

Interactive comment on “Optimal water use strategies for mitigating high urban temperatures” by Bin Liu et al.

Anonymous Referee #2

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This paper aims to determine an optimal water use strategy for urban cooling in Beijing by coupling a novel water use scheme into WRF and conducting summertime simulations. The topic does read interesting and the paper well fits the scope of HESSD; however, the presentation of current manuscript, which has great room to improve, does hinder the my understanding of some key points of this work.

As such, the authors are suggested to improve the manuscript by considering the following concerns:

1. As numerous WRF simulations have been done in Beijing, I have less concerns about the model performance per se; instead, I would encourage the authors to investigate more if the consideration of urban water use could effectively improve the WRF simulations in Beijing.

2. It is very unclear how the optimisation of water use is done in section 3.3, which, however, should be one of the key contributions the paper attempted to make. I suggest to incorporate sections 2.1 into 3.3, so the optimal strategy part could be more coherently presented.

3. Presentation is a major issue: grammatical errors and typos are pervasive; figures in general miss appropriate caption and proper legends. A small portion of the issues are given below as examples: - L58: "role" → "roles" - L101: "nonmatter" → "no matter" - L115: "he specific" → "the specific" - caption of Figure 1: "it's coupling" → "its coupling"; the full name of WRF is unnecessarily given twice; - caption of Figure 4: "moister" → "moisture". - units: watts should be in uppercase, i.e., "W". - in English, the words and punctuations should be separated by spaces. e.g., in "model(CLM4.5)", a space should be added between "model" and "(" . - ...

Other specific comments:

1. Figure 1: please explain: - What is 'time judge'? - Why is the road sparkling only activated during summer night? And when is summer? When is night? (when kdown==0?) - What is "imperative layer" in the "Urban Canopy" circle of panel b?
2. Section 2.3: Unclear what experiments were actually carried out in this work.
3. L165: Please provide more details on the construction of 4-day climate ensemble.
4. L175: This term "atmospheric stochastic processes" is confusing: either provide examples or reword it.
5. Figure 11a: the regression for results of city centre looks problematic.
6. Table 4: it's unclear what the "units" row (the first row) indicate.

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Discussion paper

