



Investigation of Water Balance of a Nordic Urban Catchment by using Three Different Approaches

Chong-Yu Xu, Hong Li, Ina Cecilie Storteig , and Nils Roar Sælthun

University of Oslo, Department of Geosciences, Hydrology, Oslo, Norway

(c.y.xu@geo.uio.no)(lihong2291@gmail.com)(inacst@student.geo.uio.no)(n.r.salthun@geo.uio.no)

Over 50 percent of the world's population live in urban areas and the percentage is steadily increasing. Oslo, the capital city of Norway, is projected to grow by 20 percent by 2030 according to Statistics Norway. Urbanization has strong impacts on quality and quantity of local runoff as well as erosion and sediment transport. The urban hydrological system is very complex due to interaction of overland runoff and groundwater with the sewer system and man-made changes of the land surface. The water balance in urban catchments is significantly changed due to human activities. Here we study the water balance in an urban catchment in Oslo by three independent methods, data analysis, MIKE Urban and Storm Water Management Model (SWMM). By using the three methods, we quantify each water balance component, i.e. precipitation, evapotranspiration, base flow from sewage system, base flow from groundwater and runoff from precipitation. The study contributes not only to the understanding of urban water system, but also to the ongoing project at the Oslo Municipality to implement low impact development (LID) infrastructure, such as green roof and rain gardens, to reduce and delay overland flow. The catchment studied is a suburban residential area that drains into the Akerselva River, which is the largest river in the Oslo.

Acknowledgements: This work is supported by the Research Council of Norway (New Water Ways: 270742).