

Interactive comment on “A new data assimilation approach for improving hydrologic prediction using remotely-sensed soil moisture retrievals” by W. T. Crow and D. Ryu

Anonymous Referee #2

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The article is well written and presents a rigorous suite of simulations to examine the viability of a new data assimilation approach for runoff predictions. The specific comments and concerns are listed below.

Major concerns: The authors seem to justify the use of the API model for rainfall correction by the fact the SAC observations are assimilated into the API model in a fraternal experimental setup. Though this will hold in a real-world scenario, the statement neglects the second part of the experiment, where SAC observations are assimilated into SAC model itself. Ideally it will be best to adopt a fraternal strategy for the whole system

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than for one part of it.

I believe the authors need to outline the justification for the use of different LSMs for the rainfall correction and soil moisture updates, as it was not clear to me why this approach is used. Why not follow a purely fraternal setup where SAC model is used for both rainfall and soil moisture correction with soil moistures generated from API or some other model?

Minor comments: 1. Title : Since the article focuses primarily on runoff prediction, would be better to say 'runoff prediction' than 'hydrologic prediction'?

2. Page 2010, paragraph 2: mentions Figure 1. I guess the point of this figure is to show that you are considering basins with considerable range of runoff ratios? If yes, mentioning in the text would help in understanding the relevance of this figure.

3. Page 2016 : typo in reference (Dunn and Entekhabi should be Dunne and Entekhabi)

4. Page 2023: 'As demonstrated in Fig.2 ' - shouldn't it be Fig.1?

5. Figure 2: needs labels for each time series data

6. Figure 6, 7, 8, 9, 10 : Might be good to mention what the 'fraction' is (Fraction of what and what)

7. Figure 6 caption: mentions Fig.3 - shouldn't it be Figure 4?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2005, 2008.

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