

BIOGEOCHEMICAL MODEL OF TRACE ELEMENTS IN THE WESTERN MEDITERRANEAN SEA

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The vertical distribution of trace elements in marine systems results from the interaction of physical, chemical and biological processes. The distribution of trace elements in the water column and their fluxes at boundaries were intensively studied during the European River Ocean System (EROS 2000) project. These measurement allowed to establish a coherent mass balance for trace elements in the system and to develop a biogeochemical model describing their behaviour.

Many trace metals behave like nutrients and are incorporated actively or passively in the living material in the euphotic zone and released in deep waters by bacterial degradation of the organic matter. These processes play an important role in the scavenging of the trace elements and their removal from the water column.

It is possible to describe their behaviour by using a box model which takes into account the fluxes of the element at the boundaries, the water circulation, chemical processes and the biological activity. The structure of the model is shown schematically in figure 1. This model allows to predict long term changes of the composition of the system due to the perturbations, for instance of anthropogenic origin. It is also possible to evaluate what was the situation before presently existing human perturbations.

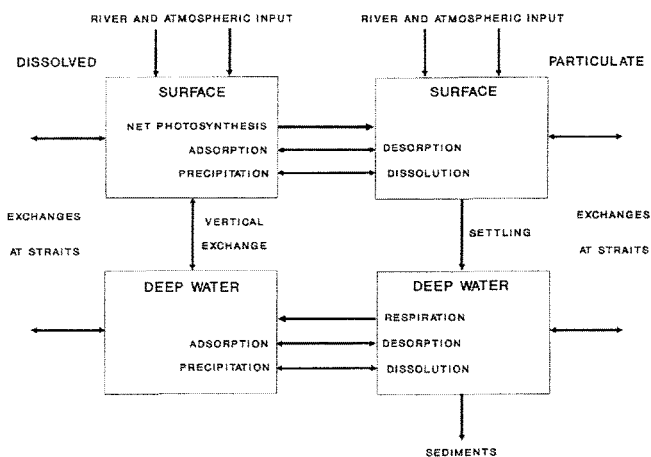


Figure 1. Schematic representation of the biogeochemical model describing the behaviour of trace elements in the Western Mediterranean Sea.