

Author responses to the comments from Referee #2

Minor comments:

1. User guide: I suggest providing an *.yml file for sharing python environments.

Response:

An environment.yml file is now provided at the model script link [10.6084/m9.figshare.19665531](https://doi.org/10.6084/m9.figshare.19665531) so users can download and use it. We also provide the relevant information in the user guide manual of the model.

2. Page 7, Line 23: Is “ presented as a daily average for the month” all-day average, which should be fair for CRU comparison (without removing nighttime as fig. 5,6)?

Response:

Thank you for the suggestion.

Indeed, the CRU is a daily average value of PET for each month. In order to directly compare, we would need to remove the nighttime values from CRU, which we cannot do since they are provided as a daily average value. We wanted to show on Fig. 5 and Fig. 6 that the stochastically generated PET (stoPET) captures the spatial variability of PET from hPET. However, we have included in the point analysis (Fig. 8 and Fig. 9) that by adding the nighttime PET of hPET to stoPET and comparing it with CRU, the stoPET data are within the range of values of widely used (e.g., hPET and CRU).

3. Page 2 Line 8-29: I am grateful the authors clarifying LSM-PET. Is it possible to condense the words? I am afraid current statements are too long.

Response:

Thank you for the suggestion.

We modified this paragraph based on some of the comments from the previous review. The paragraph explains the challenges related to PET data availability within LSMs and the importance for the water balance. Although the paragraph seems long, it clarifies the rationale for our work in detail. Condensing it would result in leaving out some sentences and we fear that it might not clearly state what we want to convey. We prefer to leave the paragraph as it is as it makes it more clear for readers.

4. Page 17 line 11, “ is currently experiencing its 5th consecutive season of drought” Please add a specific time range here and reference , if possible.

Response:

Thank you for the suggestion.

Specific time range and references have now been added.

Relevant text has been added to the main paper:

Page 17 line 11, the following has been added:

(October-November-December 2020; March-April-May 2021; October-November-December 2021; March-April-May 2021; and October-November-December 2022) (FEWSNET, 2022a).

Page 17 line 14, the following has been added:

(FEWS NET, 2022b)