

Public justification (visible to the public if the article is accepted and published):

Thank you to the authors for their revisions and to the reviewer for assessing the manuscript again. Some additional points were raised by the reviewer, so please could you also address these plus the minor technical notes from me below.

1. The notation for pH is unusual – why the subscript sw? At first glance, it seems to imply that it is both on the total scale and the seawater scale. If keeping the notation, please explain what it means on its first appearance (in the abstract, line 24).

Thank you for pointing that out. We have corrected the notation and now use $\text{pH}_{\text{T,sw}}$ consistently throughout the manuscript. In addition, an explicit explanation of the meaning of this notation has been added to its first appearance, clarifying that it corresponds to the pH on the total scale.

2. pH is dimensionless, so please remove references to “pH units” throughout (e.g., in the abstract lines 34-35).

Done

The authors seem to have addressed most of my previous concerns. However, I have a few remaining notes.

The language continues to struggle in some places. It could benefit from thorough copy and language editing.

We appreciate this comment. A thorough revision of the language has been carried out, and the manuscript has been carefully edited throughout to improve clarity, grammar, and readability. As a result, several sections of the article have been modified to address these issues.

I was pleased to see the data subdivided between the training and the validation data by cruise or platform. However, I failed to find the added text that would make it clear that this was what was done. Please add this text or provide line numbers in responses to reviewers to indicate where the new text is found.

Done. The clarification has been added in section 2.3, lines 180–185.

Line by line comments:

210: seasonally dependent

Corrected.

241: data were

Corrected.

261: These methods are

Corrected.

268: Networks

Corrected.

392: The validations statistics were... For the RMSE, MAE....., respectively

Corrected and added.

697: converted to or converted from?

Corrected.

Figure 4: I see! Consider placing a thin dark border around the overlaid data or somehow make the data more apparent. They are difficult to see when they are the same or similar values, and it can be tough to tell when we are looking at data or just structures in the estimates.

Thank you for the suggestion. We explored the possibility of adding a thin dark outline to the overlapping data to improve visibility. However, due to the high density of overlapping points with very similar values, the addition of a dark border resulted in excessive visual superposition, ultimately making the figure more difficult to interpret. For this reason, we decided to keep the current representation, which provides the clearest overall visualization of the data.