

COMPARISON OF TWO LANDSLIDE TRIGGERING EVENTS USING FREQUENCY-AREA STATISTICS

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The assessment of the relative intensity of landslide events is of interest for understanding the geomorphological evolution of a landscape shaped by mass-wasting process, and for landslide hazard-assessment studies. We examine the frequency-area statistics of two landslide populations, one in the Umbria region (central Italy) and the other in the Liguria region (northern Italy), both triggered by extreme climatological events. Landslides in Umbria were caused in January 1997 by a rapid snow-melting event and identified through medium-scale aerial photographs, supplemented by field mapping. A total of 4233 shallow and deep-seated landslides, covering 12.7 km², were mapped in an area of about 2000 km². Landslides in Liguria were caused by high-intensity rainfall in November 2000. A total of 1024 slope failures, covering 1.6 km² and mostly soil-slips and debris flows, were identified from large-scale aerial photographs. For landslides exceeding a minimum area, both landslide data sets show a robust frequency-area power-law (fractal) relationship. Below this minimum area, both data sets show the same deviation from the power-law fit. We discuss ways of comparing the relative intensity of the two data sets, showing that power-law statistics can provide the basis for quantifying triggered landslide events.