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## **Analysis of flooding potential with different return periods-A case study of Dianbao River in Kaohsiung City, Taiwan**

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In Taiwan, when the rainy season comes, the extreme rainfall and typhoon events cause floods and economic losses in the middle and lower reaches, which impacts on the safety of people's lives. In this study, we took Dianbao River in Kaohsiung City as an example and simulated the rainfall-runoff in the upstream water catchment area based on the HEC-HMS model and used its results as the flow input condition of the FLO-2D model. The two models were validated by the Kongrey typhoon event in 2013 and the Megi typhoon event in 2016. In terms of upstream watershed, the analysis results of the HEC-HMS rainfall-runoff errors for the Kongrey typhoon and the Megi typhoon were as follows: percent errors of peak discharge ( $EQ_p$ ) were 0.6% and 4.6%, respectively; errors of time to peak ( $ET_p$ ) were 0 hour and 2 hours, respectively; coefficients of efficiency (CE) were 0.89 and 0.91, respectively. In the Dianbao River, the FLO-2D model error analysis results of Kongrey typhoon and Megi typhoon events were as follows: percent errors of peak water level ( $EW_p$ ) were 13.51% and 4.71%, respectively; errors of time to peak ( $ET_p$ ) were 1 hour and 0 hour, respectively; coefficients of efficiency (CE) were 0.69 and 0.79, respectively. The simulation and validation of the two typhoon-inundated areas were reasonable and then the model was applied to explore the flood potential of the Dianbao River during different flood return periods.

**Keywords** HEC-HMS FLO-2D rainfall-runoff error analysis flooding potential