PRELIMINARY PARTICLE FLUX RESULTS OF EUROMARGE NB PROJECT IN THE NW MEDITERRANEAN CONTINENTAL MARGIN

A. Palanques[1], S. Heussner[2], A. Monaco[2], P. Puig[1], J. Carbonne[2], N. Delsaut[2], and A. Calafat[3]

[1]Institut de Ciències del Mar (CSIC), Paseo Nacional s/n, Barcelona 08039, Spain.
[2]Laboratoire de Sédimentologie et Géochimie Marine, Université de Perpignan, 54 Av de Villeneuve, 66810 Perpignan, France.
[3] Departament de Geologia Dinámica, Geofísica i Paleontologia, Universitat de Barcelona, Nucli de Pedralbes, E-08071 Barcelona, Spain.

The EUROMARGE NB Project is studying fluxes, transfer and fate of suspended particulate matter in the water column along the Liguro-Catalán-Balear current. For this purpose, moorings equipped with sediment traps and current meters have been deployed at four selected sites between 500 and 1200 m depth (Fig. 1) following a 3-D strategy. These instruments have been installed in near-bottom and intermediate waters on submarine canyons and interfluves. Deployments have a six months duration. Collection interval is either 15 days or one month depending on trap model (6 or 12 cups). Mooring deployments began in April 1993 at site 3, in October 1993 at sites 1 and 2, and in April 1994 at site 4.

The first deployment of site 3 was recovered successfully although fishing forced to eliminate the shallower mooring. The second deployment of site 3 and the first deployment of sites 1 and 2 were also successfully recovered. A total of 143 sediment trap samples have been recovered up to now from sites 1, 2 and 3. The first deployment of site 4 will be recovered in November 1994.

The collected particle samples are being processed ashore in the laboratory according to procedures described in Heussner et al. (1990). Up to now, many samples underwent preliminary treatment and mass fluxes, real or estimated, are already available (Fig. 2). From this set of data it is already possible to infer interesting features in terms of particle transfer processes affecting the Liguro-Catalan margin. Some of these features are:

– Mass fluxes within canyons are higher than on the interfluves indicating that the studied canyons are active at present in funnelling particles seaward from the shelf edge.

– Total mass fluxes decrease from the canyon head to the 1000 m depth moorings as a consequence of dispersion outside the canyon and/or deposition, which could confirm the hypothesis of a mid slope depocenter.

– The higher peacks of mass fluxes are produced during or immediately after periods of rains and floods, which shows that climate is one of the main factors responsible for the high variability of particle transfer in the study area.

– There is a trend in the mass fluxes to increase from the northeast to the southwest,

suggesting that they are generally higher downstream with respect to the general circulation of the system.

These provisory results seem to confirm the importance of hydrodynamic forcing and advective transport of material along the slope, which was pointed out in previous studies such as ECOMARGE (Monaco et al., 1990). These results evidence also the particular role played locally by each different canyon. For example, the higher mass fluxes in the 1000 m depth moorings of site 3 suggest a particle transfer to deeper slope areas at site 3 than at sites 1 and 2.

Recovering of present and future deployments will provide more series of samples. Longer series of total mass fluxes, mass fluxes of the major constituents and other biogeochemical analyses e.g: radionuclides, trace metals, C isotopes....) will allow to identify and measure the influence of general and local factors controlling particle transfer in the Northwestern Mediterranean.

REFERENCES

Monaco, A., Biscaye, P.E., Soyer, J., Pocklington, R. and Heussner, S. (1990) Particle fluxes and ecosystem response on a continental margin: the 1985-1988 Mediterranean ECOMARGE experiment. Continental Shelf Research, 10, 9-11: 809-839.

Heussner, S., Ratti, C. and Carbonne, J., (1990) The PPS 3 time-series sediment trap and the trap sample processing techniques used during ECOMARGE experiment. Continental Shelf Research, 10, 9-11: 943-958.

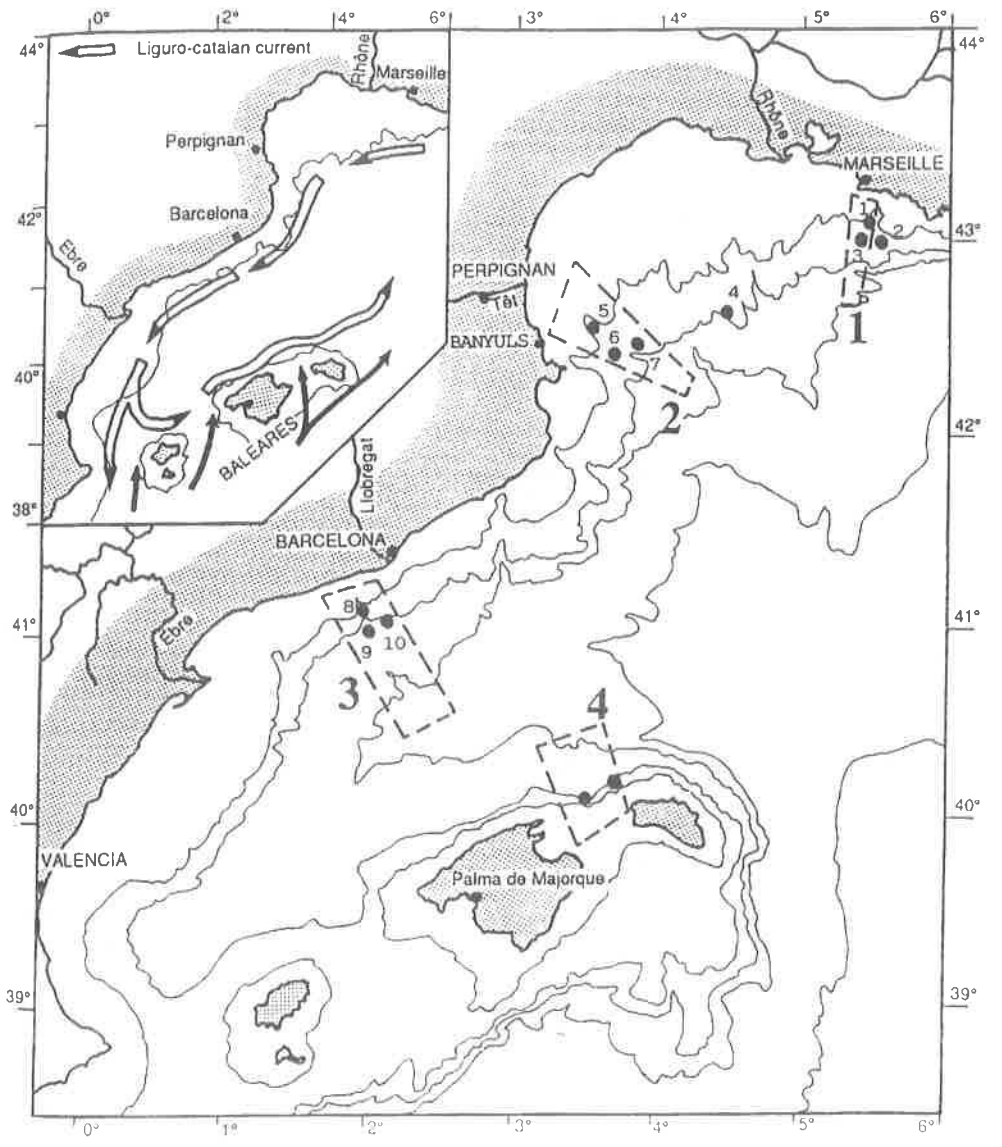

Fig. 1: Location of the main experimental sites along the Liguro-catalonian current in the Gulf of lion (1 and 2), Catalonian margin (3) and Balearic Margin (4). Black points indicate mooring locations.

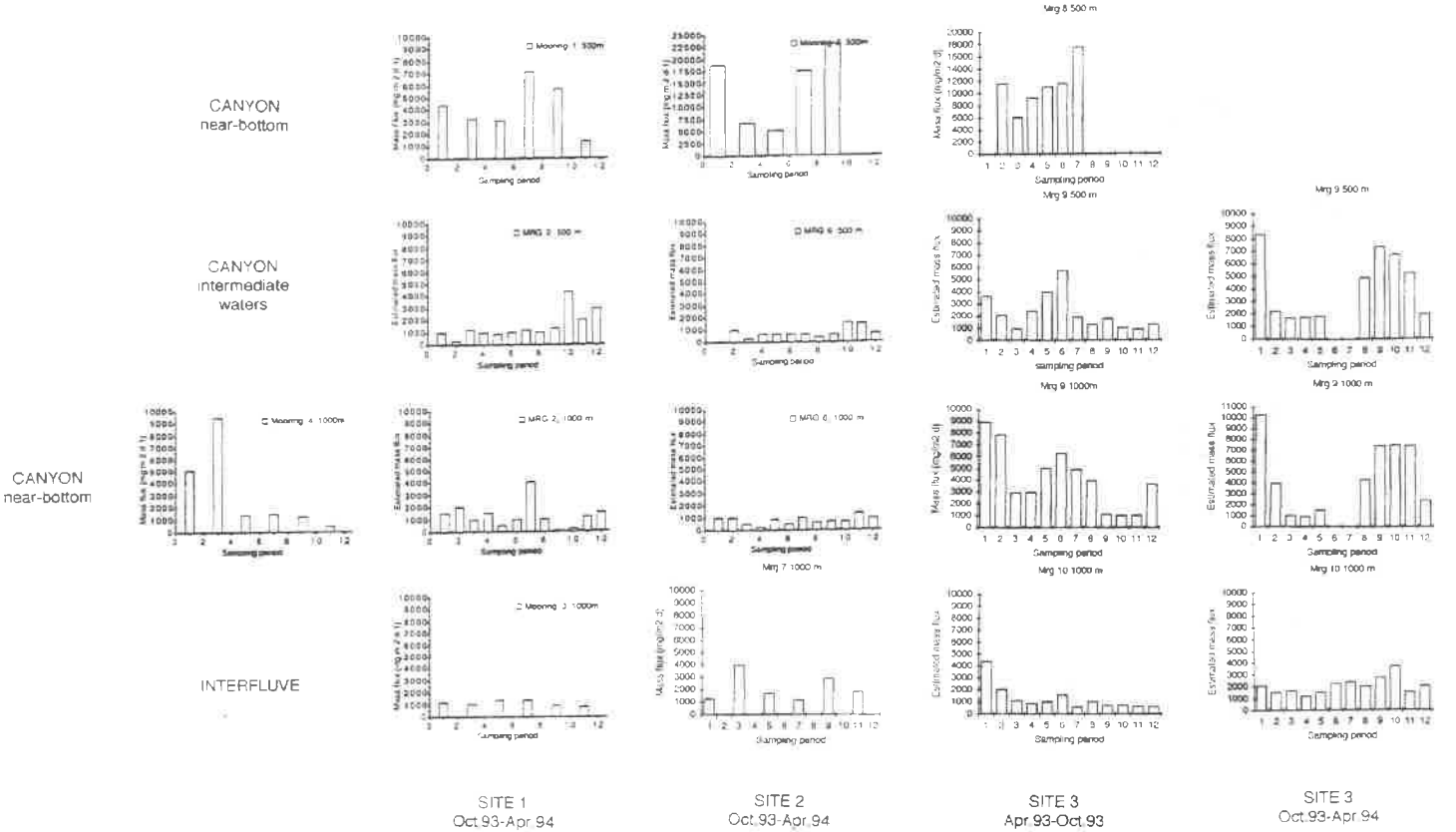

Fig. 2: Preliminary mass flux results of the two 6-month-deployments at site 3 (april-October 1993 and October 1993-April 1994) and the first 6-month deployments at sites 1 and 2 (October 1993-April 1994). Estimated mass fluxes (from volume of samples in the cup) are giwenin mg/m²d. Moorings 1 to 3 refers to site 1, moorings 5 to 7 correspond to site 2 and moorings 8 to 10 are from site 3. mooring 4 is between sites 1 and 2. Given depths are trap nominal depths. Notice also the difference in sacle for the trap at moorings 5 and 8.