Volume XXXIX-B2

Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXIX-B2, 67-70, 2012
www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XXXIX-B2/67/2012/
doi:10.5194/isprsarchives-XXXIX-B2-67-2012

VERIFICATION AND RISK ASSESSMENT FOR LANDSLIDES IN THE SHIMEN RESERVOIR WATERSHED OF TAIWAN USING SPATIAL ANALYSIS AND DATA MINING

J. S. Lai[1] and F. Tsai[1,2]

[1]Department of Civil Engineering, National Central University, No. 300, Zhong-Da Rd., Jhongli, Taoyuan, Taiwan 32001

[2]Center for Space and Remote Sensing Research, National Central University, No. 300, Zhong-Da Rd., Jhongli, Taoyuan, Taiwan 32001

Keywords: Hazard assessment, Landslides, Disaster Mitigation, Data Mining

Abstract. Spatial information technologies and data can be used effectively to investigate and monitor natural disasters contiguously and to support policy- and decision-making for hazard prevention, mitigation and reconstruction. However, in addition to the vastly growing data volume, various spatial data usually come from different sources and with different formats and characteristics. Therefore, it is necessary to find useful and valuable information that may not be obvious in the original data sets from numerous collections. This paper presents the preliminary results of a research in the validation and risk assessment of landslide events induced by heavy torrential rains in the Shimen reservoir watershed of Taiwan using spatial analysis and data mining algorithms. In this study, eleven factors were considered, including elevation (Digital Elevation Model, DEM), slope, aspect, curvature, NDVI (Normalized Difference Vegetation Index), fault, geology, soil, land use, river and road. The experimental results indicate that overall accuracy and kappa coefficient in verification can reach 98.1% and 0.8829, respectively. However, the DT model after training is too over-fitting to carry prediction. To address this issue, a mechanism was developed to filter uncertain data by standard deviation of data distribution. Experimental results demonstrated that after filtering the uncertain data, the kappa coefficient in prediction substantially increased 29.5%.The results indicate that spatial analysis and data mining algorithm combining the mechanism developed in this study can produce more reliable results for verification and forecast of landslides in the study site.

Conference Paper (PDF, 428 KB)

Citation: Lai, J. S. and Tsai, F.: VERIFICATION AND RISK ASSESSMENT FOR LANDSLIDES IN THE SHIMEN RESERVOIR WATERSHED OF TAIWAN USING SPATIAL ANALYSIS AND DATA MINING, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXIX-B2, 67-70, doi:10.5194/isprsarchives-XXXIX-B2-67-2012, 2012.

Bibtex EndNote Reference Manager XML