Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2019-601-RC2, 2020

Atmospheric Chemistry and Physics Discussions

Interactive comment on "The long-term trend and production sensitivity change of the U.S. ozone pollution from observations and model simulations" *by* Hao He et al.

Anonymous Referee #3

Received and published: 1 January 2020

This manuscript presents a modeling study of the decadal ozone trend in the US. I am impressed by the significance of the results, but there are still several important issues need to be addressed before publication.

1 How will the results of CWRF-CMAQ differ from WRF-CMAQ? You can also use WRF to simulate decadal climate with long-term reanalysis. Better to include some description of the advantage of CWRF over WRF.

2 Scaling factors were used to get historical emissions. However, this will keep the spatial distribution the same at 2011 level. Why don't you use the information from other historical inventories, such as EDGAR? Could you discuss how this will affect the

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Discussion paper

results?

3 Chemical initial and boundary conditions were obtained from the default concentration profiles built in CMAQ. For long lived chemical species like ozone, long range transport and stratospheric intrusions would be important. If default concentration profiles are set, how to consider the historical changes in sources outside the US?

4 O3/NOy ratio was used as the indicator of VOC or NOx limited. The threshold of was adopted (O3/NOy < 15 indicating the VOC-sensitive regime). How to demonstrate this threshold and ratio is proper and accurate or represent the sensitivity. As model usually has difficulty in capturing the concentrations of NOy, the results might be questionable with this assumption.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2019-601, 2019.

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