23rd International Liege Colloquium on
Ocean Hydrodynamics, Liége (Belçika),
6-10 Mayıs, 1991

PHYSICAL OCEANOGRAPHY OF THE EASTERN MEDITERRANEAN

By
ÜMİT ÜNLÜATA and EMİN ÖZSOY

INSTITUTE OF MARINE SCIENCES
MIDDLE EAST TECHNICAL UNIVERSITY
P.K. 28, Erdemli, İçel, 33731 Turkey

The Eastern Mediterranean and in particular the Levantine Basin has been one of the least understood parts of the world ocean. In the past, the lack of a coherent description of the circulation and the water mass production in the Levantine Basin has often been attributed to the insufficiency of the data base. It is only after the recent observations that we understand complexity and natural variability are inherent features of the circulation.

The new and definitive phenomenology of the Eastern Mediterranean is based on the comprehensive hydrographic data base formed through the National programs of the bordering countries and collaborative scientific experiments in the region. The POEM research programme designed for the cooperative investigation of the Physical Oceanography of the Eastern Mediterranean has played a central role in the success of these efforts and in the scientific interpretations of the observations.

The circulation of the Eastern Mediterranean as derived from the recent data sets is discussed here. Special emphasis is given to the Levantine Basin. The existence of the interacting mesoscale/synoptic dynamical features such as sub basin scale and mesoscale eddies and jets, superposed on inter annual time scales are displayed. Long term qualitative changes in the circulation are reflected in the bifurcation patterns of the mid-basin jets, relative strengths and shapes of some eddies and the hydrographic properties at the core of these eddies. The confinement of the circulation features in the Basin has a strong influence on their interaction and evolution.

Some of the observed features and their more detailed surface expressions are supported by the available satellite data. In addition, some continuous measurements of the surface properties suggest a complete range of scale corresponding to the observed characteristics of the region. The complexity of the circulation is well correlated with the basin-wide and smaller scale heterogeneity of the hydrographic properties, and the their overall characteristics are investigated from this point of view. The formation of LIW in the region has inter annual dependency that seems to be correlated with the evolution of the circulatory features. Wintertime convective overturning and intermediate depth mixing appear to be a dominant mechanism of LAW formation in anticyclonic eddies.

In spite of these new developments, much remains to be done before a thorough understanding of the underlying dynamics is reached.