Ocean Science

Discussions

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Interactive comment on "Temporal evolution of Red Sea temperatures based on insitu observations (1958–2017)" *by* Miguel Agulles et al.

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Interactive comment on "Temporal evolution of Red Sea temperatures based on insitu observations (1958–2017)" by Miguel Agulles etal. Anonymous Referee #2 Received and published: 19 September 2019 This study investigates the temperature distribution in the Red Sea from observations collected from 1958 to 2017. The authors combine the data from multiple sources and apply a stringent quality control resulting in a high quality data set which is interpolated to produce a gridded climatology. This allows for an understanding of the Red Sea variability.

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- We are grateful to the referee for the constructive comments provided and the in depth reading of the present work. We have followed his/her suggestions, which we believe have helped to improve our manuscript.

As the observational data was collected from CTDs the article could have been greatly improved if the authors had included the analysis of salinity and done the calculations along density isopycnals rather than on depth surfaces.

- Thanks for the comment. We also believe that salinity is important, but there have been several reasons for us to not include its analysis in this work. The number of salinity observations in the basin is significantly smaller than the temperature ones. At the same time, the correlation length scales for salinity are smaller than those of temperature (Llases et al, 2016), so more data would be required to obtain a reliable product. Additionally, including salinity would require specific tests to calibrate the algorithm, and to quantify the uncertainties, which would involve a huge extra effort For all this, we have prefered to focus on temperature characterization, specially considering that temperature has been recognized as the most influential factor for Red Sea ecosystems. We hope in the near future there will be enough salinity profiles thanks to the new observational systems that will allow us to produce an equivalent product for the salinity.

Furthermore the temperature used needs to be either Conservative Temperature or potential temperature not in situ temperature.

- The reviewer is right and in fact potential temperature has been used. By in-situ we aimed at differentiating the in-situ observations from the satellite observations used afterwards. We have included the term "potential temperature" in the first paragraph of section 2.1.

I was surprised by the high percentage of the observations data was located incorrectly,
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are the authors sure there is not a salinity compensation to this low temperature water that produces an appropriate density for this region.

- Thanks for your appreciation. We had carefully checked that extent prior to discarding those profiles, but we are sure that there is no salinity compensation.

Overall I found the paper to be well written and is interesting and I believe it should be published. It is great that the authors made TEMPERSEA freely available.

- Thank you very much. The product will be made freely available at PANGEA repository once the paper is accepted by the journal.