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Interactive comment on "Evaluation of dust and trace metal estimates from the Community Multiscale Air Quality (CMAQ) model version 5.0" *by* K. W. Appel et al.

K. W. Appel et al.

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First, I would like to thank the reviewer for their time and effort in reviewing this manuscript. We greatly appreciate the comments and corrections provided. We've tried to address all the comments as best we can. Below are our responses to the specific reviewer suggestions.

P1863, L15-16: Please explain how the WRF model was run. Was it run in segments of 1 month with 10-day spin up?

Response: The WRF simulation was run in 5 1/2 day increments, which has been our procedure for performing long-term WRF simulations for some time. We've indicated

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in the text that the simulation was run in 5 1/2 segments.

P1864, L5: It is mentioned on P1863, L21 that the emission inventory and ancillary ïňĄles were based on the 2005 NEI emission modelling platform and here that area source emissions were based on estimates from the 2002 version of the NEI. Please explain.

Response: While we used the 2005 NEI, some of the emission sectors, including area sources, were the same as the 2002 NEI. This was confusing in text, since we singled out area sources. We've changed the text to indicate that we simply used the 2005 NEI with various updates where applicable.

P1864, L25: "PM2.4 and/or PM10"?

Response: We changed PM2.4 to PM2.5.

P1867, L14-16: Please explain how this has been done or give a reference.

Response: We've greatly expanded the explanation of how the GEOS-Chem data were processed for use as boundary conditions, including adding a new table (Table 3) showing the mapping between the GEOS-Chem and CMAQ species. We feel that the updated text does a much better job explaining how the boundary conditions were created.

P1868, L5: Please change "please refer to" to "the reader is referred to".

Response: Changed as suggested.

P1870, L27: The XRF analysis is presumably not done at the sites. Please change "at the IMPROVE sites" to "for the IMPROVE sites".

Response: Changed as suggested.

P1877, L10: Is there satellite data to show that high concentrations were observed?

Response: Based on the reviewers comment, we obtained some satellite derived

aerosol optical depth (AOD) data for late July and early August 2006, which showed relatively high AOD values for that time period. We added a sentence in the text stating such, but did feel it was necessary to add an additional figure showing the satellite AOD values. We feel confident that elevated dust during that time period was largely contributed to by transported dust from Africa.

P1877, L23: What about TRMM data?

Response: Agreed. Some satellite derived sources of precipitation do exist. However, an analysis of the offshore precipitation is really beyond the focus of the current analysis. However, we did add a note in the text that satellite derived precipitation data may be available for future analyses.

P1888, Table 1: Please indicate the unit for the transportable fraction (%?).

Response: It was unclear from the text exactly what transportable fraction represented. We've added additional text to clarify exactly what the transportable fraction represents. In addition, we've added text to the caption for Table 1 further explaining was transportable fraction represents.

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