

Interactive comment on “Downscaling a global climate model to simulate climate change impacts on US regional and urban air quality” by M. Trail et al.

Anonymous Referee #1

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The authors used spectral nudging technique to downscale the result of large-scale climate model to a spatial resolution of 12 km x 12 km. The downscaling results were evaluated by comparing with in situ observations. They found the high-resolution simulations produce different results than the coarse resolution simulations. They also analyzed the meteorological variables that most strongly influence air quality in the US for present-day (2006-2010) and future (2048-2052). The manuscript was clearly written and the results were also well discussed. Clearly, this manuscript deserves publication on this journal. Still, there are still several minor suggestions the authors may need to consider:

Page 5 line 3: Weaver, et al.

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Page 9 line 17-19: I suggest add the boundaries of these regions in Fig. 1.

Page 10 line 2: the names of the regions need to be consistent with what you have defined at the end of section 3.

Page 11 line 19: Why is the unit of the standard deviation K2?

Page 14 line 8: Any reference supporting your choice of 6000 m²/s?

Page 17 line 5: You need to name the four regions.

Page 23: In table 1 and Table 2, you introduced two new terms “bias” and “error”. Are they the same as “MB” and “MAGE”, respectively? If so, please use consistent terms. If not, you need to define them here.

Page 30: I'm confused by the figures 7-10. It seems that there are more than one curves (4?) for each city under each scenarios. Are they for different seasons? These curves fuse together and are hard to identify. I suggest use thinner curves and use a table to list the percentiles discussed in the text.

Interactive comment on Geosci. Model Dev. Discuss., 6, 2517, 2013.

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