

Response to Editor, Peter Haynes:

I uploaded my replies to the two Reviewers on December 19, and I am hoping that they are acceptable to them and to you. They both requested that I provide some additional analyses plus major rewrites of several sections. Accordingly, I am submitting a revised manuscript instead of merely trying to make track changes to my original manuscript. My primary findings are essentially unchanged, but I believe that I have quantified the uncertainties for them much better now. I have also put my findings within the context of changes for the Brewer-Dobson circulation, rather than using the more ambiguous term, net circulation.

Section 1 puts this study in the context of the Brewer-Dobson circulation, as recommended by Reviewer 1. Original Section 2 is separated now into Objectives (new Section 2) and Analysis Approach (new Section 3), and I describe the terms of my MLR models in Section 3. Section 4 on sampling and data bias has been added to satisfy the concerns of Reviewer 2. The remaining sections of the paper are similar to the ones of the original manuscript, but they contain more details and updated figures. A number of pertinent references have been added, as well.

Figures 1 and 2 are unchanged and Figures 3, 5, 7, 10, 13, and 14 are similar to what I provided originally, although the interannual terms for my current MLR models have periods that are slightly different now. Figures 4 and 6 are new and in response to a request from Reviewer 2 for further analyses. Figures 8 and 9 show the methane trend profiles at 10° and 60° latitude for the southern and the northern hemisphere, respectively, and using a latitude bin width of 10 degrees. The methane trend profiles are compared with those of water in Figures 11 and 12, but in terms of ppmv/decade instead of percent so that the reader can relate the trends to their absolute values more easily.

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