



Landslide susceptibility mapping using conditional probability and artificial neural networks and their comparison: a case study from Alucra (Giresun-Turkey)

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This study presented herein compares the landslide susceptibility mapping methods of conditional probability (CP) and artificial neural networks (ANN) applied in the Alucra county (Giresun-Turkey). Digital Elevation Model (DEM) was first constructed using a GIS software. Parameter maps affecting the slope stability such as geology, faults, drainage system, topographical elevation, slope angle, slope aspect, topographic wetness index (TWI) and stream power index (SPI) were considered. In the last stage of the analyses, landslide susceptibility maps were produced using the conditional probability and neural networks, and they were then compared by means of their validations. Comparison of the landslide susceptibility maps with known landslide locations indicated the higher accuracies of the susceptibility maps for the two models. However AUC (Area Under Curve) values of CP and ANN showed that the map obtained from ANN model looks like more accurate than CP model, accuracies of two models can be evaluated relatively similar. The results obtained in this study also showed that the CP model can be used as a simple tool in assessment of the landslide susceptibility when a sufficient number of data was obtained. Because input process, calculations and output process are very simple and can be readily understood in the CP model, however neural networks require a conversion of data into ASCII or other formats. Moreover, it is also very hard to process the large amount of data in the statistical package. It should not be forgotten that “the simple is best in engineering”.

Key words: Landslide; susceptibility map; GIS; conditional probability; artificial neural networks; Giresun (Turkey).