



## Analysis of the relationship of occurrence between precipitation and debris flows in Mexico

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The debris flows are the fast earth landslide movements, caused by hyperconcentrated flows of water and sediments, which happen in a great variety of environment throughout everybody. They are formed of a mixture of fine material (sand and clay), heavy material (gravel and rocks) and a variable amount of water, that a mud forms, which moves down towards slope, in swelling generally induced by the action of the gravity and the sudden collapse of the material in the bank. They are particularly dangerous for the life and the properties due to its high speeds and great destructive force, lowering natural houses, ways, bridges, trees and farmings, currents and ecosystems throughout its trajectory.

Empirical thresholds are based on the historical analysis of the relationship of occurrence precipitation and debris flow (e.g., statistical analyses). There is now a limited number of this type of empirical thresholds and have been employed different diagrams to represent them, depending on rainfall parameters commonly used combinations: antecedent precipitation, duration, intensity and accumulated rain, to be the most famous obtained by Caine and Aleotti.

In this article it was applied the function of mobilization of Iritanno and the propose relations of empirical thresholds by Caine and Aleotti to the precipitation registries that originated, among other factors, the debris flows happened in Teziutlán, México, being appraised that the relations intensity of rain-duration for this debris flow are greater from 3,43 to 2,1 times with respect to generating the empirical precipitation thresholds of debris flows proposed by Caine and Aleotti.