Geoscientific Model Development Discussions

Geosci. Model Dev. Discuss., referee comment RC1
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Comment on gmd-2021-137

Ty P. A. Ferre (Referee)

Referee comment on "DRYP 1.0: a parsimonious hydrological model of DRYland Partitioning of the water balance" by E. Andrés Quichimbo et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2021-137-RC1, 2021

The authors have brought together many analyses into a useful, integrated platform. As they point out, a fully distributed model that can capture all of the processes represented would be unwieldy at best and unattainable at worst. On this basis, I fully support the development of this tool. My only concern is that this model, while an improvement, still requires many simplifications. The authors have sufficient experience and expertise to know which module is best to use for specific conditions ... especially as they are familiar with the Walnut Gulch site and with modeling COSMOS data. Could they provide more guidance for less well-informed users? Which assumptions are most critical? Under what ranges of conditions should this model not be used? How could a user identify potential systematic errors from the model results? In short, simpler models are better - but, only if they aren't significantly flawed. Can the authors help to make sure that their model will be used appropriately and constructively? If I have one other quibble, it is with the testing of the model. It is true that spatially distributed numerical models are expensive to run and I wouldn't suggest that they need to build and run one to test the applicability of their simplified model. But, I would have thought that someone, somewhere, would have a model that could be used as a basis for comparison to give a better estimate of the magnitude and distribution of errors. It isn't my field, exactly, but I'm not sure that mass balance errors alone are sufficient to validate a model.

All of these comments should be seen as suggestions only. It is entirely possible that I am out of touch with what is expected/required for models at this scale and especially for use in hydrometeorology. I leave it entirely to the authors' discretion to decide to consider or ignore my comments.

Nice work!

Ty Ferre

P.S. I did see one spelling error on a plot axis ... cummulative. I first thought that it might be a British spelling, but Google doesn't support that hypothesis.