

Sussex County Green Infrastructure Seminar Series  
Seminar 3

Monday, November 8, 2010  
6:30 – 8:30PM

Sussex County Administrative Center

***Green Infrastructure: Projects & Programs for  
Green Teams & Environmental Commissions***

Rutgers Cooperative Extension Water Resources Program

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# Goals & Objectives

## GOAL

Help communities become sustainable.

## OBJECTIVES

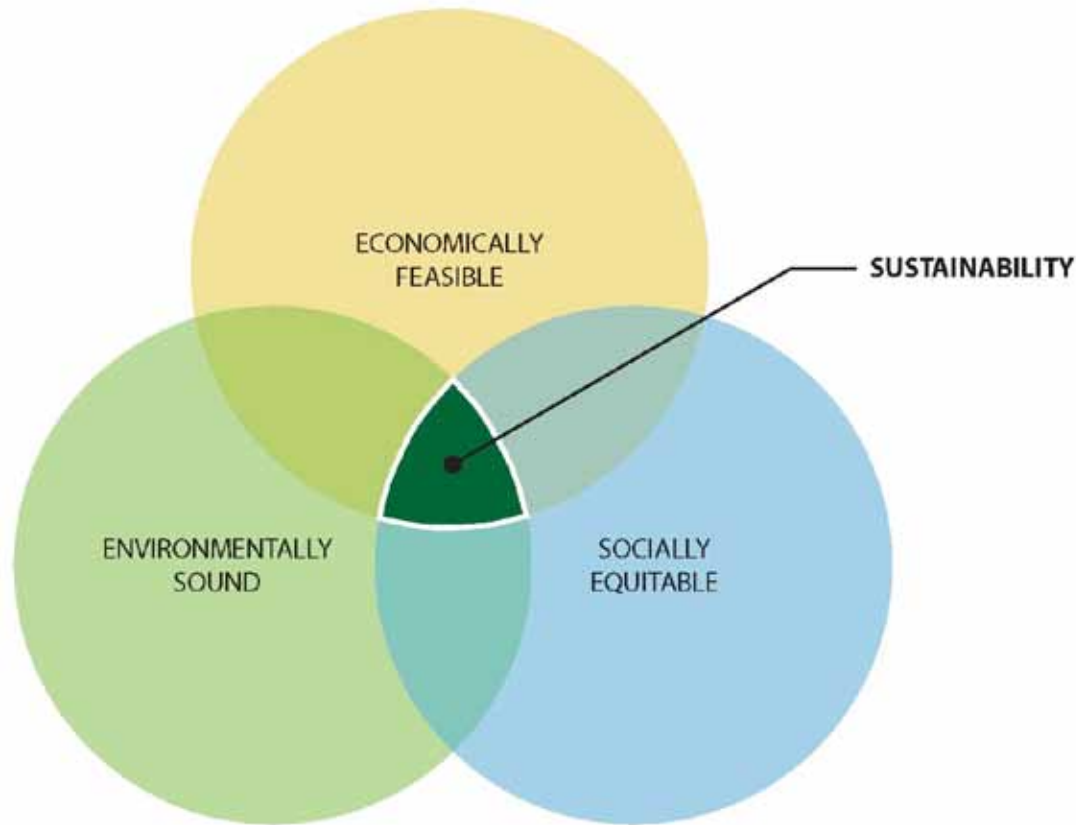
Provide attendees with good examples of projects and programs they can implement.

Help attendees understand the opportunities to partner with RCE to implement projects and programs.

# What is Sustainability?

*"Design, construction, operations, and maintenance practices that meet the needs of the present without compromising the ability of future generations to meet their own needs."*

- Brundtland Report, *Our Common Future* (1987)



# Taking Steps Toward a Sustainable Future

1. Form a municipal Green Team
2. Develop and distribute educational materials
3. Implement educational and training programs within the community
4. Change the behavior of residents, officials, municipal employees, and contractors while implementing best management practices
5. Reduce energy and resource consumption
6. Reduce nutrients and sediment in stormwater runoff and conserve water
7. Better develop our lands and become stewards of our environment
8. Provide hands-on experiences for citizens in taking the first steps towards building a sustainable community

**FUNDING OPPORTUNITIES**



Non-competitive funding



Competitive funding



# Sustainable Jersey Actions

Earn up to 10 points

Community Partnership & Outreach	Funding	Bronze	Silver	Points	Select
<a href="#">Create Green Team</a>		M	M	10	<input type="checkbox"/>
<a href="#">Community Education and Outreach</a>				10	<input type="checkbox"/>
<a href="#">Energy Outreach and Incentive Programs</a> <small>Click to View Subactions</small>					
<a href="#">School-based Energy Conservation Programs</a>				10	<input type="checkbox"/>
<a href="#">Education for Sustainability Programs</a>				10	<input type="checkbox"/>
<a href="#">Green Challenges &amp; Community Programs</a>				10	<input type="checkbox"/>
<a href="#">Green Fairs</a> <small>Click to View Subactions</small>					
Diversity & Equity	Funding	Bronze	Silver	Points	Select
<a href="#">Diversity on Boards &amp; Commissions</a>				10	<input type="checkbox"/>
<a href="#">Environmental Justice in Planning &amp; Zoning</a>				10	<input type="checkbox"/>
<a href="#">Lead Education and Outreach Programs</a>				10	<input type="checkbox"/>
<a href="#">Lead-Safe Training Programs</a>				10	<input type="checkbox"/>
<a href="#">Cumulative Risk Assessment</a>				10	<input type="checkbox"/>
Energy Efficiency	Funding	Bronze	Silver	Points	Select
<a href="#">Energy Audits for Municipal Facilities</a> <small>Click to View Subactions</small>		P	P		
<a href="#">High Efficiency Municipal Buildings</a> <small>Click to View Subactions</small>					



# Sustainable Jersey Actions

Greenhouse Gas	Funding	Bronze	Silver	Points	Select
<a href="#">Municipal Carbon Footprint</a>		P	P	10	<input type="checkbox"/>
<a href="#">Community Carbon Footprint</a>				10	<input type="checkbox"/>
<a href="#">Climate Action Plan</a>				10	<input type="checkbox"/>
<a href="#">Wind Ordinance</a>				10	<input type="checkbox"/>
Green Design	Funding	Bronze	Silver	Points	Select
<a href="#">Green Building Policy/Resolution</a>				5	<input type="checkbox"/>
<a href="#">Green Building Training</a>				5	<input type="checkbox"/>
<a href="#">Green Design Commercial and Residential Buildings</a> <a href="#">Click to View Subactions</a>					
<a href="#">Green Design Municipal Buildings</a> <a href="#">Click to View Subactions</a>					
Health and Wellness	Funding	Bronze	Silver	Points	Select
<a href="#">Building Healthier Communities</a>				20	<input type="checkbox"/>
<a href="#">Anti-Idling Education &amp; Enforcement Program</a>				10	<input type="checkbox"/>
<a href="#">Safe Routes to School</a>				10	<input type="checkbox"/>
Land use & Transportation	Funding	Bronze	Silver	Points	Select
<a href="#">Sustainable Land Use Pledge</a>		P	P	10	<input type="checkbox"/>
<a href="#">Sustainability Master Plan Revision</a>				20	<input type="checkbox"/>
<a href="#">Complete Streets Program</a>				20	<input type="checkbox"/>
<a href="#">Municipal Planning and Zoning Self-Assessment</a>				10	<input type="checkbox"/>
Local Economies	Funding	Bronze	Silver	Points	Select
<a href="#">Buy Local Programs</a> <a href="#">Click to View Subactions</a>					
<a href="#">Green Business Recognition Program</a>				10	<input type="checkbox"/>
<a href="#">Green Jobs/Economic Development</a>				10	<input type="checkbox"/>



# Sustainable Jersey Actions

Food	Funding	Bronze	Silver	Points	Select
<a href="#">Support Local Food Subactions</a> <a href="#">Click to View</a>					
<a href="#">Food Production Subactions</a> <a href="#">Click to View</a>					
<a href="#">Planning for Local Food Production</a> <a href="#">Click to View Subactions</a>					
<a href="#">Farmland Preservation</a> <a href="#">Click to View Subactions</a>					
Natural Resources	Funding	Bronze	Silver	Points	Select
<a href="#">Environmental Commission</a>				10	<input type="checkbox"/>
<a href="#">Caring for Conservation Easements</a> <a href="#">Click to View Subactions</a>					
<a href="#">Natural Resource Inventory</a>		P	P	20	<input type="checkbox"/>
<a href="#">Open Space Plans</a>				10	<input type="checkbox"/>
<a href="#">Natural Resource Protection Ordinances</a> <a href="#">Click to View Subactions</a>					
<a href="#">Tree &amp; Woodlands Management</a> <a href="#">Click to View Subactions</a>					
<a href="#">Water Conservation Education Program</a>				10	<input type="checkbox"/>
<a href="#">Water Conservation Ordinance</a>		P	P	20	<input type="checkbox"/>
Operations & Maintenance	Funding	Bronze	Silver	Points	Select
<a href="#">Green Purchasing Program</a> <a href="#">Click to View Subactions</a>					
<a href="#">Grounds &amp; Maintenance</a> <a href="#">Click to View Subactions</a>					
<a href="#">Green Fleets</a> <a href="#">Click to View Subactions</a>		P	P		
<a href="#">Adopt Behavioral Policies</a>				5	<input type="checkbox"/>

Earn up to 10 points



# Sustainable Jersey Actions

Sustainability Planning	Funding	Bronze	Silver	Points	Select
<a href="#">Community Asset Mapping</a>				10	<input type="checkbox"/>
<a href="#">Community Visioning</a>				10	<input type="checkbox"/>
<a href="#">Sustainable Community Plan</a> Click to View Subactions					

Waste Management	Funding	Bronze	Silver	Points	Select
<a href="#">Recycling</a> Click to View Subactions					
<a href="#">Waste Reduction</a> Click to View Subactions					

Innovative Demonstration Projects	Funding	Bronze	Silver	Points	Select
<a href="#">Solar</a>				10	<input type="checkbox"/>
<a href="#">Wind</a>				10	<input type="checkbox"/>
<a href="#">Geothermal</a>				10	<input type="checkbox"/>
<a href="#">Green Roofs</a>				10	<input type="checkbox"/>
<a href="#">Raingardens</a>				10	<input type="checkbox"/>
<a href="#">Other</a>				10	<input type="checkbox"/>

Animals in the Community	Funding	Bronze	Silver	Points	Select
<a href="#">Companion Animal Management Plan</a>				20	<input type="checkbox"/>
<a href="#">Pledge Supporting NJ Wildlife Action Plan</a>				10	<input type="checkbox"/>
<a href="#">Wildlife Interaction Plan</a>				20	<input type="checkbox"/>
<a href="#">Animals in the Community Education</a>				10	<input type="checkbox"/>

Arts/Culture/Historic Preservation	Funding	Bronze	Silver	Points	Select
<a href="#">Strengthen School Arts Programs</a>				10	<input type="checkbox"/>
<a href="#">Historic Preservation Plan</a>				10	<input type="checkbox"/>

Earn up to 10 points



# Sustainable Jersey Actions

ACTION	POINTS
Community Education and Outreach	10
Water Conservation Education Program	10
Rain Gardens	10
<b>TOTAL</b>	<b>30</b>

The Water Resources Program is currently working with municipalities throughout New Jersey to implement programs that encompass these actions.

PROJECTS & PROGRAMS

**COMMUNITY  
EDUCATION & OUTREACH**

# Community Rain Barrel Programs

## One Barrel at a Time Co-op Program



artist: Tamara Petrosino



artist: Jon Horowitz



artist: Dorothy Cohen



artist: Helen Haniffy

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**WATER SAVERS**

**RUTGERS**  
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# One Barrel At a Time Co-op Program

- Aesthetic appeal, accessible to general public
- Highlights work of 35 local artists from communities all across NJ
- Earth Day – all barrels available for bid on eBay®



Painted rain barrels on display at East Greenwich Township Building.

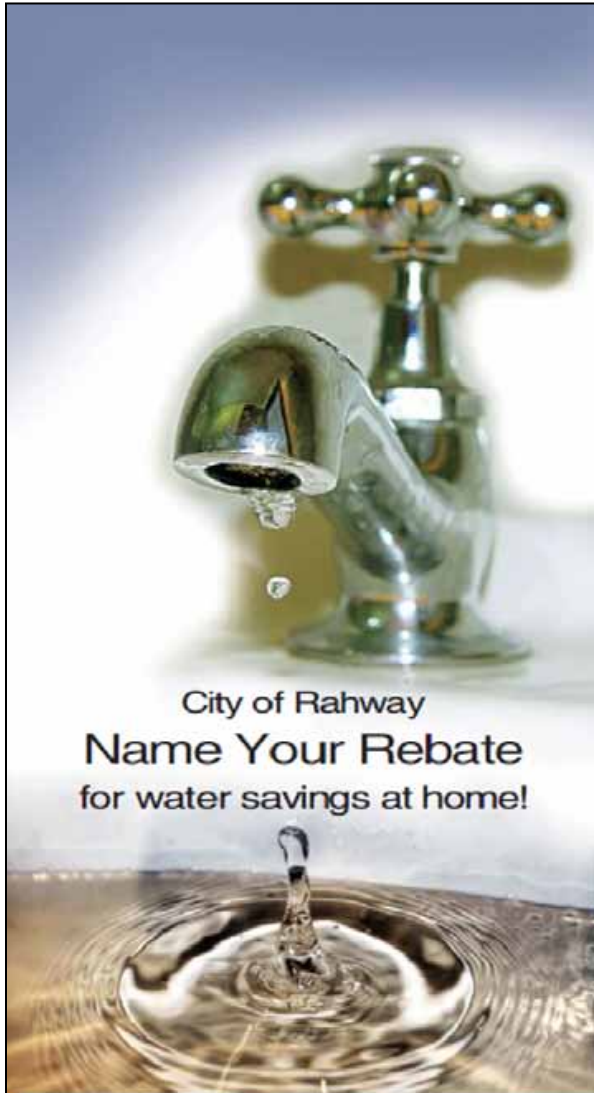
# One Barrel At a Time Co-op Program

1. Create a contract between sponsoring organization and artist
2. Each artist submits design
3. Artist agrees to have completed barrel on display at local venues with informational brochures
4. Profit from auction is remitted to the artist



Painted rain barrels on display at United States Environmental Protection Agency Region 2 headquarters in NYC.

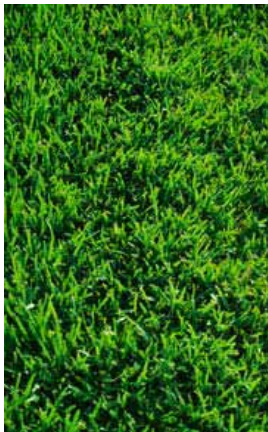
# “Name Your Own Rebate”



- Rahway Water Savings
- Reverse auction method
- Homeowners given opportunity to request rebate award at the dollar increment needed to purchase various water-saving products

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# Turf Management for a Healthier Lawn



- Problem: soil stripping
- Solution: 2 demonstration sites
  - 2-month long process of killing invading weeds
  - Install 55 yards of compost
  - Prepare soils
  - Hydro-seeding
- 1 demo site will feature Smart Irrigation System that accounts for soil moisture and atmospheric conditions when scheduling and applying water

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WATER SAVERS

NATURAL RESOURCES

**WATER CONSERVATION  
EDUCATION PROGRAM**



# Build-Your-Own Rain Barrel Workshop



**BUILD-YOUR-OWN  
RAIN BARREL  
WORKSHOP**

Montville Library  
Saturday, October 9, 2010  
9am - 11am or 11am - 1pm

Montville Library  
90 Horseneck Road  
Montville, New Jersey 07045

Directions:  
<http://montvillelib.org/directions.htm>

\$45 per barrel (55 gallon)

Fee includes 30 minute training, guidance,  
and all materials to retrofit rain barrel(s)!

Register on-line at  
[www.water.rutgers.edu](http://www.water.rutgers.edu)

REGISTRATION DEADLINE:  
**OCTOBER 4, 2010**

Sponsored by:  
**RUTGERS**  
New Jersey Agricultural  
Experiment Station



- Post flyers and distribute handouts
- \$45 Registration includes 30 minute training, guidance, and all materials to retrofit rain barrels

# Build-Your-Own Rain Barrel Workshop

Holmdel, NJ (June 6, 2010)



# Build-Your-Own Rain Barrel Workshop

New Brunswick, NJ (September 14, 2010)



# Build-Your-Own Rain Barrel Workshop

Burlington County, NJ (July 30, 2009)



# Build-Your-Own Rain Barrel Workshop

Union County, NJ (August 13, 2009)



# Build-Your-Own Rain Barrel Workshop

Middlesex County, NJ (July 28, 2009)



# Build-Your-Own Rain Barrel Workshop

Middlesex County, NJ (July 28, 2009)



# Peters Brook Neighborhood Program

- Somerset, NJ (Somerset County)
- Summer 2010
- Part of an initiative to reduce stormwater runoff and conserve water in the Peters Brook watershed
- Series of 4 rain barrel workshops
- Grant subsidized – lower cost at \$20 per barrel



# Peters Brook Neighborhood Program

- Preliminary survey results:
  - 94.1% installation rate (statewide 67% installation rate)
  - many participants already purchased or planning to purchase a 2<sup>nd</sup> or 3<sup>rd</sup> rain barrel

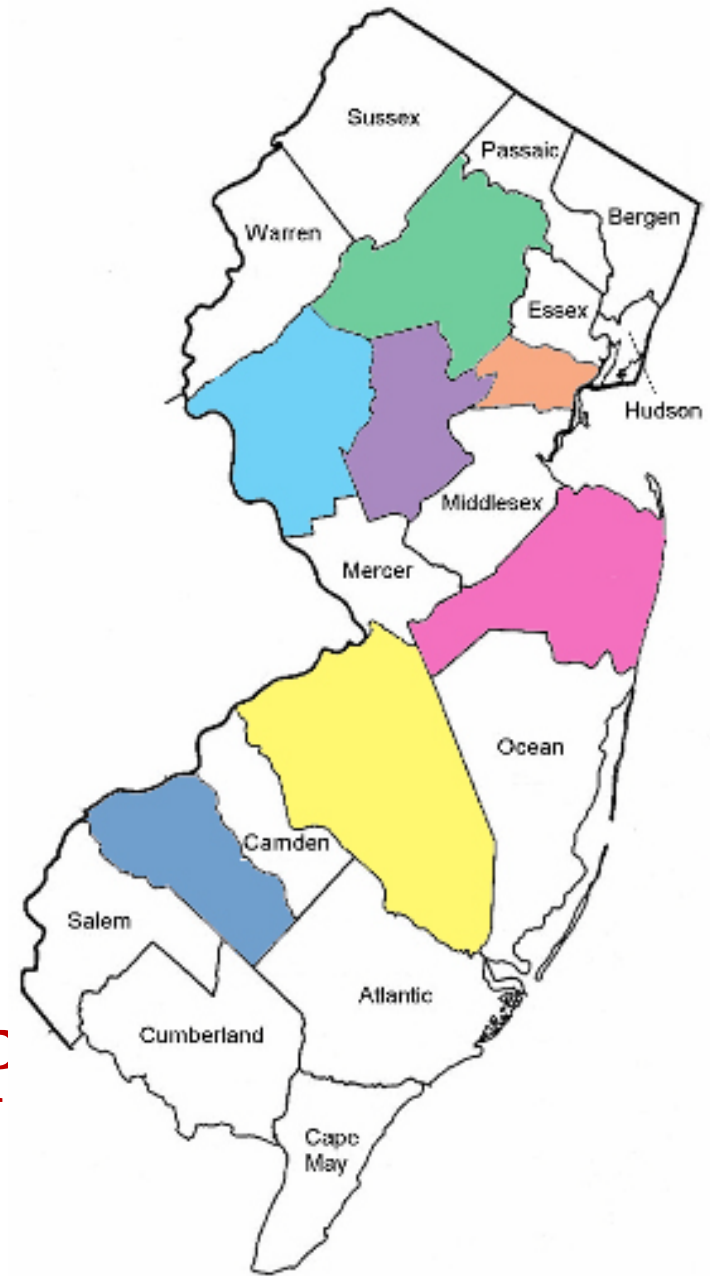


# Peters Brook Neighborhood Program



INNOVATIVE DEMONSTRATION PROJECTS

# **RAIN GARDENS & STORMWATER BME**



# STORMWATER MANAGEMENT IN YOUR BACKYARD

## Rain Garden

Water Quality and Habitat Enhancement Project

This garden is designed to intercept, treat, and infiltrate stormwater at the source, before it becomes runoff. The plants are native to the region and help retain pollutants that could otherwise harm nearby waterways.

Rain gardens are beautiful, low-maintenance, and inexpensive gardens that you can install at home.

[www.water.rutgers.edu](http://www.water.rutgers.edu)

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## EDUCATIONAL

1. Biotechnology High School (Freehold, NJ)
2. Hurffville Elementary School (Sewell, NJ)
3. Village School (Holmdel, NJ)

## RELIGIOUS

1. Holy Nativity Lutheran Church (Wenonah, NJ)

## MUNICIPAL

1. Springfield Township (Union County)
2. Belmar Township (Monmouth County)
3. Clawson Park (Ringoes, NJ)
4. Leonard Park (Rockaway, NJ)
5. Parsippany Troy Hills Municipal Building (Morris County)

# Biotechnology High School

- Freehold, NJ (Monmouth County)
- August 2009
- Student initiative
- Rain garden certification class project



# Installation



# Installation



# Completed





# Hurffville Elementary School

- Sewell, NJ (Gloucester County)
- October 2009
- PTO Funds
- Manages stormwater runoff from the sidewalk and a portion of one of the school's parking lots
- Student planting (Grades 1-5)



# Hurffville Elementary School



BEFORE



AFTER

# Hurffville Elementary School



BEFORE



AFTER

# Installation



# Village School

- Holmdel, NJ (Monmouth County)
- September 2010
- Holmdel Township Environmental Commission
- Holmdel Board of Education
- Monmouth County



# Village School



BEFORE

AFTER



# Village School



BEFORE

AFTER



# Village School



BEFORE



AFTER



# Village School



BEFORE

AFTER





# Indoor Learning



EnviroScape® Watershed Model



# Indoor Learning



# Student Planting

## Spring Rain Garden



# Student Planting

Fall Rain Garden



Spring Rain Garden



# Student Planting

Winter Rain Garden



Summer Rain Garden



# Completed

Summer Rain Garden



Spring Rain Garden



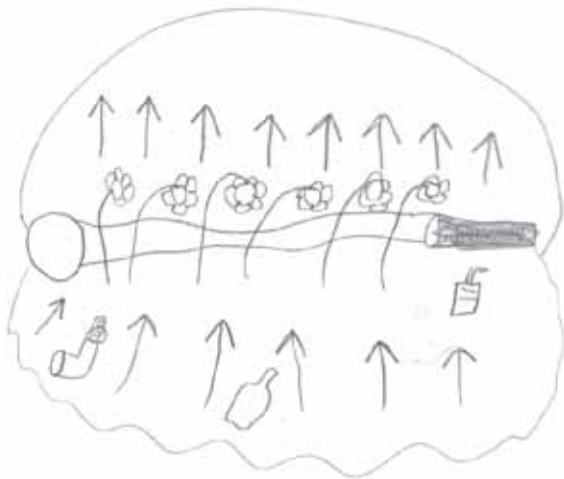


# Student Evaluations



# Student Evaluations

Rain gardens pull bad water in and let clean water out.



# Holy Nativity Lutheran Church

- Wenonah, NJ (Gloucester County)
- Summer 2008
- Master gardener and retiree
- Church involvement



# Holy Nativity Lutheran Church



# Completed



# Completed



# Completed



# 2 Years After Installation





# Springfield Township Municipal Annex Building

- Springfield, NJ (Union County)
- May 2007
- RCE of Union County
- Springfield Environmental Commission
- Springfield Public Works Department



# Installation



# Installation



# Completed



# Completed



# Silver Lake Rain Garden

- Belmar, NJ (Monmouth County)
- Fall 2009
- Belmar Borough Environmental Commission
- Monmouth County and RCE Master Gardeners
- Divert runoff from the road going into storm sewer leading into Silver Lake



# Installation



# Installation





# Completed



# Clawson Park

- Ringoes, NJ (Hunterdon County)
- Bioretention basin
- Clawson Park Project Coordinator
- 3 hour classroom training with demonstration project



# Clawson Park

## Existing Conditions



# Installation



# Installation



# Completed



# Leonard Park

- Boonton, NJ (Morris County)
- Rockaway Valley Garden Club
- Town donations
- Landscape supplier donations



# Installation





# Installation



# Completed



# Completed



# Parsippany-Troy Hills Town Hall

EXISTING



# Training



# Installation



# Installation



# Installation





# Completed



INNOVATIVE DEMONSTRATION PROJECTS

**OTHER OPPORTUNITIES**

# Irrigation Efficiency

- Belmar, NJ
- According to USEPA – nationwide, landscape irrigation is estimated to account for 1/3 of all residential water use
- 50% of water is wasted
- 2009 – NJ Water Savers and Middletown Sprinkler Company conducted irrigation audit of the Magical Garden in Belmar
- Study showed water savings of 58%



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# Irrigation Efficiency



# Rainwater Harvesting



- East Greenwich Township Board of Education
- Samuel Mickle School
- Middletown Sprinkler Company
- Spring Irrigation Company
- Two 500 gallon rainwater-harvesting tanks and irrigation system installed

# Rainwater Harvesting



Samuel Mickle School Rainwater Harvesting System

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# Rainwater Harvesting



Project WILD site at Samuel J. Mickle School in East Greenwich Township, NJ.

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# Rainwater Harvesting



Newly installed sprinkler head at the Project WILD site at Samuel J. Mickle School.



Newly installed control system at the Samuel J. Mickle School



# Smart Irrigation Controllers



- Thompson Soccer Field in East Greenwich Township
- Smart Irrigation Controllers use sensors and weather information to manage watering times and frequency
- 15-30% estimated water savings

# Detention Basin Retrofit Program

Hillsborough Detention Basin Retrofit Program  
Somerset County, NJ



VALIS ROAD



WESCOTT ROAD



PRALL ROAD



FRANCIS ROAD

## TABLE OF CONTENTS

SHEET C-1:	COVER SHEET
SHEET S-1:	VALIS AND PRALL ROAD
SHEET S-2:	FRANCIS AND UPDIKE STREET
SHEET S-3:	WESCOTT ROAD
SHEET S-4:	VALIS AND PRALL ROAD (ALTERNATIVE LANDSCAPING PLAN)
SHEET S-5:	FRANCIS AND UPDIKE STREET (ALTERNATIVE LANDSCAPING PLAN)
SHEET S-6:	WESCOTT ROAD (ALTERNATIVE LANDSCAPING PLAN)



UPDIKE ROAD

APRIL 30, 2009

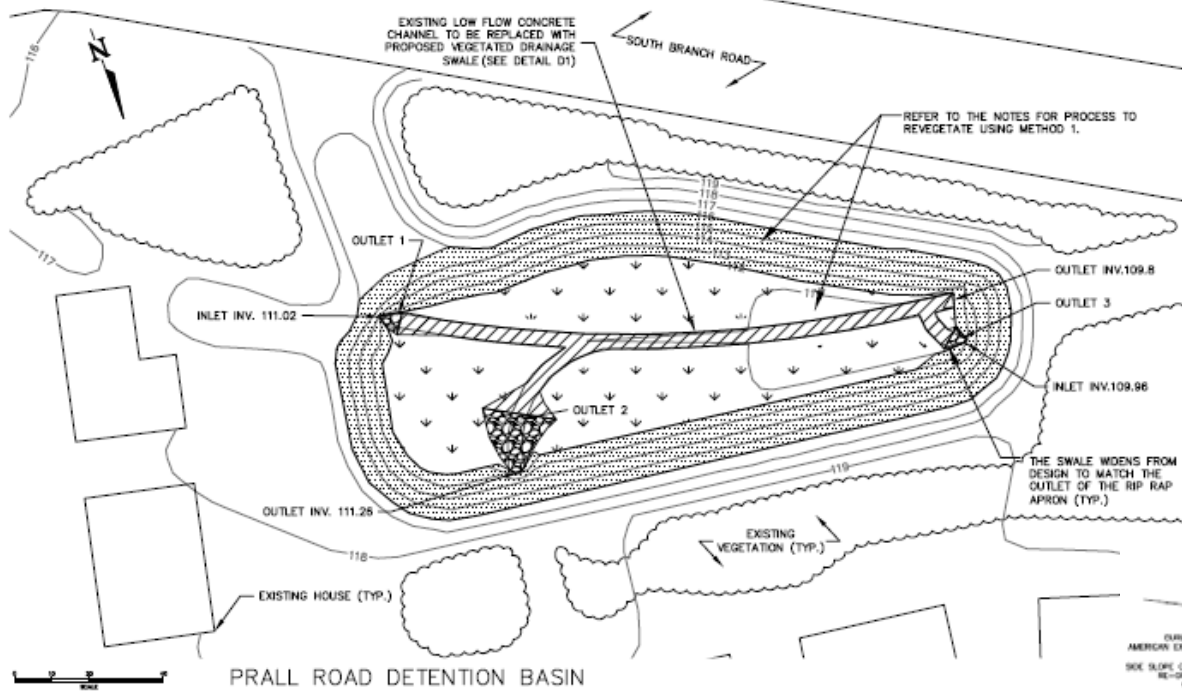
# RUTGERS

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# Detention Basin Retrofit Program

Hillsborough Detention Basin Retrofit Program  
Somerset County, NJ

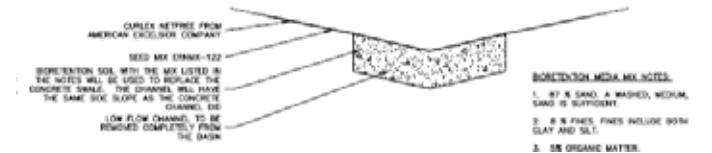
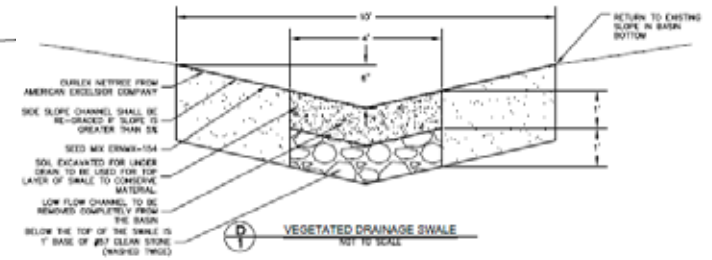
Prall Road



- NOTES:
1. THE RIP RAP APRONS OF PRALL ROAD WILL NOT BE ALTERED FROM THEIR EXISTING DESIGN.
  2. THE FIRST RESEEDING METHOD FOR THE BASINS ARE SHOWN ON SHEET S-2 AND S-3.
  3. THE SECOND RESEEDING METHOD FOR EACH BASIN IS SHOWN ON SHEET S-5.

**RIP RAP APRON DETAILS**

OUTLET	Lo (FT)	W (FT)	DSO (IN)
1	6	16	6
2	6	20	6
3	3	8	3



PRALL ROAD DETENTION BASIN

**LEGEND**

- |                                   |  |                            |  |
|-----------------------------------|--|----------------------------|--|
| ERNMX-127                         |  | EXISTING VEGETATION        |  |
| ERNMX-123                         |  | EXISTING CONTOURS          |  |
| PROPOSED VEGETATED DRAINAGE SWALE |  | EXISTING SW INFRASTRUCTURE |  |
| EXISTING RIP RAP APRON            |  | EXISTING INFRASTRUCTURE    |  |

# Detention Basin Retrofit Program

## Prall Road Detention Basin Retrofit Township of Hillsborough, NJ

### PROPOSED PLANTS SPECIES + QUANTITIES

Herbaceous plantings 4' on center:

- BIG BLUESTEM - 110 plugs
- INDIAN GRASS - 130 plugs
- LITTLE BLUESTEM - 125 plugs
- SWITCHGRASS - 130 plugs

Herbaceous plantings 3' on center:

- FOX SEDGE - 80 plugs
- SOFT RUSH - 45 plugs

**620 PLANTS TOTAL**



↑ NORTH  
Scale 1:10

- EXISTING SITE ELEMENTS**
- EXISTING VEGETATION
  - EXISTING LOW FLOW CONCRETE CHANNEL
  - EXISTING RIP RAP APRON
  - EXISTING RESIDENCE
  - DIRECTION OF WATER FLOW

# Always remember...

1. Sustainability is more than getting 150 points
2. People often want to take action, but need guidance
3. Don't be afraid to ask for help
4. Sustainability doesn't have to be expensive
5. Rutgers Cooperative Extension is a resource for you and your community

# CONTACTS

PROGRAM	CONTACT	PHONE	EMAIL
WATER CONSERVATION	Elaine Rossi	732-932-9800 ext. 6129	erossi@aesop.rutgers.edu
RAIN GARDEN PROGRAMS	Amy Boyajian	732-932-9800 ext. 6164	boyajian@envsci.rutgers.edu
STORMWATER BMP PROJECTS	Jeremiah Bergstrom	732-932-9800 ext. 6126	jbergstrom@envsci.rutgers.edu
RAIN BARREL PROGRAMS	Sara Mellor	732-932-9800 ext. 6163	saramellor@envsci.rutgers.edu

[www.water.rutgers.edu](http://www.water.rutgers.edu)

# GRANT FUNDING OPPORTUNITIES

- Sustainable Jersey – Small Grants Program
  - <http://www.sustainablejersey.com/resources.php>
- ANJEC – Smart Growth Planning Grants
  - <http://www.anjec.org/index.htm>
- NJ Watershed Institute
  - <http://www.thewatershedinstitute.org/resources/twig/index.php>
- NJ American Water – Environmental Grant Program
  - <http://amwater.com/corporate-responsibility/Environmental-Sustainability/environmental-stewardship-and-innovation/environmental-grant-program.html>
- Johnson & Johnson grants:
  - [http://thesah.org/template/page.cfm?page\\_id=15](http://thesah.org/template/page.cfm?page_id=15)

# GRANT FUNDING OPPORTUNITIES

- Home Depot Building Healthy Communities Grant
  - <http://corporate.homedepot.com/wps/portal/Grants>
- Lowe's Charitable and Educational Foundation
  - [http://www.lowes.com/cd\\_Corporate+Citizenship\\_674540029](http://www.lowes.com/cd_Corporate+Citizenship_674540029)
- NJ Dept of Health and Senior Services Healthy Community Development Mini-Grant
  - <http://www.state.nj.us/health/fhs/shapingnj/grantopportunities.shtml>
- The Big Help Grant Program: "Million Dollars for a Million Moves" – Projects for Schools & Children
  - <http://pro-social.nick.com/grant-application/>



# QUESTIONS?



## *Rutgers Cooperative Extension Water Resources Program*

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# Upcoming Seminars

## *Green Infrastructure Planning, Design & Implementation: Training for Design Professionals*

Tuesday, November 30, 2010

1:00-3:00PM

Sussex County Administrative Center

## *Spring Seminars*

*Details and schedule to come. Topics to include:*

- 1. Streamside living and open space management*
- 2. Green alternatives and opportunities for homeowners*
- 3. Green alternatives and opportunities for commerce/business/industry*
- 4. Build-Your-Own Rain Barrel Workshop*
- 5. Rain garden training and certification*

Visit [www.water.rutgers.edu](http://www.water.rutgers.edu) to register for each seminar.