This research conducted a comprehensive study by integrating two distinct soil mapping approaches, FAO and SoilGrids, into CLM modeling in Africa. Additionally, it investigated the impact of different soil texture upscaling methods.

The findings reveal that the origin of soil texture exerts a significant influence on simulated ET, runoff, and soil moisture content, surpassing the impact of the chosen upscaling method. This phenomenon is particularly pronounced as variations in soil properties directly affect surface water distribution. Our prior publication, which integrated soil texture into fully coupled modeling, corroborates this observation and underscores potential feedback loops between soil uncertainty and atmospheric dynamics in the African region.

Zhang, Z., Laux, P., Baade, J., Arnault, J., Wei, J., Wang, X., Liu, Y., Schmullius, C., & Kunstmann, H. (2023). Impact of alternative soil data sources on the uncertainties in simulated land-atmosphere interactions. Agricultural and Forest Meteorology, 339(March), 109565. https://doi.org/10.1016/j.agrformet.2023.109565

All these studies underscore the importance of accurately representing soil texture within land surface models, as well as in coupled land-atmosphere and earth system models. It highlights the necessity for further research to refine these soil representations for improved modeling skills.

Dear Reviewer,

Thank you for reviewing our work. We appreciate your effort and your interest in ensuring that science is at its best in this community.

We are glad that your study corroborates our observations and will consider citing your work in the revised edition of our manuscript.

Thanks once again.

Best regards,
Bamidele Oloruntoba on behalf of all co-authors.