

Journal: HESS

Title: Sensitivity of potential evapotranspiration to changes in climate variables for different climatic zones

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MS Type: Research article

- 1) Initial paragraph or section evaluating the overall quality of the discussion paper ("general comments");
- 2) A section addressing individual scientific questions/issues ("specific comments");
- 3) A compact listing of purely technical corrections at the very end ("technical corrections": typing errors, etc.).

General Comments

The purpose of this manuscript is to understand the possible implications of anthropogenic climate change on watershed-scale water budget through a global sensitivity analysis of PET. Several scenarios were analyzed in which baseline (current) climatic conditions were subjected to changes in: temperature; relative humidity; solar radiation; and, wind speed. The methods in this paper appear sound.

Specific Comments

LINE 72: List the references to “number of recent studies”

LINES 72-86: Were these analyses all specific to PET sensitivity? Which PET models did each use in their analysis? How were they similar and different to this analysis?

LINES 87-90: How are baseline hydrologic and climatic conditions affected by PET? Aren't the baseline conditions used as the baseline for comparison? How is “...and how these sensitivity estimates are affected by baseline hydrologic and climatic conditions” in (i) different than “...and how this changes with the baseline hydrologic and climatic conditions” in (ii)? I am unclear what the difference is. Wouldn't the baseline hydrologic and climatic conditions be the baseline?

LINE 96: What is meant by “climate-induced changes”?

LINE 97: Provide examples of how climate variables have been amplified or offset in the referenced literature.

LINES 99-101: What is meant by the term “successful”? This sentence is unclear. Which environmental models is the author referring to?

LINES 101-102: Which results? The analysis presented in this paper or the past studies referenced in this paragraph? Clarify which results are presented. What does the author mean by “elucidate the specific roles of the baseline hydro-climatic condition on the PET sensitivity”?

Earlier in the Introduction, the goal of the paper was stated to present how PET sensitivity changes with the baseline condition. Clarify this statement.

LINES 105-107: Do these two sets of results coincide with the study aims from LINES 87-90?

LINES 123-124: This data period seems to be pretty old. Can you provide explanation as to why more recent data was not selected?

LINE 128: Instead of sunshine hour, sunrise-sunset?

LINE 136: Instead of level, use elevation for land surface elevation, and values for the meteorological values listed in the table.

LINE 140: What are the water-limited and energy-limited ratios based on? Provide a reference.

LINES 142-144: Penman and P-T estimates of PET can vary significantly, especially if wind is a factor and the P-T alpha-parameter is under- or over-estimated. Provide an example of the range of differences (i.e. uncertainty) between these two models for the climatic conditions you are presenting. In LINES 22-25 the authors mention there may be a need to select a different PET model based on the climatic conditions. I think the statements need to be revised to be more in line with the overall message.

Technical Corrections/ Comments

Lines 67, 93, 144, etc.: Correct spelling throughout text: Priestley-Taylor, not Priestly-Taylor

LINE 108: spell out Section

LINE 166: remove extra "the"