

This manuscript has the potential to provide some key strengths, by seeking to contribute to addressing the thorny problem of geoinformation retrieval from satellite data through information-technologically assisted inverse modeling: more precisely ocean "heat" content from proxy parameters derived from satellite data and assisted by artificial neural network data-based modeling.

Overall, the initiative is welcome and courageous, given the minefield of caveats across the retrieval and estimation workflow, which can easily hinder the accuracy and reliability of the formal results and condition the confidence with which novel insights can effectively be drawn from the whole process.

Notwithstanding the complexity and fragility of the overall procedure, the authors have made efforts to document the workflow and underlying reasoning. That does not mean that the results can be taken for factual and fail-proof. However, that does not mean that they should be entirely discarded either without a further attempt to strengthen the methodological and operational robustness of the study workflow, namely in terms of enabling assumptions, limitations and implications.

(For instance, Pearson correlation suffers from various disqualifying shortcomings, especially when relating such complex data, that the reliance on such basic linear metric for relating environmentally relevant datasets is highly questionable).

To that end, it will be crucial to aptly and thoroughly explain and clarify all the fundamental and operational assumptions, limitations and respective mitigation strategies. That is required to more confidently be able to legitimize the research procedure and allow for interpretable results to be drawn and effectively assessed as valid outcomes. While the authors have invested considerable efforts in explaining such in the original manuscript, further diligence is needed, as also pointed out by the other reviewer.

Crucial attention needs to be placed in the formal algorithmic procedures, the underlying mathematical details, and the physical justifications for each conducted step, so that a more detailed feedback can be provided pertaining the associated intricacies and underpinnings beyond these more general remarks. Currently, as also shared by the other referee, major concerns hover over the solidity of the research procedure, which will require thorough clarification and revision.

On a more minor (yet still relevant) aspect, the density scatterplots require some visualization improvement, namely in terms of color scale, so that the different shades can be more easily seen and grasped.

While not repeating the concerns of the other reviewer, I reiterate my overall agreement with them and the need to overcome such for strengthening the contribution. Notwithstanding the difficulties faced by the submitted study and the lack of detail that precludes a clear conclusion on the validity of the procedure and quality of the data (which require thorough clarification and exploitation in the revised version), I hope that the authors can clarify the questions, overcome the shortcomings and produce a much more solid revised manuscript.

Thank you for your critical points about strengthening the manuscript. The motivation for the current study is to address the challenges associated with satellite-based estimation of OHC. To achieve this, we have conducted a thorough literature to understand the deficiency in OHC estimations and to identify the shortcomings in the existing works. It is observed that the OHC modeling needs a solution that involves accurate computation of in-situ OHC from CTD profiles, precise theoretical formulations for choosing the remote sensing-based parameters and their accurate retrievals, the latest version of climatological data, efficient modeling tools, and appropriate validation methods. To the best of our knowledge, we have made a successful attempt by fulfilling all the considerations and explained the same in the manuscript. However, we will make a thorough revision of the manuscript to better present the theoretical formulations

(mathematics and physics involved), methodology, data, modeling techniques, validation methods, figures (density scatterplots), limitations, and future directions.