GMDD

Interactive
comment

Interactive comment on "The Multi-Assumption Architecture and Testbed (MAAT v1.0): Code for ensembles with dynamic model structure including a unified model of leaf-scale C3 photosynthesis" *by* Anthony P. Walker et al.

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The paper "The Multi-Assumption Architecture and Testbed (MAAT v1.0): Code for ensembles with dynamic model structure including a unified model of leaf-scale C3 photosynthesis" by Walker et al. describes a newly developed testbed for assessing parameter and structural uncertainty in mathematical models. The paper introduces and describes the MAAT system. The paper also tests the parameter sensitivity analysis component of the system using a comparison with a previously published paper utilizing a simple groundwater model. Finally, the paper examines the formulation un-

certainty component of the system using a leaf-scale photosynthesis model. In each case, MAAT performs as intended, demonstrating a great deal of potential benefit to researchers working with models of systems (biological, geological, and beyond).

My largest criticism, and it is minor, is that the broad implementation of MAAT is, as presented, somewhat difficult to envision. The authors note that "once a few simple rules are learned on how to write a system model in the MAAT formalism, MAAT provides an ideal testbed for novel model development and for developing stand-alone components of mode complex models..." However, I'm left wondering what these few simple rules are and whether there is an explicit protocol for integrating different model systems into the MAAT framework. I was not able to find this on the bitbucket site. This would substantially broaden the impact of the paper. While I personally find the integrated plant physiology model useful, the reach of the MAAT system could be exponentially greater if used by other communities (as is noted by the authors). A brief section on integration of different models into MAAT would be useful.

Related to the point above, there is a lot of text devoted to describing the photosynthesis models. While this is great information, it may be a bit distracting to readers that are not interested in the plant physiology responses per se, but rather the capabilities of the MAAT system. Many of the details could be included as supplement. This is not critical, but would improve readability.

Smaller concerns:

Title: The title does not address the model's capacity to evaluate multiple sources of epistemic uncertainty, which seems to be the best feature! Also, I think the connection to the photosynthesis model does not necessarily need to be in the title and may limit the reach of the paper.

P1L8: More completely than what?

P5L5: Cite the proto package. citation('proto')

Figure 3: I'd suggest increasing the font size on axes and axis titles.

P18L2: Should this be gs = (1/rs) ?

P20L4: You could just say "a form." It seems unnecessary to speculate whether it's the most common form.

P26L8: It is my understanding that the Tjoelker et al. (2001) Q10 respiration is not acclimation per se, but just a modification of the instantaneous response that allows for the observed dampening of the exponential slope with increasing leaf (not acclimated) temperature

Figures 4 and 5: Check that the axis text does not overlap.

Figure 4 legend: "analystical" should be "analytical"