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IDF curves in nonstationary regions using regional frequency analysis and RCP scenarios in south korea

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Recently, extreme hydrological phenomena are increasing rapidly due to abnormal climate caused by global warming, and many damages are occurring as the change of precipitation characteristics. The intensity-duration-frequency (IDF) curve is widely applied in practice for designing the hydro-infrastructures. In addition, it is important to predict future changes in rainfall intensity due to climate change.

For this purpose, this study intends to derive the IDF curve, for future periods. In this study, the RCP scenario, a climate change scenario, was used based on historical data (1975-2020) and future rainfall data (2021-2100). Using these data, the stationary and nonstationary regions in the Korean are classified using regional frequency analysis, and the rainfall quantiles for non-stationary regions was calculated using the GEV(1,0,0) model with time varying location parameter. Finally, IDF curves for the historical and future data were derived and analyzed.