

Interactive comment on “Aerosol trends as a potential driver of regional climate in the central United States: Evidence from observations” by Daniel H. Cusworth et al.

Anonymous Referee #3

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This study ‘Aerosol trends as a potential driver of regional climate in the central United States: Evidence from observations’ by Cusworth et al., shows links of changes in aerosol burden on surface variables (temperature and soil moisture) and meteorological parameters using In situ observations from two sites over the central and southeastern United States. The problem address in this paper is a relevant scientific question within the scope of ACP. The abstract is concise and and complete. The introduction is set to nice stage and the results are interesting and worth to publish in ACP. I have few minor suggestions:

(a) The statement in abstract “Our work has implications for severely polluted regions

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outside the U.S., where improvements in air quality due to reductions in the aerosol burden could inadvertently increase vulnerability to drought”. This statement is based on limited variables and I think it is more appropriate if we consider the direct and indirect effect of aerosol. This may be part of another study, but to avoid any misunderstanding, it will be helpful if authors mentioned it clearly in the MS.

(b) The authors used observations from two sites Bondville, Illinois, and Goodwin Creek, Mississippi over the central and eastern U.S. Wonder how these sites are representative of these regions?

(c) On page 6 line 7-10, it is mentioned that tower/sites in Bondville located within an active corn/soybean agriculture field experiences little irrigation which could influence the microclimate. Wonder how much the effect of the irrigation on the observations used in this study, any quantities information will be useful.

(d) Additional details are needed on unit of temperature change as a results of radiative forcing (e.g. what is “a” in the units $K a^{-1}$ and $W m^{-2} a^{-1}$).

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