

Large Scale Simulation of Watershed Mass Transport – A Case Study of
Tsengwen Reservoir Watershed

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Abstract

We present the large scale simulation of watershed mass transport, including landslide, debris flow and sediment transport. A case study of Tsengwen reservoir watershed under the extreme rainfall triggered by the typhoon Morakot is run for verification. This approach integrates volume area relationship formula with inventory method to predict time varying landslide volume and distribution. Then, debris flow model, DEBRIS 2D, is used to simulate the mass transport of debris flow from hillslope to fluvial channel. Finally a 1 D sediment transport model, NETSTARS, is used for hydraulic and sediment routing in river and reservoir. The results give a very good agreement with the sediment concentration variation recorded downstream.

Key words : Large scale simulation; Watershed; DEBRIS 2D; Sediment transport; Landslide