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Titolo dell'abstract

PROBABILISTIC LANDSLIDE HAZARD AND RISK ASSESSMENT IN THE COLLAZZONE AREA, CENTRAL UMBRIA

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Parole chiave

Landslide
Hazard
Vulnerability
Risk
Model

Abstract

Results of an experiment aimed at determining landslide hazard and risk in the Collazzone area, in central Umbria, are presented. The experiment involved assessing landslide hazard, ascertaining landslide vulnerability, and determining landslide risk. In the 79 square kilometres study area landslides are primarily of the slide and slide-earth flow types. Landslide hazard was ascertained adopting a probabilistic model that predicts where landslides will occur, how frequently they will occur, and how large they will be in the study area, based on geomorphological information collected through field surveys and the interpretation of aerial photographs. A multi-temporal inventory map was prepared through the interpretation of aerial photographs taken between 1941 and 1997 and field surveys conducted in the period between 1998 and 2004. The study area was partitioned into 894 slope units, and the probability of spatial occurrence of landslides was obtained by discriminant analysis of thematic variables. For each slope unit, the expected landslide recurrence was computed by dividing the total number of landslide events inventoried in the terrain unit by the time span of the investigated period. Assuming landslide recurrence was constant, and adopting a Poisson probability model, the exceedance probability of having one or more landslides in each slope unit was determined, for different periods. The probability of landslide size, a proxy for landslide magnitude, was obtained by analysing the frequency-area statistics of landslides, obtained from the multi-temporal inventory map. Assuming independence of the three obtained probabilities, landslide hazard was ascertained for each slope unit as the joint probability of landslide size, of landslide temporal occurrence, and of landslide spatial occurrence. Information on landslides of the slide and slide-earth flow types that have resulted in damage to buildings and roads in Umbria was used to establish empirical dependencies between the area of the landslide and the vulnerability to landslides. The dependencies were used in the Collazzone area to determine the geographical distribution of the vulnerability to landslides. By combining the obtained hazard and vulnerability forecasts, multiple scenarios of landslide risk were prepared.

Modalita' di presentazione

Invitato

Scelta della sessione

T34 - Approcci innovativi nella valutazione della pericolosità e del rischio di frana