

Interactive comment on “Urbanization-induced urban heat island and aerosol effects on climate extremes in the Yangtze River Delta Region of China” by Shi Zhong et al.

Anonymous Referee #2

Received and published: 19 January 2017

The authors performed fine-resolution model simulations using coupled WRF-Chem model to study the individual and combined effect of changes in land use and atmospheric aerosol loading from 1970 to 2006 on the climatic changes. The paper is generally well-written and the results are well discussed. I have following comments before it is accepted to be published on ACP.

One major comment: According to Table 2&3, the authors quantified the urban land use changes on the climatic effect under the atmospheric aerosol loading in 2006, and the aerosol loading changes on the climatic effect under the land use in 1970. Have the authors considered to run extra sensitivity simulation with LU06E70, to quantify these effects under the same year's base condition? How the authors consider the

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uncertainties associated with that?

Minor comments: Pg 9: line 178: Can the authors elaborate why they consider the nighttime light correction for deriving the land use data in 2006 but not for 1970?

Pg 12: line 241-243, the description of the Figure 6 is not the same as in Pg 47. Please double check the imposed surface wind speed is from LU70E70 or LU06E06? Change “PM2.5” to “PM_{2.5}”; Also update the quality of Figure 6. It is less clear compared with other figures.

Pg 12: line 252: have the authors consider how the different definition of the heatwave could affect the results?

Pg 44: figure 3, change “unit” to “units”

Pg 49: Figure 8: I would suggest the authors to rewrite the captions for Figure 8. Since it no longer shows the subtitle of “Land-Cover” “Aerosol” as in Figures 4 & 5, I think it is better to express that the red lines are for Land cover, blue lines for Aerosol effect, and green lines for total.

Pg 51: Figure 10 (a), missing the units of “ 10^{-5} s^{-1} ” in the top of the vertical colorbar.

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-953, 2016.

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