

Earth Syst. Sci. Data Discuss., referee comment RC1
<https://doi.org/10.5194/essd-2022-343-RC1>, 2022
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Comment on **essd-2022-343**

Anonymous Referee #1

Referee comment on "Southern Europe and western Asian marine heatwaves (SEWA-MHWs): a dataset based on macroevents" by Giulia Bonino et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-343-RC1>, 2022

The manuscript describes a dataset of MHW events built on ESA CCI SST. The dataset is geographically limited to Southern Europe and Western Asia, even if the SST dataset is global. The approach is rooted in Hobday et al 2016 framework, but introducing refined statistical methods for the detection of marine heatwaves.

I have enjoyed reading the manuscript; it is well written, the length is just about right, it is clear and concise. The description of the dataset is appropriate. I easily downloaded the dataset and was able to inspect it without problems.

From a methodological point of view, the manuscript is certainly interesting for the community. The proposed methodology to take into account shifts toward warmer climate is something we have to deal with and the way the authors tackle this is worth reading. The clustering analysis of macro events is valuable, although the authors did not attempt to associate driving synoptic (atmospheric) conditions to each clusters, something that was the reason for the clustering in Stefanon et al 2012. However, this is likely beyond the mere description of the dataset required by ESSD.

Even if I find the methodological part very interesting, I am a little bit doubtful about the relevance of the dataset itself. The reduced geographical boundaries limit the number of potential users, while it would have been straightforward to run the methodology on the global dataset. The STL-method needs to be re-run every time ESA CCI SST is updated (e.g., including recent years), otherwise the dataset gets quickly outdated. The fact that this dataset is inevitably linked to a specific SST dataset may limit its relevance. Scientists may want to rerun the methodology but on different or newer SST datasets. The significance of the dataset itself, in my opinion, is thus limited.

Specific remarks:

- Geographical names cited in the text should be shown somewhere, to help readers unfamiliar with the region
- Section 3.2 the definition of macro event is $>64\text{km}^2$ (4 pixels), while the definition of macro event in 1 is $>100000\text{ km}^2$. I think this is confusing and the first definition is not really about "macro events", maybe the authors should call the filtering out of few pixels in other way.
- Figure 3: it is not clear to me if the % is on counted events in a category or total days within a category
- The title of Cleveland et al 1990 in the references is incomplete. Also, title of figure 2D should be "Remainder", not Reminders.
- Figure 4C and 4D: 0 in the colorbar should be in white color
- I have the visual feeling that fig6a and fig 6b are not consistent. For example, the average intensity in phase 5 in fig 6a is always >0.5 while in fig 6b it is hardly above 0.5. Am I wrong?
- Line 267 pg 13: "during the last decades (2011-2016)". 5-years period cannot be decades ... also, "as instead reported in Dayan et al., 2022": you may want to specify why you get different results