We thank AR2 for their additional minor comments. Our responses to these comments are included in black below.

In addition to the changes suggested by AR2, some additional minor changes have been made, mostly to increase the clarity of the manuscript and correct minor errors. These additional changes are noted in the tracked changes document. We note that the equations in Section 2.2.2 have been updated to correct a minor error in the original manuscript. In these equations, z_j is actually the midpoint of each soil layer, and is expressed relative to 1.5 m to ensure that soil properties do not vary in the first 4 shallow soil layers.

The first paragraph of the Results section has been updated to reflect this comment:

Figure 2 depicts simulation mean water table depth (WTD) and uptake shallower than 1 m in the ROOT experiment for all months, relatively dry months outside of the South American monsoon period (Jun-Sep), and relatively wet months during the monsoon period (Nov-Feb).

Mean WTD is generally deeper in drier months (Fig. 2a), reflecting seasonal availability of moisture from precipitation. WTD is consistent with simulated values for the same region from other studies (Martinez et al., 2016a; Fan et al., 2017). Frac onal uptake shallower than 1 m (Fig. 2b) varies between dry and wet periods, with a clear shift in uptake to depths below 1 m during drier months. This is consistent with a seasonal shift in RWU from shallower to deeper areas of the root zone as moisture from precipitation becomes scarce during drier months.

The caption of Fig. 2 has also been updated in response to this comment.

The correction was not done as I expected, but I accept. However, remove the mention of “South American Monsoon” or “monsoon” (the month of March is part of this monsoon, and you did not include it). Moreover, remove the word “relatively” before “wet months”. Keep the word "relatively" only before "dry months".

Thank you for this feedback. This change has been made as requested.

The following paragraph has been added to the Discussion section as the first paragraph. It includes text that was originally in the Conclusion, as well as a comparison of results from previous studies with our work:

Overall, we find that the results of this work support the hypotheses detailed in the Introduction and are in accordance with previous studies that motivated these hypotheses.

These include Fan et al. (2017), which highlighted the importance of groundwater as a moisture source for vegetation during dry periods, and Miguez-Macho and Fan (2021), which clarified that while moisture from groundwater is important in valleys, deep vadose zone storage of past precipitation is critically important in uplands during dry months. Additionally, the findings of this study are in line with others listed in Table 2, all of which found that inclusion of deep and/or dynamic RWU in Noah-MP improved model performance (Gayler et al., 2014; Wang et al., 2018; Liu et al., 2020; Niu et al., 2020; Li et al., 2021). In particular, Niu et al. (2020) and Li et al. (2021) noted improvements in Noah-MP's performance during drier periods after enhancements were made. Zanin (2021) is the only study in Table 2 that focused on the Amazon region and included the domain for this study. Similar to our work, they found changes in seasonality of soil moisture in shallow and deep layers resulting from addition of deep RWU. While simulation of sensible heat flux improved in Zanin (2021) when deep RWU was activated, latent heat flux was overestimated.

Regarding the results of Zanin (2021) mentioned in the last sentence of this paragraph, it is important to mention that these results refer to the RJA flux tower. Moreover, it is interesting to mention that despite the overestimation of the simulated latent heat flux in this flux tower, the seasonality of simulated evapotranspiration is reduced with the deep soil water uptake by tree roots.

Thank you for this comment. This section of the manuscript has been updated:

Zanin (2021) is the only study in Table 2 that focused on the Amazon region and included the domain for this study. They compared their model results to flux tower data from the LBA project. Similar to our work, they found changes in seasonality of soil moisture in shallow and deep layers resulting from addition of deep RWU. While simulation of sensible heat flux improved in Zanin (2021) when deep RWU was activated, latent heat flux was overestimated. However, seasonality of evapotranspiration was reduced.