

Future IDF curves in Korea using scale-invariance technique under AR5 RCP scenarios

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The frequency and intensity of extreme rainfall event are likely to increase according to IPCC Climate Change 2014 Synthesis Report. In fact, in Korea, the damages triggered by extreme rainfall events exceeding design capacity of hydraulic structures have increased. In order to avoid these damages, it is necessary to estimate the new probabilistic design rainfall amount reflecting adverse effect of climate change. In this study, the future IDF curves are projected using the scale-invariance technique. The scale properties for hourly observed rainfall data in 60 rainfall gauging stations operated by the Korea Meteorological Administration are reviewed, and scaling parameters for each station are calculated with considering the regional climate characteristics. Also, trend parameters which have the information on the trend of future climate condition are estimated by using the future daily simulated rainfall data. Then, the Korean future probabilistic design rainfall amounts for various durations are predicted by applying these parameters to the IDF curve equation derived by the scale-invariance technique. It is found that for RCP 2.6, the probabilistic design rainfall amount is expected to decreased relative to the present in the most rainfall gauging stations. For RCP 4.5, it is expected to maintain a similar to present. While, for RCP 6.0 and 8.5, on most stations, the increasing trend on the probabilistic design rainfall amount is projected. In addition, the uncertainty involved in estimating future IDF curves will be presented.

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