Rain Gardens & Bioretention Areas

- Shallow depression of soil and plants, filters runoff and slows its flow

Ashford Park, Ardsley

Kingston Library

Vegetated Swales

- Natural drainage paths or vegetated channels used to transport water above ground

Subdivision, Pawling

Village Hall, Greenwood Lake

Green Roofs

- Layers of soil and vegetation on rooftops that capture runoff

SUNY Orange, Newburgh

Marist College, Poughkeepsie

Porous Pavement

- Paved surfaces that allow stormwater to infiltrate

Sojourner Truth Ulster Landing County Park, Saugerties

NYS Parks, Recreation & Historic Preservation, Staatsburg

Stream Buffer Restoration

- Improves stream health, filters and slows polluted runoff, many other benefits

Whaley Lake Stream, Beekman

SUNY Orange, Middletown

Other Green Infrastructure Practices

- Street trees
- Stormwater planters
- Rain barrels
- Stream daylighting

Stormwater planter – bus shelter, Ardsley

Rain barrel – Greenburgh Nature Center

Benefits of Green Infrastructure

- Manage stormwater (quality and quantity)

Benefits of Green Infrastructure

- Manage stormwater (quality and quantity)
- Recharge groundwater

Benefits of Green Infrastructure

- Manage stormwater (quality and quantity)
- Recharge groundwater
- Reduce CSOs, reduce wastewater treatment costs

Benefits of Green Infrastructure

- Manage stormwater (quality and quantity)
- Recharge groundwater
- Reduce CSOs, reduce wastewater treatment costs
- Improve watershed resiliency

Benefits of Green Infrastructure

- Manage stormwater (quality and quantity)
- Recharge groundwater
- Reduce CSOs, reduce wastewater treatment costs
- Improve watershed resiliency
- Cool urban areas – energy savings

Benefits of Green Infrastructure

- Manage stormwater (quality and quantity)
- Recharge groundwater
- Reduce CSOs, reduce wastewater treatment costs
- Improve watershed resiliency
- Cool urban areas – energy savings
- Provide wildlife habitat

Benefits of Green Infrastructure

- Manage stormwater (quality and quantity)
- Recharge groundwater
- Reduce CSOs, reduce wastewater treatment costs
- Improve watershed resiliency
- Cool urban areas – energy savings
- Provide wildlife habitat
- Improve air quality

Benefits of Green Infrastructure

- Manage stormwater (quality and quantity)
- Recharge groundwater
- Reduce CSOs, reduce wastewater treatment costs
- Improve watershed resiliency
- Cool urban areas – energy savings
- Provide wildlife habitat
- Improve air quality
- Improve human health

Benefits of Green Infrastructure

- Manage stormwater (quality and quantity)
- Recharge groundwater
- Reduce CSOs, reduce wastewater treatment costs
- Improve watershed resiliency
- Cool urban areas – energy savings
- Provide wildlife habitat
- Improve air quality
- Improve human health
- Increase land values

Benefits of Green Infrastructure

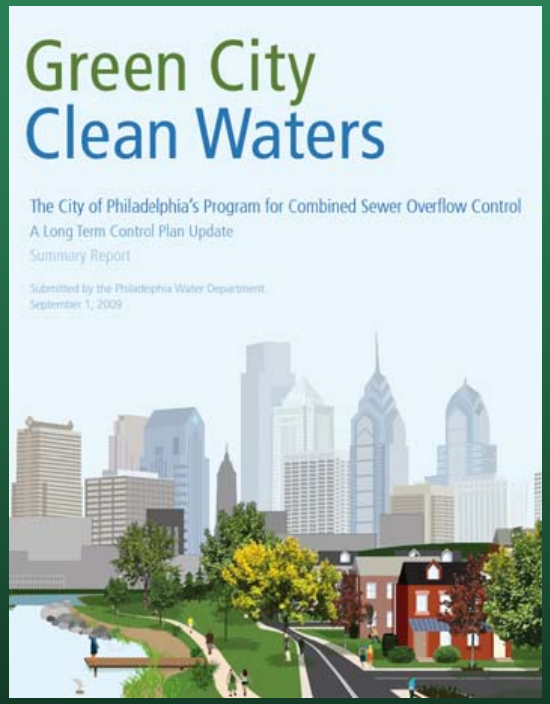
- Manage stormwater (quality and quantity)
- Recharge groundwater
- Reduce CSOs, reduce wastewater treatment costs
- Improve watershed resiliency
- Cool urban areas – energy savings
- Provide wildlife habitat
- Improve air quality
- Improve human health
- Increase land values
- Beautify neighborhoods

Benefits at a Municipal Scale

<u>Philadelphia</u>

40-year strategy to deal with CSOs:

- Gray - $122.0 million in benefits
- Green - $2.85 billion in benefits
  - Save energy ($33.7 million)
  - Avoid 196 fatalities from heat stress
  - Increase residential property values (> $1.1 billion)
  - Create > 15,000 jobs for local laborers



Watershed Resiliency and Climate Change

- Resilient watershed = better able to deal with and recover from extreme weather
- Reduce vulnerability of communities & ecosystems

Flooding from the Fall Kill, Poughkeepsie – Hurricane Irene

Watershed Resiliency and Climate Change

- Manage stormwater
- Protect forests, wetlands, floodplains
- Restore vegetation along streams
- Replace undersized road crossings
- Move infrastructure out of floodplains
- Create partnerships, work intermunicipally

Implementing Green Infrastructure

- Homeowners, watershed groups, neighborhoods, regional planners, businesses, and
- <u>Municipalities</u>
  - Planning
  - Codes/ordinances to encourage, incentivize, or require
  - Demonstration sites

SUNY Orange, Middletown

What can you do?

- Integrate green infrastructure into plans
- Climate adaptation strategies
- Review codes/ordinances
- Visit local practices
- Build demonstration projects
- Submit projects for website
- Restore stream buffers with Trees for Tribs

New York State Water Resources Institute

Emily Vail

Watershed Outreach Specialist

eevail@gw.dec.state.ny.us

(845) 256-3145

Hudson River Estuary Program

New York State Department of Environmental Conservation

In cooperation with Cornell University NYS Water Resources Institute