Forty-five years of oceanographic and meteorological observations at a coastal station in the NW Mediterranean: a ground truth for satellite observations

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INTRODUCTION

Marine and atmospheric parameters, including temperature observations from surface to 80 m (at 6 depths) are measured since September 1973 on a higher-than-weekly frequency, at a coastal station 4 km offshore L’Estartit (Costa Brava; NW Mediterranean). This constitutes the longest available uninterrupted oceanographic time series in the Mediterranean Sea. The present contribution focuses on observed climatic trends in temperature (°C/year) of air (AT; 0.05), sea surface (SST; 0.03), sea at 80 m depth (S80T; 0.02) as well as comparison with trends estimated from coincident high resolution satellite data.

CONCLUSIONS:

The trending evolution is not uniform across seasons, being significantly higher in spring for both AT and SST, while in autumn for S80T. Other climatological results are a stratification increase (0.02 °C/year in summer temperature difference between 20 m (S20T) and S80T), trends in summer conditions at sea (when S20T > 18 °C), estimated as 0.5 and 0.9 days/year for the starting day and period respectively, and a decreasing trend of nearly 2 days/year in the period of conditions favourable for marine evaporation (when AT < SST. The good agreement for 2013–2018 (RMS 0.5–0.6, bias −0.1 to −0.2; trends of 0.09 °C/year in situ vs. 0.06 to 0.08 °C/year from satellite) allows considering this observational site as ground truth for satellite observations and a monitoring site for climate change.