



## **A Comparative Study on Extreme Precipitation of the Han River Basin using a Bivariate Goodness-of-fit Measure for Regional Frequency Analysis**

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In statistical hydrology, frequency analysis has been widely used for design of water resource systems. The traditional at-site analysis is recommended when the sample size is bigger than twice target return period (2T). However, in reality, the sample size of subject site is usually smaller than the target return periods such as 100- and 200-year ones. To overcome such a weakness, regional frequency analysis has been suggested and performed since 1960. To estimate robust precipitation quantiles in regional frequency analysis, it is important to select an appropriate probability distribution for a given region. Typically, goodness-of-fit measure developed by Hosking and Wallis based on the L-moment ratio diagram is used to select an appropriate probability distribution. Recently, several studies have been carried out on goodness-of-fit test for regional frequency analysis such as a bivariate goodness-of-fit measure to choose more appropriate probability distribution. In this study, regional frequency analysis is conducted for 1-hour maximum rainfall data (1961~2015) of the Han River basin in Korea. In this application, appropriate probability distributions are selected using the traditional goodness-of-fit and a bivariate goodness-of-fit measures, and then extreme precipitation quantiles from both methods are compared to suggest better method.

Keywords: regional frequency analysis; goodness-of-fit measure; a bivariate goodness-of-fit measure; extreme precipitation events