

Thank you for the significantly improved revised manuscript. The reviewers have suggested the following minor adjustments, which I agree with:

Thanks for your positive feedback on our revised manuscript. We are very grateful to you and reviewers for the careful reading and constructive comments, which have helped
5 further enhance the quality of our paper.

We have addressed all the points raised, and our responses are provided below.

Please reduce the colorbar range in Figure 3e, 3f, 3g, 4e, 4f, 4g to amplify the anomalies on the maps.

10 We sincerely appreciate this suggestion. The colorbar ranges in the specified figures have been adjusted accordingly as suggested.

Line 50: change "extending to seafloor" to "extending to the seafloor".

15 Line 54: change "with no model replicating post-2000 acceleration in AW warming" to "with no model replicating the post-2000 acceleration in AW warming".

Line 185: change "high-resolution the Ocean Model Intercomparison Project Phase 2 (OMIP2) models" to "high-resolution Ocean Model Intercomparison Project Phase 2 (OMIP2) models".

20 Line 229: change "dataset, represents a long-term climate data record" to "dataset, which represents a long-term climate data record".

Line 421: change "E3SMv2-MPAS can successfully reproduces observed vertical temperature structure" to "E3SMv2-MPAS can successfully reproduce observed vertical temperature structure".

25 Line 602: change "A study by Schauer et al. (2004) show annual mean net volume transport" to "A study by Schauer et al. (2004) shows annual mean net volume transport".

Thank you and reviewer #2 for the thorough and attentive review. All the suggested grammatical and phrasing corrections have been carefully incorporated into the revised manuscript.

30 Specifically, we have updated the text at the indicated lines, with line numbers referring to the track-changes file:

"extending to **the** seafloor" (Line 50);

"**the** post-2000 acceleration" (Line 54);

"high-resolution Ocean Model Intercomparison Project..." (Line 185);
"dataset, **which** represents..." (Line 229);
35 "can successfully reproduce" (Line 423);
"Schauer et al. (2004) shows" (Line 604).

[After those changes, we can then proceed to publish. Thanks again!](#)

40 After these changes, we sincerely hope the manuscript now meets the journal's standards
for publication. Once again, we extend our deepest gratitude to you and reviewers for
your insightful comments and unwavering support throughout the review process. We
look forward to your final confirmation.