Atmos. Chem. Phys. Discuss., 15, C12350–C12351, 2016
www.atmos-chem-phys-discuss.net/15/C12350/2016/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Comparisons of urban and rural $PM_{10-2.5}$ and $PM_{2.5}$ mass concentrations and semi-volatile fractions in Northeastern Colorado" *by* N. Clements et al.

Anonymous Referee #2

Received and published: 12 February 2016

Review of Clements et al. "Comparisons of urban and rural PM10-2.5 and PM2.5 mass concentrations and semi-volatile fractions in northeastern Colorado".

This manuscript reports on the three-year CCRUSH study that investigated PM10-2.5 and PM2.5 mass concentrations and SVM for several sites in urban Denver and comparatively rural nearby Greeley. Diurnal, weekday/weekend, seasonal, and annual concentrations are reported and interpreted. The data were related to meteorological variables such as relative humidity, wind speed, and direction. The authors have presented a thorough analysis in a well-written and well-organized paper. The strengths of the paper include the detailed analyses of differences/similarities in the various measured

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parameters at each site and their relation to each other and meteorological variables. A weakness of the paper is the absence of the greater overall implications of the work. A statement at the end of the abstract along these lines would help place the importance of the work in a greater context. This is also true for the summary. I recommend the paper be published after addressing a few minor comments listed below.

Minor comments Abstract, line 7: Please provide years. Page 24590, line 15: Stating the greater purpose of the study here would be helpful. Will this work ultimately be used for health research, regulatory work, emissions reductions, etc. Page 24598, line 10: Please list Greeley value. Page 24600, line 4: Can the authors comment on the similarity of PM2.5 SVM at both Denver and Greeley sites? One might expect these concentrations to be somewhat higher in Greeley (and also higher fraction) given the nearby agricultural activity. Page 24602, line 21: Can the authors clarify what they mean by "regional shifts in meteorological conditions"? Page 24603, line 1: Perhaps change "around Colorado" to around either 'Denver and the Front Range' or 'northeastern Colorado' since these data do not necessarily reflect all of Colorado. Page 24606, line 3: Define first usage of "NPR".

Technical Corrections Table 2: Please define SD, COV, and N in the caption or footnote. Also include the city next to the site identifier (e.g., ALS, Denver). A challenge when reading this paper is keeping track of all the sites and their locations as the reader doesn't have the benefit of the familiarity that that authors have. Table 3: Define "Cb" in the caption. Figure 1: The data in figure 1 are very hard to read and separate. This may be a function of the journal printing them very small, but increasing the legend font size would help. Also, for part (a), consider adding a second axis for the SVM data. They are completely unreadable. Figure 2: Same comment as figure 1 in that the text is tiny and very difficult to read. Figure 3: Define "NPR" in the figure caption. Table S1: Over what time period do the traffic data correspond?

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 24587, 2015.