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Earth System Dynamics
Discussions

Interactive comment on "Contrasting roles of interception and transpiration in the hydrological cycle – Part 1: Simple Terrestrial Evaporation to Atmosphere Model" *by* L. Wang-Erlandsson et al.

Anonymous Referee #4

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This is a well written paper.

Yes, I also felt that a model is presented without highlighting the novelty towards further understanding biosphere-atmosphere interactions. But I see several new aspects (phenology, irrigation, landuse change), which, the authors can highlight in the revised work rather than portraying it as a model development paper.

I support the authors for using the Jarvis model approach, which is pragmatic for a spatially-explicit hydrological model at the global scale. There are several uncertainties in the Ball-Berry model too. The B-B also equally suffers from uncertainties that are related to photosynthesis and soil moisture simulations under future climates. The

behavior of A-gs relationship in C3 and C4 plants also gets complicated as climate changes.

I think, the Jarvis model is pertinent here because STEM is a global scale hydrological model that does not have a serious C cycle component.

Specific equations of runoff are not shown. Please show them.

I am interested to know how you parameterized the soil depth globally. This constitutes the soil storage size, which determines the depth of watertable. The position of water table determines surface runoff-generation (ie runoff initiates when WTD reaches 0). So I would like to see how runoff is calculated. Is it Hortonian runoff? How is the river routing done?

The soil moisture scalar of the Jarvis equation should decline beyond saturation, especially in high-latitude biomes. In this way you can have stress due to water excess also.

After providing the references, you may delete some equations that are already well-documented in the literature.

Overall, I recommend for a revision (somewhere between minor and major)

Interactive comment on Earth Syst. Dynam. Discuss., 5, 203, 2014.