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SEA SURFACE EXPRESSION OF MESO-SCALE EDDIES
IN THE NORTHEASTERN MEDITERRANEAN - NOVEMBER 1985

E. ÖZSOY, C. SAYDAM, I. SALLIHOĞLU and Ü. ÜNLÜATA
Institute of Marine Sciences, METU, P.K. 28, Erdemli,
İcel (Turkey)

The northeastern corner of the Mediterranean (north of 34°N and east of 28°E) was surveyed by the R/V BİLİM during 1-12 Nov. 1985. Hydrographic casts were made at 54 deep stations using a Seabird model SBE9 CTD profiler. Along the ship course between these stations, the CTD instrument was immersed in an on board overflow tank through which sea water was pumped at constant rate. The surface temperature, salinity and density were sampled continuously in real time with an averaging period of 1 minute for each recording. In addition, water samples were collected for the analysis of nutrients. The samples were then analyzed with an on board Technicon II autoanalyzer with single channel colorimeter for the determination of phosphate concentration. The ship position was also monitored continuously using mainly satellite navigation, or dead reckoning when fixes were not available.

In processing the large volume of sea surface data, the original time series were first transposed to ship position coordinates making use of the available fixes. Positioning data with obvious errors were either corrected or eliminated based on checks for maximum calculated ship speed and total distance travelled. Ship positions between consecutive fixes were interpolated. Then the surface data along the ship course were projected onto straight paths connecting stations and filtered to eliminate noise originating from ship roll and wake, interference of microscales and other sampling errors. Contours of temperature, salinity, density and phosphate concentration were then passed manually through intercepts determined from the processed data.

In the surface temperature distribution, a series of eddies are identified with cold centers to the SE of Rhodes I. (19°C), in Antalya Bay (21°C) and at the NE tip of the Island of Cyprus (21°C), and warm centers (23°C) to the NW of Cyprus. The SE Rhodes eddy is the most intense among these, with two associated breakup eddies located S of the Gulf of Antalya. Similar eddies were also found by Özturgut (1976), Anati (1984) and Ovchinnikov (1984) at different times. Frontal crossings with gradients occasionally exceeding 1°C/10 km and displaying meanders are identified at the edges of some of these eddies. Part of the frontal zone extends parallel to the coast and separates coastal and open sea water masses. The observed surface features are closely correlated with the deeper circulation. In the westernmost eddy center considerable upwelling occurs as manifested by the deep station profiles, increased surface turbidity and visual sightings of seabirds, squids and dolphins. Light penetration measurements indicate higher extinction coefficients (0.2-0.5 m⁻¹) the upwelling zone SE of Rhodes as compared to other regions such as the warm core eddy located NW of Cyprus - (0.05-0.1 m⁻¹).

Features that are typical of oceanic fronts (Bowman and Esaias, 1978) are also identified as follows: Along the frontal zones, salinity is reduced through frontal mixing with the underlying minimum salinity waters. A significant increase in phosphate concentration occurs near the fronts, although it is uniformly distributed elsewhere and only increases with depth. Strong interleaving is observed in the T-S diagrams near the fronts.

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WATER MASSES OBSERVATIONS IN THE MIDDLE ADRIATIC SEA
DURING POEM-0-85 AND POEM-1-86

A. ARTEGLIANI and E. PASCHINI
Institute of Research and Marine Fishery, C.N.R., Ancona (Italy)

First analyses of the data collected in the middle Adriatic Sea during the cruises POEM-0-85 (November 1985) and POEM-1-86 (May 1986) are presented.

A mass of water with a temperature around 13°C and density 29.15 was present in the Italian side of the section of Vieste. The central area of the section was almost occupied by a mass of water with high salinity ($S_{max} = 38.82$ PSS) and a temperature of approximately 14.2 °C.

This two mass of water are not so clearly present in the section of Pescara. In this section, instead, is present in the bottom layer an "old" mass of water (T=10.9°C S=38.49 PSS $\sigma_t = 29.55$ and AVO 1.8 cm²/l).

During the winter time this mass of water was renewed. In fact during the POEM-1-86 cruise we found in the two Pomo pits a new mass of water, originated in the north Adriatic sea, characterised by a salinity less than 38.3 PSS, temperature less than 10°C and AVO less than 0.48 cm²/l.

In the section of Vieste and Vasto is present along the Italian coast a dense mass of water with a minimum of salinity of 38.09 PSS and temperature of 10.17°C on the section of Vasto.

In the central part of the section of Vieste is present a mass of water with a salinity maximum of 38.77 PSS and a temperature of approximately 14.2 °C like in the previous cruise.