

# New Mediterranean Sea climatologies

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New temperature and salinity monthly climatologies have been produced for the Mediterranean Sea within the framework of SeaDataNet2 EU project. The climatologies are based on the V1.1 historical data collection of all available temperature and salinity in situ profiles (<http://dx.doi.org/10.12770/cd552057-b604-4004-b838-a4f73cc98fcf>) spanning the time period 1900-2013 (Simoncelli et al. 2016).

The Mediterranean climatology is defined between 9.25°W-36.5°E of longitude and 30-46°N of latitude with an horizontal resolution of 1/8 of a degree on 33 IODE vertical standard levels. DIVA software (4.6.9 version) has been used (Troupin et al, 2012) for both the analysis and reference field computation. The salinity reference field has been computed through annual semi-normed analysis considering all available observations, while monthly temperature reference fields have been considered due to the large temperature seasonal variability.

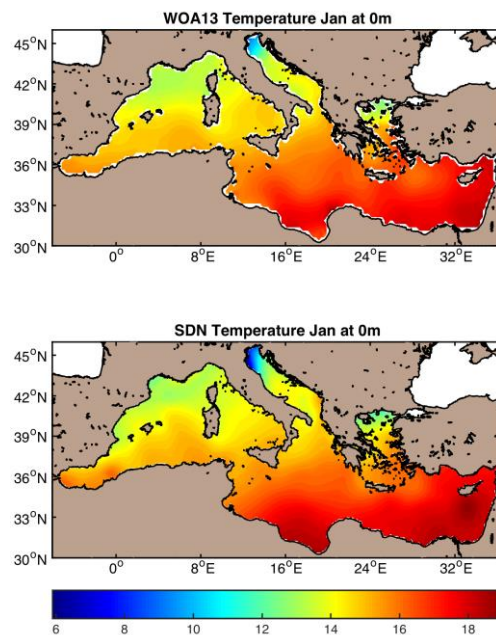


Figure 1: January temperature maps at the surface from WOA13 (top) and the corresponding SeaDataNet2 (SDN) field (bottom).

## Consistency Analysis

The quality of the Mediterranean Sea climatology has been analyzed considering the World Ocean Atlas (WOA13) temperature (Locarnini et al. 2013) and salinity (Zweng et al. 2013) climatologies as a reference. WOA13 climatology has 1/4 of horizontal resolution and it is defined over 57 vertical levels from the surface up to 1500m, thus the consistency analysis has been performed on 24 coincident levels. We first checked the consistency between SDN and WOA13 by visual inspection. Then we used statistical indexes like BIAS and RMSE to quantify the differences between SDN and WOA13 fields (Figure 2).

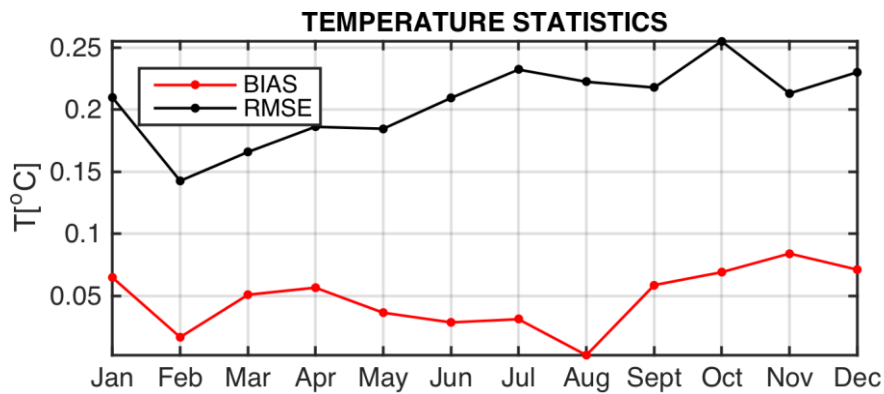


Figure 2: Basin monthly averages of BIAS and RMSE computed between temperature SeaDataNet2 (SDN) climatology and WOA13.

### Conclusions and Developments

The new SeaDataNet Mediterranean Sea climatologies are in good agreement with the WOA13 but presents higher horizontal resolution and it covers the entire water column. The quality of the presented climatology allows its use for many applications.

New climatologies of the recent era, which considers the available in situ observations starting from the mid nineties, and a new consistency analysis will be presented considering Copernicus Marine Environment Monitoring Service products.

### Bibliography

Simoncelli S., Coatanoan C., Back O., Sagen H., Scory S., Myroshnychenko V., Schaap D., Schlitzer R., Iona S., Fichaut M. (2016). *The SeaDataNet data products: regional temperature and salinity historical data collections*. EGU 2016 - European Geosciences Union General Assembly 2016. 17-22 April 2016, Austria.

Troupin, C, Barth, A, Sirjacobs, D, Ouberdous, M, Brankart, J.-M, Brasseur, P, Rixen, M, Alvera Azcarate, A, Belounis, M, Capet, A, Lenartz, F, Toussaint, M.-E, & Beckers, J.-M. (2012). *Generation of analysis and consistent error fields using the Data Interpolating Variational Analysis (Diva)*. *Ocean Modelling*, 52-53, 90-101. doi:10.1016/j.ocemod.2012.05.002