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A Rapid Evaluating System for Urban Inundation Assessment

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Typhoon-induced flood and inundation are among the major natural disasters in Taiwan. According to the official statistics, there are 3.5 typhoons hit island each year with an average precipitation amount of 2,500 millimeters. Modeling means is frequently used for establishing the earlier warning system and devastating effects on people's life and property. However, physical based numerical model may not meet the needs during emergencies because of the computational efficiency. Therefore, developing an evaluation system with quickly yield the possibilities of the urban inundation would be helpful for hazard mitigation.

This paper proposed a Rapid Evaluation System (RES) for evaluating the inundated probability in the urban of Taiwan. Total of 314 townships in Taiwan is studied. Three levels of criteria of rainfall intensity with one and two hour durations are proposed in our platform. These criteria are used to identify different set of inundation probabilities: high risk, medium risk and low risk. The platform of Web GIS based technique is used to integrate the Quantitative Precipitation Forecast (QPF) system for displaying the inundation probability as well as the inundation time. A hit rate formula is proposed to verify the applicability of the integrated system via the investigation data of five inundation events. The results demonstrated that the proposed system is suitable and efficient for assessing the urban inundation probabilities.