission, geosphere-biosphere coupling and the relation between biodiversity and habitat structure in the deep ocean.