



## **Assessing the Parameter Estimation Method for Bivariate Probability Model of Rainfall Data**

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Multivariate frequency analysis has been developed for analyzing hydro-meteorological data such as rainfall, flood, and drought. Particularly, the copula model has been used as a useful tool for multivariate frequency analysis because the copula model has no limitation on deciding marginal distributions. The maximum likelihood, inference function for margin, maximum pseudo-likelihood, and nonparametric methods are being used for estimating the parameter of copula models. In the current study, performances of the referred parameter estimation methods in bivariate probability models of hydrological variables are assessed. Their performances are assessed by the case study of bivariate frequency analysis for the extreme rainfall events in South Korea. Annual maximum rainfall events are collected from 64 stations from Korea Meteorological Association with over 30 years. Each annual maximum rainfall events consist of rainfall depth and rainfall duration, and these two variables are used as the random variables in bivariate frequency analysis. The characteristics of the used parameter estimation method are investigated, and then their performances are assessed.