



Estimation of Debris-Flow Magnitude In The Serra Do Mar, Sao Paulo State, Brazil Using Morphological Characteristics Watersheds

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In Serra do, Mar zone, located in the south-southeast region of Brazil, is frequent the occurrence of landslides, especially debris flows type, that has caused thousands of victims and economic damages in the country in the last decades. Thus, the goal of this research estimated the debris-flow magnitude in the Serra do Mar using morphological characteristics watersheds. To achieve this goal, it were a) selected watersheds with occurrence of debris flow; b) determined the magnitude through the identification of the characteristics of the deposits and the delimitation of the inundation area; and c) mapped the morphological parameters (area above 25°, drainage density, drainage hierarchy, longitudinal profile, basin relief, roughness index and relief ratio) in digital terrain models (resolution of 30 m), selected through literature and its relevance to the process. The results showed the susceptibility of the area to the occurrence of debris flow, however, to the critical values related to the watersheds with high magnitude, highlighting the parameters longitudinal profile, drainage density, and hierarchy. Concerning to the magnitude classification of debris flow, the results were consistent with the records from the event, in other words, the expected damage related to specific magnitudes were observed in the watersheds with such classification. Therefore, it was observed the relationship between the morphological parameters and the magnitude of debris flows, which can support future researchers in the prediction of the magnitude of new debris flow events.