

Interactive comment on “The effect of water storage change in ET estimation in humid catchments based on Budyko framework and water balance models” by Tingting Wang et al.

Anonymous Referee #1

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Review of “The effect of water storage change in ET estimation in humid catchments based on Budyko framework and water balance models” by Wang et al – submitted to HESS.

Wang and colleagues compare various ET estimation at the annual and multi-annual timescale and conclude that storage changes should be accounted for in ET estimations.

The writing of this paper needs a lot of improvement, and can benefit strongly from a native speaker rigorously rewriting it. I made a long list of suggestions for the first 50 sentences, but this list is not exhaustive (even not for this small part of the manuscript). In its current stage I cannot fully judge the scientific merit of the contribution because

C1

the I do not always understand the interpretation of generated results.

The paper does not address anything sufficiently novel. The main conclusion that water storage changes can be significant at annual time-scales is already well known. In addition, some of the methods that the paper uses to estimate ET (Budyko and a water balance accounting) have been extensively reported to be only applicable at longer time-scales. Consequently, I do not see why the paper is relevant to HESS

The paper does not review previous work appropriately. Statements like “While in humid region, the quantity of research are limited (Tekleab et al., 2011; Zhang et al., 2012; Carmona et al., 2016)” do not represent the vast work that has been done in ET research. This also related to the previously addressed issue that the novelty of this paper is not sufficient.

The manuscript is not based on sound reasoning that can be easily followed. While this may be a linguistic issue, since the authors are (I assume) no native English speakers, it hinders me from properly judging the scientific merit of this work.

Sorry I cannot be more positive about the paper

Detailed comments - Title: Avoid abbreviations in the title, and write evapotranspiration instead of ET - Title: the title should be include the time-scale(s) that the paper reports on (e.g. annual) - Title: “for evapotranspiration estimations” instead of “in ET estimation” - Title: “water balance models” is unclear. I suggest to use more commonly used wording. - Title: “based on the Budyko framework” instead of “based on Budyko framework” - Line 26: “water-energy budget research” is unclear. - Line 26: “resources” instead of “resource” - Line 26-27: “while it”, be explicit where “it” refers to. - Line 26 – 28: this sentence needs to be reformulated. - Line 28: include the timescale of ET estimates. - Line 29: “located in” instead of “over” - Line 28 – 32: “Here we . . . time scale”. This sentence should be completely rewritten. Consider to break down this information into two separate (shorter) sentences. - Line 32: “and we” is not a way to start a sentence. - Line 34: “works fine” is vague - Line 34: replace “in” by “for” - Line 35: be more

C2

specific than “well” - Line 36: “of this poor” instead of “for this poorly” - Line 37: “the neglecting of dS ” should be replaced by something like “the assumption that storage changes are negligible” - Line 37: “real” is redundant - Line 37: “increases” instead of “enlarges” - Line 37: specify if “it” refers to “neglecting storage changes” or “storage changes” - Line 38: “Much improvement has been made” - Line 37-39: This sentence should be rigorously rewritten: “Much improvement has been made when comparing estimated $ET + \Delta S$ with those ET_{wb} , and the bigger the catchment area is, the better this improvement can be.” The message is clear, but the sentence is not English. - Line 39-40: what does “an acceptable explanation” mean? Because of the confused English I am unsure how “certain” this attribution is. - Line 41-43: “We highlight ... humid catchments.” Or “Overall this highlights that storage changes affect evapotranspiration at the annual time-scale and should therefore be accounted for.” - Line 46: “over terrestrial surface” is redundant since terrestrial and land are repeated later in the sentence. - Line 47: replace “returns” for “equals” - Line 49: “is captured by” is vague. Do you mean “controlled by” - Line 50: replace “i.e.,” by “as described by” - Line 50: Why is there no citation to the original Budyko paper/book? - Line 51: “, and it” it is unclear what “it” refers to + you should start this as a new separate sentence. - Line 52: the limitation you refer to are explained in the original Budyko equation, there is no need to refer to other studies here as long as this original publication is cited.

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