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**Landslide volume estimation by landslide area-frequency distribution**

Chen, C.Y.<sup>1</sup>, and Huang, W.Y.<sup>1</sup>

<sup>1</sup>National Chiayi U., Dept. of Civil and Water Resources Engineering, Chiayi City 60004, Taiwan ROC,  
[chienyuc@mail.ncyu.edu.tw](mailto:chienyuc@mail.ncyu.edu.tw)

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Global climate change has caused many natural disasters worldwide in recent years. Earthquakes in Taiwan occur frequently because it is situated at the juncture of the Eurasian Plate and the Philippine Sea Plate. Geographical location also causes Taiwan to be frequently affected by typhoon-induced landslides. The magnitude-frequency distributions of landslides at Shihmen Reservoir Watershed induced by typhoons Sinlaku and Jangmi in 2008 are studied. The methodological approach included geomorphic analysis of DEMs before and after landslide using the ArcGIS spatial analysis tool. This study develops landslide regression equations for landslide area and volume using the landslide inventory. The landslide volume was estimated using soil thickness and field measurements. Results of the analysis show that the shallow landslides exhibit self-similar behaviour with a power law exponent of 1.5. The proposed regressed equation for landslide area and volume is comparable to other published results. A two segment regression equation is proposed for separating small and large-scale of landslides to avoid over-estimation of landslide volume. The proposed equations can be used to estimate landslide volume using landslide area-frequency relationship with reasonable results and for landslide disaster planning and mitigation.

