



CHAPTER SIX

CATEGORY 4, PUBLIC EDUCATION AND OUTREACH

INTRODUCTION AND ISSUES IDENTIFICATION

Some residents in the Jamaica Bay watershed drive fuel-efficient cars, engage in recycling initiatives, and practice water conservation or other activities that reduce the amount of impact they have on their local environment. Unfortunately, illegal actions such as dumping, littering, and vandalism, especially in the few remaining open spaces of the watershed, continue to occur and impair water quality and ecological integrity of Jamaica Bay. The sum of these actions is the “ecological footprint” of human uses in the watershed. Long-term ecological sustainability is directly linked to the actions and attitudes of the people that live, work, and play in the watershed. The concept of environmental stewardship is that residents understand, value, and care for their environmental resources, and thus are motivated to make decisions that improve the health of the watershed and the Jamaica Bay estuary.

Many residents in the Jamaica Bay watershed may not be aware of how their individual behaviors and lifestyle choices have a direct impact on the Bay. By increasing personal connections to Jamaica Bay, and providing education on the linkage between human activities and ecological health, public awareness of ecological issues within the watershed will be strengthened.

People typically do not care for what they do not know. Therefore, it is important to provide residents with opportunities to learn about the Bay – to explore it, study it, and play in it. These opportunities can help to promote a sense of value and environmental stewardship in individuals, both young and old. Diverse learning experiences encourages residents to gain knowledge of how their everyday actions affect water quality, human health, and the ecological processes of the landscape in which they live, develop a sense of caring for that environment, prioritize environmental health, and voluntarily modify their behaviors and practices toward more ecologically sustainable options.

While an individual’s efforts may appear small, collective stewardship has the power to significantly reduce degradation of the Bay. In fact, education and outreach may be the most important factors in the attainment of an environmentally-healthy Jamaica Bay because significant change will be challenging without broad constituent support to alter status quo behaviors and to enact the political will needed to promote ecological health. Many outstanding education and outreach programs that focus on the importance of Jamaica Bay and stewardship currently exist; however, one challenge is that the efforts of different entities are uncoordinated and, therefore, may not target or reach the diverse population groups – public officials, property owners, business owners, school children, and other stakeholders – throughout the watershed.

In order to bring about effective and lasting change for improving the water quality and ecological conditions in Jamaica Bay, it is essential that there be a coordinated effort to promote and implement a comprehensive environmental education program. This will be most effective if the learning styles and needs of all people – watershed residents, visitors, students, educators and civic officials – are addressed. The Jamaica Bay Watershed Education Coordinating Committee, initiated by NYCDEP as part of the *Jamaica Bay Watershed Protection Plan* process, provides one such forum for formal and



informal educators to collaborate and cooperate in its effort to provide comprehensive K-12 education curricula for students within the Jamaica Bay watershed. The Committee meets regularly and involves the participation of many organizations that provide school-based, after school and weekend education opportunities within New York City including NPS, NYSDEC, NYCDPR, HEP, NYCSWCD, Brooklyn College, EQA, Friends of Gateway, and many more.

An effective public outreach program includes instructive techniques of teaching as well as opportunities for the active engagement of the public in the natural environments that the *Jamaica Bay Watershed Protection Plan* endeavors to protect and restore, that is, direct, physical interaction with the natural world. To ensure widespread application and complete information throughout the watershed, outreach efforts also need a coordinated approach in which the programs and activities of different providers are integrated.

OBJECTIVE 4A: RAISE AWARENESS OF JAMAICA BAY'S UNIQUE ASSETS AND CHALLENGES

Current Programs

There are at least a dozen active Jamaica Bay natural resource and environmental education programs for people of all ages within the watershed. Community-based organizations and government agencies offer a wide variety of educational opportunities from classroom presentations to field trips to professional development workshops for educators and other professionals. Information about Jamaica Bay is available online, including the Jamaica Bay Research and Management Information Network (JBRMIN) website (<http://nbii-nin.ciesin.columbia.edu/jamaicabay/>). The Jamaica Bay Institute (JBI) website (www.nature.nps.gov/jbi/index.htm) publishes information about current research topics, scientific investigations, and scientific reports relating to the Jamaica Bay watershed. The JBI website contains summaries of current research efforts, and priority research needs in the watershed. The JBI organized and led a 2004 conference on the status and trends in the Jamaica Bay estuary. NYCDEP's website (www.nyc.gov/dep) provides relevant information about Jamaica Bay, including reports and links to these other organization sites.

There are many existing programs designed to raise awareness of Jamaica Bay-related issues. The following organizations and programs, although not an exhaustive list, currently provide opportunities for young people and adults to engage in the study of Jamaica Bay. See also Volume I, Chapter 7, for additional organizations.

- *Jamaica Bay Task Force (JBTF)*: holds quarterly meetings, which serve as a forum for stakeholders to share information about ongoing activities and programs.
- *Jamaica Bay Research and Management Information Network (JBRMIN)*: a website which includes an online bibliography; a catalog of stakeholders and universities involved in Jamaica Bay research, programming and advocacy; information on the Jamaica Bay Task Force and the Jamaica Bay Watershed Protection Plan Advisory Committee; a news page; and an events calendar. (<http://nbii-nin.ciesin.columbia.edu/jamaicabay/>)



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- *Jamaica Bay Ecowatchers*: the first environmental group to discover the loss of marshes in Jamaica Bay, Ecowatchers coordinates research about marsh loss and holds conferences to promote ecosystem restoration in the Bay.
- *American Littoral Society, Jamaica Bay Guardian*: provides educational programs about Bay resources for schools and civic groups and bi-weekly programs on general ecology issues with the NPS; maintains an extensive resource slide library, which is available to other organizations; and coordinates International Beach Clean-up Day along Jamaica Bay.
- *Eastern Queens Alliance*: gives presentations to local groups and individuals to increase awareness of Idlewild Park's resources and encourage community involvement.
- *Gateway National Recreation Area, Jamaica Bay Institute*: houses the Jamaica Bay Resources Library - a collection of over 3,000 books, reports, theses, maps, and other materials relating to the natural and cultural resources of the Jamaica Bay Watershed.
- *Gateway National Recreation Area, Jamaica Bay Unit*: operates the Jamaica Bay Wildlife Refuge which provides a variety of public programs and services; offers day programs to provide students (ranging from 4th-8th grade) with a variety of lessons about marine explorations and environments at Gateway National Recreation Area (GNRA), and overnight camping programs at Ecology Village for grades 4-12; and serves as a cooperating agency for Operation Explore, a year-long school program for 4-6th graders which includes a full day professional development workshop for participating teachers, a guided interpretive walk by Rangers at GNRA field sites followed by a visit to Stonykill Farm and a two-night trip to the Taconic Outdoor Education Center. NYCDEP is also a cooperating agency, together with the New York City Department of Education (NYCDOE), NYCDPR, Cornell Cooperative Extension and the NYSDEC.
- *New York/New Jersey Harbor Estuary Program (NY/NJ HEP)*: maintains an online stewardship network; and hosted Estuary Live, on September 29, 2006, which was an interactive program that involved many different environmental education partners and high school students from the watershed in an hour-long live nationwide web broadcast from Big Egg Marsh.
- *Friends of Gateway*: operates the Gateway Greenhouse Education Center which provides learning opportunities at Jamaica Bay by getting children to the Bay and offering a set of lesson and activities.
- *Metropolitan Waterfront Alliance*: produces an electronic newsletter, "Waterwire," which includes articles on Jamaica Bay. (<http://www.waterwire.net/>)
- *New York City Soil and Water Conservation District (NYCSWCD)*: hosts an annual Jamaica Bay Roundtable, in cooperation with The New School University, to discuss critical issues facing the Bay.
- *New York City Audubon Society*: sponsors trips to the Jamaica Bay Wildlife Refuge.

In addition to serving as a cooperating agency for Operation Explore, NYCDEP sponsors the International Beach Clean-up Day; provides program and financial support for the NYCSWCD to



help them achieve their mission; participates in HEP educational activities including Estuary Live; hosts the annual Water Conservation Art and Poetry Contest which encourages fifth and sixth grade students to creatively express their understanding of New York City's water resources; offers professional development opportunities for formal and informal educators on water quality issues; produces and distributes education materials related to New York City's water resources; offers student internship opportunities; assists with curriculum development and student research projects; and, organizes and supports the Jamaica Bay Watershed Education Coordinating Committee that was formed as part of the *Jamaica Bay Watershed Protection Plan* development process.

As part of the development of an ecological restoration project at Paerdegat Basin, NYCDEP will implement a 6 acre Ecology Park designed to showcase many of the ecosystems present within New York City and enable a close-up view of these communities. NYCDEP expects the Ecology Park at Paerdegat Basin will be an important environmental tool in helping area residents to gain an understanding of the many ecosystem types found within New York City and the important role the residents have in maintaining a delicate ecosystem.

The NYCDEP will strengthen its ongoing public education and outreach program to promote stewardship of the Jamaica Bay area among residents and visitors. NYCDEP's public education program includes school programs, public education programs, volunteer programs, publications, promotional items, and a website that provides useful educational resources.

Public Education Programs: NYCDEP attends numerous outreach events during the year. Events are typically programmed upon request and include table top displays and outreach at fairs, festivals, and concerts, most of which are community based. Last year NYCDEP participated in community group events in the Jamaica Bay watershed that included presentations and table top displays at churches, professional associations, and the Boy Scouts, as well as events conducted at city parks and museums.

Volunteer Programs: NYCDEP leads and supports various volunteer cleanup and environmental programs. In 2006 the NYCDEP conducted two major volunteer cleanup events in the Jamaica Bay watershed and participated and contributed to additional initiatives by other organizations. These programs have a positive effect on the reduction of floatable litter through its physical removal and the environmental education messages inherent in these hands-on programs.

Publications: NYCDEP distributes or displays flyers, brochures, posters, and other publications at public outreach events. Most of this material is readily available on the NYCDEP website. Each piece of literature is targeted to a particular message, *i.e.*, water conservation, floatable litter prevention, etc.

Promotional Items: NYCDEP has developed numerous promotional items designed to communicate a targeted environmental message, *i.e.*, water conservation, floatable litter prevention, etc., and distributes hundreds of thousands of these items yearly.

NYCDEP Website www.nyc.gov/dep: The NYCDEP website constitutes one of the most accessible and far reaching portions of the NYCDEP public education program. The site has numerous pages and links that connect viewers to all manner of environmental education topics, including information on how New York City protects its water environment, pollution control programs, harbor water quality programs, floatable litter reduction, as well as information on how citizens can make a difference.



Other City agencies have educational and outreach programs including:

- *New York City Department of Parks and Recreation (NYCDPR)*: operates the Salt Marsh Nature Center in Marine Park which provides an in-park community center for public education, recreational activities and environmental studies.
- *The New York City Department of Education's (NYCDOE)*: Scope and Sequence provides the structure and themes to ensure that students meet the standard requirements for the upcoming year's curricula in science and other subjects.
- *The New York City Department of Education (NYCDOE)*: The new Science Scope and Sequence provides the structure and themes to ensure that students develop the skills to investigate important issues in the world around them through instruction and investigation and discovery. The gateway center for Science and the Environment at Floyd Bennett Field, Brooklyn, serves as an important site for coordinating and hosting professional development trainings for NYCDOE and collaborating organizations' staff.
- *The New York City Department of Sanitation (DSNY)* participates with the Mayor's Fund to Advance New York City, and Waste Management, Inc., in conjunction with STOMP, the long-running New York hit theatre troupe, and Keep America Beautiful, the nationwide organization that sponsors beautification projects and mobilizes volunteers to conduct a major city-wide anti-littering public awareness campaign; "STOMP Out Litter." The campaign delivers its message through several methods, including print media, television and radio public service announcements, billboards, and posters, many featuring the cast of STOMP. Street litter is tracked through the SLR system conducted by the Mayor's Office of Operations. In addition, the Litter Prevention Working Group (LPWG) represents one avenue for coordination among city, state, and federal litter prevention efforts.



Management Strategy 4a1: Raise awareness among young people to promote local environmental stewardship early during a child's development.

STRATEGY DESCRIPTION

Young children learn about the natural environment best through physical interaction with their natural surroundings. Children that play on the beach, in streams, or in forests within their neighborhood develop an early awareness and appreciation of wild plant and animal communities. They experience an essential connection to the natural world and react when it is disturbed or changed in any way. Without this exposure, children can grow to feel "disconnected" from the natural landscape and have little perspective of their ability to influence, or be influenced by these natural environments. Especially in the ultra-urban environments typical in many of the neighborhoods in the Jamaica Bay watershed, it is essential to understand the reciprocity between human use and environmental conditions, and promote a "value" to maintaining ecological health. Instilling some measure of environmental awareness at a young age, through education and direct experience, may help to encourage stewardship as the child becomes an adult. In the classroom, this can be accomplished by offering environmental science in the curriculum starting at an early age. Outside of the classroom, this can be achieved by offering programmed opportunities for children to participate



in stewardship and other hands-on activities which offer direct connection with natural areas in the Jamaica Bay watershed.

Evaluation of Management Strategy

This strategy would have a positive environmental benefit through fostering environmental stewardship and protection at the grassroots level. There are no significant technical or legal obstacles to its implementation. Costs are discussed below under the specific Implementation Strategies.

RECOMMENDATION

It is recommended that schools, city agencies, educational organizational programs, after school programs, and camps and other summer programs further pursue existing educational and youth programs that provide environmental, science and water-based educational resources and can be applied within the Jamaica Bay watershed.

IMPLEMENTATION STRATEGIES

The following Implementation Strategy will be pursued in the near term. Additional strategies for future consideration are discussed in Chapter 9. A key strategy for implementing public outreach and education strategies is the development of a Education and Outreach Steering Committee to be managed by the Soil and Water Conservation District through funding from NYCDEP. The Soil and Water Conservation District will provide staff to organize these efforts. (See Chapter 8, Plan Implementation and Coordination, for information on the Education and Outreach Steering Committee.)

Enhance Jamaica Bay-Related Educational Curriculum

The Jamaica Bay Watershed Education Coordinating Committee is in the process of developing the Jamaica Bay Educators' Resource Guide to provide a comprehensive directory of multi-disciplinary, inquiry-based environmental education resources for kindergarten through 12th grade formal and informal educators within the Jamaica Bay watershed. The resource guide will be organized according to specific topics young people should know about Jamaica Bay and organizations with existing curricula or programs for each topic. Each program will be described to encourage educators to contact the organization or utilize the program that most suits their educational needs. Information included in the guide will be formatted in several ways to allow users to look up information by program type, topic, or sponsoring organization. Programs offering educational field trips and recreational opportunities on the Bay will also be identified in the guide to encourage teachers to provide students with hands-on, outdoor experiences.

Since a network and partnership has been established through the Jamaica Bay Watershed Education Coordinating Committee, the distribution mechanism for printed and electronic versions of the resource directory will be through members to colleagues and co-workers. A promotional letter will be developed to introduce the Guide and describe its development and use. NYCDEP will also promote the Guide through on-going professional development workshops in cooperation with the NYCDOE and independent schools, participation on the NYCDOE Science Education Task Force and professional organizations such as the Environmental Education Advisory Council. Most importantly, both NPS and NYCDEP are cooperating agencies for Operation Explore and will



provide information about Jamaica Bay resources directly to teachers participating in the Fall 2007 professional development training at the Gateway Center for Science and the Environment.

The resource guide, once completed, will align existing curricula and programs with key topics related to Jamaica Bay and identify gaps, if any, in topics and resources. This information could be used in the future to establish priorities for creating new Jamaica Bay education resources and will encourage continued communication about planning, implementation and evaluation processes among educators involved in the Jamaica Bay Watershed Education Coordinating Committee (see strategies for future consideration in Volume 2, Chapter 9).

Cost: Final design of the prototype will cost approximately \$1,000; printing and distribution will cost approximately \$5,000.

Schedule: The Jamaica Bay Educators' Resource Guide prototype will be completed Fall 2007; printing and distribution will begin in Winter 2008.



Management Strategy 4a2: Raise awareness of Jamaica Bay-related issues through creating an informed citizenry.

STRATEGY DESCRIPTION

Educating businesses and residents in the watershed about sustainable water use, sustainable energy use, and low impact development can bring about reductions in the amount of pollutants entering the Bay, and savings in energy and water utility costs. Framing this type of educational campaign as both a long-term cost savings to businesses and residents, as well as a positive environmental action, will make these type of volunteer-based efforts more attractive. Disseminating information about the methods to be implemented (including water and energy conservation techniques, proper disposal of toxic materials, invasive species management, landscaping techniques, and stormwater management techniques), the environmental and economic benefits (including taxpayer savings related to overall infrastructure costs, increased property values, enhanced community features, and improved overall watershed conditions), and providing a list of resources to further aid the individual, requires coordination between many city agencies, including the Mayor's Office of Sustainability, NYCDDC, and NYCDEP. This approach is meant to complement and provide the public education aspect to many of the Stormwater Best Management Practices articulated in Chapter 5.

Water use, landscaping practices, and energy use also have a direct impact on environmental conditions in the watershed. The more water that is used, the more treatment capacity must be provided by WPCPs prior to that water ending up in the Bay. In combined sewer areas, where treatment plant capacity is often exceeded, water conservation efforts can directly reduce the amount of sewage entering the receiving waters of Jamaica Bay. The use of stormwater BMPs can also reduce the amount of water that ends up in the combined sewer system, and similarly affect water quality conditions. Through education and outreach, knowledge about how individual behaviors affect environmental conditions in the watershed, and recommendations for changing behaviors (through conservation and sound land use practices) to reduce the amount of impact can be passed along to watershed residents.



Littering, dumping, and vandalism occur in many urban communities, including those in the Jamaica Bay watershed. This can take the form of street litter, which ends up in the Bay via the storm drain system, or dumping refuse in open areas around in the watershed, creating an eyesore and degrading habitat. Water pollution from improper residential, commercial, or industrial waste disposal can end up in the storm drain system, and eventually drains to the Bay. Whether intentional or unintentional, these types of polluting behaviors can seriously degrade water quality and environmental conditions in the places that they occur. Anti-littering and anti-dumping campaigns, and education to promote the proper disposal of waste materials, can limit these types of destructive practices and help to remind residents that their actions have a direct influence on the condition of their local environmental resources. The proper placement of signage can often be used to great effect, in combination with public messages that discourage pollution.

In addition, citizen awareness of environmental conditions in the Jamaica Bay watershed is reliant on research and scientific investigations to ascertain physical, ecological, and biological trends, as well as the effective broadcast of this information to citizens and stakeholders. The transfer of information necessary to allow stakeholders the ability to make good, informed decisions can be enabled through scientific conferences, organization of research efforts, and utilization of service learning opportunities for higher education.

Evaluation of Management Strategy

This strategy would have a positive environmental benefit through fostering environmental stewardship and protection at the grassroots level. There are no significant technical or legal obstacles to its implementation. Costs are discussed below under the specific Implementation Strategies.

RECOMMENDATION

It is recommended that city agencies, elected officials, universities, environmental organizations and other entities further pursue educational programs focused on the Jamaica Bay Watershed.

IMPLEMENTATION STRATEGIES

The following Implementation Strategy will be pursued in the near term. Additional strategies for future consideration are discussed in Chapter 9.

Organize a “State of the Bay” Scientific Symposium

The NYCSWCD, working with NYCDEP and the JBI, will organize a “State of the Bay” symposium every two years to bring together researchers, academicians, civic groups, community members, resource managers and agencies to coordinate and guide scientific investigations and report scientific findings related to the Jamaica Bay watershed. There is already considerable momentum to build upon for developing this symposium. Jamaica Bay is currently an epicenter of research and scientific investigations for major academic institutions throughout New York City and Long Island, as well as the focus of ongoing research efforts by many federal, state, and City agencies. JBI serves as a clearinghouse for much of this research and hosts several events a year dedicated to disseminating new research and information about Jamaica Bay. In addition, Jamaica Bay has been the subject of several targeted “research symposiums” in the last six years including JBI’s March 2004 conference on the State of the Bay, and a recent “Borrow Pit Workshop” hosted at Stony Brook University in the summer of 2006, which brought together scientists and managers to compare research and discuss the



borrow pits in the Jamaica Bay estuary. The formalization of a biennial “State of the Bay” conference would expand upon the efforts of the JBI to continue information-sharing and coordination between the citizens and the scientific community to continue, and potentially compel more research efforts in the watershed. In addition, the symposium could be timed with the biennial *Jamaica Bay Watershed Protection Plan* update process.

JBI’s March 2004 conference will be used as a model for the development of the “State of the Bay” symposium. The format of the workshop would be designed to discuss scientific investigations and findings during concurrent sessions featuring a number of scientists, natural resource managers, educators, or outreach coordinators working on Jamaica Bay related projects or have had demonstrated success implementing similar scientific studies and programs in other locations facing similar issues as Jamaica Bay. The morning session will consist of speaker presentations on the current state of the Bay with respect to water quality and ecological restoration. The afternoon session will feature a panel discussion with audience participation to identify priority research topics and additional needs for scientific data and knowledge. Discussions will be arranged with other governmental and non-governmental organizations to identify keynote speakers, presenters and panelists and to further develop a symposium based on scientific investigations and the *Jamaica Bay Watershed Protection Plan*.

Cost: \$20,000 for one full day conference with 250 attendees including refreshments, speaker travel, speaker honoraria, outreach, and materials.

Schedule: The first symposium would be held Summer 2008 to allow the proceedings to be used for the *Jamaica Bay Watershed Protection Plan* Update in October 2008, per Local Law 71.

Create a targeted campaign for developers, residents, and business owners to protect Jamaica Bay

NYCDEP will create a targeted campaign for developers, residents, and business owners to provide information about how to protect Jamaica Bay through on-site stormwater management techniques, wise use of household chemicals, water conservation, and energy conservation measures.

For example, the Division of Pollution Prevention and Monitoring within the Bureau of Wastewater at the NYCDEP has made tremendous progress in the development of BMPs for the automotive industry. The BMPs being studied include workplace placards designed to educate workers on good housekeeping practices and provide establishments with literature that explain in greater detail the damage to the environment. BMPs under this program focus on key areas of concern such as chemical storage, facility upkeep, and typical daily operations in an effort to prevent or reduce impacts from contaminated stormwater runoff. The NYCDEP has taken a proactive approach in implementing anti-pollution strategies and projects that are cost-effective, publicly accepted, and environmentally sound.

As a first step, NYCDEP will develop a brochure to identify actions that developers, residents, and business owners can take to conserve water and energy, install on-site stormwater runoff management, minimize use of household chemicals, and promote sound landscaping practices to address lawn care and invasive species. Information included in the brochure could be expanded upon in the future to create a series of brochures, newsletters or guides targeted toward property owners. The City of Philadelphia’s *A Homeowner’s Guide to Stormwater Management* (2006) provides a

model of detailed, user-friendly guidance for property owners to improve stormwater management and pollution prevention on their own property or in their community. In addition, a media or ad campaign similar to the Mayor’s GreenNYC TV campaign *Small Steps, Big Strides* could be developed to help spread the word about best management practices for the home and business. Following the production and early distribution of the brochure described above, NYCDEP will partner with other organizations including the NYCSWCD to expand upon the information about how to protect Jamaica Bay and develop a watershed-wide ad campaign to spread the message.

Cost: Printing and distribution of the brochure will cost approximately \$2,000.

Schedule: The brochure prototype will be completed Fall 2007; printing and distribution will begin in Winter 2008.

JAMAICA BAY AND ITS WATERSHED
A watershed is the area of land from which rainwater or stormwater collects and drains into a common waterbody. The watershed of Jamaica Bay spans 91,000 acres – more than 100 times the size of Central Park. In an urban watershed, like the Jamaica Bay watershed, impermeable surfaces created by pavement and buildings prevent stormwater from percolating into the soils. Thus, the stormwater can overwhelm the sewer system and become runoff carrying pollutants found on the roads, sidewalks, rooftops and other paved areas.

PROBLEMS FACING THE BAY
Various sources of pollution that impact water quality of the Bay are generally grouped into two categories: point source pollution and non-point source pollution (NPS). Point source pollution originates from known localized sources such as industrial and wastewater treatment plants. NPS pollution comes from many diffuse sources, and is often referred to as “people pollution” because it originates with the daily activities of people. An example of NPS pollution is stormwater running off impervious surfaces, carrying commonly found substances, such as excess fertilizers; oil, grease, and toxic chemicals from roadways and parking lots; sediment from improperly managed construction sites; bacteria from pet wastes on sidewalks; litter from streets.

IT'S EASY TO PROTECT THE BAY
The pollutants and the water carrying them originate from all over the watershed. For this reason, the actions residents of the watershed take inside and outside of their homes can have a major impact on the water quality of the Bay. Follow some of these easy guidelines to reduce your impact on Jamaica Bay!

STORMWATER BEST MANAGEMENT PRACTICES FOR YOUR HOME OR WORKPLACE
Best management practices (BMPs) are structural or non-structural methods to prevent or control the discharge of pollutants. The use of plants and soils is a common theme among various BMPs. This is because permeable surfaces, especially those covered by healthy vegetation, help capture stormwater and filter pollutants picked up by runoff. Plant roots allow water to percolate back into the ground and keep the soil loose and healthy.

Here are some BMPs that home and building owners can install:

Stormwater BMPs	Description
Rain garden	Stormwater is directed into a garden designed to capture, use and retain water over several days.
Rain barrel	A large container captures and stores stormwater from rooftops, and includes a sealed system to prevent mosquito breeding.
Green roofs	Layer of soil and vegetation installed on a conventional roof capture, use, and retain stormwater.
Stormwater Planters	Small treatment devices reduce quantity (through infiltration) and improve quality (through filtration) of stormwater.
Permeable pavers	Roadways, parking lots, sidewalks, and plazas are paved using a group of pervious pavements.
Maintaining green space	Maintenance of green space ensures that the system functions properly and infiltrates stormwater efficiently.
Planting trees	Trees intercept stormwater, reducing the amount of water reaching the ground.

SIMPLE RESIDENTIAL POLLUTION PREVENTION STEPS

- Pick up and dispose **pet wastes** properly as required by law.
- **Keep litter, pet wastes, leaves, and debris out of street gutters and storm drains.**
- **Apply lawn and garden chemicals sparingly and according to directions.**
- **Dispose of used oil, antifreeze, paints, and other household chemicals properly; never pour them in storm drains.**
- **Compost yard litter.**
- **Use dry methods** (sweeping, cat litter, rags, etc) for spill cleanup of brake fluid, oil, grease, and antifreeze.
- **Consider using alternatives to household chemicals.**
- **Use a Special Waste Drop-off Site for hazardous chemical disposal. For more information, call 311.**
- **Compost your yard waste and kitchen waste.**

FOR MORE INFORMATION ON POLLUTION PREVENTION AND BMPs

- **Using native plants in your stormwater best management practices:** http://www.nycgovparks.org/sub_about/parks_divisions/nrg/documents/Native_Plant_Guide.pdf
- **Alternatives to Household Chemicals:** <http://es.epa.gov/techninfo/facts/safe-fs.html>
- **Better Lawn Care:** <http://nysipm.cornell.edu/program/whatis.asp>
- **Do's and Don'ts of Water Conservation:** <http://home2.nyc.gov/html/dep/html/dodont.html>
- **Energy Conservation to Fight Climate Change:** <http://www.coned.com/customercentral/energysavingtips.asp>
- **NYC Compost Project:** <http://www.nyccompost.org>
- **Leaf litter pick up (bi-annual):** <http://nyc.gov/html/dsny/html/home/home.shtml>

Over the last 15-years the Department has made great strides in reducing nitrogen loading to Jamaica Bay by nearly 30%. The Jamaica Bay Watershed Protection Plan will build upon these on-going efforts and investigate innovative techniques that will help further reduce nitrogen loading while improving the overall aquatic and wildlife habitats within Jamaica Bay and its watershed.

Bayswater Point State Park boasts beachfront, wetlands, and woodlands.

FIGURE 6.1 Excerpt from NYCDEP’s draft brochure prototype, *Protecting Jamaica Bay: It Starts with Where You Live and Work in the Watershed*, to be printed and disseminated in 2008; Source: NYCDEP

REFERENCES

City of Philadelphia. 2006. A Homeowner’s Guide to Stormwater Management. Office of Watersheds, Philadelphia, PA.