

Interactive comment on “Use of North American and European air quality networks to evaluate global chemistry-climate modeling of surface ozone” by J. L. Schnell et al.

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We thank anonymous referee #2 for their useful review and encouraging comments. The minor comments relating to odd constructs or grammatical errors have been fixed to follow the referee's suggestions. Below we address the major and other minor comments made by referee.

The only major comment from referee #2 was reiterating the suggestion from the initial technical review of the manuscript – to seek publication in GMD rather than ACP.

Response: We appreciate the referee's suggestion and are pleased to know the referee

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now agrees with publication in ACP.

Minor comments:

"page 11375, line 1: +0.6 . . . isn't it -0.6 ppb? I assume the mju's in the figure panels represent the averages (-0.4, -0.6, -0.9 for the three percentiles) which you here refer as being about +0.6 'overall'. Ok, if the sign is corrected. Or did I miss something?"

Response: Thank you for catching the mistake. +0.6 ppb should indeed be -0.6 ppb. The text and discussion has been changed accordingly.

"page 11380, line 1: How does this sentence relate to the previous one? Why 'however'? Do you mean that even a perfect boundary layer scheme probably wouldn't remedy the underestimation of H? Probably need one more sentence here."

Response: This statement was made to only convey the possibility of the boundary layer schemes causing the underestimates of H. The text has been changed to the following: "The ACCMIP models use a wide range of boundary layer mixing schemes but consistently underestimate H. The boundary layer schemes may be responsible for these underestimates, however, Menut et al., (2013) notes that at least for one model, increasing its vertical resolution results in very small surface O₃ changes."

"page 11392, line 13: could be highly relevant for many Air Quality modelers, dealing typically with 10 km resolution or finer. Is there any activity to produce such a data set?"

Response: Although we are not currently doing so, we appreciate knowing there is interest in such a dataset. The generation of a 10-km data set will require re-evaluation of the parameters that were optimized for the 100-km data used here, and we will be pleased to work with anyone, supplying station data and code knowledge, who has an interest.

"Table S1: can you please write 350-351 instead of 350-1? Similarly in the other grid cells"

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Response: The notation, for example, “350-1”, was meant as including all longitudes from 350°E to 1°E (i.e., 10°W to 1°E). The table caption has been updated to make this clear.

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