

Technical improvements for the dynamic measurement of general scour and landslides

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Disasters occurring near riverbeds, such as landslides, earth slides, debris flow, and general scour, are easily caused by flooding from typhoons. The occurrence of each type of disaster involves a process, so if a disaster event can be monitored in real time, hazards can be predicted, thereby enabling early warnings that could reduce the degree of loss engendered by the disaster. The study of technical improvements for the dynamic measurement of general scour and landslides could help to release these early warnings. In this study, improved wireless tracers were set up on site to ensure the feasibility of the improved measurement technology. A wireless tracer signal transmission system was simultaneously set up to avoid danger to surveyors caused by them having to be on site to take measurements. In order to understand the real-time dynamic riverbed scouring situation, after the flow path of the river was confirmed, the sites for riverbed scouring observation were established at the P30 pier of the Dajia River Bridge of National Highway No. 3, and approximately 100 m both upstream and downstream (for a total of three sites). A rainy event that caused riverbed erosion occurred in May 2015, and subsequently, Typhoons Soudelor, Goni, and Dujuan caused further erosion in the observed area. The results of the observations of several flood events revealed that wireless tracers can reflect the change in riverbed scour depth caused by typhoons and flooding in real time. The wireless tracer technique can be applied to real-time dynamic scouring observation of rivers, and these improvements in measurement technology could be helpful in preventing landslides in the future.