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Prediction rate of GIS-based models for predicting landslides and its applications

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Abstract
Selection of models for predicting landslides directly influences the accuracy of landslide prediction and is the key factor in landslide prediction. By using the geo-spatial data about landslides and related resulting factors in Alpago, Italy, the roles and applications of prediction rate of models for predicting landslides are discussed. Four models are used as examples including fuzzy gamma model (FGM), fuzzy algebraic product model (FAPM), fuzzy algebraic sum model (FASM) and fuzzy minimum model (FMM). Prediction rate is the cumulative distribution function of the area percentage of the landslides not used to construct a model with respect to the classes in the prediction map generated. By using the geographic information system (GIS), the prediction rate of a model can be calculated with the prediction map generated by the model and the landslide distribution data not used to construct the model. Based on the calculated prediction rates, the prediction abilities of the four models are compared and evaluated. The results show that the prediction rate of a model for predicting landslides is an indicator of the model characteristics; and that under the condition of defined input layers and specified landslides, the prediction rates of different models can be used as quantitative criteria for comparing, evaluating the models and for selecting the best one.

Author Keywords
Geographic information system (GIS); Landslide; Prediction model; Prediction rate; Slope engineering

Index Keywords
Distribution functions, Forecasting, Geographic information systems, Mathematical models, Slope protection, Slope stability; Alpago, Area percentage, Cumulative distribution function, Fuzzy algebraic product model (FAPM), Fuzzy algebraic sum model (FASM), Fuzzy gamma model (FGM), Fuzzy minimum model (FMM), Geospatial data, Indicator, Input layer, Landslide distribution data, Landslide prediction, Model characteristic, Prediction map, Prediction model, Prediction rate, Quantitative criteria, Slope engineering; Landslides

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