

Interactive comment on “Evaluating the hydrological consistency of satellite based water cycle components” by O. López et al.

Anonymous Referee #2

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The paper is quite well written and the topic is important. However, there are unfortunately some serious problems with the paper:

1. The study focuses on four "relatively simple" catchments. But what's so simple about these catchments? The runoff fraction is definitely not negligible (see Figure 2). The snowfall fraction in some of them is quite high (e.g., precipitation in the Aral Sea and Colorado catchments is composed of about 15% snowfall). The Niger catchment and maybe others have extensive wetlands which store and evaporate large amounts of water. Some of the catchments (e.g., the Colorado one) are also littered with reservoirs. All these factors contribute considerably to the total water storage and thus should be explicitly accounted for in such a study (as recognized by the authors at the end of the paper on page 17).

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2. "We selected four basins as focus regions of study: the Colorado River basin in North America, Niger basin in Africa, Aral basin in Asia and the Lake Eyre basin in Australia (Figure 1)." Given the amount of hydrological data and computing resources available these days, why did you decide to focus on such a small sample of catchments?

3. Why are three products considered for evaporation and only one for precipitation? The differences among products are probably even larger for precipitation than for evaporation. Other viable precipitation products include WFDEI, MSWEP, and GPCC.

4. Why did you use simulated rather than observed runoff? NOAH is an uncalibrated model which means its simulated runoff contains biases.

5. The study concludes that there is little consistency among the different hydrological variables in the catchments. This is really not a novel result. Previous (global-scale!) papers have arrived at similar conclusions for evaporation (e.g., Miralles et al., 2016, HESS, cited in the paper) and precipitation (e.g., Herold et al., 2015, GRL). What new lessons we can learn from this paper?

6. The abstract is very poor. Only the last sentence can be considered results/discussion/conclusions. The previous sentences (with the exception of maybe the second to last sentence) are all introduction. It is not even mentioned how many catchments have been examined. Stick to one or maybe two sentences introduction.

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