

Hydrol. Earth Syst. Sci. Discuss., author comment AC3  
<https://doi.org/10.5194/hess-2022-187-AC3>, 2022  
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## Reply on RC2

Sangchul Lee et al.

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Author comment on "Enhanced Watershed Modeling by Incorporating Remotely Sensed Evapotranspiration and Leaf Area Index" by Sangchul Lee et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-187-AC3>, 2022

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We thank the referee for the valuable comments on our manuscript. The response to the comment is shown below. The line numbers (Line) on the manuscript referenced may have changed in the final version of the revised manuscript.

**Reviewer #2:** I do not recommend this paper for publication. There is nothing new in this paper. A similar topic has been addressed in several previous studies.

Rajib et al., 2020. <https://doi.org/10.3390/rs12132148>

Ma et al., 2019. <https://doi.org/10.1016/j.jhydrol.2019.01.024>

Parr et al., 2015. <https://doi.org/10.1175/JHM-D-15-0009.1>

Rajib et al., 2018. <https://doi.org/10.1016/j.jhydrol.2018.10.024>

We hope our response can well show our novelty.

This study was designed to improve the common SWAT modeling approach that uses only remotely sensed evapotranspiration (RS-ET) by adding remotely sensed leaf area index (RS-LAI). We have illustrated the necessity of this paper with an emphasis on the use of two remotely sensed products (RS-ET and RS-LAI) in the introduction section (Lines 77 – 104). To our knowledge, our manuscript is the first paper that demonstrates the benefits of two remotely sensed products in SWAT modeling on both equifinality reduction and spatial calibration. We have thoroughly compared our papers with four papers that the reviewer listed down (Table 1). Three of four papers (Ma et al., 2019; Rajib et al., 2018; Rajib et al., 2020) only used either RS-ET or RS-LAI. Although the study by Parr et al. (2015) adopted both RS-ET and RS-LAI, a different model (VIC) was used.

Table 1. remotely sensed products and model used in the literature

Literature	Remotely sensed products	Model
Rajib et al., 2020	RS-LAI	SWAT
Ma et al., 2019	RS-LAI	SWAT
Parr et al., 2015	RS-ET; RS-LAI	VIC
Rajib et al., 2018	RS-ET	SWAT

SWAT: Soil and Water Assessment Tool; VIC: Variable Infiltration Capacity

To emphasize our novelty, we have stated the differences between our results and previous studies in **Lines 477 – 487**:

**Lines 477 – 487**: Especially, our results provided several insights on the use of two additional RS products although previous studies already reported their advantages (Andersen et al., 2002; Jiang and Wang, 2019; Parr et al., 2015). First, our studies showed the benefits of the two additional RS products for SWAT modeling with an emphasis on equifinality reduction. Especially, SWAT improvements with the single use of RS-ET (Becker et al., 2019; Rajib et al., 2018; Wambura et al., 2018) or RS-LAI (Ma et al., 2019; Rajib et al., 2020) have been well investigated while the simultaneous use of the two RS products has been rarely conducted. In addition, a substantial reduction of model uncertainty was highlighted by the model evaluation at two spatial scales using two RS products. Lastly, this study chose the two RS products frequently used to monitor croplands, and thus our results could inform an improved modeling approach for agricultural watersheds.