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Discussions

Interactive comment on "Soil storage influences climate–evapotranspiration interactions in three western United States catchments" *by* E. S. Garcia and C. L. Tague

Anonymous Referee #1

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Garcia and Tague present an interesting comparison of hydrologic partitioning in three catchments, reaching the conclusion that differences in landscape characteristics, specifically subsurface water storage, attenuates the role of climate in controlling ET. The paper is a nice example of how the timing and amount of precipitation interact with variable storage to control the fate of precipitation in mountain catchments and should be of interest to the range of observationists and modelers.

Although the authors focus on the implications for these three catchments, the take home messages potentially are applicable to a wide range of systems where the spatially and temporally explicit interplay between climate and landscape has the potential

to result in different hydrologic responses in locations with similar mean climate.

Although I am generally supportive of the work, I do have a number of concerns and suggestions that I hope will focus the presentation.

Shorten and focus conclusions to highlight key implications. The current take home points are somewhat buried, including both modeling issues (e.g. error introduced by absence of soil calibration) and broader science take homes (e.g. precipitation timing vs. storage interactions)

The paper could and should be improved by explicitly addressing alternative explanations for the differences between the three catchments. For example, they vary significantly in size, elevation, and total precipitation and the differences between catchment responses plausibly could be explained by these factors

Similarly, how do the specifics of climate across the three sites influence results? For example, what does PET look like across time and space for your study catchments? Presumably, higher elevations in CO are always energy limited, while lower elevations switch are water limited. In contrast, CA and OR experience the seasonal pattern in energy vs. water limitation that is your focus.

Abstract begins with winter-wet summer dry but CO-ROC receives 46% precipitation in growing season while other sites are much less. This is an important part of your paper but suggests using a more objective metric perhaps AET: PET to describe differences between supply and demand

On a related note, the introduction begins with Mediterranean climates, but CO is a cold continental climate; I'm not certain that OR is technically Mediterranean either.

The results section as written reads too much like a discussion with numerous references and comparisons other work, making it difficult to focus on the key points of this effort

I suggest you either changing the term "soil AWC" or more clearly define it to include

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other potential water sources. There is a growing body of literature that suggests that soil storage alone is often not sufficient to represent available water in mountain catchments. There this is rock water, groundwater, mobile vs. immobile water, etc. You have an opportunity to broaden the discussion and awareness among the land surface/ hydroclimate modeling community of these distinctions with this work.

Addressing the above issues should not require large amount of work, but should help focus the paper on important take home messages by addressing and removing distracting aspects of the current presentation likely to distract a critical reader.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 7893, 2015.

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