

Reviewers comments

Reviewer #1

I suggested that the authors carry out an analysis of forcing mechanisms, but they decided not to do so.

Please remove this sentence from the abstract: "We attribute these spatial differences to regional variations in atmospheric forcing and to intensified tidal mixing that promotes heat redistribution within the inner shelf."

Thank you very much for reviewing the manuscript. As suggested, we have deleted the sentence from the abstract.

Reviewer #2

I would like to thank the authors for their detailed and point-by-point response to my previous comments. The revisions made to the manuscript, particularly the enhanced justification for the study's motivation and the clarification of the methodological choices regarding the moving baseline, have significantly strengthened the paper. The inclusion of multi-dataset comparisons also adds a layer of robustness to the findings. I am pleased with the majority of the revisions; however, there are remaining points that require minor adjustment before final publication.

Thank you for reviewing the paper and your constructive comments which enhanced the quality and scientific rigor of the manuscript.

1. Line 18-19 The manuscript attributes the spatial differences of MHW characteristics directly to "regional variations in atmospheric forcing" and "intensified tidal mixing." While these are plausible drivers for the Patagonian Shelf, this study primarily analyzes SST data and does not provide direct diagnostic evidence (such as wind stress analysis, heat budget terms, or tidal data) to confirm these causal links. To maintain scientific rigor, please either rephrase these statements to be more speculative or remove the definitive attribution.

As suggested by both reviewers we have deleted the sentence of the abstract section.

2. The abstract (Line 14) and other sections mention the use of "42 years" of satellite-derived daily SST data. However, the analysis period specified in the text (and likely the datasets like ESACCI) appears to cover 1982-2021, which constitutes 40 years. Please check and ensure consistency throughout the manuscript. If the analysis indeed starts in 1982, "42 years" should be corrected to "40 years" to avoid misleading the readers.

We are very sorry but that mistake. Indeed are 40 years of satellite-derived daily SST data. We have carefully revised the whole manuscript to keep the consistency in the number of years.

3. To further strengthen the discussion on the ecological importance of MHWs in this region, the authors can consider citing the following study regarding phytoplankton responses to MHWs: <https://www.nature.com/articles/s43247-025-02718-y>

Thank you very much for the suggestion. We have incorporated the recommended reference and added a sentence in the introduction, discussing the potential impacts of marine heatwaves on phytoplankton responses in the revised manuscript.

4. In the current version, several dataset acronyms are used in the Abstract and Section 2.1 without their full formal names being introduced at their first occurrence. Please check and revise these according to the journal's guidelines.

We have revised now all the acronyms, being sure of describing them, specifically we have removed from the abstract the acronyms of the dataset.

5. Several related papers: Marine heatwaves are shaping the vertical structure of phytoplankton in the global ocean. *Communications Earth & Environment*, 6(1), 715.2025. Intraseasonal oscillations modulate spring marine heatwaves in the northern South China Sea , *Journal of Geophysical Research: Oceans*, 130(8).

We have included both references in the introduction of the manuscript.