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Urban Runoff Simulation with Considering River Stage

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The EXTRAN block of EPA's storm water management model (SWMM) is used to simulate the stormwater runoff from two small urban watersheds in Korea. The study watersheds consist of combined sewers and pumping stations to drain the urban runoff into adjacent rivers. If there are no pumping stations or sewer system is designed improperly, severe inundation problems may occurr due to the low inland ground elevation and the high river stage. Therefore, it is necessary to study the effects of river stage on the capacity of the sewer system. The objective of this study is to test the applicability of the SWMM (EPA, 1998) to simulate the urban runoff by considering river stage and to evaluate the efficiency of pumping stations for inundation decrease. The simulation results are suggested for 2003 rainfall events. When the object sites do not have pumping stations but are affected by river stage, the pressurized, backward flows in addition to overflows at some parts of the sewer system occurred, and caused inundation of the sites. It is also found that even a small amount of rainfall can cause a serious inundation. The efficiency of pumping stations is very high for the study watersheds that are influenced significantly by river stage. Finally, it is found that the pumping stations contribute remarkably to diminish the overflow.