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Objective Analysis of Rainfall for Urban Sewer System Simulation

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Urban sewer systems convey stormwater away from the city. While the stormwater exceeds the capacity of urban sewer systems, inundation occurs. An accurate urban sewer system simulation gives an early warning of inundation. However, an accurate simulation depends on correct rainfall inputs and model calibration. The purpose of this study is to investigate the effect of different objective analyses of rainfall on urban sewer system simulation. Three methods are selected to compare to each other: the inverse distance to a power method, the Kriging method, and the radial basis function interpolation method. Then, the hourly observed rainfalls of 4 raingauges near the study area are compared with the interpolations of the other hourly observed rainfalls by the three methods. The optimal method has the minimum error between the interpolations and the observations. Finally, the optimal objective analysis is applied to interpolate the grid of rainfall for the study area based on the nearest 4 raingauges, and the urban sewer system simulation is performed to show the hydrograph of the rainfall.