

Influence Of Non Uniform Rainfall Fields On Slope Stability

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Abstract. The interaction between meteorological features and landform shaping processes is treated in this paper as far as shallow landslides triggered by extreme rainfall are concerned. The spatial variability of the rainfall field is particularly analyzed on a small mountainous watershed. By the discussion of a case study we show how wind, by focusing the action of rainfall on windward hillslopes, can be a major factor in determining the location of failures. To obtain this result we infer an approximate estimate of wind gust direction and intensity based on physical considerations. Once the raindrop velocity is known we can determine the time averaged rainfall direction and, via a fine resolution DEM of the case study area, the average rainfall flux on each hillslope element. We show how the value of this flux shows an excellent correlation with the occurrence of shallow landslides and debris flows being one of the major factors in determining these processes. This fact confirms the importance of distributed modeling for shallow landslides analysis and risk assessment.

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