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GIS and statistical analysis for landslide susceptil mapping in the Daunia area, Italy

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Abstract. This study focuses on landslide susceptibility mapping in Daunia area (Apulian Apennines, Italy) and achieves this by using multivariate statistical method and data processing in a Geographi Information System (GIS). The Logistic Regression (hereafter LR) n was chosen to produce a susceptibility map over an area of 130 0(where small settlements are historically threatened by landslide phenomena. By means of LR analysis, the tendency to landslide occurrences was, therefore, assessed by relating a landslide inven (dependent variable) to a series of causal factors (independent va which were managed in the GIS, while the statistical analyses wer performed by means of the SPSS (Statistical Package for the Social Sciences) software. The LR analysis produced a reliable susceptibil of the investigated area and the probability level of landslide occu was ranked in four classes. The overall performance achieved by tl analysis was assessed by local comparison between the expected susceptibility and an independent dataset extrapolated from the la inventory. Of the samples classified as susceptible to landslide occurrences, 85% correspond to areas where landslide phenomen actually occurred. In addition, the consideration of the regression coefficients provided by the analysis demonstrated that a major ro played by the "land cover" and "lithology" causal factors in determ occurrence and distribution of landslide phenomena in the Apulian Apennines.

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