

In this study, the authors reviewed current progress in partitioning soil/canopy interception evaporation and canopy transpiration. The review is impressive and I suspect that it will stand out among previous studies. In addition, they also provided a perspective on how to improve the involved theory and observations. It is well written, organized, and easy to understand. I think a minor revision is required before it can be considered for a publication in Biogeosciences.

We thank Dr. Wei for insightful comments and we hope that we have addressed them all adequately.

Major Comments:

1. The manuscript structure is a little bit confusing. In my opinion, the title of Sec. 3.2 should be changed in order to distinguish from 3.1. Or simply merge 3.1 and 3.2 together. It is better to move Sec. 3.6 to other section.

Reviewer 1 also recommended a re-structuring of Section 3. We wanted to keep sections 3.1 (on half-hourly eddy covariance data) and sections 3.2 (on high frequency eddy covariance data) separate to emphasize that these use different data sources and assumptions. We like how section 3.6 serves as a bridge between remote sensing and isotopic approaches, but undertook a comprehensive re-structuring of section 3 following the insightful recommendation (below) to add the approach of Or and Lehmann (2019) and following the recommendations of Reviewer 1.

2. It is better to briefly introduce the method performance at different time scales. For example, a stable state isotopic assumption may work well in daily time scale but fail in an hourly or sub-hourly time scale. While Zhou et al. (2015) and (2016) found the underlying water use efficiency method works well at the half-hourly and daily time scales both.

All approaches have a range of time scales at which they are more applicable, and approaches that work at shorter time scales should in principle be able to scale up to larger time scales. We added text to explain the time scale sensitivity of different approaches while attempting to avoid an exhaustive discussion of the time sensitivity of each.

3. Additional review of a novel and direct method for ET partitioning method proposed by Or and Lehmann (2019) is suggested. This method is useful and Unique. This will make the paper more complete.

Or, D., & Lehmann, P. (2019). Surface evaporative capacitance: How soil type and rainfall characteristics affect global- scale surface evaporation. *Water Resources Research*, 55. <https://doi.org/10.1029/2018WR024050>

Thank you for suggesting the manuscript of Or and Lehmann, which was published shortly before our manuscript was submitted and likely would have escaped our notice. We added a subsection in section 3 that describes the fundamentals of this approach.

Minor comments:

1. P2L2 some ecosystems, but other ecosystems do: please specify.

We re-worded this passage for clarity.

2. P2L28 I suggest adding the method proposed by Or, D., & Lehmann, P. (2019) in Table 1.

We have added the Or and Lehman method to Table 1, thank you for the suggestion.

3. P3L3 The ratio of transpiration to evapotranspiration: long term?

T/ET in this instance refers to annual time scales (see Fig. 3 in Good et al., 2015) and we added this detail to the text.

4. P4L7 Rn-G is another uncertainty source, especially for the wetland.

This is correct, advective energy flux via moving water is a major challenge for closing the energy balance of wetlands. We added text to incorporate this notion.

5. P7L12 (Perez-Priego et al., 2018): Perez-Priego et al. (2018)

6. P9L24 Alemohammad et al., 2017; Damm et al., 2018; Lu et al., 2018; Pagán et al., 2019; Shan et al., 2019): (Alemohammad et al., 2017; Damm et al., 2018; Lu et al., 2018; Pagán et al., 2019; Shan et al., 2019)

Thank you for noting the referencing errors, which are now fixed.

7. P9L32 FCOS (pmol m⁻² s⁻¹): FCOS (pmol m⁻² s⁻¹)

This comment refers to incorrect superscripting of the FCOS units. We have fixed them and thank you for noticing.

8. P14 Sec.4.2 This question is great. For some vegetation types, T/ET is easy to reach unity not only because of high canopy conductance but also e.g. tree morphological, soil/root condition and human impact. For example, crops have high T/(E + T) under low LAI conditions potentially influenced by human effects (a high water use efficiency and less constrained by environmental stresses). Please check Wei et al. (2017) for further information.

Thank you for noting this, we added Wei et al. (2017) to this subsection in addition to its mention in other subsections given its importance to this topic.

9. P17L25: Please also introduce the measurement of radiometric surface temperature.

This comment made us realize that we used a subscripted 'T' when discussing temperature in the Appendix, which changed to 'Temp' to avoid confusion. We did not want to delve into too much detail for a well-established approach, especially given the diversity of platforms from which radiometric surface temperature can be measured, so we kept the wording as is.

10. P18L19 g_{surf}: g_{surf}

Thank you for noting this error. This section has since been re-written by Dr. Rigden.

11. P16L14 (Fisher et al., 2008): Fisher et al. (2008)
12. P16L15 (Jarvis, 1976) : Jarvis (1976)
13. P17L24 Norman et al.)1995): Norman et al. (1995)

Thank you for noting these errors that we made when referencing.