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Feasibility of estimate sediment yield in the non-sediment monitoring station area - A case study of Alishan River watershed,Taiwan

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Due to the steep topography, frail geology and concentrated rainfall in wet season, slope disaster occurred frequently in Taiwan. In addition, heavy rainfall induced landslides in upper watersheds. The sediment yield on the slopeland affects the sediment transport in the river. Sediment deposits on the river bed reduce the river cross section and change the flow direction. Furthermore, it generates risks to residents' lives and property in the downstream. The Taiwanese government has been devoting increasing efforts on the sedimentary management issues and on reduction in disaster occurrence. However, due to the limited information on the environmental conditions in the upper stream, it is difficult to set up the sedimentary monitoring equipment.
This study used the upper stream of the Qingshuei River, the Alishan River, as a study area. In August 2009, Typhoon Morakot caused the sedimentation of midstream and downstream river courses in the Alishan River. Because there is no any sediment monitoring stations within the Alishan River watershed, the sediment yield values are hard to determine. The objective of this study is to establish a method to analyze the event-landslide sediment transport in the river on the upper watershed. This study numerically investigated the sediment transport in the Alishan River by using the KINEROS 2 model developed by the United States Department of Agriculture and the CCHE1D model developed by the National Center for Computational Hydroscience and Engineering. The simulated results represent the morphology changes in the Alishan River during the typhoon events. The results consist of a critical strategy reference for the sedimentary management for the Alishan River watershed.