DISTRICT DEPARTMENT OF THE ENVIRONMENT

green forward

DISTRICT OF COLUMBIA

2011 NONPOINT SOURCE POLLUTION PROGRAM

ANNUAL REPORT

February 2012

Greening OUR HOUSE: Workers installing vegetated sedum carpet on retrofitted roof at 1200 First Street, NE

District of Columbia
Department of the Environment
Watershed Protection Division

Table of Contents

I. Mission and Goals of the District of Columbia's Nonpoint Source Program

The mission of the District of Columbia's Nonpoint Source Program is to prevent and control nonpoint source pollution in the District's watersheds. Employing both regulatory and non-regulatory approaches, the Program works to safeguard the city's water and soil resources as well as the health and welfare of citizens using those resources.

Long-term goals and short-term milestones to mark progress toward those goals are outlined in the *District Nonpoint Source Management Plan II: Addressing Polluted Runoff in an Urban Environment* (2000). The Plan is aimed at reducing nonpoint source pollution from urban runoff, construction, and hydrologic/habitat modification and includes:

- Supporting activities that reduce pollutant loads from urban runoff, construction activity, combined sewer overflows and trash disposal for the purpose of attaining present designated uses by 2015 and future designated uses by 2025.
- Supporting programs and activities that strive to restore and maintain healthy natural habitat, species diversity and necessary base flow to all of the Anacostia River tributaries by 2015 and to all surface waters of the District of Columbia by 2025 by restoring degraded watersheds and preserving healthy ones.
- Coordinating the District Nonpoint Source Program efforts with other District, federal, not-for-profit, environmental advocacy, private sector programs and adjoining jurisdictions to deliver the best possible nonpoint source pollution prevention and control services in the District of Columbia with the resources available.
- Carrying out effective information and education campaigns on nonpoint source pollution prevention to targeted audiences who live, work, teach or visit in the District of Columbia and its watersheds, reaching at least ten thousand (10,000) individuals each year.

DC's Nonpoint source management program has also created three detailed Watershed Implementation Plans (WIPs) for three major watersheds in the District. Of these plans, the *Oxon Run WIP* (approved 2010) and the *Rock Creek WIP* (approved 2010) have been approved by EPA. Additionally, the District participated in the development of the Army Corps of Engineers facilitated Anacostia Watershed Restoration Plan which was released to the public in April of 2010. These plans lay out waterbody impairments, technically appropriate implementation projects, and timelines that guide DDOE in its work.

The District Department of the Environment (DDOE) assesses the health of all significant waterbodies in the District, and prioritizes water quality improvement efforts based on data gathered from water quality monitoring. DDOE then characterizes waterbody impairments and threats; these characterizations are included in the District of Columbia's Section 305(b) reports as required by the federal Clean Water Act. The reports describe many of the District waterbodies as not supporting their swimmable (primary contact recreation) and fishable (fish consumption) designated uses.

Urban stormwater runoff is a prevalent source of pollutants to District of Columbia waterbodies. Primary nonpoint source pollutants of concern include nutrients, sediment, toxicants (Heptachlor Epoxide and DDE), pathogens and hydrocarbons. The few waterbodies that partially or fully support a designated use are also threatened by nonpoint source pollutants. A process to prioritized subwatersheds for nonpoint source implementation in the District can be found in the Watershed Implementation Plans referenced above. To properly address the water quality problems associated with the District's urban environment, the District amended its approved Nonpoint Source Management Plan (1989) and created the *Nonpoint Source Management Plan II: Addressing Polluted Runoff in an Urban Environment* (2000). This document outlines a comprehensive strategy for managing nonpoint source pollution in an urban

environment in an effort to restore beneficial uses by the year 2025. The Plan sets goals and objectives of specific milestones that will be achieved.

This annual report is written in response to *Sections 319 (h)(8) and (11) of the Clean Water Act (33 USC 1329)*, for the purpose of documenting progress made in fiscal year 2011 by the District of Columbia in implementing its *Nonpoint Source Management Plan II: Addressing Polluted Runoff in an Urban Environment* (2000).

II. Regulatory Management

The District employs both regulatory and non-regulatory approaches to reach its nonpoint source milestones. The Branches within the Watershed Protection Division responsible for regulatory management are the Sediment and Stormwater Technical Services Branch and the Inspection and Enforcement Branch.

These branches aim to ensure that any development or construction activities occurring within the District properly control potential erosion or runoff from their sites and properly adhere to all federal and city laws relating to floodplains and waterways. In addition, they ensure that Best Management Practices (BMPs) are installed correctly and receive appropriate maintenance and upkeep.

A. Sediment and Stormwater Technical Services Branch

The Branch reviews construction and grading plans for stormwater management, erosion and sediment control, and flood plain management considerations. As required by EPA regulations regarding new construction permits, all new construction in the District must have Storm Water Pollution Prevention Plans (SWPPPS) that "identify all potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges from the construction site."

The District already has strong erosion and sediment control regulations in place, requiring an erosion and sediment control permit for any land disturbance over 50 square feet. In comparison, other jurisdictions require that these permits be filed when more than 5,000 square feet of soil are disturbed. Furthermore, the DDOE has published the *District of Columbia Soil Erosion and Sediment Control Standards and Specifications* and the *DC Storm Water Management Guidebook*. These documents are used by DDOE in the plan review process for new construction.

In FY2011 the Sediment and Stormwater Technical Services Branch accomplished the following:

- Reviewed 2057 building permit applications and plans for regulatory compliance.
- Processed 23 Environmental Impact Screening Forms (EISFs) after they were reviewed for regulatory compliance.
- Provided 3800 customers with technical assistance.
- Filed 44 EPA Stormwater Notices of Intent (NOIs) for construction activities with land disturbance one acre and greater.

In addition to these regulatory actions, engineers from the Technical Services Branch regularly attend relevant trainings on new stormwater technologies. They also attend regional workshops related to stormwater control and Chesapeake Bay restoration efforts. Some examples of this include:

- Three staff engineers attended a presentation on foam glass for use as a water tight material in green roof construction. The presentation was given by an international consulting firm.
- Three staff engineers attended a presentation on *Rainwater Harvesting, Infiltration and Ex-filtration BMPs* and *Hydrodynamic Systems*. The presentation was given by the CONTECH consulting firm.

- Eight staff engineers participated in a Webinar training on *Rainwater Harvesting* delivered by the Center for Watershed Protection.
- Two staff members attended the Chesapeake Bay Urban Stormwater Workgroup meeting in Annapolis, MD on "WIPs". They also participated in a number of conference calls by the group to discuss issues related to urban inputs to the Bay's Watershed Model as well as review guidance and jurisdictional representations on various BMP Panels.
- Two staff engineers attended a one-day COG Workshop on *The Impacts of Climate Change and Sea Level Rise* in relation to local planning efforts.
- Three staff engineers participated in a Webcast training on *The Design, Installation and Maintenance of Constructed Wetlands and Regenerative Stormwater Management*.
- One staff engineer participated in an EPA Webinar training on the draft *MS-4 Construction General Permits*.
- Four staff engineers attended an in-house presentation on the District's Stormwater Fee Discount Program.

B. Inspection and Enforcement Branch

The District has a strong Inspection and Enforcement Branch that inspects construction sites throughout the District to make sure they are in compliance with District regulations. DDOE regularly inspects existing stormwater management facilities to ensure that they are in proper working order. It also inspects Best Management Practices (BMPs) to ensure they are adequately maintained. In addition, the DDOE Inspection and Enforcement Branch is responsible for investigating citizen complaints relating to soil erosion and drainage problems, and recommending appropriate solutions.

DDOE also performs outreach to industrial and construction facilities through workshops, brochures, and site inspections. DDOE personnel use inspections to promote awareness of the proper methods of facility maintenance for stormwater regulation compliance. To aid facilities in ensuring proper maintenance of stormwater management facilities, DDOE has established and published guidelines for their proper maintenance.

Lawrence Omoregbe, Environmental Engineer for the Watershed Protection Division, Inspection and Enforcement Branch, inspects a stormwater management facility

In FY2011 the Inspection and Enforcement Branch accomplished the following:

- Conducted 5899 inspections at construction sites for enforcement of erosion and sediment control and stormwater management regulations.

- Took 138 enforcement actions, including stop-work orders and civil infractions, to strengthen enforcement activities.
- Conducted 111 investigations for erosion, drainage and related complaints.
- Inspected 2524 stormwater management facilities to ensure proper functioning of these facilities.
- Inspected 320 BMPs for proper maintenance.
- Continued to develop outreach materials, including brochures, web material and presentations.
- Continued to work with DCRA toward the inclusion of stormwater management in their Certificate of Occupancy process.
- Added two new staff members.

DDOE inspectors are now using toughbooks in the field and Watershed Protection Division continues to work on automating inspection forms for all Inspection and Enforcement operations as a move toward a total paperless process. Desktop computers will no longer be provided to inspectors since portable toughbooks have replaced them. This is expected to streamline regulatory operations by allowing inspectors to have a complete inspection history of any sites while in the field, including inspections related to other media.

III. Non-Regulatory Management

Through non-regulatory programs, the District educates community members about nonpoint source pollution and how their actions contribute to it, with the ultimate goal of changing personal behavior for an effective long-term solution. Additionally, the District tests and develops innovative approaches to urban nonpoint source pollution reduction, increases acceptance and implementation of Low Impact Development (LID), and provides support and financial incentives for citizens wishing to implement LID and pollution prevention techniques.

A. Planning and Restoration Branch

This Branch of the DDOE, Watershed Protection Division, sponsors and conducts non-regulatory programs and activities that protect and restore river, stream, and wetland habitats in the District and increase the ecological diversity of the District of Columbia and Chesapeake Bay watersheds.

With the goal of changing personal behaviors to achieve an effective long-term solution, DDOE, Watershed Protection Division, educates community members about nonpoint source pollution and how their actions contribute to it. Additionally, the Planning and Restoration Branch tests and develops innovative approaches to urban nonpoint source pollution reduction, increases acceptance and implementation of Low Impact Development (LID), and provides support and financial incentives for citizens wishing to implement LID and pollution prevention techniques.

Some of this non-regulatory work includes:

- Wetland and river habitat creation and restoration programs
- Providing technical advice on the application of Low Impact Development (LID) and innovative Best Management Practices (BMPs) technology
- Administering RFPs to fund LID retrofits
- Education and outreach programs
- RiverSmart Rooftops program (Green roof incentive program)
- RiverSmart Homes program
- RiverSmart Schools program
- Pollution prevention programs

Green Roof Rebate/Retrofit Program

Historically, the District has offered a rebate for installation of a new green roof or the retrofit of an existing roof. Programs offered through DDOE provided varying rebate amounts with varying constraints. For 2012, DDOE has restructured this rebate program to offer a single application process and set dollar rebate of $5 per square foot regardless of the roof size.

Additionally, the city has been aggressively retrofitting their existing rooftops with green roofs and installing vegetated roofs on new city-owned buildings. As a result of this push,

Washington, DC is second only to Chicago in the square footage of green roofs installed. In 2011, DDOE provided rebates for and in some instances fully funded the installation of 425,547 square feet of green roofs on the rooftops of 2 private and 6 District buildings.

Stream Restoration

Stream restoration is the act of modifying the current channel of a stream in an attempt to improve the environmental health and habitat of the waterway. Urban streams face immense pressure from high stormwater flows due to runoff from impervious surfaces. The erosion we see in urban streams is the

stream's way of adjusting to accommodate the new (geologically) flow regime it is experiencing. Stream restoration attempts to create a new channel that is in stasis with the flows it experiences.

Bingham Run and Milkhouse Ford Projects

These two restoration projects serve to demonstrate the effectiveness of regenerative stormwater conveyances along Oregon Avenue in Northwest D.C. A regenerative stormwater conveyance (RSC), also known as a coastal plain outfall, is a specialized type of low impact development technique that uses stream restoration techniques to create a dependable open channel conveyance with pools and riffle-weir grade controls to create a system of physical features, chemical processes, and biological mechanisms that greatly reduce erosive forces and positively impact the ecology of a drainage area. The RSC installations will reduce erosion and decrease pollutants reaching Rock Creek by slowing down and infiltrating stormwater runoff from Oregon Avenue.

These projects are a unique partnership between the District and the National Park Service (NPS) to control stormwater from District lands while restoring intermittent streams on NPS land. It is hoped that DDOT and DC Water will adopt these techniques in future roadway and storm sewer upgrades that are adjacent to or drain onto NPS land or open space. The two systems were installed with funding from the EPA's 319 program (Bingham Run) and the American Reinvestment and Recovery Act of 2009 (Milkhouse Ford).

Milkhouse Ford - fall 2011(post restoration)

Nash Run

Nash Run is located in northeast Washington, DC, and is a first-order tributary of the Anacostia River. The headwaters of the stream are located in Prince George's County, Maryland, but 75% of the watershed is within the borders of the District. The stream is piped, beginning in Prince George's County, and outfalls east of Kenilworth Avenue in northeast DC. The Nash Run sewer shed encompasses a 229-acre area in the District, 112 acres (49%) of which is impervious.

The heavily urbanized character of the Nash Run watershed, and its consequent imperviousness, result in flashy and intense stream flows, even during the most moderate of storms. Considerable amounts of trash and debris wash out of the storm sewer system during rain events, choking portions of the stream and causing areas for ponding and mosquito breeding. The resulting hydrologic alterations have deteriorated the water quality of Nash Run and degraded natural habitat downstream of the outfall. A study on trash in the Anacostia River estimated that Nash Run produces approximately 3% of the total trash from the District that washes into the Anacostia River. Beginning in 2011, DDOE funded the design of a system to capture trash at the end of the storm sewer system as well as the restoration designs for an 800-foot

section of the stream valley using floodplain reconnection design techniques. DDOE plans to implement these designs in 2013.

Springhouse Run Stream Restoration

Springhouse Run is a remnant of one of the original tributaries to Hickey Run, a tributary of the Anacostia River, with a drainage area of approximately 100 acres. The majority of the tributary is stable, although it is highly altered and armored in most areas. The armoring has resulted in a stream with poor habitat value and very limited ability to trap sediment and uptake nutrients.

Springhouse Run – winter 2011 (pre-restoration)

The Watershed Protection Division is coordinating the design of a stream and habitat restoration for Springhouse Run. The stream will be reconnected to its historic floodplain and its sinuosity will be restored. This project reach measures approximately 1,600 feet in length and lies entirely within the U.S. National Arboretum. DDOE is partnering with the U.S. Department of Agriculture, Agricultural Research Service, which owns the Arboretum, to complete this project.

An additional component of this project is to construct a bioretention facility in the circular drive at the entrance to the Arboretum Visitor Center and additional bioretention facilities in the Visitor Center parking lot at the R Street entrance to the Arboretum. This project is being funded in part with EPA 319 funds.

Broad Branch

The goal of this project is to daylight a 1,600 foot portion of Broad Branch, a tributary to Rock Creek in Northwest DC. Daylighting a stream is the act of restoring to the open air some or all of the flow of a previously covered creek, or stormwater drainage. Daylighting this section of the Rock Creek watershed will improve water quality at the location and downstream water quality by exposing water to sunlight, air, soil, and vegetation, all of which help process and remove pollutants. Furthermore its restoration will reduce nutrient and sediment pollution from erosion caused by fast flowing stormwater by creating meanders and floodplain wetlands which will have a wider cross-section and a greater channel depth than the pipe it will replace. Additional surface flow from adjacent streets and rooftops may be able to be directed to the area by creating curb cuts and redirecting storm sewers to the area further slowing, cooling, and filtering

Broad Branch (pre-restoration)

stormwater in the subwatershed. The Broad Branch daylighting will also likely include two Regenerative Stormwater Conveyances and is undergoing an Environmental Assessment prior to completing the designs and commencing construction. This project is being funded with EPA 319 funds.

Watts Branch Stream Restoration Project

The District Department of the Environment, the U.S. Fish and Wildlife Service and the Natural Resources Conservation Service of USDA completed a restoration project for the Watts Branch tributary of the Anacostia River in Washington, DC from Southern Avenue to Minnesota Ave. NE. The stream restoration project used Natural Channel Stream Design (NCD) practices over a 1.7 mile stretch of stream on District property. Through the natural channel design method a series of in-stream structures were installed (cross vanes, j-hooks, and vane arms) to keep the high velocity flows in the center of the stream channel thus minimizing erosive forces on the stream banks. NCD also creates a series of pools and riffles that both create areas for fish habitat and offer grade control on the stream. In addition to the in-stream work the project also entailed the creation of bankfull benches for energy dissipation during high flow events further reducing bank erosion. The final component of the project was to plant thousands of trees and shrubs along the stream corridor to increase the riparian area along the stream.

Watts Branch-summer 2011 (post restoration)

The project will reduce stream bank erosion, improve water quality, and restore aquatic habitat. Estimates show that this stream project will help reduce total suspended solids (TSS) in Watts Branch by 45,778 lbs/yr, nitrogen (N) by 359 lbs/yr, and phosphorous (P) by 63 lbs/yr. Through the aforementioned water quality improvements coupled with in-stream structures and an improved riparian corridor DDOE anticipates an improvement in aquatic species over the ensuing years. In the years to come DDOE will be actively monitoring the stream to look for an increase in macro-invertebrates, improvements in water quality, and changes in geomorphology.

Stream restoration is one part of a multi-agency, collaborative effort to improve water quality of the Watts Branch watershed and the Anacostia River. Other projects include rehabilitating sanitary sewers, constructing stormwater management facilities, and reducing the amount of stormwater runoff from impervious areas. This project was funded with EPA 319 funding, local funds, and a grant from the National Fish & Wildlife Foundation.

Pope Branch Regenerative Stormwater Conveyances

At three different locations DDOE installed regenerative stormwater conveyances to help catch and filter stormwater runoff from the streets that drain into the Pope Branch tributary of the Anacostia River. A regenerative stormwater conveyance (RSC), also known as a coastal plain outfall, is a specialized type of low impact development technique that uses stream restoration techniques to create a dependable, open-

channel conveyance with pools and riffle-weir grade controls to create a system of physical features, chemical processes, and biological mechanisms that greatly reduce erosive forces and positively impact the ecology of a drainage area. The RSC installations will reduce erosion and decrease pollutants reaching Pope Branch and the Anacostia River by slowing down and infiltrating stormwater runoff from streets along Pope Branch.

This project was implemented using American Recovery and Reinvestment Act of 2009 funding and was a partnership between DDOE and the District Department of Parks and Recreation.

Pope Branch Stream Restoration and Sewer Line Replacement

Located in southeast Washington, DC, Pope Branch is a 1.6-mile first-order tributary of the Anacostia River. The entire stream lies within DC city boundaries. The primary land uses of the 250-acre watershed are parkland and residential lands. Pope Branch is listed on the 303-D List for bacteria, organics, and metals. The primary sources of pollutants are stormwater runoff from yards, streets, and parking lots as well as an aging sanitary sewer that runs along the stream.

Pope Branch (pre-restoration)

This project has multiple components, all of which will work toward improving the water quality of Pope Branch. DDOE, DCWASA, and the District Department of Parks and Recreation have partnered on a stream restoration and sewer replacement project in the Pope Branch tributary of the Anacostia River. Located in Southeast, Pope Branch parallels Massachusetts Ave. and Pennsylvania Ave. SE and lies in a watershed that is predominantly single family homes. Due to high volume and velocity stormwater flow that enter the stream, substantial bank erosion has compromised the stream banks and has exposed the sewer line in several areas. Additionally, DDOE has funded the construction of several LID storm water retrofits to begin addressing the issue of untreated storm water runoff in this subwatershed. DDOE has worked with a small citizens group, the Pope Branch Park Restoration Alliance, to help organize neighborhood activities such as trash clean ups.

Following sewer line work which will bury the sewer line deeper under the existing stream, the stream itself will be restored using base flow channel design. After years of the stream incising and becoming disconnected from its natural floodplain, the stream will be reconnected to its floodplain which will help dissipate the energy of water in the stream by allowing it to spread out into the floodplain. A series of weirs and steps pools will also help reduce the in-stream erosive forces while also creating areas for

increased habitat and nutrient uptake. The project will result in the creation of a healthy floodplain forest that enhances water quality and habitat conditions.

The PennBranch community lies within the Pope Branch watershed and was the pilot community for DDOE's RiverSmart Homes program. Trees, rain barrels, and rain gardens were installed at homes throughout the PennBranch community to help catch, slow, and filter the stormwater that runs-off of residential properties ending up in the Pope Branch stream.

B. Environmental Education and Outreach

DDOE, Watershed Protection Division, sponsors and conducts environmental education and outreach activities targeted to teachers, environmental educators and students throughout the District. These programs and resources include the following:

Conservation Education (Project Learning Tree, Project WET, and Project WILD)

These internationally recognized programs are utilized to train educators in innovative techniques for exploring a wide range of environmental concepts with students and teaching critical thinking skills that lead to environmental stewardship (grades K-12).

Environmental Protection Specialist, Trinh Doan, hosts a rainbarrel installation workshop for 15 teachers at the Walker Jones EC farm

Teacher Training Workshops

Teacher-training workshops in environmental education can provide teachers with continuing education credits through accredited environmental curriculums that support the DCPS teaching and learning standards and provide students with meaningful environmental education experiences via outdoor activities and events.

- The Watershed Protection Division hosted a rain barrel installation demonstration workshop at the Walker Jones EC farm for 15 teachers on Thursday, Sept. 29, 2011.
- On October 28, 2011, at the Anacostia River Environmental Center (AREC), Watershed Protection Division, Fish and Wildlife Division, and DCEEC staff presented and hosted a 6-hour watershed and aquatic education workshop for eight (8) DCPS after-school coordinators from seven (7) District schools. Teachers and presenters canoed down the Anacostia River to observe the river and the wildlife that it has to offer. Other hands-on activities included invasive plant removal, watershed model construction, a water quality test kit demo, and a rain barrel installation demonstration. Teachers received six recertification credits for attending the training workshop and walked away with funding and environmental education resources.

RiverSmart Schools

RiverSmart schools works with applicant schools to install Low Impact Development (LID) practices to control stormwater. These practices are specially designed to be functional as well as educational in order to fit with the school environment. Additionally, schools that take part in the RiverSmart Schools

program receive teacher training on how to use the sites to teach to curriculum standards and how to properly maintain the sites.

In FY 2011 DDOE, Watershed Protection Division accomplished the following:

- Provided 27 teachers with a 4-day workshop on RiverSmart schools site usage and programming.

Stokes Public Charter

- Installed permeable pavement with sufficient depth to infiltrate both the stormwarer generated from the parking area of approximately 7,000 square feet and from the impervious roadway and play area upslope of the parking lot.
- Removed a 1.5 foot diameter invasive tree and planted a native shade tree and shrubs along the north end of the permeable parking lot.
- Created an outdoor classroom on the southern side of the campus with seating for 30

Hardy Middle School

- Awarded Hardy Middle School a RiverSmart Schools grant to build a new wetland area, butterfly garden and vegetable garden on a marshy patch of grass next to the impervious tennis courts.
- Provided students in 6th and 7th grades with lessons about their local environment and watershed and engaged students in wetland planting activities.

Benjamin Banneker High School

- Coordinated the installation of a flow-through, bioretention planter and a 500 gallon cistern to capture and store rainwater from the rooftop.
- Installed built-in seating for students using the courtyard.

Walker Jones Education Campus

The DDOE, Watershed Protection Division, Planning and Restoration Branch staff oversaw and contracted the construction of a 45' x 12' covered classroom and a 1,300 gallon cistern installation at the Walker Jones Education Campus, one of the five selected schools in the RiverSmart Schools program. The construction and installation took three (3) weeks with students helping to lay down the donated mulch under the covered classroom. Since the completion of the project, more than 250 students (Walker Jones EC and visiting school

Installation of a covered classroom and a 1,300 gallon cistern enhance the schoolyard conservation site at Walker Jones EC

students) have used the shelter and have been taught about rain water harvesting.

District of Columbia Environmental Education Consortium (DCEEC)

DDOE helps to organize a network of environmental educators throughout the city so that ideas and resources can be shared among them. DCEEC provides opportunities for networking, event coordination and program partnering among its members. The members provide environmental expertise, professional development opportunities, curricula and resources, and hands-on classroom and field studies to District schools.

- DDOE and the DC Environmental Education Consortium (DCEEC) hosted their 5th Annual D.C. Teacher's Night at the U.S. Botanical Gardens on September 22, 2011. 250 participants came to explore the exhibits of 40 environmental organizations. Teachers met with local environmental educators for connection with EE opportunities both inside and outside the classroom. Participants also took part in hands-on experiments and left with lesson plans for their classrooms.
- DDOE and the DC Schoolyard Greening Committee of DCEEC coordinated the 5th Annual D.C. School Garden Week. This week is dedicated to highlighting the more than 100 School Gardens that have sprouted up all over the city, ranging from a few containers to small-scale farms. School Gardens are valuable resources for engaging all grade levels and teaching across the curriculum. They are used to teach everything from science and math to language arts and nutrition. School Garden spaces play an important role in the health of our schools and the environmental literacy of our students and teachers. In FY2012 DDOE is challenging schools to take their gardens to the next level by engaging students in garden-related activities, building on their existing garden programs, and creating new gardens.

Students at Walker Jones EC engage in garden-related activities at the 5th Annual D.C. School Garden Week

The Anacostia River Environmental Education Fair

This annual outdoor event offers District school children a variety of educational experiences designed to promote in them a conservation and stewardship ethic toward their watersheds, the Anacostia and Potomac Rivers, and the Chesapeake Bay. The fair also provides additional resources to District teachers interested in enriching their curriculum through environmental studies. The fair took place on Friday, May 6, 2011. In total the fair included six DCPS schools, thirty-eight teachers, four hundred students, and nineteen exhibitors were a part of the event. Students took part in activities on and off the water and learned about human behaviors and the connections between the health of their watersheds and the Bay.

Meaningful Watershed Educational Experiences (MWEEs)

As part of DDOE's sub-grant program several initiatives were funded for non-profit partners to create meaningful watershed educational experiences for hundreds of District young people. Outcomes include:

- Alice Ferguson Foundation (AFF), with DDOE funding, successfully conducted 10 overnight field-study trips for 237 4th and 5th grade students at Hard Bargain Farm from May 17 through October 4, 2011. AFF provided 20 MWEE hours and 4 follow-up hours for 237 students.
- Living Classrooms of the National Capital Region provided 398 MWEE hours and 20 hours of follow-up for 913 4th and 5th grade students.
- The National Council for Science and the Environment provided 398 MWEE hours and 17 hours of follow-up for 415 students.

C. Pollution Prevention

RiverSmart Homes Program

Since 2008 DDOE has developed a Low Impact Development (LID) retrofit program aimed at single family homes. The program started with eight demonstration sites – one in each Ward of the city. It then expanded to a pilot program in the Pope Branch watershed of the city. The program is now mature and has been open city-wide since summer of 2009.

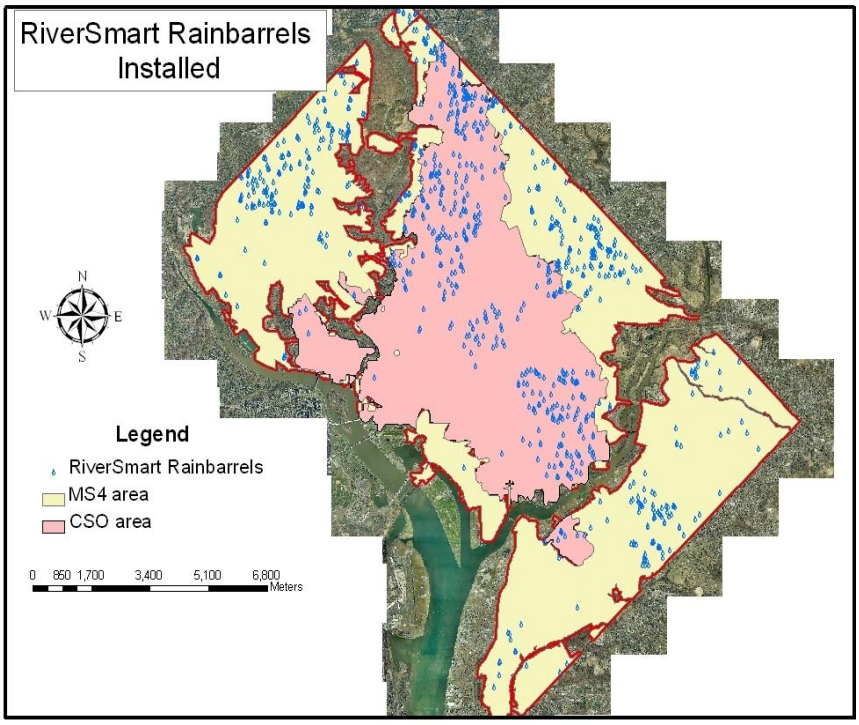
Through this program, DDOE performs audits of homeowner's properties and provides feedback to the homeowners on what LID technologies can be safely installed on the property. The city also offers up to $1,600 to the homeowner to help cover the cost of installation of any LID the homeowner chooses. Currently the program offers five different landscaping items including shade trees, native landscaping to replace grass, rain gardens, rain barrels and permeable pavement.

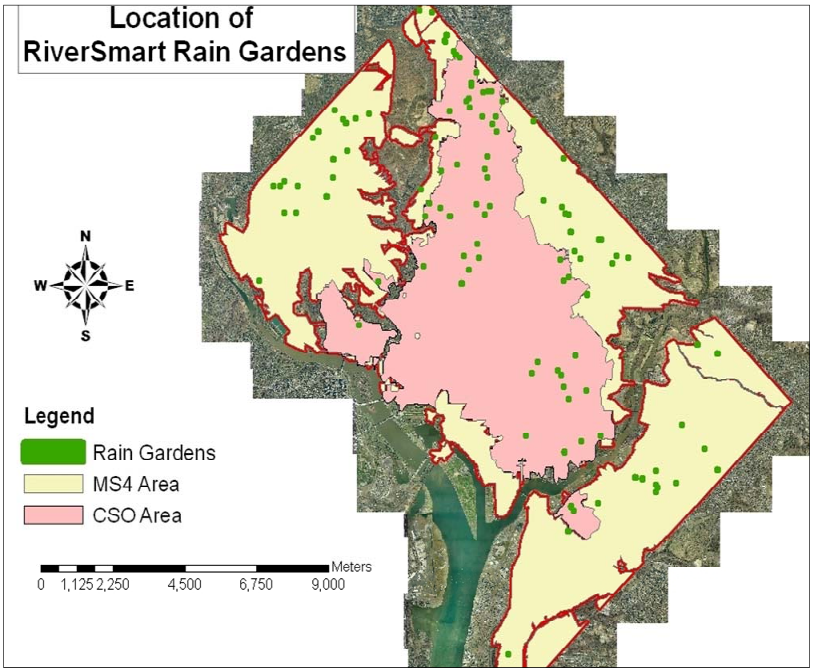
Students and teachers arrive in Anacostia Park ready to take part in a day of hands-on environmental education experiences

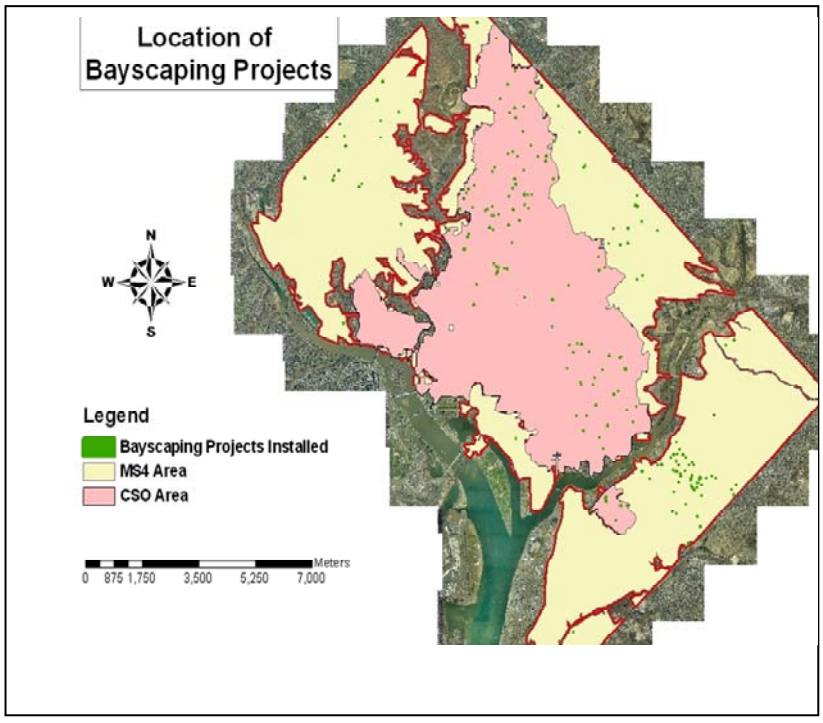
The District has recognized the importance of targeting homeowners for pollution reduction measures because the residential property is the largest single land use in the city and is the slowest of all construction areas to be redeveloped. FY2011 accomplishments include the following:

- Installed 428 rain barrels
- Planted 729 shade trees
- Installed 66 rain gardens
- Implemented BayScaping at 142 properties
- Replaced impervious surfaces with green space or pervious pavers at 28 properties.
- Conducted 1,176 audits

The maps below site where RiverSmart installations occurred in 2011:







Rain Barrel Rebate Program

Property owners who purchase and install a rain barrel from an approved rain barrel list are able to apply for rebate. Rebate amount depends on the volume of the rain barrel. Rain barrels with a capacity of 75

gallons or more are eligible for a $100 rebate and rain barrels with a capacity of 74 gallons or less are eligible for a $50 rebate. The rebate program includes conducting outreach to advertise the program through traditional channels and through innovative approaches, e.g. partnerships with local hardware stores. The rain barrel rebate program is administered by the nonprofit organization, DC Greenworks. DC Greenworks verifies that the requested rebates are in the District and that the rain barrels were actually installed. Homeowners are eligible to receive up to two rebates per property.

RiverSmart Communities Program

The *RiverSmart Communities* program is an extension of the RiverSmart *Homes* program to multi-family residences such as condominiums and co-ops, businesses, houses of worship, etc. The current program, *RiverSmart Homes*, targets private, single-family homeowners to encourage the use of five specific stormwater BMPs (rain gardens, BayScaping, pervious pavement, rain barrels, and shade trees) to control nonpoint source pollution on their property. The *RiverSmart Communities* Program aims to implement similar practices on a larger scale that is more appropriate for the increased runoff area often seen on larger developments.

The *RiverSmart Communities* program has received thirty-five applications from cooperative, condominium, apartments and churches. Three sites have been approved for funding and are in the design phase. These projects include a permeable pavement parking area, cistern, BayScape, and rain garden. These projects will be installed in the summer of 2012.

Tree Planting

The District of Columbia has been called "The City of Trees." It has a tree canopy cover of 35 percent, which is high for a dense urban environment, but is lower than the canopy cover has been historically – even when the city had a higher population density. In an effort to improve air and water quality, reduce the urban heat island effect, and offset greenhouse gas emissions, the city has adopted a 40 percent tree canopy goal. Currently, DDOE and the Urban Forestry Administration (UFA) are drafting an Urban Tree Canopy Plan that lays out concrete actions to achieve the canopy goal. We have projected that we will need a 25 percent increase in tree planting over current efforts to achieve this goal. Currently, UFA, which maintains the city's street trees, plants an average of 4150 trees annually.

DDOE, with help from non-profit partners such as Casey Trees and Washington Parks and People, plants trees on private, federal, and other District lands. DDOE and its partner's planting efforts have added 2476 trees to the District in 2010. FY2011 accomplishments include the following:

- Planted 1 acre of new trees as part of the Oxon Run Trail Rehabilitation Project.
- Planted 729 trees as part of the RiverSmart Homes Program
- Planted native trees at the bank of a steep slope at Stokes Elementary (RiverSmart School)

Trash Removal

Trash removal, although having a minimal impact on pollutant loads, is an excellent activity for involving the public in restoration work and in generating watershed stewards. Many of these projects are small and can be easily and safely accomplished by teams of volunteers in one or two days. FY2011 accomplishments include:

- Removal of over 6 tons of trash from stream banks of Oxon Run on DDOE All Hands Cleanup Day
- Removal of 2 to 3 tons of trash on MLK Jr. Clean-Up Service Day with DC Sierra Club, UFA-DDOT, DPW, ANC 7A, Penn Branch Civic Association

Education of Public on Pet Wastes/Enforcement of Pet Waste Regulations
DDOE has developed educational materials such as fliers and videos that inform citizens of their legal obligations to manage pet waste, proper application and disposal of fertilizers, and the use of landscaping to control storm water runoff. These materials are regularly distributed at public events such as community meetings, Earth Day celebrations, and community cleanup days. In addition, this information is distributed door to door in communities where storm drain marking is taking place. This information is also available on the DDOE website.

Integrated Pest Management and Nutrient Management
DDOE has developed an education and outreach program on Integrated Pest Management (IPM) and Nutrient Management. The purpose of the program is to better inform the public on the proper use and disposal of pesticides and on the use of safer alternatives. The program provides education and outreach activities designed to property owners and managers about environmentally sound practices with regard to the use of pesticides in the yard or garden and the introduction of "good" pests into the landscape. Through DDOE's Nutrient Management Program, the property owners receive education regarding the proper amount of fertilizer to use on a lawn. In addition to fertilizer use, this program addresses the proper way to mow, the proper use of mulch, and the effects of applying too much mulch.

Furthermore, the DDOE Pesticide Management Program trains commercial applicators in the legal and safe appliance of pesticides and herbicides. Commercial applicators must receive a certification through the program to legally apply pesticides and herbicides in the District. A part of this program involves the use of IPM.

WPD Storm Drain Marker Program
In FY2011, the DDOE Watershed Protection Division installed 942 storm drain markers throughout the District of Columbia with private citizens, youth groups, individuals from various volunteer groups and DCPS school groups.

Low Impact Development Program(LID)
Low Impact Development Practices are focused on four main practices: cistern installation, establishment of bioretention cells, retrofit of vegetated (green) roofs and installation of pervious pavers.

In FY2011, DDOE/WPD partnered with DC Fire and Emergency Management Services (DC Fire & EMS) to install Harvest for non potable use system of cisterns at Fire House #3 and #25. The water collected in these cisterns will be used to both prime the pumper trucks and wash all the trucks. This site also serves as a research site to study "smart controls" system of draining the stored water from the cistern. This computerized device tracks weather patterns and times the cistern to drain in advance of precipitation so that the empty cistern is ready to accept the "first flush" of storm water – that which carries the most stormwater pollutants.

Cistern and piping at Engine House #25

Another area of research at Fire House #3 is a measurement of the efficiency of running cistern overflow and a portion of the adjacent parking lot runoff over a permeable friction course (PFC) before it enters the storm drain. A permeable friction course (PFC) is a layer of porous asphalt approximately 50 mm thick which is often applied on top of conventional asphalt highways to enhance safety. The impact of PFC on stormwater runoff quality has been evaluated in a few scientific studies. Observed concentrations of suspended solids and pollutants associated with particulate material were much lower in the runoff from the PFC than those derived from the conventional asphalt surface. DDOE is funding monitoring of the installed PFC to determine the efficiency of this practice for urban rooftop and parking lot runoff.

Enginehouse #25 with cistern at the rear

Another major accomplishment was the completion of the ARRA funded Jay St. Project. Six bioretention cells were installed treated over 56,000 sq ft of roadway in NE DC in the Watts Branch watershed. DDOE worked with the National Park Service and the District Department of Transportation to address a long-standing roadway flooding issue. The project not only has addressed the flooding issue but also now treats a significant amount of stormwater that previously discharged directly into nearby Watt Branch.

Jay St. Prior to construction with flooding

Jay St. after construction

DDOE also provided funds for the installation of sizable stormwater rain tanks at IDEA public charter school in 2011. This project will treat over 1.8 acres of rooftop and parking lot through a bioretention and rain tank system. DDOE used NFWF and Chesapeake Bay Implementation funding to assist with the construction costs.

Further accomplishments include:

- Three additional harvests for non-potable use systems, for a total treatment of 75,350 square feet of impervious surface;
- Bioretention installations to treat 168,408 square feet of impervious surface;
- Impervious surface removal of 145,100 square feet; and

- A program called "The District Curb Alternative" in which three local organizations each identified an area in the public right-of-way to retrofit with Bioretention and other LID features; worked with the local residents to create a retrofit design that suits the community; and presented the outcomes with plan drawings to DC Department of Transportation (DDOT) managers.

Rain tanks during installation and IDEA public charter school in Watts Branch watershed.

D. Nonpoint Source Pollution Watershed Implementation Plans

The District Department of Environment, Watershed Protection Division, is responsible for watershed management planning within the District of Columbia. The Division manages these activities in accordance with its mission to conserve the soil and water resources of the District of Columbia and to protect its watersheds from nonpoint source pollution.

By strengthening its existing programs and continuing to seek innovative solutions for reducing nonpoint source pollution in an urban setting the District of Columbia continues to move steadily toward reaching the goals outlined in its Nonpoint Source Pollution Watershed Implementation Plans.

The tables below include and describe the coordinated activities conducted in designated watersheds and sub-watersheds to meet those goals. Accomplishments in fiscal year 2011 include the following:

Anacostia Watershed 2011 Activities

Activity	Description	Status	Output (quantity)	Partners	Fund-ing
Green Roof Rebate Program	A rebate program to subsidize the installation of green roofs throughout the city	Completed	288,333 sq. ft. of green roof	Anacostia Watershed Society	MS4
Springhouse Run Stream Restoration	A 1800 foot stream restoration project with wetland creation for a tributary of Hickey run	In Progress; completion scheduled for 2012-13	1800 linear feet stream restoration	National Arboretum-USDA; Friends of the National Arboretum	319
National Arboretum Bioretention Cells	Installation of bioretention cells to treat over 1 acre of run-off from parking areas around the main visitor center	In Progress; Designs to be completed in 2012-13	43,560 sq. ft. of impervious area treated	National Arboretum-USDA; Friends of the National Arboretum	319

Anacostia Watershed 2011 Activities					
Activity	**Description**	**Status**	**Output (quantity)**	**Partners**	**Fund-ing**
Storm Drain Marking	Marking storm drains with labels identifying pollutants that drain into the Anacostia River	Completed	860 markers	Green Summer; Volunteers	NFWF; 319
130 gallon rain barrel installations	As part of the RiverSmart Homes program, DC Greenworks installs 130 gallon rain barrels on residential properties.	Completed	160 rain barrels	DC Greenworks	MS4
Shade tree installation	As part of the RiverSmart Homes program, Casey Trees installs medium to large shade trees on residential property.	Completed	257 shade trees	Casey Trees	ARRA
Pervious Paver installation	As part of the RiverSmart Homes program, pervious pavers are installed to replace existing impervious surface on residential property.	Completed	17 properties	Alliance for the Chesapeake Bay	ARRA
BayScaping installation	As part of the RiverSmart Homes program, BayScaping is installed to replace existing turf.	Completed	60 proper-ties average 120 sq. ft. per property	Alliance for the Chesapeake Bay	ARRA
Rain Garden installation	As part of the RiverSmart Homes program, rain gardens are installed to replace existing turf.	Completed	23 rain gardens installed average 50 sq. ft. per property	Alliance for the Chesapeake Bay	ARRA
William Penn House	Installation of a green roof and bioretention	Completed	1,800 sq. ft. of impervious area treated	William Penn House	319
Golden Triangle BID	Large bioretention facility in downtown DC	In Progress	Installation of a large bioretention cell in NW DC	Golden Triangle BID	319

Anacostia Watershed 2011 Activities					
Activity	**Description**	**Status**	**Output (quantity)**	**Partners**	**Fund-ing**
Anacostia Senior High School	Installation of a green roof & harvest reuse system for "green toilets"	Completed	35,200 sq. ft. of impervious run-off captured for reuse	DCPS	ARRA
Banneker Senior High School	Installation of a large 500 gallon cistern and a bioretention cell	Completed	Capture, reuse and treatment of 4,600 sq. ft. of impervious surface run-off	DCPS	319
IDEA Public Charter School	Installation of rain tanks to treat excess stormwater run-off	Completed	78,408 sq. ft. of area treated	IDEA PCS	NFWF, CBP
Stokes Elementary (RiverSmart School)	Retrofit of an asphalt parking lot into a permeable pavement system. Construction of a retaining wall and planting of the adjacent slope for stabilization. Rehabilitation of existing infiltration trench.	In Progress (70% Complete) Perm eable pavement parking lot and retaining wall completed. Planting planned for early spring 2012.	Permeable pavement facility treating about 7,000 sq. ft.	Elsie Whitlow Stokes Public Charter School, Anacostia Watershed Society Watershed Steward Academy.	319
Benning Road Library Green Roof	Installation of Green Roof	Completed	12,030 sq. ft. roof	DC Public Libraries	ARRA
Fire Station #3	Installation of Harvest/Reuse System	Completed	Capture and reuse of run-off from 2,600 sq. ft. of impervious area	DCFEMS	ARRA
Fire Station #25	Installation of Harvest/Reuse System	Completed	Capture and reuse of run-off from 7,550 sq. ft. of impervious area	DCFEMS	ARRA

Watts Branch Sub-watershed Activities 2011					
Activity	**Description**	**Status**	**Output (quantity)**	**Part-ners**	**Fund-ing**
Watts Branch Stream Restoration Project	1.7 mile urban stream restoration project using natural channel stream design	Completed	1.7 mile of restored stream, 5 new acres of riparian plantings, estimated load reductions of 45,778 lbs/yr of TSS, 359 lbs/yr of N, and 63 lbs/yr of P.	USFWS, NRCS, DPR, DC WATER	319, Local, NFWF
Jay St. Bioretention Cells	6 bioretention cells	Completed	Treatment of over 56,000 sq. ft.	DDOT	ARRA
Storm Drain Marking	Marking all storm drains in the Watts Branch sub-watershed with labels identifying pollutants that drain into the Anacostia River	Completed	685 total storm drains (part of the entire Anacostia numbers and includes markings in 2010).	Green Summer	NFWF
Dix St. District Curb Alternative Project	Conceptual design of a “green street”	Completed	Designs for a green street to treat several acres of impervious surface run-off	Wash-ington Parks & People	319
H.D. Woodson High School	Installation of Cisterns & Green Roof	Completed	5,000 sq. ft. of area treated or captured	DCPS Office of Public Facili-ties Management	ARRA, Local Funds
IDEA public charter school	Installation of rain tanks and bioretention	Completed	78.000 sq. ft. of impervious area captured	IDEA public Charter School	NFWF, CBP

Pope Branch Sub-watershed Activities					
Activity	**Descrip-tion**	**Status**	**Output (quantity)**	**Partners**	**Fund-ing**
MLK Jr. Clean-Up Service Day	Community Clean-Up Day	Completed	100 Volunteers; 2-3 Tons of trash; invasive species removal	DC Sierra Club, UFA-DDOT, DPW, ANC 7A, Penn Branch Civic Associa-tion	319
Pope Branch Regenerative Stormwater Conveyances	Installation of 3 RSCs that lead into Pope Branch	Completed	Three RSCs will reduce pollutants from street run-off from entering the stream unfiltered	DPR	ARRA

Nash Run Sub-watershed Activities					
Activity	**Description**	**Status**	**Output (quantity)**	**Partners**	**Fund-ing**
Trash Trap and Stream Restoration Project	Designs for an end of pipe trash trap with a downstream stream restoration project	In Progress	30% designs at end of FY11; designs to be complete in FY12	NA	MS4, DC Bag Bill

Oxon Run Watershed Projects					
Activity	**Description**	**Status**	**Output (quantity)**	**Partners**	**Fund-ing**
DDOE All Hands Clean-Up Day	All staff work day removing trash from illegal dumping along Oxon Run	Completed	Over 6 tons of trash removed from stream banks	NPS & DPW	N/A
Oxon Run Trail Rehabilitation Project	Rehabilitate and connect bike trails in Oxon Run Park and Include LID techniques throughout the project, including bio-retention cells and permeable pavement and tree planting.	In Progress 30% designs have been completed and DC Department of Transportation is putting the 2005 designs out for bid.	Treatment for roughly 43,560 sq. ft of run-off	DDOT, Depart-ment of Parks and Recreation	Funds have not yet been identified for the LID portion of this project.
Bald Eagle Recreation Center Rehabilitation Project	Include bio-retention cells and permeable paving to absorb stormwater from this facility and prevent runoff from causing erosion on NPS land	In Progress Coordination with OPEFM and conceptual designs		Depart-ment of Parks and Recreation and OPEFM	Storm-water Enter-prise Funds
District Curb Alternative	Work with community to redesign a residential street as green street	Completed	Concep-tual Designs for Green Streets and Com-munity Enthu-siasm for new Street Design	Casey Trees	Storm-water Enter-prise Fund

Rock Creek Watershed Activities					
Activity	**Description**	**Status**	**Output (quantity)**	**Partners**	**Funding**
130 gallon rain barrel installations	As part of the RiverSmart Homes program, DC Greenworks installs 130 gallon rain barrels on residential properties.	Completed	268 rain barrels	DC Greenworks	MS4

Rock Creek Watershed Activities					
Activity	**Description**	**Status**	**Output (quantity)**	**Partners**	**Funding**
Shade tree installation	As part of the RiverSmart Homes program, Casey Trees installs medium to large shade trees on residential property.	Completed	472 shade trees	Casey Trees	ARRA
BayScaping installation	As part of the RSH program, BayScaping is installed to replace existing turf.	Completed	81 properties average 120 sq. ft. per property	Alliance for the Chesapeake Bay	ARRA
Rain Garden installation	As part of the RiverSmart Homes program, rain gardens are installed to replace existing turf.	Completed	43 rain gardens installed average 50 sq. ft. per property	Alliance for the Chesapeake Bay	ARRA
Broad Branch Stream Daylighting	Daylighting (restoring to the open air) the flow of a previously covered portion of Broad Branch.	Designs completed. Working on MOUs for installation and Environmental Assessment (EA)	1,600 linear feet of stream restored. Bioretention treatment for 78,408 sq. ft. of run-off	DDOT, Peruvian Embassy, NPS	319, Bag Bill Revenue
Installation of two regenerative stormwater conveyances (RSC): Peruvian Embassy	Type of LID that uses stream restoration techniques to create a dependable open channel conveyance that greatly reduces erosive forces and positively impacts the ecology of the treated area.	Designs completed. Projects will be installed with the Stream Daylighting.	Two regenerative conveyances installed with a combined length of 1300 linear feet.	Peruvian Embassy	319, Bag Bill Revenue
Bingham Run Regenerative Stormwater Conveyance	One RSC to treat and stabilize NPS parkland receiving stormwater runoff from Oregon Avenue.	Completed	1 regenerative conveyance installed with a length of 950 linear feet.	NPS, DDOT	319
Milkhouse Ford Regenerative Stormwater Conveyance	One RSC to treat and stabilize NPS parkland receiving stormwater runoff from Oregon Avenue.	Completed	2 regenerative conveyances installed with a combined length of 1800 linear feet.	NPS, DDOT	ARRA
Klingle Run Restoration	Stream restoration of Klingle Run and the removal of a	60% designs are complete. An EA has been	3,100 linear feet of stream restored. At least 32,670 sq. ft.	DDOT, NPS	DDOT

Rock Creek Watershed Activities					
Activity	**Description**	**Status**	**Output (quantity)**	**Partners**	**Funding**
	roadway next to Klingle Run which is to be replaced with a bike path and LID.	completed. The project is waiting on funding.	of impervious surface removed and 60,984 sq. ft. of stormwater treated		
Beach Drive LID	LID retrofits along Beach Drive NW to treat uncontrolled stormwater into Fenwick Branch.	60% designs are complete. The project is waiting on funding.	At least 43,560 sq. ft. of stormwater treated	DDOT, NPS	MS4
Green roof rebate program	District-wide rebate program to subsidize the installation of green roofs	Completed	137,214 sq. ft. of green roofs	Anacostia Watershed Society	MS4
Harvest/Reuse at Wilson High School	Installation of two cisterns: 1 cistern for green toilets and 1 cistern for irrigation	Completed	Harvest/reuse stormwater to supply water demand for 50 water closets and 15 urinals per month; harvest/reuse stormwater to irrigate 1,500 sq. ft. of planted space	OPEFM	MS4

Summary

The District of Columbia's Nonpoint Source Program meets the challenges of the highly urbanized setting within the District by seeking and employing innovative solutions for reducing nonpoint source pollution. With the help of creative partnerships and cutting-edge technologies, the District will continue to make significant progress toward achieving its goals. In FY2012 the District of Columbia will work to strengthen its existing programs for regulation and enforcement, stream and wetland restoration, education and outreach and pollution prevention. The Nonpoint Source Program will continue to provide technical assistance and resources that that will improve the water quality District's waters.

Appendix A: Financial Information

FY 2011 Grant	*Source*	*Federal*	*Match*
319 Grant (FY11)	EPA	1,048,000	698,667
Ches. Bay Implementation (Sec. 117)	EPA	767,000	767,000
Ches. Bay Regulatory Enyhancement (Sec. 117)	EPA	623,036	623,036
NFWF RiverSmart Washington	NFWF	800,000	2,500,000

Appendix B: Agency Partners

District of Columbia - Lead Agency:

Department of the Environment, Watershed Protection Division

District Government:

DC Department of Parks and Recreation (DPR)

DC Department of Public Works (DPW)

DC Department of Transportation (DDOT)

Deputy Mayor's Office for Planning and Economic Development

DC Office of Planning (OP)

DC Public Schools (DCPS)

DC Soil and Water Conservation District (DCSWCD)

DC Water and Sewer Authority (WASA)

Federal Government:

Architect of the Capitol

National Park Service (USNPS)

US Army Corps of Engineers (USACE)

US Fish and Wildlife Service (USFWS)

US Department of Agriculture Natural Resources Conservation Service (USDA-NRCS)

US Environmental Protection Agency (EPA)

US Environmental Protection Agency, Chesapeake Bay Program (CBP)

US Geological Survey (USGS)

Various federal facilities

Local Groups:

Anacostia Watershed Society (AWS)

Casey Trees Endowment

DC Greenworks

FORCE, Washington, DC

Alice Ferguson Foundation

Interstate Commission on the Potomac River Basin (ICPRB)

Living Classrooms of the National Capital Region

Marina Environmental Education Fund (MEEF)

Metropolitan Washington Council of Governments (MWCOG)

Potomac Conservancy

Student Conservation Association (SCA)

Sustainable Community Initiative (SCI)

Washington Parks and People