

From associate editor

There remain a number of minor issues to deal with (see reviews), and from my point of view one major one: the source for the model really needs to be made available at this stage; it's simply unacceptable to promise it but not provide a link in the paper. Doing so will increase the future use of this model, and improve scientific transparency and reproducibility.

Response: *We have addressed the few remaining minor issues raised by the referees and our punctual response is reported below. We agree with the editor regarding the benefits and importance of sharing source code. We plan to have the model open-source for research use as soon as possible. However, since we received requests for using this model by private companies, we are in the process of licensing the code. In the meantime, we are willing to share the code with peer scientists upon individual request. We thus changed the statement in the Code Availability section, which now reads: "The source code of the MEMS 2.0 model is available upon request".*

From Anonymous Referee #2

A few minor comments:

Line 233: I believe this should be Richards Equation, not Richard Equation

Response: *Changed to "Richards" (Line 233)*

Line 515: receives is misspelled

Response: *Changed to "receives". (Line 515)*

Line 548-549: While oscillations and insensitivity to inputs have been identified in the past as issues with some microbial-explicit soil carbon models, later versions of most models have largely corrected those issues, so I'm not sure it's accurate to describe this as still being a major issue in current microbial-explicit models. See: Georgiou, K., Abramoff, R. Z., Harte, J., Riley, W. J., & Torn, M. S. (2017). Microbial community-level regulation explains soil carbon responses to long-term litter manipulations. *Nature Communications*, 8(1), 1–10. <https://doi.org/10.1038/s41467-017-01116-z>

Response: *We thank the referee for this very important and relevant reference and are sorry we previously missed it. We added a new sentence in Line 549-550. "Georgiou et al. (2017) proposed a way to reduce the oscillation and correct the insensitivity to C input by introducing a density-dependent formulation of microbial turnover."*

Line 579: CORPSE is misspelled

Response: *Changed to "CORPSE". (Line 579)*