

Interactive comment on “Modeling transient soil moisture limitations on microbial carbon respiration” by Yuchen Liu et al.

Anonymous Referee #2

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The authors contrast the performance of four models describing the transition from dormant to active state by soil microbial communities subjected to drying and rewetting conditions. They compare their models to a limited soil core incubation study at the East River in Gothic, Colorado. I have a couple of major concerns with the authors' work. First, the authors conducted a soil core incubation study to calibrate their models. They sampled a relatively deep depth (0-165 cm) in multiple core sections (and observed expected trends in bulk parameters), yet the measurements were not replicated, nor did they conduct analyses that seem critical to their question. For example, how does microbial biomass change under different moisture conditions, or with depth? Finally, I found that paper to be overly detailed and rambling, especially through the discussion of the models in Section 4. Model Development (a combination of model

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description and results, oddly), as well as the Discussion. In the case of Section 4, I'm wondering if some of the detail can be included in Supplementary Material. In the case of the Discussion, the authors need to provide more of a framework at the beginning of the section that guides the readers. Also, the authors did not spend sufficient time relating their findings back to insight about process or contributions to improving models, which seems critical for a journal like Biogeosciences. Brief mention of these implications appeared in the last few lines of the Conclusions section, but would be better suited to more attention in the Discussion.

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