Green Infrastructure Center (GIC) Stormwater Management Tree Grant

FUNDING SOURCE & AMOUNT

Green Infrastructure Center (GIC)

TIMEFRAME

December 2016 – May 2018

GRANT ADMINISTRATOR

Green Infrastructure Center

IN-KIND PARTNERS

City of Wilmington

- Stormwater Services
- Parks Division
- Engineering Division

SUMMARY / DESCRIPTION

North Carolina was one of seven southern states that received funding to carry out a project to link urban tree canopy to stormwater mitigation, specifically for cities with Municipal Separate Storm Sewer Systems (MS4). The project will help southern cities, like Wilmington, to utilize their urban forests as a vital tool for managing and reducing stormwater runoff.

Rapid urbanization and climatic fluctuations have led to increased risk of flooding and degraded water quality in cities. Trees can be utilized as a key strategy for addressing this problem. Trees intercept, store and transpire stormwater and are a vital tool in abating and cleaning stormwater runoff. One urban tree can intercept thousands of gallons of water annually. But while the benefits of trees are well known, most cities do not include trees as a component of their stormwater management strategies.

GRANT GOAL(S)

The primary outcome was a process for integrating trees into the city's stormwater management program. This process was developed during the project with significant input by the city and the public and is described in a project case booklet produced at the end of the project. Ultimately, each city has a more strategic and effective process for combating stormwater runoff. In addition to a developed process, each city received:

- ✓ Updated tree canopy and impervious land cover map used to map current canopy and analyze runoff, stormwater benefits and potential for mitigating stormwater (map and in GIS digital format) + metadata.
- ✓ Potential planting areas map (digital GIS) used for strategic planning to set future canopy goals.
- ✓ Codes and ordinance audit for urban trees to facilitate better management and care.
- ✓ Workshops with local committees to provide education and solicit input.
- ✓ Model ordinance language or other program/policy documents for using trees to meet stormwater regulations.
- ✓ Written step-by-step- strategy and methodology for linking urban forest systems to urban MS4 requirements for each of the specific partner city(s).
- ✓ Case study of the project suitable for sharing at workshops, with elected and appointed officials and other agencies and stakeholders.

Trees: the original –best – green infrastructure!

Trees give us cleaner air, shade, beauty and stormwater benefits at a cost that is far cheaper than engineered systems!

Estimates for the amount of water a typical street tree can intercept in its crown, range from 760 gallons to 4000 gallons per tree per year, depending on species.

Airlie Oak in Wilmington, NC

Paved Areas Can Cause Extreme Flows

1. Impervious surfaces prevent rain infiltration, causing greater runoff volume and velocity.

2. Storm flows peak sooner in the stream at higher volumes.

3. Higher volumes and velocities of runoff lead to more flooding and damages – the firehose effect!
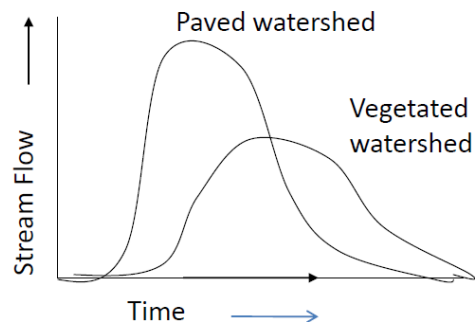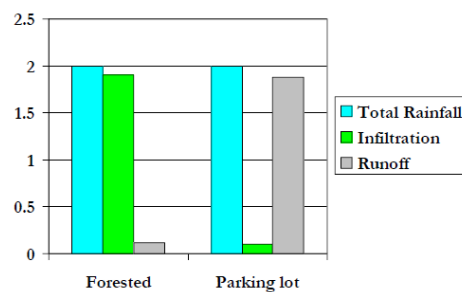
This parking lot could be retrofitted so we get less of this …

One acre of pavement releases 36 times more runoff than a forest.

During a rainfall event of one inch, one acre of forest will release 750 gallons of runoff, while a parking lot will release 27,000 gallons.

(PennState Extension).

Flooding in Wilmington, NC

A solution:

Maintaining and/or restoring forest functionality in urban ecosystems may help reduce stormwater runoff and improve water quality.

(Rose and Peters, 2001; Schoonover et al., 2006; Boggs and Sun, 2011)