

Transport processes by mesoscale eddies in the northern Levantine

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Hydrographic data obtained in a total of nine research cruises, carried out by the R/V BILIM in the northern Levantine Basin during 1985-1988, were utilized to study the circulation and water mass characteristics. These surveys, repeated on a seasonal basis, for the first time enabled a detailed evaluation of the northern Levantine in terms of its oceanographic features. Objective analysis of geopotential anomaly, derived from the data set, shows that some of the northern Levantine eddies persisted during the period of observation, although with occasional shifts in position. There is coincidence of these eddies, which appear to be persistent, and the bottom topographic features. Long term [interannual] changes in the patterns of circulation are also significant. The central Basin jet flow which bifurcated and joined in the Rhodes gyre circulation in the early part of the observations was found reformed as a coherent flow along the Anatolian coast in the following years. Eddies circumnavigating the island of Cyprus in the latter part of the development appeared to transport Atlantic water entrapped within them, which in the earlier period appeared only in filaments west of Cyprus.

The distribution of water masses and a series of variables (petroleum hydrocarbons, nutrients, total suspended matter) coherently correlates with the eddy fields and the fronts.

Transport of water and selected substances through the Turkish straits

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Long term exchanges of water and the selected substances between the Black Sea and the Mediterranean are estimated. The water budgets of the Turkish straits formed by the Bosphorus, the Sea of Marmara and the Dardanelles are evaluated using the recent reliable salinity data obtained with sufficient frequency and are compared with previous estimates, as well as with the results of numerical models. The fluxes of phosphate, nitrate, total organic carbon, petroleum hydrocarbons, mercury and total suspended solids are estimated by using the elements of the water budget and the concentrations of these variables.

Wind and tide induced baroclinic motions in the Gulf of Korinthos

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By the use of 152 NOAA-6 and NOAA-7 satellite infra-red images, a detailed description of sea surface temperature features and their evolution in time was obtained. More specifically, the strong wind-induced upwellings occurring in the NW coasts of the gulf near the Rio-Antirio strait were studied.

A discussion of the satellite data in the light of recent theories on wind-induced marine upwellings near the capes (Crepon and Richez, 1982; Crepon et al., 1984) confirmed the existence of a number of predicted features, more specifically, the theoretical prediction of a more intensive upwelling signal in the downwind side of triangular capes compared to the upwind side.

In situ thermistor chain measurements in the area rendered a detailed image of the time evolution of upwelling events and of their relation to atmospheric synoptic variability.

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