



Monitoring the evolution of the Aegean Sea thermohaline characteristics in the post-Eastern Mediterranean Transient period

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During the late 80s the thermohaline circulation and the deep-water hydrological properties of the eastern Mediterranean Sea underwent a strong and abrupt change, known as the “Eastern Mediterranean Transient (EMT)”. In contrast to the slow long-term drifts in temperature and salinity that have been observed in the entire Mediterranean for several decades, the above changes represented a qualitative jump, changing significantly the circulation and stratification of the region. The Aegean Sea became the new more effective source than the old one, since it produced not only denser water, namely the Cretan Deep Water (CDW), but also higher volumes. From 1988 to 1995, massive outflow of CDW occurred through the Straits of the Cretan Arc towards the Ionian and Levantine basins. The CDW being of particularly high density (29.3 kg/m³) sank into the near-bottom layers, uplifting the older deep waters of Adriatic origin and affecting the exchange between the Aegean and the adjacent basins. Since 1995, the event started to decay, but the rate of the Eastern Mediterranean system relaxation as well as its final state (old or modified) remain still unclear. Aiming at investigating the post-EMT evolution and understanding the mechanisms involved, a data set was compiled focussing on various Aegean Sea basins and the adjacent west Levantine region. It consists of recently acquired CTD data and data derived from profiling floats deployed in the Aegean Sea. The changes associated with EMT started to decay dramatically confirming its transitional character but subsequent changes were slower and its signal still remains present. Although changes in the stratification are notable, the basic water masses related to the EMT event are present in the Aegean

Sea water column. The Cretan Sea profiles reveal a relatively less saline intermediate layer centered at around 800m. Its origin is the deep-water lying between Levantine Intermediate Water and Eastern Mediterranean Deep Water, namely the Transitional Mediterranean Water (TMW), which was present in the Cretan Sea shallower levels (200-600m) during the first stages of EMT. Comparison with older observations indicates important mixing processes within and outside the Aegean and a possible evolution of the exchange between the Cretan Sea and the Levantine basin. The Aegean outflow that contributed to the Eastern Mediterranean shallower layers (1500-2500m), during 1998-99, has been obviously minimized. This current phase is characterized by the inflow of the TMW, at least through the deepest strait of Kassos. Finally, the waters just outside the Eastern Cretan Straits, below 1000m, are a mixture of deep water of Adriatic and Aegean origin, with the former contributing to a higher percentage compared to earlier observations.