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The analysis of size and shape of rainfall-induced landslides

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Landslide size and shape are important variables that interact the distribution and dynamics of landslides. Many studies has been focused on determining potential locations of landslides, but the question of what defines their size and shape is unanswered. Statistical methods have been used to determine the relationship between the frequency of mapped landslides and their size through examining landslide inventories. However, these methods do not explain why a specific landslide is of a particular size or a shape. To our knowledge, there is no explicit model available for quantifying and even for predicting the size and shape of landslides across slopes. In fact, only few indices have been designed for describing landslide shape, such as landslide length L and width W. Both are non-topologic features. In this study, a landslide geometry generating algorithm (LsGA) is developed for quantifying landslide geometric features, by considering topographic topology such as the upper length, the lower length and the lateral boundary of landslide scar. With examining the landslide inventory manually interpreted after Typhoon Morakot, which severely damaged Southern Taiwan during 8-10, August 2009, total 15 landslide geometric features were generated by LsGA and used to correlate to geo-environmental factors, such as slope, contributing area and the position of slope, for Kaoping watershed in Southern Taiwan. Primarily findings show that the landslide size influences the variation of landslide shape, meanwhile the landslide size changes with the position of slope. Other results will be presented in the meeting.