Geophysical Research Abstracts, Vol. 8, 00378, 2006
SRef-ID: 1607-7962/gra/EGU06-A-00378

A practical solution for the management of urban stormwater pollution in Perth, Western Australia.

M. Stovold (1), KRJ. Smettem (2)

(1) Centre for Water Research, University of Western Australia, (2) Centre for Water Research, University of Western Australia

Most urban watersheds display impervious surfaces as a result of urbanization and industrialization. Such constructed surfaces include the large-scale presence of roads, pathways and buildings. These alterations to the natural environment cause the reduction of broad-scale infiltration and increase surface runoff, particularly from roads, which are an important source of pollutants in urban environments. Roads, which are commonly more connected to the urban drainage system than other impervious surfaces, function as a source for contaminants such as heavy metals, nutrients and hydrocarbons, which exist as a result of automotive activity, atmospheric deposition and leaching of contaminants from organic materials. They also act as pathways for contaminants to end of pipe locations, encouraging the fast tracking of stormwater to hydrologically connected treatment nodes. To compensate for increases in surface water runoff, large drainage systems are installed in urban areas designed to capture and dispose of surface waters. These alterations dramatically change the way rainfall interacts with groundwater by reducing regional scale infiltration and concentrating urban flows to point sources such as infiltration basins. The utilization of porous asphalts in place of conventional impervious asphalt has potential to reduce runoff volumes to groundwater recharge points by infiltrating surface water through a porous road construction, rather than contributing waters to the urban drainage system. This is expected to allow the broad scale filtration of contaminants through the soil vadose zone, ultimately recharging clean water to groundwater. The conversion of impervious to pervious road systems has been modeled to predict changes to stormwater flows and quality within an urban catchment in Perth, Western Australia. Various scenarios have been compared to provide a framework to allow potential water quality targets to be met based on the extent of suggested changes.