Development of Inundation Model for Real-time Scenario Simulations

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Traditional inundation models have been widely applied with good accuracy to many studies in Taiwan. The main drawback of these models is that extraordinary requirement of computing time, which causes the obstacle for real-time applications. The meteorological and geographical conditions in Taiwan frequently result in flashfloods within short time periods when storms occur. The lead time for emergency response is too short to indicate the areas with high flood risks by using the traditional inundation models.

The study aims to develop an efficient 2-D inundation model for real time flood simulations. The rainfall observations of rain gauges and the rainfall predictions of the Quantitative Precipitation Estimation and Segregation Using Multiple Sensor system (QPESUMS system, developed by Center Weather Bureau, Taiwan) are applied to the model, for simulating the flood scenarios induced by the occurring and the forecasted rainfalls. The goal is that providing real time flood forecasting in 3-hours advance to help the emergency managers taking proper strategies for disaster mitigations.

The Pachang River basin in south Taiwan is selected as the study area for model testing. The model's accuracy and efficiency are discussed in the study to find the applicable criteria and the model limits for further applications.

Keywords: Inundation model, QPESUMS system, Real-time simulation.