



A Study on Regional Rainfall Frequency Analysis for Flood Simulation Scenarios

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Recently, climate change has been observed in Korea as well as in the entire world. The rainstorm has been gradually increased and then the damage has been grown. It is very important to manage the flood control facilities because of increasing the frequency and magnitude of severe rain storm. For managing flood control facilities in risky regions, data sets such as elevation, gradient, channel, land use and soil data should be filed up. Using this information, the disaster situations can be simulated to secure evacuation routes for various rainfall scenarios. The aim of this study is to investigate and determine extreme rainfall quantile estimates in Uijeongbu City using index flood method with L-moments parameter estimation. Regional frequency analysis trades space for time by using annual maximum rainfall data from nearby or similar sites to derive estimates for any given site in a homogeneous region. Regional frequency analysis based on pooled data is recommended for estimation of rainfall quantiles at sites with record lengths less than $5T$, where T is return period of interest. Many variables relevant to precipitation can be used for grouping a region in regional frequency analysis. For regionalization of Han River basin, the k-means method is applied for grouping regions by variables of meteorology and geomorphology. The results from the k-means method are compared for each region using various probability distributions. In the final step of the regionalization analysis, goodness-of-fit measure is used to evaluate the accuracy of a set of candidate distributions. And rainfall quantiles by index flood method are obtained based on the appropriate distribution. And then, rainfall quantiles based on various scenarios are used as input data for disaster simulations.

Keywords: Regional Frequency Analysis; Scenarios of Rainfall Quantile

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