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Hydrology and Earth System Sciences Discussions

Interactive comment on "Dryland ecohydrology and climate change: critical issues and technical advances" *by* L. Wang et al.

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This paper summarizes recent advances and gaps in our knowledge which are related to dryland ecohydrology and climate change. The authors have done a very good job in identifying and summarizing this topic and it is clear that they have put much effort and thought in doing so. Thus the paper has a scholastic attribute, and can definitely educate a wide range of people that are interested or even actively involved in such research. I recommend accepting this paper for publication in HESSD after some reorganization and additions, as follows:

1. With the approval and appreciation of this paper, as well as with most other remarks, I agree with the previous referees. Especially I would like to point out to the fact that

I too, feel that the division into 'Critical issues' and 'Technical advances' is somewhat peculiar and that the choices made here are not straight forward. Of course one paper cannot cover all relevant topics and some selection must be made, but while in 'Critical issues' quite a few important and interesting aspects received attention, 'Technical advances' focused on two, relates lengthily to each (especially the RESTREND method), and they are both questionable. My recommendation is either to drastically decrease the length of this section, or add a table summarizing more technical advances, as one of the other referees mentioned (amongst many other advances I can suggest to also relate to the new crop of geophysical tools such as GPR and EMI, phencam, improved modeling efforts, and geo-spatial informatics engines).

2. I suggest relating more in-depth to how climate change is expected to change not only precipitation amounts but also the temporal pattern of precipitation. Some studies indicate that increased storm intensity will most likely result with deeper infiltration depth in drylands, thus increasing plant, and especially tree water availability. Changes in precipitation pattern and increased storm intensity will also effect interception, which is mentioned in section 2.5.1 / 2.

3. The topic of tree/shrub vs. intercanopy patches, which is noted in Pg. 4789, could also receive more elaboration. A few studies have been conducted recently showing large differences in soil carbon, grass productivity, and soil evaporation between these ecosystem components. Correctly defining the differences between them is critical for upscaling plot to ecosystem processes.

Specific remarks:

- Pg. 4783 LN 23: ". . . increasingly dependent on more water resources than they do not control . . .". This sentence is not clear.

- The division into sections 2.2 and 2.3 is confusing and it seems there is some overlap between the two.

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Interactive Comment

- Pg. 4794 LN 22: ". . .more specific catchment-specific data . . .". Please try to rephrase.

- Pg. 4794 LN 27: The use of 'groundstory' is to me less familiar than 'understory'.

- Pg. 4800 section 3.2.1 Soil moisture: It would be worthwhile to mention that COSMOS can separately define soil moisture at the topsoil and soil moisture in the subsoil.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 4777, 2012.