

# SEA SURFACE TEMPERATURE ANOMALIES IN THE SOUTH EASTERN MEDITERRANEAN SEA

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## Abstract

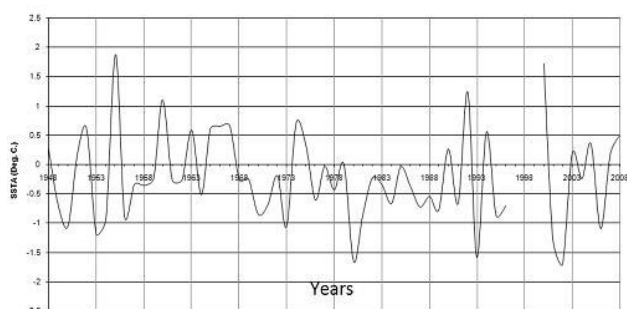
The hydrographic data of 61 years were used to study the regular formation of the sea surface temperature anomalies (SSTA) in the South Eastern Mediterranean Sea.

Time distribution of SSTA values display both positive and negative cycles which are nearly associated with the 11 year cycle of sun-spots activities. Normal SSTA band occupies only 21.41%, while the positive and negative bands occupy 32.90% and 45.69%.

*Keywords: Eastern Mediterranean, Temperature*

The relationship between sea surface temperature (SST) and atmospheric variables is very important for the formation of the intermediate and deep waters [1-2]. The area of study lies between 30 - 33°N and 25 - 34°E. The vertical mean temperature of the upper 10 m layer is considered as sea surface temperature to reduce the diurnal variations. The monthly mean sea surface temperature (T) is calculated for each 1° grid (18 grids, Fig. 1) for every month in the period from April 1948 to August 2008 using the available historical data.

The mean monthly Sea surface temperature is obtained from the Climatological Atlas [3]. The deviation from the mean is computed and considered as monthly SSTA for every grid. The mean monthly positive and negative SSTA through the investigated period are determined, from which the SSTA amplitudes are calculated. The regular formation and evaluation of the SSTA will be studied.



**Fig. 1. Mean annual variation of SSTA of the South Eastern Mediterranean Sea.**

## Spatial and temporal distribution of SSTA

The normal, positive and negative SSTA bands occupy 21.41, 32.90% and 45.69% of the investigated period (Table 1). The negative SSTA is developed in January, June and November. As for positive SSTA, there are one active periods from May to August. The maximum SSTA amplitude occurs in June, which coincided with negative and earlier than positive anomalies. The active period of the SSTA amplitude is extended between May and November.

Tab. 1. The percentage of occurrence of SSTA bands.

SSTA band (°C)	Percentage of occurrence (%)
<-2.0 °C	17.75%
-2.0 = band = -1.0 °C	18.02%
-1.0 = band = -0.5 °C	9.92%
-0.5 = band = 0.5 °C (Normal)	21.41%
0.5 = band = 1.0 °C	8.62%
1.0 = band = 2.0 °C	12.79%
band >2.0 °C	11.49%

The high amplitude lies close to land with inverse relation to the shelf width. The low amplitude is centered off the Nile Delta characterized by very wide continental shelf.

The positive SSTA is high in the west and centre decreasing seaward. In the north-east there is an area of high positive anomaly. There are two areas of low positive anomaly coincide with Mersa Matruh and Dammetta anticyclonic

gyres [4-5].

The Interannual variability of the anticyclones is the reason of the presence of negative active areas. This conclusion is coinciding with the results of [6-7].

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