

On the formation of the intermediate water masses off the Egyptian Mediterranean Coast

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The presence of an intermediate water characterized by a secondary maximum of salinity in the Mediterranean Sea has a very peculiar phenomenon. Regions of formation of this water mass have been already more or less identified in the Mediterranean Sea. Along the Egyptian Mediterranean coast, the formation of this intermediate water mass was studied by Morcos (1972), who suggested that the area to the east of longitude 29° E and west of Alexandria is a secondary source of formation of the intermediate water. In addition, Abdel-Moati and Said (1987) suggested that the area in front of Damietta is another region of formation. The aim of the present work is to identify more accurately the locations of the formation of this water mass on the Egyptian Mediterranean shelf and its spreading using the isopycnic analysis.

The oceanographic data used were selected from several expeditions carried out by Egypt and different countries for the last 27 years (1959-1986). Water temperature and salinity data have been taken from 145 hydrographic stations in winter. The average values of temperature and salinity of these data were computed, using the optimum interpolation of the correlation algorithm, for stations distributed in a regular grid half degree latitude by half degree longitude for the winter season.

Our study confirms the findings of Morcos (1972) and Abdel-Moati and Said (1987). Besides, a new source has been identified which appears as a region of salinity > 39.30 ‰ (Fig.1) and a relatively high temperature $> 17.00^{\circ}\text{C}$ (Fig.2). The salinity distribution on the $\sigma = 28.80$ (Fig.1) indicates that the saline warm water flows away from the continental shelf to the northwest in a high-salinity tongue and it reaches the open sea with values as low as 38.95 ‰. This supports the suggestion of Morcos (1972) that more than one starting point representing various sources of formation of the intermediate water mass of maximum salinity are present in the Levantine basin.

The irregularities which appear particularly for the lateral salinity distribution west of 27° E (Fig.1) might be attributed to meso-scale noise in the data. In fact it needs more stress in the future work in order to get more clear picture of the thermohaline flow paths.

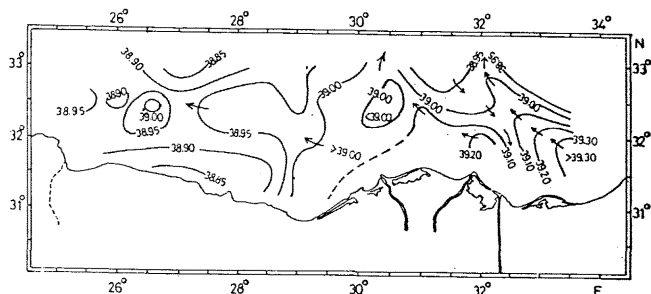


Fig.1. Salinity (‰) on the $\sigma = 28.80$ surface in winter.

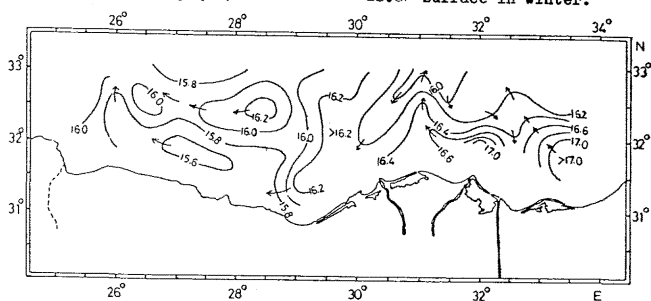


Fig.2. Potential temperature on the $\sigma = 28.80$ surface in winter.

References

- Abdel-Moati, A.K. and M.A. Said. 1987. Hydrographic structure of the Mediterranean shelf waters off the Egyptian coast during 1983-1986. *J. Thalassographica*, 10(2) : 23-39.
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