

Reducing Runoff Pollution with Green Infrastructure

BY KATE SHIRLEY

When you stop to think that everything that enters our sewer system is deposited, untreated, into the local bodies of water we use for recreation, fishing and drinking water, it is apparent that we need to find an economical and sustainable solution to deal with storm water runoff pollution. As rain falls on impermeable surfaces, like pavement, sidewalks and driveways, excess water cannot soak into the ground, and must run off into the sewer system. As rain washes the ground, it picks up many pollutants like oil, debris, pesticides, fertilizers, pet waste and household chemicals, before flowing into sewers. Incorporating green infrastructure into city planning and development projects is a natural solution to wet weather management that has been proven to effectively reduce the amount of polluted runoff entering our water resources while reducing erosion, conserving water, increasing the natural beauty of our surroundings as well as improving the air quality of our cities.

Using green infrastructure as a wet weather management tool is a cost effective way to benefit the environment while providing important flood and pollution control services. Green infrastructure can be implemented through both large and small scale projects. Larger projects involve preserving and restoring the naturally existing ecosystems, like forests or wetlands. Not only is this an important aspect of natural storm water runoff management, but it benefits local wildlife and boosts outdoor recreation potential. Smaller green infrastructure projects incorporate green roofs, rainwater

harvesting, porous pavement and rain gardens into city planning projects.

Green infrastructure has already proved its usefulness in numerous cities across the United States. Take Chicago, for example. In 2001, the city completed the first phase of its green infrastructure initiative, installing a 20,300 square foot demonstration green roof on Chicago's City Hall. The roof not only absorbs and conserves rainfall, improves air



The green roof installed in 2001 on top of Chicago's City Hall reduces water pollution and saves on utility bills.

quality naturally and reduces waste, but it also saves \$5,000 a year on utility bills. As a result of the success of this trial, the city of Chicago has now installed over 80 green roofs around the city, and has inspired other cities to set similar environmental goals.

The city of Lansing, Michigan has also implemented green infrastructure techniques to protect and improve local water quality. The city invested in engineered bioretention areas, also known as rain gardens, which were placed along Michigan Avenue and Washington Square in 2008. Instead of flowing directly into the sewers and draining to the local waterbody, storm water runoff now flows naturally to the

rain gardens, where it is absorbed by native plants and soil that is specially engineered to absorb pollutants. Not only has this project proved to be a beautiful addition to the cityscape, but it has reduced water pollution in the Grand River, which flows into Lake Michigan.

In the late 1990's, the University of North Carolina at Chapel Hill was experiencing frequent flooding and clogged pipes, and was concerned by the amount of pollution and debris in runoff water being drained into campus sewers. The administration decided to implement a network of sustainable green infrastructure including rain gardens, porous parking lots, infiltration beds under pavement and grassy areas to catch and cleanse excess water, as well as cisterns placed both above and below ground, for storing water to be used for non-potable uses, like in toilets or for irrigation. All these improvements have reduced flooding around campus, and have also saved the

city of Chapel Hill time and money by facilitating compliance with their storm water permit. Bolstered by the success of these projects, the university encourages future sustainable projects by sponsoring infrastructure design contests.

Excess storm water and pollutants that enter our streams, creeks, rivers, lakes and ocean are not only expensive to treat, and can cause significant erosion, but are harmful, even deadly, to local wildlife and can disrupt recreational activities. Incorporating green infrastructure into city planning and new development projects, or enhancing existing projects, is one way we can reduce harmful storm water runoff pollution while creating a sustainable and pleasing natural environment.