

Dear Editor,

thank you to letting us know your decision about the submission of our manuscript NHESS-2022-175.

We are pleased to learn the manuscript can be handled with minor revisions and, in this regard, we thoroughly appreciated your recommendations that certainly helped us to improving its presentation.

The manuscript has been reviewed paying attention to presenting the potential of our research from a better perspective, focusing on a reviewed explanation of the aim of the study, as well as of the gained results. The main adjustments to the manuscript are detailed below:

1. The title of the manuscript has been revised as follows: “Using Principal Component Analysis to incorporate multi-layer soil moisture information in hydro-meteorological thresholds for landslide prediction: an investigation based on ERA-Land reanalysis data”, in order to emphasize the novel aspect of our study, namely the implementation of multi-layer soil moisture information in hydro-meteorological thresholds’ identification.
2. The abstract has been entirely reworded and reframed in order to focus more on the innovative aspects of the work, i.e., multi-layer approach and comparison with single-layer as a tool supporting decision-making in LEWS, and downplaying also the importance of the hydro-meteorological thresholds as opposed to the traditional intensity-duration thresholds (For instance, refer to lines 12-30 of the revised manuscript).
3. The introduction section has been largely amended. Some details on the traditional rainfall triggering thresholds have been cut down, as well as a number of details about the previous studies using soil moisture information for landslide prediction. Thus, we focused more on giving the potential impact on the key aspects of our study: *i*) taking into account the multi-layer soil moisture information within hydro-meteorological thresholds, while keeping these two-dimensional; *ii*) corroborating the improvements of the prediction performances with the hydrometeorological approach, respect to the traditional precipitation (Please, refer to lines 32-73 of the revised manuscript).
4. Overall remarks at the end of the results section have been reworded and enhanced to highlight the gained results and their significance (Please, refer to lines 313-318 of the revised manuscript).
5. The conclusion’s section was largely amended by clearly summarizing the findings of our study, as well as their scientific interest, also in view of future perspectives. Specifically, we pointed out how the comparison of prediction performances relative to thresholds based on multi- versus single-layer soil moisture information, provides a mean to assess which soil depth intervals retain the most relevant information for improving thresholds’ predictive performances, and thus how the proposed approach can be a strategic decision-making tool in the development of LEWSs. (Please, refer to lines 320-337 of the revised manuscript).

We hope that the new version of the manuscript could be ready for the next phase of the revision process, and we remain at your disposal for any questions and/or details.

Kind regards,

Nunziarita Palazzolo