Review comments

Peng et al. have responded to the reviewers' comments, but there are significant concerns that remain inadequately addressed. Therefore, I recommend a MAJOR revision.

1. The novelty of this study lies in the PET computation, as the authors state, "This study proposes to incorporate surface vegetation characteristics, such as vegetation dynamics data, aerodynamic, and physiological parameters, into existing potential evapotranspiration (PET) methods."

   The authors highlight the inclusion of surface vegetation characteristics—such as vegetation dynamics data, aerodynamic, and physiological parameters—into existing potential evapotranspiration (PET) methods as a novel aspect of their study. However, despite recognizing the importance of these characteristics, the study does not fully utilize the most recent datasets available. Notably, new datasets like the global canopy height dataset released approximately 2 years ago and the global 1k datasets mentioned in prior reviews offer valuable insights. The paper by Sun et al. (2023), while utilizing a different model, aims to leverage the most current global datasets possible. To align with current scientific advancements and fulfill the novelty criteria of the ESSD journal, it is imperative that the authors consider incorporating these more recent datasets into their analysis.

2. Regarding the modification, "A recent study by Sun et al. (2023) highlighted the importance of incorporating surface properties, especially vegetation control, in PET and used a two-source model designed for sparse vegetation surfaces. However, its applicability beyond sparse vegetation remains unclear, raising questions about data requirements and potential uncertainties." It's unclear why the S-W model used by Sun et al. (2023) is deemed unsuitable for areas beyond sparse vegetation, without further explanation or references.

3. A main focus here is on the PET products, and there are numerous available PET datasets over CONUS. However, the comparison between your products and other reference datasets is lacking. As noted in previous comments, the authors only provide a visual comparison, "The LC method not only yields modest absolute PET values (Fig.5a) but also demonstrates better performance across many regions (Fig.6). Specifically, LC estimates an annual PET of approximately 1200 mm, aligning with PET estimates for the same region and temperate zones

reported in a recent study (Fig.8 in Sun et al., 2023)." A more comprehensive comparison with other reference PET datasets seems necessary. It appears that the response from the authors does not attempt to resolve the issues but rather tries to avoid directly addressing the comments.

4. Attempting to access the data, I found it currently unavailable. Does ESSD typically require data accessibility for reviewers? Additionally, statements like "The data generated in our study are published in this public repository: https://doi.org/10.6084/m9.figshare.12132696.v1 (active after acceptance)" are too vague. Specific details regarding data accessibility (e.g., which specifical datasets) should be provided.