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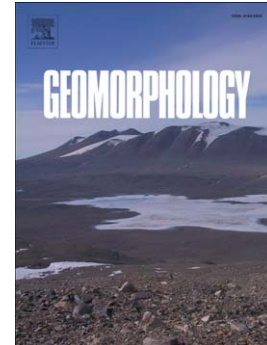
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Spatial prediction of landslide susceptibility using an adaptive neuro-fuzzy inference system combined with frequency ratio, generalized additive model, and support vector machine techniques

Wei Chen^{1, 2}, Hamid Reza Pourghasemi³, Mahdi Panahi⁴, Aiding Kornejady⁵, Jiale Wang¹, Xiaoshen Xie¹, Shubo Cao⁶

¹ College of Geology & Environment, Xi'an University of Science and Technology, Xi'an 710054, China

² Shandong Provincial Key Laboratory of Depositional Mineralization & Sedimentary Minerals, Shandong University of Science and Technology, Qingdao 266590, China

³ Department of Natural Resources and Environmental Engineering, College of Agriculture, Shiraz University, Shiraz, Iran

⁴ Department of Geophysics, Young Researchers and Elites Club, North Tehran Branch, Islamic Azad University, Tehran, Iran

⁵ Department of Watershed Management Engineering, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran

⁶ Sichuan Institute of Nuclear Geology, No.35 Huaguan Road, Chengdu, 610052, China.

*Email: hamidreza.pourghasemi@yahoo.com; hr.pourghasemi@shirazu.ac.ir (Corresponding author)

Abstract

The spatial prediction of landslide susceptibility is an important prerequisite for the analysis of landslide hazards and risks in any area. This research uses three data mining techniques, such as an adaptive neuro-fuzzy inference system combined with frequency ratio (ANFIS-FR), a generalized additive model (GAM), and a support vector machine (SVM), for landslide susceptibility mapping in Hanyuan County, China. In the first step, in accordance with a review of the previous literature, twelve conditioning factors, including slope aspect, altitude, slope angle, topographic wetness index (TWI), plan curvature, profile curvature, distance to rivers, distance to faults, distance to roads, land use, normalized difference vegetation index (NDVI), and lithology, were selected. In the second step, a collinearity test and correlation analysis between the conditioning factors and landslides were applied. In the third step, we used three advanced methods, namely, ANFIS-FR, GAM, and SVM, for landslide susceptibility modeling. Subsequently, the results of their accuracy were validated using a receiver operating characteristic curve. The results showed that all

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