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A framework connecting landslide susceptibility and rainfall thresholds

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Results from numerical experiments and empirical observations of rainfall-induced landslides indicate that threshold model parameters are related to landslide susceptibility. This paper exploits such connection by formulating a conceptual framework, which is further expanded into three practical applications: (1) empirical estimates of the probability of landslide-triggering rainfall; (2) time-trend analyses of rainfall series; (3) susceptibility-based alert levels. The relatively straightforward use of these applications in the context of climate change studies and early-warning systems is also illustrated. Examples of the applications are presented using landslide observations and rainfall records from Central America, the Caribbean and Southeast Asia.