

Interactive comment on “Does consideration of water routing affect simulated water and carbon dynamics in terrestrial ecosystems?” by G. Tang et al.

G. Tang et al.

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Dear the Editor,

We have addressed all comments from three reviewers. After fixing one bug in the model code, new simulations were repeated based on identical climate forcing data and model parameterization as in our previous manuscript. In addition, two additional simulations under two contrasting climate-forcing scenario: one "wet" and another "dry" scenario were added to the revised manuscript. Our new results demonstrated the following:

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Interactive Discussion

Discussion Paper



(i) Consideration of water routing in process-based models better captures the spatial patterns of soil moisture deficit and water table depth.

(ii) The pattern of simulated water fluxes (evaporation, transpiration, and evapotranspiration) were spatially more variable under simulation considering water routing than that ignoring water routing. Simulation ignoring water routing has a tendency to underestimate above water fluxes from land to the atmosphere.

(iii) The pattern of simulated carbon fluxes (NPP, soil autotrophic and heterotrophic respiration) were also spatially more variable under simulation considering water routing than that ignoring water routing. Simulation ignoring water routing has a tendency to overestimate above carbon fluxes.

(iv) The effects of consideration of water routing on simulated carbon and water dynamics are more remarkable in dry condition than that in wet condition.

Overall, based on a same model, this study demonstrated that ecosystem and carbon cycle model need explicitly represent water routing in order to more accurately simulate the spatial pattern and magnitudes of carbon and water dynamics in terrestrial ecosystems.

By the way, Drs. Lawrence Band, Elliot Schneiderman, Don Pierson and Mark Zion preferred being acknowledged in the “Acknowledgement” section. Since all of them commented and contributed more or less to this study, we moved their names to the “Acknowledgement “ section to express our appreciation to their comments/contribution.

We appreciated your time in handling this manuscript.

Sincerely,

Guoping Tang On behalf of co-authors

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 12537, 2013.