

THE LAST STAND OF EMT INFLUENCE ALONG THE EASTERN COAST OF THE AEGEAN SEA

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Abstract

The time evolution of water properties along the Eastern Aegean Coast is studied by analyzing CTD data to depict the temporal variability of the water characteristics of the Eastern Aegean Sea. The data show the relaxation period of the EMT, which continued well into the early 2000s. The Central Aegean seems to play the key role in the Aegean deep water formation processes. Our analysis reveals that the dense water formation in the Central Aegean Sea is considerably connected mainly to the anomalous decrease in winter atmospheric temperature during the EMT period and to preconditioning settled before. The isopycnal levels started to increase not only in the Central Aegean Sea also in the regions near the Eastern Aegean Coast and reached their maximum after the EMT relaxation period in 2007.

Keywords: Hydrography, Aegean Sea, Water transport

The water exchange between the Aegean Sea and the Mediterranean Sea is related to the deep water formation in the Aegean Sea. The causes concerning the increasing the density of the Aegean Sea water is mainly due to strong winter convection and the resulting dense water formation occurring in the cold winters 1992 and 1993 especially in the Central Aegean Sea [1-4]. Time series of density obtaining from the CTD data of the Saroz, Edremit, Candarli, Izmir, Kusadasi, Güllük Bays and Chios Cyclonic Region show the relaxation period of the EMT continued well into the early 2000s. The isopycnal levels started to increase not only in the Central Aegean Sea also in the regions near the Eastern Aegean Coast and reached their maximum after the EMT relaxation period in 2007 together with a salinity increase in the water column (Figure 1) [5].

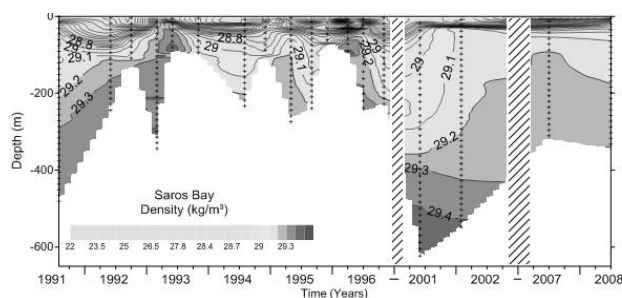


Fig. 1. Temporal evaluations of density fields of the Saros region from summer 1991 up to summer 2008. The areas in white represent where data were not collected. The slash lines show the shortening of the long gap in time (from Eronat and Sayin, 2014 [5]).

A numerical simulation by Androulidakis et al. [6] showed that the period 2006–2008 was marked by dense water formation in the Central Aegean mainly caused by the intrusion of saline masses of Levantine origin. Salinity driven dense Cretan Sea outflow occurring during 2007, 2008, and 2009 is investigated by Velaoras et al. 2014 [7]. He called this occurrence as “EMT-like” event. Georgiou et al. [8] showed that the period of 2006–2012 is characterized by two strong cooling events (2008–2009 and 2012) in the south Aegean Sea and by a significant increase (2010–2011).

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