

COMPARISON OF ACCURACY OF AREAL RAINFALL BETWEEN RAIN GAUGE AND RADAR

SEOKHWAN HWANG^{*1}

¹*KOREA INSTITUTE of CIVIL ENGINEERING and BUILDING TECHNOLOGY*

In this study, we compare and evaluate spatial interpolation methods in small catchments, which have small number of rain gauges in South Korea. Local heavy rainfall events have been selected for case studies and 10-minute rain gauge rainfall data are used, since short time scales of rainfall data is generally needed for flash flood forecasting and alerts. Furthermore, we analyze the characteristics of different spatial interpolation techniques by comparing the results with weather radar rainfall. The results revealed that mean absolute percentage error (MAPE) of areal mean rainfall between Thiessen polygon method and the other three interpolation schemes (Inverse distance weighting, Multiquadric interpolation, Kriging) increase rapidly as the catchment area becomes smaller, especially when the catchment area is less than 500?. In addition, regarding the number of rain gauges in catchment, the smaller the rain gauges used in calculating areal mean rainfall is, the larger the MAPE becomes. Furthermore, number of rainfall events that include outliers increased as correlation among rain gauge locations increased, which implies that outliers are more likely to happen when the gauges are more likely located in linear. Finally, temporal distribution of areal mean rainfall between using rain gauge and weather radar data is different depending on the direction of rainfall movement, especially in sparsely gauged catchments. This study provided a useful guideline for rain gauge number and placement to estimate areal mean rainfall accurately at small catchments.

Keywords : spatial interpolation method, Thiessen polygon, Inverse distance weighting, Multiquadric interpolation, Kriging, radar rainfall