

# Implementation of drainage network layout as a flood mitigation measure: A case study in Seoul, South Korea

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Network topology itself is one of important catchment characteristics that affect the shape of hydrographs directly. Typically, our design criteria propose a proper size, slope and roughness of a drainage conduits or pipes given return periods or design storms. Unfortunately, a majority of design criteria has not been focused on this topic so far. Flood vulnerability in urban areas is increasing more and more due to climate change and intense or rapid urbanization. In this study, we focused on the impact of layout of urban drainage networks on the resulting hydrographs at the outlet of an urban catchments. We utilized a stochastic network model: Gibbs' Model that has been applied to regenerate or classify complex river networks. We applied the model to flood-prone areas in Seoul Korea, which have experienced severe rainstorms in 2010 and 2011. Simulation results with historical data shows the importance of drainage network layouts on flood risk mitigation. We expect that these results can contribute to overcome limitation of conventional measures and focus on sustainable drainage network configuration that can operate persistently to prevent floods in the event of hydrologic extremes.

**Keywords :** Drainage network

Gibbs' Model

Stochastic network model

Drainage network layout

Network configuration