

A Warming Mediterranean: 38 Years of Increasing Sea Surface Temperature



Introduction

Temporal analysis

Statistical analysis

Conclusion

Sea surface temperature (SST) is a main driver of Mediterranean climate and weather, being of great interest to know its evolution in the recent decades to evaluate its role in regional climate change.

The largest available and complete blended SST time series (1982–2019) has been used to study its seasonal cycle and look for a possible warming trend in the basin.



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[Full story here](#)

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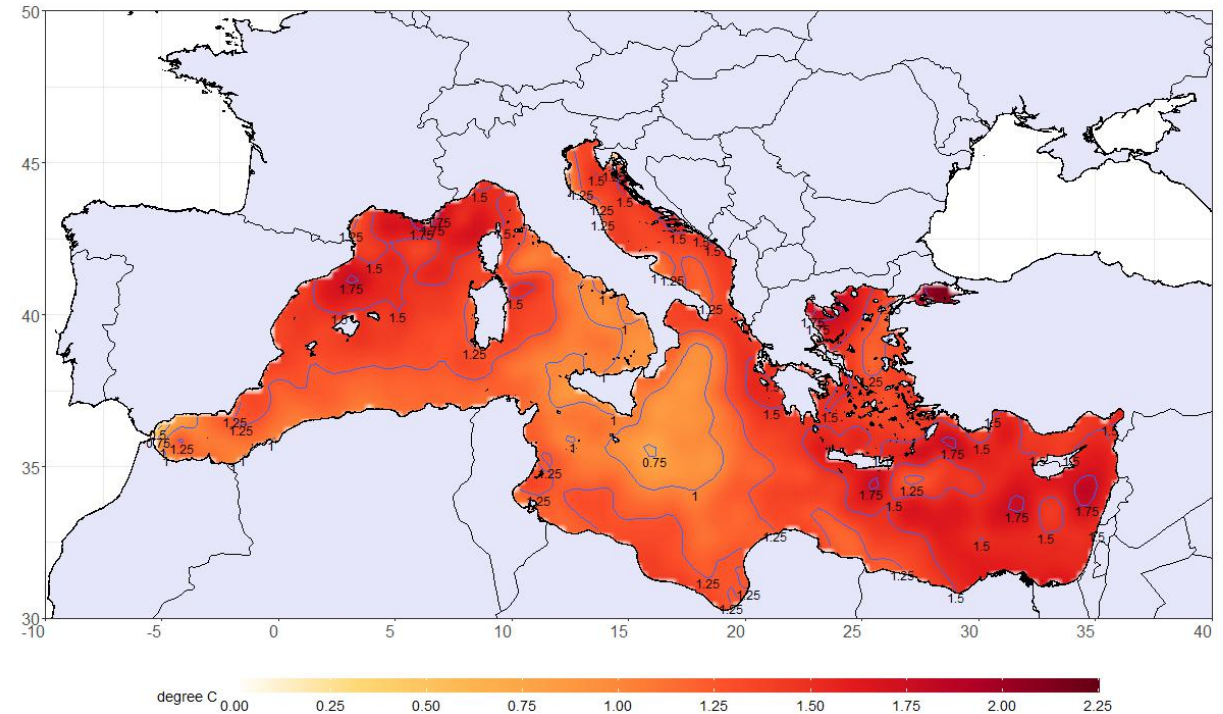


Figure 1. Accumulated SST warming in the Mediterranean from January 1982 to December 2019

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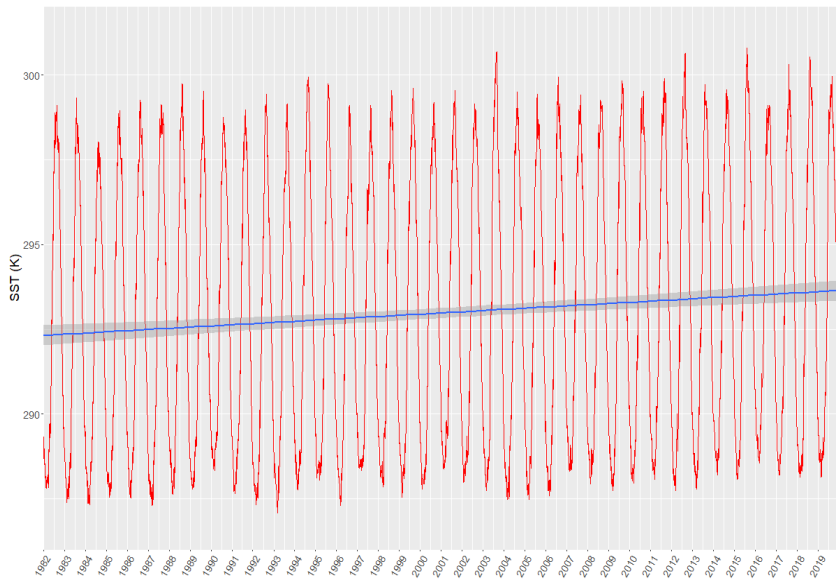
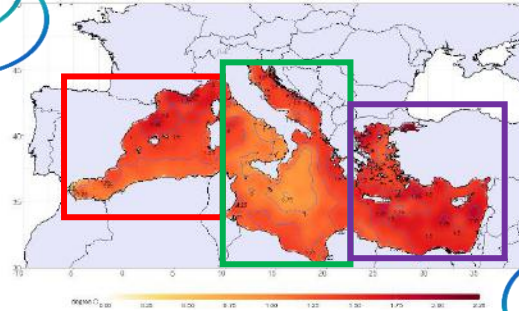


Figure 2. Mean Mediterranean SST time series (1982-2019) and linear regression (at 99% confidence level).

Mean Mediterranean SST presents a warming trend since the 80s of the XX century to the present.



Regional differences arise in the warming trend with the higher values in the Eastern Mediterranean basin and the lower trend in the Central Mediterranean basin (south of Italy).

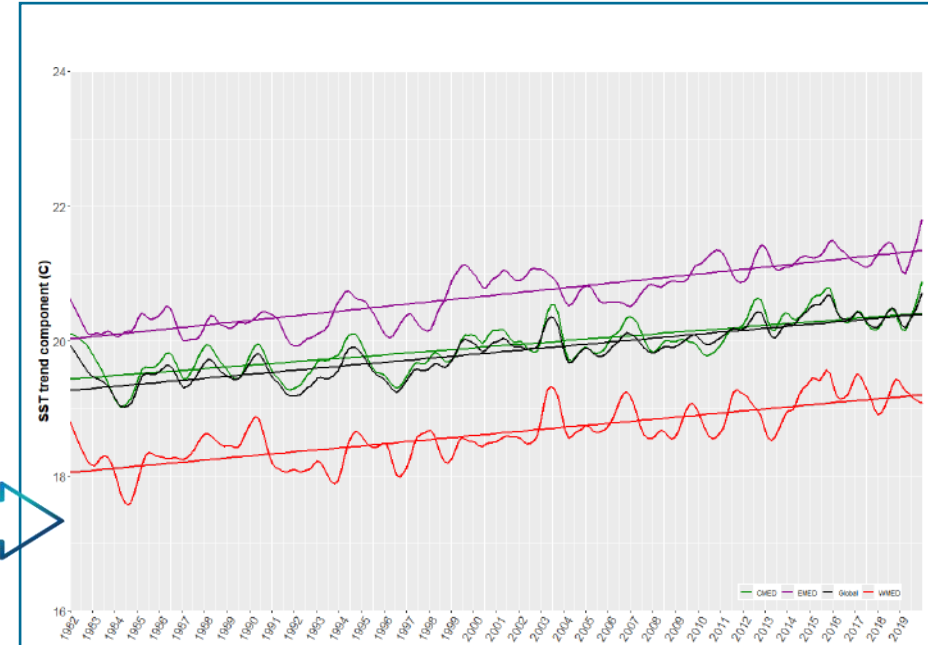


Figure 3. Deseasonalized SST trend component and linear regression (at 99% confidence level) for 1982-2019 for the global Mediterranean basin (black), WMED (red), CMED (green) and EMED (magenta).

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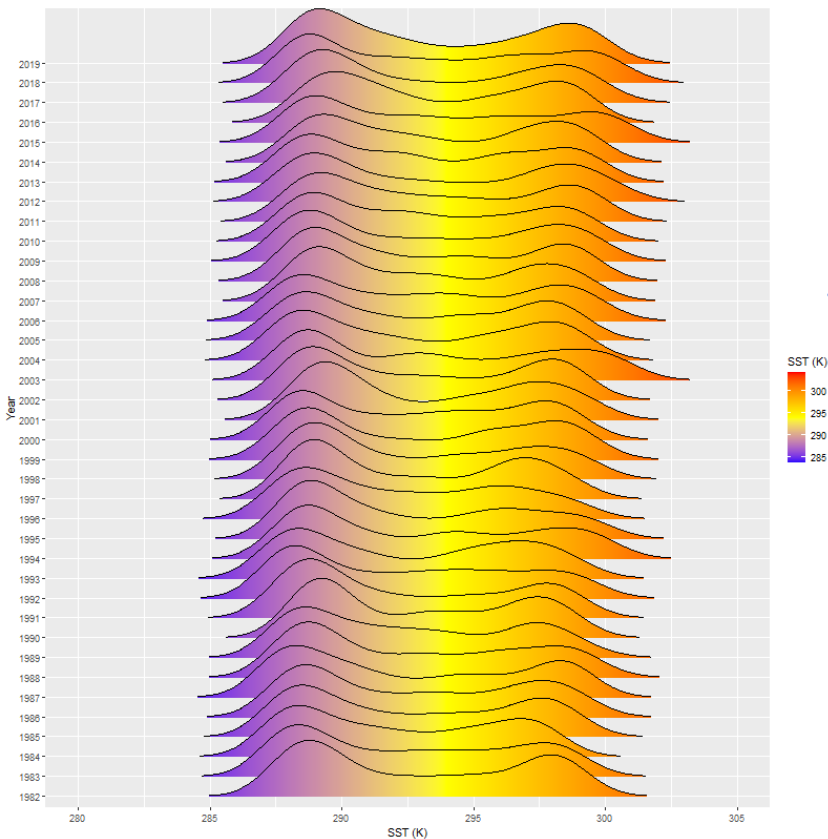


Figure 4. Yearly density plot for mean Mediterranean SST in the whole basin

Two density peaks for winter and summer SST. Progressive widening of the curve towards the high (maximum) values.

Positive trend for all quantiles for the global mean Mediterranean SST. Accelerated warming for 75 and upper quantiles. Highest quantile trend for 75 quantile in the Western Mediterranean

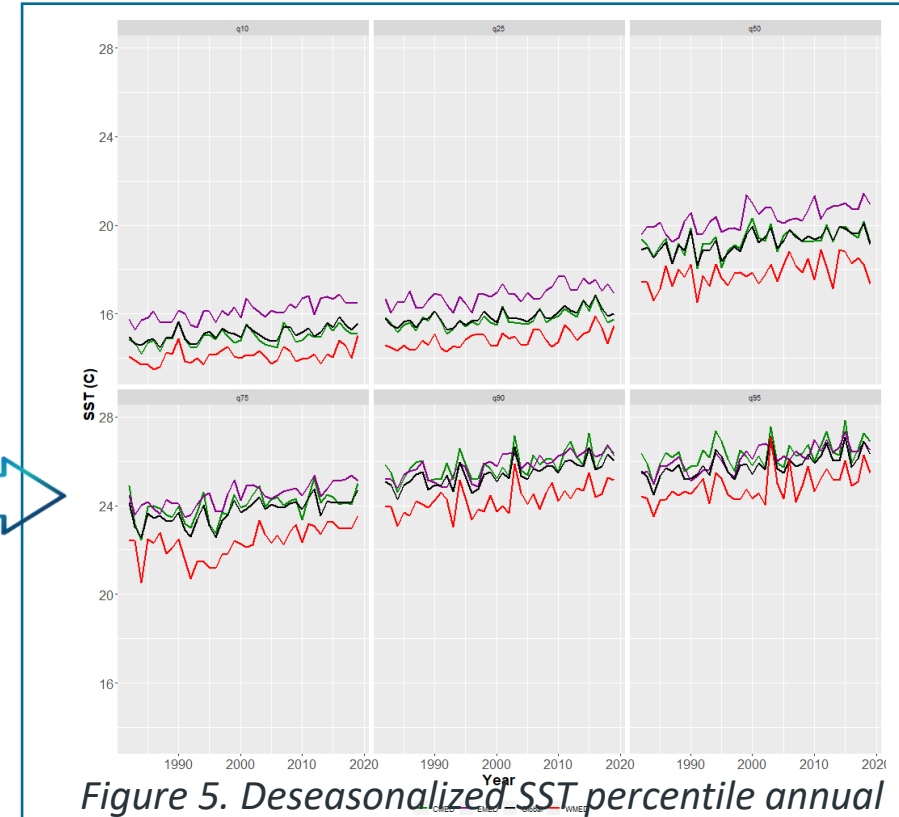


Figure 5. Deseasonalized SST percentile annual time series for the period 1982–2019 in the global Mediterranean basin (black), WMED (red), CMED (green) and EMED (magenta).

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- Mediterranean SST has been consistently warming since the 80's
- Warming presents spatial variability, being higher in the Eastern Med basin
- Warming made up of a higher “most frequent SST” rather than an increment of extreme values
- Positive warming trend in the whole Mediterranean basin
- Highest trend in most of the Eastern basin and northern half of the Western basin, lowest but still positive trend in the Central Mediterranean

