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Earth System Dynamics Discussions

Interactive comment on "Comparing projections of future changes in runoff and water resources from hydrological and ecosystem models in ISI-MIP" *by* J. C. S. Davie et al.

Anonymous Referee #2

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This article deals with a very interesting topic on comparing hydrological and ecosystem models for projections of future changes in runoff. The authors revealed that ecosystem models tended to project larger increases and smaller decreases in runoff than the hydrological models, likely due to the hydrological models ignore the effects of CO2 and vegetation dynamics. The results are important to global hydrological study, and inspiring for selecting useful models for simulations. The paper should be published after major revision considering the following comments:

General comments:

(1)In the introduction, put the description of WaterMIP (Page 282, line 3-27) to the end

of Introduction. It is not suggested to put this part at the beginning.

(2)There is a need to present calibration and validation of all models for runoff simulations.

(3)River basins are recommended for runoff study. The authors need to give reasons why they did not study at a river basin level.

(4)There is a need to present how the models consider vegetation change.

(5)Page 297, Line 15-19: How the decision makers plan water resources management with a large uncertainty from different models?

(6)It is not suggested using many unpublished references.

(7)The English language and manuscript format should be further improved.

Specific comments:

(1) Page 281, line 25: the first sentence should be improved.

(2) Page 283, Line 1-4: References should be added to the statement "Firstly, plant structural changes,... alter evapotranspiration rates and albedo". Possible references include:

- Liu J. and Yang H., 2010. Spatially explicit assessment of global consumptive water uses in cropland: green and blue water. Journal of Hydrology 384: 187-197. Doi: 10.1016/j.jhydrol.2009.11.024

- Liu, J., A. J. B. Zehnder, and H. Yang, 2009. Global consumptive water use for crop production: The importance of green water and virtual water, Water Resources Research 45, W05428, doi:10.1029/2007WR006051.

(3) Page 283, Line 7: the following references should be added:

Liu J., Folberth C., Yang H., Röckström J., Abbaspour K., et al. (2013) A Global and Spatially Explicit Assessment of Climate Change Impacts on Crop Production and Con-

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sumptive Water Use. PLoS ONE 8(2): e57750. doi:10.1371/journal.pone.0057750

(4)Page 284: Line 9: correct the format of (Fallon et al., 2012b), and delete ";"

(5)Page 286, Line 5: format Meehl et al. (2007) is not correct

(6)Page 286, Line 8: "information about which is lost ..." this sentence is not clear for me.

(7) In Fig. 2, regional names are sometimes too close to each other. This also applies to Fig. 4, Fig. 6

(8) C02 in figure legend should be capital (not co2). [this applies to many graphs]

(9) Supplementary Fig. 2, the legend and title are put in a crowd way. Pls adjust the formats.

Please also note the supplement to this comment:
http://www.earth-syst-dynam-discuss.net/4/C184/2013/esdd-4-C184-2013-supplement.pdf

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Interactive comment on Earth Syst. Dynam. Discuss., 4, 279, 2013.