

Response to comments: Referee #2

On behalf of all authors I would like to thank the referee the time implied in revising our work. As follows you will find a point-by-point response to your comments, with your comments in ***bold-italics*** and our responses in normal font.

Figure 1 effectively illustrates the interaction process among variables influencing landslide-triggering conditions. However, the bidirectional relationship between evapotranspiration (EV) and temperature (T) must be considered, rather than solely the unidirectional effect of temperature (T) on evapotranspiration (EV). Specifically, an arrow indicating the influence of evapotranspiration (EV) on temperature (T) is missing. Evapotranspiration processes induce energy fluxes that directly affect temperature.

Thank you for this insightful suggestion. We agree that the bidirectional relationship between temperature (T) and evapotranspiration (ET) is a fundamental component of the surface energy balance. We will update Figure 1 to include this feedback loop to ensure thermodynamic accuracy. However, we will also clarify in the text that for the purposes of our slope stability simulations, T is treated as an external forcing to compute ET unidirectionally, consistent with the methodology described in the Materials and Methods section.

In Figure 4, a distinct improvement in the fit between the histogram of observed events and the modeled rainfall events following the bias-correction procedure is evident, particularly regarding events with lower rainfall accumulation (up to 100 mm). However, modeled rainfall events with higher accumulation (>150 mm) appear to be overestimated (showing a higher frequency than observed events). Unfortunately, the vertical scale of the graphs prevents a definitive confirmation of this observation. I would recommend presenting this graph in a manner that highlights the tail of the x-axis (>150 mm) to clarify this uncertainty.

Thank you for this suggestion. We will add a figure showing this aspect of rainfall bias correction technique to the new version of the manuscript, but we will consider if we will insert it directly in the body of the text or as a supplementary material due to the current extension of the document. In any case, as you can see from Figure R2.1, the method successfully bias correct the rain events especially for the right tail of the distribution.

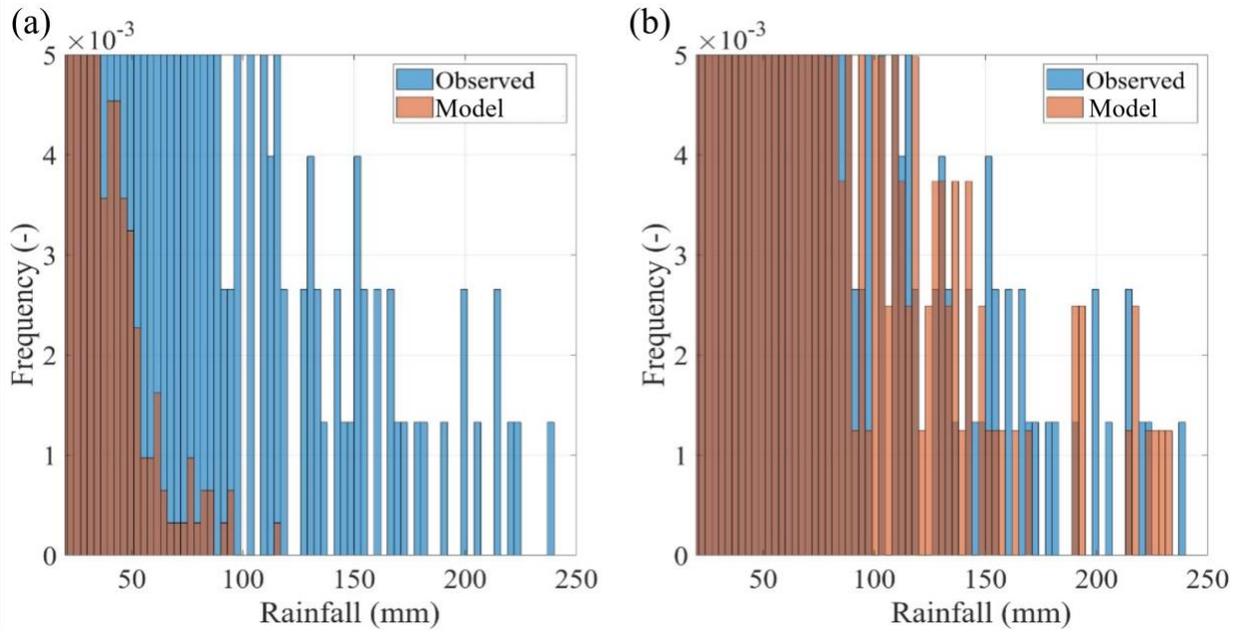


Figure R2.1. Detailed view of the upper tail of the rainfall frequency distributions for Observed (blue) and Modeled (orange) data at the Cervinara station. Panel (a) shows the distributions prior to the bias-correction procedure, and panel (b) shows the distributions after the application of the bias-correction procedure.