



A world-wide database of rainfall thresholds for the possible initiation of landslides

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Rainfall is a recognized trigger of landslides, and investigators have long attempted to determine the amount of precipitation needed to trigger slope failures, a problem of scientific and societal interest. Rainfall thresholds can be defined on physical (process-based, conceptual) or empirical (historical, statistical) basis. Empirical rainfall thresholds for the initiation of landslides have been proposed at the global (world-wide), regional, and local scale. Review of the literature reveals that no unique set of measurements exists to characterize the rainfall conditions that are likely (or not likely) to trigger slope failures. Based on the used rainfall measurements, empirical rainfall thresholds can be grouped in three broad categories: (i) thresholds that combine precipitation measurements obtained for a specific rainfall event, (ii) thresholds that consider the antecedent conditions, and (iii) other thresholds. We present a world-wide database of empirical rainfall thresholds for the possible occurrence of landslides. The empirical thresholds were proposed in the literature in the period from 1970 to 2006, in five continents. The database lists 125 thresholds, and was compiled through a thorough review of the existing literature on rainfall induced landslides (more than 400 references searched). In the database rainfall thresholds are classified based on the type of threshold (e.g., intensity - duration thresholds, thresholds based on the total event rainfall, rainfall event - duration thresholds, rainfall event - intensity thresholds, thresholds that consider the antecedent rainfall conditions, etc.), the geographical extent of the area for which the threshold is applicable (i.e., global, regional, or local threshold), and the type of landslides predicted by the threshold (e.g., shallow landslide, debris flow, deep-seated landslide, all landslide types, etc.). We further present a specific web site to disseminate the information on rainfall thresholds for the possible initiation of landslides stored in the database. The web site, available at

<http://rainfallthresholds.irpi.cnr.it/>, can be searched based on the geographical area of interest, the type of rainfall threshold, the type of rainfall induced landslides, and the geographical extent of the area for which thresholds are applicable.