
[JJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-HW Hydrology & Water Environment

[A-HW26]Water Environment and Geology in Urban Areas

convener:Takeshi Hayashi(Faculty of Education and Human Studies, Akita University), Kei Nishida(Interdisciplinary Centre for River Basin Environment, Interdisciplinary Graduate School, University of Yamanashi), Hiroaki SUZUKI(日本工営株式会社 中央研究所, 共同)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

The scope of this session is to create an interdisciplinary forum on the most recent advances in water environment and environmental geology research in urban areas. Various kinds of studies concerning environmental issues on water and geology in urban areas (e.g. water balance, water cycle, water resource development and management, inundations, hydrogeology, pollution and remediation, geohazard, basic law on the water cycle) are welcome from academia, industry, and government as well as wider geographic diversity.

[AHW26-P01]Hydrodynamic simulation of urban stormwater drain using iRIC Model

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Keywords:iRIC, Nays2DFlood, 2 Dimensional modelling, Hydrodynamic Modelling, urban flood

Flooding in urban areas takes place mainly due to increased urbanization, decrease in infiltration rate and poor infrastructure for stormwater drainage network. Nays2DFlood is a recently developed solver by iRIC for the simulation of river flow regime. The number of input data requirement is few which makes this solver superior to other models but has been rarely applied to urban catchments. In this paper, a hydrodynamic model was developed to assess the model's feasibility to simulate urban stormwater drainage system of Delhi, the capital city of India for mapping inundation extents using Nays2DFlood solver. The data used in this model is a DEM (5 × 5 m resolution) and daily discharge data of the drains. The simulated drainage is analyzed keeping in mind the constraints which were observed during the collection of field data; the storm-water drains are choked, the drains have improper flow gradient or damaged flow gradients. Based on the simulated results, the water depth and velocity profiles were analyzed for the drain. The model identified four critical locations where the problem like zig-zag bed slope of the drain, undersized cross-section of the drain and last but not the least the backflow problem which was in close agreement with the observed field data. The flood propagation exactly predicting the inundated area. Thus, Nays2DFlood solver model can also be applied to urban catchments for identifying the flood inundation extent.