Geophysical Research Abstracts
Vol. 13, EGU2011-63-1, 2011
EGU General Assembly 2011

Mass Movements Susceptibility Assessment Using a "Logistic Regression" Model

Mohamed Mastere (1,2,3), Brigitte Van Vliet - Lanoë (1,2), and Lahsen Ait Brahim (3)

(1) Université Européenne de Bretagne, Bretagne. France. Mastere@univ-brest.fr, (2) CNRS, UMR 6538 Domaines Océaniques, Université de Brest, Institut Universitaire Européen de la Mer, Place Nicolas Copernic, 29280 Plouzané, France., (3) UM5A, Faculté des Sciences de Rabat, Laboratoire GEORISK, Av Ibn Batouta B.P. 1014, Rabat-Agdal, Maroc

Mass movements susceptibility assessment, effected by probabilistic methods, is based on the analysis of the relationships between there spatial distribution and selected causal factors of the instability. The main purpose of this study is to map automatically mass movements susceptibility using a logistic regression (LR) model applied in the Zoumi area (central Rif – Morocco), with datasets developed for application in a geographic information system (GIS). The study area was selected because of the spatial frequency and the wide distribution of active mass movements. Lithology, fracturing, slope angle, expositions, network drainage, seismicity, and land use were used as main parameters, controlling the occurrence of mass movements. In order to validate the LR methodology, we have compared the spatial distribution of inventoried mass movements with the zones with the highest susceptibility extracted by LR simulation.
The logistic regression model is applied in four steps: - 1° Sampling, where all relevant characteristics in a part of the sector are assessed. - 2° Setting of a parameterization of each variable, where all continuous variables are converted into categories. - 3° Model fitting, where the regression coefficients of each causal parameters are iteratively calculated in the sampled area. - 4° the Model application to the entire study area, where the best-fit regression function is applied. Finally the degree of model fit of the susceptibility map produced with the LR mapping will be compared with other susceptibility maps produced by statistical method (Mastere et al., 2010) and the surfacial approach.

Key words: Mass movements, Susceptibility, logistic regression analysis (LR), GIS, Morocco.

References

Mastere M, Ait Brahim L, B Van Vliet-Lanoë-2010. Evaluation de l'aléa mouvements de terrain, application à la région de Chefchaouen, Maroc : SIG et analyse statistique. Bull. Sci. Terre, Rabat (à paraitre).