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# High-Temporal-Resolution Precipitation Data for Improving Flood Simulation Accuracy in Taiwan


## ABSTRACT

The accuracy of flood simulations depends on various factors, especially the uncertainty in precipitation data. Therefore, selecting an appropriate combination of meteorological data and flood models is crucial for effective flood management. This study presents a framework that highlights the necessity of high-temporal-resolution precipitation data by utilizing an operational QPE product, the nowcast system MAPLE, and the hydrodynamic model 3Di. The six selected heavy rainfall events are happened in 2024, northeastern and southwestern Taiwan.

With improved data availability from flood events in 2024, we incorporated various sources to validate the flood model. In an idealized experiment, the concentration of rainfall over time was found that flooding may be underestimated if heavy rainfall occurs within a duration of less than one hour, particularly when hourly rainfall data is used as input, thereby emphasizing the need for higher temporal resolution in flood forecasting. Moreover, the results indicate that MAPLE provides a reliable forecast within one hour, whereas any errors in the forecast are likely to be amplified when input into the flood model.



## Keywords

Quantitative Precipitation Estimation (QPE)

Quantitative Precipitation Nowcasts (QPN)