

Interactive comment on “A simple mixing explanation for late Pleistocene changes in the Pacific-South Atlantic benthic $\delta^{13}\text{C}$ gradient” by L. E. Lisiecki

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The results of Toggweiler et al. (2006) present a cohesive explanation of the glacial reversal of PDW-SCW $\delta^{13}\text{C}$ gradients and provide a great deal of insight into the results presented in this study. It was not my intention to overlook or minimize the importance of that study. The excellent summary of that work provided by Toggweiler in his comments has helped me better incorporate the findings of that study into my discussion. My results appear to be completely consistent with Toggweiler et al’s model results and additionally suggest that similar circulation patterns may also have occurred during glaciations since 800 kyr ago. I have added new references to Toggweiler et al’s

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results in the introduction, background, and discussion sections. I would have included a more direct comparison of the two studies if that paper provided estimates of %NCW and %SCW for glacial PDW.

Both referees have pointed out that a constant mixture of NCW and SCW is not the only possible way to explain the observed changes in $d^{13}C$ gradients, and I completely agree. The point that I wish to emphasize in this study is that the observed $d^{13}C$ values are consistent with a constant mixing ratio, and, therefore, any arguments for changes in PDW ventilation should be based on other lines of evidence (e.g., GCM simulations or other proxies).

Interactive comment on Clim. Past Discuss., 5, 2607, 2009.

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