Flooding is an age-old hazard, especially for coastal areas. But a changing world is making flooding an increasingly pressing issue for the people and resources of the Delaware Estuary.

Sea level is rising, causing more sea water to surge up the Delaware River and into coastal communities, especially when combined with storm surges. Precipitation is also increasing and concentrating into more extreme rains, causing more and faster water to flow across the land and through streams and floodplains toward the Delaware River. The result is more flooding.

At the same time, culture, economics, and natural beauty continue to drive people to the coasts, with half the population of the United States now living in coastal areas and more coming. Marshes and other wetlands are communities’ best natural defense against flooding, but these are being lost and degraded at an alarming rate. The result is more people and property in harm’s way of flooding.

continued on page 2
Floodling and You  continued from page 1

The combined result of these changes is that more people in our region are impacted by flooding than in the past. And that trend is likely to continue, depending on how well we adapt.

This issue of Estuary News is focused on the important work under way in our region to develop new tools and management strategies for making our communities and resources less vulnerable to flooding. Coastal impoundments are an important tool for holding back rising seas and storm surges to protect communities and natural resources, but they don’t always receive the attention, maintenance, or investment needed to keep them functioning well. In Delaware (and elsewhere), coastal managers are assessing impoundments to improve their condition and management for better protection of communities and natural areas (see story page 4).

Preparedness can make a huge difference to the impacts of flooding. The Delaware River Basin Commission, together with the National Weather Service, has developed an advanced flood-warning system designed to give communities and resource managers the information they need to prepare for high waters and protect themselves against the worst impacts (see story page 6). The Nurture Nature Foundation has conducted a survey on flooding and used the results to educate people, including how to protect their communities from it (see story page 7).

There are things we can all do to help prevent the worst impacts of flooding. Taking advantage of local collection events to properly dispose of hazardous materials insures that those materials don’t get washed into local waters during floods, where they can harm aquatic life and human health (see story page 11).

Protecting and restoring marshes and other wetlands are perhaps the most important actions communities can take since they soak up and hold water during flood events and buffer coasts from storms. Where natural wetlands are no longer possible, creating a rain garden that mimics a wetland is a good alternative. A new “Rain Gardens for the Bays” campaign (see story page 9) aims to inspire and help people to create rain gardens throughout our region.

Even with aggressive action to cut carbon emissions today, the changes we are seeing to our climate will continue for decades due to the impacts of carbon already in the atmosphere. Adapting to change is never easy, but in this case it is critical. Recognizing the need to adapt and the options for doing so is half the battle.

Recognizing the need to adapt and the options for doing so is half the battle.

MEETINGS CONTACT LIST

Meetings conducted by the Partnership for the Delaware Estuary’s implementation and advisory committees occur on a regular basis and are open to the public. For meeting dates and times, please contact the individuals listed below:

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(800) 445-4935, ext. 102
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**Monitoring Advisory Committee**
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**Polychlorinated Biphenyls Implementation Advisory Committee**
Pamela Bush, Esq.
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Pennsylvania’s Growing Greener Program in Jeopardy

The Growing Greener program—a vital source of support for cleaning up rivers and streams and protecting and restoring fish and wildlife habitat in Pennsylvania—is nearly depleted of funds. The Partnership for the Delaware Estuary and its colleagues in Pennsylvania rely in part on Growing Greener funds to restore and protect resources critical to the Delaware Estuary.

The Growing Greener and Growing Greener II programs have provided communities throughout Pennsylvania with $1.3 billion since 1999. This money has paid for a wide variety of projects intended to enhance, preserve and restore farmland, parkland, drinking-water systems, sewer systems and more. Many of these projects have improved the quality of both land and water in the Delaware Estuary’s watershed.

Unless action is taken soon, total funds available for Growing Greener will drop from $200 million in 2007-2008 to just $15 million as early as 2012. Renew Growing Greener, a coalition of conservation, recreation, and environmental groups from across Pennsylvania, is working to encourage the legislature and new governor to prevent this with a dedicated, sustainable source of funding.

Please visit RenewGrowingGreener.org to learn more about the effort to continue this 11-year-old grants program. And log on to www.dced.state.pa.us/growinggreener to see the impact of the Growing Greener program in your community.

PDE Receives First Donation of Stock

The Partnership for the Delaware Estuary (PDE) was pleased to receive its first gift of donated stock in 2010. Eugenia Phelps provided the PDE with a considerable donation of stocks, which will be used to help further ongoing work to protect and enhance the Delaware Estuary. We thank her and her family not only for the generous contribution to our organization, but also for helping us through the process of opening a stock portfolio for future stock donations. We hope that our newly expanded ability to accept donations of stock from our friends and supporters will help open up even more opportunities for the PDE to sustain its current programs, as well as initiate new projects in support of the Delaware Estuary.

Thank You, Speakers and Sponsors

The Partnership for the Delaware Estuary would like to thank all those who sponsored and spoke at the Delaware Estuary Science and Environmental Summit on January 30 to February 2 in Cape May, New Jersey. While there are too many speakers to list here, we would like to recognize our sponsors. They include:

**Benefactor**
- Philadelphia Water Department
- U.S. Environmental Protection Agency

**Patron**
- Delaware Coastal Management Program
- Delaware Department of Natural Resources and Environmental Control
- DuPont
- New Jersey Department of Environmental Protection
- Sunoco, Inc.
- U.S. Geological Survey

**Contributor**
- National Oceanic and Atmospheric Administration

**Friend**
- The Academy of Natural Sciences, Patrick Center for Environmental Research
- ConocoPhillips
- Delaware River Basin Commission
- Delaware Sea Grant
- Matrix New World Engineering, Inc.
- McCabe & Associates
- Pennsylvania Sea Grant
- Pennsylvania Department of Environmental Protection, Coastal Resources Management Program
- PSEG Nuclear, LLC
- Rutgers University’s Institute of Marine and Coastal Sciences
- U.S. Fish and Wildlife Service

Please stay tuned to DelawareEstuary.org for access to an estimated 130 presentations and posters from the summit, each of which will detail a successful program, project, or body of research.
Sea level rise is such an important issue that helping prepare for its effects has become a priority focus for the Delaware Department of Natural Resources and Environmental Control’s (DNREC) Delaware Coastal Programs Office. For several years, scientists and planners with the Delaware Coastal Programs (DCP) have been conducting research, working with residents and professionals to fill holes in our knowledge, and helping communities in Delaware plan and prepare for higher seas in the future. More specifically, DCP scientists have begun examining natural resources that are particularly vulnerable to sea level rise, yet on which little research has been done: coastal marshes and impoundments.

Coastal impoundments are managed wetlands that are carefully controlled to foster healthy fish, wildlife and habitats. They help natural resource managers compensate for the loss of naturally occurring, low-salinity wetland habitats to human intervention. Impoundment managers maintain these wetlands with dykes, levees, structures, and devices that control their water level and salt content through excluding and managing tides.

Impoundments can function as either fresh- or brackish-water (slightly salty) pools or marshes. Water-control structures in the impoundments allow for seasonal manipulations of water levels to maximize their habitat usefulness throughout the year. Delaware’s impoundments provide habitat not only for over 70 species of birds and over 160 species of plants, but also they are managed for many overlapping uses, such as mosquito control, fish nursery areas, furbearer trapping, crabbing, fishing, waterfowl hunting, and bird watching.

The Delaware Estuary’s gently sloping coastal plain makes the state’s clean-water investments and natural resources, like coastal impoundments, more vulnerable than other areas to sea level rise. The level of the ocean, bays and rivers have risen and fallen before, and throughout Earth’s history, as a result of natural warming and cooling cycles. However, scientists from the Intergovernmental Panel on Climate Change and the U.S. Climate Change Science Program have found that the current rate of sea level rise will likely accelerate because of global climate change.

During periods of climatic warming such as this, two major processes can cause sea level rise. First, as water warms, it expands slightly and increases its volume. Second, warmer air temperatures can melt land-based glaciers and icecaps, which contributes additional water to the oceans. Based on the projections of these scientists, states and federal agencies are planning for sea level to increase anywhere from one foot to five feet or more by 2100. These changes could have major impacts on the Delaware Estuary. As sea levels rise, high-tide lines will push farther inland, and the flatter the land, the more extensive the inland movement will be. In developed areas it is likely that people will try to build up structures to protect themselves from rising sea levels, but it will be much harder to protect vast expanses of natural areas.

Sea level rise will have critical implications for impounded areas. Rising sea levels may wash away shorelines, weakening impoundment structures to the point where they can no longer be maintained as they have been in the past. Higher sea levels may also cause long-term “inundation,” or flooding, of low-lying, impounded marsh areas. This could lead to an inability to maintain the water levels, which could result in marsh areas being replaced by open water.

Unfortunately, relatively little applied research has been directed to assist impoundment managers in developing plans that balance the needs of their diverse user groups while incorporating predicaments associated with higher seas. Issues like regional subsidence (natural sinking of land), storm surge, climate change, and wetland degradation also complicate this quandary.
Impoundment management will certainly need to be modified in order to preserve the availability of this important habitat, but exactly how to do this has been unclear so far.

To determine how best to manage Delaware’s impoundments with all of these changing variables and higher sea levels, DCP and its partners from DNREC’s Division of Fish and Wildlife, DNREC’s Watershed Assessment Section, the Center for the Inland Bays, and the U.S. Fish and Wildlife Service have undertaken several new studies to provide a scientifically sound basis for long-term impoundment management decisions. These will help scientists predict how vulnerable or resilient each impoundment will be to rising sea levels. For example, new monitoring programs will study the interaction of water levels and rates of flooding within the impoundment compared to the outside tidal waters. In another study, underground samples of marsh soils will be used to analyze years of accumulated marsh sediment (mud) and biomass (dead plants), which will help evaluate sediment accumulation and loss in the marshes. With this information, scientists can evaluate the differences in historic elevation and sediment-accumulation rates between man-made impoundments and naturally occurring marshes. Other studies will monitor structures placed in the marsh called “sediment elevation tables” to better understand underground processes and changes that occur in the marsh impoundments and wetlands.

Impoundments are an important part of Delaware’s landscape, and they serve as critical wildlife habitats that are missing and declining within the state. Their continued function and protection is too important to Delaware’s fish and wildlife for us to get their management wrong in the future. With the results of these studies and our other initiatives on sea level rise, DCP and its partners will help make sure that any long-term plans for impoundment management in the face of sea level rise will be based on sound science and responsible decision making.

Delaware is the First State, so it should come as no surprise that it has a long history of building dams, dikes, levees, sea walls, and other impounding structures in coastal areas. These were used to foster agriculture, development, and waterfowl while addressing common problems such as flooding.

As this article states, impoundments require maintenance. They also block the natural, inland movement of coastal wetlands as sea levels rise, resulting in less wetland acreage. And since they are enclosed, impoundments prevent fish from swimming into areas where they can breed and raise their young.

For these and other reasons, many experts recommend that the coastal zone be managed as a dynamic, changing landscape by opting for self-sustaining solutions that are more natural. And in some cases, they suggest we should retreat from impoundments; allowing the sea to reclaim them as estuarine habitats.

— Danielle Kreeger, Ph.D., Science Director, Partnership for the Delaware Estuary
A new flood-preparedness tool is now available for several central Delaware River communities. Flood-inundation mapping is an interactive, Web-based product that shows the extent and depth of floodwaters over given land areas, enabling public safety officials and residents to examine the threat of floodwaters and determine areas of highest flood risk.

“Flood-inundation maps will assist emergency management and planning, and these are among the first to be made available to the public in the Northeast,” Delaware River Basin Commission (DRBC) Executive Director Bob Tudor said.

Flood-inundation mapping was one of the recommendations identified in the Delaware River Basin Interstate Flood Mitigation Task Force’s “Action Agenda” following the floods of 2004, 2005 and 2006. The goal of this effort is to improve flood warnings and aid in conveying an awareness of flood risk along the Delaware River.

The flood-inundation maps were made possible by the partnership efforts of the National Weather Service (NWS), Philadelphia District of the U.S. Army Corps of Engineers (USACE), and the DRBC. Thanks to Congressional and grant funding secured by the DRBC, map sets for the following flood-forecast points are now available on http://Water.Weather.gov/ahps, the NWS Advanced Hydrologic Prediction Service’s website:

- Trenton, NJ
- Lambertville, NJ/New Hope, PA
- Stockton, NJ
- Frenchtown, NJ
- Riegelsville, NJ

Four additional flood-inundation map sets are planned to be completed in the next few months at these locations:

- Phillipsburg, NJ/Easton, PA
- Belvidere, NJ
- Montague, NJ
- Port Jervis, NY

In September 2010, the new flood-inundation maps were highlighted to over 130 county and local emergency managers at three Flood Warning Users Forums convened by the DRBC and its partnering agencies in Easton, Pennsylvania, Lambertville, New Jersey, and Narrowsburg, New York. Attendees heard presentations from the NWS, USACE, U.S. Geological Survey (USGS), Nurture Nature Foundation (NNF), and other agencies about the latest flood-warning advancements in the basin, as well as available online tools and forecast products.

“A great deal of the information provided at the forum was interesting and useful; in particular the online tools that are available, both weather and hydrology related, as well as the discussions on uncertainty in forecasting,” Mercer County Deputy Coordinator Robert Hartman said.

Flood-inundation mapping, combined with various flood-alert products, provide critical information to emergency-management officials and citizens, enabling greater flood preparedness (see page 7 for a related campaign). Tools, such as iNWS Mobile Alerting [http://inws.wh.noaa.gov] and USGS WaterAlert [http://water.usgs.gov/wateralert], create customized text-message or e-mail alerts that provide real-time data from stream gages and notify users when a critical threshold is reached or forecasted. Citizens can stay informed, and more importantly, stay safe with such accurate, up-to-date information.

It is hoped that the use of flood-inundation maps will facilitate more detailed forecasts of impacts and will enable emergency personnel to make quick decisions about when and how to close roads and evacuate residents threatened by rising floodwaters. In addition, it could prove to be a strong planning tool used by both residents and communities. The ability to view inundation levels of past flood events allows communities and residents to better understand their flood risk and plan for a sustainable future.

The National Oceanic and Atmospheric Administration’s NWS is the primary source of weather data, forecasts and warnings for the United States and its territories.
‘Focus on Floods’ Campaign
Boosting Interest in Flood Alerts

By Rachel Hogan Carr, Director of Environmental Outreach, Nurture Nature Foundation

The bad news: Flooding is the nation’s most common, costly and deadly hazard.

The good news: Flood losses are the most preventable, new flood-forecast and warning technology can help communities prepare, and Nurture Nature Foundation is spreading the news.

“Focus on Floods,” a flood education-and-awareness campaign, is the latest effort by Nurture Nature Foundation (NNF), a nonprofit organization working in Easton, Pennsylvania, to help educate communities about flooding. Working with the National Oceanic and Atmospheric Administration and the National Weather Service (NWS), NNF has developed a new website, www.FocusonFloods.org, which hosts a series of materials developed in the past year and a half as part of its campaign in the Delaware River Basin. These materials include: audio and visual public service announcements, interviews with flood experts and authorities, an introduction to understanding flood risks, a 10-minute animated film demonstrating best practices for flood preparedness, classroom worksheets, posters and activities, and more. All materials can be requested in hard copy while supplies last by e-mailing KMaxfield@NurtureNature.org, or through the website www.FocusonFloods.org.

The focus of the materials is on the use of new “flood alerts” available from the NWS, which are available by RSS (Really Simple Syndication) feed to Internet browsers, e-mail or cell phone, and which provide notice when a flood warning is issued. These flood alerts are available at the NWS Advanced Hydrologic Prediction Service (AHPS) website (http://Water.Weather.gov/ahps), where graphs show current and forecasted river levels at stream gages throughout the Basin (see article on page 6). Learning to monitor river levels is a critical first step in flood preparedness; as water levels rise, individuals and organizations can begin to take important planning steps – such as moving important items higher in a building, or evacuating before access roads flood – to reduce the loss of property, and lives.

The campaign’s creators developed numerous materials to share this message. Write-on/wipe-off “What’s Your Number?” refrigerator magnets, and an accompanying poster, direct people to visit the AHPS’s website to register for flood alerts and learn more about river levels in their community, including the flood stage for their own area. These magnets are equally appropriate for classrooms and households.

NNF also hosted a series of one-hour radio shows in cooperation with the local radio station, WDIY 88.1 FM, which explored the effects of flooding on the region through interviews with community leaders, flood survivors, a swift-water rescue trainer and flood counselors, as well as with Mary Shafer, the author of Devastation on the Delaware: Stories and Images of the Deadly Flood of 1955. Along with most of the other pieces developed through the campaign, these shows are available online at www.FocusonFloods.org.

Throughout the campaign, NNF hosted meetings and public discussions about flooding with those most affected, including emergency managers, professionals and residential audiences. We also developed educational pieces appropriate for youth, including the worksheets and animated film. Using a floodplain simulator table, NNF showed large groups of Boy Scouts the way that stormwater travels through the landscape under different development scenarios.

NNF also developed a traveling exhibit about flooding that can be requested by organizations throughout the Basin for display. A second exhibit about how to live with the river safely resides at the Nurture Nature Center, the science center NNF is developing in Easton, Pennsylvania, at the confluence of the Delaware and Lehigh rivers. The Nurture Nature Center will open formally later this year. For more information, visit NurtureNatureCenter.org.

A campaign is now under way to increase flood preparedness along the Delaware River, and its tributaries. This includes postcards (above), an animated film entitled “Day of the Flood” and more. Visit YouTube.com/FocusonFloods to watch the 10-minute film today.

By Rachel Hogan Carr, Director of Environmental Outreach, Nurture Nature Foundation

Credit: Nurture Nature Foundation and the National Weather Service

A project of the Nurture Nature Foundation in cooperation with the National Weather Service.

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GreenTreks Network, Inc., an award-winning Philadelphia non-profit, has begun dividing its vast library of captivating documentaries and television programs into short video segments for use in area schools. These personal, story-based videos make environmental issues come alive by focusing on local people who are taking on a wide range of issues and getting them solved. From dumpster divers, who are literally turning trash into art, to volunteers combating the effects of development on wetlands and drinking-water supplies; from family farmers who are turning to organic practices to students who are learning how innovative thinking can make use of renewable forms of energy to power transportation and homes; each has a lesson to teach.

“The informative, inspiring videos are only the start,” said Brie Knight, director of the EcoExpress Program. “The true power of this hub of environmental learning lies in the wealth of materials it puts into the hands of teachers, with the simple click of a mouse.”

Each video is aligned to Pennsylvania’s “Academic Standards for Environment and Ecology,” “Science and Technology and Engineering Education,” as well as The School District of Philadelphia's core curriculum to allow for easy integration into classrooms. In addition, each features corresponding Learning Pod content, which includes classroom activities, discussion questions, homework suggestions, and other resources for grades kindergarten through 12. The Learning Pod content was developed to help educators utilize the videos as part of a holistic educational experience, said Knight. Finding appropriate videos is easy and can be accomplished in a surprising number of ways: by keyword or subject, age range, Pennsylvania standard, and core-curriculum area, so EcoExpress resources are useful to anyone, even if Pennsylvania standards aren’t a primary concern.

A segment from GreenTreks’s acclaimed Eat Locally, Think Globally video offers an example of how EcoExpress works. The video follows a group of children as they discover the connection between thriving soil, fresh food, and human health during a class trip to an organic farm. The story combines fun and facts, and it involves kids so others can easily relate.

“We’ve always known that our programs resonate with kids,” said Knight, “but as environment and ecology standards became mandatory, we found more and more teachers wanting help putting them to use in the classroom. Videos like Eat Locally are a great entry point for themes like biodiversity, and they really work because they place issues in a local context, rather than some abstract, far-away place.”

EcoExpress provides the opportunity to bring the learning full circle, as each video is linked to a Community Partner that offers experiential education programs and service-learning projects. EcoExpress Community Partners range from environmental non-profits to other community-based organizations that are experts in engaging with kids, and they include the Fairmount Water Works Interpretive Center, Pennsylvania Horticultural Society, Delaware Valley Earth Force and many others.

EcoExpress is helping educators teach about environmental issues across the region, and it’s making an impact. Numerous Philadelphia middle school teachers who have been through training workshops have noted that the videos are very useful for the students and engage them in familiar ways. An educator in Chester said his program has greatly benefited from EcoExpress resources, and he plans to use a Community Partner to teach his high school students about wind turbines and wind energy. In fact, he has encountered such a positive response from his students that he says, “I have been using your site as a tool for new intakes [students]!”

Because of its engaging and locally relevant videos and complementary content, EcoExpress offers a way to get students excited about the local environment—and teachers are taking notice.

To find out more, visit EcoExpress.org or contact Brie Knight at BKnight@GreenTreks.org or Meghan Filoromo at Production@GreenTreks.org.
It was a beautiful day for gardening when Governor Jack Markell proclaimed the final week of summer Rain Gardens for the Bays Week in Delaware. He did so by visiting the Delaware Agricultural Museum, appropriately enough. That’s where workers had put the finishing touches on a brand new rain garden, but not just any rain garden. This was a demonstration garden, or a plot planted to show others how it’s done.

Demonstration rain gardens are sprouting up in strategic locations throughout the mid-Atlantic region. These include both recently completed and soon-to-be-completed gardens at (from north to south):

**Pennsylvania**
- Riverbend Environmental Education Center in Gladwynn*
- Springside Elementary School in Philadelphia*
- Heebner Park of Worcester Township
- Marcus Hook Community Center

**Delaware**
- DuPont Environmental Education Center of Wilmington, sponsored by Pepco Holdings, Inc.
- Rittenhouse Park of Newark
- Blackbird State Forest of Clayton
- University of Delaware’s College of Earth, Ocean, and Environment in Lewes*
- Bethany Beach Nature Center
- Delaware Agricultural Museum of Dover*
- H.O. Brittingham Elementary School of Milton
- Sussex County Library of Milton

- Fairview Elementary of Dover
- Ceasar Rodney High School*
- Natural Resource Conservation Services Building of Dover*

**Maryland**
- Germantown Rosewald School of Berlin*

Schools, parks, and other public places have been selected for demonstration rain gardens because they will be seen by many people. So, too, will their signs proclaiming, “Registered Rain Garden” and “Join the Campaign!” In this way, organizers are hoping to multiply their efforts many times over.

continued on page 10

* Indicates these rain gardens are finished, though not all have been registered and marked with signage.
Rain Garden continued from page 9

The idea is simple. Each time someone encounters a demonstration garden, sponsors are counting on them to read the sign and, in turn, consider planting their own rain garden. To aid this process, they have created RainGardensfortheBays.org. This website offers insider info, step-by-step instructions, and a gallery of photos depicting—what else—rain gardens. But sponsors are not stopping there. They are also reaching out to plant nurseries in an effort to provide them with free countertop displays. These signboards will be stocked with literature about the program, and clerks can use them to encourage the purchase of plants; native plants, preferably.

This is not to say, however, that gardeners must have money to take part in the campaign. Those with an existing rain garden can register theirs, too, after which they will receive a sign in the mail. And therein lies the key. The more people who register their rain garden, the more exposure the campaign will get. And the more exposure given to the campaign, the more each estuary in the mid-Atlantic region will benefit.

The “Rain Gardens for the Bays” campaign was created last year to improve the health of three estuaries. These include:

- the tidal Delaware River and Bay in Delaware, New Jersey and Pennsylvania
- the Inland Bays of Delaware, including Indian River, Little Assawoman, and Rehoboth bays
- the Maryland Coastal Bays, including Assawoman, Chincoteague, Isle of Wight, Newport, and Sinepuxent bays

Each rain garden will help protect its nearest bay by soaking up both rain and snowmelt before they carry pollutants into waterways. See how this works at RainGardensfortheBays.org. Anyone residing in the mid-Atlantic region is encouraged to participate.

Participants in the Rain Gardens for the Bays Campaign will receive this sign to display in their rain gardens. It is designed to draw attention to each rain garden and encourage others to create their own.
For many people, recycling is second nature. They either drop it off or it gets picked up at the curb. But what about those hard-to-recycle items, like hazardous chemicals? These have to be dropped off at a neighborhood collection event, but as you probably know, this can get complicated.

The good news is almost every county in the Delaware Valley recycles hazardous waste. The bad news is not all programs are created equal. County recycling programs go by different names — some of them real mouthfuls — like improvement authority, solid waste authority, and municipal utilities authority. Some have fixed locations open every day, for the most part. Others jump from place to place, and they’re only open a day or two per year. Occasionally they will charge you to accept some items, but most do not. And some won’t accept certain items at all, like electronics, medications, and tires for example. Yet others do, but only on certain days.

Confused yet? Don’t worry.

Simply use the following list to discover when you can drop off hazardous materials. Do it early and do it often, because you never know when floodwaters may wash them into a nearby waterway — with disastrous effects.

Please visit the “Lifestyle” tab of DelawareEstuary.org for a more detailed list that includes times of day, locations, and more. And visit Earth911.com to find out how you can recycle additional items your county does not collect.

### Delaware
- **New Castle County**: March 5, April 2, July 2, September 3, November 5, and December 3
- **Kent County**: June 4 and October 1
- **Sussex County**: May 7 and August 6

### New Jersey
- **Atlantic County**: March 5, May 7, July 9, September 10, October 8, and November 5
- **Burlington County**: Drop offs welcome year round at 18 sites
- **Camden County**: March 19, April 16, May 21, June 18, September 17, and October 15
- **Cape May County**: TBD for May and September
- **Cumberland County**: April 9, June 4, and September 10
- **Gloucester County**: April 9, May 21, September 10, and October 15
- **Mercer County**: March 26, June 11, and October 1
- **Monmouth County**: TBA this spring, but drop offs are welcome year round
- **Salem County**: April 16 and October 15

### Pennsylvania
- **Berks County**: April 16 (chemicals), April 30 (tires), and May 7 (medications)
- **Bucks County**: TBA in early March
- **Chester County**: April 9, May 21, June 24, September 10, and October 8
- **Delaware County**: April 9, May 7, September 15, and October 15
- **Lehigh County**: Does not have a household hazardous waste collection program at this time.
- **Montgomery County**: April 16, April 30 (tires), May 14, June 25, August 20, September 10 (tires), September 24, and October 22
- **Philadelphia County**: April 9, May 14, June 11, July 21, September 24, October 22, and November 5
- **Schuylkill County**: TBD for late September, at which chemicals may or may not be accepted

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**Dispose of Chemicals — Before Floodwaters
Do It for You**

By Shaun Bailey, Marketing and Communications Coordinator, Partnership for the Delaware Estuary

Chemicals, electronics and medications are piled together during the 2008 Christina River Watershed Cleanup in Wilmington, Delaware. Dispose of these and other hazardous materials at a local collection event—before a flood carries them to your local river.
Every corporation or community group landscapes its property, so why not make that landscaping count by planting groups of plants that provide food and habitat for wildlife, or reduce flooding issues? Members of the Corporate and Community Environmental Stewardship Program (CESP) are working with the Partnership for the Delaware Estuary (PDE) to improve their landscapes by making them more functional and more beautiful, and they’re having fun while doing it.

Most land maintained by corporations or community centers is mowed turf with a few trees or shrubs close to the buildings. Maintaining that lawn is very expensive — about $700 per acre annually — and does not help reduce stormwater runoff or provide wildlife habitat. These turf lawns are taking over the U.S. landscape and currently cover almost 2 million acres across the country. That is triple the amount of land that is used to grow corn. CESP members are trying to reduce those numbers by planting habitats on their properties that improve water quality, reduce flooding problems, provide food and shelter for wildlife, and create walking paths and beautiful views for employees and communities to enjoy. The following are descriptions of what some of these companies and communities are focusing on as Delaware Estuary environmental stewards.

Logan Generating Company has been a CESP member for over 10 years and has made commendable efforts to maintain and conserve its surrounding natural resources by taking an explicit interest in restoring its property. The project area at the Logan Generating Station in Logan Township, New Jersey, consists of approximately 31 acres of fields that were converted from agricultural production to wildlife habitat by planting trees and shrubs, starting in 2002.

In 2010, Logan Generating began a monitoring program for this area to track the health and survival of planted trees and shrubs, as well as the area’s use by birds and other animals. They also began the process of eradicating Sericea lespedeza, an invasive plant that prevents healthy native plants from growing. After a couple of seasons of this work, they can begin planting the area again. In November, about 25 employees and some of their children planted about 100 trees and shrubs in a second habitat restoration area on the property.

Sunoco became a CESP member in 2010 and has been working with PDE staff to plan several projects. Sunoco employees are active in the Marcus Hook and Philadelphia communities, so the goal for its CESP projects is to get more involved in these communities and also benefit the environment by doing planting projects at local elementary schools, community parks and ball fields, and around Sunoco’s properties. On Earth Day in April, Sunoco plans to have several opportunities for employees to participate in projects, such as marking storm drains with “No Dumping” signs or planting trees in the area to help improve the environment and educate the community about water pollution and other issues.

New Castle County also joined the CESP in 2010, and it has already laid the groundwork for improving the attractiveness and functionality of two stormwater ponds in Hockessin, Delaware. Both ponds have had problems with invasive plants like Phragmites, a nuisance made worse by the fact that they are located on the main road through town and adjacent to a ball
field. New Castle County is currently working to enhance these stormwater ponds with native wetland plants. The ponds will be seeded by volunteers in the spring with attractive, native sprigs and plugs, such as blue flag iris and joe pye weed. Educational signs will also be placed on the sidewalk between the ponds to explain the need for plants in stormwater ponds to help soak up water and prevent nutrients from getting into nearby streams.

Pepco Holdings, Inc., is currently planning a rain-garden project at their site in Wilmington, Delaware. The rain garden will capture polluted runoff from one of the parking lots on the property, and the nutrients in the runoff will be absorbed by the native plants in the rain garden instead of leaching into the nearby Christina River. The rain-garden site is in an urban location and will provide a good opportunity to educate people walking by about how to manage their own runoff.

Pepco’s rain garden will be among the first installed in the Delaware Estuary’s watershed as part of a new “Rain Gardens for the Bays” campaign that the Partnership for the Delaware Estuary is working on with the U.S. Environmental Protection Agency and others (see article on page 9).

Wheelabrator Gloucester is located on 153 acres on the shores of the Delaware River, and the property includes a variety of habitat types, including grasslands, upland forests and wetlands. As part of the Wildlife Habitat Council’s Wildlife at Work program, the six-person Waste Management wildlife team actively manages 30 acres of the site for wildlife-habitat enhancement and restoration.

Wheelabrator is continuing its environmental symposium program with a local middle school, West Deptford Middle School, to educate the students on environmental issues. This year, the students are working on signs for Wheelabrator’s wildlife habitat that will educate the public about the Delaware River and the wildlife it supports.

In May, Mannington Mills volunteers in Salem, New Jersey, took the third and final step to complete a major local habitat-restoration project. The three-stage project has restored 12 acres of low-grade agricultural ground to an improved streamside buffer. By planting this buffer with native trees and shrubs, they are establishing an area of shrub habitat that will last for over 30 years before eventually becoming forest. During this time, the project will provide habitat for the following bird species of concern: the blue-winged warbler, eastern kingbird, brown thrasher, prairie warbler, eastern towhee and field sparrow.

In March 2009, the entire field was planted with a mix of native grasses, which have established well over the past two years. In May 2009, they also established the beginnings of a woody buffer adjacent to the marsh. This spot is adjacent to Route 45, directly across the street from The Bank. In the fall of 2009, they planted the long, five-plus-acre stretch of the field with native shrubs and trees. In total, Mannington Mills planted well over 3,000 native trees and shrubs at this site during three volunteer events.

The New Jersey Audubon Society, U.S. Fish and Wildlife Service, and the PDE helped to coordinate this project, which was identified as one of only five Priority Projects for the Delaware Estuary by the New Bolton Center buffer project and other projects on their companies’ properties.

The New Bolton Center site is one of several demonstration plantings by the PDE that utilized The Guide to the Natural Communities of the Delaware Estuary for the selection of plants. In 2008, Centocor, Noramco, GBSC and McNeil (all Johnson & Johnson companies) began working with the PDE on the first phase of a stream-restoration project at the University of Pennsylvania’s New Bolton Center in Kennett Square, Pennsylvania. Phase one of the project involved planting native trees, shrubs, and grasses in a 10-foot-wide buffer along a stream that flows through a pasture where animals are allowed to roam. This was needed because nutrient-rich animal waste was causing bacteria and algae to grow in the tributary, reducing the amount of oxygen available for aquatic plants living downstream. Additional plants were installed by company volunteers in 2009, and today, Centocor and Noramco are working with the PDE on new ideas for expanding and improving the New Bolton Center buffer project and other projects on their companies’ properties.
ConocoPhillips and the PDE are currently teaming up to complete a rain garden in the community near the corporation’s property in Marcus Hook, Pennsylvania. The rain garden will intercept polluted rainwater and snowmelt running off nearby buildings and streets before it can run into the Delaware River nearby. The rain garden should be complete next spring and will have educational signs for the community.

In addition to being a member of the CESP, ConocoPhillips has provided additional funding to support the Freshwater Mussel Recovery Program.

CESP Eco-excursion

Each year, CESP members go on an Estuary Eco-excursion to learn more about the estuary and network with each other. In September 2010, the group toured the DuPont Nature Center at the Russell W. Peterson Wildlife Refuge on the Wilmington Riverfront and heard a presentation on wetlands by the PDE’s science director and science specialist. The marsh surrounding the nature center is one site in the PDE’s Mid-Atlantic Coastal Wetland Monitoring and Assessment Program, where the health and condition of the estuary’s tidal wetlands are being monitored over several years. CESP members learned about the unique fresh and saltwater tidal wetlands that are a hallmark feature in the Delaware Estuary. Then the group went down the river to visit the official tall ship of Delaware, the Kalmar Nyckel, where CESP members toured the ship and learned the history of it and the region.

The PDE’s Corporate and Community Environmental Stewardship Program provides corporations and community members in the Delaware Estuary region with the opportunity to take a leadership role in preserving their communities’ environmental well-being. These environmental stewards combine technical assistance from the PDE with corporate funds and manpower to make tangible, environmental improvements in Delaware Estuary Watershed communities. For more information or to join the CESP, please contact Karen Johnson Forst at (800) 445-4935, extension 101, or KJohnson@DelawareEstuary.org.

Members of the CESP watch as Angela Padeletti, science specialist at the Partnership for the Delaware Estuary, demonstrates how she and others assess the health of marshes. This visit to Wilmington’s DuPont Environmental Education Center was one of several stops during the program’s annual Eco-excursion on September 30.
Art Contest Deadline  
February 25  
Philadelphia, PA
Not all kids are into nature. Some are interested in art, for example, or maybe theater. That’s why the Philadelphia Water Department (PWD) continues to sponsor its annual art contest. Students who otherwise may show no interest in nature can win prizes and, in the process, discover something new.

All they have to do is create a drawing showing others how to protect Philadelphia’s hidden streams. That or they can film a video portraying the PWD’s new spokesdog in action. Visit DelawareEstuary.org for details and an entry form.

Voting Deadline  
February 28  
Greater Philadelphia, PA
Last November you watched as democrats, republicans and others campaigned for your vote. Now watch as dalmatians, Russell terriers and mixed breeds do the same. Visit PhillyWatersheds.org to vote daily for the dog you feel best represents the title of Philly Water’s Best Friend. More than 80 dog owners have declared their pets’ candidacy. And how “This is My Watershed” and you could win $50 or a green plan for your school. Log on to SchuylkillWaters.org for details.

Video Contest Deadline  
March 1  
Schuylkill River Watershed, PA
Charge those batteries, because the Schuylkill River is ready for its close up. Why, those spring floodwaters are just waiting to be filmed, and what better reason than the Schuylkill Stories Contest? Students in kindergarten through college are encouraged to enter, and it couldn’t be easier. All you have to do is create a three-minute video. Show us Delaware River Basin, and each of them has a say when it comes to the purity of that water. You, too, have a say, and you can make it heard. All you have to do is take part in the Delaware River Basin Forum, a one-day opportunity to discuss issues affecting drinking water. Participants can visit one of eight satellite sites, or they can watch live via Webcast. Please visit DelawareBasinDrinkingWater.org to learn more and register.

Christina River Watershed Cleanup  
April 16, from 8 a.m. to noon  
New Castle County, Delaware
Each spring a flood of debris makes its way into northern Delaware’s waterways, like the Christina River, Red Clay Creek, and White Clay Creek. It’s up to us to capture this trash before it can pollute Delaware Bay, and you can help. Register for the Christina River Watershed Cleanup online at ChristinaRiverCleanup.org. The Partnership for the Delaware Estuary is a proud sponsor of this annual event, and you can join us by choosing the Riverfront Wilmington site.
Partnership for the Delaware Estuary: a National Estuary Program

The Partnership for the Delaware Estuary, Inc. (PDE) is a private, nonprofit organization established in 1996. The PDE leads collaborative and creative efforts to protect and enhance the Delaware Estuary and its tributaries for current and future generations. The PDE is one of 28 National Estuary Programs. To find out how you can become one of our partners, call the PDE at (800) 445-4935 or visit our website at www.DelawareEstuary.org.

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