



A prototype warning system to forecast rainfall induced landslides in Italy

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We are designing a system to forecast the possible occurrence of rainfall-induced landslides, using empirical rainfall thresholds and small scale zonations of landslide hazard and risk. Rainfall thresholds include national and regional empirical thresholds of the intensity-duration (ID) and normalized-ID types. The thresholds were calculated using objective methods and robust statistical techniques, exploiting a database of 673 rainfall events that have resulted in landslides. The synoptic landslide hazard zonation was obtained through multivariate statistical analysis of small scale environmental information, and catalogues of historical landslides. Similarly, the risk zonation was prepared exploiting a catalogue of historical landslides with human consequences in Italy. The hazard and risk zonations are used to establish if the expected slope failures occur in areas that are considered highly prone to landslides, or where landslide risk is severe or significant. The warning system, designed to support civil defense decisions, compares rainfall measurements with empirical rainfall thresholds, to inform “where” and “when” landslides are expected in a given region. A prototype version of the warning system was applied to the Abruzzo region, Central Italy.