



Study on Development of 1D-2D Coupled Real-time Urban Inundation Prediction model

Seungsoo Lee

APEC Climate Center, Climate Application Team, Korea, Republic Of (seungsoo_lee@apcc21.org)

In recent years, we are suffering abnormal weather condition due to climate change around the world. Therefore, countermeasures for flood defense are urgent task.

In this research, study on development of 1D-2D coupled real-time urban inundation prediction model using predicted precipitation data based on remote sensing technology is conducted. 1 dimensional (1D) sewerage system analysis model which was introduced by Lee et al. (2015) is used to simulate inlet and overflow phenomena by interacting with surface flow as well as flows in conduits. 2 dimensional (2D) grid mesh refinement method is applied to depict road networks for effective calculation time. 2D surface model is coupled with 1D sewerage analysis model in order to consider bi-directional flow between both. Also parallel computing method, OpenMP, is applied to reduce calculation time. The model is estimated by applying to 25 August 2014 extreme rainfall event which caused severe inundation damages in Busan, Korea. Oncheoncheon basin is selected for study basin and observed radar data are assumed as predicted rainfall data.

The model shows acceptable calculation speed with accuracy. Therefore it is expected that the model can be used for real-time urban inundation forecasting system to minimize damages.