

# Analysis of the Urbanization Effect on Hydrologic Response

Younghun Jung\*, Na rae Kang\*\*, Seung oh Lee\*\*\*, Hung Soo Kim\*\*\*\*

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## Abstract

Urbanization leads to a change of hydrologic responses because impervious area is increased by urbanization. Decrease of groundwater recharge and increase of overland flow are general hydrologic characteristics caused by urbanization. This can be a source of damages such as increased flooding and reduced groundwater levels. Daily streamflow in Gabcheon watershed, South Korea is simulated by ARCSWAT model, an extension of SWAT2005. After calibration and validation of model, the simulated daily streamflow from 1997 to 2001 are statistically analyzed. The phenomenon that  $T_{Q_{mean}}$  is inversely proportional to coefficient of variation for the simulated daily streamflow is demonstrated. Also, hydrologic response was more influenced by weather than land use for high flow. This study also examines the effect of land use change on daily streamflow with spatially and quantitatively different land use maps. The simulated stream flow is tested by Mann-Whitney method. The median between stream flows simulated for 1990 and 2000 land use maps is significantly different, but the simulated streamflow for spatially different land use maps is almost unchanged.

**Keywords:** Urbanization, SWAT, Runoff, Land use, Mann-Whitney

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\* Research Professor, Department of Civil Engineering, 100 Inha-ro, Nam-gu, Inha University, Incheon 402-751, South Korea. E-mail : yjung@inha.ac.kr

\*\* Graduate Research Assistant, Department of Civil Engineering, 100 Inha-ro, Nam-gu, Inha University, Incheon 402-751, South Korea. E-mail : naraeme@naver.com

\*\*\* Assistant Professor, School of Urban and Civil Engineering, Hongik University, Seoul 121-791, Republic of Korea. E-mail : seungoh.lee@hongik.ac.kr

\*\*\*\* Professor, Department of Civil Engineering, 100 Inha-ro, Nam-gu, Inha University, Incheon 402-751, South Korea. E-mail : sooklim@inha.ac.kr