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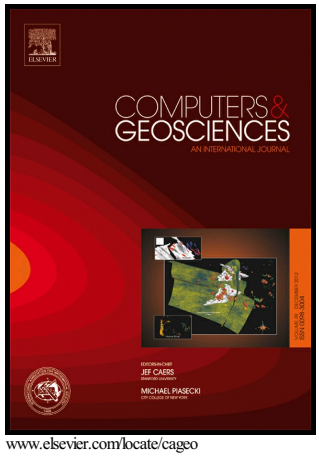

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ACCEPTED MANUSCRIPT

An expert-based landslide susceptibility mapping (LSM) module developed for Netcad Architect Software

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Abstract

The main purpose of this study is to introduce an expert-based LSM module developed for Netcad Architect Software. A landslide-prone area located at the eastern Black Sea region of Turkey was selected as the experimental site for this study. The investigations were performed in four stages: (i) introducing technical details of LSM module and theoretical background of the methods implemented in the module, (ii) experiments; landslide susceptibility evaluations by applying the methods M-AHP and Mamdani type FIS by using the expert-based LSM module, (iii) map similarity assessments and evaluations for the generalization capacities of the expert-based models, and (iv) performance assessments of the LSM module. When considering the areal distributions of matching ratios obtained from the map similarity evaluations, it is revealed that M-AHP is more pessimistic and covers a greater area in higher hazard classes, whereas the Mamdani type FIS behaves more optimistically and restricts the area of higher hazard classes in the experimental site. According to the Receiver Operating Characteristics (ROC) curve analyses, the value of Area Under the ROC Curve (AUC) was obtained as 0.66 for the resultant map produced with Mamdani type FIS and 0.82 for the map produced with M-AHP. To compare the time consumptions of the expert methods, experiments were implemented. Mamdani type FIS completes its task in 3 hours and 39 minutes, whereas M-AHP only

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