

General comment

This manuscript describes an attempt to improve the methodology behind the Copernicus OMI indicator regarding SST extremes. The authors run an assessment of two different approaches regarding the use of different initialisation data (interim) or a multi-product ensemble approach that integrates regional and global model outputs with satellite-based observations. The main results show the benefits of these two approaches with respect to the actual procedure.

My only concern is that the analysis has only been run for 2024, which causes some uncertainty about the robustness of the new methodology. Indeed, the authors indicate in the conclusions section that a statistical analysis of the new methodology over decadal time scales would be necessary for a statistical characterisation of error distributions. This analysis would improve the consistency of the new approaches before operational applications.

As this seems to be the next step for the authors, my recommendation is to accept the manuscript for publication in its current form.

We thank the reviewer for their positive evaluation of the manuscript and for highlighting the limitation related to the temporal coverage of the analysis.

We fully agree that restricting the assessment to a single year (2024) limits the statistical robustness of the results. However, this constraint is largely inherent to the current operational configuration of the OMI SST extreme indicator, which relies on near-real-time (NRT) datasets that do not provide sufficiently long historical records to support medium- or long-term analyses.

As stated in the Conclusions, our intention is to address this limitation in future work by performing a decadal-scale assessment of the methodology. Although this may require adaptations to the original indicator configuration, relying exclusively on multi-year or reprocessed datasets, such an approach would enable a robust evaluation of long-term trends and interannual variability.

Minor comments

Which is the period referring to “the corresponding climatological 99th percentile”? Is it “(1993–2023)”? Why is this period used? Have different reference periods been tested?

The period should be indicated and justified in the data section, or different reference periods should be tested in the discussion sections.

We thank the reviewer for this comment. After a careful re-examination of the manuscript, we acknowledge that the definition of the reference period used to compute the climatological 99th percentile was insufficiently detailed in the methodology.

To address this, we have revised the methodological section and the relevant figure captions to explicitly include the following clarifications:

- 1. A justified explanation of the reference period used (1993–2023), which is primarily based on adopting a methodology as consistent as possible with the reference indicator under evaluation (OMI-NRT). Accordingly, the longest time period commonly available across all datasets considered is used as the reference climatology.*
- 2. A revision of all figure captions displaying anomalies to ensure that the reference period used for their computation is explicitly stated.*

Figure 3 caption does not describe panel (c)

We apologize for this oversight and commit to revising the caption of Figure 3 in the next version of the manuscript.