

Title: Are we doing enough to manage stormwater and protect urban streams? Insights from hydrologic data, modeling, and water quality

Abstract: Managing the excess runoff generated from rainfall on rooftops and paved surfaces is one of the principal environmental challenges in urban areas, with stormwater runoff firmly linked to increased flooding, erosion, and environmental degradation in urban streams. Engineered stormwater control measures are now widely required for new urban development and are slowly being retrofit into existing urban areas, at a cost of millions per city per year. Yet, what is the cumulative impact of these practices at the watershed scale? How effective is our implementation at changing stream hydrographs and protecting water quality? For peak flows and runoff volumes, watershed models suggest that the more area that is treated by stormwater controls, the better the results. Examining other parts of the hydrograph or probing observed data generates a more complex picture, where the results of stormwater management may be equivocal. Finally, water quality data suggest that stormwater is only one of the ubiquitous stressors on urban streams.