Hydrology and
Earth System
Sciences
Discussions

Interactive comment on "Exploring the relationship between warm season precipitation, potential evaporation, and "apparent" potential evaporation at site scale" *by* Xi Chen and Steven G. Buchberger

Anonymous Referee #1

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In this research, by collecting and analyzing precipitation (P), pan evaporation (Epa) and potential evaporation (Ep) data at 259 stations in the US, the authors find that (1) Epa shows a negative correlation with P; (2) the negative correlation between P and Epa is more significant in arid region; (3) P and Ep are independent. These conclusions have been reported in many previous literatures (Hobbins et al., 2004; Ramírez et al., 2005; Kahler and Brutsaert, 2006; Brutsaert et al., 2015). It seems that what the authors did is to prove these findings without new perception or substantial contribution. By combining Budyko equation and CR equation mathematically, they claim that they

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find the connection between the two frameworks. But except for putting the theoretical curves and data clouds together, no further analysis is provided. There are too many qualitative descriptions in the manuscript without quantified analysis and evidence.

L188-194: what's the source of temperature (should be used to calculate Δ and γ)? what's the spatial resolution of net radiation? did you take the Ep data for the grid where the station is located as the Ep data for the station? It will caused great uncertainty. Is there radiation data collected at the weather stations? Line215-219: please provide detailed statistics to support your conclusion, like the percentage of significant P~Epa correlation, the mean P, the mean aridity index in the western and eastern regions. The same for L238-239, please provide the statistics for Ep variability and P variability. L219-220, L231-232 and L310: it seems that most of your results are similar to previous researches or have be reported before. L244-245: As you classify the US into western and eastern parts, or northwestern, southwestern, northeastern and southeastern parts, I don't think there is any need to color the data points according to their latitudes and longitudes. Why not just use four colors? I cannot tell if "Southeastern region of the US has a wide range of precipitation; while points of the northeastern region are more concentrated" from fig5. L312: the boundary is 'Ep=Epa' L344-345: please add quantitative analysis herein. Why it is 'when P/Ep is lower than 1' instead of 'when P/Ep is lower than 1.5'? how did you define 'signifcant E ~Epa relationship'? L349-350: what does 'fits with' mean herein? In my point of view, you just provide some curves that located in the data clouds. L359-360: To use the combination of Budyko equation and CR equation, you must take care about the time scales, i.e., Budyko equation is merely applicable at long time scale. L364-367: recommend to delete these nonsense. Fig1(a): the label of x axis should be 'P'. Fig6: please mark the locations of these four stations in Fig3.