Reply to Referee's comments

Referee: Clerc-Schwarzenbach, Franziska

Referee's comments are in black text

Authors's response are in blue text

1) General and specific comments: In my opinion, the revised manuscript is a great improvement compared to the originally submitted version. I especially appreciate that you added additional analyses to assess the influence of the large number of temperature-based methods as well as if there is a change in the results when only significant trends are considered. Thank you for answering my concerns in such a detailed way. Here are a few minor points that I would still like to raise:
We would like to thank the Referee once again for their continued engagement and constructive feedback. We appreciate the time and effort devoted to reviewing our revised manuscript and believe the minor suggestions have helped us further refine and improve its quality

   (a) I think that the introduction strongly benefits from the thoughts that you added on different terms and concepts that are relevant for an evapotranspiration study. However, on lines 28-30 you state that PET is used in agriculture. I would argue (and this is also how I understand (Xiang et al.) that it is actually not PET which is used in agriculture, but mainly ET0.
   We agree with the reviewer that in agricultural applications, reference evapotranspiration (ET_0) is commonly used. Therefore, we have removed the sentence from the text to avoid any confusion.
   Removed text: In agriculture, it is employed for irrigation scheduling and modeling crop water requirements (Xiang et al., 2020).

   (b) In lines 42-46, you added interesting information on the number of temperature-based, radiation-based and combinational methods, as well as on the suitability of different methods for specific climates. If all of this comes from Lu et al. (2005), I think it would be good to make this clearer, and also to state that in the last 20 years, even more formulae were developed (see for

example Valiantzas (2013), 10.1016/j.jhydrol.2013.09.005). If you used other references for these new points, can you please add them?

Thank you for your comment. We agree with your observation. We had already referred to the recent study by (Proutsos et al., 2023) and cited it at the beginning of the paragraph. However, to improve clarity, we have now added the citation again in the revised manuscript.

Old text: Out of these 100+ methods, the majority are temperature-based methods (40+), followed by radiation-based methods (30+) and combination-based methods (10+).

Revised text: Out of these 100+ methods, the majority are temperature-based methods (40+), followed by radiation-based methods (30+) and combination-based methods (10+) (Proutsos et al., 2023).

(c) Thank you for not shying any effort to change Fig. 6. I really like the result and together with the additional text about it, it is now much more easily understandable for me. Potentially, you could also add in the caption (in addition to the text) why the rows do not always add up to the number of catchments, but I also understand that the caption is already quite long, so consider this just an idea.

This is a very helpful suggestion. We have included a dedicated paragraph (the first paragraph of Section 3.4) that discusses these key details related to the figures. Therefore, we believe it is not necessary to further extend the caption.

2) Please find below some comments and suggestions for small corrections that should be implemented to improve the quality of the text. In general, I think that the manuscript will benefit from a thorough proof-reading to smooth out any remaining errors. Please carefully go through the list of technical corrections that I had provided with my review. Some of these have not been corrected in the revised manuscript. I noted down some points, but this may not be complete:

a) (technical correction d) I think that the sentence starting at the end of line 89 (formerly line 75) is redundant (stating the same as the preceding sentence in other words) and incomplete, please double-check and correct.

We agree with your comment; however, our intended meaning for this sentence was different. We have revised it accordingly in the updated manuscript.

Old text: To assess the agreement between changes in different PET methods and corresponding hydrological components.

Revised text: We further evaluate the agreement among PET methods by applying the Data Concurrence Index (DCI) to the trends of each corresponding hydrological cycle component (AET, Q, and TWS).

b) (technical correction f) "Baier-Robertson" and "McGuinness-Bordne" are still not consistently spelled correctly (and maybe this also applies to other names, I did not check them all). Please make sure that they are all used in a correct and consistent manner, including in the tables. Similarly, also make sure that the Penman-Monteith[CO2] method is named consistently.

We have revised the spellings of 'Bair' to 'Baier', 'Borden' to 'Bordne', and updated 'Penman-Monteith which account CO_2' to 'Penman-Monteith[CO_2]'. We have also corrected several previously unnoticed typographical errors throughout the manuscript.

c) (technical correction g) In Table 1, the reference that should be "Tucker et al. (2004) is in a different format than the other references. Please double-check all references, especially those that were changed manually.

We have corrected the format of the mentioned as well as other references.

d) Note that the first paragraph of chapter 2.1 is there twice. The same applies for the paragraph starting on line 421 (very slight differences in the two occurrences).

We agree with your comment. The repetitive text has been removed from both of the mentioned locations in the revised manuscript.

e) Note that the figures in the supplementary material should be re-ordered so that they are referred to in increasing order in the manuscript (e.g., Figure S21 is mentioned already on line 224).

Thank you very much for your comment. We have arranged the supplementary figures in ascending numerical order.

f) Please also double-check the correction of all the individual typos that I had listed in the original review, some are still there in the revised manuscript. There were also some new typos (for example: line 58: “canopy”, line 202: “example”, lines 480/481: brackets around references) which should be corrected.

We have corrected the typographical errors in line 58 and line 202, and also revised the references in lines 480/481. Additionally, we carefully reviewed the individual typos mentioned in the previous review. Most of them had already been addressed, and the remaining ones have been incorporated in the revised manuscript.

References

Proutsos, N., Tigkas, D., Tsevreni, I., Alexandris, S. G., Solomou, A. D., Bourletsikas, A., Stefanidis, S., and Nwokolo, S. C.: A Thorough Evaluation of 127 Potential Evapotranspiration Models in Two Mediterranean Urban Green Sites, Remote Sensing, 15, 3680, https://doi.org/10.3390/rs15143680, 2023.

Xiang, K., Li, Y., Horton, R., and Feng, H.: Similarity and difference of potential evapotranspiration and reference crop evapotranspiration – a review, Agricultural Water Management, 232, 106 043, https://doi.org/10.1016/j.agwat.2020.106043, 2020.