

# **COUPLING 1D AND 2D HYDRAULIC MODELS FOR IMPROVED FLOOD PREDICTION IN URBAN AREAS**

**Byunghyun Kim**, UC Irvine, 949-824-1314, bh.kim@uci.edu

1. Byunghyun Kim, UC Irvine/Dept. of Civil & Environ. Eng., UC Center of Hydrologic Modeling
2. James S. Famiglietti, UC Irvine/Dept. of Earth System Science, Dept. of Civil & Environ. Eng., UC Center for Hydrologic Modeling
3. Brett F. Sanders, UC Irvine/Dept. of Civil & Environ. Eng., UC Center of Hydrologic Modeling

Natural damage associated with flood disasters has been dramatically increasing. In particular, inundation in urban area causes serious damage to people and assets because of the high concentration of infrastructure and population. To develop an integrated urban flood inundation analysis system, the one-dimensional (1D) Storm Water Management Model (SWMM) and the two-dimensional (2D) BreZo model are coupled. SWMM is employed to resolve storm sewer flow, and BreZo is used to calculate detailed inundation zone characteristics including, depths and velocity. The interaction between the two models occurs at catch basin inlets and manholes and these flows are modeled with weir and orifice type equations. This study focuses on this important linkage, in particular the sensitivity of flood inundation predictions to weir and orifice equation parameters as well as stability of the modeling system in relation to this linkage. Validation data from flood events in Korea and California are used.