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## COULD THE EASTERN MEDITERRANEAN TRANSIENT (EMT) HAVE BEEN PREDICTED?

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### Abstract

The transient that has dominated the Eastern Mediterranean intermediate and deep waters since about 1990, generated by dense-water output from the Aegean Sea, was of unprecedented magnitude and has had a rather complex cause. These features exclude an assessment based on climate statistics and a prediction of hypothetical similar events in the future.

*Keywords : Eastern Mediterranean, Aegean Sea, Hydrography, Circulation, Deep Waters.*

The EMT (Eastern Mediterranean Transient) was brought about by extremely high outflow of enhanced-density waters from the Aegean Sea in the 1990s, which induced a transient of unprecedented magnitude in the hydrography and circulation of the entire Eastern Mediterranean [1]. No previous such event of any similar magnitude, interrupting the prevailing predominance of the Adriatic Sea as the source of the deep waters, has ever been documented. The high densities of EMT-related Aegean outflow [2] resulted from a combination of greatly enhanced salinities in the Aegean (maximum in 1992) and of excessive winter cooling in 1991-92 and 1992-93 [3]; the high salinities presumably resulted from a blocking of upper-water exchange south of Crete, observed in 1991, that led to excessive salinity storage in the Levantine Sea [4]. Peak outflow occurred between mid-1992 and late 1994, with a maximum during 1993. The total volume of Aegean dense water output over the mid-1992 to late 1994 period corresponded to about twice the total volume of the Aegean Sea. Such fast turnover of the Aegean Sea requires that a large region beyond the Aegean Sea proper was involved in the formation of the Aegean dense waters. On the other hand, the maximum density effected by the EMT in the Eastern Mediterranean waters was not higher than that of young northern Ionian bottom waters replenished from the Adriatic previously. Aegean dense outflow continued until at least 1998, and the hydrography of the South Aegean Sea had not recovered a decade after the onset of the EMT (in about 1990). It is argued that the EMT has been a matter of coincidence of extreme events of rather unrelated cause, and that, furthermore, the magnitude of the Aegean outflow required internal, non-linear forcing within the Eastern Mediterranean system. The conclusion is that the EMT cannot be related to climate statistics, such as correlation with climatic indices, and that, particularly due to the internal non-linear feedback and in view of the decades-long predominance of the Adriatic over the Aegean previously, modelling is limited to hindcast assessments.

### References

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