

Horizontal Circulation of the Eastern Mediterranean Waters during the Winter and Summer seasons

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ABSTRACT

The water circulation of the Eastern Mediterranean at the free sea surface and at the 50, 100, 300 and 500 db surfaces was computed during the winter and summer seasons using the dynamic method. The reference level was taken at the 1000 db surface. The used data were taken from 1338 hydrographic stations collected from several expeditions carried out by different countries during the last 20 years (1963-1982). 680 stations were collected in the winter season and 658 stations in summer (obtained from the Hydrographic Data Centre B, Moscow). Vertically unstable stations were either corrected for temperature or salinity or rejected if many levels of instability were observed. The average values of temperature and salinity of these collected data were computed, using the optimum interpolation of the correlation algorithm, in stations distributed in a regular net one degree longitude by one degree latitude for winter and summer seasons.

The fulfilment calculations evidenced the considerable stability of the geostrophic water circulation in the eastern and central basins of the Mediterranean Sea. The most existence features of the geostrophic circulation during the winter and summer seasons were : the vast cyclonic gyre in the Levantine Sea, enveloping the southern part of the Aegean Sea; the cyclonic gyre in the Ionian Sea; and the anticyclonic gyre in the Libyan Sea and near the Egyptian coast.

These main features of the dynamic relief were also observed by several authors, and testified the stability of the Mediterranean water circulation through long standing survey. However, some distinctions were obtained from the present work when comparing with the previous works.

The geostrophic current velocity varied between 5-10 cm/sec in the Libyan Sea, 15-25 cm/sec near the Egyptian coast and between 35-40 cm/sec in the eastern part of the Levantine Sea. At the straits of Crete island, it reached 15-30 cm/sec. Particular noticeable differences between the winter and summer surface current velocity in the eastern and central basins of the Mediterranean Sea were not found.

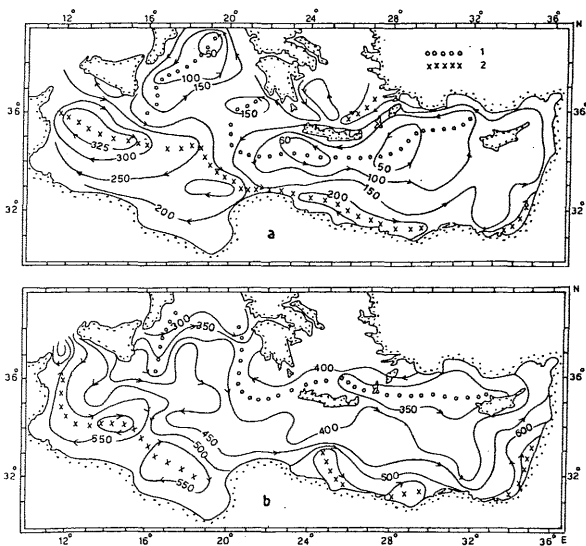


Fig.(1). Dynamic relief (dyn. mm.) of the free sea surface during : a- winter and b- summer seasons.

1- depression and 2- crest of the dynamic relief.

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