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Hydrology and Earth System Sciences Discussions

Interactive comment on "Assessing the impact of climate variability on catchment water balance and vegetation cover" *by* X. Xu et al.

Anonymous Referee #1

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Using 193 relatively dry (DI>1) catchments in Australia, this paper tried to assess the climate variability on water balance and vegetation cover on the basis of correlation analysis. The results are interesting and the paper can benefit from a major revision by addressing and including the following comments and suggestions.

Specific comments:

1. Page 6293, Lines 3-5, I cannot see the significance of introducing and separating growing and non-growing seasons. In addition, according to Page 6306, the growing season is defined on a monthly basis. It is not the same as the definition usually used, for example using some physical measures, like temperature based on daily data.

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2. Page 6293, Lines 23-26 have the same meaning as the next sentence in Page 6294.

3. Page 6295, lines 26-29. “Studies have suggested that increased precipitation variability results in reduced grass growth in grasslands (Knapp et al., 2002) and drylands (Williams and Albertson, 2006), and that higher precipitation variability favors tree establishment, e.g., in Argentina’s ecotones.” I wonder why.

4. Page 6296, Line 26, the order of Fig.1 and Fig.2 is wrong.

5. Eqn 1 what is k?

6. Page 6298, Lines 21-22, “the correlation coefficient greater than 0.8 is considered as strong, whereas a correlation coefficient less than 0.5 could be described as weak”, why?

7. Page 6299, Table 1, what is the message of Table 1?

8. Page 6300, Lines 10-15, I cannot follow the logic. Plus, “this is energy controlled”? but for all the study catchments, the dryness index is larger than 1, which means the evaporation is controlled by the available water. Because of that, the authors are encouraged to find the theoretical basis to separating the basins by E0/P=2.

9. Page 6300, Lines 20-22, what does it mean by saying “an indicator for the general characteristics”?

10. Fig.3, because Fr/Ft=1-Fp/Ft, Fig.3e and 3f are not necessary. In fact, I cannot see the value added by Fig.3b and 3d either. Same issue is in Fig.4i-l, 5c-d.

11. Page 6303, Lines 21-24, did it imply that a shorter period would cause a worse prediction? Why?

12. Page 6305, Lines 6-9. E0/P<2 but still larger than 1, so it is not humid climate.

13. Page 6311 Lines 7-9, this sensitivity is really small. It is hard to draw any conclusion about the trends based on that.

HESSD

8, C4910–C4912, 2011

14. Page 6311, Lines 24-26 the conclusion about the impact of solar radiation is opposite to Lines 1-5 in Page 6313.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 6291, 2011.