

Reviewer #2

I recommend that the manuscript be accepted for final publication after the authors address the remaining concerns and suggestions from the reviewers. The authors have made significant improvements in response to the initial major comments and have effectively addressed issues related to the title, advantages of their high-resolution approach, restructuring of sections, and comparisons with other models. The addition of a dedicated section on the South China Sea Throughflow (SCSTF) and water budget analysis further enhances the manuscript's content.

However, there are a few questions and recommendations that should be addressed in the final revision. The authors should provide more clarity regarding the underestimation of Mixed Layer Depth (MLD) and the role of wind speed, as well as the robustness of lateral interocean exchanges ratios and their validation against observational or previous studies. Additionally, the suggestion to use a coarser version of the same model core for comparison instead of other coarser-resolution models should be addressed if possible, exhibiting the benefits of the higher-resolution more directly. Once these remaining points are adequately addressed, the manuscript should be considered suitable for final publication.

Major Comments:

1. MLD Underestimation and Wind Speed: How the authors concluded that all models' underestimation of Mixed Layer Depth (MLD) is attributed to the underestimation of wind speed. Do all models use the same forcing? It's important for the authors to clarify and provide further details on the role of wind speed and the consistency of forcing among the models when discussing MLD underestimation.
2. Use of Coarser Configuration: It is recommended that the authors consider using a coarser version of the same model core for comparison, in addition to comparing their high-resolution model with other coarser-resolution models. Including a coarser configuration with the same model core will provide a more convincing basis for highlighting the benefits of their new setting, especially in terms of finer resolution and other relevant factors. This approach can offer a more direct and robust assessment of the advantages of their high-resolution model.
3. Robustness of Lateral Interocean Exchanges Ratio: The ratio of different lateral interocean exchanges is interesting. I am also wondering if it is robust. If there is any observational or previous study support for this ratio. It's essential for the authors to provide information on the robustness and potential sources of validation for the ratios presented in the study.

Minor Comments:

1. Title Prolixity: The new title appears somewhat lengthy. It might be advisable to streamline the title by removing some of the detailed configuration information, thus achieving a more concise and reader-friendly title. The authors should contemplate this suggestion and determine if certain elements of the title can be omitted while retaining the core information.
2. Legend of Figure 2: The legend of Figure 2c is overlapped with the graph.