

Green roofs as a BMP in the Mississippi River Watershed

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Storm water runoff has become a serious environmental concern due to increased impervious surfaces in urban areas. Increasing urbanization within a watershed exacerbates this issue. Green roofs are a possible solution to this problem in the great river basins of the world; however there is insufficient research regarding this tool. Data is needed to determine how much storm water will be retained by green roofs with varying growth media depths, species composition, and design. Our research includes thirty-two green roof models and four Green Roof BlocksTM, located at the SIUE Environmental Science field site in Edwardsville, IL. The green roof systems were placed in a completely randomized design with four replicates of each medium depth and four control roofs on September 5, 2005. Storm water runoff has been calculated from each model green roof system following every rain event through September 2008. Our findings, like others, verify that green roof models retain more storm water than control roofs. However, our study also indicates that storm water retention of green roof models of different types (modular and built-in-place) and growth media depth differs significantly. In the first eighteen months of the study, sixty-four percent of storm water was retained by green roof models with 15 cm of growth media. During the growing season in 2008, green roof models with 15 cm growth medium retained 80% of the storm water that fell on them. Our data indicates that green roofs can be used as a mitigating tool to reduce the quantity of storm water entering already overburdened stormwater systems and that design choice impacts storm water retention of green roof systems. A properly designed green roof would be a viable choice for mitigating storm water runoff in the Mississippi River Watershed.