

Geosci. Model Dev. Discuss., editor comment EC1
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Comment on gmd-2021-332

Jinkyu Hong (Editor)

Editor comment on "Implementation of a new crop phenology and irrigation scheme in the ISBA land surface model using SURFEX_v8.1" by Arsène Druel et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-332-EC1>, 2022

This study describes a new irrigation parameterization for ISBA land surface model (LSM). Despite interesting subjective of this study, it is hard to read and to understand what the unique things in this study are. Please revise the manuscript carefully for better readability and provide clearly 1) how to parameterize irrigation processes in the model codes, 2) remove redundant sentences many places, 3) clarify the information on the data so that other people reproduce what this study did, and 4) rewrite fractured sentences. It is also important to organize sentences, paragraph, and figures to converge into clear goals and to support your conclusions.

Here I put some comments on the manuscript, but I believe that overall structure of this manuscript should be reorganized and rewritten carefully.

- There is not enough information to reproduce the modeling results in this manuscript. Please provide more details on the irrigation parameterization especially for different kinds of irrigation methods. How do you deal with different irrigation types in the model?

- Please provide specific information on water conservation and differences between different irrigation methods in the model.

- Writing is important and this manuscript is not well organized. This manuscript is not easy to read and understand because of inconsistent and poorly organized sentences and redundant statements. More efforts are necessary to revise the manuscript carefully.

- Fluxcom data by Jung et al. do not consider the irrigation process and I am not sure if these data are useful for the model evaluation.

- Irrigation process may change local climate around the irrigated lands and I am not sure if reanalysis data of coarse resolution is appropriate to simulate the irrigation effects or not. In-situ observation data instead of the reanalysis data and its related offline simulation is more useful in this respect.

- Line 115: Rewrite this sentence for better readability. I cannot understand the method used in this study. It seems to me that this is not downscaling. This is just to assign the same value to 1 km grid.

- Line 140: Is there any inconsistency between these data?

- Line 144: How to distribute the annual values and how to justify the process?

- Line 147: What kinds of inconsistencies? Any impacts on the results and conclusion?
- Line 149: What LAI values are used for the initial conditions?
- Line 154: Clarify how to process the data
- Line 155: I am not sure if there is any GPP observation by the eddy-covariance method in this study region.
- Line 158: Clarify how to interpolate the data into the model grid.
- Line 169: what is for periods after "evaporation, sensible heat" . Absolutely, sensible heat is different from sensible heat fluxes.

- Line 176: One example of redundant sentences in this manuscript
- Line 178: What kinds of technical development?
- Line 182: I cannot figure out what were done to deal with heterogeneity.
- Line 188: One example of redundant sentences in this manuscript
- Line 197: I am not quite sure if this is realistic or not.
- Line 202: I am not quite sure if other types of irrigation also need evaluation.
- Line 210: This approach is valid only for sprinkler irrigation.
- Line 216: trough ?
- Line 218: references.
- Line 234: I am not quite sure if the sum of this irrigated water is consistent with the USGS annual irrigation data.
- Line 238: how to consider water conservation?
- Line 249: What are nature types and how to decide it?
- Line 254: One example of redundancy

- Line 304: One example of redundancy
- Line 334: I cannot understand the meaning of this sentence. What kinds of code changes?
- Results: I am not sure if the new parameterization give improvement of important variables. For example, I don't believe that the new parameterization gives peak timing of LAI. Please check figures and numbers if they support the conclusion and results.