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## Partnership for the Delaware Estuary: a National Estuary Program

The Partnership for the Delaware Estuary, Inc., is a private, nonprofit organization established in 1996. The Partnership leads collaborative and creative efforts to protect and enhance the Delaware Estuary and its tributaries for current and future generations. The Partnership is one of 28 National Estuary Programs. To find out how you can become one of our partners, call the Partnership at 1-800-445-4935 or visit our website at [www.DelawareEstuary.org](http://www.DelawareEstuary.org).



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# ESTUARY NEWS



NEWSLETTER OF THE PARTNERSHIP FOR THE DELAWARE ESTUARY: A NATIONAL ESTUARY PROGRAM

## Estuary Economics Means Money in the Bank

By Kathy Klein, Executive Director, Partnership for the Delaware Estuary



PHOTO: CREDIT: PARTNERSHIP FOR THE DELAWARE ESTUARY

**Investment in natural-resource restoration can reap great rewards. Shell-planting efforts in Delaware Bay, for example, have generated \$50 for every \$1 invested.**

**T**he Delaware Estuary is a powerful economic engine. For decades the Estuary has supported one of the world's largest concentrations of heavy industry, the world's largest freshwater port, and the second-largest petrochemical refining center in the United States. The Estuary is the source of drinking water for millions of people. It provides water to irrigate farm fields and to support livestock. As a recreational resource, the Estuary fuels a variety of water-related activities, including boating, fishing, rowing, birding and hunting, all of which support a multi-billion dollar ecotourism industry. The Delaware Estuary is, lit-

erally, the economic backbone of our region.

Historically, however, we have not factored into the region's economic equation the value of the Estuary's ecological resources. In fact, we have pushed aside concerns about ecological health in the name of economic progress. Outside of oil and minerals, few people have thought about the idea of assigning an economic value to a natural resource, living resource or, for that matter, an ecological state of being. Fortunately we are beginning to see a paradigm shift in how we as a society value ecological resources. Modern economists and those working in other disciplines are advancing the idea that a

healthy, balanced ecosystem is inextricably linked to a healthy economy, both on a local and global scale.

To get a better idea of how this new way of thinking is taking hold in the Delaware Estuary region, I encourage you to read the articles in this edition of *Estuary News*, to think about the concepts, and to discuss the ideas presented with others.

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## Trees Pay Us Back

By Patrice Carroll, Project Director, TreeVitalize

**O**f all the benefits that trees provide, those that are economic in nature are least understood. People naturally recognize the benefits they can see and feel. For instance, we love the visual appeal of leafy neighborhoods. And it does not take a Ph.D. to know that trees make it cooler. Seats in the shade are invaluable on a blisteringly hot day. What people do not see or feel is that trees do so much more. Trees toil 24-7, invisibly multi-tasking to improve the bottom line of households, businesses and communities every day.

A number of researchers are working hard to measure bottom-line, economic benefits. Such evidence is increasingly important to justify public spending for tree plantings and care. Despite the many benefits of trees, public investment in urban forests continues to decline. At the same time, tree cover is disappearing. New development, aging trees and exploding deer populations have caused Southeastern Pennsylvania to lose eight percent of its heaviest tree cover between 1985 and 2001. Tree cover in Southeastern Pennsylvania stands only at 27 percent, far below the 40 percent American Forests recommends for large metropolitan areas. How can we persuade decision makers to see trees, like roads, as infrastructure

necessary for a healthy economy?

Many communities contend they cannot afford trees, but the Center for Urban Forestry has meticulously documented all the costs and benefits associated with public trees. The results are clear: benefits exceed costs by a wide margin. Tree benefits are, on average, three times greater than tree-care costs. Their greatest economic benefits come from increased property values and energy savings.

### Boosting Property Values

The American dream house may or may not be a single-family home with a white-picket fence, but it definitely sits on a tree-lined street. Anton Neelsen and Associates, who pioneered the use of Visual Preference Surveys for community visioning, queried residents across the country about how their community should look. Consistently, one of the highest-ranked community scenes was the "cathedral street," or a street where tree canopies form a green ceiling and create a sense of complete enclosure. When 250 residents of Detroit were interviewed concerning their preference of trees in



PHOTO CREDIT: TREEVITALIZE

**By planting new trees along their street in East Kensington, Philadelphia, residents are not only adding to the value of their homes. They are also helping to combat stormwater-runoff pollution.**

urban areas, eight out of 10 respondents stated that trees would have an influence on their choice of a place to live.

This preference for trees translates into higher property values. Many studies have looked at the impact that mature trees and landscaping have on home values. Results vary by location, indicating the impact from a single landscaping tree ranges from one to 10 percent. Other

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### MEETINGS CONTACT LIST

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# NJDEP Natural Capital Project Nears Completion

By William J. Mates, Research Scientist, New Jersey Department of Environmental Protection

Note: The opinions expressed in this article are the author's and do not necessarily represent the official positions of any agency in the State of New Jersey.

In the summer of 2004, then-Commissioner Bradley Campbell of the New Jersey Department of Environmental Protection conceived a project to estimate the economic value of all the state's natural capital.

Two years later, this ambitious undertaking is nearing completion, and the results are expected to be released in September. Most of the research is being conducted by a team led by Dr. Robert Costanza of the Gund Institute for Ecological Economics at the University of Vermont, one of the acknowledged world leaders in this area. The project is being funded with generous grants from the Geraldine R. Dodge

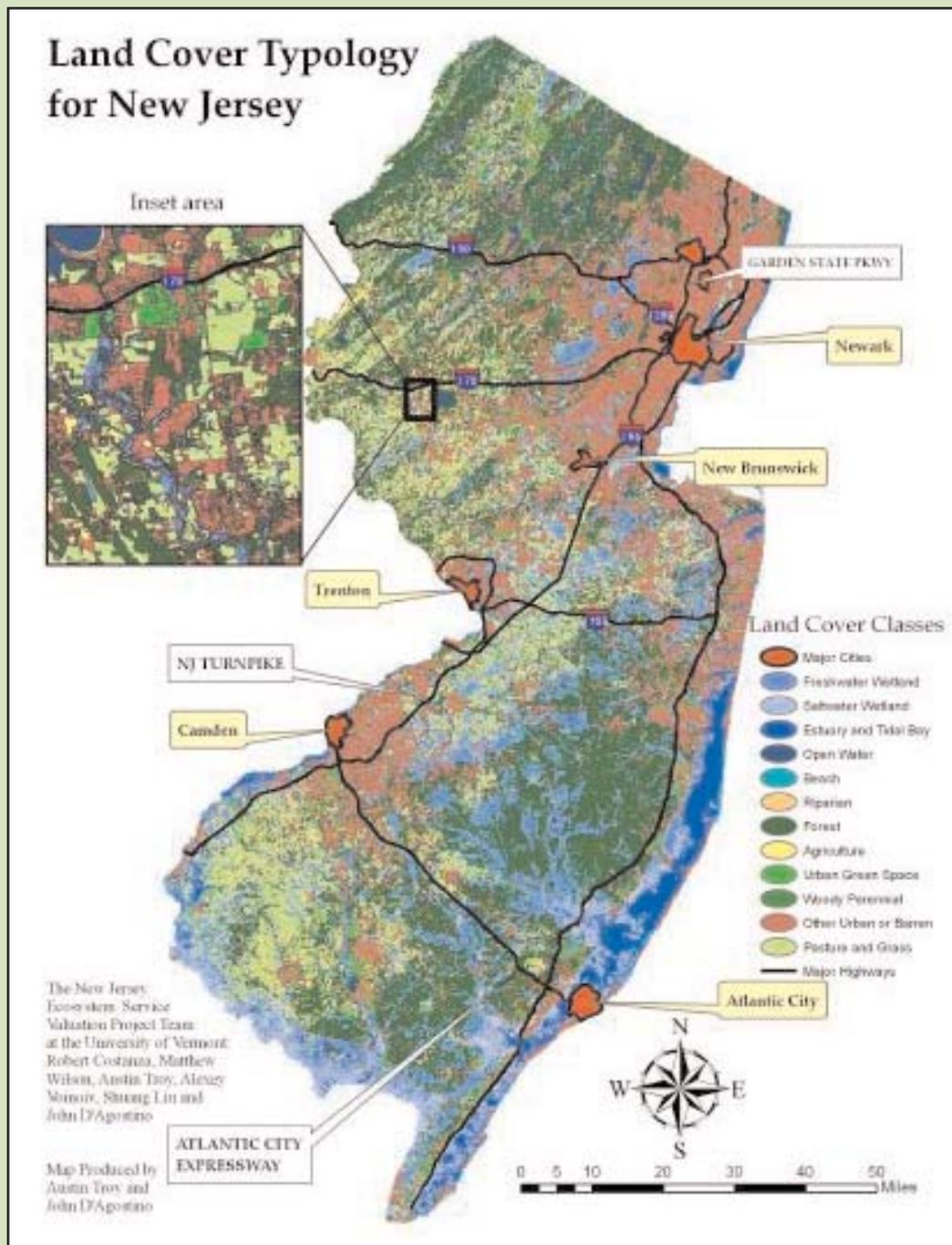
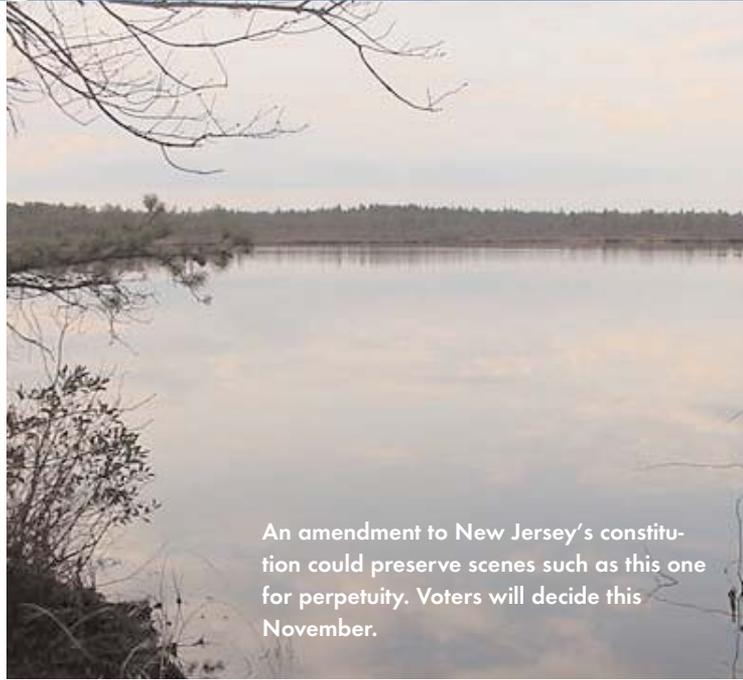


PHOTO CREDIT: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

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## Support Growing for New Jersey's State Parks and Forests



An amendment to New Jersey's constitution could preserve scenes such as this one for perpetuity. Voters will decide this November.

By Pola Galie, Development Associate, Conserve Wildlife Foundation of New Jersey; and Webmaster, Outdoor Recreation Alliance

Participation in wildlife-related recreational opportunities at New Jersey's natural areas provides a significant economic benefit to the state and its citizens. While most residents and visitors do not realize the economic ripple effects of a lost opportunity for fishing, hunting, or wildlife watching, the more than 35 member-organizations of Outdoor Recreation Alliance (ORA) — including the New Jersey Audubon Society, Sierra Club, New Jersey State Federation of Sportsmen's Clubs, Jersey Coast Anglers Association, and others — know firsthand what it means.

ORA represents statewide environmental organizations, sportsmen's groups, affordable housing advocates, and environmental justice activists working to secure a long-term, stable source of funding for capital projects and the operation, maintenance, and stewardship of New Jersey's state and local parks, as well as for natural heritage conservation. ORA also supports the establishment of a dedicated funding source for land acquisition and increased appropriations in the state budget for the New Jersey Department of Environmental Protection's Division of Fish and Wildlife, Division of Parks and Forestry, and Office of Natural Resources Restoration.

Each year over two million people participate in pastimes such as fresh and saltwater fishing, hunting, and a variety of wildlife-watching activities. Many of these people travel from other states and countries for such experiences. These visitors often stay in local hotels and support nearby restau-

rants and other businesses.

The retail sales generated by wildlife-related activities alone totals \$2.5 billion and supports over 37,000 jobs in New Jersey. Additionally, state-tax revenue, salaries, wages, and business profits from outdoor opportunities provided in parks and natural areas generates \$3.9 billion a year. This number represents a significant portion of the \$18.9 billion total-economic value of tourism in New Jersey. While this grand total includes businesses that provide direct goods and services to visitors, there is also an additional \$6.8 billion generated by industries that are not directly involved in tourism, such as agriculture. And this number would be even greater if we could easily quantify the many economic benefits of clean air and water, and a high quality of life.

In 2005 the Outdoor Industry Foundation published the eighth edition of its "Outdoor Recreation Participation Study." Trend analysis for the United States indicates that last year, 59.5 million Americans over the age of 16 took a vacation specifically to participate in an outdoor activity. The top five activities in the study were identified as: bicycling, fishing, hiking, camping and trail running.

The study did not take hunting into consideration, so the number is likely even greater. When researchers collect and evaluate data on wildlife-related recreational activities, they are frequently looking at a smaller portion than the total of all activities. This is one area of data collection that

is often based on the culture and immediate needs of the researcher, but I believe this keeps us from seeing the larger picture.

One can see from the results of the study that people who enjoy outdoor activities represent a major consumer niche of the population impacting local economies. Thus, if we do not provide good stewardship and maintenance for natural areas, we are doing a grave disservice to our state and local economies, residents, visitors to New Jersey, and future generations. We must take care of New Jersey's frequently visited streams, waters, beaches and wildlife habitats in order to ensure the health of our tourism industry. In addition to upholding our inherent duty to care for our natural resources, we must also acknowledge and embrace the economic benefits of ensuring adequately staffed and maintained recreational areas (both private and public) that provide a broad range of activities for the public to enjoy.

Eco-tourism is a relatively new field of study within both ecology and tourism. Although studies are still underway to quantify the economic impact of environmental health and eco-tourism on our economy, there is no denying the amount of money involved and the number of jobs created or lost. Similarly, there is no denying the desire of people to visit New Jersey for its wide array of activities, from its sea coast to its salt marshes and its mountains in the northwest to its Pine Barrens in the southeast.





PHOTO CREDIT: CONSERVE WILDLIFE FOUNDATION OF NEW JERSEY

This November, New Jersey voters will determine the future of their parks and natural areas. This is a result of the successful passage of ACR195/SCR105: the concurrent resolutions that passed both houses on July 8 (Assembly vote: 79 to 0; Senate vote: 40 to 0). The resolutions propose a constitutional amendment on the November ballot to create a stable source of funding for the improvement, construction, renovation, and repair of parks and natural areas on the local and state levels. The amendment would reallocate a surplus of already existing, environmentally dedicated funds from Corporate Business Tax revenue to improving urban and rural parks across the state. This funding would total \$15 million a year through 2015 and \$32 million a year thereafter.

## Helpful Web links for additional information

**Outdoor Recreation Alliance:**  
[www.OutdoorRecreationAlliance.org](http://www.OutdoorRecreationAlliance.org)

**New Jersey Tourism:** [www.VisitNJ.com](http://www.VisitNJ.com)

**Outdoor Industry Foundation:**  
[www.OutdoorIndustryFoundation.org](http://www.OutdoorIndustryFoundation.org)

# Trees Pay Us Back continued from page 2

studies have shown that the value of homes in neighborhoods with trees is higher than those of comparable neighborhoods without trees. In addition, neighborhood green spaces, or greenways, typically increase the value of properties located nearby. New developments that conserve existing trees on site also command higher prices.

One of the most astonishing studies comes from researchers at the University of Pennsylvania's Wharton School. They found that trees have a huge impact on sale prices in modest row-house neighborhoods with low tree cover. The presence of just one new street tree boosted sale prices 10 to 15 percent, or approximately \$3,500 per house. That single new street tree also lifted the values of other row houses within 50 feet. Amazingly, a \$500 investment in one new street tree resulted in a combined property-value gain of over \$20,000.

## Saving Energy

With energy costs rising sharply, people are increasingly looking for ways to save. Trees conserve energy through direct shading and evapotranspiration (the release of cooling moisture through their leaves). According to the U.S. Forest Service, three or more large trees planted on the southwest side of a house can reduce air-conditioning costs as much as 30 percent. Just shading an air conditioning unit can capture a 10-percent savings. And in some locations, winter heating costs can be reduced 5 percent by using evergreen trees to buffer prevailing winds and severe cold.

As populations and energy use continue to grow, planting trees can reduce peak demand and the need for costly new power plants. A study by the Center for Urban Forestry estimated that the energy saved by planting 50 million trees on residential properties in energy-saving locations could help California avoid building seven new 100-megawatt power plants in the future.

## Other Bottom-line Benefits

Researchers at the Center for Urban Horticulture at the University of Washington have spent the last decade studying trees in commercial districts. According to them, shopping has become an experience and much more than a routine trip to buy goods and services. Thus, amenities that enhance the shopping experience are taking on greater importance. Studies completed show that well-maintained trees create a positive impression of the district and influence behavior. Shoppers are likely to visit more frequently, stay longer, pay more for parking, and spend more on goods and services in dis-

tricts with healthy, attractive, tree-lined streets.

Public works budgets can also achieve big savings with trees. The Center for Urban Forestry recently reported that streets shaded by trees need less maintenance. For example, shaded asphalt requires only two-and-a-half slurry seals over 30 years, slashing resealing costs by 60 percent.

Because trees intercept rainfall, investing in them, or preserving existing trees, can preclude the need for costly stormwater systems. American Forests estimates that the existing tree cover in the nine-county Delaware Valley region detains 53 million cubic feet of stormwater. Without trees, the region would have to spend over \$105 million to build retention ponds and other engineered systems to intercept this water.

Many experts agree that planting trees is often the most cost-effective strategy to addressing a number of environmental, economic and even social issues. What is so unique about tree-planting strategies is their multiple benefits. If trees are planted specifically to reduce energy use, they do not stop there. Trees pay us back in so many ways.

TreeVitalize, launched by the Pennsylvania Department of Conservation and Natural Resources, is a partnership working to restore tree cover in Southeastern Pennsylvania. This five-county region has lost millions of trees to development and old age. TreeVitalize aims to plant 20,000 shade trees in older neighborhoods, restore 1,000 acres of riparian buffer and educate 2,000 citizens over a four-year period. For more information or to volunteer with TreeVitalize, visit [www.TreeVitalize.net](http://www.TreeVitalize.net) or call (215) 988-8874.

## Additional Online Resources

**U.S. Forest Service, Trees Pay Us Back Program:**  
[www.na.fs.fed.us/Urban/TreesPayUsBack](http://www.na.fs.fed.us/Urban/TreesPayUsBack)

**Center for Urban Forest Research:**  
[www.fs.fed.us/psw/programs/cufr](http://www.fs.fed.us/psw/programs/cufr)

**Center for Urban Horticulture, University of Washington:**  
[www.cfr.Washington.edu/Research.EnvMind](http://www.cfr.Washington.edu/Research.EnvMind)

**TreeLink, An Urban Forestry Portal:**  
[www.TreeLink.org](http://www.TreeLink.org)

**Tree Benefit Estimator:**  
[www.AppaNet.org/Treeben/Calculate.asp](http://www.AppaNet.org/Treeben/Calculate.asp)

**American Forests:** [www.AmericanForests.org](http://www.AmericanForests.org)



## NJDEP Natural Capital Project

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Foundation of Morristown, New Jersey, and the William Penn Foundation of Philadelphia. I have had the privilege and challenge of serving as the manager of this project since its inception.

The project was designed to estimate the economic value of the ecosystem services and other economic benefits provided by New Jersey's natural capital (e.g., its forests, streams, and wetlands). The project also includes inanimate natural capital such as mineral deposits. Any healthy, functioning ecosystem provides multiple services to human beings, such as water and air purification, carbon sequestration, floodwater impoundment, and so forth. More traditionally recognized benefits include agricultural products, fish and shellfish, timber, etc.

The idea of viewing nature as a capital asset has been gaining currency among economists and others in recent years. The basic idea is simple: nature provides services to society that have economic value and would be very costly to replace with artificial substitutes, such as water treatment plants. In some cases, such substitutes may not even exist; for example, it is hard to imagine anything substituting for a forest as habitat for the animal species we care about. Whereas traditional accounting treats nature as a source of resources with no value until they are harvested, the natural capital approach reminds us that in economic terms, nature is an asset, and, like any asset, it provides value over an extended period — if we take good care of it.

The study employs a range of analytic techniques, including the "transfer" of results from prior studies, statistical analysis of the relationship between property values and environmental features, and creation of dynamic models to explore changes in ecosystem services over time and space. New Jersey's entire natural landscape is cov-

ered, including its estuaries and bays.

While some question the whole idea of assigning a dollar value to nature, those (including myself) who advocate this type of valuation research contend that in a society where "money talks," failure to estimate nature's economic value to us is the same as assigning it a value of zero. That makes it harder to justify foregoing the supposed benefits of development of the natural landscape. Like many, I do not think that economic factors alone should dictate environmental policy, but they should definitely be on the list of things to consider.

Even though the results of the study are not final yet, it is clear that the portions of New Jersey's natural capital that can be valued have an aggregate economic value of tens of billions of dollars annually, and hundreds of billions of dollars on a present-value basis. New Jersey's forests, wetlands and coastal areas appear to be especially valuable on a per-acre basis. The final results will be presented both as dollar amounts and as maps of aggregate "ecoservice" values at the watershed and subwatershed levels.

There are still many gaps in our knowledge of how ecosystems work, and therefore it is not possible yet (and may never be possible) to estimate the full economic value of our natural capital. For this reason, the study's results will only give us a lower bound on the total economic value of New Jersey's natural capital. Still, those of us involved with the project believe that its results will strengthen the case for aggressive environmental protection. I look forward to presenting our findings to you this fall.

For more information on the New Jersey Department of Environmental Protection's Natural Capital Project, please contact Bill Mates at (609) 292-7692 or [william.mates@dep.state.nj.us](mailto:william.mates@dep.state.nj.us).

# Water is of High Value in the Garden State



PHOTO CREDIT: NEW JERSEY FARM BUREAU

*By Pegi Adam, Publicist, New Jersey Farm Bureau*

In 1995, World Bank vice president Ismail Serageldin predicted an acute water shortage for the new millennium: “If the wars of this century were fought over oil, the wars of the next century will be fought over water,” he said. This certainly looms large as an issue in New Jersey, which has the highest population density in the country. This density results in pressure on its open land, especially from the two cities that bookend the state: New York and Philadelphia.

While the world’s population has tripled, water demand has sextupled. The United Nations and the United States government estimate that by 2015, at least 40 percent of the world’s population will lack an adequate water supply. The State of New Jersey is hardly immune as water is a highly valued asset used in agriculture, industry and housing, with all entities competing for a regulated supply. While much progress has been made in cleaning up the state’s polluted waterways, rainfall still reigns supreme when it comes to water resources.

The average market value for New Jersey real estate is one of the highest in the country at more than \$10,000 per acre according to the U.S. Department of Agriculture. Consequently, water is in demand statewide and this has led to controversial conservation programs, such as the Highlands Act in 2004, to protect the water supply in approximately 800,000 acres

of Northern New Jersey, and the earlier Pinelands Act, to protect water in Southern New Jersey. A water-supply master plan, “Water for the 21st Century,” calls for a comprehensive watershed-management plan for each of the state’s 20 watershed-management areas.

Of New Jersey’s 4.75 million acres, 17 percent — more than 820,000 acres — consists of agricultural land. About 12 percent throughout the state is irrigated, with a high proportion being in Southern New Jersey, where the largest tracts of high-value commercial crops are grown. As climate changes bring warmer weather and possibly higher sea levels and saline contents to New Jersey’s portion of the Delaware Estuary, the need will increase for deep-aquifer, fresh-water resources to provide irrigation.

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**With development on the rise in New Jersey, farmers are finding it more difficult to secure deep-aquifer, fresh-water resources for crop irrigation.**





## Environmental Stewardship

### Golden Eagle Members (\$2500 Donors)



### Agilent Technologies

#### Agilent Technologies

As a member of CESP, Agilent Technologies is interested in looking at its own property for ways to improve habitat and water quality. In the fall of 2005, employees worked to plant an underutilized site with native plants. This area will serve as a demonstration site that will help educate approximately 700 employees about the benefits of native plants.

Educational signage was installed in the spring. The project site is now an inviting area where employees can sit and eat lunch.



PHOTO CREDITS: PARTNERSHIP FOR THE DELAWARE ESTUARY

By Jenn Jones, Environmental Stewardship Coordinator

The Corporate Environmental Stewardship Program (CESP) provides businesses in the Delaware Estuary with an opportunity to take a leadership role in preserving their community's environmental well-being. Participating corporations quickly discover that sound ecological enhancement and economic savings are not mutually exclusive.

CESP provides corporations across the region with technical expertise to help



### Wheelabrator Gloucester

Wheelabrator sponsors a yearly Symposium for Environment and Education. The goal of the symposium is to create environmental and social awareness among today's youth, and to be an educational, rewarding, and fun experience. Similarly, each Wheelabrator-owned plant works with its local middle school to develop a project that deals with important environmental issues in its area. Wheelabrator Gloucester sponsors a group of seventh and eighth graders from West Deptford Middle School. This year, students chose to educate their community about fish-consumption advisories in their area.



# STEWARDSHIP PROGRAM

## Growing Among Corporations

them better manage and enhance their land through the use of native species and the restoration of natural habitat. The program not only helps to improve the environmental health of the Delaware Estuary, but also it increases employee morale and reduces property maintenance costs at participating sites.

For more information or to become a member of CESP, please call (800) 445-4935, extension 107.



### Logan Generating

Logan Generating continued restoration efforts on its 150-acre property along the Delaware River by restoring three acres of palustrine-emergent wetlands and upland habitat in 2004 and 2005. This project was a great success and the area is continuing to thrive. Plant employees, along with the U.S. Fish and Wildlife Service, further enhanced the area by adding more native trees and shrubs last spring. Future plans include a wetland planting and project expansion.





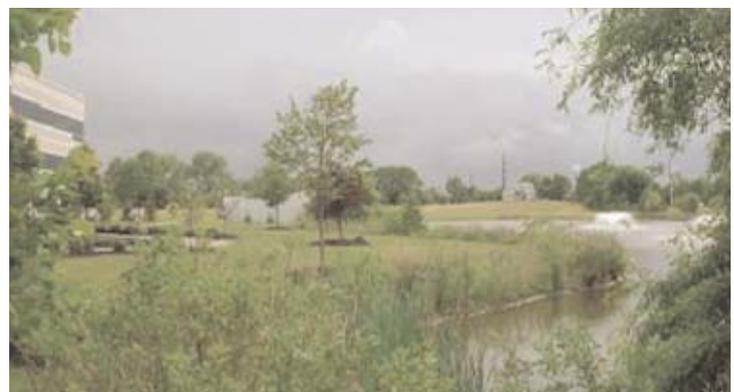
## McNeil CHC

McNeil CHC is continuing its efforts to educate the local community about reducing lawn sizes and using native plants to create habitat and reduce stormwater runoff. The company does this by sponsoring a planting at the Whitemarsh Township Building. The project began in 2005 and is supported by the Whitemarsh Township Environmental Advisory Board. A sign will be installed this year and a brochure, developed to encourage residents to use native plants in their home gardens, will be available in the lobby of the Township Building.



## Atlantic City Electric, a PHI Company

The retention basin at Atlantic City Electric's offices in Carney's Point, New Jersey, has been enhanced with native plants to create a buffer along the water's edge. Since the initial planting in 2004, employees have spent time in the spring and fall of each year weeding, planting and providing general upkeep on the project. Other sites belonging to Pepco Holdings, Inc., are also interested in participating in various environmental stewardship projects, including the installation of osprey platforms, native plantings to reduce stormwater runoff and environmental education.





## Noramco

Native plants were installed in place of mown grass at Noramco's site along the Christina River in Wilmington to reduce mowing and discourage Canada geese. Employees participated in two days of planting and were educated on the benefits of using native plants. The vegetation is doing so well that Noramco has decided to expand the planting to include even more mown areas at the site. A small rain garden is also being considered to further control stormwater runoff.



*Red-Tailed  
Hawk Members  
(\$500 Donors)*

## Mannington Mills



## Waste Management



## Wawa



## Wheelabrator Falls



# Water is of High Value in the Garden State

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David Friedman, director of Ocean County's Soil Conservation Service, has expressed his concern regarding the need for careful monitoring of the water supplies in his area.

"Development greatly affects the watershed here," Friedman said. "Development compacts soil so that water cannot readily percolate through it, and we're now seeing greatly increased flows in stormwater basins and saltwater intrusion in wells. Over-pumping of freshwater is responsible for shallow wells becoming contaminated by saltwater intrusion."

Over-pumping is greatly increased by tolerance concerning state development codes, permitting developers to build 50-unit or less housing complexes without securing water allocations. On the other hand, farmers in the region must file their water needs and secure allocations, many of which often get diminished.

Southern New Jersey's estuary region extends from Trenton to the tip of Cape May and includes portions of the following counties:

Atlantic, Camden, Cape May, Cumberland, Gloucester, Salem, and Burlington. The estuarial soils here are largely comprised of loose sands, soft clay and marl. The combination functions as a great aquifer, retaining billions of gallons of fresh water in subterranean aquifers that are hundreds of thousands of years old. Surface water is quickly replenished (or recharged); the deep aquifers take much longer to recharge. As long as the surface water is sufficient to provide enough recharge, the aquifers are safe. Historically, Southern New Jersey has not faced pressures on its water supply. However, with development increasing, the situation is changing.

Large agricultural tracts in Southern New Jersey are where the majority of high-value crops for the commercial market are grown. Nursery stock is now New Jersey's leading crop with a wholesale value of approximately \$343 million. There are 577 certified nurseries in this region, totaling almost 9,800 acres. Other Southern New Jersey

commercial crops include fruits (market value of \$94.8 million) and vegetables (market value of \$158 million). These normally require the support of regular irrigation systems. However, when rainfall is below normal, as it was during April and early May of this year, and the state's Department of Environmental Protection issues drought warnings, competition for water increases between developments and farms.

According to Gabor Grunstein, water specialist for the New Jersey Farm Bureau, it makes economic sense to irrigate high-value crops. But farmers cultivating these crops, especially in the Southern New Jersey estuary region, face increasing review of their water allocations.

"Agricultural water users must register their diversion privileges with the state Department of Environmental Protection and conform to allocation and reporting requirements in order to receive priority consideration," said Grunstein. "It's a fine plan that historically has enabled farmers to secure the water they need for

crop irrigation. But, with developers' ability to build complexes of 50 or less units, thus avoiding the need for allocations, the water supply for farmers is diminishing and coming under increased scrutiny."

Wesley Kline, a Rutgers Cooperative Extension agricultural agent in Cumberland County, added that the farmers do not receive any credit for their recharge from fields.

"Water-use allocations don't take field recharge into consideration," said Kline. "It's like all water that a grower applies to fields is lost, and everyone involved with agriculture knows that is not true. But farmers historically have not been good about fighting for water because they have had access without too much hassle. This is changing. If growers do not start being at the table every time water issues are discussed, they will lose. Farmers need to make sure that legislators and the general public all understand that water is essential if economically viable agriculture is to survive in New Jersey."

PHOTO: COURTESY NEW JERSEY FARM BUREAU





Once operational, the interpretive center will be a prime eco-tourist destination during the spring, when horseshoe crabs spawn and shorebirds migrate.

PHOTO CREDIT: PARTNERSHIP FOR THE DELAWARE ESTUARY

## INTERPRETIVE CENTER PLANNED AT SLAUGHTER BEACH

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

Delaware's Department of Natural Resources and Environmental Control (DNREC), DuPont, and the Public Service Enterprise Group have partnered and begun to renovate a bayside building near Slaughter Beach, Delaware, that is destined to become a unique environmental interpretive center. DuPont has committed \$500,000 toward the project, in addition to providing engineering and construction-management support. The company is also working with DNREC to identify donation opportunities for select DuPont products that will be incorporated into the building.

The purpose of this project is to create a tourism destination where visitors can observe, and not disturb, native wildlife, such

as spawning horseshoe crabs and the migrating shorebirds that feed upon their eggs every spring. Other plans include onsite programs, workshops, and interactive exhibits that will entertain and inform guests, as well as a boardwalk and pier for fishing and observation.

The interpretive center is located in one of Delaware's five community-based horseshoe crab sanctuaries and is currently scheduled to open during the spring of 2007. It will likely be staffed by a full-time manager and a combination of unpaid interns, docents, and volunteers. Planners have not yet determined whether the building will be open seasonally or year round.

Organizers predict that guests at the interpretive center will include

anglers, birders, photographers, beachcombers, school groups, tourists, and casual visitors. They also anticipate that travelers will visit from as far away as Kitsuki, Japan, a prospective "Sister City" to Slaughter Beach because of its status as a prime breeding ground for horseshoe crabs. The Ecological Resource and Development Group is currently working to bridge relations between the two towns in an effort to increase horseshoe crab conservation worldwide.

An open house also took place in May, allowing the public to view both the facility and migrating flocks of red knots and other shorebirds on the beaches of Mispillion Harbor.

"We believe the center will serve not only as an attractive site for

birdwatchers and eco-tourists, but it also will provide a valuable platform for supporting education and awareness about important environmental and ecological issues in the Estuary," said Jim Porter, chief engineer and vice president of DuPont Engineering and Operations. "We think this is a fantastic project and we're thrilled to be involved with DNREC in its development."

For more information, please contact Greg Smith, public affairs manager with DuPont, at (302) 992-4127 or [gregory.w.smith@usa.dupont.com](mailto:gregory.w.smith@usa.dupont.com). Interested parties can also contact Karen Bennett, program manager with DNREC's Division of Fish and Wildlife, at (302) 739-9124.





# Ecological Literacy: A National Education Imperative

By Dr. Danielle Kreeger, Science Director, Partnership for the Delaware Estuary

**E**nvironmental sciences have traditionally been given limited attention in schools' programming, being relegated as part of basic science and biology classes. Unless you have sought out knowledge regarding ecology or environmental topics on your own in upper-level or college courses, you most likely were never taught about ecological sustainability or the consequences of disrupting nature's many complex balancing acts.

Changes appear to be underway, however, in how we view our environmental curricula. Increasingly, environmental issues appear at the core of a host of emerging threats to our global economy and way of life. This comes as a result

of a natural world that is becoming increasingly unbalanced, combined with the depletion of the many limited resources on which we depend. Global warming represents one example of how unbalanced natural systems can take a toll on modern civilizations, linking ecology, economics and human well-being.

Today's children represent the first generation in the history of humankind to face an uncertain future because of the cumulative impact of our past environmental practices, which have emphasized human exploitation of natural resources rather than our living in balance with natural systems. At the risk of sounding alarmist, our children will be saddled with problems we can only begin to

imagine today, such as stabilizing world-population growth, replacing our energy base and repairing crucial, life-sustaining environmental services that we continue to degrade. Without success on all these challenges, global competition over natural resources is also likely to escalate hostilities among nations.

For all these reasons, the long-perceived tradeoff between environmental and economic health is certain to be replaced with a new paradigm: that a healthy, balanced ecosystem managed for sustainability is crucial for maintaining economic vigor, human health, and national security. To facilitate this necessary shift in public consciousness, all of us "in the know" have a moral obligation to step up our efforts to inform the public at all age and education levels.

Without sounding too sensationalistic, we must capitalize on the growing concern about global warming and other environmental hot topics. In our schools, environmental sciences can no longer take a back seat in educational programming. The basic concepts of "ecological literacy" should be taught along with the "three 'R's," from pre-kindergarten up. And at colleges and universities, all students should be given the tools to become "ecological thinkers" by broadening core liberal-arts coursework and translating basic environmental principles into economic and human-health terms.



Students participate in annual festivals like Southeastern Pennsylvania Coast Day where they have the opportunity to become more "eco-literate."

PHOTO CREDIT: PARTNERSHIP FOR THE DELAWARE ESTUARY

# ESTUARY EVENTS

## Experience the Estuary Celebration

**Tuesday, September 12, 2006**

**5 to 9 p.m.**

Hagley Museum and Library, Wilmington, Delaware

Last year, *Delaware Today* magazine called the Partnership for Delaware Estuary's annual dinner and reception "a hidden gem," and "the most creative fundraiser" its correspondent attends every fall. This year's 10th-anniversary event, "A Decade on the Delaware," will include a silent auction, exquisitely prepared food, Delaware Bay oysters, cocktails, live music, giveaways and so much more. For sponsorship and ticket information, please call Dee Ross at (800) 445-4935, extension 106.

## Park Fest 2006

**Saturday, September 16, 2006**

**7 a.m. to 4 p.m.**

Fairmount Water Works Interpretive Center, Philadelphia



Southeastern

Pennsylvania Coast Day has partnered with Fairmount Park's annual Walk/Run for the Park, and the Philadelphia Water Department's Philly Fun Fishing Fest, to bring you a trio of terrific events called Park Fest

For more information about ecological literacy, some basic references are:

*Ecological Literacy: Education and the Transition to a Postmodern World*, by David Orr (1991; ISBN: 0791408736)

*Ecological Literacy: Educating Our Children for a Sustainable World*, by Michael K. Stone (2005; ISBN: 1578051533)

The website for the Center for Ecoliteracy, [www.Ecoliteracy.org](http://www.Ecoliteracy.org), also offers some examples for broadening school programs.

2006. For more information on how you can "Fish, Run, Walk, Play Along the Schuylkill River All Day," please call (800) 445-4935 or visit [www.DelawareEstuary.org](http://www.DelawareEstuary.org).

## Coastal and Estuarine Shallow Water Science and Management Conference

**Monday, September 25, to Wednesday, September 27, 2006**

Holiday Inn Boardwalk, Atlantic City

The shallow-water zone is the area of maximum interaction between humans and critical biological resources. Based on the abstracts submitted, the theme for this year's conference will be the interrelationship between shallow-water habitats, water quality and adjacent land use. Although presentations in these areas will predominate, there are a host of other interesting topics as well. For more information and to reserve your spot, please visit [www.WetlandsWorkgroup.org/ShallowWater](http://www.WetlandsWorkgroup.org/ShallowWater).



## 30th Annual Delaware Coast Day

**Sunday, October 1, 2006**

**11 a.m. to 5 p.m.**

The University of Delaware's Hugh R. Sharp Campus in Lewes, Delaware

Whether you attend lectures and research demonstrations, browse the nautical craft show, or partake of the crab cake cook-off and seafood chowder challenge, there is lots to discover at Delaware's Coast Day. Kids will especially enjoy the ship tours, touch tanks and countless other activities. This award-winning event attracts upward of 10,000 visitors each year. Count yourself among them when you visit the Partnership for the Delaware Estuary's booth to sample and learn about Delaware Bay oysters. For more information on this free celebration, please call (302) 831-8083 or visit [www.ocean.udel.edu/coastday](http://www.ocean.udel.edu/coastday).



## Coast Day New Jersey

**Saturday, October 7,**

**11 a.m. to 4 p.m.**

Long Beach Island, New Jersey

**Sunday, October 8, 2006**

**11 a.m. to 4 p.m.**

Cape May, New Jersey

Exhibits, demonstrations, and various tours showcase New Jersey's commercial fishing industry every year at New Jersey's Coast Day. This popular festival is dedicated to increasing awareness and stewardship for the state's marine, coastal, and estuarine environments. Please call the New Jersey Marine Sciences Consortium at (732) 872-1300, extension 22, or visit [www.NJMSC.org](http://www.NJMSC.org) for additional information.

## 25th Annual International Submerged Lands Management Conference

**October 15-20, 2006**

Oyster Point Hotel, Red Bank, NJ

Join representatives from state, federal, and provincial governments, academia, industry, advocacy organizations and the general public to discuss management issues of submerged lands and resources. These include public trust rights in tidal waterways and on their shores, development that extends below the high or low water mark, and many other relevant coastal zone management and land use issues.

For more information, go to [http://www.nj.gov/dep/cmp/czm\\_25aislmc.html#Invitation](http://www.nj.gov/dep/cmp/czm_25aislmc.html#Invitation). Deadline for registration is September 15, 2006.

## HOLD THE DATE: 2007 Delaware Estuary Science Conference and Environmental Congress

**January 22 to 24, 2007**

Cape May, New Jersey

Stay tuned to the Partnership's website at [www.DelawareEstuary.org](http://www.DelawareEstuary.org) for more details.

