This manuscript is improved, but I still have some minor concerns:

1. The authors still seem to be confused about the default configuration of CLM5. CLM5 is run by default with variable soil thickness (see Section 2.2.2.2 in Lawrence et al.). However, soil depth is not allowed to go down to the maximum 25 layers but is restricted to be less than or equal to 20 layers (down to a depth of 8.6 m). If the authors have run CLM5 in the default configuration for Nlayers = 20, then they would've run it with variable soil thickness not with constant soil depth. To run with constant soil depth, they would've had to turn off the variable soil thickness in the user namelist. Is this what they did?
Response: We have carefully checked our model settings. For our default simulations, we indeed used the option with 20 soil layers (plus 5 bedrock layers) and the fixed soil depth of 8.6 m at the bottom above the bedrock. We have revised the manuscript accordingly.

2. The authors find that numerical issues arise due to vertical discretization when the number of layers is less than ~150. This is a very important conclusion, and it seems this needs to be emphasized a little more in the Conclusions than they have done. I don't think any land model approaches this level of vertical resolution.

Furthermore,

Line 235: The authors quote 8.03 m as the soil bottom in CLM5, but this is the node depth (see Table 2.2.3 in Lawrence et al.). This node depth is not the actual soil bottom which would be the real soil depth. Node depth is the middle of the soil layer. Thus, the authors should be quoting the interface depth (bottom of the soil layer) which is 8.6 m in the 20th layer.
Response: Thank this reviewer very much for pointing it out. This have been corrected in the revised text (Section 5.1).

Line 268: Is 50 years enough for spin up? What qualification do you use to determine if the model is spun up enough?

Response: In our previous manuscript, we meant that the spin-up time was at least 50 years in our tests to ensure that the soil moistures at all model grids were well spun up where the initial soil moistures were set to 0.2 mm^3/mm^3. Actually, during the production simulations, we conducted two cycles of continuous simulations over the period of 1901-2010. The first cycle was discarded as spin-up, and the second cycle was retained for analysis as shown in Figure 5. So, the total spin-up time was 110 years. Our criterion was that the soil moistures at all model grids were sufficiently spun up if the soil moisture with the deepest soil depth of 197 m in the simulation domain reached the equilibrium state (without a strong temporal trend through a visual check as shown in Figure 5). We revised the statements as follows (Section 5.2):

"The initial SWC was set to 0.2 mm^3/mm^3, and we performed two cycles of continuous simulations over the period of 1901-2010. The first cycle was discarded as spin-up, and the second cycle was retained for analysis. Through these spin-up runs, the SWC at all model grids

can reach the equilibrium state (an example given in Figure 5 where the soil has the deepest depth of 197 m in our simulation domain). In this study, each sensitivity run had its own spin-up cycles."