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Interactive comment on "Modeling natural emissions in the Community Multiscale Air Quality (CMAQ) model – Part 1: Building an emissions data base" *by* S. N. Smith and S. F. Mueller

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Comments on "Modeling natural emissions in the Community Multiscale Air Quality (CMAQ) model – Part 1: Building an emissions data base".

As discussed by the NARSTO emissions assessment, the need for improved emissions data for air quality modeling is great. The authors of this paper should be congratulated for their efforts to improve the characterization of natural emissions.

My comments and suggestions are of mostly a minor nature:

Abstract: The abstract gives the impression that windblown dust emissions are part

of the operational version of CMAQ/SMOKE. Unless added (like with Mansell et al., 2006), they are not part of the operational version of CMAQ, nor are they distributed as part of EPA's National Emissions Inventory (NEI).

Section 2.1 provides a background on natural emission estimates. I agree that NAPAP (1991) represented a key milestone and reference, but the author should probably cite and discuss the more recent recommendations (at least for VOCs and NOx) in Guenther, A., C. Geron, T. Pierce, B. Lamb, P. Harley, R. Fall, Natural emissions of non-methane volatile organic compounds, carbon monoxide, and oxides of nitrogen from North America, Atmospheric Environment 34:2205-2230 (2000).

p. 1759-1760: The paragraph on wildfire emissions should probably consider the excellent work performed by the U.S. Forest Service, EPA, and Sonoma Tech on developing the SMARTFIRE system, which has led to national inventories for 2002-2006. Lines 17-20 on p. 1760 should be moved up to this paragraph on wildfire, as these lines seem misplaced in the natural VOCs paragraph.

p. 1760: The paragraph on fugitive dust gives the impress that EPA (and by extension CMAQ) does not consider dust from categories like unpaved roads and agriculture. In fact, the NEI includes estimates for those categories. It should be noted that there is a great deal of uncertainty with fugitive dust, and many scientists have suggested that estimates under this category are overestimated.

Section 3.1: For completeness, Novak, J. and T. Pierce, Natural emissions of oxidant precursors, Water, Air, and Soil Pollution 67: 57-77 (1993) discuss the use of the National Lightning Detection Network to develop NO emissions from lightning for applications with the Regional Oxidant Model.

p. 1781: The Novak and Pierce (1993) reference is probably a better replacement for Pierce et al. (1999).

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 1755, 2010.