

Optimization of active to permanent pool volumes ratio for wet ponds in tropical catchments

Abstract :

Urban stormwater is the second major urban flow of concern to the drainage engineer and the second largest source of impairment to lakes and estuaries. Safe and efficient removal of urban stormwater is important to maintain public health and safety and to protect the receiving water environment. Detention ponds are stormwater best management practices used for the treatment and control of urban stormwater. Wet detention ponds have two zones: the active and the permanent pool volumes. In this research, long term hourly rainfall and case study catchment's data were collected and the effect of varying the ratio of active to permanent pool volumes investigated using analytical probabilistic models. It was observed that the pollution control performance of wet ponds increase with increase in the ratio reaching a peak value of 82% at a ratio of 0.6 and declines. For optimum benefit, design of the wet ponds in tropical catchments should target this point where the pollution control is highest although other design considerations might also need to be considered.