Geophysical Research Abstracts
Vol. 14, EGU2012-3538, 2012
EGU General Assembly 2012

On the Characteristics of the Upstream Bedrock Erosion in Taiwan

K.-J. Shou and Y.-Y. Lee

National Chung-Hsing University, Dept. of Civil Engineering, Taichung, Province Of China Taiwan
(kjshou@dragon.nchu.edu.tw)

Taiwan is located in a region with frequent natural hazards and active tectonic activities; moreover, the significant surface displacement caused by the 1999 Chi-Chi Earthquake resulted in a huge impact on riverbed erosion. Over the past years, hazards to the mid- and up-stream slopes have been increasing, which is closely related to bedrock erosion and the channel instability due to the erosion.

This study investigate the behavior of upstream bedrock erosion of the Ba-chang River and the Chou-Shuei River in Central Taiwan through a modified stream-power erosion model. The data collected from the field measurement of erosion nails and the change in riverbed elevation from the multi-timescale digital elevation were applied in the analyses. In addition, the slope of the slope unit as well as the sub-watershed was derived from the digital elevation model, and to the upstream discharge was obtained from the rainfall distributions and the elevation model.

Additionally, to consider the influence of landslides in the upstream, the landslide ratio was also considered and included in the modified erosion model. The influence of the riverbed concavity index of the longitudinal river profile was compared for the regression results of the models with and without modification. The results show that the modified erosion model has better regression results and correlates significantly to the riverbed concavity index.