Green Infrastructure as a Stormwater Management Strategy: Case Studies in NJ Municipalities

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NY/NJ Baykeeper's mission is to protect, preserve, and restore the ecological integrity and productivity of the NY-NJ Harbor Estuary.

The Harbor Estuary encompasses the Ports of NY and NJ, as far north as the Tappan Zee Bridge and as far south as Sandy Hook Bay.
Rutgers Cooperative Extension

Rutgers Cooperative Extension (RCE) helps the diverse population of New Jersey adapt to a rapidly changing society and improves their lives through an educational process that uses science-based knowledge.
Our Mission is to identify and address community water resources issues using sustainable and practical science-based solutions.
The Natural Hydrologic Cycle
The Impact of Development on Stormwater Runoff

More development → More impervious surfaces → More stormwater runoff
The Urban Hydrologic Cycle
Rutgers

NPS = “People Pollution”

- litter
- fertilizers
- animal waste
- grass clippings
- septic systems
- oil & grease from cars
- household cleaning products
- sewage & cleaners from boats
Impacts of NPS

• Fish and wildlife
• Recreational water activities
• Commercial fishing
• Tourism
• Drinking water quality
ACTIONS AND PRACTICES FOR SUSTAINABLE COMMUNITIES

Managing Impervious Surfaces with Green Infrastructure
Simple Disconnection
Green Infrastructure (GI)

- GI is an approach to stormwater management that is cost-effective, sustainable, and environmentally friendly.
- GI practices **capture**, **filter**, **absorb**, and/or **reuse** stormwater to help restore the natural water cycle.


**Bioretention Systems/Rain Gardens**

**Native Plants**
A rain garden is planted with a variety of grasses, wildflowers, and woody plants that are adapted to the soil, precipitation, climate, and other site conditions.

**Drainage Area**
This is the area of impervious surface that drains stormwater runoff to the rain garden.

**Curb Cut**
This curb cut and concrete flow pad are designed to help redirect stormwater runoff to the rain garden system and out of the storm drain.

**Inlet**
This is the area where stormwater enters. The inlet is often lined with stone to slow water flow and prevent erosion.

**Berm**
The berm is constructed as a barrier to control, slow down, and contain stormwater.

**Ponding Area**
The ponding area is the lowest, deepest visible area of the garden. When designed correctly, this area should drain within 24 hours.
Rain gardens can be implemented throughout communities to begin the process of re-establishing the natural function of land.

They offer one of the quickest and easiest methods to reduce runoff and help protect our water resources.
Rainwater Harvesting Systems

**DRAINAGE AREA**
This is the area of impervious surface that is captured in the rainwater harvesting system. In this case, it is a structure rooftop.

**GUTTER**
This captures runoff from the rooftop and carries it to the rainwater harvesting system.

**FIRST FLUSH DIVERTER**
This mechanism is installed to by-pass the first several gallons of runoff which tend to be the dirtiest water before it enters the tank.

**CISTERN TANK**
This tank is designed in different sizes to accommodate the runoff from a designated drainage area.

**SPIGOT**
A spigot is installed near the base of the cistern tank to allow water to be removed for use without an electronic pump system.

**OVERFLOW**
This mechanism is designed to act as a discharge for the water when the cistern is full or when it is winterized.

**SEDIMENT**
Sediment and other pollutants that enter the tank will settle to the bottom.
Rainwater Harvesting Systems

• These systems are often paired with other green infrastructure practices to increase their storage capacity or efficiency.

• Are commonly paired with a vegetative system to capture the overflow from the system once it has reached full capacity.
The Green Hydrologic Cycle
What is a Municipal Action?

A municipal action team is a collaborative group of local governments officials, utility authorities, residents, and community organizations.
The goal of this action team is to **foster collaboration** and **collective action** that helps the municipality and its organizations speak with a **common voice** to achieve a common goal.

The goal is to educate and improve **advocacy for green infrastructure** as one solution to manage stormwater in our communities.
Examples of Green Infrastructure Municipal Action Teams

• Camden SMART
• Newark DIG
• Paterson SMART
• Perth Amboy SWIM

Coming soon names for:
• Jersey City
• Trenton
• Gloucester City
Doing Infrastructure Green

NEWARK DIG

EST. 2013

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DOING INFRASTRUCTURE GREEN

- City of Newark
- Clean Water Action & Clean Water Fund
- Greater Newark Conservancy
- Ironbound Community Corporation
- New Jersey Department of Environmental Protection
- New Jersey Tree Foundation
- NY/NJ Baykeeper
- MnM Consulting
- Passaic Valley Sewerage Commission
- Rutgers Cooperative Extension Water Resources Program
- Trust for Public Land
- Unified Vailsburg Services Organization
- Urban League of Essex County
- Victoria Foundation
Newark DIG is

• Committed to continuously improving the quality of life, health, and viability of the City of Newark and its residents through use of strategic collaborative methods, including:
  – community-driven urban design
  – public policy planning
  – environmental and social justice advocacy
  – education
  – local capacity building

• Our primary goal is the establishment of **sustainable green infrastructure** as the first line of defense to
  – better manage stormwater runoff
  – improve water quality & resilience to flooding
  – reduce combined sewer overflows (CSOs) with a focus on the Passaic River and its tributaries
Over 40 sites identified, 15 green infrastructure projects installed, and 2,538 trees since 2013.
Stormwater Management and Resource Training

PATERNON SMART

EST. 2015

www.patersonsmart.org
Facebook @PatersonSMART
Stormwater Management and Resource Training

- City of Paterson
- City Green
- New Jersey Department of Environmental Protection
- New Jersey Tree Foundation
- NY/NJ Baykeeper
- Passaic County
- Passaic Valley Sewerage Commission
- Paterson Habitat for Humanity
- Rutgers Cooperative Extension Water Resources Program
Paterson SMART...

Aims to incorporate sustainable green infrastructure strategies to generate multiple benefits, including resiliency to flooding, reduced CSO events, and improve quality of life.

Paterson SMART is current working on:

- Forming partnerships with appropriate city representatives and organizations
- Project site identification for green infrastructure pilot projects
- Outreach and education strategies
Over 15 sites identified, 1 green infrastructure project installed, and more to come in 2017!
PERTH AMBOY SWIM
EST. 2014
Perth Amboy SWIM is...

- a **collaboration** of community members and stakeholders committed to improving the quality of life of residents by:
  - addressing combined sewer and stormwater pollution,
  - flooding
  - economic development
- through the **strategic implementation** of green infrastructure, educational programming, and public outreach.
Rutgers

StormWater Infrastructure Management

- City of Perth Amboy
- NY/NJ Baykeeper
- New Jersey Department of Environmental Protection
- Rutgers Cooperative Extension Water Resources Program
- Perth Amboy Green Team
- Raritan Riverkeeper
- Jewish Renaissance Foundation
- Americorps
- Middlesex Water
- AristaCare at Alameda Senior Facility
- Middlesex Planning Department
Over 25 sites identified, 4 green infrastructure projects installed, and more to come in 2017!
How can you get involved?

• Network Building - join/participate in a MAT!

• Real World Project Opportunities
  – Research
  – Design (design charrettes and plans)
  – Community Outreach

• Internship Opportunities with MAT members
Questions?

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