Geophysical Research Abstracts, Vol. 9, 08247, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08247

Nature and source of the organic matter collected by sediment traps in the Bari canyon (southern Adriatic Sea)

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Within the EU-funded Project HERMES, special attention is given to the factors/processes controlling biodiversity and ecosystem functioning in the deep seas. Canyons directly affect the functioning of the deep ecosystem by providing a fast way of fuelling highly nutritive, fresh organic matter to the deep. The geochemical characterization of the organic material delivered via the submarine Bari canyon to the deep southern Adriatic basin was the primary object of this study.

The efficiency of the canyon, as major transfer conduit of particulate material, was examined through two hydrological cruises and the deployment of three instrumented moorings over one year. Hydrological study and suspended matter characterization were conducted in two contrasting seasons at the shelf edge and within the canyon in order to investigate temporal and spatial variability. ^{210}Pb activities, carbon elemental and stable isotopic compositions and biomarkers (CuO-reaction products) were used to infer the sources of the trapped material in the Bari Canyon.

The fluxes of particulate matter collected in the sediment traps showed values 2-3 higher in the canyon relative to the adjacent open slope. Particle fluxes showed a marked temporal variability (maximum values recorded in April-May) that occurred simultaneously in all stations. In spring, a vein of North Adriatic Dense Water (NAdDW) was observed flowing southward, along the Adriatic shelf, and spreading in the deep basin. This was related to enhanced across-slope current component with

a pulse regime, which in turn was responsible of the higher particle delivery both in the open slope and canyon stations. The trapped organic material was result of both vertical and lateral fluxes which displayed different OM features in terms of the autochthonous and allochthonous source. The local primary production from the uppermost water column contributed to the vertical flux of export. Conversely, the advected sediment could possibly originate from the resuspension of material in the North Adriatic and/or in the Apennine clinoform as well as from adjacent regions such as the Bari continental shelf and the upper canyon walls.