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应用CF和Logistic回归模型编制滑坡危险性区划图

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摘要: 根据地理信息系统(GIS), 以滑坡发生确定性系数(CF)和Logistic回归模型编制贵州省滑坡灾害区划图, 其主要步骤为: 应用历史滑坡灾点面积和滑坡致灾因子子集面积计算CF, 由此确定主要的滑坡致灾因子; 应用Logistic回归模型、地理信息系统(GIS)空间分析工具和统计软件SPSS寻求最合适的模型描述灾害是否发生(因变量)与致灾因子(自变量)之间的关系; 计算研究区域内各单元的滑坡概率, 划分危险性等级, 绘制基于GIS的贵州省滑坡灾害区划图; 最后, 用历史灾害分布数据检验滑坡灾害区划图。研究表明: 根据区划图, 贵州省可分为4个区域, 即低危险区、中等危险区、高危险区和极高危险区; 对贵州省的危险性分区合理, 结合CF与Logistic回归模型编制滑坡灾害区划图的方法有效。
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关键字: 滑坡; 危险性区划; 确定性因素; Logistic回归模型; 地理信息系统

Landslides susceptibility mapped with CF and Logistic regression model

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Abstract: The landslides susceptibility mapped in Guizhou Province was established through integrating a certainty factor (CF) and the Logistic regression model based on geology information system (GIS). The procedures were as follows: Firstly, the key factors were selected according to CF deduced from the area of landslides inventory and the area of factors subclasses. Secondly, the most appropriate model was selected to describe the relationship between hazards (dependents) and the key factors (independents) using the Logistic regression model, GIS spatial analysis tools and SPSS. Thirdly, the landslide probability was calculated, the dangerous levels were divided and landslides susceptibility map was established. Finally, the susceptibility map was verified by the distribution of landslide inventory. The results show that according to susceptibility map, the study area can be classified into four categories of landslide susceptibility, i.e., low dangerous zone, moderate dangerous zone, high dangerous zone and very high dangerous zone. The method of integrating the CF and the Logistic regression model is an effective way to evaluate the landslide susceptibility.

Key words: landslide; dangerous zone; certainty factor; Logistic regression model; geology information system

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