Geoscientific Model Development Discussions

Geosci. Model Dev. Discuss., referee comment RC1
https://doi.org/10.5194/gmd-2022-105-RC1, 2022

Comment on gmd-2022-105

Gil Bohrer (Referee)

Referee comment on "Impact of the numerical solution approach of a plant hydrodynamic model (v0.1) on vegetation dynamics" by Yilin Fang et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2022-105-RC1, 2022

The development of FATES-HYDRO is important and represents an advance in modeling capability.

The study is conducted well, the code is made available through Zenoto, and the analysis is clear.

I have few minor comments that would help improve the comprehension of the results

Please add explicit vertically resolved formulation of how the soil interacts with the root. As is, the description is rather confusing (I could not figure out lines 220-225, or what "The stack of vertical soil-root interaction layers" at L190 means). I do not expect all the formulation of FATES to be repeated here, but the soil-root water interaction is the key physical process studied here, so at least that component of the formulation should be detailed to completion.

Also, list how betta (water stress factor) enters the transpiration/stomatal conductance calculation.

You treated above ground biomass as the only tested indicator of model performance differences. I am very curious about other model related predictions, specifically, evapotranspiration and water use efficiency. Can you add some analysis of differences regarding these?