

Interactive comment on the work entitled “Temporal evolution of Red Sea temperatures based on in situ observations (1958–2017)” (Miguel Agulles et al. (os-2019-66)) by C. P. Abdulla.

Appreciating the authors for the work entitled “Temporal evolution of Red Sea temperatures based on in situ observations (1958–2017)” by Miguel Agulles et al., 2019 which has analyzed the in situ profiles in the region and developed a gridded product based optimal interpolation technique. The article further discussed the seasonal, interannual and decadal signal in the temperature of the Red Sea and outer region (mainly Gulf of Aden). My major concern is on the analysis and some of them are listed below.

Comment 1: Please add in the text about the criteria used for removing the spikes, out layer and density inversion.

Comment 2: In Figure 2, why in the left panel the out data are plotted, it would be better to keep only the Red Sea data to cope with the caption of the Figure.

Comment 3: Figure 5 shows the distribution of all the available observations for January in the region and the profiles distribution after applying the K-means algorithm. Are these profiles shown in (Figure 5b) the only profiles used in Optimal Interpolation?

Comment 4: When I check the data availability in the Red Sea region from World Ocean Database, the data points are mostly aligned along the center with significantly lower number profiles towards both eastern and western coast. To what extent the second source of data cover this in space and time?

Comment 5: The 3D gridded temperature product spanning for the period 1958-2017 is will be very helpful in understanding the Red Sea. From my understanding of the manuscript, I found that the amount of profiles in the Red Sea used for the analysis is very low, except for 2 or 3 years (~1959, ~2000 and ~2016). If this is true, is the derived product will be reliable to discuss interannual and decadal signal?

Comment 6: A table explaining the number of profiles used in the OI per each decade separately in the Red Sea will be helpful to show the data distribution in the Red Sea (which is the prime focus of the study) used in the analysis in addition to a map showing the data spread can be added as supplementary file.

Comment 7: Most of the data represent the outer region and few only represent the Red Sea, so the title of the manuscript and the name of the product should consider that.