Suspended Particulate Matter (S.P.M.)
during the cruise ALGERS
(South Western Mediterranean Sea,
B.I.O. Hespérides, 14-21 October, 1996)

Team composition:

Marta Manzanera Bosch, Departament d’Ecologia, Universitat de Barcelona
Enrique Isla, Institut de Ciencies del Mar
Miquel Àngel Rodríguez, Departament d’Ecologia, Universitat de Barcelona

Initial scopes:

During the sampling design phase, the general cruise planning and our methods sampling was considered to choose where and when we would take water samples. We measured two kind of variables:

- Seston size spectra, the number distribution of particles measured with an electronic counter analyser (Coulter Counter ®). Water samples from the majority of the Niskin bottles taken during each CTD-Rosette cast were procesed. Spectra range extended from 3.12 to 80.7 µm ESD (equivalent espherical diameter), counting time lasted 150 seconds and water volume inspected was 13.05 ml. Counter output consisted in absolute particles number in 64 narrow size counting channels covering the full range. Post-cruise data manipulation will produce total counts (particles per milliliter), seston volume (ppm) and size spectra (functions or multivariate linear or non linear combinations describing the shape or the distribution). This workable data will be available in two weeks.

Seston size spectra use to be a good tracer of both physical or biologically controlled processes. Water masses use to carry a characteristic particle distribution depending on their origin. Biological processes change the spectra in some well studied ways. Over all this variability, sedimentation and resuspension act differentially over different parts of the spectra. Bottom interactions mainly near the slope must be taken into account also. In this cruise we expect to trace well Mediterranean and Atlantic Surface waters, coastal upwelled water and Intermediate and Deep Mediterranean waters. If we succeed then will we be able to show the eddy patterns and dynamics with the superimposed biological effects using the size spectra.

- Suspended Particulate Matter (SPM) absolute value estimation and Particulate Organic Carbon (POC) and Nitrogen (PON) content by filtration of a volume of water. During this cruise our scope was not to characterize the distribution of this variables. Our main interest was to test a new methodology to estimate it.
Classically the amount of SPM is given as a concentration obtained from the change of weight of a narrow pore-size filter divided by the volume of water filtered. In a previous cruise (FLUBAL’95, R/V Suroit, Gulf of Lions, in preparation) an ANOVA experiment showed a tremendous variability between replicates, filters and water volume in filtering exactly the same water. During this cruise a new method concerning a flux decay control during the filtration an a different combination of filters, was tested. We thought that the Algerian Current with their meanders and eddies and with the interaction of minimum two clearly different water masses was an optimum occasion to make the field test of the methodology. Our intention is to compare 2-dimensional maps of SPM, POC and PON with the available satellite images and with the continuum recording of physical variables to show how the new estimates match better the hydrology due to their better estimations and reduced methodological variability.

During the cruise we took 15 liters from the surface bottles in the CTD-Rosette casts or from the continuous water supply on board in the XBT-Doppler lines. Espatial separation between samples along the line was about 10 nm. Three filtrations were done, two following classical methods (with glass fiber depth filter, and membrane screen filter, both 45 μm pore-size, filtering to saturation) and the third one following the new procedure.

Samples list:

Seston size spectra:
30 profiles with an average of 20 samples per profil (600 samples). Water from niskin bottles.
10 additional surface samples in the XBT-Doppler lines in the same position as the sampling for the filtration experiment

Filtration experiment:
15 filtration comparisons with surface water in CTD lines
10 filtration comparisons with surface water in XBT-Doppler lines

Totals:
610 size spectra
100 filtrations

Miquel Angel Rodríguez Arias
Departament d’Ecologia. Universitat de Barcelona
Avgda. Diagonal 645. Barcelona 08028
e-mail: mar@porthos.bio.ub.es
Telf. (93) 402 15 06
Volume (ppm x 100)

Dist. to E57 along the transect (m.)