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Development of a real-time susceptibility evaluation for rainfall-induced landslide on a regional scale in Taiwan

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Landslide susceptibility analysis is significant for hazard mitigation. Statistical and deterministic approaches are frequently adopted for landslide susceptibility analysis. Deterministic approaches are superior to the statistical approach, but it is difficult to get the required hydraulic-mechanical and geotechnical parameters in a deterministic model in a large scale area. This research attempted to build a dynamic landslide susceptibility model which linked two ways. A regional scale landslide susceptibility map by slope unit will be made in statistical approach with landslides inventory and rainfall data of the event, DEM and geological data. The hydraulic-mechanical and geotechnical parameters were obtained from the landslide occurrence of the actual time and rainfall data through inversion of deterministic approach and rainfall thresholds of back analysis. Finally, it fitted a curve that based on landslide susceptibility and rainfall threshold. According to the curve, a real-time susceptibility could be displayed under different rainfall. The automated landslide susceptibility analysis and display system can be developed for early warning purposes.