MESO-SCALE HYDROGRAPHIC CHARACTERISTICS IN THE NORTHEASTERN MEDITERRANEAN - NOVEMBER 1985

E. Ozsoy, M.A. Latif and U. Unluata

Institute of Marine Sciences, METU, Erdemli, Icel, Turkey

A meso-scale survey of high resolution has been carried out in the northeastern quarter (north of 34 deg. N and east of 28 deg. E) of the Levantine Sea by the R/V BILIM during 1-12 November 985. A total of 54 deep stations with spacings of 1/2 degree latitude and longtitude were occupied during the survey. Hydrographic casts at the stations were down to a maximum depth of 1000 m with vertical resolution using a Seabird Model SBE9 CTD profiler equipped with an oxygen sensor. The volume of data has been edited and processed such that original data failing consistency checks are eliminated. The remaining data have been despiked and filtered. Derived quantities such as mixed layer depth, heat and salt storage in the mixed layer and in the upper layers and salt volumes in the subsurface salinity minimum and maximum layers. Turner double-diffusive stability index and Brunt-Vaisala frequency are calculated from the data. Overall hydrographic features and a summary of important results are presented.

In general, a mixed layer of 20-50 m thickness is found at the surface. Immediately below the mixed layer, an abrupt drop in salinity marks waters of Atlantic origin. At intermediate depths, a maximum in the salinity profiles indicates the presence of Levantine Intermediate Water (LIW). These characteristics are similar to those found by Wust (1961) and Miller et. al. (1970).

The LIW core (maximum salinity: 39.1) is found maximally to the south of Antalya and NW of Cyprus where is seems to be trapped in anticyclonic eddies.

Just further to the south and also within the cyclonic eddy located near Rhodes, upwelling is indicated by the upward lifting of isohalines (isopycnals) by several hundreds of meters. In fact, below a thin surface layer, temperature and salinity are more or less uniform since the LIW core and minimum salinity waters are destroyed by upwelling. A secondary center of high density is located to the east of Cyprus. The minimum salinity water (minimum 38.3) below the mixed layer (at 40-50 m dept) is found most abundantly to the SW of Cyprus and is partially advected towards the Gulf of Antalya. In the west of Cyprus, the zones of minimum salinity subsurface water and LIW are separated by a front which extends in an E-W direction. Near this front, interleaving is observed in the salinity profiles.

References

Miller, A.R., Tchernia, P., and Charnock, H. (1970), Mediterranean Sea Atlas of Temperature, Salinity, Oxygen Profiles and Data from Cruises of R.V. Atlantis and R.V. Chain, WHOI Atlas Series 3, Woods Hole, Mass., WHOI.

Wust, G. (1961) On the Vertical Circulation of the Mediterranean Sea, J. Geophys. Res., 66: 3261-3271.