

4th International Conference on **Earth Science & Climate Change**

June 16-18, 2015 Alicante, Spain

Using landscape metrics to evaluate the change of landslide and vegetation restorative area in Nan-hua reservoir watershed, Taiwan

Jie-Lun Chiang, Ssu-Hsuan Chang, Kuang-Jung Tsai and Yie-Ruey Chen
National Pungtung University of Science and Technology, Taiwan

Nan-hua reservoir is an important water conservancy facility and habitat in southern Taiwan. Due to vulnerability of geological condition, typhoons and heavy rain cause serious erosion and sediment in Nan-hua watershed. In 2009, typhoon Morakot caused sediment amounted to 17,060,000 m³ and also brought uncertainty of water supply. As a result, to renovate landslides of watershed is an important issue for the operation of reservoir. In this study, SPOT image and landscape metrics are used to analyze the variations and characteristics of the patch which is seen as vegetation restorative of landslide 2008-2012. Maximum likelihood classifier was used in this study. The features of classification included green, red and near-infrared, short-wavelength infrared band of SPOT and normalized difference vegetation index (NDVI). We classified the land cover into three categories: Vegetation, bare soil, and water. The overall accuracies of classification can achieve higher than 99%. Then, the landslide areas were selected from the classified images. The area of landslide is reduced from 745(ha) in year 2008 to 247(ha) in year 2012. The number of patches (NP) is reduced from 3510 to 1326, and patch density (PD) is reduced from 32.5 to 12.28 in year 2008 to 2012, respectively. The results show that some indices including NP, PD and mean patch size (AREA_MN) increase along with the typhoon rainfall amount. But there is no significant relationship between largest patch index (LPI) and typhoon rainfall amount. The results of this study indicate those indices are suitable for identifying rainfall-induced landslide.

Biography

Jie-Lun Chiang received his BS degree in Hydraulic Engineering from Feng Chia University in 1994, the MS degree in Agriculture Engineering in 1996 and PhD degrees in Bioenvironmental System Engineering in 2006 from National Taiwan University. He is currently an Associate Professor in GIS and remote sensing with the Department of Soil and Water Conservation, National Pingtung University of Science & Technology, Taiwan. His research interests include hydrology, GIS and remote sensing application to watershed management, uncertainty of temporal-spatial data, and climate change impact on soil and water resources.

jchiang@mail.npust.edu.tw

Notes: